RESULTS OF FOREST INSECT AND DISEASE SURVEYS IN THE ALGONQUIN REGION OF ONTARIO, 1983

(FOREST DISTRICTS: PARRY SOUND, BRACEBRIDGE, ALGONQUIN PARK, PEMBROKE, MINDEN and BANCROFT)

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CANADIAN FORESTRY SERVICE

DEPARTMENT OF THE ENVIRONMENT

1984

MISCELLANEOUS REPORT NO. 5

Catalogue No. Fo29-8/5E
ISBN 0-662-13094-4
ISSN 0826-0222

Copies of this report may be obtained from:

Great Lakes Forest Research Centre
Canadian Forestry Service
Department of the Environment
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Sault Ste. Marie, Ontario
P6A 5M7

SURVEY HIGHLIGHTS

This report is a review of the more important forest insect and disease conditions in the Algonquin Region in 1983. Because of illness, Regional Supervisor H.J. Weir was unable to execute his field duties in 1983. Harvey's expertise after 13 years in the Region will be missed in the future, as he retired in the fall of 1983.

The western half of the Region, namely Parry Sound, Bracebridge and Minden districts, was covered by former Survey Technician H.D. Lawrence until mid-July, after which Messrs. Applejohn, Evans, Brodersen and Czerwinski covered the area as required.

A large infestation of the eastern blackheaded budworm was mapped in the Bracebridge District. Cedar leafminers were recorded at high levels in the southern part of Minden District. Spruce budworm levels remained relatively stable, although there was some eastward expansion in Algonquin Park District. The area of damaged birch increased dramatically in the Parry Sound and Bracebridge districts as a result of birch skeletonizer feeding. The jack pine budworm infestation expanded in a continuous belt along the Georgian Bay shoreline, and there was a marked increase in area. Aerial and ground checks for gypsy moth failed to reveal defoliation.

The European race of *Gremmeniella abietina* was not detected. Frost damage was recorded at higher than normal levels across most of the Region on both hardwoods and conifers, and probable drought damage was noted at severe levels in the southern part of Bancroft District. Special surveys were conducted in white pine plantations across the Region and on cone and seed pests of white pine and red oak.

The criteria used in this report to categorize the insects and diseases are as follows:

Major Insects or Diseases

capable of causing serious injury to or death of living trees or shrubs

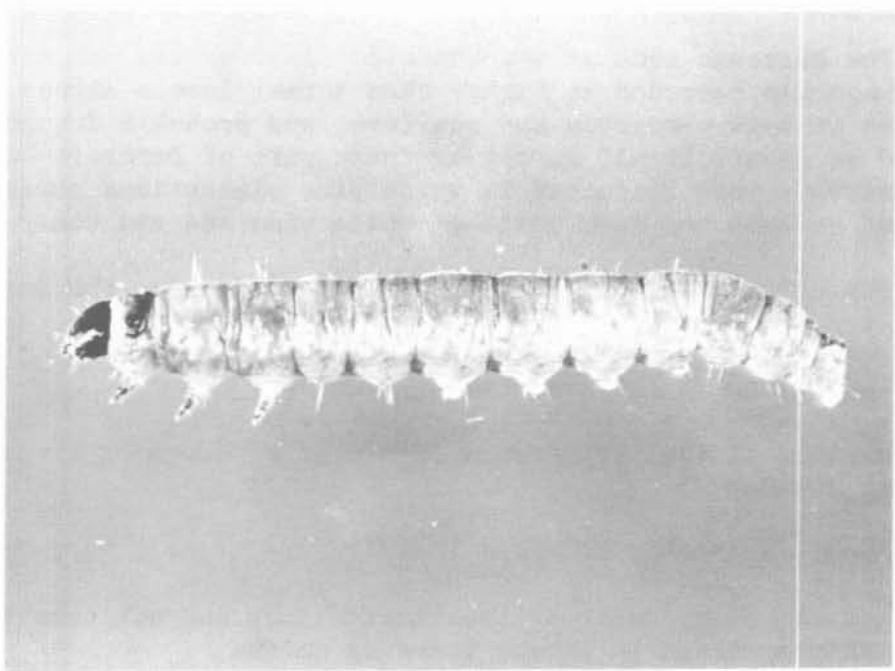
Minor Insects or Diseases *

capable of sporadic or localized injury but not usually a serious threat to living trees or shrubs

* No minor insects or diseases were recorded in the Algonquin Region in 1983.

Frontispiece

Skeletonizing of white birch (*Betula papyrifera* Marsh.) caused by the birch skeletonizer, *Bucculatrix canadensisella* Cham.



Mature larva of the eastern blackheaded budworm, *Acleris variana* (Fern.)

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,

2) those which are capable of causing serious damage but, because of low populations or for other reasons, did not cause serious damage in 1983.

The authors wish to thank Ontario Ministry of Natural Resources (OMNR) personnel and private individuals for their continuing cooperation, assistance and support during the field season.

H. Brodersen

H.D. Lawrence

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INSECTS

Major Insects

Pine False Webworm, *Acantholyda erythrocephala* (L.)

Varied incidence of attack was reported across the Region during inspection of red pine (*Pinus resinosa* Ait.) plantations.

A white pine (*P. strobus* L.) seed orchard (approx. 8 ha) in Snowdon Township, Minden District was sprayed to control a high number of insects as hatching occurred. This was done on 13 June with Orthene.

Except for a few significant populations noted by OMNR staff in Bancroft District, surveys failed to reveal anything but low populations in the eastern half of the Region.

Eastern Blackheaded Budworm, *Acleris variana* (Fern.)

A large single infestation comprising approximately 19,720 ha (Fig. 1) was mapped in the Bracebridge District. This pocket of severe defoliation of eastern hemlock (*Tsuga canadensis* [L.] Carr.) was located south of the Muskoka lakes. Throughout the southern half of this district low numbers of insects were seen frequently (see Frontispiece).

Varying levels of damage were also reported throughout the southern portion of Humphrey Township, Parry Sound District, and in the Minden District where moderate defoliation was recorded west of the town of Carnarvon, in Stanhope Township and around Bentshore Lake, Hindon Township.

Cedar Leafminers, *Argyresthia aureoargentella* Brower, *A. canadensis* Free., and *A. thuiella* (Pack.)

Damage to eastern white cedar (*Thuja occidentalis* L.) was mapped across much of the extreme southern portions of Carden, Somerville and Harvey townships in the Minden District.

Although defoliation levels varied, most trees suffered moderate damage (25%-75%); the single notable exception occurred in Carden Township, Minden District, where a distinct pocket of severe damage totaling approximately 3,069 ha was recorded. Elsewhere across the Region, all populations encountered were at low levels.

ALGONQUIN REGION

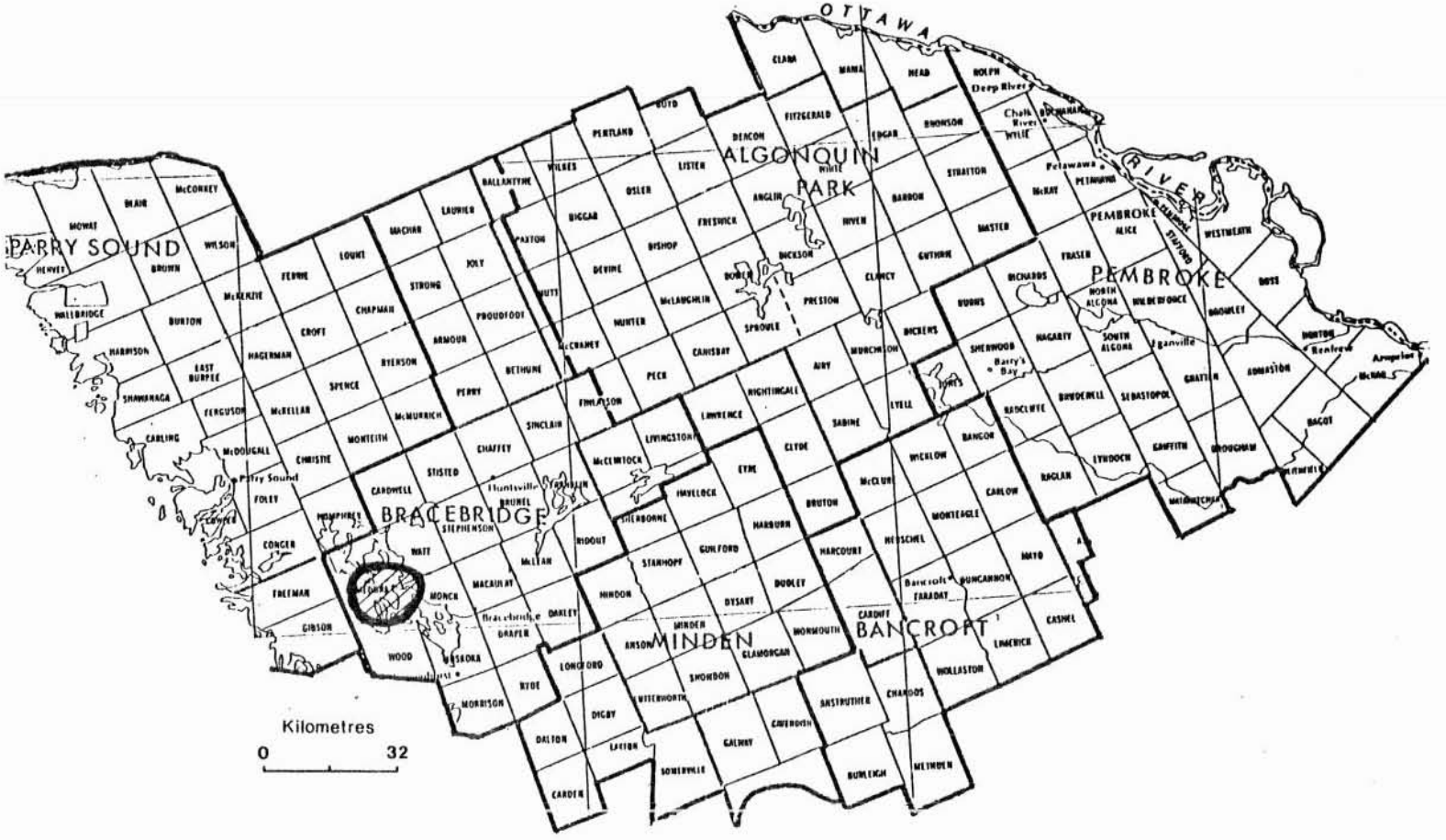

Figure 1. Eastern Blackheaded Budworm, *Acleris variana* (Fern.)

Area within which severe defoliation of eastern hemlock (*Tsuga canadensis* [L.] Carr.) occurred in 1983 . . . . . ▨

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

The total area of moderate-to-severe foliar damage caused by this skeletonizer on white birch (*Betula papyrifera* Marsh.) was aerially mapped at approximately 4,810 km^2.

Located in the northwest corner of the Region, this infestation (which also forms the southern extremity of a larger infestation to the north) is located in the northern portions of Parry Sound, Bracebridge and Algonquin Park districts (Fig. 2). Five small pockets of severe damage were noted outside the main body of the infestation as far south as Hindon Township, Minden District and eastward in Pentland Township, Algonquin Park District.

Feeding by this defoliator is often accompanied by premature leaf drop (see Frontispiece).

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Results of damage surveys, population sampling and egg-mass counts of this perennial pest will be published with those of other regions at a later date in a report specifically devoted to this insect. That report will provide a complete description and analysis of developments in the spruce budworm situation in Ontario in 1983 and will give infestation forecasts for the province for 1984.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

The 600-ha infestation on open-grown jack pine (*Pinus banksiana* Lamb.) reported in the Parry Sound District in 1982 expanded to approximately 30,202 ha of moderate-to-severe defoliation in 1983.

Aerial surveys in the district revealed three small, discrete pockets of infestation in Carling Township, a continuous belt of defoliation along the Georgian Bay shoreline from Carling Township north to Byng Inlet, and a small pocket of damage in the Henvey Inlet Indian Reserve No. 2 (Fig. 3).

Ground checks subsequent to the aerial survey along Highway 69 confirmed the presence of low populations of budworm from Carling Township north to the Key River.

Egg-mass samples were taken at nine locations in an effort to forecast populations for 1984. The results are shown in Table 1. They indicate that levels will be varied in 1984.

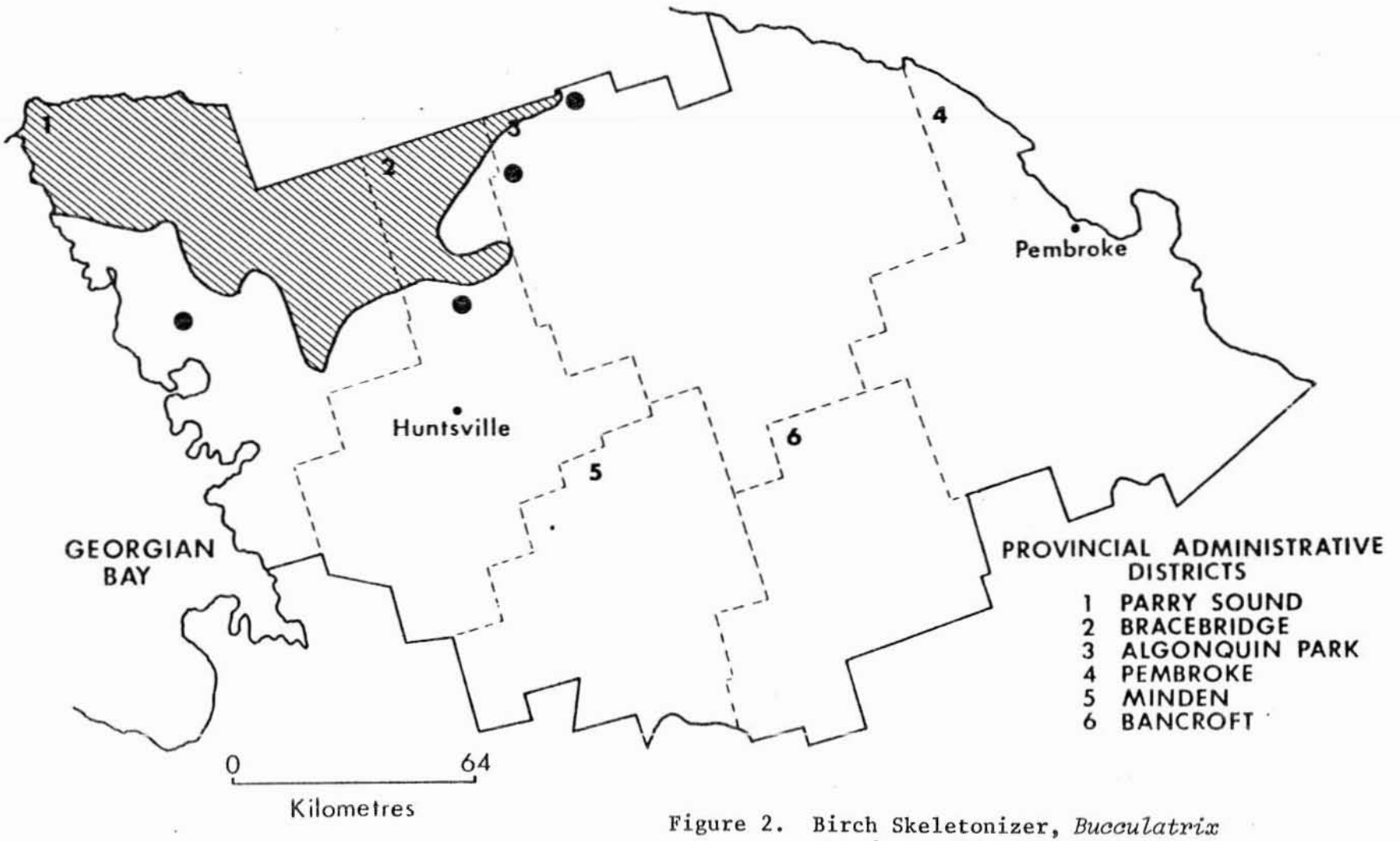

Figure 2. Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Area within which moderate-to-severe defoliation of white birch (*Betula papyrifera* Marsh.) occurred in 1983

● or ▨

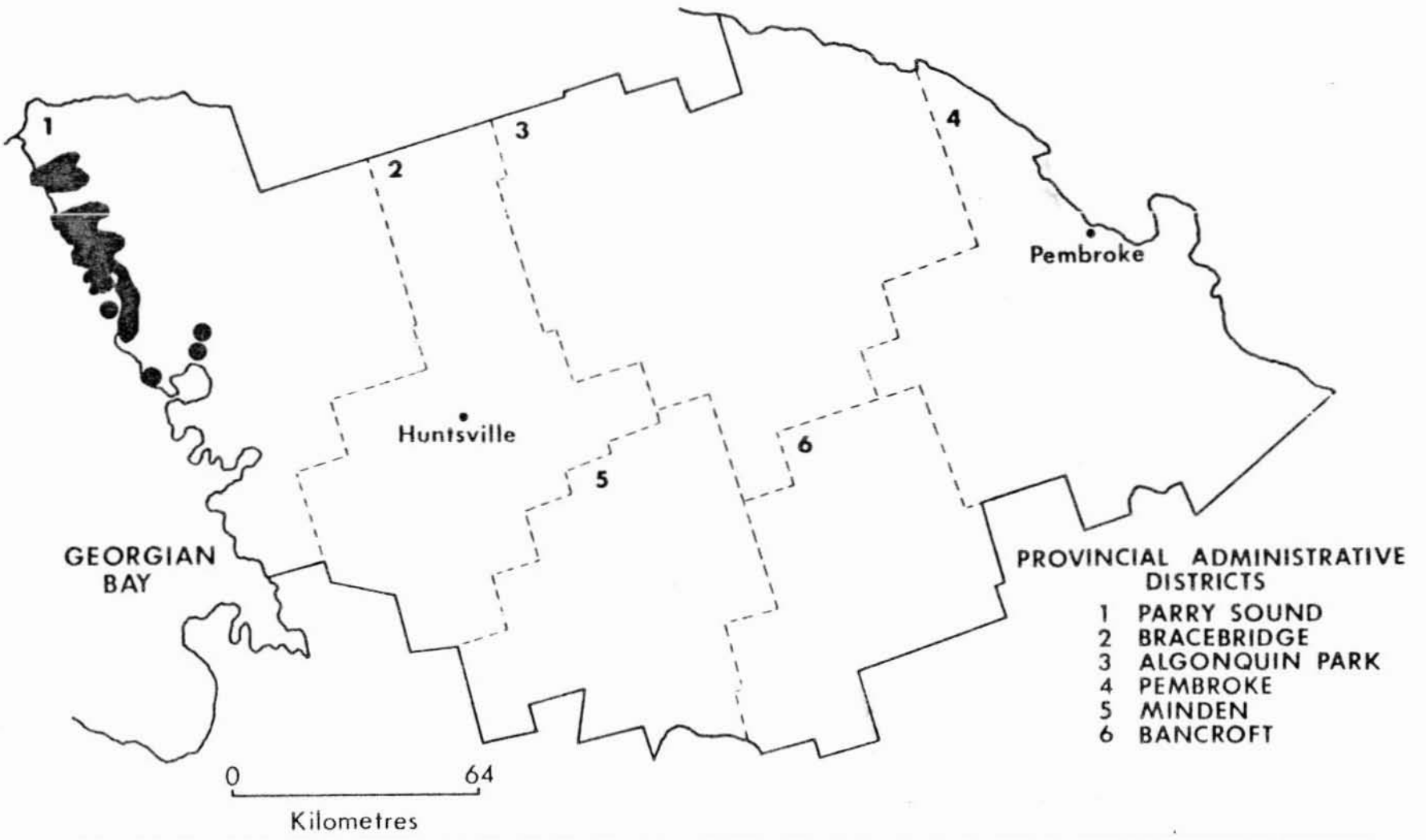

Figure 3. Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Area within which jack pine (*Pinus banksiana* Lamb.) suffered moderate-to-severe damage ■ or ●

Table 1. Summary of jack pine budworm egg-mass counts and defoliation in 1983 and infestation forecasts for 1984 in the Parry Sound District (counts based on the examination of six 61-cm jack pine branch tips at each location).

Location	1983 defoliation (%)	Total no. of egg masses	Infestation forecast for 1984
Carling Twp			
NW Dillon	10	1	L
N. Snug Harbour	30	0	N
S. Snug Harbour	60	4	M
Harrison Twp			
Hwy 529A	75	22	H
S. Point au Baril	10	0	N
Shawanaga Twp			
Indian Reserve No. 17B	30	1	L
Wallbridge Twp			
N. Magnetawan River	5	0	N
S. Magnetawan River	50	8	H
Harris River	15	1	L

N = nil; L = light; M = moderate; H = heavy

Leaf Beetles, *Chrysomela* sp., *Altica populi* Brown, *Gonioctena americana* (Schaef.)

Damage to balsam poplar (*Populus balsamifera* L.) of all ages was noted throughout much of the Pembroke and Bancroft districts.

All trees inspected throughout these districts suffered some degree of foliar damage; however, in the eastern portions of the Pembroke District, most stands of balsam poplar (< 1 ha, 40-50 trees) suffered moderate-to-severe foliar damage. A similar situation prevailed in Harcourt, Faraday, Dungannon and Limerick townships, Bancroft District. The total area defined by this leaf feeder at the moderate (25-75% defoliation) infestation level amounted to approximately 142,000 ha between the two districts. One or more of the insect species listed could usually be found at any affected site.

Foliar damage became readily apparent after mid-July, by which time most larval feeding was complete and leaf desiccation was pronounced.

Maple Trumpet Skeletonizer, *Epinotia aceriella* (Clem.)

High populations of this skeletonizer were recorded in sugar maple (*Acer saccharum* Marsh.) stands in the northeastern and northern townships of Parry Sound and Bracebridge districts, respectively (Fig. 4). This area of damage totaling approximately 54,341 ha formed the southern extremity of a larger infestation to the north. The incidence of attacked trees was recorded as approximately 90%, although the level of foliar damage was generally low (< 25%).

Control measures for this insect are rarely necessary; hand-picking or fall leaf raking should provide sufficient control for ornamentals.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Examination of virus-treated plantations in the eastern half of the Region continue to show encouraging results in the carry-over effect of the virus as no populations have been recorded to date in these same areas. In some instances, three seasons of checks after the initial control measures were undertaken have failed to disclose any larvae.

Although sites on which virus has yet to be employed are few in number, examination indicated that populations in most of these areas are at or near endemic levels.

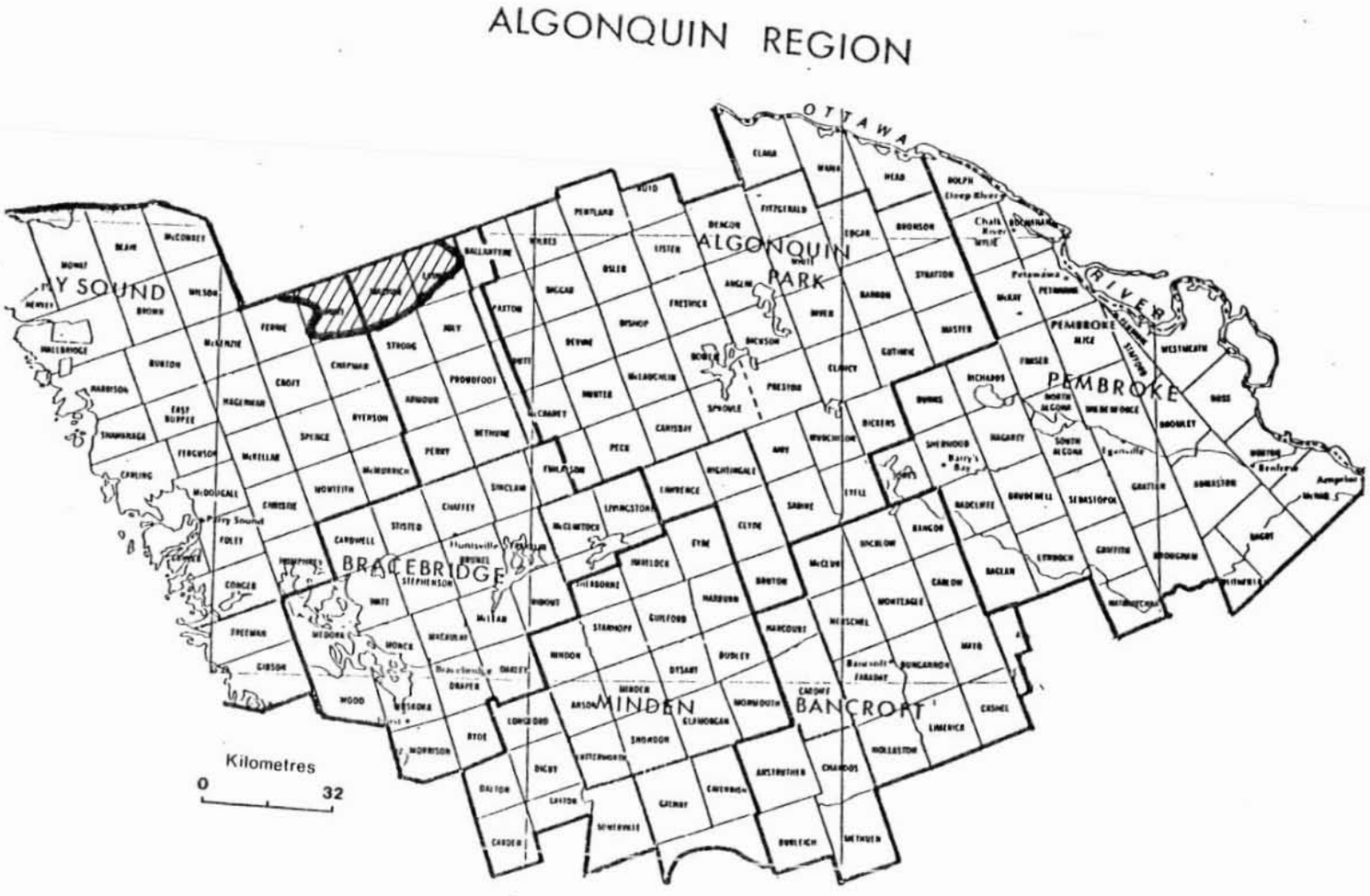

Figure 4. Maple Trumpet Skeletonizer, *Epinotia aceriella* (Clem.)

Area within which high numbers of sugar maple (*Acer saccharum* Marsh.) were attacked . . . . . ▨

A limited number of plantations in which this pest was of concern were examined. Surveys in three of these plantations revealed various damage levels; a 1-ha pocket of 5-m red pine averaged 30 colonies per 100 trees in Chandos Township, Bancroft District; in Ross Township, Pembroke District, a small pocket of 1-m red pine averaged three colonies per 100 trees; and finally, the most dramatic damage monitored occurred in a small roadside planting (< 1 ha) near km 5 on Hwy 60 in Algonquin Park where 70% of all trees (7 m tall) suffered moderate-to-severe damage.

Gypsy Moth, *Lymantria dispar* (L.)

In 1983, the Forest Insect and Disease Survey Unit, in cooperation with OMNR, Parks Branch, conducted a survey employing burlap and pheromone traps at 23 provincial campgrounds throughout the Region. All burlap traps (left in place until mid-July) failed to trap any gypsy moth larvae; pheromone traps, however, succeeded in capturing varying numbers of adult male moths. These traps were put in place after the discontinuation of the burlap traps and were retrieved in mid-September. A significant number of moths (29) were trapped in Silent Lake Provincial Park, Bancroft District. Smaller numbers of moths (1 or 2) were also positively identified in Bonnecherre Provincial Park, Pembroke District and in several campgrounds situated along the Highway 60 corridor in Algonquin Park. Exclusive of these catches, only another single moth was trapped, that being in Killbear Provincial Park, Parry Sound District.

Aerial surveys of suspect areas failed to detect any defoliation by gypsy moth, and only one egg mass, in Bagot Township, Pembroke District, was uncovered.

To date no significant damage by this pest has been detected in the Algonquin Region.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

Significant populations of this leafminer were commonly sighted on all but the largest of trembling aspen (*Populus tremuloides* Michx.) and occasionally largetooth aspen (*Populus grandidentata* Michx.) in numerous locales throughout the Pembroke and Algonquin Park districts for the past two years. The incidence and levels of foliar damage appear to be lower than those noted in 1982. Generally foliar damage fell into the low-to-moderate defoliation class.

The only notable exception was located in Ross Township, Pembroke District where a small stand (< 1 ha) of mature aspen suffered high levels of foliar damage.

This insect is capable of localized or sporadic injury to trees and shrubs and is not known to cause whole-tree mortality.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

The incidence of white spruce (*Picea glauca* [Moench] Voss) trees attacked by this sawfly increased notably over the near-endemic populations reported throughout the Region in the previous year.

Damaged roadside regeneration and ornamentals were frequently sighted across the western and southern townships in Bancroft District. Throughout portions of Bromley, Admaston, Radcliffe and Raglan townships in Pembroke District moderately damaged white spruce regeneration was occasionally seen.

Examination of six white spruce plantations chosen at random across Pembroke, Algonquin Park and Bancroft districts failed to reveal significant numbers of larvae.

White Pine Weevil, *Pissodes strobi* (Peck)

Populations monitored across the eastern half of the Region disclosed that, with few exceptions, pine (*Pinus* spp.) continued to be subjected to high levels of leader damage.

Evaluations were done in Algonquin Park on roadside plantings and natural open-grown regeneration. Surveys in Pembroke District included underplanted stock in Ross Township, while the checks in Bancroft District were done on roadside plantings designed to curtail erosion and act as windbreaks (Table 2).

Table 2. Summary of damage caused by white pine weevil in pine at 12 locations in the Algonquin Region in 1983.

Location (Twp)	Host	Avg ht of sample trees (m)	Trees weeviled 1983 (%)	Area (ha)
Algonquin Park District				
Sproule	wP	2	10	< 1
Stratton	wP	1.5	19	< 1
Airy	mP	2	16	< 1
FitzGerald	wP	2	11	< 1
Lister	wP	2	2	< 1
Pembroke District				
Wylie	wP	< 1	2	< 1
Fraser	jP	2	1	1
Westmeath	wP	5	14	< 1
Ross	wP	2.5	6	< 1
Bancroft District				
Dungannon	mP	1	14	< 1
Monteagle	mP	1.5	7	< 1
Wicklow	wP	2	10	< 1

Table 3. Other forest insects.

Insect	Host(s)	Remarks
Aceria sp. Mite	yB	trace incidence and high foliar damage on single tree, Rolph Twp, Pembroke District
Aphrophora cribrata (Walker) Pine spittlebug	wP	6% incidence of attack in single 3-m-tall plantation, Horton Twp, Pembroke District
Aphrophora saratogensis (Fitch) Saratoga spittlebug	rP	small pocket of mortality in stressed plantation trees in Hagarty Twp, Pembroke District
Archips cerasivoranus (Fitch) Uglynest caterpillar	ecCh, pCh	trace incidence on roadside shrubs in Head Twp, Algonquin Park District and Wilberforce, Sebastopol and Fraser twps, Pembroke District
Archips fervidanus (Clem.) Oak webworm	rO	low numbers in Carling Twp, Parry Sound District
Bucculatrix ainsliella Murt. Oak skeletonizer	rO	low numbers in Bracebridge Resource Centre, Bracebridge District
Cameraria hamadryadella (Clem.) Solitary oak leafminer	bO	low levels of foliar damage on open-grown trees common in Westmeath, Ross, Bromley and Horton twps, Pembroke District
Cinara sp. Aphid	wS	single incidence of high numbers on ornamental in Alice Twp, Pembroke District
Coleophora laricella (Hbn.) Larch casebearer	eL,tL	varying levels of defoliation common in Minden District; light defoliation noted in Stephenson Twp, Bracebridge District and Carling Twp, Parry Sound District

(continued)

Table 3. Other forest insects (continued).

Insect	Host(s)	Remarks
Coleophora tiliaefoliella Clem. Basswood casebearer	Ba	low incidence and moderate levels of crown damage on mature trees found in conjunction with fall webworm in Horton and McNab twps, Pembroke District
Corythucha ulmi O. & D. Elm lace bug	sE	high level of foliar damage to a few trees near White Lake, McNab Twp, Pembroke District
Croesia semipurpurana (Kft.) Oak leaf shredder	rO	low numbers collected in Harvey Twp, Minden District; moderate numbers at several locations in McLean Twp, Bracebridge District
Eriosoma americanum (Riley) Woolly elm aphid	E	small pocket of severe foliar damage on roadside trees in Rolph Twp, Pembroke District
Exoteleia pinifoliella (Cham.) Pine needleminer	jP	heavy mining of old foliage, Harrison Twp, Parry Sound District
Fenusa pusilla (Lep.) Birch leafminer	wB	low incidence of moderate foliar damage in eastern half of Region; commonly found in western half of Region
Hydria prunivorata Ferg. Cherry scallopshell moth	blCh	light defoliation on natural regeneration in Carden Twp, Minden District
Hyphantria cunea (Dru.) Fall webworm	bAs, wAs	varying levels of damage to small stands (< 1 ha) in Burleigh Twp, Bancroft District and in Bromley, Horton and Ross twps, Pemborke District

(continued)

Table 3. Other forest insects (concluded).

Insect	Host(s)	Remarks
Malacosoma americanum F. Eastern tent caterpillar	ecCh	commonly found at low damage levels in rural fencerows in Pembroke, Bancroft and Minden districts
Neodiprion abietis complex Balsam fir sawfly	bF	light defoliation commonly observed in western half of Region
Neodiprion pratti paradoxicus Ross Jack pine sawfly	jP	low numbers observed on 9-m-tall trees in Bagot Twp, Pembroke District
Paraclemensia acerifoliella (Fitch) Maple leafcutter	M	< 1 ha pocket of low defoliation noted in Anstruther Twp, Bancroft District
Pseudexentera oregonana Wlshm. Aspen leafroller	bPo	low damage to mature trees in Monteagle Twp, Bancroft District
Sparganothis sulfureana Clem. Needletier	rP	trace incidence and damage on young stock in private plantations in Alice Twp, Pembroke District
Symmerista canicosta Francl. Redhumped oakworm	rO	low numbers on mature trees, Franklin Island, Carling Twp, Parry Sound District
Zelleria haimbachi Busck Pine needle sheathminer	jP	commonly noted between Parry Sound and French River, Parry Sound District

TREE DISEASES

Major Diseases

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

The annual aerial and ground survey carried out at 21 locations in the Algonquin Region in 1983 revealed no evidence of the European race of this pathogen.

Throughout the Region an additional 14 plantations were surveyed for the presence of the North American race of this fungus. All surveys conducted in the Algonquin Park, Pembroke and Bancroft districts proved negative. Four infection centres were detected in the western half of the Region as follows: Lot 23, Conc. IX, McMurrich Township, Parry Sound District, with a low incidence of infection on 1.5-m red pine; Lot 16, Conc. VI, Proudfoot Township, Bracebridge District where 15% infection occurred on 1-m red pine; Lot 31, Conc. XI, Bethune Township, Bracebridge District where fruiting was common on lower branches of 5-m red pine; and Lot 8, Conc. VIII, Macaulay Township, Bracebridge District where numerous small 1.5-m red pine were diseases.

Table 4. Other forest diseases.

Organism	Host(s)	Remarks
Apiognomonia errabunda (Rob.) Höhn. Anthracnose	sM	noted on transplanted stock, town of Calabogie, Bagot Twp, Pembroke District
Armillaria mellea (Vahl ex Fr.) Kumm. Armillaria root rot	wS	small pocket of dying trees in < 1 ha plantation, Westmeath Twp, Pembroke District
Ciborinia whetzelii (Seav.) Seav. Ink spot of aspen	tA	low incidence of this disease at varying levels of foliar damage observed in Algonquin Park and Pembroke districts
Coniophora puteana (Schum ex Fr.) Karst. Brown rot	ewC	trace incidence of moderate damage to ornamentals in Head Twp, Algonquin Park District
Coleosporium asterum (Diet.) Syd. Pine needle rust	rP	low incidence and foliage damage noted on young plantation trees (< 1 ha) in Fraser Twp, Pembroke District

(continued)

Table 4. Other forest diseases (continued).

Organism	Host(s)	Remarks
Cronartium sp. Blister rust	aP	several stem cankers on < 1 m plantation stock (< 1 ha), Alice Twp, Pembroke District
Cytospora sp. Canker	hybrid poplar	low numbers of branch cankers causing crown damage in several plantation trees, Westmeath Twp, Pembroke District
Davisomycella ampla (Davis) Darker Tar spot needle cast	jP	low incidence and foliage damage recorded on 4-m plantation trees in Westmeath Twp, Pembroke District and on understory regeneration in Fitzgerald Twp, Algonquin Park District
Endocronartium harknessii (J.P. Moore) Y. Hirat. Western gall rust	scP, jP	single instance of severe damage on mature Scots pine (*Pinus sylvestris* L.) tree, Canisbay Twp, Algonquin Park District; low incidence and damage on mature open-grown trees in Buchanan Twp, Pembroke District
Hendersonia sp. Needle cast	jP	single instance of defoliation on mature forest trees, Wicklow Twp, Bancroft District
Lophodermium sp. Needle cast	rP	commonly sighted, occasionally at moderate or severe levels of foliar damage, in western half of Region
Venturia macularis (Fr.) Müller & Arx Shoot blight	tA	single sightings in Algonquin Park, Bancroft and Pembroke districts; highest incidence recorded (60%) in 2-m regeneration (< 1 ha), Fraser Twp, Pembroke District

(continued)

Table 4. Other forest diseases (concluded).

Organism	Host(s)	Remarks
Sirococcus strobilinus Preuss Shoot blight	rP	high percentage of trees affected at moderate damage level (69%) in 1-m tree plantation, Proudfoot Twp, Bracebridge District
Taphrina caerulescens (Mont. & Desm.) Tul. Leaf blister rust	rO	low level of foliar damage on single ornamental, town of Renfrew

Diebacks and Declines

Oak Decline

Observations to date in the oak decline plots in Pembroke District reveal a trend towards a potential recovery for these stands. No new mortality was reported this year (Table 5) and the rate of decline is slowing down as trees continue to recover in both Alice and Wylie townships. Oak leaf shredder populations continue to remain at endemic levels in these stands.

Abiotic Damage

Frost

Spring frosts caused widespread foliar damage to several species of hardwoods and conifers throughout much of the Region.

Damage was most prevalent on the new flush of balsam fir (*Abies balsamea* [L.] Mill.) foliage. The percentage of damaged trees varied considerably in all of the districts, from as low as 20% in Maria Township to a high of 80% in Admaston Township, both in Pembroke District; however the percentage of foliar damage was low (10% and 20%, respectively) in the aforementioned townships. Low foliar damage levels were characteristic of virtually all trees examined, with damage usually restricted to the outer half of the new shoot and the top third of the crown. Highly visible damage became apparent by the third week of June, when the affected foliage had turned a distinct red from desiccation.

Table 5. Data for oak decline on monitoring plots, Algonquin Region, 1977-1983 (based on the annual examination of 100 tagged trees at each location).

Location (Twp)	Avg DBH of sample trees (cm)	Area affected (ha)	Year	Percentage of crown dead				Tree dead
				0-20	21-40	41-60	>60	
Pembroke District								
Alice	16	4	1977	44	45	11	0	-
			1978	43	45	12	0	0
			1979	28	58	13	1	0
			1980	16	65	17	2	0
			1981	9	34	55	2	0
			1982	0	40	56	2	2
			1983	3	38	55	2	2
Wylie	24	3	1977	26	43	30	1	-
			1978	8	54	37	1	0
			1979	4	48	44	4	0
			1980	2	43	48	6	1
			1981	2	43	48	6	1
			1982	0	48	46	4	2
			1983	3	46	45	4	2

Frost damage was also noted in several scattered white spruce plantations in the eastern half of the Region. Evaluations revealed higher than normal foliar damage levels; the most severe case was in a 1-ha plantation of white spruce in Fraser Township, Pembroke District, where all trees examined suffered an average of 10% loss of new growth.

Blackened, frost-damaged foliage was commonly sighted in all age classes of basswood (*Tilia americana* L.) throughout much of the southern half of the Minden District, as early as the last week of May. Foliar damage in most instances was high (>75%); however, these trees grew later in the spring and had regained their normal appearance by the start of July.

Frequent May frosts also injured the partially developed foliage of red oak (*Quercus rubra* L.) throughout a large portion of the southwestern corner of the Minden District and the southeastern portion of the Bracebridge District. The total area aerially mapped in this instance consisted of approximately 238,928 ha (Fig. 5). Foliar damage, reported as high throughout this area, proved of little consequence, as trees readily grew by the second week of June.

Drought

During the months of June and July the amount of precipitation in the Bancroft District fell off appreciably from the 30-year norms established for this area and time frame.

A rainfall deficit of 52% and 64% for the months of June and July, respectively, probably accounted for the desiccation of all or most foliage on ridge-top red oak throughout much of the southern portion of the Bancroft District as well as in several parts of the southern portion of the Minden District (Fig. 6).

Small patches of trees or single trees suffering drought symptoms on sites with poor water retention were occasionally noted across the Region.

Aerial surveys of damaged oaks on ridge tops in the Bancroft District revealed an area totaling approximately 16,800 ha in which severe damage occurred. Similar damage encompassing approximately 5,200 ha was aerially mapped in the Minden District. Crown damage and whole-tree mortality are expected on those sites on which all trees, shrubs and ground cover were severely desiccated.

Trees in slightly depressed areas on the ridge tops, where soil accumulation measured in excess of several centimetres, suffered no significant damage.

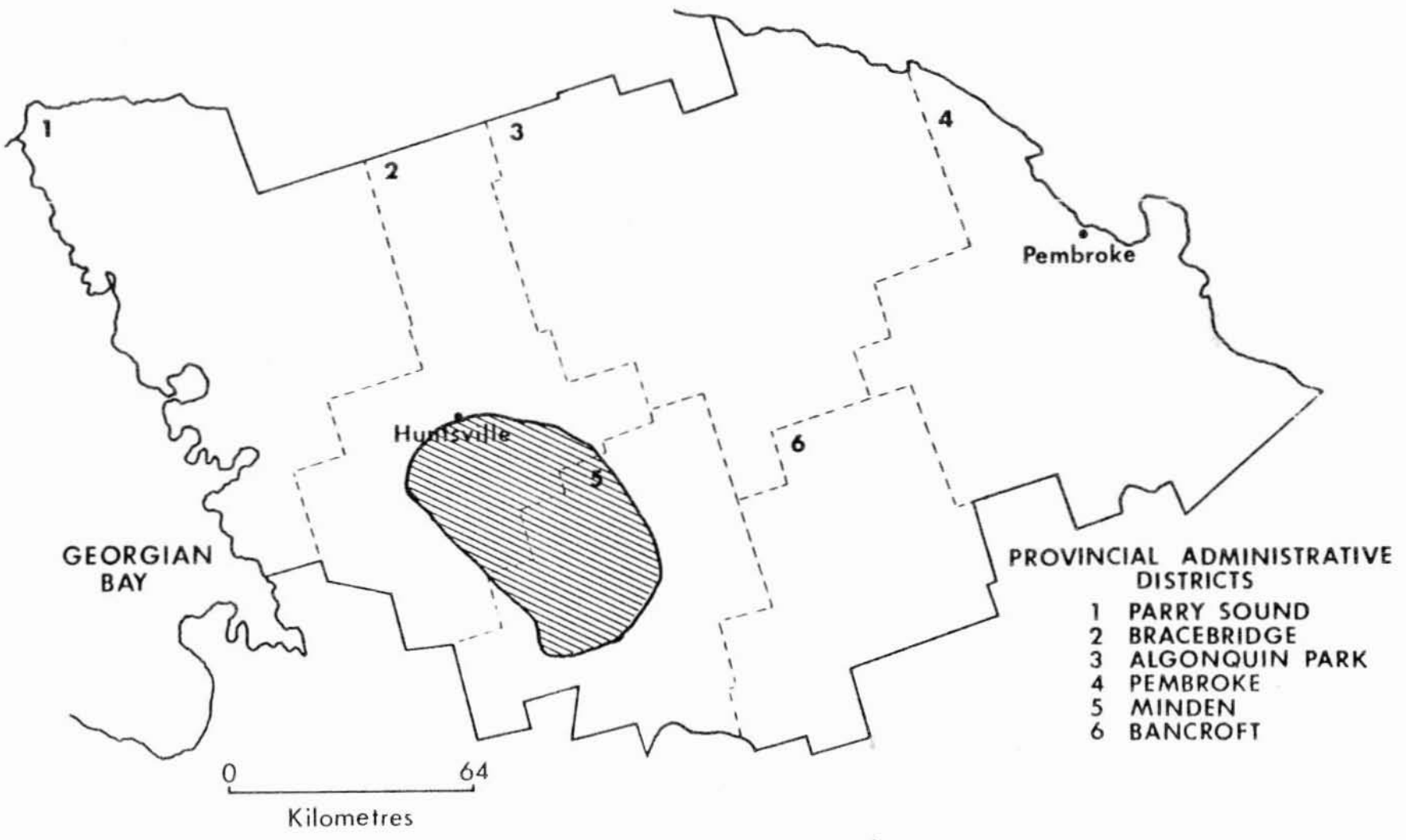

Figure 5. Frost Damage

Area within which severe damage occurred on red oak (*Quercus rubra* L.) . . . . . ▨

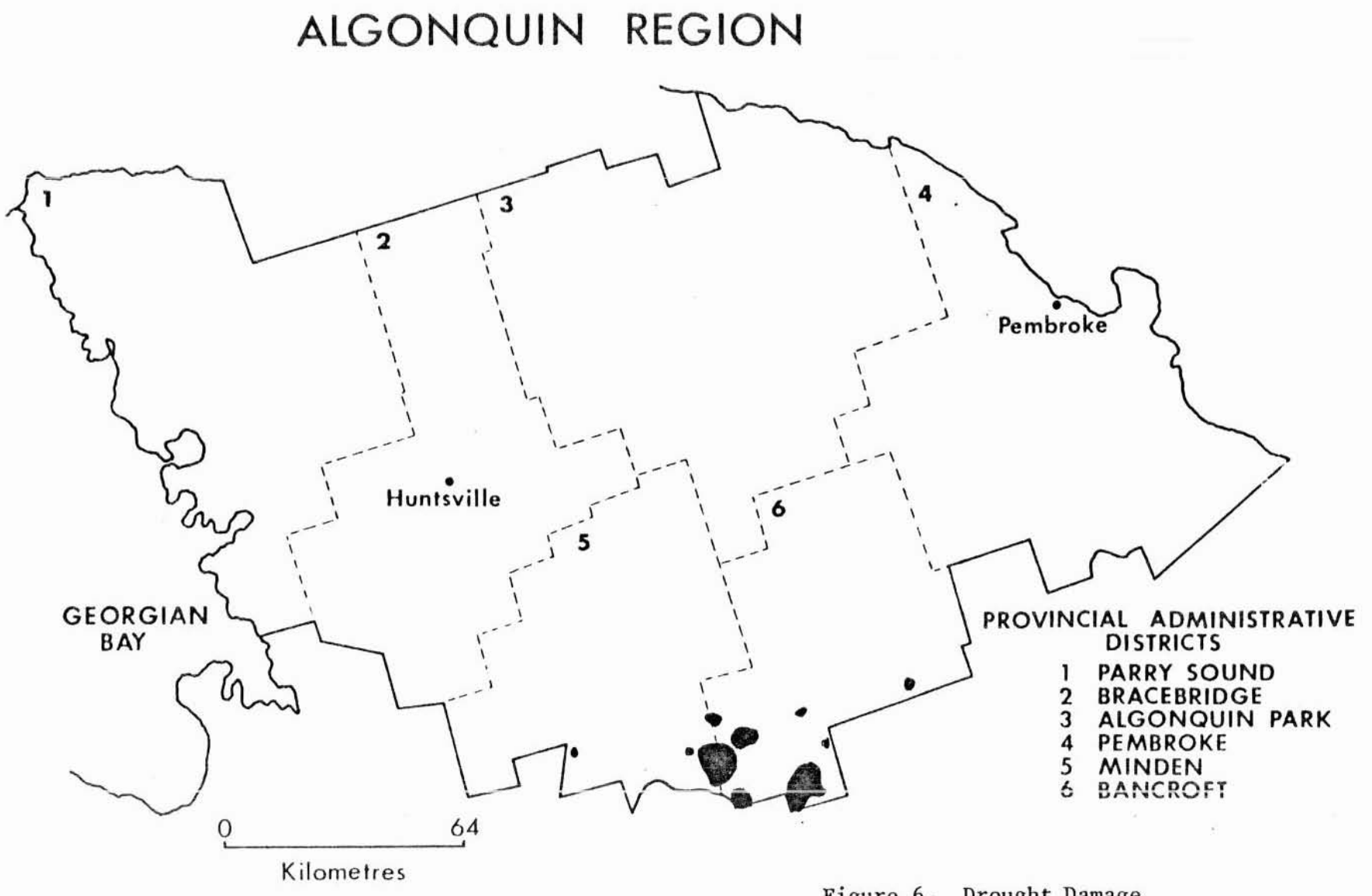

Figure 6. Drought Damage

Area within which moderate-to-severe drought damage occurred . . . . ■

Physiogenic Needle Droop

Needle base tissue collapse precipitated by a high rate of water transpiration during dry and breezy weather conditions (usually in late summer) can result in desiccated and drooping foliage (current year) on young red pine plantation stock.

Damage of this nature was noted in the western half of the Region in the fall of 1982 and was evaluated in two plantations during the spring of 1983.

Defoliation due to needle droop was noted in young red pine in Lot 23, Conc. IX, McMurrich Township, Parry Sound District and on stock of the same age in Stanhope Township, Lot 9, Conc. I, Minden District, where 63% of all trees examined lost an average of 93% of last year's foliage.

Winter Drying

Little damage was reported this year. Low levels of foliar damage were found on cedar hedges in Driftwood Provincial Park, Algonquin Park District and on young scattered cedar (< 5%) in a private nursery in Dungannon Township, Bancroft District. An evaluation in Monteagle Township, Bancroft District in a 1-ha plantation of 1-m-tall red pine on a southerly exposure revealed only low incidence (< 5%) and damage levels (< 5%).

Animal Damage

Porcupine

An aerial survey of numerous red pine plantations in the Pembroke District revealed a low incidence of top-killed trees, attributable to girdling by porcupine feeding. Two plantations were chosen for inspection; both were approximately 2 ha in area and 10 m tall, and were located in Sebastopol and Wilberforce townships, Pembroke District. Approximately 1% of the trees in each plantation had been attacked.

Special Surveys

White Pine Plantation Survey

In a continuing effort to assess insect and disease problems in plantations, 10 white pine plantations in three height classes (< 2 m, 2-6 m, > 6 m) were evaluated in 1983 (Fig. 7).

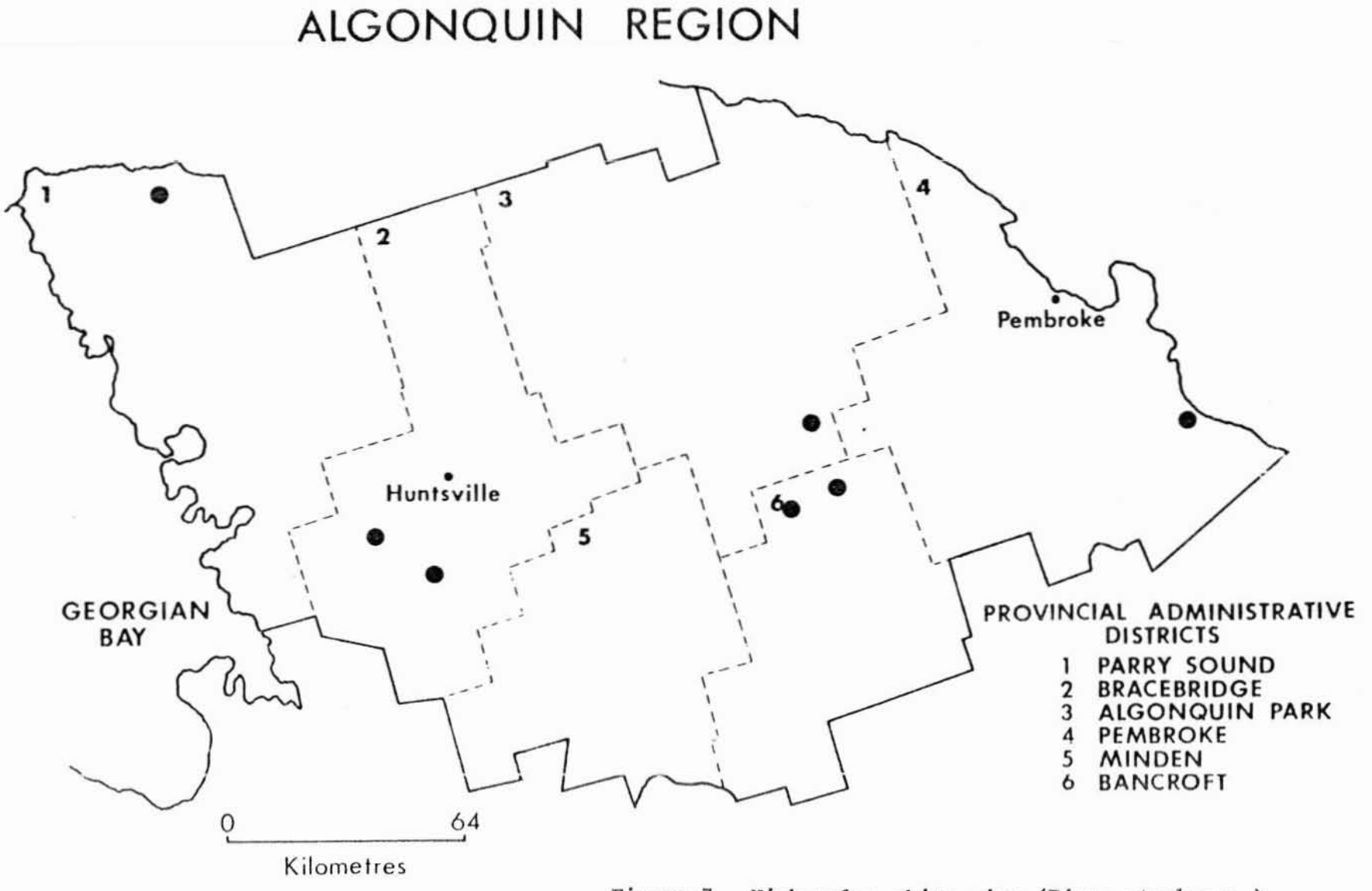

Figure 7. High-value white pine (*Pinus strobus* L.) plantation survey 1983

Townships wherein plantations were surveyed . . . . . ●

The first of two inspections was completed by 15 June, while the second visit was made in the period between 15 July and 15 August.

White pine weevil, pine bark adelgid, pine spittlebug, white pine blister rust, *Cronartium ribicola* J.C. Fisch., and Armillaria root root were all found. The percentage of trees affected and the amount of damage present varied. The white pine weevil had the greatest impact (Table 6). One pest that was looked for but not found was the European pine shoot moth, *Rhyacionia buoliana* (Schiff.). No identifiable foliar diseases were recorded.

Only one incidental pest was found during the survey. The pine leaf adelgid, *Pineus pinifoliae* (Fitch), a small sucking insect, was found at low levels on new foliage in Lyell Township, Algonquin Park District and in Wicklow Township, Bancroft District.

White Pine Blister Rust Survey

Three evaluations for this disease was carried out in the spring, to complement the data being used to establish "a hazard of infection" by this rust, in site district 12 of site region 5.

Open-grown plantations, all in the 2-6 m height class, constituted the survey. All were located in old agricultural fields.

Affected trees were identified by basal stem cankers that exhibited fruiting. Two evaluations in Westmeath Township, Pembroke District had 2% and 2.6% of the pines cankered, while the third evaluation in the district, on the Rook property, Wilberforce Township revealed less than 1% of the tree cankered.

White Pine Cone Survey

Concern expressed about seed production and damaging agents prompted a special collection of white pine cones in the Region for analysis of pests and damage incurred.

A collection of 40 green, but not hardened, second-year cones was taken from trees in a seed production area in Buchanan Township, Pembroke District. Results are listed in Table 7.

The white pine coneworm, *Eucosma tocullionana* Heinr., was the most important organism found. More than half the cones (56%) were infested by this insect and there was an average seed loss of 10% in infested cones.

Table 6. Summary of the results of a white pine plantation survey in the Algonquin Region in 1983.

Location (Twp)	Estimated stems per ha or vol. in m^2/ha	Avg tree ht (m)	Avg DBH (cm)	Stand size (ha)	White pine weevil	Pine bark adelgid	Pine spittlebug		White pine blister rust		Armillaria root rot
					Leaders attacked (%)	Incidence[a]	Incidence (%)	Avg no. of colonies/ tree	trees affected (%)	stem cankers (%)	trees affected (%)
Algonquin Park District											
Lyell	2,100 stems	1.7	-	25	2.0	L	2.6	2.5	0.0	0.0	1.3
Lyell	2.75 m^2/ha	3.6	4.3	6	5.3	0	5.3	2.3	0.0	0.0	0
Bancroft District											
McClure	7.0 m^2/ha	8.8	11.0	25	0.6	L	0.0	0.0	0.0	0.0	0
Wicklow	5,000 stems	0.8	-	14	0.0	0	2.0	1.6	0.0	0.0	0
Bracebridge District											
Macaulay	2,700 stems	3.6	8.5	4	23.0	L	0.0	0.0	6.6	3.3	0
Watt	2,000 stems	0.6	-	5	0.0	L	0.0	0.0	0.0	0.0	0
Parry Sound District											
Blair	500 stems	0.5	-	4	0.0	L	0.0	0.0	0.0	0.0	0
Hagerman	1,000 stems	11.7	26.7	5	0.0	L	0.0	0.0	14.7	6.7	0
Pembroke District											
Horton	1,400 stems	2.0	0.9	1	16.0	L	9.3	1.3	0.0	0.0	0
Jones	2,200 stems	1.8	2.0	3	29.0	L	7.3	1.6	0.0	0.0	0

[a] L = low, 0 = zero population

Table 7. Summary of white pine cone survey, Algonquin Region 1983

Insect	Cones infested (%)	Actual seed loss (%)
Eucosma tocullionana Heinr. White pine coneworm	56	10
Dioryctria abietivorella (Grt.) Fir coneworm	2	0.4
Resseliella sp. Dipterous larvae	2	0.4
Lepidoptera	7	0
Unknown	7	1

Red Oak Acorn Survey

A total of 340 acorns were collected from three townships in the Region: Carling, Parry Sound District; Ridout, Bracebridge District; and Methuen, Bancroft District.

Two collections were made in each district: one of overwintering acorns from the ground in the early spring, the second from the current year's crop in the early fall.

This material was then submitted to the Great Lakes Forest Research Centre for damage assessment; results will be available when rearing of material submitted has been completed.