FOREST INSECT AND DISEASE SURVEYS IN THE CENTRAL SURVEY REGION

(FOREST DISTRICTS: SUDBURY, CHAPLEAU, SAULT STE. MARIE AND WHITE RIVER)

1970

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FOREST RESEARCH LABORATORY

ONTARIO REGION

SAULT STE. MARIE, ONTARIO

INFORMATION REPORT O-X-144

CANADIAN FORESTRY SERVICE

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SURVEY HIGHLIGHTS

In 1970, the working unit for surveying forest insect and disease conditions in Ontario was changed from an individual technician assigned to a forest district, to a survey team led by an experienced supervisor and consisting of one to three additional technicians. Each team covered three to six forest districts. The Central Survey Region, which was designated to include four forest districts, was staffed by a 3-man team as follows:

Sault Ste. Marie District - K. C. Hall, Supervisor

Chapleau District - F. Livesey

Sudbury District - E. L. Houser

White River District - K. C. Hall, F. Livesey

This report deals with the more important, or potentially more important, forest insect and disease conditions found by the team in 1970.

The spectacular increase in the size of spruce budworm outbreaks was of primary importance in 1970 and forecasts indicate a further increase in 1971. Population levels of the large aspen tortrix, *Choristoneura conflictana*, and a noctuid, *Enargia decolor*, increased substantially and caused severe defoliation to numerous stands of trembling aspen, particularly in the northern part of the Region. In the Sudbury District jack-pine budworm populations increased in Bigwood and Allen townships and declined in the Humbolt-Travers area.

The known range of the Dutch elm disease was extended north to 47°N latitude. Surveys were also made in connection with the discovery of the smaller European elm bark beetle, *Scolytus multistriatus*, a second vector of the disease, in the Sault Ste. Marie area. A high incidence of needle rust on spruce recurred at High Falls south of Wawa. Evaluations showed the sweet fern blister rust, *Cronartium comptoniae*, to be present in most jack pine stands in which the alternate host was growing. Bud failure on balsam fir and spruce probably caused by abnormal climatic conditions was widespread throughout the Region but especially severe in Foleyet Division and at several locations in Gogama Division.

During the field season a total of 550 insect collections and 149 disease samples were made and 44 disease evaluations were carried out.

K. C. Hall
Supervisor
Central Survey Region.

INSECTS

Yellow Birch Leaf Tier, *Anchylopera discigerana* Wlk.

A sudden upsurge in the abundance of this pest was observed in the Northwestern portion of the Region. The highest concentration occurred in scattered stands of mature birch in Twp. 24 Rge. 24, Twp. 27 Rge. 23 along the Michipicoten River, and in Twp. 30 Rge. 18. Light populations were common on understory and fringe trees in the western part of the Chapleau District, the eastern part of the White River District and the northern part of the Sault Ste. Marie District. The last occurrence of this defoliator in infestation proportions was reported in 1962-1964 when high populations were present north and east of Sault Ste. Marie.

Pine Spittle Bug, *Aphrophora parallela* (Say)

High populations persisted in Scots pine plantations on Manitoulin Island in the Sudbury District. Heavy infestations were recorded in Sandfield and Billings townships and medium infestations were common in Dawson, Carnarvon and Gordon townships. Elsewhere in the Region populations were at a low level.

Birch Skeletonizer, *Bucculatrix canadensisella* Chamb.

A marked increase in the populations and areas infected by this insect was evident in the Region in 1970.

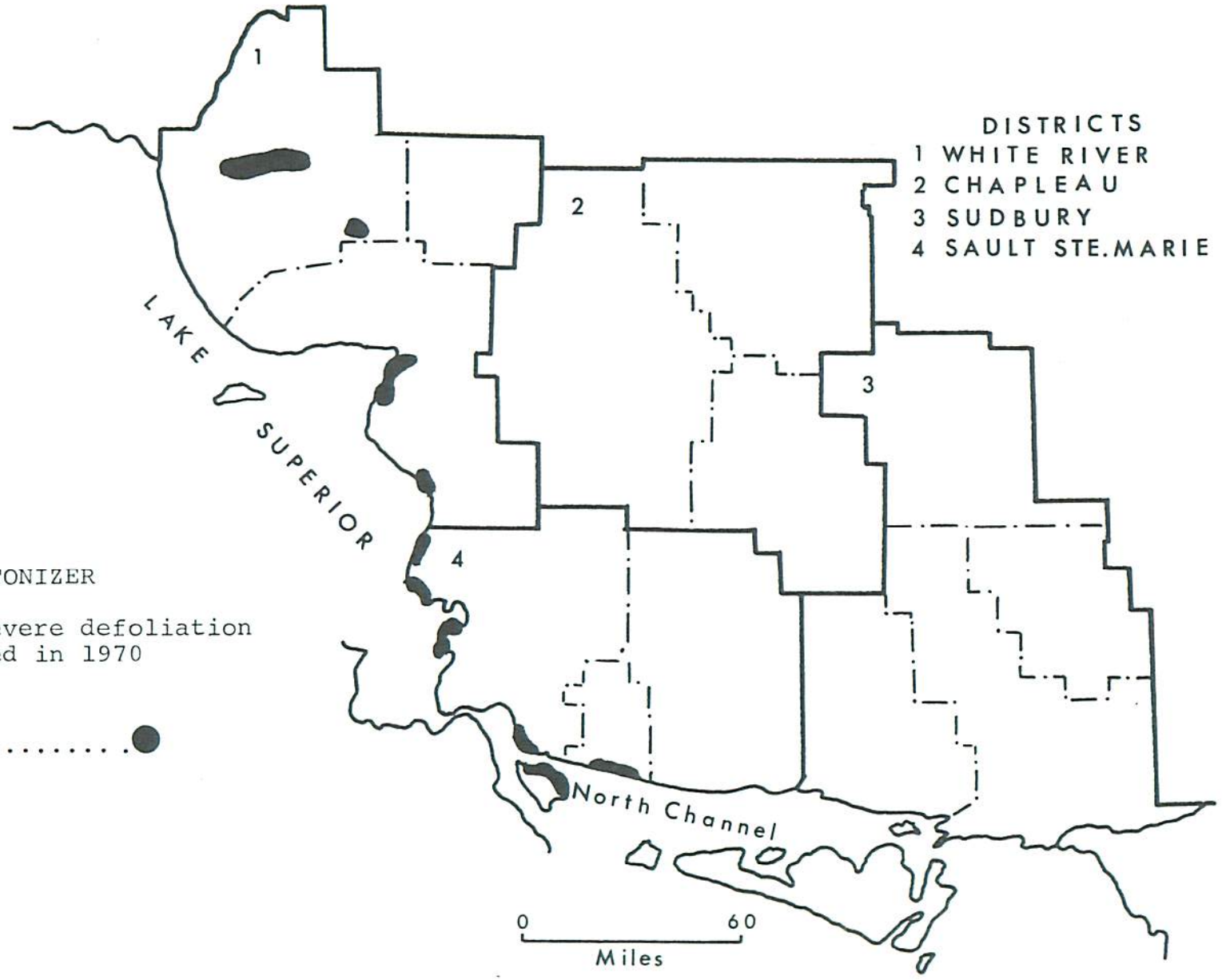
In the Sault Ste. Marie District, heavy infestation persisted in the same areas reported in 1969 with extensions occurring along the north shore of St. Joseph Island and in Laird and Tarbutt Additional townships. New areas of severe defoliation were mapped in Lefroy and Plummer Additional townships and at scattered locations north of Pancake Bay to Montreal River (see map). New areas of infestation occurred in the White River District along Highway 17 from Old Woman Bay to Michipicoten River, from Bertrand Creek to Manitouwadge Jct. and in the Hammer Lake area. Populations were low in the Chapleau District and at endemic levels in the Sudbury District.

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

For the second consecutive year population levels and areas infested increased in the Region.

In 1969, eight pockets of infestation were reported in the Chapleau District, the largest being approximately 80 square miles. In the White River District a single infestation covered approximately 40 square miles and one small pocket was observed in Sault Ste. Marie District.

CENTRAL SURVEY REGION



DISTRICTS
1 WHITE RIVER
2 CHAPLEAU
3 SUDBURY
4 SAULT STE.MARIE

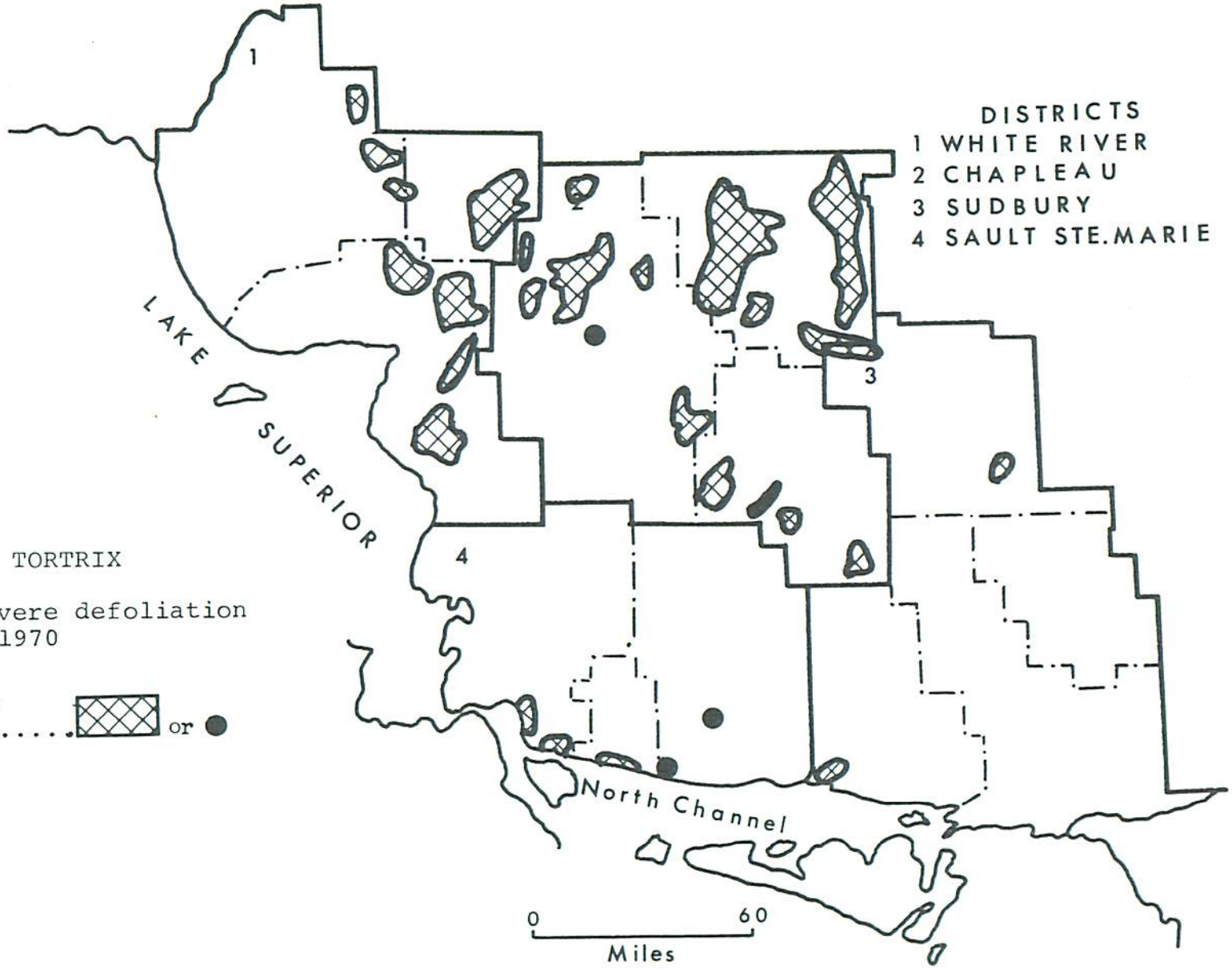
BIRCH SKELETONIZER

Areas within which severe defoliation of birch occurred in 1970

Legend

Severe defoliation.....●

CENTRAL SURVEY REGION



LARGE ASPEN TORTRIX

Areas within which severe defoliation of aspen occurred in 1970

Legend

Severe defoliation..... or

In 1970, approximately 700 square miles of heavy infestation was mapped northeast of Chapleau and 150 square miles west of Wakami Lake. Numerous pockets of heavy infestation also occurred in the northwest part of the Chapleau District and extended into the White River District. Farther west, large areas of severe defoliation were mapped from Amyot to Hambleton Township and small isolated pockets of heavy feeding were observed southeast of Wawa. In the Sault Ste. Marie District, severe defoliation ranging from 60 to 90 per cent occurred in an area of approximately 60 square miles between Echo Bay and Thessalon. Moderate defoliation occurred near Cutler on Highway 17 and in Fawcett and Churchill townships in the Sudbury District (see map).

Spruce Budworm, *Choristoneura fumiferana* Clem.

The importance of this pest and the widespread damage it caused in 1970 led to a separate report outlining its activities on a province-wide basis. Specific information summarizing the various outbreaks is provided in Information Report O-X-147 included herein.

Jack-pine Budworm, *Choristoneura pinus pinus* Free.

Jack-pine budworm numbers fluctuated considerably in the Sudbury District, and in the Sault Ste. Marie District a declining trend was evident.

In the Sudbury District, the most noteworthy increase occurred in the French River area where the heavy infestation enlarged to 140 square miles compared with 98 square miles in 1969. The expansion occurred principally in Allen and Bigwood townships where the defoliation exceeded 50 per cent and light tree mortality was observed at Hartley Bay. A new area of light infestation of approximately 80 square miles was mapped in portions of Jennings, Cherriman, Hoskin and Cosby townships (see map). On Manitoulin Island, high populations persisted in a private plantation in Gordon Township where defoliation averaged 30 per cent and low numbers were present in Carnarvon and Billings townships. The declining trend in the Sudbury District was most evident in the Humboldt-Travers area and in Scollard Township where light to moderate infestation occurred.

In the Sault Ste. Marie District endemic levels occurred at all sampling points except in the southern portion of the Mount Lake area which was lightly infested.

TABLE 1

Summary of Larval Counts of the Jack-Pine Budworm in the Sudbury District, 1968-1970 (Counts based on the examination of 16-18 inch branch tips at each location)

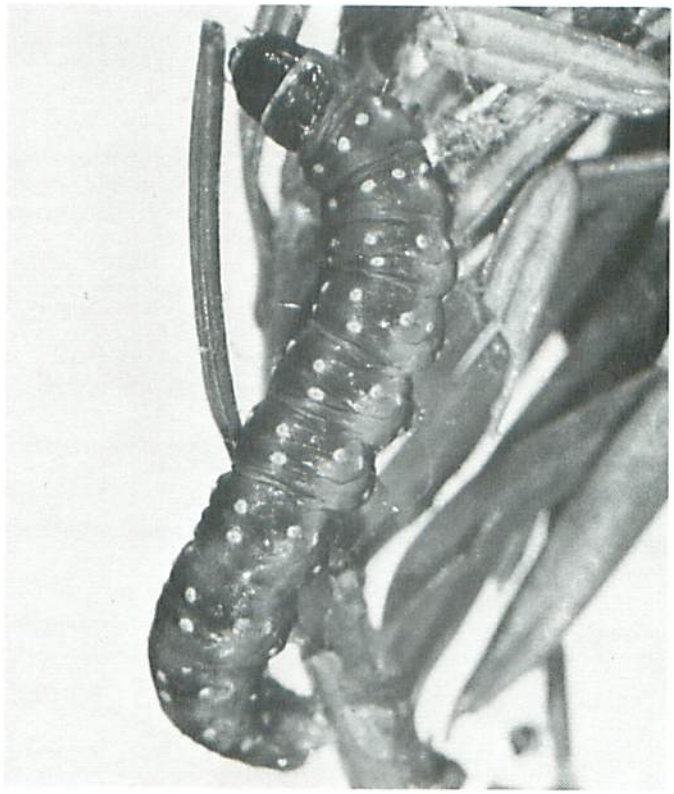
Location	Av. d.b.h. of sample trees	Total number of larvae 1968	1969	1970
Sudbury District				
Allen Township	5	44	121	218
Scollard "	7	28	102	28
Mason "	6	-	22	15
Cox "	9	-	-	115

TABLE 2

Summary of Jack-Pine Budworm Egg Mass Counts in the Central Survey Region in 1969 and 1970 (Counts based on the examination of one 24-inch branch tip from the mid crown of each of six trees at each location)

Location	Host	Av. d.b.h. in inches	Total number of egg masses 1969	1970
Sudbury District				
Gordon Township	ScP	3	15	1
Allen "	jP	6	7	0
Bigwood "	jP	9	1	6
Scollard "	jP	7	2	0
Hoskin "	jP	8	-	1
Cherriman "	jP	8	-	0
Cox "	jP	9	-	1
Philip Ed. Island	jP	4	-	0
Sault Ste. Marie Dist.				
Mount Lake	jP	8	2	0
Mount Lake	jP	6	1	0

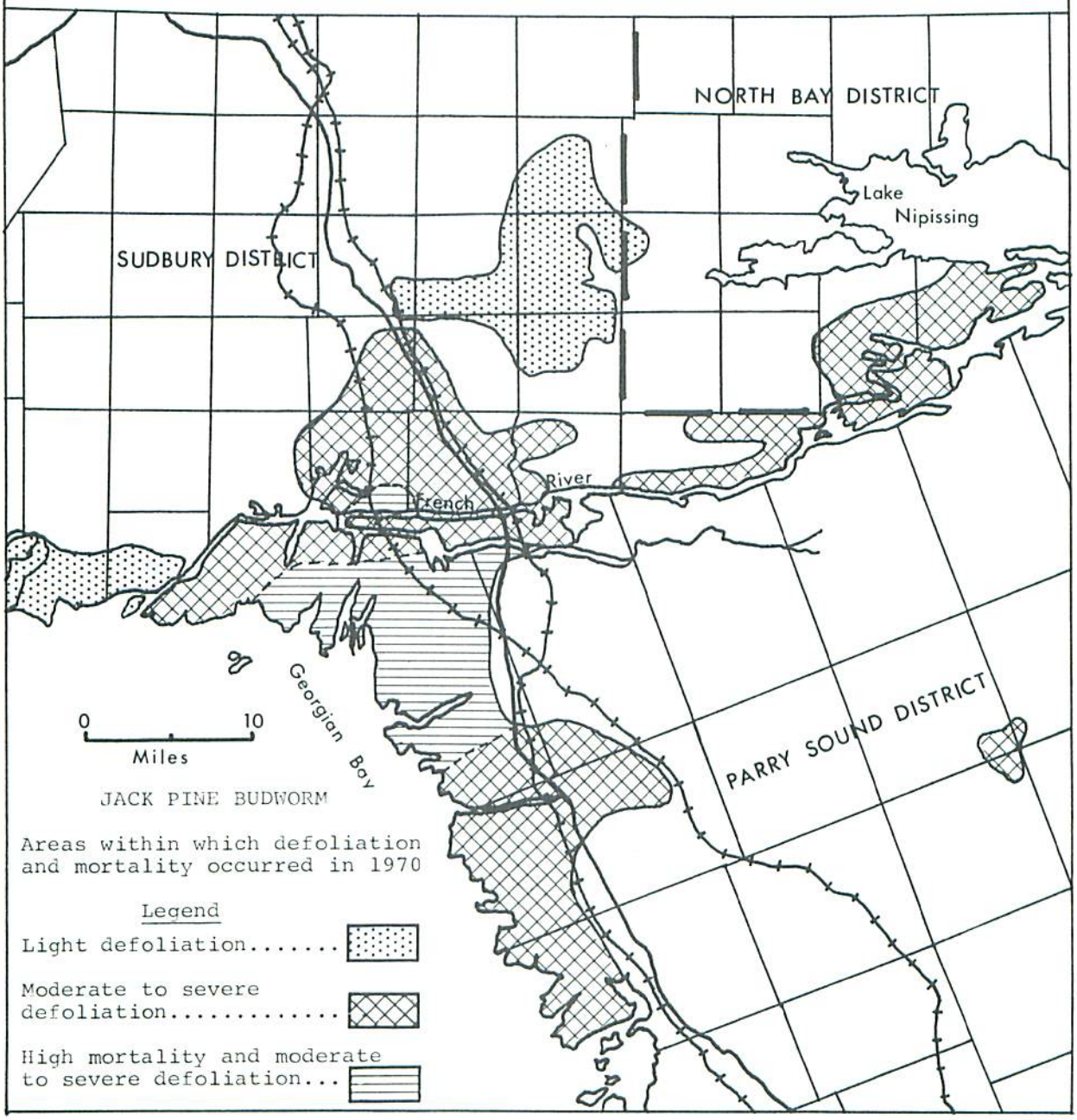
SPRUCE BUDWORM



Mature larva feeding on balsam fir

Severe defoliation of young balsam fir tree

FRENCH RIVER AREA



Larch Casebearer, *Coleophora laricella* (Hbn.)

Population levels of the larch casebearer fluctuated considerably in 1970. The most noteworthy increase occurred in Dill Township, Sudbury District, where an average of 8.2 insects per 18" branch tip was recorded compared with 1.5 in 1969. A pocket of heavy infestation located at Garden River in the Sault Ste. Marie District for the past several years declined to light intensity. Quantitative counts showed an average of 20 insects per tip, a substantial decline compared with 1969 when an average of 90 insects per tip was recorded (Table 3). Elsewhere in the Region population levels remained low.

TABLE 3

Summary of Larch Casebearer Counts at Four Points in the Central Survey Region, 1968-1970 (Counts based on the examination of four 18" branch tips from each of four trees at each location.)

Location	Av. d.b.h. of sample trees	Av. no. of larvae per br. tip 1968	1969	1970
Sault Ste. Marie Dist.				
Garden River I. R.	10	122.1	90.3	20.0
Sudbury District				
Hallam Township	5	0.4	1.4	1.4
Dill "	6	0.1	1.5	8.2
Delamere "	5	0.2	0.1	0.1

A Noctuid, *Enargia decolor* Wlk.

Population levels of this leaf tier increased sharply in the Region. Heavy infestations were common in the northern half of the Sudbury District, in the Chapleau and Foleyet divisions of the Chapleau District and in the eastern part of the White River District. Mapping of infestations was not possible as most stands had been severely defoliated by the large aspen tortrix, *C. conflictana*. Elsewhere in the Region populations were light at all sampling points. With few exceptions populations of *E. decolor* were found principally on small diameter understory or on roadside trembling aspen.

Maple Trumpet Skeletonizer, *Epinotia aceriella* Clem.

Light-to-medium infestations of this insect persisted on sugar maple at several locations on St. Joseph Island. In addition light infestations were also common at a number of other locations in the Sault Ste. Marie District.

Birch Leaf Miner, *Fenusa pusilla* (Lep.)

Populations of this miner were widespread in the Region in 1970. In the Chapleau District, high populations were reported on small diameter hosts in Twp. 23 Rge. 17, Benton, Peters and 11H townships. Low populations were sampled at several points in Twp. 22 Rge. 18, Heenan and 12H townships. In the Sault Ste. Marie and Sudbury districts, small roadside white birch were heavily infested in Kars and Botha townships respectively. Low populations occurred in Nairn, Waldie, Burpee, Cherriman and Bigwood townships in the Sudbury District.

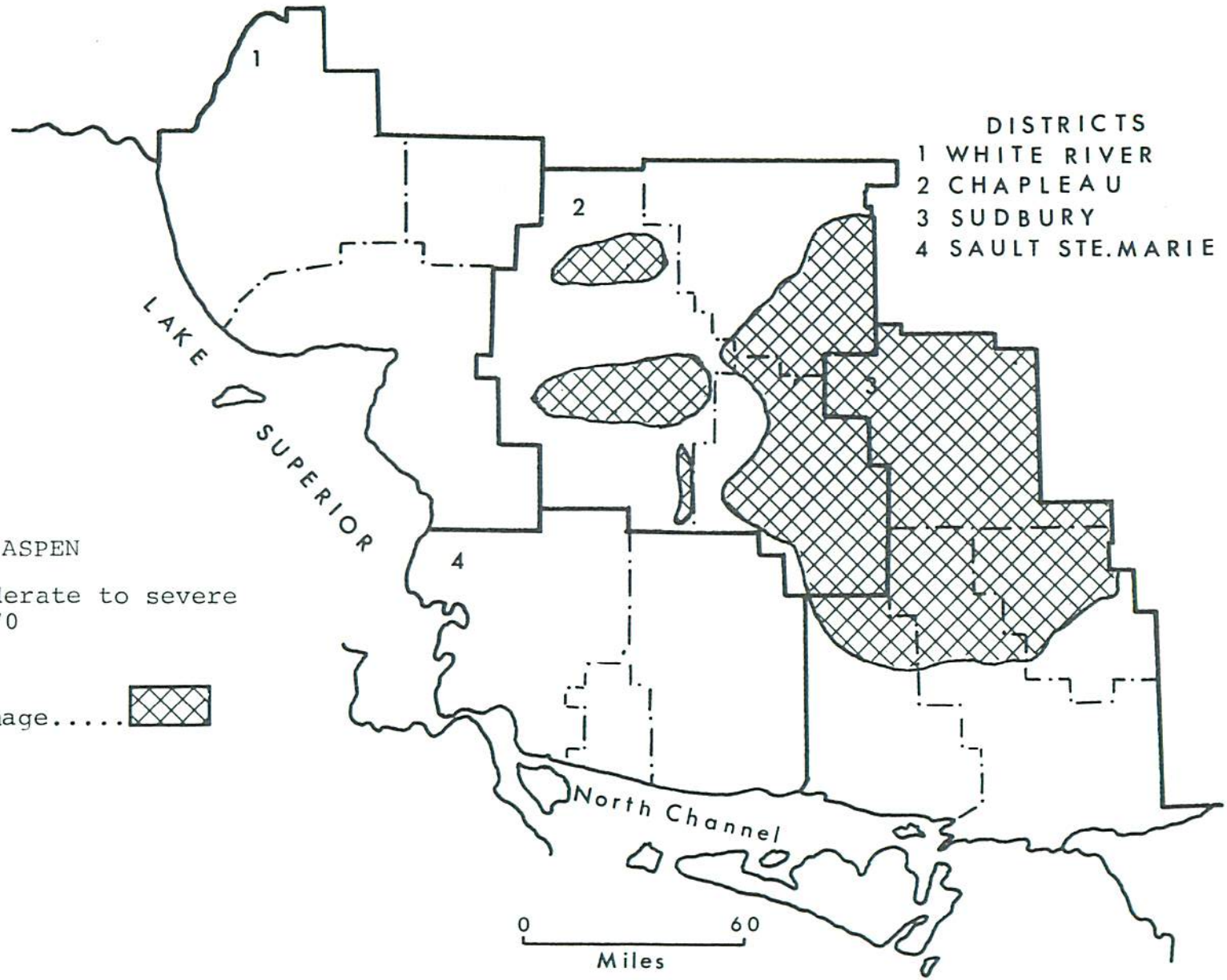
Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

No infestations of this defoliator occurred in the Region and heavy populations which have persisted in the Blind River-Cutler area for the past several years declined to endemic levels. Examination of egg masses in the spring from the Blind River area showed an average of 57 per cent successful emergence. Field surveys showed high populations of early instar larvae established on the host trees but surveys conducted several weeks later failed to reveal any populations. Between surveys the area had been subject to severe rain storms over a period of several days and it is felt this was a contributing factor for the sharp decline.

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

The most noteworthy occurrence of this insect was reported in the Sault Ste. Marie District where heavy defoliation occurred in several red pine plantations in the immediate vicinity of the city. In contrast, the high populations reported in 1969 in one red pine plantation at Garden River declined to endemic levels in 1970 due to a high incidence of disease (Table 4). In the Sudbury District population levels remained low.

CENTRAL SURVEY REGION



A NOCTUID ON ASPEN

Areas within which moderate to severe damage occurred in 1970

Legend

Moderate to severe damage.....

TABLE 4

Summary of Red-headed Pine Sawfly Colony Counts in the Central Survey Region in 1969 and 1970 (Counts taken on 100 trees at each location)

Location	Av. height of sample trees	Host	Av. no. of colonies per tree 1969	1970
Sault Ste. Marie Dist.				
Garden River	6	rP	1.6	0.0
Sudbury District				
Burwash Township	10	rP	1.1	0.8
Victoria "	10	rP	1.0	0.0
May "	8	rP	1.7	0.6
Gordon "	6	ScP	1.7	1.0

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

An upward trend in the population levels of this important sawfly was evident at most sampling locations in 1970. Quantitative sampling carried out in Scots pine plantations on Manitoulin Island showed higher colony counts in all, except at Sandfield, where a small reduction was recorded (Table 5). In the city of Sault Ste. Marie the number of colonies increased substantially but no major extension of range was observed.

TABLE 5

Summary of European Pine Sawfly Colony Counts in Scots Pine Plantations on Manitoulin Island in 1969 and 1970

Location	Av. height of trees in feet	No. of trees examined 1969	1970	Total no. of colonies 1969	1970	Av. no. of colonies per tree 1969	1970
Sudbury District							
Dawson Township	6	713	1674	2	30	.003	.018
Carnarvon "	6	405	377	21	31	.052	.082
Sandfield "	6	200	311	14	16	.070	.052
Gordon "	6	424	305	43	40	.102	.131
Billings "	7	512	575	12	39	.024	.068

Swaine Jack Pine Sawfly, *Neodiprion Swainei* Midd.

The only infestation of this sawfly in the Region recurred on red and jack pine trees on two small islands in Shakwa Lake, Sudbury District. Impact plots established in jack pine stands at this location showed an average of 80 per cent defoliation. Low populations were reported in Bigwood, Munster and Ulster townships.

Red-headed Jack Pine Sawfly, *Neodiprion virginianus* complex

Populations declined to a very low level in the Region in 1970. The heavy infestation in Burrows Township, Sudbury District, which was present for the past two years collapsed. Quantitative counts showed negative results compared with an average of 7.5 colonies per tree in 1969 (Table 6).

TABLE 6

Summary of Red-headed Jack Pine Colony Counts in the Central Survey Region in 1969 and 1970 (Counts based on the examination of 100 jack pine trees at each location.)

Location	Av. d.b.h. of trees	Av. no. of colonies per tree 1969	1970
Sault Ste. Marie Dist.			
4D Township	5	3.0	0.0
5D "	5	5.0	0.0
Sudbury District			
Burrows Township	5	7.5	0.0
Burwash "	5	0.08	0.0
Hallam "	5	0.06	0.03
Parkin "	5	0.11	0.0
Burpee "	5	--	0.28

White Pine Weevil, *Pissodes strobi* Peck

White pine weevil populations fluctuated considerably in the Region in 1970. In the Chapleau District, low populations persisted whereas high levels were recorded in several areas in the Sault Ste. Marie District. Although medium and high population levels occurred in some areas of the Sudbury District quantitative counts showed slight declines in the majority of locations (Table 7).

TABLE 7

Summary of Leader Damage Caused by the White Pine Weevil in the Central Survey Region in 1969 and 1970 (100 trees examined at each location except where indicated)

Location	Host	Per cent of trees weevilled 1969	1970
Sudbury District			
Kemp Twp.	wP	32	30
Foster Twp.	wP	24	22
Delamere Twp.	wP	-	5
Hart Twp.	jP	4	3
Merritt Twp.	jP	8	8
Twp. 119	jP	4	4
Nairn Twp.	jP	4	3
Benneweiss Twp.	jP	2	0
Moncrieff Twp.	jP	3	9
Twp. D	jP	-	4
Hanmer Twp.	ScP	5	7
May Twp.	ScP	13	12
Baldwin Twp.	ScP	29	25
Chapleau District			
Benton Twp.	jP	6	1
Edith Twp.	jP	16	2
Lloyd Twp.	jP	11	2
Panet Twp.	jP	2	1
Strathearn Twp.	jP	20	2
8D	wP	10	1
Sault Ste. Marie Dist.			
Wells Twp.	ScP	69	72
Thessalon Twp.	ScP	-	44
Garden River Ind. Res.	wP	29	32
Thessalon Twp.	wP	-	36
Portelance Lake (L&F)	wP	9.9	27
Bridgland Twp. (L&F)	wP(344 trees)	-	5.8
Kirkwood Twp. (L&F Block 2)	wP(136 ")	-	9.5
Kirkwood Twp. (L&F Block 1)	wP(275 ")	6.4	5.4
Kirkwood Twp. (L&F)	jP(1505 ")	-	2.2
Parkinson Twp. (L&F)	wP	-	44

Larch Sawfly, *Pristiphora erichsonii* Htg.

Population levels of the larch sawfly increased slightly in the Region. Heavy defoliation occurred in Hallam, Lorne and Baldwin townships in the Sudbury District; Marshall and Twp. 9E, Chapleau District; Parkinson, Lewis, Spragge and Thessalon townships, Sault Ste. Marie District and at several locations along the Dubreuilville road in the White River District. Populations were generally light at all other sampling points.

Amber-marked Birch Leaf Miner, *Profenusa thomsoni* Konow

Scattered pockets of heavy infestation of this miner occurred southwest of the town of Chapleau in the townships of 11G, 11H, 12G, 12H, 22 Rge. 18, 23 Rge. 17, 28, 29 and Peters. The only other high populations observed occurred in a small area in Twp. 30 Rge. 22 in the White River District. In all other areas of the Region where the insect was found population levels were low.

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

Moderate populations of this introduced insect which has caused a major problem in southern Ontario persisted in a red pine plantation in Mills Township on Manitoulin Island. Quantitative sampling showed an average of 23 per cent of the shoots infested. The insect was not collected elsewhere in the Region.

Larch Needle Worm, *Zeiraphera improbana* Wlk.

The first record of this insect in infestation proportions in Ontario was recorded in 1970 with the occurrence of a small pocket of heavy infestation in the Wawa Division. The affected area, located just west of Wawa on Highway 17 north, was approximately 200 acres in size with larch comprising approximately 30 per cent of the composition. Larch trees of all diameters were completely stripped of foliage by mid-July. Moderate defoliation to understory black spruce also occurred.

TABLE 8

Other Noteworthy Insects Collected

Insect	Host(s)	Remarks
Anisota rubicunda Fabr.	M	Low populations in south part of Sault Ste. Marie District.
Archips cerasivoranus Fitch	Ch	High populations at several locations in Sault Ste. Marie District.
Cenopis pettitana Rob.	Ba, rM	Light-to-moderate defoliation in Gordon Twp., Sudbury Dist.
Croesia semipurpurana Kft.	rO	Heavy defoliation of scattered hosts at Hiawatha Park; light in Parke Twp., Sault Ste. Marie District.
Dioryctria reniculella Grt.	wS	Low populations common in Region.
Diprion similis Htg.	wP	One collection in Sault Ste. Marie District. First occurrence in this area.
Elaphidionoides parallelus	rO	Medium infestation Hartley Bay, light several other locations Sudbury District.
Gonioctena americana Schaef.	tA	Heavy infestation Twp. 8D, Chapleau District.
Gretchena delicatana Heinr.	I	High populations Hiawatha Park, Sault Ste. Marie Dist.
Neodiprion pratti banksianae Roh.	jP	Small numbers of colonies two locations Sudbury Dist.
Orgyia antiqua L.	wB	Moderate defoliation of several hosts on Nepahwin Island, Sudbury District.
Pikonema alaskensis Roh.	wS	Moderate defoliation in one plantation, Foster Twp. and on open-grown small trees Churchill Twp., Sudbury Dist.
Pristiphora geniculata Htg.	Mo	Heavy defoliation at numerous locations in the Region.

TABLE 8 continued

Location	Host(s)	Remarks
Setoptus jonesi Keifer	rP	Severe damage in a 50-acre plantation Twp. 11B, Chapleau District.
Tetralopha aplastella Hlst.	tA	Common southwest of Chapleau.

TREE DISEASES

Armillaria Root Rot, *Armillaria mellea* (Vahl ex Fr.) Kummer

This pathogen occurred throughout the Region generally at a low incidence level. The highest incidence of attack was recorded in a six-year-old red pine plantation in Dunlop Township, Sudbury District. The plantation, which was established on a sandy jack pine cutover area, suffered 27.5 per cent mortality. On a similar site in Township 124, ten per cent of the white pine trees had died.

A small red pine plantation in the Kirkwood Management Unit, Sault Ste. Marie District, sustained five per cent mortality. Overstory trembling aspen trees had been removed previously to release the red pine.

TABLE 9

Summary of Incidence of Armillaria Root Rot in the Central Survey Region, 1970 (Evaluations based on the examination of four trees in each of ten plots at each location)

Location (township)	Host	Acres affected	Per cent incidence
Sudbury District			
Dunlop	rP	3	27.5
124	wP	5	10.0
Sault Ste. Marie Dist.			
Kirkwood	rP	2	5.0

Dutch Elm Disease, *Ceratocytis ulmi* (Buism.) C. Moreau

The range of this virulent pathogen was extended in the Sault Ste. Marie District to the 47th parallel of latitude in 1970. In addition, the smaller European elm bark beetle, *Scolytus multistriatus* (Marsh.), was found for the first time in the city of Sault Ste. Marie. In the Sudbury District, twenty five per cent of the elm trees in all age classes were infected along La Cloche Creek and an increasing number of trees were beginning to die between Sudbury and Sault Ste. Marie.

Yellow Witches' Broom of Spruce, *Chrysomyxa arctostaphyli* Diet.

This pathogen was common in an area of 200 acres near Wawa in Twp. 30 Rge. 23. Quantitative assessment showed twelve per cent of the black spruce trees infected with one or more brooms per tree. The organism was present at several other locations in the Region but at a very low level of infection.

Needle Rusts of Spruce, *Chrysomyxa ledi* (Alb. & Schw.) d By. and *Chrysomyxa ledicola* Lagh.

A high level of infection caused by *C. ledicola* occurred on white spruce trees along the High Falls road in Twp. 30 Rge. 23, White River District. All white spruce in an area of approximately 200 acres were severely affected, having in excess of 75 per cent of the current year's foliage damaged. Moderate infection levels of *C. ledi* were reported in a three-acre stand of small black spruce in Westbrook Township in the Sudbury District. These rusts were rarely observed elsewhere in the Region.

Ink Spot of Aspen, *Ciborinia whetzelii* (Seaver) Seaver

This leaf disease was present in many stands of trembling aspen usually at the light or trace level of infection. The most notable exception occurred in the Foleyet Division of the Chapleau District where reddened foliage was very conspicuous. Four small areas of heavily infected trees were observed from the air in Reeves and Melrose townships, and large areas of moderate infection occurred north of Highway 101 east of Foleyet. Table 10 shows both the generally high incidence and low level of infection which was prevalent in the Region.

TABLE 10

Summary of Incidence and Level of Infection of Ink Spot Disease in the Central Survey Region, (Evaluations based on the examination of four trembling aspen trees in each of ten plots at each location)

Location (township)	Acres affected	Per cent incidence	Per cent level of infection
White River District			
Hunt	25	80	2.5
27 Rge. 23	100	75	15.0
Sault Ste. Marie Dist.			
Bridgland	25	67.5	15.0
Chapleau District			
Reeves	500	100.0	50.0
Rennie	300	92.5	15.0
Sudbury District			
Loughrin	100	72.5	15.0
Mongowin	100	90.0	20.0
Carlyle	100	80.0	30.0
Balfour	50	85.0	20.0

Sweet fern Blister Rust, *Cronartium comptoniae* Arth.

This canker-causing organism was found throughout the Region in nearly all jack pine stands which contained sweet fern, the alternate host of the pathogen. Highest incidence of attack was recorded in Ermatinger and 124 townships, Sudbury District, where 40 and 37.5 per cent of the trees examined were infected respectively. Elsewhere evaluations showed the level of incidence to range from 2.5 to 25 per cent (Table 11).

TABLE 11

Summary of Incidence of Sweet fern Blister Rust in the Central Survey Region, 1970 (Evaluations based on the assessment of four trees in each of ten plots at each location)

Location (township)	Acres affected	Per cent incidence
White River District		
64	100	7.5
27 Rge. 23	100	5.0
Sault Ste. Marie Dist.		
Gaudette	200	20.0
1A	100	7.5
Haughton	100	2.5
6D	50	2.5
2E	50	10.0
Chapleau District		
10E	500	7.5
DeGaulle	100	5.0
11B	1000	2.5
29	400	25.0
Cosens	50	2.5
Sudbury District		
Cartier	50	20.0
Ermatinger	20	40.0
Unwin	50	7.5
Carter	35	10.0
Nairn	10	20.0
124	20	37.5
Hawley	20	15.0

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

This pathogen occurs commonly in the Region. In 1970 the highest incidence was recorded in a small plantation in Thessalon Township where 47 per cent of the trees were affected. Evaluations carried out are summarized in Table 12.

TABLE 12

Summary of Incidence of White Pine Blister Rust in the Central Survey Region, 1970 (Evaluations based on the examination of four white pine trees in each of ten plots at each location)

Location (township)	Acres affected	Per cent incidence
Sault Ste. Marie Dist.		
Cobden	5	25.0
Thessalon	50	47.0
Kirkwood	5	20.0
Bridgland	150	10.0
Sudbury District		
Cherriman	50	7.5
Cosby	100	12.5
Delamere	40	15.0
Foster	30	17.5

Gall Rust of Hard Pines, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

The most notable occurrence of this organism was in Carnarvon Township, Sudbury District, where forty per cent incidence was recorded in one Scots pine plantation. Galls were found on both the stems and branches of infected hosts and considerable branch mortality had occurred. A very low level of infection was observed on adjacent Austrian pine. The disease was found at several locations in the Chapleau District on jack pine and in the Sault Ste. Marie District on jack and Scots pine.

A Stem Rust of Pine, *Peridermium stalactiforme* Arth. & Kern

This organism which causes an elongated stem canker on jack pine trees, was sampled at two locations in the White River District in 1970. The incidence of infection is shown in Table 13. Stands were examined at numerous other locations in the Region but showed negative results.

TABLE 13

Summary of Incidence of Peridermium stalactiforme in the Central Survey Region, (Evaluation based on the assessment of four trees in each of ten plots at each location)

Location (township)	Host	Acres affected	Per cent incidence
White River District			
64	jP	50	5.0
30 Rge. 23	jP	200	17.0

Scleroderris Canker, *Scleroderris lagerbergii* Gremmen

A high level of infection was recorded in a red pine plantation in Parkinson Township, Sault Ste. Marie District (Table 14). Although incidence was high, the severity of the disease was rated low because the infected trees are large enough to survive. However, small trees used for fill-in planting will likely die. In Kirkwood Township a disease impact evaluation made in a stand which had recently been released by the removal of trembling aspen overstory revealed the red pine understory to be infected by both Armillaria mellea (Vahl ex Fr.) Kummer and by *S. lagerbergii*, the latter is expected to increase both in incidence and severity.

TABLE 14

Summary of Incidence and Level of Infection of Scleroderris Canker in the Central Survey Region, 1970

Location (township)	Host	Acres affected	Per cent incidence	Level of infection
Sault Ste. Marie Dist.				
Parkinson	rP	200	65.0	low
Kirkwood	rP	2	2.5	low
Sudbury District				
Vrooman	jP	10	67.0	low
Chapleau District				
Edith	jP	0	0	nil
Nimitz	jP	100	4.0	low
13H	jP	50	0.5	low
Calais	jP	0	0	nil

Sixty-seven per cent of the trees in a 7-foot jack pine plantation in Vrooman Township, Sudbury District, showed lower branch infection. No mortality was observed.

In the Chapleau District, the highest incidence occurred in Township 8D where one small red pine plantation was severely damaged. The pathogen is also present in jack pine plantations which extend over large cutover areas between Highway 129 and Wakami Lake. Fruiting was found on an understory tree in a mature natural jack pine stand in Township 10E. In the White River District, this disease was again prevalent in a red pine plantation in Hunt Township.

Birch Deterioration

This condition was most pronounced in the Ranger Lake area and along Highway 17 in Lake Superior Park. Deterioration, in varying degrees, has occurred in these areas for the past several years and in 1970 the condition became more apparent when dwarfed foliage was produced in the upper crowns of many trees.

Bud Failure on Spruce and Balsam Fir

Bud failure, probably caused by abnormal climatic conditions during the winter, was common and heavy on white spruce and balsam fir at many locations in the Chapleau District. The area of greatest damage to balsam fir and white and black spruce occurred in the Foleyet area. No discernible pattern to the damage was evident except that no damage occurred below the snow line. Adjacent trees of the same species were often affected in widely varying degrees, raising the possibility that inherent genetic differences in individual trees of the same species made some trees more resistant to winter bud injury.

On white spruce a few gnarled needles from each aborted bud usually developed and grew "cupped" in a rosette around the bud giving a heavy "clumpy" appearance to the 1969 growth. On balsam fir current needles were rarely seen around damaged buds, but an exceedingly high number of new buds were formed around the old aborted bud, so that instead of the usual three buds as many as 15 were counted on terminal shoots. Bud failure was also observed in the Gogama Division in Sudbury District.

Reddening of Balsam Fir

This condition was most prevalent in the Sault Ste. Marie District. The largest number of affected hosts was observed in the Horner-Primeau-Conacher lakes area in Township 195 south of Mashagama Lake in Township 4E and 4F, west of Ranger Lake in Township 22, 3H and Curtis and along the Boland River north of Elliot Lake. The cause of this condition is not known. Although intensive sampling was not carried out in these areas Armillaria root rot was present at all sampling locations.

Small pockets of red balsam fir trees were observed in Twps. 22 and 23 Rge. 18 in the Chapleau District.

Wind Damage

Severe damage and tree mortality due to a wind storm in August occurred in the Sudbury District in 1970. The damaged area, approximately 1/4 mile wide extended from nine miles northwest of Webbwood east to the District boundary at Markstay. All tree species were affected and damage ranged from broken main stems and tops to uprooted trees. Damage estimates were carried out at four locations and are summarized in the following table.

TABLE 15

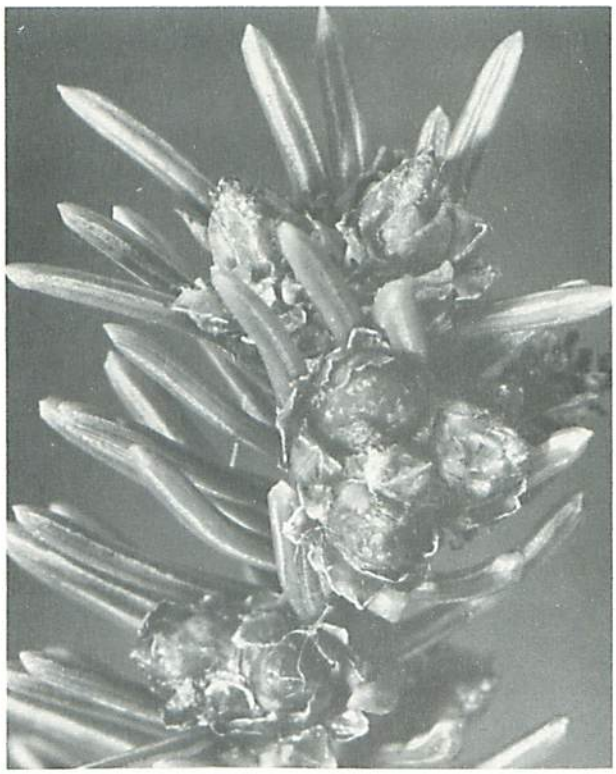
Summary of Wind Damage at Four locations in the Sudbury District, 1970

Location	Tree species	Av. d.b.h.	Per cent of trees Damaged	Dead
Dunlop Twp. (Mi. 13 Eddy Co. rd.)	tA, wS	7	60	50
Drury Twp. (1 mi. south of Prov. Park)	tA	8	40	30
Ramsey Lake (south of Sudbury)	tA, wB, eCo	8	50	40
Hagar Twp. (Markstay intersection Hwy. 17)	jP, tA	8	70	60

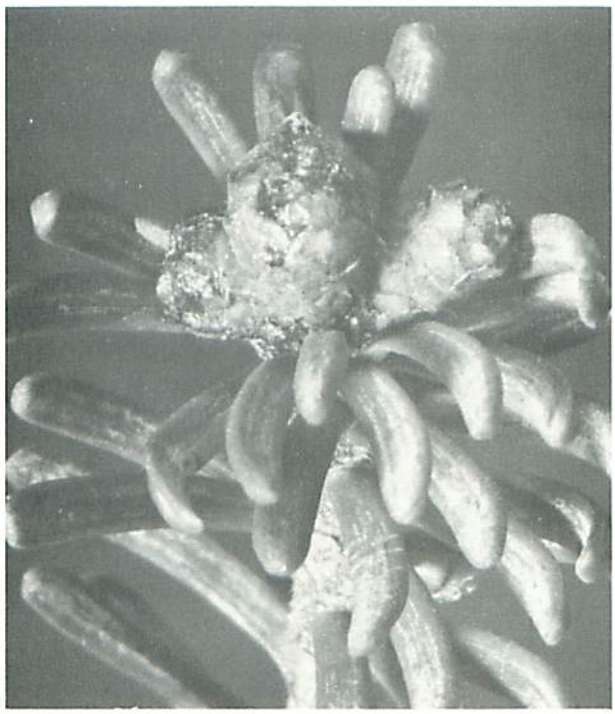
TABLE 16

Other Noteworthy Diseases

Organism	Host(s)	Remarks
Arceuthobium pusillum Peck	bS	Continued high incidence in Ryan and Ley twps., Sault Ste. Marie District.
Cenangium abietis (Pres.) Rehm	wP, jP	Common on dead branches of living trees at two locations in Sault Ste. Marie, and Chapleau Districts.
Cenangium atropurpureum Cash & Davidson	jP	Heavy infestation one location in Kirkwood Twp. Sault Ste. Marie Dist.
Coccomyces hiemalis Higgins	pCh	High incidence Twp. 64, White River Dist. and in the eastern part of Chapleau District.



Failure of white spruce buds to open



Bud damage to balsam fir

TABLE 16 continued

Organism	Host(s)	Remarks
Cronartium comandrae Pk.	jP	Trace levels Parke Twp., Sault Ste. Marie District and Noble Twp., Sudbury Dist.
Cytospora chrysosperma (Pers.) ex Fr.	tA	Common on small host Plummer Add'l Twp., Sault Ste. Marie District.
Cytospora friesii Sacc.	bF	Light infection on small hosts in Twp. C, Sudbury Dist.
Cytospora pini Desm.	wP	Low incidence on small trees Twp. W, Sault Ste. Marie District.
Daldinia vernicosa (Schw.) Ces. & de N.	wB	Trace of infection in Broder Twp., Sudbury Dist.
Davisomycella ampla (Davis) Darker	jP	Common at several locations in Chapleau District.
Gelatinosporium abietinum Pk.	bF	Low level Twp. C, Sudbury District.
Gymnosporangium clavipes (Cke. & Pk.) Cke. & Pk.	moA	High incidence at several locations Twp. 29 Rge. 14, White River District.
Melanconiales	moM	Most trees infected in Town of Chapleau, Chapleau Dist.
Pollaccia saliciperda (Allesch. & Tub.) Arx	W	Shoot blight on a few trees in Borden Twp., Chapleau District.
Poria laevigata (Fr.) Karst.	pCh	Common at one location Hunt Twp., White River Dist.
Pucciniastrum epilobii Otth	bF	Low level of needle infection near Hawk Junction, White River District.
Rhizosphaera pine (Cda.) Maubl.	bF	Needle cast disease on insect-damaged trees east of Chapleau, Chapleau District.

TABLE 16 continued

Organism	Host(s)	Remarks
Rhytisma acerinum (Pers.) ex Fr.	rM	High incidence on leaf petioles Striker Twp.; low incidence Kars and Rose twps., Sault Ste. Marie District.
Rhytisma punctatum Fr.	sM, moM	Low incidence on sM, Ryan Twp.; light-to-moderate infection on moM common throughout the Region.
Scoleconectria cucurbitula (Tode ex Fr.) Booth	wP, rP	Heavy infection on wP at Flame Lake, Chapleau Dist. Trace levels in Thessalon Twp. (wP), Wells Twp. (ScP), Hunt Twp. (rP).
Tympanis hypopodia Nyl.	jP	Trace infection Twp. 1A, Sault Ste. Marie District.
Tympanis sp.	wS	Low infection level Twp. C, Sudbury District.
Uncinula salicis (Dc. ex Merat) Wint.	W	Trace levels Kars Twp., Sault Ste. Marie District.
Zythia sp.	jP	Trace level Twp. A, Sudbury District.