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ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
ONTARIO 1964

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*Regional Supervisors

FOREWORD

Heavy frosts prevailed in Ontario during the early part of the 1964 field season. Freezing temperatures in early June coincided with the development of foliage and caused extensive damage to the tender shoots of white spruce and balsam fir as well as foliage of oak and ash in a large part of the Province. Although it was difficult to determine the effect of this condition on bud and shoot insects generally, heavy mortality of the balsam shoot-boring sawfly may have been caused by these late frosts in several districts.

The forest tent caterpillar was the major defoliator of deciduous stands in 1964. The largest outbreak, located in the western part of the Province, inundated poplar stands in extensive areas in the Western Region and the western part of the Port Arthur District. Extremely heavy moth flights occurred in this vast area and around Black Sturgeon Lake in the Port Arthur District. Results from egg band surveys indicate that heavy infestations will persist in 1965 and spread eastward across most of the Port Arthur District. In the eastern part of the Province, much smaller elements of the outbreak persisted in the Sudbury, North Bay, Parry Sound, and Pembroke districts and new infestations were located near Blind River in the Sault Ste. Marie District, in Cambridge Township in the Kemptville District and in Medonte Township in the Lake Simcoe District.

Population levels of the spruce budworm and larch sawfly, two major pests of coniferous stands in Ontario for many years, were lower than at any time during at least the past decade. Pockets of medium-to-heavy and light infestation of the spruce budworm occurred on white spruce in the Uxbridge Forest in the Lake Simcoe District and on open-grown balsam fir and white spruce in Rawdon Township in the Tweed District. Defoliation by the larch sawfly was generally light in northern Ontario, but in southern Ontario pockets of heavy infestation persisted in numerous European larch plantations and moderate defoliation of tamarack occurred at scattered locations.

An increase in population levels of several plantation pests occurred in central and southern Ontario. Most noteworthy of these were the red-headed pine sawfly and the European pine sawfly. Insecticides and polyhedral viruses have been used to good effect against these insects in recent years. However, the existence of untended plantations in numerous areas continue to be focal points for the build-up and spread of infestations.

Forest Research Technicians devoted considerable time to instructing Junior Ranger and School Conservation groups on the role of insects and tree diseases in the forest community. They also participated in programs sponsored by Tree Growers in several districts. Many extension calls, involving the examination of plantations, woodlots and forested areas, were made throughout the Province. The maintenance of such services is highly desirable but major increases in these functions of the Survey may require careful weighing in relation to other important aspects of future work.

J. E. MacDonald

SOUTHEASTERN FOREST REGION

1964

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INTRODUCTION

Southeastern Forest Region

This report summarizes forest insect and tree disease conditions in the southeastern Forest Region in 1964. With the exception of the forest tent caterpillar which is dealt with on a regional basis, information on the status of insects is contained in the district section of the report. Tree diseases are dealt with regionally.

The forest tent caterpillar, European pine sawfly, red-headed pine sawfly and white pine weevil were the most noteworthy insects in 1964 in the region. Forest tent caterpillar infestations increased in extent and intensity in Pembroke District, in the northeastern part of Tweed District and in the eastern part of Kemptville District. The European pine sawfly extended its range eastward slightly in Lindsay District and population densities increased to a very high level in most instances. Populations of the red-headed pine sawfly persisted at approximately the same level as in 1963 in most of Kemptville District but increased in Pembroke, Lindsay and Tweed districts.

In 1963 infestations of the basswood looper, Erannis tiliaria (Harr.) occurred throughout the region. In 1964 these infestations subsided and no larvae were found in the region.

Forest disease surveys were again conducted throughout the region. A rust on hemlock cones, Melampsora abietis-canadensis Ludwig. ex Arth. was recorded for the first time in the region, increasing the previously known range eastward into Tweed District. The incidence and area of infection of Dutch elm disease increased in 1964, and the rate of tree mortality increased in the older areas of infection. Numerous checks for the fungus Fomes annosus (Fr.) Sacc. were made throughout the region but results were negative.

Insect and disease collections from all sources in the region in 1964 totalled 1,173. Twenty special collections were made for various research projects. Special studies were carried out on the biology of one insect and the host preferences of two others. The number of extension and service calls dealt with in 1964 was 73, a slight decline from 1963.

Wm. J. Miller

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The forest tent caterpillar was a forest defoliator of major importance in the Southeastern Forest Region in 1964. Population levels increased at all but four sample locations in the region. Three heavy infestations of 1963 located near Chalk River in Buchanan Township, Round Lake in Richards Township in Pembroke District, and around Halfway Lake in Radcliffe Township in Tweed District, coalesced to form a single large area of severe defoliation in 1964. Despite these increases, the total infested area was somewhat less than anticipated from egg surveys. For example infestations failed to materialize in Head and Dickens townships, where egg bands were observed in 1963.

Severe defoliation of 300 acres of trembling aspen was discovered in South Plantagenet Township in Prescott County in the Kemptville District. The light infestations observed on sugar maple trees in Chandos Township, Peterborough County and in Minden Township, Haliburton County in Lindsay District in 1963, declined in 1964 to very light intensity. Scattered colonies of larvae were observed in mixed hardwood stands in Cambridge, Torbolton and Nepean townships in the northern part of Kemptville District.

To assess mortality from parasitism and other causes in the cocoon stage, 100 cocoons from numerous locations were dissected. The results are shown in Table 1.

TABLE 1

Summary of Forest Tent Caterpillar Cocoon Dissections in the Southeastern Forest Region in 1963 and 1964

Location (township)	Per cent of cocoons Parasitised		Per cent of mortality other than parasitism in 1964	Per cent adult emergence in 1964
	1963	1964		
Alice	-	62	2	36
Bangor	-	48	2	50
Brudenell	-	53	0	45
Buchanan	62	58	0	42
Burns	59	63	0	37
Jones	49	59	2	39
Petawawa	-	41	0	59
Radcliffe	27	46	7	47
Richards	53	49	3	48
S.Plantagenet	-	9	0	91
Westmeath	27	43	3	54
Wilberforce	-	52	8	40

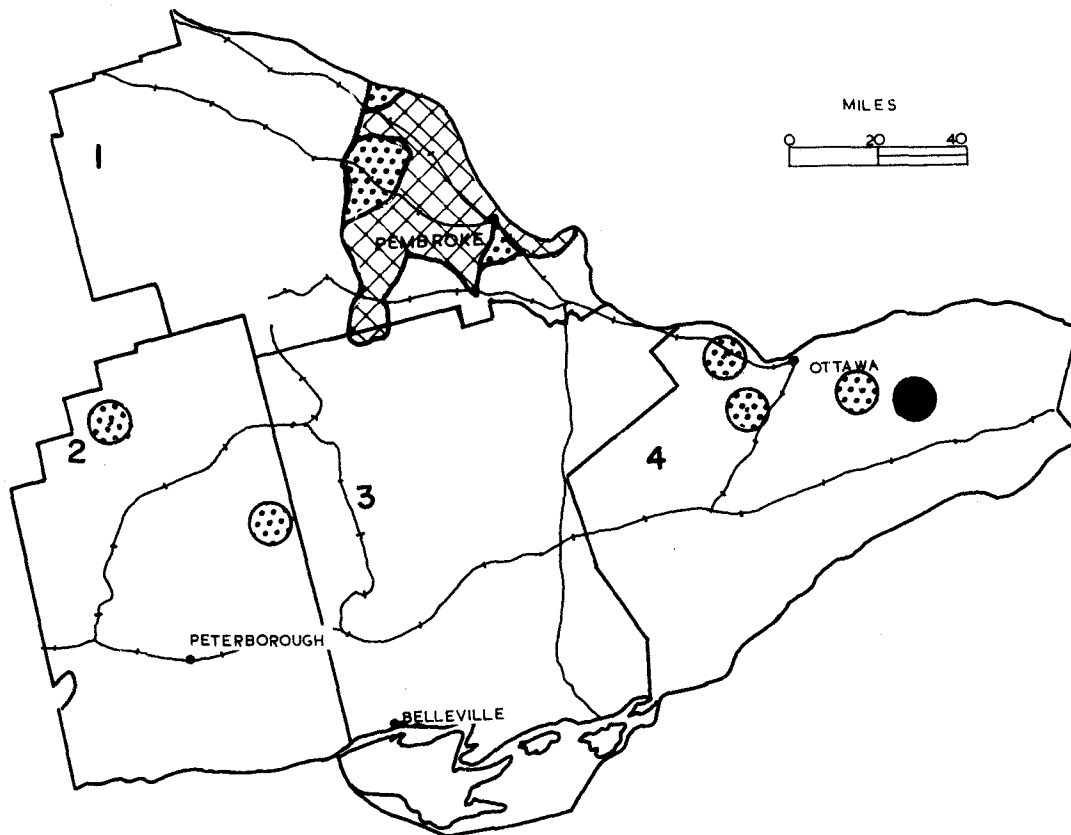
Egg band counts were made on three trees at 12 locations in the fall to forecast probable population trends in 1965. These surveys indicate that continued high larval populations will occur in most areas of 1964 infestation but little spread is expected. Negative counts, shown in the accompanying table, were obtained from locations outside the 1964 infestation. (Table 2).

TABLE 2

Summary of Forest Tent Caterpillar Egg Band Counts in the Southeastern Forest Region in 1963 and 1964.

Location (township)	Av.D.B.H. sample trees in inches	Av. No. of egg bands per tree		Forecast for 1965
		1963	1964	
Anglia	12	0	0	Nil
Buchanan	10	34.0	35.6	Heavy
Burns	10	22.3	54.6	Heavy
Cameron	5	0	0	Nil
Dickens	8	3.7	2.6	Light
Fraser	10	42.3	50.3	Heavy
Head	5	5.3	4.3	Moderate
Lyndock	6	0	0	Nil
Master	9	0	5.0	Moderate
Radcliffe	9	37.6	25.3	Heavy
Richards	10	27.3	29.6	Heavy
S. Plantagenet	3	-	3.0	Moderate
Stratton	4	0	0	Nil
Westmeath	5	4.0	10.6	Heavy
White	10	-	0	Nil

SOUTHEASTERN FOREST REGION







DISTRICTS

- 1 PEMBROKE
- 2 LINDSAY
- 3 TWEED
- 4 KEMPTVILLE

FOREST TENT CATERPILLAR

Areas in which defoliation occurred in 1964

Legend

- Light defoliation.....  or 
- Moderate to severe defoliation.....  or 

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

The Dutch elm disease is known to occur throughout the entire Southeastern forest region. Incidence of the disease increased in the northern half of the region in 1964 over that of 1963. In the southern half of the region the incidence remained at the same high level that has persisted for several years.

Mortality of elms caused by the Dutch elm disease was relatively light in the northern half of the region, while in the southern half, mortality was higher (Table 3). The highest mortality recorded in mortality sample plots occurred in Clarke, Hamilton and Cramahe townships where the disease has persisted for the past eight years. These high mortality figures may reflect the lack of sanitation measures in these areas as opposed to the practice of cutting out dead trees in some of the older areas of disease attack.

TABLE 3

Summary of the Occurrence of the Dutch Elm Disease and of the Mortality to Elm Trees Caused by the Disease in the Southeastern Region in 1964

Location (township)	No. of trees examined	Per cent of trees diseased	Per cent of trees dead
Minden	50	10	16
Stanhope	50	14	16
Ennismore	50	10	6
Clarke	50	12	66
Hamilton	50	14	60
Cramahe	50	12	38
Ameliasburgh	100	2	10
Marysburgh	100	6	24
Thurlow	100	2	4
Madoc	50	12	20
Tudor	50	6	18
W. Hawkesbury	50	2	0
Drummond	50	8	2
Augusta	50	10	4
Goulbourn	50	2	2
Westmeath	59	25	22
N. Algona	62	2	1
Buchanan	93	2	2

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

Incidence of the ink spot of aspen was more common in the Southeastern Region in 1964 than it was in 1963. Patches of heavy infection were widespread and the amounts of damage to foliage was, in many instances, severe. The heaviest patches of infection were in Lindsay District where 95 per cent of the aspen trees in Cavendish Township were infected, 90 per cent in Lutterworth Township, and 100 per cent in Darlington Township. The amount of damaged foliage per tree in the above instances varied from 35 to 90 per cent. Small patches of light and medium infection were common in the rest of the region.

A Microcyclic Pine Needle Rust, Coleosporium pinicola (Arth.) Arth.

Currently this pine needle rust is known to occur only along the Ottawa River Valley, in Ontario. In 1964 there was an increase in area and in the number of trees infected in Clara and Petawawa townships in Pembroke District and in McNab Township in Tweed District. Severity of infection decreased in both Clara and Petawawa townships, while in McNab Township the incidence of infection was 3.2 per cent and the severity of infection was 10 per cent.

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

Small patches of heavy infection caused by the white pine blister rust were common at scattered locations in Pembroke and Tweed districts in 1964. Quantitative samples revealed that 14 and 46 per cent of the white pine trees were infected in plantations in Wilkes and Stafford townships Pembroke District, and 44 per cent were infected in McNab Township, Tweed District. Small patches of light infection occurred throughout the rest of the Southeastern Region.

A mortality check of white pine killed by the blister rust in a plantation in Westmeath Township, Pembroke District, revealed that 30 per cent of the trees were dead.

Hypoxylon Canker of Poplar, Hypoxylon pruinaum (Klotsche) Cke.

Small patches of heavy cankering of trembling aspen caused by Hypoxylon canker occurred at widely separated locations in the Southeastern Region in 1964. In Fitzgerald and Frazer townships in Pembroke District 29 and 45 per cent respectively, of the trees examined were infected with cankers. In Clarke Township, Lindsay District, 50 per cent of the trees checked were cankered and 20 per cent of the stems in the clone were dead. All the dead trees bore old cankers. Numerous cankered trees were noted in Bagot Township, Tweed District. Small patches of light infection were common in the rest of the region.

A Hemlock Cone Rust, Melampsora abietis-canadensis Ludwig ex Arth.

This rust of hemlock cones was found in small amounts throughout Lindsay District and in the southeastern part of Tweed District in 1964. In most instances there was less than 0.5 per cent of the hemlock cones infected. The one exception was in Laxton Township, Victoria County where approximately 2 per cent of the cones on a few trees at one location were infected.

Shoot Blight of Trembling Aspen, Pollaccia radiosa (Lib.) Bald & Gif.

A small area of heavy infection caused by this shoot blight occurred on trembling aspen reproduction along approximately one mile of hydro line right-of-way in Anstruther Township, Peterborough County. Approximately 90 per cent of the aspen along the right-of-way were infected and approximately 75 per cent of the shoots per tree were infected. A medium infection occurred in Airy Township where 18 per cent of the young aspen in a small area were infected. Small amounts of the shoot blight were noted on aspen throughout the rest of the Southeastern Region.

Frost Injury

Late severe frosts in the spring damaged foliage throughout all of the Southeastern Forest Region in 1964. The tree species most severely damaged were: balsam fir, spruce, black ash and sugar maple. Most other species were damaged to a lesser degree. In many instances, all of the current year's growth on spruce and balsam fir was killed. This condition was most noticeable on trees growing in low lying areas (see photograph).

Maple Dieback

Dead and dying maple trees were observed at scattered locations throughout the Southeastern region. In 1964, the incidence of this disease remained at the same low level as in 1963. Usually trees affected occurred along roadsides and either singly or in groups.

Wetwood of Elm

A small area of heavy incidence of this disease occurs on Chinese elm in the City of Lindsay. The disease is common in small amounts on native elm and to a lesser degree on other hardwoods in the rest of the region.

This disease is caused by the bacterium Erwinia nimipressuralis. It occurs in many genera of trees, including elm, maple, mulberry, oak, poplar, and willow. It is more widespread and causes more injury in elm than in any other tree. Asiatic elms are unusually susceptible to wetwood.

TABLE 4

Other Noteworthy Diseases in the Southeastern Region in 1964.

Organism	Host(s)	Remarks
<i>Arceuthobium pusillum</i> Pk.	bS	High incidence of this organism in Faraday and Chandos townships and low incidence in Outlet Park, Prince Edward County.
<i>Armillaria mellea</i> (Fr.) Kummer	jP,rP	Small patches of light infection occurred throughout the region.
<i>Coccomycetes hiemalis</i> Higgins	pCh	Light infections in the LaRose Forest in Cambridge Township.
<i>Cytospora chrysoperma</i> (Pers.) Fr.	W,bPo, tA	Occasional infections on various hosts in Snowdon, Fraser and Westmeath townships.
<i>Dibotryon morbosum</i> (Schw.) Theiss. & Syd	pCh	Heavy infections in pockets of Cherry in Eyre and Clara townships.
<i>Eutypella parasitica</i> Davidson & Lorenz	sM	Low incidence at two locations in Dalton Township Lindsay District

TABLE 4

Organism		Remarks
Gloeosporium spp.	sM, pCh, wB, Ba	Heavy infections occurred in the eastern part of Prince Edward County. Light infections occurred in Bangor, Manvers, Sherborne and Havelock townships.
Needle Blight	wP	This condition was particularly severe in the greatest part of Lindsay District. Small amounts were common in the rest of the region.
Peridermium sp.	jP, scP	Low numbers found in Lindsay, Tweed and Pembroke districts.
Polyporus versicolor L.exFr.	wS	Commonly found on stumps in the Flinton Forest.
Pollaccia elegans Serv.	bPo	Light infections in the tree nursery at Kemptville.
Puccinia extensicola var hydnocida (Berk & Curt.) Arth.	Leatherwood	This rust was common on understory shrubs in most of Lindsay District.
Rhizina inflata (Schaff.) Sacc.	ground	Fruiting bodies numerous in burnt over areas in the County Forest in Clarke Township.
Rhytisma acerinum Pers. ex Fr.	siM, rM	Infection of this tar spot heavy in Buchanan Township. Light in Radcliffe Township.
Rhytisma salicinum Pers. ex Fr.	W	Light infections in the tree nursery at Kemptville.

STATUS OF INSECTS IN LINDSAY DISTRICT

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Larch Casebearer	<u>Coleophora laricella</u> Hbn.	A 9
Lace Bugs	<u>Corythucha</u> spp.	A 9
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Wm. J. Miller

STATUS OF INSECTS

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

Infestations of these leaf miners declined in both area and population density in 1964 compared with 1963. Heavy infestations occurred in a belt averaging 20 miles in width across the central part of the south half of Lindsay District. Small pockets of light and medium infestation occurred in the rest of the southern half of the district, while small areas of light infestation were common in the northern half of the district.

The species most frequently found in 1964 were Argyresthia thuiella Pack., A. aureoargentella Brower, and Pulicalvaria thujaella Kft.

Larch Casebearer, Coleophora laricella Hbn.

Populations of this casebearer remained at a low level in tamarack stands in the district in 1964. Larval counts at permanent sample points showed a decline in numbers at all locations but one where a slight increase occurred (Table 5).

TABLE 5

Summary of Larch Casebearer Counts in the Lindsay District
in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of larvae per 18-inch branch tip	
		1963	1964
Anson	6	2.0	0.1
Asphodel	7	3.0	0.6
Cardiff	6	1.0	0.1
Dysart	8	0.7	0.1
Galway	7	1.0	0.0
Haldimand	9	0.2	0.2
Hamilton	6	3.9	6.9
Harvey	5	1.4	0.0
Minden	9	1.8	0.0
Snowdon	6	0.5	0.0
Somerville	7	3.7	0.1
Stanhope	8	1.2	1.0

Lace Bugs, Corythucha spp.

Small patches of heavy infestation of lace bugs occurred on oak, elm, butternut, white birch, black cherry and mountain ash, at eight widely-scattered locations in the district. Pockets of light infestation were common on most species of deciduous trees.

The lace bugs collected most frequently were: Corythucha ulmi O. & D., Corythucha elegans Drake, and Corythucha pergandei Heidmann.

Nursery Pine Sawfly, Diprion frutetorum (F.)

Populations of this sawfly persisted at a low level on Scots pine throughout the district in 1964. The numbers of insects collected in beating tray samples increased in most instances (Table 6).

TABLE 6

Summary of Nursery Pine Sawfly Larval Counts
Taken in Lindsay District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Burleigh	3	12	20
Cartwright	3	14	40
Clarke	2	30	40
Cramahe	3	-	12
Darlington	3	22	30
Fenelon	3	6	17
Haldimand	3	10	8
Hope	2	8	20
Manvers	2	14	17
Snowdon	2	7	0
Somerville	3	1	0

European Spruce Sawfly, Diprion hercyniae (Htg.)

Very low populations of this sawfly occurred throughout the district in 1964. Larvae were found on white, black, red and Norway spruce. Larval counts made on white spruce in September, showed little change compared with 1963 (Table 7).

TABLE 7

Summary of European Spruce Sawfly Larval Counts
in Lindsay District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Carden	14	0	0
Cardiff	8	2	4
Cartwright	8	0	14
Galway	15	20	6
Havelock	8	0	12
Laxton	16	25	11
Sherborne	9	10	8
Snowdon	8	5	6
Somerville	12	10	12
Stanhope	10	5	9

Introduced Pine Sawfly, Diprion similis (Htg.)

Very low populations continued on Scots pine in Cartwright, Clarke, and Manvers townships in Durham County and at one location in the southern part of Fenelon Township in Victoria County (Table 8). There was no significant increase in population levels or in the area of infestation in 1964.

TABLE 8

Summary of Introduced Pine Sawfly Larval Counts
in Lindsay District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Cartwright	5	30	18
Clarke	4	0	1
Manvers	4	5	13
Fenelon	3	10	3

White-pine Shoot Borer, Eucosma gloriola Heinr.

Heavy infestations of the white-pine shoot borer occurred in white and Scots pine in several small plantations in Brighton Township, Northumberland County. Light infestations were observed in Scots and red pine in Darlington Township, Durham County and in Emily Township, Victoria County. Small numbers of the insect occurred in scattered plantations in the rest of the district.

A quantitative sample taken in a white pine plantation in Brighton Township, showed that 100 per cent of the trees were infested with an average of 2 infested shoots per tree. Samples taken in plantations in the Durham, Ganaraska and Northumberland forests were very low or negative. It is probable that the closing of the crowns of the trees in these plantations limited its attack.

Birch Leaf Miner, Fenusa pusilla (Lep.)

Heavy infestations of the birch leaf miner occurred in scattered clumps of young white birch in Clarke Township, Durham County; Fenelon Township, Victoria County and in Hindon, Harburn and Bruton townships, Haliburton County. Very light infestations were common in the rest of the district. Except in Harburn Township, populations were low at all permanent sample points (Table 9).

TABLE 9

Summary of Birch Leaf Miner Damage in Lindsay District
in 1963 and 1964

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

Location (township)	Per cent of leaves mined		Total no. of mines	
	1963	1964	1963	1964
Brighton	8	5	12	8
Clarke	11	6	44	10
Eyre	4	2	8	6
Harburn	2	50	4	151
Havelock	2	4	5	9

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Small patches of light-to-medium infestation of this caterpillar occurred at scattered locations in the district in 1964. Tents of the caterpillar were numerous in clumps of roadside cherry trees at a few locations in the district. Populations were, in general, the same as in 1963, with slight increases in numbers recorded in Harvey and Snowdon townships (Table 10).

TABLE 10

Summary of Eastern Tent Caterpillar Colony Counts
in Lindsay District in 1963 and 1964

Location (township)	No. of tents observed per mile of roadside	
	1963	1964
Glamorgan	2	1
Guilford	2	1
Harvey	47	58
Lutterworth	46	42
Manvers	0	0
Minden	92	38
Percy	3	2
Snowdon	10	23

Cedar Sawfly, Monoctenus juniperinus MacG.

Light infestations of this sawfly persisted on white cedar throughout the district in 1964. Populations increased at almost all permanent sample points compared with 1963. The highest number occurred in Chandos Township, Peterborough County where 65 larvae per sample were recorded (Table 11).

TABLE 11

Summary of Cedar Sawfly Larval Counts Taken from White Cedar
in Lindsay District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Anson	4	0	9
Carden	4	2	2
Hindon	5	1	10
Laxton	5	0	5
Somerville	5	1	8
Verulam	5	3	16
Chandos	5	-	65
Ops	7	0	17

Balsam-fir Sawfly, Neodiprion abietis complex

Very light infestations of this sawfly occurred in small clumps of balsam-fir trees at one location in Cardiff Township and at one location in Monmouth Township, both in Haliburton County. Quantitative samples taken at permanent sample points decreased except at one location in Monmouth Township where an insignificant increase in the number of colonies per tree occurred (Table 12).

TABLE 12

Summary of Balsam-fir Sawfly Colony Counts
in the Lindsay District in 1963 and 1964

Note: Counts were based on the examination of ten balsam-fir trees at each location.

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of colonies per tree	
		1963	1964
Cardiff	7	6.0	3.0
Guilford	9	0.0	0.0
Monmouth	7	0.3	2.7
Somerville	5	5.0	0.0

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Heavy infestations of the red-headed pine sawfly occurred in approximately five acres of a red pine plantation, in six small clumps of roadside red pine in Guilford Township, and in approximately 50 acres of scattered red pine plantations in the southeastern corner of Glamorgan Township, all in Haliburton County. Heavy infestations also occurred in a 20-acre plantation of red pine and on scattered roadside trees in Snowdon Township, Victoria County.

Small numbers of colonies were found on red and jack pine trees at scattered locations in all counties in Lindsay District except Durham County. Quantitative samples taken at permanent sample points outside the areas of heavy infestation were low, the highest being one colony per tree on seven of 100 trees examined.

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

A small heavy infestation of N. pratti banksianae persisted in a 1-acre, jack pine plantation in Dalton Township, Victoria County. A quantitative sample at this location revealed that 100 per cent of the trees were infested with an average of 7.4 colonies per tree. Defoliation of infested trees was in excess of 50 per cent of the total foliage. Light infestations occurred in clumps of jack pine trees in Carden and Chandos townships. At these two locations only small numbers of trees were infested and defoliation was less than 5 per cent.

Small patches of heavy infestation of N. pratti paradoxicus occurred in one jack pine plantation in Burleigh Township and in Belmont Township, both in Peterborough County. In Belmont Township 100 per cent of the jack pine trees in a roadside plantation approximately 25 feet high were infested by over 25 colonies per tree. Defoliation at this location was in excess of 50 per cent of the total foliage. Light infestations were found on small numbers of jack pine trees in Belmont and Chandos townships.

In Chandos Township, colonies of both N. pratti banksianae and N. pratti paradoxicus were found feeding on the same trees. However, no intermingling of colonies of the two species was observed.

European Pine Sawfly, Neodiprion sertifer (Geoff.)

Heavy infestations of this introduced pine sawfly occurred throughout most of Darlington Township, half of Cartwright Township and the western one-third of Clarke Township, all in Durham County. The infestation advanced eastward approximately two miles in the vicinity of Orono, and about six miles along the northern boundary of Clarke Township (see map).

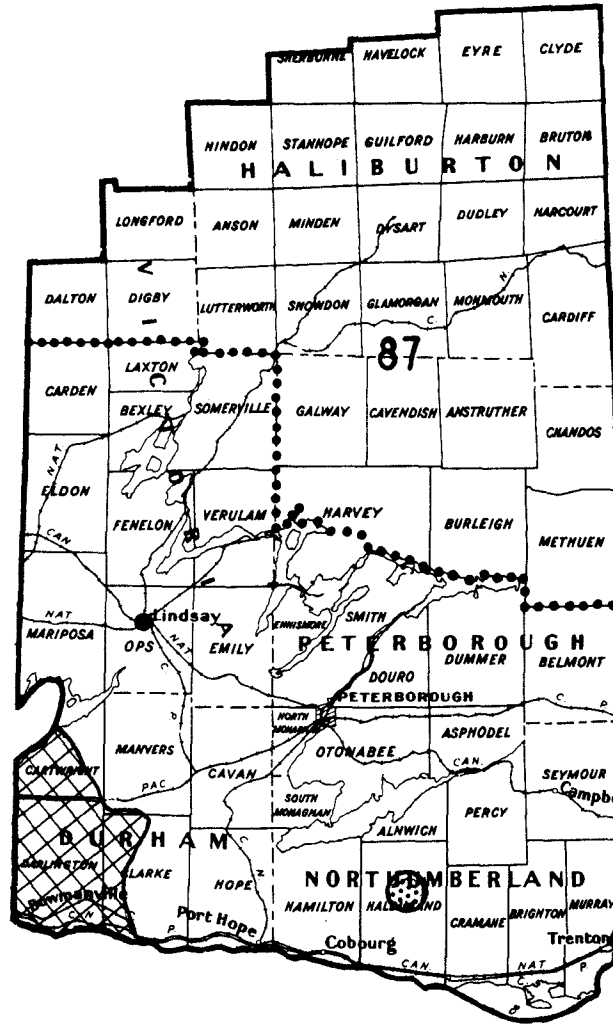
Larval populations within the area of infestation were very high, particularly in Scots pine plantations in Darlington and Cartwright townships where 852 larval colonies per 100 trees were counted at one location (Table 13).

North of Centreton in Haldimand Township a small, light infestation persisted and increased in size from an area of 40 acres in 1963 to approximately 100 acres in 1964.

Efforts to control the insect using insecticides were very successful in most instances. Checks made in many of the plantations following spraying revealed that most of the larvae had been killed before severe defoliation occurred (see photograph). In one case quantitative sampling indicated over 8 colonies of sawfly larvae per tree prior to spraying, whereas, none were found seven days after the control operation. These control programs are usually highly successful and defoliation is kept to a minimum in treated plantations. However, failure to control the insect in adjacent plantations, hedgerows, and ornamentals, usually results in reinfestation in succeeding years.

Use of a polyhedral virus has also been successful in effecting control of this sawfly. The disease is selective inasmuch as it only infects the

LINDSAY DISTRICT



EUROPEAN PINE SAWFLY

Areas in which infestations occurred in 1964

Legend

Light infestation.....



Heavy infestation.....



European pine sawfly. Very small amounts of the virus mixed with water and sprayed in the infested plantations is capable of spreading and reducing populations of the sawfly to a very low level. If used when the larvae are small mortality results in approximately two weeks from the time virus sprays are applied (see photograph). However, the insect stops feeding before death occurs.

TABLE 13

Summary of European Pine Sawfly Colony Counts
in Lindsay District in 1963 and 1964

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

Location (township)	No. trees infested		Total no. colonies	
	1963	1964	1963	1964
Clarke	35	40	60	55
Darlington	30	50	45	250
Haldimand	15	1	15	1
Cartwright	20	98	25	852

Northern Pine Weevil, Pissodes approximatus Hopk.

Heavy infestations of this weevil occurred throughout most of Durham County and the western part of Northumberland County. In these areas considerable damage was done to young white and Scots pine by adult weevils feeding on the bark of twigs, causing reddening of the foliage and mortality of twigs and branches.

Thinning of plantations and cutting of Christmas tree crops in Durham and Northumberland counties left considerable quantities of slash and stumps to serve as brood material for the weevils, thus contributing greatly to the population buildup.

The northern pine weevil overwinters as either an adult or a larva. The overwintering adult population is most important in invading the stumps and slash of the previous fall's harvest. The overwintering adults become active in late April and early May, and after one or two weeks of intensive feeding on the bark of twigs and small branches of healthy pines they lay eggs in the upper part of stumps of trees cut the previous fall as well as in slash and in the trunks of decadent or dying trees. Most of the adults resulting from these eggs emerge in August and September and after feeding on healthy pines until cold weather sets in, overwinter in the soil.

White-pine Weevil, Pissodes strobi (Peck)

Heavy infestations of this weevil occurred in small, white pine plantations in Harvey, Guilford and Chandos townships, and in one acre of Scots pine in Dalton Township. Medium infestations occurred in a 1-acre plantation of mixed pine in Guilford Township. Small numbers of white, Scots, and red pine and Norway spruce were infested in the rest of the district. In 1964 there were more red and Scots pine infested than had been noted in other years. Population levels at permanent sample points in 1964 were low, varying from two per cent of the trees infested in Stanhope Township to ten per cent in Dalton Township.

Larch Sawfly, Pristiphora erichsonii (Htg.)

In general, populations of the larch sawfly were lower in Lindsay District in 1964 than in 1963. This decline in population levels has occurred for the past five years.

A heavy infestation persisted in a mature European larch plantation of approximately 20 acres in Haldimand Township, Northumberland County, and on a few small tamarack in Lutterworth Township, Victoria County. A medium infestation persisted in a small patch of tamarack in Harvey Township, Peterborough County. Light infestations were common in tamarack stands throughout Haliburton County and at one location in Cartwright and in Manvers Township in Durham County.

European Pine Shoot Moth, Rhyacionia buoliana (Schiff)

A heavy infestation of this shoot moth occurred in approximately two acres of a red pine plantation in Cramahe Township, Northumberland County. In August 100 per cent of the trees examined were infested and 87 per cent of the bud clusters examined contained larvae which constitute the overwintering population. Medium infestations persisted on roadside Scots and red pine along roads and highways in Darlington and Clarke townships, Durham County. Light infestations occurred on some Scots pine in Presq'ile Provincial Park near Brighton, Northumberland County.

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

Populations of the smaller European elm bark beetle, Scolytus multistriatus (Marsh.) persisted at the same heavy level in 1964 as in 1963, but the area of known distribution advanced northward approximately eight miles in Cartwright and Manvers townships, Durham County, and through Percy Township northward into the southern part of Asphodel Township in Peterborough County.

Populations of the native elm bark beetle, Hylurgopinus rufipes Eich. persisted at a high level on dead elm throughout the district. They were most abundant in the southern half of the district in areas infested by smaller European elm bark beetles.

Heavy populations of these two beetles were associated with areas of heavy elm tree mortality caused by persistent infections of the Dutch elm disease over a period of six years.

TABLE 14

Summary of Miscellaneous Insects Collected
in Lindsay District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Adelges abietis</i> Linn.	S	Two acres of heavy infestation in Manvers Tp. Light in Monmouth Tp. (2)

TABLE 14, Lindsay District

Insect	Host(s)	Remarks
<i>Adelges strobilobius</i> Kalt.	bS	Calls heavy on all bS around the shores of Kennisis Lake in Have-lock Tp.
<i>Agonopterix robinella</i> Pack.	Lo	Heavy in a small area in Clarke Tp.
<i>Aphrophora paralella</i> Say	scP	Light and medium infestations occurred in small patches in Garden, Darlington, Haldimand, and Snowdon tps. (4)
<i>Archips cerasivoranus</i> Fitch	cCh	Heavy at one spot in Haldimand Tp. Light in the rest of the district (6)
<i>Archips fervidana</i> Clem.	rO	Light at one location in Haldimand Tp.
<i>Baliosus ruber</i> Web.	Ba	Heavy infestation persisted on all basswood in the Curve Lake Indian Reserve in Smith Tp.
<i>Chrysopeleia ostryaella</i> Cham.	I	Heavy in small areas of Hope Tp. Light in the rest of the district (2)
<i>Corthylus punctatissimus</i> (Zimm.)	sM	Heavy in 100-acre woodlot in Otonabee Tp. 75 per cent of maple regeneration killed. Light in Sherborne and Minden tps. (3)
<i>Datana ministra</i> Dru.	Ba	Small numbers in Manvers Tp.
<i>Ecdytolopha insiticiiana</i> Zell.	Lo	Heavy in Haldimand, Cramahe, and Burleigh tps. Small amounts in the Provincial Nursery at Orono (4)
<i>Elaphidion parallelum</i> Newm.	rO	Small amounts of damaged branches on oaks in Brighton Tp.
<i>Eriophyes fraxiniflora</i> Felt	wAs	Mites were numerous in a plantation of white ash in the Provincial Nursery at Orono
Eriophyidae on wP	wP	Numerous on white pine regeneration in the Ganaraska and the Durham forests
<i>Exoteleia dodecella</i> Linn.	scP	Small numbers in Darlington and Cartwright tps. (2)
<i>Fenusa ulmi</i> Sund.	E	Heavy infestations in the town of Cobourg. Small numbers in Minden Tp. (2)

TABLE 14, Lindsay District

Insect	Host(s)	Remarks
<i>Gracillaria cuculipennella</i> Hbn.	wAs	Light in one compartment in the Provincial Nursery at Orono
<i>Gretchena delicatana</i> Heinr.	I	Heavy infestation in a small area in Stanhope Tp. Light infestations were common in the rest of the district (6)
<i>Hyphantria cunea</i> Dru.	wAs	Populations dropped to a very low level in 1964. In Harvey Tp. the count of tents per mile of road-side dropped from 881 in 1963 to 2 in 1964
<i>Hylobius congener</i> D.T.	scP	Small numbers found in beating tray samples in Cartwright Tp.
<i>Hylobius pales</i> Hbst.	scP	Numerous adults found in beating tray samples in Cartwright, Manvers and Fenelon tps. (3)
<i>Ips pini</i> Say	wP	Beetles numerous under the bark of wP logs on skidways in Methuen, Bruton, Glamorgan and Verulam tps. (4)
<i>Janus abbreviatus</i> (Say)	tA, W	Small numbers found in Sherborne and Longford tps. (3)
<i>Lambdina fiscellaria</i> (Guen)	bF	Small numbers found in tray samples in Somerville Tp. (2)
<i>Lithocolletis hamadryadella</i> Clem.	wO	Heavy infestation in a woodlot of approximately 200 acres in Hamilton Tp. (2)
<i>Lithocolletis ostensackenella</i> Fitch	Lo	Small numbers on hedge trees in the Provincial Nursery at Orono. Numerous at one location in Burleigh Tp. (2)
<i>Lithocolletis ostryarella</i> Cham.	I	Small patches of light infestation in Haldimand Tp.
<i>Monoctenus juniperinus</i> MacG.	eC	Light infestation throughout the district (5)
<i>Nematus limbatus</i> Cress.	W	Light infestations on willows in Harburn, Havelock and Stanhope tps. (3)
<i>Nematus</i> sp.	Po	Light infestations in most of the district. The highest quantitative sample recorded was 12% of the poplar leaves infested. This was in Harburn Tp.

TABLE 14, Lindsay District

Insect	Host(s)	Remarks
<i>Neodiprion nanulus nanulus</i> Schedl.	rP	Light infestation on roadside trees in Belmont Tp.
<i>Neodiprion pinetum</i> (Nort.)	wP	Light infestation in 100 acres of white pine in Minden Tp.
<i>Nepytia canosaria</i> Wlk.	bF	Small numbers in beating tray samples in Sommerville and Minden tps. (2)
<i>Nymphalis antiopa</i> Linn.	E	Small numbers on elms in Glamorgan and Fenelon tps (2)
<i>Paleacrita vernata</i> Peck	E	Small patches of heavy infestation on elms in Chandos, Glamorgan and Digby tps. (3)
<i>Paraclemensia acerifoliella</i> Fitch	sM	Light infestation on a small number of trees in Hope Tp.
<i>Parectopa robiniella</i> Clem.	Lo	Numerous mines on locust foliage in a small area in Burleigh Tp.
<i>Petrova albicapitana</i> Busck.	jP	Very small numbers found in the district
<i>Pikonema alaskensis</i> (Roh.)	wS	Heavy in small patches of young white spruce at scattered locations throughout the district (6)
<i>Pineus floccus</i> Patch	bS	Galls numerous on black spruce around the shores of Kennisis Lake, Havelock Tp.
<i>Pineus similis</i> Gill.	rS	Heavy in a small area of Eyre Tp.
<i>Plagiodera versicolora</i> Laich.	W	Heavy on willows in parts of Hope and Clarke tps.
<i>Pleroneura borealis</i> Felt	bF	Light to medium infestations in Clyde, Mornmouth, Minden and Stanhope tps.
<i>Pristiphora geniculata</i> (Htg.)	Mo	Populations declined to a very low level in the district in 1964
<i>Psyllopsis fraxinicola</i> Foerster	wAs	Aphids numerous in a plantation of white ash at the Provincial Nursery at Orono
<i>Schizura concinna</i> A. & S.	Apple	Small numbers in Cramahe and Manvers tps. (2)
<i>Schizolachnus piniradiatae</i> (Dav.)	rP	Small numbers on red pine throughout the district
<i>Sternochetus lapathi</i> (Linn.)	W	One tree heavily infested in Lutterworth Tp.
<i>Thera juniperata</i> L.	J	Light infestation on junipers near Bobcageon in Harvey Tp.

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STATUS OF INSECTS

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

Heavy infestations of cedar leaf miners persisted on white cedar in virtually the same area as in 1963. A belt of infestation between 20 and 30 miles in width extended across the south central parts of Hastings, Lennox and Addington counties and across the central part of Frontenac County. Defoliation was severe in most cedar stands, and a thinning of the crowns was noticeable by mid-summer.

As in previous years the leaf miners occurring most frequently in 1964 were; Argyresthia thuiella Pack., Argyresthia aureoargentella Brower, and Pulicalvaria thujaella Kft.

A Miner on Ironwood, Chrysopelia ostryaella Cham.

Heavy infestations of this leaf miner on ironwood occurred for the second consecutive year in Olden, Oso, Kaladar, Kennebec and Sheffield townships. Light infestations were observed in woodlots east of Hinchinbrooke Village. Widespread pockets of light infestations occurred in Hastings County (see photograph).

Larch Casebearer, Coleophora laricella Hbn.

Light infestations of this insect have persisted in tamarack stands for the past ten years throughout the district. Quantitative samples taken at ten permanent sample points show very little change in population levels in 1964 compared with 1963 (Table 5).

TABLE 5

Summary of Larch Casebearer Counts
in Tweed District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of larvae per 18-inch branch tip	
		1963	1964
Bagot	7	4.2	0.2
Barrie	2	0.6	0.9
Carlow	4	1.0	1.8
Cashel	5	2.6	0.2
Elzevir	5	3.0	1.8
Faraday	6	0.6	0.1
Olden	3	1.0	1.8
Palmerston	2	0.6	0.4
Tudor	4	1.0	0.2
Wollaston	4	0.6	1.2

Pitted Ambrosia Beetle, Corthylus punctatissimus (Zimm.)

Light mortality of sugar maple reproduction occurred in Olden and Oso townships in 1964. Sampling at one bushlot in Olden Township, for example, revealed that 14 per cent of the hosts three feet and under in height were killed. Light mortality was observed throughout most of Hastings County.

Lace Bugs, Corythucha sp.

As in 1963, heavy infestations of this sucking insect persisted on most broad-leaf trees in the southern half of the district. In a privately-owned woodlot

in Oso Township where elm was the predominant host, a pocket of very heavy infestation caused discoloration and drying of the foliage in early August. The insect feeds by puncturing the leaves and withdrawing the plant juices, thus causing early drying, withering and discoloration of the foliage.

European Spruce Sawfly, Diprion hercyniae (Htg.)

A further decline in population levels of this introduced sawfly occurred on open-grown white spruce trees at nine locations in 1964 (Table 6). Counts made at these locations showed a decline from an average of 16 larvae per sample area in 1962 to 11 in 1963 and 5 in 1964. The decline in numbers at the above sample points was representative of population trends in the district as a whole.

TABLE 6

Summary of European Spruce Sawfly Larval Counts
in Tweed District from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample		
		1962	1963	1964
Dungannon	16	11	5	6
Faraday	16	12	7	2
Herschel	6	16	6	6
Hungerford	14	16	3	7
Limerick	7	6	4	6
McLure	11	12	27	11
McNab	6	58	39	3
Wicklow	10	11	7	2
Wollaston	10	1	0	6

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Populations of this caterpillar were more widely distributed in 1964 than in 1963. Small increases in population levels were noted in the southern part of Hastings County and in Renfrew County compared with 1963 (Table 7). Heavy infestations occurred in Thurlow, Radcliffe, McNab, Sheffield and Raglan townships. Light infestations were common on roadside shrubs and bushes in the rest of the district.

TABLE 7

Summary of Eastern Tent Caterpillar Colony Counts
in Tweed District in 1963 and 1964

Location (township)	Number of tents observed per mile of roadside	
	1963	1964
Bagot	30	74
Elzevir	51	47
Faraday	51	15
Griffith	0	26
Hinchinbrooke	123	63
Lyndoch	10	49
Oso	147	93
Radcliffe	0	109
Raglan	0	96
Sheffield	142	112
Thurlow	-	82
Tudor	3	0
Wicklow	12	6
Wollaston	8	12

Cedar Sawfly, Monoctenus juniperinus MacG.

A small decline in population levels of this insect occurred in the district as a whole. This trend is reflected in larval counts at nine locations in the district (Table 8).

TABLE 8

Summary of Cedar Sawfly Larval Counts
in Tweed District, 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Admaston	6	37	29
Bangor	5	1	0
Dungannon	5	4	0
Huntingdon	5	3	0
Limerick	3	2	0
Matawatchan	8	69	16
Oso	7	8	16
Rawdon	4	3	3
Wollaston	5	2	30

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Heavy infestations of this sawfly occurred in a 3-acre plantation of red pine in Limerick Township, Hastings County and in roadside plantings of red pine in McNab Township, Renfrew County. Pockets of light infestation were observed in red pine plantations at numerous locations in Hastings, Lennox and Addington, and Renfrew counties. Although populations at all permanent sample points were low in 1964 (Table 9), there was an increase in the number of infestations

compared with 1963.

TABLE 9

Summary of Red-headed Pine Sawfly Colony Counts
in Tweed District in 1963 and 1964

Location (township)	Tree species	No. of trees examined	Av. height of trees in feet	No. of trees infested	Av. no. of colonies per infested tree	
					1963	1964
McNab	rP	128	3	124	1.3	1.3
Grattan	rP	100	3	5	-	1.0
Thurlow	jP	16	25	16	4.0	1.0
Hungerford	rP	100	6	0	0.0	0.0

Jack-pine Sawfly, Neodiprion pratti paradoxicus Ross.

Very little change in population levels of this jack pine defoliator occurred in 1964 (Table 10). Heavy infestations persisted in Hungerford, Marmora, Thurlow, Elzevir, and Bangor townships, where defoliation of the old foliage ranged from 70 to 90 per cent. A pocket of medium infestation recurred in a jack pine plantation at White Lake in Olden Township.

TABLE 10

Summary of Jack-pine Sawfly Colony Counts
in Tweed District in 1963 and 1964

Note: Counts were made on 10 jack-pine trees at each location.

Location (township)	Av. d.b.h. of trees in inches	Av. no. of colonies per tree	
		1963	1964
Elzevir	7	3.1	5.2
Hungerford	7	2.0	3.2
Marmora	8	50.+	50.+
Olden	6	-	7.0
Thurlow	6	-	50.+

Maple Leaf Cutter, Paraclemensia acerifoliella Fitch

Little change in population levels of this insect was observed in 1964. Heavy infestations occurred in sugar maple stands in Olden, Oso and Bedford townships. Light infestations were observed in Hinchinbrooke, Anglesea and in the eastern part of Elzevir townships.

Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.

Pockets of heavy infestation recurred in the Moira River Conservation Plantations in Hungerford Township, and in small clumps of white-spruce in Limerick, Faraday, Kaladar and Anglesea townships. Light infestations were common in the remainder of the district.

White-pine Weevil, Pissodes strobi (Peck)

An increased incidence of weevil injury to the leaders of pine trees is reported for 1964. Heavy infestations occurred in a plantation of white pine in Marmora Township and in a red pine plantation in Effingham Township. Fourteen per cent of the trees examined in a stand of white pine regeneration in McNab Township were infested. Light infestations were observed on white pine regeneration in Horton Township and in a white pine plantation in Flinton Forest in Kaladar Township. Low populations were common on a variety of coniferous hosts at scattered locations in the rest of the district.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Population levels of this sawfly have declined in the district for the past several years. Very light infestations persisted in Oso, Kaladar, Olden, Sheffield, Brudenell and Bagot townships. Small numbers of larvae occurred on open-grown larch trees in the rest of the district.

TABLE 11

Summary of Miscellaneous Insects Collected
in Tweed District

Note: Number of insects is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris chalybeana</i> Fern.	sM	Very small numbers in Olden and McNab tps. (2)
<i>Alsophila pomataria</i> Peck	E	Heavy in a one acre woodlot in Brudnell Tp.
<i>Anacampsis innocuella</i> Zell.	tA	Light populations of leaf rollers in Olden Tp.
<i>Anisota senatoria</i> A. & S.	bO	Small numbers found in Thurlow and Tyendinaga tps. (2)
<i>Archips cerasivoranus</i> Fitch	cCh	Light infestations in Oso Tp. Three tents per mile of roadside
<i>Argyresthia laricella</i> Kft.	tL	Small numbers found in Barrie and Oso tps.
<i>Argyrotaenia pinatubana</i> Kft.	wP	Light infestations on small groups of trees in Olden, Kaladar, Hinchinbrooke and McNab tps. (4)
<i>Brachyrhinus ovatus</i> Linn.	Buildings	High populations at the White Lake headquarters and in the town of Tweed (2)
<i>Choristoneura fumiferana</i> Clem.	bF	Light infestations in 100 acres of open growing spruce and balsam fir in Rawdon Tp. (2)
<i>Dasyneura balsamicola</i> (Lint.)	bF	Medium infestation in a small area of McNab Tp. Light in Oso Tp. (3)
<i>Datana integerrima</i> G. & R.	bO	Small area of infestation in Tyendinaga Tp.
<i>Diprion frutetorum</i> (F.)	scP	Light infestations in plantations of Scots pine in the southern part of Hastings County (3)

TABLE 11, Tweed District

Insect	Host(s)	Remarks
<i>Elaphidion parallelum</i> Newm.	rO	Small numbers in Elzevir and Olden tps. (2)
<i>Epinotia solandriana</i> Linn.	Al	Light infestation in a small area of Limerick Tp.
<i>Erannis tiliaria</i> (Harr.)	Ba	The light infestations of 1963 vanished in 1964
<i>Eriophyes abnormis</i> Garm.	Ba	Heavy infestation in small patches of reproduction in Olden Tp.
<i>Exoteleia dodecella</i> Linn.	scP	Small numbers in the district (3)
<i>Fenusa dohrnii</i> (Tischb.)	Al	Numerous in Brudnell Tp.
<i>Fenusa pusilla</i> (Lep.)	wB	Small numbers in McNab Tp. (2) Heavy infestations at scattered locations in Hastings and Renfrew counties. Light in the rest of the district (4)
<i>Fenusa ulmi</i> Sund.	wE	Heavy infestation on scattered trees in Ameliasburgh Tp.
<i>Gonioctena americana</i> Schaeff.	tA	Heavy in small patches in Limerick and Radcliffe tps. (2)
<i>Gretchena delicatana</i> Heinr.	I	Light infestations on ironwood trees throughout the district
<i>Hyphantria cunea</i> Dru.	E, wAs	Populations decreased to a very low level in 1964. Quantitative samples were one tent per mile in Bagot Tp. and three per mile in Oso Tp. All of the rest were negative (5)
<i>Hylobius pales</i> Hbst.	scP	Heavy populations of adult weevils were found in a plantation in Hungerford Tp.
<i>Janus abbreviatus</i> (Say)	bPo	Small amounts found in Limerick Tp.
<i>Leucanthisa dircella</i> Braun	Leatherwood	Medium infestation in a small area of Abinger Tp.
<i>Lithocolletis aceriella</i> Clem.	sM	Light infestations were common in Kaladar, Anglesea and McNab tps. (3)
<i>Lithocolletis ostryarella</i> Cham.	I	Low populations at one location in Abinger Tp.
<i>Lithocolletis salicifoliella</i> Fitch	bPo	Small numbers in McNab and Pakenham tps. (2)
<i>Melaphis rhoris</i> Fitch	Su	Small numbers found in Olden Tp.
<i>Neodiprion abietis</i> complex	bF	Low populations in the district. Quantitative samples were all negative in 1964.
<i>Neodiprion sertifer</i> (Geoff.)	scP	Heavy populations persisted on ornamental pines in the city of Belleville (2)
<i>Paleacrita vernata</i> (Peck)	E	Heavy infestation in one acre of elm in Brudnell Tp. Light infestation in a small area in Dungannon Tp. (2)
<i>Petrova albicapitana</i> Busck.	jP	Very small numbers in Thurlow and McNab tps. (2)

TABLE 14, Tweed District

Insect	Host(s)	Remarks
<i>Pikonema dimmockii</i> (Cress.)	wS	Small numbers in Lyndoch and Rawdon tps. (2)
<i>Pleroneura borealis</i> Felt	bF	Light infestation one location in Oso Tp.
<i>Profenusa thomsoni</i> Konow	wB	Small numbers in Oso and Kaladar tps. (2)
<i>Psilocorsis faginella</i> Cham.	Be	Small numbers found in Kaladar Tp.
<i>Psilocorsis fletcherella</i> Gibs.	tA	Numerous at scattered locations in the district (7)
<i>Pseudexentera oregonana</i> Wlsh. m.	tA	Heavy infestations in small areas of Dungannon and Matawatchan tps. (2)
<i>Rhabdophaga swainei</i> Felt	bF	Small numbers in the northern part of Hastings County
<i>Rhyacionia buoliana</i> (Schiff.)	scP	Light infestation in one plantation in Ameliasburg Tp.
<i>Sciaphila duplex</i> Wlsh. m.	tA	Light infestation on roadside trees in Faraday Tp.

STATUS OF INSECTS IN KEMPTVILLE DISTRICT

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Pine Tube Moth	<u>Argyrotaenia</u> <u>pinatubana</u> Kft. A 29
Birch Leaf Skeletonizer	<u>Bucculatrix</u> <u>canadensisella</u> Cham. . A 29
A Miner on Ironwood	<u>Chrysopelia</u> <u>ostryaella</u> Cham. A 29
Larch Casebearer	<u>Coleophora</u> <u>laricella</u> Hbn. A 29
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European Spruce Sawfly	<u>Diprion</u> <u>hercyniae</u> (Htg.) A 30
Pine Bud Moth	<u>Exoteleia</u> <u>dodecella</u> Linn. A 31
Birch Leaf Miner	<u>Fenusa</u> <u>pusilla</u> (Lep.) A 31
Fall Webworm	<u>Hyphantria</u> <u>cunea</u> Dru. A 32
Eastern Tent Caterpillar	<u>Malacosoma</u> <u>americanum</u> F. A 32
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Red-headed Pine Sawfly	<u>Neodiprion</u> <u>lecontei</u> (Fitch) A 33
A Leaf Folding Sawfly	<u>Nematus</u> sp. A 34
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Yellow-headed Spruce Sawfly	<u>Pikonema</u> <u>alaskensis</u> (Roh.) A 35
White-pine Weevil	<u>Pissodes</u> <u>strobi</u> Peck A 35
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John Hook

STATUS OF INSECTS

Cedar Leaf Miners, Argyresthia spp.

A marked decline in population levels of cedar leaf miners (four species) was evident. The heavy infestation that had occurred in Leeds, Grenville, Dundas, Carleton and Lanark counties in 1963, declined to moderate intensity in 1964.

Light damage recurred in most cedar stands, windbreaks and hedgerows throughout the central part of the district.

Pine Tube Maker, Argyrotaenia pinatubana Kft.

A pocket of heavy infestation of this insect occurred on white-pine reproduction in a private woodlot causing the trees to look very ragged in Mountain Township. Light infestations were observed in March, South Crosby, East Hawkesbury, Beckwith and Dalhousie townships. The insect was found on white-pine in all diameter classes in Beckwith and March townships.

Birch Leaf Skeletonizer, Bucculatrix canadensisella Cham.

Pockets of heavy infestation of this insect recurred in Lanark and Carleton counties. Light infestations were observed in small clumps of white birch west of Brockville, and along Highway 17 between Ottawa and Hawkesbury.

In view of the prevalence of this insect it may be well to outline the essential features of its life history. The eggs are laid singly in late June and July on both surfaces of birch leaves, and are generally located near one of the prominent veins. In about two weeks the eggs hatch and the tiny larvae enter the leaf tissue and construct winding mines. After feeding for approximately one month, the larvae emerge on the lower side of the leaves, and spin small white webs within which they moult. A period of much more extensive feeding follows during which the leaves are skeletonized. The winter is passed in the pupal stage on the ground. Adult sawflies begin to emerge late in June.

A Miner on Ironwood, Chrysopelia ostryaella Cham.

This leaf miner was found commonly on ironwood throughout the district. Pockets of heavy infestation occurred in Beckwith, Fitzroy and Wolford townships, where severe mining caused virtually complete browning of the foliage in mid-August. In one stand in the Limerick Forest, 100 per cent of the leaves had one or more mines. Pockets of medium infestation were observed in March, Bathurst, Mountain and Ramsay townships. Low numbers were noted throughout the remainder of the district.

Larch Casebearer, Coleophora laricella (Hbn.)

Very little change in population levels of this insect has occurred in the past ten years. Small numbers were again found in most tamarack stands examined (Table 5).

TABLE 5

Summary of Larch Casebearer Counts in Kemptville District
in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of larvae per 18-inch branch tip	
		1963	1964
Dalhousie	3	2.1	0.6
Lanark	4	0.0	0.0
Montague	4	6.1	8.0
Oxford	4	1.8	1.8
Plantagenet	4	1.8	0.5

Pitted Ambrosia Beetle, Corthylus punctatissimus (Zimm.)

Light infestations of this beetle persisted on sugar maple reproduction at two locations. Light infestations, as exemplified by the counts in Table 6, were prevalent throughout the district.

TABLE 6

Summary of Damage by the Pitted Ambrosia Beetle
in the Kemptville District in 1964

Note: All sugar maple reproduction in square yard sample was examined.

Location (township)	Av. basal diameter in inches	No. of trees examined	No. of trees infested	Shade Condition
Beckwith	1/4"	30	1	Shaded
	1/4"	37	4	Shaded
Goulbourn	1/2"	46	3	Shaded
	1/2"	58	7	Shaded

Lace Bug, Corythucha spp.

For the second consecutive year light to heavy infestations of this insect persisted on deciduous trees in ten townships extending from Kemptville west to the Kemptville-Tweed district boundaries. The foliage of many ornamental and shade trees was severely damaged in the town of Perth, resulting in a number of extension calls.

European Spruce Sawfly, Diprion hercyniae (Htg.)

This introduced sawfly is widely distributed in the district, but as in the past nine years its numbers remained low, as indicated by larval counts at six permanent sample points (Table 7). The highest numbers occurred in a white spruce plantation in South Crosby Township, where 18 larvae were counted on 15 beating tray samples.

TABLE 7

Summary of European Spruce Sawfly Larval Counts
in Kemptville District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	No. of larvae per 15-tray sample	
		1963	1964
Beckwith	6	3	0
Mountain	6	0	2
Oxford	5	2	0
Ramsay	6	8	0
South Crosby	5	7	18
Cambridge	5	0	4

Pine Bud Moth, Exotelia dodecella Linn.

Population levels of this insect on Scots pine remained at approximately the same level in 1964 as in 1963. Medium infestations recurred in Huntley, Kitley, Goulbourn and Gloucester townships. Light infestations were recorded at six other widely-separated sample points in the district (Table 8). Small numbers were observed on Scots pine windbreaks in the Kemptville nursery.

TABLE 8

Summary of Pine Bud Moth Counts in the Kemptville District
in 1963 and 1964

Note: Counts were based on the examination of 50 bud clusters from each of four Scots pine trees at each location.

Location (township)	Av. d.b.h. of trees in inches	Per cent of bud clusters infested	
		1963	1964
Charlottenburg	4	23	28
Cumberland	3	38	23
Elizabethtown	4	16	18
Fitzroy	3	8	15
Gloucester	4	42	32
Goulbourn	6	27	41
Huntley	5	47	30
Kitley	7	41	35
Lochiel	4	19	19
Oxford	5	8	12

Birch Leaf Miner, Fenusa pusilla (Lep.)

Heavy infestations of this miner occurred on white birch in Wolford, Oxford, Prescott and Front of Leeds and Lansdowne townships. Light infestations were observed in Cambridge, Beckwith and Goulbourn townships. Small numbers occurred on hosts 30 inches in height in the Kemptville Nursery.

The first adults appear in May and oviposit in the newly-developed leaf tissues. The larvae hatch in seven to ten days and feeding is usually completed in seven to fourteen days. The larvae then drop to the ground where they pupate, and after six weeks adults reappear. The occurrence of three generations each year makes control more difficult than for most other forest insects in the district.

Fall Webworm, Hyphantria cunea (Drury)

Except in areas along the St. Lawrence River, between Cornwall and Brockville, and in South Crosby Township, population levels of this webworm declined markedly in 1964. In Drummond and Beckwith townships where about 500 and 149 tents respectively were counted along one mile of roadside in 1963 only 4 per mile were observed in 1964. A small increase in the number of tents was recorded in South Crosby Township (Table 9).

TABLE 9

Summary of Fall Webworm Tent Counts in Kemptville District
in 1963 and 1964

Location (township)	Tree species	Number of tents per mile of roadside	
		1963	1964
Beckwith	wE, bAs	149	4
Drummond	wE, bAs	500+	4
Gloucester	wE	2	0
March	wE	2	0
Mountain	bAs	16	2
North Elmsley	wE, bAs	33	5
Nepean	wE	0	0
Oxford	wE	6	0
South Crosby	wE	4	12

Eastern Tent Caterpillar, Malacosoma americanum (F.)

The most noteworthy change in population levels of this insect occurred in Goulbourn Township, where an increase from 5 tents per mile of roadside in 1963 to 118 in 1964 was recorded. Very little change in the numbers of tents occurred throughout the district as indicated by counts at nine other sampling points (Table 10).

TABLE 10

Summary of Eastern Tent Caterpillar Colony Counts
in Kemptville District in 1963 and 1964

Location (township)	Number of tents observed per mile of roadside	
	1963	1964
Bathurst	13	10
Beckwith	16	0
Drummond	10	12
Goulbourn	5	118
Kitley	23	29
Lanark	7	0
Montague	23	23
N. Elmsley	31	6
N. Sherbrooke	16	4
Oxford	15	16

Cedar Sawfly, Monoctenus juniperinus MacG.

For the second consecutive year a sharp decline in population levels of this cedar defoliator occurred in Ramsay, Drummond, Bastard and South Sherbrooke townships (Table 11). No larvae were found on numerous beating mat samples taken elsewhere in the district.

TABLE 11

Summary of Cedar Sawfly Larval Counts in Kemptville District
in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Total number of larvae per 15-tray sample	
		1963	1964
Bastard	5	13	0
Dalhousie	4	6	0
Drummond	4	0	0
Goulbourn	3	0	3
Huntley	3	6	11
Ramsay	4	34	19
S. Sherbrooke	6	3	0

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

A decline in population levels of this sawfly occurred in 1964. A pocket of medium infestation persisted on a small clump of jack pine trees near Perth in Bathurst Township (Table 12). Scattered colonies were observed in red pine plantations in Dalhousie, Lanark, Drummond, Marlborough, Oxford, Wolford and Beckwith townships. Chemical control operations carried out by Lands and Forests personnel in the Limerick and Larose Forests where heavy infestations occurred in 1963 reduced larval populations to very small numbers.

TABLE 12

Summary of Red-headed Pine Sawfly Colony Counts
in the Kemptville District in 1964

Location (township)	Tree species	No. of trees examined	Av. height in feet	No. of trees infested	Av. no. of colonies per infested tree
Bathurst	jP	50	14	50	7.8
Dalhousie	rP	100	14	10	1.1
N. Elmsley	rP	25	14	1	2.0
Oxford	rP	100	14	8	2.1
South Crosby	rP	50	14	0	0

A Leaf Folding Sawfly, Nematus sp.

Populations of this sawfly remained at much the same level as in 1963 (Table 13). Three pockets of heavy infestation occurred in Dalhousie, Goulbourn and Oxford townships. Medium infestations were recorded in Alfred, Longeuil and North Crosby townships. Small numbers were observed on all aspen stands elsewhere in the district.

TABLE 13

Summary of Damage by a Leaf Folding Sawfly on Trembling Aspen
in Kemptville District in 1963 and 1964

Location (township)	No. of folds per 100 leaves examined	
	1963	1964
Alfred	42	30
Dalhousie	40	57
Goulbourn	53	51
Longeuil	27	42
N. Crosby	50	47
Oxford	31	58

Maple Leaf Cutter, Paraclemensia acerifoliella (Fitch)

Pockets of light to heavy infestations of this insect occurred in sugar maple stands in all counties except Stormont and Glengarry. The most noteworthy of these was a pocket of heavy infestation causing severe defoliation in a hardwood stand near Hallville in Mountain Township. Light infestations and small numbers were observed in most woodlots throughout the remainder of the district.

The maple leaf cutter is one of the most unusual defoliators of maple in Ontario. During its unique feeding period it is in turn a miner, a skeletonizer, a leaf cutter, and a casebearer. The minute moth lays eggs singly on the underside of the leaf in pockets cut into the leaf tissue. Eggs have an incubation period from 14 to 22 days. The larva spends its first instar and part of the second as a miner. Later it becomes a skeletonizer and a leaf cutter, feeding from within a case.

When full grown in late August or early September, the larva is about one-quarter inch long, slender and somewhat flattened. It is during the latter period as a casebearer that severe damage to the foliage occurs causing discoloration, withering, and premature leaf drop.

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

Light infestations of this sawfly occurred in South Sherbrooke, North Sherbrooke, Cambridge and Oxford townships. Small numbers were observed near the Ottawa River (along Highway 17) and on open-growing white spruce trees along Highway 2 between Lansdowne and Brockville. Severe defoliation occurred on white spruce trees in the village of Maberly in South Sherbrooke Township.

White-pine Weevil, Pissodes strobi (Peck)

For the third consecutive year light infestations persist on white pine trees at seven permanent sample points (Table 14). Very small numbers of leaders of white spruce regeneration were damaged by this weevil in Lanark Township.

TABLE 14

Summary of Damage to White-pine by the White-pine Weevil
in Kemptville District in 1963 and 1964

Note: One hundred white pine trees were examined at each location.

Location (township)	Av. d.b.h. of trees in inches	Degree of shade	Per cent of trees weevilled	
			1963	1964
Augusta	4	0	6	8
Bathurst	3	25	3	1
Cambridge	3	0	2	1
Dalhousie	3	10	6	4
Oxford	3	0	4	3
Stormont	3	10	3	6
N. Sherbrooke	2	0	-	7

Larch Sawfly, Pristiphora erichsonii (Htg.)

Populations of this sawfly declined to a very low level in 1964. Light defoliation of small clumps of tamarack was observed in Drummond, Goulbourn, South Plantagenet, North Sherbrooke, Beckwith, Lanark and South Sherbrooke townships.

Pine Tip Moth, Rhyacionia adana (Heinrich)

An increase in population levels of this pine tip moth occurred on Scots and jack pine trees in the Limerick Forest, Oxford Township. In one Scots pine plantation where trees were approximately 30 inches in height, 58 out of a total of 119 trees were attacked. Thirty shoots of one tree in this plantation were infested. Low numbers were observed on Scots pine in Mountain, Oxford and Wolford townships.

TABLE 15

Summary of Miscellaneous Insects Collected
in Kemptville District

Note: Number of collections is given inside brackets for insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	bF	Low numbers in Beckwith Tp.
<i>Adelges abietis</i> Linn.	wS	Heavy infestation on reproduction wS in DrummondTp. Light infestations occurred in S. Sherbrooke and S. Crosby tps. (3)
<i>Agromyza ulmi</i> Frost	wE	Small numbers observed along the north shore of Burgess Lake
<i>Anacamptis innocuella</i> Zell.	tA	Light infestation on understory reproduction in the Larose Forest
<i>Archips cerasivoranus</i> Fitch	eCh	Small numbers of tents observed in S. Crosby and S. Sherbrooke tps. (3)
<i>Cecidomyia acellaris</i> O.S.	sM	Light infestation in S. Plantagenet Tp.
<i>Corythucha elegans</i> Drake	I	Small numbers in Dalhousie Tp.
<i>Dioryctria abietivorella</i> Grt.	rP	Damaged cones commonly found in the Limerick Forest, Wolford Tp. (2)
<i>Diprion frutetorum</i> (F.)	rP	Low numbers collected by beating tray sampling in Cambridge and S. Crosby tps. (2)
<i>Elaphidion parallelum</i> Newm.	rO	Light damage observed in S. Sherbrooke and Front of Leeds and Lansdowne tps. (2)
<i>Gonioctena americana</i> Schaeff	tA	Low numbers on reproduction hosts in Cambridge Tp.
<i>Lambdina fiscellaria</i>		Few larvae collected on beating mat in Bathurst and Goulbourn tps. (2)
<i>fiscellaria</i> (Gn.)	wS	
<i>Lithocolletis aceriella</i> Clem.	sM	Low numbers in East Hawkesbury and South Plantagenet tps. (2)
<i>Lithocolletis fletcherella</i> Braun	rO	Low population on reproduction hosts in Beckwith Tp.
<i>Lithocolletis hamadryadella</i> Clem.	rO	Few larvae in North Crosby Tp.
<i>Lithocolletis ostensackenella</i> Fitch	Lo	Small numbers at two locations in S. Crosby Tp. (2)
<i>Melaphis rhois</i> (Fitch)	Su	A pocket of heavy infestation in S. Sherbrooke Tp.
<i>Neodiprion pratti paradoxicus</i> Ross	jP	A pocket of heavy infestation in Bathurst Tp.
<i>Periphyllus populicola</i> (Thos.)	cPo	Heavy infestation on roadside hosts Mountain Tp.
<i>Philonix nigra</i> Gill.	bO	Heavy infestation on open-grown tree Drummond Tp.

TABLE 15, Kemptville District

Insect	Host(s)	Remarks
<i>Pineus strobi</i> (Htg.)	wP	Heavy infestation in the Larose Forest limits (2)
<i>Pristiphora geniculata</i> (Htg.)	Mo	Few colonies observed in the towns of Perth and Kemptville (2)
<i>Prociphilus tessellatus</i> (Fitch)	Al	Pockets of heavy infestation in Cambridge, Wolford and Bathurst tps. (3)
<i>Profenusa thomsonii</i> (Konow)	wB	Medium population occurred in Kemptville Nursery
<i>Protoarmia porcelaria</i> <i>indicatana</i> Wlk.	wS	Few larvae collected by beating mat sampling, Fitzroy Tp.
<i>Pseudexentera oregonana</i> Wlsh.	tA	Medium population in Montague Tp.
<i>Psilocorsis fletcherella</i> Gibs.	tA	Small numbers in Beckwith Tp.
<i>Semiothisa</i> sp. (<i>granitata</i> group) Gn.	bF	Few larvae collected by beating tray sampling in Beckwith and S. Crosby tps. (2)
<i>Zelleria haimbachi</i> Busch.	jP	Heavy infestation in Bathurst Tp. Light in Oxford Tp. (2)

STATUS OF INSECTS IN THE PEMBROKE DISTRICT

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Larch Casebearer	<u>Coleophora larigella</u> Hbn.	A 39
European Spruce Sawfly	<u>Diprion hercyniae</u> (Htg.)	A 39
White-pine Shoot Borer	<u>Eucosma gloriola</u> Heinr.	A 40
Alder Leaf Miner	<u>Fenusa dohrnii</u> (Tischb.)	A 40
Birch Leaf Miner	<u>Fenusa pusilla</u> (Lep.)	A 41
Poplar Leaf-roller	<u>Pseudexentera oregonana</u> Wlsh., (formerly <u>Epinotia nisella</u> <u>criddleana</u>)	A 41
American Poplar Leaf Beetle	<u>Gonioctena americana</u> Schaeff.	A 41
Fall Webworm	<u>Hyphantria cunea</u> Dru.	A 41
Pine Engraver	<u>Ips pini</u> (Say)	A 42
Eastern Tent Caterpillar	<u>Malacosoma americanum</u> (F.)	A 42
Cedar Sawfly	<u>Monoctenus juniperinus</u> MacG.	A 42
A Leaf Folding Sawfly	<u>Nematus</u> sp.	A 43
Red-headed Pine Sawfly	<u>Neodiprion lecontei</u> (Fitch)	A 43
Pine Sawfly	<u>Neodiprion maurus</u> Rohwer	A 44
Red-pine Sawfly	<u>Neodiprion nanulus nanulus</u> Schedl.	A 44
Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> Roh..	A 44
Jack-pine Sawfly	<u>Neodiprion pratti paradoxicus</u> Ross	A 44
White-pine Weevil	<u>Pissodes strobi</u> Peck	A 45
Balsam Bud-mining Sawfly	<u>Pleroneura borealis</u> Felt	A 45
Larch Sawfly	<u>Fristiphora erichsonii</u> (Htg.)	A 46
Mountain-ash Sawfly	<u>Fristiphora geniculata</u> (Htg.)	A 46
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STATUS OF INSECTS

Ugly-nest Caterpillar, Archips cerasivoranus Fitch

A further increase over 1963 in population levels of this insect occurred at three locations. The most significant increase occurred near the village of Alice in Alice Township where larval colonies nearly doubled in numbers. Increases were also noted near Lake Dore in Wilberforce Township and near the village of Madawaska in Murchison Township (Table 5). A decline in population levels occurred in Lyell, North Algona and Sherwood townships, due to the clearing of highway right-of-ways in these areas.

TABLE 5

Summary of Ugly-nest Caterpillar Colony Counts in Pembroke District
from 1962 to 1964

Location (township)	Tree species	No. of nests observed per one mile of roadside		
		1962	1963	1964
Alice	ecCh	43	110	210
Lyell	"	12	8	0
Murchison	"	18	16	27
N. Algona	"	37	37	0
Sherwood	"	22	3	2
Wilberforce	"	8	16	29

Larch Casebearer, Coleophora laricella Hbn.

A decline in population levels occurred throughout the district in 1964. This decline is reflected in larval counts (Table 6).

TABLE 6

Summary of Larch Casebearer Counts in Pembroke District
from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of larvae per 18-inch branch tip		
		1962	1963	1964
Airy	7	3.9	6.7	0.9
Bromley	4	2.9	2.3	0.5
Buchanan	6	3.9	1.2	1.6
Cameron	5	3.7	3.0	2.4
N. Algona	3	1.4	5.1	1.6
Rolph	4	0.5	0.5	0.3
Sproule	8	3.2	6.1	1.2
Westmeath	7	3.5	4.1	0.6

European Spruce Sawfly, Diprion hercyniae (Htg.)

A further decline in population levels of this insect occurred in the district in 1964. Counts to show population trends were taken when the sawfly was in the mid-larval period of the second generation (Table 7). The results of

sampling at four locations were averaged over a twelve year period and the average number of larvae obtained showed that populations vary from a low of nine per sample in 1954 to a high of 63 in 1962. The average number of larvae obtained in 1964 was 21.

TABLE 7

Summary of European Spruce Sawfly Larval Counts in Pembroke District
from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	Total no. of larvae per 15-tray sample		
		1962	1963	1964
Alice	7	39	13	6
Cameron	8	78	32	27
Clara	6	62	47	32
Maria	7	73	23	19

White-pine Shoot Borer, Eucosma gloriola Heinr.

Population levels of this shoot borer increased in the Beachburg Tract in Westmeath Township in 1964. Examination of 100 trees in the red-pine plantation showed the number of infested trees increased from 47 to 51, and 21 trees had infested leaders. As in 1963 this insect was not found at any other location in the district.

Alder Leaf Miner, Fenusa dohrnii (Tischb.)

An increase in population levels of this insect occurred in the western part of the district. Medium infestations were observed along the shore of Wilkes Lake in Wilkes Township, Trout Lake in McLaughlin Township and near Deux Rivieres in Clara Township. However, infestations declined in Airy and Stratton townships (Table 8). Light infestations were observed in Nightingale, Guthrie, Murchison, Osler, Bishop and Peck townships.

TABLE 8

Summary of Damage by the Alder Leaf Miner in Pembroke District
from 1962 to 1964

Note: Counts were based on the examination of 100 leaves from alder bushes at each location.

Location (township)	Av. height of trees in feet	Per cent of leaves mined			Per cent of leaf surface mined		
		1962	1963	1964	1962	1963	1964
Airy	15	52	16	4	4	5	5
Clara	15	19	30	15	8	5	5
McLaughlin	15	-	-	31	-	-	10
Stratton	15	27	4	3	5	5	5
Wilkes	20	-	-	27	-	-	20

Birch Leaf Miner, Fenusa pusilla (Lep.)

Infestations of this insect increased in intensity throughout the district in 1964. A heavy infestation persisted on ornamental European birch trees in the Forestry Headquarters in Buchanan Township where 92 per cent of the leaves in one sample were infested. Medium infestations were observed along the Opeongo Lake road in Sproule Township, in the Beachburg Tract in Westmeath Township and near the south end of Shirley Lake in Preston Township (Table 9). Light infestations occurred in Glancy, Dickson, Airy, McLaughlin, Freswick, Anglin and Findlayson townships.

TABLE 9

Summary of Damage by the Birch Leaf Miner in Pembroke District
from 1962 to 1964

Note: Counts were based on the examination of 100 leaves from five white birch trees at each location.

Location (township)	Av. d.b.h. of trees in inches	Per cent of leaves mined			Per cent of leaf surface mined		
		1962	1963	1964	1962	1963	1964
Preston	3	-	-	21	-	-	20
Rolph	3	25	18	27	50	60	25
Sproule	3	32	25	31	50	40	35
Westmeath	3	16	19	32	15	20	20

Poplar Leaf-roller, Pseudexentera oregonana Wlsh.

Moderate to severe defoliation recurred in the southern part of the district in 1964. Trembling aspen trees along Highway 60 in Murchison Township were heavily infested. Medium infestations occurred near Stonecliffe in Head Township, along Highway 60 in Sproule Township and near the east gate of Algonquin Park in Airy Township. Light infestations were observed near Hay Lake in Sabine Township.

American Poplar Leaf Beetle, Gonioctena americana Schaeff.

An increase in population levels of this insect occurred in 1964. Severe defoliation of roadside trees occurred along the Paugh Lake road in Sherwood Township and along Highway 41 in Wilberforce Township. At the latter location 16, 25-foot trees were 90 per cent defoliated. Moderate defoliation occurred near the east gate of Algonquin Park in Sproule Township.

Fall Webworm, Hyphantria cunea Dru.

A sharp decline in population levels of this insect occurred throughout the district. The most notable decreases were near Haley Station in Ross Township and along the shoreline of Lake Dore in Wilberforce Township (Table 10). The current infestation has persisted in varying degrees of intensity since 1953.

TABLE 10

Summary of Webworm Colony Counts in Pembroke District
from 1962 to 1964

Location (township)	Tree species	No. of tents per mile of roadside		
		1962	1963	1964
Hagarty	wE	16	13	0
Peck	bCh	24	19	0
Ross	wE	175	230	1
Westmeath	wB	37	18	0
Wilberforce	wE	150	176	12

Pine Engraver, Ips pini (Say)

Heavy infestations of this insect occurred at two locations in the district in 1964. High populations built up near the main gate of Camp Petawawa in a stand of mature jack-pine trees that had been weakened by the spraying of some sort of herbicide or soil sterilant. Subsequently, control was carried out by the removal of infested trees. The second infestation was observed in a coniferous stand located in a small park in a new housing development in the village of Petawawa. Tree mortality was very high in this infestation.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

A further increase in the number of tents occurred on deciduous shrubs in the southern part of the district in 1964. Heavy infestations were observed in a block of seven townships in the eastern part of the district, and in Lyell Township in the southern part of the district. Populations in Buchanan and Petawawa townships declined to a low level due to the removal of host material for highway right-of-ways in the fall of 1963 (Table 11).

TABLE 11

Summary of Eastern Tent Caterpillar Colony Counts
in Pembroke District from 1962 to 1964

Location (township)	Tree species	No. of tents observed per mile of roadside		
		1962	1963	1964
Alice	ecCh	73	24	107
Buchanan	pCh	30	27	2
Fraser	ecCh	37	27	149
Hagarty	"	46	50	176
Lyell	"	48	26	76
Petawawa	"	39	23	1
Stafford	"	69	22	69
Westmeath	"	37	24	89
Wilberforce	"	28	43	167

Cedar Sawfly, Monoctenus juniperinus MacG.

A marked decline in population levels of this sawfly occurred in 1964.

Larval counts showed that populations have declined from an average of 290 larvae per sample area in 1962, to 189 in 1963 and to 45 in 1964 (Table 12).

TABLE 12

Summary of Cedar Sawfly Larval Counts Taken from White Cedar
in Pembroke District from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	Total no. of larvae per 15-tray sample		
		1962	1963	1964
Bromley	7	243	146	47
N. Algona	7	327	180	13
Ross	5	331	293	142
S. Algona	5	275	263	33
Westmeath	8	309	90	22
Wilberforce	6	255	162	22

A Leaf Folding Sawfly, Nematus sp.

Infestation of this insect increased from light intensity in 1963 to moderate intensity in 1964 in the southern part of the district. From 1958 to 1963 there had been a steady decline in populations ranging from an average of 90 folds per 100 leaves in 1958 to 22 folds in 1963 (Table 13).

TABLE 13

Summary of Counts of the Leaf-folding Sawfly in Pembroke District
from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	No. of folds per 100 leaves examined		
		1962	1963	1964
Cameron	3	17	10	1
Clara	3	36	16	3
Finlayson	3	27	30	37
Fraser	3	19	16	67
Maria	3	27	30	3
Richards	4	22	17	61
Rolph	3	37	29	40
Sabine	4	18	21	47
Westmeath	3	26	31	108

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

This sawfly increased in numbers in the northern and eastern part of the district in 1964. Heavy infestations persisted in a private plantation near Lake Dore in Wilberforce Township and in roadside plantings near the east gate of Algonquin Park in Airy Township. Moderate infestations occurred along the Hydro Electric transmission line in Guthrie Township and on red pine east of Deux Rivieres in Clara Township. Light infestations were observed in Head, Westmeath and Rolph townships (Table 14). Chemical control measures using 2.5% D.D.T. spray applied with pack sprayers were carried out in Wilberforce and Airy townships and good results were obtained.

TABLE 14

Summary of Red-headed Pine Sawfly Colony Counts in Pembroke District
in 1963 and 1964

Location (township)	Tree species	No. of trees examined	Av. height of trees in feet	No. of trees infested	Av. no. of colonies per infested tree	
					1963	1964
Airy	rP	110	3	6	-	2.0
Clara	"	160	3	10	-	1.6
Guthrie	"	100	3	4	1.0	1.3
Head	"	150	6	3	1.0	1.0
Rolph	jP	15	4	1	1.0	1.0
Westmeath	rP	175	12	3	1.0	1.0
Wilberforce	rP	750	6	86	1.0	1.1

Pine Sawfly, Neodiprion maurus Rohwer

Medium infestations persisted in the north-central part of the district in 1964. Population levels increased on open-grown jack pine trees near Lake Traverse in White Township, along the Brent road in Clara Township, and along access roads in Niven and Fitzgerald townships (Table 15).

Infestations of this insect were first reported in Chapleau and White River districts in 1958 and in 1960 in the Sioux Lookout District, all in Northern Ontario. The current infestation in the Pembroke District is the first recorded south of the French and Mattawa rivers. Previously, only a few larvae had been recorded at one location near the village of Chalk River in 1951.

TABLE 15

Summary of Pine Sawfly Colony Counts in Pembroke District
in 1963 and 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of colonies per tree from ten trees	
		1963	1964
Clara	4	2	16
Fitzgerald	2	-	27
Niven	3	-	16
White	3	22	42

Jack-pine Sawfly, Neodiprion pratti paradoxicus Ross

Populations of this insect remained at a low level in the district as a whole in 1964 (Table 16). Although populations declined at the sample location in Petawawa Township, a stand of jack-pine one mile west of this location was moderately defoliated. At a permanent sample location along the Hydro Electric transmission line in Bronson Township and along Red Rock road in Richards Township, colonies of Neodiprion pratti banksianae were observed feeding in association with Neodiprion nanulus nanulus and N. pratti paradoxicus.

TABLE 16

Summary of Jack-pine Sawfly Colony Counts in Pembroke District
from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches	Av. no. of colonies per tree from ten trees		
		1962	1963	1964
Bronson	6	0.9	0	0.3
Buchanan	6	1.5	0	0.1
Maria	6	2.1	0.6	0
N. Algona	7	0.8	0.9	1.5
Petawawa	3	2.2	1.8	0.1
Richards	6	0.5	0.2	0
Westmeath	6	1.6	0.9	2.1

White-pine Weevil, Pissodes strobi Peck.

Increases in population levels of this insect occurred throughout the district in 1964. Areas of medium and heavy infestation were widespread in the Ottawa River valley (Table 17). Pockets of light infestation were observed in the south-western part of the district. A small increase in numbers occurred in the Shirley Lake area in Preston Township where control operations were carried out in 1963.

TABLE 17

Summary of Shoot Damage by the White-pine Weevil in Pembroke District
from 1962 to 1964

Location (township)	Tree species	Av. height of trees in feet	No. of trees examined	Degree of shade	Per cent of trees weevilled		
					1962	1963	1964
Buchanan	wP	12	100	0	20	28	38
Cameron	scP	12	100	0	13	27	37
Maria	jP	10	100	0	9	13	14
Preston	wP	36	463	0	34	2	3
Stratton	wP, jP	12	100	10	26	29	32

Balsam Bud-mining Sawfly, Pleroneura borealis Felt

Infestations have been recorded in alternate years since 1956. Heavy infestations were observed in Bromley and Ross townships in the south-eastern part of the district in 1964 (Table 18). Moderate-to-light infestations prevailed in the remainder of the district.

TABLE 18

Summary of Balsam Bud-mining Sawfly Counts in Pembroke District
from 1962 to 1964

Note: Counts were based on the examination of four 18-inch branch tips on each of four trees per sample area.

Location (township)	Av. d.b.h. of trees in inches	No. of buds examined	Per cent of buds infested		
			1962	1963	1964
Alice	5	644	4.0	1.4	3.3
Bromley	6	655	14.1	3.4	11.8
Rolph	4	585	5.1	0.0	2.9
Ross	6	683	13.2	3.9	12.7
Westmeath	7	452	4.7	1.1	1.6

Larch Sawfly, Pristiphora erichsonii (Htg.)

A continued decline in population levels of this insect occurred throughout the district in 1964. The medium infestation near Chalk River in Buchanan Township declined to very light intensity. Low populations were observed on open-grown trees at a few other locations.

Mountain-ash Sawfly, Pristiphora geniculata (Htg.)

An increase in infestation intensity was observed along roadsides in 1964. Severe defoliation of mountain ash trees occurred along Highway 127 in Sabine Township and bordering a large private plantation on the Paugh Lake road in Sherwood Township. Moderate defoliation occurred on mature shade trees in the Town of Pembroke and near Ayles Lake in Dickens Township.

TABLE 19

Summary of Miscellaneous Insects Collected
in Pembroke District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> (Fern.)	wS	Few on beating trays in N. Algona and Airy tps. (2)
<i>Adelges strobilobius</i> Kalt.	bS	Several trees moderately infested in Bower Tp.
Agromyzidae	hyPo	Continued heavy infestation of leaf miner on six mature shade trees at Forestry Sta. in Buchanan Tp.
<i>Altica ambiens alni</i> Harr.	Al	Severe defoliation of lake-shore bushes in Anglin and Preston tps. (3)
<i>Anomoea laticlavata</i> Frost	Haw	Severe defoliation of road-side bushes in Westmeath Tp.
<i>Arge</i> sp. on Alder	Al	Light defoliation of lake-shore bushes in Guthrie and McLaughlin tps. (2)

TABLE 19, Pembroke District

Insect	Host(s)	Remarks
<i>Argyrotaenia pinatubana</i> Kft.	wP	Medium infestation on small trees in Freswick, Dickson and Rolph tps. (3)
<i>Corythucha elegans</i> Drake	yB	Moderate discoloration of foliage in Osler Tp.
<i>Croesus latitarsus</i> Nort.	wB	Light defoliation of lakeshore tree in Master Tp.
<i>Dasyneura balsamicola</i> (Lint.)	bF	Light-to-medium infestations throughout the district (9)
<i>Dioryctria zimmermani</i> (Grote)	scP	Light infestation in <i>Cronartium</i> sp. galls in Westmeath Tp.
<i>Eriophyes</i> sp.	yB	Heavy infestation of fringe trees in Nightingale Tp.
<i>Hemichroa crocea</i> (Four.)	Al	Light infestation on lakeshore bushes in Freswick Tp.
<i>Hylobius radialis</i> Buch.	scP	Continued heavy infestations at two locations in Westmeath Tp.
<i>Lithocolletis ostryarella</i> Cham.	I	Moderate infestation in Hagarty Tp.
<i>Mordvilkoja vagabunda</i> Walsh	tA	Heavy infestation on sucker growth in Richards Tp.
<i>Neodiprion nanulus nanulus</i> Schedl.	jP	A few colonies in Petawawa, Westmeath, Maria and Bronson tps. (5)
<i>Nepytia canosaria</i> Wlk.	bF, eC	Common on beating tray sample (4)
<i>Nymphalis antiopa</i> Linn.	wE	Severe defoliation of one three inch d.b.h. tree in Westmeath Tp.
<i>Petrova albicapitana</i> Busck.	jP	Few nodules in Clara, Petawawa, Westmeath, Richards, Maria, Cameron, White and Head tps. (8)
<i>Phenacaspis pinifoliae</i> Fitch	wS	Heavy infestation of ornamental spruce trees in Petawawa and Buchanan tps.
<i>Pikonema alaskensis</i> (Roh.)	bS	Light infestations in Lawrence, Freswick and Bower tps. (3)
<i>Pineus floccus</i> Patch	bS	Light infestations in Guthrie, Bishop and Maria tps. (3)
<i>Profenusa thomsonii</i> (Konow)	wB	Light infestations throughout the district (6)
<i>Psilocorsis fletcherella</i> Gibs.	tA	Light to heavy infestations common throughout the district (12)
Pyralidae	Su	Heavy infestation on one tree in Westmeath Tp.
<i>Sarrothripus cinereana</i> (N. & D.)	bPo	Heavy infestation on two trees in Niven Tp.
<i>Schizura concinna</i> J. E. Smith	Se	Moderate defoliation of one bush in Maria Tp.

TABLE 19, Pembroke District

Insect	Host(s)	Remarks
Semiiothisa sp. (granitata gp.)	bF	Common on beating tray samples throughout the district (6)
Zeugophora sp.	tA, cPo, bPo	Light on aspen and balsam poplar in Bronson and Master tps. Moderate on Carolina poplar in South Algona Tp. (3)

SOUTHWESTERN FOREST REGION

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INTRODUCTION

Southwestern Forest Region

The European pine sawfly increased alarmingly, in infestation intensity at many points and spread to new eastern boundaries in the Lake Simcoe District. Spruce budworm populations declined to low levels except at one point in Lake Simcoe District where heavy infestations persisted. A new heavy infestation of forest tent caterpillar occurred on sugar maple in Medonte Township, whereas there was little change in eastern tent caterpillar populations. Infestations of balsam fir sawfly declined from medium to light intensity in the Bruce Peninsula and from heavy to light at a point in Rama Township. Heavy infestations of larch sawfly and spring cankerworm were more widespread in the region, whereas noticeable declines occurred in populations of the black-headed jack pine sawfly, introduced pine sawfly and larch casebearer. Birch leaf skeletonizer and walnut caterpillar infestation levels declined except at points in Lake Erie District where heavy infestations of the latter recurred. The white pine shoot borer caused moderate tip damage to the lateral shoots and light damage to the leading shoots of Scots, red, white, Mugho and Austrian pine at many points in the region. Medium infestations of the elm leaf beetle recurred at several points in the southern part of the region. Jack pine needle miner infestations declined to light intensity in Lake Huron District but persisted at medium and heavy infestation levels in Lake Simcoe District.

Observations and appraisals were made on the natural and artificial controls, and biology of a wide variety of forest insects. Fungus diseases caused from 28 to 65 per cent mortality of 1964-1965 larch sawfly overwintering cocoons in sample areas and parasitism by three species of parasites ranged from one to 20 per cent. Pupae of the European pine sawfly, black-headed jack pine sawfly, larch sawfly, red-headed pine sawfly and mountain ash sawfly which were set out in cages under near natural conditions attracted several species of parasites currently being studied.

Over 78 special insect samples were submitted for parasite, disease and life history studies, and life history studies of leaf miners on ironwood, red pine and spruce were continued.

For the second consecutive year unusually late spring frosts caused severe damage to the new growth of spruce and several deciduous species such as oak, walnut, ash, beech and horse chestnut. A severe storm on June 24 caused heavy tree damage in the St. Williams area.

Extensions were noted in the distribution of white pine blister rust, and a new rust on hemlock cones, Melampsora abietis-canadensis Ludw. ex Arth. at widely separated points. Further widespread deterioration of sycamore occurred in the Lake Erie District and Gloeosporium sp. caused anthracnose and increased deterioration of sugar maple along roads.

Sample plots were established at several locations in the region to carry out systematic sampling procedures in determining the incidence of Dutch elm disease and hypoxylon canker of poplar.

Extension work involving Department of Lands and Forests personnel, plantation owners and others again constituted an important part of the activities of the Forest Technicians.

The interest and co-operation extended by the Department of Lands and Forests personnel and others in the region is gratefully acknowledged.

A. A. Harnden

STATUS OF INSECTS

European Pine Sawfly, Neodiprion sertifer (Geoff.)

Marked increases in population levels of this sawfly occurred at many points in the region in 1964 and complete stripping of the old foliage of host trees occurred commonly. Colonies on heavily infested trees often fed on the tender bark of new leaders and upper lateral shoots causing them to wilt and break off. The principal host species were Scots, red, and jack pine; Mugho and Austrian pine were less favoured hosts (Table 1).

In Lake Simcoe District, the eastern limit of known distribution advanced slightly. The new distribution boundary extended roughly southeastward from Midland, through the south end of Cook Bay and Cedar Valley, thence eastward near Bloomington through the south end of Lake Scugog into Lindsay District (see map). Populations increased sharply at many points in the Lake Simcoe District. Pockets of heavy infestation occurred in plantations in Tiny, Vespra, Adjola, Mulmur, Tosorontio, Mono, Albion, and Pickering townships. Generally the greatest population increases occurred in neglected plantations, however, sharp population increases also occurred in some Scots pine Christmas tree plantations where control measures had been carried out in recent years. It is probable the heavy infestations in the latter plantations were largely due to a mass migration in 1963 of adult sawflies from neighbouring neglected plantations. Only light infestations were found in older plantations. For example in Pickering Township near Balsam, an average of 23 colonies counted on 10-foot Scots pine trees in an open part of a plantation caused nearly complete defoliation of the old foliage while few colonies and little defoliation occurred in the remainder of the plantation where the crowns were closed.

In Lake Huron District, significant increases in larval populations occurred at several locations. Severe defoliation of Scots pine trees resulted in numerous neglected plantations in Grey and Bruce counties, in the Adams Tract in Howick Township, and in the Hyde Tract in Beverly Township. Light infestations occurred commonly in the district except in the central and northern part of the Bruce Peninsula where the insect has not been found. Very low numbers of the insect were seen in older plantations.

A marked increase in population levels occurred in the Lake Erie District. Larval colonies were found on Mugho pine at Fort Erie and on Scots pine at Niagara-on-the-Lake, thus extending the known range of the insect to include the entire district. Heavy infestations were observed at numerous points in Adelaide Township and at one location in Canborough Township where 20-foot open-grown jack pine trees were 75 to 95 per cent defoliated. Medium to heavy infestations occurred in pockets of jack pine and Scots pine plantings in Caradoc and Euphemia townships respectively, in clumps of red and Scots pine in Turkey Point Nursery, and on Scots pine windbreaks in the St. Williams Forest Nursery. Pockets of medium infestation occurred on Scots pine in Cayuga North, Euphemia, McGillivray, Middleton South, Walpole, Westminster, Windham, and Yarmouth townships. Light infestations were common throughout the district.

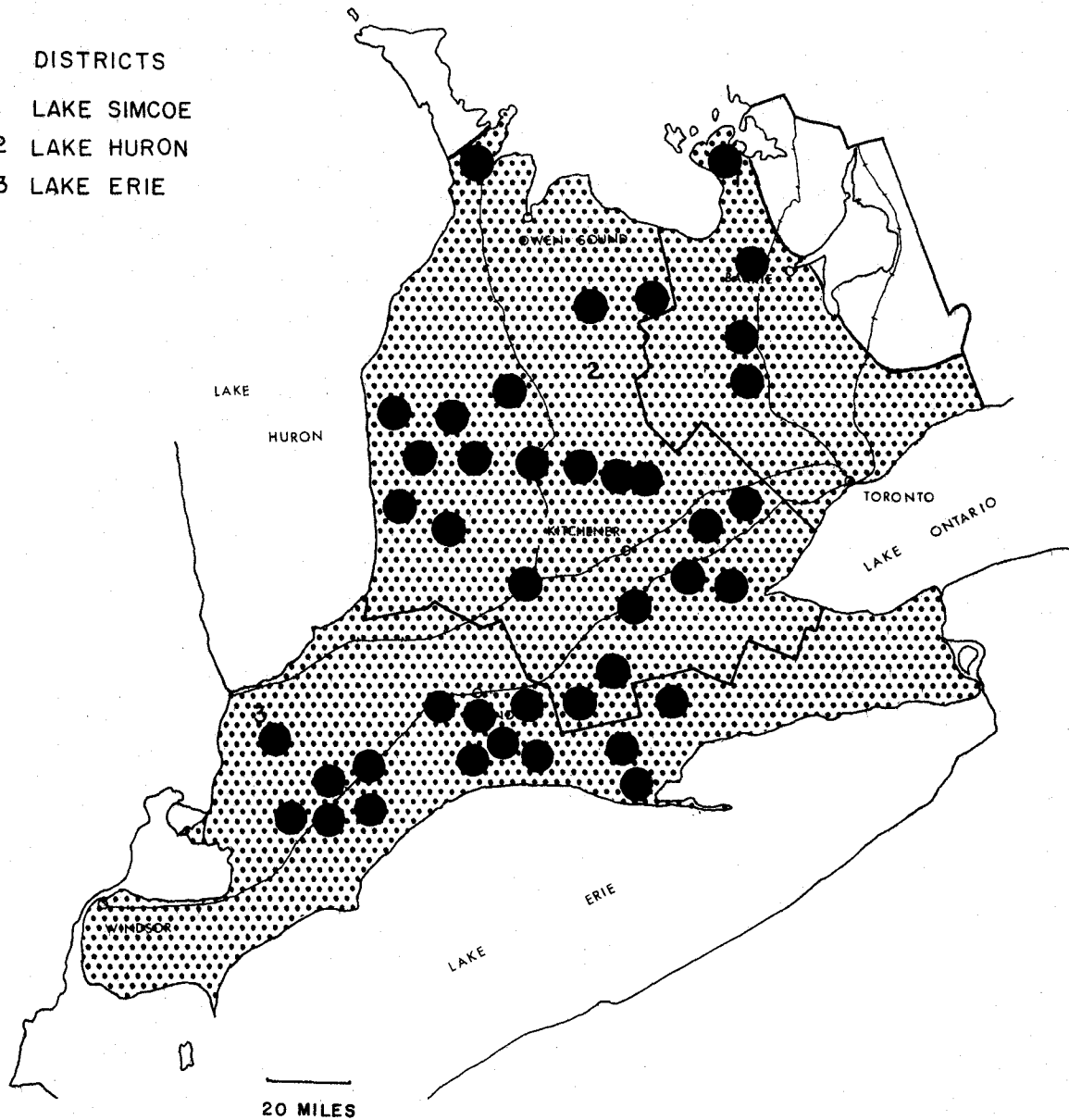
Since this insect was first reported in Ontario at Windsor in 1939 it has spread through most of the region. Unknown control factors have caused populations to remain at low levels in old as well as more recently infested locations while heavy outbreaks have also occurred in the same general areas. It is evident that some of the heavy infestations which occurred in 1964 as well as in previous years resulted from mass migrations of adult sawflies.

Insecticides such as D.D.T., the most common poison used in Christmas tree plantations, were effective in controlling the insect in the larval stage. A polyhedral virus disease, (see photographs), introduced from Europe in 1949 has been used successfully in controlling larval populations at widely-separated points in the region and at many more locations than are known. When applied in the early larval stages the disease is very effective, becoming epidemic and lethal in about ten days. If applied after the third instar fewer larvae die and survivors complete metamorphosis. The virus is transmitted by infected adults through the egg into the next and succeeding generations. In this way the disease will persist from year to year and infect healthy populations. Larval parasites play a very effective role in vectoring virus of native sawflies such as Neodiprion lecontei (Fitch.). The parasites carry the disease from one colony to another thus enlarging the epidemic. Unfortunately there are few larval parasites of the European pine sawfly to vector the disease and hence the virus spreads slowly from foci of infection. Virus sprayed in heavy infestations spreads more rapidly and is more effective in controlling succeeding populations than in light infestations. Since there are about 200,000,000 polyhedral bodies in one diseased larva, there is enough virus in one larva to infect a large number of insects. Some plantation owners collect diseased larvae and prepare a suspension of the virus for use in controlling infestations in their own plantations.

Two introduced parasite species, Dahlbominus fuscipennis (Zett.) and Pleolophus basizonus (Grav.) are firmly established throughout the range of the European pine sawfly. These parasites attack the cocoon stage and are seemingly more prevalent in newer areas of infestation.

SOUTHWESTERN REGION

- DISTRICTS
- 1 LAKE SIMCOE
 - 2 LAKE HURON
 - 3 LAKE ERIE



EUROPEAN PINE SAWFLY

Known locations where virus control sprays have been used relative to the known distribution of the sawfly in the Region in 1964

Legend



- Distribution of the sawfly 
- Virus release points 

TABLE 1

Summary of European Pine Sawfly Colony Counts and Degrees of Infestation
on Scots Pine Trees in the Southwestern Region
in 1963 and 1964

Location (township by district)	Av. height of trees in feet	Av. no. colonies per infested tree		Per cent of trees infested in 1964	Degree of infestation in 1964
		1963	1964		
<u>Lake Simcoe</u>					
Caledon	18	3	10	100	Medium
Toronto	26	4	7	90	Light
Tiny	7	4	4	95	Medium
Pickering	13	4	5	99	Heavy
Melancthon	15	0.3	0.3	55	Light
Whitby	10	11	23	100	Heavy
<u>Lake Huron</u>					
Stanley	12	1	1	17	Light
E. Wawanosh	18	5	4	64	L-M
Goderich	6	2	3	93	Medium
Brant	12	1	2	40	Light
Blandford	12	2	1	29	Light
E. Oxford	12	1	1	9	Light
<u>Lake Erie</u>					
Adelaide	9	10	13	100	Heavy
Aldborough	6	-	2	56	Light
Euphemia	7	3	5	88	Medium
McGillivray	9	5	6	90	Medium
N. Cayuga	8	3	1	40	Light
Romney	7	-	4	92	Medium
Willoughby	8	-	3	40	Light
Yarmouth	7	-	2	70	Medium

European Pine Shoot Moth, Rhyacionia buoliana (Schiff.)

Light to medium and occasional heavy infestations of this insect persisted throughout the Region in 1964. Shoot damage in the spring declined approximately six per cent at two locations.

In Lake Simcoe District, heavy and medium infestations persisted in young plantations in Tosorontio and Mono townships. A heavy infestation declined to medium intensity in Markham Township and a medium infestation persisted at a point in Mulmur Township. In Lake Huron District heavy infestations persisted in a clump of small red pine trees and medium infestations occurred on larger trees in the Kiwanis plantation in Keppel Township. Small pockets of medium and heavy infestation recurred on red pine in the Sandy Hill Tract, Woolwich Township and in a Scots pine plantation near Roseville, North Dumfries Township. Heavy infestations in a private plantation near Port Elgin, Bruce County declined to moderate intensity in 1964.

In Lake Erie District, moderate infestations occurred in clumps of trees in Scots pine plantations in Clinton and Grantham townships. Infestations on 20 hedgerow red pine trees in Charlotteville Township, Norfolk County were rated medium to heavy. A new moderate infestation occurred in a 100-acre Scots pine plantation in Romney Township, Kent County.

Declines in the incidence of shoot damage in Lake Simcoe and Lake Huron districts was attributed to mortality of overwintering larvae due to severe winter cold. This insect is an imported species and cannot withstand winter temperatures in excess of 22 below zero.

Repeated heavy infestation in young plantations causes abnormal bud clusters and stunts current growth. Damaged leading shoots often cause stem deformity at the point of infestation. When stands become closed, however, infestations usually decline sharply and damage is of little consequence. The results of quantitative sampling carried out in the past two years is summarized in Table 2.

TABLE 2

Summary of European Pine Shoot Moth Damage
in the Southwestern Region
in 1963 and 1964

Location (township by district)	Av. d.b.h. of trees in 1964	Per cent of bud clusters infested in the spring		Degree of infestation in 1964
		1963	1964	
<u>Lake Simcoe</u>				
Tosorontio	2	33.0	27.0	Medium
Mulmur	2	1.0	2.0	Light
<u>Lake Huron</u>				
Keppel	3	16.0	10.4	Medium
Saugeen	2	-	11.4	Medium
Bentinck	4	1.0	0	Nil
<u>Lake Erie</u>				
Aldborough	4	1.0	1.8	Light
Euphemia	3	1.0	2.4	Light
North Cayuga	3	-	1.6	Light
Romney	3	-	10.3	Medium
Willoughby	2	-	1.3	Light
Woodhouse	3	-	.8	Light
Yarmouth	4	-	2.6	Light

Larch Sawfly, Pristiphora erichsonii (Htg.)

High population levels persisted in several larch and tamarack stands in the Region. In the Lake Simcoe District heavy infestations recurred in older European and Japanese larch plantations and light infestations increased to medium and heavy intensity in younger plantations and tamarack stands, particularly in Simcoe County. Defoliation, ranging up to 95 per cent, was common in the older

plantations.

In the Bruce Peninsula in Lake Huron District heavy infestations declined to generally medium infestation, with scattered pockets of heavy intensity. One new small pocket of heavy infestation was observed in a tamarack stand in Lot 1, Concession XVIII Howick Township. Moderate defoliation was noted in the Bells Lake area and at Eugenia Lake in Grey County, and in a few widely-scattered areas in Bruce County. Light infestations occurred commonly in clumps and small pockets of tamarack and European larch elsewhere in the district.

In the Lake Erie District severe defoliation of European larch recurred at a quantitative sample point in South Walsingham Township. Medium infestations recurred on mature European and Japanese larch trees at the St. Williams Forest Nursery. No control program was carried out in this area in 1964. High populations occurred in the Turkey Point Forest Nursery, Charlotteville Township. Sequential sampling in the area revealed that the per cent of tips curled by adult oviposition ranged from 15 to 68. Aerial spraying was carried out here on July 19 using a solution of one pint of Malathion to two and one-half gallons of water. No living larvae were found in the area two days after the spraying was done. The heavy infestation recorded in 1963 at the Reynolds Tract, Howard Township declined to light intensity in 1964. Numbers were low at several other points in the district.

High mortality in the 1964-1965 overwintering cocoons recurred at sample points in the region. Fungus diseases were responsible for mortality ranging from 28 to 65 per cent at widely-scattered points. The percentages of cocoons parasitized by Mesoleius tenthredinis Morley, Bessa harveyi (Tns.) and Tritneptis klugii (Ratz.) ranged from 0 to 12, 0 to 3 and 0 to 8 respectively. Encapsulation of M. tenthredinis eggs was less than ten per cent at all collection points (Table 2).

For the fifth consecutive year studies have been conducted in association with Dr. T. A. Angus, Insect Pathology Research Institute in Sault Ste. Marie to determine the cause of high larval mortality in larch plantations. Although several pathogens were cultured from dead larvae they had no toxic effect when fed to healthy larvae in the laboratory. Recent observations indicate that high temperatures may be an important factor contributing to larval mortality. To test the effect of exposure fourteen mature larvae were placed on a white sheet at midday when the air temperature was approximately 95°F. During the first minute of exposure the larvae were abnormally active and at the end of two minutes all but two were dead. When heavy defoliation occurs in plantations the temperature rises sharply on clear days, at such times larvae that drop from the trees because of exposure to sunlight or to search for food encounter extreme and probably lethal temperatures on the ground.

Observations also showed that a high percentage of larvae were decapitated by an unknown species of birds at one point in Medonte Township.

Curled tip mortality due to wounding by adult oviposition was less prevalent in the region than in 1963. This lessening of tip mortality was attributed to an increase in tree vigor and shoot growth due to ample rainfall. In spite of recurring heavy defoliation the annual increment of larch in Uxbridge Forest increased from 0.8 millimeters in 1963 to 1.2 millimeters in 1964.

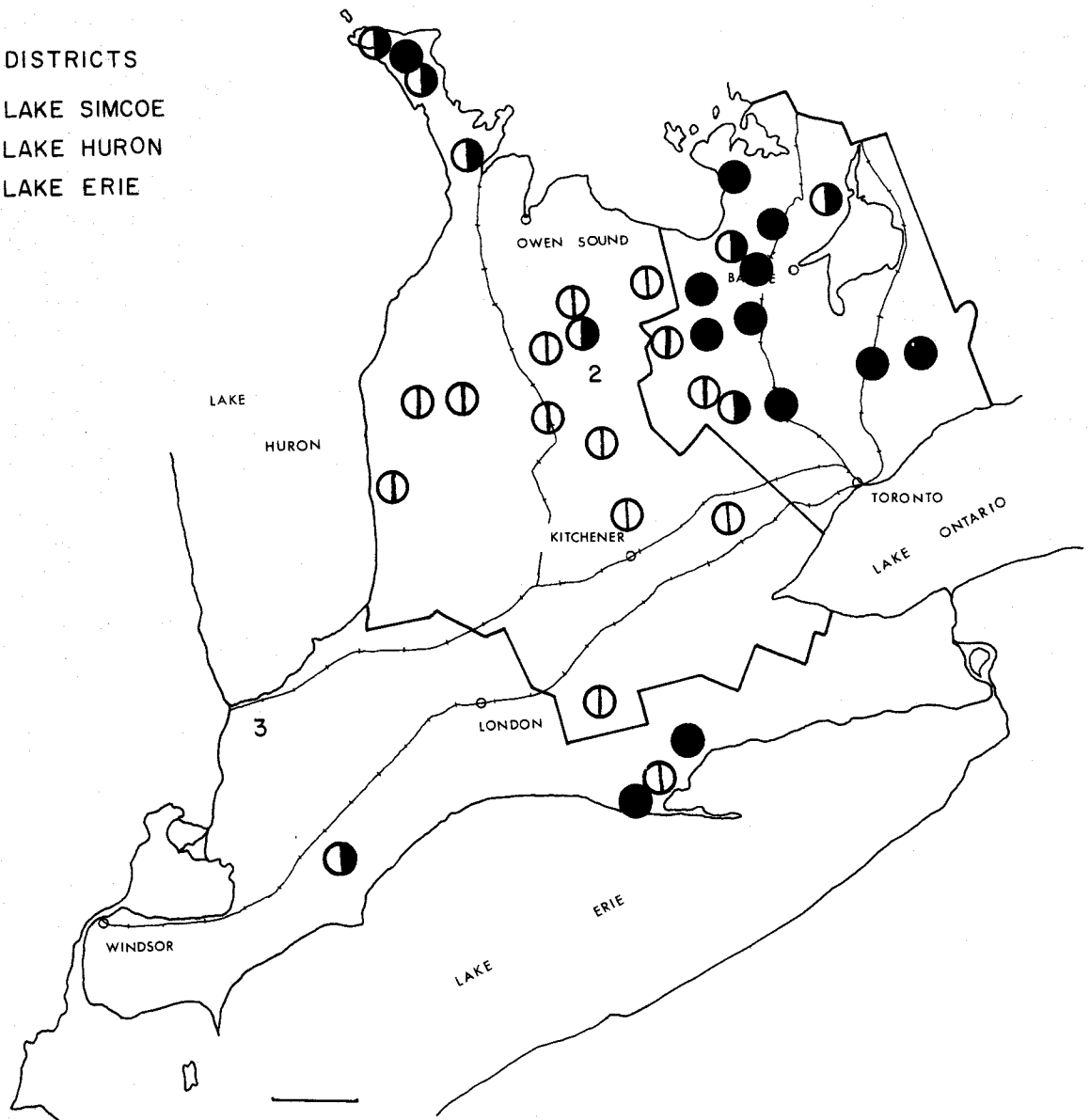
TABLE 3

Results of Larch Sawfly Cocoon Dissections in the Southwestern Region
from 1962 to 1964

Location (township by district)	No. of cocoon examined in 1964	Percentage of cocoon with encapsulated egg of <i>M. tenthredinis</i>			Percentage of cocoon with larvae of <i>M. tenthredinis</i>			Percentage of cocoon para- sitized by <i>Bessa harveyi</i>			Percentage of cocoon para- sitized by <i>Tritneptis klugii</i>			Percentage of cocoon killed by fungus disease		
		1962	1963	1964	1962	1963	1964	1962	1963	1964	1962	1963	1964	1962	1963	1964
<u>Lake Simcoe</u>																
Oro	100	4	0	6	1	1	0	0	1	0	9	4	8	83	38	65
Uxbridge	100	9	8	-	0	4	-	2	2	-	19	6	-	58	34	-
Vivian	100	-	-	7	-	-	1	-	-	3	-	-	4	-	-	44
<u>Lake Huron</u>																
St. Edmund	94	34	12	7	4	8	2	2	0	0	0	1	0	8	17	28
Lindsay		36	-	-	6	-	-	2	-	-	0	-	-	10	-	-
<u>Lake Erie</u>																
Howard	26	1	0	8	4	1	12	0	1	0	25	0	8	23	55	31
S. Walsingham	100	3	1	4	2	0	0	0	4	1	0	1	0	11	1	46

SOUTHWESTERN REGION

- DISTRICTS
- 1 LAKE SIMCOE
 - 2 LAKE HURON
 - 3 LAKE ERIE



LARCH SAWFLY

Locations where infestations
were observed in 1964

Legend

- Light infestation..... ⊕
- Medium infestation..... ◐
- Heavy infestation..... ●

Sequential sampling to determine population densities was carried out at six points in the region. The results, based on the percentage of curled tips caused by adult oviposition, are summarized in Table 4.

TABLE 4

Summary of Curled Shoot Counts and Degrees of Infestation
of the Larch Sawfly in the Southwestern Region
from 1962 to 1964

Location (township by district)	Host	Av. d.b.h. in inches in 1964	Per cent tips curled			Degree of infestation		
			1962	1963	1964	1962	1963	1964
<u>Lake Simcoe</u>								
Oro	eL	6	50	75	65	H	H	H
Uxbridge	eL	8	64	33	35	H	H	H
<u>Lake Huron</u>								
St. Edmund	tL	7	60	70	16	H	H	M
Lindsay	tL	-	42	-	-	H	H	M
<u>Lake Erie</u>								
Howard	eL	9	50	48	4	H	H	L
S. Walsingham	eL	11	13	53	60	M	H	H

STATUS OF TREE DISEASES

Eastern Dwarf Mistletoe, Arceuthobium pusillum Pk.

This dwarf mistletoe was observed commonly on white and black spruce in the Bruce Peninsula in 1964. Severe branch mortality occurred in several localized pockets between Greenough Point and Tobermory. Stem mortality was generally confined to occasional host trees in the area. Observations indicated that trees in all diameter and age classes were highly susceptible to the disease. Large witches'-brooms were observed on two mature white spruce trees in the Lake Simcoe District.

Shoestring Root Rot, Armillaria mellea (Fr.) Kummer.

Light infections of the shoestring root rot occurred in numerous pine plantations in the Region in 1964. In the Lake Simcoe District, red pine mortality occurred in characteristic circular areas in Medonte, Mara, Oro, Tosoronto, Sunnidale and Flos townships. The advance of infection was arrested in a 30-year-old red pine plantation in Medonte Township when the dead trees were removed.

Biatorrella resinae (Fr.) Mudd.

This fungus and Stereum sanguineolentum (Alb. & Schw. ex Fries) Fr. were observed fruiting on stem cankers of white spruce in a 30-year-old plantation at Midhurst. In a sample of 50 trees the incidence of cankers was 68 per cent

while mortality was four per cent. Heavy resin flow characterized most of the infected trees while a few were nearly girdled.

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

Continued high incidence of infection caused severe mortality of elm trees in many parts of the region. For the second consecutive year heavy mortality occurred in the southwestern part of the Lake Simcoe District. Up to 80 per cent mortality was noted in clumps of elm, particularly in the Toronto-Brampton area.

Except for scattered clumps of heavy infection the incidence of mortality was generally low in other parts of the district. No extension in populations of the smaller European elm bark beetle, Scolytus multistriatus (Marsh.) was evident in 1964.

In the Lake Huron District the incidence of diseased trees increased considerably in Grey and Bruce counties. Generally the degree of mortality was medium in the area but occasionally was high in open growing and fencerow elm. Where recently infected trees occurred in groups it was often observed that a previously infected tree was present. This indicates that the new infections were initiated via root grafts. As in 1963 the rate of tree mortality remained high in numerous areas of the southern part of the district and several centres of new infection were observed.

There was a marked increase in the incidence and severity of this disease in the Lake Erie District on trees of all height and diameter classes. Sampling and culturing showed trees on private property at Byng, Cayuga, Port Stanley and St. Thomas to be infected. At Port Stanley one of 40, 50-year-old English elm trees, Ulmus procera Salisb., was infected. One diseased tree which had been removed measured 23 inches at ground level. In early August an adjacent tree developed symptoms. Samples taken from this tree yielded the causal organism, C. ulmi in culture.

Roadside elms were sampled at 15 widely separated points in the Region to establish the current incidence of the disease, the percentage of the elm population killed to 1964, and the current rate of mortality. The preliminary results appear in Table 5.

TABLE 5

Summary of Dutch Elm Disease Surveys
Carried Out on Roadside Elm Trees
in the Southwestern Region
in 1964

Location (township)	No. of trees examined	Condition of Trees			Per cent of trees infected
		Healthy	Diseased	Dead	
<u>Lake Simcoe</u>					
Toronto	50	25	17	8	50
Nottawasaga	50	49	1	0	2
Orillia	50	50	0	0	0
Reach	111	103	5	3	7
<u>Lake Huron</u>					
Sydenham	50	48	1	1	4
Stanley	50	41	9	0	18
E. Oxford	50	46	3	1	8
Nassagaweya	50	37	6	7	26
<u>Lake Erie</u>					
Bosanquet	11	11	0	0	0
Dunn	17	17	0	0	0
Gainsborough	50	50	0	0	0
Maidstone	50	45	5	0	10
Southwold	31	30	1	0	3
Thorold	21	20	1	0	5
Zone	7	1	6	0	86

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

Light to heavy infections caused by this fungus occurred commonly in white pine plantations in Lake Simcoe and Lake Huron districts. In a plot in a white pine plantation representative of those in Woolwich Township, Lake Huron District, 16 per cent of the trees were infected, and four per cent had been killed. Infections were generally heaviest in areas where Ribes spp. were most numerous. New infections were noted in East Gwillimbury and Melancthon townships. In the latter approximately five per cent of the trees in a young plantation were affected. A low incidence of infection occurred at two points in Lake Erie District.

Cytospora Canker of Hardwoods, Cytospora chrysosperma (Pers.) Fr.

This fungus, perfect stage: Valsa sordida Nit., causing cankers of hardwoods was common in the Region in 1964. Severe mortality of small branches and twigs occurred in infected clumps of willow at several points in the Lake Huron District. Medium infections caused moderate damage to trembling aspen understory in Bayham Township, Lake Erie District and at one point in Amaranth Township, Lake Simcoe District. Light infections were noted on trembling aspen at the Pinery Provincial Park, Lake Erie District, two months after a fire had occurred.

Cytospora Canker of Spruce, Cytospora kunzei Sacc.

As in 1963, tree deterioration attributable to this pathogen continued in a small 20-year-old Norway spruce plantation near Shelbourne in Lake Simcoe District. Approximately 15 per cent of the trees died and the remainder were in varying stages of decline. Old fence row plantings of Norway spruce have deteriorated rapidly in recent years. For example, at a point in Markham Township along Highway 7, 25 of 46 trees averaging 18 inches in diameter have died in the past three years.

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

Severe infections of black knot on eastern choke cherry occurred at numerous points in the Region. High stem mortality occasionally reaching 75 per cent occurred near Clarkson in Lake Simcoe District and at various points in the northern part of the Lake Huron District.

Brown Root and Butt Rot of Conifers, Fomes annosus (Fr.) Cke.

This root rot fungus continued to cause tree mortality in the infection centre which was found in a 30-year-old red pine plantation in 1963 south of Orr Lake in Lake Simcoe District. A new area suspected of being a centre of infection of this disease was found north of Orr Lake in 1964 while an old area of infection in Vivian Forest re-examined in 1964 was found to be active, although recent tree mortality was negligible. In an attempt to prevent further spread of the disease by wind-borne spores, newly cut stumps in the Orr Lake area were treated with a 10 per cent solution of sodium nitrite.

Anthraces of Hardwoods, Gloeosporium spp.

These conditions caused by different species of the genus Gloeosporium were again prevalent in the Region in 1964. Unusually heavy foliar damage occurred on roadside sugar maple trees at numerous points. Varying degrees of injury were recorded commonly on exposed white oak, white ash, red maple, beech and eastern choke cherry. The unsightly appearance of these infected trees caused continued concern throughout the Region.

A Leaf and Twig Blight of Sycamore and Oaks, Gnomonia veneta (Sacc. & Speg.)
Kleb.

Widespread deterioration of sycamore trees continued throughout Lake Erie District in 1964. On one mature tree at the St. Williams Nursery branches and foliage were heavily infected, and considerable premature defoliation had occurred.

At the McConnell Nursery, Port Burwell, a mature ornamental tree heavily infected in 1962 died in 1963; this indicates the pathogen can kill trees.

Cedar-apple Rust, Gymnosporangium juniperi-virginianae Schw.

Medium to heavy infections of this rust occurred on native and exotic Juniperus spp. at several points in the Region. In Lake Erie District heavy infections occurred in a commercial tree farm in Euphemia Township and along number 3 highway in Cayuga North Township where moderate branch mortality was recorded. In the Lake Huron District, very severe aecial infections occurred on most hawthorns in Derby Township. Elsewhere the incidence and severity of infections were low.

Hypoxyylon Canker of Poplar, Hypoxyylon pruinatum (Klotsche) Cke.

In 1964, systematic sampling carried out in aspen stands throughout the Region showed that this pathogen was generally present with incidence varying from low to high at different locations (see Table 6).

TABLE 6

Summary of Surveys of Hypoxyylon pruinatum (Klotsche) Cke.
in the Southwestern Region in 1964

Location (tp. by district)	No. of trees examined	Av. d.b.h. in in.	Av. height in ft.	Stand vigour	Condition of trees			Per cent diseased trees
					Healthy	Living infected	Dead infected	
<u>Lake Simcoe</u>								
Medonte	38	5.7	40	Good	18	12	8	53
Essa	44	3.7	30	Good	17	17	10	61
<u>Lake Huron</u>								
Keppel	37	3.5	37	Good	21	9	7	43
Glenelg	35	3.7	26	Fair	22	9	4	37
<u>Lake Erie</u>								
Mosa South	43	2.9	22	Good	32	3	8	26
Middleton	24	5.2	35	Good	20	2	2	17

Eastern Gall Rust, Peridermium sp.

There was little change in the status of this gall-forming fungus in 1964. The highest number of galls seen in Lake Simcoe District on any single tree was in Camp Borden where 30 were counted on one three-foot Scots pine branch. A high incidence of galls was measured at points in Tosorontio and Vaughan townships and the disease was recorded on Ponderosa pine at Midhurst.

In the Lake Huron District heavy infections occurred on Scots pine trees in a section of the Grey Main Tract, Grey County and 23 galls were counted on a four-foot branch of a heavily infected tree in the Sheppardton Tract, Huron County.

In Lake Erie District, heavy infections occurred on individual Scots pine trees at the St. Williams Nursery, and moderate infections were recorded in the Turkey Point Provincial Park, Norfolk County.

Phoma sp.

In Lake Simcoe District a Phoma sp. was associated with the dying of branch tips of young white pine which died in the late fall of 1963. Heavy infections occurred in plantations in Melancthon and West Gwillimbury townships and moderate and light infections occurred at many other locations in the district. In Lake Huron District this fungus was associated with dead white pine branches.

and stems which were damaged previously by mechanical means.

Phomopsis sp.

Several species of this genus were recorded on different hosts (larch, white pine, Norway spruce) in 1964. In some instances parasitic activity was indicated but the extent is not yet clear because only a few trees were involved.

In Lake Erie District Phomopsis sp. was found on white pine shoots which had been killed by the white pine shoot borer, Eucosma gloriola Heinr. and the white pine weevil, Pissodes strobi (Peck).

Frost Damage

Unusually late spring frosts caused severe damage to the current growth of a wide range of tree species in the Region. Red oak, dwarf oak, walnut, beech and ash were the most seriously affected deciduous hosts. Among coniferous species the shoots and cones of scattered white and Norway spruce plantings were affected. Up to 90 per cent mortality of new growth occurred in frost pockets in numerous areas.

White Pine Needle Blight

This physiogenic disease of eastern white pine, characterized by the partial or entire death of needles of the current year, giving affected trees a rust-brown colour, caused severe to moderate damage on sporadic trees in scattered white pine plantations in Lake Simcoe and Lake Huron districts in 1964. Light damage was recorded at one point in Lake Erie District.

Wind Damage

Tornado-like winds caused widespread damage to trees in Lake Erie District on June 24. In the Village of St. Williams, Norfolk County 15 mature ornamentals were uprooted or snapped off, and 25 other trees were severely damaged. The trees destroyed or damaged included red, silver and sugar maples, and white elm. Subsequently, many of the damaged trees remained unpruned or only poorly trimmed and therefore vulnerable to pathogenic or insect injury.

Along four miles of roadside south-east of London in Westminster Township 11 mature open-grown trees were uprooted in this storm. The species most seriously affected were white spruce, white elm, cottonwood, willow and basswood. Windthrown silver maple and willow trees were observed along the St. Clair River south of the City of Sarnia.

TABLE 7

Other Noteworthy Diseases in the Southwestern Forest Region
in 1964

Organism	Host(s)	Remarks
<i>Agrobacterium tumefaciens</i> E. F. Sm. & Towns. Conn.	rM, sM	Galls common at numerous points in Lake Simcoe District. About one-third of branches of a 10-foot tree were killed and the remainder severely galled near Midhurst.
<i>Aureobasidium pullulans</i> (deBary) Arnaud	wP	Associated with white pine foliage droop in West Gwillimbury Tp.
<i>Camarosporium robiniae</i> (Westd.) Sacc.	Hon	Heavy cankering and some branch mortality widespread in Lake Simcoe District.
<i>Cladosporium sub sessile</i> Ell. & Barth.	tA	Foliar damage common in Essa Tp.
<i>Coccomyces hiemalis</i> Higgins	pCh	Foliar infections increased from moderate to heavy at the Turkey Point Forest Nursery.
<i>Coleosporium asterum</i> (Diet.) Syd.	rP, jP	Moderate to heavy rust infection on lower foliage of red pine in Lake Simcoe District and light infections of lower foliage of red and jack pines at numerous points in Lake Huron District.
<i>Coryneum</i> sp. (possible kunzei)	wO	This fungus associated with severe branch mortality near Washago.
<i>Cumminsiiella sauginea</i> (Pk.) Arth.	Mahonia sp.	Fruiting on berries at Midhurst.
<i>Cytospora</i> spp.	sM, rM wAs, bAs, nS, eL, cE	Unidentified species of this genus associated with foliar injury on a wide range of host trees.
<i>Dothichiza populea</i> Sacc. & Braird	cPo	Infections causing severe branch and occasional mortality of trees occurred on all diameter classes.
<i>Dothiorella quercina</i> (C. & E.) Sacc.	rO	Moderate branch mortality occurred in Nelson Tp. and heavy infections recurred in Niagara Tp.
<i>Eutypella parasitica</i> Davidson & Lorenz	sM, rM	Moderate incidence of infection in Lake Simcoe and Lake Huron districts.
<i>Favolus alveolaris</i> (DC. ex Fr.) Quel.	rO, sHi	Several conks on dead branch of living hickory tree and on oak slash, Lake Erie District.

TABLE 7 (continued)

Organism	Host(s)	Remarks
<i>Fomes ignarius</i> (L. ex Fr.) Gill	rO, tA	Conks caused by this heart rot common in the Region.
<i>Frommea</i> sp.	lA, bPo	Medium infection in South Walsingham Tp.
<i>Ganoderma applanatum</i> (Pers.) Pat.	cinque-foil sHi, sM wE	Shelf fungi conks abundant on dead trees and light on living trees in Lake Erie District.
<i>Ganoderma lucidum</i> (Leyss. ex Fr.) Karst.	eH	Medium incidence on stumps in Malahide Tp.
<i>Ganonia ulmea</i> (Sch. ex Fr.) Thum	wE	Light and medium foliar infections on open-grown trees in the Region.
<i>Guignardia aesculi</i> (Pk.) V. B. Stew.	hChe	Severe foliage damage at one location in Vaughan Tp.
<i>Gymnoconia peckiana</i> (Howe) Trotter	rasp- berry	Light leaf infection in South Walsingham Tp.
<i>Hydnum septentrionale</i>	sM	Large fruit body on trunk of one over-mature tree in Sullivan Tp.
<i>Hypodermella ampla</i> (J. J. Davis) Dearn.	jP	Medium needle cast in plantations in Howard and Albion tps.
<i>Lenzites seapiaria</i> (Wulf.) ex Fr.	scP	Fruiting heavy on stumps in a plantation in Middleton North Tp.
<i>Macrophoma sabinea</i> (Fr.) Petrak	pinos	Associated with severe canker- ing of scrub pine and foliage damage of ponderosa pine in Midhurst Nursery, and moderate foliar damage of red pine in the St. Williams Nursery.
<i>Marssonina populi</i> (Lib.) Sacc.	Po	Severe foliar damage of hybrid poplar in Essa Tp.
<i>Melampsora abietis-canadensis</i> Ludw. ex Arth.	eH	Range of this cone rust extended through the Region; infections generally light.
<i>Melampsora</i> sp.	Co	Very heavy infection on under- side of leaves on Pelee Island.
<i>Melanconis ostryae</i> (Dearn.) Wehm.	I	Cankers caused branch morta- lity of small trees in Glenelg Tp.
<i>Melanconium</i> sp.	Bu, Wa, weB	Heavy infection on butternut in Malahide and Bentinck tps. and on weeping birch in Holland Tp. Light on butter- nut and walnut in Bentinck and South Walsingham tps. respectively.

TABLE 7 (continued)

Organism	Host(s)	Remarks
<i>Peniophora</i> sp.	bHi, I, Be	On dead branches of two hickory trees in Woodhouse Tp.; light on beech in Grantham Tp. and on ironwood in Willoughby Tp.
<i>Phyllosticta convallariae</i>	<i>Smilacina racemosa</i>	Light in South Walsingham Tp.
<i>Pleurotus ostreatus</i> (Fr.) Quel.	sM	Large fruiting masses on an over mature tree in Orangeville.
<i>Pollacia radiosa</i> (Lib.) Bald. & Cib.	tA, lA	Light to severe tip mortality of young trees and foliar infection in the Region.
<i>Polyporus obtusus</i> Berk. Berk.	wO	Disease found at points in Baxter and Matchedash tps.
<i>Polyporus sulphureus</i> Bull. Fr.	rO, bCh	On mature trees at points in Lake Simcoe and Lake Erie districts.
<i>Polyporus tulipiferae</i> (Schw.) Overholts	Mo	On five trees at McKay Forest in Elgin County.
<i>Polyporus versicolor</i> L. ex Fr.	wO	Numerous conks on a tree in Caistor Tp.
<i>Scolecnectria scolecospora</i> (Bref.) Seav.	wP	In association with <u>Armillaria mellea</u> on dead trees in McGillivray Tp., Lake Erie District.
<i>Septoria musiva</i> Pk.	bPo	Lower foliage heavily damaged east of Lake Simcoe.
<i>Steganosporium pyriforme</i> (Hoffm. ex Fr.) Cda.	sM	Fruiting on dead branches in lower crown of small tree in Carrick Tp.
<i>Stereum purpureum</i> (Pers.) Fr.	wO	On white oak in Grantham Tp.
<i>Taphrina caerulescens</i> (Mont. & Desm.) Tul.	rO, wO	Foliar damage heavy on small trees at St. Williams Nursery; light in Mulmur Tp.
<i>Tubercularia vulgaris</i> Tode. ex Fr.	sM	Moderate infections at two points in Lake Erie District.
Drought Injury	jP, wB, tA	Discoloration and premature shedding of the foliage of some species occurred on the Bruce Peninsula in areas of thin soil over limestone formations.

STATUS OF INSECTS IN LAKE SIMCOE DISTRICT

Cedar Leaf Miners.....	<u>Argyresthia thuiella</u> Pack. and <u>Pulicalvaria thujaeella</u> Kft.	B 19
Spruce Budworm.....	<u>Choristoneura fumiferana</u> (Clem.)	B 19
Larch Casebearer.....	<u>Coleophora laricella</u> Hbn.	B 19
Pitted Ambrosia Beetle.....	<u>Corthylus punctatissimus</u> (Zimm.)	B 20
Zimmerman Pine Moth.....	<u>Dioryctria zimmermani</u> Grt.	B 21
Nursery Pine Sawfly.....	<u>Diprion frutetorum</u> (F.).....	B 21
European Spruce Sawfly.....	<u>Diprion hercyniae</u> (Htg.).....	B 21
Introduced Pine Sawfly.....	<u>Diprion similis</u> (Htg.).....	B 22
White Pine Shoot Borer	<u>Eucosma gloriola</u> Heinr.	B 23
Jack-pine Needle Miner.....	<u>Exoteleia pinifoliella</u> (Cham.)...	B 23
Ironwood Seed Worm	<u>Gretchena delicatana</u> Heinr.	B 23
Pales Weevil and the Northern Pine Weevil	<u>Hylobius pales</u> (Hbst.) and <u>Pissodes</u> <u>approximatus</u> Hopk.	B 23
Pine Root-collar Weevil.....	<u>Hylobius radialis</u> Buch.	B 24
Eastern Tent Caterpillar.....	<u>Malacosoma americanum</u> (F.).....	B 24
Forest Tent Caterpillar.....	<u>Malacosoma disstria</u> Hbn.	B 25
A Leaf-folding Sawfly.....	<u>Nematus</u> sp. on Poplar	B 25
Balsam-fir Sawfly.....	<u>Neodiprion abietis</u> (Harr.).....	B 26
Red-headed Pine Sawfly.....	<u>Neodiprion lecontei</u> (Fitch).....	B 26
Two Jack-pine Sawflies.....	<u>Neodiprion pratti banksianae</u> Roh. and <u>Neodiprion pratti paradoxicus</u> Ross.....	B 26
Spring Cankerworm.....	<u>Paleacrita vernata</u> (Peck).....	B 26
White-pine Weevil.....	<u>Pissodes strobi</u> Peck	B 27
A Poplar Leaf Roller.....	<u>Pseudexentera oregonana</u> Wlsh. ..	B 27
A Pine Tip Moth.....	<u>Rhyacionia adana</u> Heinr.	B 28
An Aspen Webworm	<u>Tetralopha asperatella</u> (Clem.)...	B 28
Summary of Miscellaneous Insects Collected.....		B 28

A. A. Harnden

Cedar Leaf Miners, Argyresthia thuiella Pack. and Pulicalvaria thujaella Kft.

Little change in the status of these insects was noted in 1964. Heavy infestations again caused severe mining and premature shedding of the foliage of eastern white cedar through the central part of the district. Recurring heavy infestations in Uxbridge, Tosorontio, and Essa townships caused severe branch damage and some tree mortality.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm populations in the Uxbridge forest headquarters tract and at Midhurst declined in 1964 (Table 8). A heavy infestation which has persisted for more than 10 years in a 30-year-old white spruce compartment in Uxbridge Forest declined to medium-to-heavy intensity in 1964. Defoliation of the current year's needles averaged 55 per cent compared with 78 per cent in 1963, and medium infestations recurred in younger adjacent compartments. A decline in egg density from 75 clusters per 100 square feet of foliage in 1963 to 68 in 1964 indicates that larval populations could be somewhat lower in 1965.

As forecast from egg surveys in 1963, the medium infestation in a 30-year-old white spruce compartment at Midhurst declined to light intensity in 1964. Defoliation averaged 11 per cent of the current year's foliage compared with 36 per cent in 1963. Low population levels are forecast at this location in 1965. Egg density surveys revealed no egg clusters on 450 square feet of foliage examined.

Population levels were very low at other points in the district in 1964.

TABLE 8

Defoliation of White Spruce by the Spruce Budworm
in 1963 and 1964, Egg Densities, and
Corresponding Forecasts for 1965

Location (township)	Per cent defoliation		Egg density per 100 feet of foliage		Forecast for 1965
	1963	1964	1963	1964	
Uxbridge Forest	78	55	75	68	Medium
Midhurst Forest	36	11	0	0	Light

Larch Casebearer, Coleophora laricella Hbn.

Populations of this insect declined to very low levels since 1961. No larvae were found in branch samples from sample plots in Vespra, Uxbridge, and Whitchurch townships. The number of larvae per branch in a plot in Albion Township declined slightly but increased slightly in Medonte Township (Table 9).

TABLE 9

Summary of Larch Casebearer Larval Counts
in 1963 and 1964

Location (township)	Av. d.b.h. in inches in 1964	Av. no. larvae per 18-inch branch tip	
		1963	1964
Medonte	5	3	6
Albion	4	2	1

Pitted Ambrosia Beetle, Corthylus punctatissimus (Zimm.)

Sample plots which were established in 1962 to study the effects of infestations of this beetle on sugar maple reproduction were re-examined in 1964. All reproduction in square-yard sample quadrats was uprooted and examined. The quadrats were located in various degrees of exposure to light, in or adjacent to mature sugar maple stands (Table 10).

In Oro Township infestation levels declined as much as 20 per cent compared with 1963. The incidence of attack was considerably higher in plots 3A and 3B in a partially-thinned mature stand than in plots 2A and 2C in shaded and fringe locations of an undisturbed immature stand.

In a mature sugar maple stand, in East Gwillimbury Township, part of which was heavily thinned in recent years, the incidence of attack increased in open and fringe quadrats. The percentage of trees infested averaged 35 and 37 respectively. In contrast, in the shaded quadrat only three per cent of the trees were attacked.

As in 1963 infestations tended to be more severe in exposed than in shaded locations. Although most infested trees were killed, some with rootlets above the point of attack survived.

TABLE 10

Summary of Damage by the Pitted Ambrosia Beetle
in Lake Simcoe District, 1962-1964

Location (township)	Plot no.	Av. basal diameter in mm. in 1964	Per cent of trees infested			Degree of exposure
			1962	1963	1964	
Oro	2A	3.5	14.3	2.5	2.5	Shaded
	2C	4.0	3.1	17.6	2.5	Fringe
	3A	4.7	-	22.2	10.0	Partial
	3B	4.4	-	37.7	7.7	Partial
East Gwillimbury	1A	4.2	2.2	3.7	3.1	Shaded
	1B	6.5	-	30.6	37.0	Fringe
	1C	6.8	-	22.0	35.0	Open

Zimmerman Pine Moth, Dioryctria zimmermani Grt.

An infestation of this insect caused considerable mortality of the current year's shoots of 30-year-old red pine trees in a plantation at Camp Borden in Tosorontio Township. Moderate shoot mortality occurred in the lower crown of fringe trees but was light in the upper crown. Heavy infestations persisted in the trunks of several 8-inch diameter Scots pine trees near Meadowvale in Tosorontio Township and severe distortion of the trunks of the trees resulted.

Nursery Pine Sawfly, Diprion frutetorum (F.)

Population levels of this insect showed little change (Table 11). Infestations were generally light.

The adult of this sawfly prefers open-grown trees for oviposition and consequently quantitative samples were taken from shelter-belts and young uncrowded plantations.

TABLE 11

Summary of Nursery Pine Sawfly Larval Counts
in Lake Simcoe District in 1963 and 1964

Location (township)	Tree species	Av. d.b.h. in inches	Total number of larvae per 15-tray sample	
			1963	1964
Pickering	scP	5	20	29
Reach	scP	5	12	34
Melancthon	scP	4	2	4
Mono	scP	6	12	6
Vespra	scP	4	2	7
Orillia	scP	4	18	16
Oro	wP	4	-	5

European Spruce Sawfly, Diprion hercyniae (Htg.)

No appreciable change in the status of this insect was noted. Quantitative samples taken from spruce trees at eight widely-separated points showed that the highest population levels occurred in Medonte Township where 25 larvae were counted in a 15-tray sample (Table 12).

TABLE 12

Summary of European Spruce Sawfly Larval Counts
in Lake Simcoe District in 1963 and 1964

Location (township)	Tree species	Total number of larvae per 15-tray sample	
		1963	1964
Medonte	wS	25	25
Mara	nS	10	5
Whitchurch	wS	1	1
Vespra	wS	2	3
Nottawasaga	wS	10	10
Oro	wS	1	1
Uxbridge	wS	2	0

Introduced Pine Sawfly, Diprion similis (Htg.)

A general decline in population levels of this sawfly occurred in 1963 and 1964 except in a recently-infested area on the east side of the district where populations have increased for the third consecutive year.

The most noteworthy decline in population occurred at a sample point in Mono Township where a total of 199 larvae were counted on a 15-tray sample compared with 431 larvae in 1963 (Table 13). Defoliation at this point averaged about 40 per cent of the old foliage and 10 per cent of the current foliage. In contrast, at a point in Reach Township, the number of larvae per 15-tray sample in 1964 was double the number counted in 1963. The eastern boundary of known infestation on the west side of Lake Simcoe advanced about eight miles to a 10-year-old white pine plantation in Oro Township.

TABLE 13

Summary of Introduced Pine Sawfly Larval Counts
in Lake Simcoe District in 1963 and 1964

Location (township)	Tree species	Av. d.b.h. in inches	Total number of larvae per 15-tray sample	
			1963	1964
Mono	scP	5	431	199
Pickering	scP	4	77	13
Reach	scP	4	57	111
Vespra	scP	4	6	0
Melancthon	scP	4	3	6
Oro	wP	4	-	17

White-pine Shoot Borer, Eucosma gloriola Heinr.

Recurring infestations of this insect caused considerable concern to Christmas tree plantation owners. The highest incidence of shoot damage was observed in Albion Township where pockets of medium infestation occurred on planted white pine. Light infestations were common in other parts of the district. Shoot damage appraisals in sample plots in white pine plantations in Oro and Albion townships are shown in Table 14.

TABLE 14

Summary of White Pine Shoot Damage Caused by the White-pine Shoot Borer in Lake Simcoe District in 1964

Location (township)	Av. d.b.h. in inches	Per cent of trees infested	Per cent	
			terminal shoots infested	Av. no. attacks per tree
Oro	4	46	12	0.7
Albion	3	45	10	1.7

Damage was also common on white, Scots, red, Austrian and Mugho pine. The appearance of infested shoots varied considerably between tree species in that infested shoots of white pine and pruned Scots pine usually turned yellow and often drooped prior to larval emergence, whereas the shoots of red, Austrian, Mugho and unpruned Scots pine showed little change in colour until the larvae had dropped to the ground in mid-July. The needles on the infested part of the shoots of red, Austrian, and unpruned Scots pine were much shorter than those on the undamaged part and the damaged part of the shoots usually turned brown in early August.

Jack-pine Needle Miner, Exoteleia pinifoliella (Cham.)

Heavy infestations of this needle miner persisted in many jack pine plantations in Flos, Vespra, Whitchurch, Uxbridge and Albion townships. In these areas an estimated 40 per cent of the current needles were killed by primary mining and about 75 per cent of the old foliage was mined subsequently. Light infestations were common elsewhere in the district. Repeated foliage damage and needle loss has thinned the crowns and reduced tree vigour.

Ironwood Seed Worm, Gretchena delicatana Heinr.

A notable increase in population levels of this insect occurred in 1964 in most areas where ironwood trees were found. Infestations increased to heavy intensity and severe damage to the seed pods resulted. In some instances 75 per cent defoliation occurred at the ends of branches where seed production is normally heaviest.

Pales Weevil, Hylobius pales (Hbst.) and the Northern Pine Weevil, Pissodes approximatus Hopk.

Damage by these weevils has become increasingly serious in Christmas tree plantations in recent years. In plantations where cutting has been done and no control measures taken, branch damage resulted from the feeding of adult weevils.

The degree of "flagging" was proportionate to the amount of brood material available and the number of consecutive years trees had been cut. Low numbers were found in lightly harvested plantations and high numbers were associated with heavy harvests over a number of consecutive years.

The eggs of H. pales and P. approximatus are laid in the roots and stumps respectively of recently cut trees where the resultant broods live until they reach the adult stage. In late summer the adults emerge and feed on the small branches of adjacent trees. H. pales adults causes open wounds on the branches whereas P. approximatus adults puncture the bark with pin-sized holes and feed in a limited area of the underlying cambium and xylem. The former species is nocturnal in its feeding habits, passing the day in the duff under the host tree. The latter feeds during the day and at night. "Flagging" of branches caused by adult-feeding in late summer appears the following May but adult-feeding in the spring results in "flagging" of the branches in August.

Pine Root-collar Weevil, Hylobius radicis Buch.

No change was noted in the extent of infestations of this weevil in 1964 (see map). Heavy infestations recurred in pine plantations in Tiny, Flos, Vespra, Sunnidale, Essa and Tosorontio townships. Most of the trees above two inches in diameter at ground level were attacked. Tree mortality was highest in young Scots pine plantations.

Population studies at one location in Tosorontio Township revealed eight adults, four pupae and 26 larvae in the root-collar area of four, 4-inch diameter trees, representing an average of 9.5 insects per tree. At one location in Flos Township 29 per cent of harvestable trees infested by the insect died in 1964.

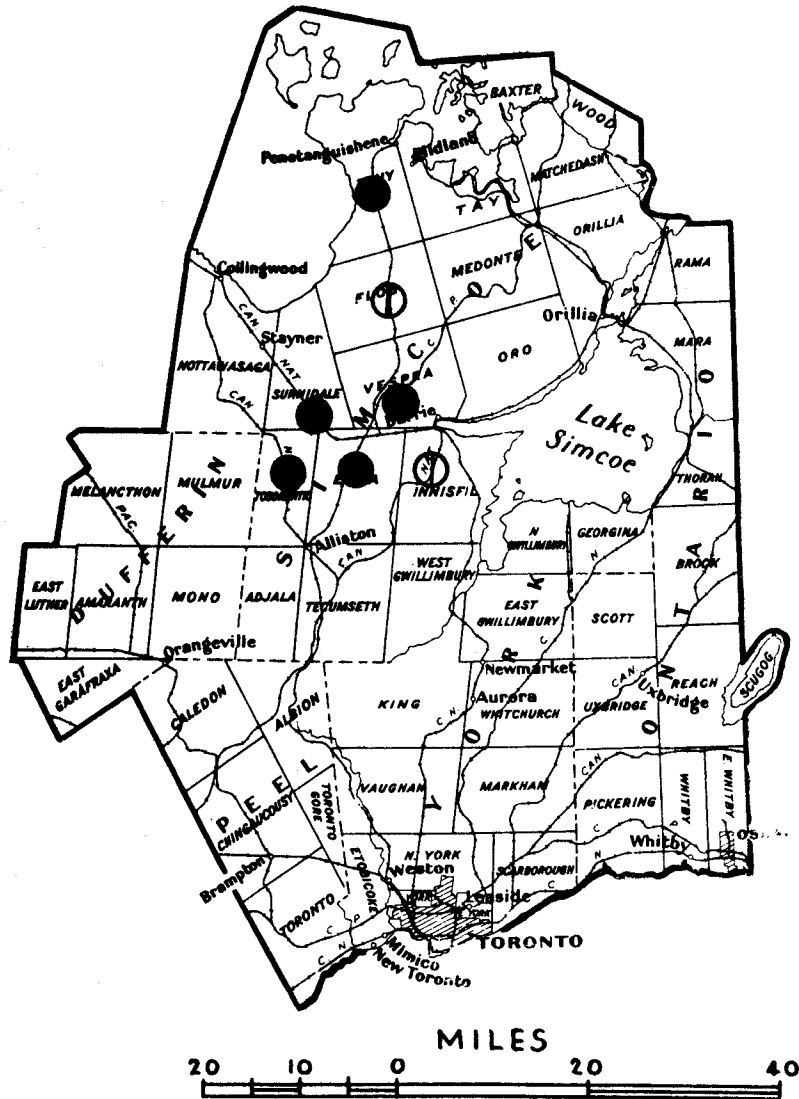
To study the movements of the adult weevils, pitfalls were placed in the ground in early June and retrieved late in September. One was located in a clear-cut Scots pine plantation, one in a young heavily infested Scots pine plantation and another in a 20-year-old lightly infested Scots pine plantation. Although several H. pales adults were trapped no H. radicis adults were caught. This indicated that there was little or no movement of H. radicis adults at the three locations during the sampling period. In contrast, at a fourth location, 19 H. radicis adults were found in the duff under four living Christmas trees adjacent to a recently clear-cut plantation. Identification of adult weevils was confirmed.

Surveys have shown that infestations have been active for the past 20 years in some red pine and Scots pine plantations and caused distortion of growth and stem damage at the root-collar. The stem damage subjects the trees to windthrow (see photographs).

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Considerable fluctuation in numbers of this insect was evident. For example, the incidence of tents along measured miles of roadside was lower at three points and higher at three locations than in 1963. The highest number occurred in a sample point in Tiny Township where 215 tents were counted on cherry along a mile of roadside compared with 131 tents in 1963 (Table 15).

LAKE SIMCOE DISTRICT



PINE ROOT-COLLAR WEEVIL

Locations where tree mortality caused by the weevil was observed in 1964

Legend

- Light mortality..... (○)
- Heavy mortality..... (●)

TABLE 15

Summary of Eastern Tent Caterpillar Colony Counts
in Lake Simcoe District in 1963 and 1964

Location (township)	Type of plot	Number of tents	
		1963	1964
Sunnidale	One mile of roadside	91	31
Vespra	" " " "	24	22
Medonte	" " " "	17	74
West Gwillimbury	" " " "	112	14
Tiny	" " " "	131	215
East Luther	" " " "	48	62
Flos	One square chain	143	110

Forest Tent Caterpillar, Malacosoma disstria Hbn.

A heavy infestation encompassing approximately 1000 acres occurred in a sugar maple stand in Medonte Township (see map). A check of cocoons showed that approximately 61 per cent were parasitized and one per cent died of disease. Egg band counts revealed that heavy infestations will probably occur in the same area in 1965 but little extension of the infestation is anticipated. An average of 4.3 egg bands were counted on three, 4-inch diameter sugar maple trees in the infested area but no egg bands were found on sugar maple and trembling aspen trees of comparable size near the perimeter of the infestation. The appearance of infestation in the Severn River area in 1965 is suspect because heavy infestations which occurred in the north part of Baxter and Wood townships in 1964 will probably expand southwards. Egg bands from Medonte Township were unusually small and considerably smaller than in 1963 and the number of eggs per band declined from an average of 146.2 in 1963 to 99.5 in 1964.

A Leaf-folding Sawfly, Nematodes sp. on Poplar

Population trends of this leaf-folding sawfly fluctuated considerably in 1964 (Table 16). Infestations declined for the third consecutive year in young trembling aspen stands in Matchedash and Orillia townships. Medium infestations recurred at two points in Albion and Tiny townships where 44 and 46 per cent respectively of the leaves were infested. As high as 90 per cent of the leaves of the lower crowns of Carolina poplar were folded at some points and two folds occurred on a high per cent of the infested leaves. However, most of the eggs failed to hatch and little damage resulted.

TABLE 16

Summary of Leaf-folding Sawfly Counts in Lake Simcoe District
in 1963 and 1964

Note: Counts were based on the examination of 100 leaves from each of four trembling aspen trees at each location.

Location (township)	Number of folds per hundred leaves	
	1963	1964
Matchedash	14	2
Orillia	22	1
Albion	32	44
Tiny	-	46
Tosorontio	-	7

Balsam-fir Sawfly, Neodiprion abietis (Harr.)

The pocket of heavy infestation reported in Rama Township in 1963 declined in intensity in 1964. Defoliation was generally light, however, some trees suffered moderate damage. In Simcoe County, light infestations persisted in most balsam fir stands. Defoliation ranging up to 75 per cent of the foliage was usually confined to the top few feet of the crown of the larger trees.

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Population levels of this sawfly were considerably lower than in 1963. Small pockets of medium and heavy infestation occurred in Baxter, Orillia, Matchedash, and Rama townships where heavy infestations occurred in 1963. Virus disease sprayed in these areas in 1963 became epizootic in the populations. However, due to the scattered nature of the infestations some pockets of infestation were missed. Infestations which recurred at these points were treated in 1964.

The effectiveness of the virus disease in controlling red-headed pine sawfly populations was demonstrated in Flos Township where a medium infestation in a red pine plantation collapsed in 1964 following application of virus disease along one side of the infestation in 1963.

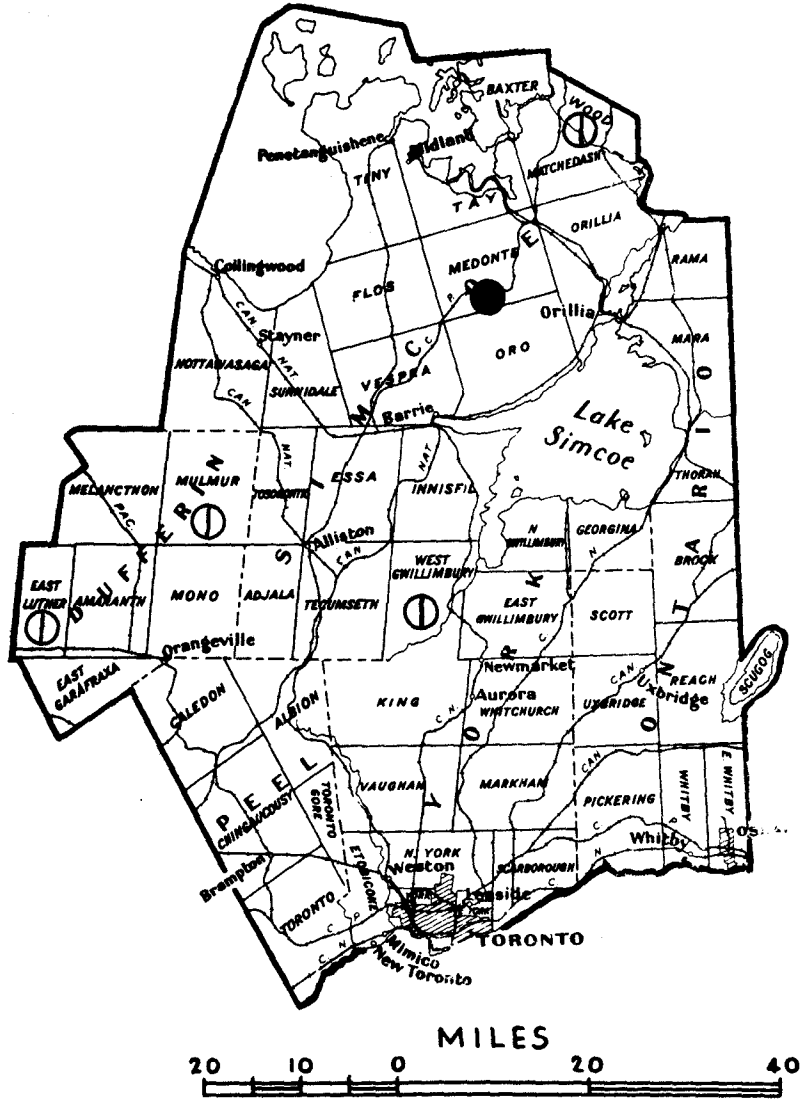
Two Jack-pine Sawflies, Neodiprion pratti banksianae Roh. and N. pratti paradoxicus Ross

Populations of these two very similar species fluctuated considerably in 1964. A medium infestation of the former in a jack pine shelter-belt in Oro Township, Simcoe County, declined to light intensity in 1964. Scattered colonies were found at widely-separated points elsewhere in the district. On the other hand, N. pratti paradoxicus was found in large numbers in the district for the first time. A new pocket of medium infestation occurred in Melancthon Township, Dufferin County. Defoliation by N. paradoxicus was impossible to assess as host trees were also defoliated by N. sertifer. Defoliation by the two species averaged approximately 75 per cent of the old foliage. Cocoons were set out in trays at the above points to study the parasite complex of these species.

Spring Cankerworm, Paleacrita vernata (Peck)

Infestations of this looper increased in extent and intensity at many points

LAKE SIMCOE DISTRICT



FOREST TENT CATERPILLAR

Location of infestation and collection points in 1964

Legend

- Heavy infestation..... ●
- Collection point..... ⊕

in the district for the third consecutive year (see map). Although a wide variety of tree species was attacked, elm along fence-rows and in stands were the principal hosts. Defoliation ranged up to 90 per cent at many points in Orillia, Medonte, Oro, Vespra, Sunnidale, Essa, Tosorontio, Mulmur, Mono, Adjala and Tecumseth townships. Medium infestations occurred in Flos and Nottawasaga townships. Infested trees refoliated in mid-summer but the leaves were smaller than normal and the crowns were less dense. Three or more consecutive years of heavy defoliation results in poor refoiliation and in late summer dead branches were numerous on many of the trees.

Unlike most moths, the female of this species is wingless and in early spring crawls up the trunk of a host tree from a pupal cell in the ground. The limited ability of the females to travel results in the slow spread of an outbreak and infestations tend to result from local population increases rather than migration.

White-pine Weevil, Pissodes strobi Peck

Population levels of this weevil increased at some locations and declined at others in 1964 compared with 1963 (Table 17). The incidence of shoot damage declined at sample points in Essa and Whitchurch townships where 71 per cent of the white pine trees and 30 per cent of the Norway spruce trees respectively were weevilled. The incidence of weevilling at sample points in Matchedash and Vespra townships increased to thirty-six per cent of white pine and 44 per cent of Norway spruce trees respectively. Light and moderate leader damage occurred commonly elsewhere in the district.

Application of a 5-per cent solution of D.D.T. in a white pine plantation in Tosorontio Township was effective in reducing the degree of damage to a low level.

TABLE 17

Summary of Leader Damage by the White-pine Weevil in Lake Simcoe District in 1963 and 1964

Location (township)	Tree species	Per cent of trees weevilled	
		1963	1964
Matchedash	wP	24	36
Essa	wP	95	71
Whitchurch	wP	47	30
Whitchurch	nS	32	5
Vespra	nS	34	44
Tosorontio	wP	8	0
Orillia	wP	-	18
E. Gwillimbury	wP	-	35
King	wP	-	33

A Poplar Leaf Roller, Pseudexentera oregonana Wlshn.

For the second consecutive year a marked decline in the extent of infestations of this insect, formerly known as Epinotia nisella criddleana Kft., occurred in the district. However, pockets of heavy infestation persisted in trembling aspen stands in the Severn River area, and pockets of medium and heavy infestation occurred in the central part of the district. Defoliation ranged between 60 per cent and 80 per cent.

A Pine Tip Moth, Rhyacionia adana Heinr.

A heavy infestation of this tip moth recurred in a red pine plantation in Nottawasaga Township in 1964. In most instances the tips of 90 to 100 per cent of the current shoots of the trees were killed. Repeated heavy shoot damage has resulted in virtual stagnation of tree growth. Although planted four or five years ago the trees averaged only about one foot in height.

An Aspen Webworm, Tetralopha asperatella (Clem.)

A heavy infestation of this small webworm occurred in a sugar maple stand in Medonte Township which had been heavily infested by the forest tent caterpillar. Large colonies of larvae skeletonized rolled leaves which had contained forest tent caterpillar pupae. Pockets of light and medium infestation occurred in maple stands at many locations in Simcoe County.

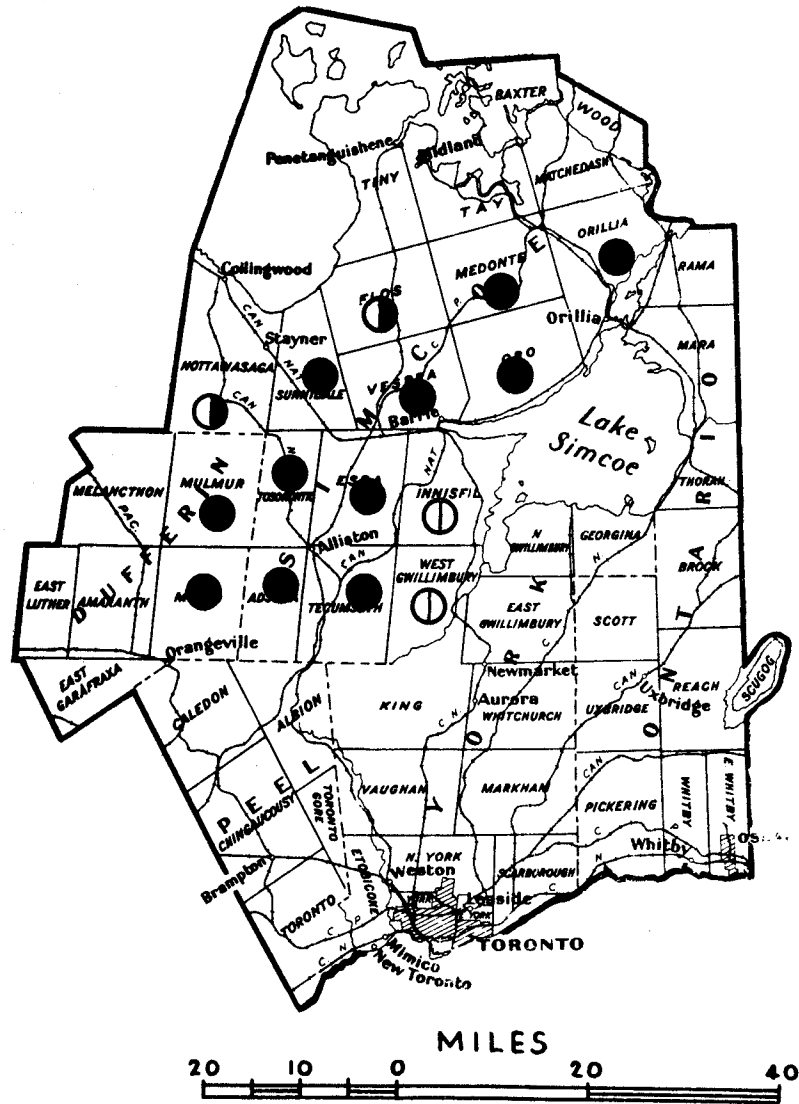
TABLE 18

Summary of Miscellaneous Insects Collected
in Lake Simcoe District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern	wS	Populations declined to very low levels (4)
<i>Adelges abietis</i> Linn.	nS, wS	Moderate numbers of galls on some trees (6)
<i>Adelges lariciatus</i> (Patch)	wS	Galls numerous at many locations (5)
<i>Adelges strobilobius</i> Kalt.	eL, nS	Heavy foliage damage of European larch at many locations. Light on Norway spruce trees (5)
<i>Agrilus liragus</i> Bary. & Br.	tA	Sucker mortality common in most areas examined
<i>Alsophila pometaria</i> (Harr.)	E, Ba	Populations declined to low levels (3)
<i>Altica ulmi</i> Woods	E	Populations very low
<i>Anoplonyx canadensis</i> Hgtn.	eL	Populations recurred at low levels (4)
<i>Aphrophora parallela</i> Say	scP, wP	Populations declined from heavy to medium at many locations (6)
<i>Archips cerasivoranus</i> Fitch	ecCh	Heavy infestations in Flos, Vespra, King, W. Gwillimbury, Mara and Oro townships declined to medium and light intensity due to poor egg hatch (4)
<i>Archippus packardianus</i> Fern	wS, blue spruce	Larvae were numerous on blue spruce along Highway 400
<i>Argyrotaenia pinatubana</i> Kft.	wP	Light infestations recurred (4)
<i>Argyrotoxa semipurpurana</i> Kft.	rO	Low populations recurred (2)
<i>Brachyrhinus ovatus</i> Linn.	wP, wS	Adults common in the district, numerous on buildings at some points (8)

LAKE SIMCOE DISTRICT



SPRING CANKERWORM

Locations where infestations were observed in 1964

Legend

- Light infestation..... ⊕
- Medium infestation..... ◐
- Heavy infestation..... ●

TABLE 18, Lake Simcoe District

Insect	Host(s)	Remarks
<i>Bucculatrix canadensisella</i> Chamb.	wB	Light infestations resulted from declines in population in the past three years (2)
<i>Cecidomyia reeksi</i> Vock.	jP	Twig mortality abundant at many locations (4)
<i>Choristoneura pinus</i> Freem.	rP, jP, scP	Light infestations general, medium in flowers of some trees (4)
<i>Choristoneura rosaceana</i> Harr.	wB, lA, wO	Populations generally low (3)
<i>Chrysopeleia ostryaella</i> Cham.	I	Medium infestation in Albion Tp., light in Uxbridge Tp. (2)
<i>Coleophora ulmifoliella</i> McD.	E	Heavy infestation at a point in Georgina Tp.
<i>Dasyneura balsamicola</i> (Lint.)	bF	Populations heavy at points in Medonte and Mulmur Tps. where 90 per cent and 75 per cent of the needles were infested respectively
<i>Datana integerrima</i> G. & R.	Wa, Che	Infestations declined from medium and heavy to light in 1964 (2)
<i>Datana ministra</i> Dru.	wB, W	Colonies rarely found (2)
<i>Dendroctonus valens</i> Lec.	rP	High numbers found in lower stems of dying trees at points in Essa and Vespra tps.
<i>Dioryctria disclusa</i> Heinr.	rP, jP	Moderate damage to cones at points in Essa and Vespra tps. (4)
<i>Elaphidion parallelum</i> Newm.	rO, bO	Branch damage generally light (4)
<i>Epinotia nanana</i> Treit	nS, wS	Medium infestations on Norway spruce and light infestations on white spruce recurred at Midhurst (4)
<i>Erannis tiliaria</i> Harr.	Ba	Populations were very low (2)
<i>Eriophes populi</i> Nal.	tA	Heavy damage occurred in Nottawasaga Tp. Light elsewhere in the district
<i>Eriophes betulae</i> Steb.	wB	Heavy damage at a point in Tiny Tp.
<i>Exoteleia dodecella</i>	scP	Light infestations persisted (2)
<i>Fenusa pusilla</i> (Lep.)	wB	Small heavy infestations at several points in the district. A heavy infestation in Newmarket subsided (4)
<i>Fenusa ulmi</i> Sund.	E	Heavy infestations recurred in Brampton, and in Vespra and Nottawasaga tps.
<i>Gossyparia spuria</i> Mod.	E	Heavy scale damage at a point in Albion Tp.
<i>Hylobius congener</i> D.T.	scP	Found in small numbers in the district
<i>Hylurgopinus rufipes</i> Eich.	E	High numbers in brood galleries in dying elm trees
<i>Hyphantria cunea</i> Dru.	deciduous	Light infestations declined to very low levels (4)

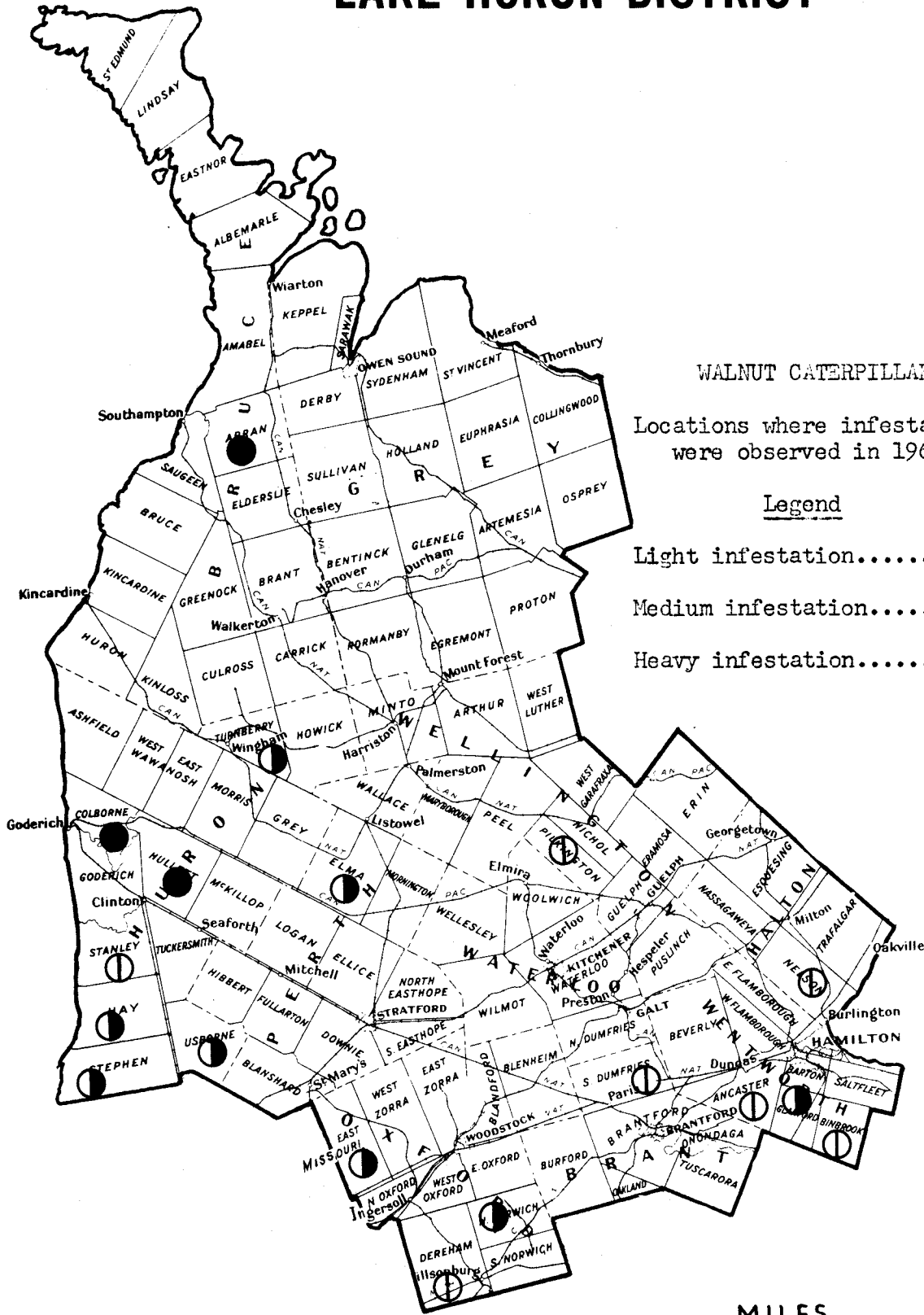
TABLE 18, Lake Simcoe District

Insect	Host(s)	Remarks
<i>Ips chagnoni</i> Sw.	rP	Heavy infestations under the bark in small clumps of dying trees in Vespra and Essa tps. (4)
<i>Ips pini</i> Say	rP, wP	Beetles common under the bark of dying trees at many points (5)
<i>Leucoptera albella</i> Cham.	bPo	Light infestations in Nottawasaga and Amaranth tps. (3)
<i>Lithocolletis aceriella</i> Clem.	sM, rM	Light infestations common (6)
<i>Lithocolletis ostryarella</i> Cham.	I	Light infestations in Simcoe County (3)
<i>Lithocolletis salicifoliella</i> Cham.	tA	Very low populations persisted (6)
<i>Macrophya punctum-album</i> (L.)	privet	Heavy infestations in privet hedges in North York Tp.
<i>Neodiprion virginianus</i> complex	jP	Light infestation in small planting increased to heavy, averaged 4.7 colonies per branch (4)
<i>Neuroteras umbilicatus</i> Bass.	bO	Heavy infestation at Orillia
<i>Nymphalis antiopa</i> Linn.	deciduous	Widely scattered colonies found (3)
<i>Ocnerostoma strobivorum</i> Free.	wP	Low numbers found in white pine plantations (3)
<i>Paratetranychus ununguis</i> (Jac.)	nS, wS, He	Heavy concentrations on spruce shelterbelts at Midhurst and on hemlock in Essa Tp. (4)
<i>Phratora purpurea purpurea</i> Brown	tA	Heavy infestations on small trees recurred in Uxbridge Forest (3)
<i>Pikonema alaskensis</i> (Roh.)	wS	Light infestations recurred in Melancthon Tp.
<i>Pineus strobi</i> (Htg.)	wP	Heavy concentrations of this aphid recurred on the stems of white pine trees in Vivian and Uxbridge forests
<i>Pissodes affinis</i> Rand	rP	Found in the district for the first time
<i>Pityogenes hopkinsi</i> Sw.	wP	High concentrations in young unthrifty trees (3)
<i>Pleroneura borealis</i> Felt	bF	Small pockets of heavy infestation at widely separated points in the district (6)
<i>Pristiphora geniculata</i> (Htg.)	Mo	Heavy infestations recurred at widely separated points. Cocoons were set out in trays at Orillia for parasite studies (6)
<i>Phylloctes aceris-crumena</i> (Rly.)	sM	Heavy infestations occurred on some trees (3)
<i>Rhyacionia busckana</i> Heinr.	jP	Mined shoots common in the district
<i>Saperda moesta</i> Lec.	tA	Heavy stem damage to young trees in Vivian Forest

TABLE 18, Lake Simcoe District

Insect	Host(s)	Remarks
<i>Scolytus multistriatus</i> (Marsh.)	E	Heavy populations in the stems of dead and dying elm trees (3)
<i>Sternochetus lapathi</i> (Linn.)	bPo	Heavy stem damage and some tree mortality at a point in Ux-bridge Tp.
<i>Taniva albolineana</i> Kft.	blue spruce	Heavy infestations along 400 Highway
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	A heavy infestation recurred in a small white spruce plantation in Medonte Tp. (4)
<i>Zelleria haimbachi</i> Busck.	jP	Heavy infestations at widely separated points. Defoliation ranged up to 75 per cent of the current foliage.

LAKE HURON DISTRICT



WALNUT CATERPILLAR

Locations where infestations were observed in 1964

Legend

- Light infestation..... ○
- Medium infestation..... ◐
- Heavy infestation..... ●

MILES



STATUS OF INSECTS

Fall Cankerworm, Alsophila pometaria (Harr.)

Light and medium infestations of this defoliator were noted commonly in Oxford, Brant, Waterloo, Wentworth and Halton counties, and in localized clumps and small pockets of host trees in Bruce County. Although occasional fencerow and open-grown white elm and basswood trees were severely defoliated damage within stands was generally light.

Spruce Budworm, Choristoneura fumiferana (Clem.)

The medium infestation that occurred on white spruce trees in a section of the Grey Main Tract, Glenelg Township in 1963 declined to light intensity in 1964. The insect was found in small numbers on white spruce and balsam fir trees at several locations in the central and northern parts of the district and at one location in the northern part of Huron County.

Jack-pine Budworm, Choristoneura pinus Free.

Small pockets of medium infestation occurred for the second consecutive year in jack-pine plantations in Keppel and Normanby townships. A new medium infestation was noted in a 25-year-old red pine plantation in the Hall Tract, Blenheim Township. The medium infestation reported in a jack-pine plantation in the Hyde Tract, Beverly Township in 1963 declined to light intensity.

The insect was observed in small numbers on Scots and jack-pine plantings at several other locations in the district.

A Leaf Miner on Ironwood, Chrysopeleia ostryaella Cham.

A heavy infestation of this leaf miner recurred in a clump of ironwood trees in Sullivan Township for the third consecutive year. Low populations were observed in a few scattered clumps of host trees elsewhere in the district.

Detailed observations and field measurements on the habits and life history of this leaf miner have been made in Sullivan Township in 1963 and 1964, results of which will appear in publication at a later date. However part of these data may be used to show that at the study location the per cent of leaves mined increased from 87 to 90 from 1963 to 1964 and the average number of mines per infested leaf increased from 3.5 to 4.0. The number of mines per infested leaf ranged from one to 12 and 87 per cent of the leaves had six or less mines.

Larch Casebearer, Coleophora laricella (Hbn.)

Medium infestations in pockets of native tamarack in Glenelg and South Dumfries townships declined to light intensity in 1964. Minor increases in larval populations occurred at quantitative sample points in Lindsay, Amabel and Bentinck townships where counts were lowest in 1963, whereas minor decreases occurred at sample points in Blandford, Glenelg and South Dumfries townships (Table 8). Pockets of light infestation were noted in tamarack stands in Greenoch and Holland townships and in a European larch stand in the Sandy Hill Tract, Woolwich Township.

TABLE 8

Summary of Larch Casebearer Larval Counts at Six Points
in the Lake Huron District from 1962 to 1964

Note: Counts were based on the examination of four 18-inch branch tips from the mid-crown of four trees at each location.

Location (township)	D.b.h. of sample trees in inches	Av. no. larvae per branch tip		
		1962	1963	1964
Lindsay	6	5.0	1.0	4.1
Amabel	5	5.6	7.2	11.2
Bentinck	4	2.4	2.1	3.3
Blandford	6	10.2	14.0	12.1
S. Dumfries	6	14.1	29.1	20.5
Glenelg	5	25.7	21.5	15.0

Pitted Ambrosia Beetle, Corthylus punctatissimus (Zimm.)

The examination of sugar maple regeneration in square-yard plots, chosen at random in partially shaded sites, was continued in two areas. Except in Sullivan Township where the incidence of attack in the 5-millimeter basal-diameter class corresponded with that of 1963, damage at sample points was generally less severe. From 5 to 31 per cent of the stems were infested (Table 9), compared with 9 to 53 per cent in 1963 and 8 to 51 per cent in 1962.

Plots 2 and 5 were located in Sullivan Township and plots 1, 3 and 4 were in Puslinch Township.

TABLE 9

Summary of Damage by the Pitted Ambrosia Beetle at Two Locations
in the Lake Huron District in 1964

Note: All the sugar maple reproduction in square-yard sample plots was examined.

Plot no.	No. stems examined	Av. basal diameter in millimeters	Av. height of tree in inches	Per cent of trees infested
1	30	6.3	12.0	16.6
2	29	5.2	11.0	31.0
3	40	3.7	10.0	12.5
4	76	3.4	8.6	8.0
5	41	3.0	5.3	5.0

Walnut Caterpillar, Datana integerrima G. & R.

Heavy infestations were noted in clumps of walnut trees in the St. Mary's-Thamesford area and at single locations in Stephen and Arran townships where 50 to 90 per cent defoliation occurred (see photograph). Numerous light and medium infestations were noted on shade and open-grown host trees in all height classes, in the southern part of the district and at several points in the central part (see map). Ten to 50 per cent defoliation occurred commonly on single and clumps of trees in these areas.

STATUS OF INSECTS IN THE LAKE HURON DISTRICT

	Page
Fall Cankerworm.....	<u>Alsophila pometaria</u> (Harr.)..... B 33
Spruce Budworm.....	<u>Choristoneura fumiferana</u> (Clem.)..... B 33
Jack-pine Budworm.....	<u>Choristoneura pinus</u> Free. B 33
A Leaf Miner on Ironwood.....	<u>Chrysopelia ostryaeela</u> Cham. B 33
Larch Casebearer.....	<u>Coleophora laricella</u> (Hbn.)..... B 33
Pitted Ambrosia Beetle.....	<u>Corthylus punctatissimus</u> (Zimm.)..... B 34
Walnut Caterpillar.....	<u>Datana integerrima</u> G. and R. B 34
Nursery Pine Sawfly.....	<u>Diprion frutetorum</u> (F.) B 35
European Spruce Sawfly.....	<u>Diprion hercyniae</u> (Htg.)..... B 35
Introduced Pine Sawfly.....	<u>Diprion similis</u> (Htg.)..... B 35
White Pine Shoot Borer.....	<u>Eucosma gloriola</u> Heinr. B 36
Pine Bud Moth.....	<u>Exoteleia dodecella</u> Linn. B 37
Pine Needle Miner.....	<u>Exoteleia pinifoliella</u> Chamb. B 37
Eastern Tent Caterpillar.....	<u>Malacosoma americanum</u> (F.)..... B 37
Balsam-fir Sawfly.....	<u>Neodiprion abietis</u> (Harr.)..... B 38
Red-headed Pine Sawfly.....	<u>Neodiprion lecontei</u> (Fitch)..... B 38
Two Jack-pine Sawflies.....	<u>Neodiprion pratti banksianae</u> Roh. and <u>N. pratti paradoxicus</u> Ross... B 38
Spring Cankerworm.....	<u>Paleacrita vernata</u> Peck B 39
Yellow-headed Spruce Sawfly.....	<u>Pikonema alaskensis</u> (Roh.)..... B 39
White-pine Weevil.....	<u>Pissodes strobi</u> Peck. B 40
Undetermined Loopers.....	<u>Semiothisa</u> spp. B 40
Summary of Miscellaneous Insects.....	B 41

R. L. Bowser

The high populations that occurred in the Binbrook area in 1963 declined to generally low levels in 1964.

Nursery Pine Sawfly, Diprion frutetorum (F.)

Larval populations remained at a low level. Counts made on Scots and white pine trees at quantitative sample points in several areas showed a slight decrease in numbers (Table 10).

TABLE 10

Summary of Nursery Pine Sawfly Larval Counts Taken at Four Locations in the Lake Huron District from 1963 to 1964

Location (township)	Tree species	Av. d.b.h. in inches	Total no. larvae collected per 15-tray sample	
			1963	1964
Keppel	scP	6	16	9
St. Vincent	scP	5	2	0
Euphrasia	scP	4	4	2
Woolwich	wP	5	3	1

European Spruce Sawfly, Diprion hercyniae (Htg.)

Based on quantitative sampling, no significant changes in larval populations of this sawfly occurred (Table 11). The highest numbers of larvae were noted in Holland, St. Edmund and Euphrasia townships, where a total of 82, 47 and 43 larvae respectively were counted in 15-mat samples.

Small numbers of the insect were found in clumps of white spruce at a few locations in the southern part of the district. For example, ten larvae were recovered from a 30-mat sample in a roadside windbreak in Burford Township.

TABLE 11

Summary of European Spruce Sawfly Larval Counts Taken from White Spruce Trees at Seven Points in the Lake Huron District from 1962 to 1964

Location (township)	Av. d.b.h. of sample trees	Total no. larvae per 15-tray sample			Date sampled
		1962	1963	1964	
Albemarle	6	58	14	13	Sept. 14
St. Edmunds	6	63	45	47	Sept. 14
Glenelg	6	10	3	9	Sept. 11
Holland	3	-	86	82	Sept. 10
Woolwich	4	-	6	10	July 3
Euphrasia	5	-	-	43	Aug. 28
Minto	5	-	-	9	Sept. 11

Introduced Pine Sawfly, Diprion similis (Htg.)

A significant decline in larval populations occurred in Scots pine windbreaks

in St. Vincent and Keppel townships where numbers of larvae in quantitative samples decreased from 126 and 42 in 1963 to 25 and 26 respectively in 1964 (Table 12). Observations and sampling revealed that populations remained low and were generally similar to 1963 elsewhere in the district.

TABLE 12

Summary of Introduced Pine Sawfly Larval Counts Taken at Seven Locations in the Lake Huron District from 1962 to 1964

Location (township)	Tree species	Av. d.b.h. in inches	Total no. larvae per 15-tray sample		
			1962	1963	1964
St. Vincent	scP	5	4	126	25
Artemesia	wP	4	20	9	7
Minto	wP	5	0	3	7
Keppel	scP	6	8	42	26
Woolwich	wP	5	7	3	10
Beverly	wP	4	-	4	2
Euphrasia	scP	4	-	13	14

White-pine Shoot Borer, Eucosma gloriola Heinr.

This insect continued to cause light to moderate damage to the new shoots of white, Scots and red pine trees in plantations throughout the district. A small pocket of medium infestation occurred in a recently released white pine planting in the Little Tract, Puslinch Township where eight per cent of the leaders were damaged (Table 13).

Although the number of attacks per infested tree varied from one to ten, leader attack elsewhere in the district generally ranged from one to five per cent.

TABLE 13

Summary of Shoot Damage by the White-pine Shoot Borer at Two Points in the Lake Huron District from 1962 to 1964

Note: Counts were based on the examination of 20 trees at each location.

Location	Tree species	Av. height of trees in feet	Per cent of trees infested			Av. no. of attacks per infested tree			Per cent of leaders attacked		
			1962	1963	1964	1962	1963	1964	1962	1963	1964
Stingal Tract											
Ashfield Tp.	wP	12	100	87	85	5	5	4	15	6	3
Little Tract											
Puslinch Tp.	wP	12	100	78	100	8	6	10	10	4	8

Pine Bud Moth, Exoteleia dodecella Linn.

Sharp decreases in larval populations of this insect occurred in the district. The most notable declines were recorded in Scots pine plantations in Beverly and North Dumfries townships where the percentages of infested buds decreased from 22.5 and 35.0 in 1963 to 4.2 and 9.1 respectively in 1964 (Table 14). Bud damage was generally very light in areas of infestation elsewhere in the district.

TABLE 14

Summary of Damage Caused by the Pine Bud Moth to Scots Pine Buds
at Three Points in the Lake Huron District
from 1962 to 1964

Note: Samples were based on the examination of buds from single branches from ten trees at each point.

Location (township)	Total no. of buds examined		Per cent of buds infested		
	1964		1962	1963	1964
Beverly	360		19	22.5	4.2
Glenelg	479		10	2.6	3.0
North Dumfries	516		63	35.0	9.1

Pine Needle Miner, Exoteleia pinifoliella Chamb.

The heavy infestation which occurred in a jack-pine stand in the Miller Lake Forest in 1963 declined to light intensity in 1964. Although an occasional fringe or open-grown tree suffered 15 to 20 per cent mining of the old foliage, damage within the stand was approximately five per cent. Light infestations persisted in Derby and Holland townships and a new light infestation was noted in a section of the Sandy Hill Tract, Woolwich Township. Damage was negligible in East Oxford and Puslinch townships where light infestations occurred in 1963.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Following an increase in population levels from 1961 to 1963 a general decline was evident in 1964. Except in Brant Township where the number of tents along a mile of roadside increased from 48 in 1963 to 95 in 1964 this downward trend was consistent in most sampling areas (Table 15).

The most notable decline occurred in Sullivan Township where only 39 tents were counted compared with 136 in 1963. Light infestations were common in clumps of eastern choke cherry, wild apple and pin cherry at numerous points in the district.

TABLE 15

Summary of Eastern Tent Caterpillar Colony Counts at Eight Points
in the Lake Huron District from 1962 to 1964

Location (township)	Number of colonies per mile of roadside		
	1962	1963	1964
Brant	42	48	95
Albemarle *	2	0	0
Derby	36	14	16
Sullivan	114	136	39
Burford	4	21	3
Amabel *	-	43	21
Guelph	39	53	33
Arran	30	19	24

* Square chain plot

Balsam-fir Sawfly, Neodiprion abietis (Harr.)

Following two consecutive years of medium and heavy infestation, population levels declined to light intensity in the Bruce Peninsula in 1964. Medium infestations recurred in the Durham-Arthur area where occasional balsam fir trees suffered 50-to 75 per cent defoliation of the new foliage in the upper third of the crown. Light infestations occurred commonly in low-lying areas elsewhere in Grey and Bruce counties.

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Low larval populations of this sawfly were noted at two points in Bruce County. Six colonies were counted on three infested 15-foot red pine trees in Amabel Township and occasional colonies were observed in one section of the Miller Lake Forest in Lindsay Township. The insect was not found in a plantation at the Freeport Sanitarium where a light infestation had persisted since 1961.

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

For the third consecutive year these two sawflies jointly caused light to moderate defoliation of the old foliage of jack-pine trees at several locations in Grey and Bruce counties. The highest populations were noted in a plantation near Priceville in Artemesia Township (Table 16), and in the Derby Tract in Derby Township. A light infestation persisted in the Rodgers Tract in East Wawanosh Township.

Five species of parasites have been reared from N. pratti banksianae in the Derby Tract. Two species, Exenterus canadensis (Prov.) and E. amictorius (Panz.) were responsible for six and eight per cent parasitism of larvae in separate cages. Three species Pleolophus basizonus (Grav.), P. indistinctus (Prov.) and Mastrus argeae (Vier.) were recovered from cocoons. E. amictorius and P. basizonus are introduced species.

A polyhedral virus disease was recovered in larval collections from Amabel and East Wawanosh townships.

TABLE 16

Summary of Colony Counts of Two Jack-pine Sawflies and Estimates of Defoliation of Old Foliage at Three Points in the Lake Huron District from 1962 to 1964.

Note: Counts were taken on ten trees at each sample point.

Location (township)	Av. d.b.h. in inches	Av. height in feet	Av. no. colonies per tree			Estimated per cent defoliation
			1962	1963	1964	
Amabel	5	20	1.0	2.0	2.1	- 10
Holland	3	20	6.5	1.0	1.0	- 5
Artemesia	4	20	-	-	6	10+

Spring Cankerworm, Paleacrita vernata Peck

Heavy infestations recurred in small pockets of white elm trees in Keppel Township, in the Rocklyn-Goring area in Euphrasia Township, and in the Flesherton-Maxwell area. Scattered fencerow and open-grown host trees in the Hanover-Durham-Arthur area suffered 75 to 90 per cent defoliation for the second consecutive year.

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

Larval populations increased in some areas and decreased in others. Light infestations in Euphrasia and Bentinck townships increased to medium intensity in 1964 whereas a marked decrease was noted in a neighbouring white spruce plantation in Euphrasia Township (Table 17). Light infestations recurred at other collection points in the district.

TABLE 17

Summary of Infestations of the Yellow-headed Spruce Sawfly at Eight Points in the Lake Huron District from 1962 to 1964

Note: Counts were based on the examination of 100 white-spruce trees at each point.

Tract	Township	Per cent of trees infested			Degree of infestation in 1964
		1962	1963	1964	
Rennie	Euphrasia	63	68	75	M
Rocklyn	Euphrasia	62	54	15	L
Riddell	Bentinck	57	40	90	M
Crawford	Bentinck	17	14	50	L
Main	Glenelg	94	35	75	L
Kenny	Glenelg	19	42	35	L
Minto	Minto	50	20	16	L
Victory	Arthur	9	4	4	L

White-pine Weevil, Pissodes strobi Peck.

Marked increases in the incidence of weevil damage were noted in white pine plantations at two points in Grey County in 1964. In the Riddell Tract, Bentinck Township the incidence of attack ranged as high as 50 per cent compared with 20 per cent in 1963 and increased from five to 20 per cent in one small section of the Grey Main Tract, Glenelg Township. Although slight increases occurred in scattered plantations in the southern part of Bruce County infestations were generally light and similar to 1963.

Chemical control, using methoxychlor and applied to white pine leaders in the Riddell Tract in mid-April proved ineffective. Counts to determine the degree of infestation were made at two sample points (Table 18).

TABLE 18

Summary of Shoot Damage by the White-pine Weevil in Plantations
at Two Points in the Lake Huron District
from 1962 to 1964

Note: Counts were based on the examination of 100 trees at each point.

Location (township)	D.b.h. of sample trees in inches	Per cent trees infested			Per cent of trees infested all years
		1962	1963	1964	
Brant Private plantation	5	12	7	3	61
Culross Moir Tract	3	-	2	5	8

Undetermined Loopers, Semiothisa spp.

These loopers were observed commonly in beating samples from white and Scots pine, white spruce and balsam fir at widely-separated points in the district. Counts made in seven areas showed that the highest numbers occurred on balsam fir (Table 19).

TABLE 19

Summary of Semiothisa spp. Larval Counts Taken from Four Tree
Species at Seven Points in the Lake Huron District in 1964

Location (township)	Tree species	Av. d.b.h. of sample trees in inches	No. trays sampled	Total no. larvae per sample
Ashfield	wP	3	15	4
Keppel	scP	6	15	10
Holland	wS	3	15	25
Artemesia	wP	4	15	21
Minto	wP	5	15	6
Artemesia	bF	6	20	127
Glenelg	bF	6	20	58

TABLE 20

Summary of Miscellaneous Insects Collected
in Lake Huron District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	bF	Trace population persisted in Glenelg Township
<i>Anatis mali</i> (Say)	bF	One adult collected in beating sample in Artemesia Township
<i>Anisota senatoria</i> (J.E. Smith)	Bur oak	The medium infestation persisted in a few roadside trees in N. Oxford Township and trace population was observed at one point in E. Oxford Township
<i>Anomogyna elimata</i> Gn.	bF	Single larvae collected from beating samples in Artemesia and Sullivan townships
<i>Archips cerasivoranus</i> Fitch	ecCh	Heavy infestation in small clump of shrubbery in St. Edmund Township (3)
<i>Arge pectoralis</i> (Leach)	wB	Small pocket of light infestation on small trees in Dorcas Bay area
<i>Argyresthia aureoargentella</i> Brower.	eC	Heavy infestation at Greenough Point in Lindsay Township.
<i>Argyresthia laricella</i> Kft.	tL	Light in Arthur Township
<i>Argyresthia thuiella</i> Pack.	eC	Three and 2.4 per cent of one year old shoots infested at points in Amabel and Holland townships respectively
<i>Brachys aerosus</i> Melsh.	sM	Medium infestations in Lindsay, Holland, Brant and Arthur townships
<i>Caripeta divisata</i> Wlk.	bF	Trace population in Bruce Township
<i>Cecidomyia reeksi</i> Vock	jP	Four larvae collected from quantitative beating sample in Artemesia Township
<i>Cecidomyia reeksi</i> Vock	jP	Localized medium to heavy infestations causing moderate branch tip mortality in Holland and Keppel townships. Light damage in Woolwich and Beverly townships
<i>Compsolechia niveopulvella</i> Chamb.	tA	Trace population in Ashfield Township
<i>Dasyneura balsamicola</i> Lintn.	bF	Low population in Artemesia Township

TABLE 20, Lake Huron District

Insect	Host(s)	Remarks
<i>Datana ministra</i> Dru.	wE, Be	Light to moderate defoliation of several We trees south of Thamesford. Scattered colonies elsewhere (5)
<i>Elaphidion parallelum</i> Newm.	rO	Moderate damage to several large roadside trees in N. Dumfries Township. Light infestations in Ancaster and Blenheim townships
<i>Epinotia aceriella</i> (Clem.)	sM	Light infestation of skeletonizers in Arran Township
<i>Epinotia solandriana</i> Linn.	wB	Low population in St. Edmunds Township
<i>Epizeuxis aemula</i> Hbn.	Spruce	High population on two ornamental trees in Tillsonburg
<i>Eupithecia filmata</i> Pears.	wS	One larva collected from beating sample in Glenelg Township
<i>Eupithecia mutata</i> Pears.	He	Common in the district (4)
<i>Exoteleia</i> sp.	rP, scP	Light infestation in Chesney Tract, Blandford Township
<i>Fenusa pusilla</i> (Lep.)	wB	Generally light although occasional six foot trees in Artemesia Township suffered 75 per cent mining of foliage in the upper third of crown
<i>Feralia jocosa</i> Gn.	wS, bF	Trace populations in Glenelg and Holland townships
<i>Forficula auricularia</i> L.	ecCh	One adult collected
<i>Gonioctena americana</i> (Schaeff.)	tA	Localized small pockets of light and medium infestation in Holland and Euphrasia townships respectively
<i>Gretchena delicatana</i> Heinr.	I	High larval populations occurred at several locations in the central and northern part of the district
<i>Griselda radicana</i> Wlshn.	wS	Larvae found in small numbers in beating samples in St. Edmund and Glenelg townships
<i>Halisidota caryae</i> Harr.	wE, wO, Wi	Occasional colonies (3)
<i>Herculia intermedialis</i> Wlk.	Spruce	Two larvae preserved, collected from ornamental spruce in Tillsonburg
<i>Hydriomena divisaria</i> Wlk.	bF	One larva collected from beating sample in Artemesia Township
<i>Hyperaspis bigemminata</i> Rand.	bF	One adult collected in Glenelg Township

TABLE 20, Lake Huron District

Insect	Host(s)	Remarks
<i>Hyphantria cunea</i> (Drury)	wE, ecCh	Localized pockets of light infestation and widely scattered colonies occurred on a variety of deciduous hosts (11)
<i>Lambdina fiscellaria fiscellaria</i> Gn.	bF, wS	Found in small numbers in beating samples in St. Edmund and Artemesia townships
<i>Lepidosaphes ulmi</i> (Linn.)	W	Heavy infestation of scale in Carrick Township
<i>Lepyrus palustris</i> Scop.	wP	One adult weevil collected in Minto Township
<i>Lithocolletis aceriella</i> Clem.	sM	Trace population in Bruce Township
<i>Lithocolletis betulivora</i> Wlsh.	wB	Found in small numbers in Amabel Township
<i>Lithocolletis ostensackenella</i> Fitch	Hon	Found in small numbers in Sullivan Township
<i>Lithocolletis salicifoliella</i> Chamb.	1A	Low population in Sullivan Township
<i>Malacosoma disstria</i> Hbn.	sM	One colony collected in Holland Township
<i>Melissopus latiferreanus</i> (Wlsh.)	rO	Borers common in acorns in St. Edmund Township
<i>Mindarus abietinus</i> Koch.	bF	One collection from Glenelg Township
<i>Monoctenus fulvus</i> (Nort.)	ec	Nineteen and four larvae collected from 15 mat samples in W. Garafraxa and Sullivan townships respectively
<i>Mulsantina hudsonica</i> Csy.	bF	Few adults collected in beating samples (2)
<i>Neodiprion nanulus nanulus</i> Schedl.	JP	Scattered colonies observed in St. Edmund Township
<i>Neodiprion pinetum</i> (Nort.)	wP	A light infestation persisted in a small section of the Sandy Hill Tract, Woolwich Township
<i>Nepytia canosaria</i> Wlk.	bF, ec	Found in small numbers in Artemesia and Sullivan townships
<i>Nyctobia limitaria</i> Wlk.	bF	One larva from beating sample
<i>Nymphalis antiopa</i> Linn.	wE	Single colonies (2)
<i>Paroctopa robiniella</i> Clem.	Hon	Miners common at one point in Sullivan Township
<i>Parorgyia plagiata</i> Wlk.	bF	One larva collected
<i>Pikonema dimmockii</i> (Cress.)	wS	Found in small numbers (3)
<i>Pineus similis</i> Gill.	wS	Moderate to severe damage at three locations
<i>Pissodes approximatus</i> Hopk.	scP	Common in the district
<i>Plagiodera versicolora</i> Laich.	W	High population of beetles at one location

TABLE 20, Lake Huron District

Insect	Host(s)	Remarks
<i>Pleroneura borealis</i> Felt.	bF	Light and medium infestations in St. Edmund and Holland townships respectively
<i>Polydrusus impressifrons</i> Gyll.	tA	Few adults
<i>Polygonia interrogationis</i> Fabr.	wE	One small colony observed
<i>Pristiphora geniculata</i> (Htg.)	Mo	Light to heavy infestations common in the district (5)
<i>Pristiphora lena</i> Kincaid	wS	One larva collected
<i>Prociphilus imbricator</i> Fitch	Be	Heavy infestation of aphids on three small branches of one tree
<i>Profenusa thomsoni</i> (Konow)	wB	Low populations in Grey and Bruce counties (4)
<i>Protoboarmia porcelaria</i> <i>indicataria</i> Wlk.	bF	Few larvae in beating samples at two points
<i>Psilocorsis fletcherella</i> Gibs.	tA	Leaf tiers common at one location
<i>Recurvaria apicitripunctella</i> Clem.	He	Light infestation in Blandford Township
<i>Recurvaria piceaella</i> Kft.	wS, nS	Low populations common in district (7)
<i>Recurvaria thujaella</i> Kft.	eC	Commonly found feeding in association with other leaf miners
<i>Rhabdophaga swainei</i> Felt.	wS	Low populations on the Bruce Peninsula (2)
<i>Schizura concinna</i> A. & S.	wB	One only colony observed
<i>Sciaphila duplex</i> Wlshn.	tA	Feeding in association with other leaf rollers in Ashfield Township
<i>Semiothisa bisignata</i> Wlk.	wP	Few loopers collected in beating samples (2)
<i>Semiothisa orillata</i> J. E. Smith	eC	Ten loopers collected from 30 mat samples
<i>Taniva albolineana</i> Kft.	wS	Trace population at one location
<i>Tetralopha asperatella</i> Clem.	sM	Low populations (2)
<i>Tetrastichus strobilus</i> Burks	wS	Medium infestation of this chalcid in buds in W. Luther Township. Low population in Minto Township
<i>Zale helata</i> Sm.	wP	Found in beating sample in Glenelg Township
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	Medium and heavy infestations in St. Edmund Township. Light elsewhere
<i>Zellaria haimbachi</i> Busch.	jP	Low populations in Artemesia and Keppel townships
<i>Zenobia pleonectusa</i> Grt.	tA	Low population feeding in association with other poplar leaf rollers at one location

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STATUS OF INSECTS

Fall Cankerworm, Alsophila pometaria Harr., and Spring Cankerworm, Paleacrita vernata Peck

A marked upward trend in population levels of fall and spring cankerworms was evident in 1964. Most of the damage occurred in woodlots and roadside or fence-row trees, white elm being the preferred host.

Moderate to severe defoliation of scattered white elm trees occurred along Highway 3 between Canboro and Canfield, and in bushlots in Bertie, Caistor, North Cayuga, Oneida, Seneca, and Willoughby townships (see map). Apple trees were severely defoliated in an untended orchard in Wainfleet Township.

Defoliation of elm, basswood and hawthorn was severe in a 7-acre area in Caradoc Township. At this point, as well as one location in North Cayuga Township, spring cankerworms constituted two-thirds of the population. This represented a shift in the species dominating the complex. In all other infestations studied the fall cankerworm made up 75 per cent or more of the larval population.

A pocket of severe defoliation was recorded on white elm, silver maple, red oak, shagbark hickory and basswood at Byng Conservation Park, Dunn Township. At Vanessa Conservation Park in Windham Township, damage was heavy on understory and moderate on overstory red oak and shagbark hickory. At the public park, St. Williams Forest Nursery, numbers declined generally from moderate to light intensity in 1964, although moderate defoliation recurred on individual basswood and apple trees.

Repeated defoliation by these pests will cause tree mortality. One 35-foot white elm at Glenshee, Norfolk County which was moderately defoliated in 1963 was severely defoliated in 1964. The tree re-foliated by early July but declined in vitality shortly afterward and was dead by August 8. On this date branch samples were submitted to the Laboratory of Forest Pathology, Maple, with a request to culture for Dutch elm disease or any other wilts, but the sample was sterile.

At the St. Williams Nursery public park and several other points in the district cankerworms fed on the wings of maple, basswood and white ash samaras when they had stripped the trees of foliage. Low numbers were recorded at numerous points in the central and eastern parts of the district.

Orange-striped Oakworm, Anisota senatoria A. and S.

A heavy infestation recorded in a clump of bur oak trees in Howard Township in 1963 declined to moderate intensity in 1964. Defoliation was severe on occasional trees near Stephenville in Bertie Township and at Florence in Dawn Township.

Medium infestations recurred on the lower branches of several mature roadside trees in Mosa Township near Glencoe. Populations were light at several other points in the district, bur oak being the favoured host.

Larch Twig Borer, Argyresthia laricella Kft.

Populations of larch twig borer increased in Adelaide Township and declined in South Walsingham Township (Table 8).

TABLE 8

Summary of Larch Twig Borer Counts in Lake Erie District
from 1962 to 1964

Location (township)	Host	Percentage of one-year- old shoots attacked		
		1962	1963	1964
Adelaide	tL	.0	0.6	1.4
South Walsingham	eL	.01	3.6	2.8

Bark Beetles of Hickory, Apple, Elm, Spruce and Pines, Chramesus hicoriae Lec., Scolytus mali Bechst., S. multistriatus Marsh., S. piceae Sw., Ips chagnoni Sw., I. pini Say, Orthotomicus caelatus Eichh., and others.

During the 1964 field season special emphasis was placed on collecting bark beetles from a wide variety of hosts for Dr. J. B. Thomas, Sault Ste. Marie, Dr. W. R. Nickle, Belleville, and Mr. G. R. Hopping of Calgary, Alberta. These requests were made to assist in taxonomic revisions, to record new species, and to replenish reference collections.

Moderate numbers of a humpbacked bark beetle of hickory, Chramesus hicoriae Lec. occurred in branches of roadside trees in Aldborough, Pelham, and Rainham townships. Larvae and adults were present in larger numbers in low-hanging branches and limbs which had been injured by trucks.

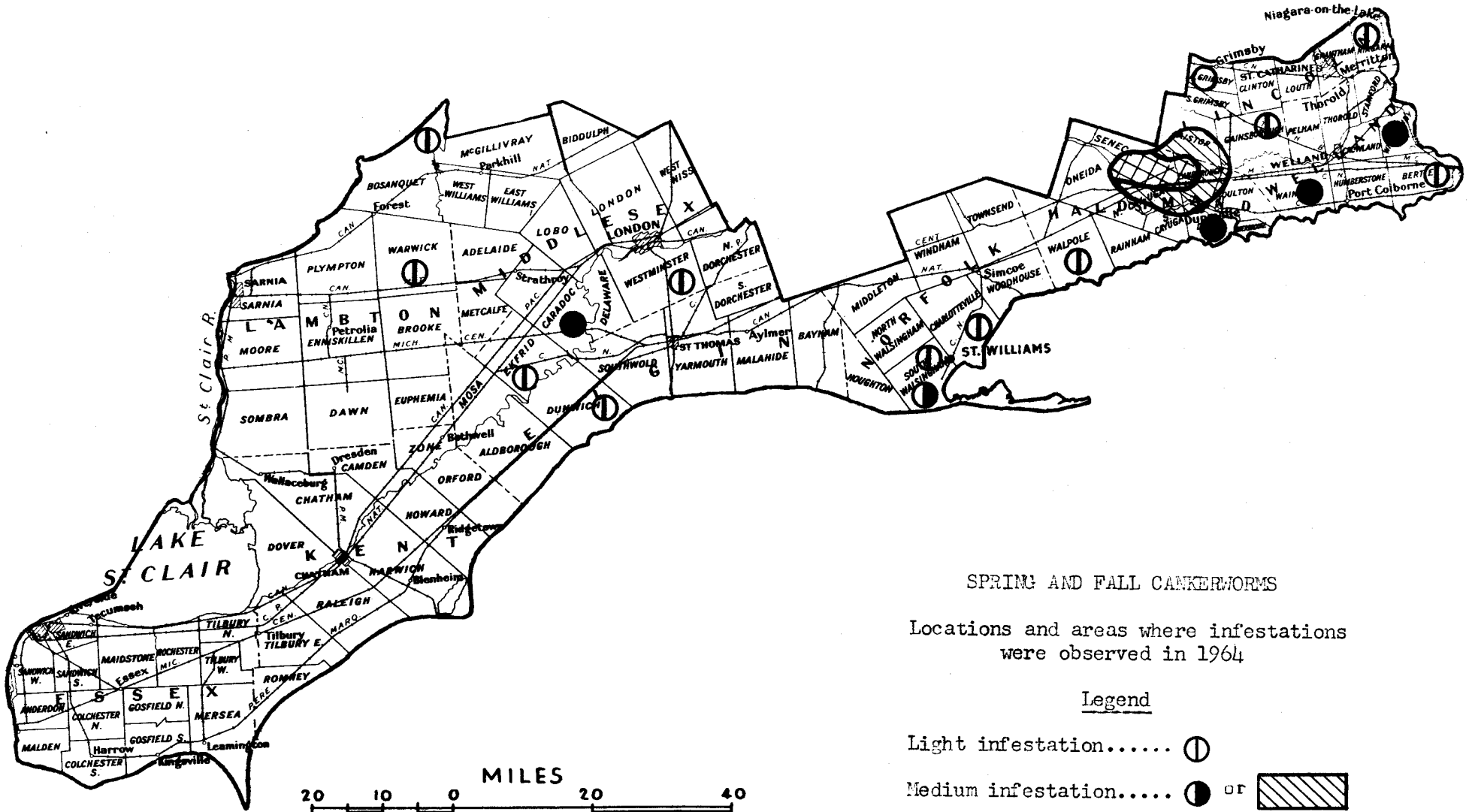
Four collections of bark beetles, Scolytus mali Bechst. were sent to Dr. W. R. Nickle at the Belleville laboratory from scattered apple orchards in the district. He hoped to find parasitic nematodes for manipulation to S. multistriatus Marsh., however none were present in the material submitted.

S. multistriatus Marsh., a vector of the Dutch elm disease, is common throughout the district. Three white elm shade trees at a residence in Maidstone Township were under heavy attack by these beetles on August 12. One of the trees, planted in 1930, was very heavily infested. The beetles were seen at every bifurcation on all twigs, and in one 4-inch section five adults were feeding at every fork. Beetles continued to feed on small sections of twigs and leaves which had fallen to the ground. On September 6 a mass collection of adults was submitted in alcohol for the reference collection at the Sault Ste. Marie laboratory.

The spruce scolytus, S. piceae Sw. was found in several white spruce trees in the St. Williams Forest Nursery which had been severely scorched in a lightning fire in June, 1962. Numbers were high in the trunks and low in the branches.

At many points large numbers of Ips chagnoni Sw. bark beetles were found in pine trees which had been injured by fire or wind or damaged by bulldozers. Populations were very high in 30-foot red pines at the Pinery Provincial Park, Bosanquet Township and in 6-foot Scots pine Christmas trees in Mosa Township. Fires had scorched both the afore-mentioned plantations in April, and by late



LAKE ERIE DISTRICT



SPRING AND FALL CANKERWORMS

Locations and areas where infestations were observed in 1964

Legend

- Light infestation..... ○
- Medium infestation..... ● or 
- Heavy infestation..... ⊗ or 

June the weakened trees were heavily attacked. I. chagnoni were often found with other bark beetles, the most common associates being I. pini Say and Orthotomicus caelatus Eichh.

In May over 50 Scots pine trees along the fringe of a woodlot in South Walsingham Township were bulldozed over to make way for a road. By mid-August the boles and branches of the felled trees were heavily infested by I. pini Say and fewer numbers of I. chagnoni Sw.

Orthotomicus caelatus Eichh. beetles were found in Scots pine and white spruce trees at four widely-separated points in the district.

In mid-summer a 45-foot white pine at Turkey Point Nursery (which had been weakened by borers) was broken off at ground level by high winds. Six weeks later populations of Pityogenes hopkinsi Sw. were high along the stem and in the branches. On July 21 a discoloured 9-foot white pine at Turkey Point Nursery was cut down and on October 5 the slash was infested by numerous P. hopkinsi. They were also present in a dead 8-foot white pine near Crumlin airport, West Nissouri Township.

During June log traps were set out in South Walsingham Township to trap weevils in flight (see writeup). Several species of bark beetles were retrieved from the log traps, the most common being Hylurgops pinifex Fitch. Numerous adults were present from June 10 to 27.

Larch Casebearer, Coleophora laricella (Hbn.)

High populations of larch casebearers recorded on tamarack in Bosanquet Township in 1963 declined to light intensity in 1964. Moderate damage was observed on the lower branches of several trees in the Kettle Point Indian Reserve. At all other sampling points numbers remained low (Table 9).

TABLE 9

Summary of Larch Casebearer Counts in Lake Erie District
from 1962 to 1964

Note: Counts were taken on four 18-inch branch tips from each of four sample trees at each location.

Location (township)	Host	Av. d.b.h. in inches	Av. no. larvae per branch tip		
			1962	1963	1964
Adelaide	tL	10	-	-	0.9
Bosanquet	tL	10	14.0	26.0	5.0
Charlotteville	eL	8	1.0	1.0	1.0
North Dorchester	tL	8	3.0	4.0	5.5
South Walsingham	eL	9	1.0	0.5	0.4
Yarmouth	eL	9	1.0	3.0	0.7

Walnut Caterpillar, Datana integerrima G. & R.

Walnut caterpillar population levels were generally high throughout Essex and Kent counties. Single and clumps of black walnut trees were severely defoliated along Highway 3 from Aylmar east to the district boundary, near Iona Station, and in MacGillivray Township. In Dunwich Township defoliation was estimated at 10 per cent for the ten trees examined (Table 10), however most of

this defoliation occurred on one tree which was 95-per cent defoliated. Severe branch mortality was observed on nearby walnut trees.

Branch mortality has been increasing for two years at the Mosa Township sample point and is now moderate on several trees. On August 25 masses of late-instar larvae were molting on the boles of five of the 20 mature trees checked. All caterpillars were on the lower three feet of the trunks and one mass contained 226 larvae two inches or more in length.

One black walnut tree was killed and many dead branches occurred on nine other trees at the sampling point in South Cayuga Township. One tree was half dead in the spring of 1962, was moderately infested by the walnut caterpillar in 1962 and 1963, and died in the autumn of 1963.

Heavy infestations observed in 1963 at the junction of highways 22 and 81, Middlesex County, declined to light intensity in 1964. Light to heavy populations on casual trees were recorded at numerous points throughout the district (see map).

TABLE 10

Summary of Walnut Caterpillar Defoliation Estimates
made in Lake Erie District in 1963 and 1964

Note: Counts were based on estimates of defoliation of ten black walnut trees at each location.

Location (township)	Av. d.b.h. in inches	Av. height in feet	Approx. per cent defoliation	
			1963	1964
Dunwich	8	22	10	10
Enniskillen	13	35	1	5
McGillivray	8	20	-	55
Mosa	12	32	10	10
South Cayuga	4	11	10	0
Tilbury North	5	16	15	15
Wainfleet	6	20	20	1
Windham	12	25	0	3

Yellow-necked Caterpillar, Datana ministra (Drury)

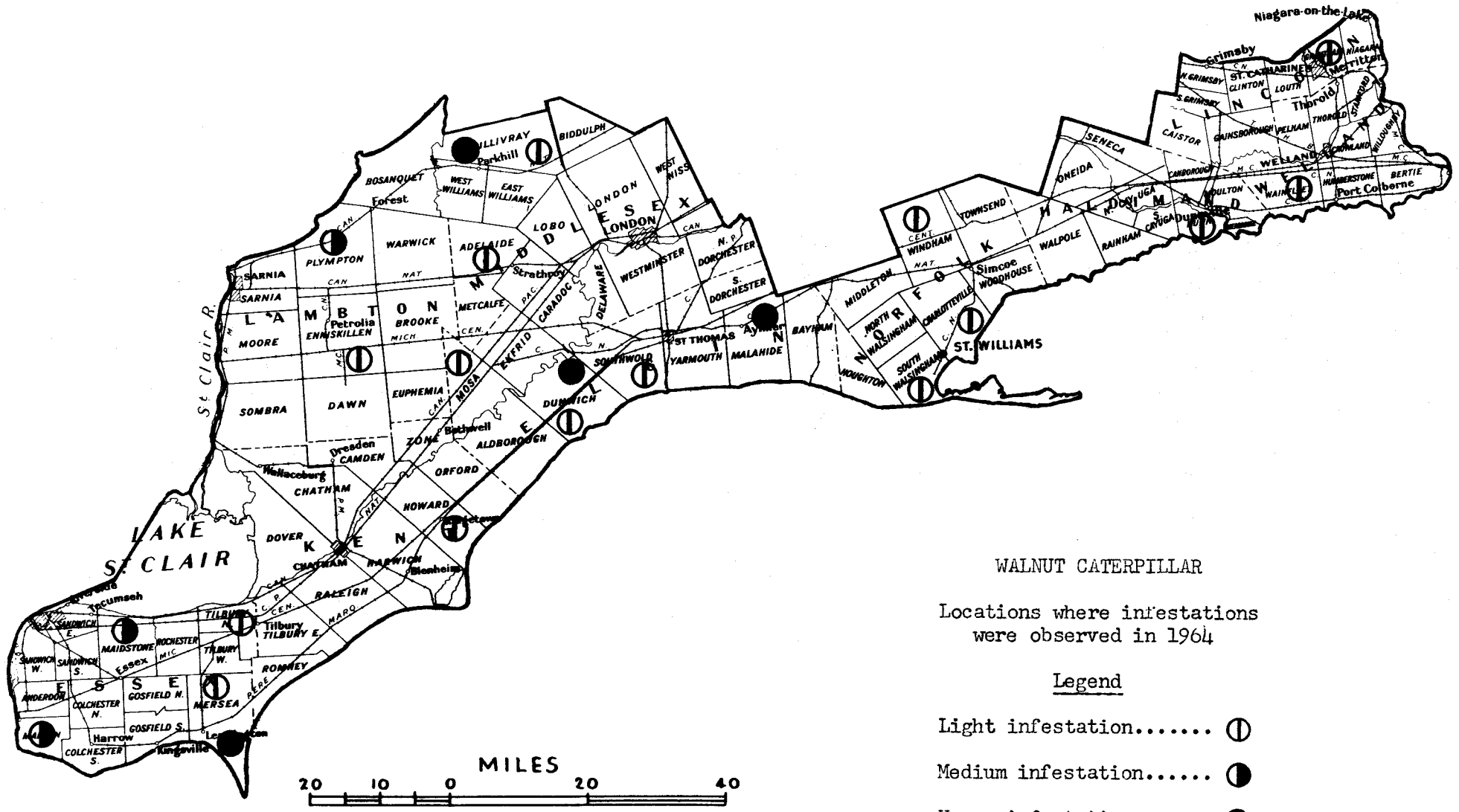
Moderate infestations occurred near Belle River, Maidstone Township and near Theford, Bosanquet Township.

The medium infestation recorded in 1963 along Highway 81 south of Strathroy declined to light intensity in 1964. Numbers were low near Boyle and Tilbury and along the Queen Elizabeth Way from Niagara Falls to Fort Erie. Unfavourable weather during August may have contributed to the reduction in numbers of this insect in 1964.

Zimmerman Pine Moth, Diorycetria zimmermani Grt.

High population levels of this insect persisted in a Scots pine plantation in Euphemia Township. Larvae occurred from May 26 to August 25 in this plantation. A brood tree dissected on July 30 contained 10 larvae, eight being confined to one branch whorl. When final surveys were made on October 20, less than 25 per cent of the trees were merchantable Christmas trees because of branch flagging. Scots pine is the favoured host of this presumably native pest, but Austrian, red

LAKE ERIE DISTRICT



WALNUT CATERPILLAR

Locations where infestations
were observed in 1964

Legend

- Light infestation..... ○
- Medium infestation..... ◐
- Heavy infestation..... ●

and white pine were also infested.

The number and size of infestations increased considerably in 1964. Three brood trees and several lightly infested trees were found in a neglected Scots pine plantation in Thorold Township south of the City of St. Catharines. West of this plantation, at the DeCou House grounds, five red pine and two Scots pine were lightly infested. Populations were light to moderate in a Christmas tree plantation in West Nissouri Township. Numbers were low in a Scots pine plantation near Bothwell which had been burned-over in the spring.

A 10-foot white pine tree at Turkey Point Forest Nursery was infested by Zimmerman pine moth larvae. All insects were within one foot of the ground in the stem or branches, and a great deal of pitch flowed from the wounds into the litter. When the seriously weakened tree was examined on July 21 all foliage was very conspicuously yellowed, and Hylobius and Pissodes weevils were found to be associated.

White pine trees in the Wright Tract, McGillivray Township have been weakened sporadically by a complex of insects, D. zimmermani was probably responsible for the initial attack and D. abietivorella larvae were secondary. Further surveys will be conducted here in 1965.

Mechanical damage may predispose trees to attack by the Zimmerman pine moth. A Scots pine in Pinafore Park, St. Thomas, and a white pine in Vanessa Conservation Area, Windham Township were damaged by automobiles, and the wounds apparently attracted D. zimmermani moths and provided points of entry for larvae which occurred adjacent to the wounds.

Heavy rainfalls in late summer and in the fall are known to have an adverse affect on the insect and to reduce numbers. Accordingly population trends in 1965 will be watched carefully because of the cold wet weather of August, 1964.

A light trap was operated in a lightly infested Christmas tree plantation in Middleton Township from July 20 to August 31, but no adults of this species were captured.

Nursery Pine Sawfly, Diprion frutetorum Lec.

In Stamford Township medium infestations recurred on Scots pine plantings along the Queen Elizabeth Way, while numbers were low on adjacent jack pine trees. An infestation in Enniskillen Township increased to medium intensity in 1964. A medium infestation also occurred on 9-foot Scots pine trees in a large plantation in Wainfleet Township.

Populations remained low on scattered trees in Charlotteville Township, most larvae occurring on the lower crowns. Several new quantitative sampling points were established (Table 11).

TABLE 11

Summary of Nursery Pine Sawfly Larval Counts
made in Lake Erie District in 1963 and 1964

Location (township)	Host	Av. d.b.h. in inches	Total no. of insects per 15-tray sample	
			1963	1964
Charlotteville	scP	5	1	15
Enniskillen	scP	5	44	72
Dunn	wP	4	8	0
McGillivray	scP	3	-	1
Oneida	scP	3	-	1
Stamford	jP	4	12	1
Stamford	scP	5	80	110
Wainfleet	scP	2	-	74
Willoughby	scP	3	4	12

European Spruce Sawfly, Diprion hercyniae (Htg.)

Populations of the European spruce sawfly remained low throughout the District (Table 12).

TABLE 12

Summary of European Spruce Sawfly Larval Counts made in Lake
Erie District in 1963 and 1964

Location (township)	Host	Av. d.b.h. in inches	Total no. of insects per 15-tray sample	
			1963	1964
Adelaide	wS	6	-	7
Cayuga North	wS	7	-	18
Gainsborough	nS	7	13	1
South Walsingham	wS	8	19	12
Woodhouse	nS	9	0	6

Introduced Pine Sawfly, Diprion similis (Htg.)

Medium infestations recorded in 1963 on jack and Scots pine plantings along the Queen Elizabeth Way in Stamford Township subsided to light intensity in 1964 (Table 13). Foliage was sparse on the jack pine trees at this point, and road salt was probably partially responsible for this condition.

TABLE 13

Summary of Introduced Pine Sawfly Larval Counts
in Lake Erie District in 1963 and 1964

Location (township)	Host	Av. d.b.h. in inches	Total no. of insects per 15-tray sample	
			1963	1964
Dunn	scP	4	25	2
Dunn	wP	2	21	2
Stamford	JP	6	303	104
Stamford	scP	6	118	8

White Pine Shoot Borer, Eucosma gloriola Heinr.

A sharp upward trend in population levels of this pest occurred. One of the areas of greatest increase was Turkey Point Forest Nursery, Charlotteville Township, where up to 19 and 22 infested shoots were observed on 8- and 12-foot white pine trees respectively.

In 1964 there was a striking increase in the incidence of attack to tree leaders. At the Turkey Point Nursery 54 per cent of the leaders of infested white pine trees were attacked, compared with eight per cent in 1963 (Table 14). Infestations were very heavy in an untended Scots pine plantation in Middleton Township. Thirty-two shoots were infested on one 7-foot tree, and an average of about 11 shoots per infested tree was attacked. Infestations were light to medium on neighbouring Austrian pine plantings, on Scots pine hedgerows along highways in the Petrolia-Wyoming area, and on Mugho pine in the Moraviantown-Wardsville section of the district. Clumps of trees were lightly infested at numerous points in the district.

Numerous white pine shoots at the Turkey Point Nursery which had been infested by the white pine shoot borer in 1963 were diseased in 1964. Branch cankers occurred about 1/4-inch below the conspicuous emergence holes of the insects, and the twigs from the canker to the apical end of the stunted shoots were devoid of foliage, discoloured, and infected with Phomopsis sp.

TABLE 14

Summary of Damage by the White Pine Shoot Borer
in Lake Erie District in 1964

Location (township)	Host	Av. height of trees in feet	Per cent of trees infested	Av. no. of attacks per infested tree	Per cent of leaders infested
Aldborough	wP	7	52	1.2	16
Charlotteville	wP	12	95	4.0	54
Howard	scP	4	6	1.0	3
Middleton	scP	7	100	10.8	40
Mosa	wP	22	85	4.5	35
Thorold	wP	12	31	1.3	0
West Nissouri	wP	12	5	1.0	1

A Needle Miner of Red Pine, Exoteleia new sp.

This insect is known at Harrow, Port Burwell, Woodstock, Elmira, Alliston, Toronto, and Ottawa. Observations of the insect's life history have been made in a red pine plantation at Port Burwell in Elgin County since 1962. The following facts pertaining to the life history of this undescribed species have been determined either by myself in the field or in collaboration with O. H. Lindquist from samples submitted from the district.

The moths are in flight from early July to early August, and the eggs are laid on needle sheaths or small branches. The first-instar larvae begin mining in early August and overwinter in the fourth instar within the needles. In the spring mining is resumed until late May when the larvae vacate the needles and feed in staminate flowers or buds. Pupation occurs in these sites in mid-June and lasts for about two weeks.

Elm Leaf Beetle, Galerucella luteola (Schrank.)

This insect was first recorded in Canada at St. Catharines in 1945 and has been a major shade-tree problem since then. In 1964 a medium to heavy infestation occurred on about 25 mature white elm trees near Montebello Park in the above-mentioned city. In early August skeletonizing was light to heavy on plantings along the Queen Elizabeth Way west of the Garden City Skyway.

Medium to heavy infestations occurred in a clump of white elm trees in Gainsborough Township, on several mature ornamentals on the grounds of Fort Malden in the Town of Amherstburg, and on 40 English elm trees, Ulmus procera Salisb. at Port Stanley in Elgin County. This was the first infestation reported on this host in Ontario.

Medium infestations recurred on the lower branches of mature white elm shade trees on the court house lawn in the City of St. Thomas where up to 26 larvae per leaf were observed on June 29. Localized infestations of varying intensity have persisted at St. Thomas since 1949. A light infestation recurred on a clump of small white elms at Jordan Valley in Louth Township.

Log Trapping of Pine Weevils, Hylobius congener D. T., H. pales Boh., Pissodes approximatus Hopk. and Brachyrhinus ovatus Linn.

Distributional records of pine weevils are incomplete in Ontario and log trapping was conducted to ascertain their occurrence and distribution.

On June 2 five freshly cut Scots pine logs were set out at one point in each of the St. Williams and Turkey Point forest nurseries. The bolts, 18 inches long and about five inches in diameter were first dipped in a pail of water containing four tablespoons of DDT 50 per cent wettable powder. When dry they were piled on a sheet of plastic in a shallow depression in a pine stand which had been cut over within the previous six months. Fresh pine foliage was placed on top of the logs to prevent overheating. The traps were visited weekly until July 6 and the material submitted.

H. pales was collected in small numbers at Turkey Point. Numerous H. pales adults and small numbers of P. approximatus occurred at St. Williams. Strawberry root weevils, Brachyrhinus ovatus (L.) were found in small numbers in the traps.

A second set of log traps were set out in the St. Williams area on August 18, and checked weekly until September 5. Red, Scots, and white pine logs were

treated as above and set out in a white oak woodlot, 25 feet away from numerous Scots pine trees which had been pushed over two months previously by a bulldozer to make a roadway.

Small numbers of Hylobius congener adults were procured from the red pine logs on August 24 and 31; a first record of this insect in the district. H. pales adults were also found in small numbers.

Scots pine stumps from three widely-scattered plantations in the district were submitted to the Survey in early August to determine what weevils were present. P. approximatus was found for the first time in Euphemia Township in the western part of the district. This was the only extension in the known range of any of the afore-mentioned weevils. Pissodes affinis has still not been found in the district.

Fall Webworm, Hyphantria cunea (Drury)

Medium to heavy infestations of this insect occurred throughout Pelee Island. Numerous choke cherry shrubs on the East Shore Road were enshrouded in webbing. Other favoured host trees were hackberry, mulberry, walnut, and willow. A medium infestation occurred in Thorold Township, and populations were low elsewhere in the district.

Seed and Cone Insects, Laspeyresia caryana Fitch, Melissopus latiferreanus Wlsh., Eucosma tocullionana Heinr., Dioryctria dusclusa Heinr., Paralobesia piceana Free., and others

Special collections of seed and cone insects from many species of trees and shrubs were made during the field season for Mr. C. S. Kirby, Insect Control Officer at Maple, Ontario. Results are summarized in Table 15.

TABLE 15

Seed and Cone Insects Collected in Lake Erie District in 1964

Insect	Host(s)	Remarks
<u>Laspeyresia caryana</u> Fitch	shagbark hickory	In Pelham Tp. the husks of 85 per cent of the nuts of seven shade trees were infested; most of the nuts on the ground were also heavily infested. In Rainham Tp. a light infestation occurred on one 50-foot tree.
<u>Melissopus latiferreanus</u> Wlsh.	swamp white oak	Light infestations of filbert worms in Aldborough Tp. in an uncommon host tree.
<u>Eucosma tocullionana</u> Heinr.	white pine	Heavy infestations in cones of three trees near Vittoria, Charlotteville Tp. Numerous reddened cones observed about 22 feet from the ground.

TABLE 15, (continued)

Insect	Host(s)	Remarks
<u>Dioryctria disclusa</u> Heinr.	jack pine, Scots pine	Medium infestations in 35-foot Scots pine hedgerow trees at the St. Williams Nursery. Medium infestations recurred in clumps of jack pine plantings in Walpole and Windham tps., populations light on same host in Caradoc and Moulton tps. Larvae always attacked cones of trees, none were found in the twigs. Often two larvae fed in separate chambers in one cone, and their mining habits destroy cones and seeds.
<u>Paralobesia piceana</u> Free.	European larch	Infestations light to heavy in cones of plantings in County plantation, South Walsingham Tp.
<u>Conophthorus coniperda</u> Sw.	white pine	White pine cone beetles moderate on several mature trees near the fish tanks, Turkey Point Nursery.
<u>Alsophila pometaria</u> Harr., and <u>Paleacrita vernata</u> Peck	white ash, basswood, maple	Fall and spring cankerworms fed on the wings of samaras of several hosts at scattered points in the district.
<u>Eupithecia mutata</u> Pears.	hemlock	Light infestations in cones of three trees near Glenshee, Norfolk County. Some cones infected by rust, <u>Melampsora abietis-canadensis</u> Ludw. ex Arth.
<u>Epinotia</u> sp.	alder	Heavy in the catkins of shrubs at the Spooky Hollow Sanctuary in Charlotteville Township. In the larval and pupal stages on September 29.
Lepidoptera	honey- locust	Heavy infestations in fruits of hedgerow near Port Dover. Rearing is incomplete.

TABLE 15, (continued)

Insect	Host(s)	Remarks
Curculionidae	white ash	Heavy infestations of snout beetles were found in samaras of 25-foot plantings at Turkey Point Nursery. When clusters of key fruits from five trees were placed in a paper bag and 100 drawn at random, 78 per cent were found infested. On dissecting five keys an average of 4.3 weevils were found therein. Several roadside trees in Walpole Township were infested, and when the above-mentioned sampling method was carried out, 37 per cent of the keys were found infested with an average of 2.4 larvae per key. Rearing is not yet complete.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Medium infestations observed along Highway 21 from Grand Bend to The Cut, Bosanquet Township in 1963 increased to heavy intensity in 1964 (Table 16). On June 8 infested shrubs were completely defoliated and numerous larvae were migrating across a 10-mile section of the highway. Defoliation to pin cherry shrubs was severe in nearby Pinery Provincial Park.

Heavy infestations recurred near Waterford, Villanova and Windham Centre. New medium infestations were recorded on eastern choke cherry shrubbery near Courtland and on three 20-foot red cherry trees in West Nissouri Township. Larval colonies were medium to heavy in a clump of orchard apple trees in Adelaide Township. On a lower branch of one severely defoliated tree there were five large egg bands on a 12-inch section of a twig. Occasional tents were seen at numerous scattered points in the district (see map).

TABLE 16

Summary of Eastern Tent Caterpillar Colony Counts
in Lake Erie District in 1963 and 1964

Location (township)	Sample unit	No. of colonies per sample unit	
		1963	1964
Bosanquet	1 mile of roadside	200+	400+
McGillivray	1 square chain plot	3	1
Moulton	1 mile of roadside	0	2
South Walsingham	1 mile of roadside	1	1
West Nissouri	1 square chain plot	5	5
Woodhouse	1 mile of roadside	0	1
Yarmouth	1 square chain plot	-	2
Zone	1 mile of roadside	0	5

A Leaf-folding Sawfly, Nematus sp.

Medium infestations reported at Port Dalhousie, Grantham Township in 1963 subsided in 1964. Populations of this sawfly were low throughout the district (Table 17).

TABLE 17

Summary of Counts of the Leaf-folding Sawfly
in Lake Erie District in 1963 and 1964

Note: Counts were based on the examination of 100 leaves taken at random from each of three three trembling aspen trees at each location.

Location (township)	Av. no. of folds per leaf	
	1963	1964
Bayham	1.10	0.25
Middleton	0.80	0.18
Raleigh	0.01	nil
Wainfleet	-	0.03
Zone	1.20	0.07

White Pine Weevil, Pissodes strobi (Peck)

Light infestations of this insect reported in Norfolk County in 1963 increased to moderate intensity in 1964. Numbers remained endemic throughout the balance of the district.

Control measures were carried out in white pine plantations at Turkey Point Forest Nursery, and in the Bayne Tract in Mosa Township in midsummer. The weevilled tops were hand-clipped and burned. In five compartments of the Turkey Point Nursery a total of 375 infested trees were counted. In two hours three men clipped off 96 infested terminals in a 5-acre compartment northwest of Five Corners. This method of control was employed at Turkey Point for 12 years prior to 1939, but with the outbreak of World War II was discontinued until July, 1964.

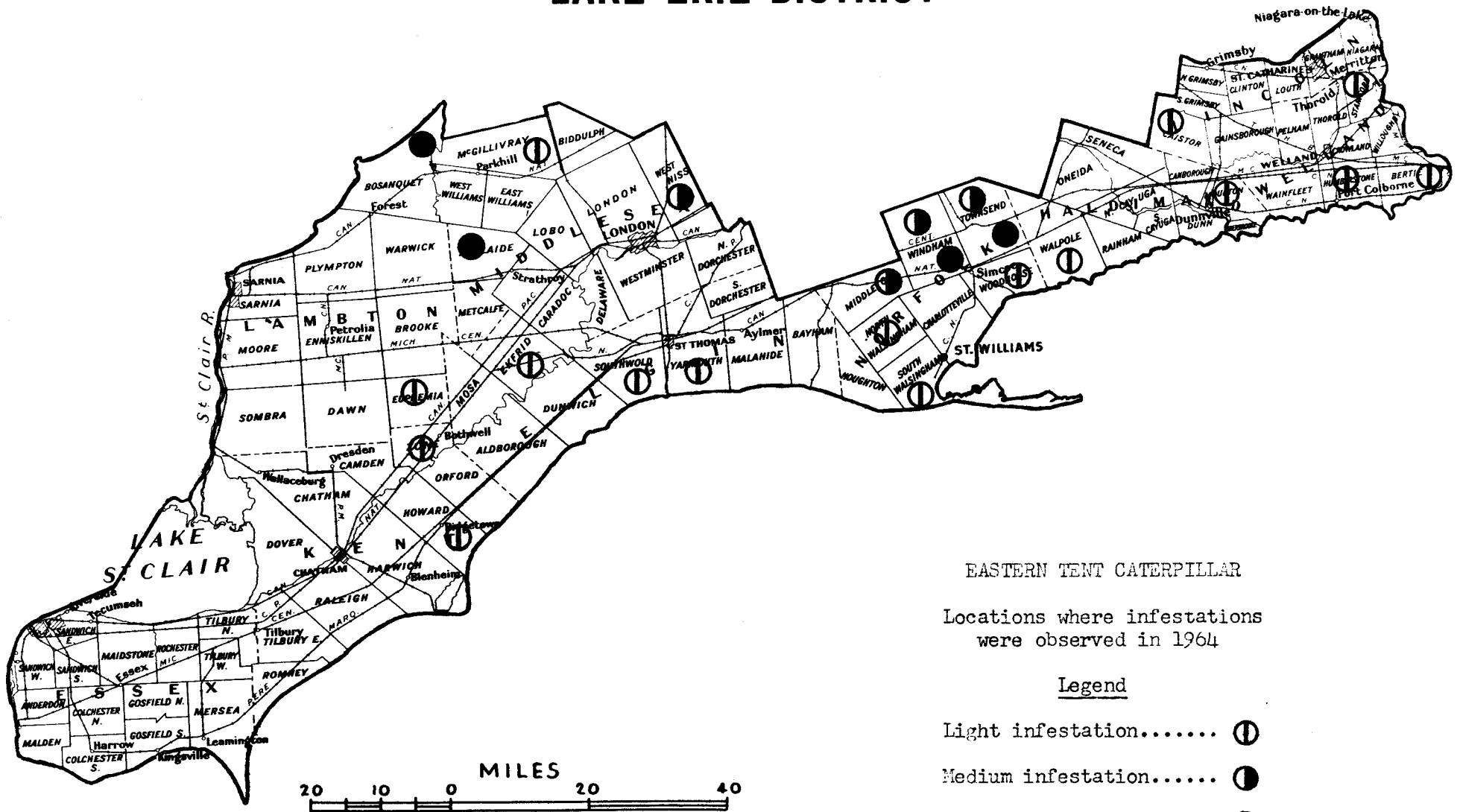
A new quantitative sampling point was established at St. John's in Thorold Township (Table 18). No adults had emerged when surveys were conducted here on August 27. Sixty-five per cent of the weevils were in the adult stage while the balance had not yet transformed from the pupal stage. Insect development may have been retarded by unfavourable weather in August.

TABLE 18

Summary of Damage by the White Pine Weevil
in the Lake Erie District in 1963 and 1964

Location (township)	Av. d.b.h. in inches	Per cent of white pine trees infested	
		1963	1964
Aldborough	1	1	0
Charlotteville	2	5	9
South Walsingham	1	8	1
Thorold	2	-	3

LAKE ERIE DISTRICT



EASTERN TENT CATERPILLAR

Locations where infestations were observed in 1964

Legend

- Light infestation..... ○
- Medium infestation..... ●
- Heavy infestation..... ●

Pitch Mass Borer, Vespamia pini Kell.

One 35-foot Austrian pine in the Port Dover Cemetery was heavily infested. Pitch masses were so profuse along the stem that little bark was visible at the 15- to 25-foot level. Attack on the lower stem of this tree and several neighbouring 50-foot Norway spruce trees was light.

A medium infestation occurred on over 30 shade trees in the Aylmer Cemetery, Malahide Township. Favoured hosts in descending order of occurrence were Norway spruce, Scots pine and blue spruce. A light to medium infestation was observed on Scots pine at the Pine Park Rifle Club grounds, Charlotteville Township.

Four of 10 Norway spruce trees at the Turkey Point Forest Nursery were lightly infested. Attacks occurred at the 5-foot level of these trees. At Burgoyne Woods in St. Catharines two Scots and one jack pine were lightly infested.

Trees which have been branch-pruned or wounded are most subject to infestation by this borer. Feeding habits are similar to that of the Zimmerman pine moth, however, the pitch masses of V. pini are much larger (up to four inches in diameter). Galleries occur in the inner bark and sapwood near branch stubs or wounds and may be triangular or rectangular; the latter being up to one inch wide by two and one-half inches long transversely. Infested trees become very unsightly and vigour is reduced.

TABLE 19

Summary of Miscellaneous Insects Collected
in Lake Erie District in 1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acronicta americana</i> Harr.	r0	Light on one tree at the Turkey Point Forest Nursery
<i>Acronicta dactyline</i> Grt.	W	Insect rare at Byron Bog.
<i>Acronicta interrupta</i> Gn.	Haw	Light; numbers continued to decline
<i>Acronicta lepusculina</i> Gn.	Co, lPo	Low numbers (2)
<i>Adelges abietis</i> Linn.	nS	Moderate on several trees at Ridgeway; light at spruce plot in Woodhouse Tp. (2)
<i>Adelges strobilobius</i> Kalt.	nS	Light in Woodhouse Tp.
<i>Agrilus</i> sp.	tA	In living and dead regeneration in Bayham Tp., parasites present
<i>Anoplonyx luteipes</i> Cress.	eL	Light on several trees at county plantation, South Walsingham Tp., upward trend for two years
<i>Anisota rubicunda</i> Fabr.	siM	Low numbers in Dunn and Gosfield North tps. (2)
<i>Anisota virginensis</i> Dru.	r0	One colony at Turkey Point Nursery
<i>Antispila nyssaefoliella</i> Clem.	black gum	Heavy mining on one mature tree at Byng Conservation Park, Dunn Tp.

TABLE 19, Lake Erie District

Insect	Host(s)	Remarks
<i>Archips cerasivoranus</i> Fitch	ecCh	Moderate near Vittoria, Charlotteville tps. and St. Clair R., Sarnia Tp., light at other points (5)
<i>Archips purpuranus</i> Clem.	wAs	Insect uncommon
<i>Arge scapularis</i> (Klug)	blO, rO	Moderate on several trees, light on others at Turkey Point Nursery and Provincial Park (2)
<i>Asterocampa celtis</i> Bdv. & Lec.	hackberry	Many rare larvae on one tree at Point Pelee nature trail
<i>Atomacera debilis</i> Say	trefoil	Further observations made on life history at the Backus Tract
<i>Atteva aurea</i> Fitch	tree-of-heaven	Medium and heavy infestations at Scudder, Pelee Island; light at the Ontario Paper Co. plantation in Wainfleet Tp. (2)
<i>Balsa malana</i> Fitch	apple	Light, Adelaide Tp.
<i>Catocala cara</i> Gn.	W	A new record for Ontario
<i>Catocala crataegi</i> Saund.	Haw	Light in Caradoc Tp. woodlot; a new provincial record
<i>Choristoneura fumiferana</i> Clem.	nS, wS	Small numbers in Cayuga North and Woodhouse tps. (3)
<i>Choristoneura pinus</i> Freem.	aP, scP	Low numbers in Romney and Willoughby tps. (2)
<i>Choristoneura rosaceana</i> Harr.	quince, wAs, Ba	Moderate on two shade trees, town of Aylmer; light at other points (3)
<i>Chrysoclista linneella</i> Clerck	linden	Life history begun on bark borer at a park in St. Catharines
<i>Corthylus punctatissimus</i> Zimm.	sM	Damage remains heavy in woodlot in Oneida Tp.
<i>Datana contracta</i> Wlk.	wO	One colony in Dawn Tp.
<i>Datana perspicua</i> G. & R.	Su	Medium recurrence at Port Rowan where shrubs were cut at ground level in early May. Light near Tilbury (2)
<i>Dichomeris ligulella</i> Hbn.	pO	Heavy on four trees, Willoughby Tp.
<i>Dioryctria abietivorella</i> Grote	wP	A secondary insect often associated with several species at widely-separated points in the district (4)
<i>Elaphidion parallelum</i> Newm.	rO, wO	Four trees near Bothwell lightly infested; light at Vanessa Conservation Park (2)

TABLE 19, Lake Erie District

Insect	Host (s)	Remarks
<i>Erannis tiliaria</i> Harr.	wE, Ba, Hack	Marked decline in populations; only a casual larva at widely-separated points in the district (7)
<i>Exoteleia pinifoliella</i> Cham.	jP	Populations at Allanburg, Thorold Tp. declined to light and moderate intensity; all were in the pupal stage on May 21
<i>Fenusa dohrnii</i> (Tischb.)	European black Al	Heavy populations recurred on roadside hedges at many places in Norfolk County. Up to 25 larvae per leaf on some shrubs south of Vittoria; heavily infested leaves drop prematurely (2)
<i>Fenusa pusilla</i> (Lep.)	wB	Light to heavy on fringe trees at the Kettle Point Indian Reserve. First and second generations present on 10 July, and up to 20 minute mines of second generation larvae occurred in numerous leaves
<i>Feralia jocosus</i> Gn.	wS	Light on one tree at the sawfly plot in McGillivray Tp.
<i>Gluphisa septentrionalis</i> Wlk.	Co, lPo	Larvae rare (2)
<i>Halisidota caryae</i> Harr.	Wa	Colonies at several points
<i>Heterocampa bilineata</i> Pack.	wE	Light on one tree, Thorold Tp.
<i>Lapara bombycoides</i> Wlk.	wP	One larva in Thorold Tp. submitted for photographing
<i>Lepidosaphes ulmi</i> (Linn.)	wE, siM, dogwood	Heavy on occasional shade trees or roadside trees (6)
<i>Limenitis astyanax</i> Fabr.	W	A rare insect
<i>Lithocolletis aceriella</i> Clem.	sM	Moderate on a tree near Forestville, Charlotteville Tp.
<i>Lithocolletis hamadryadella</i> Clem.	wO	Heavy mining on two trees at Pinafore Park, City of St. Thomas
<i>Lithocolletis ostryarella</i> Chamb.	Hornbeam	Light mining on upper and lower crowns of shaded trees, Grantham Tp. woodlot
<i>Lithocolletis salicifoliella</i> Chamb.	tA	Rare insect
<i>Macrophya punctumalbum</i> L.	privet	Observations made on life history of sawfly at St. Catharines
<i>Malacosoma disstria</i> Hbn.	wAs	Numbers very low

TABLE 19, Lake Erie District

Insect	Host(s)	Remarks
<i>Megacyllene robiniae</i> Forst.	black locust	Numerous larvae, pupae and adults in several trees in City of London; found by J. A. Fingland on an extension call
<i>Monochamus mutator</i> Lec.	rP	Moderate attack to trees severely scorched in a spring fire at Pinery Provincial Park
<i>Nematus ventralis</i> Say	W, tA	Heavy infestations recurred and branch mortality noted on a tree at the Port Rowan wharf; three species of parasites attacked larvae in early July. Light at Crumlin airport and Newbury
<i>Neurotoma fasciata</i> (Nort.)	pCh	Heavy infestation recurred on shrub near Calton; light at the John E. Pearce Provincial Park
<i>Nymphalis antiopa</i> Linn.	W, Co	Heavy infestation recurred on several trees on the Queen Elizabeth Way at the Fort Erie race track. Heavy on two shrubs in Middleton North Tp. Low numbers at Clay Creek and Turkey Point provincial parks, Pinafore Park in St. Thomas, Port Burwell Conservation Area and other locations (3)
<i>Orgyia leucostigma</i> J. E. Smith	apple, cE, Wa, siM	Medium on solitary trees in Ekfrid, Gosfield North and Maidstone tps., light to medium on apple trees along Queen Elizabeth Way, Niagara Falls (5)
<i>Pandemis canadana</i> Kft.	Haw	Light in Caistor Tp.
<i>Pantographa limata</i> G. & R.	Ba	Medium to heavy at John E. Pearce Provincial Park, Elgin County in 1963 subsided to light in 1964. One tree at Point Pelee nature trail moderately infested and several trees on Turkey Point Co. private road lightly infested

TABLE 19, Lake Erie District

Insect	Host(s)	Remarks
<i>Petrova albicapitana</i> Busck.	jP, scP	Moderate numbers recurred on roadside hedgerow near Windham Centre. Numbers moderate on jack pines near Strathroy, Caradoc Tp., and at Jarvis in Walpole Tp. Light at other points (5)
<i>Phenacaspis pinifoliae</i> Fitch	wP	Heavy on one tree at the Vineland Experimental Station
<i>Pheosia rimosa</i> Pack.	tA	Insect not common
<i>Phratora purpurea purpurea</i> Brown	lA	Light on two trees at the Turkey Point Forest Nursery
<i>Pikonema alaskensis</i> (Roh.)	wS	Medium infestation at roadside park in Cayuga North Tp. declined to light intensity in 1964. Not found elsewhere in the district
<i>Polygonia interrogationis</i> Fabr.	wE	Moderate defoliation on a small, roadside tree at Fish Point, Pelee Island; light elsewhere (2)
<i>Pristiphora geniculata</i> (Htg.)	sMo	Heavy on shelterbelt near Boston in 1962-63 but all trees were cut and burned in winter and only one colony here in 1964. Severe defoliation on five trees at McKay Forest, Elgin County. Several colonies on shade trees at Point Edward (2)
<i>Prociphilus tessellatus</i> (Fitch)	European black Al	Woolly aphids heavy at several points in the district
<i>Proleucoptera smilaciella</i> Busck.	green brier	Medium infestation in South Walsingham Tp., up to 12 miners per leaf
<i>Pterocomma smithiae</i> (Monell)	W	Aphids heavy on shrubs, Turkey Point
<i>Pulvinaria vitis</i> (Linn.)	rM	Moderate on ornamental near Vittoria
<i>Raphia frater</i> Grt.	tA	Light on one tree in Oxford Tp.
<i>Saperda moesta</i> Lec.	bPo	Twig-borers moderate to heavy in Middleton Tp., some branch and tree mortality

TABLE 19, Lake Erie District

Insect	Host(s)	Remarks
<i>Schizura concinna</i> A. & S.	sHi, apple	Single colonies at DeCou Historical House and St. John's Conservation Area in Thorold Tp.
<i>Synanthedon decipiens</i> <i>decipiens</i> Hy Edw.	pO	Old horned oak galls in Willoughby Tp. moderately weevilled
<i>Synanthedon pictipes</i> G. & R.	Haw	Medium on disease organisms in Walpole Tp.
<i>Taniva albolineana</i> Kft.	wS	Light at Calton
<i>Tibicen</i> sp.	Ba, scP, nS, burO	Cicadas at scattered points; none were diseased (5)
<i>Tolyte laricis</i> Fitch	eL, wS	Larvae sparse (2)
<i>Toumeyella liriodendri</i> Gmelin	magnolia	Heavy on two trees at Superintendent's residence, St. Williams Nursery; numerous bees present
<i>Toumeyella numismaticum</i> P. McD.	scP	Heavy scales recurred at the Heskett plantation, South Walsingham Tp.
<i>Trichiocampus gregarius</i> Dyar	tA	Light on two trees, Rock Glen Park
<i>Trichiocampus viminalis</i> (Fall.)	lPo	Severe defoliation in clumps near Boyle, Gainsborough Tp., and near army camp in Walpole Tp. (2)
<i>Trirhabda canadensis</i> Kby.	goldenrod	Severe defoliation near Long Point Bay
<i>Triplax thoracica</i> Say	siM	Numerous pleasing fungus beetles in several <u>Pleurotus</u> sp. conks on dead tree at Point Pelee nature trail

SOUTH-CENTRAL FOREST REGION

1964

INTRODUCTION

TREE DISEASES

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INTRODUCTION

South-central Forest Region

The following report summarizes the status of forest insect and tree diseases in the South-central Forest Region. Tree diseases are dealt with regionally and insect conditions on a district basis. Insects and diseases of major importance are reported in detail while those currently causing minor damage are listed alphabetically in tabular form.

Late spring frosts caused pockets of damage in coniferous and deciduous stands at many points in the region (Photograph). Blister rust and Hypoxylon canker continued to cause appreciable mortality in white pine and poplar stands respectively. A significant extension in the distribution of the Dutch elm disease occurred, infected trees being found for the first time in the North Bay District.

Forest tent caterpillar infestations increased in extent and intensity. The Muskoka Lakes and Lake Nipissing infestations encompassed areas of approximately 600 and 175 square miles respectively. Pockets of moderate to severe defoliation of poplar by two species of leaf rollers occurred at numerous points in the region. Population levels of the red-headed pine sawfly increased sharply in the Parry Sound District causing severe defoliation in numerous red pine plantations in the southern part of that district. A downward trend in populations of the bruswood looper and birch skeletonizer was general in 1964.

Special projects carried out in the region included information studies of white and red pine needle miners and of a birch leaf roller. A total of 765 insect and disease samples were submitted and 69 service and extension calls were answered during the field season. Short courses of instruction on insects and diseases were given to junior forest rangers at 11 camps in the region. The writers gratefully acknowledge the co-operation extended by personnel of the Department of Lands and Forests.

L. S. MacLeod -

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

An increase in the incidence of this disease occurred in previously infected areas in the vicinities of Gravenhurst, Bracebridge and Huntsville, Parry Sound District. Quantitative sampling in the Rosseau area showed that 18 per cent of the living elm was infected and that 17 per cent had been killed.

In the North Bay District a significant increase in the distribution of the disease occurred along the north shore of Lake Nipissing. Infected trees were found at Trout Lake in Widdifield Township, at five locations within the town limits of Sturgeon Falls and at one point southwest of Warren in Dunnet Township. The disease was not found within the city limits of North Bay in 1964.

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

Branch and stem mortality caused by this rust occurred in varying degrees of intensity in most white pine stands in the region. Results of quantitative sampling are shown in Table 1.

TABLE 1

Summary of Incidence of White Pine Blister Rust and Tree Mortality at Four Points in the South-central Region, 1964

Location (township)	Total trees examined	Rusted (living)	Rusted (dead)
Boulter	18	6	0
Gillies Limit	21	2	1
Briggs	28	3	2
Papineau	<u>19</u>	<u>2</u>	<u>1</u>
Totals	86	13	4
Incidence		15.1%	4.6%

Hypoxyylon Canker of Poplar, Hypoxyylon pruinatum (Klotsche) Cke.

This disease continued to cause appreciable mortality in aspen stands through the region in 1964. Results of plots established at five locations are shown in Table 2.

TABLE 2

Summary of Incidence of Hypoxyylon Canker of Poplar at Three Points in the South-central Region, 1964

Location (township)	Tree sp.	Av. D.B.H. of sample trees inches.	No. of trees examined	Per cent trees infected
Franklin	tA, 1A	3	50	26.0
Franklin	tA	4	51	11.8
Boulter	tA, 1A	4	82	25.6
Dana	tA, 1A	3	40	17.5
Pardo	tA, 1A	6	25	20.0

Frost Damage

Unusually late and severe frosts caused extensive injury to conifers in low-lying areas at many locations in 1964. White spruce plantations in Armour and Strong townships in the Parry Sound District were heavily damaged. Varying degrees of injury to deciduous trees including ash, oak, and poplar was also observed at several points in the region.

Anthracnose Disease, Gloeosporium spp.

This condition was widespread through the North Bay District in 1964. Appreciable twig mortality occurred at several locations. Host species included sugar maple, red maple, mountain maple, hazel, elderberry and honeysuckle.

TABLE 3

Other Noteworthy Diseases in the South-central Forest Region 1964

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Fr.) Kummer	rP	Common in red pine plantation near Sundridge, Parry Sound District.
<i>Apiosporina collinsii</i> (Schw.) Von Hohnel	Se	Two infected trees in Pardo Township, North Bay District.
<i>Bifusella crepidiformis</i> Darker	bS	Observed commonly on this host throughout the North Bay District.
<i>Ciborinia whetzelli</i> (Seav.) Seav.	tA	Heavy infection of aspen foliage at one point each in the North Bay and Parry Sound districts. Light infections common at numerous locations throughout the region.
<i>Chrysomyxa ledicola</i> Lagerh	bS	Generally light in 1964. Several trees infected at one point in the North Bay District.
<i>Coleosporium asterum</i> (Diet.) Syd.	jP	Small groups of trees lightly infected in Merrick, Haddo and French townships, North Bay District.
<i>Coleosporium pinicola</i> (Arth.) Arth.	jP	Not observed on jack-pine trees in Mattawan Township in 1964 where trees were severely infected in 1962 and 1963.
<i>Cronartium comptoniae</i> Arth.	jP	A few basal stem cankers observed in Loudon, Haddo and McNish tps., North Bay District.
<i>Cytospora chrysosperma</i> (Pers.) Fr.	tA, W, 1A	Dead branches common on these hosts throughout the region.
<i>Cytospora friesii</i> Sacc.	bF	Scattered trees with dead tops at one point in Bastedo Township, North Bay District.
<i>Cytospora</i> sp.	Mo, rM	Moderate branch mortality on these tree species at two points in the Parry Sound District.
<i>Diatrype albopruinosa</i> (Schw.) Cke.	I	One tree dead near Bracebridge, Parry Sound District.
<i>Diatrype</i> sp.	Be	Several branches dead on one tree near Port Sandfield, Parry Sound District.
<i>Dibotryon morbosum</i> (Schw.) Thiess. & Syd.	cCh, pCh	Black knot of cherry common at numerous locations throughout the region.
<i>Erwinia amylovora</i> (Burr.) Wins. et al	Mo	Small groups of trees infected at numerous locations throughout the region.

TABLE 3 (continued)

Organism	Host(s)	Remarks
<i>Eutypella parasitica</i> Davidson & Lorenz	sM	Light mortality at two points in the North Bay District. Common in pure stands of sugar maple at numerous locations throughout the southern half of the Parry Sound District.
<i>Gymnosporangium</i> sp.	mO	Common on Mountain ash trees along old highway 69 in the Parry Sound District.
<i>Hypodermella ampla</i> (J.J.Davis) Dearn	jP	Moderate infection of jack-pine needles at two locations in the Parry Sound District and at one location in the North Bay District.
<i>Lienospora tetraspora</i> G.E.Thompson	bPo	Foliage of one tree infected in Dana Township, North Bay District.
<i>Marssonia populi</i> (Lib.) Sacc.	tA	Discoloured foliage on several trees in Bastedo Township, North Bay District.
<i>Melampsora abietis-canadensis</i> Ludw, ex Arth.	eH	Boundaries of infection extended several miles from original collection point in 1964. Only light infection observed at new sample points.
<i>Melanconis alni</i> var. <i>marginalis</i> (Pk.) Wehm	Al	Several branches of alder infected along roadside in Croft Township, Parry Sound District.
<i>Melanconis ostryae</i> (Dorn.)	I	Several dead branches on one tree near Horseshoe Lake, Parry Sound District.
<i>Myxosporium</i> sp.	rM	Light infection on one tree near Severn Bridge, Parry Sound District.
<i>Nothophacidium abietinellum</i> Reid & Cain	bF	Dead branches common in five townships, North Bay District.
<i>Peniophora</i> sp.	rO	Common on lower branches and twigs of red oak trees at one location in the Parry Sound District.
<i>Peridermium</i> sp.	jP	Galls common in Jack-pine stands at several points, particularly in Askin, Haddo and Mattawan tps., North Bay District.
<i>Phomopsis</i> sp.	Mo	Light infection on several trees near Dorset, Parry Sound District and at one location in Olive Township, North Bay District.
<i>Pollaccia elegans</i> Serv.	bPo	Moderate infection of stems on small trees in Gillies Limit Township, North Bay District and near Emsdale, Parry Sound District.
<i>Pollaccia radiosa</i> (Lib.) Bald & Cif.	tA	Moderate to heavy infection on reproduction trees throughout the central part of the North Bay District and the southern part of the Parry Sound District.
<i>Pollaccia saliciperda</i> (All. & Tub.) W V.Ar.	W	One collection from the North Bay District.
<i>Rehmeillopsis balsamæ</i> Waterman	bF	Small numbers of infected trees in Pardo and Widdifield tps., North Bay District.
<i>Rhytisma acerinum</i> Pers. ex Fr.	rM	Heavy infection of tar spot on leaves of red maple at several points in Medora Township, Parry Sound District.

TABLE 3 (continued)

Organism	Host(s)	Remarks
<i>Rhytisma punctatum</i> (Pers.) Fr.	mM	Common on this host throughout the North Bay District.
<i>Rhytisma salicinum</i> (Pers.) Fr.	W	This disease was widely dispersed throughout the North Bay District.
Salt Injury	wP, rP etc.	Severe damage to roadside trees along major highways at several locations in the Parry Sound District.
Scorch	bPo	Observed at several points in the North Bay District.
Sooty Mold	eH	Discoloured foliage at one point in Widdifield Township, North Bay District.
<i>Sphaerotheca</i> sp.	bPo	Small trees heavily infected at one point in South Lorrain Township, North Bay District.
<i>Steganosporium pyriforme</i> (Hoffm. ex Fr.) Cda.	sM	Common in varying degrees of intensity at several points in the Parry Sound District.
<i>Tubercularia vulgaris</i> Tode	sM	Small trees heavily infected near Port Carling, Parry Sound District.
<i>Tubercularia</i> sp.	sM	Suppressed sugar maple trees heavily infected near Port Sandfield, Parry Sound District.
<i>Uromyces junci</i> (Desm.) Tul.	Astor	Heavy rust infection on underside of leaves in Strathcona Township, North Bay District.
Winter Browning	rP, scP	Observed commonly on these host species at several locations in the Parry Sound District and on red pine trees within the city limits of North Bay.

STATUS OF INSECTS IN THE NORTH BAY DISTRICT

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Birch Skeletonizer	<u>Bucculatrix canadensisella</u> Cham. .	C 7
Larch Casebearer	<u>Coleophora laricella</u> Hbn.	C 7
Cone Beetles	<u>Conophthorus resinosae</u> Hopk., and <u>C. coniperda</u> (Schz.)	C 7
European Spruce Sawfly	<u>Diprion hercyniae</u> (Htg.)	C 7
A Noctuid	<u>Enargia decolor</u> Wlk.	C 8
Fall Webworm	<u>Hyphantria cunea</u> Dru.	C 8
Aspen Blotch Miner	<u>Lithocolletis salicifoliella</u> Chamb.	C 8
Eastern Tent Caterpillar	<u>Malacosoma americanum</u> (F.)	C 8
Forest Tent Caterpillar	<u>Malacosoma disstria</u> Hbn.	C 9
Black-headed Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> Roh..	C 10
Red-headed Pine Sawfly	<u>Neodiprion lecontei</u> (Fitch)	C 10
Red-pine Sawfly	<u>Neodiprion nanulus nanulus</u> Schedl.	C 11
Swaine Jack-pine Sawfly	<u>Neodiprion swainei</u> (Midd.)	C 11
White Pine Weevil	<u>Pissodes strobi</u> (Peck)	C 11
Balsam-shoot Boring Sawfly	<u>Pleroneura borealis</u> Felt	C 12
Birch Leaf Miners	<u>Profenusa thomsoni</u> (Konow) and <u>Heterarthrus nemoratus</u> (Fall.)	C 12
Poplar Leaf Rollers	<u>Pseudexentera oregonana</u> Wlshm. <u>Epinotia nisella</u> <u>criddleana</u> Kft.	C 12
Spruce Gall Midge	<u>Rhabdophaga swainei</u> Felt.	C 12
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L. S. MacLeod

STATUS OF INSECTS

Birch Skeletonizer, Bucculatrix canadensisella Cham.

Population levels of this insect declined in 1963 and 1964. White birch trees in the southern, eastern and northeastern parts of the district which were severely defoliated in 1963 supported light infestations in 1964. The western part of the district was relatively free of infestation.

Larch Casebearer, Coleophora laricella Hbn.

Minor increases in population levels of the larch casebearer were recorded at most permanent sample stations in 1964 (Table 4). However, definite declines occurred at a sampling station in Mattawan Township and in extensive tamarack stands in Pedley and Beaucage townships where light to moderate infestations were reported in 1963.

TABLE 4

Summary of Larch Casebearer Larval Counts Made at Seven Points in the North Bay District from 1962 to 1964

Note: Counts were based on the examination of four 18"-branch tips from each of four trees at each point.

Location (township)	Av. D.B.H. of sample trees in inches	Av. number of larvae per tip		
		1962	1963	1964
Strathcona	5	3.0	3.0	5.4
Olive	4	1.0	1.5	3.4
Bastedo	6	2.8	1.4	2.2
Widdifield	3	2.0	2.2	3.4
Bonfield	3	3.8	2.4	4.2
Mattawan	4	1.4	1.9	0.3
Gillies Limit	5	0.6	1.5	8.1

Cone Beetles, Conophthorus resinosae Hopk. and
Conophthorus coniperda (Schz.)

A heavy infestation of these cone beetles occurred in Strathcona Township in 1964. Approximately 10 acres of mature and overmature white and red pine trees were heavily infested. White pine were attacked by C. coniperda and red pine by C. resinosae and damage caused by the two species was similar. The adult beetles leave the cones in late summer and enter the current year's shoots where they tunnel through the pith into the vegetative buds. The twigs are weakened at the point of entry and soon break off and fall to the ground where the beetles overwinter. Damage is twofold as both cones and twigs are destroyed.

European Spruce Sawfly, Diprion hercyniae (Htg.)

Quantitative sampling at permanent sample stations revealed appreciable increases in population levels of this insect in Ratter and MacPherson townships (Table 5). Although sawflies were numerous on trees at these locations little defoliation resulted.

TABLE 5

Summary of European Spruce Sawfly Larval Counts from White Spruce Trees at Six Points in the North Bay District from 1962 to 1964

Location (township)	Av.D.B.H. of sample trees in inches	Total number of larvae per 15-tray sample		
		1962	1963	1964
Springer	6	31	17	7
Ratter	4	28	18	61
MacPherson	6	23	22	46
Widdifield	9	39	20	14
French	6	36	20	21
Papineau	10	20	14	9

A Noctuid, Enargia decolor Wlk.

In 1962 and 1963 light to moderate defoliation of poplar stands by this insect was common in the northern and central parts of the district. In 1964 a general decline in population levels occurred and defoliation was negligible. Average parasitism at five check points increased from 36 per cent in 1963 to 71 per cent in 1964, contributing substantially to the decline.

Fall Webworm, Hyphantria cunea Dru.

Populations of this caterpillar have remained at a relatively low level since 1958. No appreciable change occurred in 1964 (Table 6).

TABLE 6

Summary of Fall Webworm Larval Colony Counts per Mile of Roadside at Six Points in the North Bay District from 1962 to 1964

Location (township)	Total number of tents per mile of roadside		
	1962	1963	1964
Springer	3	0	0
Notman	7	2	2
Sisk	8	3	1
Strathy	2	0	1
Gillies Limit	0	0	1
Casimir	0	0	0

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Clumps of small, open-grown trembling aspen trees were heavily infested with these leaf miners at 14 widely-separated locations in the district. Only occasionally were infested leaves found on trees exceeding two inches D.B.H. Quantitative samples taken from 18-foot trees at four points showed an average of only .8 per cent of leaves mined.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

Although colony counts at sample locations showed little change in 1964, populations of this caterpillar increased appreciably through the southern part of the district. Roadside clumps of cherry were heavily defoliated at many points through the townships of Kirkpatrick, MacPherson, Caldwell, Loudon and East Ferris.

TABLE 7

Summary of Eastern Tent Caterpillar Colony Counts per Mile of Roadside at Five Points in the North Bay District from 1962 to 1964

Location (township)	Total number of tents per mile of roadside		
	1962	1963	1964
East Ferris	16	22	10
Widdifield	20	18	16
Dunnet	15	10	10
MacPherson	7	15	22
Springer	4	10	4

Forest Tent Caterpillar, Malacosoma disstria Hbn.

A significant increase in the extent and intensity of the forest tent caterpillar infestations occurred in the southwestern part of the district. In the West Arm - Lake Nipissing area moderate to severe defoliation was observed through most of the townships of Casimir, Kirkpatrick and MacPherson, and in parts of the townships of Caldwell, Haddo and Martland (Map 1). Colonies of the caterpillars were found frequently through the southern parts of Dunnet, Hugel and Badgerow townships but little defoliation resulted. Single colonies were observed at widely-separated locations through the central and eastern parts of the district.

Cocoon dissections were made at four locations to determine the degree of parasitism and disease within the infestation (Table 8).

TABLE 8

Summary of Forest Tent Caterpillar Cocoon Dissections at Four Points in the North Bay District in 1964

Note: Based on the examination of 100 cocoons at each point.

Location (township)	Per cent adults emerged	Per cent cocoons parasitized	Per cent cocoons diseased	Per cent unsuccess. emergence	Per cent predation
Martland	24	76	0	0	0
Caldwell	20	69	7	3	1
Kirkpatrick	41	55	0	3	1
MacPherson	71	27	0	2	0

In 1963 the Insect Pathology Research Institute initiated an experimental control project by introducing a virus disease into forest tent caterpillar populations in the area. This programme was continued in 1964 and although more work remains to be done, results to date have been satisfactory.

Egg band surveys made inside and on the fringe of the 1964 infestation formed the basis of defoliation forecasts for 1965 (Table 9). The reliability of these forecasts are subject to the influence of spring weather and may be influenced by temperature extremes which contribute to egg and larval mortality.

TABLE 9

Summary of Forest Tent Caterpillar Egg Band Counts and Defoliation Forecasts for 1965 in the North Bay District

Location (township)	Average number of egg bands per tree, 4-6 in. D.B.H.		Defoliation forecast for 1965
	1963	1964	
Loudon	19	165	Severe
Martland	9	35	Severe
Kirkpatrick	15	55	Severe
Caldwell	1	32	Severe
Falconer	1	23	Severe
Casimir	-	61	Severe
Badgerow	-	24	Severe
Beaucage	-	1	Light

Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

For the second consecutive year high populations of this sawfly were present on jack-pine reproduction in cut-over areas on the upper Sturgeon River watershed. Pockets of moderate and severe defoliation were observed at many points in the townships of Sheppard, Armagh and Afton (Map 2). Colonies of the sawfly occurred commonly in jack-pine stands of all age classes in the western part of the district and along shorelines and on islands in Rabbit, Anvil, Duncanson, Temagami and Nipissing lakes.

TABLE 10

Summary of Black-headed Jack-pine Sawfly Larval Colony Counts at Five Points in the North Bay District from 1963 to 1964

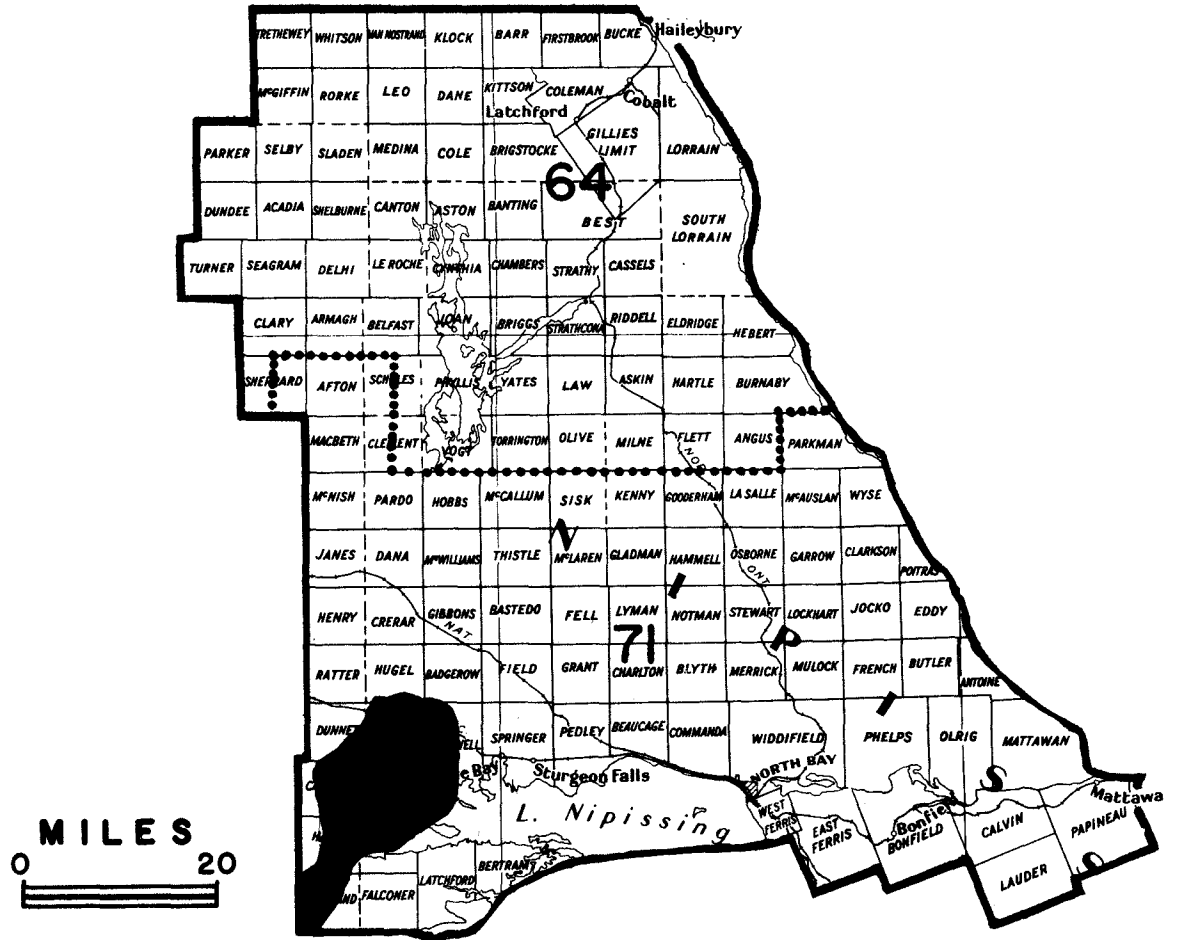
Note: Counts were based on the examination of 10 jack pine trees at each point.

Location (township)	Av. D.B.H. of sample trees in inches	No. of trees infested		Av. number of colonies per infested tree	
		1963	1964	1963	1964
Sheppard	2	10	10	4	4
Afton	2	5	10	3	3
Joan	3	-	4	-	2
Cynthia	2	10	10	3	3
Briggs	2	3	5	2	1

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

A light infestation of the red-headed pine sawfly persisted in a mixed pine plantation in Springer Township near Sturgeon Falls. A quantitative sample of 100 trees revealed 16 per cent were infested by an average of 1.3 colonies per infested tree. Scattered colonies were observed in a plantation in Widdifield Township and on red pine reproduction on two small islands in Lake Temagami.

NORTH BAY DISTRICT



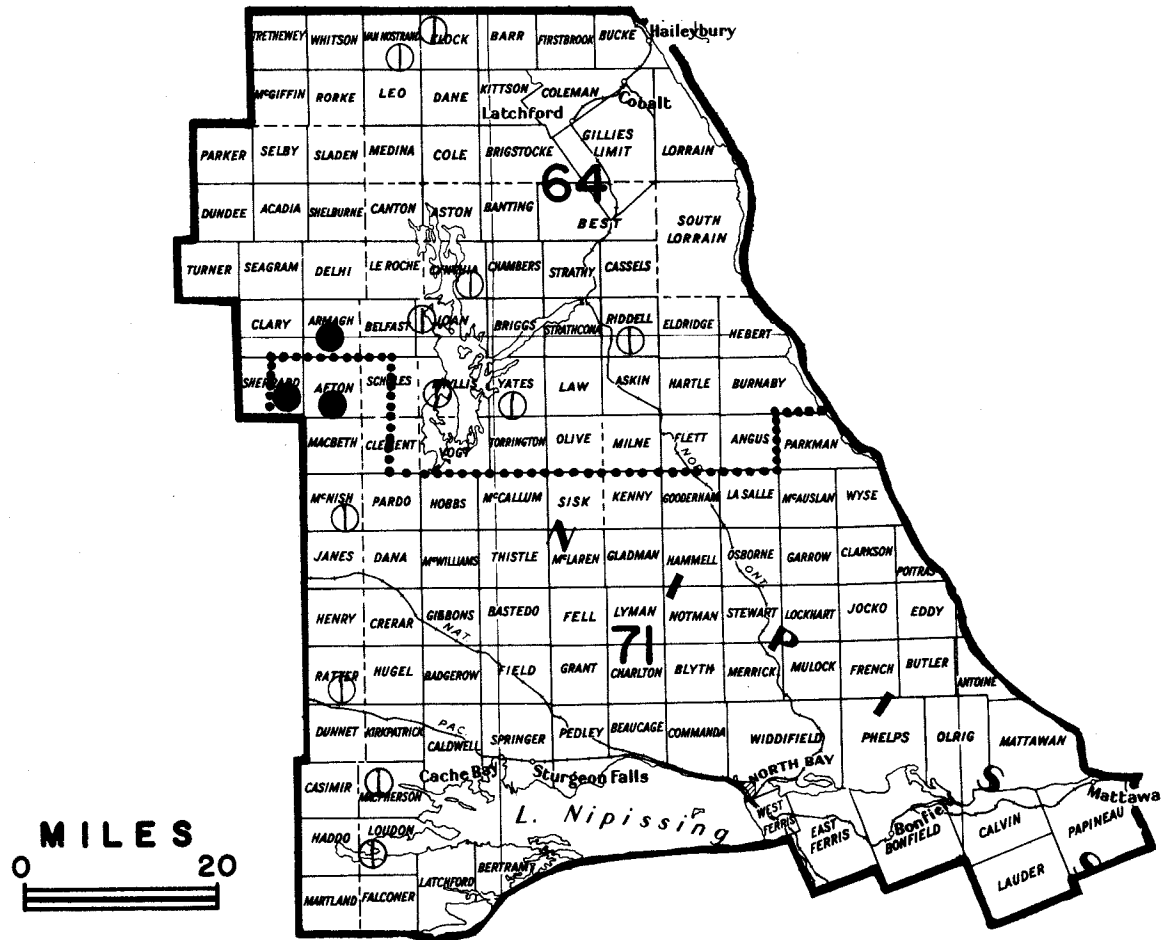
FOREST TENT CATERPILLAR

Area in which defoliation occurred in 1964

Legend

Moderate to severe defoliation.....●

NORTH BAY DISTRICT



BLACK-HEADED JACK PINE SAWFLY

Locations where pockets of infestation occurred in 1964

Legend

- Light infestation ⊙
- heavy infestation ●

Red-pine Sawfly, Neodiprion nanulus nanulus Schedl.

Populations of this sawfly continued at approximately the same level as in 1963. Colonies were found commonly through the western and central parts of the district but rarely in the eastern part. Small pockets of light infestation occurred in jack and red pine reproduction along the Sturgeon River north of River Valley.

TABLE 11

Summary of Red-pine Sawfly Larval Colony Counts at Seven Points in the North Bay District, 1963-1964

Note: Counts were based on the examination of 10 trees at each point.

Location (township)	Tree species	Number trees infested		Av. number of colonies per infested tree	
		1963	1964	1963	1964
Cynthia	rP	6	10	3	2
Calvin	"	7	2	5	1
Afton	jP	4	10	2	2
Joan	rP	5	6	2	2
Ratter	rP	-	5	-	2
Armagh	jP	4	3	3	3
McNish	"	6	6	7	3

Swaine Jack-pine Sawfly, Neodiprion swainei (Midd.)

Light infestations of the Swaine sawfly persisted on two small islands in Banks and Rabbit Lakes. Scattered colonies were observed in the West Arm of Lake Nipissing area, in MacPherson Township and on islands in Lake Temagami in Phyllis, Briggs and Strathcona townships.

White Pine Weevil, Pissodes strobi (Peck)

The white pine weevil continued to cause extensive damage to white pine reproduction in the district. Pockets of heavy infestation occurred in cut-over tracts in the upper Sturgeon River area and in the McLaren Township Management Unit. Jack pine, black and white spruce trees were also attacked in varying degrees at many locations. Open-grown white pine trees in the 4-to-7-inch diameter class were heavily weeviled in French and Bonfield townships.

TABLE 12

Summary of Leader Damage by the White Pine Weevil at Four Points in the North Bay District in 1964

Note: Counts were based on the examination of 100 trees at each point.

Location (township)	Tree species	Av. height in feet	Per cent of trees weeviled in 1964	Cumulative per cent of trees weeviled all years
French	jP	12	9	19
Widdifield	wP	12	10	22
Gibbons	scP	15	13	30
Afton	wP	15	18	39

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

High populations of the shoot-boring sawfly have occurred in alternate years since 1958. Feeding by the insect causes damage resembling that of frost to the developing buds of balsam-fir trees. In 1964 population levels were comparable to those of 1962. (Table 13)

TABLE 13

Summary of Balsam Shoot-boring Sawfly Larval Counts at Six Points
in the North Bay District from 1962 to 1964

Note: Counts were based on the examination of twenty 18"-branch tips,
four from each of five trees at each point.

Location (township)	Av. D.B.H. of sample trees in inches	Per cent of new shoots infested		
		1962	1963	1964
East Ferris	4	17	2	25
Calvin	4	13	3	15
French	5	29	0	13
Hugel	6	12	0	14
Sisk	4	27	2	16
Gillies Limit	4	5	1	12

Birch Leaf Miners, Profenusa thomsoni (Konow)
Heterarthrus nemoratus (Fall.)

Populations of these leaf miners have remained at a low level since 1962, due probably to unfavourable conditions created by drought and heavy infestations of the birch skeletonizer. In 1964 small clumps of white birch trees were lightly infested at several points on islands in the Northeast Arm of Lake Temagami.

Poplar Leaf Rollers, Pseudexentera oregonana Wlshn.
Epinotia nisella criddleana Kft.

For the third consecutive year high populations of these leaf rollers occurred in poplar stands in the district. The boundaries of infestation in 1964 were similar to those in 1963. Light defoliation was common through the central and southern parts of the district with pockets of heavy defoliation in Bonfield, Widdifield, East Ferris and West Ferris townships. Moderate defoliation occurred in the Field-Hagar-River Valley areas interspersed with pockets of heavy defoliation. In the remainder of the district infestations were generally light with isolated pockets of moderate and severe defoliation at several locations in the townships of Gillies Limit, Lorrain and South Lorrain.

Spruce Gall Midge, Rhabdophaga swainei Felt

Populations of this insect were lower at permanent sample locations in 1964 than in recent years (Table 14). The midge was found on black, blue and white spruce trees in the district.

TABLE 14

Summary of Bud Damage by the Spruce Gall Midge at Four Points in the North Bay District, 1962 to 1964

Note: Counts were based on the examination of 50 white spruce branch tips, five from each of ten trees at each point.

Location (township)	Per cent buds infested		
	1962	1963	1964
Caldwell	2.8	3.4	0.5
Bonfield	3.5	6.8	0.0
Gillies Limit	1.3	3.7	1.2
French	0.5	3.5	0.0

Bark Beetles

In 1964 the Forest Insect Survey initiated a program to obtain information on the distribution of various species of bark beetles attacking spruce in Ontario. Samples were collected from logs, pulp, slash and living trees which showed evidence of bark beetle activity. Collections were also taken from white, red and jack pine trees (Table 15).

TABLE 15

Summary of Bark Beetle Adults Collected in the North Bay District, 1964

Bark beetle		Location (township)
<u>Ips pini</u> Say	jP, wS	Briggs, Strathcona, Hugel, Van Nostrand, Clarkson, McNish.
<u>Pityogenes hopkinsi</u> Sw.	wP	Strathcona, Best, French
<u>Polygraphus rufipennis</u> Kby.	wS	MacPherson, Strathy
<u>Ips chagoni</u> Sw.	jP	Caldwell
<u>Pityokteines sparsus</u> Lec.	bF	Strathcona
<u>Dryocoetes autographus</u> Ratz.	wP	McLaren
<u>Orthotomicus latidens</u> Lec.	wS	Clement

TABLE 16

Summary of Miscellaneous Insects Collected in the North Bay District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Accleris variana</i> Fern.	bF	Occasional larvae in beating samples from balsam fir plot in Sisk Tp.
<i>Acrobasis betulella</i> Hlst.	wB	Present in small numbers in most white birch stands.
<i>Adelges strobilobius</i> Kalt.	bS	Heavily infested trees at many points. Pockets of heavy infestation in Gillies Limit, Strathcona, Sisk and McLaren tps.
<i>Agromyza ulmi</i> Frost	wE	Light mining of open-grown elm in Field Tp.
<i>Altica ulmi</i> Wood	wE	Found commonly on open-grown elm through the southern part of the district.
<i>Aphrophora parallela</i> Say	bS,wP	Very low populations for the third consecutive year.
<i>Archips cerasivoranus</i> Fitch	Cherry	Populations approximately the same as in 1963. Small pockets of infestation persisted in French and Widdifield tps.
<i>Argyresthia laricella</i> Kft.	tL	Quantitative samples in Bastedo, Bonfield and Widdifield tps. revealed infested shoot counts of 0.6, 0.4 and 0.8 per cent respectively.
<i>Argyrotaenia pinatubana</i> Kft.	wP	Found in small numbers in most white pine stands examined.
<i>Argyrotaenia quercifoliana</i> Fitch	rO	Light on rO reproduction in Pedley Tp.
<i>Caripeta divisata</i> Wlk.	bF	Recovered in beating samples from balsam fir plots.
<i>Cecidomyia reeksi</i> Vock.	jP	Found only at one point in Calvin Tp. in 1964.
<i>Chionaspis furfura</i> (Fitch)	Do	Common on dogwood at one point in Lorrain Tp.
<i>Choristoneura fumiferana</i> Clem.	wS	One larva from Kirkpatrick Tp.
<i>Choristoneura pinus</i> Freem.	jP	One larva from Gillies Limit Tp.
<i>Choristoneura rosaceana</i> Harr.	w,bPo	Found commonly throughout the district (6).
<i>Compsolechia niveopulvella</i> Chamb.	lA	Small numbers in Pedley and Scholes tps.
<i>Contarinia canadensis</i> Felt	bAs	One tree infested, Field Tp.
<i>Depressaria groteela</i> Rob.	Ha	Common on this host throughout district.
<i>Diacrisia virginica</i> Fabr.	yB	One colony from Byth Tp.
<i>Dioryctria abietivorella</i> Grt.	wS, wP	Infested cones in Strathy, LeRoche and Strathcona tps.
<i>Drepana bilineata</i> Pack.	wB	Found at only one point in Clary Tp.
<i>Epinotia solandriana</i> Linn.	wB,Al	Heavily infested trees in Gillies Limit and Sisk tps. Common through the eastern part of the district.
<i>Episimus argutanus</i> Clem.	Su	Light on this host in pine plantation in Bonfield Tp.

TABLE 16 (continued)

<i>Eriophyes betulae</i> Steb.	wB	One tree heavily infested in Gillies Limit Tp.
<i>Erynnis icelus</i> Scud. & Burg.	tA	Four larvae, Law Tp.
<i>Eupithecia filmata</i> Pears.	wS, bF	Few larvae in beating samples in plots from Sisk and French tps.
<i>Eupithecia transcandata</i> McK.	wS	Beating samples from Springer Tp.
<i>Exoteleia pinifoliella</i> Cham.	jP	Low numbers through district, lightly infested trees in a plantation in Widdifield Tp. where 3.2 infested needles per 18"-branch tip were recorded.
<i>Fenusa dohrnii</i> (Tischb.)	Al	Heavy mining of foliage along lake-shores at several points (2).
<i>Fenusa pusilla</i> (Lep.)	wB	Small trees heavily infested at numerous points in the district (4).
<i>Gonioctena americana</i> Schaeff.	tA	Pockets of light infestation through central and northern parts of the district (3).
<i>Gonioctena notmani</i> (Schaeff.)	W	Severely defoliated trees at several points in Strathy Tp.
<i>Hylurogpinus rufipes</i> Eich.	wE	Common through the southern part of the district.
<i>Lithocolletis aceriella</i> Clem.	sM	Light mining in Papineau and Blyth tps.
<i>Lithocolletis ostryarella</i> Cham.	I	Occasional leaves mined at one point in Phelps Tp.
<i>Malacosoma pluviale</i> (Dyar.)	rCh	One colony from Apton Tp.
<i>Meroptera pravella</i> Grt.	tA	Found in moderate numbers in most poplar stands in 1964.
<i>Monoctenus fulvus</i> (Nort.)	eC,rJ	Low on cedar at all points but numerous on juniper in Caldwell, Kirkpatrick and Loudon tps. (5).
<i>Nematus limbatus</i> Cress.	W	Colonies observed at several points (1).
<i>Nematus</i> sp. (Leaf-folding sawfly)	tA	Generally light on clumps of small open-grown trees.
<i>Nematus</i> sp. (Pouchmaker)	W	
	lA	Found in small numbers in central part of district.
<i>Neodiprion abboti</i> (Leach)	jP	One larva in beating samples in Aston Tp.
<i>Neodiprion abietis</i> complex	bF	Low numbers in beating samples from Strathcona, Strathy and French tps. (3).
<i>Neodiprion virginianus</i> complex	jP	Populations continued to decline in 1964. Scattered colonies observed at three locations in Gladman, Sisk and McLaren tps.
<i>Nepytia canosaria</i> Wlk.	eH,bF	Single larvae in beating samples from Poitras and Strathcona tps.
<i>Nyctobia limitaria</i> Wlk.	eH	Four larvae from Poitras Tp.
<i>Nymphalis antiopa</i> Linn.	tA,W	Small fringe trees severely defoliated at several points in 1964 (2)
<i>Pareophora minuta</i> MacG.	bAs	Upper crowns of black ash trees lightly defoliated at many locations (2).
<i>Petrova albicapitana</i> (Busck)	jP	Common in most jack pine stands examined.

TABLE 16 (continued)

Insect	Host(s)	Remarks
<i>Phratora purpurea purpurea</i> Brown	tA	Found commonly on aspen reproduction in the central and southern parts of the district.
<i>Pikonema alaskensis</i> (Roh.)	wS	Very low populations in 1964. Scattered larvae in beating samples(3).
<i>Pikonema dimmockii</i> Cress.	wS	Occasional larvae in beating samples.
<i>Pineus floccus</i> Patch	bS	Galls common at many points in the district.
<i>Pinus pinifoliae</i> Fitch	wP	Adults found on small trees at several locations.
<i>Pristiphora erichsonii</i> (Htg.)	lT	Little change in population levels in 1964. Scattered colonies of the sawfly found at many points.
<i>Pristiphora geniculata</i> (Htg.)	Mo	Widely distributed through district but only light defoliation observed at most points. Severe defoliation of some ornamentals in North Bay.
<i>Pseudexentera cressoniana</i> Clem.	rO	Light infestation by leaf rollers in Lorrain, Thistle and Pedley tps.
<i>Recurvaria piceaella</i> Kft.	wS,bF	Found in small numbers through the southeastern part of the district (3).
<i>Rhyacionia buskana</i> Hein.	jP	Collections from Bucke & Gillies
<i>Rhyacionia frustrana</i> Comst.		Limit tps. Small light infestation of <i>R. frustrana</i> in plantation in Springer Tp.
<i>Saperda calcarata</i> Say	tA	Adults observed at several locations.
<i>Schizura concinna</i> A. & S.	tA,W	Lightly defoliated fringetrees through central part of district (4).
<i>Tetralopa aplastella</i> Hlst.	tA	Nests common in most poplar stands but no severe defoliation observed (6).
<i>Tetralopa expandens</i> Wlk.	rO	In low numbers in Lorrain Tp. (2).
<i>Toumeyella numismaticum</i> P.McD.	jP	Small numbers of heavily infested trees in the townships of Askin, Barr, Loudon, Ratter, Coleman and Bucke.
<i>Zeiraphera fortunana</i> Kft.	wS	Open-grown trees lightly infested in East Ferris, Kirkpatrick and MacPherson tps.
<i>Zeiraphera ratzeburgiana</i> Ratz.		
<i>Zellaria haimbachi</i> Busck.	jP	Very low numbers in 1964 (3).

STATUS OF INSECTS IN THE PARRY SOUND DISTRICT

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Birch Leaf Skeletonizer	<u>Bucculatrix canadensisella</u> Cham. .	C 17
Larch Casebearer	<u>Coleophora laricella</u> Hbn.	C 17
European Spruce Sawfly	<u>Diprion hercyniae</u> (Htg.)	C 17
Basswood Looper	<u>Erannis tiliaria</u> (Harr.)	C 18
White-pine Shoot Borer	<u>Pycnosma gloriola</u> Heinr.	C 18
Jack-pine Needle Miner	<u>Exoteleia pinifoliella</u> Chamb.	C 18
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Fall Webworm	<u>Hyphantria cunea</u> (Drury)	C 19
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Forest Tent Caterpillar	<u>Malacosoma disstria</u> Hbn.	C 20
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Red-pine Sawfly	<u>Neodiprion nanulus nanulus</u> Schedl.	C 23
Black-headed Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> Roh..	C 23
Red-headed Jack-pine Sawfly	<u>Neodiprion virginianus</u> complex ...	C 23
White-pine Needle Miner	<u>Oenoseroma strobivorum</u> Free	C 24
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Balsam Bud-mining Sawfly	<u>Pleroneura borealis</u> Felt	C 24
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C. A. Barnes

Birch Leaf Skeletonizer, Bucculatrix canadensisella Cham.

After three consecutive years of heavy infestation, population levels of this insect declined sharply in most of the district. A pocket of medium infestation persisted west of South River in Machar Township and scattered clumps of white birch regeneration were lightly infested in the northeast corner of the district.

Larch Casebearer, Coleophora laricella Hbn.

Minor fluctuations in population levels occurred in 1964 compared with 1963 (Table 4). Light infestations were common in all larch stands examined, however, defoliation did not exceed 10 per cent at any location. As in the past three years the introduced parasite Agathis pumila (Ratz.) was common in overwintering larvae submitted for dissection from Ridout and Strong townships and small numbers of another introduced parasite Chrysocharis (Epilampsis) laricinella (Ratz.) was recorded.

TABLE 4

Summary of Larval Counts of the Larch Casebearer at Eight Points in the Parry Sound District, 1963-1964

Location (township)	Tree species	Av. no. of larvae per 18" branch tip	
		1963	1964
Wallbridge	tL	0.3	1.2
Chapman	tL	1.8	0.4
Perry	tL	1.0	0.4
McLean	tL	1.3	0.6
Gurd	tL	0.5	0.3
Chisholm	tL	1.3	1.5
Ridout	eL	2.2	6.7
Stephenson	tL	1.4	0.7

European Spruce Sawfly, Diprion hercyniae (Htg.)

Increases in larval counts occurred at all sample points in 1964 compared with 1963. The most significant increase in numbers occurred at a sample point in Joly Township, where 38 larvae were collected in 1964 compared with 7 larvae in 1963 (Table 5). In recent years the introduced parasite Drino bohemica Mesn. has occurred commonly in collections but few of these parasites were recovered in 1964.

TABLE 5

Summary of European Spruce Sawfly Larval Counts Taken on White Spruce Trees at Ten Locations in the Parry Sound District, 1960-1964

Location (township)	1960	Total no. of larvae per 15-tray sample				1964
		1961	1962	1963		
Ryerson	33	9	12	11	24	
Chapman	5	13	6	2	6	
Gurd	-	19	25	6	11	
McMurrich	8	7	15	8	5	
Monteith	8	8	21	18	26	
Perry	31	26	69	5	17	
Croft	13	5	13	9	14	
Joly	-	35	10	7	38	
McLean	-	13	14	8	10	
Machar	-	14	10	0	6	

Basswood Looper, Erannis tilliaria (Harr.)

Except in a few acres of sugar maple near Grindstone Lake in Ridout Township, where a medium infestation has persisted for the past two years, population levels of this insect were much lower than in 1963. Defoliation of sugar maple in this area approximated 25 per cent.

Scattered pockets of light infestation were common on elm and sugar maple near Dorset in Ridout Township, on elm and basswood near Orrville in Christie Township, and on sugar maple and basswood near Port Carling in Medora Township. In the last two areas forest tent caterpillars were also observed in large numbers. Defoliation by the basswood looper did not exceed 10 per cent at any of these scattered locations.

White-pine Shoot Borer, Eucosma gloriola Heinr.

Population levels declined in 1964 compared with 1963 (Table 6). The medium infestations reported in Armour, McLean and McMurrich townships in 1963 declined to light intensity. The number of trees infested at all sample points did not exceed eleven per cent.

TABLE 6

Summary of Shoot Damage Caused by the White-pine Shoot Borer at Eight Locations in the Parry Sound District from 1962 to 1964

Note: One hundred trees were examined at each location.

Location (township)	Host species	Av. height of trees in feet in 1964	Per cent of trees infested			Per cent of trees with leaders infested in 1964
			1962	1963	1964	
McLean	rP	8	16	23	9	2
McLean	jP	15	11	7	5	1
Stisted	rP	16	7	6	6	1
McAulay	rP	13	31	16	11	0
McAulay	jP	19	11	11	6	0
McMurrich	rP	8	28	24	15	1
McMurrich	jP	18	8	5	3	1
Armour	scP	11	37	21	15	5

Jack-pine Needle Miner, Exoteleia pinifoliella (Chamb.)

Medium infestations of this miner were observed in clumps of jack-pine near Parry Sound in McDougall Township, near Huntsville in Chaffey Township and on scattered trees near Bracebridge in McAulay Township. Light infestations were common in Harrison, Humphry, Christie and Patterson townships. Less than 25 per cent of the old needles were mined.

The Pales Weevil, Hylobius pales (Hbst.)
 The Northern Pine Weevil, Pissodes approximatus Hopk.

These two pine weevils were found in large numbers in two Scots pine plantations where suitable brood material in the form of stumps and slash was available. In past years the pales weevil alone has not been a serious pest in pine plantations in the district. However, in 1964, heavy infestations developed in plantations in Armour and Morrison townships where partial cropping of Christmas trees has been carried out over the past three years. The remaining trees in the plantations showed a severe reddening of the lower branches, causing a decline in the merchantable value of the trees. The northern pine weevil was observed commonly in both plantations feeding in stumps and slash. The pine engraver beetle, Ips pini Say, was also observed, particularly in trees that had been cut, but not marketed.

Fall Webworm, Hyphantria cunea (Drury)

In 1959 this web-spinning caterpillar was found commonly in the district. Since that time populations have declined steadily, and only occasional nests have been observed in the past four years (Table 7.)

TABLE 7

Larval Colony Counts of the Fall Webworm Taken at Seven Locations in the Parry Sound District, 1960-1964

Location (township)	No. of webs per mile of roadside					
	1959	1960	1961	1962	1963	1964
Medora	16	6	2	6	3	2
McAulay	5	1	2	1	0	0
Perry	2	0	3	2	2	0
South Himsworth	7	6	2	1	2	0
Franklin	8	4	5	3	1	1
Chapman	18	7	3	2	1	0
Armour	5	0	0	0	0	0

Eastern Tent Caterpillar, Malacosoma americanum F.

A decline in population levels of this insect occurred in the district as a whole in 1964. Although marked declines were recorded in sample points in McAulay, Brunel, Wood, McDougall and Stephenson townships (Table 8), high numbers of tents were common along roadsides and in old fields in the south-central part of the district. As in the past five years only occasional tents were observed in the northern part of the district.

TABLE 8

Summary of Eastern Tent Caterpillar Colony Counts taken at Eleven Locations in the Parry Sound District 1959-1964

Note: Counts were based on the number of initial tents found in square chain plots or along a measured mile of roadside

Location (township)	Sampling area	No. of primary tents					
		1959	1960	1961	1962	1963	1964
Franklin	square chain plot	2	7	13	18	11	8
Stephenson	" " "	1	3	17	11	14	11
McAulay	" " "	27	36	47	32	23	3
Chisholm	" " "	0	0	1	3	3	1
Boulter	" " "	0	0	2	0	3	2
McLean	mile of roadside	22	79	91	63	42	28
Brunel	" " "	17	28	31	18	14	7
Stephenson	" " "	16	21	22	27	21	14
Wood	" " "	-	31	53	62	40	29
McDougall	" " "	-	18	44	51	31	17
MacKenzie	" " "	17	16	29	24	11	8

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Population levels of the forest tent caterpillar increased in 1964, particularly in the southwestern part of the district. The most notable increases occurred on red oak and sugar maple near Port Carling in Medora Township, on trembling aspen, white elm and sugar maple south of MacTeir in Freeman and Gibson townships, and on trembling aspen just north of Milford Bay in Monck Township. Defoliation throughout these areas approximated 60 per cent. No appreciable change occurred in the heavy infestations that have persisted for the past three years on sugar maple and red oak trees near Port Sandfield and Walkers Point in Medora and Wood townships.

Elsewhere in the district light infestations were observed near the French River in Mowat and Henvy townships, and in a small pocket of trembling aspen near Bracebridge in McAulay Township. It is interesting to note that the heavy infestation that has persisted for the past three years in Bigwood Township, Sudbury District, has still not spread south into Parry Sound District.

In 1964 considerable mortality occurred in larvae in the Walkers Point and Orrville areas. This condition was attributed to an Entomothera fungus which was quite widespread in both of these infestations.

Mass collections of cocoons were dissected to determine the percentage of parasitism, predation, disease and moth emergence (Table 9).

TABLE 9

Summary of dissections of the Forest Tent Caterpillar From Two Locations in the Parry Sound District, 1964

Note: 100 cocoons were dissected from each location

Location (township)	Parasitism	Predation	Disease	Successful emergence	Unsuccessful emergence
Medora	39	7	9	38	7
Wood	41	6	10	36	7

Egg band surveys carried out in the fall of 1964 are summarized in Table 10. From the results of this survey, populations are expected to be approximately the same as in 1964.

TABLE 10

Summary of Egg Band Counts of the Forest Tent Caterpillar at Thirteen Locations in the Parry Sound District, 1962-1964

Location (township)	Av.D.B.H. of sample trees in inches	No. of trees sampled			Total no. of egg bands			Forecast
		62	63	64	62	63	64	1965
Mowat	5	0	3	3	0	0	0	nil
Mowat	6	3	3	3	0	1	1	light
Mowat	6	3	3	3	0	0	0	nil
Foley	6	0	1	3	0	12	2	light
Foley	5	0	3	3	0	1	0	nil
Medora	4	3	3	1	12	7	56	severe
Patterson	5	3	3	3	0	0	0	nil
Carling	6	3	3	3	0	0	0	nil
Machar	6	3	3	3	0	0	0	nil
Henry	5	3	3	3	0	0	0	nil
Wood	5	1	2	1	11	21	16	severe
Watt	6	-	-	1	-	-	20	severe
Monck	6	-	-	3	-	-	4	moderate

After the peak year of 1962, a decline has occurred for the past two years in the numbers of two species of Malacosoma adults captured in a light trap operated near Dorset for the past four years, the results of which can be found in Table 11.

TABLE 11

Summary of Two Species of Malacosoma Recovered from Light Trap in the Parry Sound District for the Years 1961-1964

Location (township)	Insect	Total no. of female and male moths.			
		1961	1962	1963	1964
Ridout	<u>M. disstria</u>	13	71	56	31
Ridout	<u>M. americanum</u>	34	77	45	38

Cedar Sawfly, Monoctenus fulvus (Nort.)

A significant increase in population levels occurred in two of four sample points in 1964 compared with 1963 (Table 12).

TABLE 12

Summary of Cedar Sawfly Counts at Four Locations in the Parry Sound District 1960-1964

Location (township)	Av. D.B.H. of sample trees in inches	Total no. of larvae per 15 tray samples				
		1960	1961	1962	1963	1964
Machar	5	100	2	10	0	28
Humphry	6	41	28	1	17	11
McKonkey	6	18	14	13	5	4
Shawanaga	4	68	47	31	29	54

Red-headed Red Pine Sawfly, Neodiprion lecontei (Fitch)

Heavy infestations of this insect occurred in plantations in Livingstone, McClintock, Sherborne, McAulay, Machar and Medora townships. Defoliation approximated 60 per cent at these locations. Control measures were recommended and most infested plantations were treated with insecticides with good results. Medium infestations occurred for the first time on 20-foot red pine trees in the Department of Lands and Forests plantations in Ballantyne Township, particularly on open-growing and roadside trees.

Jack and Scots pine windbreaks were moderately infested in Ridout, Mills and Wilson townships. Occasional colonies of larvae were observed on clumps of jack pine and red-pine regeneration at several locations.

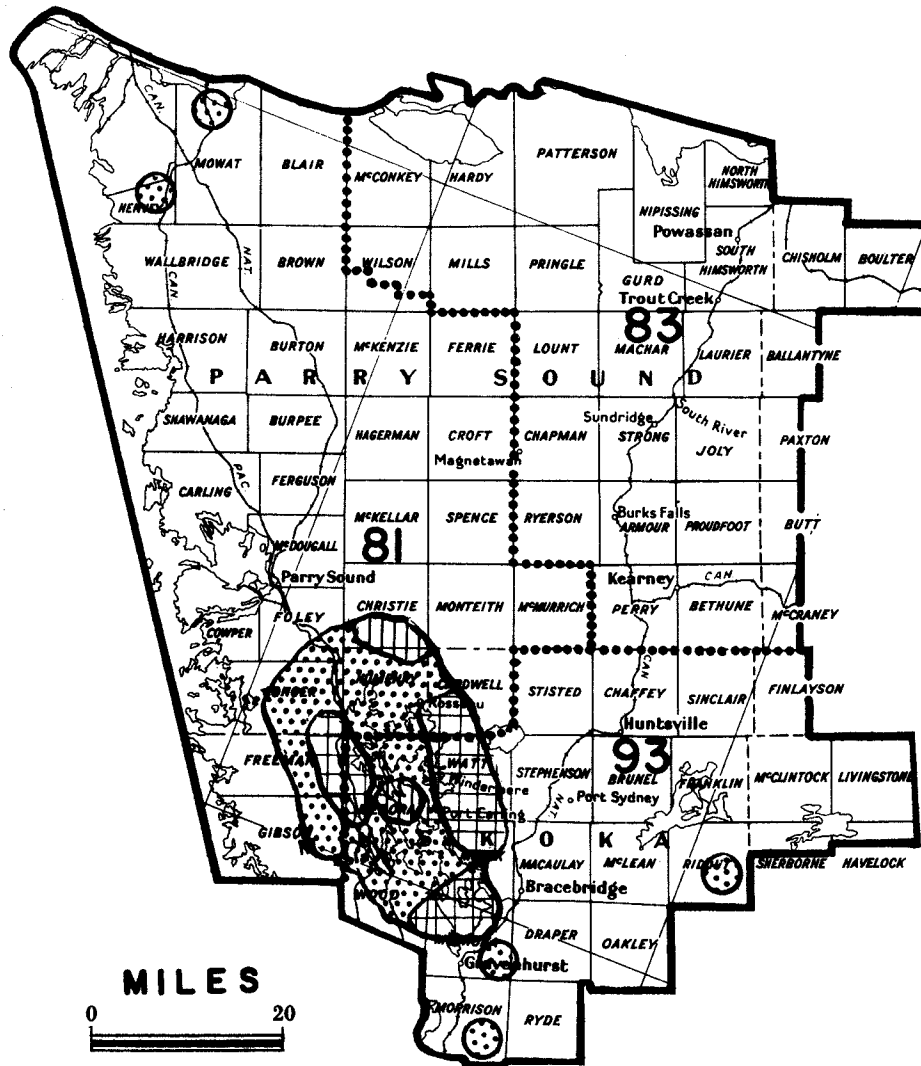
Colony counts based on the examination of 100 trees at each location are summarized in Table 13.

TABLE 13

Summary of Red-headed Pine Sawfly Colony Counts Made at Four Points in the Parry Sound District, 1963-1964

Location (township)	Av. height of sample trees in feet	No. of trees infested	Av. no. of colonies per infested tree	
			1963	1964
Henry	7	10	1.3	1.2
Livingstone	3	61	1.2	1.2
Franklin	6	17	-	1.3




PARRY SOUND DISTRICT



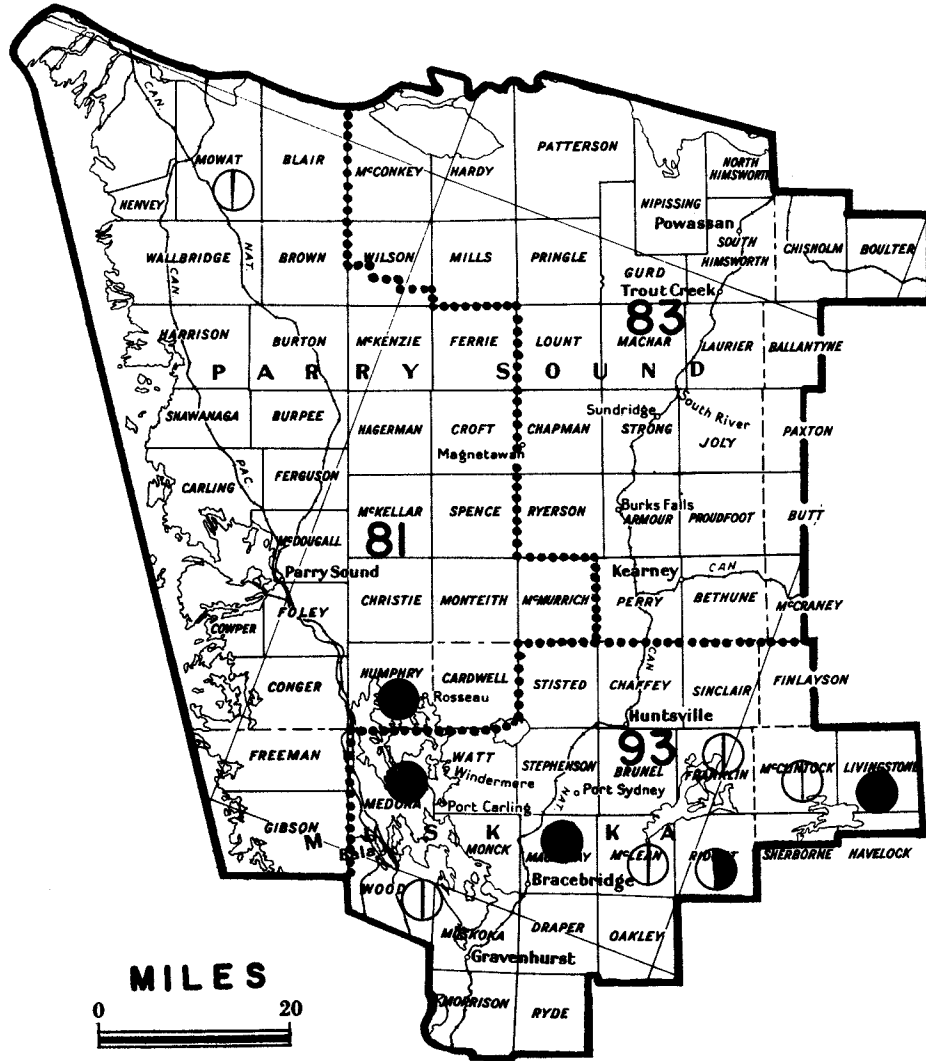
FOREST TENT CATERPILLAR

Areas in which defoliation occurred in 1964

Legend

- Light defoliation..... 
- Moderate defoliation..... 
- Severe defoliation..... 

PARRY SOUND DISTRICT



RED-HEADED RED PINE SAWFLY

Locations where infestations were observed in 1964

Legend

- Light infestation..... ○
- Medium infestation..... ◐
- Heavy infestation..... ●

Red-pine Sawfly, Neodiprion nanulus nanulus Schedl.

Since 1959 this sawfly has remained at a relatively low level. In 1964 minor increases in population levels occurred at three of four sample points (Table 14). However, defoliation in most cases did not exceed 10 per cent. No colonies have been found on jack pine, for the past five years.

TABLE 14

Summary of Red-pine Sawfly Colony Counts Taken at Four Locations in the Parry Sound District in 1963 and 1964

Location (township)	Av. D.B.H. of sample trees in inches	Av. no. of colonies per tree	
		1963	1964
McDougall	5	0.7	1.1
Franklin	5	0.3	0.7
South Himsworth	6	1.1	2.0
Perry	6	0.7	0.5

Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae Roh

No appreciable change in population levels occurred at six of eight sample points compared with 1963 (Table 15). At the sample point in Humphry Township all but two of the jack-pine trees have been removed. These trees supported several colonies in 1964 compared with more than 100 colonies in 1963. In Monck Township an average of 2.1 colonies were counted in 1964 compared with 9.7 in 1963. Defoliation did not exceed 20 per cent of old foliage at any location.

TABLE 15

Summary of Black-headed Jack-pine Sawfly Colony Counts Taken at Eight Points in the Parry Sound District in 1963-1964

Location (township)	Av. D.B.H. of sample trees in inches	Av. no. of colonies per tree	
		1963	1964
Draper	5	1.9	2.1
Ryerson	5	1.1	1.6
McDougall	4	0.7	0.5
Humphry	4	100+	7.0*
Monteith	5	1.8	1.6
Monck	3	9.7	2.1
McLean	5	0.0	0.1
Medora	5	0.4	0.3

* 1964 colony counts based on the examination of the two remaining trees

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

No appreciable change in population levels of this insect occurred in 1964 compared with 1963 (Table 16). Since 1959 only small numbers of colonies have been observed in the district.

TABLE 16

Summary of Red-headed Jack-pine Sawfly Colony Counts Taken at Five Locations in the Parry Sound District in 1963 and 1964

Location (township)	Av. D.B.H. of sample trees in inches	Av. no. of colonies per tree	
		1963	1964
Mowat	4	0.0	0.7
Pickernel River	4	0.2	0.0
Henry	5	1.1	1.7
Shawanaga	3	0.7	0.4
Burton	5	0.0	0.1

White-pine Needle Miner, Ocnerostoma strobivorum Free

For the third consecutive year white pine needles were lightly infested by this insect along the north shoreline of the Muskoka River in Monck Township. Small clumps of white pine were lightly infested near Bracebridge in McAulay Township and near Parry Sound in McDougall Township. Studies are continuing to determine what difference, if any, exists between Ocnerostoma strobivorum Free. on white pine and Ocnerostoma sp. on red pine.

White-pine Weevil, Pissodes strobi Peck

Minor increases in population levels of this insect occurred in 1964. Although populations generally were relatively low, a medium infestation persisted in a Scots pine plantation in Armour Township, where about 8 per cent of the trees were infested. Light infestations were noted in a Scots pine plantation in Stisted Township and on white-pine reproduction in Chaffey Township. Counts based on the examination of 100 trees at five locations are summarized in Table 17.

TABLE 17

Summary of Damage by the White-pine Weevil at Five Points in the Parry Sound District in 1963 and 1964

Note: 100 trees were examined at each location

Location (township)	Tree species	Per cent trees infested		Per cent cumulative damage all years	
		1963	1964	1963	1964
McLean	rP	0	0	18	18
McLean	jP	0	3	38	41
McAulay	jP	0	1	54	55
McMurrich	jP	0	2	39	41
Armour	scP	7	8	33	41

Balsam Bud-mining Sawfly, Pleroneura borealis Felt.

A general increase in population levels of this insect occurred in 1964 compared with 1963. In past years, infestations have been recorded in alternate years. Counts based on the examination of six 18-inch branch tips from each of four trees are summarized in Table 18.

Summary of Balsam Bud-mining Sawfly Larval Counts in the Parry Sound District 1956-1964

Location (township)	Av. height of sample trees in feet	No. of new buds examined in 1964	Per cent of buds infested		
			1962	1963	1964
McLean	24	379	10.8	1.4	17.0
Chaffey	35	402	15.9	0.6	7.9
MacKenzie	30	383	6.9	1.1	8.1
Ferguson	25	311	10.8	2.9	7.1
Joly	22	291	7.3	1.6	5.8
Franklin	45	197	6.1	0.04	13.7
Laurier	35	327	21.0	3.0	11.3
Wilson	35	401	15.6	0.0	16.0

Larch Sawfly, Pristiphora erichsonii (Htg.)

Population levels of this sawfly have declined since 1962. However, a medium infestation was observed in a 20-acre stand of larch near Byng Inlet in Henry Township. Defoliation approximated 35 per cent at this location. A light infestation persisted in a pocket of larch near the Algonquin Park boundary in Ballantyne Township. Elsewhere in the district only scattered colonies were observed.

A Poplar Leaf Roller, Pseudexentera oregonana Wlshw.

In the past four years this leaf-rolling insect on trembling aspen has been tentatively identified as Epinotia nisella criddleana Kft. In 1964 mass collections of larvae were submitted to the Forest Insect Lab. at Sault Ste Marie for rearing. Adults obtained from this rearing program were identified largely as P. oregonana Wlshw.

For the fourth consecutive year heavy infestations were common in poplar stands throughout the district. Severe defoliation of trembling aspen occurred at many points. Defoliation of poplar stands ranged from a low of 30 per cent to a high of 100 per cent.

Pine Tortoise Scale, Toumeyella numismaticum P. McD.

In the fall of 1964 heavy infestations of this scale insect on Scots pine were observed in two plantations near Huntsville in Stisted Township. A survey in these plantations revealed that over 5000 trees were infested. Control measures were recommended and a spray containing a solution of 50 per cent Malathion emulsifiable concentrate mixed at the rate of two pints to 100 gallons of water was applied three times at 10-day intervals. A further examination will be made in the spring of 1965 to determine the effectiveness of the control measures.

TABLE 19

Miscellaneous Insects Collected in the Parry Sound District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	wS	(3) Small numbers of this insect at all collection points.
<i>Adelges abietis</i> Linn.	wS	(3) This needle gall common on white spruce at three locations.
<i>Adelges strobilobius</i> Kalt.	rS, bS	(2) Common on red spruce at Swan Lake research station.
<i>Anomogyna elimata</i> Gn.	rS, wS	(4) Small numbers of these loopers at each location.
Aphidae	rS, bF, jP	(6) Aphidae found on numerous host species throughout the district.
<i>Aphrophora parallela</i> Say	jP, wP	(2) Observed commonly in Shawanaga, Sherbourne and Ridout tps.
<i>Archips cerasivoranus</i> Fitch	cCh	(5) Observed only occasional nests of this insect in the district. At a low level.
<i>Arge</i> sp.	Al	(2) Fewer colonies observed near Katrine in 1964, compared with the past three years.
<i>Argyresthia laricella</i> Kft.	tL	(2) Small numbers observed at each sample point.
<i>Caripeta divisata</i> Wlk.	bF, wS, eH	(6) This looper found commonly in beating samples throughout the district.
Cercopidae	scP	(3) Heavy spittle bug infestations in scots pine plantations in Armour and Stisted tps.
<i>Cinara nepticula</i> Hottes.	rS	(2) Heavy infestations of this aphid on red spruce at the Swan Lake research station.
<i>Conopthorous resinosae</i> Hopk.	rP	Red pine cones heavily infested by this beetle near Nipissing Village.
<i>Corthylus punctatissimus</i> (Zimm.)	sM	(3) Light infestations common in Franklin and Ryerson tps.
<i>Corythucha elegans</i> Drake	wB	These insects caused moderate defoliation of white birch reproduction near Livingstone Lake.
<i>Dasyneura balsamicola</i> Lintn.	bF	(9) This needle gall common throughout the district.
<i>Elatobium abietinum</i> (Walk.)	rS	Green spruce aphid collected in small numbers at the Swan Lake research station.
<i>Energia decolor</i> Wlk.	tA	Light infestation observed near the French River.

TABLE 19 (continued)

Insect	Host(s)	Remarks
<i>Eriophyes</i> sp.	Be	(6) Mite damage heavy on occasional beech trees in Shawanaga and Peck tps.
<i>Epinotia solandriana</i> Linn.	wB	This leaf roller common on several white birch trees near South River.
<i>Fenusa dornhii</i> (Tischb.)	Al	(3) Heavy infestation of this leaf miner observed near Scotia.
<i>Fenusa pusilla</i> Lep.	wB	(7) Severe mining of white birch leaves at several locations in Machar and Chapman tps.
<i>Feralia jocosu</i> Gn.	eH, bF	(3) Small numbers of larvae at each location.
<i>Gonioctena americana</i> (Schaeff.)	tA	(2) Moderate infestations of the poplar leaf beetle in Chaffey and Stephenson tps.
<i>Gracillaria syringella</i> F.	lilac	(2) Severe mining of lilac leaves near Parry Sound.
<i>Hydriomena divisaria</i> Wlk.	wS	(6) These loopers collected in small numbers at all locations.
<i>Hylobius radialis</i> Buch.	scP	No adults collected in 1964 from infestation that has persisted in scots pine hedgerow near Bracebridge.
<i>Hylurgopinus rufipes</i> Eich.	wE	Observed commonly on dead elm that has been infected by the dutch elm disease.
<i>Ips pini</i> Say	scP, wS	(2) Found commonly under bark of cut trees in Ryerson and Chaffey tps.
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> Gn.	eH, bF	(5) Few larvae collected in 1964 from permanent sample plots.
<i>Lithocolletis astryarella</i> Cham.	I	(4) This leaf miner on ironwood found commonly at several locations.
<i>Lithocolletis salicifoliella</i> Chamb.	tA	(2) This leaf miner on aspen collected in small numbers in the district.
<i>Mindarus abietinus</i> Koch.	bF	(2) This powdery aphid common on balsam fir trees near Muskoka falls in Draper Township.
<i>Nematus</i> sp.	tA	(4) Light infestations common through the district.
<i>Nepytia canosaria</i> Wlk.	eH	(3) Collected on beating mat at three locations.
<i>Paratetranychus ununguis</i> (Jac.)	wS	Spider mites common on occasional spruce near Huntsville.
<i>Parorgyia plagiata</i> Wlk.	rP	Small numbers.
<i>Phenacaspis pinifoliae</i> Fitch	scP	(3) Heavy infestations of this insect at several points in McDougall and Armour tps.
<i>Phyllocoptes aceris-crumena</i> Rly.	rM	Common on red maple trees through the district.
<i>Pikonema alaskensis</i> Roh.	wS, bS	(4) Light infestations on small white and black spruce in Chaffey and Sinclair tps.
<i>Pineus floccus</i> Patch	bS, rS	Needle galls common on occasional trees in Peck and Sinclair tps.

TABLE 19 (continued)

Insect	Host(s)	Remarks
<i>Pristiphora geniculata</i> Htg.	Mo	(5) Light infestations common in South Homsworth, Patterson, Perry and McClintock. Occasional colonies observed at several other locations.
<i>Profenusa thomsonii</i> (Konow)	wB	(4) Moderate mining of white-birch leaves near Rosseau, Baysville, Port Carmen and Bigwood.
<i>Recurvaria piceaella</i> Kft.	wS	(2) Small numbers at each location.
<i>Rhabdophaga swainei</i> Felt	wS	(4) Small numbers at each location.
<i>Rubsaamenia</i> sp.	rP	Common in red pine cones near Nipissing Village.
<i>Schizura concinna</i> A. & S.	W	Occasional colonies of this caterpillar near Magnetawan.
<i>Sparganothis sulfureana</i> Clem.	rP	Found in small numbers only.
Tenthredinidae # 11	tA	Numerous colonies of this sawfly observed near Walkers Point.
<i>Vasates quadripes</i> Shim	rM	(2) Heavy infestations of this gall insect observed at several locations in Shawanaga and McClintock tps.
<i>Zeiraphera fortunana</i> Kft.	wS	(2) Found in small numbers.
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	(5) New buds of white spruce heavily infested near Melissa and the French River.

CENTRAL FOREST REGION

1964

INTRODUCTION

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Larch Sawfly	<u>Pristiphora erichsonii</u> (Htg.) D 3
Mountain-ash Sawfly	<u>Pristiphora geniculata</u> (Htg.) D 4

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Spruce Needle Rusts	<u>Chrysomyxa</u> spp. D 5
Ink Spot of Poplar	<u>Giborinia whetzellii</u> (Seav.) Seav.. D 5
A Needle Rust on Pine	<u>Coleosporium asterum</u> (Diet.) Syd.. D 6
Sweetfern Blister Rust	<u>Cronartium comptoniae</u> Arth. D 6
White Pine Blister Rust	<u>Cronartium ribicola</u> J. C. Fischer D 7
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INTRODUCTION

Central Region

The following report is a summary of information on the status of forest insects and tree diseases in the Central Forest Region. This information was derived from ground and aerial surveys, quantitative and general sampling by research technicians during the field season extending from May to early October. Sections of the report dealing with tree diseases, and insect problems common to all districts are presented on a regional basis, and data on other insects are contained in the district sections.

The 1964 season was unusually cool with above average moisture in the northern part of the region, whereas drought conditions prevailed in the southern part until August. Severe frosts occurred in May and early June which seriously damaged new shoots of balsam fir and white spruce trees, and the foliage of deciduous species.

Infestations of the forest tent caterpillar persisted in the Sudbury District, a new outbreak occurred in the Sault Ste. Marie District, and population increases were recorded in both Chapleau and Gogama districts. Outbreaks of the birch skeletonizer subsided in Sault Ste. Marie, Sudbury and White River districts whereas sharp increases occurred in the Chapleau and Gogama districts. Infestations of the European pine shoot moth persisted on Manitoulin, Cockburn, and St. Joseph's islands. Damage by the white pine weevil was again evident in most young pine stands.

The forest pathology program in 1964 was devoted to the maintenance of general surveys, as well as the establishment of several sample plots to assess the incidence of changes in the status of important tree diseases.

Numerous stands, plantations and ornamental trees were examined by technicians at the request of forest industries or private owners. Information on insect identification and suitable control methods were supplied through the Forest Insect Laboratory when required. Short courses of instruction on forest insects and tree diseases were presented by technicians to some 650 junior forest rangers at the request of the Department of Lands and Forests. Technicians again participated as instructors at Conservation Schools for Grade 8 students held at Espanola and Massey.

The co-operation and assistance provided by personnel of forest industries and the Department of Lands and Forests is gratefully acknowledged.

H. G. McPhee

White Pine Weevil, Pissodes strobi (Peck)

This destructive insect persisted as a major pest of white pine, jack pine and Scots pine (see Information Report, Forest Insect and Disease Surveys 1962 and 1963). A heavy infestation on red pine, a less common host, occurred in a 500-acre tract in Township 4D, Sault Ste Marie District, and red pine stands were infested in 8D and Panet townships of the Chapleau District. Infestations were also observed on young white spruce and black spruce trees in localized areas.

The results of surveys conducted in representative stands to assess the intensity of attack are summarized in Table 1.

TABLE 1

Summary of Damage by the White Pine Weevil in the Central Region in 1964

District	Host Species	No. of sample areas.	Av. no. of trees examined per sample	Range in percentage of trees infested.	General index in per cent
Sault Ste Marie	rP	1	5000	27	27
	JP	5	100	3 - 8	6
	scP	2	200	21 - 32	26
	wP	5	200	1 - 11	4
Gogama	JP	10	100	1 - 26	6
	scP	1	100	2	2
	bS	2	100	2 - 9	5
Chapleau	JP	9	100	3 - 14	7
	wP	1	100	2	2
	rP	2	100	2 - 7	4
Sudbury	JP	5	100	0 - 7	2
	scP	1	100	10	10
White River	JP	1	500	3	3
	bS	1	500	14	14
	wS	2	350	13 - 22	17

Larch Sawfly, Pristiphora erichsonii (Htg.)

No major change was noted in the status of this insect compared with 1963. Infestations generally declined to light intensity in most larch stands in the region. Two exceptions were in the Spanish River Reserve, Sudbury District, where a medium infestation persisted in a 40-acre larch stand and in Gogama District where severe defoliation occurred in about 15 pockets of regeneration in five townships. In the remainder of the region more than 35 scattered pockets of light infestation persisted. Moderate-to-severe defoliation was confined to occasional clumps of open-grown regeneration along roadsides or bordering stands.

Sequential sampling showed negative results except in White River District where 2 per cent of the shoots were curled by oviposition at a sample point in Township 73. Dissection of overwintering cocoons to determine parasitism was discontinued due to the decline in population levels and lack of material for examination.

Mountain Ash Sawfly, Pristiphora geniculata (Htg.)

Population levels of this sawfly showed little change in the Central Region in 1964, except in the southern half of the Chapleau District where marked increases in infestation intensity occurred.

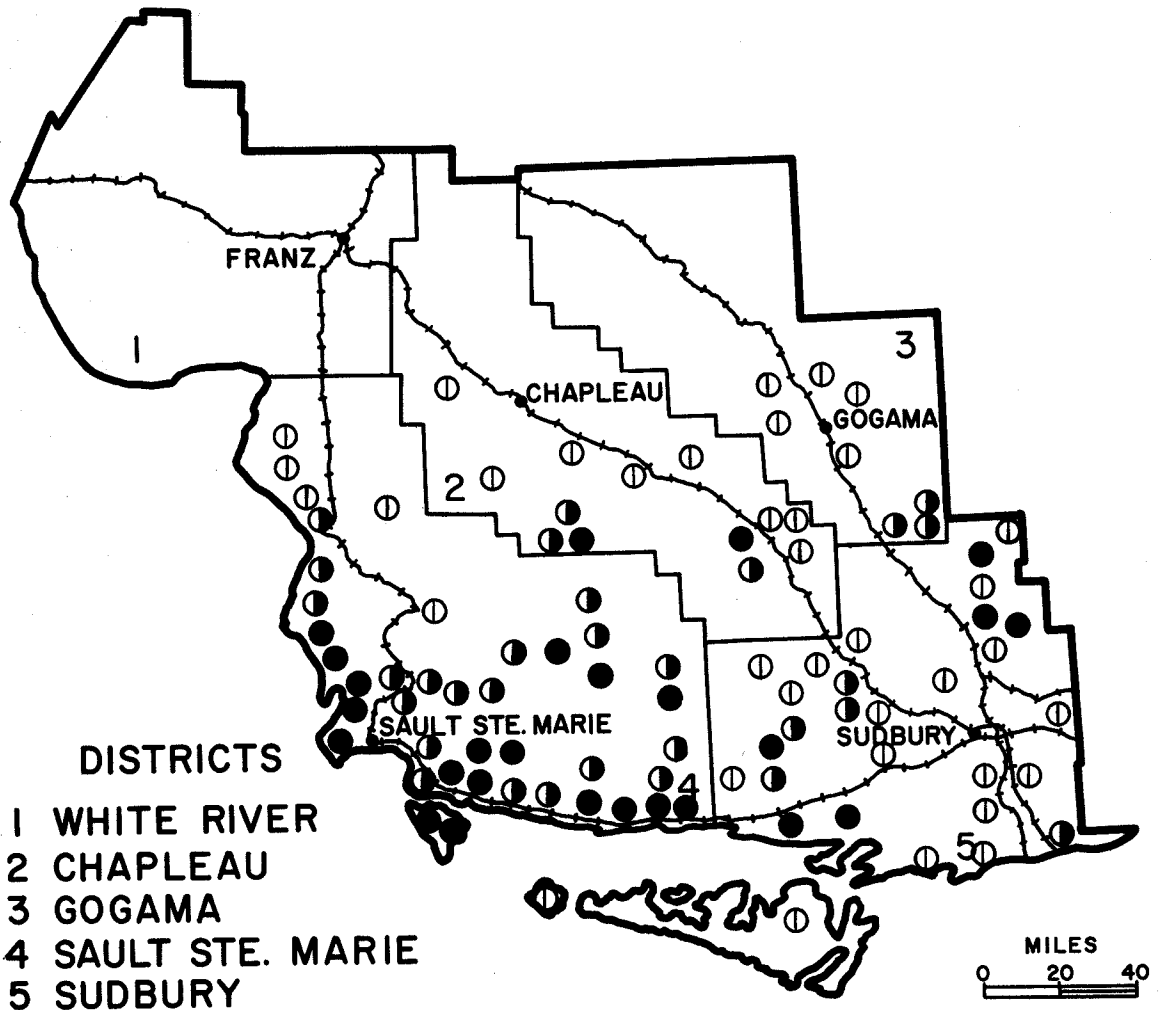
Pockets of heavy infestation in which defoliation of most mountain-ash trees reached 100 per cent were observed throughout Township 8D, and moderate defoliation occurred in townships 9D and 9E. In Margaret Township, also in Chapleau District, mountain-ash trees on an island in Biscotasi Lake were denuded, and a general light-to-medium infestation occurred in the area around the village of Biscotasing. A larval collection made in 1964 at Little Wawa Lake in Peters Township represented a 30-mile extension of the known distribution of the insect in the district. It is expected that ornamental trees in the town of Chapleau will be infested within two or three years.

In Division 72 of the Gogama District, a medium infestation occurred on clumps of mountain-ash in a large area in the townships of Hodgetts, Unwin, and Browning, with defoliation ranging from twenty to thirty per cent. In Hodgetts Township an average of seven colonies per tree was found, while counts of three colonies per tree were recorded in Unwin Township. This infestation extended along the Ruel road for approximately twelve miles.

In the Sudbury District the insect was more widely distributed than in recent years. Light defoliation of clumps of mountain-ash trees occurred frequently in the southeastern part of the district where the insect was rarely found previously. In the rest of the district varying degrees of defoliation occurred on most trees examined, and heavy infestations were found in the townships of Grigg, Aylmer, 124, and Hallam, and in the Spanish River Indian Reserve.

Moderate to severe defoliation occurred throughout the southern half of the Sault Ste Marie District, and larval colonies were observed commonly throughout the remainder of the district. The insect was not found in the White River District.

CENTRAL FOREST REGION



MOUNTAIN-ASH SAWFLY

Locations where infestations
were observed in 1964

Legend

Light infestation.....⊙

Medium infestation.....◐

Heavy infestation.....●

STATUS OF TREE DISEASES

Shoestring Root Rot, Armillaria mellea (Fr.) Kummer

There was no significant change in the incidence or distribution of this root rot in the Central Region in 1964. The organism was collected most frequently from jack pine regeneration, usually on old burn sites. In the Sault Ste Marie District, scattered dead or dying trees were observed through the 1948 Mississagi burn area. In the Gogama District, a quantitative sample taken in Vrooman Township showed that eight per cent of the trees in a 1/20th acre plot were dead. The disease was common throughout the rest of the district.

In the Chapleau, Sudbury, and White River districts the disease was found at scattered locations, notably in 8D and Brutus townships in the Chapleau District, and in Township G in the Sudbury District..

Spruce Needle Rusts, Chrysomyxa spp.

These fungi, which attack current needles only, were found on single and groups of trees throughout most of the Central Region, infected trees being especially common in the Gogama District. There, in a sample plot in Ivanhoe Township, every white spruce tree and 95 per cent of the current foliage in each was affected. In another sample plot in this district, in Noble Township, 59 per cent of the trees were infected with foliar injury ranging from light to moderate in a white spruce stand. In a mixed black and white spruce stand, in Carter Township, incidence was 52 per cent and the severity of infections was low. In Township 32, Range 27, White River District, numerous small black spruce trees were severely infected by C. ledi de Bary. In the Sault Ste Marie District diseased trees were common along the Lake Superior shoreline between Goulais Bay and the Michipicoten River.

Ink Spot of Poplar, Giborinia whetzellii (Seav.) Seav.

This foliage disease was slightly less prevalent in 1964 than in 1963, except in the Gogama District where most trembling aspen were infected to some degree. Large areas of medium and severe infection occurred in the following eight townships in the Gogama District: Noble, Malcolm, Strachan, Melrose, McMurchy, Beulah, Unwin, and Ivanhoe. In the Sault Ste Marie District a large area of heavy infection occurred near Blind River, comprising the townships of Patton, Scarfe, Cobden, and Thompson. In the Chapleau District, pockets of medium to heavy infection were found in Panet, 28, Chapleau, 45, 46, 8D, Sandy, and DeGaulle townships. A moderate infection was observed in Balfour Township in the Sudbury District, and two small pockets of low to medium infection were found near Franz and Lochalsh in the White River District.

A Needle Rust on Pine, Coleosporium asterum (Diet.) Syd.

This organism was generally less common in 1964 than in 1963, although a large area of medium to heavy infection persisted on jack pine regeneration for the second consecutive year in Sandy Township in the Chapleau District. Pockets of medium infection were seen in Township 28 and in Durban Township in the same district. Small pockets of heavy infection occurred in low-lying jack pine and red pine plantations in the North Channel area of the Sault Ste Marie District.

The disease was moderate to severe on scattered jack pine regeneration in townships B and C in the KVP Company limits near the West Branch of the Spanish River. Incidence was low elsewhere in the region.

Sweetfern Blister Rust, Cronartium comptoniae Arth.

As reported in 1963, this rust continued to cause basal stem cankers on jack pine in numerous stands in Gogama and Sudbury districts. Surveys in 1964 showed that the disease was also prevalent in several areas of Chapleau District and a new centre of infection occurred in the nursery in Gogama District where a low incidence was recorded on red pine seedlings and on jack pine windbreaks. The organism was not found in Sault Ste Marie or White River districts. Significant mortality occurred at sample plots in Chapleau District, but other factors, e.g. insects, other diseases, and natural selection may also have been responsible. Only occasional dead trees were observed at sample points in Gogama and Sudbury districts.

Measurements of stem cankers taken in 1963 and 1964 in Gogama District revealed a substantial increase in size in most instances. The incidence of sporulating cankers was much lower in 1964 compared with 1963 in all three districts.

Permanent sample plots were established to determine the percentage of trees attacked and the effect on host species.

TABLE 2

Summary of Incidence of Basal Stem Canker on Jack-pine in the Central Region in 1964.

Location (township by district)	Av. d.b.h. inches.	Size of Plot Acres	No. of trees examined	Number of trees infected	
				sporulating	non- sporulating
<u>Gogama</u>					
Carter	8	1/5	101	0	15
Noble	7	1/5	188	21	0
<u>Sudbury</u>					
124	8	1/20	20	4	-
Hart	6	1/20	30	7	-
<u>Chapleau</u>					
9D	5	1/20	69	13	36
29	6	1/20	43	7	19

White pine trees infected with this rust fungus were again found commonly throughout the range of white pine in the region. There was no significant change in incidence compared with 1963. As in previous years incidence was highest along the North Channel areas of Sault Ste Marie and Sudbury districts. Pockets of moderate incidence were recorded in three townships in Gogama District. The level of incidence was low in the remainder of the region.

A Canker of Poplars and Willows, Cytospora chrysosperma (Per.) Fr.

This fungus usually associated with cankers on stems and branches, was found in all districts in the region, with incidence and severity being greatest in the southern sections. Trembling aspen was the principal host; Lombardy poplar, large tooth aspen, and willow were hosts of minor importance.

Numerous small centers of heavy infection occurred in the White River Forest area in the Sault Ste Marie District. Single infected trees were observed commonly throughout the remainder of the District.

In the Sudbury District, 100 per cent incidence occurred in several pockets of trembling aspen regeneration, in Merritt Township, and in one pocket in Munster Township on pole-sized trembling aspen. Numerous centers of light to medium infection, including one pocket of light infection on willow in Burwash Township, were observed in the remainder of the district.

Occasional centers of infection in which severity ranged from light to heavy, were recorded in the Chapleau, Gogama, and White River districts.

A Stem Canker on Poplar, Hypoxyylon pruinatum (Klotsche) Cke.

This fungus, one of the most common causes of poplar mortality, was observed at numerous locations throughout all five districts in the Central Region. Trees of all size classes were infected. Site quality appeared to be of little influence on the incidence of the disease. For example, in plots in Burwash Township (Sudbury District), and Jack Township (Gogama District) located on good sites the incidence was higher than on the plots which were located on poorer sites in the same districts.

Two sample plots were established in each district to determine the incidence and to study the progress of the disease. (See table).

TABLE 3

Summary of Incidence of Poplar Stem Canker in the Central Region in 1964.

Location (tp. by district)	Av.D.B.H. inches	No. trees examined	No trees infected	Per cent trees infected
White River				
Hunt	5	66	8	12
74	7	45	8	18
Chapleau				
DeGaulle	8	31	10	32
Fawn	9	31	6	19
Gogama				
Jack	6	72	47	65
Noble	4	43	11	26
Sault Ste Marie				
Bridgland	5	100	77	77
Thessalon	6	100	3	3
Sudbury				
Burwash	4	63	22	35
Hallam	2	64	7	11

Balsam Fir Deterioration.

This physiogenic condition was observed in the Sault Ste Marie, Sudbury, Chapleau, and Gogama Districts. Single dead trees of all size classes, exhibiting bright reddish-brown foliage, were observed at many locations in each of these districts. Incidence was not high at any point but mortality appeared to be occurring more frequently than in recent years. Fringe and exposed trees seemed to be most serious affected. Close examination of dead trees revealed no evidence of insect attack, and no specific causal agent was determined, however, in the Sudbury District the following fungi were found in association with this condition: Thyronectria balsamea, Phomopsis sp., and Valsa abietis.

Leaf and Twig Blight of Aspen, Pollaccia radiosa (Lib.) Bald. & Cib.

This disease of aspen, which attacks primarily trembling aspen regeneration and suckergrowth, occurred again very commonly throughout the Central Region in 1964.

Numerous centers of severe infection were observed along the Massey Tote Road, the Killarney Highway, and in Hallam Township (all in Sudbury District); near Franz and Dubreuilville in the White River District; in 175, Rose, Well, and Duncan townships in the Sault Ste Marie District; and in Ivanhoe, Mattagami, Kemp, Gouin, Hazen, and Reeves townships in the Gogama District. Many pockets of light to medium infection were found in the remainder of the aforementioned districts as well as in Chapleau District.

In the Gogama District, a sharp increase in incidence as well as in severity of infections occurred, whereas in the other districts incidence and severity was comparable to 1963.

Deterioration of White Birch Stands

White birch stands throughout the region continued to show signs of deterioration in 1964. Mortality occurred most frequently on dry rocky sites, or in residual stands following logging operations. Dead trees in the larger diameter classes were observed commonly in all stands examined.

Drought Injury

The southern part of Sault Ste Marie and Sudbury districts received below average rainfall in 1963 and up to July in 1964. The effect of this period of drought became apparent on ridges and rocky sites at mid-summer. Premature foliage drop occurred on white birch, red maple, and red oak on these dry sites. Mortality of trees was observed at several points. Lower than usual survival rates in new plantations were attributed to the dry conditions.

Frost Injury

Severe frosts which occurred in late May and early June caused widespread damage to the new shoots of balsam fir and white spruce trees throughout the region. The most severe damage occurred on open-grown balsam fir trees, with records of 90 to 100 per cent loss of new shoots on individual trees. Foliage of trembling aspen, red oak, and white ash trees was similarly affected.

Hail Injury

Pockets of damage from severe hailstorms were observed in Jocelyn and Duncan townships in the Sault Ste Marie District and Stetham, Togo, and St. Louis townships in the Gogama district. Open-grown pole-sized trembling aspen were the species most severely damaged in both areas, while small jack pine trees sustained loss of twigs and foliage. Damage to the bark on stems and branches occurred generally on all species in the storm areas.

Winter Drying of Conifers

This condition was much less prevalent in 1964 than in 1963. Light damage to young conifers, particularly red pine, occurred in all districts of the region except White River. Pockets of moderate damage were reported at one location in Gogama and Chapleau districts, three locations in Sudbury District and four locations in the Sault Ste Marie District.

TABLE 4

Other Noteworthy Diseases in the Central Region
in 1964

Organism	Host(s)	Remarks
<i>Bifusella crepidiformis</i> Darker	bS	Pockets of heavy infection recurred on old needles of lower crowns at several points in Sudbury District and at one location in White River District.
<i>Chrysomyxa arctostaphyli</i> Diet.	Bear- berry	Found sparingly on underside of leaves in Township 29 Range 27. Reputed to cause brooms on spruce.
<i>Cladosporium</i> sp.	wE	Occasional small scattered trees heavily infected in Unwin Township, Gogama District.
<i>Coccomyces hiemalis</i> Higgins	pCh	High incidence where host occurs in Gogama District.
<i>Dibotryon morbosum</i> (Schw.) Theiss. & Syd.	pCh, ecCh	Prevalent where cherry occurs throughout region. Highest incidence on Manitoulin and St. Joseph's islands in Sudbury and Sault Ste Marie districts where damage was severe on most host species.
<i>Gloeosporium</i> spp.	W,Ha, Cran- berry	Causing leaf and twig blight at a few locations in White River and Sudbury districts.
<i>Gymnosporangium clavariiforme</i> (Pers.) DC.	Se	Heavy infection on shoreline shrubs at Ivanhoe Lake, Gogama District.
<i>Gymnosporangium</i> sp.	Mo	Small pockets of heavy infection along Lake Superior in Sault Ste Marie District.
<i>Hypodermella ampla</i> (Davis) Dearn	jP	Individual trees suffered light-to-heavy damage at widely scattered points in region.
<i>Linospora tetraspora</i> Thompson	bPo	Prevalent in White River District and Division 68, Gogama District.
<i>Lophodermium pinastri</i> (Schrad. ex Fr.) Chev.	jP	Severe infection on foliage of lower branches of open-grown trees in Invergarry Tp., Gogama District and in Township B, Sudbury District.
<i>Marssonina populi</i> (Lib.) Sacc.	tA	Pockets of severe leaf blight occurred on aspen reproduction at numerous locations in Chapleau and Sudbury districts.
<i>Melampsora</i> sp.	tA	Varying degrees of infection on small trees at several locations in White River and Sudbury districts.

TABLE 4 (continued)

Organism	Host(s)	Remarks
<i>Melampsorella caryophyllacearum</i> Schroet.	bF	No change in incidence. Clumps of trees infected at scattered points in White River District.
<i>Nothopacidium abietinellum</i> (Dearn.)	bF	Scattered trees suffered moderate-to-severe damage at several locations in Gogama, Chapleau, and Sudbury districts.
Nursery Problem	Spruce	"Basal stem girdle" of spruce stock in White River nursery. Decline in incidence in 1964. Very little seedling mortality observed.
<i>Peridermium</i> sp.	jP	Generally less prevalent than in 1963. One new pocket of heavy infection in Invergarry Tp., Gogama District. Incidence was low elsewhere in the region.
<i>Phoma</i> sp.	Mo	Severe damage on scattered trees at numerous points in the north-eastern part of Sudbury District.
<i>Pollaccia elegans</i> Serv.	bPo	Pockets of heavy infection in Ivanhoe Township and found commonly where host occurs in Gogama District. Severe damage on clumps of small trees at several points in Sudbury District.
<i>Pollaccia saliciperdua</i> (All. & Tub.) v. Arx	W	A high incidence occurred on large shade trees along the Chapleau R. Scattered pockets of light and medium infection elsewhere in the region.
<i>Pucciniastrum epilobii</i> Otth.	bF, Fireweed	Light infection on scattered trees in Foleyet Township., Gogama District. Found on <u>alternate host</u> near Amwri Lake in White River District.
<i>Septoria musiva</i> Pk.	bPo	Prevalent in four townships in Gogama District and in one township in Sudbury District.
<i>Taphrina robinsoniana</i> Geis.	Al	Less prevalent in White River District than in 1963. Light infections observed frequently in Gogama District.
<i>Uncinula salicis</i> (DC. ex Merat) Wint.	tA	Pockets of light infection in Penhorwood Tp., Gogama District.

STATUS OF INSECTS IN THE SAULT STE. MARIE DISTRICT

	Page
A Tortricid on Oak	<u>Argyrotoxa semipurpurana</u> Kft. D 13
Birch Skeletonizer	<u>Bucculatrix canadensisella</u> Chamb.. D 13
Larch Casebearer	<u>Coleophora laricella</u> Hbn. D 13
European Spruce Sawfly	<u>Diprion hercyniae</u> (Htg.) D 13
White-pine Shoot Borer	<u>Eucosma gloriola</u> Heinr. D 14
Aspen Blotch Miner	<u>Lithocolletis salicifoliella</u> Chamb. D 14
Eastern Tent Caterpillar	<u>Malacosoma americanum</u> F. D 14
Forest Tent Caterpillar	<u>Malacosoma disstria</u> Hbn. D 15
Western Tent Caterpillar	<u>Malacosoma pluviale</u> Dyar D 16
Balsam-fir Sawfly	<u>Neodiprion abietis</u> complex D 16
Red-headed Pine Sawfly	<u>Neodiprion lecontei</u> Fitch D 17
Red-pine Sawfly	<u>Neodiprion nanulus nanulus</u> Schedl. D 17
Black-headed Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> Roh.. D 17
Red-headed Jack-pine Sawfly	<u>Neodiprion virginianus</u> complex ... D 17
Pine Bark Aphid	<u>Pineus strobi</u> (Htg.) D 18
Balsam Shoot Boring Sawfly	<u>Pleroneura borealis</u> Felt D 18
Leaf Rollers on Aspen	<u>Pseudexentera</u> sp. D 19
Spruce Bud Gall Midge	<u>Rhabdophaga swainei</u> Felt D 19
Bark Beetles on Conifers	D 20
Summary of Miscellaneous Insects Collected	D 20

H. G. McPhee

STATUS OF INSECTS

A Tortricid on Oak, Argyrotoxa semipurpurana Kft.

Pockets of heavy infestation persisted on red oak stands from Gros Cap on Lake Superior eastward along the North Channel to Indian Reservation No. 12. The foliage of host trees was severely damaged by frosts during the larval feeding period in early June. A high rate of larval mortality occurred thereafter, either from the direct or indirect effects of frosts. Since only a small percentage of insects completed feeding, a reduction in population levels could result.

Birch Skeletonizer, Bucculatrix canadensisella Chamb.

The declining trend in population levels of this insect observed in 1963 continued in 1964. Small pockets of heavy infestation persisted on white birch stands along the Lake Superior shoreline in Ley, Kars, Fenwick, Havilland and Fisher townships. Light to medium infestations were observed on clumps of white birch along the North Channel between Desbarats and Algoma Mills.

Larch Casebearer, Coleophora laricella Hbn.

A slight increase in numbers of this insect was recorded in 1963. This trend did not continue in 1964 and populations returned to the low level of recent years (Table 5).

TABLE 5

Summary of Larval Counts of the Larch Casebearer at Five Points
in the Sault Ste. Marie District from
1962 to 1964

Note: Counts were based on the examination of four 18-inch branch tips from four trees at each sample point.

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. larvae per 18-inch branch tip		
		1962	1963	1964
Kirkwood	5	1.25	1.80	1.25
Wells	3	1.56	2.00	1.15
Parke	4	0.75	1.10	1.80
Ryan	5	0.30	0.45	.04
Garden River I. R.	5	1.25	2.15	3.60

European Spruce Sawfly, Diprion hercyniae (Htg.)

Populations of this sawfly remained at a low level. Minor fluctuations in numbers were noted at sample points (Table 6).

TABLE 6

Summary of European Spruce Sawfly Larval Counts on White Spruce Trees in the Sault Ste. Marie District in September 1963 and 1964

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of larvae per tray sample	
		1963	1964
Bright	22	1.7	0.5
Wells	12	1.6	2.0
Kirkwood	20	1.3	0.4
Garden River I.R.	4	0.6	1.8

White Pine Shoot Borer, Eucosma gloriola Heinr.

High populations of this insect persisted in young jack-pine stands in Bridgland, Haughton and Parkinson townships. A high incidence of attack occurred on a red pine plantation in lots 8, 9 and 10 of Concession II, Haughton Township. Attacks on jack-pine were largely confined to leaders whereas lateral shoots were usually infested on red pine (Table 7).

TABLE 7

Summary of Damage by the White Pine Shoot Borer in the Sault Ste. Marie District in 1964

Location (township)	Host species	Av. ht. of sample trees in feet	No. infested trees per 100- tree sample	No. infested leaders per 100- tree sample
Haughton	jP	6	38	34
	rP	8	29	2
Parkinson (Bells Falls)	jP	7	38	36
" (Constance Lake)	jP	8	26	26
Bridgland	jP	5	34	33

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Small pockets of heavy infestation persisted on young stands of trembling aspen along roadways and in cutover areas. The heaviest attacks occurred on clumps of open-grown aspen under 15 feet in height. Very low populations were observed on fringe trees in closed stands in the larger diameter classes. Quantitative sampling at ten points in representative infested stands showed an average of 73 per cent of leaves mined compared with 70 per cent in 1963.

Eastern Tent Caterpillar, Malacosoma americanum F.

Populations of this insect persisted at relatively the same level as in 1963 (Table 8). Light to medium infestations occurred on open-grown cherry and wild apple trees along the North Channel from Echo Bay east to the Serpent River.

TABLE 8

Summary of Eastern Tent Caterpillar Colony Counts at Six
Points in the Sault Ste. Marie District in
1963 and 1964

Location (township)	Sample Unit	No. of tents per sample unit	
		1963	1964
Thompson	1 mile of roadside	3	4
Spragge	1 mile of roadside	11	13
Gould	square chain plot	13	9
Plummer	1 mile of roadside	9	11
Rose	1 mile of roadside	16	18
Wells	1 mile of roadside	17	11

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Small numbers of larvae and cocoons of this insect have been found in aspen and sugar maple stands along the North Channel since 1962. The frequency of occurrence indicated that a new outbreak was imminent. In 1964 an area of heavy infestation occurred near Blind River in the townships of Patton, Thompson, Cobden and Scarfe. Stands of aspen and red oak were completely defoliated on hilltops and ridges, while moderate to severe feeding occurred on host species elsewhere in the area.

In the western part of the district larval colonies were found commonly in aspen and red oak stands south of a line from Echo Bay to Ophir and in the townships of Day and Gladstone.

Samples of 100 cocoons from two points in the Blind River infestation were dissected to determine the presence of biological control factors (Table 9).

TABLE 9

Summary of Forest Tent Caterpillar Cocoon Dissections
at Two Points in the Sault Ste. Marie District
in 1964

Note: Counts are based on the examination of 100 cocoons at each location

Location (township)	Emerged	Parasitized	Disease	Unsuccessful emergence
Scarfe	45	40	10	5
Cobden	55	42	3	0

Egg-band surveys taken in the autumn indicate that infestations will increase in size and intensity in 1965 if conditions are favourable for hatching and larval development (Table 10).

TABLE 10

Summary of Forest Tent Caterpillar Egg Band Counts
in Sault Ste. Marie District in 1964

Note: Three trembling aspen trees were examined at each location.

Location (township)	Av. d.b.h. of samples trees in inches	Av. no. egg bands per tree	Infestation forecast for 1965
Mack	5	19	Severe
Scarfe	6	29	Severe
Patton	4	2	Moderate
Gladstone	6	1	Light
Parkinson	5	0	Nil
Tarbutt Addt'l	4	2	Moderate
Meredith	5	1	Light
Thompson	4	3	Moderate
149	5	28	Severe

Western Tent Caterpillar, Malacosoma pluviale Dyar

Small pockets of light-to-medium infestation occurred in 1964. Quantitative samples reflected a general upward trend in numbers (Table 11).

TABLE 11

Summary of Western Tent Caterpillar Colony Counts at Six
Points in the Sault Ste. Marie District
in 1963 and 1964

Location (township)	No. of tents per mile of roadside	
	1963	1964
3D	6	9
5E	8	11
4E	9	13
6E	7	8
Gaudette	11	22
Rose	-	16

Balsam-fir Sawfly, Neodiprion abietis complex

This sawfly was abundant in the southern part of the district in 1962 and 1963. A sharp reduction in infestations occurred in 1964. Severe frosts that coincided with the hatching of eggs probably contributed largely to this decline.

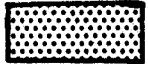
Crowns of balsam-fir trees known to have high egg numbers were examined at mid-June. The eggs on these trees had hatched, larvae had fed briefly and vanished. Small numbers of late stage larvae were collected in these stands in beating samples in late June.


SAULT STE. MARIE DISTRICT

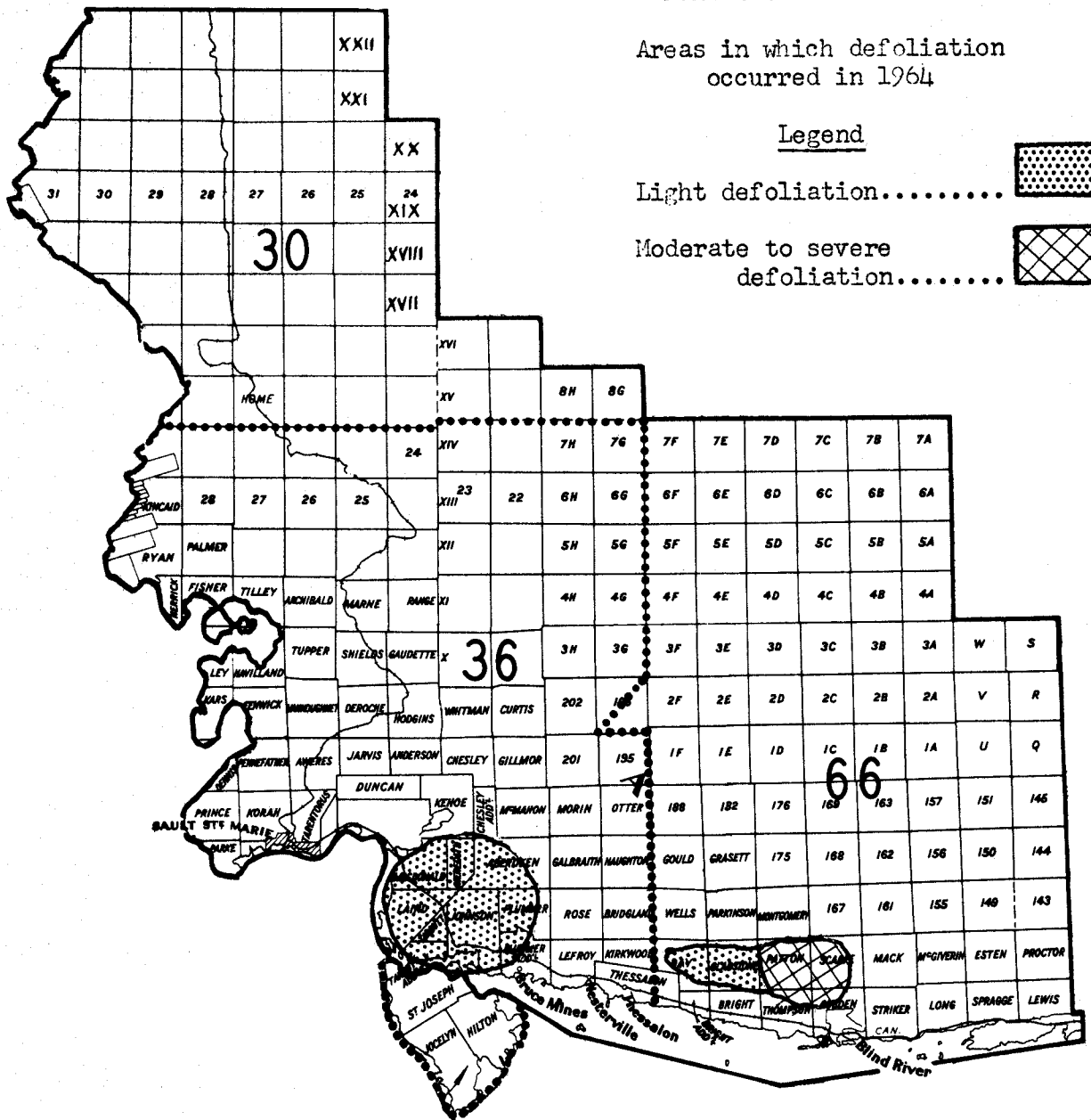
FOREST TENT CATERPILLAR

Areas in which defoliation occurred in 1964

Legend

Light defoliation..... 

Moderate to severe defoliation..... 



Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Population levels of this sawfly showed a marked increase in the southern part of the district in 1964. Small pockets of heavy infestation occurred on red-pine plantations in the area between Iron Bridge and the Serpent River. Larval colonies were observed frequently in red pine and jack pine plantations along the North Channel from Sault Ste. Marie to Iron Bridge. Quantitative samples taken in pockets of infestation in the Iron Bridge area are summarized in Table 12.

TABLE 12

Summary of Red-headed Pine Sawfly Larval Colony Counts and Defoliation Estimate at Five Points in the Sault Ste. Marie District in 1964

Note: Counts are based on examination of 100 trees in each stand

Location (township)	Host species	Av. ht. of sample trees in feet	Percentage of trees infested	Av. no. colonies per infested tree	Per cent defoliation of infested trees
Gladstone	rP	8	60	5	50
Thompson	rP	16	55	9	40
Cobden	rP	12	28	7	50
Parkinson	rP	6	6	0.6	Trace
Wells	jP	10	10	8	70

Red-pine Sawfly, Neodiprion nanulus nanulus Schedl.

A general increase in the abundance of this sawfly was noted in 1963. This trend continued in 1964, particularly in the southern part of the district where light infestations were observed more frequently than in recent years. Fringe trees along roads and firebreaks in the Kirkwood Management Unit were lightly attacked, averaging 15 colonies of larvae per 100 trees examined. Light infestations persisted on shoreline stands of red-pine at Pancake, Batchawana and Agawa Bays on Lake Superior.

Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

A noteworthy increase in the numbers of this sawfly occurred in Haughton, Bridgland, Kirkwood and Rose townships in the Kirkwood Management Unit. Counts on 20 jack pine trees at representative points showed an average of 0.4 larval colonies per infested tree.

Larval colonies were observed occasionally throughout the remainder of the district.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Small pockets of infestation which caused moderate defoliation of jack pine trees occurred in Townships 4F and 5F, west of Mashagama Lake in Division 66. Counts taken on 100 trees in these townships showed an average of 5 colonies per infested tree and an average of 65 per cent of the trees infested. Larval colonies were observed frequently in the northern part of Division 66.

Pine Bark Aphid, Pineus strobi (Htg.)

High populations of this aphid have persisted in plantations of white pine in the Kirkwood Management Unit since 1962 (Information Report, Forest Insect and Disease Surveys, Sault Ste. Marie District 1962 and 1963). Aphids were abundant again in 1964 in these stands.

White pine trees which had been infested for two or more years developed a decadent appearance, with thin, faded, or yellow foliage and retarded growth of new shoots. The bark of infested trees became thickened and spongy with a yellowing of the cambium. Most trees which died in the infested stands during the 3-year period were also infected by white pine blister rust, Cronartium ribicola, J. C. Fischer, or were severely suppressed. Periods of drought in recent years could also have contributed to decadence in the plantations.

A control project was conducted by personnel of the Department of Lands and Forests in a heavily infested tract of young white pine on the North West quarter of Section 1, Lefroy Township in late July, 1964. Two methods of control were employed. One involved an insecticide (DDT) which was sprayed on infested trunks and the other a stream of water which was applied under high pressure from a pumper truck to wash the insects from the trunks.

The spray containing 2.5 per cent D.D.T. in water was applied with back-pack sprayers to the infested area of the trunks. The washing method could only be used on rows of trees adjacent to access roads.

Examination of the treated stand was carried out at regular intervals throughout the remainder of the summer and early autumn, to appraise the two methods. On 100 sample trees in the D.D.T.-sprayed area, no living insects could be found 10 days following spray, and autumn rains cleaned the trunks of the characteristic white flocculence. Sample trees in the washed area still retained patches of insects which were either missed or withstood the water pressure. This stand will be kept under surveillance in 1965 to determine the longer term effects of spraying.

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

This sawfly was last abundant in 1962 and since high numbers usually occur in alternate years, larvae were again numerous in 1964. Severe frosts in early June which caused browning and curling of the new shoots of balsam fir made surveys difficult. Quantitative samples (Table 13) were completed in the southern part of the district before frosts occurred. In the area north of the Montreal River frost damage occurred when larvae were extremely small causing a high rate of larval mortality. Lower populations may be expected in 1966 as a result of weather conditions in the spring of 1964.

TABLE 13

Summary of Damage Caused by the Balsam Shoot-boring Sawfly
at Five Points in the Sault Ste. Marie District
in 1964

Note: Counts were based on the examination of 20 branch tips, four from each of five trees at each point.

Location (township)	Av. d.b.h. of sample trees in inches	Per cent of shoots infested
Gladstone	4	17
Lewis	6	19
Thessalon	5	11
Plummer	5	9
Whitman	7	13

Leaf Rollers on Aspen, Pseudexentera sp.

Heavy infestations of leaf rollers were observed in aspen stands in a band two townships in depth, fronting on the North Channel from Sault Ste. Marie east to the Serpent River. Numerous small pockets of light to moderate feeding occurred throughout the district. Samples taken in the infested area indicated that a complex of leaf rollers was involved. Those occurring most frequently were, Pseudexentera sp., Epinotia solandriana Linn., Epinotia nisella criddleana Kft., and Sciaphila duplex Wlshn.

Quantitative samples taken at representative points showed that an average of 75 per cent of the leaves were rolled and contained feeding larvae.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt

This insect has persisted at a low but constant level of abundance since 1961. A high rate of parasitism was observed in 1963 and this occurrence was reflected by reduced numbers in 1964 (Table 14).

TABLE 14

Summary of Counts of Terminal Buds Infested by the Spruce Bud Gall Midge
at Five Points in the Sault Ste. Marie District
from 1962 to 1964

Location (township)	Tree species	Av. ht. in feet	Per cent of terminal buds infested		
			1962	1963	1964
Shields	WS	9	7.0	6.3	1.6
Bridgland	BS	10	4.1	5.9	1.8
Thessalon	WS	8	8.2	9.3	Negative
Jocelyn	WS	7	5.6	6.8	Negative
Thompson	WS	8	9.1	7.4	2.1

Bark Beetles on Conifers

Increased attention was given to the collection of bark beetles on spruce in 1963 and 1964 to determine the distribution of the insects and to increase the knowledge of the various species found. Dead and dying trees, windfalls, logs and pulpwood bolts were examined throughout the field season. White pine, jack pine and balsam fir were also examined where suitable brood material was found. Data presented in Table 15 lists the species collected to date.

TABLE 15

Summary of Bark Beetle Species Collected
in the Sault Ste. Marie District
in 1963 and 1964

Location (township)	Bark beetle species	Host species
Curtis	<i>Polygraphus rufipennis</i> Kby.	wS
Curtis	<i>Orthotomicus caelatus</i> Eich.	wS
Shields	<i>Pityokteines sparsus</i> Lec.	bF
Ley	" "	bF
24 Range <u>XI</u>	<i>Ips perturbatus</i> Eich.	wS
Parkinson	<i>Pityogenes hopkinsi</i> Sw.	wP
Day	<i>Ips pini</i> Say	wP
Day	<i>Gnathotrichus materiarius</i> Fitch	wP
Whitman	<i>Ips</i> sp.	wP, jP
Hodgins	<i>Ips</i> sp.	wP
Patton	<i>Ips</i> sp.	wP
Rose	<i>Ips</i> sp.	wP

TABLE 16

Summary of Miscellaneous Insects Collected
in Sault Ste. Marie District

Note: Numbers of collections is given inside brackets for those insects collected more than one.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	bF, wS	Small numbers in beating samples (4)
<i>Acrobasis rubrifasciella</i> Pack.	Al	Numerous Galbraith Tp.
<i>Adelges abietis</i> Linn.	wS	Found commonly on young trees (6)
<i>Adelges strobilobius</i> Kalt.	bS	Small numbers on young under-story (2)
<i>Agrilus</i> sp.	tA	Found occasionally on sucker growth (2)
Agromyzidae	tA	Occurred commonly on sucker growth in Constance Lake area (2)
<i>Argyresthia aureoargentella</i> Brower	eC	Found in small numbers on St. Joseph's Island

TABLE 16, Sault Ste. Marie District

Insect	Host(s)	Remarks
<i>Argyresthia thuiella</i> Pack	eC	Small numbers (2)
<i>Argyresthia</i> sp.	bS	Occurred occasionally on open-grown trees (2)
<i>Archips cerasivoranus</i> Fitch	ecCh	Small pockets heavy infestation along North Channel (4)
<i>Caripeta divisata</i> Wlk.	bF	Occurred commonly in beating samples (4)
<i>Cecidomyia reeksi</i> Vock.	jP	Heavy infestations on clumps open-grown trees, Haughton and Curtis townships (4)
<i>Cimbex americana</i> Leach	tA	Occasional single larvae (3)
<i>Choristoneura fumiferana</i> Clem.	wS, bF	Collected in small numbers (6)
<i>Compsolechia niveopulvella</i> Chamb.	tA	Small pockets of heavy infestation on fringe trees (3)
<i>Clepsis persicana</i> Fitch	bF	Small numbers (2)
<i>Conophthorus</i> sp.	rP, jP	Damaged shoots and cones found commonly (4)
<i>Epinotia nisella criddleana</i> Kft.	tA	Small pockets infestation Parkinson Tp.
<i>Epinotia solandriana</i> Linn.	tA, wB	Commonly found along North Channel and Lake Superior (4)
<i>Eriophes betulae</i> Steb.	wB	Single trees infested at Black Creek
<i>Eriophyes</i> sp.	mM, sM, wB	Heavy infestation shaded trees Rose Tp.
Eriophyidae	rP	High populations on open-grown trees at Agawa Bay
<i>Eucordylea atrupictella</i> Dietz.	wS	Small numbers in beating samples (2)
<i>Eupithecia filmata</i> Pears.	bF	Commonly taken in beating samples (4)
<i>Eupithecia luteata</i> Pack.	bF, wS	Larvae numerous in late season beating samples (4)
<i>Eupithecia transcanadata</i> McK.	bF, wS	Larvae numerous in late season beating samples (2)
<i>Eupithecia</i> various spp.	J	Larvae numerous in early season beating samples (2)
<i>Eupithecia</i> sp.	J	Collected commonly in Wells and Aberdeen townships (3)
<i>Fenusa dohrnii</i> (Tischb.)	Al	Small numbers (3)
<i>Fenusa pusilla</i> (Lep.)	wB	Occasional pockets of infestation on sucker growth or clumps of open-grown young trees (5)
<i>Feralia jocosa</i> Gn.	wS, bF	Collected commonly in small numbers (3)
<i>Gonioctena americana</i> (Schaeff.)	tA	Small pockets of infestation on fringe or open-grown trees (3)

TABLE 16, Sault Ste. Marie District

Insect	Host(s)	Remarks
<i>Griselda radicana</i> Wlsh.	wS	Occasional larvae in beating samples
<i>Hydriomena divisaria</i> Wlk.	wS	Occasional larvae in beating samples (2)
<i>Hyphantria cunea</i> (Drury)	Al, wB, wE, W, tA	Occasional colonies observed (3)
<i>Lambdina fiscellaria</i> Gn.	eC, bF, He, J	Occasional colonies observed (4)
<i>Lytta sayei</i> Lec.	ecCh	Very numerous on open flat in Gaudette Tp.
<i>Mindarus abietinus</i> Koch.	bF	Commonly found on young trees (3)
<i>Monochamus scutellatus</i> Say.	wS	High populations in slash following cut
<i>Mulsantina hudsonica</i> Csy.	bF	Adults collected commonly in beating samples (3)
<i>Nematus</i> sp.	tA	Common on sucker growth or fringe trees
<i>Nematus erythrogaster</i> Nort.	Al	Colonies occurred commonly through Kars Tp.
<i>Nematacampa filamentaria</i> Gn.	bF	Small numbers (2)
<i>Neodiprion pratti paradoxicus</i>	JP	Colonies in small numbers on open-grown trees in Tarentorus Tp. (3)
<i>Neomysia pullati randalli</i> Csy.	wS	Adults common in Tp. 22 R <u>XXII</u>
<i>Nepytia canosario</i> Wlk.	bF	Small numbers (2)
<i>Nyctobia limitaria</i> Wlk.	bF	Small numbers in beating samples (3)
Olethreutidae	tA	Small pocket heavy infestation on mature trees, Day Tp. (2)
<i>Parorgyia vagans</i> B. & McD.	rO	Found commonly in association with other leaf rollers (2)
<i>Palthis angulalis</i> Hbn.	wS	Collected in beating samples (3)
<i>Periclista</i> sp.	rO, bAs	Small numbers (4)
<i>Pegahylemyia anthracina</i> Czerny	bS	70 per cent of cones infested Kars Tp.
<i>Petrova albicapitana</i> Busck.	Mugho pine JP, scP	Insect scarce, single pitch nodule found at 10 locations
<i>Pheosia rimosa</i> Pack.	tA	Single larvae found late in season in tops of mature trees
<i>Pikonema alaskensis</i> Roh.	wS, bS	Single open-grown trees defoliated in North Channel area (5)
<i>Pikonema dimmockii</i> (Cress.)	wS	Larvae collected commonly in small numbers (4)
<i>Pineus coloradensis</i> Gill.	rP	Heavy infestations, St. Joseph's Island
<i>Pineus floccus</i> Patch	bS	Small pockets heavy infestation, understory trees in townships 175, 3E, 2F, 5F (8)

TABLE 16, Sault Ste. Marie District

Insect	Host(s)	Remarks
<i>Pissodes approximatus</i> Hopk.	rP, scP	Abundant in Kirkwood and Searchmont Units (5)
<i>Podapion gallicola</i> Riley	rP	Small pocket infestation in Tp. 175
<i>Prociphilus tessellatus</i> (Fitch)	Al	High populations at Tikamaganda Lake
<i>Profenusa thomsoni</i> (Konow)	wB	Sharp decline 1964. Insect found in small numbers (3)
<i>Protoboarmia porcellaria</i> <i>indicataria</i> Wlk.	bF	Most common larva collected in beating samples (7)
<i>Pseudexentera cressoniana</i> Clem.	rO	One of the most common leaf rollers on oak - small numbers (2)
<i>Recurvaria piceaella</i> Kft.	bF	Small numbers
<i>Recurvaria thujaella</i> Kft.	eC	Small numbers
<i>Rhyacionia adana</i> Heinr.	rP, scP	Small numbers in young plantations, one 8-acre pocket, 75 per cent trees infested Meredith Tp.
<i>Rhyacionia buoliana</i> Schiff.	rP	Low populations in Jocelyn Tp.
<i>Rhyacionia frustrana</i> Comst.	jP	Found commonly in Haughton and Parkinson townships (6)
<i>Sciaphila duplex</i> Wlsh.	tA	One of the common leaf rollers (3)
<i>Serica sericea</i> Ill.	tA	Adults very numerous on young trees, Haughton Tp.
<i>Semiothisa</i> sp. (<i>granitata</i> group)	wS	Very numerous in late season beating samples (6)
<i>Sparganothis sulfureana</i> Clem.	rP	15 per cent of trees on 100 acres infested, Lefroy Tp.
<i>Tetralopha aplastella</i> Clem.	tA	Light infestations Jarvis and Duncan townships (2)
<i>Tetrapium cinnamopterum</i> Kby.	wP	Found commonly in trees killed by blister rust Parkinson Tp.
<i>Thera</i> sp.	J	Collected commonly in early season beating samples (2)
<i>Toumyella numismaticum</i> P. & McD.	jP, scP	Small pockets heavy infestation, Lefroy, Parke, 4 E townships
<i>Vasates quadripes</i> Shim.	rM, sM	Heavy on understory trees along Lake Superior shoreline
<i>Zanclognatha protumnusalis</i> Wlk.	bF	Occasional specimens in beating samples
<i>Zellaria haimbachi</i> Busck.	jP	Common in Kirkwood and Mississagi Forests (8)
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	Collected in small numbers (5)

STATUS OF INSECTS IN THE SUDBURY DISTRICT

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Birch Skeletonizer	<u>Bucculatrix canadensisella</u> Chamb..	D 25
Larch Casebearer	<u>Coleophora laricella</u> (Hbn.)	D 25
European Spruce Sawfly	<u>Diprion hercyniae</u> (Htg.)	D 25
White Pine Shoot Borer	<u>Eucosma gloriola</u> Heinr.	D 26
Birch Leaf Miner	<u>Fenusa pusilla</u> (Lep.)	D 26
Aspen Blotch Miner	<u>Lithocolletis salicifoliella</u> Chamb.	D 26
Eastern Tent Caterpillar	<u>Malacosoma americanum</u> (F.)	D 26
Forest Tent Caterpillar	<u>Malacosoma disstria</u> (Hbn.)	D 27
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Black-headed Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> Roh..	D 29
Red-headed Jack-pine Sawfly	<u>Neodiprion virginianus</u> complex ...	D 30
Yellow-headed Spruce Sawfly	<u>Pikonema alaskensis</u> (Roh.)	D 30
Balsam Bud-mining Sawfly	<u>Pleroneura borealis</u> Felt	D 30
Poplar Leaf Rollers	<u>Pseudexentera oregonana</u> Wlshm.	
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	<u>criddleana</u> Kft.	D 31
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J. R. McPhee,

STATUS OF INSECTS

Birch Skeletonizer, Bucculatrix canadensisella Chamb.

A further decline in infestations of this skeletonizer occurred in 1964. Medium-to-heavy infestations reported on pockets of white birch in the southern part of the district in 1963 declined to scattered pockets of light infestation. One exception was in the area around the city of Sudbury where clumps of white birch were heavily infested. The insect virtually disappeared on Manitoulin Island where infestations had occurred since 1959. In the northern part of the district conspicuous damage to foliage was rarely observed.

Larch Casebearer, Coleophora laricella (Hbn.)

Population levels of this insect remained low throughout the district. Larval counts at four locations showed no significant change in numbers since 1962 (Table 5).

TABLE 5

Summary of Larval Counts of the Larch Casebearer in the Sudbury District from 1962 to 1964

Note: Counts are based on the examination of four 18-inch branch tips from four trees at each location.

Location (township)	Av. d.b.h. of trees in inches in 1964	Av. no. of larvae per 18-inch branch		
		1962	1963	1964
Dill	4	5.0	3.0	4.1
Cascaden	3	-	1.0	3.0
Hallam	4	1.5	3.0	2.5
Delamere	3	1.1	0.8	0.5

European Spruce Sawfly, Diprion hercyniae (Htg.)

Although populations of this insect remained at about the same level or declined at most sample locations compared with 1963, a marked increase in numbers occurred on open-grown white spruce trees in Bigwood Township (Table 6). As in previous years incidence was highest in the southern part of the district where open-grown white spruce was most abundant.

TABLE 6

Summary of European Spruce Sawfly Larval Counts in September on White Spruce Trees in Sudbury District from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches in 1964	Total no. of larvae per 15-tray sample		
		1962	1963	1964
Bigwood	10	8	12	140
Hagar	6	22	16	4
Denison	5	4	9	7
Hallam	6	50	25	15
Salter	12	54	23	17
Balfour	8	6	10	13
Billings	8	36	52	10

White Pine Shoot Borer, Eucosma gloriola Heinr.

A general decline was noted in shoot damage caused by this pest in 1964. One exception was in Norman Township where damage to leaders of jack-pine reproduction increased from 11 to 23 per cent. Although light infestations persisted in jack pine plantations and pockets of reproduction at some locations, counts of infested terminal shoots at sample points were lower than in 1963 (Table 7).

Scattered shoots were infested in plantations of small red pine trees in Burwash Township and on young open-growing white pine trees in Servos Township.

TABLE 7

Summary of Terminal Shoot Damage by the White-pine Shoot Borer in Sudbury District from 1962 to 1964

Note: 100 jack-pine trees were examined at each location

Location (township)	Av. d.b.h. of trees in inches in 1964	Per cent of leaders infested		
		1962	1963	1964
Merritt	2	15	10	8
119	1	32	14	2
Norman	2	18	11	23
Hart	2	13	26	4

Birch Leaf Miner, Fenusa pusilla (Lep.)

This leaf-miner again caused moderate-to-severe damage to the foliage of small open-grown white birch trees along roadsides and on rocky sites around the city of Sudbury, along Highway 69 and the Killarney Highway, and in the Spanish River Reserve south of Massey. Clumps of white birch were lightly damaged at several other locations. Leaf mining was negligible on trees over 10 feet in height.

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

High population levels of this leaf miner persisted throughout the northern part of the district in 1964. As in 1963, the heaviest infestations occurred in the northern parts of Divisions 67 and 70 where most aspen reproduction and under-story in and around coniferous stands suffered from 90 to 100 per cent leaf mining. Damage to foliage in pure aspen stands was negligible. A decline in population levels occurred in Division 76, where moderate damage and occasional clumps of heavy infestation persisted. Small numbers of mined leaves were observed at scattered points in the southern part of the district.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

This tent caterpillar was again abundant through the southeastern part of the district. Numbers of tents exceeded those in 1963 except in Appleby Township where a decline was evident (Table 8). Population levels were highest in Bigwood and Delamere townships, on Cloche Island and the east end of Manitoulin Island where numerous medium and heavy infestations occurred on clumps of choke and pin cherry along roadsides and in clearings. An increase in numbers of tents was noted in the Espanola and Massey areas where several light infestations were observed on clumps of cherry south of Highway 17. The insect was rarely found north of Highway 17.

TABLE 8

Summary of Eastern Tent Caterpillar Colony Counts on Cherry
Shrubs in Sudbury District from 1962 to 1964

Location	Sampling unit	No. of colonies per sampling unit		
		1962	1963	1964
Bigwood Township	sq. chain plot	15	21	27
Bidwell Township	1 mile roadside	44	42	46
Appleby Township	1 mile roadside	15	19	10
Hallam Township	1 mile roadside	-	-	7
Cloche Island	1 mile roadside	14	11	16

Forest Tent Caterpillar, Malacosoma disstria (Hbn.)

Weather conditions favourable to the development of forest tent caterpillars in the spring of 1964 resulted in some increases in infestation intensities in the district, but no significant enlargement of infestations occurred. Moderate-to-severe defoliation of poplar stands recurred in two small areas west of Sudbury for the fifth consecutive year. A heavy infestation persisted for the third year over an area comprising approximately 150 square miles in the French River area. New small pockets of heavy infestation occurred in four townships immediately southeast of Ramsey Lake and in Rayside Township several miles north of the Whitewater Lake infestation (see map). Colonies of caterpillars were observed more frequently than in 1963 outside areas of infestations in the southeastern part of the district. Elsewhere the insect was rarely found.

Experimental control using a virus disease initiated by the Insect Pathology Research Institute continued to show encouraging results. Examination of larval samples in the laboratory from several points where the virus was introduced in 1963 revealed light mortality caused by the disease.

Dissection of cocoons showed an increase in parasitism in Bigwood Township. Parasitism in Graham and Rayside townships was about the same as in 1963 (Table 9).

TABLE 9

Summary of Forest Tent Caterpillar Cocoon Dissections on One-hundred Cocoons
at Each of Four Locations in Sudbury District
in 1963 and 1964

Location (township)	<u>Emerged</u>		<u>Parasitized</u>		<u>Disease</u>		<u>Predation</u>		<u>Unsuccessful emergence</u>	
	1963	1964	1963	1964	1963	1964	1963	1964	1963	1964
Bigwood	39	25	60	75	0	0	0	0	1	0
Graham	22	25	76	74	2	0	0	0	0	1
Rayside	26	37	64	63	9	0	0	0	2	0
Dill	-	31	-	69	-	0	-	0	-	0

Data from egg surveys shown in the following table suggest further increases in infestation intensity in 1965 but no substantial enlargement of infestations is expected.

TABLE 10

Summary of Forest Tent Caterpillar Egg Band Counts on Trembling Aspen
in Sudbury District in 1963 and 1964

Location (township)	Av. d.b.h. of trees in in- ches in 1964	No. of trees examined	Av. no. of egg bands per tree		Infestation forecast for 1965
			1963	1964	
Bigwood	4	1	43	66	Heavy
Cox	6	3	2	2.3	Light
Hagar	6	3	-	0.3	Light
Cosby	3	1	27	35	Heavy
Graham	4	1	50	39	Heavy
Rayside	4	1	6	28	Heavy
Dill	6	1	-	30	Heavy
Blezard	4	3	-	2	Light
Burwash	5	3	-	1	Light

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

A decline in population levels of this tent caterpillar was evident at sample points in Telfer and G. townships. Counts of colonies revealed 5 and 8 colonies per measured mile of roadside respectively compared with 9 and 12 colonies in 1963. Counts at three other sample points in the district were nil. However, scattered colonies were observed in Street, Rayside, M and L24 townships.

Balsam-fir Sawfly, Neodiprion abietis complex

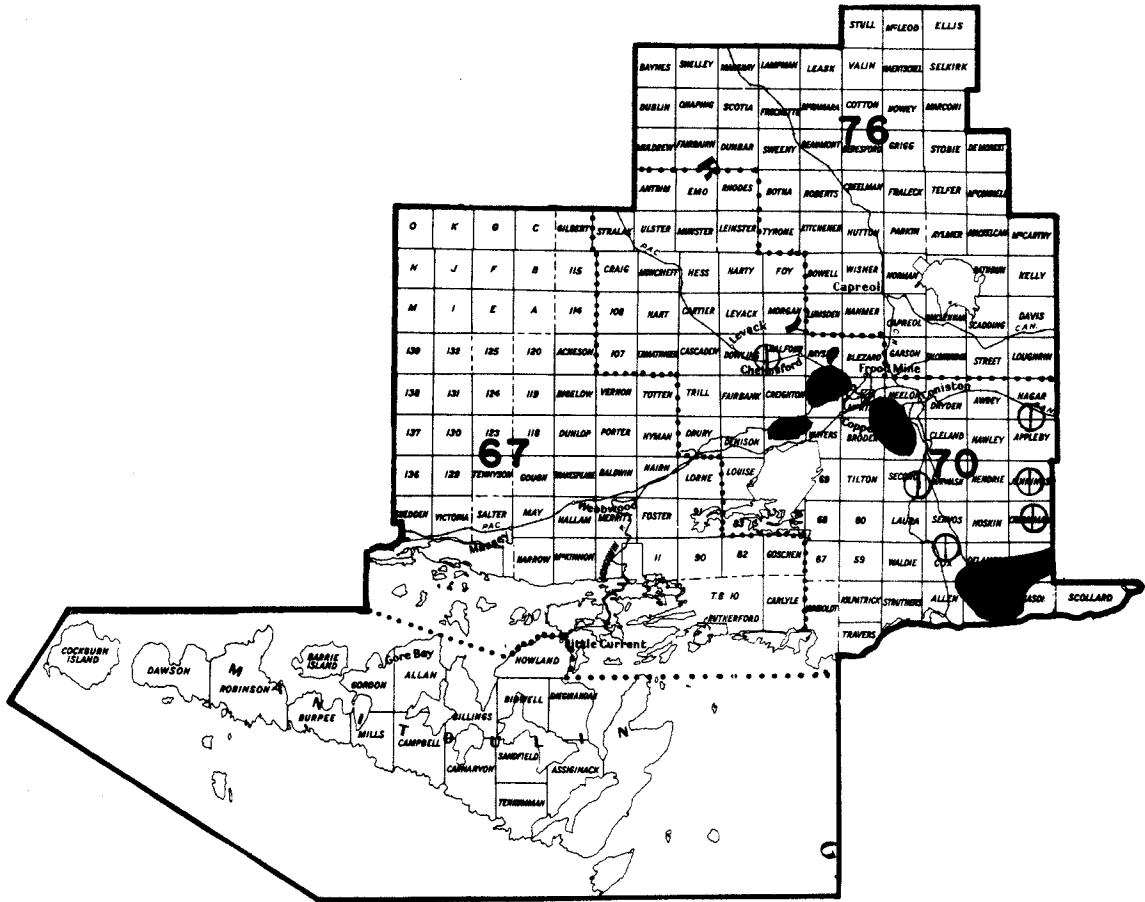
Population levels of this sawfly were lower than at any time since 1958. One pocket of light infestation persisted in Mills Township on Manitoulin Island where a count revealed an average of 3.2 colonies per tree on 10 trees averaging 3 inches d.b.h. Colony counts at four other sample points were nil. The sawfly was rarely found elsewhere in the district.

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

A significant increase in numbers of this sawfly occurred in the southwestern part of the district in 1964. This trend was particularly evident on a 75-acre plantation on Cockburn Island where clumps of red pine trees ranging from 2 to 4-feet in height suffered moderate-to-severe defoliation. Elsewhere on the island scattered trees in smaller plantings of red and jack pine were stripped. Light-to-severe defoliation of small scattered clumps of red pine persisted along Highway 17 between Walford and Massey and a new clump of heavy infestation occurred in the Spanish River Reserve south of Massey (Table 11).

Experimental control using a virus disease was initiated by the Insect Pathology Research Institute on Cockburn Island. The results of the experiment will not be known until 1965.

SUDBURY DISTRICT



FOREST TENT CATERPILLAR

Areas in which defoliation occurred in 1984

Legend

- Light defoliation ⊕
- Moderate to severe defoliation..... ■

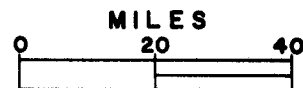


TABLE 11

Summary of Red-headed Pine Sawfly Colony Counts on
Red Pine in Sudbury District in 1964

Location	No. of trees examined	Av. height of trees in feet	No. of trees infested	Av. no. of colonies per infested tree
Cockburn Island	100	3	50	2
Hallam Township	10	5	10	5
Spanish River Reserve	50	3	25	2
Salter Township	100	2	3	1

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl.

This sawfly was again abundant in numerous areas. As in 1963, population levels were highest in the northwestern part of the district where moderate-to-severe defoliation of small red pine trees and light defoliation of large scattered trees occurred along roadsides in five townships. Pockets of light infestation persisted in red and jack pine plantations in Nairn Township and in jack pine stands at numerous other locations (see map). The insect was associated with two other species of sawflies on jack pine in most areas. See account on Neodiprion pratti banksianae Roh.

Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

High population levels of this sawfly reported in several areas in the northern part of the district for the past three years declined sharply in 1964. For example, a heavy infestation in a 40-acre jack pine stand in Hamner Township declined to light intensity and extensive light infestations in stands in the central and northern parts of the district virtually subsided. Pockets of moderate-to-severe defoliation of old foliage persisted on exposed trees along lakeshores at the north end of Wanapitei Lake in Aylmer Township, at Onaping Lake in Emo Township, Shakwa Lake in B Township, and along K.V.P. roads in Gilbert and 115 townships. Small pockets of light infestation recurred in Nairn Township and on Cloche Island (see map).

As in 1963, two other species of sawflies, Neodiprion pratti paradoxicus Ross and Neodiprion nanulus nanulus Schedl. occurred on the same trees as Neodiprion pratti banksianae Roh. Because of their similarity in appearance and feeding habits larval colony counts shown in Table 12 include all three species.

TABLE 12

Colony Counts of Jack Pine Sawflies on Ten Jack Pine Trees
at Each of Five Locations in the Sudbury District
from 1962 to 1964

Location	Av. d.b.h. of trees in inches in 1964	Av. no. of colonies per tree		
		1962	1963	1964
Nairn Township	6	5.5	5.2	6.0
Hanmer Township	5	15	25+	3.0
Rathbun Township	4	2.4	1.0	0.3
Cloche Island	5	2.2	1.7	2.0
Shakwa Lake	5	5.5	6.0	3.5

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Generally, populations of this sawfly remained at low levels, but a sharp increase in numbers occurred in a small jack pine plantation in Burpee Township on Manitoulin Island where a light infestation reported in 1963 increased to heavy intensity in 1964. A larval colony count revealed an average of 10.5 colonies per tree on 10 trees averaging 3-inches d.b.h. Counts of colonies at sample points in Burwash and Tehkummah townships averaged less than one colony per tree and were nil at two other locations.

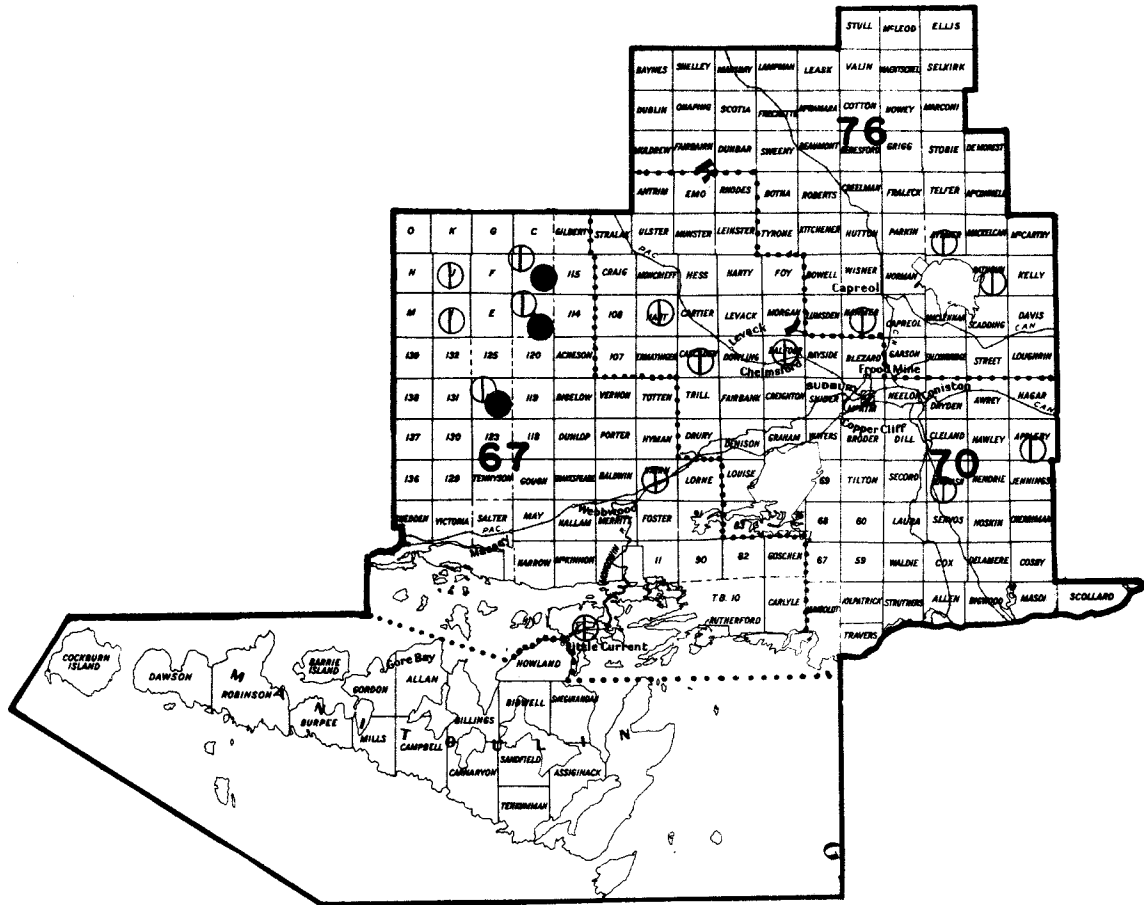
Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

An increase in the incidence of this pest, on small white spruce trees was evident in 1964. Severe defoliation occurred in two small plantations in Merritt Township. Scattered trees in plantations on the west end of Manitoulin and on Cockburn islands suffered light to severe defoliation. Elsewhere in the district small individual white and black spruce trees along roadsides and in old fields were heavily infested at numerous points.

Balsam Bud-mining Sawfly, Pleroneura borealis Felt

This bud-mining sawfly occurs in high numbers in alternate years and was prevalent on balsam throughout the district in 1964. Clumps of small open-grown trees frequently suffered moderate-to-severe shoot damage but generally damage was light. Population levels were higher at most sample locations than in 1962 when the insect was last abundant. One exception was in Salter Township where the percentage of shoots infested was much lower than in 1962 (Table 13). This was probably due to severe frost injury to the developing shoots in this area in 1964.

SUDBURY DISTRICT



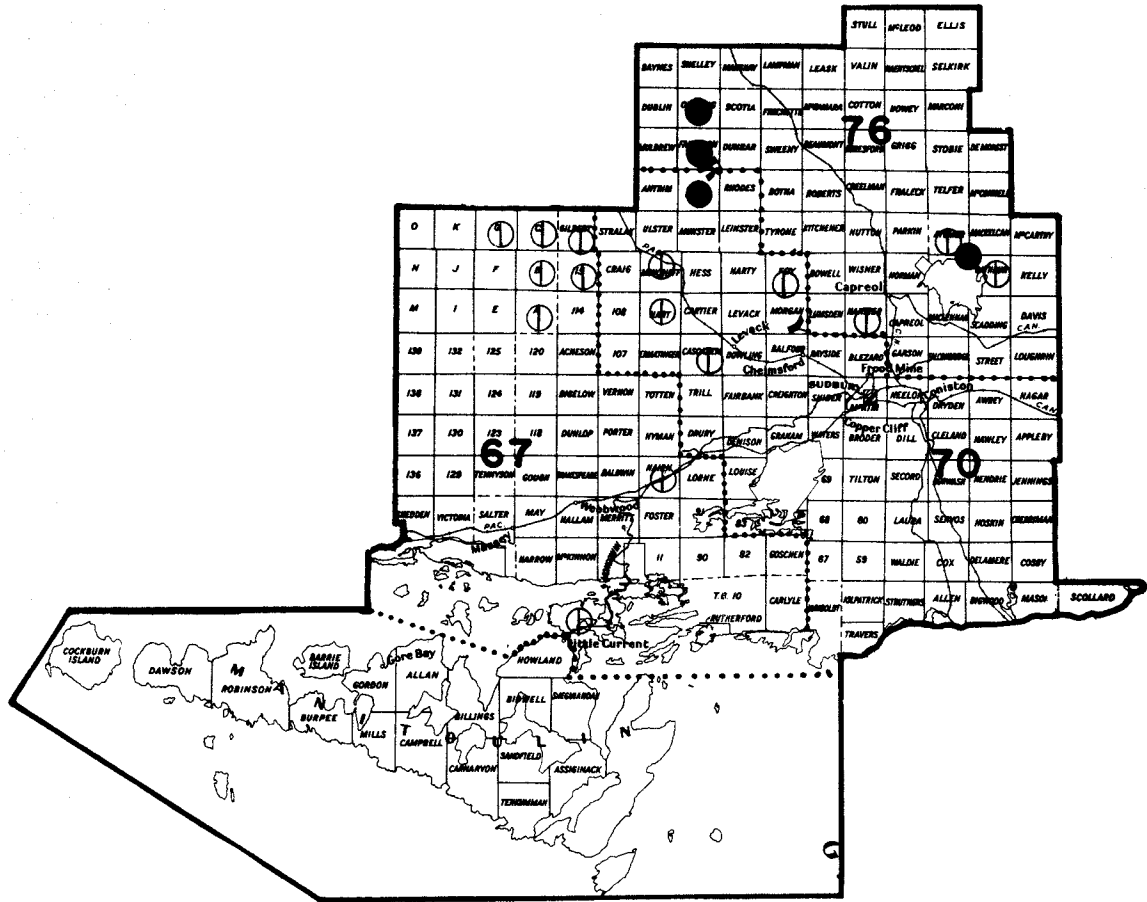
RED PINE SAWFLY

Locations where pockets of infestation occurred in 1964

Legend

- Light infestation ○
- Heavy infestation ●

SUDBURY DISTRICT



BLACK-HEADED JACK PINE SAWFLY

Locations where pockets of infestation occurred in 1964

Legend

- Light infestation ○
- Heavy infestation ●

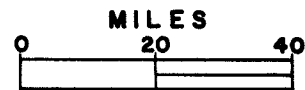


TABLE 13

Summary of Balsam-fir Shoot Boring Sawfly Counts
in Sudbury District from 1962 to 1964

Location (township)	Av. d.b.h. of trees in inches in 1964	Per cent of shoots mined		
		1962	1963	1964
Bigwood	2	11.5	1.0	24.5
Secord	2	4.7	1.9	5.3
Salter	2	32.0	0.0	1.7
Hallam	3	4.9	0.5	13.7
A	3	1.1	1.8	2.4
Mills	2	-	-	5.6
Moncrieff	2	3.5	7.0	11.5

Poplar Leaf Rollers, Pseudexentera oregonana Wlsh. m.
Epinotia nisella criddleana Kft.

This complex of leaf rollers again caused moderate-to-severe defoliation of most pole-sized aspen stands in the southern half of the district. Infestations were heaviest in Hallam, Denison, Balfour and Secord townships where complete stripping of clumps of aspen occurred. In the northern part of the district young trees on the fringes of stands were frequently heavily infested. However, defoliation inside stands was light or negligible.

European Pine Shoot Moth, Rhyacionia buoliana (Schiff.)

Infestations of this insect reported in plantations of red pine trees ranging from 3 to 6-feet in height on Manitoulin and Cockburn islands for the past three years increased in intensity in 1964. For example, 75 per cent of the bud clusters were infested in a small plantation in Mills Township on Manitoulin Island compared with 50 per cent in 1963 and severe shoot damage occurred in a large plantation on Cockburn Island where damage was light in 1963. Small scattered trees were lightly infested in several other red pine plantations on the islands but the insect was not found elsewhere in the district.

Bark Beetles, Scolytidae

During 1963 and 1964, intensive surveys were carried out to provide information on the distribution of bark beetles on white spruce and jack pine in Ontario. Although bark beetles usually attack dead and dying trees or slash, population levels of some species are known to build up sufficiently to cause mortality of healthy trees. Collections from Sudbury District are summarized in the following table.

TABLE 14

Summary of Bark Beetle Collections from White Spruce and Jack Pine
in Sudbury District in 1963 and 1964

Species	Host	Location
<i>Crypturgus atomus</i> Lec.	wS	Rutherford Township
<i>Dendroctonus piceaperda</i> Hopk.	wS	Rutherford Township
<i>Dryocoetes affaber</i> Mann.	wS	Parkin Township
<i>Dryocoetes affaber</i> Mann.	wS	139 Township
<i>Hylastes porculus</i> Erich.	wS	Salter Township
<i>Hylurgops pinifex</i> Fitch	wS	Salter Township
<i>Ips pini</i> Say	wS	Salter Township
<i>Ips pini</i> Say	wS	Tehkummah Township
<i>Ips pini</i> Say	wS	Robinson Township
<i>Ips pini</i> Say	jP	M Township
<i>Ips pini</i> Say	jP	Hart Township
<i>Ips pini</i> Say	jP	124 Township
<i>Ips chagnoni</i> Sw.	wS	Robinson Township
<i>Ips perturbatus</i> Eich.	wS	Howey Township
<i>Ips perturbatus</i> Eich.	wS	Hoskin Township
<i>Orthotomicus caelatus</i> Eich.	wS	Howey Township
<i>Orthotomicus caelatus</i> Eich.	wS	139 Township
<i>Orthotomicus caelatus</i> Eich.	jP	Nairn Township
<i>Orthotomicus caelatus</i> Eich.	jP	M Township
<i>Orthotomicus caelatus</i> Eich.	jP	Mills Township
<i>Orthotomicus caelatus</i> Eich.	wS	Servos Township
<i>Pityogenes plagiatus</i> (Lec.)	jP	Hart Township
<i>Pityogenes plagiatus</i> (Lec.)	jP	Selkirk Township
<i>Pityophthorus</i> sp.	wS	Salter Township
<i>Pityophthorus</i> sp.	jP	G Township
<i>Polygraphus rufipennis</i> Kby.	wS	Howey Township
<i>Polygraphus rufipennis</i> Kby.	wS	Parkin Township
<i>Trypodendron rufitarsus</i> Kby.	jP	132 Township
<i>Trypodendron rufitarsus</i> Kby.	jP	Hart Township

Spruce Bud Moth, *Zeiraphera ratzeburgiana* Ratz.

A general decline in intensity of infestations was evident in 1964. Although heavy infestation persisted on most open-grown white spruce trees on Manitoulin Island and at several other locations in the southern part of the district damage was less severe than in 1963. For example, damage to developing shoots rarely exceeded 50 per cent in 1964 whereas shoot damage estimated at 75 to 90 per cent occurred frequently in 1963. Scattered open-grown trees showed light damage at a few points in the northern part of the district.

TABLE 15

Summary of Miscellaneous Insects Collected
in Sudbury District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acordulecera</i> sp.	r0	Light infestation on scattered trees in Carlyle Township
<i>Acrobasis comptoniella</i> Hulst.	Sweet fern	Heavy infestation in Hanmer and Merritt townships
<i>Acrobasis betulella</i> Hlst.	wB	Light infestation in Rayside Township
<i>Adelges abietis</i> Linn.	wS, nS	Scattered trees heavily infested in white spruce plantations on Manitoulin and Cockburn islands; light damage on individual trees at a few other points (6)
<i>Anacamptis innocuella</i> Zell.	lA	Light infestation in Tilton Township
<i>Archips cerasivoranus</i> (Fitch)	cCh	Light infestation on clumps of cherry at numerous scattered points (6)
<i>Argyrotoxa semipurpurana</i> Kft.	r0	Light infestation in Billings and Allan tps.
<i>Choristoneura fumiferana</i> (Clem.)	bF, wS	Small numbers of larvae at each location (9)
<i>Cecidomyia reeksi</i> Vock	jP	Scattered shoots infested in Appleby Township
<i>Dasyneura balsamicola</i> Lintn	bF	Scattered pockets of heavy infestation on regeneration in northern part of district (10)
<i>Depressaria groteela</i> Rob.	Ha	Scattered pockets of light infestation (2)
<i>Dioryctria abietivorella</i> Grt.	wS	Heavy infestation on cones of scattered trees in plantations on Cockburn Island (2)
<i>Elaphidion parallelum</i> Newm	r0	Light infestation in Salter Tp. and in the Spanish River Reserve
<i>Enargia decolor</i> Wlk.	tA	Light infestation in Bigwood Tp.
<i>Epinotia momonana</i> Kft.	Al	A few pockets of light infestation (2)
<i>Epinotia lindana</i> Fern.	Do	Heavy infestation on lakeshore shrubs in Struther Tp.
<i>Epinotia solandriana</i> Linn.	wB	Light infestation in Secord, Hallam and G tps. (6)
<i>Eriophyes populi</i> Nal.	tA	Heavy infestation on single trees in Graham and Struthers tps.
<i>Exoteleia pinifoliella</i> Cham.	jP	A pocket of heavy infestation reported in Carnarvon Tp. in 1963 subsided to light intensity in 1964
<i>Fenusa dohrnii</i> (Tischb.)	Al	Light leaf mining at each location (3)

TABLE 15, Sudbury District

Insect	Host(s)	Remarks
<i>Gonioctena americana</i> Schaeef.	tA	Pockets of severe defoliation on aspen reproduction in B Township; light infestations at other scattered points (5)
<i>Gretchena delicatana</i> Heinr.	Ironwood	A few trees heavily infested in Tehkummah and Gough tps.
<i>Hyphantria cunea</i> Dru.	W, Ch, Al	A few widely scattered colonies (5)
<i>Lithocolletis ostensackenella</i> Fitch	Locust	Light leaf mining in Dawson Tp.
<i>Messa</i> sp.	tA	Light leaf mining on reproduction on Cloche Island
<i>Monoctenus juniperinus</i> MacG.	eC	Found only in Robinson Tp. on Manitoulin Island where a total of 10 larvae were collected in 15 beating-mat samples, a count in Billings Tp. was negative
<i>Nematus limbatus</i> Cress.	W	Light infestation in Hagar Tp.
<i>Neodiprion swainei</i> Midd.	jP	Light infestation persisted on a small island in Onaping Lake
<i>Nymphalis antiopa</i> Linn.	W, tA, E	Occasional colonies at scattered points (5)
<i>Operophtera bruceata</i> Hlst.	tA	A pocket of heavy infestation reported in Bigwood Tp. in 1963 declined to light intensity in 1964
<i>Pareophora minuta</i> (MacG.)	As	Light defoliation of scattered trees in Cosby and Waldie tps.
<i>Periclista</i> sp.	rO	Light to severe defoliation of individual trees in Cox Tp. and at a few points along the Killarney Highway.
<i>Pineus similis</i> Gill	wS	Light infestation on a few trees in Merritt Tp.
<i>Podapion gallicola</i> Riley	rP	Branches of several trees severely damaged in Broder Tp.
<i>Profenusa thomsoni</i> (Konow)	wB	Small numbers of leaves mined at each location (6)
<i>Pseudexentera cressoniana</i> Clem.	rO	Pockets of light infestation in Billings, Allan and Humbolt tps. (3)
<i>Psilocorsis fletcherella</i> Gibs.	tA	Pockets of light infestation (4)
<i>Recurvaria apicitripunctella</i> Clem.	He	Light needle mining in Mongowin Tp.
<i>Recurvaria piceaella</i> Kft.	wS	Light needle mining at each location (6)
<i>Rhabdophaga swainei</i> Felt	wS	Population levles very low throughout district, counts were negative (5)
<i>Rhyacionia frustrana</i> Comst.	jP	Light shoot mining at each location (7)
<i>Schizura concinna</i> J. E. Smith	Ap, W, wB, tA	Scattered colonies on roadside shrubs, insect more prevalent than in 1963 particularly in Espanola and Massey areas (6)
<i>Sciaphilus asperatus</i> Bonsd.	sM	A heavy infestation reported on reproduction in 1963 in Mongowin Tp. declined to light intensity in 1964

TABLE 15, Sudbury District

Insect	Host(s)	Remarks
<i>Sparganothis acerivorana</i> Mack.	sM	Light infestation in Billings Tp.
<i>Sparganothis sulfureana</i> Clem.	rP	Light infestation in plantations in Hallam Tp.
<i>Sternochetus lapathi</i> (Linn.)	W	Severe damage to roadside shrubs in Secord Tp.
<i>Tetralopha aplastella</i> Hlst.	tA	Pockets of light infestation on aspen reproduction (3)
<i>Toumeyella numismaticum</i> P. McD.	jP	Light damage on individual trees in Merritt and B tps.
<i>Zellaria haimbachi</i> Busck.	jP	Small numbers at each location (3)

STATUS OF INSECTS IN THE CHAPLEAU DISTRICT

		Page
Black-headed Budworm	<u>Acleris variana</u> Fern.	D 37
Birch Skeletonizer	<u>Bucculatrix canadensisella</u> Chamb..	D 37
Giant Elm Sawfly	<u>Cimbex americana</u> Leach	D 37
Larch Casebearer	<u>Coleophora laricella</u> (Hbn.)	D 37
A Scolytid Beetle of Jack Pine ...	<u>Conophthorus</u> sp.	D 38
A Leaf Roller	<u>Epinotia solandriana</u> Linn.	D 38
American Poplar Leaf Beetle	<u>Gonioctena americana</u> (Schaeff.) ..	D 38
Aspen Blotch Miner	<u>Lithocolletis salicifoliella</u> Chamb.	D 38
Forest Tent Caterpillar	<u>Malacosoma disstria</u> (Hbn.)	D 39
Western Tent Caterpillar	<u>Malacosoma pluviale</u> (Dyar)	D 39
Red-pine Sawfly	<u>Neodiprion nanulus nanulus</u> Schedl.	D 40
Black-headed Jack-pine Sawfly	<u>Neodiprion pratti banksianae</u> (Roh.)	D 40
Red-headed Jack-pine Sawfly	<u>Neodiprion virginianus</u> complex ...	D 40
Balsam Shoot-boring Sawfly	<u>Pleroneura borealis</u> Felt.	D 41
Amber-marked Birch Leaf Miner	<u>Profenusa thomsoni</u> (Konow)	D 41
A Leaf Roller on Aspen	<u>Pseudexentera oregonana</u> Wlsh. ...	D 42
Bark Beetles of Pine and Spruce Trees	<u>Scolytidae</u>	D 42
Summary of Miscellaneous Insects Collected		D 43

Fred Livesey

Black-headed Budworm, Acleris variana Fern.

Numbers of this insect in the district have declined sharply each year since 1962 when it occurred commonly on spruce and balsam fir (Table 5).

TABLE 5

Summary of Black-headed Budworm Larval Counts at Five Points in the Chapleau District from 1962 to 1964

Location (township)	Host	Av. d.b.h. of sample trees in inches	Total larvae per 15 tray sample		
			1962	1963	1964
11B	wS	9	8	4	1
9E	bF	4	4	1	0
13H	wS	9	24	2	0
Borden	bF	2	13	1	0
32	bF	3	8	1	0

Birch Skeletonizer, Bucculatrix canadensisella Chamb.

A marked increase was evident in numbers of this insect throughout the district. A broad band of medium infestation, averaging 30 miles in width, interspersed by pockets of heavy infestation occurred across the central part of the district.

A large area of heavy infestation occurred on immature white birch trees in parts of Peters, 35, 37, and Cosens townships. Foliage discolouration was especially conspicuous in the vicinities of Prairie Bee and Little Wawa lakes. Pockets of heavy infestation occurred along Highway 101 between the Nemegosenda River and the Chapleau-Gogama district border. Low population levels prevailed in the northern and southern parts of the district.

Elm Sawfly, Cimbex americana Leach

For several years inquiries have been received from Ontario Department of Lands and Forests towermen regarding large insects flying into tower windows or landing on the tower roofs, especially on warm days in the month of July. Specimens obtained in 1964 were identified as the giant elm sawfly. Entomological interest was aroused by the height at which these insects, (the so-called "tower-bugs,") were flying. This large, heavy-bodied adult is evidently a much stronger flyer than had been suspected, and larval populations must be higher and more widely distributed than was commonly believed.

Larch Casebearer, Coleophora laricella (Hbn.)

This potentially serious defoliator was found in the district for the first time in recent years, occurring in small numbers at three locations in the central part of the district.

A collection of casebearer larvae from Hoey Township was dissected at the Forest Insect Laboratory and revealed that 51 per cent of the larvae were sound. An introduced European parasite, Chrysocharis laricinellae (Ratz.), which was released in southern Ontario between 1934 and 1943, was recovered from 5 per cent of the larvae, and another internal parasite, Agathis pumilis (Ratz.) was found in 43 per cent of the larvae.

A Scolytid Beetle of Jack Pine, Conophthorus sp.

Population levels of this twig borer declined sharply throughout the district in 1964. For example, numbers of infested shoots dropped sharply in Township 12F, where quantitative sampling showed an average of 2.7 infested shoots per tree, compared with 24.3 per tree in 1963. Similar declines occurred near the village of Nemegos in Halsey Township and at other locations (Table 6).

TABLE 6

Summary of Damage by Conophthorus sp. on Jack Pine
Trees at Seven Points in the Chapleau District
from 1962 to 1964

Location (township)	Av. height in feet	Total no. of damaged shoots on ten trees		
		1962	1963	1964
Panet	16	42	56	37
28	15	46	81	19
11B	20	9	161	14
12F	16	106	243	27
Tooms	15	16	70	12
Halsey	15	-	251	37
11G	14	-	-	20

A Leaf Roller, Epinotia solandriana Linn.

Little change in population levels of this insect occurred in 1964. Immature and understory white birch trees were preferred hosts and rolled leaves were occasionally found on trembling aspen. A small area of heavy infestation occurred on fringe and understory white birch in 10D Township. Pockets of medium infestation persisted on exposed, shoreline trees in Five Mile Lake Provincial Park. Small light infestations occurred in the following widely-separated townships: D'Arcy, Chewett, DeGaulle, Cochrane, Borden, Biscotasi, 12H, Rennie, 35, Hoey, and Peters.

American Poplar Leaf Beetle, Gonioctena americana (Schaeff.)

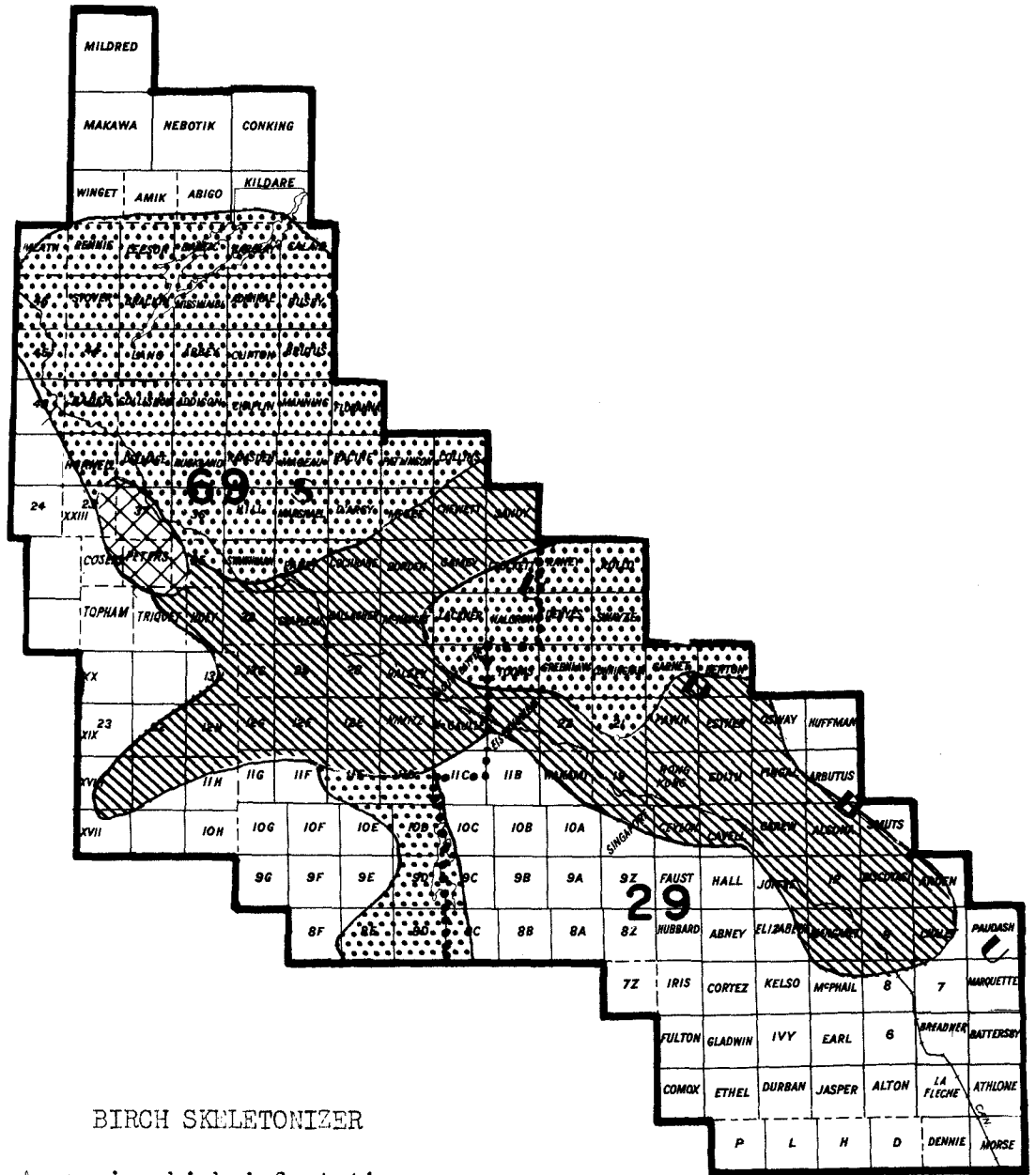
Pockets of medium-to-heavy infestation of this insect occurred on small trees at scattered locations in the central part of Division 69. Poplar understory and fringe trees were lightly defoliated at the 14-Mile Rapids on the Chapleau River; at Montreal Lake in 13G Township; and at Olympic Lake in Township 29. In Division 29 an isolated area of medium infestation occurred on Sheppard Island, Biscotasi Lake, in McPhail Township. Light infestations were observed in clumps and pockets of poplar reproduction along roadsides and in stands in Brutus, Busby, Brackin, Borden, 8D, 11C, and DeGaulle townships.

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Heavy infestations of recent years declined in 1964 but understory trees in large areas of the district still supported high populations. The eastern and southern parts of Division 29 had the highest larval populations, and foliage discolouration was severe throughout Fulton, McPhail, Smuts, and Durban townships.

In Division 69, one area of heavy infestation was observed around Nephic Lake in 12F Township. A count taken in this area revealed that 96 per cent of the leaves sampled were mined (Table 7).

CHAPLEAU DISTRICT



BIRCH SKELETONIZER

Areas in which infestations occurred in 1964

Legend

Light infestation.....



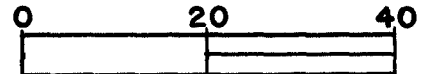
Medium infestation.....



Heavy infestation.....



MILES



Medium infestations were observed along Highway 101 from the town of Chapleau to the Gogama district boundary, and also near Wenebagon Lake in the southern part of the district.

TABLE 7

Summary of Aspen Blotch Miner Counts at Six Points in the Chapleau District from 1962 to 1964

Note: Counts were based on examination of 100 leaves from three trees at each location.

Location (township)	Per cent of leaves mined			Av. no. of mines per leaf		
	1962	1963	1964	1962	1963	1964
Manning	5	8	6	0.06	0.09	0.06
Fawn	20	97	14	0.23	6.81	0.15
Cochrane	-	6	16	-	0.06	0.19
Osway	94	81	67	4.80	10.17	2.82
10C	14	5	19	0.15	0.05	0.42
12F	84	90	96	2.16	9.32	4.71

Forest Tent Caterpillar, Malacosoma disstria (Hbn.)

A slight increase in numbers of this important insect was observed in the central part of the district in 1964. A pocket of light infestation occurred at Mulligan Bay on the Chapleau River in Cochrane Township, and scattered larvae were observed at Henderson and Robinson lakes in D'Arcy Township. Traces of defoliation occurred at Hoey Lake in Hoey Township, at Borden Lake in Borden Township, and near Five Mile Lake in Township 11D.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Population levels of this caterpillar increased slightly in the district. Herbicide spraying of roadside shrubbery in Blamey Township was an effective control measure (Table 8). Larval colonies were found on a large variety of deciduous hosts.

TABLE 8

Summary of Western Tent Caterpillar Larval Colony Counts per Measured Mile at Six Points in the Chapleau District from 1962 to 1964

Location (township)	Number of tents per mile		
	1962	1963	1964
Manning	4	13	9
L	3	12	8
Panet	14	6	6
8D	21	7	21
Chewett	-	34	12
Blamey	6	16	0

Red-pine Sawfly, Neodiprion nanulus nanulus (Schedl.)

Light-to-medium infestations persisted on fringe and open-grown jack pine in the southern part of Division 29. Exposed trees on rocky sites at Mozhabong, Indian, and Biscotasi lakes supported numerous larval colonies. A small group of red pine trees on an island in Biscotasi Lake was moderately defoliated.

In Division 69, a small area of light infestation occurred along the Nebskwashi River west of the Department of Lands and Forests Nursery at Chapleau. Scattered colonies were observed on both jack pine and red pine trees in four townships along the Chapleau River.

The generally low population levels of recent years is reflected in Table 9.

TABLE 9

Summary of Red Pine Sawfly Larval Colony Counts at Three Points
in the Chapleau District from 1962 to 1964

Location (township)	Host	Av. d.b.h. in inches	Av. no. of colonies per tree		
			1962	1963	1964
Panet	JP	3	0	0.2	0.1
Chapleau	JP	2	0	0.3	0.1
McPhail	rP	2	-	-	1.4

Sampling carried out in Gallagher Township and in Township 37 yielded nil results for the third successive year.

Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae (Roh.)

The three-year-old infestation at Mozhabong Lake in the southeastern part of Division 29 showed a further decline in intensity. Although some exposed trees on shorelines were severely defoliated and colonies were numerous in immature stands, infestations were light.

A small stand of 6" d.b.h. jack pine on an exposed, rocky site at Henderson Lake in D'Arcy Township was lightly infested, and suffered ten per cent defoliation. Widely-scattered colonies were observed elsewhere in D'Arcy Township, and in Panet and Chapleau townships.

Counts at Mozhabong Lake in Township D from 1962 to 1964 revealed 5.3 colonies per tree in 1962 compared with 6.1 in 1963 and 5.0 in 1964.

An interesting recovery of an introduced dipterous parasite, Drino bohemica Mesn. was made from larvae collected in Township D. This parasite was originally released in the area in 1938.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Low population levels of this insect were again observed in the Chapleau District. Small, exposed jack pine trees near Wakami Lake in the west-central part of Division 29 supported the highest population levels.

TABLE 10

Summary of Red-headed Jack-pine Sawfly Larval Colony Counts
at Six Points in the Chapleau District
from 1962 to 1964

Note: Ten trees having a d.b.h. of 2"-3" were examined at each location.

Location (township)	Av. no. of colonies per tree		
	1962	1963	1964
46	0.2	0.1	0.4
28	0	0.2	0
Panet	0	0.1	0
11D	0	0.1	0
12F	0	0	0.6
11B	-	-	1.7

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

A general increase in numbers of this insect was evident throughout the district (Table 11) but severe frost in early June killed large numbers of larvae. Small clumps of heavily infested understory and fringe trees were observed at Banana Lake in 13H Township, and at scattered points along Highway 101 east of the town of Chapleau.

TABLE 11

Summary of Damage by the Balsam Shoot-boring Sawfly
at Six Points in the Chapleau District
from 1962 to 1964

Location (township)	Av. d.b.h. of sample trees in inches	No. shoots examined	Per cent of shoots infested		
			1962	1963	1964
Borden	3	462	5.5	6.7	3.5
32	2	347	9.4	4.3	10.4
10C	2	376	4.3	2.5	3.5
Busby	2	518	6.1	3.7	8.1
Floranna	2	394	-	-	6.8
12F	2	568	-	-	10.7

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

Populations remained at extremely low levels throughout most of the district in 1964. One notable exception was observed on a small island in Murray Lake in Township 45, where understory and shoreline trees were heavily infested. Small pockets of light infestation occurred at Unegam Lake in Township 11D; at Rollo Lake in Rollo Township; at Wrong Lake in Busby Township, and near Serviss Lake in Borden Township. Population levels were low at sample locations (Table 12).

TABLE 12

Summary of Damage to White Birch Foliage at Five Points
in the Chapleau District from 1962 to 1964

Note: Counts were based on examination of 100 leaves from three trees at each location.

Location (township)	Av. height of sample trees in feet	Per cent of leaves mined		
		1962	1963	1964
Leeson	12	2	3	1
Garnet	15	7	3	1
Biscotasi	15	5	1	1
Nimitz	14	3	2	1
8E	15	6	2	0

A Leaf Roller on Aspen, Pseudexentera oregonana Wlshn.

This insect was most abundant in the southern two-thirds of the district where exposed trees in the Flame Lake-Horton Lake area of townships 8D and 9D were heavily infested, and understory and fringe trees around Biscotasi Lake in McPhail Township supported a medium infestation.

Population levels ranging from trace to light infestations occurred at numerous points in the central part of the district, rolled and shredded leaves being particularly common along Highway 101 east of the town of Chapleau.

Bark Beetles of Pine and Spruce Trees, Scolytidae

In 1963 and 1964 emphasis was given to the collection of bark beetles. In 1963 attention was focused primarily on beetles in spruce trees, whereas, in 1964 various species of pine were thoroughly examined. Although most bark beetles are found in slash or in dead trees and roots, an occasional living tree, if suppressed or decadent, will support high populations which may hasten the death of the tree.

A large area of windthrown jack pine trees south and west of the town of Chapleau has supported large numbers of beetles since the stands were extensively damaged by an ice storm in the spring of 1960. Table 13 lists the bark beetles collected in 1963, and Table 14 those found in 1964.

TABLE 13

Summary of Bark Beetles Collected from Pine and Spruce Trees
in the Chapleau District in 1963

Species	Host(s)	Township
<i>Dendroctonus obesus</i> Mann.	wS	Lackner Township
<i>Dryocoetes affaber</i> Mann.	wS	Lackner, Tp. 35
<i>Dryocoetes autographus</i> Hopk.	wS	Lackner Township
<i>Ips perturbatus</i> Eich.	wS	12E "
<i>Ips pini</i> Say	wS, bS	12E, 35, 10C tps.
<i>Orthotomicus caelatus</i> Eich.	wS, bS, jP	12E, Esther tps.
<i>Pityophthorus consimilis</i> Lec.	bS	DeGaulle Township
<i>Pityophthorus</i> sp.	bS	10C Township
<i>Polygraphus rufipennis</i> Kby.	bS, wS	12E "
<i>Conophthorus</i> sp.	jP	Widespread common

TABLE 14

Summary of Bark Beetles Collected from Pine and Spruce Trees
in the Chapleau District in 1964

Species	Host(s)	Township
<i>Conophthorus</i> sp.	jP	Widespread common
<i>Dryocoetes affaber</i> Mann.	wS	McNaught Township
<i>Dryocoetes autographus</i> Hopk.	wS	Sandy "
<i>Hylurgops pinifex</i> Fitch	jP	9E "
<i>Ips perroti</i> Sw.	jP	29 "
<i>Ips perturbatus</i> Eich.	wS	Sandy, Borden tps.
<i>Ips pini</i> Say	jP, wP, bS	22RXVIII, 35, 29, tps.
<i>Orthotomicus caelatus</i> Eich.	jP, rP	Wakami, 11B, Panet tps.
<i>Pityogenes hopkinsi</i> Sw.	wP	McGee, Fulton, 11H, 22RXVIII tps.
<i>Pityogenes plagiatus</i> (Lec.)	jP	29 Township
<i>Pityophthorus</i> sp.	jP	Wakami Township
<i>Polygraphus rufipennis</i> Kby.	wS	McNaught "

TABLE 15

Summary of Miscellaneous Insects Collected
in the Chapleau District
1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris calignosana</i> Wlk.	Alder	Low numbers in D'Arcy Township
<i>Acleris logiana</i> Linn.	wB	Low numbers in Borden Town- ship (2)
<i>Acrobasis betulella</i> Hlst.	wB	On shoreline trees along the Windermere River
<i>Acronicta funeralis</i> G. & R.	tA	Found only in Arden Township
<i>Acronicta leporina</i> Linn.	wB	Small numbers (2)
<i>Acronicta lepusculina</i> Gn.	tA	Cottonwood dagger moth found at Nephic Lake (2)
<i>Adelges strobilobius</i> Kalt.	bS	Small heavy infestation in Township L (3)
<i>Altica ambiens alni</i> Harr.	Alder	Small heavy infestations in 8D and Blamey townships (4)
<i>Anacamptodes vellivolata</i> Hlst.	bF	Low numbers at one location
<i>Anchylopera discigerana</i> Wlk.	wB	Widespread light infestations in 10H Township (3)
<i>Anchylopera fuscoliana</i> Clem.	wE	Common on understory trees along the 11G tower trail
<i>Anchylopera nebeculana</i> Clem.	pCh	Low numbers in Fawn Township (2)
<i>Badebecia urticana</i> Hbn.	Alder	Low numbers at one location
<i>Cecidomyia reeksi</i> Vock.	jP	Several trees lightly infested in Township D
<i>Choristoneura pinus</i> Freem.	jP	Low numbers of the jack pine budworm collected in Alton Tp.
<i>Choristoneura rosaceana</i> Harr.	W	Most common at Bones Lake in 10C Township (3)

TABLE 15, Chapleau District

Insect	Host(s)	Remarks
<i>Chrysomela crotchi</i> Brown	tA	Small pocket of moderate defoliation at Sinclair Lake in Panet Township (2)
<i>Chrysomela mainensis mainensis</i> Bechyne	Alder	Leaf beetle found in low numbers in D'Arcy Tp.
<i>Compsolechia niveopulvella</i> Chamb.	tA	Population levels were generally lower than in recent years (4)
<i>Croesus latitarsus</i> Nort.	wB	The Dusky Birch Sawfly was found only at Five Mile Lake
<i>Dasyneura balsamicola</i> (Lintn.)	bF	Populations greatly reduced by severe June frosts which killed developing shoots (2)
<i>Deuteronomos magnarius</i> Gn.	tA	Low numbers at Borden Lake
<i>Dimorphopteryx pinguis</i> (Nort.)	wB	Low numbers in Halsey and Borden townships (2)
<i>Dioryctria zimmermani</i> (Grote)	jP	Larvae found feeding in <u>Cronartium comptoniae</u> cankers on 7" d.b.h. trees in DeGaulle Tp.
<i>Disonycha alternata</i> Ill.	W	Small heavy infestation of leaf beetles at Zeph Lake, Blamey Tp.
<i>Dolerus</i> sp.	Elderberry	Numerous free-feeding sawfly larvae found at old mine site in McNaught Township
<i>Drepana bilineata</i> Pack.	wB	Low numbers in Halsey Tp.
<i>Elatobium abietinum</i> (Walk.)	wS	Low numbers of the Green Spruce Aphid in 13H and 11C townships (2)
<i>Euura hospes</i> (Walsh)	W	Leaf galls common in Township 45
<i>Fenusa dohrnii</i> (Tischb.)	Alder	Heavy leaf miner infestation near Unegam Lake (2)
<i>Gracillaria alnivorella</i> Chamb.	wB	Most common at Buttonshoe Creek in Township 9D (3)
<i>Gracillaria invariabilis</i> Braun	pCh	Medium infestation of the cherry leaf roller at 14-Mile Rapids, Chapleau River (2)
<i>Gracillaria syringella</i> F.	Lilac	Lilac leaf miner found commonly in town of Chapleau
<i>Gretchena semialba</i> McD.	Alder	Found only at Border Lake, Smuts Township
<i>Hyphantria cunea</i> Dru.	Alder	Low numbers of fall webworm observed at Horton Lake in 9D Township
<i>Hydriomena divisaria</i> Wlk.	bF	One larva only found
<i>Ichthyura inclusa</i> Hbn.	tA	The poplar tentmaker was found on exposed trees in Five Mile Lake Provincial Park
<i>Incisalia nippon clarki</i> Freem.	jP	Low numbers in Alton Tp.
<i>Lambdina fiscellaria fiscellaria</i> Gn.	bF, wS	Few hemlock loopers in beating tray samples (2)

TABLE 15, Chapleau District

Insect	Host(s)	Remarks
<i>Lepyrus palustris</i> Scop.	W	Large weevils found in Township 45
<i>Macrobotys</i> sp.	Ground cover	Heavy infestation at old camp in 11F Township (2)
<i>Meadorus lateralis</i> Say	wB	Collected once at Challener Lake
<i>Megastigmus piceae</i> Roh.	wS	Heavy infestation of cone insects near Challener Lake
<i>Meroptera pravella</i> Grt.	tA	Common near Wangoon Lake (4)
<i>Nematus ventralis</i> Say	tA	Scattered colonies on shoreline trees at Graveyard Lake
<i>Neodiprion swainei</i> Midd.	jP	Quantitative sampling in four townships in Division 29 yielded nil results
<i>Nepytia canosaria</i> Wlk.	jP	False hemlock loopers found on beating tray samples in Alton Township
<i>Nymphalis antiopa</i> Linn.	tA, W, wB	Individual hosts severely defoliated (6)
<i>Ortholepis pasadamia</i> Dyar	wB	Few at Rennie Lake, Rennie Township
<i>Palthis angulalis</i> Hbn.	bF	The spruce harlequin, collected only in 12E Township
<i>Pamphilius</i> (prob. <i>infuscatus</i>)	tA	Several large colonies of this web-spinning sawfly found on 10'-15' roadside trees in Stover Township
<i>Pareophora minuta</i> MacG.	bAs	Trees lightly infested in 9D and Sandy townships (2)
<i>Peridroma margaritosa</i> Haw.	ground	Common in gardens in town of Chapleau
<i>Phlyctaenia coronata tertialis</i> Gn.	Elderberry	The elder leaf tier; found along the 11G tower trail
<i>Phratora purpurea purpurea</i> Brown	tA	This leaf skeletonizer was found commonly in low numbers in the central part of the district (8)
<i>Phyllocnistis populiella</i> Chamb.	tA, bPo	Widespread low numbers of the poplar serpentine miner (2)
<i>Phyllocoptes aceris-crumena</i> (Rly.)	sM	Extremely heavy leaf gall infestation on all age classes around the 11G tower
<i>Pikonema alaskensis</i> Roh.	wS	Larval populations much reduced (3)
<i>Pikonema dimmockii</i> (Cress.)	wS	Low numbers of the green-headed spruce sawfly at scattered locations (3)
<i>Pineus similis</i> Gill.	wS	Common on individual trees at several locations (2)

TABLE 15, Chapleau District

Insect	Host(s)	Remarks
<i>Pineus strobi</i> (Htg.)	wP	The pine bark aphid; common in plantation at Flame Lake
<i>Pristiphora lena</i> Kincaid	bS	Single colonies at widely-separated points (2)
<i>Prociphilus tessellatus</i> (Fitch)	Alder	The woolly alder aphid was common in the southern and central parts of the district
<i>Protoboarmia porcelaria indicataria</i> Wlk.	wS	Occasional larvae found on beating tray samples (3)
<i>Raphia frater</i> Grote	tA	Very low numbers
<i>Rhabdophaga brassicoides</i> (Walsh)	W	Cabbage-galls common
<i>Rhabdophaga normaniana</i> Felt	W	Low numbers at Henderson Lake, D'Arcy Township
<i>Rhabdophaga strobiloides</i> (Walsh)	W	Light cone gall infestations at several locations (5)
<i>Rhabdophaga swainei</i> Felt	bS	The spruce bud gall midge virtually disappeared from the district. Four quantitative samples yielded nil results
<i>Rhinomacer elongatus</i> Lec.	wS	Weevils attracted to and trapped by gummy exudations of mechanically damaged trees in 9D Tp.
<i>Rhyacionia frustrana</i> Const.	jP	Low numbers found in Alton Tp.
<i>Sarothrips cinereana</i> N. & D.	bPo	Medium infestation under webbed leaves near Oscar Lake, Chewett Township
<i>Sarothrips frigidana</i> Wlk.	W	Small heavy infestations in Margaret and Rennie townships. Light on roadside trees at Montreal Lake in 13G Township (10)
<i>Sciaphila duplex</i> Wlshn.	tA	Most common near Flame Lake, Tp. 8D (6)
<i>Sparganothis acerivorana</i> Mack.	moM	Few leaf rollers found in McPhail Township
<i>Syngnatha selecta</i> Wlk.	wS	Collected only at 14-Mile Rapids, Chapleau River
<i>Tetralopha aplastella</i> Hlst.	tA	Light infestation on reproduction at Murray Lake, Tp. 45 (6)
<i>Toumeyella numismaticum</i> P. & M.	jP	Scattered pockets of light infestation. Some twig mortality near Horton Lake in 9D Township (2)
<i>Trypodendron betulae</i> Sw.	wB	Ambrosia beetles found in living trees in Sandy Township
<i>Vasates quadripes</i> Shim.	Cutleaf Maple	Heavy leaf gall infestation on ornamental trees in McPhail Tp.
<i>Xylomyges dolosa</i> Grt.	W, tA	Few found (2)
<i>Zanclognatha minoralis</i> Sm.	bF	One larva recovered from beating tray
<i>Zenobia pleonectusa</i> Grt.	tA	Low numbers at Flame Lake, Township 8D
<i>Zeugophora</i> sp.	tA	Low, widely scattered populations (2)

STATUS OF INSECTS IN THE GOGAMA DISTRICT

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R. A. Trieselmann

STATUS OF INSECTS

Alder Leaf Beetle, Altica ambiens alni Harr.

More extensive defoliation was caused by the alder leaf beetle in 1964 than in recent years. First generation larvae were observed throughout the eastern and southern parts of Division 72 until late July. By this time, light to moderate defoliation was noticeable at many locations in this area.

Severe defoliation of alder was caused by the second generation during August in Cabot, Churchill, Kelvin, and Kemp townships. Many pockets of medium to heavy defoliation were observed in Blewett, Garibaldi, MacMurchy, Mond, and Natal townships.

In Division 68, the insect was observed at numerous locations. Significant defoliation was caused by second generation larvae in several small pockets along Highway 101 and in the Ivanhoe Lake area. It seldom exceeded 15 per cent.

Ugly-nest Caterpillar, Archips cerasivoranus (Fitch)

A further decline of population levels of the ugly-nest caterpillar occurred in 1964. Infested shrubs were observed at many locations in the district. Quantitative sampling at five locations yielded lower results than in 1963. The sample points in Foleyet and Muskego townships which had shown negative sampling results for two years in succession were abandoned (Table 5).

TABLE 5

Summary of Ugly-nest Caterpillar Colony Counts at Five Locations in the Gogama District from 1961 to 1964

Location (township)	Host	No. of colonies per square chain plot			
		1961	1962	1963	1964
Gouin	W	-	-	6	2
Groves	pCh	0	0	1	0
Ivanhoe	cCh	-	-	7	3
Jack	cCh	2	36	5	1
Kelvin	cCh	23	17	2	0

Birch Sawfly, Arge sp., formerly Arge pectoralis (Leach)

The birch sawfly was observed at several locations in Division 72 in an area burned over in 1951 where open-growing white birch coppice was lightly infested.

One area of light infestation comprising about nine square miles occurred in parts of Burrows, Kemp, and Kelvin townships. A pocket of light infestation was observed in Mond Township and scattered clumps of white birch were lightly infested at a few locations in the north-eastern parts of Cabot and Togo townships, (Table 6 and photograph).

TABLE 6

Summary of Birch Sawfly Colony Counts and Defoliation Estimates
at Four Locations in the Gogama District in 1964

Location (township)	Host	Av. no. of colonies per 10 tree sample	Per cent defoliation	Degree of infestation
Burrows	wB	4.9	10	L
Kelvin	wB	2.4	5	L
Kemp	wB	9.3	15	L
Mond	wB	4.9	10	L

Birch Leaf Skeletonizer, Bucculatrix canadensisella Chamb.

White birch stands in most of the district continued to be infested by the birch leaf skeletonizer. The pockets of medium and heavy infestation which were recorded in 1963 increased in size, and moderate to severe damage was observed at several additional locations (see map). The damage, though generally more severe, was less conspicuous than in 1963 because white birch leaves changed color exceptionally early in the season.

Light to moderate skeletonizing of the foliage of occasional alder, hazel, and yellow birch was observed in areas where white birch was heavily infested (Table 7).

TABLE 7

Summary of Birch Leaf Skeletonizer Larval Counts at Nine Locations
in the Gogama District in 1964

Location (township)	Host	D.b.h. of sample trees in inches	Per cent leaves infested	Av. no. of larvae per leaf
Cabot	wB	2	100	5.9
Horwood	wB	3	98	2.7
Ivanhoe	wB	3	61	3.1
MacMurphy	wB	3	96	2.7
Middleboro	wB	6	94	1.7
Montcalm	wB	7	100	3.7
Pinogami	wB	7	74	1.9
Silk	wB	1	84	2.7
Sothman	wB	1	100	11.2
Sothman	Al	1	9	1.2

A Bark Beetle in Jack Pine Twigs, Conophthorus sp.

A further decline in population levels of this insect occurred in 1964. Pole-sized jack pine were infested in three cut-over and burned areas in Benneweis, Champagne, Vrooman and Westbrook townships comprising the Ostrom Flats, and in Horwood, Jack and Noble townships. The damage, though light, was conspicuous because of the flagging of shoots (Table 8). Occasional lightly infested trees were observed in the remainder of the district.

GOGAMA DISTRICT



BIRCH SKELETONIZER

Townships in which infestations were observed in 1964

Legend

- Light infestation.....⊖
- Medium infestation.....●
- Heavy infestation.....●

TABLE 8

Summary of Jack Pine Shoot Damage by Conophthorus sp. at Six Locations in the Gogama District in 1963 and 1964

Location (township)	No. of trees examined	Av. d.b.h. in inches	Av. height in feet	No. of infested trees		No. of infested shoots		No. of infested leaders	
				1963	1964	1963	1964	1963	1964
Benneweis	100	1/4	5	6	2	29	6	1	0
Garvey	100	2	12	7	5	23	12	0	0
Horwood	50	1	10	3	1	13	4	2	0
Jack	100	4	14	12	7	57	21	4	1
Vrooman	50	2	11	2	2	9	3	0	0
Westbrook	100	2	13	21	19	121	64	2	1

European Spruce Sawfly, Diprion hercyniae (Htg.)

Population levels of the European spruce sawfly increased slightly at most sampling stations. Small numbers of larvae were collected in beating samples at several locations in the district. Defoliation of spruce trees was negligible (Table 9).

TABLE 9

Summary of European Spruce Sawfly Larval Counts at Five Locations in the Gogama District from 1962 to 1964

Location (township)	Host	Av. d.b.h. of sample trees in inches	Total no. of larvae per 15-tray sample		
			1962	1963	1964
Benneweis	wS	10	3	1	7
Jack	bS	4	5	1	4
Jack	wS	10	12	9	14
Noble	wS	12	27	6	0
Stetham	wS	17	6	4	5

A Leaf Roller on White Birch, Epinotia solandriana Linn.

A pocket of medium infestation by this leaf roller was observed on a rock outcrop in Groves Township. Pole-size white birch were 35 per cent defoliated. A pocket of light infestation occurred in Coppell Township where approximately ten per cent of the foliage of mature white birch was damaged. Elsewhere in the district, large numbers of rolled leaves were found at numerous widely-scattered points.

White Pine Shoot Borer, Eucosma gloriola Heinr.

Damage by the white pine shoot borer was somewhat lighter than in recent years. Jack pine regeneration in the Ostrom Flats (parts of Garvey, Vrooman, and Westbrook townships) was infested and up to 14 per cent of the leading shoots were killed at some locations (Table 10 and photograph). No damage was observed elsewhere in the district.

TABLE 10

Summary of White Pine Shoot Borer Damage on Jack Pine at Three Locations in the Gogama District in 1963 and 1964

Location (township)	Av. d.b.h. of sample trees in inches	Av. height of sample trees in feet	No. of infested leaders per 100-tree sample	
			1963	1964
Garvey	2 1/2	12	19	14
Vrooman	1/2	6	1	2
Westbrook	1 1/2	9	14	9

A Leaf Beetle on Pin-cherry, Galerucella cavicollis Lec.

Pockets of infestation of this leaf beetle were observed at many locations in the district in 1964. Pin-cherry throughout Ivanhoe and Silk townships were severely defoliated. In Foleyet, Horwood, and Whigham townships approximately fifteen per cent defoliation of pin-cherry occurred. Numerous pockets of light to heavy defoliation occurred in Asquith, Cabot, Churchill, Kelvin, Kemp, and Mond townships. Large numbers of adult beetles emerged after mid-August.

A Leaf Beetle on Willows, Galerucella decora Say

Population levels of this insect increased sharply in 1964. A large area of heavy infestation was observed in Burrows, Kelvin, and Kemp townships. Open-growing willows, occurring in large patches in parts of these townships, which burned over in 1951, were almost completely defoliated.

Many pockets of light, medium, and heavy infestation were observed in the following townships: Benneweis, Cabot, Champagne, Mattagami, Noble, in Division 72; Foleyet, Ivanhoe, Lemoine, Strachan, Silk, Whigham, in Division 68.

Larval feeding occurred between July 12 and August 6.

American Poplar Leaf Beetle, Gonioctena americana (Schaeff.)

Leaf damage to trembling aspen by the American poplar leaf beetle was more widespread in 1964 than in recent years. The damage was generally light and confined to scattered clumps of regeneration and small pole-size trees throughout the district. More mature trembling aspen appeared to be free from attack. The following table reflects conditions encountered in numerous areas (Table 11).

TABLE 11

Summary of Estimates of Leaf Damage Caused by the American Poplar Leaf Beetle at Ten Locations in the Gogama District in 1964

Location (township)	Host	Av. d.b.h. of sample trees in inches	Per cent defoliation	Degree of infestation
English	tA	2	5	L
Ivanhoe	tA	2	20	L
Keith	tA	3	5	L
Kemp	tA	1	10	L
Mattagami	tA	2	10	L
Noble	tA	1/2	20	L
Ogilvie	tA	2	10	L
Reeves	tA	1 1/2	10	L
Sothman	tA	1 1/2	5	L
Whigham	tA	1	5	L

A Leaf Folder on Alders, Gracillaria alnivorella Cham.

Pockets of light and medium infestation of this leaf roller on alder were observed at several locations in the district. In Churchill and MacMurphy townships, 29 per cent and 27 per cent defoliation of green alder occurred. Larvae were collected from mid-June to early September. Green alder, which is less commonly found in the district than speckled alder, was the preferred host plant.

Fall Webworm, Hyphantria cunea Dru.

Low population levels persisted at several locations in the district. Occasional infested clumps of pin-cherry, alder, willow and white birch regeneration were observed in Asquith, Groves, Jack, Noble and Silk townships. Quantitative sampling results were lower at five of six permanent sample points (Table 12).

TABLE 12

Summary of Fall Webworm Colony Counts at Six Locations in the Gogama District from 1962 to 1964

Location (township)	Host	Sampling unit	Number of colonies		
			1962	1963	1964
Gouin	pCh	1 mile roadside	4	2	0
Groves	Al	1 mile roadside	8	5	1
Jack	Al	1 mile roadside	4	2	0
Jack	pCh & W	1 square chain	6	4	3
Noble	pCh & wB	1 mile roadside	7	3	2
Silk	pCh & W	1 mile roadside	38	7	9

An Army Worm, Leucania unipuncta Haw.

Large numbers of this insect occurred south-west of the CNR tracks in and around the village of Gogama in the latter part of July. Meadows and gardens as well as lawns were heavily infested. Damage was confined to the leaves of various

grasses. From 250 to over 400 larvae were counted in five, 2-square foot ground samples. Numerous dead and diseased larvae were observed.

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Light to heavy infestations of the aspen blotch miner persisted on trembling aspen regeneration and small pole-size trees in a large part of the district. Very high population levels and considerable leaf damage were observed at many locations (Table 13).

The infestations in the three eastern ranges of townships in Division 72 collapsed. Only occasional mined leaves were observed in this area.

Foliage samples from thirteen typical locations were dissected during the field season and the results are summarized in the following table (Table 14 and map).

TABLE 13

Summary of Leaf Damage
Caused by the Aspen Blotch Miner in the Gogama District in 1964,
Based on Samples of 100 Leaves at 13 Typical Locations

Location (township)	Per cent leaves infested	No. of mines per inf. leaf	Av. no. of mines per leaf
Carter	58	3.12	1.80
Champagne	22	1.14	.25
Coppell	91	4.08	3.71
Garibaldi *	3	1.00	.03
Hellyer	82	3.90	3.20
Invergarry	57	1.61	.92
Lemoine	94	2.24	2.11
Mattagami *	6	1.08	.06
Montcalm	49	1.59	.78
Oates	64	1.52	.97
Pinogami	82	5.98	4.90
St. Louis	43	1.35	.58
Silk	67	2.03	1.36

* - Based on 10 x 100 leaves to ensure greater accuracy.

TABLE 14

Summary of Larval Mortality and Adult Emergence of the Aspen Blotch Miner
Based on the Examination of 100 Infested Leaves at each
Location, in the Gogama District in 1964

Location (township)	No. of mines examined	Early instar paras.	Late instar paras.	Fungus	Cannibalism	Predation	Emerged	Unknown*
Carter	325	249	12	2	8	18	9	27
Champagne	113	33	25	6	2	4	17	26
Coppell	398	176	57	3	30	17	29	86
Garibaldi	103	56	31	6	-	3	3	4
Hellyer	388	105	152	3	11	24	27	66
Invergarry	169	108	31	9	6	2	8	5
Lemoine	234	43	116	6	16	25	26	2
Mattagami	104	46	15	-	-	3	2	38
Montcalm	145	82	24	9	3	8	14	5
Oates	146	12	53	5	6	9	19	42
Pinogami	603	98	243	12	54	13	181	2
St. Louis	157	65	33	5	1	10	20	23
Silk	201	59	60	7	13	7	35	20

* - 93 per cent of these refer to failure to complete the first instar

Western Tent Caterpillar, Malacosoma pluviale Dyar

Lightly to moderately infested clumps of shrubs, mainly along roadsides and in clearings, were observed at numerous locations in the district. The preferred host was pin-cherry, but occasional collections were taken from trembling aspen regeneration and willow. An increase in numbers of tents at most sampling stations was indicative of the increase in population levels that occurred in the district as a whole (Table 15).

TABLE 15

Summary of Western Tent Caterpillar Colony Counts Made at Six Locations in the Gogama District from 1961 to 1964

Location (township)	Host	No. of colonies per 1 measured mile of roadside			
		1961	1962	1963	1964
Kelvin	W	-	1	12	17
Mattagami	pCh & W	8	3	2	8
Noble	pCh	6	3	11	18
Roblin	pCh	-	17	19	14
Silk	pCh	-	-	11	22
Togo	pCh	3	2	5	11

Balsam Fir Sawfly, Neodiprion abietis complex

This insect occurred in large numbers and at more locations than in recent years. Two lightly infested clumps of pole-size white spruce were observed in Zavitz Township and single trees, supporting low populations, were noted at many points in the district. Defoliation was negligible in all instances. Collections were taken from balsam fir, black spruce, and white spruce (Table 16).

TABLE 16

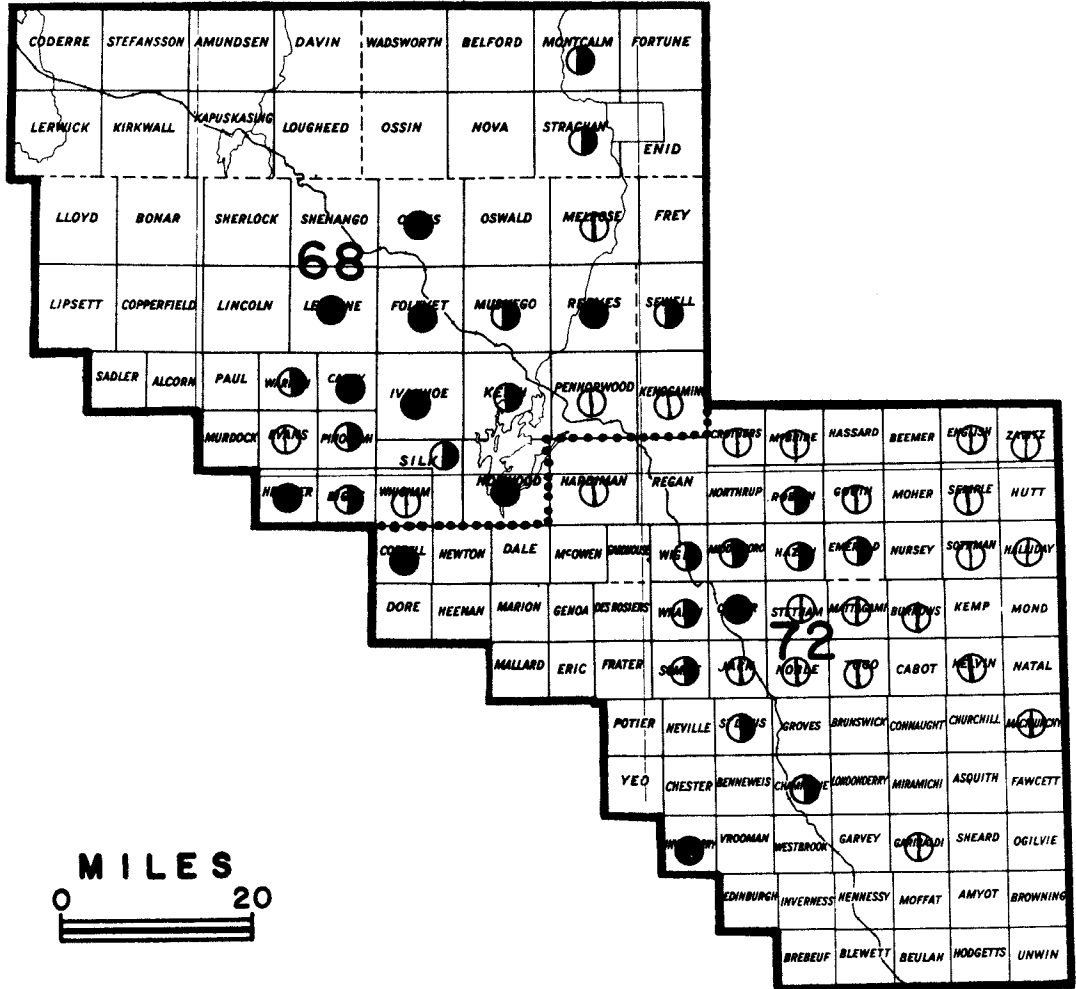
Summary of Balsam Fir Sawfly Larval Counts Made at Four Locations in the Gogama District from 1961 to 1964

Location (township)	Host	Av. d.b.h. of sample trees in inches	Total no. of larvae per 15-tray sample			
			1961	1962	1963	1964
Benneweis	wS	11	10	0	4	9
Jack	wS	13	4	0	3	6
Jack	bF	6	-	-	5	12
St. Louis	bS	3	4	0	2	3

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl.

An increase in population levels of the red pine sawfly occurred at several locations in the district in 1964. A small pocket of light infestation on pole-size red pine in the southern part of Foleyet Township caused defoliation of approximately ten per cent. Lightly infested clumps of red pine and jack pine were noted at seven other locations in the district (Table 17).

GOGAMA DISTRICT



ASPEN BLOTCH MINER

Townships in which infestations
were observed in 1964

Legend

- Light infestation.....⊕
- Medium infestation.....◐
- Heavy infestation.....●

TABLE 17

Summary of Red Pine Sawfly Colony Counts Made at Seven Locations
in the Gogama District in 1963 and 1964

Location (township)	Host	Av. d.b.h. of sample trees in inches	Av. no. of colonies per 10-tree sample	
			1963	1964
Foleyet	rP	4	-	7.2
Hodgetts	jP	4	.3	.5
Invergarry	jP	6	-	.3
Ivanhoe	rP	6	-	.4
Jack	jP	6	.2	.3
Mattagami	rP	2	-	.7
Noble	jP	6	4.6	2.2

Alder Woolly Aphid, Prociphilus tessellatus (Fitch)

Heavy infestations of this aphid were observed in 11 townships in the central and north-central parts of Division 72. Clumps of lightly to severely infested alder occurred at many locations in the district. No visible damage resulted on currently infested branches and stems but numerous alders which had been infested for consecutive years showed heavy branch and stem mortality in 1964.

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

The amber-marked birch leaf miner was observed throughout the district, mainly in the foliage of suppressed trees and shaded branches and rarely on open-grown trees. Population levels declined in 1964 but small pockets of light infestation occurred in Asquith, Ivanhoe, Mattagami, and Togo townships. Lightly infested clumps of white birch were noted at many points in the district.

A Leaf Roller on Trembling Aspen, Pseudexentera oregonana Wlshn.

This insect, not collected in the Gogama District in recent years, was observed at several locations during June, 1964. Two pockets of light infestation occurred in Noble and Whigham townships, where approximately 15 per cent of the foliage of trembling aspen regeneration was damaged. Single, lightly infested trees were noted at several points in Sothman Township.

TABLE 18

Summary of Miscellaneous Insects Collected
in the Gogama District in 1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris variana</i> Fern.	wS	A few lightly infested trees in Ivanhoe Tp. (2)
<i>Adelges strobilobius</i> Kalt.	bS	Occasional heavily infested trees at several locations
<i>Altica corni</i> Woods	Do	Small pockets of light to medium infestation in Foleyet, Ivanhoe, and Reeves tps. (3)
<i>Anchylopera discigerana</i> Wlk.	wB	Occasional lightly infested trees in Ivanhoe, MacMurchy, and Middleton tps. (3)

TABLE 18, Gogama District

Insect	Host(s)	Remarks
<i>Anchylopera nubeculana</i> Clem.	Se	Small numbers of folded leaves observed in Foleyet Tp.
<i>Choristoneura fumiferana</i> Clem.	bF, bS, wS	Small numbers of larvae found at widely scattered points in the district (6)
<i>Cimbex americana</i> Leach	tA, W	Occasional larvae in Cabot, Foleyet, and Noble tps. (3)
<i>Coleophora laricella</i> Hbn.	tL	A few lightly infested trees in St. Louis Tp. (2)
<i>Compsiolechia niveopulvella</i> Chamb.	tA	Small numbers found in Noble and Sothman tps. (2)
<i>Corythucha elegans</i> Drake	wB, W, Ha, Mos	Conspicuous browning of foliage caused by this lace bug. Heaviest damage along stretches of Highway 101 in the southern half of Division 68 (4)
<i>Dasyneura balsamicola</i> Lintn.	bF	Low population levels at scattered locations in the district (4)
<i>Disonycha alternata</i> Ill.	W	Occasional clumps of willow severely defoliated in Reeves and Foleyet townships.
<i>Elatobium abietinum</i> (Walk.)	wS	Low population levels in Foleyet Tp.
<i>Eriophyes betulae</i> Steb.	wB	Occasional infested trees in Noble and Reeves tps. (2)
<i>Eriophyes fraxiniflora</i> Felt.	bAs	Clumps of heavily infested black ash in Natal Tp.
<i>Eriophyes populi</i> Nal.	tA	Occasional lightly infested trees in Keith, Noble, and Togo tps. (3)
<i>Eriosoma americanum</i> (Riley)	wE	Heavily infested white elm in Ivanhoe Tp., lightly infested trees in Unwin Tp.
<i>Feralia jocosu</i> (Guen.)	wS	Small numbers of larvae found in Jack and Hodgetts tps. (2)
<i>Gracillaria invariabilis</i> Braun.	pCh	Lightly to moderately infested pin cherry at many locations in the district mainly in Division 68 (6)
<i>Gretchena semialba</i> McD.	Al	Found in small numbers in McBride Tp.
<i>Halisidota maculata</i> (Harr.)	Al, bPo, tA	Occasional larvae observed in Horwood, Noble, and Oates tps. (3)
<i>Hydriomena divisaria</i> Wlk.	wS, tL	Single larvae found in Benneweis, Jack, and St. Louis tps. (3)
<i>Lytta sayi</i> Lec.	cCh	Large numbers of adult beetles observed on choke cherry in Jack Tp.
<i>Macrobotis</i> sp.	Dogbane	Very common in Jack and Ivanhoe tps.

TABLE 18, Gogama District

Insect	Host(s)	Remarks
<i>Magdalis austera</i> Fall	jP	Found in beating sample in Foleyet Tp.
<i>Malacosoma disstria</i> Hbn.	tA	Approximately 150 acres very lightly infested in Beulah Tp., occasional larvae in Ivanhoe, Keith, and Mattagami tps.
<i>Mindarus abietinus</i> Koch	bF	Varying population levels observed at many locations in the district (3)
<i>Mordwilkoja vagabundus</i> (Walsh)	tA	Lightly infested trees observed in Semple and Westbrook tps. (2)
<i>Mulsantina hudsonica</i> Csy.	bF	Small numbers of lady beetles found in beating samples (3)
<i>Nadata gibbosa</i> A. & S.	wB	Found only in Silk Tp.
<i>Nematus limbatus</i> Cress.	W	Occasional colonies observed in Carty Tp.
<i>Nematus</i> sp. (l.f.s.)	tA, bPo	Very low population levels at many locations in the district (5)
<i>Nematus ventralis</i> Say	tA	Caused light damage to regeneration in Ivanhoe Tp.
<i>Nyctobia limitaria</i> Wlk.	bS, wS	Occasional larvae found in Jack and Kenogaming tps. (2)
<i>Nymphalis antiopa</i> (L.)	tA, wE, bPo	Clumps of regeneration and small pole-size trees severely defoliated by the spiny elm caterpillar in Coppell, Ivanhoe, Horwood, and Silk tps. (4)
<i>Ocnerostoma</i> sp.	rP	Low population levels in Foleyet Township
<i>Orsodacne atra</i> (Ahr.)	Do	Found in large numbers on dogwood in Ivanhoe Township
<i>Orthosia revicta</i> Morr.	wS	Small numbers in tray sample in Jack Township
<i>Paonias excaecata</i> (A. & S.)	wB	Found in Mond Township
<i>Papilio glaucus</i> L.	tA	Occasional larvae in Oates Tp., large numbers of adults in Hazen Tp.
<i>Pareophora minuta</i> (MacG.)	bAs	Clumps of black ash at many locations in the district lightly infested (3)
<i>Parorgyia plagiata</i> Wlk.	wS	Occasional larvae in Foleyet Tp.
<i>Phenacaspis pinifoliella</i> Fitch	wS	Small pockets of understory white spruce lightly infested in Foleyet Tp.
<i>Pheosia rimosa</i> Pack.	tA	Low numbers in Lemoine Tp.
<i>Phlyctaenia tertialis</i> (Guen.)	EL	Numerous pockets of light and medium infestation; very common in Ivanhoe and Mattagami tps. (3)
<i>Phratora purpurea purpurea</i> Brown	tA, W	Low population levels at many locations in the district (5)

TABLE 18, Gogama District

Insect	Host(s)	Remarks
<i>Pikonema alaskensis</i> (Roh.)	wS	Found in beating sample in Benneweis Tp.
<i>Pikonema dimmockii</i> (Cress.)	wS	Occasional larvae found in Ivanhoe and Jack tps. (2)
<i>Pineus floccus</i> (Patch)	bS	Heavily infested trees in Browning and Silk townships (2)
<i>Pineus similis</i> Gill.	wS	Clumps of heavily infested trees in Ivanhoe Tp., lightly infested trees in Somme Tp. (2)
<i>Pleroneura borealis</i> Felt.	bF	High population levels at many locations in the district wiped out by severe nightfrost in early June
<i>Pristiphora lena</i> Kincaid	wS	Occasional larvae in Hodgetts Tp.
<i>Protoboarmia porcelaria indicataria</i> Wlk.	bF, bS, wS	Solitary larvae observed at several widely scattered locations (4)
<i>Pyrrhia umbra exprimens</i> Wlk.	bPo	Lightly infested clumps of small balsam poplar in Frey and Ivanhoe townships (2)
<i>Rhabdophaga brassicoides</i> (Walsh)	W	Common throughout district
<i>Rhabdophaga strobiloides</i> (Walsh)	W	Common throughout district
<i>Rhabdophaga swainei</i> Felt	wS	Very low population levels
<i>Rhynchites cyanellus</i> Lec.	wB	Occasional adult weevils in St. Louis Tp.
<i>Saperda calcarata</i> Say	bPo	Observed in Foleyet Tp.
<i>Sarrothrippus cinereana</i> N.D.	bPo	Areas of balsam poplar regeneration in Frey, Horwood, and Ivanhoe tps. lightly infested (3)
<i>Sarrothrippus frigidana</i> Wlk.	W	Numerous clumps of willow in Noble, Silk, and Togo tps. lightly to moderately infested (3)
<i>Schizolachnus piniradiatae</i> (Dav.)	rP	Occasional lightly infested trees in Foleyet and Noble tps.
<i>Sciaphila duplex</i> Wlsh.	tA	Small numbers of larvae in Noble Tp.
<i>Semiothisa</i> sp. (<i>granitata</i> group)	bF, wS, tL	Single larvae at numerous locations in the district (4)
<i>Smerinthus</i> sp.	tA	Small numbers in St. Louis Tp.
<i>Sthenopis quadriguttatus</i> Grt.	wB, W	Single adults observed in Noble and Ivanhoe tps. (2)
<i>Syngrapha</i> sp.	bF, bS, wS	Occasional larvae in Foleyet, Jack, Noble, and Sewell tps. (4)
<i>Tetralopha aplastella</i> Hlst.	tA	Low population levels in Noble Tp., not observed in remainder of the district

TABLE 18, Gogama District

Insect	Host(s)	Remarks
Trichiosoma triangulum Kby.	tA	Single larvae in Benneweis Tp., occasional adults in Semple Tp. (2)
Zeiraphera sp.	wS, bS	Small numbers of larvae in beating samples in Foleyet, Kenogaming, and Zavitz tps. (3)
Zeugophora sp.	tA, bPo	Lightly infested clumps of regeneration in Foleyet, Ivanhoe, and Melrose tps (3)

STATUS OF INSECTS IN THE WHITE RIVER DISTRICT

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P. G. Pilley

STATUS OF INSECTS

Black-headed Budworm, Acleris variana (Fern.)

Population levels of this insect continued to decline from peak populations in 1961 and 1962 as evidenced by larval counts in sample plots (Table 5). This trend was also reflected in the number of collections submitted. Nine samples were obtained in 1964 compared with 38, 44, 25, and 13 collections in 1960, 1961, 1962, and 1963 respectively.

TABLE 5

Summary of Black-headed Budworm Larval Counts in White River District from 1960 to 1964

Note: Counts were based on the total number of larvae from 20 tray samples, two from each of ten trees at each location.

Location (township)	Host	Av. d.b.h. in inches	Total number of larvae				
			1960	1961	1962	1963	1964
74	wS	4	2	21	20	8	11
32 Range 27	bS	4	1	1	2	1	1
29 Range 23	wS	4	-	42	11	0	0
30 Range 23	wS	8	-	40	35	14	0

Cherry Ugly-nest Caterpillar, Archips cerasivoranus (Fitch)

Population levels of this tent-forming insect fluctuated moderately in 1964 (Table 6). In the vicinity of the Michipicoten Gun Club in Township 30 Range 23 an increase in the incidence of larval nests was recorded for the third consecutive year. As in 1963, no tents were observed in Township 49 where 16 were counted in a square-chain plot in 1962.

TABLE 6

Summary of Cherry Ugly-nest Caterpillar Colony Counts on Choke Cherry in White River District from 1962 to 1964

Location (township)	Sample unit	Number of tents observed		
		1962	1963	1964
29 Range 23	1 square chain	57	1	0
74	1 mile roadside	77	18	1
30 Range 23	1 mile roadside	200	410	470
29 Range 23	1 square chain	-	23	45

Birch Skeletonizer, Bucculatrix canadensisella Cham.

The heavy infestations which occurred in the northern half of Mobert Division in 1963 declined to light intensity with the exception that many pockets of severe skeletonizing of white birch foliage persisted in five townships east of White Lake. A marked increase in population levels was evident in the Fire-sand River area near Wawa, along the Manitowik Lake road, and in townships 29 ranges 25 and 26 (see map). Light skeletonizing was observed at several locations elsewhere in the district.

Larch Casebearer, Coleophora laricella (Hbn.)

Quantitative sampling has revealed a general increase in larval numbers for the past three years (Table 7). In 1964, the most noteworthy increase occurred in Township 30 Range 26 where 12.5 larvae per 18-inch branch tip was recorded, compared with 4.8 larvae per branch tip in 1963.

New distribution records were established in the district in townships 27 and 28 in Range 26. In the same range (Township 30) in late September, more than 120 overwintering larvae were counted on the top four feet of a six foot tree.

Two species of hymenopterous parasites introduced from Europe and now known to be established in White River District were recovered from overwintering larch casebearers submitted to the Laboratory. In a collection made in Township 71, for example, 75 per cent of the larvae contained a braconid, Agathis pumila (Ratz.), and 1 per cent were parasitized by Chrysocharis laricinellae (Ratz.), an eulophid recovered for the first time in 1964.

TABLE 7

Summary of Larch Casebearer Larval Counts in White River District from 1962 to 1964.

Note:- Counts were based on the number of larvae on four 18-inch branch tips from each of four trees at each location.

Location (township)	Av. d.b.h. in inches	Av. no. of larvae per branch tip		
		1962	1963	1964
Leslie	4	0.3	0.6	1.0
71	4	3.4	3.5	7.1
29 Range 23	5	1.7	0.9	1.1
30 Range 26	4	2.7	4.8	12.5
Pic	5	3.0	12.5	14.5

A Scolytid in Jack-pine Twigs, Conophthorus sp.

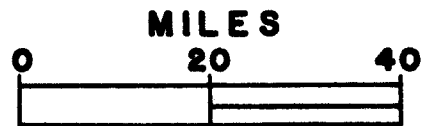
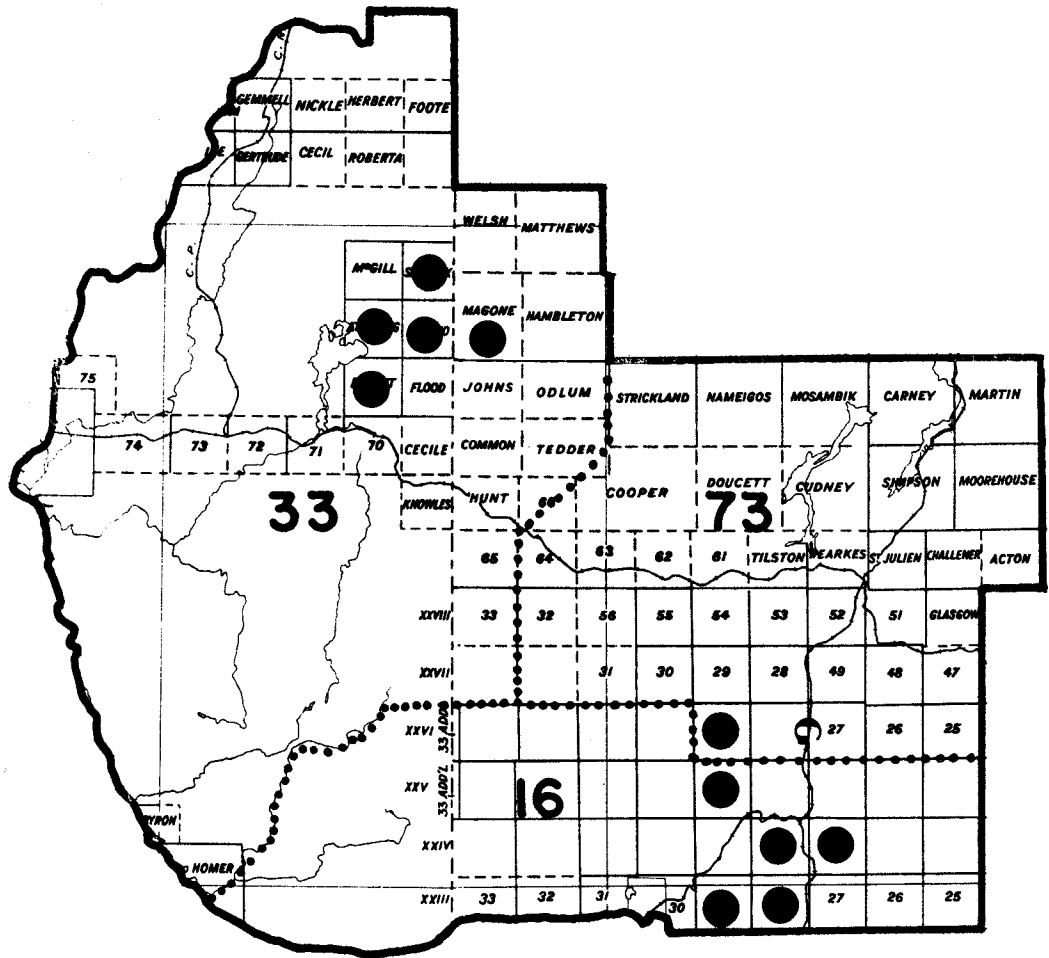
A general decline in numbers of this twig borer was observed in the district in 1964. For example, in Hunt Township an average of one infested shoot per tree was recorded, compared with four infested shoots in 1963 (Table 8). Light twig damage was observed at several locations elsewhere in the district.

TABLE 8

Summary of Conophthorus Twig Damage Counts in White River District from 1962 to 1964.

Location (tp. or sample point)	No. trees examined	Av. tree height in feet.	No. trees infested in 1964.	Av. no. of infested shoots per tree		
				1962	1963	1964
Mile 0.6,						
Camp 70 road-OPC	20	8	3	0.6	0.6	0.2
Hunt	20	11	8	6.2	4.0	1.0
29 Range 23	20	10	4	0.4	0.5	0.2
Camp 53 -OPC.	20	11	10	1.2	1.0	0.8

WHITE RIVER DISTRICT



BIRCH SKELETONIZER

Townships in which heavy infestations occurred in 1964 ●

The European spruce sawfly was first recorded from the White River District in 1938 (Ann.Rept. For. Ins. Survey. 1938: 38). Mr. B.J. Smith collected one larva of this species in beating mat samples near Hawk Junction from white spruce on July 12, 1938 (collection no.4151). Because this record represented a considerable extension in the known distribution of the insect, it was immediately followed up by an intensive search in the area and no larvae were found. Intensive sampling from both white and black spruce trees in the District over the next 23 years failed to produce this insect until 1961. In that year, five larvae were found in beating tray samples taken from white spruce in Glasgow Township. In 1964, this sawfly was collected at three locations. Very small numbers of larvae were found in Township 29 Range 23, Township 31 Range 27, and in Gudney Township. It is of interest to note that, so far, all collections of larvae have been made in July and from white spruce.

Aspen Blotch Miner, Lithocolletis salicifoliella Cham.

A decline in numbers of this leaf-mining insect was evident in the district in 1964. Counts of damaged leaves reached their lowest level in several years (Table 9).

Heavy infestations which occurred along the Cawdron Lake road in 1963 subsided in 1964. Only occasional patches of aspen reproduction were severely damaged. Regeneration was heavily infested on a small island in Wabatongushi Lake. Light leaf-mining was observed at a few locations elsewhere in the district.

TABLE 9

Summary of Aspen Blotch Miner Counts in White River District from 1962 to 1964.

Note:- Counts were based on the examination of 100 leaves from three trees at each location.

Location (tp. or sample point)	Av. d.b.h. in inches	Per cent of leaves mined		
		1962	1963	1964
Hunt	2	4	6	1
Barbara Lake	4	1	2	0
Mile o.2, Cp. 70 rd.-OPC.	3	2	5	0
Mikano	4	2	4	0
30 Range 23	3	3	4	2

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Little change in population levels of this insect was evidenced by quantitative sampling in 1964 (Table 10). Tents occurred most commonly on pin cherry, white birch, and willow and less frequently on serviceberry, choke cherry, alder, and mountain ash. At four locations, primary tents were measured and classified according to shape (long, polygonal, or triangular) for use in population studies.

TABLE 10

Summary of Western Tent Caterpillar Colony Counts per Measured Mile of Roadside in White River District from 1962 to 1964.

Location (tp. or sample point)	Number of tents per mile		
	1962	1963	1964
Mile 18, Manitowadge road	14	10	16
Bryant	12	8	6
Magone	9	6	6
Township 71	14	12	8
Mile 7, Camp 70 rd.-OPC	16	17	8

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Sampling of the red-headed jack-pine sawfly over the past five years has shown gradual change toward low values in 1962 and a return in 1964 to numbers similar to those recorded in 1960 (Table 11).

In 1964, counts on jack pine reproduction in Rumsey's plantation showed a definite decline but in Township 71 quantitative sampling revealed an average of 1.4 colonies per tree where for the past two years no colonies occurred. Defoliation at all sample points was less than ten per cent of the current year's foliage. Scattered colonies were observed at numerous locations elsewhere in the district.

TABLE 11

Summary of Larval Colony Counts of the Red-headed Jack-pine Sawfly in White River District from 1960 to 1964.

Location (tp. or sample point)	d.b.h. in inches	No. trees examined	Av. no. of colonies per tree				
			1960	1961	1962	1963	1964
Hunt	4-7	20	1.4	1.4	0.0	0.6	0.8
Pearkes	4-7	10	2.0	3.8	0.0	0.3	0.4
Township 70	2-5	20	2.1	3.9	0.0	1.6	2.2
Township 64	5-7	20	-	3.0	0.4	1.9	2.3
Rumsey's plantation	1-2	20	-	-	-	3.2	1.2
Township 71	2-3	10	2.6	1.2	0.0	0.0	1.4

Spiny Elm Caterpillar, Nymphalis antiopa Linn.

A substantial increase in population levels of this deciduous defoliator was evident in the district in 1964. Larval colonies were observed far more commonly than in recent years. Single and clumps of trees ranging up to ten feet in height were severely defoliated in Mikano, 48, Pic, 73, and Leslie townships; along the Manitowadge road; near the Michipicoten Gun Club; Camp 46-OPC; and in townships 27 and 29 Range 26. Trembling aspen was most commonly attacked. Other hosts were willow and balsam poplar.

Larvae were observed until August 31 and small flights of adults (mourning cloak butterflies) were seen at a few points in the district in late summer and early fall. Special collections of larvae were submitted to the Insect Pathology Research Institute for virus multiplication.

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

Damage to the new shoots of balsam fir caused by this sawfly was found commonly in the district. Quantitative sampling in other districts over a period of years has shown that high numbers occur in alternate years. This biennial trend occurred in White River District in 1963 and 1964 (Table 12). The highest incidence of attack was recorded at Mile 10.9 on the Manitowadge road where 13.1 per cent of the new shoots were infested, compared with 3.9 per cent in 1963. Only the new shoots which survived late frosts were tallied, thus accounting for the relatively low numbers of shoots examined.

TABLE 12

Summary of Balsam Shoot-boring Sawfly Counts in White River District in 1963 and 1964.

Note:- Counts were based on the examination of 20 branch tips, four from each of five trees at each location.

Location	Av. d.b.h. in inches	No. shoots examined		Per cent of shoots infested	
		1963	1964	1963	1964
Mile 10.9, Manitouwadge road	4	460	351	3.9	13.1
Township 70	4	510	378	2.5	12.2
Township 32 Range 28	2	626	331	2.1	6.6

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

Population levels of this insect declined sharply in 1964. Severe leaf-mining which had persisted in immature white birch stands for three years in Township 29 Range 26 and along Highway 17 near Wawa abated in 1964. A heavy infestation of four years' duration near Hawk Junction subsided to light intensity. Elsewhere in the district light leaf-mining was observed occasionally on small trees.

Spruce Bud Midge, Rhabdophaga swainei Felt

Small numbers of damaged buds were found commonly in the district. Population levels recorded at four sample points were representative (Table 13). The highest incidence was noted at the Algoma Ore Properties airfield where a count revealed an average of three infested buds per tree on black spruce reproduction.

TABLE 13

Summary of Spruce Bud Midge Counts in White River District from
1962 to 1964.

Note:- Counts were based on the examination of 50 branch tips, five from each of ten trees at each location.

Location (township)	Host	Av. d.b.h. in inches	No. of shoots examined in 1964	Per cent of terminal buds infested		
				1962	1963	1964
74	wS	4	187	2.2	4.1	3.2
70	bS	4	170	2.6	2.2	2.3
32 Range 27	bS	2	161	0.7	1.7	1.2
29 Range 23	wS	4	196	3.0	2.7	5.1

Spruce Bud Moth, Zeiraphera ratzeburgiana Ratz.

A small pocket of medium infestation was observed in Township 30 Range 23. Quantitative sampling of open-grown white spruce at the Michipicoten Gun Club revealed that 22 per cent of the new shoots which survived late frosts were damaged by this olethreutid. Small numbers of damaged shoots were also found in Township 30 Range 27.

TABLE 14

Summary of Miscellaneous Insects Collected in
White River District

Note:- Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris gallicolana</i> Clem.	W	Larvae in <u>Rhabdophaga brassicoides</u> galls, Tp. 29 R-26.
<i>Acleris minuta cinderella</i> Riley	Leather-leaf	First district record. Medium infestation in bS plot # 403. Reared larvae heavily parasitized.
<i>Acronicta dactylina</i> Grt.	JP	Parasitized larvae found near Camp 60 - OPC.
<i>Acronicta leporina</i> Linn.	tA	Two noctuids near Michipicoten Gun Club.
<i>Acronicta superans</i> Gn.	Se, Mo	Few larvae along Manitowadge road (2)
<i>Adelges strobilobius</i> Kalt.	bS	Occasional trees lightly infested (4)
<i>Agrilus</i> sp.	tA	Six infested trees along roadsides in Township 29 Range 26 (5)
<i>Altica corni</i> Woods	Do	Moderate skeletonizing at one point in Township 29 Range 25.

TABLE 14. White River District

Insect	Host(s)	Remarks
<i>Anchylopera nebeculana</i> Clem.	Se	One larva in Leslie Tp.
<i>Ancylis mediofasciana</i> Clem.	Se	Leaf tiers common in Township 52.
<i>Anomogyna elimata</i> Gn.	bF	One cutworm found.
<i>Argyresthia</i> spp.	bS, bF, wS	Common in townships 49, 52, and Pearkes (8).
<i>Argyrotaenia tabulana</i> Free.	jP	Occasional tubes found (6)
<i>Biston cognataria</i> Gn.	Mo	One looper near Camp 60-OPC.
<i>Campaea perlata</i> Gn.	bS	One spanworm near Cawdron Lake.
<i>Caripeta divisata</i> Wlk.	wS, bF	Four loopers in beating samples (3)
<i>Chilocorus stigma</i> Say	bF	One beetle in plot # 406.
<i>Chionaspis furfura</i> (Fitch)	Al	First district record. Few under-story shrubs heavily infested by the scurfy scale (3).
<i>Choristoneura fumiferana</i> (Clem.)	bF	Three spruce budworms in plot # 406.
<i>Chrysomela crotchii</i> Brown	tA	First district record. Colonies of skeletonizing larvae found in Hunt Tp. and Township 30 Range 23 (2).
<i>Compsolechia niveopulvella</i> Cham.	tA	Few leaf rolls in Simpson Tp.
<i>Corythucha elegans</i> Drake	W	Occasional shrubs heavily infested (3)
<i>Dasyneura balsamicola</i> (Lint.)	bF	This insect virtually disappeared from the district due to widespread severe frost damage to newly developing shoots (7).
<i>Dasyneura serrulatae</i> O.S.	Al	Several galled buds in Pearkes Tp.
<i>Dioryctria reniculella</i> Grt.	wS	Light feeding on new shoots in Township 28 Range 26.
<i>Diplolepis nebulosa</i> (Bass.)	Rose	A few prickly leaf galls in Tp. 74.
<i>Dryocoetes affaber</i> Mann.	bS	Scolytids found in stumps (2).
<i>Epicnaptera americana</i> Harr.	bF	One larva in plot # 406.
<i>Epinotia solandriana</i> Linn.	wB, tA	Small numbers of leaf rolls (3)
<i>Epinotia</i> sp.	Al	Staminate catkins heavily infested in Moberg Division (4).

TABLE 14 White River District

Insect	Host(s)	Remarks
Eriophyidae	bF	Low numbers of blasted buds (3)
Eupithecia albicapitata Pack.	bS	One looper in Tp. 48
Eupithecia filmata Pears.	wS	Ten larvae in beating samples in plot # 402 (2).
Euura hospes (Walsh)	W	Leaf galls common in Tp. 52.
Euura resinicola (Marlatt)	W	Numerous galls on one strub in Pearkes Township.
Euura salicispisum (Walsh)	W	Several shrubs lightly infested (2)
Fenusa dohrnii (Tischb.)	Al	Severe leaf-mining of roadside shrubs in Leslie Township (3).
Feralia jocosa Gn.	wS,bF	Total of ten larvae in beating tray samples (6).
Gelechiidae # 3B	Al	Small collection from Magone Tp.
Gonioctena americana (Schaef.)	tA	Scattered patches of moderate defoliation (10 to 50%) along roadsides in townships 29 ranges 25 to 27. Light damage elsewhere (6).
Hemichroa crocea (Four).	Al	One larval colony in Pearkes Tp.
Hydriomena divisaria Wlk.	wS	One looper near Magpie Mine.
Hylurgops pinifex Fitch	jP	Stumps infested in Township 70 (2).
Ips borealis Sw.	wS	Stems and branches attacked at four points in Wawa Division.
Ips perroti Sw.	jP	Found in slash in Township 70.
Ips perturbatus Eich.	wS,bS	Bark beetles common in windthrown trees (4).
Ips pini Say	jP	Adults common in slash (3).
Lambdina fiscellaria (Gn.)	bF,wS	Seven and four larvae in tray samples from Simpson and Challenger townships (5).
Lapara bombycoides Wlk.	jP	Three hawk-moth larvae (2).

TABLE 14 White River District

Insect	Host(s)	Remarks
<i>Lecanium</i> sp.	Ha	A fungous organism, <u><i>Ophiocordyceps clavulata</i></u> (Schw.) Petch, parasitizing coccid scales near Cigar Lake in Township 73.
<i>Lithocolletis betulivora</i> Wlsh. m.	wB	One mined leaf in Atikameg Township. 29 collections in 1961.
<i>Lobophora nivigerata</i> Wlk.	tA	One looper only found.
<i>Meroptera pravella</i> Grt.	tA	Pyralids found in association with <u><i>Tetralopha aplastella</i></u> (6).
<i>Mindarus abietinus</i> Koch.	bF	Very light in fir plots (2).
<i>Monoctenus juniperinus</i> MacG.	eC	Few sawfly larvae at Wabatongushi and Hobon lakes (2).
<i>Mulsantina hudsonica</i> Csy.	bF, wS	Numerous beetles in tray samples from plots 404 and 406 (5)
<i>Nematus hyalinus</i> (Nort.)	W	Several leaf galls near Tukanee L.
<i>Nematus limbatus</i> Cress.	tA, W	Solitary colonies of larvae (3).
<i>Nematus</i> sp. (L.F.S.)	tA	Folded leaves rarely found (5).
<i>Neodiprion abietis</i> complex	bF, bS, wS	One colony in Tp. 70. 16 larvae in tray samples elsewhere (6).
<i>Neodiprion n. nanulus</i> Schedl.	jP	Colonies found in Cudney, Simpson, Mosambik and Pearkes twps. (5).
<i>Neomysis pullata randalli</i> Csy.	bF	Three beetles in plot # 405.
<i>Neurotoma inconspicua</i> (Nort.)	pCh	One nest of pamphiliids in Township 29 Range 26.
<i>Nyctobia limitaria</i> Wlk.	bF	Three green balsam loopers (3).
<i>Orgyia antiqua</i> Linn.	bF, wS	Three tussock-moth larvae found (2).
<i>Orthotomicus caelatus</i> Eich.	bS	Found in association with complex of scolytids in freshly cut stumps.
<i>Palthis angulalis</i> Hbn.	bF	Four cutworms in fir plots (2).
<i>Pamphilius</i> sp. (prob. <i>infuscatus</i>)	tA	One nest of larvae in Township 28 Range 27.
<i>Paratetranychus ununguis</i> (Jac.)	bF	Characteristic mottling at Camp Lochalsh (3).
<i>Pegohylemyia anthracina</i> Czerny.	wS, bS	Muscid-damaged cones found commonly (7).
<i>Peridroma margaritosa</i> Haw.	--	Cutworms bothersome in gardens at White River and Wawa.

TABLE 14, White River District

Insect.	Host(s)	Remarks
<i>Petrova albicapitana</i> Busck.	jP	Low population levels (3).
<i>Phlyctaenia tertialis</i> Gn.	El	Found along Franz tower trail.
<i>Phratora p. purpurea</i> Brown	tA	Light skeletonizing in Challenger Tp.
<i>Phyllocnistis populiella</i> Cham.	tA	Few gracillariid leaf mines (3).
<i>Phytophaga piceae</i> Felt	wS	Twig galls in plot # 402.
<i>Phytophaga rigidae</i> (O.S.)	W	Occasional galls (2).
<i>Pikodema alaskensis</i> (Roh.)	wS,bS	Small numbers of larvae in beating samples (10).
<i>Pikonema dimmockii</i> (Cress.)	wS,bS	Total of 44 sawfly larvae in beating tray samples (9).
<i>Pineus similis</i> Gill.	wS	Galls common throughout district (10)
<i>Pissodes approximatus</i> Hopk.	rP	Less than 2% mortality in Rumsey's plantation, Hunt Tp.
<i>Pityogenes plagiatus</i> (Lec.)	jP	Bark beetles in slash in Tp. 70.
<i>Pityokteines sparsus</i> Lec.	bF	Found in stem of windblown tree in Magone Township.
<i>Pityophthorus</i> spp.	jP,wS	Scolytids found in jP leader, Flood Tp. and wS stem in plot # 404 (2)
<i>Polychrosis</i> (Paralobesia) <i>piceana</i> Free.	wS	One cone-boring larva found in Township 28 Range 27
<i>Polygraphus rufipennis</i> Kby.	wS,bS	Scolytids in stems and branches (3)
<i>Pristiphora lena</i> Kincaid	wS,bS	Total of seven sawfly larvae in beating samples (3).
<i>Prociphilus tessellatus</i> (Fitch)	Al	Current growth lightly infested by the woolly alder aphid (3).
<i>Protoarmia porcelaria</i> <i>indicataria</i> Wlk.	bF	Few measuring worms in fir plots (2).
<i>Pseudexentera oregonana</i> Wlshm.	tA	Several leaf rolls on one small tree at Cawdron Lake.
<i>Pulicalvaria piceaella</i> (Kft.)	bF,wS	Four gelechiid larvae found (2)
<i>Recurvaria canusella</i> Free.	jP	Few needle miners (3)
<i>Rhabdophaga brassicoides</i> (Walsh)	W	Numerous cabbage-galls on scattered clumps (5)

TABLE 14 White River District

Insect	Host(s)	Remarks
<i>Rhabdophaga strobiloides</i> (Walsh)	W	Many cone-galls on occasional shrubs.
<i>Rhinomacer elongatus</i> Lec.	jP	One pine-flower snout beetle
<i>Rhyacionia busckana</i> Heinr.	jP	Damaged shoots rarely found.
<i>Sarrothripus cinereana</i> (N. & D.)	bPo	Few nycteolid larvae in Atikameg Tp.
<i>Sarrothripus frigidana</i> (Wlk.)	W	Leaf tiers found commonly at Franz.
<i>Schizura unicornis</i> A. & S.	Se	One notodontid larva in Leslie Tp.
<i>Sciaphila duplex</i> Wlsh.	tA	One leaf roller at Cawdron Lake.
<i>Semiothisa</i> sp. (<i>granitata</i> group)	wS, bF, bS	Total of 33 geomets in beating tray samples (8)
<i>Sternochetus lapathi</i> Linn.	W	First district record of this weevil. Infested shrubs found near Hemlo and Wawa (2)
<i>Syngrapha selecta</i> Wlk.	bF	One cutworm in plot # 405.
Tenthredinidae # 13A	W	Skeletonizing larvae near Wabikoba Lake.
<i>Tetralopha aplastella</i> Hlst.	tA	Numerous webbed leaves on one tree in Mikano Tp. (8).
<i>Trypodendron lineatum</i> (Oliver)	jP, bS, wS, bF	Ambrosia beetles common in fresh stumps including a collection from Michipicoten Island (6).
<i>Vasates quadripes</i> Shim	sM	Understory heavily infested by this eriophyid mite on Michipicoten Island (2)

NORTHERN FOREST REGION

1964

INTRODUCTION

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INTRODUCTION

Northern Forest Region

Unusually warm weather early in the spring followed by an 8-day cold snap in late May - early June had a considerable effect on tree growth, insect populations, and tree diseases. During the warm period tamarack, willow, and several shrub species leafed-out completely. Foliage on tree species such as trembling aspen was only partially developed when the cold snap occurred. Damage to this foliage was severe and full leaf complement did not appear in extreme cases until late June. Similarly frosts caused heavy shoot mortality of white spruce and balsam fir. Later insect numbers were affected directly by the frosts in buds and indirectly by a shortage of foliage as in the case of young tent caterpillars.

Surveys showed that the early insects such as bud feeders, leaf miners, and leaf rollers declined in number, being difficult to collect. Special studies on Epinotia momonana Kft., Argyresthia oreasella Clem., and the Zeugophora-type beetles had to be suspended.

Although several minor insects maintained high populations in the region the only forest insect that increased extensively was the birch skeletonizer. The army worm, primarily a field crop insect, proved troublesome at the Spruce Falls Nursery near Moonbeam. New distribution records for the mountain ash sawfly were made in the Cochrane District and for the birch leaf miner in Swastika District.

The ink spot disease of poplar increased in incidence and severity over large areas. Several rusts and leaf and twig blights were maintained at high levels of infection.

Sincere appreciation is again expressed for the assistance given to field technicians by timber operators and personnel of the Department of Lands and Forests. Several collections of insects were made from Sutton Lake in the Hudson Bay area by Stanley Hoeburg and Victor Bursey.

STATUS OF INSECTS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Population levels of the forest tent caterpillar that reached outbreak proportions in other parts of Ontario in recent years failed to increase substantially in the Northern Region in 1964. Pockets of light infestation in Harley, Armstrong, Taylor, Bowman and Rand townships of Swastika District showed little change from the previous year. Population levels in the Cochrane District declined in Calder and German townships but increased to light intensity in Robb, Tisdale, and Whitney Townships, and at The Narrows on Abitibi Lake. Population levels in the Kapuskasing District were low. Collections from the region totalled 3, 18 and 31 for the years 1962, 1963, and 1964 indicating the slow but persistent buildup of this periodic defoliator. The numbers of adult moths captured in light traps at Kenogami Lake, Swastika District, and Remi Lake, Kapuskasing District, also reflect a slow buildup (Table 1).

TABLE 1

Summary of Forest Tent Caterpillar Moths Captured in Light Traps from 1961 to 1964

Location	Number of adult moths captured			
	1961	1962	1963	1964
Kenogami Lake	1	0	13	6
Remi Lake	1	1	13	4

High larval populations in Tisdale and Whitney townships were drastically reduced in the early instars by weather conditions that effectively checked a possible outbreak. Unusually warm weather early in the spring caused forest tent caterpillar egg bands to begin hatching May 6. Subsequent cold weather arrested leaf development, killed most of the opened leaves and delayed further leaf opening in some cases to late June. Partial starvation of some forest tent caterpillar colonies resulted and the development of surviving larvae was retarded to the extent that larvae were still feeding on July 20th. The abnormally small size of pupae and adult moths observed in dissecting cocoons may be attributed to unfavourable weather conditions and slow development. The above factors, by decreasing the number of hosts, increased the effect of predators and parasites on the surviving populations. Parasitism of cocoons for example was exceptionally high for a new infestation of the forest tent caterpillar (Table 2). Parasites reared from the cocoons were: Sarcophaga aldrichi Park., Achaetoneura frenchi (Will.) Exorista mella Wlk., Carcelia malacosomae Sellers, and one unidentified ichneumon fly.

Numbers of egg bands counted at six points in both Cochrane and Swastika districts were low for new infestations of the forest tent caterpillar and indicate slight increases in the Swastika District and mixed trends in the Cochrane District (Table 3). Medium infestation was forecast in Armstrong Township because of smaller trembling aspen trees in the stand sampled than those in Harley Township where the same number of egg bands were counted.

Generally in new infestations in the Cochrane District old egg bands outnumbered the new ones by a ratio of 3 : 1. This unusual situation was probably due to extremes of weather in 1964.

TABLE 2

Summary of Forest Tent Caterpillar Cocoon Dissections at each of Two Points in the Cochrane District, Expressed in Per Cent

Location (township)	Emergence	Predation	Parasitism	Emergence failure	Unknown
Tisdale	19	9	56	4	12
Whitney	12	4	77	2	5

TABLE 3

Summary of Forest Tent Caterpillar Egg-band Counts in 1964 and Infestation Forecasts for 1965 in the Northern Region

District (Township)	Av. d.b.h. of sample trees in inches	Av. no. of egg bands per tree		Forecast for 1965.
		Old	Current	
<u>Cochrane</u>				
German	5	1.3	0.0	Trace
Tisdale	3	0.3	0.0	Trace
Whitney	3	1.3	0.6	Light
Kendrey	5	0.0	0.0	Trace
Calder	4	0.0	0.0	Trace
Robb	5	2.0	1.0	Light
<u>Swastika</u>				
Otto	7	-	0.3	Light
Van Hise	5	-	0.6	Light
Armstrong	5	-	2.0	Medium
Harley	6	-	2.0	Light
McFadden	5	-	0.3	Light
Harris	5	-	0.3	Light

Larch Sawfly, Pristiphora erichsonii (Htg.)

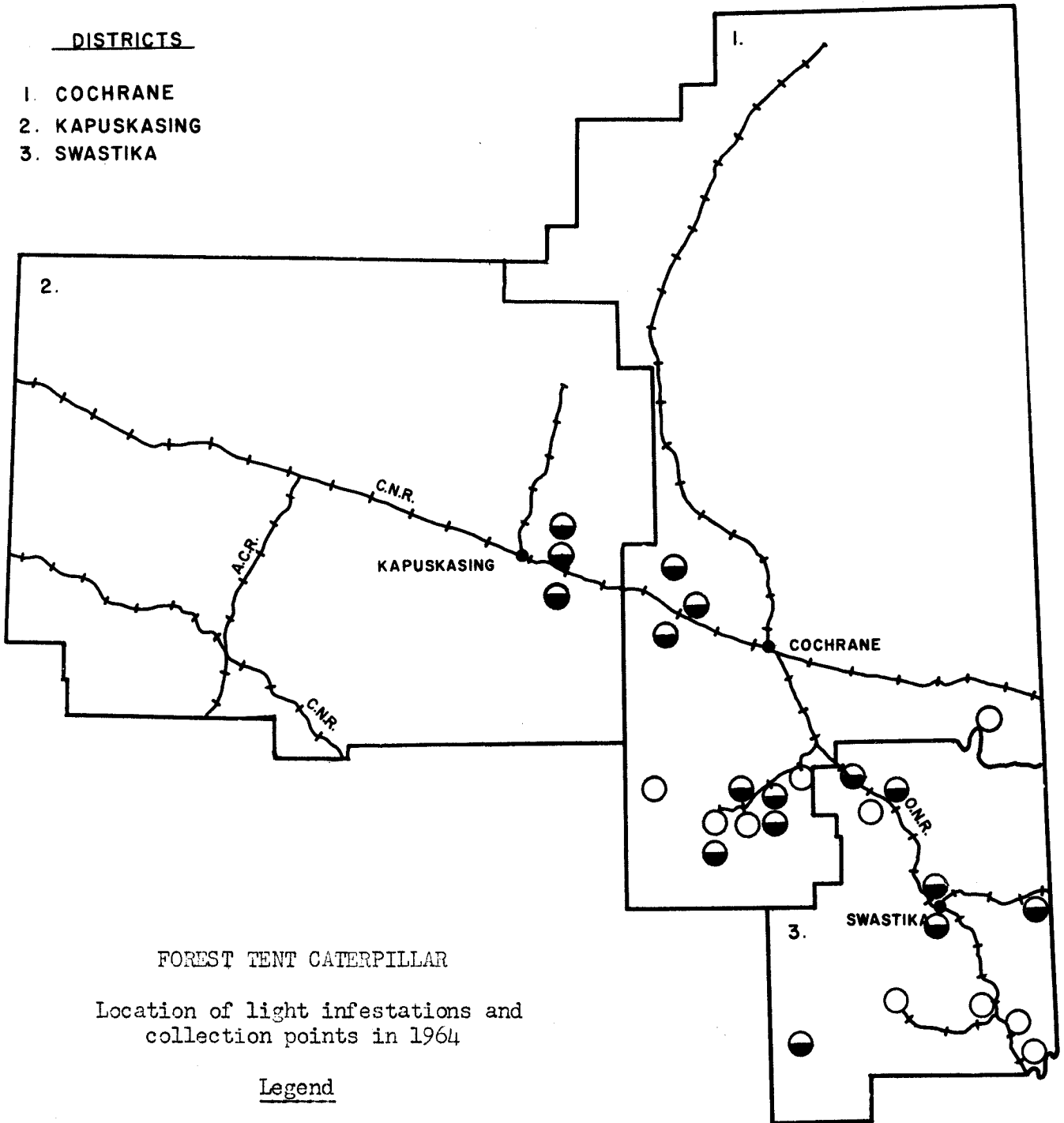
The decline in population levels of the larch sawfly in the Northern Region since 1961 continued in 1964. Declines occurred as follows; Medium infestations west of the Hornepayne Road and a heavy infestation in Nagagami Township, Kapuskasing District were reduced to light intensity in 1964; in Cochrane District, heavy infestations south from Moosonee to Sutcliffe Township were reduced to medium, and medium infestations in Robb and Tully townships were reduced to light. Minor population increases to medium intensity occurred on small tamarack trees along shorelines in Division 45, Cochrane District, and in a small area in Milner Township, Swastika District. Scattered regeneration trees along the Chain of Lakes Road and in Hanlan Township of Kapuskasing District were severely defoliated. Elsewhere in the region defoliation by the larch sawfly was light (see Map).

Mortality of small larvae that has been observed extensively since 1961 was more pronounced in 1964. The high incidence of egg hatch followed by little or no defoliation was observed commonly in Kapuskasing, Cochrane and Swastika districts, and created discrepancies between the assessments of infestation based on sequential sampling and defoliation estimates (Table 4).

NORTHERN FOREST REGION

DISTRICTS

1. COCHRANE
2. KAPUSKASING
3. SWASTIKA



FOREST TENT CATERPILLAR

Location of light infestations and collection points in 1964

Legend

- Light infestation.....○
- Collection point.....●



NORTHERN FOREST REGION

DISTRICTS

1. COCHRANE
2. KAPUSKASING
3. SWASTIKA

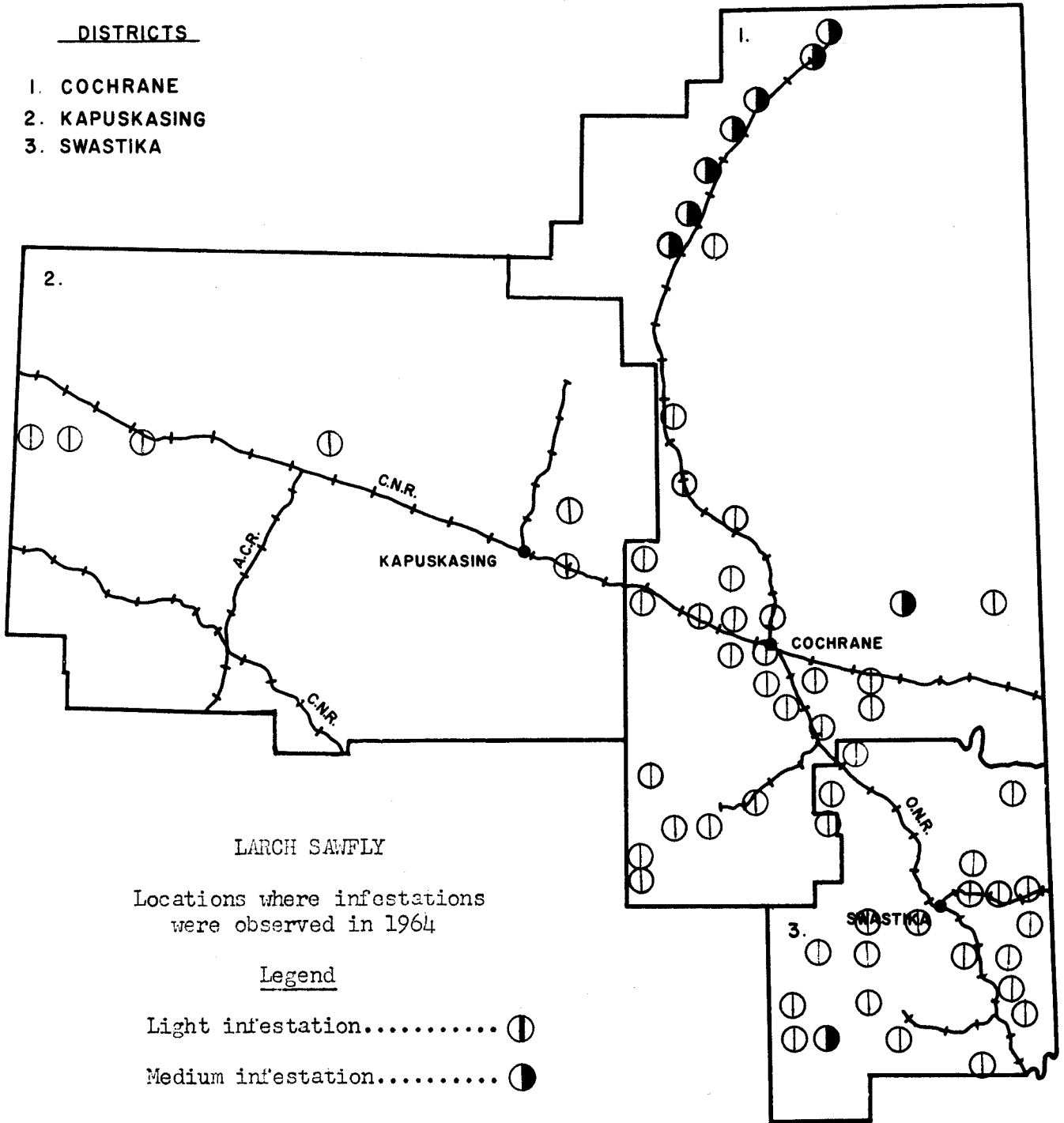


TABLE 4

Summary of Larch Sawfly Curled Tips Made at Six Locations in the Northern Region in 1964

Note: Degree of infestation is based on sequential sampling of curled tips and the per cent defoliation is determined by visual estimation.

<u>District</u> <u>Township</u>	Total No. of shoots per sample	Total No. of curled tips.	Degree of infestation	Per Cent defoliation
<u>Kapuskasing</u>				
Casgrain	100	4	Light	0
Kohler	130	6	Light	Trace
Fauquier	80	3	Light	0
<u>Swastika</u>				
Milner	140	28	Medium	4
Gauthier	70	2	Light	Trace
McVittie	80	2	Light	Trace

Surveys in 1963 and 1964 of a heavy infection of the rust Melampsora medusae Thum. on tamarack trees in Clute Township, Cochrane District, showed that first instar larch sawfly larvae were feeding in a unique way, namely on the needles of the new shoots. Normally the larch sawfly does not feed on these new needles. Further observations will be made to determine if there is a consistent relationship between this unusual feeding and the high incidence of the rust.

Tamarack tree mortality was limited to a few scattered trees and the number of trees attacked by the eastern larch beetle was low. Trees recovering from the decadence reported in tamarack mortality plots outnumbered those showing increased decadence in 1964 by a ratio of five to one.

STATUS OF TREE DISEASES

Ink Spot Disease of Poplar, Ciborinia whetzelii (Seav.) Seav.

Infestation levels of the ink spot disease increased on trembling aspen at many points in the Northern Region. The highest levels of infection occurred in Cook, Michaud and Garrison townships Swastika District. From these points a long body of light-to-heavy infections extended westward in Swastika and Cochrane districts to Eilber Township in Kapuskasing District. The main infection area generally followed the older cutover areas along the farmlands adjacent to Highway 11. Large extensions beyond the settled areas occurred in the old cutover areas south and west of Nighthawk Lake in Cochrane District and in the Spruce Falls limits in Kapuskasing District.

Light-to-medium infections extended south and west of the main centre of infection reaching the Hornepayne Road at several points. Infection levels elsewhere in Swastika and the south half of Cochrane districts were mainly light. The only exception to the above situation was observed in the Two Peak Lake area, Cochrane District where infection levels decreased from medium in 1963 to light in 1964. Infection levels of the disease were too low for mapping in the Moosonee area.

Sweetfern Blister Rust, Gronartium comptoniae Arth.

Heavy infections of this rust occurred in the Cochrane District along the Bigwater Lake road north of Timmins. Light-to-heavy infections persisted along the eastern border of Division 43 from Nellie Lake in Aurora Township southward to Timmins Township. In 1964 a center of medium infection was found in solid jack pine regeneration in a recent burnt area of Sheraton Township, Cochrane Township. Observations revealed the existence of an inverse relationship between the numbers of trees infected in the stand and the average growth rate of the trees in the stand. Counts confirmed this deduction when tallies of the number of infected stems per 100 trees in each of the following 1 - 2, 2 - 4, and 4 - 6 foot height classes showed 14, 5, and zero infections respectively.

Preliminary surveys to establish the incidence of this disease in 1963 disclosed two areas of low incidence in Swastika District and in 1964 nine additional centres of infection were located, five of which were in scattered townships with a high level of incidence in each (Table 5). The rust has now been collected in 11 and 14 townships in the Swastika and Cochrane districts respectively.

A retally of the permanent sample plot in Murphy Township, Cochrane District, showed that eight of the thirty trees with sporulating infections in 1963 failed to fruit in 1964. Relative to 1963, less than one-half the surface sporulated in cankers, on the remaining 22 trees which remained active in 1964.

TABLE 5

Summary of Counts of Basal Stem Cankers on 100 Jack Pine Trees
at Different Locations in the Northern Region, 1964

Location (township)	Av. d.b.h. of trees in inches	Per cent of cankers fruiting in 1964	Degree of infection
<u>Swastika District</u>			
Michaud	5	31	Heavy
Gross	5	35	"
Cairo	4	41	"
McCann	4	33	"
Mickle	4	12	Medium
<u>Cochrane District</u>			
Tisdale	6	25	Heavy
Aurora	8	19	"
*Murphy	4	22	"
*Macklem	4	18	"

* Counts made in permanent sample plots.

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

The incidence of this disease remained high in Grenfell Township, Swastika District, where 28 per cent of the white pine trees examined were infected (Table 6). In Eby Township, Swastika District, the outbreak reported in 1963 on ornamentals appeared to be effectively controlled by the removal of Ribes species in the immediate area. Light infections were also observed in Dunmore, Harris and Tyrrell townships, Swastika District, and in Sheraton Township, Cochrane District.

TABLE 6

Incidence of White Pine Blister Rust Cankers in the Swastika
District, 1964.

Location (township)	Av. d.b.h. of trees in inches	Number of trees examined	Per cent of trees infected
Grenfell	3	50	28
Dunmore	6	100	3
Harris	4	50	6
Thackery	1	50	0
Tyrrell	3	50	12

Hypoxyton Canker of Poplar, Hypoxyton pruinaum (Klotsche) Cke.

This canker occurred commonly throughout trembling aspen stands in the Northern Region. The incidence of attack was low in vigorous stands and was generally high in stands on poor, dry sites. Plots were established in 1964 to determine influence of site on the incidence of disease (Table 7).

A representative canker showing girdling and caused by H.pruinaum appears in the accompanying photograph.

TABLE 7

Incidence of Hypoxyton Canker on Trembling Aspen in Six One-twentieth Acre Plots in the Northern Region, 1964

Location (township)	Growth condition	Total no. of trees tallied	No. of trees infected.	Per cent of trees infected
<u>Kapusksasing</u>				
Fauquier	Poor	80	6	8
Way	Good	73	1	1
<u>Cochrane</u>				
Tisdale	Poor	62	23	37
Ogden	Good	65	2	3
<u>Swastika</u>				
Guibord	Poor	163	36	22
Otto	Good	153	19	12

Leaf Blight, Linospora tetraspora G.E. Thompson

This disease was found commonly in the region in 1964. In Way Township, Kapuskasing District, a stand of balsam poplar approximately 20 feet in height and one acre in area was severely infected and presented a blackened appearance in late August. Heavy infections were also recorded on roadside reproduction in the townships of Torrance and Parnell. In the Cochrane District the heaviest incidence of infection was observed near Timmins and in an area north of Cochrane.

A Needle Rust on Tamarack, Melamsora medusae Thum.

Light-to-severe damage recurred on open-grown tamarack trees in abandoned farm areas in Calder Township. Elsewhere in the area west of the Town of Cochrane infections were light. In the Moosonee area a centre of medium infection in 1963 was light in 1964. In Harker, Holloway and Lee townships of Swastika District infection levels were higher in 1964 than in 1963. Light infections occurred at many other points in the Cochrane and Swastika districts and occasional infected trees were found in the Kapuskasing District.

A Leaf and Twig Blight of Poplar, Pollaccia elegans Serv.

An increase in the incidence of this disease occurred on open-growing balsam poplar reproduction throughout the region in 1964. Heavy damage occurred at numerous points in the Kapuskasing District where an estimated 60 to 70 per cent of roadside regeneration was infected. Severe centres of infection were recorded in Clavet and Casselman townships where most regeneration had three to five infected tips per tree. Heavy infections also occurred in Potter Township, Cochrane District and in Pacaud Township, Swastika District. Low-to-medium infections occurred at numerous other locations in the region.

A Leaf and Twig Blight of Poplar, Pollaccia radiosa (Lib.) Bald. & Cib.

This fungus caused severe damage to aspen reproduction in most of the Kapuskasing District and in five townships in the Swastika District. Up to 90 per cent of the twigs were infected at many locations in the Kapuskasing District. Small pockets of medium infection occurred in the south half of Cochrane District. Generally light infections occurred in the remainder of the region. Collections were made as far north as Moosonee in the Cochrane District.

Frost Damage

Unusually warm weather early in May caused early development and opening of the buds of conifers. Consequently late frost which occurred towards the end of May and early June produced severe injury, in the Northern Region. Heaviest damage occurred in Divisions 39, 63 and the Kirkland-Larder-Englehart area of Division 42, Swastika District, and in the southern half of Cochrane District. In the Kapuskasing District the severest damage occurred in the townships of Gurney and Fauquier. Balsam fir was the species most severely affected. Typical damage by frost to white spruce foliage is shown in an accompanying photograph.

Hail Damage

Heavy damage to balsam fir and white spruce occurred in Pacaud Township, Swastika District. In the Cochrane District, a high wind and hail storm in July 1963, caused considerable damage in a 3-mile strip northwesterly across three adjacent townships of Adair, Abbotsford and Singer. Severe branch mortality occurred on the northwest side of most conifers in the path of this storm. Similar damage occurred for one-half mile along the Ontario Northland Railway in Sutcliffe Township, Cochrane District.

TABLE 8

Other Noteworthy Diseases Collected in the Northern Region
in 1964

Organism	Host(s)	Remarks
<i>Bifusella crepidiformis</i> Darker	bS	Heavy at four locations Swastika District.
<i>Chrysomyxa ledi</i> de Bary	wS	Low incidence in three townships in the Cochrane District and light-to-medium infections in McMillan and Fenton townships in the Kapuskasing District.
<i>Chrysomyxa ledicola</i> Lagerh.	wS, bS, bF.	Low in Cochrane District, medium in the Kapuskasing District and heavy in Milner Township, Swastika District.
<i>Coccomyces hiemalis</i> Higgins	pCh, ecC.	Low-to-medium infections throughout the region.
<i>Coleosporium asterum</i> (Deit.) Syd.	jP, aster	Heavy in Clavet Township, Kapuskasing District. Light in the remainder of the region.
<i>Cytospora chrysosperma</i> (Pers.) Fr.	cPo	Light in the Swastika Nursery.
<i>Dibotryon morbosum</i> (Schw.) Theiss. & Syd.	pCh, Al, ecC.	Common in the region.
<i>Didymascella thujina</i> Durand Maire	wC	Heavy on ornamentals in Maisonville Township, Swastika District.
<i>Elsinoe ledi</i> (Pk.) Zeller	sheep laurel Labrador tea	Heavy in Adams and Evelyn townships and light elsewhere in the Cochrane District.
<i>Fomes ignarius</i> (L. ex Fr.) Gill.	tA, wB.	Common on mature or weakened trees in Cochrane and Swastika districts.
<i>Fusicladium</i> sp.	wB	Found on trees with dieback symptoms in the town of Kapuskasing.
<i>Gloeosporium</i> spp.	wB, rM, bAs.	Heavy in Lee and Chamberlain townships, Swastika District. Light in Shearer Township, Kapuskasing District.
<i>Hymenochaete agglutinans</i> Ell.	Ha, moM, wB	Common at four locations in the Cochrane District. Light at three locations in the Kapuskasing District.

TABLE 8 (continued)

Organism	Host(s)	Remarks
<i>Hypodermella ampla</i> (J.J.Davis) Dearn.	jP.	Heavy along the O.N.R. near Fraserdale, moderate in Pitt Township and light damage at several other locations in the Cochrane District. Low incidence in the Kapuskasing and Swastika districts.
<i>Lophodermium pinastri</i> (Schrad.ex Fr.) Chev.	jP	One collection, Kapuskasing District.
<i>Melampsorella caryophyllacearum</i> Schroet.	bF	Damage by witches broom common in the region.
<i>Malampsora</i> spp.	w, tA	Common in the region.
<i>Nothophacidium abietinellum</i> (Dearn.) Reid & Cain	bF	Common in the Kapuskasing and Swastika districts and in Division 43, Cochrane District.
<i>Peridermium</i> sp.	jP	Light in divisions 43 and 45 Cochrane District, and in Michaud Township, Swastika District.
<i>Phragmidium</i> sp.	wild rose	Heavy infection in Clavet Township, Kapuskasing District. Medium in Adams Township, Cochrane District.
<i>Phoma</i> sp.	bF	Heavy infection at one location in the Kapuskasing District.
<i>Polyporus hirsutus</i> Wulf. ex Fries	honey- suckle	Possible new host record. O'Brien Township, Kapuskasing District.
<i>Poria obliqua</i> (Pers.ex Fr.) Bres.	wB	Noted at several locations Cochrane District.
<i>Puccinia asteris</i> Duby	aster sp.	Common in the region.
<i>Puccinia bolleyana</i> Sacc.	El	Noted at several points in the Cochrane District.
<i>Puccinia coronata</i> Cda.	buck- thorn	Noted at several locations in the Cochrane District.
<i>Pucciniastrum epilobii</i> Otth	bF	Low incidence in Cochrane and Kapuskasing Districts.
<i>Rehmiellopsis balsamea</i> Waterman	bF	Light damage in Division 43, Cochrane District.
<i>Rhizosphaera pini</i> (Corda) Mauble	bF	Light infection in Nansen Township Kapuskasing District.

TABLE 8 (continued)

Organism	Host(s)	Remarks
<i>Rhytisma acerinum</i> Pers. ex Fr.	rM, moM	Heavy in Knight Township, Swastika District. Light in the Cochrane and Kapuskasing districts.
<i>Rhytisma punctatum</i> Pers. ex Fr.	moM	Widespread infections in the Swastika District and Division 43 of the Cochrane District.
<i>Rhytisma salicinum</i> Pers. ex Fr.	W	Heavy infections in Adams and Bradburn townships, Cochrane District, Dack and Burt townships, Swastika District and Lisgar Township, Kapuskasing District.
<i>Taphrina</i> sp.	rM	Heavy in Thackery Township in the Swastika District.
<i>Tranzchelia pruni-spinosae</i> (Pers.) Diet.	pCh	Heavy on one tree in Godfrey Township, Cochrane District.
<i>Uncinula salicis</i> (DC. ex Merat) Wint.	bPo, W.	Heavy in Rand and Gauthier townships, Swastika District. Light at several locations in the Kapuskasing and Cochrane Districts.
Fume Injury	all sp.	Considerable damage to all tree species near Virginiato wn, Swastika District.
Flood Damage	jP, wS, wC, wB.	Heavy mortality in Thornloe Township, Cochrane District.

STATUS OF INSECTS IN THE COCHRANE DISTRICT

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H. R. Foster

STATUS OF INSECTS

Birch Skeletonizer, Bucculatrix canadensisella Cham.

The birch skeletonizer was the only forest insect that occurred in outbreak proportions in the Cochrane District in 1964. Several areas of heavy infestation coalesced in 1964 into a band about thirty miles wide extending from Abitibi Lake to Sheraton Township in the eastern part of the district to a line from Homuth to Strickland townships on the Kapuskasing District boundary (see map). North of this area, a medium infestation extended from Island Falls southeast to the Quebec border in Hepworth Township. South of the main outbreak skeletonizing of white birch trees was light.

A sharp decline in population levels following the leaf-mining stage was observed in Wark, Prosser, and Godfrey townships in 1963 and 1964. Defoliation of white birch stands in these areas was light.

Larval counts were made at six points to assess population levels (Table 9).

TABLE 9

Summary of Larval Counts of the Birch Skeletonizer on White Birch
Foliage at Six Locations in the Cochrane District in 1964

Note: Based on the examination of four leaves taken at cardinal points from each of five trees at each location.

Location (township)	Date	Number of larvae on 20 leaves	Av. number of larvae per leaf
Glackmeyer	Aug. 20	91	4.5
Ogden	Aug. 31	115	5.7
Macklem	Sept. 2	106	5.3
Hillary	Sept. 4	57	2.8
Mortimer	Sept. 3	211	10.5
Calder	Sept. 11	154	7.7

A Pitch Midge, Cecidomyia reeksi Vock.

Populations of this insect have remained at a low level in the district since 1962. Few larvae occurred on jack-pine trees at five sample locations in 1964 and none were found at sample points in Hepburn and Robb townships (Table 10). No twig mortality was observed in 1964.

TABLE 10

Summary of Pitch Midge Larval Counts on Jack Pine at Five Points
in the Cochrane District from 1962 to 1964

Location (township)	Av. ht. of sample trees in feet	No. of shoots examined in 1964	Per cent of shoots infested in		
			1962	1963	1964
Denton	25	212	0.0	0.3	1.9
Murphy	25	189	4.0	0.6	1.5
Stimson	20	212	2.5	0.3	0.5
German	20	204	1.6	0.0	1.0
Calvert	16	193	2.3	0.0	0.5

Spruce Budworm, Choristoneura fumiferana (Clem.)

Low populations of the spruce budworm occurred on young open-grown white spruce trees at Departure Lake in Haggart Township, in a small area in Timmins Township, and at one location in Sydere Township. Populations declined sharply in the early instars and only small numbers of final instar larvae were collected. No larvae were found in Thorneloe Township where a collection was made in 1963.

A Twig Borer on Jack Pine, Conophthorus sp.

Light infestations of this insect occurred commonly on open-grown jack-pine trees in Division 43 and northward along the Ontario Northland Railway to Moose River Crossing. Counts of damaged twigs were comparable to 1963 (Table 11).

TABLE 11

Summary of Damage by a Twig Borer on Twenty Jack-pine Trees
at Each of Five Locations in the Cochrane District
in 1963 and 1964.

Location (township)	Av. d.b.h. of sample trees in inches	Total number of damaged shoots	
		1963	1964
Sheraton	3	6	8
Tisdale	4	37	28
Murphy	3	10	8
Robb	2	33	15
McKeown	3	27	21

European Spruce Sawfly, Diprion hercyniae (Htg.)

This insect has never caused appreciable defoliation in the district. However, in 1962 population levels increased and small numbers of larvae were collected from most white spruce trees sampled. In the next two years population levels declined and in 1964 few larvae were recovered in beating mat samples (Table 12). Although no larvae were recovered at the regular sampling time in September in the Tisdale Township plot, a sample in October yielded 10 larvae.

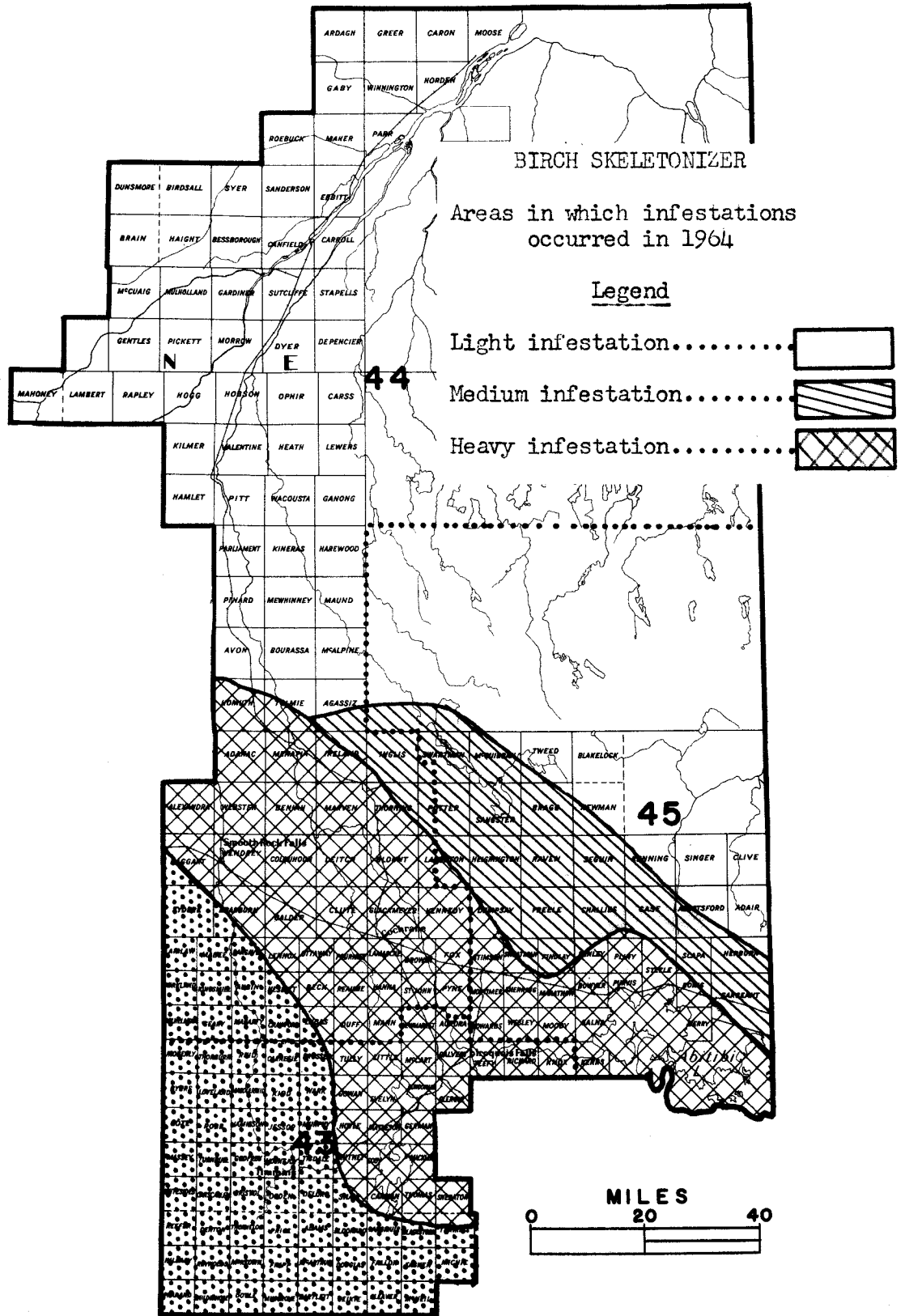
TABLE 12

Summary of European Spruce Sawfly Larval Counts Made at Five Points
in the Cochrane District from 1962 to 1964.

Note: Counts are based on the numbers of larvae found on 15 tray samples at each point.

Location (township)	Tree species	Av. d.b.h. of sample trees in inches	Total number of larvae per sample point		
			1962	1963	1964
Leitch	wS	5	12	9	4
Hanna	bS	3	5	3	0
Teefy	wS	5	3	2	0
Tisdale	wS	7	10	5	0
Calder	wS	8	18	25	1

COCHRANE DISTRICT



American Aspen Beetle, Gonioctena americana (Schaef.)

A medium infestation persisted on scattered trembling aspen trees north of Kettle Lakes Park in 1964. Other pockets of medium infestation occurred in Hillary, Ogden and Thorneloe townships. Light infestations were common elsewhere in Division 43 and the southern part of Division 44, but the insect was scarce in the area north of Abitibi Lake.

Army Worm, Leucania unipuncta Haw.

Heavy infestations of the army worm occurred in Timmins and the surrounding farm area. Severe browning of lawns occurred in the Pine Street area of Timmins and large numbers of migrating larvae were observed during the last week in July. High numbers of parasite eggs were observed on the migrating larvae. Considerable damage to flowers, ornamentals and garden crops occurred in Timmins, South Porcupine, Iroquois Falls, Cochrane and Smooth Rock Falls.

Aspen Blotch Miner, Lithocolletis salicifoliella Cham.

Population levels of this insect declined from heavy intensity in 1963 to low levels in 1964 at many points in the southern half of the district and at Moose River Crossing and in Pitt Township in the northern part of the district. For the first time in recent years negative counts were obtained at sample points (Table 13). Exceptions to the above trend were observed in Denton and Hillary townships in the southwest corner of the district where medium infestations occurred on aspen regeneration. Declines in population levels were more pronounced on trembling aspen than on balsam poplar, and mining of willows was comparable to 1963.

TABLE 13

Summary of Aspen Blotch Miner Counts Made at Six Points in the Cochrane District in 1963 and 1964

Note: Based on the examination of 100 leaves taken at random from the mid point of three 15-foot trees at each point.

Location (township)	Tree species	Number of mines per 100 leaves	
		1963	1964
Dempsey	tA	9	0
Mountjoy	tA	5	2
Haggart	tA	49	4
Brower	tA	8	0
	bPo	1	0
Murphy	tA	8	0
	bPo	2	0
Clute	tA	6	1
	bPo	8	5

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Population levels of the western tent caterpillar increased along the McChesney lumber road south of Opishig Lake in the Timmins-South Porcupine area and in German Township, but little change in population levels occurred at sample locations (Table 14).

A high percentage of the eggs hatched during a warm spell in early May. Subsequent frosts retarded the development of the insect and host trees but complete defoliation of small, weak pin cherry trees occurred. Early instar larvae were

observed migrating in German, Murphy and Deloro townships.

A record of the size and shape of larval tents was made in Deloro and German townships. In the older infestation in Deloro Township a number of tent types occurred whereas most of those in a new infestation in German Township were of the large rounded variety.

TABLE 14

Summary of Western Tent Caterpillar Larval Colony Counts
in Square Chain Sample Plots in the Cochrane District
in 1963 and 1964

Location (township)	Number of colonies counted	
	1963	1964
Calvert	0	2
Godfrey	1	2
Ogden	1	1
Thorneloe	1	2
Deloro	7	2

Leaf-folding Sawflies, Nematus spp.

Three types of leaf-folding sawflies occurred on trembling aspen, balsam poplar and narrow-leaved willow in the district in 1964. The species on trembling aspen declined to low numbers. In 1964 larvae were difficult to find, and counts from trembling aspen were negative at six points in the district (Table 15).

TABLE 15

Summary of Leaf-folding Sawfly Counts on Trembling Aspen in the
Cochrane District from 1959 to 1964

Note: Based on the examination of 100 leaves taken at random from three trees at each point.

Location (township)	Av. d.b.h. of sample trees in inches	Number of folds on one hundred leaves					
		1959	1960	1961	1962	1963	1964
Brower	2	40	0	1	1	2	0
Murphy	2	20	1	1	0	2	0
Haggart	2	10	3	1	0	1	0
Dempsay	2	40	1	0	2	3	0
Clute	2	7	1	0	0	1	0
Mountjoy	3	30	2	0	0	0	0

Medium-to-heavy infestations of a second species persisted on balsam poplar in farm areas around Cochrane, along the Abitibi roads north of Iroquois Falls, and in cutover areas in Division 43. Elsewhere in the district infestations were light on open-grown trees.

A narrow-leaved willow tree in Hanna Township was heavily infested by a third species (probably agamus).

Balsam Fir Sawfly, Neodiprion abietis complex

Pockets of heavy infestation of this insect recurred on balsam fir at Mileages 121 and 170 along the Ontario Northland Railway. Scattered light infestations occurred on balsam fir from Island Falls to Moosonee, and on white spruce and balsam fir at several points in Division 43. A few colonies were collected on black spruce.

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl.

Light infestations of this insect that occurred in Clergue, Calvert, German and Dundonald townships in 1963 decreased in extent and intensity. Elsewhere in the above townships larval colonies were scarce. Larvae were also collected in Stimson, Parliament and McCart townships.

An interesting observation on the numbers of larvae per colony was made in Dundonald Township. Colonies on young, vigorous jack-pine trees were normal in size and the larvae were healthy compared to the colonies found on large slow-growing trees. The parasite, Drino bohémica Mesn., was recovered from a larval collection from Dundonald Township.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Little change in population levels of this sawfly occurred in the district as a whole from 1962 to 1964 (Table 16). However, an exception was noted in Fournier Township where chemical sprays in 1962 reduced the number of colonies present in 1963, but the insect increased in abundance in 1964. Poor hatch was observed on jack-pine trees on the western outskirts of South Porcupine.

TABLE 16

Summary of Red-headed Jack-pine Sawfly Colony Counts on Ten Jack-pine Trees at Sample Points in the Cochrane District from 1962 to 1964

Location (township)	Av. d.b.h. of sample trees in inches	No. of trees infested in 1964	Total number of colonies on ten trees		
			1962	1963	1964
Robb	3	6	14	6	9
Tisdale	4	6	6	16	6
Dyer	3	2	0	3	2
Pitt	3	0	1	2	0
Fournier	2	8	33	2	16

White-pine Weevil, Pissodes strobi (Peck)

Population levels of this weevil increased on black and white spruce trees in the area west of Smooth Rock Falls. Severe damage recurred in white spruce on an abandoned farm in Whitney Township, and in a Scots pine provenance test plot in German Township. Elsewhere in the district damage was observed less commonly in 1963 than in recent years (Table 17).

A tally of the current, old, and pitched out weevil attacks and tree mortality was made in nine strains of Scots pine in the provenance test plot (Table 18). The intensity of weevil attack varied from nil in the Finland strains to 79 successful attacks in the Auvergne type. Although all varieties of Scots pine pitched out some white pine weevil attacks, three-quarters of the Baltic trees were weevil resistant.

TABLE 17

Summary of Trees Weevilled at Sample Points in the Cochrane District
in 1963 and 1964

Location (township)	Tree species	Av. height of sample trees in feet	Per cent of trees weevilled	
			1963	1964
Sheraton	jP	10	3	1
	bS	9	2	1
Calder	wS	7	2	4
Whitney	wS	12	21	18
Hanna	bS	10	1	0
Homuth	bS	15	3	3
Dempsey	bS	12	2	0

TABLE 18

Summary of White-pine Weevil Attack and the Effect on Mortality
and Tree Growth on Nine Strains of Scots
Pine in German Township

Origin of seed	No. of trees examined	No. of living trees	Tree heights in feet		No. of trees attacked by weevil		
			Max.	Av.	Current	Old	Failed
Auvergne	200	90	4	1.6	2	77	2
Haute Loire	191	100	6	2.5	1	39	3
Finland	192	84	6	2.7	0	0	6
Cevennes	195	146	5	2.8	15	59	2
South Finland	200	64	7	2.9	3	0	2
East Baltic	200	173	11	4.6	7	8	31
Sweden	200	103	9	4.6	0	1	14
Lower Austria	193	95	8	4.8	7	9	12
West Baltic	176	144	12	5.7	7	2	26

Balsam Bud-mining Sawfly, Pleroneura borealis Felt

Population levels of this insect increased in the district in 1964 with pockets of medium-to-heavy infestation occurring at several points in Division 43. However, considerable larval mortality was observed in balsam fir shoots that were killed by late frost. Quantitative sampling from 1960 to 1964 shows an increase in abundance of this insect in alternate years (Table 19).

TABLE 19

Summary of Balsam Bud-mining Sawfly Counts in Cochrane District
from 1960 to 1964

Note: Based on the examination of all buds on four branch tips from each of
five trees at each point.

Location (township)	Av. height of sample trees in feet	No. of shoots examined in 1964	Per cent of shoots infested				
			1960	1961	1962	1963	1964
Haggart	28	375	2.1	0.0	2.3	1.5	4.4
Thorneloe	14	401	2.4	0.0	7.2	0.0	12.0
Calder	32	392	2.5	0.0	6.7	3.9	7.3
Timmins	27	389	4.0	0.0	2.7	1.3	4.2
Pharand	20	374	-	-	19.0	4.8	11.1

Mountain-ash Sawfly, Pristiphora geniculata (Htg.)

The mountain-ash sawfly, first observed in the Cochrane District in 1962, showed little change in numbers and distribution in 1963. However, in 1964, infestations increased to light intensity at several points in Division 43. Pockets of new infestation occurred north of Abitibi Lake in Challies Township, and to the west in Leitch Township.

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

A relative infestation index for this insect in the district shows a gradual buildup of population levels beginning in 1955, reaching peak intensity in 1962, and tapering off in 1963 and 1964. Heavy infestations in the Frederickhouse, Night Hawk, Ice Chest, Porcupine, Waddington and Abitibi Lake areas declined to medium intensity in 1964. Elsewhere in the district infestations were light. Quantitative samples at six locations reflect the decline that occurred in 1963 and 1964 (Table 20).

TABLE 20

Summary of Damage by P. thomsoni (Konow) on White Birch Foliage
in the Cochrane District from 1962 to 1964

Note: Based on the examination of 100 leaves taken at random from three trees
at each point.

Location (township)	Av. height of sample trees in feet	Per cent of leaves mined			Total number of mines		
		1962	1963	1964	1962	1963	1964
Tisdale	14	78	40	33	242	119	145
Glackmeyer	24	50	32	12	106	67	24
Timmins	25	66	41	23	238	140	75
Hillary	18	31	12	10	81	16	22
Evelyn	20	68	51	34	284	198	98
Mortimer	30	100	63	40	832	264	103

Spruce Bud Midge, Rhabdophaga swainei Felt

Populations of this insect declined to a low level in 1964. Quantitative samples at six locations were negative and damaged buds were not found during a 10-minute search of spruce trees in the area surrounding two of the six plots. High parasitism observed at several points in 1962 and 1963 may have contributed to the decline in populations.

Pine Tortoise Scale, Toumeyella numismaticum (P. & M.)

Populations of this insect have been low in recent years in the district. However, an increase in numbers was observed in 1964 on a few Scots-pine trees in the Kettle Lakes Park, and on jack-pine trees near the Kamiskotia Mine in Robb Township.

Poplar Leaf-mining Beetles, Zeugophora spp.

These minute beetles were plentiful in the district during the late fifties. The highest record of abundance was in 1958 when 46 per cent of the leaves were mined in a sample plot in Denton Township. Populations have since declined to a low level.

TABLE 21

Summary of Miscellaneous Insects Collected
in Cochrane District in 1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris chalybeana</i> Fern.	rM	A few larvae
<i>Acleris semiannula</i> Rob.	wB	One larva
<i>Acleris variana</i> Fern.	wS	Larvae scarce in 1964
<i>Acrobasis betulella</i> Hlst.	wB	Light in Laughton, Keefer and Wark townships (3)
<i>Acronicta americana</i> Harr.	W	Three larvae
<i>Acronicta dactylina</i> Grt.	wB	A few larvae (2)
<i>Acronicta grisea</i> Wlk.	Al	One larva
<i>Acronicta leporina</i> Linn.	bPo	A few larvae
<i>Acronicta lepusculina</i> Gn.	bPo	A few larvae (2)
<i>Adalia bipunctata</i> Linn.	mM	A small flight of adults observed in South Porcupine
<i>Adelges lariciatus</i> (Patch)	wS	Light on open-grown trees in the farming areas around the Town of Cochrane
<i>Adelges strobilobius</i> Kalt.	bS	Heavy on understory in Giekie Township and light at several other points
<i>Allononyma diana</i> Hbn.	wB	One larva
<i>Altica ambiens ambiens</i> Lec.	Al	Heavy at points in Cleaver and McNeil townships
<i>Altica corni</i> Woods	Do	Reduced to light populations in 1964

TABLE 21, Cochrane District

Insect	Host(s)	Remarks
<i>Anchylopera burgessiana</i> Zell.	pCh	Light populations observed less commonly than in 1963
<i>Anoplonyx canadensis</i> Htgn.	tL	Light at several points (3)
<i>Aphrophora parallela</i> Say	jP	Light on open-grown trees in Porcupine-Kettle Lakes area
<i>Aphrophora signoreti</i> Fitch	wS, rP	A few adults (3)
<i>Archips cerasivorana</i> (Fitch)	cCh	Light in Leitch and Dempsey townships
<i>Arge pectoralis</i> (Leach)	wB	A few colonies in Denton Tp.
<i>Badebecia urticana</i> Hbn.	pCh	Scarce in 1964
<i>Biston cognataria</i> Gn.	tA	One larva collected
<i>Campaea perlata</i> Gn.	bF	One larva
<i>Choristoneura rosaceana</i> Harr.	tA	A few larvae
<i>Clepsia persicana</i> Fitch	bF	A few larvae (4)
<i>Compsolechia niveopulvella</i> Chamb.	tA	Light on young aspen in Division 43 (5)
<i>Coptodisca</i> sp.	Sheep's laurel	Light at several points in Division 43 (2)
<i>Corythucha</i> sp.	pCh, wB, W	Medium damage at several points
<i>Cuerna striata</i> (Walk.)	tA	One adult
<i>Dasyneura balsamicola</i> Lintn.	bF	A few medium infestations on single trees
<i>Datana ministra</i> Dru.	wB	A few colonies in Evelyn Township
<i>Depressaria groteella</i> Rob.	Hazel	Light in Pharand Tp. and in the Cochrane area
<i>Dimorphopteryx melanognathus</i> Roh.	wB	Single larva observed at many points
<i>Dimorphopteryx pinguis</i> (Nort.)	Al, wB	A few larvae (2)
<i>Dioryctria abietivorella</i> Grt.	wS	Two pupae collected
<i>Dioryctria reniculella</i> Grt.	wS	Small numbers of larvae (5)
<i>Dioryctria zimmermani</i> Grote	jP	A few larvae
<i>Dryocoetes affaber</i> Mann.	wS, bS	Ten adults (2)
<i>Dryocoetes autographus</i> (Ratz.)	bS	Ten adults
<i>Ectropis crepuscularia</i> Schiff.	bF	One larva
<i>Enargia decolor</i> Wlk.	tA	Populations low in 1964
<i>Epinotia</i> sp.	Al	Heavy in catkins in Bradburn, Calder and Mountjoy townships, and at Abitibi Lake (4)
<i>Epinotia solandriana</i> Linn.	wB	Low populations (3)
<i>Epinotia solicitana</i> Wlk.	wB	A few shoot borers
<i>Euura hospes</i> (Walsh)	W	Heavy on a narrow-leaved willow
<i>Fenusa dohrnii</i> (Tischb.)	Al	Medium in Bradburn Township (2)
<i>Feralia jocosus</i> Gn.	bF	Single larva (3)
<i>Framinghamia helvalis</i> (Walker)	bPo	A few larvae
<i>Galerucella cavicolis</i> Lea.	pCh	Light at many points
<i>Galerucella decora</i> Say	W	Heavy in Bradburn, medium in Fournier, and light in Clute townships (3)
<i>Gracillaria invariabilis</i> Braun.	pCh	A few insects
<i>Gracillaria syringella</i> F.	Lilac	Light-to-heavy in Timmins-Porcupine area

TABLE 21, Cochrane District

Insect	Host(s)	Remarks
<i>Hemichroa crocea</i> (Four.)	AL	Scattered colonies
<i>Hesperamia sulphuraria</i> Pack.	pCh	One larva
<i>Ips pini</i> Say	bS, jP	Twenty adults
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> (Gn.)	wS	A few larvae around Abitibi Lake (2)
<i>Lecanium</i> sp.	moM	Heavy in 1963 reduced to light in 1964 in the southern part of Division 43
<i>Lepidosaphes ulmi</i> (Linn.)	AL, moM	Light-to-heavy infestations at points in Division 43
<i>Lycia ursaria</i> Wlk.	tA	One larva
<i>Lytta sayi</i> Say	pCh	Small flight of adults observed feeding on cherry blossoms
<i>Melangromyza schineri</i> (Gir.)	tA	Light population of these galls at several points in the district
<i>Microweisia</i> sp.	AL, moM	Small numbers of these tiny lady beetles observed feed- ing on scale insects
<i>Messa</i> sp.	bPo	Observed less commonly in 1964 than the previous year
<i>Monochamus scutellatus</i> Say	jP	Adults observed at several points in Division 43
<i>Monoctenus juniperinus</i> MacG.	eC	Light in Tisdale Township (2)
<i>Mulsantina hudsonica</i> Csy.	bF, wS	A few adults (3)
<i>Nematus erythrogaster</i> Nort.	AL	Single colonies (2)
<i>Nematus fulvicrus</i> Prov.	W	A few colonies
<i>Nematus limbatus</i> Cress.	W	Scattered colonies (2)
<i>Nematus ventralis</i> Say	tA	Scattered colonies (2)
<i>Neodiprion maurus</i> Rohwer	jP	Light in Dyer Township
<i>Neodiprion pratti banksianae</i> Roh.	jP	Scattered colonies (3)
<i>Nycteola frigidana</i> Wlk.	W	Noted commonly
<i>Nymphalis antiopa</i> Linn.	W	Scattered colonies
<i>Orgyia leucostigma</i> J. E. Smith	wB	A few larvae
<i>Orthosia hibisci</i> Gn.	bS	One larva
<i>Palthis angulalis</i> Hbn.	bF	One larva
<i>Papilio glaucus</i> Linn.	tA, pCh	Single larva (2)
<i>Pareophora minuta</i> (MacG.)	bAs	Light in Geikie Township
<i>Parorgyia plagiata</i> Wlk.	wS	One larva
<i>Petrova albicapitana</i> Busck.	jP	Light at many points in the district
<i>Pheosia rimosa</i> Pack.	tA, bPo	Single larva (2)
<i>Phratora purpurea purpurea</i> Brown	tA	A few colonies
<i>Phyllocnistis populiella</i> Cham.	tA, bPo	Mines were scarce in the first generation, but were observed more commonly in the second generation
<i>Phyllophaga</i> sp.	Ground	Adult flight occurred in German Township early in May
<i>Pikonema alaskensis</i> (Roh.)	wS	Light on few trees at Green- water Park
<i>Pikonema dimmockii</i> (Cress.)	wS	Odd larva in beating samples (2)

TABLE 21, Cochrane District

Insect	Host(s)	Remarks
<i>Pineus floccus</i> Patch	bS	Heavy on a few small trees in Geikie Township
<i>Pineus similis</i> Gill.	wS	Small numbers throughout district
<i>Pityokteines sparsus</i> Lec.	bF	Thirty adults (2)
<i>Polygraphus rufipennis</i> Kby.	bS, wS	Twenty adults (2)
<i>Fristiphora lena</i> Kincaid	wS	Small collection
<i>Prociphilus tessellatus</i> (Fitch)	Al	Light at several points
<i>Protoboarmia porcelaria</i> porcelaria Wlk.	bF	Small numbers in beating mat samples (2)
<i>Recurvaria piceaella</i> Kft.	bF, wS	A few larvae (2)
<i>Rhyacionia adana</i> Heinr.	jP	Light on red pine regeneration in Laidlaw Township
<i>Rhyacionia busckana</i> Heinr.	jP	Damage observed less commonly in 1964 than previous year
<i>Rhynchaenus rufipes</i> Lec.	W	Low population at air base in 1964
<i>Sarothrips cinereana</i> (N. & D.)	bPo	Light at many points (5)
<i>Sciaphila duplex</i> Wlsh.	tA	One larva
<i>Semiothisa orillata</i> Wlk.	eC	A few larvae (2)
<i>Semiothisa sexmaculata</i> Pack.	tL	Light in Glackmeyer Township (3)
<i>Stenoma algidella</i> Wlk.	tA	One larva
<i>Syneta extorris borealis</i> Brown	bF	Flight of adult beetles feeding on balsam fir needles
<i>Taniva albolineana</i> Kft.	wS	Low population in plantation in Calder Township
Tenthredinidae #T3	W	Small numbers of solitary feeding larvae
Tenthredinidae #11	W	Medium on one tree (2)
Tenthredinidae #5	tA	Single larva (4)
Tenthredinidae #12	W	Light on a few trees in Haggart Township
<i>Thyridopteryx ephemeraeformis</i> Haw.	wS	Collected from spruce but observed on red pine and Scots pine
<i>Trichiocampus irregularis</i> (Dyar)	W	One colony
<i>Urablaniulus canadensis</i> (Newport)	Ground	Three millipedes collected for Dr. Causey
<i>Zeiraphera</i> sp.	wS	An undescribed bud miner on white spruce (8)
<i>Zeiraphera fortunana</i> Kft.	wS	A few larvae
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	Small numbers (2)
<i>Zenobia pleonectusa</i> Grt.	tA	A few larvae (2)

STATUS OF INSECTS IN THE KAPUSKASING DISTRICT

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G. T. Atkinson

STATUS OF INSECTS

A Bud Miner on Balsam Fir, Argyresthia sp.

Damage by this bud miner was observed more commonly in 1964 than in recent years. Light damage was observed throughout the district with the highest incidence of attack in Fauquier and Minnipuka townships. Five collections were obtained in 1964 compared with two in 1962 and two in 1963. No larvae were found in many damaged buds examined; one bud from an open-grown tree in Fauquier Township contained the remains of a chalcid fly.

Birch Skeletonizer, Bucculatrix canadensisella Cham.

Population levels of the birch skeletonizer increased greatly in 1964 with correspondingly severe defoliation. White birch stands throughout the district were heavily infested (see map). Ornamentals in the Kapuskasing-Remi Lake area and roadside trees in most of the district were severely defoliated. Competition for feeding sites was observed between the birch skeletonizer and the amber-marked birch leaf miner. The results of larval counts at seven locations in the district are shown in Table 9.

TABLE 9

Summary of Larval Counts of the Birch Skeletonizer on White Birch Foliage at Seven Locations in the Kapuskasing District in 1964

Note: Based on the examination of one leaf picked at random from each of five branches of each of five white birch trees at each location.

Location (township)	Date	Number of larvae per 25 leaves	Av. number of larvae per leaf
Seaton	Aug. 20	46	1.8
Wicksteed	Aug. 29	62	2.5
O'Brien	Aug. 31	76	3.0
Stoddart	Sept. 4	16	0.6
McMillan	Sept. 4	16	0.6
Gill	Sept. 4	23	0.9
Studholme	Sept. 4	106	4.2

A Pitch Midge, Cecidomyia reeksi Vock.

A gradual decline in population levels of the pitch midge has occurred in the Kapuskasing District in the past three years. This is borne out by quantitative sampling at three locations in the district (Table 10). Light infestations recorded in 1963 in McMillan, Wicksteed, Haig and Clavet townships subsided in 1964.

TABLE 10

Summary of Counts of the Pitch Midge on Four 18-inch Jack-pine Branch Tips From Each of Three Locations in the Kapuskasing District from 1962 to 1964

Location (township)	Av. height in feet	No. of shoots examined in 1964	Per cent of shoots infested			Per cent of dead shoots		
			1962	1963	1964	1962	1963	1964
Wicksteed	15	210	16.6	29.5	0.0	2.3	14.7	0.0
McMillan	9	220	66.6	41.5	11.9	13.9	7.5	0.9
Clavet	12	175	0.0	5.7	4.0	0.0	1.7	1.7

Larch Casebearer, Coleophora laricella (Hbn.)

Although a slight increase in numbers of casebearers occurred in a small stand of tamarack reproduction in Fauquier Township there was no enlargement of infestation boundaries in 1964. Small numbers were observed in the adjoining townships of Fauquier and O'Brien. A concerted effort was made to locate this insect in other parts of the district but no evidence of its presence was found. Quantitative sampling in Fauquier Township produced an average of 3.05 larvae per branch tip in 1964 compared with 0.4 per branch tip in 1962. Counts in O'Brien Township showed an average of 0.6 larvae per branch tip in 1962 but have been nil in the past two years.

Aspen Blotch Miner, Lithocolletis salicifoliella Cham.

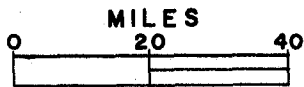
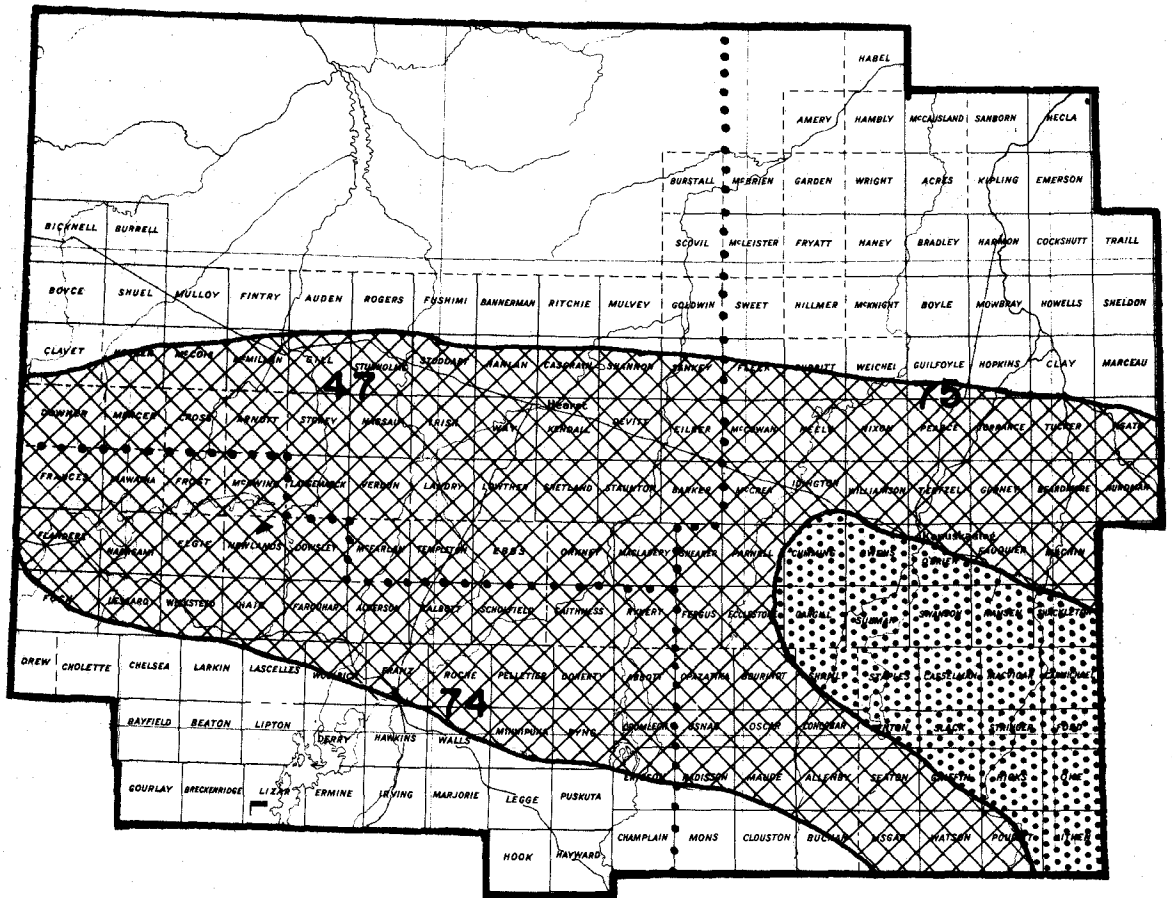
In general, population levels of this insect declined in 1964 but light infestations were observed in Slack and McCrea townships. Quantitative sampling showed a decline in numbers except at one location in Torrance Township where the insect had not been found for the previous two years (Table 11). Small numbers of parasites were recovered in collections submitted to the laboratory from O'Brien, Torrance and McMillan townships. One collection from McCoig Township revealed 53.1 per cent parasitism and 15.6 per cent adult emergence. The predominant host was trembling aspen but one collection was obtained from balsam poplar.

TABLE 11

Summary of Aspen Blotch Miner Counts Based on the Examination of 100 Leaves Taken at Random From Three Trembling Aspen Trees at Each Location

Location (township)	Av. height in feet	Per cent of leaves mined			No. of mines per 100 leaves		
		1962	1963	1964	1962	1963	1964
Wicksteed	9	26	20	0	34	23	0
O'Brien	12	31	25	4	51	27	4
Gurney	15	5	16	1	7	18	1
Torrance	10	0	0	3	0	0	3
Gill	12	9	30	1	42	33	1



KAPUSKASING DISTRICT



BIRCH SKELETONIZER

Areas in which infestations
occurred in 1964

Legend

- Light infestation..... 
- Heavy infestation..... 

A Leaf-folding Sawfly on Balsam Poplar, Nematus sp.

Heavy infestations of this insect have persisted in the district since 1962. Roadside and open-grown balsam poplar regeneration up to ten feet in height was the preferred host with only small numbers of folds being found on more mature trees. A heavy infection of a leaf and twig blight of balsam poplar, Pollacia elegans Serv., destroyed feeding sites of the insect at many locations.

Leaf samples were examined at four locations to determine the incidence of leaf folds (Table 12).

TABLE 12

Summary of Damage to Balsam Poplar Foliage in the Kapuskasing District in 1964

Location (township)	Av. height of trees in feet	Total number of leaves per tree	Number of folded leaves	Per cent of leaves folded
Fauquier	5	276	63	22.8
McCrea	5	340	93	27.3
McMillan	7	407	115	28.2
Seaton	5	283	72	25.4

A total of 217 folded leaves from seven locations was examined to estimate larval survival. These showed that an average of only 31.3 per cent of the folds contained larva that survived through to late instars (Table 13).

TABLE 13

Survival of Nematus sp. in Leaf-folds of Balsam Poplar at Seven Locations in the Kapuskasing District in 1964

Note: Samples were collected from June 29 to August 10 and are listed chronologically.

Location (township)	Per cent of folds with				Total no. of folds examined
	No egg	Egg unhatched	no feeding	Feeding but no larva	
McMillan	12.1	0.0	9.1	42.4	33
Seaton	2.7	8.1	0.0	27.0	27
McCrea	0.0	0.0	0.0	70.3	27
Kohler	39.1	4.3(para.)	30.4	0.0	23
Gill	30.3	0.0	6.1	36.4	33
Gurney	12.5	12.5(para.)	4.2	50.0	24
Fauquier	0.0	0.0	0.0	96.0	50

Observations and quantitative measurements have been made in the Kapuskasing District on the role of spiders as predators of leaf-folding sawflies in 1963 and 1964. The frequency of spiders in the leaf folds of balsam poplar have been determined at four locations (Table 14). A slight decline is evidenced in the per cent of folds inhabited by spiders but of greater interest is the relative uniform percentages between one year and the next. Percentages that range from 34 to 88 by location do not differ more than two per cent between 1963 and 1964 when examined on the same date both years.

These data are preliminary and observations will be continued and intensified in 1965.

TABLE 14

Summary of the Relative Numbers of Spiders and Empty Leaf-folds on 100 Folded Balsam Poplar Leaves at Each of Four Locations in the Kapuskasing District in 1963 and 1964

Location (township)	No. of folds examined		Number of folds with spiders		Per cent of folds with spiders		Date of observations	
	1963	1964	1963	1964	1963	1964	1963 and	1964
Sankey	78	65	27	23	34.6	35.4	Aug. 1	
Nansen	89	53	30	17	33.7	32.1	Aug. 2	
Lowther	92	87	63	58	68.5	66.7	Aug. 12	
Fauquier	94	83	83	72	88.3	86.7	Aug. 30	

A Leaf-folding Sawfly on Trembling Aspen, Nematus sp.

This sawfly was collected throughout the district in 1964. A light infestation was found in McCoig Township. Small numbers were collected in Gill, Torrance and O'Brien townships. Examination of leaf folds from Casselman and Slack townships showed 8.3 per cent with no eggs, 32.5 per cent with feeding but no larvae, and 54.2 per cent with larvae. The scarcity of leaf folds plus the fact that only about one out of every two folds contained larvae made mass collecting of the insect difficult in 1964. Quantitative sampling reflects the status of this insect in the district as a whole in 1964 (Table 15).

TABLE 15

Summary of Leaf-folding Sawfly Counts in the Kapuskasing District From 1962 to 1964

Note: Based on the examination of 100 leaves taken at random from each of three trembling aspen trees at each location.

Location (township)	Av. height in feet	No. of leaves infested			No. of folds per 100 leaves		
		1962	1963	1964	1962	1963	1964
Gill	12	3	1	1	3	1	1
Wicksteed	9	13	1	0	13	1	0
Gurney	15	2	1	0	2	1	0
O'Brien	12	7	0	4	7	0	4
Parnell	12	-	-	1	-	-	1
Torrance	10	0	0	1	0	0	1

Balsam-fir Sawfly, Neodiprion abietis complex

The first recorded collections of the balsam-fir sawfly in the Kapuskasing District were made in 1953. Populations have remained at a low level since that time. Although no infestations were found in 1964 the insect was collected in small numbers from open-grown spruce trees along the Chain of Lakes Road, the Fergus Road and in Williamson and Gill townships. Defoliation was very light in all cases.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Minor fluctuations in population levels of the red-headed jack-pine sawfly have occurred in the district since 1954. A review of records shows a decline in numbers from 1954 to 1958. A slight rise in numbers occurred in 1959 and again in 1960 when light infestations were recorded at several locations. A decline again occurred from 1961 to 1963. Population levels increased in 1964 and light infestations were observed in Clavet, Wicksteed, McMillan and Gurney townships. Numbers were low in the remainder of the district. Results of quantitative sampling are shown in Table 16.

TABLE 16

Summary of Colony Counts of the Red-headed Jack-pine Sawfly on Ten Jack-pine Trees at Each of Five Locations in the Kapuskasing District from 1962 to 1964

Location (township)	Av. d.b.h. in inches	Number of infested trees			Av. no. of colonies per tree		
		1962	1963	1964	1962	1963	1964
Clavet	3	1	0	10	0.1	0.0	2.0
McMillan	2	0	0	1	0.0	0.0	0.2
Wicksteed	4	1	0	6	0.1	0.0	1.3
Gurney	3	3	0	8	0.3	0.0	1.4
Gill	3	0	0	3	0.0	0.0	0.6

White-pine Weevil, Pissodes strobi (Peck)

Populations of the white-pine weevil remained at endemic levels from 1954 to 1963. However, in 1964 general observations and quantitative sampling indicate a rise in numbers in the district (Table 17). A heavy infestation recurred in black spruce regeneration along the Smokey Line in Pearce Township and the incidence of weevilling was also heavy in black spruce regeneration along the Fergus Road in Parnell Township. Medium infestations were recorded in roadside black spruce regeneration in the townships of McCoig, Kohler and Clavet. Weevilling was light in the remainder of the district.

Chalcid parasites were reared from a collection from Gurney Township and one collection from Clavet was 100 per cent parasitized. A mixed plantation in Fauquier Township of 40 per cent Scots pine and 20 per cent each of white spruce, jack pine and white pine supported a medium infestation and the tree species were attacked in the following proportions: Scots pine - six per cent; white pine - four per cent; white spruce - three per cent and jack pine nil.

TABLE 17

Summary of Damage by the White-pine Weevil on 100 Trees at Each of Four Locations in the Kapuskasing District

Location (township)	Host	Av. height in feet	Number of infested trees		
			1962	1963	1964
Pearce	bS	10	18	2	18
Shearer	wS	8	7	0	4
Kohler	bS	15	5	0	6
Parnell	bS	15	-	-	18

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

Quantitative sampling at three locations in the district again showed that this primitive bud-mining sawfly occurs in balsam fir shoots every second year (Table 18). Large numbers of infested shoots were found along the shore of Goat Lake, Minnipuka Township and in the townships of Shackelton, Fergus and Clavet. The insect was also abundant along the shore of Brunswick Lake in Byng Township and on ornamentals in the Remi Lake area in Fauquier Township.

TABLE 18

Summary of Balsam Bud-mining Sawfly Counts Made at Three Locations
in the Kapuskasing District From 1962 to 1964

Note: Counts were based on the examination of all buds on four branch tips from each of five balsam-fir trees at each location.

Location (township)	Total no. of buds			No. of infested buds			Per cent of buds infested		
	1962	1963	1964	1962	1963	1964	1962	1963	1964
Shackelton	221	240	246	1	0	6	0.4	0.0	2.4
Fergus	339	275	215	9	0	12	2.6	0.0	5.6
Clavet	336	265	190	12	0	10	3.6	0.0	5.3

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

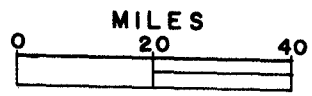
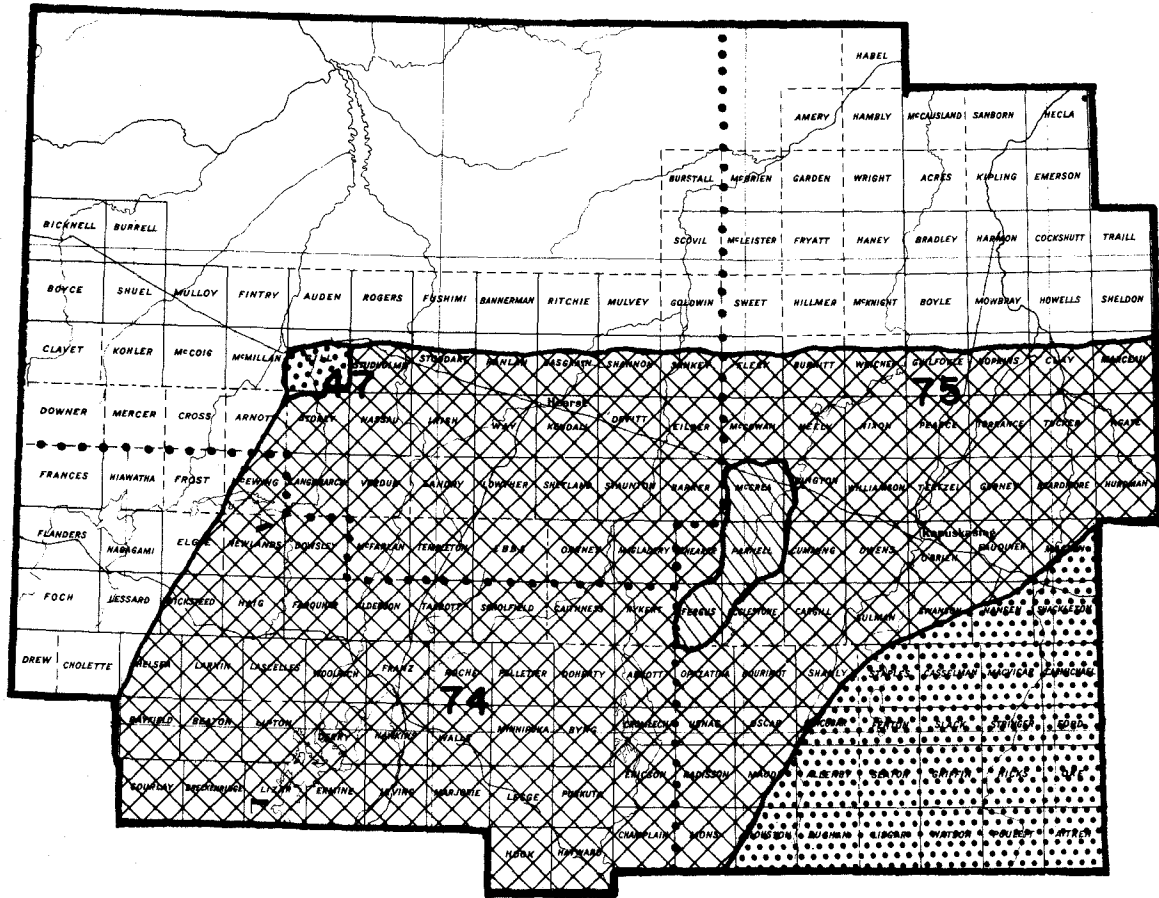
A decline in numbers of this sawfly was observed in some areas in 1964 but no changes in infestation boundaries occurred. Infestations declined from heavy to medium intensity in McCrea, Parnell and Fergus townships. Light infestations were observed in Gill Township and in the southeast part of the district where heavy infestations have been recorded in 1963 (see map). Quantitative sampling showed a decrease at all but one sample location, in Wicksteed Township, where a slight increase was noted (Table 19).

TABLE 19

Summary of Damage by P. thomsoni (Konow) on 100 White Birch
Leaves at Each of Five Locations in the Kapuskasing
District from 1962 to 1964

Location (township)	Number of leaves affected			Total number of mines		
	1962	1963	1964	1962	1963	1964
Wicksteed	-	30	37	-	112	127
Fauquier	86	50	41	282	160	113
Casselman	6	70	12	19	170	16
Seaton	12	80	3	36	250	3
Shearer	6	53	43	11	178	147




KAPUSKASING DISTRICT



A LEAF MINER ON BIRCH, Profenusa thomsoni (Konow)

Areas in which infestations occurred in 1964

Legend

- Light infestation..... 
- Medium infestation..... 
- Heavy infestation..... 

Spruce Bud Gall Midge, Rhabdophaga swainei Felt

A decline in numbers of this gall midge has been recorded in the district since 1962 and numbers were again low in 1964. Three collections were made from white spruce and one was from black spruce. All collections contained parasitized larvae. One collection of 22 larvae from Fauquier Township contained two chalcid parasites. Quantitative sampling results at five sample points were negative for the first time since 1960.

Webworm on Poplar, Tetralopha aplastella Clem.

An increase in the numbers of this insect was observed in 1964. Open-grown trembling aspen reproduction was severely attacked. Infestations were heavy in the townships of Elgie and Gurney, medium in O'Brien Township, and light throughout the remainder of the district. Results of quantitative sampling are shown in Table 20.

TABLE 20

Summary of Webworm Counts on Ten Trembling Aspen Trees at Each of Four Locations in the Kapuskasing District in 1964

Location (township)	Av. height in feet	Total number of nests on ten trees
Elgie	7	27
Parnell	10	2
Gill	12	4
O'Brien	8	5

TABLE 21

Summary of Miscellaneous Insects Collected
in Kapuskasing District in 1964

Insect	Host(s)	Remarks
<i>Acleris celiana</i> Rob.	wB, Al	Found commonly
<i>Acleris chalybeana</i> Fern.	moM	Found commonly
<i>Acleris logiana</i> Linn.	wB	Small numbers
<i>Acleris variana</i> Fern.	wS	Low populations continued
<i>Acrobasis betulella</i> Hlst.	wB	Numbers declined
<i>Acronicta lepusculina</i> Gn.	tA	Found rarely
<i>Adelges lariciatus</i> (Patch)	wS	Found commonly
<i>Allononyma diana</i> Hbn.	wB, bPo	Throughout district
<i>Altica corni</i> Woods	Do	Common in district
<i>Altica populi</i> Brown	bPo	Small numbers
<i>Anomogyna elimata</i> Gn.	bF	Low populations
<i>Argyresthia oreasella</i> Clem.	ecCh	Low populations continued
<i>Autheraea polyphemus</i> Cram.	W	Small numbers
<i>Badebecia urticana</i> Hbn.	bPo	Numbers declined
<i>Choristoneura fumiferana</i> (Clem.)	bS	Populations remained low
<i>Clepsis persicana</i> Fitch	bPo	Common in district
<i>Dicrodiplosis populi</i> Felt	tA	Common in district
<i>Diorycytria abietivorella</i> Grt.	jP	Found in old pitch nodule
<i>Drepana arcuata</i> Wlk.	wB	Small numbers

TABLE 21, Kapuskasing District

Insect	Host(s)	Remarks
<i>Enargia infumata</i> Grt.	wB	Numbers declined
<i>Epinotia cruciana</i> Linn.	W	Populations remained low
<i>Epinotia solandriana</i> Linn.	bPo	Populations remained low
<i>Erynnis icelus</i> Scud. and Burg.	W	Very low numbers
<i>Euura salicis pisum</i> (Walsh)	W	Small numbers
<i>Fenusa dohrnii</i> (Tischb.)	AL	Scattered light infestations
<i>Gracillaria invariabilis</i> Braun.	ecCh	Low numbers
<i>Gypsonoma haimbachiana</i> Kft.	bPo	More common in 1964
<i>Gypsonoma salicicolana</i> Clem.	W	Found commonly
<i>Hemichroa crocea</i> (Four.)	AL	Scattered low populations
<i>Hypagyrtis piniata</i> Pack.	bF	Low numbers
<i>Lambdina fiscellaria fiscellaria</i> (Gn.)	wS	Numbers remained low
<i>Meroptera praxella</i> Grt.	tA	Increase in numbers over past years
<i>Mindarus abietinus</i> Koch.	bF	Slight increase in 1964
<i>Nadata gibbosa</i> A. & S.	tA	Collected at scattered locations
<i>Nematus fulvicus</i> Prov.	W	Low numbers
<i>Nematus ventralis</i> Say	W, tA	Light infestation, Remi Lake area
<i>Nymphalis antiopa</i> Linn.	tA	More common in 1964
<i>Nymphalis j-album</i> Bdv. & Lec.	wB	Low numbers
<i>Orthosia revicta</i> Morr.	W	Low numbers
<i>Petrova albicapitana</i> Busck.	jP	Populations declined
<i>Phlyctaenia tertialis</i> Gn.	Elderberry	Small numbers in Kapuskasing Park
<i>Phratora purpurea purpurea</i> Brown	tA	Low numbers
<i>Phyllocnistis populiella</i> Cham.	tA	Found commonly
<i>Pineus floccus</i> Patch	bS	Low numbers throughout district
<i>Pyrrhia umbra exprimens</i> Wlk.	bPo	Small numbers found
<i>Recurvaria</i> sp.	tL	Very low numbers
<i>Rhabdophaga coloradensis</i> Felt	W	Low populations
<i>Rhabdophaga strobiloïdes</i> (Walsh)	W	Common in district
<i>Sarrothripus frigidana</i> (Wlk.)	W	High populations in 1964
<i>Stenoma algidella</i> Wlk.	tA	Low numbers
<i>Trichiocampus irregularis</i> (Dyar)	W	Found commonly
<i>Trypodendron lineatum</i> (Oliver)	bF	Found in recent windblown tree
<i>Xylomyges dolosa</i> Grt.	tA	Found rarely
<i>Zeugophora</i> sp.	bPo	Populations remained low

STATUS OF INSECTS IN THE SWASTIKA DISTRICT

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Larch Casebearer	<u>Coleophora laricella</u> (Hbn.)	E 33
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M. J. Applejohn

Ugly-nest Caterpillar, Archips cerasivoranus (Fitch)

Populations of this insect declined in the district except north of New Liskeard near Hanbury Cemetery where 51 tents were counted in a square-chain plot, and in Benoit Township where a small, medium infestation occurred. The heavy infestation reported in 1963 in Armstrong Township declined to medium intensity in 1964 (Table 9). Elsewhere in the district only occasional tents were found.

TABLE 9

Summary of Damage Caused by the Ugly-nest Caterpillar in the Swastika District from 1962 to 1964

Location (township)	Sample unit	Av. tree height in feet	Number of tents		
			1962	1963	1964
Eby	square chain plot	7	8	5	0
Pacaud	square chain plot	4	-	5	0
Armstrong	square chain plot	8	-	38	23
Kearns	one mile of roadside	4	-	8	7
Harley	square chain plot	4	7	5	3

Birch Skeletonizer, Bucculatrix canadensisella Chamb.

Widespread heavy infestations of this insect persisted in Division 39 and the northern part of Division 42 in 1964 (see map). Population levels were highest along the south shore of Lake Abitibi in Rand, Lamplugh, Frecheville, Stoughton and Marriot townships (Table 10). Most stands in the southern part of Division 42 and in Division 63 were lightly infested. Numerous small pockets of medium infestation occurred in Division 63.

TABLE 10

Summary of Larval Counts of the Birch Skeletonizer on White Birch Foliage at Eight Locations in the Swastika District in 1964

Note: Based on examination of five leaves selected at random from each of five trees at each location.

Location (township)	Av. d.b.h. in inches	Total no. of larvae	Av. no. of larvae per leaf
Rand	4	255	10.2
Lamplugh	3	272	10.8
Yarrow	3	201	8.0
Cairo	6	151	6.0
Black	3	102	4.0
Walker	4	228	9.1
Beauchamp	3	52	2.0
Marriot	3	315	12.6

Larch Casebearer, Coleophora laricella (Hbn.)

A general increase in numbers of this casebearer occurred in the district in 1964 (Table 11). Warm weather and early flushing of larch foliage in the last week of April and the first two weeks of May were ideal for larval development.

Infestations were recorded for the first time in McGarry, Teck, and Bannockburn townships in 1964.

TABLE 11

Summary of Larch Casebearer Larval Counts in the Swastika District
from 1962 to 1964

Note: Counts were based on examination of sixteen 18-inch branch tips from each location in early spring.

Location (township)	Av. d.b.h. in inches	Av. number of larvae per tip		
		1962	1963	1964
Marter	5	0.01	0.31	0.56
Gauthier	4	1.00	0.37	0.93
Powell	4	0.50	0.25	0.75
Harley	4	0.00	0.50	1.30
Hudson	6	-	7.45	13.80

European Spruce Sawfly, Diprion hercyniae (Htg.)

Little change in population levels of this insect occurred in the district in 1964 as shown in Table 12.

TABLE 12

Summary of European Spruce Sawfly Larval Counts Made in the
Swastika District in 1963 and 1964

Location (township)	Tree species	Av. d.b.h. of sample trees in inches	Av. no. of larvae per 15-mat sample	
			1963	1964
Bowman	wS	5	7	13
Pacaud	wS	3	11	17
Dymond	wS	3	2	5
Eby	bS	4	3	2
Garrison	wS	7	6	9
Eby	wS	4	-	11

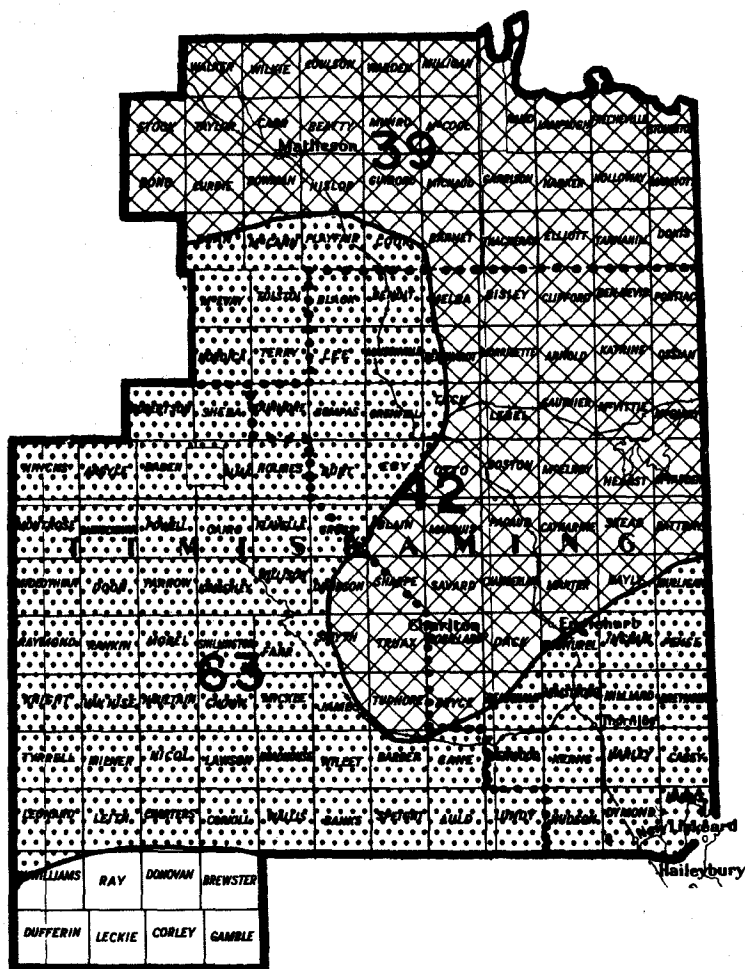
A Noctuid, Enargia decoler Wlk.

Population levels of this insect declined sharply in the district in 1964. The infestation reported in the Gowganda area in 1962 and 1963 collapsed in 1964. Small, light infestations occurred in Grenfell and Ingram townships.

Birch Leaf Miner, Fenusa pusilla Lep.

First collected in the Swastika District in 1961, this introduced insect has since spread northward to Beaverhouse Lake in Katrine Township. Small clumps of white-birch reproduction were heavily attacked at one location in Otto Township and at two locations in Eby Township in 1964. Medium numbers occurred on roadside reproduction near Raven Lake in McFadden Township and near the old Cathroy-Larder Mine in McElroy Township. Small numbers were collected at five other townships in the district.


SWASTIKA DISTRICT




BIRCH SKELETONIZER

Areas in which infestations occurred in 1964

Legend

Heavy infestation..... 

Light with pockets of medium infestation..... 

Native Elm Bark Beetle, Hylurgopinus rufipes (Eich.)

Small numbers of this insect were first collected in the district in Harley Township in 1963. In 1964, high populations occurred in windthrown elms and in slash along the Wabi River in Kearns Township. Small numbers of the beetle were also found in Harley, Casey, and Dymond townships.

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Populations of this insect declined to a low level in the district in 1964. Quantitative sampling yielded negative results in Teck and Playfair townships and showed a substantial decline in populations in Walker Township (Table 13). Medium infestations occurred in Pense and Hilliard townships and light damage was observed at several locations in Division 63.

TABLE 13

Summary of Damage Caused by the Aspen Blotch Miner in the Swastika District from 1962 to 1964

Note: Counts were based on the examination of 100 leaves taken from three trembling aspen trees at each location.

Location (township)	Av. tree height in feet	Per cent of leaves mined			Total no. of mines		
		1962	1963	1964	1962	1963	1964
Teck	18	15	10	0	20	18	0
Playfair	15	29	31	0	43	40	0
Walker	20	25	30	23	40	42	31
Kimberly	15	40	43	40	88	72	59
Marriot	15	41	16	25	72	50	40

Western Tent Caterpillar, Malacosoma pluviale Dyar

Populations of this defoliator increased for the second consecutive year. Highest numbers occurred in Munro Township where 23 tents were counted in a square-chain plot (Table 14). New infestations occurred in Argyle, Hinks, Eby and Maisonville townships. The caterpillars fed on white birch, aspen, willow and serviceberry as well as the preferred host, pin cherry.

TABLE 14

Summary of Western Tent Caterpillar Colony Counts in the Swastika District from 1962 to 1964

Location (township)	Tree species	Sample unit	No. of tents per sample unit		
			1962	1963	1964
Cook	pCh	square chain plot	6	17	20
Munro	pCh	square chain plot	-	10	23
Michaud	pCh	square chain plot	1	10	14
Walker	pCh	one mile of roadside	-	-	12
Argyle	pCh	one mile of roadside	-	-	12
Guibord	W	square chain plot	-	-	10
McEvoy	pCh	one mile of roadside	10	9	13

A Leaf-folding Sawfly on Balsam Poplar, Nematus (pontania) sp.

Small clumps of balsam-poplar reproduction were again severely attacked by this insect in 1964. Heavy infestations persisted in ten townships in Divisions 42 and 63. Medium infestations occurred in Carr, Benoit, and Yarrow townships (Table 15). Small numbers of folded leaves were observed on small open-grown trees at many other locations in the district.

TABLE 15

Summary of Leaf-folding Sawfly Damage on Balsam-poplar at Four Points in the Swastika District in 1964

Note: Counts were made by examining all the leaves on five balsam-poplar trees at each location.

Location (township)	Av. tree height in feet	Total number of leaves	Per cent of leaves folded
Carr	4.1	435	17.7
Yarrow	4.1	402	26.4
Teck	4.5	687	11.5
Savard	4.2	437	9.8

Red-pine Sawfly, Neodiprion nanulus nanulus (Schedl.)

Populations of this insect remained low in the district in 1964. A light infestation recurred in Farr Township where eleven colonies were counted on ten trees examined (Table 16). A new infestation was observed on jack-pine on a small island in Kenogami Lake in Grenfell Township. Only scattered colonies were found elsewhere in the district.

TABLE 16

Summary of Red-pine Sawfly Colony Counts Made on Ten Trees at Five Locations in the Swastika District in 1964

Location (township)	Tree species	Av. d.b.h. in inches	Av. no. of colonies per tree
Grenfell	jP	4	0.5
Kimberly	jP	4	0.3
Eby	jP	3	0.2
Dymond	rP	5	0.2
Farr	jP	4	1.1

Swaine Jack-pine Sawfly, Neodiprion swainei Midd.

The infestation at Banks Lake that has been under careful observation since 1946 declined sharply in 1964. Colony counts on ten jack pine trees at Banks Lake showed an average of 0.9 colonies per tree in 1964. In contrast, 11.1 colonies were recorded in 1960 and 1952 respectively. No larvae of this sawfly were found in the remainder of the district in 1964.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

A general increase in population levels of this insect occurred in the district in 1964. Low numbers of colonies and light defoliation were observed in sixteen townships. Highest populations occurred in Maisonville and Teck townships where quantitative sampling revealed an average of 1.5 and 1.1 colonies per tree (Table 17).

TABLE 17

Summary of Red-headed Jack-pine Sawfly Colony Counts Made on Ten Trees at Six Locations in the Swastika District in 1963 and 1964

Location (township)	Av. d.b.h. in inches	No. of trees infested		Av. no. of colonies per tree	
		1963	1964	1963	1964
Playfair	3	2	5	0.5	0.8
Eby	3	5	3	0.5	0.6
Maisonville	4	-	10	-	1.5
Teck	2	1	9	0.1	1.1
Munro	4	-	5	-	0.6
Barber	4	1	6	0.2	0.8

Pitch Nodule Maker, Petrova albicapitana (Busck.)

Small, heavy infestations of this insect occurred on clumps of jack-pine reproduction near Ramore in Playfair Township and near Kenogami in Eby Township. Elsewhere in the district very little change in population levels occurred (Table 18).

TABLE 18

Summary of Pitch Nodule Maker Counts Made on Ten Jack-pine Trees at Seven Locations in the Swastika District from 1962 to 1964

Location (township)	Av. d.b.h. in inches	Av. no. of second year nodules per tree		
		1962	1963	1964
Flavelle	4	0.9	1.1	0.9
McCann	4	1.0	1.2	1.4
Morrisette	3	0.5	0.3	0.0
McVittie	3	1.5	2.9	0.7
Gauthier	4	3.5	3.1	2.7
McEvoy	3	0.2	1.0	1.3
Michaud	4	2.1	2.0	2.0

White Pine Weevil, Pissodes strobi Peck

A marked increase in population levels of this insect occurred in the district in 1964. Medium infestations were observed near Chimenis in McGarry Township, in Grenfell and Bryce townships, and on pole-sized jack-pine in Argyle Township. At one sample point in Grenfell Township 26 per cent of the trees were infested (Table 19).

Leader damage was moderate in plantations near Hills Lake in Bryce Township

and light in windbreaks in the Swastika nursery. Elsewhere in the district generally light damage was inflicted on white and black spruce and on white, red, Scots and jack pine. Typical damage is shown in the accompanying photograph.

TABLE 19

Summary of White-pine Weevil Leader Damage in the Swastika District in 1963 and 1964

Location (township)	Tree species	No. of trees examined	Per cent of trees infested	
			1963	1964
Gauthier	jP	100	7	8
Grenfell	wP	50	22	26
Munro	bS	50	-	10
Benoit	jP	100	1	6
Nordica	jP	100	2	5
McGarry	bS	50	-	10

Balsam Shoot-boring Sawfly, Pleroneura borealis Felt

Heavy shoot damage was caused by this insect in many balsam fir stands in the district in 1964. The heaviest infestations occurred in Benoit, Eby, Marquis and Ben Nevis townships. Quantitative sampling revealed a high percentage of infested shoots at four of five locations (Table 20). Severe frosts in late May and early June destroyed many of the new shoots and caused high mortality.

TABLE 20

Summary of Damage by the Balsam Shoot-boring Sawfly in the Swastika District from 1962 to 1964

Note: Counts were based on examination of eight 18-inch balsam-fir branch tips from each location.

Location (township)	No. of buds examined, 1964	No. of buds infested			Per cent of buds infested		
		1962	1963	1964	1962	1963	1964
Bernhardt	281	13	0	5	11.3	0.0	1.7
Benoit	211	29	0	57	6.6	0.0	27.0
Eby	230	11	9	41	6.9	4.5	17.7
Marquis	218	17	3	40	11.1	1.5	18.3
Farr	199	25	0	33	6.8	0.0	16.5

Mountain-ash Sawfly, Pristiphora geniculata (Htg.)

Populations of this insect persisted at a high level in the district in 1964. Heavy infestations recurred on clumps of mountain ash in Eby, Otto and Grenfell townships. Infestations in Boston, James and Mickle townships, classed as medium in 1963, increased to heavy intensity in 1964. Infestations were found as far north as Abitibi Lake and as far west as Pidgeon Lake near the Gogama District Boundary. Defoliation of infested trees ranged from five to 100 per cent.

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

A general decline in numbers of this insect occurred in the district in 1964 (Table 21). The heavy infestation reported in 1963 in Burt Township declined to light intensity. Small pockets of heavy infestation were found on lakeshore trees in Doon and Knight townships. Numerous small light infestations occurred elsewhere in the district.

TABLE 21

Summary of Damage Caused by the Amber-marked Birch Leaf Miner
in the Swastika District from 1962 to 1964

Note: Counts were based on examination of 100 leaves from three white birch trees at each location.

Location (township)	No. of leaves infested			Total no. of mines in 1964	Av. no. of mines per infested leaf in 1964
	1962	1963	1964		
Playfair	55	40	31	80	2.5
James	62	60	53	90	1.7
Stock	33	43	30	77	2.6
Arnold	72	75	70	103	1.5
Skead	39	37	27	59	2.1
Van Hise	49	28	35	78	2.2
Clifford	46	53	58	96	1.4
Otto	-	-	56	89	1.5

A Poplar Leaf Roller, Pseudexentera oregonana Wlshn.

High numbers of this insect persisted in four townships in the southern part of Division 42. Heavy infestations occurred in the Milberta and Hanbury areas, near Brethour in Brethour Township, and in the Belle Vallee area in Casey Township. Light infestations occurred along Highway 65 from New Lisheard to the Quebec Boundary, and near Hammond Lake in Hudson Township. Pole-sized trees and reproduction were most severely defoliated with only light damage on larger trees.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt

A slight increase in numbers of this insect occurred in the district in 1964. Small, medium infestations occurred on clumps of understory white-spruce reproduction in Dunmore Township and on a clump of open-grown reproduction on the south shore of Kenogami Lake in Eby Township. A small, light infestation occurred on black-spruce in Eby Township (Table 22). Elsewhere in the district only low numbers of infested buds were observed.

TABLE 22

Summary of Damage by the Spruce Bud Gall Midge in the Swastika District from 1962 to 1964

Location (township)	Tree species	No. of shoots infested in 1964	Percentage of shoots infested		
			1962	1963	1964
Garrison	wS	10	.7	0.0	5.5
Lebel	wS	6	1.5	1.7	2.9
Dymond	wS	2	5.3	6.0	0.9
Otto	wS	3	1.2	2.4	1.6
Eby	bS	7	1.3	4.4	3.5
Eby	wS	20	-	-	9.3

TABLE 23

Summary of Miscellaneous Insects Collected in the Swastika District in 1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris calignosana</i> Wlk.	wB	Low population in Tolstoi and Frecheville tps. (2)
<i>Acrionicta dactylina</i> Grt.	Al	Small numbers at two locations (2)
<i>Acrionicta impressa</i> Wlk.	bPo	One collection from Lebel Tp.
<i>Acrionicta lepusculina</i> Gn.	tA	One collection from Lee Tp.
<i>Adelges strobilobius</i> Kalt.	bS	Large numbers at several locations (2)
<i>Altica ambiens alni</i> Harr.	Al	Heavy infestations in four townships (2)
<i>Anchylopera burgessiana pruni</i> Zell.	pCh	Small numbers at several locations (2)
<i>Anchylopera nubeculana</i> Clem.	pCh	Small numbers at two locations (2)
<i>Archippus packardianus</i> Fern.	bS	One collection from Dymond Tp.
<i>Arge</i> sp.	Mo	Low populations at several locations (2)
<i>Argyresthia</i> sp.	bF	Low population in Bompass Tp.
<i>Badebecia urticana</i> Hbn.	bPo	Small numbers at one location
<i>Bucculatrix</i> sp.	pCh	High populations in two townships (2)
<i>Calligrapha</i> sp. (prob. alni)	Al	High population in Bompass Tp.
<i>Dasyneura balsamicola</i> Lintn.	bF	Heavy at several locations (2)
<i>Dendroctinus simplex</i> Lec.	tL	High populations in dying trees at two locations (2)
<i>Dimorphopteryx pinguis</i> (Nort)	wS	Small numbers in Doon and Melba tps. (2)
<i>Dioryctria abietivorella</i> Grt.	wS	Large numbers in cones at two locations (2)
<i>Dioryctria reniculella</i> Grt.	wS	Low population at several locations (3)

TABLE 23, Swastika District

Insect	Host(s)	Remarks
<i>Dryocoetes affaber</i> Mann.	wS	Low numbers in Skead Tp.
<i>Epinotia momonana</i> Kft.	Al	High population at two locations (2)
<i>Epinotia solandriana</i> Linn.	wB	Small-to-large numbers throughout the district (5)
<i>Epinotia</i> sp.	Al	Heavy infestations in alder catkins throughout the district (8)
<i>Epizeuxis aemula</i> Hbn.	bF	Low population in witches-broom in Doon Tp.
<i>Eupithecia filmata</i> Pears.	wS	Small numbers on mat samples at two locations (2)
<i>Eupithecia mutata</i> Pears.	wS	Light damage to cones in Teck Tp.
<i>Fenusa dohrnii</i> (Tischb.)	Al	Common in the district (5)
<i>Feralia jocosa</i> Gn.	jP, wS	Small numbers at two locations (2)
<i>Galerucella cavicollis</i> Lec.	pCh	Moderate numbers at two locations (2)
<i>Galerucella decora</i> Say.	pCh	High population in Grenfell Tp.
<i>Galerucella nymphaeae</i> Linn.	Water Lily	Material requested for comparison with other species in the genus
<i>Gonioctena americana</i> Schaef.	tA	Small-to-large numbers throughout the district (7)
<i>Gracillaria invariabilis</i> Braun.	pCh	Heavy in Bannockburn Tp.
<i>Gracillaria syringella</i> F.	Lilac	Common on ornamentals
<i>Halisidota maculata</i> Harr.	tA	Low population in Grenfell Tp.
<i>Hemicroa crocea</i> Dru.	Al	Several colonies in Bompas Tp.
<i>Herculia thymetusalis</i> Wlk.	bF	Heavy infestation in deformed foliage of witches broom in Doon Tp.
<i>Hylobius congener</i> D.T.	jP	Small numbers in Grenfell Tp.
<i>Hyphantria cunea</i> Dru.	wB, ecCh, pCh	Small numbers of tents in three townships (3)
<i>Ips borealis</i> Sw.	wS	Low numbers in dead trees in Skead Tp.
<i>Ips chagnoni</i> Sw.	jP	Low population in dying tree in Bernhardt Tp.
<i>Ips perturbatus</i> Eich.	jP, wS	High numbers under bark of dead trees and slash at several locations (4)
<i>Ips pini</i> Say.	jP	High population in overthrown trees in several townships (7)
<i>Lambdina fiscellaria fiscellaria</i> Gn.	bF	Low population in Teck Tp.
<i>Macrobotys pertextalis</i> Led.	bAs	Low population Chamberlain Tp.
<i>Melangromyza schineri</i> (Gr.)	tA	One collection from Eby Tp.
<i>Mindarus abietinus</i> Koch.	bF	Light damage at one location
<i>Mulsantina hudsonica</i> Csy.	bF, wS	Common on mat samples (3)
<i>Nematus erythrogaster</i> Nort.	Al	Low numbers in Otto and Bowman tps. (2)
<i>Nematus hyalinus</i> (Nort.)	W	Heavy infestation in Beauchamp Tp.
<i>Nematus ventralis</i> Say	tA	One colony in Pacaud Tp.
<i>Neodiprion abietis</i> complex	bF, wS	Single colonies at several locations (3)

TABLE 23, Swastika District

Insect	Host(s)	Remarks
<i>Neodiprion maurus</i> Roh.	jP	Low numbers in Kimberly Tp.
<i>Neodiprion nigroscutum</i> Midd.	jP	One colony in Otto Tp.
<i>Neodiprion pratti banksianae</i> Roh.	jP	One colony in Grenfell Tp.
<i>Neuroterus macrocarpae</i> Kinsey	bO	Heavy infestation near Hanbury Cemetery
<i>Nymphalis antiopa</i> Linn.	W, bPo	Single colonies at several locations (2)
<i>Orthosia revicta</i> Morr.	wS	Low number, Garrison Tp.
<i>Pareophora minuta</i> MacG.	bAs	Single colonies at two locations (2)
<i>Peridroma margaritosa</i> (Haw.)	bS	Heavy damage to seedlings in the Swastika Nursery in Burt Tp. (2)
<i>Phenacaspis pinifoliae</i> Fitch	wS	One collection from Hinks Tp.
<i>Pissodes affinis</i> (Rand)	jP	First record in Swastika District
<i>Phlyctaenia tertialis</i> Gn.	El	Large numbers on understory trees at two locations (2)
<i>Phratora purpurea purpurea</i> Brown	tA	Small numbers in Melba Tp.
<i>Pikonema alaskensis</i> Roh.	wS	Light at two locations (2)
<i>Pikonema dimockii</i> (Cress.)	wS	Small numbers on mat samples (2)
<i>Pineus similis</i> Gil	wS	Small numbers at several locations (2)
<i>Polygraphus rufipennis</i> Kby.	wS	High population in slash in Grenfell Tp.
<i>Prochoerodes transversatta</i> Dru.	wB	Low population in Harker Tp.
<i>Protoboarmia porcelaria</i> <i>indicataria</i> Wlk.	wS	One collection from Doon Tp.
<i>Pyrrhia umbra exprimens</i> Wlk.	bPo	Moderate defoliation at one location
<i>Recurvaria piceaella</i> Kft.	bF	Low populations in Eby and Bompass tps. (2)
<i>Rhynchaenus rufipes</i> Lec.	W	Heavy infestation in Eby Tp.
<i>Sarothripus frigidana</i> Wlk.	W	Small numbers at one location
<i>Sciaphilla duplex</i> Wlsh.	tA	Low population in Hudson Tp.
<i>Semiothisa</i> sp. (<i>granitata</i> group)	bF	One collection from Doon Tp.
<i>Tenthredinidae</i> #11	tA	Several colonies in Lamplugh Tp.
<i>Tenthredinidae</i> #21	W	Low population at one location
<i>Tenthredinidae</i> #23	tA	Single colony in Grenfell Tp.
<i>Toumeyella numismaticum</i> P. McD.	jP	Widespread in Divisions 42 and 63 (4)
<i>Trichiocampus irregularis</i> Dyar	W	Several colonies in Teck Tp.
<i>Trichiosoma triangulum</i> Kby.	pCh, W	Small numbers in two townships (2)
<i>Vasates quadripes</i> Shim	siM, rM	Small-to-large numbers throughout the district (4)
<i>Zeiraphera fortunana</i> Kft.	wS	Moderate numbers in Teck Tp.
<i>Zeiraphera ratzeburgiana</i> Ratz.	wS	Heavy infestations in Harley and Burt tps. (2)
<i>Zeugophora</i> sp.	tA, bPo	Low-to-high populations through- out the district (7)

MIDWESTERN FOREST REGION

1964

INTRODUCTION

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INTRODUCTION

Midwestern Forest Region

The 1964 season was highlighted by an extension of the forest tent caterpillar outbreak from the Western Region into the western part of the Port Arthur District where severe defoliation of aspen occurred over an area of approximately 600 square miles. Forecasts based on egg mass surveys indicate that a much more substantial spread of infestation will occur in 1965.

Another forest insect, the birch leaf skeletonizer showed a marked increase in the extent and intensity of infestation. Spruce budworm populations continued to decline and no areas of infestation were observed. An aerial survey using the operations recorder was again carried out north of Pays Plat in the Geraldton District in September. This survey showed an increase in mortality and numbers of red balsam fir trees throughout the northern limits of the old spruce budworm infested area.

Late spring frosts caused severe damage to the current growth of balsam fir and white spruce at numerous locations.

Other highlights of the year were related to sampling procedures and public relations. A program for sampling insects on balsam fir was initiated in 1964 to obtain biological information and to follow trends in numbers of major species on this host. Short courses of instruction on insects and tree diseases were given at all junior ranger camps in the region. The Geraldton District Technician conducted a short course on forest insects for Grade 8 students at the first conservation school held at Marathon. Considerable extension work was carried out in urban areas.

The interest and assistance in survey work extended by the Department of Lands and Forests and Industry is gratefully acknowledged.

K. C. Hall

STATUS OF INSECTS

Larch Sawfly, Pristiphora erichsonii (Htg.)

Population levels of this sawfly were low throughout the region in 1964. Pockets of moderate infestation reported in 1963 at Castlebar Lake and in Croll Township declined to light intensity. In contrast an increase in numbers of colonies was observed on small open-grown trees in Inwood, Croll and Oakes townships and in Poshkokgan River, Black Sturgeon, Lac Du Mille Lac and Auden areas. Defoliation of scattered trees in these areas ranged from 5 per cent to 20 per cent. A summary of tamarack mortality in two plots is shown in Table 1.

TABLE 1

Summary of Larch Mortality by Volume in Two Plots in the Midwestern Region from 1961 to 1964.

Location (township)	Size of plot	Cumulative per cent mortality by volume			
		1961	1962	1963	1964
Stedman	0.2 acres	15.5	15.8	16.6	17.0
Ledger	0.2 acres	1.3	7.7	10.3	10.7

STATUS OF TREE DISEASES

Needle Rust of Spruce, Chrysomyxa ledi de Bary

Severe infections of this rust occurred in a 50 acre stand of white spruce at Jackfish Lake in Township 82. Heavy browning of current year's needles was common on trees of all diameters. Smaller pockets of heavy infection were found on open-growing white spruce in the townships of Inwood, Upsala, Pic, 84, and 78, and on open-growing black spruce at Flynn Lake. Light infection was recorded in two white spruce plantations in O'Connor Township.

Needle Rust of Spruce, Chrysomyxa ledicola Lagerh.

Light to moderate infection of this needle rust on black spruce was recorded on all diameter classes along the Atikokan road from Huronian Lake to the Fort Frances border. Light infection was found commonly on white spruce along the Armstrong and Spruce River roads, and in Joynt, Inwood, Booth and Gorham Townships.

Cone Rust of Spruce, Chrysomyxa pirolata Wint.

This fungus was found at numerous locations in the region. The heaviest centre of infection occurred south of Black Sturgeon Lake where 77 per cent of the cones were affected (Table 2). Moderate infection was recorded in Fowler and MacGregor townships. Elsewhere in the region the percentage of infected white spruce cones was low.

TABLE 2

Summary of Infection of White Spruce Cones Caused by Chrysomyxa pirolata at Seven Locations in the Midwestern Region in 1964

Note: 100 cones examined at each location.

Location	Cones diseased per cent	Severity
Black Sturgeon Lake	77	High
Fowler Tp.	46	Medium
MacGregor Tp.	41	Medium
Ware Tp.	12	Low
Sibley Peninsula	10	Low
McMaster Tp.	8	Low
Lake Helen	14	Low

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

Scattered pockets of moderate infection of this organism occurred in the area from Caramat southward to Davies Township. The average numbers of diseased leaves per tree ranged from 18 per cent in Davies Township to 42 per cent on the Le May road. Small areas of low incidence were observed along the Pine Portage and Spruce River roads, in Scoble Township of the Port Arthur District, and Errington and Croll townships, Geraldton District. Elsewhere in the region the incidence was very low.

Shot Hole of Cherry, Coccomyces hiemalis Higgins

Scattered pockets of heavy infection of this fungus on choke cherry were observed along the Blackwater River in Leduc Township, and south of Caramat in Geraldton District.

A Needle Rust, Coleosporium asterum (Diet.) Syd

High incidence of this rust caused severe browning of foliage in jack pine plantations in Sandra Township, Geraldton District, and in O'Connor Township in Port Arthur District. Incidence of infection was 100 per cent and 70 per cent respectively. High incidence also was recorded in fire origin jack pine south of Sturgeon River, Sandra Township. Light infection on lower branches of small diameter trees occurred commonly along the Atikokan road and in Upsala and Bain Townships.

Comandra Blister Rust, Cronartium comandrae Peck

This rust fungus was recovered from a clump of jack pine trees in the Thunder Bay Nursery in 1964. The incidence of infection was 22 per cent, and swellings averaged 1.5 per tree.

Sweetfern Blister Rust, Cronartium comptoniae Arth.

One collection of jack pine seedlings infected with this organism was made in the Thunder Bay Nursery in 1964.

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

This rust occurs throughout the range of white pine in the Port Arthur District. However, dead tree tops and branches attributed to this disease occur commonly along the Pigeon River. The incidence of infections in two white pine plantations is summarized in Table 3.

TABLE 3

Incidence of Blister Rust Infections at Two Locations in the Port Arthur District in 1964.

Location	Number of trees infected	Type of infection	
		Branch	Stem
Boy Scout Tree Farm Paipoonge Tp.	6	1	5
Tunder Bay Nursery Paipoonge Tp.	3	2	1

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

Two pockets of heavy infection of this disease were recorded in Port Arthur District in 1964. The largest occurred along the Armstrong road in Hele Township where 60 per cent of the pin cherry trees were affected. A smaller pocket on Sibley Peninsula showed 78 per cent incidence. Elsewhere in the region incidence was low.

A Leaf Rust of Mountain Ash, Gymnosporangium spp.

Light to heavy infections of this leaf rust recurred for the third year in the southern part of the Geraldton District. Incidence remained highest in the townships of Pic, 87 and 79; severity ranged from 64 to 100 per cent in the latter two townships. (Table 4). One small pocket of moderate infection occurred at the southern tip of Sibley Peninsula, Port Arthur District.

A high incidence of leaf rust occurred on serviceberry along the shoreline of Lake Helen and in the townships of Sandra and Herbert. The disease caused conspicuous browning of leaves.

TABLE 4

Summary of Infection of Mountain Ash Leaflets Caused by Gymnosporangium spp. in the Midwestern Region in 1964

Note: 100 leaflets were examined at each location.

Location	Leaflets infected per cent
Township 79	100
Township 87	78
Pic Tp.	64
Silver Islet, Sibley Peninsula	40
Sandstone Lake	7
MacGregor Tp.	6
Sibley Peninsula	5
Cameron Falls	5
Kopka Lake	3
Inwood Tp.	2

Needle Cast of Jack Pine, Hypodermella ampla (J.J. Davis)

Severe infection by this organism occurred in Sandra Township on small trees. A count in a 1/20 acre sample plot in the stand showed approximately 65 per cent of the trees affected. Light needle cast was observed on jack pine reproduction in Kowkash Township.

Hypoxyton Canker of Poplar, Hypoxyton pruinaum (Klotsche) Cke.

No important change in the status of this disease occurred in the region in 1964. The incidence remained low at all sampling stations. Incidence and mortality are summarized in Table 5.

TABLE 5

Incidence and Mortality of Hypoxyton pruinaum in Trembling Aspen Stands in Sample Plots in the Midwestern Region in 1964

Location (township)	Size of plot acres.	No. of stems per plot	No. of dead stems	No. of infected living trees.	No. of dead infected stems.
Lindsley	1/20	53	6	0	6
Horne	1/20	88	6	2	2
Trewartha	1/10	180	3	3	3
Pyramid	1/10	112	2	6	2
Golding	1/20	36	1	1	0
Golding	1/10	51	0	0	0
Trewartha	1/10	72	0	0	0
Walters	1/20	67	0	0	0

Nyssopsora clavellosa (Berk.) Arth.

The disease was widespread in the Port Arthur District in 1964. Moderate infection of aralia sp. occurred in Inwood Township and in the Black Sturgeon area. Light incidence was observed in Errington Township, Geraldton District.

Eastern Gall Rust, Peridermium sp.

This rust was observed in varying degrees of infection in the region in 1964. The highest incidence (72 per cent) was recorded in Stirling Township. Numerous galls occurred on all diameter classes. A moderate degree of infection was observed in Bain and Ames townships and at English River (Table 6). Low incidence was noted at all other sampling points.

TABLE 6

Incidence of Infection of Peridermium sp. in Jack-Pine Plots in The Midwestern Region, 1964

Note: 100 trees examined at each location.

Location	D.B.H. inches	Incidence per cent	No. of galls	Severity
Stirling Tp.	1-8	72	very numerous	High
Ames Tp.	1-4	38	75	High
English River	1-3	33	86	High
Bain Tp.	1-2	26		High
Irvin Tp.	1-3	9		High
Summers Tp.	1-3	6		Medium
O'Connor Tp.	1-3	2	2	Low

Leaf and Twig Blight of Poplar, Pollaccia radiosia (Lib.) Bald. & Clif.

This disease occurred commonly on aspen throughout the region in 1964. Pockets of high severity were found in the townships of Fowler, Rupert, Raynar and 91. Elsewhere in the region severity was moderate to low (Table 7).

TABLE 7

Severity of Pollaccia radiosia Infections on Aspen in the
Midwestern Region, 1964

Note: 100 tips were examined at each location.

Location	Incidence per cent	Severity
Fowler Tp.	100	High
Township 91	96	High
Raynar Tp.	94	High
Rupert Tp.	80	High
Spruce River road	100	Medium
Goldfield road	57	Medium
Dog River road	100	Low
Gull River	100	Low
Sibley Peninsula	100	Low
Sandstone Lake	100	Low

Leaf and Twig Blight of Poplar, Pollaccia elegans Serv.

Two pockets of moderate infection of this disease occurred on balsam poplar in Port Arthur District in 1964. Tip killing of regeneration was highest at the junction of Highway 17 and the Spruce River road in MacGregor Township, and on the Marks road in Marks Township. In the former location 14.5 damaged shoots were recorded per tree; in the latter they numbered 8.6 (Table 8). In Selwyn Township, Geraldton District, incidence was 22 per cent in one stand. Very low incidence was observed at all other sampling points. This disease was found most frequently on balsam poplar regeneration except at Gull Bay where twig killing occurred on the lower branches of larger trees.

TABLE 8

Severity of Pollaccia elegans Infections on Balsam Poplar in the
Port Arthur District, 1964

Note: 10 trees examined at each location.

Location	Av. No. of damaged tips per tree	Severity
MacGregor Tp.	14.8	Medium
Marks Tp.	8.6	Medium
Black Sturgeon Lake	1.8	Low
Pine Portage	1.0	Low

A tip Blight of Balsam Fir, Rehmiellopsis balsamea Waterman

The heavy centre of infection of this organism noted in 1963 persisted at the north end of Black Sturgeon Lake in 1964. Although the incidence of infection remained high, ocular assessment indicated a decline in the severity of the disease.

Speckled tar Spot of Maple, Rhytisma punctatum Pers. ex Fr.

This fungus occurs commonly throughout the region. The heaviest concentrations were at Hourglass Lake in Geraldton District, and in Scoble Township, Port Arthur District, where levels of 78 per cent and 70 per cent respectively were recorded. Low levels of incidence were observed at all other sampling points (Table 9).

TABLE 9

Severity of Infection of Rhytisma punctatum on Mountain Maple Leaves in the Midwestern Region, 1964

Note: 100 leaves examined at each location.

Location	Per cent of leaves infected
Hourglass Lake	78
Scoble Tp.	70
Plummes Lake	26
Inwood Tp.	16
Nipigon Tp.	14
Sibley Peninsula	14
North of Camp 36	11
Burchell Lake	7

Frost Injury

Late spring frosts caused considerable damage to current year's growth on balsam fir throughout the region in 1964. The damage was most severe on residual trees and regeneration in Pic Township, along the Auden, Goldfield, and Caramat roads in Geraldton District, and along the Armstrong and Spruce River roads in Port Arthur District. Shoot mortality ranged from 54 to 88 per cent, the latter being recorded in Pic Township (Table 10). Light to moderate damage on this species occurred commonly at numerous other locations in the region. Heavy damage to small diameter white spruce was recorded south of Stevens and at one location in Pic Township. Counts of damaged shoots are summarized in the following table.

TABLE 10

Summary of Frost Damage to Current Year's Growth of Balsam Fir and White Spruce in the Midwestern Region in 1964

Location	Tree species	Av. d.b.h. inches	Shoots killed per cent
Pic Tp.	bF	2	88
Onaman River	bF	4	83
Goldfield road	bF	3	78
Scoble Tp.	bF	3	68
Black Sturgeon Lake	bF	4	54
North end of Spruce River road	bF	5	54
Pine Portage	bF	5	44
Armstrong	bF	3	36
Joynt Tp.	bF	6	18
Finmark road	bF	6	12
Pic Tp.	wS	1	68
South of Stevens	wS	1	55
Goldfield road	wS	2	14

TABLE 11

Other Noteworthy Diseases in the Midwestern Region
in 1964

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Fr.) Kummer	jP, tL pCh	Collected on roots of widely distributed dead trees.
<i>Chrysomyxa arctostaphyli</i> Diet.	Bear- berry	One collection from Tp. 85 in Geraldton District.
<i>Cytospora chrysosperma</i> (Pers.) Fr.	tA, bP W	Found on widely distributed dead trees; light branch mortality on willow in Klotz Lake area, Geraldton District.
<i>Cytospora friesii</i> Sacc.	bF	Collected on dead tree in hail damaged stand, Geraldton District.
<i>Dermea balsamea</i> (Pk.) Seav	bF	On occasional dead trees through McLeod Lake area.
<i>Ganoderma applanatum</i> (Pers. ex Waller.) Pat.	tA	Cankers found on several large trees in O'Meara Tp., Geraldton District.
<i>Gloeosporium</i> spp.	wB, W	Small numbers of white birch lightly infected at Huronian Lake; common on willow at Oliver Lake, Port Arthur District.
<i>Gymnosporangium clavipes</i> Cke. & Pk.	Se	Heavy localized infections along east shore Lake Helen, Geraldton District.
<i>Hypoxyylon fuscum</i> (Pers.) Fr.	aMo	Small pocket of high incidence on shore trees at Killala Lake, Geraldton District.
<i>Lachnella occidentalis</i> (Hahn & Ayers) Seaver	tL	Fruiting collected on one dead tree in Ashmore Tp.
<i>Linospora tetraspora</i> G.E.Thomson	bPo	Found commonly at several locations in MacGregor Tp., Port Arthur District; light infection in Ramsey Lake area, Geraldton District.
<i>Macrophoma sabinea</i> Petrak	jP	Very light infection at Black Sturgeon Lake.
<i>Marssonina populi</i> (Lib.) Sacc.	tA	Low incidence in upper crowns of larger trees in Savanne Tp., Port Arthur District.
<i>Melampsora cerastii</i> (Pers.) Schroet.	bF	Common on Sibley Peninsula, Port Arthur District.
<i>Melampsora</i> sp.	W	Collected at three widely separated points in the region.
<i>Melampsorella caryophyllacearum</i> Schroet.	bS, bF	22 per cent of trees infected in an open black spruce stand in Tp.89, Geraldton District; light infections common throughout the Midwestern Region.
<i>Microsphaera</i> sp.	Herb story	Occurred commonly in Horne Lake area, Port Arthur District.
<i>Nectria galligena</i> Bres.	Se	Found on one dead branch.
<i>Phacidium abietinelium</i> Dearn.	bF	Occurred on understory trees in Blackwell and Croll tps.; not found on larger trees.
<i>Phragmidium</i> sp.	Rosa sp.	Small infections south of Stevens and in O'Meara Tp.

TABLE 11 (continued)

Organism	Host(s)	Remarks
<i>Phyllosticta minima</i> (Berk. & Curt) Ell & Ev.	sM	Light infection at Oliver Lake, Scoble Tp. in Port Arthur District; first record.
<i>Polyporus tulipiferae</i> (Schw.) Overh	wB	Found on dead top of a hail damaged tree.
<i>Puccinia asteris</i> Duby	aster	Occurred commonly in Booth and Selwyn tps.
<i>Puccinia bolleyana</i> Sacc.	elder- berry	Several heavily infected shrubs south of Caramat.
<i>Puccinia caricis</i> var <i>grossulariata</i> Arth.	goose- berry	Light infection at Abamasagi River.
<i>Pucciniastrum epilobii</i> Otth	bF	High incidence of infection on young trees at Marshall Lake, Geraldton District.
<i>Rhizospora pini</i> (Corda) Mauble	bF	Found on frost injured shoots in Croll Tp.
<i>Rhytisma salicinum</i> Pers. ex Fr.	W	Light infection at three widely separated points in Geraldton District; common in Lyons, Gillies and McMaster tps. in Port Arthur District.
<i>Tremella</i> sp.	jP	Appears on numerous dead and living trees in hail damaged stand, Errington Tp., Geraldton District.
<i>Thyronectria balsamea</i> (Cke. & Pk.) Seav.	bF	Found on dead trees in hail damaged stand in Errington Tp.
<i>Tubercularia vulgaris</i> Tode. ex Fr.	pCh, aMo	Collected on dead trees at two widely separated points.
<i>Valsa nivea</i> Hoffn. ex Fr.	W	Light incidence of branch mortality on scattered trees in Bain Tp.

STATUS OF INSECTS IN THE PORT ARTHUR DISTRICT

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Aspen Leaf Beetle	<u>Chrysomela</u> <u>drotchi</u> Brown	F 12
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K. C. Hall

STATUS OF INSECTS

Spruce Gall Aphids, Adelges spp. and Pineus spp.

The largest concentrations of gall aphids in the district occurred primarily on open-grown white and black spruce trees in Division 24. The following table lists the various species collected most frequently. The recovery of Adelges abietis in the district was of particular interest as this aphid was not known to occur west of Sault Ste. Marie.

TABLE 12

Summary of Gall Aphid Collections and Degree of Infestation
in the District in 1964

Location	Tree species	Species of aphid	Infestation status
Paipoonge Tp.	bS	<u>Adelges strobilobius</u> Kalt.	light
Port Arthur	WS	<u>Adelges abietis</u> Linn.	light
Paipoonge Tp.	WS	" " "	light
Sibley Peninsula	WS	<u>Adelges lariciatus</u> (Patch)	very light
Paipoonge Tp.	WS	<u>Pineus floccus</u> (Patch)	very light
Paipoonge Tp.	bS	" " "	heavy
Paipoonge Tp.	bS	<u>Pineus pinifoliae</u> (Fitch)	light
Sibley Peninsula	WS	<u>Pineus similis</u> (Gillette)	very light
Paipoonge Tp.	WS	" " "	light

Ugly-nest Caterpillar, Archips cerasivorana (Fitch)

No important change in the status of this defoliator occurred in 1964. A light infestation persisted on serviceberry trees in Paipoonge Township where seven colonies per mile was recorded compared with eight in 1963. Roadside spraying and brushing is an important factor in controlling this insect in the district.

Birch Leaf Skeletonizer, Bucculatrix canadensisella Chamb.

A considerable spread of infestation of this insect occurred in 1964. In 1963 approximately 500 square miles of heavy infestation was mapped along the Nipigon River. In 1964 the area of heavy infestation doubled in size extending from Black Bay to Cheesman Lake and Kaiash Bay on Lake Nipigon (see map). Severe browning of foliage and thinning of crowns of large diameter trees was observed in mid-September.

Spruce Budworm, Choristoneura fumiferana Clem

A further decline of spruce budworm populations was observed in the southwestern part of the Port Arthur District in 1964. Aerial mapping failed to show any appreciable defoliation, however, ground checks revealed small residual populations persisting at Plummes, Saganaga and Northern Light lakes. Defoliation of balsam fir trees at three sample points failed to exceed 10 per cent, a considerable decrease compared with 1963 (Table 13). On the basis of egg surveys low population levels are forecast for 1965, light to moderate mortality of balsam fir is present from Ross and Plummes lakes south to the United States border. Although there has been considerable loss of balsam fir within this area it is encouraging to note that some recovery of weakened trees has occurred since the decline of infestation.

TABLE 13

Defoliation of the Current Years Growth of Balsam-fir Trees
in the Port Arthur District from 1960 to 1964

Location	Per Cent Defoliation				
	1960	1961	1962	1963	1964
Devils Elbow Lake	99	98	54	19	7
Plummes Lake	69	97	42	24	10
Burchell Lake	98	65	12	7	0

Aspen Leaf Beetle, Chrysomela crotchii Brown

This beetle occurred in small numbers at numerous locations in the district in 1964. The heaviest damage was observed at Kabitotikwia Lake and Gull Bay where defoliation of clumps of aspen varied from 5 to 15 per cent.

Larch Casebearer, Coleophora laricella (Hbn)

Minor fluctuations in population levels of this insect occurred in 1964. Small increases were recorded at sample points in MacGregor and Crookes townships whereas in Paipoonge and O'Connor townships populations declined for the second consecutive year (Table 14). Populations were low at all other sampling points. Larch casebearers were submitted for dissection to obtain data on the presence and abundance of the two introduced parasites Agathis pumila and Chrysocharis laricinella (Table 15).

TABLE 14

Summary of Larch Casebearer Counts on Tamarack Trees at Seven
Locations from 1962 to 1964

Note: Counts are based on the examination of four 18" branch tips at each location

Location	Av. d.b.h. in inches	Av. number of larvae per branch tip		
		1962	1963	1964
Paipoonge Tp.	6	11.5	2.2	.06
MacGregor Tp.	4	5.5	3.6	4.0
O'Connor Tp.	6	5.6	1.0	.75
Crookes Tp.	4	5.6	3.4	4.6
Tp. 92	3	-	-	1.4
Lyon Tp.	5	-	-	1.2
Sibley Peninsula	5	-	-	1.2

PORT ARTHUR DISTRICT

BIRCH SKELETONIZER

Area in which heavy infestations occurred in 1964

Legend

Heavy infestation..... 

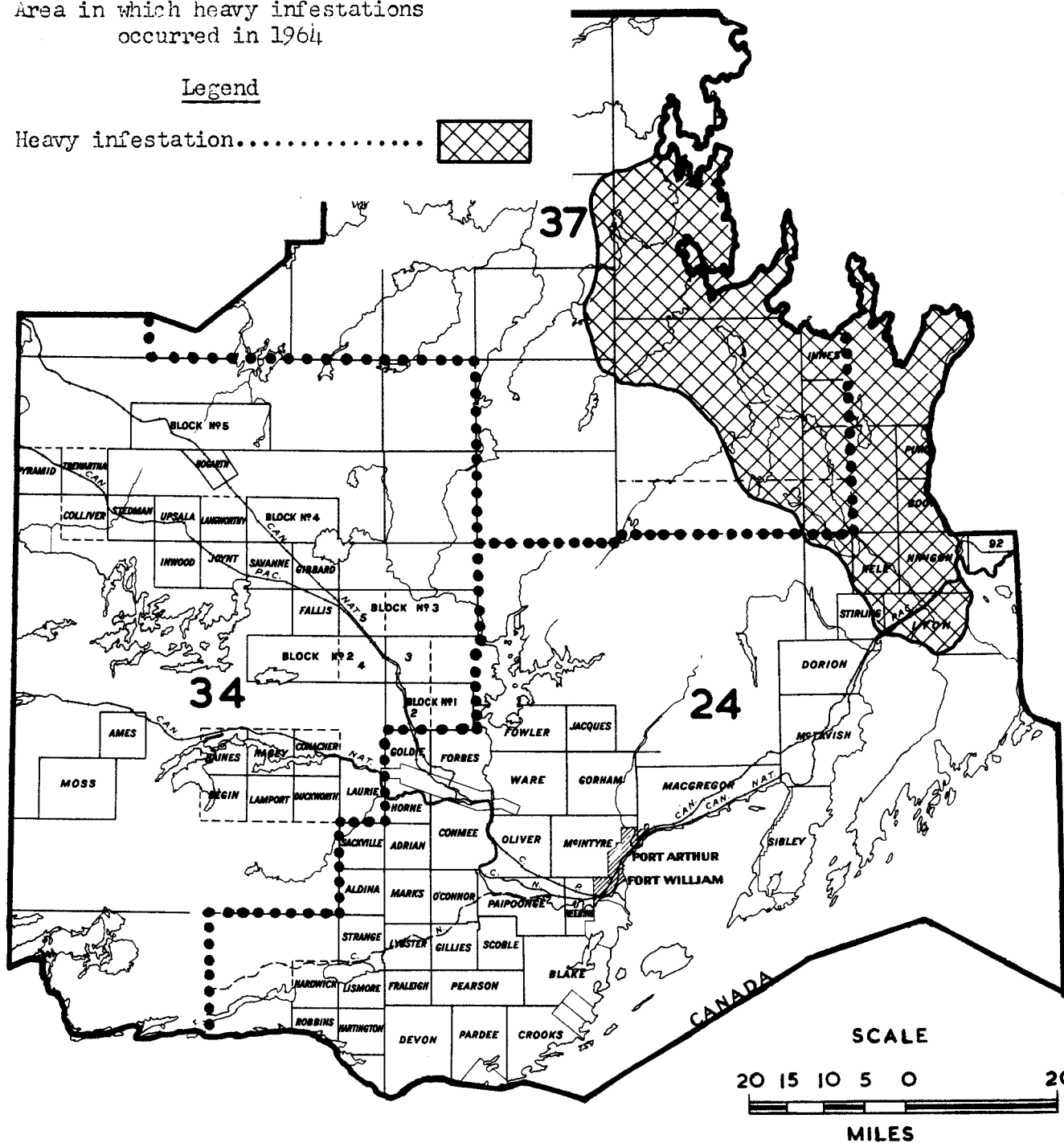


TABLE 15

Parasitism of Overwintering Larch Casebearers as Determined
by Dissection in the Winter of 1964-65

Location	Number of larvae examined	Per cent of larvae sound	Per cent parasitism	
			by <u>Agathis pumila</u>	by <u>Chrysocharis laricinella</u>
McTavish Tp.	100	39	51	7
Tp. 92	98	30	62	8

Pine and Spruce Weevils, Curculionidae

A series of trap logs was set out in 1964 to obtain a more accurate distribution of pine weevils. Logs about three feet long were immersed in a D.D.T. solution, dried and exposed on screens in a recently-cut coniferous stand in early spring. Weekly visits were made to each site. The species and numbers collected are summarized in Table 16.

TABLE 16

Summary of Pine Weevils Recovered from Trap Logs in 1964

Location	Tree species	Species of weevils recovered	Number recovered
Goldie Tp.	jP	<u>Hylobius congener</u> D.T.	1
		<u>Magdalis perforatus</u> Horn	1
Hagey Tp.	jP	<u>Hylobius congener</u> D.T.	1
		<u>Pissodes approximatus</u> Hopk.	3
Paipoonge Tp.	rP	<u>Hylobius congener</u> D.T.	3
		<u>Pissodes approximatus</u> Hopk.	2
Pyramid Tp.	jP	<u>Hylobius congener</u> D.T.	1
		<u>Pissodes affinis</u> Rand	1
Marks Lake Rd.	jP	<u>Hylobius congener</u> D.T.	8
		<u>Pissodes affinis</u> Rand	10
Stedman Tp.	jP	<u>Hylobius congener</u> D.T.	3
		<u>Pissodes rotundatus</u> Lec.	10

European Spruce Sawfly, Diprion hercyniae (Htg)

Populations of this insect remained at a low level in the district in 1964 as reflected in Table 17.

TABLE 17

Summary of Collections of the European Spruce Sawfly
in the Port Arthur District in 1964

Location	Number of mat samples	Number of insects collected	Date sampled
Aldina Tp.	5	1	June 23
Hagey Tp.	5	1	" 25
O'Connor Tp.	35	6	" 29
Hagey Tp.	10	9	July 15
MacGregor Tp.	5	4	" 16
Spruce River rd.	20	6	" 16
Gorham Tp.	5	1	" 17
Jacques Tp.	10	3	" 17
Paipoonge Tp.	40	25	" 18

Birch Leaf Miner, Fenusa pusilla (Lep)

The heavy infestation present in 1963 on open-grown white birch trees in Port Arthur and Fort William declined to light intensity in 1964 with mining confined to the upper crowns of host trees. New distribution records for the insect were established in MacGregor and McIntyre townships, however, at these locations, populations were found only on coppice growth.

Birch Leaf Roller, Gracillaria sp.

No important change in population levels of this insect was noted in 1964. A small pocket of infestation persisted on large diameter white birch trees at Plummes Lake where approximately 80 per cent of the leaves were rolled. Light to moderate infestation occurred commonly on scattered clumps of open-grown trees near Huronian, Sandstone Lake, and along the Burchell Lake road. At all other sampling points populations were low.

Poplar Leaf Beetle, Gonioctena americana (Schaeff.)

A light infestation of this beetle occurred on small reproduction aspen trees at Gull Bay in Division 27. Defoliation was confined to the upper crown and did not exceed 20 per cent. Elsewhere colony counts were low and comparable to 1963 (Table 18).

TABLE 18

Summary of Colony Counts of the American Poplar Leaf Beetle at Five
Locations in the Port Arthur District from 1962 to 1964

Location	Ave. number of colonies per tree		
	1962	1963	1964
Inwood Tp.	3.1	2.7	3.0
Gorham Tp.	2.8	2.7	2.4
Sandstone Lake	2.7	2.5	2.0
Sibley Peninsula	1.8	2.0	2.1
Upsala Tp.	.3	.5	2.2

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Population levels of this insect declined for the second consecutive year. In 1962 large populations were observed commonly on aspen trees along the Atikokan road and Highway 17 west. In 1963 the infestation occurred in the same general area but declined to moderate intensity. Parasitism ranging from 72 to 85 per cent appeared to be an important control factor, especially in older areas of infestation. In 1964 populations declined to very low levels in most areas. The only exception occurred along the Lac Du Mille Lac road where moderate defoliation recurred on second growth aspen. This marked decline is reflected in both the number of leaves mined (18 per cent in 1964 compared with 81 per cent in 1963) and in the number of mines per affected leaf (Table 19).

TABLE 19

Summary of Counts of the Aspen Blotch Miner at Six Locations in the Port Arthur District from 1962 to 1964

Location	Per cent of leaves mined			Ave. number of mines per affected leaf		
	1962	1963	1964	1962	1963	1964
Colliver Tp.	96	81	11	4.9	4.5	1.0
Ames Tp.	92	69	22	4.0	3.9	1.1
3 miles east of F.F.-P.A. border	94	72	18	5.6	4.4	1.4
Trewartha Tp.	90	88	8	4.6	3.5	2.5
Robson Tp.	81	82	23	3.4	3.2	1.3
Hagey Tp.	76	92	27	2.7	2.2	1.6

Blotch Miner on Balsam Poplar, Lithocolletis sp.

A decline in the abundance of this miner occurred at most sample points in 1964. In 1963 heavy infestations occurred in most balsam poplar stands in the southern part of Division 24 where the percentage of leaves mined ranged from 79 in Neebing Township almost to 100 per cent in Marks and Paipoonge townships. A decline in numbers was recorded in all areas in 1964, except Oliver and Scoble townships where population levels resembled those of previous years. The highest populations persisted in Paipoonge Township where virtually all leaves contained mines but a substantial decline was recorded in numbers of mines per affected leaf (Table 20).

An assessment of larval mortality showed a significant increase in predation in Marks, O'Connor, Scoble and McIntyre townships. Parasitism was the primary control factor in Neebing Township and at other sample points. Cannibalism was again low in all areas samples (Table 21).

TABLE 20

Comparison of Counts of Lithocolletis sp. at Eight Locations in the
Port Arthur District in 1963 and 1964

Note: 100 leaves examined at each location

Location (township)	Per cent of leaves mined		Av. no. of mines per affected leaf		Av. no. of mines per leaf	
	1963	1964	1963	1964	1963	1964
Marks	100	40	4.8	1.1	4.8	.4
O'Connor	84	60	2.0	1.5	1.7	.9
Neebing	79	14	1.8	1.1	1.4	.1
Scoble	84	82	2.2	1.8	1.8	1.4
Conmee	99	67	4.4	1.4	4.3	.9
Paipoonge	100	100	7.2	4.5	7.2	4.5
Oliver	84	89	2.3	2.5	2.0	2.3
McIntyre	98	86	3.5	1.4	3.4	1.2

TABLE 21

Summary of Larval Mortality of Lithocolletis sp.
at Eight Locations in the Port Arthur District

Note: 100 leaves examined at each location

Location	Per cent of mines showing adult emergence in 1964	Cause of Mortality in per cent in 1964				Per cent total mortality 1964
		Cannibalism	Parasitism	Predation	Others	
Marks	37	0	19	22	22	63
O'Connor	46	1	11	22	20	54
Neebing	50	0	50	0	0	50
Scoble	54	0	8	26	12	46
Commee	69	0	12	3	16	31
Paipoonge	61	4	15	4	16	39
Oliver	58	3	14	6	19	42
McIntyre	44	0	15	16	25	56

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The outbreak of the forest tent caterpillar which has persisted in the Western Region for the past few years spread eastward into Port Arthur District in 1964. Heavy infestations occurred in an area of approximately 600 square miles extending from Pine Lake on the Fort Frances border through Bedivere Lake northeasterly to Wawang Lake on the Sioux Lookout District Border (see map). Defoliation of aspen trees in all diameter classes ranged from 50 to 90 per cent. A band of light infestation varying in width from 8 to 16 miles extended along the entire eastern boundary of heavy infestation.

Following moth emergence 100 cocoons were examined at each of three locations in the area of heavy infestation to appraise natural control factors. Results are tabulated in Table 22.

TABLE 22

Summary of Forest Tent Caterpillar Cocoon Dissections in the Port Arthur District in 1964

Note: One hundred cocoons were examined at each location

Location (township)	Per cent successful emergence	Per cent Mortality			
		Parasitism	Predation	Disease	Unknown
Inwood	68	22		2	8
Trewartha	69	26			5
Pyramid	70	26	1		3

Very large moth flights were reported in midsummer in Port Arthur and Fort William and at Black Sturgeon Lake, up to 90 miles from the nearest infestation. An indication of the density of these flights at Black Sturgeon Lake is reflected by the recovery of 13,760 adults in one light trap. Even more significant from the standpoint of potential population in 1965 was the sharp increase of female moths which numbered 2,884 in 1964 as compared with 29 in 1963. Egg masses at this location were unusually large and averaged in excess of 200 eggs per mass.

Infestation forecasts for 1965 indicate an extensive spread of populations will occur and the area of heavy infestation is expected to at least triple in size. Moderate to severe defoliation will probably occur as far east as Black Sturgeon and Dog lakes and as far south as Greenwater Lake. Egg surveys carried out at 28 locations in this area showed an average of 24 egg masses per tree. Counts ranged from 2 egg masses per tree in Gorham and Conacher townships to 144 recorded in Pyramid Township (Table 23). Very light defoliation is expected in the southern portion of the district and along Highway 17 east.

TABLE 23

Summary of Forest Tent Caterpillar Egg Band Counts and Infestation Forecasts for 1965 in the Port Arthur District

Location	Av. d.b.h. in inches	Av. no. of egg bands per tree-1964	Forecast for 1965
Trewartha Tp.	4	28.	Severe
Pyramid Tp.	9	144.	Severe
Black Sturgeon Lake	9	69.	Severe
Fort Frances-Port Arthur Border	8	15.	Severe

TABLE 23 (cont'd)

Summary of Forest Tent Caterpillar Egg Band Counts and Infestation
Forecasts for 1965 in the Port Arthur District

Location	Av. d.b.h. in inches	Av. no. of egg bands per tree 1964	Forecast for 1965
Stedman Tp.	9	70.	Severe
65 miles north on Spruce R. Rd.	6	7.3	Severe
45 miles north on Spruce R. Rd.	9	22.	Severe
35 miles north on Spruce R. Rd.	6	16.	Severe
Cockeram Tp.	14	13.	Severe
North of Camp 36 (Black Sturgeon)	12	8.	Severe
Burchell Lake Rd.	6	6.3	Severe
Lac Du Mille Lac	7	33.	Severe
Lac Du Mille Lac	5	10.3	Severe
Michener Tp.	4	7.	Severe
Savanne Tp.	5	10.	Severe
Obonga Lake	4	70.	Severe
Garden Lake	4	102.	Severe
Black Sturgeon Lake (Camp 9)	5	2.6	Moderate
Lismore Tp. (Sunset Lake)	10	6.	Moderate
Ames Tp.	5	4.6	Moderate
55 miles north on Spruce R. Rd.	8	6.	Moderate
25 miles north on Spruce R. Rd.	4	4.	Moderate
Gorham Tp. (Trout Lake)	5	2.	Moderate
Fowler Tp. (Hawkeye Lake)	6	5.3	Moderate
Gonacher Tp.	5	2.	Moderate
Haines Tp.	4	2.6	Moderate
Golding Tp.	6	4.6	Moderate
Muskeg Lake	5	5.3	Moderate
Marks Tp.	4	.3	Light
Batwing Lake	4	.3	Light
Glen Tp. (Wolf Lake)	8	4.	Light
McMaster Tp.	5	.6	Light
Blackwell Tp.	9	1.	Light
Goldie Tp.	4	.3	Light
Neebing Tp.	4	0	Nil
Oliver Tp.	6	0	Nil
MacGregor Tp.	8	0	Nil
Scoble Tp.	4	0	Nil
Purdom Tp.	6	0	Nil
Booth Tp.	6	0	Nil
Nipigon Tp.	6	0	Nil
Paipoonge Tp.	4	0	Nil
Plummes Lake	4	0	Nil

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

A new area of light infestation of this insect occurred on eastern choke cherry trees near Kakabeka Falls in Paipoonge Township. Sixteen colonies were counted

along one mile of roadside at this location. Otherwise, a general decline in population levels was recorded at all sampling points (Table 24).

TABLE 24

Summary of Colony Counts of the Western Tent Caterpillar in the
Port Arthur District in 1963 and 1964

Location (township)	Sampling unit	Number of tents per sampling unit	
		1963	1964
MacGregor	1 mile roadside	6	4
Neebing	1 mile roadside	2	0
McIntyre	1 mile roadside	2	1
Paipoonge	1 mile roadside	-	16
Paipoonge	1 square chain	4	1

A Leaf-folding Sawfly, Nematus sp.

An increase in larval populations of this insect was noted at scattered locations in 1964. Heavy populations were observed commonly on large diameter balsam poplar trees at Sandstone Lake in Division 24. In Lismore and Lybester townships leaf folds were most numerous on small diameter host trees.

Spiny Elm Caterpillar, Nymphalis antiopa Linn.

A notable increase in colonies of this defoliator was observed in 1964. No large areas of infestation were observed, however, heavy stripping of small clumps of willow occurred commonly at numerous locations in the district. The insect was also collected on aspen and balsam poplar trees.

Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.

A substantial increase in population levels of this sawfly was noted in the district in 1964. Heavy defoliation (in excess of 50 per cent) of small diameter white spruce trees occurred at several locations in Neebing Township. Moderate defoliation ranging from 25 to 40 per cent was recorded in Blake and Paipoonge townships. Small numbers of larvae were recovered on mat samples at nine other locations in the district.

White Pine Weevil, Pissodes strobi Peck

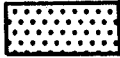

Population levels of this insect generally increased in the district in 1964. One exception occurred in a 3-to 4-inch d.b.h. pine tree plantation in Paipoonge Township where the numbers of weevilled trees declined from nine to three per cent. The highest record of damage (13 per cent) was in a Scots pine plantation east of Kakabeka Falls (Table 25). Very light damage was found on host trees in forested areas.

PORT ARTHUR DISTRICT

FOREST TENT CATERPILLAR

Areas in which infestations occurred in 1964

Legend

- Light infestation..... 
- Heavy infestation..... 

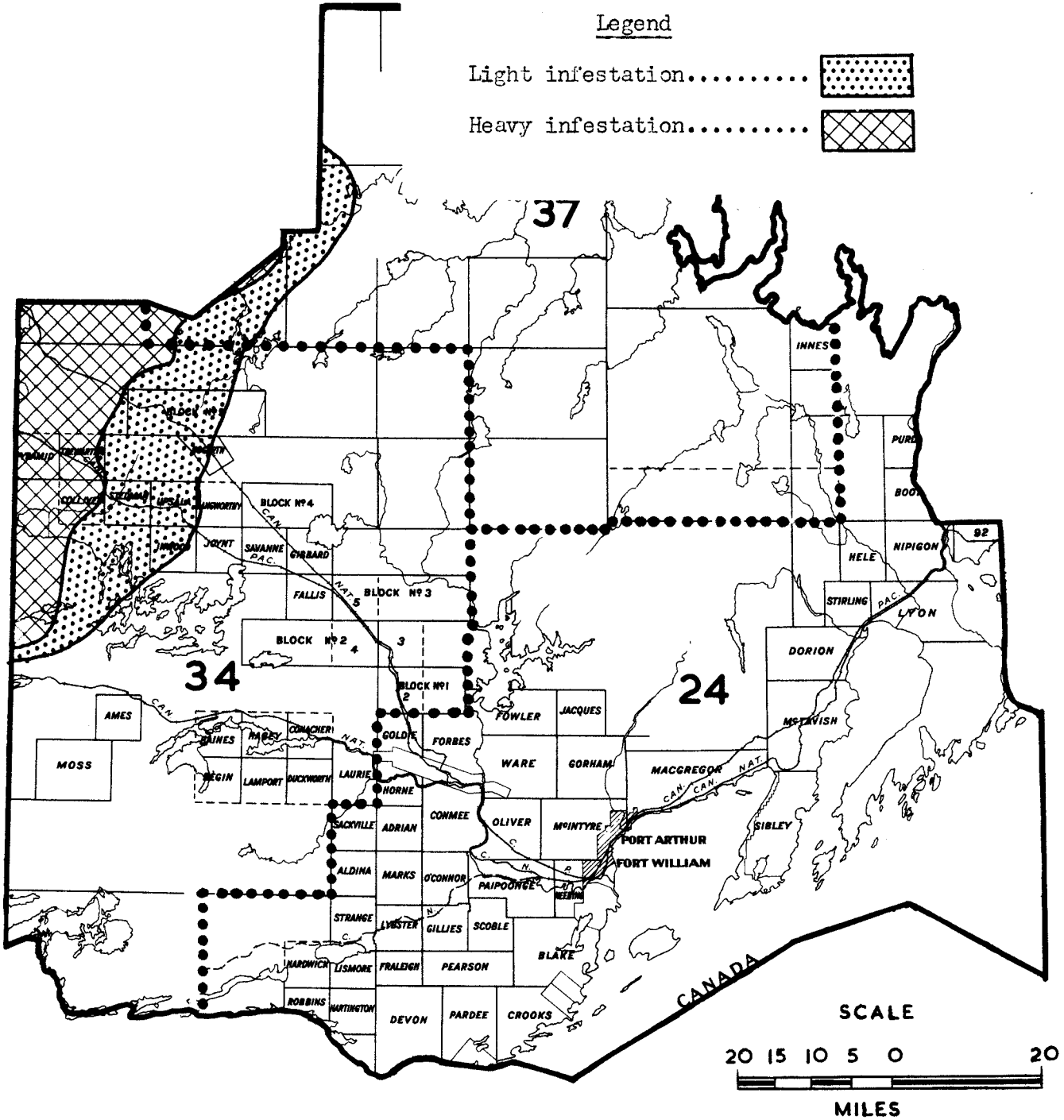


TABLE 25

Summary of Leader Damage by the White Pine Weevil in the Port Arthur
District from 1962 to 1964

Location	Tree Species	Av. d.b.h.	Number of trees examined	Per cent of trees weevilled		
				1962	1963	1964
Thunder Bay Nursery	wP	2	798	9	6	7
	jP	3-4	183	6	9	3
	jP	1-2	272	-	-	10
Boy Scout Tree Farm	wP	2	155	1	4	8
	jP	3-4	709	-	-	9
	jP	1-2	343	-	-	13

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

The status of this species was unchanged in 1964. Low populations occurred on white birch trees along Highways 17 and 61 and at scattered locations throughout Division 24. This miner first occurred in appreciable numbers in 1963 as a result of a westerly extension of infestations from Geraldton District. Although intensive sampling was carried out in 1964 no new distribution points were recorded.

A Noctuid on Balsam Poplar, Pyrrhia umbra exprimens Wlk

This insect increased in numbers and was more widely distributed than in 1963. The largest numbers were observed on balsam poplar trees along roadsides in Paipoonge and Neebing townships. Lower populations were found commonly along the Armstrong road and throughout Division 24. Parasitism of 12 per cent was recorded at one location in Paipoonge Township. Feeding by this insect is confined primarily to the leaders of small trees.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt.

Population levels of this insect remained low throughout the district and similar to 1963 except in Township 92 where a moderate increase occurred (Table 26).

TABLE 26

Summary of Terminal Bud Damage by the Spruce Bud Gall Midge at Seven
Locations in the District from 1961 to 1964

Location (township)	Tree Species	Per cent of terminal buds infested			
		1961	1962	1963	1964
Joynt	bS	3.6	4.2	1.1	1.6
Inwood	bS	.39	1.3	1.1	1.3
Goldie	bS	2.9	1.2	1.4	1.4
Gorham	bS	.93	1.2	1.2	1.2
Twp. 92	bS	.4	.51	.49	4.0
Paipoonge	wS	-	-	-	3.1
MacGregor	wS	1.2	1.1	1.2	1.0

Bark Beetles, Scolytidae

An intensive effort was made in 1963 and 1964 to collect bark beetles from various host trees. The following list of species was submitted from Port Arthur District (Table 27).

TABLE 27

Summary of Bark Beetles Collected in the District in 1964

Species	Host	Location
<u>Pityogenes plagiatus</u> (Lec.)	JP	Marks Lake, Burchell Lake, Paipoonge Tp., Hagey Tp.
<u>Hylurgops pinifex</u> Fitch	JP	Marks Lake, Goldie Tp., Sisson Creek, Paipoonge Tp.
<u>Polygraphus rufipennis</u> Kby.	bS	Marks Lake, Tp. 92, Devon Tp., Hagey Tp., Kashabowie, Stedman Tp.
<u>Pityophthorus</u> sp.	WP	Paipoonge Tp., Black Sturgeon Lake
<u>Orthotomicus caelatus</u> Eich.	WP	Paipoonge Tp., Hagey Tp., Burchell Lake, Stedman Tp.
<u>Pityogenes hopkinsi</u> Sw.	WP	Paipoonge Tp.,
<u>Phloeotribus piceae</u> Sw.	bS, wS	Sibley Peninsula
<u>Ips pini</u> Say	rP	Black Sturgeon Lake, Hagey Tp., Burchell Lake, Devon Tp., Stedman Tp.,
<u>Ips perturbatus</u> Eich.	wS	Black Sturgeon Lake
<u>Ips chagoni</u> Sw.	JP	Burchell Lake, Marks Lake
<u>Ips perroti</u> Sw.	JP	Hagey Tp., Goldie Tp.
<u>Pityokteines sparsus</u> Lec.	bF	Sibley Peninsula
<u>Hylastes porculus</u> Er.	JP	Goldie Tp., Marks Lake, Paipoonge Tp.
<u>Dendroctenus valens</u> Lep.	JP, rP	Goldie Tp., Hagey Tp., Paipoonge Tp.
<u>Dendroctenus murrayanae</u> Hopk.	JP, rP	Mark Tp., Paipoonge Tp.
<u>Gnathotrichus materiarus</u> Fitch	JP	Paipoonge Tp.

Spruce Bud Moth, Zeiraphera ratzeburgiana Ratz.

No appreciable change in the population levels of this insect occurred at sample points in O'Connor, MacGregor or Stirling townships. However, in Paipoonge Township population levels on white spruce increased from 3.5 larvae per 18-inch branch tip in 1963 to 7.7 in 1964. Larval counts are summarized in Table 28.

TABLE 28

Summary of Larval Counts of the Spruce Bud Moth in the Port Arthur District from 1961 to 1964

Location (township)	Av. no. of insects per 18" branch tip			
	1961	1962	1963	1964
O'Connor	18.6	11.2	1.1	.3
MacGregor	2.6	8.4	4.1	4.7
Paipoonge	2.4	0.3	3.5	7.7
Stirling	0.8	0.2	0.1	0.3
Marks	-	-	-	1.1

TABLE 29

Summary of Miscellaneous Insects Collected in Port Arthur District in 1964

Note: The number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris logiana</i> Linn.	wB	Widely distributed in small numbers (4)
<i>Acleris variana</i> Fern	wS	Recovered on mat samples in small numbers throughout district (10)
<i>Acrobasis betulella</i> Hlst.	wB	Commonly in small numbers along Armstrong Road (2)
<i>Acronicta dactylina</i> Grt.	W	Defoliation of 40 per cent in Haines Tp. Heavy parasitism
<i>Altica ambiens alni</i> Harr.	Al	Heavy infestation on clump of alder in Joynt Township. Defoliation ranged from 50 to 90 per cent
<i>Altica populi</i> Brown	bPo	Small numbers in Paipoonge and Pardee townships (2)
<i>Allononyma diana</i> Hbn.	Al, W	Small numbers collected, very active larvae (2)
<i>Anoplonyx luteipes</i> (Cress.)	tL	Common in the district
<i>Argyresthia</i> sp.	bF	Very small numbers on Sibley Peninsula
<i>Chrysomela</i> sp.	W	Defoliation of 60 per cent in Pyramid Township
<i>Coleophora</i> sp.	wB	Small collections made at English River and Burchell Lake
<i>Dioryctria abietivorella</i> Grt.	bF	Four per cent of cones infested Black Sturgeon Lake, 2 per cent Sandstone Lake
<i>Epinotia</i> sp.	wB	Small numbers (3)
<i>Epinotia solandriana</i> Linn.	tA, wB, bPo	Small numbers at numerous locations (4)
<i>Eupthecia prob. filmata</i> Pears.	wS	Common on mat samples at Marie Louise Lake and Stirling Township (2)
<i>Fenusa dohrnii</i> (Tischb.)	Al	Light infestation in Crookes, Lyon and Pardee townships (6)

TABLE 29, Port Arthur District

Insect	Host(s)	Remarks
<i>Gracillaria cuculipennella</i> Hbn.	bAs	One collection in Ware Tp.
<i>Gracillaria invariabilis</i> Braun.	ecCh	Light population on clump of trees in Hagey Township
<i>Hemichroa crocea</i> (Four.)	wB	One colony Sibley Peninsula
<i>Hyphantria cunea</i> Dru.	Al	Very light numbers in 1964 (3)
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> Gn.	wS, bF	Light numbers on mat samples (3)
<i>Laspeyresia youngana</i> Kft.	wS	In cones at Poshkokgan River
<i>Lithocolletis aceriella</i> Clem.	sM, MoM	Small numbers at Oliver and Iron Range Lakes (2)
<i>Lithocolletis</i> sp.	W	Small numbers, occurs infrequently
<i>Macremphytus</i> sp.	Dogwood	Large populations MacGregor Tp. Moderate numbers in Pardee and Scoble townships (4)
<i>Melanagromyxa schineri</i> (Gir.)	tA	Occurs infrequently
<i>Mulsantina hudsonica</i> Csy.	wS, bF	Small numbers adults on mat samples (4)
<i>Nematus fulvicrus</i> Prov.	W	Common on clump in Fallis Township; low levels elsewhere (4)
<i>Nematus limbatus</i> Cress.	W	Small numbers McMaster Township
<i>Neodiprion abietis</i> complex	bF	Single colonies collected in O'Connor Tp. and Sibley Peninsula
<i>Neodiprion maurus</i> Rohwer	jP	Small numbers in Ware and Golding townships
<i>Neodiprion nanulus</i> Schedl.	rP	Light populations on open-grown trees in Upsala Township
<i>Neodiprion virginianus</i> complex	jP	Heavy defoliation to scattered trees at one location on Atikokan road
Olethreutidae (prob. <i>Pseudexentera</i>)	tA	Moderate population on small diameter host in Upsala and Inwood townships, low elsewhere
<i>Pareophora minuta</i> (MacG.)	bAs	Small numbers of colonies in southern part of district; defoliation less than five per cent (3)
<i>Pegohylemyia anthracina</i> Czermy.	wS	Light numbers in cones Ware Tp.
<i>Petrova albicapitana</i> Busch	jP	Small numbers along Armstrong and Spruce River roads (3)
<i>Pikonema dimmockii</i> (Cress.)	wS	Widely distributed in small numbers (8)
<i>Pleroneura borealis</i> Felt.	bF	Very light populations (2)
<i>Prochocrodis transversata</i> Dru.	bPo	Small numbers on mat samples Paipoonge Township
<i>Recurvaria piceaella</i> Kft.	wS	Light populations in association with <i>Zieraphera</i> complex (5)
<i>Sarrothripus cinerea</i> N. & D.	bPo	Common on small trees Marie Louise and One Island lakes and Pine Portage area (5)
<i>Sarrothripus frigidana</i> (Wlk.)	W	Heavy defoliation Sandstone Lake; light numbers other locations

TABLE 29, Port Arthur District

Insect	Host(s)	Remarks
Schizura concinna A. & S.	W, tA	Light populations Crookes, Scoble, Paipoonge townships; defoliation of single trees ranged from 10 to 60 per cent
Zeugophora sp.	tA, bPo	Small numbers Sibley Peninsula (4)

STATUS OF INSECTS IN THE GERALDTON DISTRICT

		Page
Birch Skeletonizer	<u>Bucculatrix canadensisella</u> Chamb.	F 27
Larch Casebearer	<u>Coleophora laricella</u> (Hbn.)	F 27
Aspen Leaf Beetle	<u>Chrysomela crotchii</u> Brown	F 27
American Poplar Leaf Beetle	<u>Gonioctena americana</u> (Schaeff) ..	F 27
Aspen Blotch Miner	<u>Lithocolletis salicifoliella</u> Chamb.	F 27
Western Tent Caterpillar	<u>Malacosoma pluviale</u> (Dyar)	F 28
Spiny Elm Caterpillar	<u>Nymphalis antiopa</u> (L.)	F 28
White-pine Weevil	<u>Pissodes strobi</u> (Peck)	F 28
Woolly Alder Aphid	<u>Prociphilus tessellatus</u> Fitch. . .	F 29
Amber-marked Birch Leaf Miner	<u>Profenusa thomsoni</u> (Konow)	F 29
Spruce Bud Gall Midge	<u>Rhabdophaga swainei</u> Felt	F 29
A Geometrid on Birch	<u>Rheumaptera</u> sp.	F 30
A Leaf Tier on Poplar	<u>Sarrothripus cinereana</u> N. and D..	F 30
Summary of Miscellaneous Insects Collected		F 30

V. Jansons

STATUS OF INSECTS

Birch Skeletonizer, Bucculatrix canadensisella Chamb.

Heavy infestations of this insect continued in the western part of the district for the third consecutive year. In 1964 infestations increased in area extending eastward in white birch in Oakes, Bain, O'Meara and Chipman townships, and in the Pagwachuan and Klotz Lake areas (Map 1). A small pocket of heavy infestation of approximately five acres that occurred at Killala Lake in 1963 increased in size in 1964 to include the entire eastern shore of the lake. Low populations of the insect were observed in the Goldfield road area and at several other locations in the district.

Larch Casebearer, Coleophora laricella (Hbn.)

Collections of this insect made in Croll Township in 1964 represented new distribution points in the central portion of the district. In the southern part of the district population levels appeared similar to 1963 except in townships of Pic and 81 where declines were recorded (Table 12). Collections submitted to the Laboratory revealed 31.5 per cent larval parasitism by Agathis pumila in Township 83 and 5.0 per cent in Croll Township. No larch casebearers were observed elsewhere in the district.

TABLE 12

Summary of Larch Casebearer Larval Counts in the Geraldton District from 1961 to 1964

Note: Counts were based on the examination of four 18-inch branch tips from each of four trees at each location.

Location	Av. d.b.h. of trees in inches	Av. no. larvae per branch tip			
		1961	1962	1963	1964
Pic Township	5	2.2	4.2	10.9	4.6
Pays Plat	5	1.3	6.4	2.1	3.8
Township 81	4	-	8.4	1.8	0.0

Aspen Leaf Beetle, Chrysomela crotchii Brown

These leaf-eating beetles were recorded as abundant for the first time in the district in 1964. Light to moderate defoliation of small aspen occurred at numerous locations in Rupert Township, the largest pocket, approximately three acres in area, was observed on regeneration at Cavall. Single colonies of beetles were observed in Nakina, Exton, Walters, and Lindsley townships.

American Poplar Leaf Beetle, Gonioctena americana (Schaeff)

A light infestation continued for the second year on fringe trees in a young aspen stand at Hillspport. The number of colonies increased from an average of 5.2 per sample tree in 1963 to 8.4 per tree in 1964. In the area 11 miles east of Caramat where light defoliation was reported in 1963 the population declined to a low level.

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Populations of this insect increased in the district from 1960 to 1963. By 1963 severe leaf mining and browning of the foliage of small aspen was common through most of the central and northern parts of the district. In 1964 population levels collapsed throughout the district. Counts of mined leaves are summarized in Table 13.

TABLE 13

Summary of Counts of Aspen Blotch Miner in the Geraldton
District from 1962 to 1964

Note: Counts are based on examination of 100 trembling aspen leaves at each location.

Location	No. of mined leaves			Total number of mines		
	1962	1963	1964	1962	1963	1964
Camp 49 road	20	39	0	21	60	0
Orient Bay	13	34	0	14	58	0
Rupert Township	32	30	0	47	58	0
Ramsey Lake	3	33	0	3	48	0
Township 84	3	35	0	4	47	0

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Although population levels were low at most sample points, an increase in numbers of this insect was observed through the southern part of the district in 1964. New light infestations occurred in Irwin Township and at Hillspport where 16 and 13 colonies respectively were recorded on small shrubs along one mile of roadside. Colony counts are summarized in Table 14.

TABLE 14

Summary of Western Tent Caterpillar Colony Counts in the Geraldton
District from 1962 to 1964

Location	Host(s)	Total no. of tents			Sample Unit
		1962	1963	1964	
Irwin Township	wB, pCh	-	-	16	one mile of roadside
Hillspport	pCh, Se	-	-	13	" " " "
Stevens	pCh	-	-	4	sq. chain plot
Polly Lake	pCh	5	2	1	" " "
Rosspport	pCh	3	2	0	" " "
Marathon	pCh	2	3	1	" " "
Terrace Bay	pCh	3	2	0	" " "

Spiny Elm Caterpillar, Nymphalis antiopa (L.)

Severe defoliation of clumps of open-grown willow occurred in townships 78, 81, and Pic in the southern part of the district and in Kilkenny, Vivian and Coltham townships in the central part of the district.

White-pine Weevil, Pissodes strobi (Peck)

The incidence of weevilled black-spruce trees increased in the district for the third consecutive year. In 1964 a new infestation was observed in Legault Township where 16 per cent of young black spruce were attacked in a small roadside clearing. Small numbers of infested trees were observed commonly along Highway 11, in Rupert Township and in the Stevens-Caramat area. Damage appraisals are summarized in Table 15.

GERALDTON DISTRICT

BIRCH SKELETONIZER

Area in which heavy infestations
occurred in 1964

Legend

Heavy infestation..... 

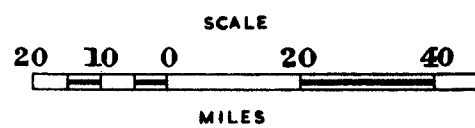
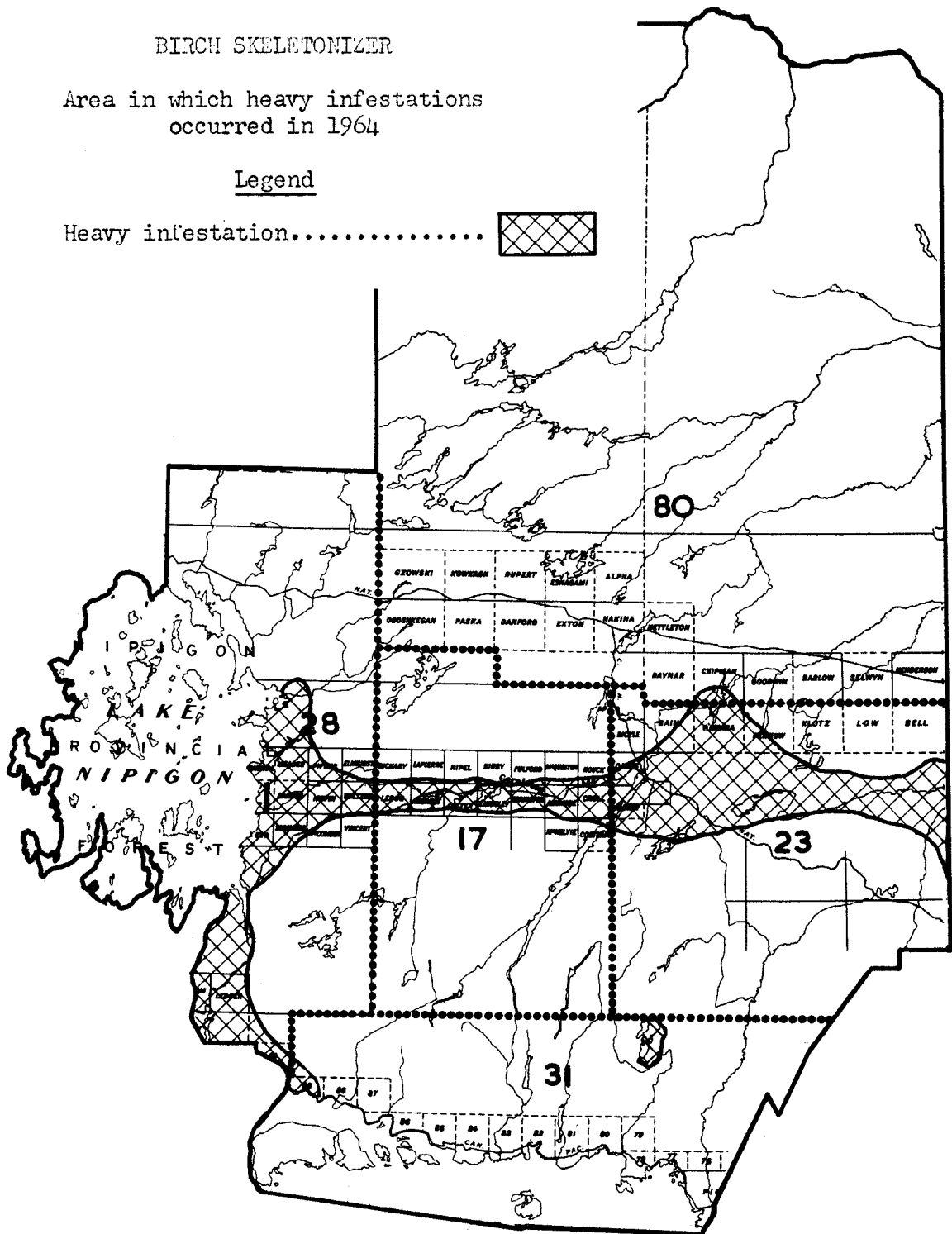


TABLE 15

Summary of Damage by the White-pine Weevil in the Geraldton District from 1962 to 1964

Note: One hundred open-grown trees were examined at each location.

Location	Tree species	Av. height of trees in feet	Per cent of trees weevilled		
			1962	1963	1964
Legault Township	bS	6	-	-	16
Rupert Township	bS	8	-	-	9
Pamela Lake	bS	8	4	6	8
Stevens	bS	6	4	5	7
Stevens	jP	6	-	3	3
Summers Township	bS	8	4	4	7
Creelman Creek	bS	7	6	4	7
Fairloch Lake	bS	8	6	1	3
Peterson Creek	bS, wS	4	-	4	3
Mile 24 Auden road	bS	8	5	2	2

Woolly Alder Aphid, Prociphilus tessellatus Fitch.

Pockets of heavy infestation were observed on alder in the Auden road area from Walters Township north to Toronto Lake. Dense aphid populations were concentrated mainly on current shoots and leaf stems.

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

This leaf miner was found in the district for the first time in 1961 causing severe browning of birch foliage at Pays Plat. In 1963 a heavy infestation was recorded at Longlac, a medium infestation occurred at Pays Plat, and small numbers of mined birch leaves were observed at Caramat and at Orient Bay. In 1964 a noticeable decline in population levels occurred at Longlac and Pays Plat (Table 16). No leaf miners were found elsewhere in the district in 1964.

TABLE 16

Summary of Damage by the Amber-marked Birch Leaf Miner in the Geraldton District from 1961 to 1964

Note: Counts are based on examination of 100 white birch leaves at each location.

Location	No. of mined leaves				Total number of mines			
	1961	1962	1963	1964	1961	1962	1963	1964
Pays Plat	40	31	38	26	92	62	68	47
Longlac	-	-	91	70	-	-	459	264
Caramat	-	-	0	0	-	-	0	0

Spruce Bud Gall Midge, Rhabdophaga swainei Felt

An increase in population levels of this bud miner was observed on black spruce through the southern part of the district. Numerous infested buds were observed on scattered open-grown black spruce along the shore of Lake Superior but the incidence of damaged white spruce buds declined in the same area. In the central part of the district populations declined to endemic levels (Table 17).

TABLE 17

Summary of Damage by the Spruce Bud Gall Midge in the
Geraldton District from 1962 to 1964

Note: Counts were based on the examination of five branch tips from each of ten trees.

Location	Tree species	Av. d.b.h. in inches	No. of shoots examined	Per cent of terminal buds infested		
				1962	1963	1964
Terrace Bay	bS	2	169	3.4	5.0	8.0
Rainbow Falls	wS	3	149	-	10.3	2.0
Beardmore	bS	1	153	1.2	1.8	1.3
Pic Township	wS	2	161	3.0	2.8	1.2
Flynn Lake	bS	1	163	4.6	0.7	0.0
Croll Township	bS	1	155	2.3	0.6	0.0
Camp 81 road	bS	2	157	1.2	0.0	0.0
Chipman Lake	wS	3	162	2.3	1.8	0.0

A Geometrid on Birch, Rheumaptera sp.

In 1964 populations of this insect declined to low levels south of Killala Lake in Township 79 and at Wabasta Lake in Township 87 where moderate defoliation of white birch was recorded in 1963. No collections of this insect were made elsewhere in the district in 1964.

A Leaf Tier on Poplar, Sarrothripus cinereana N. & D.

This insect, associated with Pyrrhia umbra exprimens Wlk., caused severe defoliation of the new shoots of numerous small balsam poplar trees along the Pagwac-huan Lake road and at Ogoki Lake. Low populations of both insects occurred in the Klotz Lake area, in Township 89, and at several other locations in the district. Sarrothripus cinereana caused light to moderate defoliation of scattered balsam poplar trees in the Coldfield road area.

TABLE 18

Miscellaneous Insects Collected
in Geraldton District in 1964

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
Acleris logiana Linn.	wB	Small numbers in Sandra Tp.
Acleris variana Fern.	wS, bF	Endemic numbers (8)
Acrobasis betulella Hlst.	wB	Occasional larva at widely scattered points (9)
Acrobasis rubrifasciella Pack.	wB	Small numbers in McQuesten Tp.
Acronicta fragilis Gn.	Al, wB	Endemic numbers (4)
Acronicta grisea Wlk.	wB, Al	Small numbers (2)
Acronicta sperata Grt.	Se	Small numbers
Agromyza salicis Mall.	W	Small numbers of galls, Davies Tp.
Allononyma diana Hbn.	bPo	One collection from Bain Tp.
Altica corni Woods	Do	Pockets of light infestation on shore shrubs at Chipman and Charlet lakes
Anchylopera nebululana Clem.	Se	Small numbers at Hillspport
Ancylis mediofasciana Clem.	Se, pCh	Small numbers at widely scattered points (4)

TABLE 18, Geraldton District

Insect	Host(s)	Remarks
<i>Anomogyna elimata</i> Gn.	bF, jP	Small numbers (2)
<i>Anoplonyx canadensis</i> Hgt.	tL	Av. of two larvae per beating tray in Colter Tp.
<i>Archips cerasivoranus</i> (Fitch)	ecCh, tA	A small infestation persisted for the fourth consecutive year east of Longlac; at other sampling points populations remained low (2)
<i>Argyresthia pygmaella</i> Hbn.	W	Small numbers of infested leaves on scattered trees in Vivian Tp.
<i>Argyrothenia quadrifasciana</i> Fern	tL	One larva in beating samples
<i>Autherea polyphemus</i> Cram.	wB	Small numbers
<i>Badebecia urticana</i> Hbn.	wB	Collection from McQuesten Tp.
<i>Biston cognataria</i> Gn.	Al	Small numbers in beating samples
<i>Catocola relictata</i> Wlk	tA	One larva
<i>Chionaspis furfura</i> (Fitch)	Al	Small pocket of heavy scale insect infestation in Croll Tp.
<i>Choristoneura fumiferana</i> Clem.	wS, bF	Endemic populations at three widely separated collection points
<i>Choristoneura rosaceana</i> Harr.	rP	One larva
<i>Chrysomela lineatopunctata</i> (Forst)	bPo	Two colonies found south of Caramat; first record for the district
<i>Cimbex americana</i> Leach	wB, Al	Small number in beating samples (3)
<i>Compsolechia niveapulvella</i> Chamb	tA	Small numbers through Tp. 91
<i>Conophthorus</i> sp.	jP	A light infestation occurred in Tp. 91 where 29 shoots were killed on ten sample trees; counts were negative in five other sampling points
<i>Croesus latitarsus</i> Nort.	wB	Small numbers (3)
<i>Dasyneura balsamicola</i> (Lint)	bF	Light populations in McLeod Park (3)
<i>Dichelonyx</i> sp.	tA	Heavy leaf chafer feeding on small fringe aspen along Hillsport road; defoliation ranged up to 50 per cent on numerous scattered trees.
<i>Dimorphopteryx pinguis</i> (Nort.)	wB, Al	Light populations in tps. 85, 87 and Pic; small numbers at other points through the district (8)
<i>Dioryctria abietivorella</i> Grt.	wS	Occasional larva (3)
<i>Diprion hercyniae</i> (Htg)	wS	Two European spruce sawfly larvae collected in beating samples in Tp. 79; first record for the district since 1960.
<i>Dryocoetes affaber</i> Mann.	wS	Bark beetles found in trunk and small branches of a dead tree

TABLE 18, Geraldton District

Insect	Host(s)	Remarks
<i>Ennomos subsignarius</i> Hbn	wB	Two larvae in beating samples; first record for the district
<i>Epinotia momonana</i> Kft.	Al	Small numbers (2)
<i>Epinotia solandriana</i> Linn.	wB	Small numbers (2)
<i>Eriophyes ulmi</i> Garman	wE	Leaf mites numerous on lower branches of a single white elm tree at Ogoki Lake
<i>Erynnis icelus</i> Scud. and Burg.	W	One larva
<i>Eupithecia filmata</i> Pears	wS, bF	Occasional larva in beating samples (2)
<i>Fenusa dohrnii</i> (Tischb.)	Al	Pockets of light to moderate leaf mining in tps. 87 and Pic; small numbers common along Lake Superior shore
<i>Feralia jocosus</i> Gn.	bF, wS	Small numbers in beating samples (3)
<i>Framinghamia helvalis</i> (Wlk)	tA	One lightly infested tree, Rupert Tp.
<i>Galerucella decora</i> Say	W	Severe defoliation of several clumps of shore willow at Chorus Lake (2)
<i>Gluphisia septentrionalis</i> Wlk.	tA	Small numbers in beating samples (2)
<i>Grapholitha prunivora</i> Walsh	pCh	Two larvae found feeding in cherry black knot organism in Tp. 91
<i>Gracillaria syringella</i> (F.)	bAs	Several leaf miners on one small tree
<i>Hemichroa crocea</i> (Four)	Al	Single colonies at widely scattered points (8)
<i>Herculia thymetusalis</i> Wlk	bS	Found in dead cone clusters of large trees; first record for the district (3)
<i>Holcocera immaculella</i> McD.	JP	Light populations found in dead male flowers at Hillsport
<i>Hylobius congener</i> D.T.	JP	Small numbers in log traps at Goldfield road mile 16 and MacLeod Lake road mile 13
<i>Hylobius piceus</i> DeG.	tL	One adult in beating samples
<i>Hylurgops pinifex</i> Fitch	JP	Beetles collected in freshly cut stumps
<i>Ips borealis</i> Sw.	wS	Beetles found in bark of a windfall
<i>Ips perroti</i> Sw.	JP	Found in freshly cut trees (2)
<i>Ips perturbatus</i> Eich.	wS	Small numbers of bark beetles collected in a dead tree
<i>Ips pini</i> Say	JP	Found in dead trees (2)
<i>Lambdina fiscellaria</i> <i>fiscellaria</i> (Guen)	bF	Collected in beating samples
<i>Leucania unipuncta</i> Haw.	ground cover	Pockets of heavy cutworm infestations at Geraldton, Longlac and numerous other locations in the district
<i>Malacosoma disstria</i> Hbn.	tA	Scattered larvae observed on understory trees in Pipher Tp. and at Klotz Lake

TABLE 18, Geraldton District

Insect	Host(s)	Remarks
<i>Melanagromyza schineri</i> (Girt.)	tA	Populations declined in Ashmore Tp.
<i>Meroptera pravella</i> Grt.	tA	Light populations on scattered small trees
<i>Mindarus abietinus</i> Koch	bF	Small numbers, Croll Tp.
<i>Monoctenus juniperinus</i> MacG.	eC	Collected in beating samples
<i>Nadata gibossa</i> A. & S.	pCh, Se, wB	Small numbers (3)
<i>Nematus erythrogaster</i> Nort.	Al	One colony
<i>Nematus limbatus</i> Cress.	W	Several colonies on one small tree, Tp. 87 (4)
<i>Nematus ventralis</i> Say	tA	Several heavily defoliated small trees observed in Houck Tp.; single colonies at other collection points (4)
<i>Nematus</i> sp. (leaf folding sawfly)	tA	Nine per cent of leaves infested on a clump of small aspen at Klotz Lake; endemic numbers through several other areas in the district (3)
<i>Neodiprion abietis</i> complex	bF, wS	Highest av. of one larva per beating mat sample in Legault Tp.
<i>Neodiprion nanulus nanulus</i> Schedl	jP	Single colonies at widely scattered collection points (4)
<i>Neodiprion virginianus</i> complex	jP	Light general population increase; highest av. of 4.8 colonies per sample tree in Colter Tp.
<i>Nyctobia limitaria</i> Wlk	bF	Small numbers in balsam fir plots (2)
<i>Oligothropus salicifolius</i> Felt.	W	Light leaf midge infestation on several small trees in Tp. 87
<i>Ortholepsis pasadama</i> Dyar	wB	Occasional larva (3)
<i>Orthotomicus caelatus</i> Eich.	jP	Bark beetles found in freshly cut logs (3)
<i>Orthotomicus latidens</i> (Lec.)	bS	Small collection from Croll Tp., first survey records
<i>Pareophora minuta</i> (MacG.)	bAs	Severe branch tip defoliation on one tree, Leduc Tp.
<i>Peridroma saucia</i> Hbn.	wB	One egg mass, Ashmore Tp.
<i>Petrova albicapitana</i> Busck.	jP	General population increase; common in small numbers through the area south of Caramat
<i>Phratora purpurea purpurea</i> Brown	tA	Two colonies east of Longlac
<i>Phyllocnistis populiella</i> Chamb.	tA	Small numbers (2)
<i>Pikonema alaskensis</i> (Roh.)	wS, bS	One heavily infested tree in Tp. 78; small numbers at other collection points (5)
<i>Pikonema dimmockii</i> Cress.	wS	Small numbers in beating samples (7)
<i>Pineus floccus</i> Patch	bS	One heavily infested tree in Ledger Tp.

TABLE 18, Geraldton District

Insect	Host(s)	Remarks
<i>Pineus similis</i> Gill.	wS	Moderate gall infestation on lower branches of one tree
<i>Pissodes affinis</i> Rand	jP, rP	Adults collected in beating samples in Sandra Tp. and in log trap at Goldfield road
<i>Pissodes approximatus</i> Hopk.	jP	Collected in log trap at Goldfield road
<i>Pityogenes plagiatus</i> (Lec.)	jP	Beetles collected in windfalls (2)
<i>Pityokteines sparsus</i> Lec.	bF	Found in a dead tree
<i>Plathypena scabra</i> Fabr.	W	Three larvae in beating samples
<i>Pleroneura borealis</i> Felt	bF	Eleven per cent of current shoots infested in a clump of shore trees at Pamela Lake (2)
<i>Prochoerodes transversata</i> Dru.	wB	One larva
<i>Protoboarmia porcelaria</i> <i>indicataria</i> Wlk.	bF	Small numbers in beating samples
<i>Rhabdophaga batatas</i> (Walsh)	W	Occasional galls at Pagwachuan Lake
<i>Rhabdophaga strobiloides</i> (Walsh)	W	Common in small numbers in O'Meara Tp.
<i>Sarrothripus frigidana</i> Wlk.	W	Pockets of moderately infested trees in Eva Tp., small numbers elsewhere (7)
<i>Schizura concinna</i> J. E. Smith	tA	One colony
<i>Sciaphila duplex</i> Wlsh	tA	Endemic numbers (2)
<i>Scoliopterix libatrix</i> Linn.	W	Four larvae in beating samples
<i>Semiothisa sexmaculata</i> Pack.	tL	Small numbers in beating samples (4)
<i>Semiothisa orillata</i> J. E. Smith	eCe	Two larvae
<i>Sternochetus lapathi</i> (Lin.)	W	Endemic populations at two widely separated collection points; first record for the district (2)
<i>Sycia macularia</i> Harr.	wB, AL	Small numbers (2)
<i>Syngrapha selecta</i> Wlk.	bF, wS	Small numbers in beating samples (3)
Tenthredinidae #11	W	One colony (2)
Tenthredinidae #12	W	One colony
Tenthredinidae #35	W	Single colonies (2)
<i>Tetralopha aplastella</i> Hlst	tA	Light populations in the Rod Lake area and on scattered small trees in Raynar and Pifher tps. (5)
<i>Trichiosoma triangulum</i> Kby.	AL	Small numbers in beating samples (2)
<i>Vanessa virginiensis</i> Dru.	pearly everlasting	Several heavily infested plants on Bell Island, Lake Nipigon
<i>Zeiraphera fortunana</i> Kft.	wS	Small numbers
<i>Zenobia ploenoctusa</i> Grt.	tA	One larva

WESTERN FOREST REGION

1964

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INTRODUCTION

WESTERN FOREST REGION

The following report summarizes forest insect and tree disease conditions in the Western Forest Region. Information on the forest tent caterpillar and results of forest disease surveys are presented on a regional basis, whereas data on other insects are contained in the respective district sections.

The extent and intensity of infestation of the forest tent caterpillar and the aspen leaf beetle increased throughout the Region in 1964. Larch sawfly populations remained at a low level in the region as a whole but one pocket of heavy infestation occurred in the Kenora District. Population levels of spruce budworm, and jack-pine sawflies continued to decline.

The known distribution of European Spruce Sawfly, Diprion hercyniae (Htg.) and A Leaf Miner on Birch, Profenusa thomsoni (Konow) were extended.

Forest Pathology surveys carried out revealed little change in incidence and intensity of diseases. Needle rusts on conifers were observed commonly in the Region. A leaf and twig blight on trembling aspen regeneration, Pollaccia radiosa (Lit.) Bald. & Cif., caused severe wilting of new shoots in all districts. Noteworthy deterioration of coniferous stands caused by drought injury occurred within an area approximating 1,600 square miles in Lake of the Woods area including Morson and Mathieu townships.

Technicians co-operated in educational programs of the Department of Lands and Forests and Dryden Pulp and Paper Company. Numerous extension and service calls resulting from forest insect and disease problems were received from private individuals, Department of Lands and Forests personnel, and industry. A total of 1,200 insect and disease collections were submitted to the Forest Entomology and Forest Pathology laboratories from the Region.

The Forest Technicians in the Western Region gratefully acknowledge the interest and assistance of the Ontario Department of Lands and Forests and operating companies.

P. E. Buchan

STATUS OF INSECTS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

This marks the fifth consecutive year that forest tent caterpillar infestations increased in extent in the region. In 1964 the outbreak spread eastward to the Port Arthur District and southward in the Quetico Park area. As a result, poplar stands were severely defoliated in approximately two-thirds of the region representing an increase in total area of medium to heavy infestation from 18,000 square miles in 1963 to 27,000 square miles in 1964.

Egg hatch was determined at numerous locations in the region. These revealed that the egg hatch was high, ranging from 62 to 95 per cent in 1964 compared with 2 to 89 per cent in 1963. Hatch failure in 1964 was due mainly to egg sterility and the inability of larvae to emerge (Table 1).

TABLE 1

Summary of Per Cent of Forest Tent Caterpillar Egg Hatch
at 13 Points in the Western Forest Region in 1964

Location	Av. no. of eggs per band	Per cent of eggs hatched	Per cent egg mortality caused by			Degree of infestation
			Para- site	Unsuccess. emergence	Sterile eggs	
<u>Sioux Lookout District</u>						
Madsen	168.3	84	0	9	7	H
Baird Tp.	148.8	69	2	13	16	H
Ear Falls	181.9	62	2	32	4	H
* English River	220.0	90	3	5	2	H
Block 10	178.8	94	1	3	2	H
Echo Tp.	164.2	95	1	2	1	H
Ilsley Tp.	154.5	87	3	6	4	H
<u>Fort Frances District</u>						
Manion Lake	193.7	88	1	3	8	H
N.E. Bay, Rainy Lake	173.8	95	0.3	1.2	3.5	H
* Highway 11, Atikokan	190.3	95	2	1	2	H
Laseine	181.6	75	5	6	14	H
<u>Kenora District</u>						
McIntosh	205.2	91	3	2	4	H
Dyment	185.9	64	0	26	4	H

* Only 3 hatched egg bands found at these locations in 1964.

Weather conditions were highly favourable for the development of the insect from the time the eggs hatched in the spring until the adults emerged in July.

More adult moths were observed in many areas than were noticed since the outbreak began. At the height of the adult flight clouds of moths caused hazard-

ous night driving conditions in the Sioux Lookout area.

The status of parasites and diseases which traditionally contribute to the collapse of outbreaks were assessed in the region. Numbers of the parasitic fly Sarcophaga aldrichi Park. increased (see photograph), particularly in the Kenora and Sioux Lookout districts where the infestation has been active for several years. Diseased larvae submitted from the three districts to the Insect Pathology Research Institute for diagnosis were infected mainly by a polyhedral virus (see photograph). At Eltrut and Rainy Lake in the Fort Frances District two white birch trunks were examined revealing 3.6 and 0.8 dead larvae per square foot of bark. To assess the degree of control by parasites, predators and disease, 100 cocoons were examined at 23 points in the region (Table 2). Mortality by disease was most obvious in the Kenora District where the infestation is oldest. Successful adult emergence ranged from 11 to 67 per cent.

TABLE 2

Summary of Forest Tent Caterpillar Cocoon Dissection
in the Western Region in 1963

Note: One hundred cocoons examined at each location.

Location	Per cent parasitized		Per cent diseased		Per cent killed by predation		Per cent successfully emerged	
	1963	1964	1963	1964	1963	1964	1963	1964
<u>Kenora District</u>								
Sand Lake	39	51	20	21	2	0	39	28
Southworth Tp.	40	19	14	14	0	0	46	65
Aubrey Tp.	28	24	11	17	4	1	47	58
Mutrie Tp.	37	41	12	13	0	2	51	56
Zealand Tp.	44	38	16	20	0	0	40	42
Willingdon Tp.	26	26	12	17	4	0	62	57
Redditt Tp.	61	61	37	28	0	0	34	11
Satterly Tp.	28	19	10	14	2	0	60	67
Upper Manitou Lake	47	48	29	29	1	1	33	22
Canyon Lake	-	27	-	9	-	1	-	63
<u>Sioux Lookout District</u>								
Pakwash Lake	42	41	14	2	3	-	41	57
Ilsley Tp.	35	37	4	3	1	1	60	59
Uchi Road	53	53	2	1	0	2	45	44
Norway Lake Road	32	36	2	4	1	-	65	60
Drayton Tp.	37	42	1	9	2	1	61	46
Block 10	34	49	5	6	2	1	57	44
Echo Tp.	-	49	-	3	-	0	-	48
<u>Fort Frances District</u>								
Redgut Bay	61	54	2	6	2	4	35	36
Northwest Bay	75	53	2	5	1	3	22	39
Atikokan	57	37	5	2	1	1	37	61
Northeast Bay	60	65	1	4	1	1	38	30
Little Turtle Lake	60	49	0	1	3	1	37	49
Eltrut Lake	55	48	2	14	2	0	41	38

A special study was carried out in the Sioux Lookout District to determine the vertical distribution of egg bands in the crowns of co-dominant trembling aspen trees. Only a small fraction of the data are presented here. For example, as shown in Table 3 most egg bands are laid in the top six feet of the crown. However, inconsistencies are evident. In Corman Township where the infestation began in 1963, the percentage of eggs in the upper six feet of the crown increased with time (1962-50%; 1963-69%; and 1964-86%), whereas in Block 10 where the infestation was first reported in 1961 the percentage of egg bands in the top six feet decreased with time (1962-60%; 1963-47%; and 1964-31%). The trends which are taking shape relating age of infestation and the position of the eggs in the tree crown will be studied further in 1965.

TABLE 3

Summary of Forest Tent Caterpillar Egg Band Numbers in the Top Six-foot Section of the Crowns of Five Trembling Aspen Trees at each of Eight Points in the Sioux Lookout District 1962-1964

Location	Year	Av. crown Length-Width		No. of egg bands	Per cent of eggs laid in top 6' section of crown	No. of years of heavy infestation
Block 10	1962	20	8	1,008	60	3
	1963	25	7	135	47	
	1964	18	6	239	31	
McAree Tp.	1962	18	7	561	46	3
	1963	15	6	85	72	
	1964	15	6	59	64	
Baird Tp.	1962	21	6	425	63	2
	1963	19	6	22	76	
	1964	14	6	351	57	
Detector Lake	1962	17	6	25	64	3
	1963	18	6	35	60	
	1964	18	6	188	43	
Valora Road	1962	19	6	34	79	3
	1963	18	5	109	55	
	1964	19	6	165	56	
Corman Tp.	1962	19	6	8	50	2
	1963	16	9	49	69	
	1964	11	6	70	86	
Ilsley Tp.	1962	19	7	385	57	3
	1963	14	7	167	84	
	1964	14	7	96	59	

Based on egg band surveys carried out in the fall of 1964 at 45 locations in the Region, heavy infestations are forecast for 1965 (Table 4). Numbers of egg bands found in the majority of areas sampled in the Region decreased in comparison with previous years. However, there were sufficient numbers of egg bands per tree to indicate that a further extension of heavy infestation will occur in 1965. New areas of heavy infestation are expected in Quetico Park area of the Fort Frances District and in the Savant Lake area in the Sioux Lookout District.

TABLE 4

Summary of Forest Tent Caterpillar Egg Band Counts and Infestation
Forecasts for 1965 in the Western Region

Note: Counts were based on the examination of three trembling aspen trees at each location.

Location	Av. d.b.h. in inches	Av. no. egg bands per tree			Forecast for 1965
		1962	1963	1964	
<u>Sioux Lookout District</u>					
Block 10	3	201	27	48	Severe
McAree Tp.	3	114	17	12	"
Corman Tp.	3	2	10	14	"
Baird Tp.	4	92	5	70	"
Valora	3	8	22	33	"
Uchi Road	4	5	7	38	"
Ilsley Tp.	3	76	34	17	"
Sturgeon Lake	5	-	46	17	"
Raggedwood Lake	3	-	4	8	"
Savant Lake	3	-	15	12	"
Wapesi Lake	4	-	5	7	"
Norway Lake	3	-	83	90	"
Delesseps Lake	4	-	-	26	"
Echo Tp.	3	-	-	10	"
<u>Kenora District</u>					
Southworth Tp.	3	92	26	29	"
Satterly Tp.	4	51	75	14	"
Zealand Tp.	4	122	33	36	"
Mutrie Tp.	4	149	66	8	"
Tustin Tp.	5	19	14	20	"
Canyon Lake	4	8	71	27	"
Sand Lake	4	28	31	23	"
Lemay Tp.	4	13	16	23	"
Willingdon Tp.	3	19	36	31	"
Work Tp.	3	18	41	12	"
Minaki	4	180	109	49	"
Upper Manitou Lake	4	34	87	32	"
Perrault Lake	3	54	31	19	"
Bay Is. Lake of the Woods	4	-	0	10	"
Godson Tp.	3	-	-	10	"
Redditt Tp.	5	-	-	48	"
<u>Fort Frances District</u>					
Little Turtle Lake	5	8	24	19	Severe
Otukamamoan Lake	4	3	21	5	"
Kaiarskons Lake	4	3	6	11	"
McCrosson Tp.	4	0.3	2	3	"
Atikokan	4	-	8	43	"
Eltrut Lake	4	-	8	8	"
Quetico Lake	6	-	6	9	"
Claxton Tp.	4	-	2	15	"
Foresburg Lake	5	-	-	72	"

TABLE 4, continued

Location	Av. d.b.h. in inches	Av. no. egg bands per tree			Forecast for 1965
		1962	1963	1964	
<u>Fort Frances District (cont'd)</u>					
Redgut Bay Rainy Lake	5	-	-	33	Severe
Northeast Bay Rainy Lake	4	-	-	19	"
Northwest Bay Rainy Lake	4	-	-	15	"
Sandpoint Is. Rainy Lake	4	-	-	7	"
Kingsford Tp.	4	-	-	1	Light
Highway 11 east district boundary	6	3	2	12	Severe

A Foliage Rust on Spruce, Chrysomyxa ledi deBary

This disease was found for the second consecutive year at numerous points in the region. Heavily infected black spruce trees were observed at Deception Lake, along the Wenasaga Road in Sioux Lookout District, at Camp Robinson on the Red Lake Road and in Mutrie Township in Kenora District. Lightly infected white and black spruce trees were observed at eighteen points elsewhere in the region. Although this rust is common on spruce and severe attack causes extensive loss of foliage no permanent injury has been observed.

A Foliage Rust on Spruce, Chrysomyxa ledicola Lagerh.

This needle rust was found at nine widely-scattered points in the Sioux Lookout and Kenora districts. Although only light infection occurred, both black and white spruce in many diameter classes were attacked. This rust frequently discolours infected foliage to the extent that trees appear yellowish in colour but has little significance in this region since no permanent injury has been observed.

A Spruce Cone Rust, Chrysomyxa pirolata Wint.

Light infection by this rust fungus was found throughout the Sioux Lookout District. Generally the cones of black spruce appeared more susceptible than those of white spruce.

This rust causes a reduction in the amount of seeds produced and may delay regeneration.

A Foliage Rust on Jack-pine, Coleosporium asterum (Diet.) Syd.

This needle rust was found at eleven widely-separated points in the region in 1964. Six collections were taken from jack-pine trees and the remainder were found on golden-rod and wild aster, the alternate hosts of the fungus. Heavy attack was observed on regeneration jack-pine trees near Dryden and in a stand of the 5-inch diameter class at Blackstone Bay, Eagle Lake in Kenora District.

Elsewhere incidence was low.

A Leaf Rust, Gymnosporangium spp.

This perennially occurring leaf rust on mountain ash was widespread throughout the region. Generally the incidence of the fungus was low.

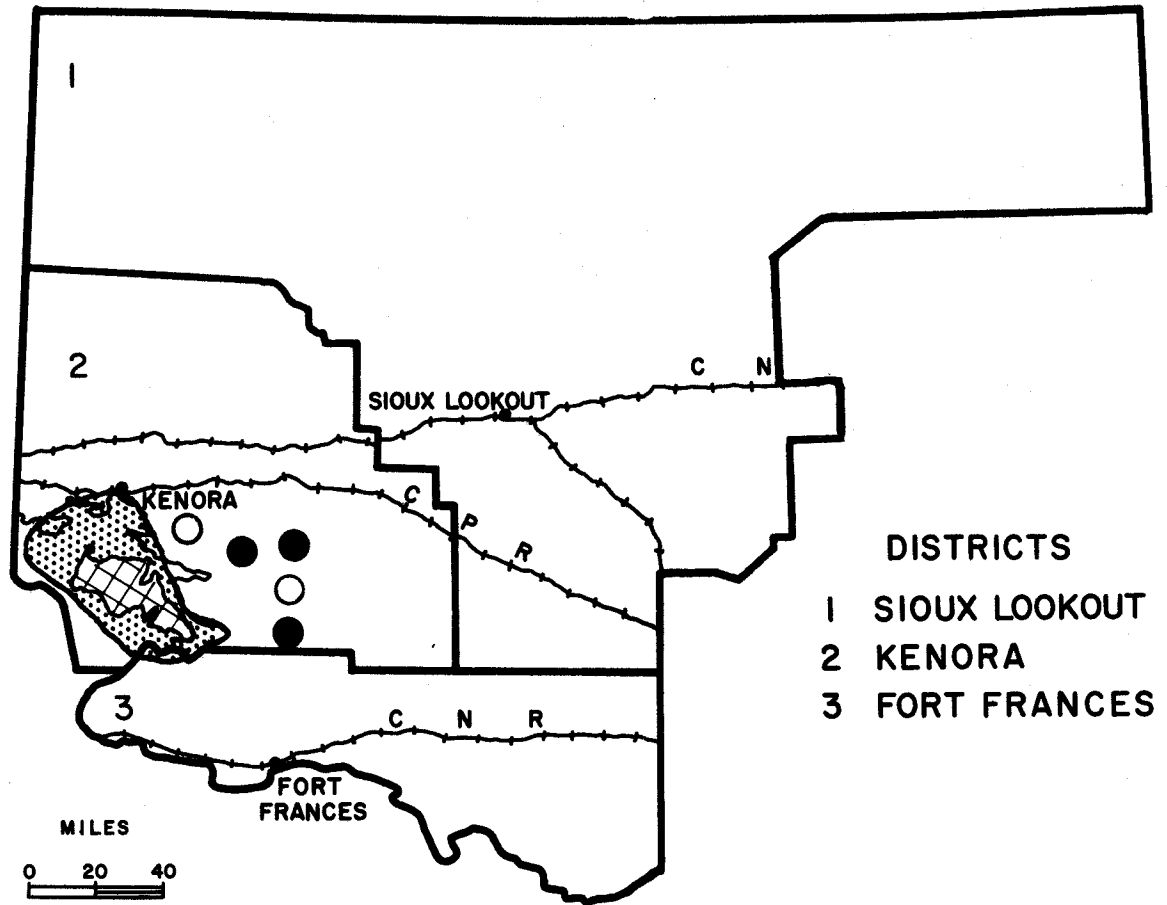
A Gymnosporangium sp. was noticeable on Amelanchier in the Fort Frances District in 1964. Moderate-to-heavy infection of this rust was observed at several points near Rainy and Russel lakes, Fort Frances District.

Hypoxyton Canker of Aspen, Hypoxyton pruinatum (Klotsche) Cke.

Trees infected with this pathogen were found in most aspen stands examined. Cankers caused by this disease were more prevalent in stands on poor sites than those on good sites.

Permanent plots were established at several points in the region to assess the damage caused by this disease and to record the incidence of F. igniarius. Results are shown in Table 5.

WESTERN FOREST REGION



- DISTRICTS**
- 1 SIOUX LOOKOUT
 - 2 KENORA
 - 3 FORT FRANCES

CONIFEROUS DETERIORATION

Areas in which deterioration of conifers occurred in 1964

Legend





- Moderate to severe deterioration.....  
- Light to moderate deterioration.....  

TABLE 5

Incidence of Hypoxyylon pruinatum and Fomes igniarius in plots
in trembling aspen stands in the Western Region, 1964

Location	Av. d.b.h. in inches	Site factor	Per cent incidence of infection by <u>H. pruinatum</u>	Per cent mortality caused by <u>H. pruinatum</u>	Per cent incidence of infection by <u>F. igniarius</u>	Degree Forest tent caterpillar infestation 1964
<u>Fort Frances District</u>						
Redgut Bay Rainy Lake	4	good	4	3	2	Heavy
Northeast Bay Rainy Lake	6	poor	12	5	10	"
Northwest Bay Rainy Lake	4	fair	8	4	1	"
Eltrut Lake	5	fair	13	3	3	"
Kingsford Tp.	3	good	2	1	0	Light
<u>Kenora District</u>						
Caribou Falls	5	fair	3	0	8	Heavy
Sioux Narrows	4	fair	6	0	2	"
Kekekewa Lake	5	good	2	0	0	"
<u>Sioux Lookout District</u>						
Red Lake	6	fair	25	23	4	Light
Ear Falls	6	good	0	0	33	Moderate

A Rust on Wild Rose, Phragmidium sp.

This pathogen was collected throughout the range of wild rose in the Western Forest Region and incidence was low except in one location at Lake of the Woods where medium infection occurred. Though this disease does not apparently cause mortality, the rust which infects the seed pods will cause a reduction in the numbers of viable seeds.

A Leaf and Twig Blight of Aspen, Pollacvia radiosa (Lib.) Bald. & Cib.

This shoot blight was found commonly on trembling aspen regeneration throughout all districts in the Western Forest Region. Heaviest infections appeared near Sioux Lookout, in Dobie Township west of Fort Frances and in Docker Township west of Vermilion Bay (Table 6).

TABLE 6

Incidence of Tip Blight Damage on Regeneration Aspen
in the Western Region, 1964

Note: 100 trees examined at each point.

Location	Per cent of trees affected
Wild Land Reserve	71
Dobie Tp.	83
Aylsworth Tp.	23
Rainy Lake	42
Niobe Lake	27
Docker Tp.	67
Sydney Lake	37
Mutrie Tp.	28
Sabaskong Bay	32
Wenasaga Lake	66
Mile 70 Savant Rd.	74
Block 10	58
Drayton Tp.	81

A Foliage Rust on Balsam-fir, Pucciniastrum epilobii Oth.

This foliar rust was found at nine widely-scattered points in the region. Moderate to heavy infection occurred on fringe and partially-shaded balsam fir trees at Mile 60 on the Savant Road in Sioux Lookout District. Light infection of balsam-fir was observed at one point elsewhere in the Sioux Lookout District, at one point in Kenora District and at six points in Fort Frances District.

Drought Injury of Conifers

Considerable deterioration and mortality occurred to some of the coniferous species in an area of approximately 1,600 square miles in the Western Region in 1964. Generally, affected trees were confined to islands in Lake of the Woods and to shorelines of lakes and high, rocky ridges east of Lake of the Woods in Kenora District, and to the northern parts of Morson and Mathieu townships in Fort Frances District (see map).

Examination of coniferous species at numerous points in the area revealed that

considerable mortality had occurred in stands of balsam-fir and jack pine, and that small numbers of white pine, red pine, and spruce had died as well. The highest incidence of mortality was observed in jack pine stands on high, flat, rocky sites and on steep slopes with a southern or western exposure. Practically no mortality occurred on northern or eastern slopes or in areas where deep soil was present.

Although considerable mortality occurred in balsam-fir stands, records show that this condition was general in the region in mature and overmature fir stands and in stands growing on high, rocky sites, and common in areas where firs had been under attack by the spruce budworm, Choristoneura fumiferana Clem. within the past two decades.

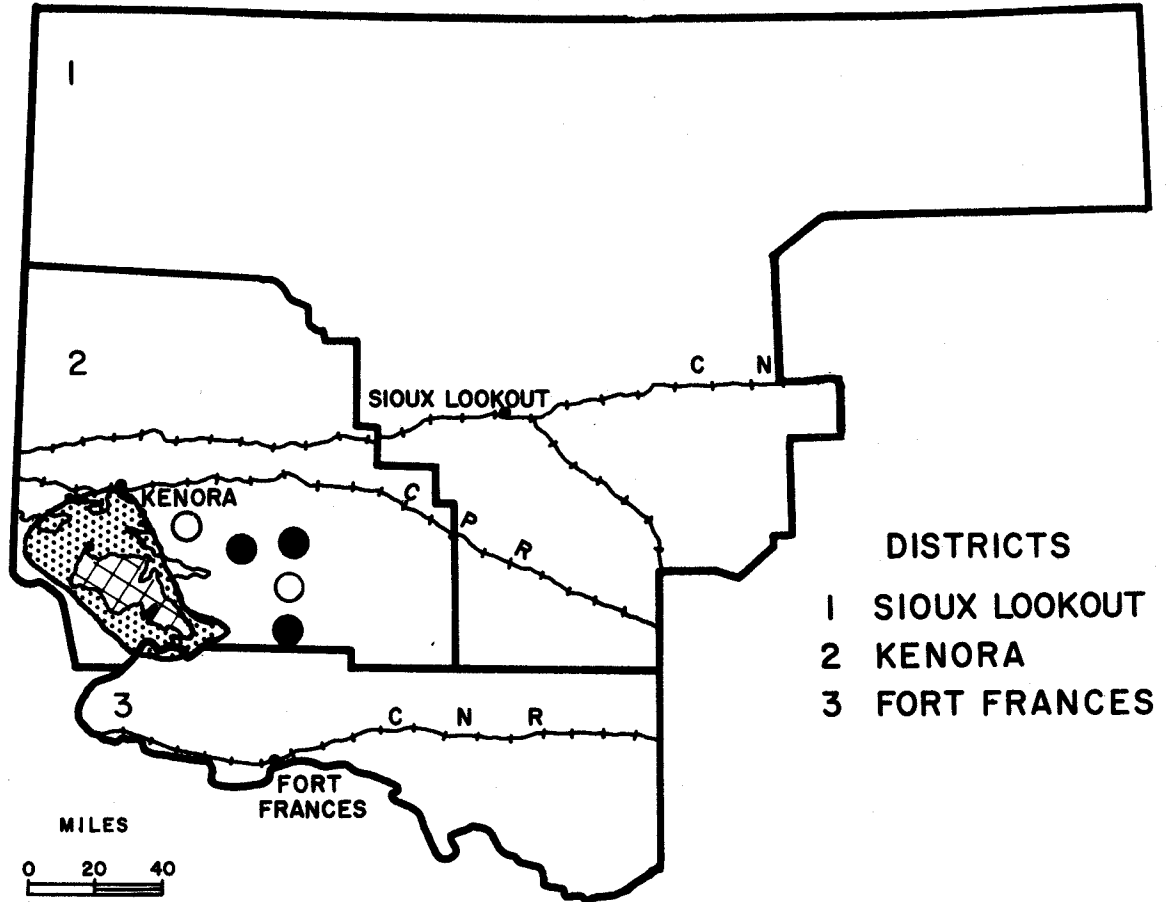
The emphasis in an intensive survey to assess the amount of mortality caused by the condition was confined to stands of jack, red, and white pines at numerous points. For this purpose sample plots were established in three pure jack pine stands and in one mixed stand of white and red pines. Examination of trees in the white and red pine plot revealed that no recent mortality of red pine had occurred, but that 45 per cent of the recently dead white pines had been killed by white pine blister rust, Cronartium ribicola J. E. Fischer and an additional 10 per cent was suspected to be attacked by this disease. This sudden and conspicuous deterioration witnessed in 1964 is attributed mainly to four predisposing factors: thin, shallow soils overlying bedrock; a high degree of stocking density in most stands and generally adverse exposures (islands and peninsulas); and to sub-normal precipitation in 1961. These have culminated in drought injury.

TABLE 7

Summary of Conifer Mortality at Four Points Where Deterioration
Attributed to Drought Occurred in the Western Region in 1964

Location	Tree sp.	No. of trees examined	Av. d.b.h. (inches)	Approx. age of stand (yrs.)	No. of trees per acre	Volume (cu. ft.) per acre	Recent Mortality by Crown Class (per cent)			
							S	CD	D	Total
Alneau Peninsula (Lake-of-the-Woods)	jP	223	3.8	25-30	1,115	1,638.5	10.7	1.3	7.6	19.6
Sabaskong Bay (Lake-of-the-Woods)	jP	95	6.2	60-70	475	2,039.1	7.3	6.3	26.3	39.9
Morson Tp.	jP	171	2.3	20-25	1,710	906.0	26.4	2.8	6.4	35.6
Sabaskong Bay (Lake-of-the-Woods)	wP	104	7.9	70-80	520	4,383.5	4.8	1.9	3.8	10.5

WESTERN FOREST REGION







- DISTRICTS**
- 1 SIOUX LOOKOUT
 - 2 KENORA
 - 3 FORT FRANCES

CONIFEROUS DETERIORATION

Areas in which deterioration of conifers occurred in 1964

Legend

- | | | |
|---------------------------------------|---|---|
| Moderate to severe deterioration..... |  |  |
| Light to moderate deterioration..... |  |  |

Frost Injury

Unusually late heavy frosts occurred during late May causing severe injury to the new shoots of several species of coniferous trees. Balsam fir and white spruce were the most seriously damaged (Table 8).

It is evident in the following table that a lower degree of damage occurred in the northern part of the region. There, possibly new shoots were not advanced enough to be susceptible to a climatic change.

TABLE 8

Summary of the Number of New Shoots Damaged by Late Frosts
in the Western Forest Region, 1964

Location	Tree species	No. shoots examined	Per cent of shoots damaged
Menary Tp.	wS	200	70
Moroson Tp.	wS	"	94
Carpenter Tp.	wS	"	86
Wild Land Reserve	wS	"	44
Niobe Lake	bS	"	28
Wabigoon Tp.	bF	100	40
Redditt Tp.	wS	"	37
Jones Road	bS	"	21
Ignace	bF	"	47
McAree	wS	"	28
Red Lake	bS	"	17
Ear Falls	bF	"	21

TABLE 9

Other Noteworthy Diseases in the Western Region
in 1964

Note: Number in brackets signifies the number of times disease organism was collected in any one of the districts.

Organism	Host(s)	Remarks
<i>Apiosporinia collinsii</i> (Schw.) Hoehn.	Sask.	Low incidence at three locations in Lake of the Woods, Kenora District (1)
<i>Aureobasidium pullulans</i> (deBary)	wP	Small numbers of dead new shoots at one point in Shenstone Tp. (1)
<i>Auricularia auricularis</i> (S.G. Gray) Martin	bF	Infections light in Division 18 (1)
<i>Geratosystis</i> sp.	tA	Moderate incidence of this canker infection observed at Eagle Lake in Division 18 (1)
<i>Ciborinia whetzellii</i> (Sear.)	tA	Observed at two locations in the Fort Frances District (2)
<i>Coccomyces hiemalis</i> Higgins	pCh	One shrub infected 10 miles south of Sioux Lookout in Jordan Tp. (1)

TABLE 9, Other Noteworthy Diseases

Organism	Host(s)	Remarks
<i>Coryneum</i> sp.	bO	Fruiting on stems and twigs at Blackstone Bay in Eagle Lake in Division 18 (2)
<i>Cronartium ribicola</i> J. C. Fischer	wP ribes	Present throughout region (8)
<i>Cytospora paucispora</i> (Pk.) Berl. & Vogl.	Al	Light infection at Stanzkikimi and Shabuskeua lakes in the Sioux Lookout District (1)
<i>Cytospora</i> sp.	aMo	Low incidence occurred at mileage 61 Savant Lake Rd., Division 19 (1)
<i>Dermea ariae</i> (Pers. ex Fr.) Tul. ex Karst.	aMo	Light infection at one point at Butterfly Lake-Division 25 (1)
<i>Diobotryon morbosum</i> (Schn.) Theiss. & Syd.	pCh	Found commonly on roadside cherry shrubs throughout all districts in the region (2)
<i>Fomes roseus</i> Fr.	wS	Low incidence occurred near Bruin Lake in Tustin Township in the Kenora District (1)
<i>Gloeosporium</i> spp.	bO, moM	Found at two locations in Fort Frances District (2)
<i>Hymenochaete agglutinans</i> Ell.	Al	Light infection at Manomin Lake in Division 18, Kenora District (1)
<i>Lophodermium</i> sp.	Juniper	Infected needles on single host plant at Breezy Island in Rainy Lake (1)
<i>Marssonina populi</i> (Lib.) Sacc.	tA	Dead shoots observed at one point in Sioux Lookout Townshite (1)
<i>Melampsora</i> sp.	W	Collected at three points in the Sioux Lookout District and at one location in the Kenora District (4)
<i>Melampsorella caryophyllacearum</i> Schroet.	bF, bS	This needle rust observed at six locations in the Sioux Lookout District only (6)
<i>Melanconis alnivar marginalis</i> (Pk.) Wehm.	Al	Low incidence at Hough Lake in Division 25 (1)
<i>Nectria</i> sp.	wB	Observed at one location on Eagle Lake in the Kenora District (1)
<i>Nyssopsora clavellosa</i> (Berk.) Arth.	aralia sp.	Common in all districts (5)
<i>Peridermium</i> sp.	jP	Galls numerous at one point near Dryden, low incidence at three other points in the region (3)
<i>Pestototia</i> sp.	bur oak	Low incidence on open-grown trees at Eargney Lake-Division 21 (1)

TABLE 9, Other Noteworthy Diseases

Organism	Host(s)	Remarks
<i>Puccinia asteris</i> Duby.	Aster	High incidence of infection in McAree Tp., Sioux Lookout District. Common throughout region (7)
<i>Puccinia caricis</i> var. <i>grossulariata</i> Arth.	ribes sp.	Rust common at Flake Lake in Division 18 (1)
<i>Puccinia mesomajalis</i> Berk. & Curt. ex Pk.	clintonia sp.	Collected at one point in each district (3)
<i>Pucciniastrum</i> spp.	bF, fS	Low incidence in the Kenora and Sioux Lookout districts (2)
<i>Rhytisma punctatus</i> Pers. ex Fr.	MoM, maM	Light-to-moderate infection at two points in Sioux Lookout District (2)
<i>Rhytisma salicinum</i> Pers. ex Fr.	W	Infected shrub submitted from Coles Lake in Division 32 (1)
<i>Septoria musiva</i> Pk.	bPo	Collected at one point in the Fort Frances District (1)
<i>Thyronectria balsamea</i> (Cke. & Pk.) Seav.	bF	Low incidence in Van Horne Township-Division 18 (1)
<i>Uromyces polygoni avicularis</i> (Pers.) Karst.	black bindweed	Single infection Drayton Tp. Division 25

STATUS OF INSECTS IN THE SIOUX LOOKOUT DISTRICT

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STATUS OF INSECTS

Black-headed Budworm, Acleris variana (Fern.)

Generally, population levels of this insect were high (Table 10). The highest number of larvae occurred near Sioux Lookout in Block 10, and near Eaid Lake 20 miles south of Savant. A marked decline in numbers occurred at a sampling station south of Red Lake where larval densities have fluctuated since 1960. Annual quantitative samples from 1960 to 1964 at this location produced counts of 3, 60, 13, 118 and 26 larvae per sample. At one point near Red Lake the broom tops of recently-cut black spruce contained high numbers of this insect.

TABLE 10

Summary of Black-headed Budworm Larval Counts on 20 Mat Samples
From 23 Points in the Sioux Lookout District
in 1964

Location	Tree species	Av. d.b.h. in inches	Total no. of larvae	
			1963	1964
Vermilion Add Tp.	bS	3	42	24
McAree Tp.	wS	3	4	14
Block 10	bS	3	67	136
Eaid Lake	bS	3	23	65
Raven Lake	wS	3	8	11
Sowden Lake	wS	4	12	11
Forestry Hdqts.	wS	5	13	17
Highway 105	bS	5	118	26
Uchi Road	wS	3	7	21
Scotch Lake	wS	2	1	16
Vermilion Add Tp.	wS	2	-	18
Dien Lake	bF	4	-	2
St. Raphael Lake	bF	4	-	16
Drayton Tp.	wS	2	-	4
Pickeral Tp.	wS	3	-	17
Ilisley Tp.	bS	3	-	20
Dewan Tp.	bF	4	-	6
Split Lake	bF	5	-	7
Norway Lake	bS	2	-	5
White Otter Lake	wS	4	-	26
Highway 105	wS	3	-	30
Wenasaga Lake	bF	3	-	7
Long-legged Lake	bS	4	-	7

Birch Leaf Skeletonizer, Bucculatrix canadensisella Chamb.

Medium to heavy infestations recurred in the area southeast of Lake St. Joseph, encompassing McAree, Minchin and DeLessups lakes. Light infestations occurred near Miniss, Churchill, and Highstone lakes, to the west and south of the main body of infestation. Although the extent of infestation was comparable to 1963, quantitative sampling showed an appreciable decline in population levels, particularly at Coles Lake (Table 11).

TABLE 11

Summary of Birch Leaf Skeletonizer Counts on Four Eighteen-inch
White Birch Branch Tips From Each Location in the
Sioux Lookout District in 1964

Location	Av. d.b.h. in inches	No. of leaves examined	Per cent of leaves infested	Av. no. of larvae per infested leaf	Total no. of larvae found	
					1963	1964
Coles Lake	2	202	5.4	1.1	326	12
Highstone Lake	3	172	18.6	1.8	213	62
Churchill Lake	3	169	21.9	1.4	20	52
McCrea Lake	4	154	34.4	3.7	137	195
Pashkokogan Lake	3	156	39.1	1.8	-	175
Minchin Lake	3	187	35.8	2.8	182	189
Miniss Lake	3	176	27.8	1.2	10	59

Aspen Leaf Beetle, Chrysomela crotchii Brown

Severe skeletonizing of immature and regeneration trembling aspen occurred in many areas in the district in 1964. Population levels of the insect were particularly high in Echo Township south of Sioux Lookout and along Highway 105 about 30 miles south of Red Lake (Table 12).

In areas of forest tent caterpillar infestation, feeding by leaf beetles occurred on the second flush of foliage and on leaves half consumed by the tent caterpillar.

TABLE 12

Summary of Leaf Damage Caused by the Aspen Leaf Beetle from
Four Points in the Sioux Lookout District in 1964

Note: One hundred trembling aspen leaves were examined from each of three branches, one from each section of the crown and every tenth leaf was examined for degree of surface damage.

Location	Av. d.b.h. in inches	Per cent of leaves damaged	Crown section examined	Per cent of leaves damaged by crown section	Per cent of leaf surface skeletonized by crown section
Block 10	4	53.3	top	28	11
			middle	34	16
			bottom	63	40
Ilsley	3	31.4	top	9	1
			middle	30	11
			bottom	55	32
Highway 105	3	56.8	top	39	6
			middle	52	12
			bottom	57	18
Echo Tp.	3	80.2	top	75	21
			middle	69	44
			bottom	99	60

A Bark Beetle, Conophthorus sp.

Low population levels of this insect were generally found throughout the district. Highest number of damaged jack pine shoots were found near Dyment along Highway 17 and along the Wenasaga Road near Ear Falls (Table 13).

TABLE 13

Summary of Damage Caused by Conophthorus Sp. on Fifty Jack Pine
Trees at Each Sampling Point in the Sioux Lookout District
in 1963 and 1964

Location	Av. d.b.h. in inches	No. of trees attacked		Total no. of damaged shoots	
		1963	1964	1963	1964
Mile 16, Highway 105	3	-	10	-	14
Highway 17	3	5	16	12	23
Martin Road	2	4	1	4	1
Vermilion Add Tp.	3	3	5	4	5
Echo Tp.	3	7	2	8	2
Webb Tp.	1	-	2	-	2
19 Mi S Red Lake	2	-	3	-	3
Wenasaga Road	4	-	14	-	20

European Spruce Sawfly, Diprion hercyniae (Htg.)

A collection made in 1964 at White Otter Lake south of Ignace constitutes a first record of this insect in the Sioux Lookout District. Sampling at this point produced 11 larvae in 20 beating mat samples.

In the Western Forest Region the insect was first found in 1949 in the Fort Frances District and in 1961 in the Kenora District.

White-pine Shoot Borer, Eucosma gloriola Heinr.

Generally, the highest number of infested shoots were observed in the southern part of the district, particularly in stands of immature jack pine.

Typical damage occurred in McIlraith and Vermilion Additional townships west of Sioux Lookout and in Echo Township to the south. Negative results were obtained at many other locations. Results of quantitative sampling at seven locations in the district are summarized in Table 14.

TABLE 14

Summary of Terminal and Lateral Shoot Damage by the White Pine Shoot Borer on 50 Jack-pine Trees at Each Point in the Sioux Lookout District in 1964

Location	Av. d.b.h. in inches	No. of trees attacked	No. of shoots attacked			
			Leaders		Laterals	
			1963	1964	1963	1964
Corman Tp.	2	6	8	6	0	1
Vermilion Add. Tp.	1	23	4	22	0	2
Echo Tp.	2	28	3	24	7	14
Valora	2	10	-	10	-	0
Flayers Road	2	11	-	9	-	3
Webb Tp.	1	12	-	1	-	2
McIlraith Tp.	1	32	-	27	-	9

The Green-striped Spruce Caterpillar, Feralia jocosu Gn.

This insect occurred in small numbers on a variety of coniferous tree species (Table 15). Larvae were collected from mid-June to late July. In 1962 and 1963 there were two and three collections respectively of this insect made compared with ten samples in 1964.

TABLE 15

Summary of the Green-striped Spruce Caterpillar Larval Counts
on Twenty Beating Mat Samples in the Sioux Lookout District
in 1964

Location	Tree species	Av. d.b.h. in inches	Total number of insects collected
Dewan Tp.	bF	4	1
Vermilion Additional	wS	2	2
Wenasaga Road	bF	3	1
Drayton Tp.	wS	5	1
Norway Lake Road	bS	2	1
Dewan Tp.	bF	5	2
Dien Lake	bF	3	3
Block 10	bS	3	1
Vermilion Additional	bS	3	2

Hemlock Looper, Lambdina fiscellaria fiscellaria (Gn.)

This insect occurred more commonly in the district in 1964 in recent years. The highest numbers occurred on balsam fir (Table 16).

TABLE 16

Summary of Hemlock Looper Larval Counts on 20 Mat Samples
from 12 Points in the Sioux Lookout District in 1964

Location	Tree species	Av. d.b.h. in inches	Total no. of larvae per sample
Scotch Lake	wS	2	1
Uchi Road	wS	3	1
Drayton Tp.	wS	5	2
Sowden Lake	wS	4	8
White Otter Lake	wS	4	1
Norway Lake Rd.	bF	3	9
Rauen Lake	wS	3	3
Dewan Tp.	bF	4	14
Mi 21 on 72	wS	4	7
Mi 14 on 72	bF	3	4
St. Raphael Lake	bF	4	3
Echo Tp.	wS	3	3

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.

Population levels of this leaf miner declined sharply on dominant and co-dominant trees. High numbers of mined leaves occurred on 1-inch trees at Lindbergh Lake. Elsewhere in the district varying numbers were found on sucker-growth.

Western Tent Caterpillar, Malacosoma pluviale Dyar.

Generally, population levels of this insect were comparable to 1963. Tent counts were highest at sample points in Vermilion Additional and Echo township, along the Deception Bay Road near Sioux Lookout and at mileage 38 on the Valora Road (Table 17). Red cherry was the preferred host but the insect was also found occasionally on white birch and willow.

TABLE 17

Summary of Larval Colony Counts of the Western Tent Caterpillar in the Sioux Lookout District from 1961 to 1964

Location	No. of tents per mile of roadside			
	1961	1962	1963	1964
Vermilion Additional	1	7	10	34
Drayton Tp.	1	4	3	2
Baird Tp.			1	6
Echo Tp.		5	17	9
Mi 31 Valora Road		3	3	2
Mi 38 " "			11	10
Deception Bay		2	6	11
Stone River				3

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

An increase in population levels of this insect occurred on jack pine at many locations in the district in 1964 (Table 18). A medium infestation occurred approximately 21 miles south of Sioux Lookout in Pickerel Township. Light infestations recurred at Hanna Lake and in Jordon Township. Few colonies were observed elsewhere in the district.

TABLE 18

Summary of Red-headed Jack-pine Sawfly Colony Counts on 10 Jack-pine Trees at Each Location Sampled in the Sioux Lookout District from 1961 to 1964

Location	Av. no. colonies per tree			
	1961	1962	1963	1964
Wenasaga Road	0.8	0.2	0.2	1.1
Hanna Lake	6.0	1.6	1.5	1.7
Norway Lake Road	3.1	0.1	0.6	1.3
Raven Lake	1.1	0.3	0.3	0.6
Moonlight Falls Rd.	0.4	0	0.3	1.7
Dien Lake	1.0	0.2	0.1	1.7
Jordon Township	1.7	0.2	0.8	1.3
Vermilion Additional				0.1
Hilltop Lake				0.4
Pickerel Township Mi 21				2.6

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

Generally, population levels of this insect were low in the district. The highest number of larvae were found in the Ignace Division (Table 19). Except on a few ornamental trees in the town of Sioux Lookout defoliation by this sawfly was light in 1964.

TABLE 19

Summary of Yellow-headed Spruce Sawfly Larval Counts
in the Sioux Lookout District 1963-1964

Location	Tree species	Av. d.b.h. in inches	Total larvae found	
			1963	1964
Vermilion Additional	bS	3	3	3
Eaid Lake	bS	3	2	2
Raven Lake	wS	3	1	4
Drayton Tp.	wS	5	4	2
Ilisley Tp.	bS	3	-	17
Norway Lake	bS	2	-	1
Maimewess Lake	wS	3	-	1
White Otter Lake	wS	4	-	4
Mi 16 on 105	bS	3	-	3
Scotch Lake	wS	2	-	18

Green-headed Spruce Sawfly, Pikonema dimmockii (Cress.)

No appreciable change in numbers of this insect occurred in the district in 1964. Though population levels were comparable to those of Pikonema alaskensis (Roh.) the amount of defoliation caused by Pikonema dimmockii (Cress.) is considerably less. Quantitative samples taken from throughout the district show that the highest numbers were found in McAree Township and at Scotch Lake (Table 20).

TABLE 20

Summary of Green-headed Spruce Sawfly Larval Counts on 20 Mat
Samples from Each Point in the Sioux Lookout
District 1963-1964

Location	Tree species	Av. d.b.h. in inches	Total larvae found	
			1963	1964
Block 10	bS	3	2	1
Raven Lake	wS	3	6	5
Sowden Lake	wS	4	8	3
Drayton Tp.	wS	5	1	7
Wenasaga Road	wS	3	5	6
Vermilion Additional	wS	2	1	1
McAree Tp.	wS	3	6	14
Ear Falls	wS	3	-	7
Norway Lake	bS	2	4	1
Scotch Lake	wS	2	-	15

White Pine Weevil, Pissodes strobi Peck.

No appreciable change in population levels of this insect occurred in the district in 1964 compared with 1963. The highest number of infested trees were observed in the Ignace Division. Results of quantitative sampling are shown in Table 21.

TABLE 21

Summary of Damage by White Pine Weevil on 50 Jack-pine Stems
at 8 Points in the Sioux Lookout District in 1964

Location	Av. height in feet	Per cent of trees weevilled	
		1963	1964
Corman Tp.	6	2	2
Vermilion Additional	8	2	1
Highway 105	10	8	1
Norway Lake Rd.	11	-	4
Valora	13	-	6
Ignace	6	-	5
Echo Tp.	12	-	1
Ear Falls	10	-	4

Larch Sawfly, Pristiphora erichsonii Htg.

No appreciable change in population levels of this insect was observed. Light infestations occurred on larch tamarack near Sioux Lookout in Drayton Township, in Corman and Cathcart townships east of Ignace, near Centrefire Lake west of Hudson, and at Bingo Lake north of Sioux Lookout.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt.

No appreciable change in population levels of this insect was noted. Although small numbers of infested buds were found at widely-separated points, counts were negative at many other locations. The highest number of damaged buds recurred near Ignace in Osaquan Township (Table 22).

TABLE 22

Summary of Counts of Terminal Buds Infested by the Spruce Bud
Gall Midge in the Sioux Lookout District 1963-1964

Location	No. of shoots examined in 50 branch tips	Per cent terminal buds infested	
		1963	1964
Osaquan	139	1.3	1.4
Highway 105	169	0	0.7

Bark Beetles,

In 1963 and 1964 a survey was undertaken to determine the species of bark beetles that occur on conifers in the district. Fifteen species were collected. Those occurring most commonly were Ips pini Say and Polygraphus rufipennis Kby. (Table 23).

TABLE 23

Summary of Bark Beetles Collected and Host Species Sampled
from the Sioux Lookout District 1963 and 1964

Bark beetle species collected	No. of beetles per host species					
	jP	wS	bS	wP	bF	eL
<u>Ips pini</u> Say	x	x	x	x		
<u>Polygraphus rufipennis</u> Kby.		x	x			x
<u>Orthotomicus caelatus</u>	x	x	x			
<u>Trypodendron lineatum</u>	x		x			
<u>Crypturgus borealis</u>		x				
<u>Dryocoetis affaber</u>	x					
<u>Dryocoetis autographus</u>	x					
<u>Gnathotrichus materiarius</u>	x					
<u>Hylurgops pinifex</u>	x					
<u>Ips chagnoni</u>	x					
<u>Ips perroti</u>	x					
<u>Ips perturbatus</u>		x				
<u>Pityogenes hopkinsi</u>				x		
<u>Pityogenes plagiatus</u>						
<u>Pityokteines sparsus</u>						x

Coniferous Tree Mortality Caused by Monochamus Feeding

These wood-borers reach extremely high levels following forest fires. Large fires occurred in the Sioux Lookout District in late 1961 resulting in an abundance of dead trees and brood material. In 1964 it became evident that enormous numbers of adult beetles must have emerged from this material in 1963. These beetles which were attracted to a recent cut attacked and killed living trees in the immediate vicinity by stripping their branches of bark.

Tree mortality resulted in the Great Lakes Pulp and Paper Company limits north of Ignace and in the Dryden Pulp and Paper Company limits west of Sioux Lookout. Mortality was confined to jack pine trees, one to eight inches in diameter along the periphery of the 1963 and 1964 cut. Killed trees were confined mainly to the immediate vicinity of the cut but branch mortality caused by feeding was in evidence over a broader area. Balsam fir, tamarack, and black spruce trees were also fed upon but to a much lighter degree than jack pine.

Weevil Distribution in Sioux Lookout District

Surveys to extend the known distribution of Pissodes affinis, Pissodes approximatus, Hylobius congener, and Hylobius pales were initiated in 1962. The distribution of three of the four weevils was extended somewhat in the district. Of the three species, only Pissodes affinis was found in the northern part of the district. Hylobius pales has not been recorded west of Sudbury District.

TABLE 24

Summary of Miscellaneous Insects Collected
in Sioux Lookout District

Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris logiana</i> Linn.	wB	Leaf roller populations low (2)
<i>Acrobasis betulella</i> Hlst.	wB	Populations increased slightly (5)
<i>Acronicta dactylina</i> Grt.	alder	Single larva found
<i>Acronicta fragilis</i> Gn.	d.B.	Found with miners
<i>Acronicta grisea</i> Wlk.	wB	Low populations
<i>Acronicta interrupta</i> Gn.	pCh	One larva found
<i>Adelges strobilobius</i> Kalt.	bS	Light along Highway 105
<i>Altica ambiens alni</i> Harr.	Al	Third year moderate Cloven Lake
<i>Anatis mali</i> (Say)	jP	Small numbers Division 19
<i>Anomogyna elimata</i> Gn.	jP	Six larvae taken from 15 trees
<i>Archippus albertus</i> McD.	bS	Low populations Wright Lake
<i>Arctia caja americana</i> Harr.	ground	One larva found
<i>Argyresthia laricella</i> Kft.	lT	Single collection Highway 105
<i>Autheraea polyphemus</i> Cram.	wB	More adults than larva observed
<i>Calligrapha ignota</i> Brown	wB	One adult in beating sample
<i>Choristoneura fumiferana</i> Clem.	bF, wS	Low numbers in Divisions 19, 25
<i>Choristoneura rosaceana</i> Harr.	wB	Found in beating sample
<i>Chrysomela laurentia</i> Brown	bPo	Low populations Otatakan Lake (2)
<i>Chrysomela falsa</i> Brown	bPo, W	Very scarce in district (2)
<i>Chrysomela mainensis mainensis</i> Bechyne.	Al	Moderate numbers Carling Lake
<i>Cimbex americana</i> Leach	wB	One larva in beating sample
<i>Conotrachelus nenuphar</i> Hbst.	rCh	Found feeding in swellings
<i>Creophilus villosus</i> (Grav.)	-	A scavenger found in buildings
<i>Croesus latitarsus</i> Nort.	wB	Single colonies at each point (3)
<i>Dasyneura balsamicola</i> (Lint.)	bF	Populations appeared higher than 1963 (5)
<i>Datana ministra</i> Dru.	wB	Single colony at each point (3)
<i>Dimorphopteryx pinguis</i> (Nort.)	wB	Low numbers at each point (2)
<i>Dioryctria abietivorella</i> Grt.	lT, bS, jP	Low numbers at each point. Also infests galls formed by rust (4)
<i>Drepana bilineata</i> Pack.	wB	Light scatterings of these
<i>Ectropis crepuscularia</i> Schiff.	bS	Found in beating sample
<i>Epinotia corylana</i> McD.	Al	Feeds in seed pods (2)
<i>Epinotia solandriana</i> Linn.	wB	Leaf rollers very scarce (2)
<i>Epinotia transmissana</i> Wlk.	d.B.	Found in the fruit
Eriocraniidae	wB	Low populations (3)
<i>Eupithecia albicapitata</i> Pack.	wS	Found in sampling of spruce
<i>Gracillaria cuculipennella</i> Hbn.	bA	Single shoot miner on 10 shrubs
<i>Griselda radicana</i> Wlsh.	wS	Three larvae in 20 mat samples
<i>Gypsonoma haimbachiana</i> Kft.	bPo	Shoot miners in low numbers
<i>Hemichroa crocea</i> (Four.)	Al	Low populations recurred (2)

TABLE 24, Sioux Lookout District

Insect	Host(s)	Remarks
<i>Hypagyrtis piniata</i> Pack.	bF	Found in beating samples (2)
<i>Ayperaspis binotata</i> Say	bF	One larva on mat
<i>Hyphantria cunea</i> Dru.	rCh	A few tents in Echo Tp.
<i>Ichthyura apicalis</i> Wlk.	tA	One larva Trout Lake
<i>Incisalia nippon clarki</i> Freem.	jP	Small jack pine trees heavily infested Norway Lake Rd. (3)
<i>Limenitis arthemis</i> Drn.	tA	One larva from 10 trees
<i>Lithocolletis betulivora</i> Wlsh. m.	wB	Single miner collected
<i>Meroptera pravella</i> Grt.	tA	Low numbers Trout Lake
<i>Mindarus abietinus</i> Koch.	bF	Cast skins in Dewan Tp.
<i>Nadata gibosa</i> A. & S.	wB	Low numbers at Frog Rapids
<i>Nematus</i> (L.Fs.)	bPo	Moderate-to-low populations at 2 points
<i>Nematus limbatus</i> Cress.	W	Single colony found
<i>Neodiprion abietis</i> complex	wS	Found east of Red Lake for first time in many years (2)
<i>Neodiprion maurus</i> Rohwer	jP	5,3,7 colonies on 10 trees at Dewan, Ilsley and Gordon tps. respectively (3)
<i>Neodiprion nanulus nanulus</i> Schedl.	jP	Two colonies Bigshell Lake
<i>Neodiprion nigroscutum</i> Midd.	jP	One colony near Ear Falls
<i>Nepytia canosaria</i> Wlk.	wS, bF	Increased numbers in 1964 (5)
<i>Neurotoma inconspicua</i> (Nort.)	rCh	Single colony at Norway Lake
<i>Nyctobia limitaria</i> Wlk.	bF	Found in beating mat samples
<i>Papilio glaucus</i> Linn.	W	One larva Webb Tp.
<i>Parorgyia plagiata</i> Wlk.	jP, wS	Single larva from each point (2)
<i>Pegohylemyia anthracina</i> Czerny.	bS	Damaged cones only (2)
<i>Petrova albicapitana</i> Busck.	jP	Recurring low numbers (3)
<i>Phratora purpurea purpurea</i> Brown	tA	Skeletonizers heavy Bruce's Point
<i>Phytomyza alpigenae</i> Hend.	Swampfly honeysuckle	3 pupae Div. 32
<i>Phytophaga piceae</i> Felt.	wS	One tree heavily infested in 1963 was moderately infested in 1964
<i>Pineus floccus</i> Patch.	bF	A few trees moderately infested
<i>Pineus similis</i> Gill.	wS	One collection in Jordon Tp.
<i>Pinipestis zimmermani</i> Grt.	jP	Found in slim swellings of regeneration jack pine
<i>Pleroneura borealis</i> Felt.	bF	Low populations (2)
<i>Pristiphora lena</i> Kincaid	wS	Occurred further west in 1964 than in previous years (2)
<i>Profenusa thomsonii</i> (Konow)	wB	Distribution records moved westward to Drayton Tp.
<i>Pyrrhia umbra</i> <i>experimens</i> Wlk.	W	Four larvae on one clump
<i>Sarothrips cinereana</i> N & D	bPo	One colony at Minnitaki Lake
<i>Sarothrips frigidana</i> (Wlk.)	W	Possible two generations as found from May 31 to July 22
<i>Schizura concinna</i> J. E. Smith	W	Single colony at Mileage 23 on 72
<i>Semiothisa granitata</i> Gn.	bF, bS, wS	Occurs in small numbers in beating samples (6)

TABLE 24, Sioux Lookout District

Insect	Host(s)	Remarks
Sphinx gordius Cram.	ground	One larva Vincent Lake
Tetrastichus strobilus Burks	bF	Light bud mining
Thecabius populimonilis (Riley)	bPo	Low gall insect numbers
Toumeyella numismaticum P. McD.	jP	A single branch infested Hanna Lake
Zeugophora sp.	bPo	One shrub infested Slate Lake

STATUS OF INSECTS IN THE KENORA DISTRICT

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G. G. Jackson

STATUS OF INSECTS

Black-headed Budworm, Acleris variana Fern.

Generally, infestations of this insect were light for the fourth consecutive year. One pocket of heavy infestation was recorded in a stand of black spruce on a large point in Kaoskauta Lake in Division 18. Shoreline white spruce trees were also heavily attacked and defoliation of both tree species approximated 50 per cent of the new growth. Small clumps of lightly infested trees were observed at Ord, Fluke and Upper Lawrence lakes, and in Aubrey, Docker, Melick and Wainwright townships. Small numbers of larvae were submitted from beating samples at numerous other points throughout the district.

Cherry Ugly-nest Caterpillar, Archips cerasivoranus (Fitch.)

Silken nests made by this caterpillar were generally fewer in number and more scattered than in 1963. Light defoliation occurred on numerous small clumps of willow and eastern choke-cherry shrubs at eight permanent sample points. Single colonies of this insect were observed at widely-scattered points in all divisions (Table 10).

TABLE 10

Summary of Cherry Ugly-nest Caterpillar Colony Counts at Eight Locations in the Kenora District from 1961 to 1964

Location (township)	No. of colonies per mile of roadside			
	1961	1962	1963	1964
Haycock	7	5	0	1
Jaffray	4	2	0	7
Mutrie	2	3	4	1
Pellatt	6	4	0	3
Forgie	5	5	4	1
Boys	2	9	7	2
McMeeken	3	1	2	0
Langton	7	4	5	1

Jack-pine Budworm, Choristoneura pinus Freem.

A noteworthy decrease in population levels of this budworm occurred in 1964. However, two areas of medium-to-heavy infestation persisted in the district totalling approximately 96 square miles. Within these areas considerable browning of jack pine foliage was observed. The larger of the two infestations was bounded by Atikwa and Rainmaker lakes on the west, Canal Bay (Atikwa Lake) and Tadpole Lake on the north and east, and Kapesakosi and Crispin lakes on the south. The smaller pocket of medium-to-heavy infestation occurred at Upper Lawrence Lake where high populations have been recorded since 1961 when a large area approximating 900 square miles was heavily infested. Small numbers of larvae were collected in beating samples at numerous other points throughout the district.

Aspen Leaf Beetle, Chrysomela crotchii Brown

In 1964, high population levels of this insect caused severe defoliation of trembling aspen stands. Major areas of infestation were recorded around Nestor

Falls, Sioux Narrows, Kenora, Minaki, MacIntosh, Dryden and in the Upper and Lower Manitou lakes area. Severe defoliation took place over a three month period owing to the occurrence of more than one brood. Pockets of light infestation were observed at Splitrock and Painted-Rock islands in the central and southeastern part of the Lake of the Woods. In areas outside of the heavy infestations, open-grown aspen along roadways and shorelines appeared most susceptible to attack by this gregarious feeder.

European Spruce Sawfly, Diprion hercyniae (Htg.)

A noticeable increase in population levels of this introduced sawfly has occurred since it was first recorded in the Kenora District in 1961. Of the three locations sampled, larvae were most numerous at Sunshine Lake in Division 18 where white spruce trees were lightly infested (Table 11).

TABLE 11

Summary of European Spruce Sawfly Larval Counts made on White Spruce in the Kenora District in 1964

Location	Av. d.b.h. in inches	Av. no. of larvae per 15-mat sample
Sunshine Lake	3	2.8
Bruin Lake	4	1.9
Docker Tp.	3	1.4

White-pine Shoot Borer, Eucosma gloriola Heinr.

This insect was collected each year since 1960 but in no instance did the proportion of trees attacked approach the percentage found in 1964. Four pockets of light infestation were recorded in jack pine plantations in Smellie, Langton and Willingdon townships and near Canoe Narrows in Eagle Lake. Individual trees were attacked at numerous other widely-separated points in the district (Table 12).

TABLE 12

Summary of Terminal and Lateral Shoot Damage by the White Pine Shoot Borer at each Point in the Kenora District in 1964

Location	Av. d.b.h. in inches	No. of trees sampled	No. of trees infested	No. of shoots attacked	
				Leaders	Laterals
Willingdon Tp.	3	50	7	13	9
Smellie Tp.	2	100	27	18	11
Langton Tp.	3	50	21	9	14
Eagle Lake (Canoe Narrows)	3	100	42	41	19

Fall Webworm, Hyphantria cunea (Drury)

In 1964, a sharp decline in population levels occurred in the district as a whole (Table 13). One small pocket of heavy infestation was observed at Bay Island in central Lake of the Woods, where 139 colonies were observed in a square chain plot compared with 21 colonies at the same location in 1963. Fewer colonies were observed throughout the district than in 1963.

TABLE 13

Summary of Fall Webworm Colony Counts at Eleven Locations
in the Kenora District from 1961 to 1964

Location	Number of colonies per mile of roadside			
	1961	1962	1963	1964
MacNicol Tp.	6	4	14	3
Tustin Tp.	5	4	0	0
Colenso Tp.	3	2	6	1
Langton (1)	7	8	8	0
Langton (2)	4	1	8	2
Pellatt Tp.	2	1	4	0
Baller Tp.	8	7	9	0
Tweedsmuir Tp.	3	5	32	7
Mutrie Tp.	3	1	5	1
Canyon Lake	-	3	7	2
Zizania Lake	-	-	-	2

Western Tent Caterpillar, Malacosoma pluviale Dyar

Numbers increased for the fourth consecutive year. Colony counts per mile of roadside increased over 1963 at all 14 sample stations (Table 14).

The factors involved in keeping western tent caterpillar populations at a low level are not well known. However, it is clear from the tabular results that these factors have been very ineffective over the past few years. Open-grown cherry and willow shrubs were most frequently attacked although white birch and striped alder were also infested at several locations.

TABLE 14

Summary of Western Tent Caterpillar Colony Counts at Fourteen Locations in the Kenora District from 1962 to 1964

Location	Host(s)	Number of colonies per mile of roadside		
		1962	1963	1964
Camp Robinson Road	pCh, Al	28	34	63
MacNicol Tp.	pCh	8	43	44
Ewart Tp.	pCh	0	19	27
Mutrie Tp.	pCh, W	2	14	29
Docker Tp.	pCh, wB	4	9	16
Desmond Tp.	pCh, Al	5	11	19
Work Tp.	W, pCh	6	13	18
Willingdon Tp.	pCh, W	9	2	26
Lemay Tp.	pCh, wB	3	16	20
McMeeken Tp.	Al, W	6	8	23
Godson Tp.	Al, wB	1	6	17
Jaffray Tp. (Jones Road)	Al, W	4	17	22
Forgie Tp.	pCh	7	21	22
Melick Tp.	pCh, W	9	10	32

Balsam-fir Sawfly, Neodiprion abietis complex

Numbers of this sawfly decreased sharply in 1964. Defoliation of balsam-fir trees was very light at all locations sampled. The heavy infestation recorded at Shoal Lake in 1963 declined to light intensity in 1964. Scattered colonies were observed at three other widely-separated points in the district.

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl.

Colony counts increased slightly at sample points over 1963. Although no areas of heavy infestation were observed, as high as 12 colonies were counted on jack pine regeneration at several locations. Light infestations occurred at five permanent sample points (Table 15).

TABLE 15

Summary of Red Pine Sawfly Larval Colony Counts on Ten Trees at each of Five Locations in the Kenora District in 1964

Location (township)	Av. d.b.h. in inches	Av. no. of colonies per tree
Upper Lawrence Lake	3	0.6
Nestor Falls	4	0.8
Colenso Tp.	2	1.1
Docker Tp.	3	1.2
Tustin Tp.	3	0.1

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

A noticeable increase in the number of colonies was apparent in 1964. Colony counts made at 11 sampling stations are shown in Table 16.

Several hundred cocoons were exposed at two locations in the district to determine the species of cocoon parasites present. Results obtained disclosed the presence of an introduced parasite, Pleolophus basizonus (Grav.), which was released against the larch sawfly at Hawk Lake in 1940. The recovery point was near Wabigoon, a distance of approximately 70 miles from its point of release. Surveys will be carried out in 1965 to further define the distribution of this parasite.

TABLE 16

Summary of Red-headed Jack-pine Sawfly Larval Colony Counts
on Ten Trees at each Location in the Kenora District
in 1964

Location	Host	Av. no. of colonies per tree
Miles Bay (L. of W.)	jP	0.3
Redvers Tp.	jP	0.1
MacNicol Tp.	jP	1.6
Kirkup Tp.	jP	0.9
Van Horne Tp.	jP	3.3
Work Tp.	jP	0.8
Docker Tp.	jP	0.9
Wabigoon Tp.	jP	0.4
Rugby Tp.	jP	2.6
Tustin Tp.	jP	0.8
Mutrie Tp.	jP	1.4

White Pine Weevil, Pissodes strobi Peck.

The number of weevilled leaders of white and jack pine trees increased noticeably in 1964. Medium infestations occurred in Van Horne, Redvers and Colenso townships, and at Wabigoon Bridge in Division 18. Open-grown white spruce trees were also attacked, usually individual trees at widely-separated points throughout the district (Table 17).

TABLE 17

Summary of Leader Damage by the White Pine Weevil at Eight Points in the Kenora District from 1962 to 1964

Location (Township)	Host	No. of trees examined			Per cent of trees weevilled		
		1962	1963	1964	1962	1963	1964
Van Horn Tp.	wP	100	100	100	11	10	18
Redditt Tp. (1)	wP	50	50	50	3	4	7
Redditt Tp. (2)	jP	50	50	50	2	2	7
Willingdon Tp.	jP	100	100	100	3	5	9
Colenso Tp.	jP	-	100	100	-	14	17
Wabigoon Bridge	jP	-	100	100	-	-	14
Redvers Tp. (1)	wP	-	-	50	-	-	3
Redvers Tp. (2)	jP	-	-	50	-	-	6

Larch Sawfly, Pristiphora erichsonii Htg.

Population levels of larch sawfly have decreased considerably since the major outbreak in 1948-1952. However, in 1964 a noteworthy increase was observed at several locations. One pocket of heavy infestation occurred in Willingdon Township where trees were approximately 70 per cent defoliated. Pockets of light and moderate defoliation were observed at eight locations in Division 20.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt.

Low population levels of this insect occurred in the district for the second consecutive year. Small numbers of infested buds were observed in Ewart, Forgie, Redditt, MacNicol and Buller townships and at Rowdey Lake in the northern part of Division 20 (Table 18).

TABLE 18

Summary of Counts of Terminal Buds Infested by the Spruce Bud Gall Midge at Five Locations in the Kenora District from 1962 to 1964

Location (township)	Tree species	No. of shoots examined			Per cent of terminal buds infested		
		1962	1963	1964	1962	1963	1964
Ewart	wS	151	139	160	0.0	0.1	0.1
Redditt	bS	156	134	153	2.6	1.8	2.0
Forgie	bS	149	138	142	0.7	1.1	0.8
MacNicol	bS	151	147	161	1.9	2.1	1.6
Buller	wS	146	151	139	2.1	0.0	1.1

TABLE 19

Summary of Miscellaneous Insects Collected
in Kenora District

Note: Number of collections is given inside bracket for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Abbottana clemetaria</i> A. & S.	wB	Low numbers observed at L & F Tree Nursery near Dryden (2)
<i>Acleris logiana</i> Linn.	wB	Endemic population levels at Entwine and Manomin lakes (2)
<i>Acrobasis betulella</i> Hlst.	wB	Light infestation at several points in all divisions (6)
<i>Acronicta americana</i> Harr.	wB	Low numbers (4)
<i>Acronicta dactylina</i> Grt.	W	Common on roadside shrubs (8)
<i>Acronicta fragilis</i> Gn.	Al	Single clump of lightly infested trees at Eye Lake
<i>Acronicta grisea</i> Wlk.	W	Collected at two locations (2)
<i>Altica populi</i> Brown	bPo	Very light in 1964 (3)
<i>Amauronematus fallax</i> (Lep.)	wB	Moderate numbers observed in Redvers Township
<i>Ancylis mediofasciana</i> Clem.	pCh	Submitted from Mac Lake on Highway 72
<i>Anomogyna elimata</i> Gn.	jP	Occurs throughout district (6)
<i>Archippus strianus</i> Fern.	bF	Low numbers collected at Bowden Lake, Division 18
<i>Arctia caja</i> L.	Do, lilac wild rose	Occurs commonly throughout district
<i>Argyrotaenia quadrifasciana</i> Fern.	pCh	Low numbers near Stewart Lake in Division 21
<i>Biston cognataria</i> Gn.	W	Present in low numbers (5)
<i>Campea perlata</i> Gn.	W	Small numbers observed at widely-separated points (3)
<i>Cecidomyia reeksi</i> Vock.	jP	Midge damage common at numerous points (8)
<i>Cephalcia fascipennis</i> Roh.	jP	This pamphiliidae observed in high numbers in Willingdon Township
<i>Chlorochroa uhleri</i> Say	jP	Predators common where collected (3)
<i>Choristoneura conflictana</i> Wlk.	tA	Leaf rollers numerous (2)
<i>Choristoneura fumiferana</i> (Clem.)	wS	Low numbers of spruce bud-worm obtained in beating samples (3)
<i>Choristoneura rosaceana</i> Harr.	aMo	Small numbers of larvae on trees examined
<i>Chrysomela mainensis mainensis</i> Bechyne	Al	Collected at Sabaskong Bay, Lake of the Woods
<i>Coleophora</i> sp.	wB	This casebearer most common from Kenora west to the Manitoba-Ontario provincial boundary (8)
<i>Croesus latitarsus</i> Nort.	wB	Sawfly larvae collected along the Gordon Lake Road

TABLE 19, Kenora District

Insect	Host(s)	Remarks
<i>Crypturgus borealis</i> Sw.	bS	Light attack by this beetle near Nathalie Lake, Minaki Division (2)
<i>Dasyneura balsamicola</i> (Lint.)	bF	This gall-forming insect was common throughout the district (6)
<i>Deuteronomos magnarius</i> Gn.	wB	Low numbers at Entwine Lake
<i>Dioryctria abietivorella</i> Grt.	bS	Spruce cones moderately infested at two locations (2)
<i>Disonycha alternata</i> Ill.	W	Leaf beetles common on shrubs at L & F Nursery near Dryden
<i>Epinotia lindana</i> Fern	Do	Submitted from two locations (2)
<i>Epinotia solandriana</i> Linn.	wB	Small numbers found (4)
<i>Epixeusis aemula</i> Hbn.	wS	Low populations along Red Lake Highway
<i>Eriophyes abnormis</i> Garm.	Ba	Leaf gall common on ornamental trees in Dryden area (2)
<i>Eriosoma americana</i> (Riley)	wE	Young elm trees adjacent to North Narrow Lake heavily infested
<i>Eudelinia herminiata</i> Gn.	Do	Light infestation on shoreline trees at Sunshine Lake
<i>Eupithecia filmata</i> Pears.	bS, wS	Collected at Upper Lawrence and Fluke lakes (2)
<i>Feralia jocosa</i> Gn.	wS	Small numbers submitted from widely-separated points (4)
<i>Galerucella calvicollis</i> Lec.	pCh	Observed in Docker and Bridges townships (2)
<i>Galerucella decora</i> Say	W	Low populations of this leaf beetle (4)
<i>Gonioctena americana</i> (Schaeff.)	tA	Leaf beetles common on aspen regeneration (3)
<i>Gracillaria cuculipennella</i> Hbn.	bAs	Low numbers at Segise Lake
<i>Gracillaria invariabilis</i> Braun.	pCh	Collected from roadside trees near Cedar Lake Field Station
<i>Griselda radicana</i> Wlsh.	bS, wS	Light infestations (3)
<i>Halisidota maculata</i> Harr.	Al, wB	Small numbers observed (3)
<i>Hemichroa crocea</i> (Four.)	Al	A slight decrease in population levels occurred in 1964 (14)
<i>Herculia thymatusales</i> Wlk.	bS	Coneworm common near Stewart Lake in Bridges Township (2)
<i>Holcocera immaculata</i> McD	jP	Collected in small numbers at Manomin Lake in Division 21
<i>Hypagyrtis piniata</i> Pack.	bF	Small numbers only (3)
<i>Incisalia nippon clarki</i> Freem.	jP	Most common on jack pine regeneration (4)
<i>Lambdina fiscellaria fiscellaria</i> Gn.	bF	Low numbers (4)

TABLE 19, Kenora District

Insect	Host(s)	Remarks
<i>Lepyrus palustris</i> Scop.	W	Single large weevil adult collected at Akin Lake in Rowell Township
<i>Lithocolletis salicifoliella</i> Chamb.	tA	Low numbers probably due to severe defoliation by the forest tent caterpillar (6)
<i>Meroptera pravella</i> Grt.	bPo, tA	Light infestation at each location (2)
<i>Monoctenus juniperinus</i> MacG.	eC	Collected at Wapageisi Lake
<i>Nematus erythrogaster</i> Nort.	Al	Sawfly larvae caused light defoliation at two widely-separated points (2)
<i>Nematus</i> sp.	bPo	Small pocket of heavy infestation of leaf-mining sawfly at MacIntosh (3)
<i>Nemoria mimosaria</i> Gn.	W	Common on roadside willow shrubs (7)
<i>Neodiprion compar</i> (Leach)	jP	First records of this insect in the Kenora District in 1964
<i>Neodiprion maurus</i> Roh.	jP	Clumps of light infestation at each point (3)
<i>Neodiprion swaini</i> Midd.	jP	Light defoliation of shoreline trees in Sabaskong Bay, Lake of the Woods (2)
<i>Nepytia canosaria</i> Wlk.	eC, bF, jP	Found in small numbers throughout the district (4)
<i>Neurotoam inconspicua</i> (Nort.)	pCh	Two colonies of this insect collected near Splitrock Narrows in Lake of the Woods
<i>Nyctobia limitaria</i> Wlk.	bF	Small numbers at widely-separated points (3)
<i>Nymphalis antiopa</i> Linn.	bPo, W, wB	One pocket of medium infestation, two clumps of light infestation (3)
<i>Oligonychus ununguis</i> (Jac.)	bF, jP	High population levels of this mite were recorded at Big Canyon Lake and along the Blue Lake Road (2)
<i>Oneida lunulalis</i> Hlst.	bO	Moderately infested trees at Clytie Bay in Shoal Lake and at Earngy Lake on Highway 17 (2)
<i>Orthosia revicta</i> Morr.	bF	Needle galls common on trees examined (2)
<i>Papilio glaucus</i> Linn.	wB	Light infestation at North Narrow Lake
<i>Parorgyia plagiata</i> Wlk.	wS, jP	Common at balsam-fir sample plots (4)
<i>Periclista albicollis</i> (Nort.)	bO	Two pockets of heavy infestation at each location

TABLE 19, Kenora District

Insect	Host(s)	Remarks
<i>Petrova albicapitana</i> Busck.	jP	Low numbers throughout the district (8)
<i>Peridroma margaritosa</i> (Haw.)	wS, bS	Heavy infestation of this cutworm caused severe damage in numerous spruce seedbeds at the L & F Nursery in Dryden
<i>Phalonia rutilana</i> Hbn.	juniper	Two pockets of medium infestation in Sabaskong Bay and near Splitrock Narrows in Lake of the Woods (2)
<i>Phylloconistis populiella</i> Chamb.	bPo	Noticeable damage at each location (4)
<i>Pikonema alaskensis</i> Roh.	wS, bS	Open-grown host trees moderately defoliated at several locations (14)
<i>Pikonema dimmockii</i> (Cress.)	wS, bS	Generally low population levels throughout the district (8)
<i>Pissodes dubius</i> Rand.	bF	Collected from decadent trees near Ontario-Manitoba border
<i>Pityogenes plagiatus</i> (Lec.)	jP, rP	Bark beetles common throughout district (4)
<i>Pityokteines sparsus</i> Lec.	bF	Decadent trees moderately attacked (4)
<i>Podapion gallicola</i> Riley	rP	Four trees attacked at Sabaskong Point in Lake of the Woods
<i>Pristiphora lena</i> Kincaid	bS	Single larva collected at Kapesakosi Lake. First district record
<i>Profenusa lucifex</i> (Ross)	bO	First record of this insect in the Kenora District (2)
<i>Profenusa thomsonii</i> (Konow)	wB	Collected in small numbers at Entwine Lake in Division 18
<i>Psilocorsis quercicella</i> Clem.	bO	Leaf miners abundant on trees sampled
<i>Raphia frater</i> Grt.	ltA	Common on understory trees (2)
<i>Recurvaria thujella</i> Kft.	eC	Small numbers observed
<i>Saperda moesta</i> Lec.	bPo	Shoot borers common on regeneration (3)
<i>Sarrothripus cinerea</i> N.D.	bPo	Common throughout district (3)
<i>Sarrothripus frigidana</i> Wlk.	bPo, W	Single clump of light infestation, endemic numbers elsewhere (3)
<i>Scoliopteryx libatrix</i> Linn.	W	Collected in Smellie Township
<i>Sphinx gordius</i> Cram.	tL, wB	Single larva collected from each point (2)
<i>Stenocorus inquisitor</i> Linn.	wB	Moderate numbers in Redvers Township

TABLE 19, Kenora District

Insect	Host(s)	Remarks
<i>Stenoma algidella</i> Wlk.	tA, pCh	Low population levels of leaf tiers (2)
<i>Tetralopha aplastella</i> Clem.	tA, bPo	Common in areas heavily infested by the forest tent caterpillar (7)
<i>Tetralopha expandens</i> Wlk.	bO	First district records (2)
<i>Tetralopha vacciniivora</i> Munroe	blueberry	Low numbers collected on Eagle Lake
<i>Toumeyella numismaticum</i> P. & McD.	jP	Jack pine regeneration lightly infested at three points (3)
<i>Trichiosoma triangulum</i> Kby.	W, wB	Common on trees examined (6)
<i>Xanthothes forticorne</i> (O. & S.)	bO	Wide distribution (7)
<i>Sylotrechus amosus</i> (Say)	bPo	Single tree heavily attacked
<i>Zale duplicata largera</i> Sm.	jP	In low numbers near Wabigoon River on Jones Road (2)

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Red-pine Sawfly.....	<u>Neodiprion nanulus nanulus</u> Schedl. G 43
Swaine Jack-pine Sawfly.....	<u>Neodiprion swainei</u> (Midd.)..... G 44
Red-headed Jack-pine Sawfly.....	<u>Neodiprion virginianus</u> complex.. G 44
Yellow-headed Spruce Sawfly.....	<u>Pikonema alaskensis</u> (Roh.)..... G 45
White-pine Weevil.....	<u>Pissodes strobi</u> (Peck) .. G 45
Larch Sawfly.....	<u>Pristiphora erichsonii</u> (Htg.)... G 46
A Leaf Miner on Birch.....	<u>Profenusa thomsoni</u> (Konow)..... G 46
Spruce Bud Gall Midge.....	<u>Rhabdophaga swainei</u> Felt. G 46
Summary of Miscellaneous Insects Collected.....	G 47

M. J. Thomson

STATUS OF INSECTS

Spruce Budworm, Choristoneura fumiferana Clem.

Waning spruce budworm populations showed further declines in 1964. A light infestation was observed on the shores of Saganaga Lake, in the southeast corner of Division 38.

Examination of balsam-fir foliage at nine sample points within the area where light defoliation was recorded the previous year revealed that the degree of defoliation was less at six points and remained about the same at Mack, Joice and Calm lakes. Values given in (Table 10) verify the low level to which budworm populations have declined in the district.

TABLE 10

Summary of Defoliation of Balsam-fir by the Spruce Budworm
in Fort Frances District from 1961 to 1964

Location	Per cent defoliation			
	1961	1962	1963	1964
Mack Lake	99	16	3	3
Cache Bay, Saganaga Lake	87	26	9	7
French Lake	33	12	4	3
Namakan Lake	63	6	3	2
Sturgeon Narrows, Sturgeon Lake	57	15	2	0
Joice Lake	40	44	2	2
Calm Lake	2	4	2	2
Lac La Croix	14	5	6	2
Beaverhouse Lake	23	26	4	2

Based on egg mass sampling, endemic populations can be expected in 1965. No egg masses were found at nine sequential sampling points. The decline of infestation as depicted by declining numbers of egg masses since 1961 is shown in (Table 11).

TABLE 11

Summary of Spruce Budworm Egg Mass Counts in Fort Frances
District from 1961 to 1964

Location	Av. no. of egg masses per 100 sq. ft. of foliage				Infestation rating in 1964
	1961	1962	1963	1964	
Mack Lake	863	96	0	0	Trace
Cache Bay, Saganaga Lake	265	867	256	0	Light
French Lake	567	197	0	0	Trace
Namakan Lake	155	-	0	0	Trace
Sturgeon Narrows, Sturgeon Lake	220	33	0	0	Trace
Joice Lake	302	200	0	0	Trace
Calm Lake	38	24	0	0	Trace
Lac La Croix	76	25	33	0	Trace
Beaverhouse Lake	77	232	0	0	Trace

Mortality of balsam-fir as a direct result of defoliation by the spruce budworm continued in Quetico Park in 1964, but as indicated from the values obtained at two mortality plots, volume losses declined when compared with three previous years (Table 12).

TABLE 12

Summary of Balsam-fir Mortality Caused by the Spruce Budworm
in Fort Frances District, 1961 to 1964

Location	Size of plot in acres	Cumulative per cent mortality by volume				Per cent increase in mortality by volume in 1964
		1961	1962	1963	1964	
Sturgeon Narrows						
Sturgeon Lake	.20	23.2	46.3	58.1	66.3	8.2
Cache Bay, Saganaga Lake	.20	11.1	36.4	68.0	75.5	7.4

Larch Casebearer, Coleophora laricella Hbn.

Populations of this casebearer remained at low levels. However, for the third consecutive year, an extension of distribution was recorded when larvae were collected for the first time in Dilke Township. This collection represented a westward spread of about four miles compared with 1963.

Quantitative sampling points were established at four locations in the western part of the district to assess population trends (Table 13)

TABLE 13

Summary of Larch Casebearer Larval Counts in Fort Frances
District in 1964

Note: Counts are based on the examination of sixteen 18-inch branch tips, four from each of four larch trees at each point.

Location (township)	Av. d.b.h. in inches	Av. no. of larvae per 18-inch branch tip
Potto	2	1.0
Miscampbell	1	0.2
McIrvine	3	0.6
Dobie	5	0.1

Although this is a minute insect it is capable of causing considerable damage as well as mortality in larch stands after two years of heavy infestation (photograph).

European Spruce Sawfly, Diprion hercyniae (Htg.)

Populations of this introduced sawfly have remained at a low level since it was first recorded near Basswood Lake in 1949. The insect was found most commonly in Division 22. However, in 1963, larvae were collected from spruce trees at Kahshahpiwi Lake in the southeastern part of the district and at numerous points in Division 38 in 1964, indicating that an easterly and northeasterly spread is occurring. Highest numbers were found at Roscoe Lake in the northeastern part of Division 22 in 1964 (Table 14).

TABLE 14

Summary of European Spruce Sawfly Larval Counts in
Fort Frances District in 1964

Note: Counts are based on examination of 20 sampling trays, four from each of five trees at each point.

Location	Tree species	Av. d.b.h. in inches	Av. no. of larvae per sample tray
Morley Tp.	bS	3	0.4
Watten Tp.	wS	6	0.5
Roscoe Lake	wS	4	3.0
Poohbah Lake	bS	4	0.3

White-pine Shoot Borer, Eucosma gloriola Heinr.

The incidence of attack by this insect increased in 1964. A heavy infestation occurred in a stand of jack pine regeneration in Morson Township where a quantitative sample on 100 trees showed that a total of 152 shoots were killed, 41 being terminal shoots and 111 laterals. Light infestations were observed on jack pine regeneration in Mather Township and near Williamson Lake north of Atikokan in divisions 22 and 38 respectively. Damage of terminal shoots causes severe deformation of host trees (photograph).

Balsam-fir Sawfly, Neodiprion abietis complex

The incidence of this sawfly declined markedly in 1964. Light infestations being confined to single pockets in Shenstone and Devlin townships compared with numerous pockets and clumps of infestation in 10 townships in 1963. Larval colony counts which were made on 10 balsam-fir trees in each township averaged 0.3 per tree. Small numbers of larvae were found in beating samples from white spruce trees at four widely-scattered points elsewhere in the district.

Red-pine Sawfly, Neodiprion nanulus nanulus Schedl.

Although only small numbers of larval colonies were found at collection points, a slight increase in numbers was observed at widely-scattered points in divisions 22 and 38. Quantitative sampling at four points showed that colonies were present on about one-half of the trees examined (Table 15).

TABLE 15

Summary of Red-pine Sawfly Colony Counts at Four Points
in the Fort Frances District in 1964

Location	Tree species	No. of trees sampled	Av. d.b.h. in inches	No. of trees infested	Av. no. of colonies per tree
Basswood Lake	rP	5	1	1	0.4
Lac La Croix	rP	10	10	4	1.5
Winkle Lake	rP	10	6	4	0.9
Russell Lake	rP	10	5	6	0.8

Swaine Jack-pine Sawfly, Neodiprion swainei (Midd.)

The Heavy infestation of this important sawfly reported for two consecutive years on a small island in Rocky Islet Bay, Rainy Lake, declined to light to moderate intensity in 1964. Some tree mortality occurred on this island as predicted in 1963. Although a decrease in the population level occurred at the above location, a marked increase in numbers of the insect was observed as far east as Bad Vermilion Lake and at scattered points on lakeshores to the northwest between Rainy Lake and Lake of the Woods. Quantitative sampling points were established at three locations to determine population trends in future years (Table 16).

TABLE 16

Summary of Swaine Jack-pine Sawfly Colony Counts
in the Fort Frances District in 1964

Note: Counts are based on examination of ten jack-pine trees at each point.

Location	Av. d.b.h. in inches	Av. no. of colonies per tree
Jackfish Lake	6	0.2
Footprint Lake	6	0.3
Bad Vermilion Lake	4	0.3

Repeated heavy defoliation by this gregarious feeder can cause extensive tree mortality in jack pine stands in all age classes (see photograph).

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Although this jack pine defoliator was more widely distributed in 1964, fewer larval colonies were observed at sample locations (Table 17). In one plantation east of Atikokan a marked increase in numbers was recorded.

TABLE 17

Summary of Red-headed Jack-pine Sawfly Colony Counts
in the Fort Frances District, 1961 to 1964

Location	No. of trees sampled	Av. d.b.h. in inches	Av. no. of colonies per tree			
			1961	1962	1963	1964
Richardson Tp.	5	5	0.2	4.0	9.4	1.4
Dobie Tp.	10	3	0.2	0.2	2.1	0.4
Claxton Tp.	10	3	3.6	3.5	1.1	0.3
Potts Tp.	10	4	-	-	4.2	3.1
Manitou Sound						
Rainy Lake	10	2	-	-	-	0.7
Niobe Lake	10	2	-	-	-	0.5
Kaiarskons Lake	10	1	-	-	-	0.3

Examination of jack pine trees in a mixed jack and red pine plantation at the entrance to Quetico Provincial Park from Highway 11 revealed that 96 per cent of the trees were attacked and that defoliation in some instances was nearly 100 per cent. Mid-instar larvae migrated from denuded trees causing considerable defoliation of trees that had not been initially infested.

Chemical control measures were carried out by Department of Lands and Forests personnel using 25 per cent emulsifiable D.D.T. applied with a fog sprayer. No larval colonies were found five days after the spraying operation indicating that the control operation was successful.

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

No appreciable change in population levels occurred in 1964. Small numbers of white spruce trees were heavily infested for the second consecutive year at a point on the shoreline of Basswood Lake. Light infestations were observed on shoreline and clumps of open-grown spruce trees at six points elsewhere in Division 38, and at 17 points in Division 22. Approximately 50 per cent of the new foliage was destroyed on the heavily infested trees at Basswood Lake but defoliation was less than 10 per cent elsewhere in the district.

White-pine Weevil, Pissodes strobi (Peck)

White-pine weevil damage tended to be more widespread in 1964 but little overall change in numbers could be detected. Damaged trees were more commonly observed than in the three previous years. Sampling results are summarized in (Table 18).

TABLE 18

Summary of Leader Mortality by the White-pine Weevil at Four
Points in Fort Frances District, 1963 and 1964

Note: Counts are based on examination of 100 trees at each point

Location	Tree species	Av. d.b.h. in inches	Per cent of leaders killed	
			1963	1964
Morson Tp.	jP	1	6	6
Miscampbell Tp.	wP	1	4	8
Williamson Lake	jP	2	-	9
Pickerel River at Highway 11	jP	1	-	5

Larch Sawfly, Pristiphora erichsonii (Htg.)

Although population levels of this sawfly remained at a low ebb, an increase in incidence occurred in 1964. Colonies were found commonly on open-grown and fringe trees on high sites but in no case did defoliation exceed ten per cent.

A Leaf Miner on Birch, Profenusa thomsoni (Konow)

The light infestation reported at Roscoe Lake in 1962 and 1963 virtually subsided in 1964. Mined leaves were confined to small shoreline and understory trees. Small numbers were observed on regeneration white birch trees at Pickerel, Bullmoose and Marmion lakes.

Spruce Bud Gall Midge, Rhabdophaga swaini Felt

No appreciable change in population levels of this midge occurred in 1964. Only small numbers of damaged buds were found at sample points and at numerous locations elsewhere in the district (Table 19). Larval parasites were recovered from two of four samples submitted to the Forest Insect Laboratory.

TABLE 19

Summary of Counts of Terminal Buds Infested by the Spruce Bud
Gall Midge in Fort Frances District, 1961 to 1964

Note: Counts are based on examination of 50 branch tips, five from each of ten trees at each location.

Location	Tree species	Av. d.b.h. in inches	No. of buds examined in 1964	Per cent of buds infested			
				1961	1962	1963	1964
Sifton Tp.	wS	3	163	4.0	0.0	0.0	0.6
Claxton Tp.	wS	3	171	1.3	0.0	2.5	6.4
Aramis Lake	bS	1	144	2.7	0.0	1.8	0.0
Factor Lake	wS	4	139	2.3	0.0	0.0	1.4
Highway 11 at east district boundary	bS	1	151	2.3	2.70	1.3	0.0

TABLE 20

Summary of Miscellaneous Insects Collected
in Fort Frances District

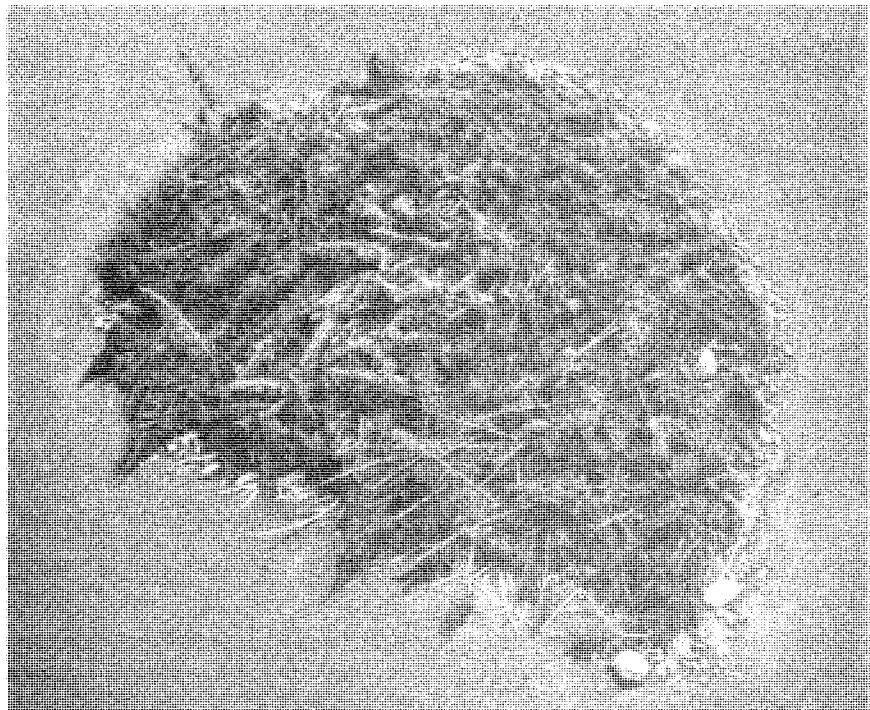
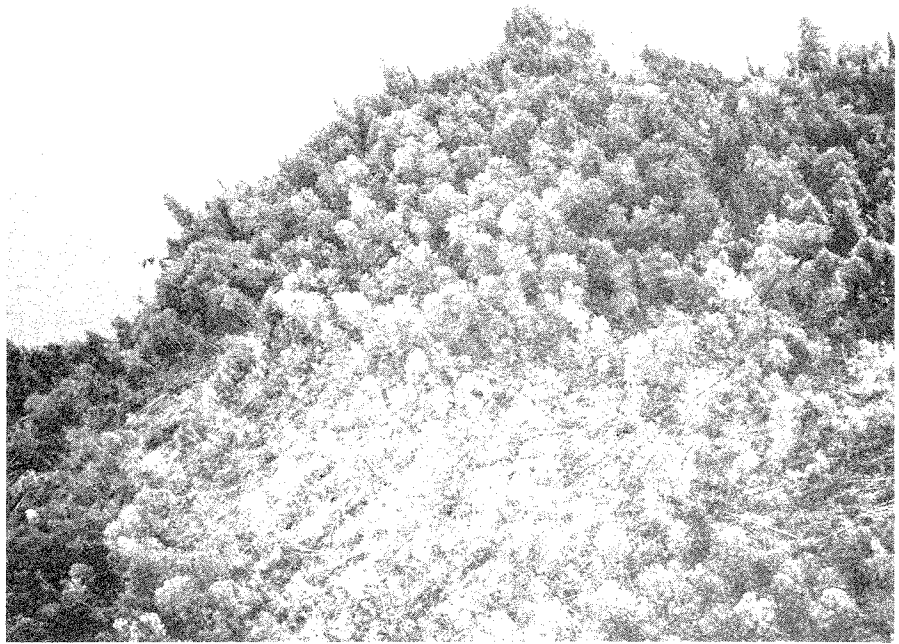
Note: Number of collections is given inside brackets for those insects collected more than once.

Insect	Host(s)	Remarks
<i>Acleris logiana</i> Linn.	wB	A total of eight larvae collected at four points (4)
<i>Acleris variana</i> Fern.	wS, bF	Small numbers at three widely scattered points (3)
<i>Acrobasis betulella</i> Hlst.	wB	Collected on lakeshore trees at each point (4)
<i>Acrobasis rubrifraciella</i> Pack.	Al	Small numbers at two points in Division 22 (2)
<i>Acronicta dactylina</i> Grt.	W	Collected at Eye Lake in Division 38
<i>Acronicta retardata</i> Wlk.	mM	Small numbers at Burt Lake
<i>Altica corni</i> Woods	Do	Low population at Russell Lake
<i>Anomogyna elimata</i> Gn.	bF	One larva collected
<i>Archips cerasivoranus</i> (Fitch)	cCh	Light infestations near Off Lake and in Dance Township
<i>Archippus packardianus</i> Fern.	bF	Small numbers in Potts Township
<i>Argyresthia laricella</i> Kft.	Lt	Pupae found in Dilke Township
<i>Argyresthia pygmaeola</i> Hbn.	W	One larva found
<i>Argyrotaenia quadrifasciana</i> Fern.	Haw	Heavy infestation at one point in Carpenter Township
<i>Choristoneura rosaceana</i> Harr.	Al, Ha	Small numbers at two points in Division 38
<i>Chrysomela crotchi</i> Brown	tA	Light to medium infestations in north part of Division 22, small numbers elsewhere (3)
<i>Chrysomela mainensis mainensis</i> Bechyne	Al	Small numbers on lakeshore trees at each point (5)
<i>Dasyneura balsamicola</i> (Lint.)	bF	Low population in Claxton and Mather townships (2)
<i>Dioryctria abietivorella</i> Grt.	jP	Small numbers on regeneration trees in Morson Township
<i>Dioryctria reniculella</i> Grt.	wS	Small numbers at Clearwater West Lake
<i>Ectropis crepuscularia</i> Schiff.	bF	Collected at one point in Potts Township
<i>Epinotia lindana</i> Fern.	Do	Small numbers on shoreline of Rainy Lake
<i>Epinotia solandriana</i> Linn.	wB	Collected on shoreline trees at two points in Division 38
<i>Epizeuxis aemula</i> Hbn.	wS	Rare insect, first record west of Sault Ste. Marie District
<i>Feralia jocosus</i> Gn.	bS, wS	Small numbers at each point (3)
<i>Hemichroa crocea</i> (Four.)	Al	Lightly infested clumps of trees at Pipestone Lake
<i>Hylobius congener</i> D.T.	jP	Rare in district
<i>Hylobius piceus</i> DeG.	bF	One adult collected
<i>Hyphantria cunea</i> Dru.	Al, wE	More common than in previous year (5)

TABLE 20, Fort Frances District

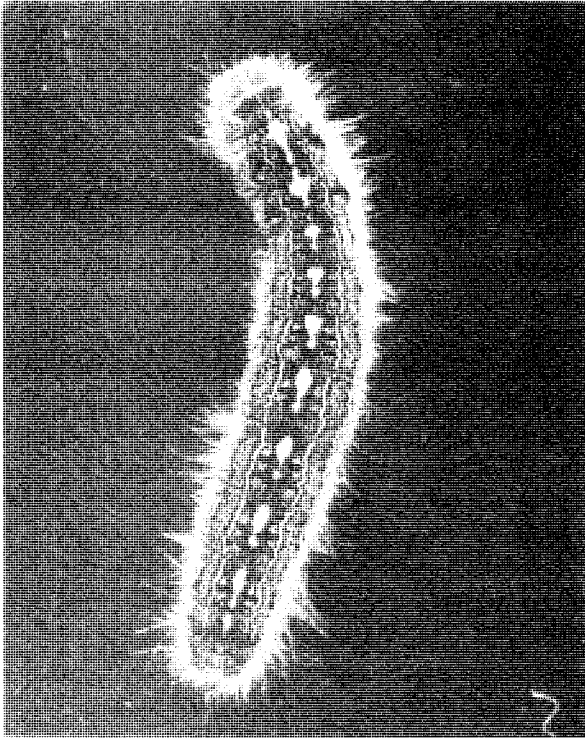
Insect	Host(s)	Remarks
<i>Lambdina fiscellaria fiscellaria</i> (Gn.)	eC	Small numbers collected in Miscampbell and Potts townships
<i>Lapara bombycoides</i> Wlk.	jP, wP	Small numbers on lakeshore trees at two points (2)
<i>Lithocolletis aceriella</i> Clem.	moM, rM	Trace population at each point (3)
<i>Lithocolletis hamadryadella</i> Clem.	bO	Small numbers in Morson Township
<i>Lithocolletis salicifoliella</i> Chamb.	W, tA	Light infestation near Eva Lake, small numbers elsewhere (4)
<i>Malacosoma pluviale</i> (Dyar)	pCh	One colony on the Nym Lake road
<i>Meroptera pravella</i> Grt.	tA	Small numbers at each point (3)
<i>Monoctenus juniperinus</i> MacG.	eC	Collected on fringe trees in Miscampbell Township
<i>Nematus limbatus</i> Cress.	W	Trace population at Rainy Lake
<i>Nematus</i> sp.	bPo, cPo	Small numbers on each host at each location (3)
<i>Neodiprion banksianae</i> (Roh.)	jP	Only one colony of this common sawfly found
<i>Neodiprion maurus</i> Rohwer	jP	One colony found in Division 38
<i>Nepytia canosaria</i> Wlk.	bF, wS	Trace population at each point (4)
<i>Neuroterus batatus</i> Fitch	rO	Small numbers at Brule Narrows, Rainy Lake
<i>Nymphalis antiopa</i> Linn.	W, tA	Small numbers of trees heavily infested at each point (4)
<i>Orgyia leucostigma</i> J. E. Smith	W	Trace population at Rainy Lake
<i>Ortholepis pasadamia</i> Dyar	wB	Small numbers at Wolsely Lake
<i>Pareophora minuta</i> (MacG.)	bAs	Trace population in Mather Township
<i>Palthis angulalis</i> Hbn.	bF	Small numbers at two widely separated points
<i>Petrova albicapitana</i> Busck.	jP	More common than in three previous years
<i>Phratora purpurea purpurea</i> Brown	tA, bPo	Population widespread in District (6)
<i>Phyllaconistis populiella</i> Cham.	tA	Small numbers at Agnes Lake
<i>Pikonema dimmockii</i> (Cress.)	wS	Small numbers at widely scattered points (5)
<i>Pissodes approximatus</i> Hopk.	scP	One tree heavily infested in Burriss Township
<i>Pleroneura borealis</i> Felt	bF	Small numbers at a permanent sample plot in Potts Township
<i>Podapion gallicola</i> Riley	rP	Light infestation persisting on shoreline trees on Rainy Lake
<i>Pristiphora lena</i> Kincaid	wS	Small numbers in Lash Township
<i>Raphia frater</i> Grt.	bPo	Trace population in Morson Township
<i>Rhabdophaga batatus</i> (Walsh)	W	Lightly infested trees at Feather Lake
<i>Sarrothripus cinereana</i> (N. & D.)	tA	Twelve larvae collected
<i>Sarrothripus frigidana</i> (Wlk.)	W	Small numbers at Mainville Lake
<i>Schizura concinna</i> J. E. Smith	tA	One colony found in Division 38
<i>Stenoma algidella</i> Wlk.	wB	Rare insect, new in Ontario
<i>Syngrapha selecta</i> Wlk.	bS	Trace population at Serpent Lake
<i>Tetralopha aplastella</i> Hlst.	W, bPo, tA	Common in District (5)
<i>Tetralopha robustella</i> Zell.	jP	Found on regeneration trees in Morson Township

WIND DAMAGE

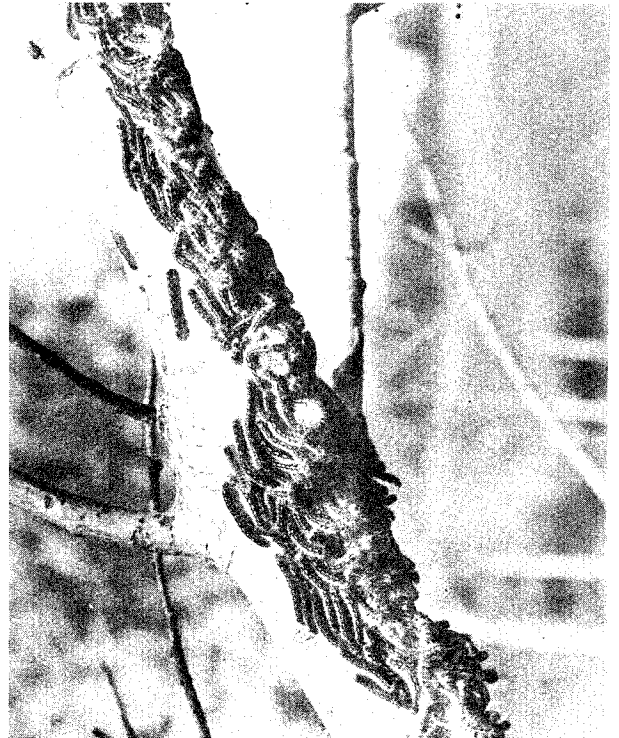


Typical damage caused by a wind storm in Algonquin Park

FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.

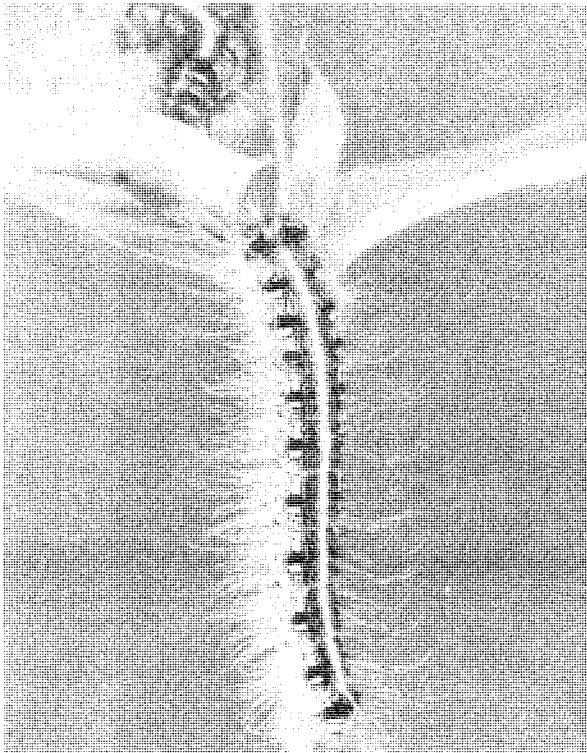


Larva enlarged. Note distinctive keyhole markings down the back.



Colony of forest tent caterpillar on poplar stem. This species does not spin a tent.

EASTERN TENT CATERPILLAR, Malacosoma americanum (F.)



Larva enlarged. Note solid white line down the back.



Colony of larvae on a silken tent.

DUTCH ELM DISEASE, caused by
Ceratocystis ulmi (Buism.) C. Moreau



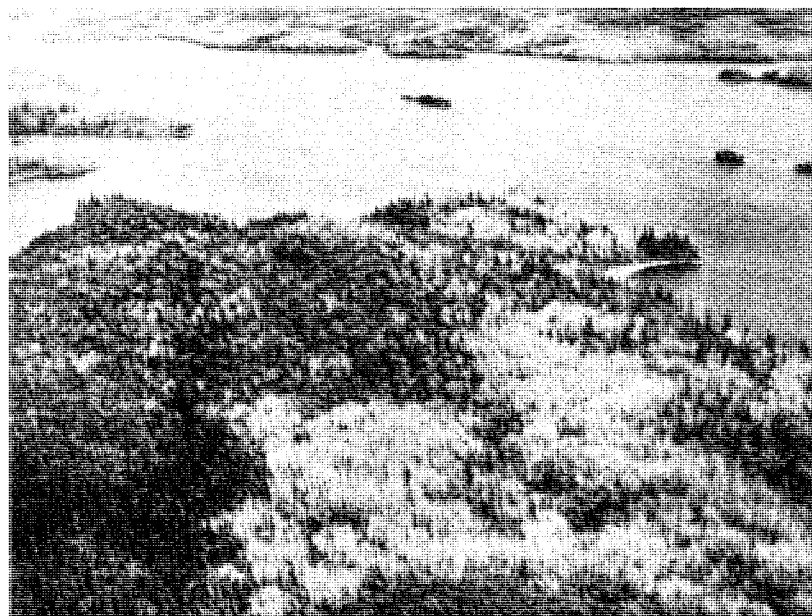
Elm tree killed by Dutch
elm disease

BLACK-HEADED JACK PINE SAWFLY
Neodiprion pratti banksianae Roh.



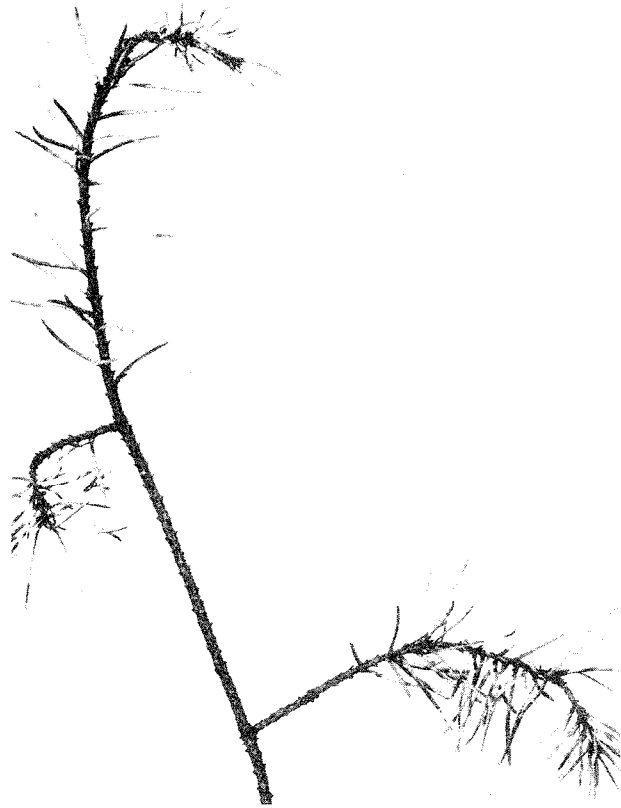
Severe defoliation of old
foliage on a jack pine tree

FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.



Aerial view of severe defoliation.

A MICROCYCLIC PINE NEEDLE RUST, Coleosporium pinicola (Arth.) Arth.

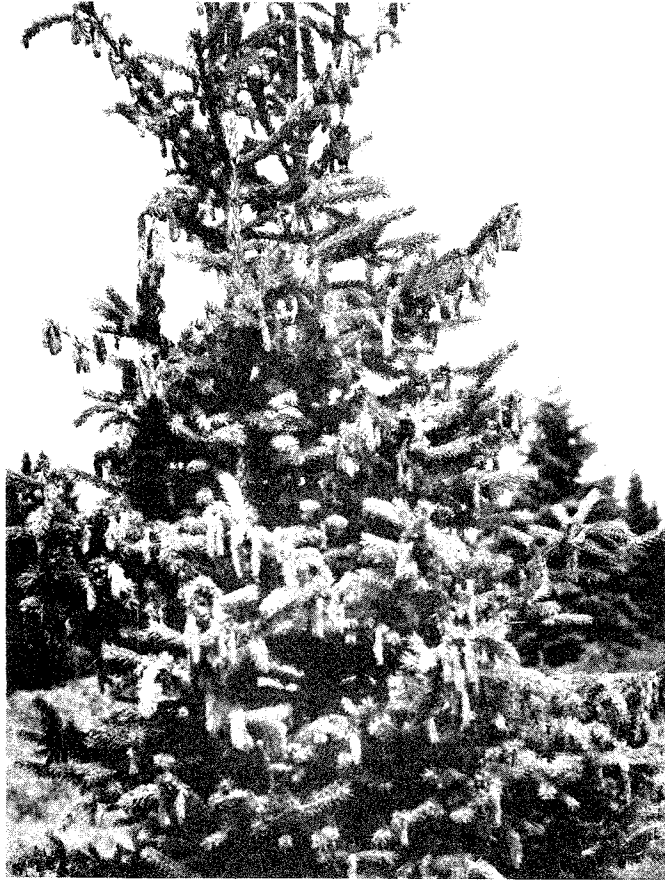


Loss of jack pine needles caused by heavy infection



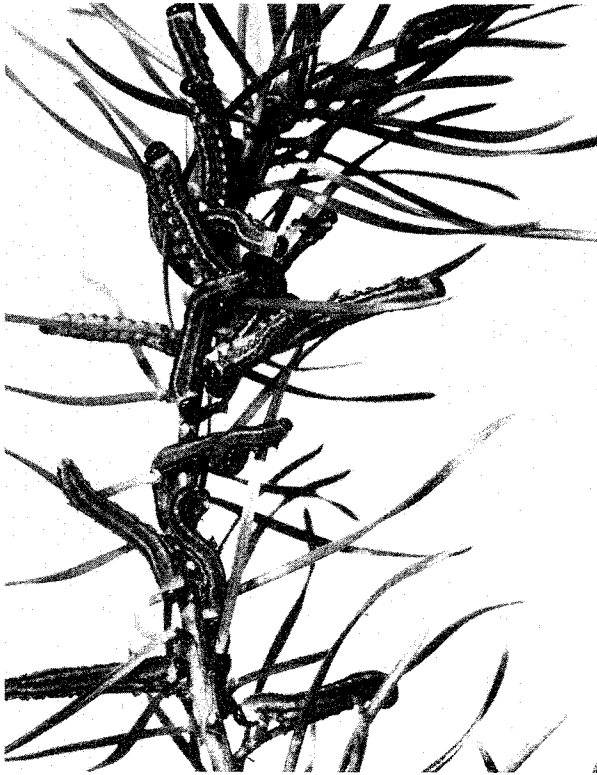
Infected jack pine trees

FROST DAMAGE



Severe damage to the new shoots of white spruce caused by late spring frost

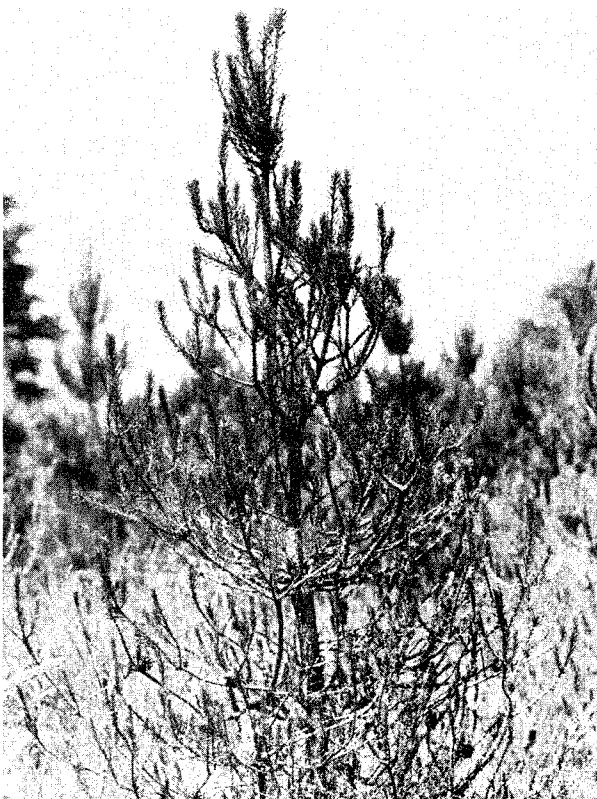
EUROPEAN PINE SAWFLY, Neodiprion sertifer Geoff.



A colony of larvae

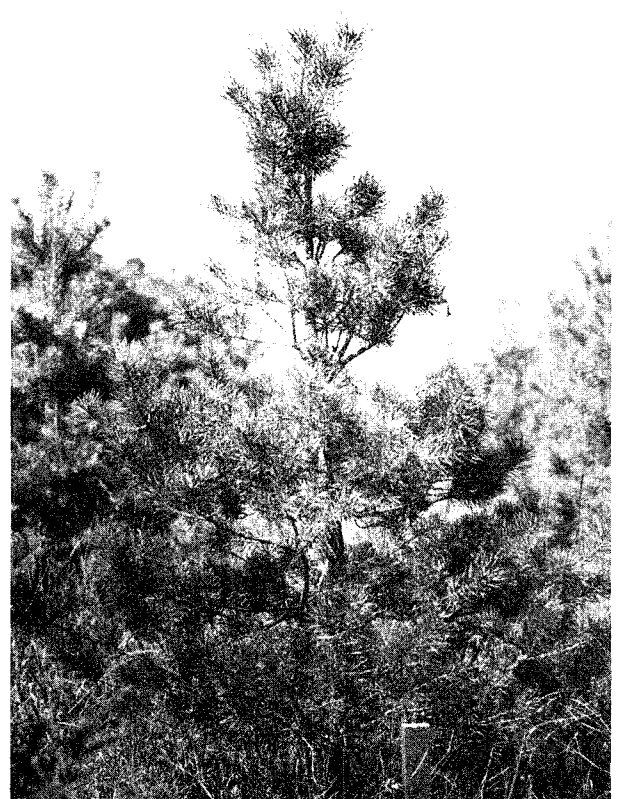


Larvae killed by virus disease



Severe defoliation of a Scots pine as it appeared

- On June 17/64



- On Sept 14/64

RED-HEADED PINE SAWFLY, Neodiprion lecontei Fitch



A colony of larvae

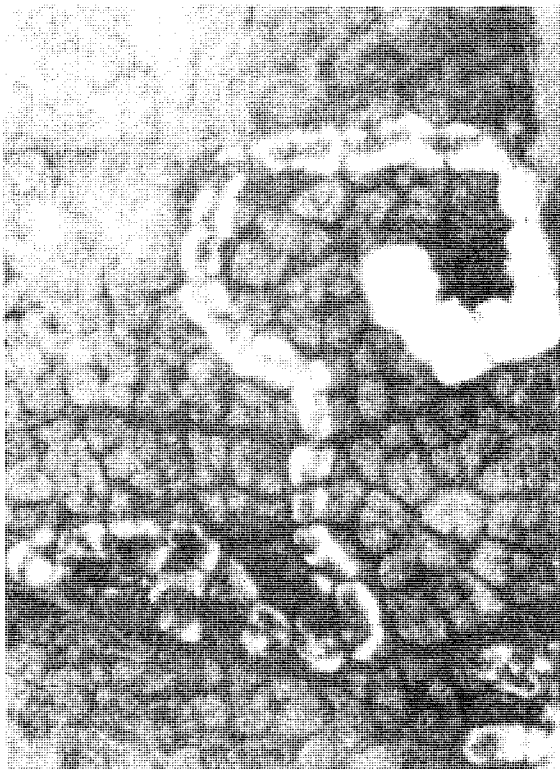


Severe defoliation of a red pine tree

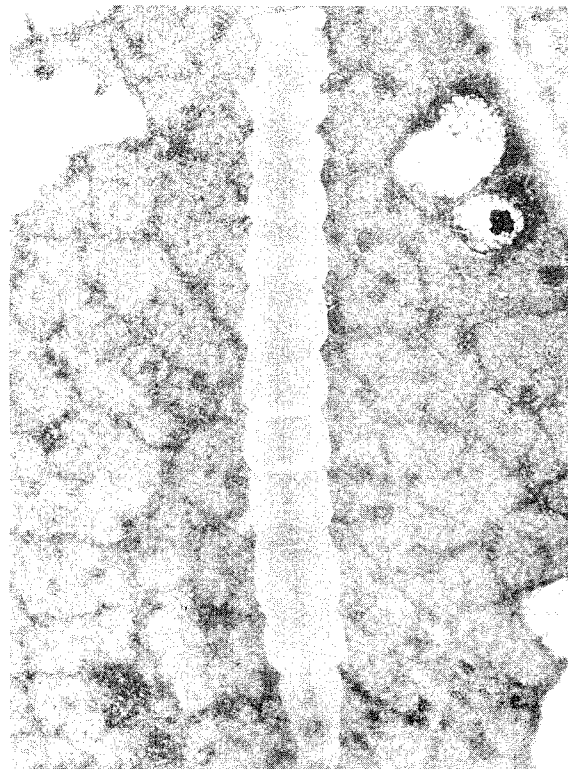
BIRCH SKELETONIZER, Bucculatrix canadensisella Cham.



Severe defoliation of a white birch stand. Larvae skeletonize the leaves which then turn brown and drop prematurely.

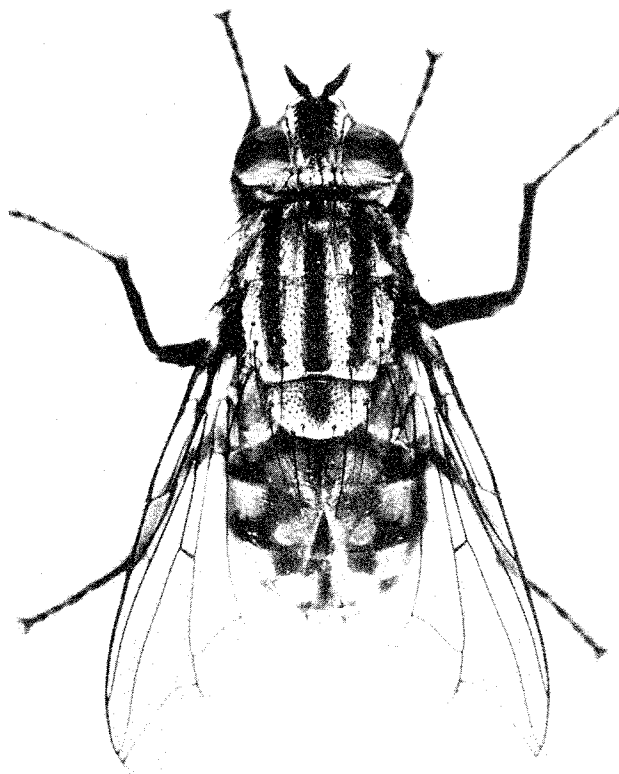


Serpentine mine caused by an early larval instar.



Enlargement of a larva.

FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.



A common parasite, Sarcophaga aldrichi Park.

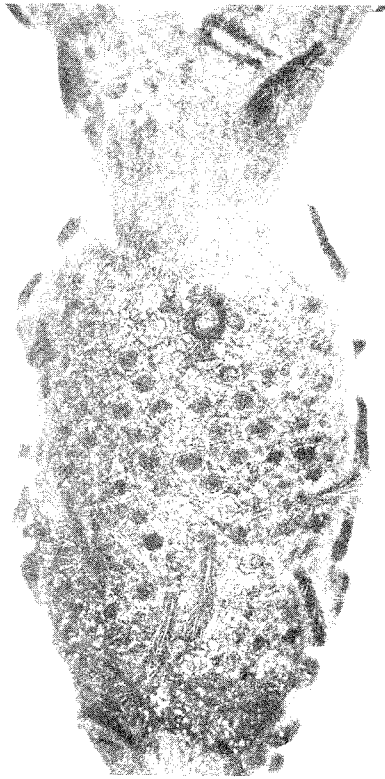


Larvae killed by polyhedral virus disease



Larvae killed by a fungus disease Empusa sp.

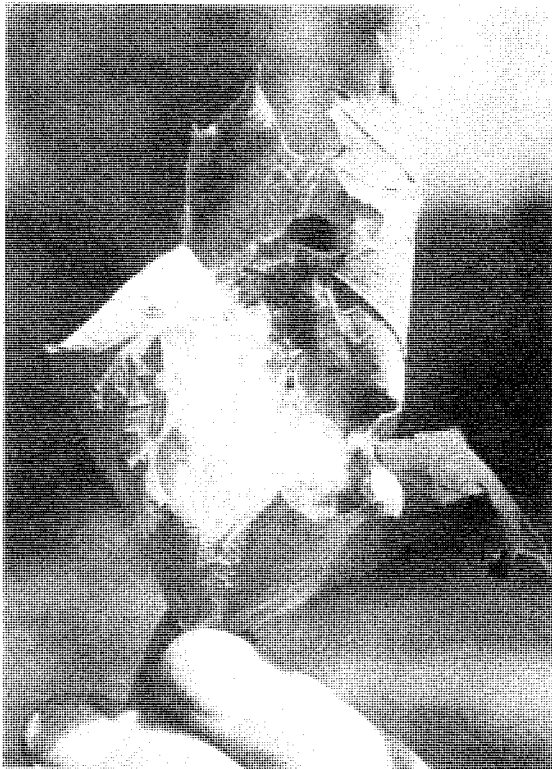
FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.



Newly-hatched larvae on an egg band.



An inactive colony of larvae on trembling aspen.

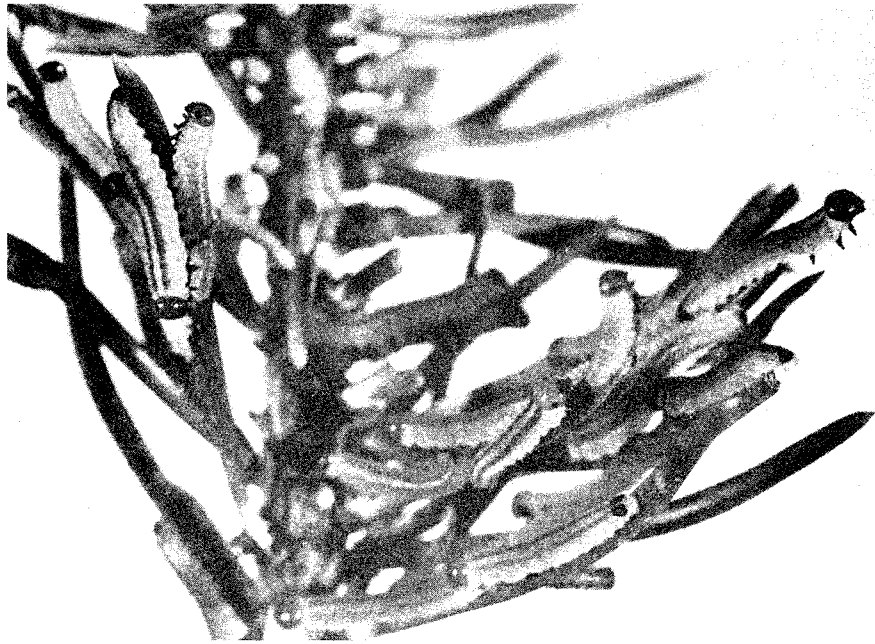


Cocoon in rolled leaves.

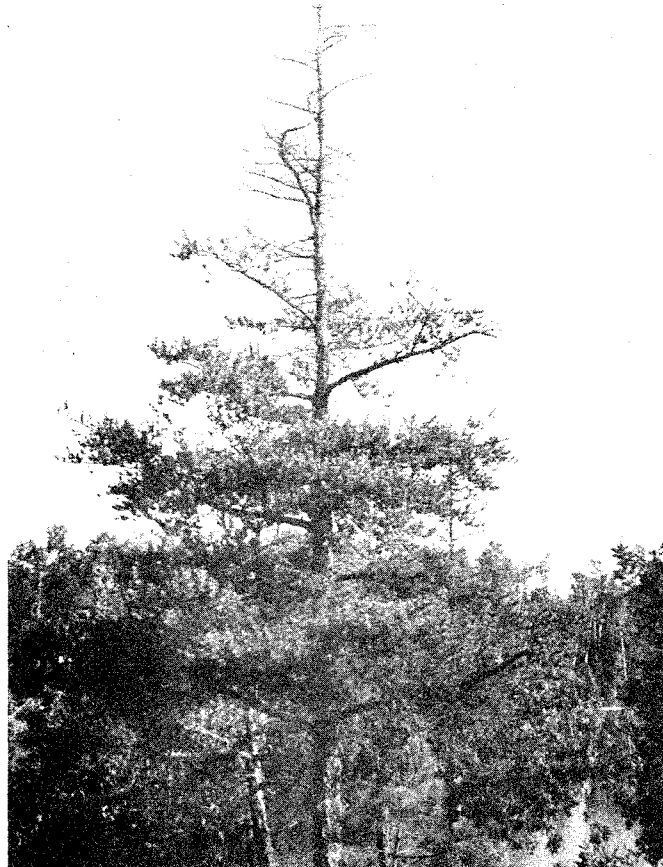


A male moth.

SWAINE JACK-PINE SAWFLY, Neodiprion swainei Midd.



A colony of feeding larvae



Jack pine tree showing top and branch mortality caused by repeated defoliation

A LEAF MINER ON BIRCH, Profenusa thomsoni (Konow)



Blotch mines on a birch leaf. Larvae feed on tissue between the surfaces.

PITCH NODULE MAKER, Petrova albicapitana (Busck)



Larva on an opened pitch nodule.

EUROPEAN SPRUCE SAWFLY, Diprion hercyniae Htg.

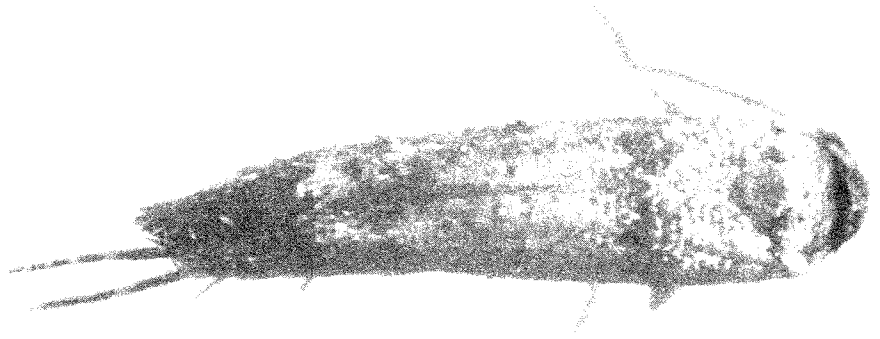


Late stage larvae



Moderate defoliation of white spruce trees

AN IRONWOOD LEAF MINER, Chrysopelia ostryaella Cham.



An adult



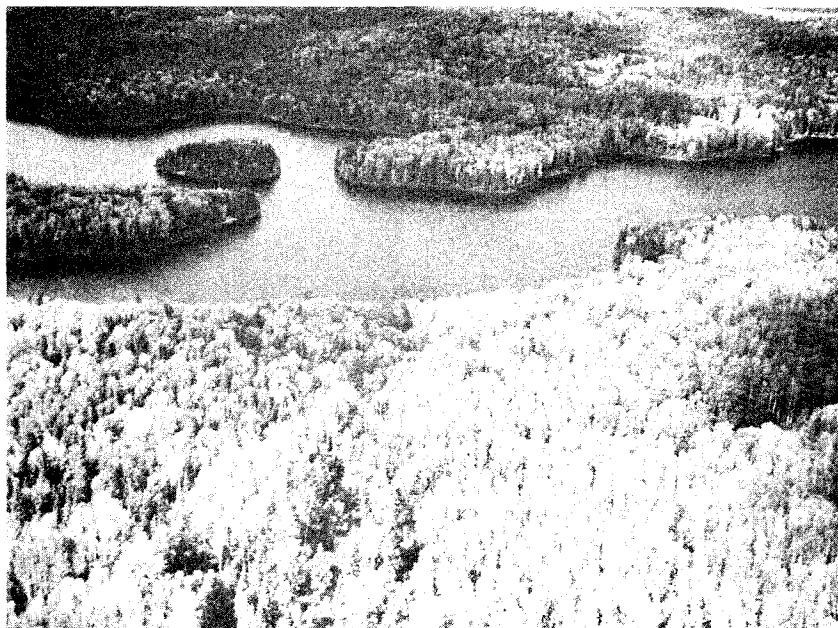
Typical mining of ironwood foliage

A LEAF ROLLER ON POPLAR, Epinotia nisella criddleana Kft.



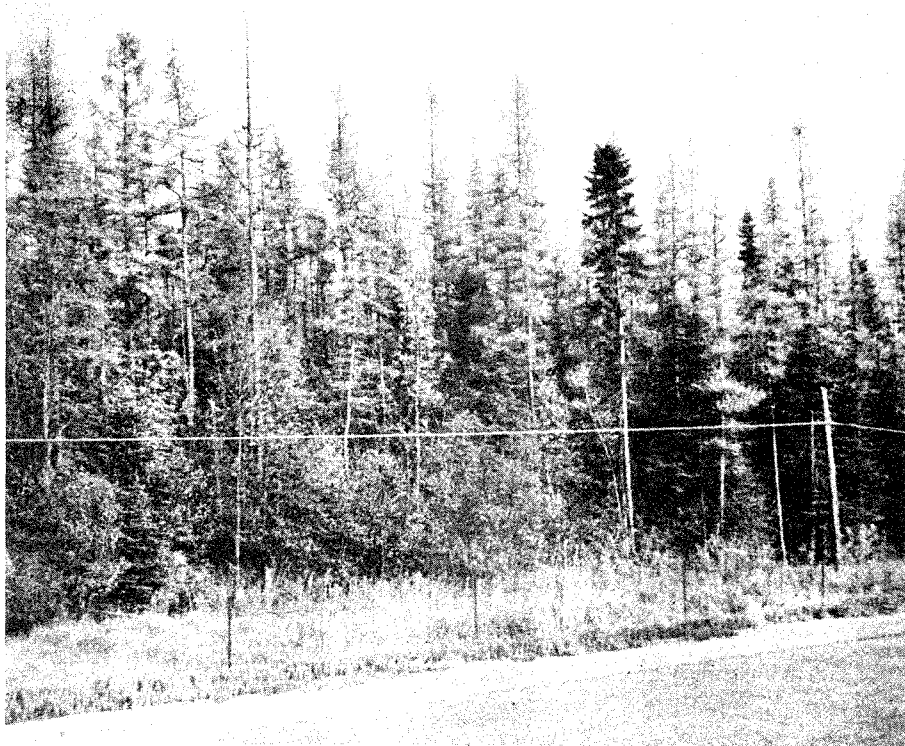
Moderate defoliation of trembling aspen

BIRCH SKELETONIZER, Bucculatrix canadensisella Cham.

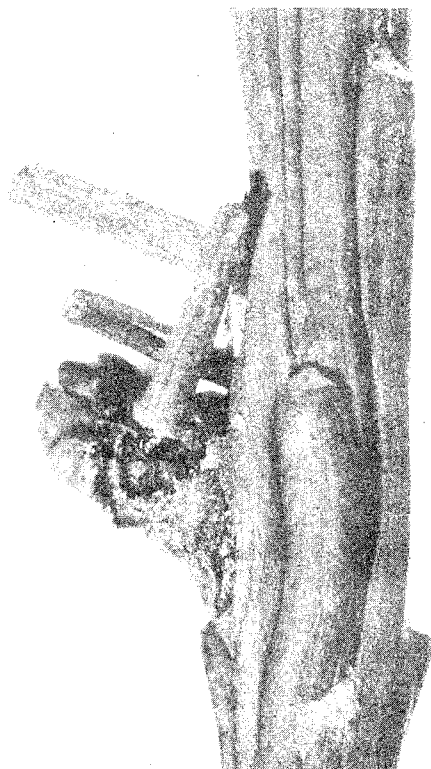


Aerial view of defoliated white birch stands

LARCH CASEBEARER, Coleophora laricella Hbn.

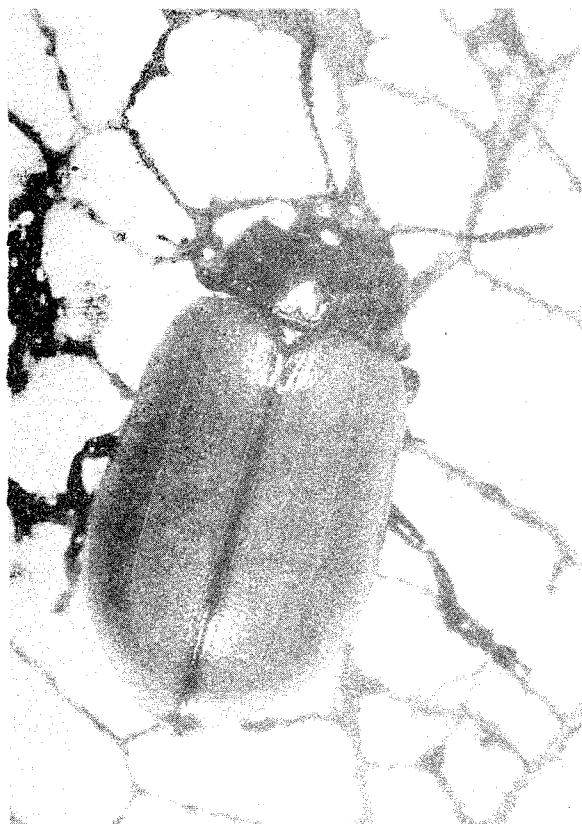


Severe damage to foliage in a tamarack stand.

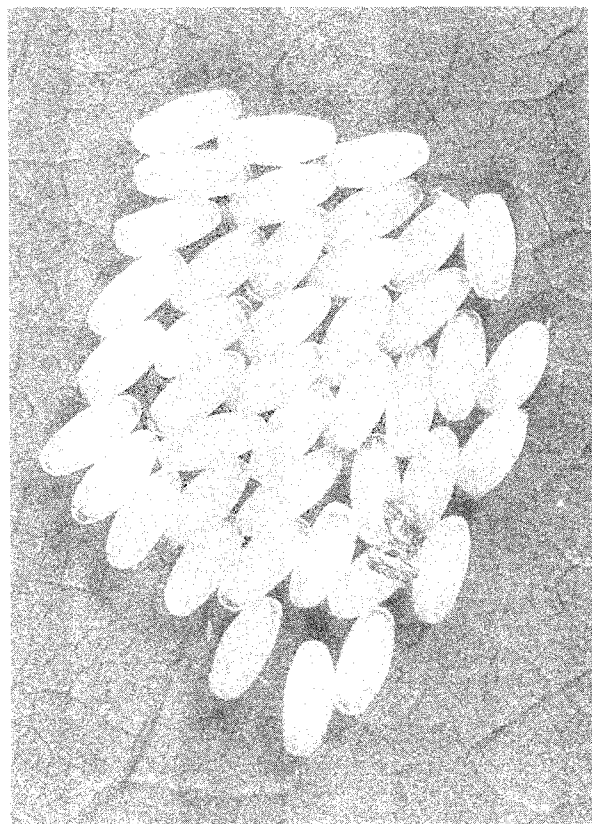


Cases on a branch resembling old needles.

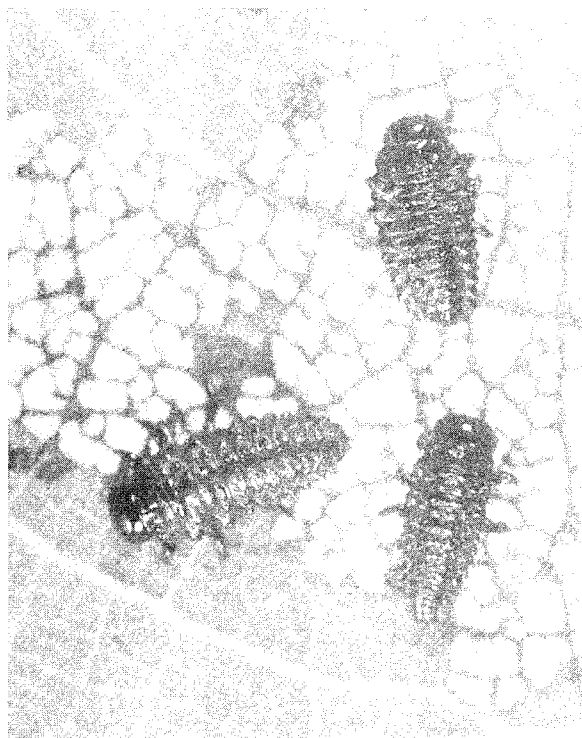
ASPEN LEAF BEETLE, Chrysomela crotchii Brown



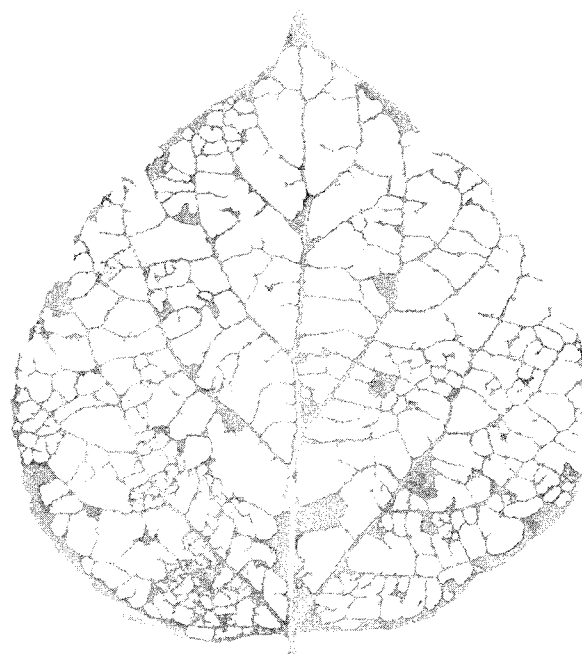
The adult beetle



A cluster of eggs

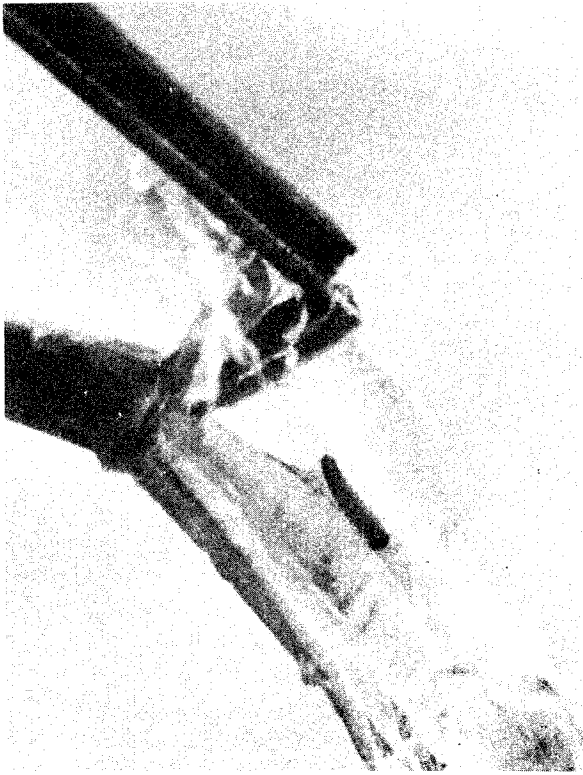


Feeding larvae

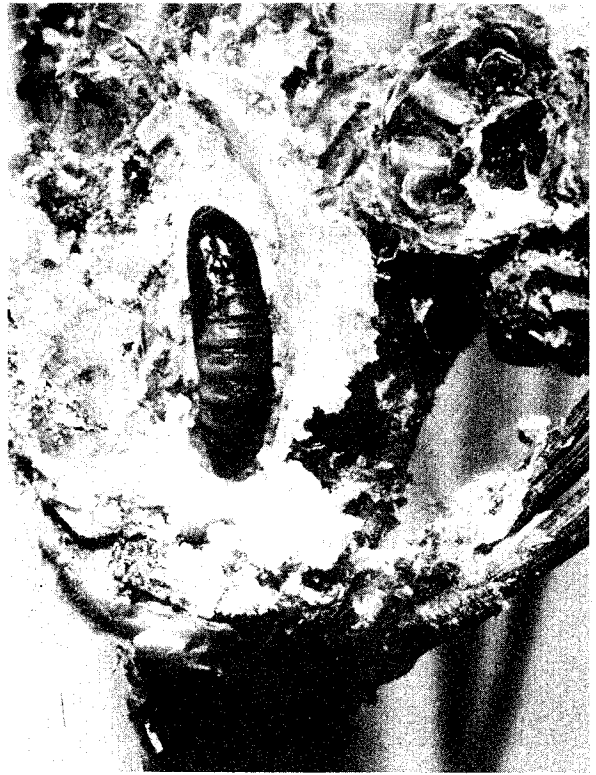


A severely skeletonized leaf of
trembling aspen

EUROPEAN PINE SHOOT MOTH, Rhyacionia buoliana Schiff.



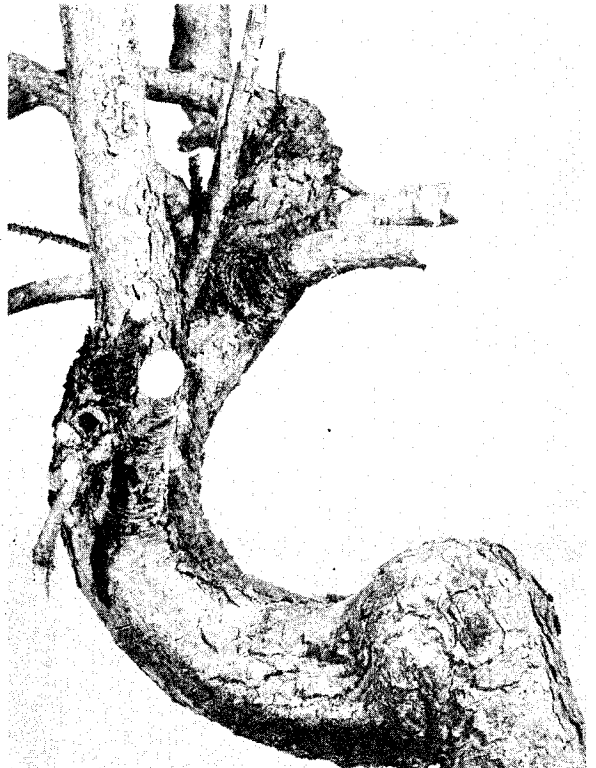
Early instar larva and damaged needles



Pupa in a dead bud

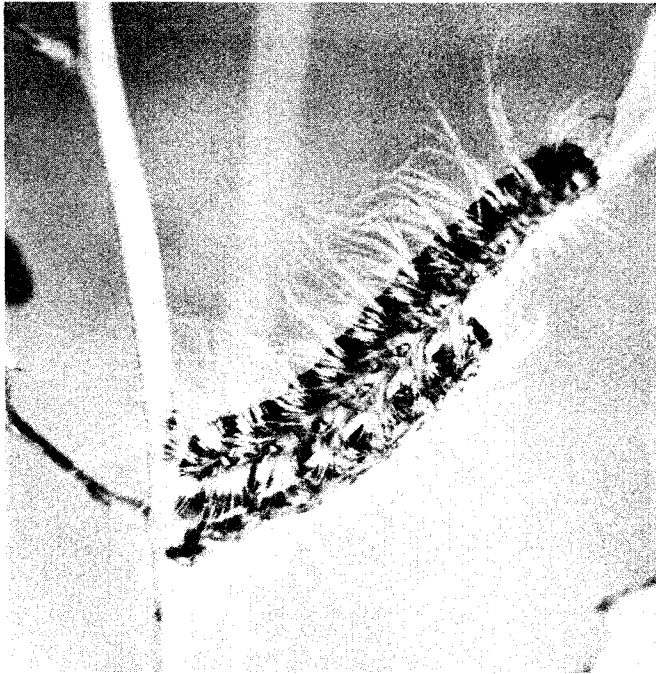


Severe damage stunts growth and produces abnormal bud clusters



Deformed red pine tree resulting from repeated attack

THE WALNUT CATERPILLAR, Datana integerrima G. & R.



Late instar larvae feeding on walnut foliage



Branch mortality caused by repeated defoliation



Severe defoliation of black walnut trees

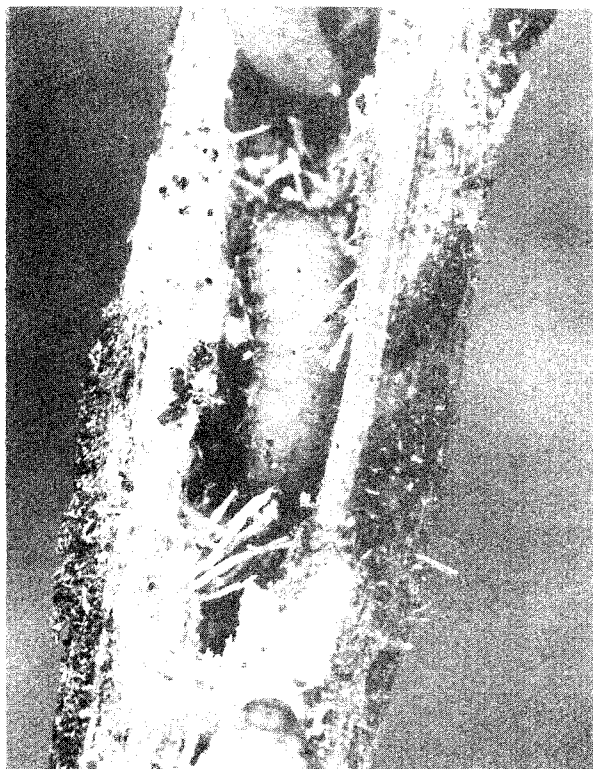
WHITE-PINE WEEVIL, Pissodes strobi Peck



Adult weevil



Weevil damage on white spruce



Full-grown larvae in a terminal shoot



Pupae in a terminal shoot

ZIMMERMAN'S PINE MOTH, Dioryctria zimmermani (Grote)

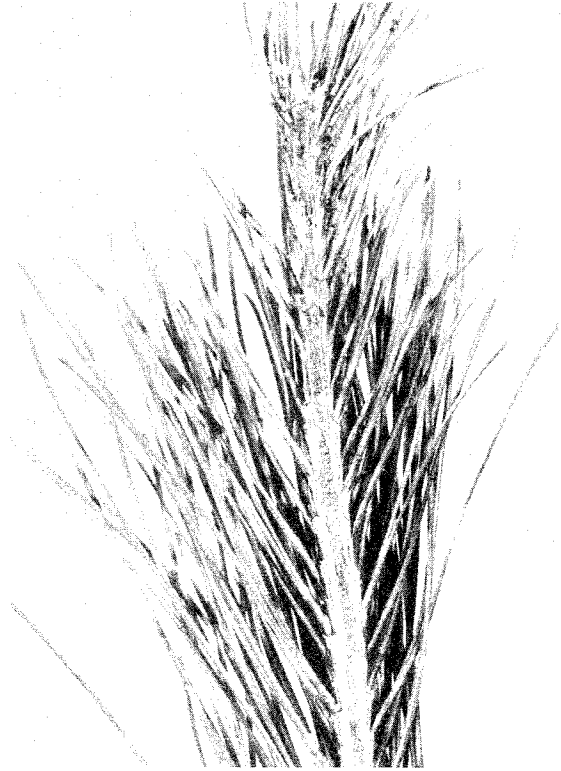


The Zimmerman moth often attacks young white pine trees at the root collar

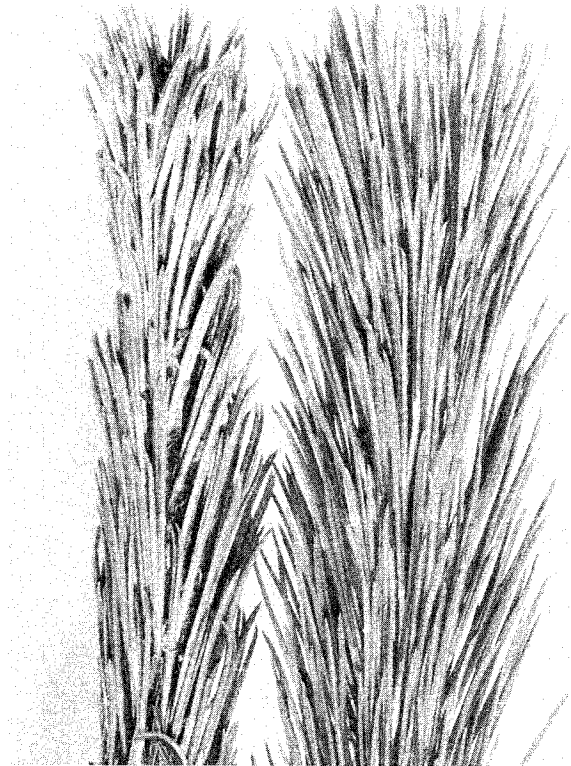


Pitch masses characterize larval attack on upper nodes of an 8-foot Scots pine

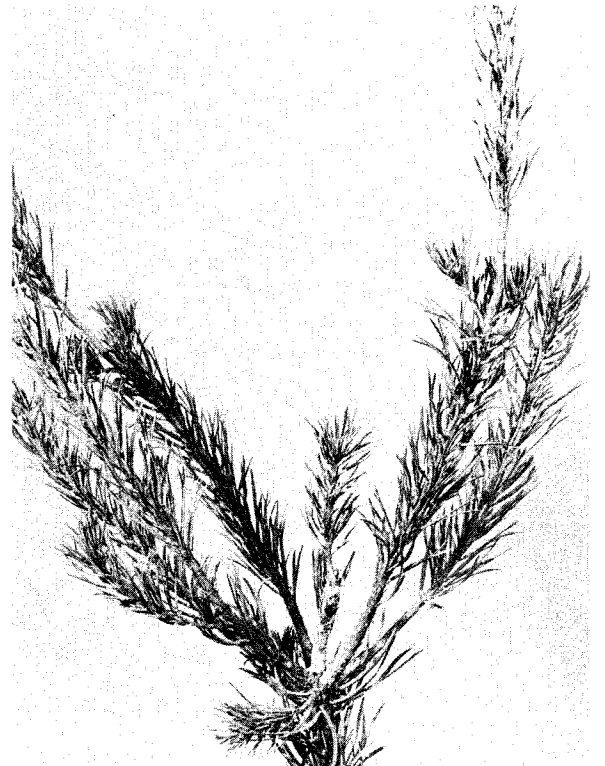
WHITE-PINE SHOOT BORER, Eucosma gloriola Heinr.



Infested shoot showing frass-filled tunnel

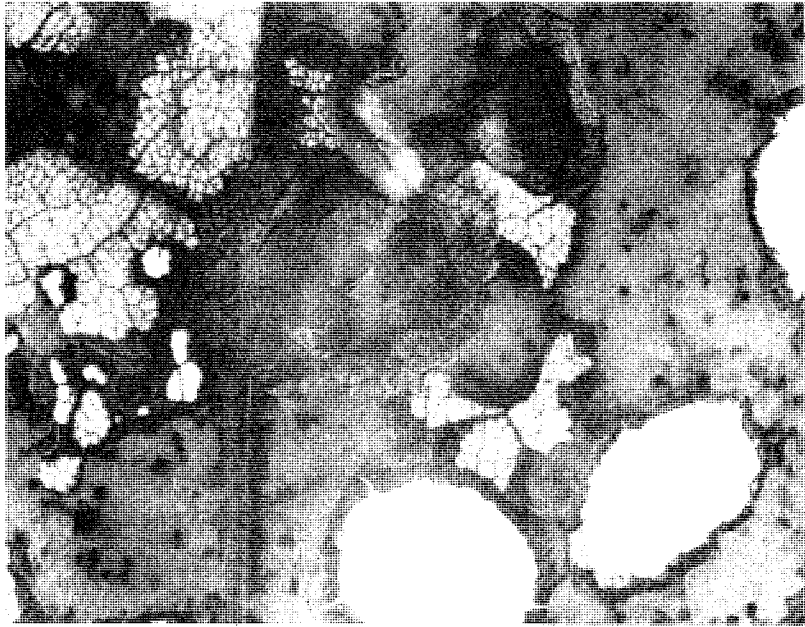


Infested shoot showing stunted needles on the left; normal shoot on the right



Deformed crown of jack pine tree

MAPLE LEAF CUTTER, Paraclemensia acerifoliella Fitch



Larva feeds inside a circular case



Typical feeding on sugar maple foliage

SWEET FERN BLISTER RUST



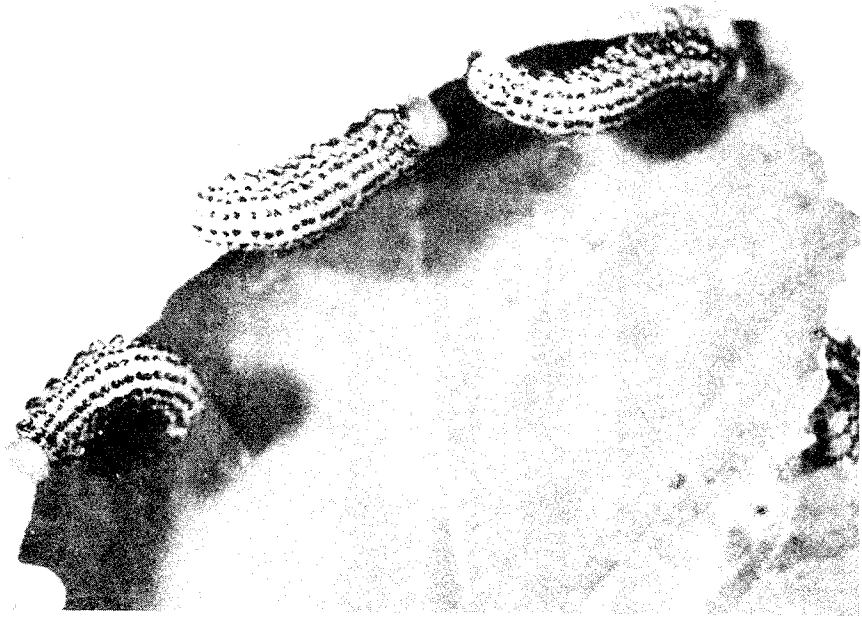
Fruiting of sweet fern blister rust on living jack pine

HYPOXYLON CANKER OF POPLAR



Hypoxylon canker on trembling aspen

BIRCH SAWFLY, Arge pectoralis Leach

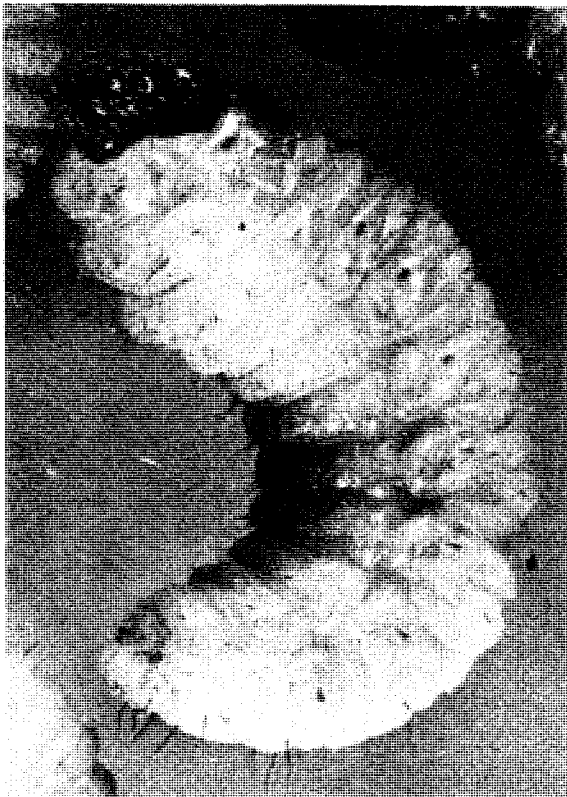


Sawfly larvae feeding on white birch leaf



Severe defoliation of a white birch tree

PINE ROOT COLLAR WEEVIL, Hylobius radicis Buch.



Larva



Infested red-pine are commonly wind-thrown



Typical damage of root collar



Cross section of root collar showing repeated attacks

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A. semiannula															E20								
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A. <i>fuscoliana</i>												D43												
A. <i>nebeculana</i>												D43	D56	D67		E40			F30					
<i>Ancyliis mediofasciana</i>														D67										
<i>Anisota rubicunda</i>																								
A. <i>senatoria</i>		A25				B41	B45																	
A. <i>virginiensis</i>							B57																	
<i>Anomoea laticlavata</i>				A46																				
<i>Anomogyna elimata</i>						B41			C26					D67	E31				F31	G26	G35	G47		
<i>Anoplonyx canadensis</i>					B28										E21				F31					
A. <i>luteipes</i>							B57											F23						
<i>Antispila nyssaefoliella</i>							B57																	
<i>Aphrophora parallela</i>	A17				B28			C14	C26						E21									
A. <i>signoreti</i>															E21									
<i>Archippus albertus</i>																						G26		

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<i>Archippus packardianus</i>					B28												E40					G47		
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<i>Archips cerasivoranus</i>	A17	A25	A36	A39	B28	B41	B58	C14	C26	D21	D33		D47	D61	E21		E33		F31			G29	G47	
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<i>Arge pectoralis</i>						B41							D47		E21									
<i>A. scapularis</i>							B58																	
<i>Arge sp. on alder</i>				A46					C26								E40							
<i>Argyresthia aureoargentella</i>	A9	A21				B41				D20														
<i>A. laricella</i>		A25				B41	B46	C14	C26													G26	G47	
<i>A. oreasella</i>																E31								
<i>A. pygmaeella</i>																			F31				G47	
<i>A. thuiella</i>		A21			B19	B41				D21				D67		E25	E40	F23						
<i>Argyrotaenia pinatubana</i>		A25	A29	A47	D28			C14														F31		
<i>A. quadrifasciana</i>																						F31	G35	G47

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A. tabulana														D67										
<i>Argyrotoxa semipurpurana</i>					B28					D13	D33													
<i>Asterocampa celtis</i>							B58																	
<i>Atomacera debilis</i>							B58																	
<i>Atteva aurea</i>							B58																	
<i>Antheraea polyphemus</i>			A31																F31	G26				
<i>Badebecia urticana</i>												D43		E21	E31	E40			F31					
<i>Balsa malana</i>							B58																	
<i>Baliosus ruber</i>	A17																							
<i>Biston cognataria</i>														D67	E21				F31				G35	
<i>Brachyrhinus ovatus</i>		A25			B28																			
<i>Brachys aerosus</i>						B41	B52																	
<i>Bucculatrix canadensisella</i>			A29		B29			C7	C17	D13	D25	D37	D48	D61	E13	E25	E33	F11	F27	G17				
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<i>C. pinus</i>					B29	B33	B58	C14				D43									G29	
<i>C. rosaceana</i>					B29		B58	C14				D43			E21				F31	G26	G35	G47
<i>Chramesus hicoriae</i>							B46															
<i>Chrysoelista linneella</i>							B58															
<i>Chrysomela crotchi</i>												D44		D67				F12	F27	G18	G29	G47
<i>C. falsa</i>																					G26	
<i>C. laurentia</i>																					G26	
<i>C. lineatopunctata</i>																			F31			
<i>C. mainensis mainensis</i>												D44								G26	G35	G47
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<i>Chrysopeleia ostryaella</i>	A17	A21	A29		B29	B33																
<i>Cimbex americana</i>										D21		D37	D56						F31	G26		
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<i>Coleophora laricella</i>	A9	A21	A29	A39	B19	B33	B47	C7	C17	D13	D25	D37	D56	D62		E26	E33	F12	F27			G42

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<i>C. ulmifoliella</i>					B29																	
<i>Compsolechia niveopulvella</i>						B41		C14		D21		D44	D56	D67	E21					F31		
<i>Conophthorus coniperda</i>								C7														
<i>C. resinosae</i>								C7	C26													
<i>Conophthorus</i> sp.										D21		D38	D48	D62	E14					F31	G19	
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<i>Contarinia canadensis</i>								C14														
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<i>Corthylus punctatissimus</i>	A17	A21	A30		B20	B33	B58		C26													
<i>Corythuca elegans</i>			A36	A47					C26				D56	D67								
<i>Corythuca</i> sp.	A9	A21	A30												E21							
<i>Croesus latitarsus</i>				A47								D44								F31	G26	G35
<i>Crypturgus borealis</i>																						G36
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Curculionidae																		F13		G25			
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<i>D. serrulatae</i>														D67									
<i>Datana contracta</i>																							
<i>D. integerrima</i>		A25			B29	B34	B47																
<i>D. ministra</i>	A17				B29	B42	B48								E21					G26			
<i>D. perspicua</i>																							
<i>Dendroctenus simplex</i>																	E40						
<i>D. valens</i>					B29																		
<i>Depressaria groteela</i>								C14			D33				E21								
<i>Deuteronomus magnarius</i>												D44										G36	
<i>Diacrisia virginica</i>								C14															
<i>Dichelonyx</i> sp.																				F31			
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<i>E. solandriana</i>		A26				B42	C14	C27	D21	D33	D38	D49	D67	E21	E32					G26	G36	G47	
<i>E. solicitana</i>														E21									
<i>Epinotia</i> sp.													D67	E21			E41	F23					
<i>Episimus argutus</i>							C14																
<i>Epizeuxis aemula</i>						B42											E41				G36	G47	
<i>Erannis tiliaria</i>		A26			B29	B49	C18																
Eriocraniidae																				G26			
<i>Eriophyes abnormis</i>		A26																			G36		
<i>E. betulae</i>					B29		C15					D56											
Eriophyidae on wP	A17																						
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<i>Eriophyes fraxiniflora</i>	A17											D56											
<i>E. populi</i>					B29					D33		D56											
<i>E. ulmi</i>																				F32			

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<i>Eriophyes</i> sp. on <i>Be</i>				A47					C27	D21													
<i>Eriosoma americanum</i>													D56										G36
<i>Erynnis icelus</i>								C15								E32			F32				
<i>Eucordylea atrupictella</i>										D21													
<i>Eucosma gloriola</i>	All			A40	B23	B36	B51	C18	D14	D26			D49								G20	G30	G43
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<i>Eudeilinia herminata</i>																							G36
<i>Eupithecia albicapitata</i>														D68									G26
<i>E. filmat a</i>							B42	C15		D21				D68			E41	F23	F32				G36
<i>E. luteata</i>										D21													
<i>E. mutata</i>							B42										E41						
<i>E. transcanadata</i>								C15		D21													
<i>Euura hospes</i>												D44		D68	E21								
<i>E. resinicola</i>														D68									
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<i>Exoteleia dodecella</i>	A17	A26	A31		B29	B37																	
<i>E. pinifoliella</i>					B23	B37	B59	C15	C18		D33												
<i>Exoteleia</i> sp.						B42	B52																
<i>Fenusa dohrnii</i>		A26		A40			B59	C15	C27	D21	D33	D44		D68	E21	E32	E41	F23	F32				
<i>F. pusilla</i>	A11	A26	A31	A41	B29	B42	B59	C15	C27	D21	D26							FL4					
<i>F. ulmi</i>	A17	A26			B29																		
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<i>Framinghamia helvalis</i>															E21				F32				
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<i>Herculia intermedialis</i>						B42																	
<i>Hemichroa crocea</i>				A47										D68	E22	E32	E41	F24	F32	G26	G36	G47	
<i>Herculia thymetusalis</i>																	E41		F32			G36	
<i>Hesperumia sulphuraria</i>															E22								
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<i>Holcocera immaculella</i>																			F32			G36	
<i>Hydriomena divisaria</i>						B42		C27	D22		D44	D56	D68										
<i>Hylobius congener</i>	A18				B29		B52										E41		F32			G47	
<i>H. pales</i>	A18	A26			B23		B52		C18														
<i>H. piceus</i>																			F32			G47	
<i>H. radialis</i>				A47	B24				C27														
<i>Hylurgopinus rufipes</i>	A16				B29			C15	C27														
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<i>Hypagyrtis piniata</i>																E32				F32	G27	G36	

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