Status of Insects in the Sudbury District

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INFORMATION REPORTS - INSECT AND DISEASE SURVEYS

Ontario, 1968

FOREWORD

The Forest Insect and Disease Survey maintains a continuing interest in improving existing sampling methods and in developing new techniques for rating forest pests and appraising damage. In 1968, a new approach for evaluating incidence and levels of infection of a number of tree diseases was explored. This involved determining degrees of damage in random and non-random plots in relation to the basal area of infected stands, the ultimate objective being to provide information on the impact of the organisms on forest stands in Ontario. Studies during the winter to test the accuracy of the new sampling system will be useful for planning field work in 1969. Improvement of insect survey methods in 1968 was largely directed toward jack-pine budworm sampling with emphasis on egg population studies. To this end, the distribution of egg masses on individual branches and at various crown levels of sample trees was investigated as a basis for determining the nature and size of samples required to assess population levels. The value of these new approaches in disease and insect sampling will be proven with use in forthcoming field seasons.

Marked changes in insect and disease conditions were recorded in large areas of the Province in 1968. A sharp increase in population levels of the spruce budworm and jack-pine budworm occurred in many parts of Ontario. The largest areas of infestation of the spruce budworm were located in the Burchell Lake area in the Port Arthur District, in parts of the Chapleau, Kapuskasing and Swastika districts and in southeastern Ontario. Localized infestations were centered in Parkinson Township in the Sault Ste. Marie District and in Fairbanks Township west of Sudbury. Egg surveys in most of the above areas except Burchell Lake, indicated that infestations will increase in extent in 1969.

The chemical control operation undertaken by the Ontario Department of Lands and Forests against the spruce budworm in the Burchell Lake area dominated insect surveys in western Ontario during several periods from May until September. Technicians were involved in intensive sampling to delineate the area to be treated, to time the spray applications and to assess spruce budworm numbers before and after the control operation.

Infestations of the jack-pine budworm abated somewhat in the Kenora and Fort Frances districts but several years of severe defoliation, particularly on rocky sites, caused considerable crown damage. In parts of the Sault Ste. Marie and Pembroke districts very severe defoliation of both jack pine and red pine was reported. Other insects occurring in particularly high numbers in 1968 included the saddled prominent, larch casebearer and several species of cedar leaf miners.

Devastation of elm by Dutch elm disease continued in southern Ontario and numerous new centers of infection were found throughout a large part of the range of elm in central Ontario. A vector of Dutch elm disease, the smaller European elm bark beetle extended its range eastward along the north shore of Lake Ontario and St. Lawrence River. Hypoxylon canker of poplar proved to be a serious problem in many parts of Ontario. Evaluations revealed particularly high levels of infection in aspen stands in the Sault Ste. Marie and Sudbury districts. Scleroderris canker of pine again caused considerable

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mortality in young red pine and jack pine plantations in parts of central and northeastern Ontario. Fomes root rot usually associated with thinning operations, caused varying amounts of mortality in red pine plantations in southern Ontario. Four new centers of infection of this disease were found in Larose forest in the Kemptville District in 1968. Details on the above and other noteworthy insect and disease problems are contained in the report that follows.

J. E. MacDonald

STATUS OF INSECTS IN THE SUDBURY DISTRICT

E. L. Houser

Pine Spittle Bug, Aphrophora parallela Say

High populations of this insect have persisted for four consecutive years in Scots pine plantations on Manitoulin Island. The most severely damaged trees were observed in Gordon, Sandfield, Dawson, and Billings townships. Damage was characterized by loss of vigor, browning foliage, and dried out twigs. Low populations were observed on white and jack pine stands in Allen, Struthers, Travers, N and B townships.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Population levels of the spruce budworm increased sharply in the district in 1968. Moderate to severe defoliation was observed at two locations, the larger comprising an area of about 17,500 acres occurred in Fairbank and Creighton townships in Division 70. A smaller pocket of about 300 acres was observed in Asquith Township in the eastern part of the Gogama Division (see map). Ground surveys showed higher larval populations than in 1967 (Table 7).

TABLE 7

Summary of Spruce Budworm Larval Counts in the Sudbury District in 1967 and 1968

Location (township)	Host	Av. d.b.h. of sample trees in inches	Total no. of larvae per 20 tray sample	
			1967	1968
Balfour	wS	8	26	131
Hallam	bF	5	--	4
Hart	wS	10	--	10
Nairn	bF	6	2	4
Salter	wS	10	10	70

Defoliation and egg mass surveys carried out at several locations to forecast population levels in 1969 are shown in Table 8.

TABLE 8

Summary of Spruce Budworm Egg and Defoliation Estimates for 1969

Location	% Defoliation	Cumulative no. of egg masses/100 sq. ft. of foliage	1969 defoliation forecast *
Asquith	35	1440	S
Fairbank	47.5	435	M
Hazens	22	40	L
Kelvin	6	43	L
Stethan	14	8	L

* L - light; M - moderate; S - severe

Jack-pine Budworm, Choristoneura pinus pinus Free

A further increase in population levels of this insect occurred in the district in 1968. A medium infestation persisted on flowering trees in a Scots pine plantation in Gordon Township. Pockets of moderately defoliated jack pine trees were observed in Allen Township near Hartley Bay (Table 9) and a band of light infestation was observed along the north shore of the French River (see map). Light infestations were also observed in Noble and Hallam townships.

TABLE 9

Summary of Larval Counts of the Jack Pine Budworm in the Sudbury District in 1968

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

Location (township)	Host	Av. d.b.h. of sample trees in inches	Total number of larvae per location
Allen	jP	5	44
Scollard	jP	4-6	28

Larch Casebearer, Coleophora laricella Hbn.

This insect declined in numbers throughout the district (Table 10).

Several heavily defoliated larch trees were observed approximately six miles north of Providence Bay in Campbell Township, Manitoulin Island.

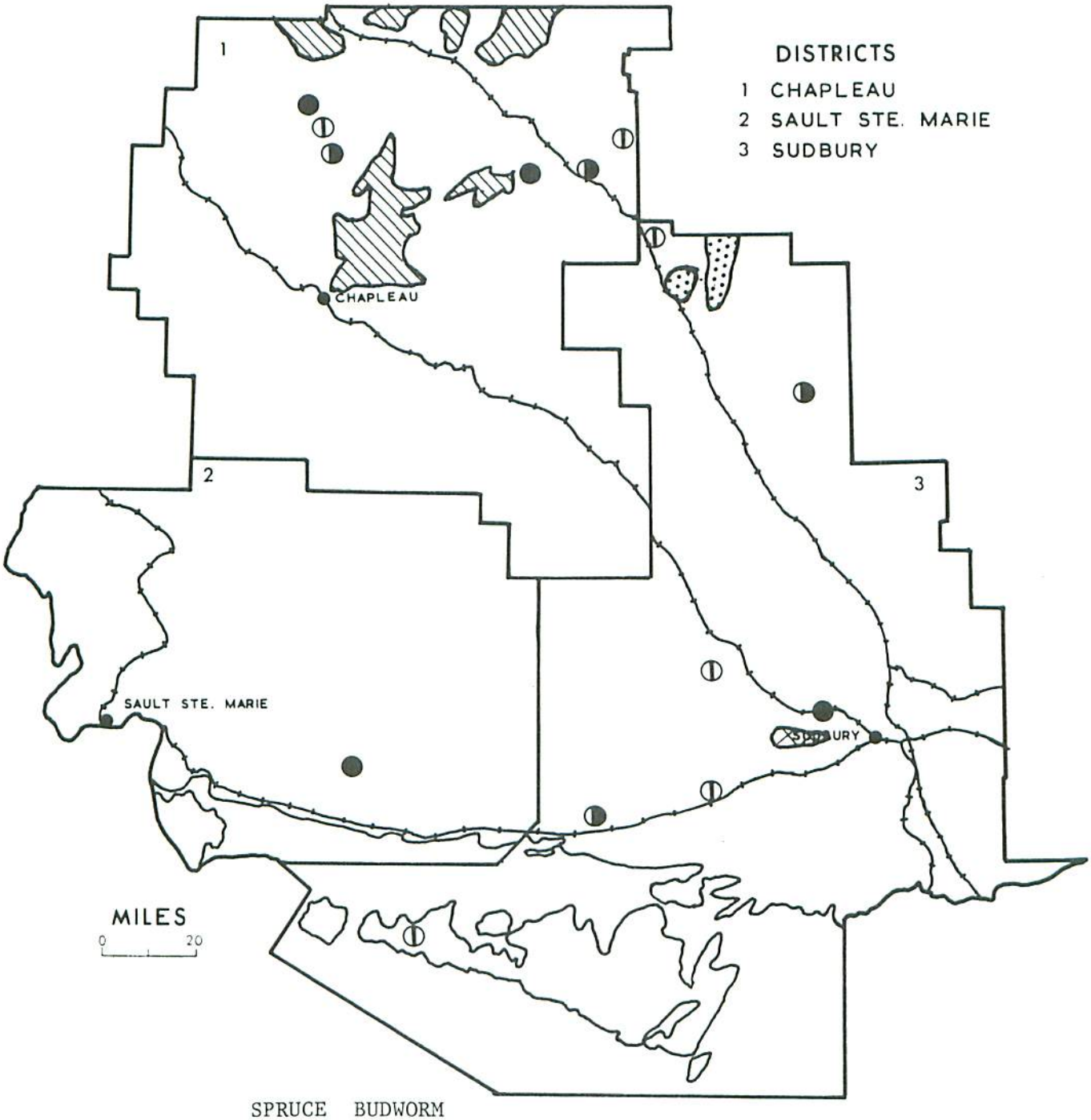
TABLE 10

Summary of Larval Counts of the Larch Casebearer in the Sudbury District from 1966 to 1968

Note: Counts are based on the examination of four 18 inch branch tips from each of four trees at each location.

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of larvae per 18-in. branch tip		
		1966	1967	1968
Cascaden	4	0.8	7.2	0.1
Delamere	4	0.1	0.1	0.2
Dill	5	5.2	1.1	0.1
Hallam	5	1.5	8.1	0.4

CENTRAL FOREST REGION



SPRUCE BUDWORM
Areas and locations where defoliation was observed in 1968

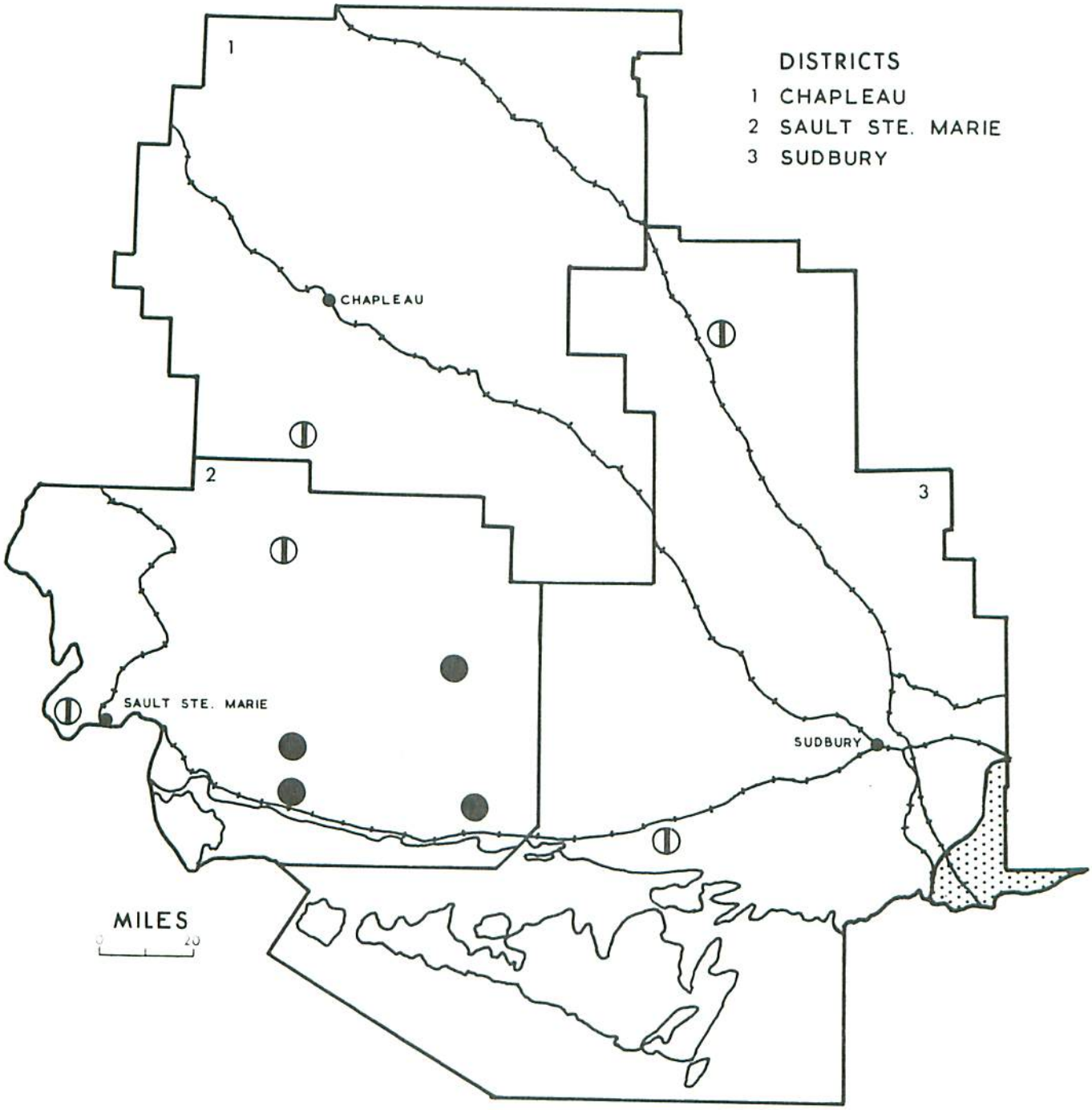
Legend

Light defoliation ---------- and ◑

Moderate defoliation ---------- and ◑

Severe defoliation ---------- and ●

CENTRAL FOREST REGION



JACK PINE BUDWORM

Areas and locations where defoliation was observed in 1968

Legend

Light defoliation --------- ◐ and ▭

Severe defoliation -------- ●

European Spruce Sawfly, Diprion hercyniae (Htg.)

Surveys showed a further decrease in population levels of this insect (Table 11).

TABLE 11

Summary of European Spruce Sawfly Larval Counts on White Spruce Trees in Sudbury District from 1966 to 1968

Location (township)	Av. d.b.h. of sample trees in inches	Total no. of larvae per 15 tray sample 1966	1967	1968
Bigwood	12	160	—	11
Billings	10	52	14	5
Denison	12	10	—	10
Hagar	10	48	—	9
Hallam	10	31	26	8

Forest Tent Caterpillar, Malacosoma disstria Hbn.

A considerable increase in population levels of the forest tent caterpillar occurred in the southwestern part of the district (see map). This represented an extension of the infestation from the southeastern part of the Sault Ste. Marie District. Trembling aspen within this area of approximately 120 square miles was moderately to severely defoliated. Infestations in Merritt Township and near Mindemoya on Manitoulin Island declined in 1968. Egg band surveys carried out in Shedden Township averaged 17 egg bands per tree indicating that high populations can occur in that area in 1969.

Red Headed Pine Sawfly, Neodiprion lecontei (Fitch)

A general decline in the numbers of colonies occurred at sample locations (Table 12). Scattered colonies were observed in red pine windbreaks along Highway 17 in Victoria and Salter townships. A few colonies were also observed in Scots pine plantations in Gordon Township on Manitoulin Island. Population levels in a formerly heavily infested red pine plantation on Cockburn Island declined to a very low level.

TABLE 12

Summary of Red-headed Pine Sawfly Colony Counts on 100 Red Pine Trees at Two Locations in Sudbury District from 1966 to 1968

Location (township)	Av. height of sample trees in feet in 1968	No. of trees infested			Av. no. of colonies per infested tree		
		1966	1967	1968	1966	1967	1968
Burwash	10	—	30	4	—	1.9	1.5
Hallam	11	10	6	2	7.7	3.0	1.0

Red Pine Sawfly, Neodiprion nanulus nanulus Schedl. and
Black-headed Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

Populations of these two species of sawflies remained low in 1968. Light defoliation of jack pine trees was observed at several locations throughout the district (see map). N. pratti banksianae was found at all quantitative sample points except on Cloche Island (Table 13). Scattered colonies of N. nanulus nanulus were observed on both red and jack pine trees near Shakwa Lake in B Township.

TABLE 13

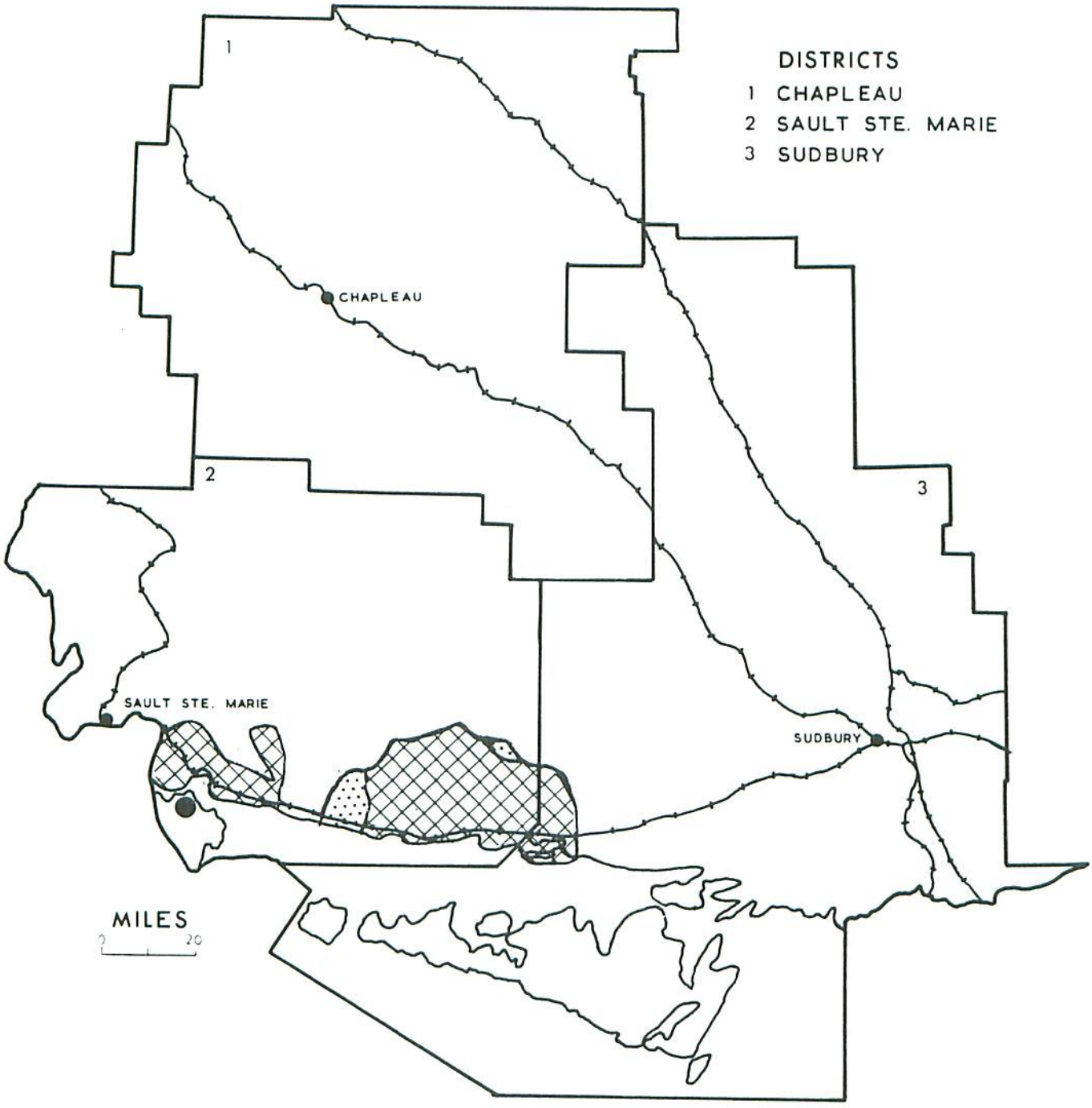
Colony Counts of Jack and Red Pine Sawflies on 100 Jack Pine Trees at Each Location in the Sudbury District in 1968

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of colonies per tree in 1968
Cloche Island	4	.33
Hanmer	5	.05
Nairn	7	.06
Rathburn	6	.09

European Pine Sawfly, Neodiprion sertifer (Geoff)

Intensive surveys carried out in Scots pine plantations on Manitoulin Island showed no appreciable change in population levels of this sawfly (Table 14). Dead larvae found near West Bay contained only insignificant amounts of bacteria. No polyhedral virus was recovered at any location.

CENTRAL FOREST REGION



FOREST TENT CATERPILLAR

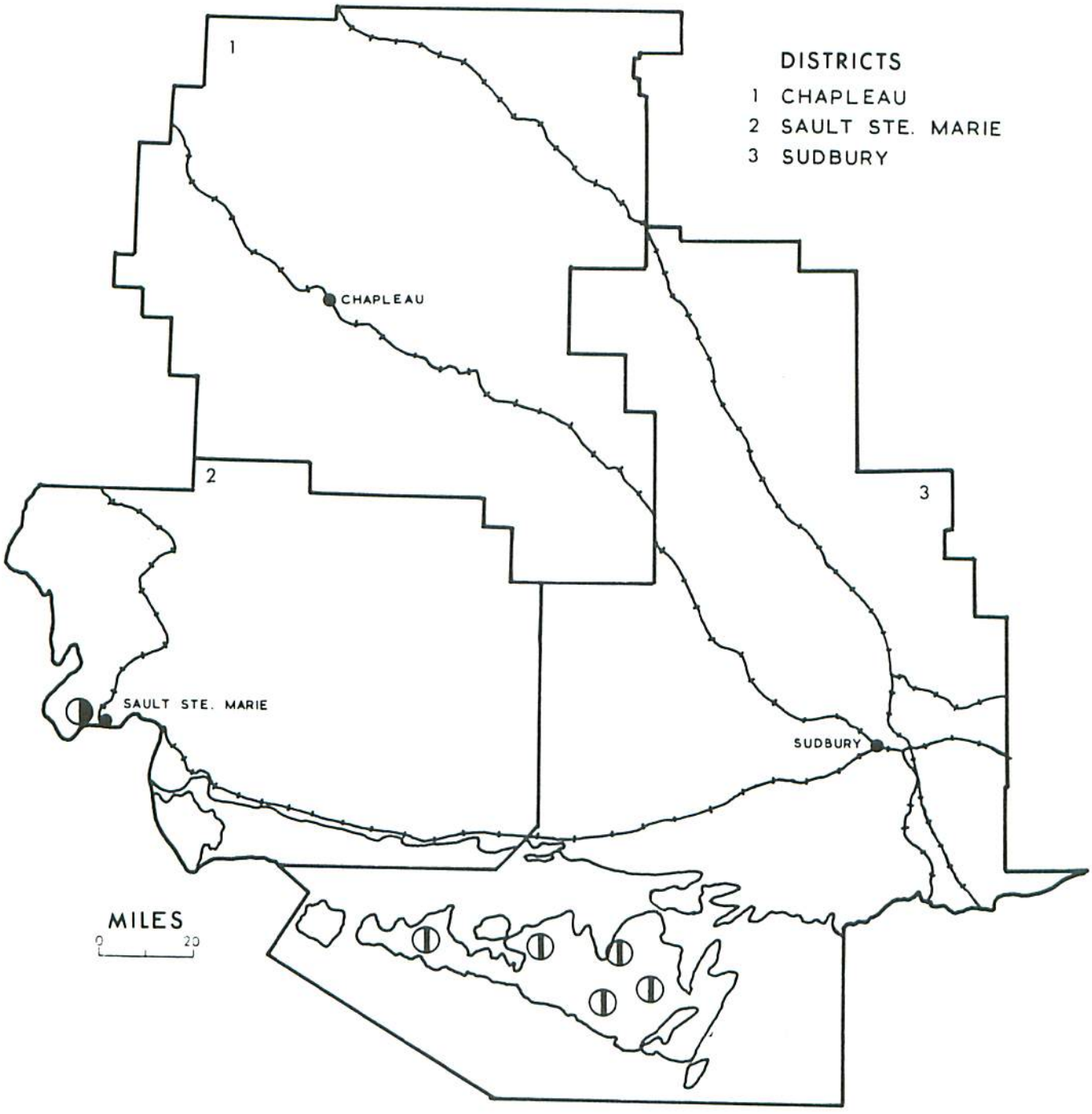
Areas where defoliation occurred in 1968

Legend

Light defoliation -------

Moderate to severe defoliation ---------- and ●

CENTRAL FOREST REGION



EUROPEAN PINE SAWFLY

Locations where infestations were observed in 1968

Legend

Light infestation ----------◐

Moderate infestation ----------◑

TABLE 14

Summary of European Pine Sawfly Colony Counts on Scots Pine on Manitoulin Island, Sudbury District, 1967 and 1968

Location (township)	Av. height of sample trees in feet	No. of trees examined		Total no. of colonies		Average no. of colonies/tree	
		1967	1968	1967	1968	1967	1968
Billings	6	4350	3156	173	26	.039	.008
Carnarvon	8	500	872	4	20	.008	.023
Dawson	6	2750	1456	21	42	.008	.029
Gordon	7	3140	3420	52	83	.016	.024
Sandfield	7	800	679	16	42	.020	.064

Swaine Jack-pine Sawfly, Neodiprion swainei Midd.

A general increase in populations of this sawfly occurred in the district. Medium infestations were observed on small islands in Shakwa and Onaping lakes. Most of the larger trees in the Onaping infestation have been killed by repeated defoliation. Light infestations were observed in Morgan, Jennings and Chester townships (see map).

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

No appreciable change in population levels was observed in the district in 1968. A heavy infestation in Groves Township persisted for the third consecutive year (Table 15). The heavy infestation near Birch Creek on Highway 17 declined to a very low level. Low populations were observed at scattered locations elsewhere in the district (see map).

TABLE 15

Summary of Red-headed Jack-pine Sawfly Colony Counts in the Sudbury District in 1968

Note: Based on the examination of 100 jack-pine trees at each point.

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of colonies per tree
Burpee	4	0.2
Burrows	3	2.9
Groves	3	3.6

White Pine Weevil, Pissodes strobi Peck

Populations of this insect increased generally in the district in 1968 with infestations in numerous plantations throughout the central and southern part of the district (Table 16). In addition to the locations in Table 16, light leader damage was observed on Scots, white and jack pine trees in Delamere, Hart, Denison and Burwash townships.

TABLE 16

Summary of Leader Damage by the White Pine Weevil in the Sudbury District in 1968

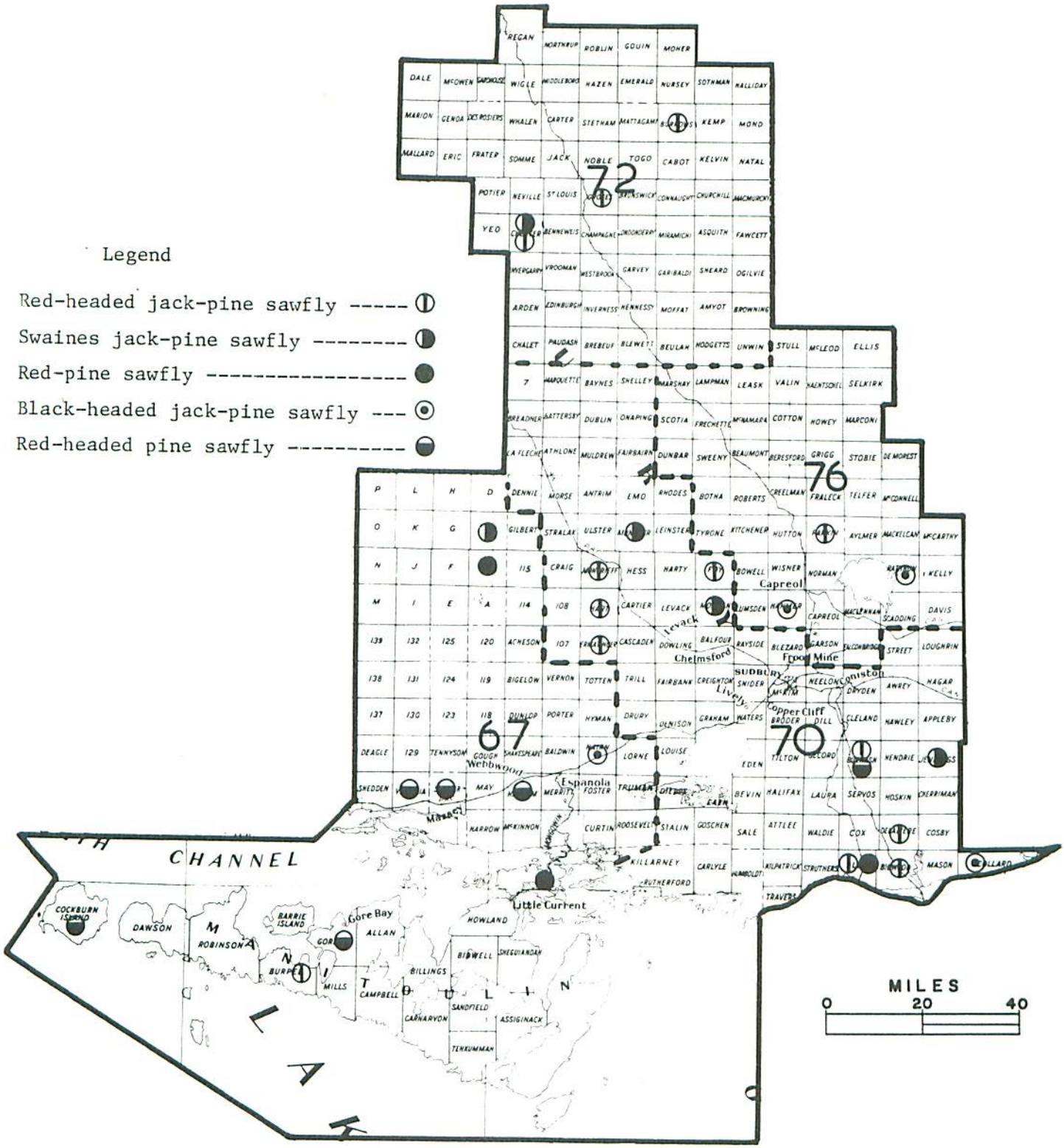
Note: Counts were made on 100 trees at each location.

Location (township)	Host	Per cent of trees infested in 1968
Baldwin	scP	38
Hallam	scP	32
Hart	jP	3
Merritt	jP	8
Norman	jP	0
119	jP	6

Larch Sawfly, Pristiphora erichsonii Htg.

For the past three years population levels of this insect have remained low in the district, however a significant increase in numbers occurred in 1968. Medium infestations were observed in small stands of larch in Baldwin, May and Salter townships in the southwestern part of the district, and low numbers were observed at scattered locations in the central part of the district. Examination of European larch plantations on Cockburn Island in late September showed a low incidence of curled tips and little defoliation.

SUDBURY DISTRICT



NEODIPRION SAWFLIES

Locations where Neodiprion sawflies were observed in 1968

TABLE 17

Summary of Miscellaneous Insects Collected in the Sudbury District

Insect	Host(s)	Remarks
Acleris gallicolana Clem.	W	One observation made in Jack Twp.
Acleris variana Fern.	wS, bF	Found commonly in small numbers throughout the district
Acrobasis betulella Hlst.	wB	Small numbers in Shedden and Neelon twps.
Adelges strobilobius Kalt.	wS	Heavily infected trees at one location in McCarthy Twp.
Anchylopera discigerana Wlk.	wB	Low numbers in Jennings Twp.
Anisota rubicunda Fabr.	rM	Several colonies along Highway 17 in Victoria Twp.
Archips cerasivoranus (Fitch)	ecCh, pCh	Heavily infested clumps of shrubs in Salter, 119, Bigwood and Bidwell twps.
Caripeta divisata Wlk.	wS	Few larvae in beating samples in Cosby, Hoskin and Cockburn twps.
Choristoneura conflictana Wlk.	tA	Small numbers in Gouin Twp.
Choristoneura rosaceana Harr.	bF	Low numbers found in Gouin, Cosby and Fairbank twps.
Croesia semipurpurana (Kft.)	rO	Few heavily infested trees in Shedden Twp.
Croesus latitarsus Nort.	wB	Light defoliation of understory trees in Burpee Twp., Manitoulin Island
Danaus plexippus (L.)	Milkweed	Numerous larvae in Gordon Twp., Manitoulin Island

TABLE 17 (continued)

Insect	Host(s)	Remarks
Datana ministra Dru.	wB	Small numbers in Attlee Twp.
Dioryctria abietivorella Grt.	jP	Few larvae in Merritt Twp.
Dioryctria reniculella Grt.	wS	Found in three locations in the Gogama Division
Eacles imperialis pini Michener	wP	Few larvae found in Bigwood Twp.
Epinotia solandriana Linn.	wB, Po	Lightly infested trees in Burpee, Shedden and B twps.
Erannis tiliaria (Harr.) and Phigalia titea Cr.	rO, wB	A small pocket of severely defoliated red oak trees in Gordon Twp., Manitoulin Island
Exoteleia pinifoliella Cham.	jP	This leaf miner found at several locations in southern part of the district
Fenusa pusilla (Lep.)	wB	Occurred commonly in low numbers throughout the district
Feralia jocosa Gn.	wS	Low populations at four locations in the Gogama Division
Gonioctena americana Schaef.	tA	Light defoliation in Gouin Twp. and other locations in the Gogama Division
Halisidota maculata Harr.	tA	Low numbers in Victoria Twp.
Hydriomena divisaria Wlk.	wS	Small numbers in Salter, Dawson, Cosby and Cockburn twps.
Hypagyrtis piniata Pack.	bF	Low numbers in Noble, Nairn and B twps.
Hyphantria cunea Dru.	wB, W	Several colonies observed in Killarney, Victoria and McKim twps.

TABLE 17 (continued)

Insect	Host(s)	Remarks
Lambdina fiscellaria fiscellaria Guen.	wS	Larvae found at several locations on the western end of Manitoulin Island
Lithocolletis betulivora Clem.	wB	Leaf mining at widely scattered locations in Jennings, Moncreiff, Valin and Dunbar twps.
Malacosoma americanum (F.)	pCh, ecCh	Moderate population levels in Bidwell Twp. where 39 colonies were counted along one mile of roadside. Low populations at seven other locations in southern part of the district.
Malacosoma californicum pluviale (Dyar)	pCh	Low populations at several locations in the northern part of the district
Monoctenus fulvus Nort.	eC	Low populations in Roblin Twp., Gogama Division
Nematus populi Marl.	tA	Several colonies on understory aspen in Moncreiff Twp.
Nematus ventralis Say	W	Several colonies along lake shore, Fairbank Twp.
Neodiprion abietis complex (Harr.)	bF, wS	Scattered colonies in Noble and Jack twps.
Oligonychus ununguis (Jac.)	bF	Few trees infested in Moncreiff Twp.
Pamphiliidae	jP, rP, wS	Sawflies found at widely scattered locations in southern part of district
Petrova albicapitana Busck.	jP	Low incidence of pitch nodules in Bigwood, N, Scotia, and Cockburn twps.
Pikonema alaskensis Roh.	wS	Low populations throughout the district

TABLE 17 (concluded)

Insect	Host(s)	Remarks
Pikonema dimmockii Cress.	wS	Low populations found at 12 scattered locations in the district
Pineus similis Gill.	wS	Few individual trees heavily infested on Cockburn Island
Pissodes approximatus Hopk.	wS	Observed at one location in Billings Twp.
Pristiphora geniculata Htg.	Mo	Occurred commonly in the northeastern part of district
Pristiphora lena Kincaid	wS	Low numbers in Gouin, Cosby and Fairbank twps.
Profenusa thomsoni (Konow)	wB	Occurred in low numbers at several locations in the northern part of district
Protoboarmia porcelaria indicataria Wlk.	wS	Low populations in Hoskin and Denison twps.
Pseudexentera oregonana Wlshm.	tA	Low populations in Gouin Twp.
Sciaphila duplex Wlshm.	tA	Low populations in Gouin Twp.
Semiothisa signaria dispuncta Wlk.	wS	Few larvae found in Dawson, Hoskin, Cosby and Drury twps.
Tomeyella numismaticum P. & McD.	jP	Individual trees infested at locations in Bigwood, Cherryman and Hallam twps.
Zeiraphera canadensis Mut. & Free.	wS	Low numbers at one location in Capreol Twp.
Zelleria haimbachi Busck.	jP	Occurred in low numbers in B, Allen, and Appleby twps.