

1966

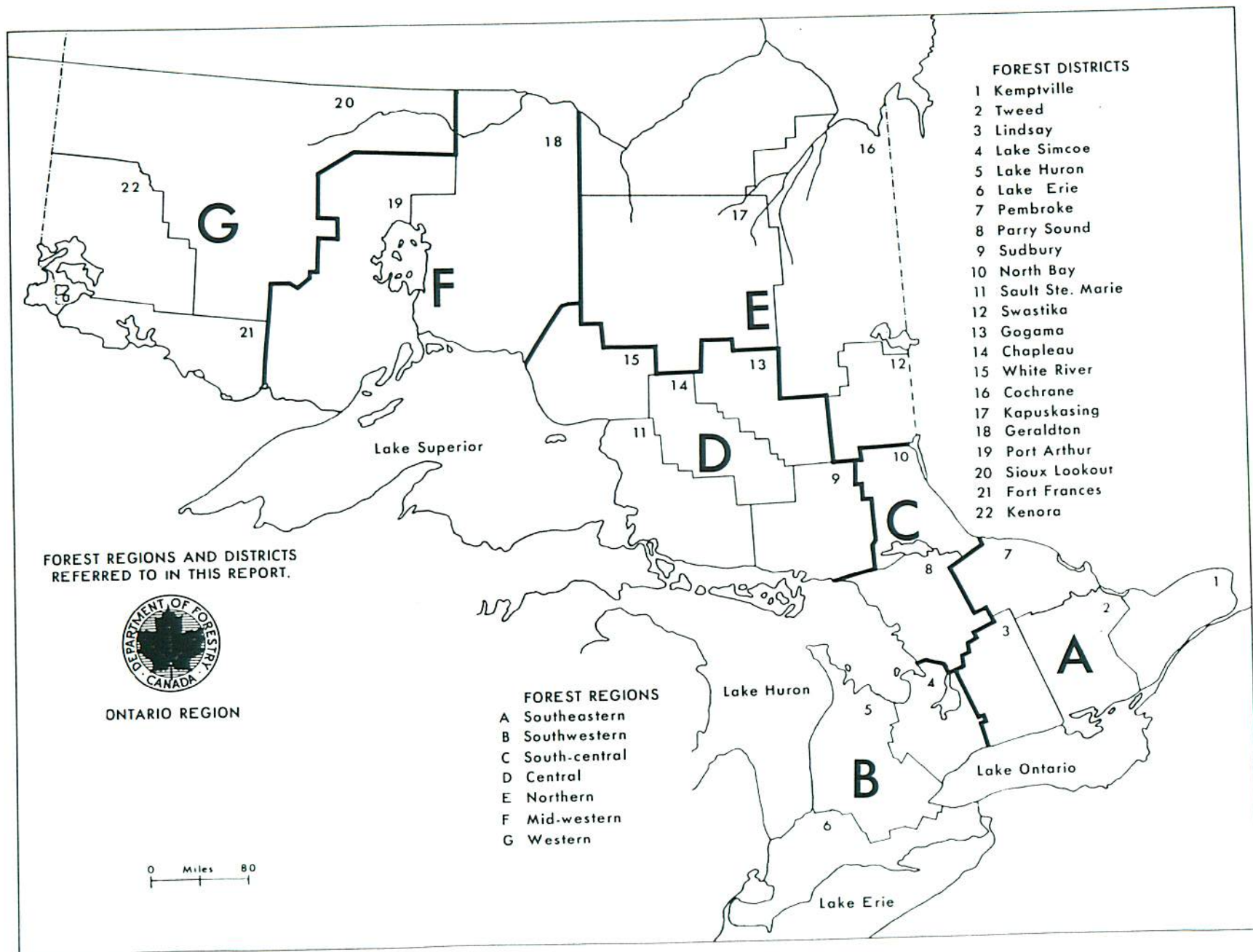
Information Report No.	Subject	Author
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O-X-36	--Kemptville District	J. Hook
O-X-37	--Pembroke District	R. A. Trieselmann
O-X-38	--Lake Simcoe District	A. A. Harnden
O-X-39	--Lake Huron District	R. L. Bowser
O-X-40	--Lake Erie District	J. R. Trinnell
O-X-41	--North Bay District	L. S. MacLeod
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Photographs

* Regional Supervisors



FOREWORD

J. E. MacDonald

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

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

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

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

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

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

MIDWESTERN FOREST REGION

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STATUS OF INSECTS (DISTRICT)

INTRODUCTION

Midwestern Forest Region

This report deals with the status of forest insects and tree diseases in the Midwestern region. The larch sawfly and tree diseases are dealt with regionally and other insects on a district basis.

A late cold spring caused almost complete hatch failure of forest tent caterpillar larvae and was responsible for a very large reduction in the extent of infestations in the region. Larch sawfly populations increased for the second consecutive year in Port Arthur District and the central part of Geraldton District. Light defoliation of balsam fir caused by the spruce budworm occurred in the Burchell Lake area. The upward trend of populations of Phyllocolpa sp., a leaf folding sawfly, continued in the Geraldton District and light-to-moderate infestation of aspen was observed at numerous locations.

The results of an intensive survey of Scleroderris canker of pines, Scleroderris lagerbergii, showed that the disease is widespread in the eastern portion of the region. The organism was confined to small diameter red and jack pine in plantations and natural stands and caused considerable tree and branch mortality at several locations. A severe wind storm caused extensive damage to stands in an area of approximately 50 square miles north of Nakina.

Special sampling of insects in balsam fir plots and diseases in hail damaged areas was continued. Service work, extension calls and short courses of instruction to junior forest rangers constituted an important part of the work of district technicians.

The interest and assistance of Department of Lands and Forests and Woods operating personnel is gratefully acknowledged.

K. C. Hall

STATUS OF INSECTS

Larch Sawfly, Pristiphora erichsonii (Htg.)

For the second consecutive year population levels of the larch sawfly increased substantially in the region. The heaviest defoliation, approximately 70 per cent, occurred in several stands of large diameter trees in Soper Township and on numerous open-grown planted larch trees in McIntyre Township. The largest and most noticeable areas affected by the population increase included Division 34 and 24 in Port Arthur District and the central part of Geraldton District (see map). Infestations throughout these areas increased to moderate intensity with defoliation ranging from 10 to 40 per cent. Elsewhere in the region colonies occurred more frequently but defoliation was light.

STATUS OF TREE DISEASES

Yellow Witches' Broom, Chrysomyxa arctostaphyli Diet.

Light to moderate incidence of this disease continued on white spruce and black spruce in Townships 82, 85, and 89 in the Geraldton District. The highest incidence was recorded in a stand of open-growing spruce at Nipigon Bay Road, Township 89, where 18 per cent of the examined white spruce trees were diseased with one to three brooms per affected tree. This organism was collected on the alternate host, bear-berry, at White Sand Lake in Township 85.

In the Port Arthur District witches' brooms were common on black spruce in Savanne and Joynt townships.

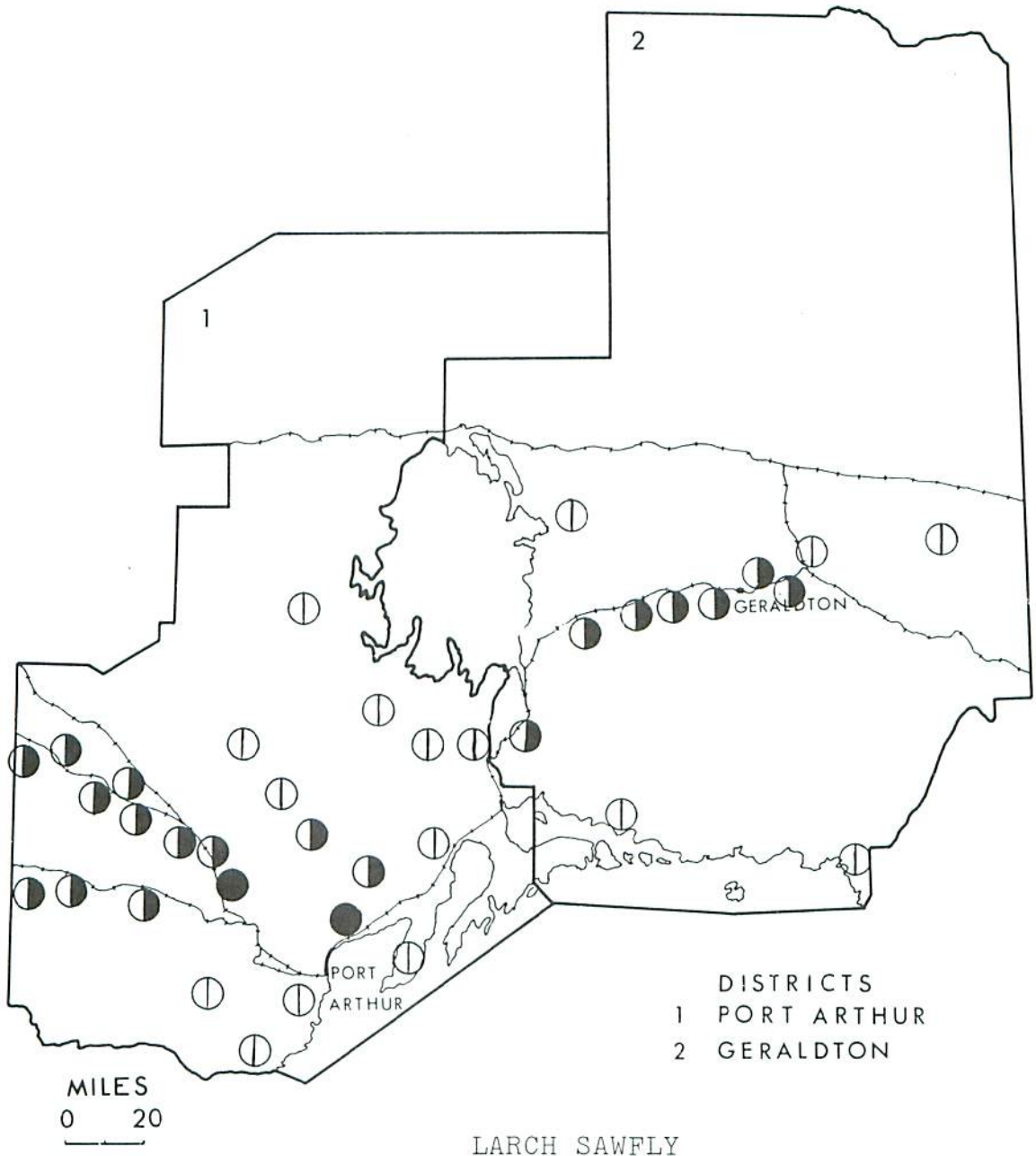
Needle Rust of Spruce, Chrysomyxa Ledi de Bary

In 1966, the incidence of this rust increased in the western part of the Port Arthur District. Light to moderate infections were observed in numerous stands of black spruce of all diameter classes along Highway 17 from Raith to English River. In the Atikokan Road area the rust was common on small black spruce trees. In Geraldton District the severity of this needle rust declined from a high to a low level in a 50-acre white spruce stand at Jackfish Lake, Township 82. New pockets of moderate infection were observed on black spruce regeneration at mile 16, Auden Road, at Mile 3 on the Camp 81 Road, and in Vivian Township.

Ink Spot of Aspen, Giborinia whetzeli (Seaver) Seaver

The incidence of this leaf spot declined to a low level in the Region in 1966. The only area of infection observed was in Exton Township, Geraldton District, where several stands of young trembling aspen were lightly infected. In 1965 the disease was common at numerous locations in the region.

MIDWESTERN FOREST REGION



Locations where infestation of the larch sawfly were observed in 1966

Legend

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

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

Infections of this disease continued to be severe in Pic Township, in Townships 79 and 87 and at scattered locations in Division 23, Geraldton District. The highest incidence was observed in a small pocket of pincherry (*Prunus pennsylvanica*) one mile east of Camp 54, Division 23, where all trees were diseased and the severity ranged from 4 to 20 infections per tree. In Port Arthur District pockets of moderate infections were common along the Armstrong Road, on Sibley Peninsula, in Nipigon Township and through the Fort William and Port Arthur area.

White Trunk Rot of Hardwoods, Fomes igniarius (L. ex Fries) Kickx.

This destructive wood rot was found commonly on large trembling aspen trees through Blacksand Park. Quantitative sampling at one location showed that 16 per cent of host trees were affected, with the number of conks ranging from 1 to 8 per tree.

A Leaf Rust of Mountain Ash, Gymnosporangium sp.

For the fifth consecutive year, severe infection of mountain ash by this rust was observed along the north shore of Lake Superior in Geraldton District. The degree of severity on leaflets ranged from 75 per cent to 100 per cent which represented a substantial increase since 1965 (Table 1). New pockets of severe infection were observed at several locations along the Auden Road where the highest incidence was recorded at Milage 19, here, 85 per cent of the leaves were infected. The disease was common between Nipigon and Port Arthur, but in all cases the severity was light. High incidence of infection occurred on several clumps of serviceberry (*Amelanchier*) in Pic Township and in Township 86.

TABLE 1

Summary of Infection of Mountain Ash Caused by Gymnosporangium sp. in the Geraldton District from 1964 to 1966

Location	Per cent of leaflets infected		
	1964	1965	1966
Township 87	78	100	100
Pic Township	64	36	90
Auden Road mile 19	-	-	85
Township 79	100	43	75

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

In 1966 the incidence of this disease increased in the Geraldton District. Light twig mortality was common on small trembling aspen in O'Meara, Sandra, and Kowkash townships, through the area south of Caramat in Division 23, and in the Goldfield Road area in Division 17. In the Port Arthur District the incidence of this disease remained low.

Tip Blight of Balsam Fir, Rehmiellopsis balsamea Waterm.

A new distribution record for this organism was established in the Port Arthur District in 1966 when light to moderate infection occurred on several open-grown balsam fir trees in MacGregor Township. The disease was found for the first time in 1958 but until 1966 was confined to the Black Sturgeon area.

Tar Spot of Maple, Rhytisma punctatum Pers. ex Fries.

This leaf disease of mountain maple occurred commonly throughout the Port Arthur District and the western part of Geraldton District. The severity of infection was light at most locations. However, moderate to severe damage was observed at several points on Sibley Peninsula and along the Armstrong Road.

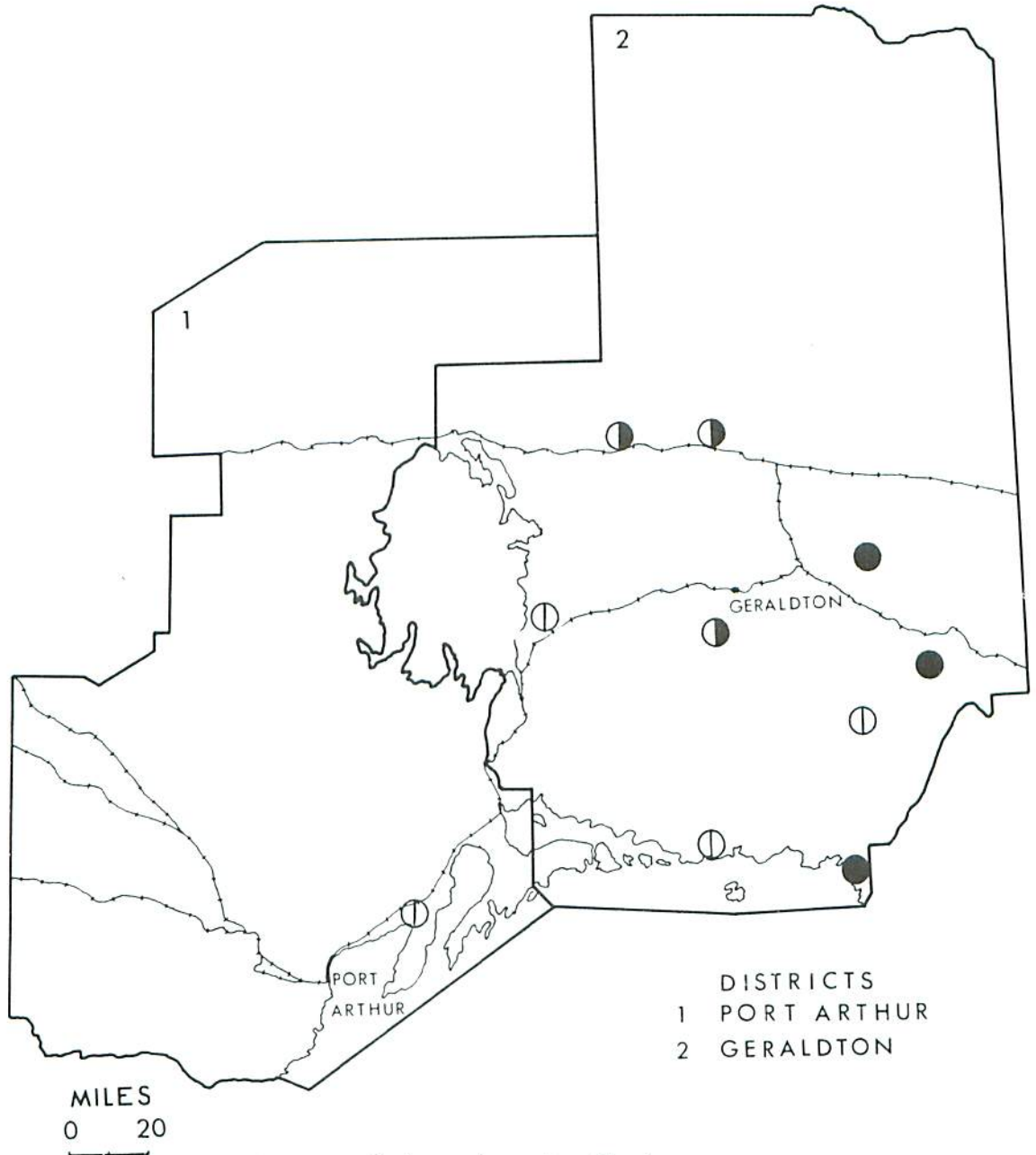
Tar Spot of Willow, Rhytisma salicinum Pers. ex Fries.

A marked increase in the incidence of this disease occurred in the Geraldton District in 1966. A high degree of infection was observed on scattered clumps of willow along the Auden and Goldfield roads and east of Longlac. The highest incidence was recorded at Chipman Lake Road, in Division 23, where 70 per cent of the leaves were infected. The incidence remained low at all sampling points in Port Arthur District.

Scleroderris Canker of Pine, Scleroderris lagerbergii Gremmen.

This destructive organism occurred commonly in the eastern part of the region in 1966, but only rarely in the western section (see map). Although the disease is confined to small diameter hosts, it was present in both plantations and natural regeneration and in varying degrees of severity. In plantations the highest incidence of infection was observed on Scots and jack pine trees in O'Meara Township, in jack pine plantings in Kowkash and Pic townships and at one location south of Stevens. In sample plots in the latter area 41.2 per cent mortality was caused by this organism. The degree of infection in red pine plantations was considerably lower, however, in Sandra and McTavish townships a low percentage of mortality was recorded (Table 2). Infections were found frequently in natural jack-pine regeneration throughout Division 23 and in several areas in Division 80. Light to moderate branch mortality occurred commonly in the affected stands; however, tree mortality was low except at one location in Kowkash Township where 18.8 per cent of the examined trees were killed.

MIDWESTERN FOREST REGION



Scleroderris Canker

Locations where infections
were observed in 1966

Legend

- Light infection ⊙
Medium infection ◐
Heavy infection ●

TABLE 2

Summary of Incidence and Tree Mortality Caused by Scleroderris lagerbergii in the Midwestern Region in 1966

Location	Stand type	Host	No. of trees examined	Height in feet	Incidence Per cent of infected trees	Mortality Per cent of dead trees	Old mortality cause unknown
Stevens	Plant.	jP	160	3	10.6	41.2	Light
Kowkash Twp.	"	jP	415	3	0	25.0	"
Pic Twp.	"	jP	100	6	77.0	20.0	"
McTavish Twp.	"	rP	400	3	5.8	3.5	Nil
Sandra Twp.	"	rP	206	8	37.3	3.4	Light
Kowkash Twp.	Natural	jP	170	4	0	18.8	Nil
Kowkash Twp.	"	jP	100	8	62.0	0	"
Exton Twp.	"	jP	100	6	88.0	3.0	"
Goldfield Rd.	"	jP	100	6	84.0	2.0	Light
Township 83	"	jP	160	5	25.0	2.5	"
Davies Twp.	"	jP	223	8	9.4	.4	Nil
Average for all sampling points					22.9	11.4	

Hail Damage

In May 1963 two sample plots were established in Errington Township to study tree mortality in an area that was heavily damaged by a hailstorm in 1961 (Forest Insect and Disease Annual Report Ontario Region 1962). The trees were tallied as respecting to the extent of damage, d.b.h. and crown class. In the following years examinations were made periodically and all disease organisms found on dead trees or branches were submitted to the Forest Disease Survey for identification. The damage to individual trees in both plots ranged from light to severe branch mortality. In the majority of cases the bark was punctured by hail stones and the cambial layer on one side of the trunk was killed.

Plot No. 1 was established in a dense young, fire-origin jack pine stand containing trees in the 1 to 5 inch d.b.h. class. Armillaria mellea (Vahl. ex Fr.) Kummer was the most common organism found and accounted for ~~22.3~~ per cent of tree mortality (Table 3).

TABLE 3

Jack Pine Tree Mortality in a Hail Damage Plot in the
Geraldton District from 1963 to 1966

Causal organism	Cumulative percentage of dead trees			
	1963	1964	1965	1966
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer	2.8	9.3	14.9	22.3
<i>Tremmela</i> sp.		5.6		
<i>Scolecocetria</i> sp.		.9		
<i>Tympanis confusa</i> Nyl.		.9		
Other organisms	1.8			

Plot No. 2 was established in a mixed regeneration stand in an old cutover. The highest mortality rate, 43.6 per cent, occurred on balsam fir followed by white birch, 9.5 per cent and black spruce, 8.0 per cent. Disease organisms found on dead trees are as follows (Table 4):

TABLE 4

Summary of Organisms Collected and Per Cent of Trees Affected
in a Hail Damage Plot in the Geraldton District

Causal Organism	Tree species	Per cent of trees affected
<i>Thyronectria balsamea</i> (Cke. & Pk.) Seel.	bF	12.8
<i>Valsa</i> sp.	bF	10.2
<i>Bothrodiscus pinicola</i> Shear	bF	5.1
Other fungi	bF	15.5
<i>Diatrypella betulina</i> (Pk.) Sacc.	wB	4.7
<i>Melanconium</i> sp.	wB	2.4
Other fungi	wB	2.4

Wind Damage.

In early July, 1966, a windstorm caused heavy damage to coniferous and broad-leaved trees in an area of approximately 50 square miles north of Nakina. The affected area extended from the eastern half of Esnagami Lake southeastward between Alph and Sexsmith lakes and through the Cordingley Lake area (see map). The damage was most severe on Louella, Bill and Ara islands and along the southeastern shore of Esnagami Lake where trees in jack pine and trembling aspen stands were partially, or completely, uprooted and others were broken. Heavy windthrow and breakage also occurred along lakeshores and on knolls in the Cordingley Lake area. Extensive blow-down was observed in the cut-over areas south east of Cordingley Lake where large residual trembling aspen and clumps of black spruce were uprooted or broken.

Numerous trees were also broken in a hillside white birch stand at Leonard Lake in Kilkenny Township.

TABLE 5

Other Noteworthy Organisms in the
Midwestern Region in 1966

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Vahl ex Fr.)	tA	Found on small dead trees in Rupert Twp.
<i>Cenangium ferruginosum</i> Fries	jP	Collected on dead branches at Marathon
<i>Chrysomyxa ledicola</i> Lagerh.	Labrador tea	Pockets of this rust common at one location in Croll Twp.
<i>Coleosporium asterum</i> (Diet) Syd.	jP	Lower branches lightly infested on several trees in Upsala and Bain twps.
<i>Cronartium ribicola</i> J. C. Fischer	Goos-berry	Light infections on several plants at Percy Lake
<i>Cytospora chrysosperma</i> (Pers.) Fries	tA	Organism found on small trees killed by <i>A. mellea</i> in Rupert Twp.
<i>Erwinia amylovora</i> (Burr.) Winslow et al.	Mo	Very low incidence in Gorham Twp.
<i>Erysiphe aggregata</i> (Pk.) Farl.	Al	Low incidence on scattered hosts, Upsala Twp.; found commonly in Conmee Twp.
<i>Ganoderma applanatum</i> (Pers. ex Waller) Pat.	tA	Recovered on root system of one hybrid aspen at Thunder Bay Nursery
<i>Hypodermella ampla</i> (J. J. Davis) Dearn.	jP	Incidence declined from severe to light in Eva Twp. Light to moderate infections on scattered trees in O'Meara Twp.
<i>Mamianiella coryli</i> (Batsch ex Fries) Hoehn.	Hazel	Severe on one clump, Limestone Lake
<i>Melampsora epitea</i> Thuem.	W	Heavy infection on scattered branches of lakeshore trees, Twp. 83
<i>Melampsora medusae</i> Thuem.	W	Light leaf rust on small shrubs at Pays Plat River, Twp. 87
<i>Mellampsorella caryophyllacearum</i> Schroet.	bF	Witches' brooms occur throughout the Pays Plat area and in Blacksand Park in Kilkenny Twp.
<i>Nyssopsora clavellosa</i> (Berk.) Arth.	Aralia	Rust common along the MacDiarmid Fire Tower trail
<i>Peridermium</i> sp.	jP	Occasional galls on understory trees at Owl Lake

TABLE 5 (continued)

Organism	Host(s)	Remarks
<i>Pollaccia saliciperda</i> (All. & Tub.) V. Arx	W	One clump of willow moderately infected in the City of Port Arthur, first district record
<i>Puccinia asteris</i> Duby	Aster	Low incidence common at widely scattered collection points
<i>Puccinia coronata</i> Cda.	Rhamnus sp.	Common in Croll Twp.
<i>Puccinia hieracii</i> (Roehling) Martius	Dandelion	First record for Geraldton District
<i>Pucciniastrum potentillae</i> Korn.	Potentilla tridentata	Found in Twps. 78 and 86
<i>Pucciniastrum pustulatum</i> (Pers.) Diet.	bF	Low incidence of leaf rust at Marshall Lake
<i>Sclerophoma pithyophila</i> Hoehn.	rP, scP	Found on numerous dead red pine tips at Twomey Lake and in plantations in Neys Park and in O'Meara Twp.
<i>Scolecnectria scolecospora</i> (Bref.) Seaver	wP	Found infrequently in a white pine plantation in Paipoonge Twp.
<i>Thyronectria balsamea</i> (Cke. & Pk.) Seel.	bF	Collected on widely scattered dead trees along LeMay Road and in Herbert Twp.
<i>Valsa leucostoma</i> Fries	W	Pocket of severe stem and branch mortality at Mile 10 Goldfield Road.

STATUS OF INSECTS IN THE PORT ARTHUR DISTRICT

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K. C. Hall

STATUS OF INSECTS

Ugly-nest Caterpillar, Archips cerasivorana Fitch

Three pockets of heavy infestation of this insect occurred in the district in 1966. The largest of these was located at Whitefish Lake where over 200 tents was recorded along $\frac{1}{4}$ mile of roadside. High populations persisted at the junction of the Stanley and Twin City Crossroads. A new area of infestation occurred in Rosslyn Village in Paipoonge Township. Colony counts at these locations averaged 37 and 23 respectively. Low populations were observed in Devon Township and along the Burchell Lake road.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Population levels of this important insect increased in a 5-acre stand containing balsam fir and white spruce in a wide range of diameter classes in the Burchell Lake area in 1966. The last year of significant damage by the spruce budworm in this locality occurred in 1963 when seven per cent defoliation was recorded. Population levels remained at endemic levels the following two years but, in 1966, an appreciable population increase occurred and nine per cent defoliation of balsam fir resulted. An assessment of egg mass densities showed an average of five masses per 100 square feet of foliage indicating that a light infestation will continue in 1967. Elsewhere in the district population levels were very low.

Larch Casebearer, Coleophora laricella (Hbn.)

No important change in the status of this insect was observed in 1966. A small increase in numbers of larvae occurred in MacGregor Township and minor declines were recorded in Crookes Township and on Sibley Peninsula (Table 6).

TABLE 6

Summary of Larch Casebearer Counts on Tamarack Trees in the Port Arthur District from 1964 to 1966

Location	Av. d.b.h. in inches	Av. number of larvae per 18" branch tip		
		1964	1965	1966
MacGregor Twp.	7	4.0	5.4	6.2
O'Connor Twp.	6	.7	.1	.1
Crookes Twp.	4	4.6	1.9	1.2
Sibley Peninsula	5	1.2	1.6	.2

A Bark Beetle of the Genus Conophthorus sp.

A light-to-moderate infestation of this beetle persisted on a jack pine windbreak in Upsala Township. Quantitative sampling showed an average of 2.4 damaged shoots per tree. Low populations were observed at one other location in the district.

European Spruce Sawfly, Diprion hercyniae (Htg.)

This introduced sawfly occurred in small numbers throughout Division 24, primarily on open-grown white spruce trees. The highest number was an average of 5.1 insects per mat sample in O'Connor Township (Table 7.)

TABLE 7

Summary of Collections of the European Spruce Sawfly in the Port Arthur District in 1966

Note: Ten mat samples taken from white spruce trees.

Location	Date sampled	Av. number of insects per mat sample
Devon Twp.	July 15	1.5
Devon Twp.	Sept. 9	.5
O'Connor Twp.	Aug. 30	2.6
O'Connor Twp.	Sept. 26	5.1
Scoble Twp.	Aug. 8	1.6

A Birch Leaf Miner, Fenusa pusilla (Lep.)

A marked increase in population levels of this miner was observed in the cities of Fort William and Port Arthur. Light to moderate infestations occurred on numerous white birch trees and, in several instances, high populations were observed. Numerous extension calls were received with respect to this insect. No infestations were observed in forested areas but new distribution records were established in Conmee Township, on Sibley Peninsula and as far north as Black Sturgeon Lake.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Population levels of this beetle varied considerably in the district in 1966. A sharp decline occurred in the Dog Lake area where very light defoliation of small diameter roadside trees was observed. Along Highway 11 and 17 west populations increased and defoliation ranging from 5 to 15 per cent was observed on numerous small, fringe trees. Light defoliation occurred commonly along the Armstrong road.

Birch Leaf Roller, Gracillaria sp.

Heavy infestations of this roller persisted on large white birch trees at Plummes Lake in 1966, where approximately 75 per cent of the leaves were damaged. Light to moderate infestations occurred at scattered locations along Highway 11 from Huronian Lake west to the district boundary. Elsewhere in the district populations were low.

Blotch Miner on Balsam Poplar, Lithocolletis sp.

Population levels of this insect were high at most sample points in 1966. Heavy infestations persisted in Marks, Scoble, Conmee and Oliver townships where an upward trend in larval populations and numbers of mined leaves was recorded. Although heavy infestations persisted in Paipoonge and O'Connor townships, quantitative sampling revealed a decline in numbers of mined leaves (Table 8). Medium infestations were observed in Neebing Township where low populations had occurred for several years.

Adult emergence was slightly lower than in 1965 at all sample points except in Scoble and Marks township where significant increases were recorded (Table 9). Larval mortality ranged from 21 to 48 per cent. Parasitism was the primary control factor causing from 12 to 28 per cent mortality. Cannibalism and predation were low and mortality from unknown causes increased from an average of 9 per cent to 12 per cent.

TABLE 8

Comparison of Counts of Lithocolletis sp. in the Port Arthur District in 1965 and 1966

Note: 100 leaves examined at each location.

Location (township)	Per cent of leaves mined		Av. no. of mines per leaf	
	1965	1966	1965	1966
Marks	54	96	.6	1.9
O'Connor	98	85	3.8	2.3
Neebing	15	50	.1	.6
Scoble	79	100	1.4	4.4
Conmee	61	63	1.0	.9
Paipoonge	96	68	3.7	1.2
Oliver	67	100	1.0	3.9

TABLE 9

Summary of Adult Emergence and Larval Mortality of Lithocolletis sp.
in the Port Arthur District in 1965 and 1966

Note: 100 leaves examined at each location.

Location (township)	Per cent of mines showing adult emergence		Per cent larval mortality	
	1965	1966	1965	1966
Marks	41	79	59	21
O'Connor	84	73	16	27
Neebing	67	52	33	48
Scoble	70	77	30	23
Conmee	73	53	27	47
Paipoonge	67	53	33	47
Oliver	70	62	30	38

Aspen Blotch Miner, Lithocolletis salicifoliella Chamb

The light infestations of this miner reported in the Lac Des Mille Lac area and along the Atikokan road in 1965 increased to heavy intensity in 1966. Populations were confined to small diameter roadside aspen trees. Elsewhere in the district populations were low.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

A marked reduction in the area of heavy infestation of the forest tent caterpillar occurred in the district in 1966. This spectacular decline was attributed to a late cold spring which caused almost complete hatch failure throughout a large portion of the district (Table 10). Records show that forest tent caterpillar eggs normally hatch in early May. However, in 1966, cold weather conditions delayed hatching until late May and most of the fully-formed larvae died inside the eggs.

In 1965 heavy defoliation of trembling aspen occurred over an area of approximately 5000 square miles. In 1966, moderate-to-heavy infestation was mapped in an area of 120 square miles extending from Deatys Lake west to the district border (see map). Damage within the infestation was spotty with numerous patches of heavy and light defoliation interspersed. Small isolated pockets of light infestation occurred at Watershed and Greenwater Lakes in Division 34 and at Kabitotikwia Lake in Division 27.

Forecasts for 1967, based on egg mass counts, indicate a southward spread of light infestation and an upward trend of populations in the Greenwater Lake area (Table 11).

TABLE 10

Summary of Per Cent of Forest Tent Caterpillar Egg Hatch in the Port Arthur District in 1966

Note: Ten egg masses examined at each location

Location	Av. number of eggs per band	Per cent of eggs hatched	Degree of defoliation
Upsala Twp.	156	2.0	Nil
English River	169	3.2	Nil
East of Raith	167	1.5	Nil
Trewartha Twp.	149	1.4	Nil
Chief Bay	172	5.0	Nil
Mile 70 (Armstrong Rd.)	141	0.0	Nil
Black Sturgeon Lake	135	19.5	Nil

TABLE 11

Summary of Forest Tent Caterpillar Egg Band Counts and Infestation Forecasts for 1967 in the Port Arthur District

Location	Av. d.b.h.	Av. number of egg bands per tree 1966	Forecast for 1967
Greenwater Lake	4	7	Severe
Greenwood Lake	5	3	Moderate
Moss Lake	6	1	Light
Plummes Lake	5	0	Nil
Burchell Lake	4	0	Nil

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Population levels of this insect remained low in the district. The highest count was recorded in MacGregor Township where eight colonies were recorded along one mile of roadside.

Balsam-fir Sawfly, Neodiprion abietis complex

No important change in the status of this insect was observed in the district in 1966. At Black Sturgeon Lake and Inwood Park colony counts on open-grown balsam fir averaged 1.3 and 1.0 per tree respectively. Population levels on white spruce in O'Connor, Marks, Gillies and Paipoung townships were low and comparable to 1965.

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl

No infestations of this sawfly were observed in 1966. The highest colony counts occurred on a jack pine shelterbelt in Savanne Township and on open-grown regeneration in Paipoonge Township where an average of 1.3 and 1.0 colonies per tree was recorded. Small numbers of colonies were collected more commonly than in the past several years.

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Two small pockets of medium infestation of this sawfly occurred in the district in 1966. Medium populations persisted on open-grown jack pine trees at the Department of Highways Headquarters on the Atikokan road where an average of 8.6 colonies was recorded compared with 7 in 1965. In Savanne Township populations increased from endemic levels in 1965 to an average of 5.9 colonies per tree in 1966. Heavy defoliation was observed on scattered open-grown trees in Oliver, McIntyre and Neebing townships and on Sibley Peninsula.

Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.

Infestations of this defoliator occurred at numerous locations throughout Division 24. The most severe damage was observed in a white spruce plantation in McTavish Township where defoliation ranged from 40 to 90 per cent. Moderate defoliation occurred on numerous small open-grown spruce in the Lakehead cities. In the Great Lakes plantation in O'Connor Township defoliation averaged 10 per cent. Elsewhere in the district damage was light and confined to small trees or lower branches of fringe trees.

White pine Weevil, Pissodes strobi Peck

Damage caused by the white pine weevil was light in all areas sampled in 1966. Damage appraisals showed a decrease in the per cent of trees weevilled in five pine plantations (Table 12).

TABLE 12

Summary of Leader Damage by the White Pine Weevil in the Port Arthur District from 1964 to 1966

Location	Tree species	Av. d.b.h.	Number of trees examined	Per cent of trees weevilled		
				1964	1965	1966
Thunder Bay Nursery	jP	4-5	183	3	6	4
(Paipoonge Twp.)	jP	2-3	272	10	8	2
Boy Scout Tree Farm	wP	3	155	8	9	7
(Paipoonge Twp.)	ScP	4-5	709	9	6	3
	ScP	3-4	343	13	12	9

Amber-marked Birch Leaf Miner, Profenusa thomsoni (Konow)

Population levels of this insect remained low in the district in 1966. This miner was first observed in the district in 1963 occurring at scattered locations in Division 24 as a result of a westerly extension of infestation from Geraldton District. New distribution records established in the past three years show that the insect is widely distributed throughout the district.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt.

Population levels of this insect remained low in the district in 1966. Quantitative sampling showed a downward trend in the number of infested buds at all sample points (Table 13).

TABLE 13

Summary of Damage by the Spruce Bud Gall Midge in the Port Arthur District from 1963 to 1966

Location (township)	Tree species	Per cent of terminal buds infested			
		1963	1964	1965	1966
Joynt	bS	1.1	1.6	1.1	1.0
Goldie	bS	1.4	1.4	1.0	0.0
92	bS	.4	4.0	1.9	1.1
MacGregor	wS	1.2	1.0	1.1	.6

TABLE 14

Summary of Miscellaneous Insects Collected in the Port Arthur District in 1966

Insect	Host(s)	Remarks
<u>Acleris gallicolana</u> Clem	W	Small numbers at several locations in Paipoonge Township
<u>Acleris variana</u> Fern	wS	Light populations in association with spruce budworm along the Burchell Lake road. Small numbers common on fringe trees in O'Connor Township
<u>Adelges abietis</u> Linn.	bS	Small numbers on many small trees at Ameythst Harbour. This is an introduced insect and although found principally in the east has been collected at several locations in the district in the past few years
<u>Adelges strobilobius</u> Kalt.	bS	Few galls on one tree at English River

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Anchylopera</i> sp.	W	Small numbers on one species of willow at one location in O'Connor Township
<i>Aphrophora parallela</i> Say	ScP, jP	Light infestation on fringe trees at several locations in Conmee and Oliver townships
<i>Calligrapha multipunctata</i> <i>bigbyana</i> Kby.	W	Small numbers on sample trays in Paipoonge Township
<i>Chrysomela falsa</i> Brown	W	Adults found frequently at one location in Pyramid Township
<i>Chrysomela</i> sp.	W	Light skeletonizing on numerous hosts along Lac Des Mille Lac road and at scattered locations in Pyramid Township
<i>Cimbex americana</i> (Leach)	W	Recovered in small numbers on sample trays at numerous locations
<i>Coleophora betulivora</i> McD.	wB	Single larvae collected at two locations
<i>Dasyneura serrulatae</i> O.S.	Al	Galls caused by this insect common at one location in Fallis and Upsala townships
<i>Eufidonia notataria</i> Wlk.	jP	Collected in Paipoonge Township. Not recovered in other areas where beating samples taken
<i>Eupithecia palpata</i> Pack	jP	Found in small numbers in association with <i>Semiothisa bicolorata</i> at all sampling points
<i>Fenusa dohrnii</i> (Tischb)	Al	Light infestation on most trees along Twin city crossroads in Paipoonge Twp. and along the Pine Portage road
<i>Galerucella decora</i> Say	W	Moderate infestation at several locations along the Spruce River road. Defoliation averaged 40 per cent
<i>Gypsonoma fasciolana</i> Clem	Se	Endemic population, Sibley Peninsula
<i>Hydriomena divisaria</i> Wlk	wS	Few larvae on sample trays in Scoble Township
<i>Monochamus scutellatus</i> (Say)	bS	Numerous larvae recovered in trap logs at Marks Lake
<i>Monoctenus fulvus</i> (Nort.)	eC, Jun.	Small numbers recovered on tray samples in O'Connor Township, Whitefish Lake and on Sibley Peninsula
<i>Nematus fulvicrus</i> Prov.	W	Ave. 4 colonies per tree, Savanne Township

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Nematus limbatus</i> Cress.	W	Occurred commonly on open-grown trees in Fort William, scattered colonies along Spruce River road
<i>Neodiprion abbotti</i> Cress	jP	Few larvae on tray samples, Paipoonge and Oliver townships
<i>Neodiprion compar</i> (Leach)	jP	Recovered on mat samples in Paipoonge and Oliver townships and at scattered locations along the Atikokan road
<i>Neodiprion nigroscutum</i> Midd	jP	Small numbers, Oliver Township
<i>Nycteola cinerea</i> N. & D.	bPo	Small numbers on small diameter hosts in Nipigon Township
<i>Nycteola frigidana</i> Wlk	W	Light populations on scattered host at Marie Louise Lake
<i>Paratetranychus ununguis</i> (Jac.)	jP	Very heavy populations on three trees in Fort William
<i>Phratora americana canadensis</i> Brown	W	One colony on fringe trees, Argon River
<i>Phyllocolpa agama</i> (Roh.)	W	Moderate populations on numerous trees at one location in O'Connor Township
<i>Phyllocolpa</i> sp.	bPo, tA	Common on small diameter hosts along Stanley road, Paipoonge Township
<i>Pikonema dimmockii</i> (Cress.)	wS	Found in small numbers on sample trays at numerous locations
<i>Pineus pinifoliella</i> Fitch	wS	Small number of galls on open-grown hosts, MacGregor Township
<i>Pineus similis</i> Gill	wS	Few galls on one tree at Black Sturgeon Lake
<i>Pineus strobi</i> (Htg.)	wP	Light infestation on several trees, Kab Lake
<i>Pissodes approximatus</i> Hopk.	S	Numerous adults collected from roots at one location in Paipoonge Township
<i>Pristiphora lena</i> Kincaid	wS	Few larvae, Devon Township
<i>Pulicalvaria piceaella</i> Kft.	wS	Few larvae on sample trays, O'Connor Township
<i>Pyrrhia umbria expermens</i> Hufn	bPo	Small numbers on small roadside hosts, Nipigon Township
<i>Semiothisa bicolorata</i> Fabr.	jP	Found commonly on open-grown trees in Paipoonge Township. Smaller populations recovered in Devon, Oliver and O'Connor Townships

TABLE 14 (continued)

Insect	Host(s)	Remarks
<i>Semiothisa bisignata</i> Wlk	wP	Small numbers, Neebing Township
<i>Semiothisa dispunctata</i> Wlk.	wS	Few larvae on fringe trees in Devon and O'Connor townships
<i>Semiothisa orillata</i> Wlk	eC	Small numbers on sample trays in Pardee and O'Connor townships
<i>Semiothisa sexmaculata</i> Pack	tL	Found commonly in Joynt and Upsala townships
<i>Sternochaetus lapathi</i> (Linn.)	W	Collected in O'Connor Township, two trees dead
<i>Thera juniperata</i> (L.)	Jun.	Small numbers, Sibley Peninsula
<i>Trichiocampus irregularis</i> (Dyar)	W	Small numbers, Argon River
<i>Trichiosoma triangulum</i> Kby	W	Light populations in association with <i>Calligrapha</i> sp., Paipoonge Township
<i>Zeugophora</i> sp.	bPo	Light numbers on small hosts along Spruce River and Silver Mt. roads.