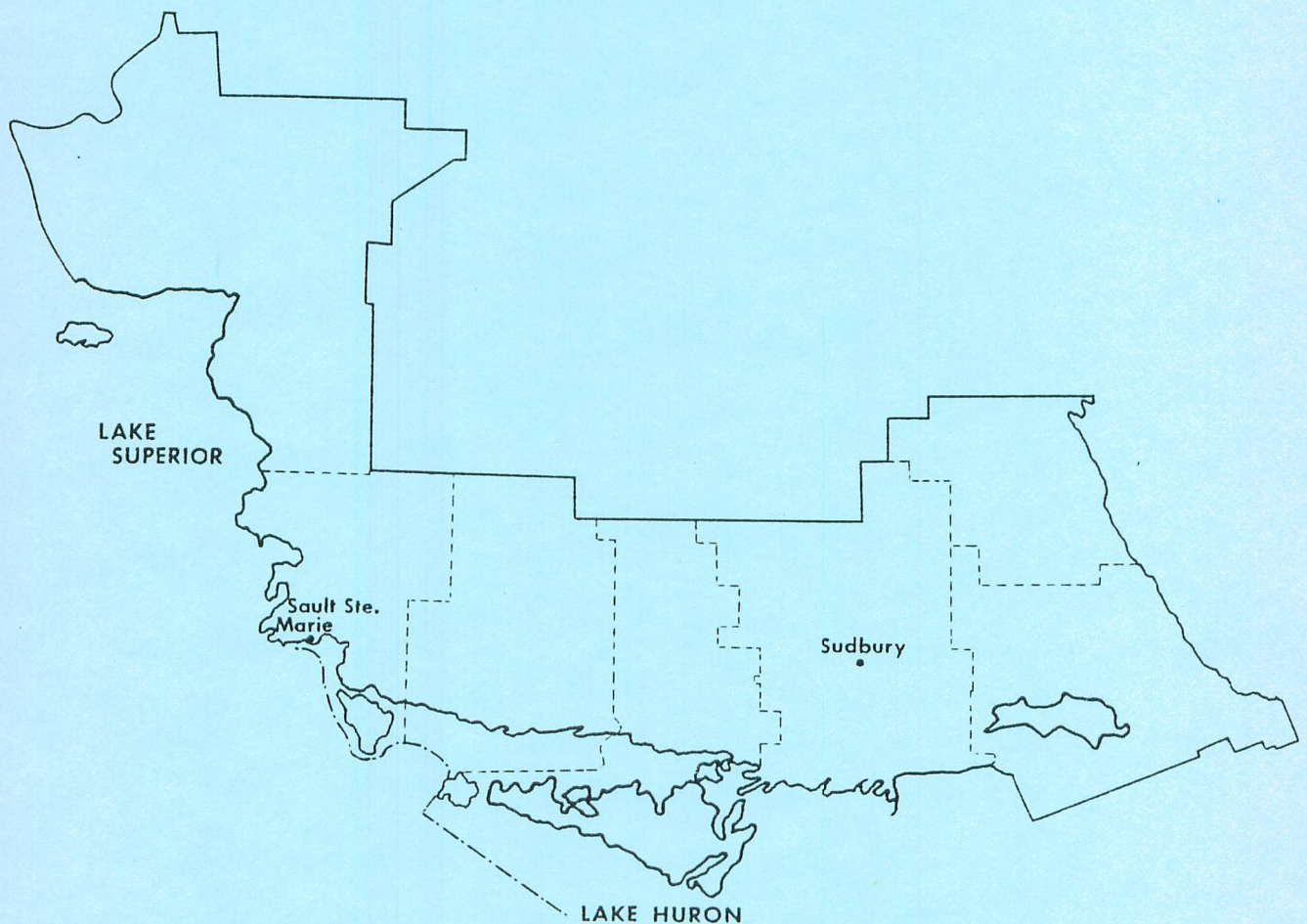


Results of forest insect and disease surveys in the NORTHEASTERN REGION of Ontario, 1981



CARRIED OUT BY THE GREAT LAKES FOREST
RESEARCH CENTRE IN CO-OPERATION WITH
THE ONTARIO MINISTRY OF NATURAL RESOURCES

SURVEY HIGHLIGHTS

This report records forest insect and disease conditions in the Northeastern Region of Ontario in 1981.

Populations of spruce budworm remained high in the Wawa District. In other areas, populations declined but were still sufficiently high to cause moderate-to-severe defoliation of balsam fir and spruce stands. Lower numbers of forest tent caterpillar resulted in marked reductions in infestations in two areas of the Sudbury District. The infestation in Espanola District persisted at a level comparable to that of 1980. A major increase in populations of birch skeletonizer resulted in severe foliar damage throughout an extensive area in the southern part of the Region. Likewise, severe defoliation of birch as a result of large increases in spearmarked black moth populations was noted in the Wawa District. White pine weevil was again present in high numbers and caused severe leader damage in many plantations. There were noticeable reductions in numbers of greenstriped mapleworm, European pine sawfly and balsam fir sawfly.

Major hardwoods suffered varying degrees of foliar wilt and die-back in the North Bay District. Infection levels of tip and shoot blights were comparable with those of the previous year, but increases were noted in the incidence of needle casts and gall rusts. Special surveys were conducted to determine the impact of pests on white spruce cones and seeds and to evaluate insect and disease conditions in white spruce plantations.

Forest insects and diseases are rated according to their impact (or potential impact) as follows:

Major Insects or Diseases

Capable of causing serious injury to or death of living trees or shrubs (formerly categories A and B)

Minor Insects or Diseases

Capable of sporadic or localized injury but not usually a serious threat to living trees or shrubs (formerly category C)

Other Forest Insects/Diseases (Tables)

These tables provide information on two types of pest: 1) those which are of minor importance and have not been known to cause serious damage to forest trees, and 2) those which are capable of causing serious damage but, because of low populations or for other reasons, did not cause serious damage in 1981.

Another feature of this report is that each pest is listed in the Table of Contents according to occurrence in Ontario Ministry of Natural Resources districts.

It should be noted that E. Czerwinski replaced H. Brodersen as survey field technician in the Espanola, Sudbury, and North Bay districts in 1981.

The excellent cooperation and assistance of Ontario Ministry of Natural Resources personnel and woods operators are gratefully acknowledged.

K. Hall

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L. MacLeod

V. Jansons

Frontispiece. Birch (*Betula* spp.) damaged by the birch skeletonizer (*Bucculatrix canadensisella* Cham.)



Aerial view of stand

Defoliated branch

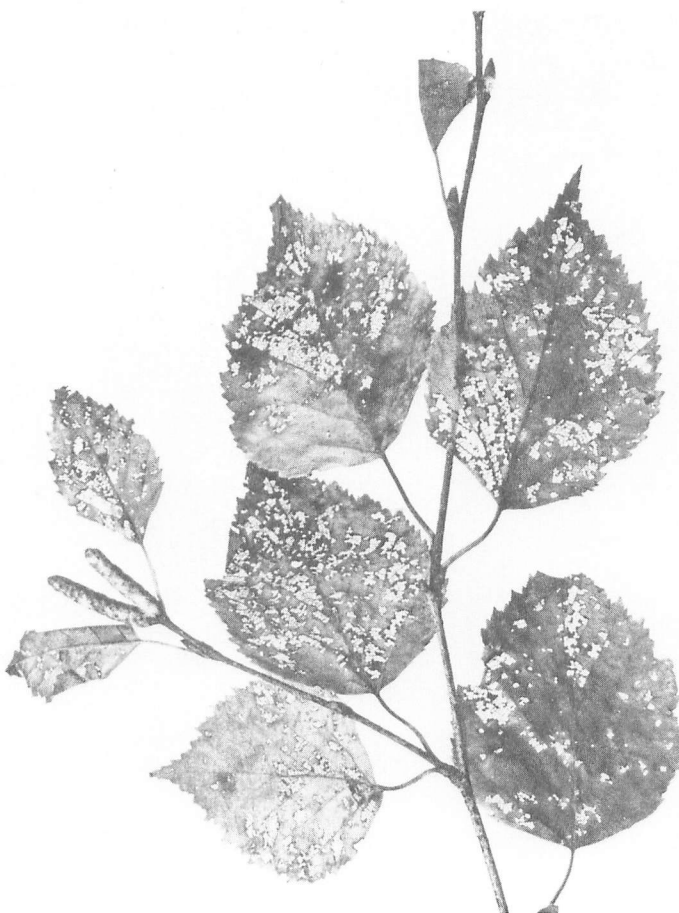


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INSECTS

Major Insects

Eastern Spruce Gall Adelgid, *Adelges abietis* (Linn.)

The highest incidence of this gall-forming insect was recorded in Killarney Township, Sudbury District, where 15% of one 16 ha white spruce (*Picea glauca* [Moench] Voss) plantation was infested. Populations were generally at the trace-to-light level but in one instance were sufficiently high to cause tree mortality (Table 1). Trace levels were noted elsewhere in the Region.

Table 1. Summary of white spruce affected by the eastern spruce gall adelgid in North Bay, Sudbury and Espanola districts in 1981 (150 trees examined at each location).

Location (Twp)	Stand size (ha)	Avg height (m)	Avg DBH (cm)	No. of trees infested	Tree mortality (%)
North Bay District					
Gurd	1.5	1.9	1.6	10	0
Falconer	31.0	1.7	0.9	2	0
Dana	5.0	3.5	4.9	1	0
Sudbury District					
Killarney	16.0	2.8	3.6	23	1.3
Espanola District					
Foster	2.0	9.5	17.1	2	0

Pine Spittlebug, *Aphrophora cribrata* (Walker)

The highest incidence of spittlebug was recorded in Scots pine (*Pinus sylvestris* L.) and jack pine (*P. banksiana* Lamb.) plantations in Espanola District. Quantitative sampling in Scots pine plantations showed light infestation on 97% of the trees in Billings Township and 57% in Carnarvon Township on Manitoulin Island. In Hallam Township 21% of one jack pine plantation was lightly infested. The only report of twig mortality was from Temagami District where most plantations were lightly infested. Elsewhere, trace populations were common both in plantations and in natural stands.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

There was a very marked increase in populations and area infested in the Region in 1981.

In 1980, population levels reached infestation proportions in Blind River District and resulted in 50 ha of moderate-to-severe defoliation in scattered pockets along highways 108 and 639. Light infestation was recorded throughout a much larger portion of the district.

In 1981, high populations were recorded from Echo Bay in Sault Ste. Marie District through Blind River, Espanola, Sudbury and North Bay districts to the Quebec border. In addition, small isolated areas of heavy infestation were found in Kincaid and VanKoughnet townships, Sault Ste. Marie District and in Lendrum Township, Wawa District (Fig. 1). White birch (*Betula papyrifera* Marsh.) and yellow birch (*B. alleghaniensis* Britton) throughout the area of 2,477,000 ha suffered severe browning and premature leaf drop (see Frontispiece). Beyond the area of heavy damage light populations were found commonly in the northern parts of Sault Ste. Marie and Blind River districts, south of Lake Nipissing, and throughout the Temagami District and the northern section of the North Bay District.

Maple Leafroller, *Cenopsis acerivorana* Mack.

For the second consecutive year high populations were recorded at Hiawatha Park and along the Shultz Road, Highway 17 north and the 5th line in the city of Sault Ste. Marie. Sugar maple (*Acer saccharum* Marsh.) and red maple (*A. rubrum* L.) suffered heavy foliar damage throughout an area of approximately 900 ha. Light populations were present in the area for several years prior to 1980.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling, and egg-mass counts will be included with those of other Regions in a special report to be published later this year. That report will provide a complete description and analysis of developments in the spruce budworm situation in Ontario in 1981 and will give infestation forecasts for the province for 1982.

Oak Leaf Shredder, *Croesia semipurpurana* (Kft.)

No major change in the status of this defoliator was observed. Moderate-to-severe defoliation was again evident at Hiawatha Park and in Jocelyn Township, Sault Ste. Marie District and at Maple Ridge, Blind River District. In all, approximately 80 ha were affected, with defoliation ranging from 25% to 40%. Egg counts carried out at Hiawatha Park

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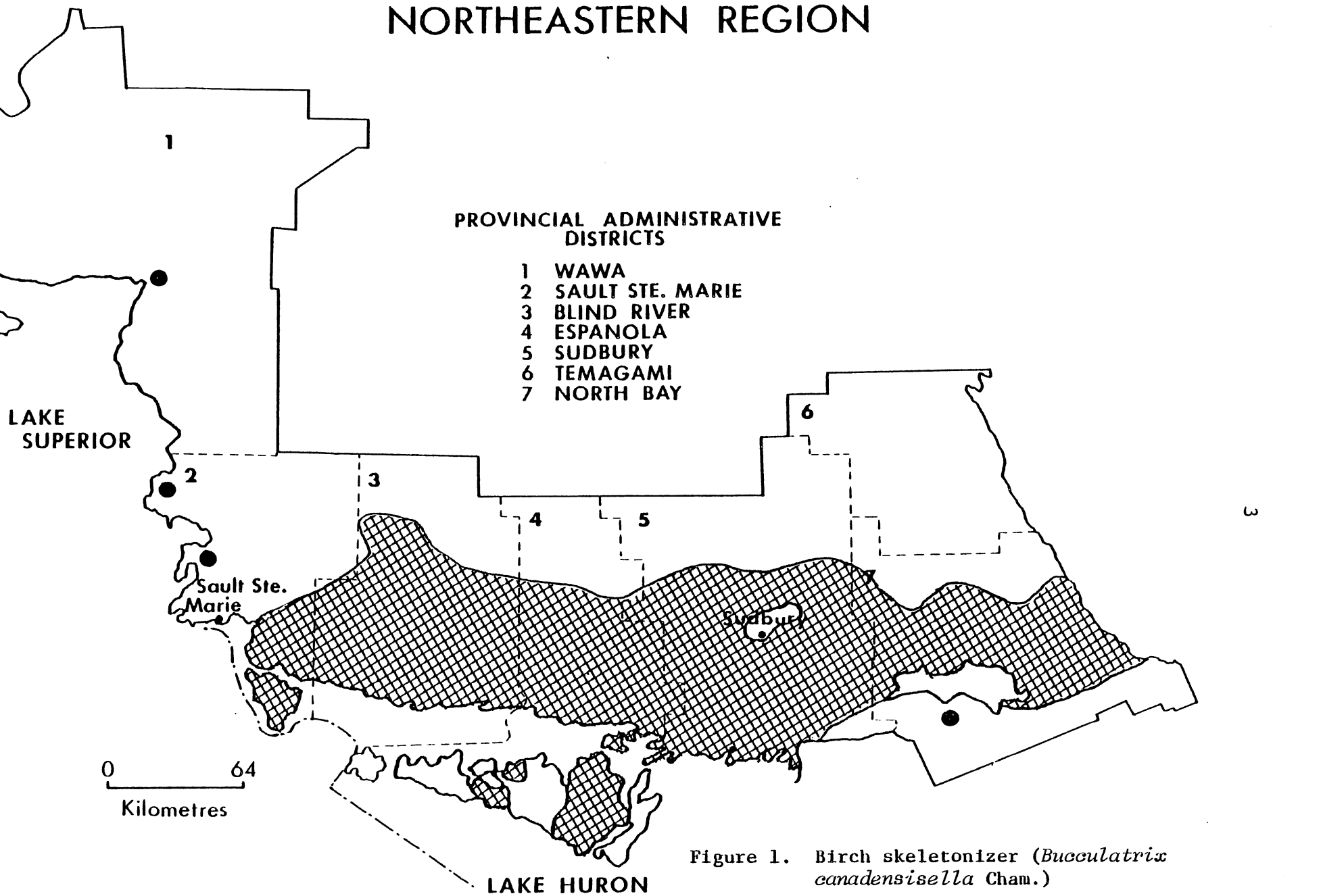



Figure 1. Birch skeletonizer (*Bucculatrix canadensisella* Cham.)

Areas within which moderate-to-severe defoliation occurred in 1981 . . . ● or 

and Maple Ridge indicate that the infestation will continue in 1982, but at a reduced level. Elsewhere, light-to-moderate damage to individual red oak (*Quercus rubra* L.) trees was observed in Rutherford, Humboldt and Attlee townships, Sault Ste. Marie District and in Day, Gladstone, Cobden and Striker townships, Blind River District.

Greenstriped Mapleworm, *Dryocampa rubicunda rubicunda* (Fabr.)

For the past several years population levels have generally increased throughout the Blind River District, reaching a high point in 1980 with small pockets of heavy defoliation near Iron Bridge and Elliot Lake and light populations throughout the eastern part of the District from Thessalon onward. In 1981, a sharp decline resulted in endemic levels at all sample points. The only area of appreciable numbers was east of Mattawa in Cameron Township, North Bay District where scattered red maple suffered moderate damage.

Elm Spanworm, *Ennomos subsignarius* (Hbn.)

The first occurrence of this insect in infestation proportions was reported at Hagans Hill east of Thessalon in 1979. Defoliation of maple and red oak was heavy. Populations persisted in 1980 but at a lower level. In 1981, the infestation collapsed and sampling showed no larvae in the area.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Low populations of this insect are common in pine plantations and natural regeneration throughout the Region. However, in jack pine plantations in Barr Township, Temagami District and in red pine (*Pinus resinosa* Ait.) plantations in Patton Township, Blind River District, leader damage was recorded at 19% and 11%, respectively.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Extremely high populations were common throughout the Temagami District, especially in the New Liskeard, Cobalt and Haileybury areas where damage to ornamental birch was particularly severe. Similarly, moderate-to-severe damage was observed in birch stands in the Sturgeon River and Powassan areas of North Bay District. Elsewhere in the Region populations were high on open-growing hosts along highway corridors and in open areas.

Table 2. Summary of leader damage caused by the eastern pine shoot borer in Temagami and Blind River districts in 1981 (counts based on the examination of 100 or 150 trees per location).

Location (Twp)	Tree species	Area affected (ha)	Estimated trees/ha	Height (m)	Leaders infested (%)
Blind River District					
Patton	rP	50	2,990	2.7	17
Patton	rP			3.0	5
Temagami District					
Barr	jP	200	2,990	2.5	19
Firstbrook	jP	6	2,990	3.5	6
Aston	jP	25	2,990	4.5	8

Fall Webworm, *Hyphantria cunea* (Dru.)

The only population increases in 1981 occurred in Tehkummeh Township on Manitoulin Island where white ash (*Fraxinus americana* L.) was moderately defoliated. Populations remained at a level comparable to that of the previous year on black ash (*F. nigra* Marsh.) at Beaucage Park, North Bay District. Light-to-moderate populations have persisted at this location for the past several years. Elsewhere in the Region feeding nests were observed frequently on a variety of deciduous hosts but not in infestation proportions.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Forest tent caterpillar population levels declined drastically in North Bay and Sudbury districts and to a lesser degree in Espanola District. The total area of moderate-to-severe defoliation of trembling aspen (*Populus tremuloides* Michx.) in 1981 was 69,811 ha--a substantial reduction from the 121,542 ha recorded in 1980 (Fig. 2).

In North Bay District, the area of heavy infestation in 1980 which covered approximately six townships between Warren and Hagar south of Highway 17 collapsed, and only small pockets of light infestation were noted in Jennings, Dunnet and Casimir townships. The infestation in Sudbury District, which had doubled in size in 1980, declined sharply, and only small residual pockets of moderate-to-severe defoliation were noted in Denison and Drury townships. Field observations revealed very low larval emergence from overwintering egg bands in Sudbury and North Bay

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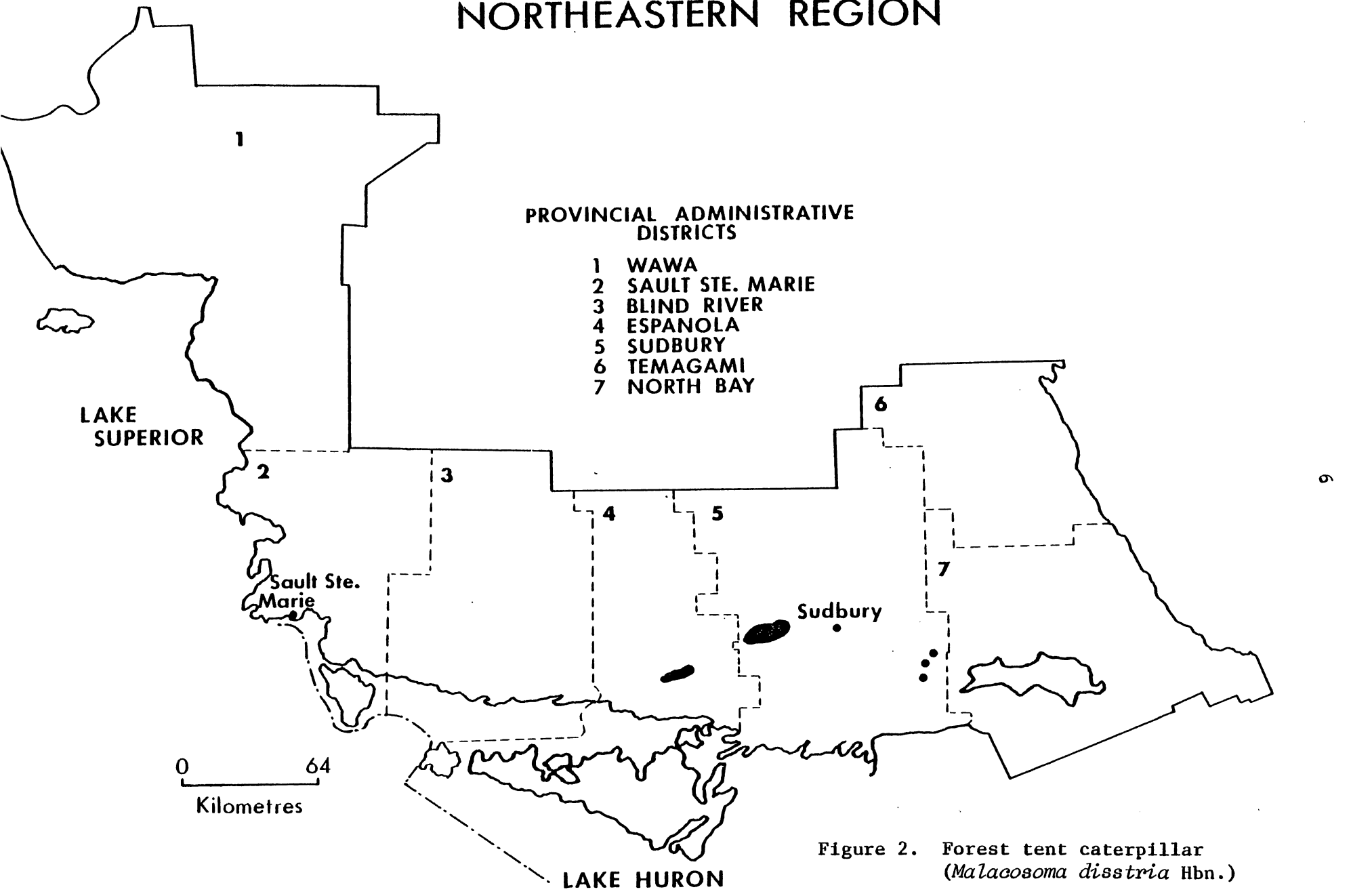


Figure 2. Forest tent caterpillar (*Malacosoma disstria* Hbn.)

Areas within which moderate-to-severe defoliation occurred in 1981 . . . ●

districts. This egg hatch failure was due in part to egg parasitism and in part to an unknown cause. Population levels in Espanola District, though lower than in 1980, were sufficiently high to cause moderate-to-severe damage in the same areas of May, Shakespeare and Baldwin townships. Starvation and infection by *Entomophthora* fungus were evident in late-instar larval populations in several areas of the Espanola infestation.

Examination of egg bands for forecast purposes indicates that infestations will decline in all areas except Baldwin and Hallam townships, where high numbers are expected to continue (Table 3).

Table 3. Summary of forest tent caterpillar egg-band counts and infestation forecasts for 1982 in the Northeastern Region (counts based on the examination of three trembling aspen trees per location).

Location (Twp)	Avg DBH (cm)	Avg no. of egg bands per tree	Infestation forecast for 1982 ^a
Espanola District			
Hallam	9	15	S
Merritt	9	4	M
Shakespeare	11	5	M
Baldwin	10	3	M
Baldwin	8	9	S
May	16	5	L
Sudbury District			
Denison	13	3	M
Denison	12	3	M
Denison	10	2	L
Drury	12	2	L
Drury	18	1	L
Drury	11	1	L

^a S = severe, M = moderate, L = light

Balsam Fir Sawfly, *Neodiprion abietis* complex

The moderate infestation on balsam fir (*Abies balsamea* [L.] Mill.) in Calvin, Lauder and Papineau townships, North Bay District in 1980 declined to endemic levels in 1981. The only occurrence of the insect in the Region was reported in Foster Township, Espanola District where low numbers were found.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Populations increased in North Bay District and persisted at a comparable level in Blind River District. The heaviest damage was reported in two Ontario Ministry of Natural Resources (OMNR) plantations in Rose Township, Blind River District. In the larger of the two plantations, control measures were initiated with the introduction of virus. Quantitative sampling in the smaller (private) plantation showed that 76% of the red pine were severely defoliated and that there was 33% mortality. In North Bay District, virus provided by the Forest Pest Management Institute (Sault Ste. Marie) was used to control high populations in Gurd, Lauder, Calvin, Papineau, Cameron and Boulter townships and in Restoule Provincial Park. In a follow-up treatment, surviving colonies were treated with malathion later in the season. In all, more than 30 plantations were treated in North Bay District. Elsewhere in the Region population levels were low and individual colonies were clipped and destroyed during plantation examinations.

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

Populations declined to trace levels at all sample locations in the Region. On Manitoulin Island negative results were recorded in all Scots pine plantations except in Billings Township where a total of 11 colonies were counted on 100 trees. In Thessalon Township, Blind River District and throughout the city of Sault Ste. Marie the reduction was also evident as lower numbers of colonies were observed.

Swaine Jack Pine Sawfly, *Neodiprion swainei* Midd.

The Swaine jack pine sawfly infestation in the Elk Lake Management Unit, Temagami District increased in extent and intensity. The larger portion of the infestation along Makobe River in Banks and Wallis townships spread north and east to encompass an area of approximately 4,663 ha of jack pine. The northern apex is approximately 1.5 km south of Alexander Lake in Willet Township. The infestation in this area now includes parts of the townships of Banks, Wallis, Willet, Roadhouse and Whitson. A small 20 ha infestation was recorded east of Makobe River in James Township. Scattered colonies were found in Mickle, Corkill, Brewster and Gamble townships.

At Big Boot Lake north of Lady Evelyn Lake the increase was more modest. This segment now totals about 1,036 ha and extends along the north shore of Lady Evelyn Lake from east of Slade Lake to Waswaning Narrows including parts of Van Nostrand, Klock, Leo and Dane townships. There was light-to-moderate defoliation at several locations on Lake Temagami and colonies were more frequent in the northern part of the District.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex

This sawfly caused conspicuous defoliation at scattered locations in the Region. Defoliation was heavy on small jack pine trees in a 200 ha plantation in Barr Township and a 6 ha plantation in Firstbrook Township, Temagami District. In Barr Township an examination of 150 trees showed 36% infested with a total of 54 colonies. In one 10 ha plantation in Wells Township, Blind River District, 12% of the open-growing hosts were lightly infested. Trace-to-light numbers of colonies were present in Espanola and Sudbury districts.

White Pine Weevil, *Pissodes strobi* Peck.

Levels of leader damage to pines fluctuated considerably throughout the Region. Quantitative counts of leader damage to white pine (*Pinus strobus* L.) in Blind River, Espanola and Sudbury districts remained high with incidence ranging from 31% to 58% (Table 4). Damage incidence on jack pine varied from 4% to 12%. Notable exceptions were in Barr Township, Temagami District and in Rose Township, Blind River District, where leader damage was recorded at 21% and 33%, respectively. The incidence of weeviling in red pine and white spruce plantations was low in all areas sampled.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)

This insect is widely distributed in the Region. In the Wawa District severe defoliation of the American mountain-ash (*Sorbus americana* Marsh.) was recorded throughout Lake Superior Park and along Highway 17 west of Wawa. Defoliation of mountain-ash, which occurs commonly in the understory, ranged as high as 90%. Similarly, in Temagami District defoliation of ornamentals and forest hosts was severe. Elsewhere in the Region light damage was general although occasional trees suffered severely.

Aspen Leafroller, *Pseudexentera oregonana* Wlshn.

For the second consecutive year high populations caused moderate-to-severe damage to large-diameter trembling aspen trees in Jennings, Dunnet and Casimir townships, Sudbury District. Defoliation exceeded 40% in all areas sampled. In the Sault Ste. Marie District, scattered stands of small-diameter aspen along the Ranger Lake road in Hodgins and Whitman townships sustained heavy defoliation. New pockets of moderate damage were found on small hosts in Patton Township, Blind River District. Infested areas did not exceed 1 ha in size. Elsewhere population levels were low.

Table 4. Summary of leader damage by the white pine weevil in pine plantations in the Northeastern Region, 1979-1981.

Location (Twp)	Host	Area affected (ha)	1979	1980	1981
Blind River District					
Lefroy	wP	20	32	79	52
Patton	wP	40	31	55	49
Rose	jP	5	-	-	33
Wells	jP	10	-	-	6
Patton	rP	5	-	-	2
Wells	rP	10	-	-	2
Patton	scP	20	-	-	44
Espanola District					
Merritt	wP	2	49	75	58
Victoria	wP	2	29	35	31
Nairn	jP	5	5	0	0
North Bay District					
Badgerow	wP	3	23	23	48
Gurd	wP	1	-	-	18
McLaren	wP	25	-	12	6
Temagami District					
Aston	jP	25	-	-	12
Barr	jP	200	-	-	21
Firstbrook	jP	6	14	11	4
Sault Ste. Marie District					
Curtis	jP	10	-	9	9
Sudbury District					
Burwash	wP	12	41	40	46
Wawa District					
Bryant	wS	10	-	1	3
Mikano	wS	5	-	3	4
Magone	wS	5	-	2	3

Spearmarked Black Moth, *Rheumaptera hastata* (Linn.)

This insect was reported in 1961 in Geraldton District and in 1962 in Port Arthur (now Thunder Bay) District. Appreciable numbers of insects were next reported in 1980 when heavy damage was recorded at scattered locations in the western part of Wawa District. In 1981 a substantial increase in population levels resulted in a large new outbreak in Wawa District (Fig. 3). The affected area of approximately 316,089 ha extended from the Mosambik-Oba lakes in the north to Highway 101 in the south and merged with the large infestation in the Chapleau District. The high populations were responsible for severe browning of birch trees and premature leaf drop, which resulted in moderate defoliation by mid-August. Infestations of the insect tend to be of short duration--usually one to two years.

*Minor Insects*Red Pine Cone Beetle, *Conophthorus resinosae* Hopk.

Since 1967, high populations of this species have caused varying degrees of damage in red pine stands in Temagami District. Damage is two-fold as both cones and vegetative buds are destroyed. Heavy infestation recurred in 1981 on trees up to 40 m in height in the northern part of the District. In many areas the ground was littered with fallen twigs containing adult beetles. The jack pine tip beetle (*Conophthorus banksianae* McPherson), a closely related species, is found commonly on immature jack pine east of Wawa in Wawa District. Evaluation of one 100 ha plantation showed 16% of the trees damaged, and of these, 4% had terminal damage.

Table 5. Other forest insects.

Insect	Host(s)	Remarks
<i>Acantholyda erythrocephala</i> (Linn.) Pine false webworm	rP	trace to low populations in Bastedo Twp, North Bay District; new distribution point
<i>Acrobasis betulella</i> Hlst. Birch tubemaker	wB	moderate numbers in most birch stands in Temagami District
<i>Anacampis innocuella</i> Zell. Darkheaded aspen leafroller	ltA	high populations on fringe trees in Gordon Township, Espanola District

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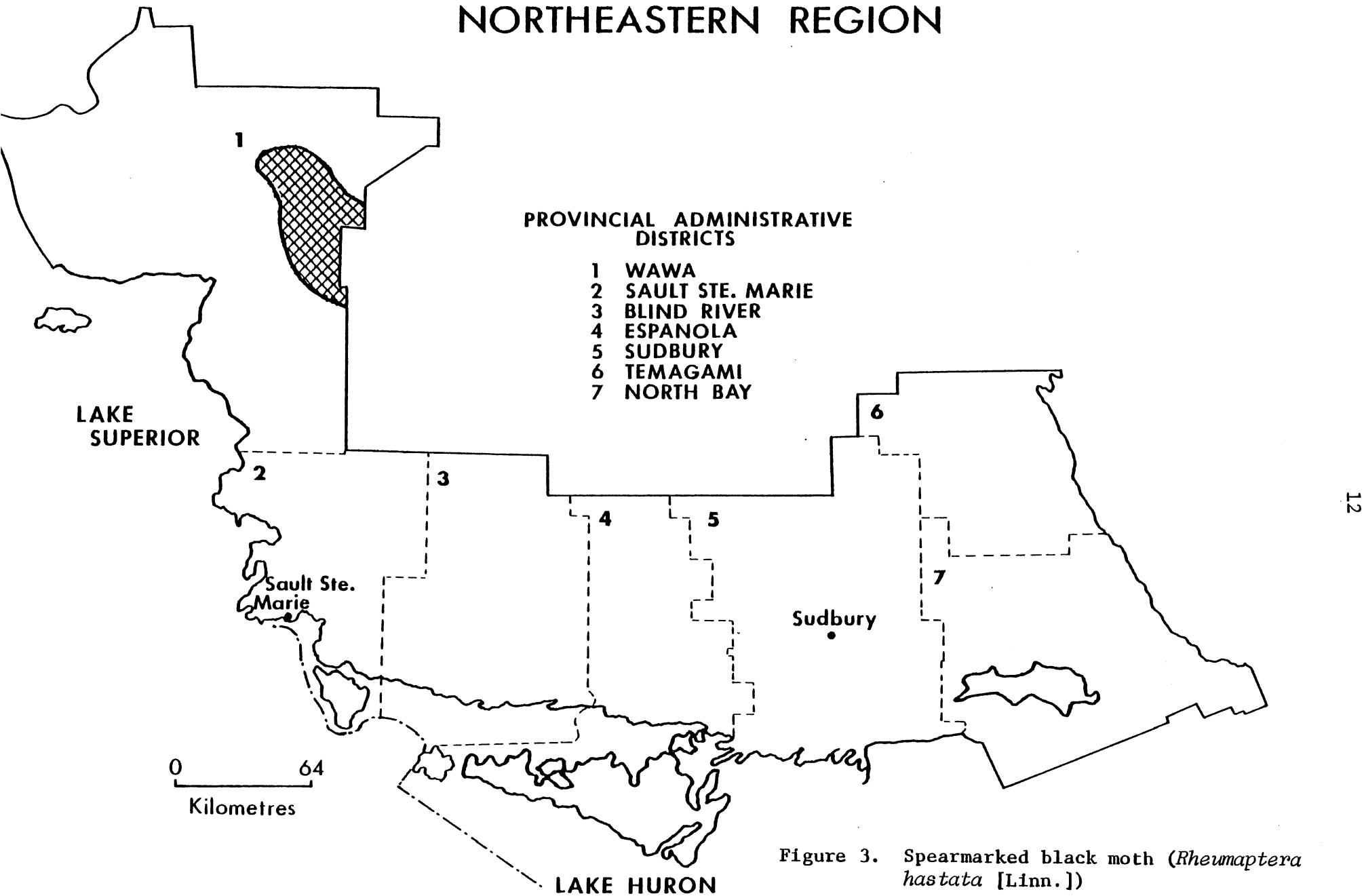


Figure 3. Spearmarked black moth (*Rheumaptera hastata* [Linn.]


Areas within which heavy infestation occurred in 1981 

Table 5. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Archips cerasivoranus</i> (Fitch) Uglynest caterpillar	ecCh	numerous tents in rural areas near New Liskeard, Temagami District, and north of Swinn Lake, Kirkwood Twp, Blind River District; moderate numbers along roadsides throughout Espanola, Sudbury and North Bay districts
<i>Archips negundanus</i> (Dyar) Larger boxelder leafroller	mM	light-to-moderate damage throughout Sault Ste. Marie, Sault Ste. Marie District; occasional heavy damage in Hallam Twp, Espanola District
<i>Cenopis pettitana</i> (Rob.) Maple basswood leafroller	Ba	light populations in Gordon Twp, Espanola District
<i>Choristoneura pinus pinus</i> Free. Jack pine budworm	jP	very light numbers on beating samples at one location in Kirkwood Twp, Blind River District
<i>Chrysomela mainensis mainensis</i> Bech. Alder leaf beetle	Al	found commonly along lake-shores in Strathy and Strathcona Twps, Temagami District
<i>Chrysomela walshi</i> Brown Balsam poplar leaf beetle	bPo	moderate discoloration caused by the insect at many locations in Temagami District
<i>Coleophora laricella</i> (Hbn.) Larch casebearer	tL	Populations declined to endemic levels in Garden River Indian Reserve and on St. Joseph Island, Sault Ste. Marie District.
<i>Dioryctria reniculelloides</i> Mut. & Mun. Spruce coneworm	wS	high numbers on occasional trees in Wells Twp, Blind River District; low numbers in association with spruce budworm at numerous other locations

(continued)

Table 5. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Disonycha alternata</i> Ill. Striped willow leaf beetle	W	high numbers at one location in Nadjiwon Twp, Wawa District
<i>Eriophyes fraxiniflora</i> Felt Ash flowergall mite	wAs	moderate-to-high incidence in the eastern part of Sudbury District
<i>Eupareophora parca</i> (Cress.) Spiny ash sawfly	bAs	light damage throughout Temagami District
<i>Gonioctena americana</i> (Schaeef.) American aspen beetle	tA	Populations declined to endemic levels in Temagami District.
<i>Halysidota maculata</i> (Harr.) Spotted tussock moth	mM, wB, W, Al	high populations in Villeneuve Twp, Blind River District; defoliation of understory mountain maple (<i>Acer spicatum</i> Lam.) ranging from 10% to 25%; moderate populations in Oshell Twp, Espanola District; trace levels common
<i>Malacosoma americanum</i> F. Eastern tent caterpillar	ecCh	moderate numbers of colonies at scattered locations in Espanola and North Bay districts
<i>Neodiprion nanulus nanulus</i> Schedl. Red pine sawfly	jP	low numbers recorded in a 7 ha plantation in Hallam Twp, Espanola District
<i>Neurotoma inconspicua</i> (Nort.) Plum web-spinning sawfly	pCh	recurrence of high populations at one location in Patton Twp, and new pocket of heavy damage in Thompson Twp, both in Blind River District
<i>Nymphalis antiopa</i> (L.) Mourningcloak butterfly	Al	heavy infestation at one location in Tehkummah Twp, Espanola District; trace levels widely distributed elsewhere

(continued)

Table 5. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Phratora purpurea purpurea</i> Brown Aspen skeletonizer	tA	severe discoloration on small trees around Temagami, Temagami District
<i>Phyllobius oblongus</i> (Linn.) European snout beetle	sM,rM	high populations at scat- tered points in Aberdeen Twp, Sault Ste. Marie District and in Kirkwood and Patton Twps, Blind River District
<i>Pikonema alaskensis</i> (Roh.) Yellowheaded spruce sawfly	wS,bS	moderate defoliation of occasional trees at Findlayson Point Park, Temagami District; trace levels in Espanola, Sudbury and North Bay districts
<i>Pristiphora erichsonii</i> (Htg.) Larch sawfly	tL	low populations in Cascaden Twp, Sudbury District

TREE DISEASES

Major Diseases

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

The highest incidence of this needle rust was recorded once again in the western and northern parts of Wawa District. Small-diameter white spruce in Lendrum and Rabazo townships suffered high levels of needle infection. Infection of black spruce (*Picea mariana* [Mill.] B.S.P.), though common, declined to trace levels along Highway 17 west, the Dubreuilville road and Highway 101. In the Sault Ste. Marie District, high infection levels were again common in black spruce stands in several locations in Pine Township. Elsewhere trace levels were reported, but infrequently.

Ink Spot of Poplar, *Ciborinia whetzeli* (Seaver) Seaver

The only area of appreciable damage caused by this defoliating pathogen was in a 1 ha stand of trembling aspen in Dana Township, North Bay District. Infection of 30% was recorded on 18% of the trees. The heavy infection reported in 1980 in Jocelyn and Cobden townships declined to trace levels in 1981. Trace-to-low damage levels were found at many locations in the Region.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

A pocket of moderate infection by this disease which causes distorted basal cankers was found in Merritt Township, Espanola District. The affected area comprised approximately 50 ha of semimature jack pine trees, 7.8% of which were affected. The disease is widespread in the Region at varying infection levels.

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirat.

Moderate incidence levels of this gall-forming disease were assessed in two locations in the Region. The most severe infection was in Jocelyn Township, Sault Ste. Marie District, where 15% of the trees in a 2 ha Scots pine plantation were diseased. Of these, 7.3% were severely infected and .7% mortality was recorded. In Carnarvon Township, Espanola District, the incidence was 17%, and 4% of the Scots pine were severely affected in the 1 ha plantation. The disease occurs commonly in the Region at trace-to-low levels on both Scots pine and jack pine.

(continued)

Scleroderris Canker, *Gremmeniella abietina* (Lagerb.) Morelet

Levels of infection comparable to those in 1980 were recorded in jack pine and red pine plantations. In a 25 ha jack pine plantation in Gaudette Township, Sault Ste. Marie District, 6% foliar damage was recorded on 96% of the trees. Similarly in Recollet Township, Wawa District, 5% damage was noted on 100% of the jack pine trees. Trace levels of infection persist in immature plantations in Kirkwood Management Unit, Blind River District. Occasional infected trees are found elsewhere in the Region.

Needle Cast, *Lophodermium australe* Dearn.

High levels of infection were recorded in Bridgland Township, Blind River District. Evaluations showed 30% foliar damage in one 20 ha jack pine plantation 13 m in height. Light levels were recorded on small-diameter jack pine in Boulter Township, North Bay District. The fungus is usually found in more southern or tropical climates. This is apparently the first occurrence detected in Ontario. The organism was identified by Dr. R.A. Shoemaker, Biosystematics Research Institute, Ottawa. There were other, as yet unidentified, species of *Lophodermium* on the collected material. Further work will be required to assess the pathogenic role of *L. australe* and the other species of this genus.

Needle Cast, *Lophodermium pinastri* (Schrad. ex Hook.) Chev.

The only occurrence of this disease at high levels of foliar damage was recorded in South Himsforth Township, North Bay District. There red pine, 10-14 m in height, sustained 90% foliar damage on 70% of the trees. Light levels of infection were recorded on red pine in Gurd Township and trace levels were common elsewhere in the North Bay District.

Table 6. Other forest diseases.

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Vahl ex Fr.) Kumm. Armillaria root rot	jP, rP, wS	light damage levels in Parkinson Twp, Blind River District; trace levels common elsewhere in the Region
<i>Cronartium ribicola</i> J.C. Fischer White pine blister rust	wP	light infection levels in a small plantation in Thessalon Twp, Blind River District; trace levels found throughout the range of white pine

(continued)

Table 6. Other forest diseases (concluded).

Organism	Host(s)	Remarks
<i>Davisomycella ampla</i> (Davis) Darker Needle cast	jP	moderate infection levels on natural regeneration in Dunlop Twp, Espanola District
<i>Hypoxylon mammatum</i> (Wahl.) J.H. Miller Hypoxylon canker of poplar	tA	light damage in one immature stand in Curtis Twp, Sault Ste. Marie District
<i>Kabatiella apocrypta</i> (Ell. & Ev.) Arx Maple anthracnose	sM	trace-to-light infection levels common in Sylvan Valley, Sault Ste. Marie District
<i>Kabatiella prunicola</i> (Ell. & Ev.) Arx Cherry anthracnose	pCh	high incidence at one location in Kirkwood Twp, Blind River District
<i>Melampsora epitea</i> Thuem. Needle rust of willow	W	scattered pockets of light-to-moderate infection in Bright Twp, Blind River District
<i>Venturia macularis</i> (Fr.) Müller & Arx. Shoot tip blight	tA, ltA	trace levels of infection common on aspen regeneration in the Region

Diebacks and Declines

Maple Dieback

Throughout the city of North Bay, sugar maple, silver maple (*Acer saccharinum* L.) and other hardwoods suffered varying degrees of crown mortality, usually preceded by wilting of foliage during the period from June to mid-August. The majority of affected trees ranged from 7 to 20 years in age, and were up to 6 m tall. Damage ranged from loss of the occasional branch to whole-tree mortality. Trees over 6 m seemed less affected. The cause is as yet unknown but the situation will continue to be monitored.

Abiotic Damage

Frost

Frost damage this year was minimal in the Region and was confined to small-diameter trees. In assessments of jack pine and spruce plantations only trace foliar damage was detected. White spruce retained foliage killed by frost in 1980 and gave the impression that damage was much heavier in 1981.

Rodent Damage

A small area of light leader damage to white pine was noted in McLaren Twp, North Bay District.

Winter Drying and Salt Damage

Trace-to-low damage levels were recorded on white pine, red pine, jack pine and white spruce along main highways in the Region.

Special Surveys

White Spruce Flower and Cone Survey

A special survey was carried out to determine the influence of insects and disease on flowers and cones of white spruce. A collection of 200 late female flowers was made in late May in Espanola and Blind River districts. A second collection of 100 immature cones was made in late July in the same areas. The samples were assessed for the proportion of damaged flowers and cones and the identity of insects present (Table 7).

Table 7. A summary of white spruce female flowers collected between late May and early June and white spruce cones collected between mid-July and 10 August.

Location (Twp)	Flowers		Developed cones		No. of insects retrieved from cones		
	examined (no.)	damaged (%)	examined (no.)	damaged (%)	Lepi- doptera	<i>Hylemya</i> <i>anthracina</i>	other insects
Blind River District							
Patton	207	37	120	74	64	28	27
Espanola District							
Foster	211	10	100	89	14	42	109

The proportion of damaged flowers varied considerably between areas from a low of 10% in Espanola District to 37% in Blind River District. Lepidopterous insects, including spruce budworm, were most common in both areas but in much higher numbers in the latter area. Damage in the second collection was more severe with 89% and 74% of the cones being affected in Espanola and Blind River districts, respectively. The largest proportion of insects found in Blind River District were lepidopterous whereas in Espanola dipterous pests were more abundant. The incidence of *Hylemya anthracina* (Czerny), which feeds as a maggot destroying the seeds, increased markedly in Espanola District from 0% in the first collection to 42% in the second collection. In Blind River District the incidence was 6% and 23% in the early and late collections, respectively. These figures reflect the timing of the activity of this pest, not an increase in population. No evidence of disease damage was detected.

White Spruce Plantation Survey

In the summer of 1981 a special survey was conducted in 12 plantations to determine the status of insects and diseases on high-value white spruce (Table 8). Stands were selected in three height classes: < 2m, 2-6 m, and > 6 m. An increment core technique was used at ground level, 0.3 m above ground, and 1.3 m above ground to rate internal defect. The most prevalent organism throughout all plantations was the spruce budworm. In Daumont Township, Sault Ste. Marie District, stem and root rot by *Polyporus tomentosus* were detected on one of the 10 trees sampled. As in 1978, chlorotic spruce were prominent in Kirkwood Township, Blind River District. Trees in Gurd Township, North Bay District also had chlorosis. Some 2 m spruce exhibited faded green to yellowish needles. In addition to the above insects and diseases, *Adelges abietis* (eastern spruce gall adelgid), *Acleris variana* (eastern blackheaded budworm), *Aphrophora cribrata* (pine spittlebug), *Neodiprion abietis* (balsam-fir sawfly), and *Adelges lariciatus* (spruce gall adelgid) were recorded in low numbers in some plantations. Of the specific insects and diseases for which the stand was examined, spruce coneworm, broom rust, cone rust and mistletoe were all reported to be absent.

Table 8. Results of the white spruce survey conducted in 12 plantations throughout the Northeastern Region (150 trees examined at each location; visits made 11-30 June and 15-23 July).

Location (Twp)	Area (ha)	Esti- mated trees/ ha	Ht class (m)	Spruce budworm		Yellowheaded spruce sawfly		Weevil trees affected (%)	Spruce bud moth trees affected (%)	Frost		Needle rust		Armillaria root rot trees affected (%)	
				trees affected (%)	defoli- ated (%)	trees affected (%)	defoli- ated (%)			trees affected (%)	trees defoli- ated (%)	trees affected (%)	trees defoli- ated (%)		
Wawa District															
Lendrum	2	2990	2	74.6	6.5	0	0	0	16.6	0	0	100	7.5	0	
Blind River District															
Haughton	25	2990		0	0	0	0	0	0	94	5	0	0	1	
North Bay District															
Gurd	1.5	1600		58	6	0	0	0	13.3	0	0	0	0	0	
Falconer	31	3800		62	4.2	19.3	5	0	2.6	0	0	0	0	0	
Blind River District															
Kirkwood	3	2990	2-6	31.3	1	0	0	1.3	0	90	1	1.3	0.2	0	
Wells	10	2990		34	1	2.6	0.3	0	16	0	0	0	0	0	
Sudbury District															
Killarney	16	2990		56.6	3.4	0	0	0	28	0	0	0	0	0	
North Bay District															
Dana	5	2000		80	2.3	0	1.3	0	0	0	0	0	0	0	
Sault Ste. Marie District															
Daumont	40	1078	6	100	52	0	0	0	0	0	0	0	0	0	
Blind River District															
Kirkwood	14	2990		100	66	0	0	0	0	0	0	0	0	0	
Espanola District															
Dawson	5	3800		100	5	0	1.6	0	0	0	0	0	0	0	
Foster	2	4100		86	2.0	2	1.5	0	64.6	0	0	0	0	0	