

FOREST INSECT AND DISEASE SURVEYS
IN THE CENTRAL SURVEY REGION, 1971

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

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*Frontispiece. Severe mortality to a stand of white elm caused by
Ceratocystis ulmi (Buism.) C. Moreau*

SURVEY HIGHLIGHTS

This report describes the more important forest insects and tree diseases in the Central Survey Region in 1971.

For the second consecutive year, the abundance of spruce budworm and the further extension of heavy budworm infestations into many areas, most notably the Lake Superior Provincial Park, highlighted insect surveys. In contrast, a substantial reduction of jack-pine budworm populations occurred in all areas infested in 1970, and further declines are indicated for 1972. Although more fragmented than 1970, high populations of the large aspen tortrix persisted in all districts. Notable increases in birch skeletonizer populations were evident, with new and enlarged infestations occurring in the White River, Sudbury, and Sault Ste. Marie districts.

The Scleroderris canker of pine, *Scleroderris lagerbergii*, was the major disease problem with large areas of infection detected in the Chapleau District and smaller pockets in the Sault Ste. Marie and Sudbury districts. Severe wilting of elm caused by the Dutch elm disease, *Ceratocystis ulmi*, was more prevalent at several locations in the Sudbury and Sault Ste. Marie districts. A high incidence of spruce needle rusts, *Chrysomyxa ledi* and *C. ledicola*, recurred at Wawa in the White River District, and light infection by the ink spot disease of aspen, *Ciborinia whetzellii*, was common in the Region.

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Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

A decline in population levels and size of infestations of this insect was evident throughout most of the Region, except in the Sudbury District and a portion of the Chapleau District where increases were noted.

In the Chapleau, White River, and Sault Ste. Marie districts, heavy infestations were fragmented and less severe than in 1970. The only exceptions occurred near the town of Chapleau and in the south-central part of the Chapleau District, where severe infestation occurred. In the Sudbury District, numerous small, widely scattered pockets of moderate to severe infestation were present (see Appendix, Fig. A2).

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

A considerable proportion of the field season was devoted to different types of surveys and sampling related to the determination of the spruce budworm situation in Ontario as a whole. In view of the magnitude and importance of the current outbreak in this province and to avoid a piecemeal presentation, our results will be presented, as in 1970, along with those of other survey regions in a single report, see appended Information Report O-X-163 by G. M. Howse *et al.*

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

There was a general decline in populations of this important insect in areas infested in 1971 (Tables 1 and 2). In the French River area of Sudbury District, the total area of moderate to severe defoliation declined from 140 square miles in 1970 to 82 miles in 1971, (see Appendix, Fig. A3). Severity of defoliation declined from 50 to 30%. The heavy infestation in a Scots pine [*Pinus sylvestris* L.] plantation in Gordon Township on Manitoulin Island declined to light intensity. In the Cherriman and Humboldt-Travers areas of the Sudbury District and at Mount Lake in the Sault Ste. Marie District, populations were reduced to endemic levels. Light populations were present on flowering jack pine [*P. banksiana* Lamb.] at two locations near Wawa in the White River District. Few larvae or none was found at all other collecting points in the Region.

Galls caused by the pathogen were observed at a number of other locations in the Region.

Beech Bark Disease, *Nectria coccinea* var. *faginata* Lohm., Wats & Ayers

A thorough search was made for the beech bark disease, an important pathogen of beech [*Fagus grandifolia* Ehrh.] in the Maritime Provinces, in areas of high beech tree content on St. Joseph Island in the Sault Ste. Marie District. Examination failed to reveal the disease or the associated scale insect, *Cryptococcus fagi*.

Scleroderris Canker of Pine, *Scleroderris lagerbergii* Gremmen

This canker was the most important disease in the Region in 1971. New areas of infection were found in the Chapleau and Sault Ste. Marie districts, and increasing mortality occurred in Salter Township in the Sudbury District, in a replanted red pine plantation which had previously been severely damaged by the disease.

In the Chapleau District, large areas of heavily infected jack pine plantations were observed in the plains between Highway 129 and the village of Sultan. Infected living and dead trees were observed in the following townships: Nimitz, DeGaulle, Wakami, 11C, 11B, 19, 8D, and 10E. The most noteworthy infection center was located in a 500-acre stand of 15-year-old jack pine regeneration on a burn site east of Sultan in Wakami Township. Every tree in the stand apparently was infected, mortality has been heavy, and many trees can be expected to die in the next few years.

Plantations of red pine at Flame Lake in Township 8D have been infected for several years and mortality is high. At this location the disease can now be found on the lower branches of surrounding jack pine regeneration, but these trees are tall enough to withstand the infection. Mortality continues to occur in the Little Wenebagon Lake area in Township 11C where successive plantings of red and jack pine have been nearly wiped out.

In the Sault Ste. Marie District, a 10-acre infection center in a red pine plantation in Township V showed an infection incidence of 100%. Also in the Sault Ste. Marie District, infection incidences of 90 and 67.5% were found in townships 5D and Parkinson, respectively, (Table 12).

In a 1-acre red pine plantation in Hunt Township, White River District, all trees examined were diseased but mortality was still at the trace level.

INSECTS

Yellow Birch Leaf Tier, *Anchylopera discigerana* Wlk.

High populations of this leaf tier were found along Highway 17 in Township 30 Range 18, and Township 30 Range 19, in the White River District. Numerous large-diameter yellow birch [*Betula alleghaniensis* Britton], which appeared to be the preferred host, had more than 75% of their leaf complement affected. Elsewhere in the Central Survey Region, population levels were low at all sampling points.

Green-striped Mapleworm, *Anisota rubicunda* Fabr.

The most noteworthy change in the status of this insect occurred in the southern part of the Sudbury District, where sharp population increases were noted in two areas. A heavy infestation in the central part of Cockburn Island caused moderate to severe defoliation to approximately 4 square miles of semimature sugar maple [*Acer saccharum* Marsh.]. The second area, approximately 8 square miles, was at Tyson Lake. There defoliation was confined to the understory and the lower crowns of larger red maple [*A. rubrum* L.]. Population levels remained low in the Sault Ste. Marie District.

Pine Spittle Bug, *Aphrophora parallela* (Say)

In 1971, a general reduction in population of the pine spittle bug occurred on Manitoulin Island in the Sudbury District. The heavy infestations present in Sandfield and Billings townships in 1970 declined to moderate intensity in 1971. A reduction was also noted in Carnarvon, Gordon, and Dawson townships where populations declined to light. Severe browning of foliage was common in plantations in Sandfield and Billings townships as a result of heavy spittle bug attack in 1970.

Birch Skeletonizer, *Bucculatrix canadensisella* Chamb.

Major increases in population levels and severe defoliation were observed in the Region for the second consecutive year (see Appendix Fig. A1). The largest area of heavy infestation, evidenced by a discoloring and loss of foliage in late summer, occurred in the northwest third of the White River District. In the Sault Ste. Marie District, trees were heavily infested in the Goulais Bay area and along the north shore of St. Joseph Island. In addition, a long narrow band of heavy infestation extended along the North Channel from Bruce Mines east to Espanola in the Sudbury District, a distance of approximately 100 miles. This is in marked contrast to the 1970 infestation which occurred in a 15-mile-long band centered around Bruce Mines. In the eastern part of the Sudbury District, a large area of severe damage was mapped in the Trout Lake-French River area.

Table 1. Summary of larval counts of the jack-pine budworm in the Sudbury District 1968-71. (Counts based on V- and VI-instar larvae)

Location (twp)	Avg DBH sample trees (in.)	Avg no. larvae/18-in. branch tip			
		1968	1969	1970	1971
Allen	7	2.8	7.6	13.6	2.6
Scollard	7	1.8	6.4	1.8	0.5
Mason	6	--	1.4	0.9	0.0
Cox	9	--	--	7.2	2.0
Bigwood	9	--	--	4.0	8.0

Table 2. Summary of jack-pine budworm fall egg-mass counts in the Central Survey Region 1969-71. (Counts based on the examination of one 24-in. branch tip from the mid-crown of each of six trees at each location)

Location (twp)	Avg DBH sample trees (in.)	Total no. egg masses		
		1969	1970	1971
Sudbury District				
Allen	6	7	0	0
Bigwood	9	1	6	0
Scollard	7	2	0	0
Cox	9	-	1	0
Sault Ste. Marie Dist.				
Mount Lake	8	2	0	1
Mount Lake	6	1	0	0
Kirkwood	6	-	-	0
Rose	6	-	-	0

Larch Casebearer, *Coleophora laricella* (Hbn.)

No appreciable change in the status of the larch casebearer was observed in the Sault Ste. Marie District in 1971. The highest populations persisted in the Garden River Indian Reserve where quantitative samples showed an average of 18.3 insects per 18-in. branch tip, compared to an average of 20 in 1970.

In the White River District, a new area of heavy infestation occurred at Tremblay in the Wawa Division. Population sampling showed an average of 33.2 insects per branch tip throughout an area of approximately 200 acres.

Elsewhere in the Region, population levels were low.

A Cone Beetle, *Conophthorus resinosae* Hopk.

Light to moderate damage caused by this beetle was observed on red pine [*P. resinosa* Ait.] in Long Township in the Sault Ste. Marie District. The area affected extended for approximately 1 mile along Highway 17. Light damage was present in a private red pine plantation in Wells Township north of Thessalon, and on small jack pine trees in a plantation in Township 119 in the Sudbury District.

Oak Leaf Tier, *Croesia semipurpurana* Kft.

High populations of this defoliator persisted on scattered red oak [*Quercus rubra* L.] in Hiawatha Park in the Sault Ste. Marie District. In addition, new pockets of heavy damage occurred in several areas of the Garden River Indian Reserve, and scattered areas of light to moderate damage were observed north of Echo Bay in MacDonald Township. In the Sudbury District a medium infestation was reported in one location in Gordon Township on Manitoulin Island. In areas of heavy infestation, defoliation was well in excess of 75% and ranged from 20 to 35% in areas of lighter damage.

A Noctuid, *Enargia decolor* Wlk.

Population levels and damage caused by this insect declined sharply in the Region in 1971.

In 1970, heavy infestations were common in the Sudbury, Chapleau, and parts of the White River districts. In 1971, the only significant populations were observed at Trout Lake in the Sudbury District. Defoliation averaged approximately 20% and occurred on all age classes in an area of approximately 200 acres. Elsewhere in the Region, endemic populations were observed.

Maple Trumpet Skeletonizer, *Epinotia aceriella* Clem.

A medium infestation occurred on a mature sugar maple windbreak on Cockburn Island, Sudbury District, where defoliation reached approximately 30%. Light to medium infestation persisted on sugar maple on St. Joseph Island, and light infestations occurred commonly at numerous other locations in the Sault Ste. Marie District.

Linden Looper, *Erannis tiliaria* Harr.

The most noteworthy populations of this looper were found in the town of Espanola, where medium infestation occurred on a wide variety of hosts. Defoliation of approximately 30% was most apparent on the larger basswood [*Tilia americana* L.], silver maple [*Acer saccharinum* L.], elm, ash, and willows. Small populations were found throughout Manitoulin Island and in the vicinity of Sault Ste. Marie.

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

Heavy infestations of this miner occurred along the E. B. Eddy road between Ramsey and Jerome, in Benton and Garnet townships, and in the Lineus Lake area, all in the Chapleau District. A number of locations in the Lake Superior Provincial Park in the White River District and in Kars Township in the Sault Ste. Marie District were also heavily infested. Low populations were common at numerous other locations in the Region. In all instances, populations were confined to small open-grown or fringe white birch [*Betula papyrifera* Marsh.].

Aspen Blotch Miner, *Lithocolletis ontario* Free.

High populations of miners were observed on roadside reproduction and on regeneration at numerous locations.

In the Chapleau District, heavy infestations occurred along the Mate Lakes road in Borden Township, along Highway 129 in Township 10E, at Duncannon Creek in Marshall Township and between Dalton and Shumka in Township 43. The largest area of infestation in the White River District, approximately 500 acres of regeneration, was located at Whitefish Lake in Township 27 Range 23. Smaller pockets of high populations were found at Fungus Lake and in 51, 52, and Glasgow townships. The only pocket of heavy infestation in the Sault Ste. Marie District occurred at McElrea Lake in Township U. Throughout these areas of infestation, between 75 and 95% of the trembling aspen [*Populus tremuloides* Michx.] leaves were mined. In the Sudbury District, light infestation was found at numerous locations in 119 and Cascaden townships.

Red-headed Pine Sawfly, *Neodiprion lecontei* Fitch

A new, medium infestation of this sawfly occurred on the north side of Cockburn Island in the Sudbury District. Quantitative sampling showed an average of 0.4 colonies per tree, except on fringe trees when colonies were more numerous. Elsewhere in the Sudbury and Sault Ste. Marie districts, colony counts were low at all sample points (Table 3).

Table 3. Summary of colony counts of the red-headed pine sawfly in the Central Survey Region in 1970 and 1971

Location (twp)	Avg ht trees (ft)	Total no. colonies	
		1970	1971
Sudbury District			
Burwash	5	8	7
May	8	6	0
Cockburn Island	6	-	42
Sault Ste. Marie District			
Garden River Indian Res.	6	0	2

Note: 100 red pine trees examined at each location.

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

Population levels of this important sawfly remained low at all sampling points. Quantitative sampling showed that the highest incidence occurred in Gordon Township on Manitoulin Island, where the number of colonies per tree increased three-fold. At all other sampling points populations were comparable with 1970 (Table 4).

No change in the distribution of the insect was noted in the Sault Ste. Marie District.

Table 4. Summary of European pine sawfly colony counts in Scots pine plantations on Manitoulin Island in 1970 and 1971

Location (twp)	No. trees examined		Total no. colonies		Avg no. colonies/ tree	
	1970	1971	1970	1971	1970	1971
Manitoulin Island						
Dawson	1674	492	30	16	.02	.03
Carnarvon	377	250	31	15	.08	.06
Sandfield	311	150	16	12	.05	.08
Gordon	305	300	40	102	.13	.34
Billings	575	300	39	13	.07	.04

Note: Average height of trees at each location approximately 6 ft.

Swaine's Sawfly, *Neodiprion swainei* Midd.

Infestation levels and damage caused by this insect remained unchanged. The heavy infestation on two small islands in Shakwa Lake, Township C, in the Sudbury District persisted and defoliation averaged approximately 90%. Light infestation occurred at five other widely scattered locations in the Sudbury District.

The insect was not found elsewhere in the Region.

European Snout Weevil, *Phyllobius oblongus* Linn.

Infestations of this introduced insect were recorded at three locations. Populations increased to outbreak proportions at a golf course in Carnarvon Township on Manitoulin Island where it was first reported in 1967. A wide variety of host species including elm, maple, basswood, and willow, ranging in size from saplings to dominant fringe trees in an adjoining woodlot, were severely defoliated. In the Sault Ste. Marie District, high populations occurred on white birch trees at one location in Fenwick Township and at several locations within the city of Sault Ste. Marie.

The insect was not found elsewhere in the Region.

White Pine Weevil, *Pissodes strobi* Peck

Numbers of weevilled trees were marginally higher in most white [*Pinus strobus* L.] and jack pine plantations throughout the Region, whereas a decline in weevil damage was noted in Scots pine plantations,

especially in the Sudbury District (Fig. 1). Consistently high percentages of weevilled trees were recorded at sampling areas in the Sault Ste. Marie District and at several locations in the Sudbury District (Table 5). In the Chapleau District, damage was light except in Township 11C where weevilling was 11%.

White pine weevil, *Pissodes strobi* Peck

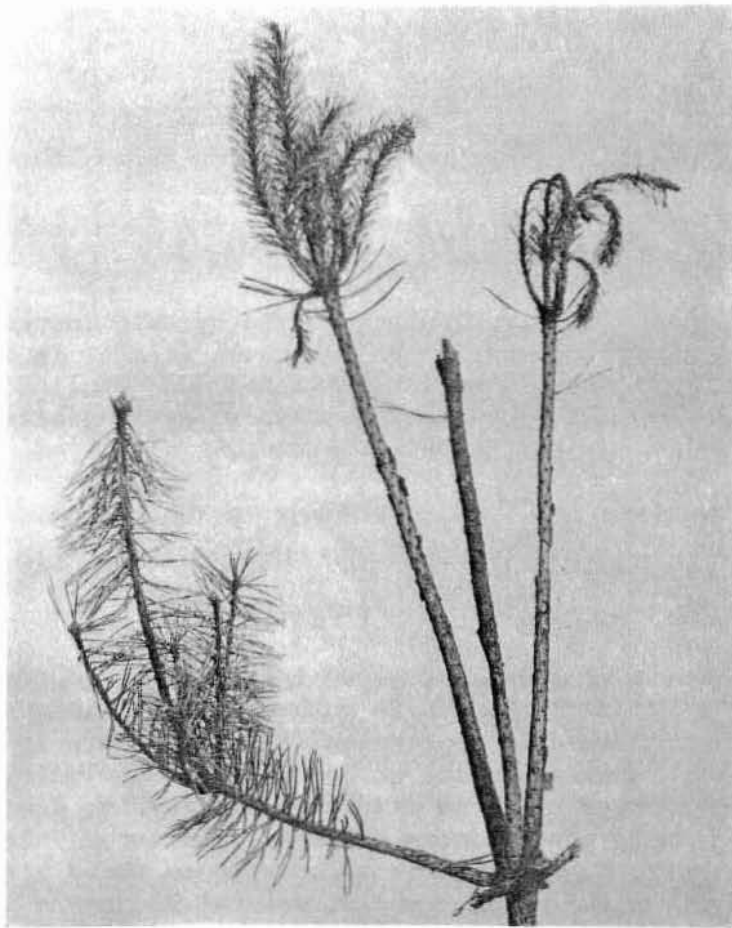


Figure 1. White pine top showing current and 1-year-old weevilling injury.

Table 5. Summary of leader damage caused by the white pine weevil in the Central Survey Region in 1970 and 1971 (100 trees examined at each location except where indicated)

Location	Host	% of trees weevilled	
		1970	1971
Sault Ste. Marie District			
Wells Twp	scP	72	33
Wells Twp	wP	--	40
Parkinson Twp	wP	44	38
Thessalon Twp	wP	36	45
Garden River Indian Res.	wP	32	28
Sprayed areas			
Twp 2A	wP	21	13
Twp 2A	wP	34	10
Rose Twp (311 trees)	wP	11.9	5.7
Sudbury District			
Kemp Twp	wP	30	13
Foster Twp	wP	22	35
Delamere Twp	wP	5	18
Cox Twp	wP	--	33
Hart Twp	jP	3	5
Merritt Twp	jP	8	10
Nairn Twp	jP	3	4
Benneweis Twp	jP	0	3
Moncrieff Twp	jP	9	5
Twp D	jP	4	4
Twp 139	jP	--	5
Hammer Twp	scP	7	8
Baldwin Twp	scP	25	19
May Twp	scP	12	9
Chapleau District			
Calais Twp	wP	--	4
Calais Twp	jP	--	3
Twp 8D	wP	1	3
Edith Twp	jP	2	2
Lloyd Twp	jP	2	3
Panet Twp	jP	1	3
Strathearn Twp	jP	2	3
Twp 12E	jP	--	6
Twp 11C	jP	--	11

Larch Sawfly, *Pristiphora erichsonii* Htg.

Larch sawfly populations fluctuated somewhat with small increases occurring generally throughout the north, whereas in the south the reverse was noted. Severe defoliation was confined to small isolated pockets in natural stands in 11 townships in the Chapleau District, one in the White River District, at scattered locations along Highway 17 north in the Sault Ste. Marie District, and on Cockburn Island in the Sudbury District. Medium infestation was present in four townships in the Sudbury District, and at three locations in the White River District. Elsewhere in the Region, population levels were low at all sample points.

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

The heavy infestations reported southwest of the town of Chapleau in 1970 recurred in 1971. Pockets of severely discolored trees, caused by the mining of this insect, were observed along roads and lake-shores in the following townships: 29, 13G, 13H, 12G, 12H, 11G, 11H, Township 22 Range 18, and Township 23 Range 17. Medium infestations were present at Nephic Lake in Township 12F, and at Wangoon Lake in Township 32. Pockets of light infestation occurred commonly at numerous other locations in the Chapleau District. In the Sudbury District, light populations were recorded in Nairn Township.

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

Infestations persisted in two red pine plantations in the Sudbury District. High populations recurred on Cockburn Island where an estimated 40% of the shoots were infested. The medium infestation in Mills Township remained at the same level as 1970, with the shoot damage being assessed at 20% and occurring mainly in the lower crown levels.

The insect was not collected elsewhere in the Region.

Aspen Webworm, *Tetralopha applastella* Hlst.

Populations of this insect occurred commonly in the eastern part of the Region. The highest incidence occurred in Kelvin, Hammer, and C townships in the Sudbury District, where the percentage of leaves infested ranged from 20 to 40%. In the remainder of the Sudbury District, and at numerous locations in the Chapleau District, light infestations were common in most aspen stands. The insect was generally found in stands where *Choristoneura conflictana* or *Enargia decolor* had been present earlier in the season.

Larch Needle Worm, *Zeiraphera impropiana* Wlk.

High populations at Tremblay in Wawa Division in 1970 marked the first occurrence of severe damage to larch by this insect in Ontario. Observations carried out early in 1971 in the area indicated a continuation of the high populations; however, as the season progressed, a reduction of populations to light to moderate levels was evident. The weekly collecting and rearing program initiated in early spring showed a high percentage of parasitism by mid-season, and would account for the marked reduction in populations. Damage appraisal was impossible as the trees suffered heavy damage by the larch casebearer and to a lesser degree by the spruce budworm.

The only other occurrence of the insect was reported in Sudbury District where low populations were found at one location in Hallam Township.

Table 6. Other noteworthy insects

Insect	Host(s)	Remarks
<i>Archips cerasivorana</i> Fitch	pCh, ecCh	Heavy infestations in the Blezzard Valley, Sudbury District. Low populations at several locations elsewhere in Region.
<i>Arge</i> sp.	Al, wB	Common in southern part of Chapleau District.
<i>Cinara strobis</i> Fitch	wP	Moderate infestation on numerous trees in Parkinson Township, Sault Ste. Marie District.
<i>Croesia albicomana</i> Clem.	Rose	Large moth flight in July in Sault Ste. Marie.
<i>Diprion similis</i> Htg.	scP	Several collections in Sault Ste. Marie.
<i>Gonioctena americana</i> Schaeff.	tA	Light infestation in Parkinson Township, Sault Ste. Marie District; small numbers common in Chapleau District.
<i>Hyphantria cunea</i> Dru.	wB, Apple	High populations on scattered ornamentals and shade trees in Sudbury, Espanola, and on Manitoulin Island.

(continued)

Table 6. Other noteworthy insects (concluded)

Insect	Host(s)	Remarks
<i>Lexis bicolor</i> Grt.	L	Numerous adults in light trap at Ivanhoe Lake.
<i>Lithocolletis kenora</i> Free.	W	Small light infestation Township 9C, Chapleau District.
<i>Lithocolletis lucidicostella</i> Clem.	sM	Light infestation on ridges Twp 8D, Chapleau District.
<i>Meadorus lateralis</i> Say	wB	Heavy infestation on open-grown hosts Ivanhoe Lake, Chapleau District.
<i>Neodiprion maurus</i> Roh.	jP	Small numbers Baynes Twp, Sudbury District.
<i>Neodiprion pratti banksianae</i> Roh.	jP	Few colonies in Hoskin and Nairn townships, Sudbury District and Park Township, Sault Ste. Marie District.
<i>Nymphalis antiopa</i> L.	W, tA	Several heavily damaged ornamentals at Ramsey Lake, Sudbury District; small numbers at numerous locations in Region.
<i>Okanagana rimosa</i> Say	rP	Very high populations in Gaudette and Haughton townships in jack pine flats, Sault Ste. Marie District.
<i>Psilocorsis quercicella</i> Clem.	rO	20% skeletonizing of small host in Carlyle Twp, lighter damage in Shedden and Curtin townships Sudbury District.
<i>Rhyaciona sonia</i> Miller	jP	Light shoot mining common on smaller trees in Nairn, Trill and 124 townships, Sudbury District.
<i>Toumeyella numismaticum</i> (P. & M.)	jP	High populations with associated branch mortality in several areas in Gaudette and Haughton townships, Sault Ste. Marie District; light populations in Nairn Township, Sudbury District.

TREE DISEASES

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

This pathogen continued to infect pine plantations in the Region at a low incidence and infection level (Table 7). Although the organism attacks a wide variety of hosts, it is most conspicuous in young red pine plantations between 5 and 15 years old.

Table 7. Summary of incidence of Armillaria root rot in the Central Survey Region. (Evaluations based on the examination of four red pine in each of 10 plots at each location)

Location (twp)	Acres affected	Incidence (%)	Mortality (%)
Sudbury District			
Street	50	7.5	7.5
Hallam	15	5.0	5.0
Noble	10	5.0	5.0

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

This destructive introduced disease was first detected north of Lake Nipissing and the French River in 1964, and it is now widespread in the southern portion of the Sault Ste. Marie and Sudbury districts (see Frontispiece). The most noticeable degree of incidence and level of infection in the Sault Ste. Marie District in 1971 occurred along Highway 546 where typical symptoms occurred wherever elm [*Ulmus americana* L.] was present (Table 8). A similar situation, along with an increase in mortality, was observed along the Whitson River in the Sudbury District near Blezzard Valley.

Table 8. Summary of incidence and level of infection of the Dutch elm disease in the Sault Ste. Marie District. (Evaluations are based on the examination of ten elm trees at each location)

Location	Incidence (%)	Level of infection	% Current mortality (%)
Township 1B	10	Low	Nil
Township 163	60	High	30
Township 175	50	High	Nil
Township 169	80	High	20

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

These pathogens of spruce were collected infrequently in the Region in 1971; however, several small pockets of infection did occur. The highest level of infection and incidence of *Chrysomyxa ledi* was recorded in Township 30 Range 22 in the White River District, where an area of approximately 5 acres of understory white spruce [*Picea glauca* (Moench) Voss] was heavily infected (Table 9). This area was smaller than in 1970 partly as the result of heavy defoliation caused by the spruce budworm which also attacks current foliage. In Township 25 Range 23 of the Chapleau District, light infection was assessed in a 200-acre stand of black spruce [*P. mariana* (Mill.) B.S.P.]. The second organism, *Chrysomyxa ledicola*, was recovered at trace and light levels of infection on black spruce at one location in White River District, and three locations in the Sudbury District.

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

Leaves infected by this fungus show one or more black spots about 1/4 inch in diameter, which drop out of the leaves in late summer. The fallen "ink spots" stay on the ground until spring when they give rise to fruit bodies from which spores are released to infect the new foliage.

The disease was found commonly throughout the Region but both the incidence and severity of attack were reduced from the levels observed in 1970. Trace to light levels of infection were commonly observed. The disease was more prevalent in the Sudbury District than elsewhere in the Region (Table 10).

Table 9. Summary of incidence and level of infection of spruce needle rusts in the Central Survey Region. (Evaluations are based on the examination of four trees in each of 10 plots at each location)

Location (twp)	Host	Acres affected	Incidence (%)	Level of infection
<i>Chrysomyxa ledi</i>				
White River District				
Twp 30 Rge 22	wS	5	100	High
Chapleau District				
Twp 25 Rge 23	bS	200	100	Low
<i>C. ledicola</i>				
White River District				
Twp 30 Rge 22	bS	5	90	Low
Sudbury District				
Garvey	bS	3	30	Low
Kemp	bS	5	80	Low
Garibaldi	bS	20	20	Trace

Table 10. Summary of incidence and level of infection of ink spot of aspen in the Central Survey Region. (Evaluations based on the examination of four trembling aspen trees in each of 10 plots at each location)

Location (twp)	Acres affected	Incidence (%)	Level of infection (%)
Sudbury District			
Mongowin	20	80	13
Merritt	10	30	15
Graham	20	80	15
Rutherford	20	100	15
Chapleau District			
Mageau	10	97.5	25

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

The 1970 survey of this important canker-forming rust on jack pine revealed the disease to be widely distributed in the Region and varying from trace to high incidence levels. Frequencies of the organism in 1971 remained comparable to those of previous assessments; however, one new centre of infection was noted in Benneweis Township in the Sudbury District. Evaluation showed a low level of incidence throughout an area of 400 acres of small diameter (2- to 3-in.) jack pine.

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

This pathogen is found throughout the range of white pine in the Region. Assessments in 1971 revealed a low level of incidence and infection in both plantations and natural stands (Table 11).

Table 11. Summary of incidence of white pine blister rust in the Central Survey Region, 1971. (Evaluations based on the examination of four white pine trees in each of 10 plots at each location)

Location (twp)	Acres affected	Incidence (%)
Sudbury District		
Hagar	3	5
Salter	5	7.5
Struthers	20	5
Sault Ste. Marie District		
Thessalon	1	5
Rose	200	5

Rust Canker of Jack Pine, *Endocronartium harknessii* (J. P. Moore)
Y. Hiratsuka

The highest incidence of this gall-forming rust occurred on semi-mature jack pine in Hunt Township in the White River District. Evaluation showed an incidence of 15% and trace level of infection. A similar condition was present in small-diameter jack pine in Benneweis Township in the Sudbury District.

Galls caused by the pathogen were observed at a number of other locations in the Region.

Beech Bark Disease, *Nectria coccinea* var. *faginata* Lohm., Wats & Ayers

A thorough search was made for the beech bark disease, an important pathogen of beech [*Fagus grandifolia* Ehrh.] in the Maritime Provinces, in areas of high beech tree content on St. Joseph Island in the Sault Ste. Marie District. Examination failed to reveal the disease or the associated scale insect, *Cryptococcus fagi*.

Scleroderris Canker of Pine, *Scleroderris lagerbergii* Gremmen

This canker was the most important disease in the Region in 1971. New areas of infection were found in the Chapleau and Sault Ste. Marie districts, and increasing mortality occurred in Salter Township in the Sudbury District, in a replanted red pine plantation which had previously been severely damaged by the disease.

In the Chapleau District, large areas of heavily infected jack pine plantations were observed in the plains between Highway 129 and the village of Sultan. Infected living and dead trees were observed in the following townships: Nimitz, DeGaulle, Wakami, 11C, 11B, 19, 8D, and 10E. The most noteworthy infection center was located in a 500-acre stand of 15-year-old jack pine regeneration on a burn site east of Sultan in Wakami Township. Every tree in the stand apparently was infected, mortality has been heavy, and many trees can be expected to die in the next few years.

Plantations of red pine at Flame Lake in Township 8D have been infected for several years and mortality is high. At this location the disease can now be found on the lower branches of surrounding jack pine regeneration, but these trees are tall enough to withstand the infection. Mortality continues to occur in the Little Wenebagon Lake area in Township 11C where successive plantings of red and jack pine have been nearly wiped out.

In the Sault Ste. Marie District, a 10-acre infection center in a red pine plantation in Township V showed an infection incidence of 100%. Also in the Sault Ste. Marie District, infection incidences of 90 and 67.5% were found in townships 5D and Parkinson, respectively, (Table 12).

In a 1-acre red pine plantation in Hunt Township, White River District, all trees examined were diseased but mortality was still at the trace level.

Table 12. Summary of incidence and level of infection of Scleroderris canker in the Central Survey Region, 1971. (Evaluations based on the examination of four trees in each of 10 plots at each location)

Location (twp)	Host	Acres affected	Incidence (%)	Level of infection
Sault Ste. Marie District				
Parkinson	rP	2	67.5	High
Kirkwood	jP	50	2.5	Low
5D	jP	3	90.0	High
V	rP	3	100.0	High
Chapleau District				
Wakami	jP	500	100.0	High
10E	jP	10	20.0	Moderate
8D	rP	20	99.0	High
Sudbury District				
Salter	rP	7	52.5	High
White River District				
Hunt	rP	1	100.0	High
Gertrude	jP	100	10.0	Trace
Nickle	jP	200	1.0	Trace

Deer Damage

Heavy deer browsing occurred in Gladstone Township in the Sault Ste. Marie District. Damage was confined to Scots pine in the 3- to 4-in. diameter class in one small plantation. Adjacent plantations of red and smaller diameter Scots pine were relatively free of damage.

Root and Butt Rot Survey

A root and butt rot survey was initiated in 1971 in white spruce, black spruce, and balsam fir [*Abies balsamea* (L.) Mill.] stands. The stands sampled were in a state of decline or contained "stand openings" caused by some agent other than the obvious such as fire, insects, or animals. Root discs which showed evidence of rot from among those taken from up to five trees per stand were sent to the Great Lakes Forest Research Centre for culturing to determine the causal agent. A

subsequent disease evaluation was based on symptoms. In the Central Survey Region, a total of 18 stands were sampled; six of each of the tree species named earlier. The results of the survey follow.

Butt Rot of Conifers, *Polyporus tomentosus* Fr.

This root and butt rotting organism was found at three locations in the Sault Ste. Marie District and at two locations in the Sudbury District. Root examinations showed that incidence in infected stands ranged from 32 to 52%, with associated mortality ranging from 0 to 5% (Table 13).

Table 13. Summary of incidence and mortality caused by *Polyporus tomentosus* in the Central Survey Region in 1971

Location (twp)	Host	Acres affected	Incidence (%)	Mortality (%)
Sault Ste. Marie District				
3H	bS	2	52.5	2.5
Hiawatha Park	wS	50	32.5	5.0
Sudbury District				
Servos	wS	20	25.8	3.2
Hess	wS	50	32.3	0.0

Two other root rotting fungi, *Polyporus schweinitzii* Fr. and *Coniophora puteana* (Schum. ex Fr) were found in the white spruce evaluation sites at Hiawatha Park and in Hess Township, respectively, but the degree of their contribution to the existing mortality is not known.

Winter Drying of Conifers

Only scattered instances of winter drying were observed. In the Sudbury District, severe winter drying occurred in open-grown red and white pine plantations established along the Grassy Lake Road in Calvin and Kemp townships. These plantations were approximately 13 years old and incidence of damaged trees was 100%. A lower incidence occurred in a small mixed red and white pine plantation in the Burwash Management Unit.

Table 14. Other noteworthy diseases

Organism	Host(s)	Remarks
<i>Apiosporina collinsii</i> (Schw.) Hoehn.	Se	Common on undergrown hosts along Hwy 101 east of Wawa.
<i>Cenangium abietis</i> (Pers.) Rehm	jP, scP	Light incidence in Twp 30 Rge 22, White River District.
<i>Coryne sarcoides</i> (Jacq. ex Fr.) Tul	bS	Associated with cultures of root rot samples, White River and Sault Ste. Marie districts.
<i>Cytospora</i> sp.	scP	Moderate incidence on upper dead branches of Scots pine in Scadding Twp, Sudbury District.
<i>Cytospora</i> sp.	Se	Top-killing common on open-grown shrubs at Ivanhoe Lake, Chapleau District.
<i>Fomes pinicola</i> (Sw. ex Fr.) Cke	bS	Cultured from rot sections from Twp 28 Rge 24, White River District.
<i>Isthmiella faullii</i> (Darker) Darker	bF	Common in Sandy Twp, Chapleau District; heavy infection on scattered trees Twp 30 Rge 22, White River District.
<i>Massaria inquinans</i> (Tode) deN	sM	Fruiting on large flat stem cankers, canker incidence approximately 20% Cockburn Island, Sudbury District.
<i>Odontia bicolor</i> (Alb. & Schw) Bres	bF	Cultured from root sections one location, Sudbury District.
<i>Sclerophoma pithya</i> (Theum.) Hoehn.	rP	Found on recently dead host Noble Twp, Sudbury District.

(continued)

Table 14. Other noteworthy diseases (concluded)

Organism	Host(s)	Remarks
<i>Scolecconectria cucurbitula</i> (Tode ex Fr.) Booth	wP	Common on dead branches in Parkinson Twp, Sault Ste. Marie District.
<i>Trametes odorata</i> (Wulf ex Fr.) Fr.	bF	Cultured from root section from Vankoughnet Twp, Sault Ste. Marie District.
<i>Tryblidiopsis pinastri</i> (Fr.) Karst	wS	Heavy infection on dead lower branches Parkinson Twp, Sault Ste. Marie District.
<i>Tubercularia vulgaris</i> Tode ex Fr.	E	Light infection along Montreal River Road, White River District.
<i>Tympanis</i> sp.	jP	Light infection townships 19 and Edith, Chapleau District; Twp V and 5D, Sault Ste. Marie District.
<i>Valsa pini</i> (Alb. & Schw) Fr.	rP	Incidence of trees infected 7.5%, Street Township, Sudbury District.

APPENDIX

CENTRAL SURVEY REGION



FIG. A1

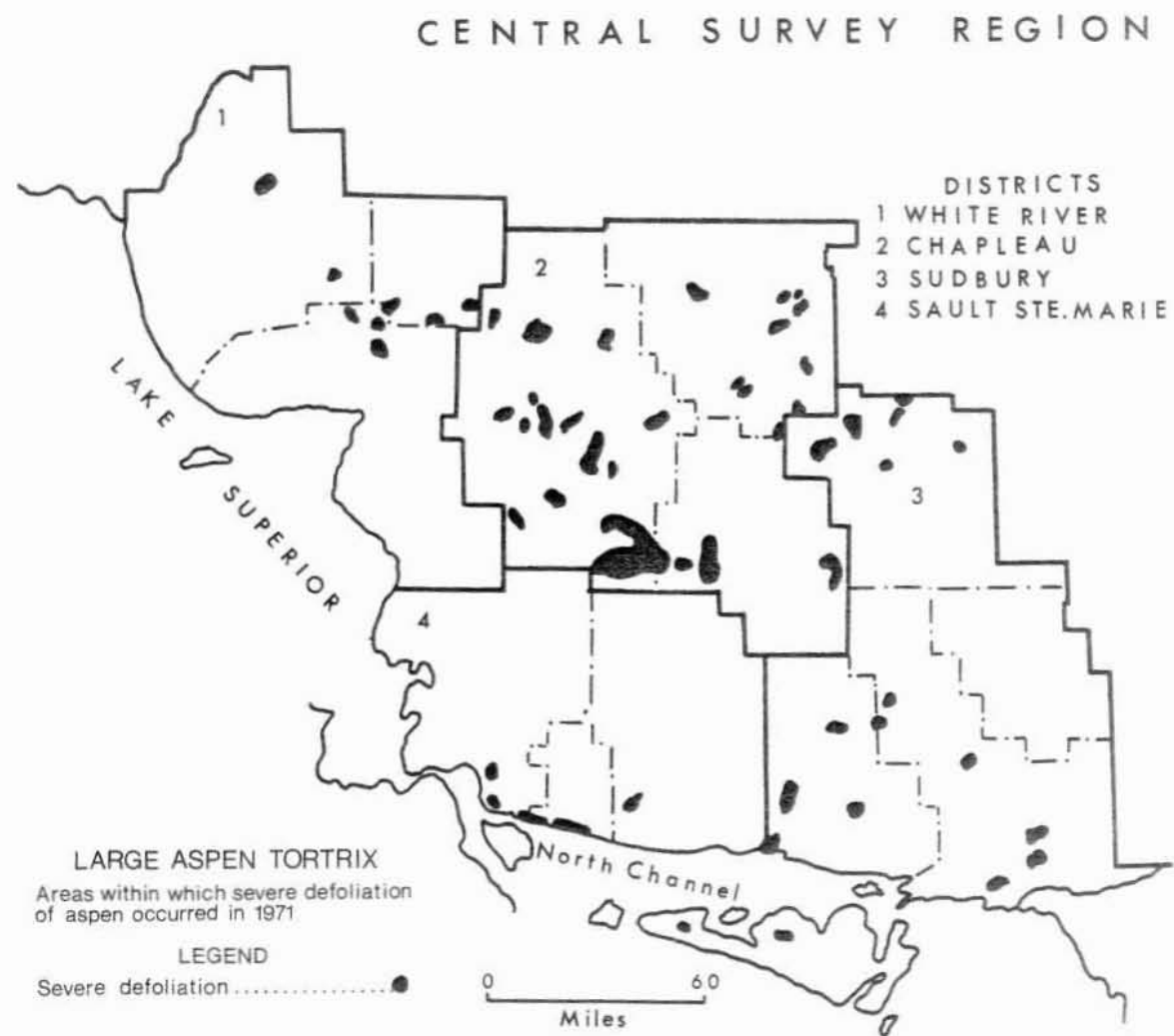
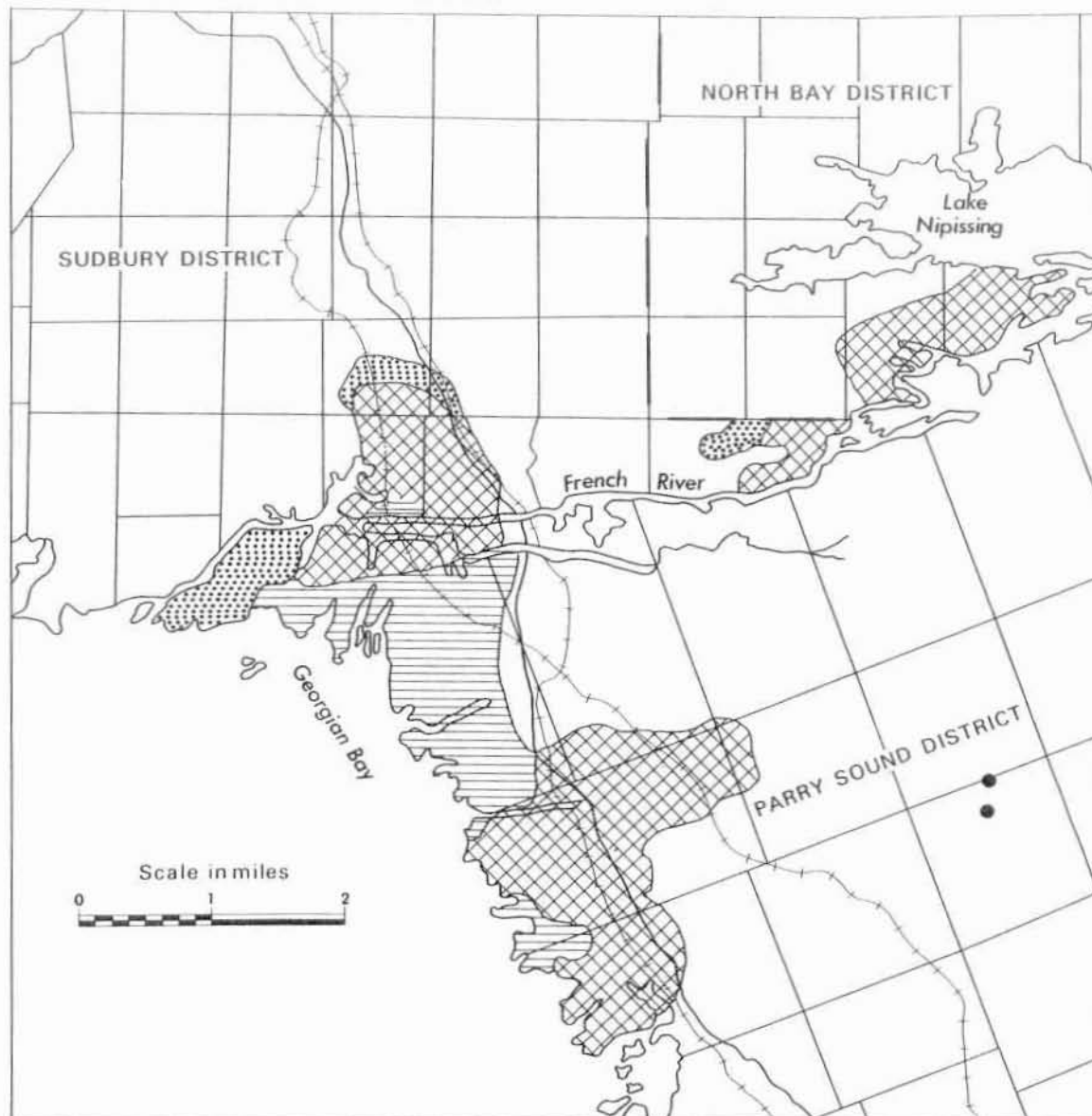


FIG. A2

FRENCH RIVER AREA



JACK PINE BUDWORM

Areas within which defoliation and mortality occurred in 1971



FIG. A3