

A REVIEW OF IMPORTANT FOREST  
INSECT AND DISEASE PROBLEMS  
IN THE LINDSAY DISTRICT  
OF ONTARIO, 1950 - 1980

Compiled by

M.J. Thomson, L.S. MacLeod, H.J. Evans, D.C. Constable and C.G. Jones<sup>1</sup>

FORESTRY CANADA  
ONTARIO REGION  
GOVERNMENT OF CANADA

1990

<sup>1</sup> *Forest Research Technicians, Forest Insect and Disease Survey Unit*

## FOREWORD

The first forest insect surveys in Ontario were carried out in 1936 from the Dominion Entomological Laboratory in Ottawa and continued from this location until 1944, when the province of Ontario was divided, for the purpose of these surveys, into northern and southern Ontario. In 1945, personnel from Ottawa continued to conduct and report on surveys in the area south of Algonquin Park and Parry sound forest districts, while personnel from the Forest Insect Laboratory in Sault Ste. Marie carried out surveys in the area to the north. In 1950 responsibility for reporting insects for all of Ontario fell to the Sault Ste. Marie laboratory. In 1952 the Forest Disease Survey was initiated with headquarters in Maple, Ontario, then was moved to Sault Ste. Marie in 1967. The results of these surveys of insects and diseases are reported in the Annual Report of the Forest Insect and Disease Survey (FIDS) published by Forestry Canada headquarters in Ottawa. In addition, annual district and regional reports, begun in 1948, are prepared by FIDS technicians (Rangers) in Sault Ste. Marie. In 1980 a new provincial report was released in Ontario. The contents of the following review have been abstracted from these reports and compiled in alphabetical order by the scientific names of species in each of the following three categories:

*Major Insects or Diseases*

Capable of causing serious injury to or death of living trees or shrubs.

*Minor Insects or Diseases*

Capable of causing sporadic or localized injury but not usually a serious threat to living trees or shrubs.

*Abiotic Damage*

Damage caused by non-living factors.

All measurements in this review are in metric form and conversions from Imperial measurements from the earliest reports are taken to the second decimal point, i.e., [sq. mi. to km<sup>2</sup> = area (sq. mi.) x 2.59 = area km<sup>2</sup>]. Infestation maps in this review were copied from the original maps in the FIDS technicians' reports. Abbreviations for the common names of the host tree species, along with the scientific names, are shown in Appendices A and B. To facilitate the location of hosts, deciduous and coniferous species have been separated and listed alphabetically under the common names.

Appendix C is a series of maps for southern Ontario grouped alphabetically by insect species or disease pathogen and showing the location of infestations within a region or infestation boundaries that extend beyond regions.

## ACKNOWLEDGMENTS

The authors wish to acknowledge Dr. G.M. Howse, Chief, Forest Insect and Disease Survey Unit; Miss C.A. Plexman, Chief, Communications Services; and Mr. P. Jakibchuk, Technical Services Officer, for advice and support during the preparation of this review.

We wish to acknowledge the following authors of the annual FIDS district and regional reports from which this review was abstracted.

1950-1951	R.J. DuBreuil and J.C. Charbonneau
1952	J.C. Charbonneau
1953-1957	L.S. MacLeod
1958-1966	W.J. Miller
1967-1969	M.J. Thomson
1970-1971	H.J. Weir and M.J. Applejohn
1972-1973	H.J. Weir and W.D. Biggs
1974	H.J. Weir and R.L. Bowser
1975	H.J. Weir and H.R. Foster
1976-1979	H.J. Weir and M.J. Applejohn
1980	H.J. Weir, M.J. Applejohn and C.A. Barnes

## TABLE OF CONTENTS

Page

INTRODUCTION

SUMMARY

FOREST INSECTS

Pine False Webworm, *Acantholyda erythrocephala*Cedar Leafminers, *Argyresthia aureoargentella*, *A. freyella*,  
*A. thuiella* and *Coletechnites thujaella*Birch Skeletonizer, *Bucculatrix canadensisella*Spruce Budworm, *Choristoneura fumiferana*Walnut Caterpillar, *Datana integerrima*Walking Stick, *Diapheromera femorata*Eastern Pine Shoot Borer, *Eucosma gloriola*Pine Bud Moth, *Exoteleia dodecella*Jack Pine Needleminer, *Exoteleia pinifoliella*Birch Leafminer, *Fenusa pusilla*Saddled Prominent, *Heterocampa guttivitta*Native Elm Bark Beetle, *Hylurgopinus rufipes*Fall Webworm, *Hyphantria cunea*Eastern Tent Caterpillar, *Malacosoma americanum*Forest Tent Caterpillar, *Malacosoma disstria*Balsam Fir Sawfly, *Neodiprion abietis complex*Redheaded Pine Sawfly, *Neodiprion lecontei*Jack Pine Sawfly, *Neodiprion pratti paradoxicus*European Pine Sawfly, *Neodiprion sertifer*Spring Cankerworm, *Paleacrita vernata*Yellowheaded Spruce Sawfly, *Pikonema alaskensis*White Pine Weevil, *Pissodes strobi*Larch Sawfly, *Pristiphora erichsonii*Mountain-ash Sawfly, *Pristiphora geniculata*European Pine Shoot Moth, *Rhyacionia buoliana*

(continued)

## TABLE OF CONTENTS (continued)

Page

## FOREST INSECTS (cont'd)

Smaller European Elm Bark Beetle, *Scolytus multistriatus*

Other Noteworthy Insects

## FOREST DISEASES

Anthracnose, *Apiognomonia quercina*  
*Kabatiella apocrypta*Armillaria Root Rot, *Armillaria mellea*Twig Blight, *Cenangium ferruginosum*Dutch Elm Disease, *Ceratocystis ulmi*Ink Spot of Aspen, *Ciborinia whetzellii*White Pine Blister Rust, *Cronartium ribicola*Cytospora Canker, *Cytospora kunzei*Western Gall Rust, *Endocronartium harknessii*Eutypella Canker, *Eutypella parasitica*Fomes Root Rot, *Heterobasidium annosum*Hypoxylon Canker, *Hypoxylon mammatum*Shoot Blight, *Ventura macularis*

Other Noteworthy Diseases

## DIEBACKS AND DECLINES

Maple Deterioration

Oak Deterioration

## ABIOTIC DAMAGE

Drought

Frost

Salt

Semimature Tissue Needle Blight

Winter Drying

## APPENDICES

## INTRODUCTION

This is a review of significant forest insects and diseases in the area covered by the Lindsay District from 1950 to 1980. The Lindsay District underwent a significant boundary change in 1973, when a small section of the former Lake Simcoe District was added to the southwestern boundary and large areas to the north became parts of the Minden and Bancroft districts. In the selection of pests for this report particular attention was paid to the major working groups of host species in the area, namely oak, maple, birch, pines, spruce, balsam fir and larch as well as some ornamental and shade trees. The insects and diseases included are capable of causing, or have caused, tree mortality or a reduction in growth. Also included are abiotic problems that cause damage, i.e., frost, wind, hail and winter drying, etc.

## SUMMARY

## FOREST INSECTS

Pine False Webworm, *Acantholyda erythrocephala* (L.) [Major]  
page

This insect was not found in damaging numbers in the district until 1976. From 1976 to 1980 considerable defoliation in pine plantations occurred but no extensive mortality was recorded.

Cedar Leafminers, *Argyresthia aureoargentella* Brower, [Major]  
*A. thuiella* (Pack), *A. freyella* Wlshm., and  
*Coletechnites thujaella* Kft.  
page

Repeated defoliation by this complex of miners has caused some mortality in cedar stands in southern Ontario. High populations were present in the district from 1955 to 1957, from 1962 to 1967, from 1969 to 1975, and from 1979 to 1980.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham. [Major]  
page

Defoliation by this insect seldom caused mortality of the host but weakened trees are subject to attack by secondary insects and diseases. Large outbreaks of this insect usually last 3 to 4 years, then decline rapidly. Medium-to-heavy infestations were present in the district in 1959 and 1960.

Spruce Budworm, *Choristoneura fumiferana* (Clem.) [Major]  
page

This insect is considered the most destructive insect pest of several coniferous hosts in eastern Canada, the main hosts being white spruce and balsam fir. Though not major hosts, black spruce, eastern hemlock, and tamarack are attacked and considerable tree mortality can occur.

Pockets of moderate-to-severe defoliation were found through the district from 1969 to 1980.

Walnut Caterpillar, *Datana integerrima* G. & R.  
page

[Major]

Although not a major component of hardwood stands in the district, black walnut trees are often heavily defoliated by this caterpillar. High numbers were recorded in Haldimand Twp from 1967 to 1969.

Walking Stick, *Diapheromera femorata* (Say)  
page

[Major]

Although no extensive tree mortality has been attributed directly to defoliation by this insect, heavy feeding has contributed substantially to deterioration of hardwood stands. Heavy infestations were present in the district in 1951, from 1953 to 1955, in 1957, in 1961, and in 1963.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.  
page

[Major]

This insect usually infests lateral shoots and causes only aesthetic damage. When high populations develop, some leaders are infested and killed causing deformity of infested trees. Leader mortality caused concern to Christmas tree growers and reforestation managers from 1955 to 1980.

Pine Bud Moth, *Exoteleia dodecella* (L.)  
page

[Major]

In Ontario, the greatest injury caused by this insect has been to roadside plantings of older Scots pine but mugho pine is also frequently attacked. High numbers occurred frequently in Christmas tree plantations in the district from 1958 to 1980.

Pine Needleminer, *Exoteleia pinifoliella* (Cham.)  
page

[Major]

Although no tree mortality has been attributed to this insect, needle mining turns the foliage yellow by July thus reducing the value of Christmas tree plantations. Periodically high numbers were found in the district from 1957 to 1980.

Birch Leafminer, *Fenusa pusilla* (Lep.)  
page

[Major]

Defoliation by this miner can weaken trees and leave them susceptible to secondary insects and diseases, and may be a predisposing factor in birch decline. As a rule, these insects attack single trees, but when populations build up, stands of trees are severely defoliated. Sporadic infestations were present in the district from 1955 to 1980.

Saddled Prominent, *Heterocampa guttivitta* (Wlk.)  
page

[Major]

Sporadic infestations of this insect have caused moderate-to-severe defoliation of hardwood stands, weakening trees and predisposing them to attack by other insects and diseases. Infestations were found through Durham County in 1969.

Native Elm Bark Beetle, *Hylurgopinus rufipes* (Eich.) [Major]  
page

One of the beetles responsible for transmitting the fungus which causes Dutch elm disease, this beetle was found commonly throughout the district.

Fall Webworm, *Hyphantria cunea* (Drury) [Major]  
page

Black ash stands have been seriously defoliated by these unsightly feeders causing branch mortality and contributing to the deterioration of stands. Pockets of medium-to-heavy infestation were recorded from 1958 to 1960, from 1971 to 1976 and from 1978 to 1980.

Eastern Tent Caterpillar, *Malacosoma americanum* (F.) [Minor]  
page

This caterpillar feeds primarily on pin cherry, choke cherry and apple, and is more common in orchards than forest stands. High numbers were found in many years from 1950 to 1980 through the district.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. [Major]  
page

This caterpillar is widely distributed through North America. Infestations usually last an average of five years and high populations denude large areas of susceptible stands. The principal host attacked is aspen, however, many other deciduous species also suffer severe defoliation. Repeated defoliation retards tree growth and vigor leaving them susceptible to attack by other pests. Medium-to-heavy infestations were present in the district from 1950 to 1952 and from 1975 to 1977.

Balsam Fir Sawfly, *Neodiprion abietis* complex [Major]  
page

Severe defoliation can cause mortality of balsam fir and white spruce trees when an infestation persists over a period of years. Medium-to-high numbers were reported in the district from 1953 to 1956 and again in 1965.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch) [Major]  
page

This destructive pest of pine plantations can cause mortality after several years of severe defoliation. The preferred hosts are Scots pine, red pine and jack pine planted in pure stands. Pockets of infestation were found regularly through plantations from 1950 to 1980.

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross. [Major]  
page

This sawfly is capable of causing serious damage and mortality of semimature and plantation jack pine trees when high populations occur over a period of years. Moderate-to-severe defoliation occurred in small pockets from 1962 to 1966.

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

[Major]

This sawfly feeds on many species of pine but is a particular pest of Scots pine plantations and, consequently, a threat to Christmas tree growers. Varying numbers were found in the district from 1962 to 1980.

Spring Cankerworm, *Paleacrita vernata* (Peck)  
page

[Major]

Although this insect rarely caused tree mortality, heavy defoliation retards growth and vigor making host trees susceptible to attack by other pests. Small infestations were recorded in the district in 1955 and from 1960 to 1962.

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

[Major]

This destructive insect has been categorized as a serious pest of young spruce plantations and open-growing ornamentals. High mortality can occur after successive years of severe defoliation. Pocket of medium-to-heavy infestation were reported in 1952, from 1972 to 1975, in 1977 and in 1980.

White Pine Weevil, *Pissodes strobi* (Peck)  
pages

[Major]

This weevil is considered the most destructive pest of white pine in North America. Successive weeviling over a period of years results in multiple-stemmed trees. Weevils caused varying amounts of damage in plantations from 1951 to 1980.

Larch Sawfly, *Pristophora erichsonii* (Htg.)  
pages

[Major]

The larch sawfly is the primary defoliating insect of native and most exotic species of larch. On good sites, larch trees can withstand six to nine years of severe defoliation before mortality occurs; on less favourable sites, mortality may follow three or more years of complete defoliation. Frequently, medium-to-high populations caused heavy defoliation of forest stands, plantations and ornamental trees from 1958 to 1980.

Mountain-ash Sawfly, *Pristophora geniculata* (Htg.)  
pages

[Major]

Although mountain-ash trees are not considered merchantable, a great many are utilized as shade and ornamental trees in urban and rural areas. This insect weakens trees when prolonged, severe defoliation occurs, leaving them susceptible to attack by secondary insects and diseases. Varying degrees of damage were reported in the district since 1952.

European Pine Shoot Moth, *Rhyacionia buoliana* (D. & S.)  
page

[Major]

This imported pest attacks all species of pine but red and Scots pine are preferred. Repeated attacks on red pine have been especially damaging because of the resulting stem deformity. Varying degrees of damage occurred in plantations in the district from 1950 to 1969.

Smaller European Elm Bark Beetle, *Scolytus multistriatus* (Marsh.) [Major]  
pages

This is one of the beetles responsible for transmitting the fungus which causes Dutch elm disease. The range of this imported beetle is restricted to southern Ontario and is found commonly through the southern part of the district.

Other Noteworthy Insects [Major and Minor]  
pages

These are insects with the potential for causing damage to stands, regeneration and plantations.

#### FOREST DISEASES

Anthraxnose, *Apiognomonia quercina* (Kleb.) Höhnelt  
*Kabatiella apocrypta* (Ell. & Ev.) v. Arx [Major]  
pages

This condition caused premature leaf loss and repeated attacks can reduce tree increment. Varying degrees of infection were reported from 1953 to 1977.

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer [Major]  
pages

This root rot disease often kills trees previously stressed by drought, insects, other pathogens or unfavourable environment. However, under some circumstances the fungus, or certain strains of the fungus, can kill vigorous trees. Both deciduous and coniferous trees are attacked. Infections were widely distributed through the district and were reported from 1965 to 1979.

Twig Blight, *Cenangium ferruginosum* Fr:Fr  
pages

Damage caused by this organism is branch and twig mortality and was mainly a concern of Christmas tree growers from 1973 to 1975.

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau [Major]  
pages

This major disease organism, which affects all species of elm, was first recorded in Ontario in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. The disease was first reported in the district in 1956.

Ink Spot of Aspen, *Ciborinia whetzellii* (Seaver) Seaver [Major]  
pages

This ink spot disease is widespread throughout the range of aspen. Many poplar species and hybrids are susceptible, but trembling aspen is most commonly affected. Heavily infected trees may be defoliated prematurely and repeated attacks can reduce increment and even kill regeneration. The disease was reported at various levels from 1958 to 1979.

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer [Major]  
page

White pine blister rust is the most serious disease of eastern white pine. The disease caused top killing and mortality in trees of all ages. Status of this disease in the district was reported from 1953 to 1980.

Cytospora Canker, *Cytospora kunzei* Sacc.  
page

Cankers usually on kill branches on their hosts. Moderate and high incidence was reported at points in the district from 1966 to 1968.

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats [Major]  
page

This rust may kill trees outright or make them more susceptible to insects, decay, wind breakage depending on the degree of infection. The organism was found mainly in Christmas tree plantations in the district.

Eutypella Canker, *Eutypella parasitica* Davidson & Lorenz [Major]  
page

Cankers deform the trunk often leading to breakage. Incidence was generally low through maple stands in the district.

Fomes Root Rot, *Heterobasidium annosum* (Fr.) Bref. [Major]  
page

This organism causes root rot and was a problem in plantations from 1965 to 1980.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller [Major]  
page

Mortality caused by this disease is usually restricted to trees in the 7-cm to 13-cm class, growing on poor sites, but branch and top mortality may occur in trees of greater diameter. Varying degrees of infection were found through aspen stands in the district.

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx. Major]  
page

Reduced stocking of regeneration aspen occurs when the incidence of this disease is high. Trees more than 5 years old are seldom affected and, therefore, the disease is of little economic importance in natural stands. Various infection levels were reported through the district from 1952 to 1976.

Other Noteworthy Diseases [Major and Minor]  
pages

These are diseases with the potential for causing damage to natural stands, regeneration and plantations.

DIEBACKS AND DECLINES

Maple Deterioration  
page

[Major]

This condition was reported from 1958 to 1979.

Oak Deterioration  
page

[Major]

This condition was reported from 1966 to 1979.

ABIOTIC DAMAGE  
pages

Abiotic damage is caused by a variety of influences, i.e., frost, winter drying, salt, etc. Weakened trees are susceptible to a number of diseases.

I N S E C T S

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

Host(s): red pine, eastern white pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1975	not reported
1976	Heavy infestations caused moderate-to-severe defoliation in red pine plantations in Douro, Harvey and Belmont twps.
1977	Moderate-to-severe defoliation recurred in Harvey and Douro twps and on eastern white pine trees at Balsam Lake Provincial Park in Bexley Twp.
1978	medium-to-high populations again recorded on red pine in Douro Twp and on eastern white pine in Bexley Twp
1979	Moderate-to-severe defoliation occurred in plantations in Bexley, Dummer, Harvey and Mariposa twps.
1980	Moderate-to-severe defoliation was again recorded in Harvey, Douro and Bexley twps.

Cedar Leafminers, *Argyresthia aureoargentella* Brower,  
*A. thuiella* (Pack), *A. freyella* Wlshm., and  
*Coletechnites thujaella* Kft.

Host(s): cedar

[Major]

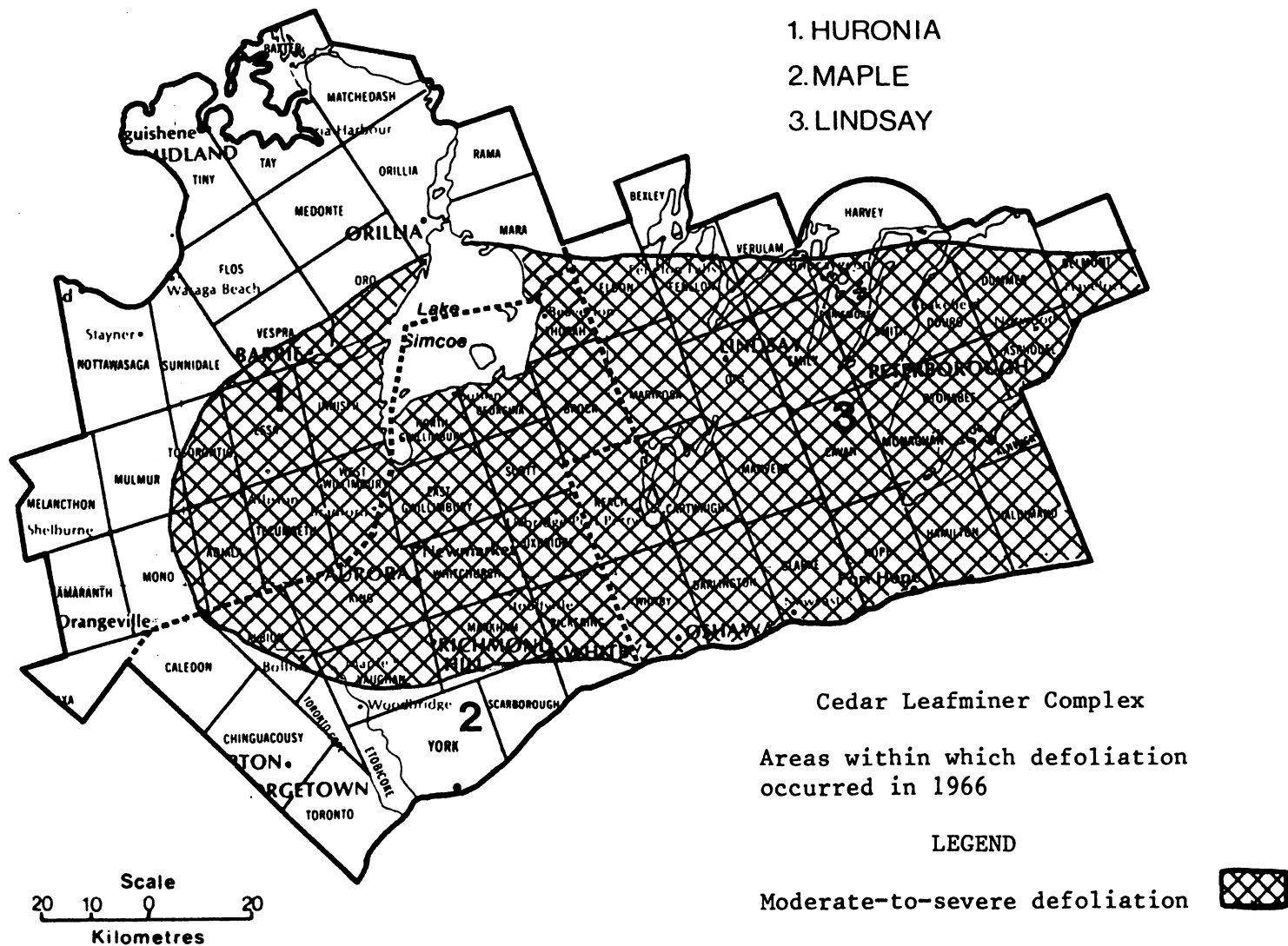
<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	moderate-to-severe discoloration of cedar foliage at many locations in Durham and Northumberland counties
1956-1957	Heavy infestations persisted in Durham and Northumberland counties.
1958	low numbers through the district
1959-1961	not reported
1962	Moderate-to-severe damage to white cedar foliage was observed throughout Durham and Northumberland counties.
1963	Medium-to-heavy infestations persisted in Durham and Northumberland counties and in the Peterborough area.
1964	A strip of medium-to-heavy infestation approximately 40 km wide recurred through the central part of the district.
1965-1966	Moderate-to-severe defoliation continued through the district. Repeated defoliation has left the crowns of most white cedar trees very sparsely foliated (see map, page     ).

(cont'd)

Cedar Leafminers, *Argyresthia aureoargentella* Brower,  
*A. thuiella* (Pack), *A. freyella* Wlsh., and  
*Coletechnites thujella* Kft. (concl.)

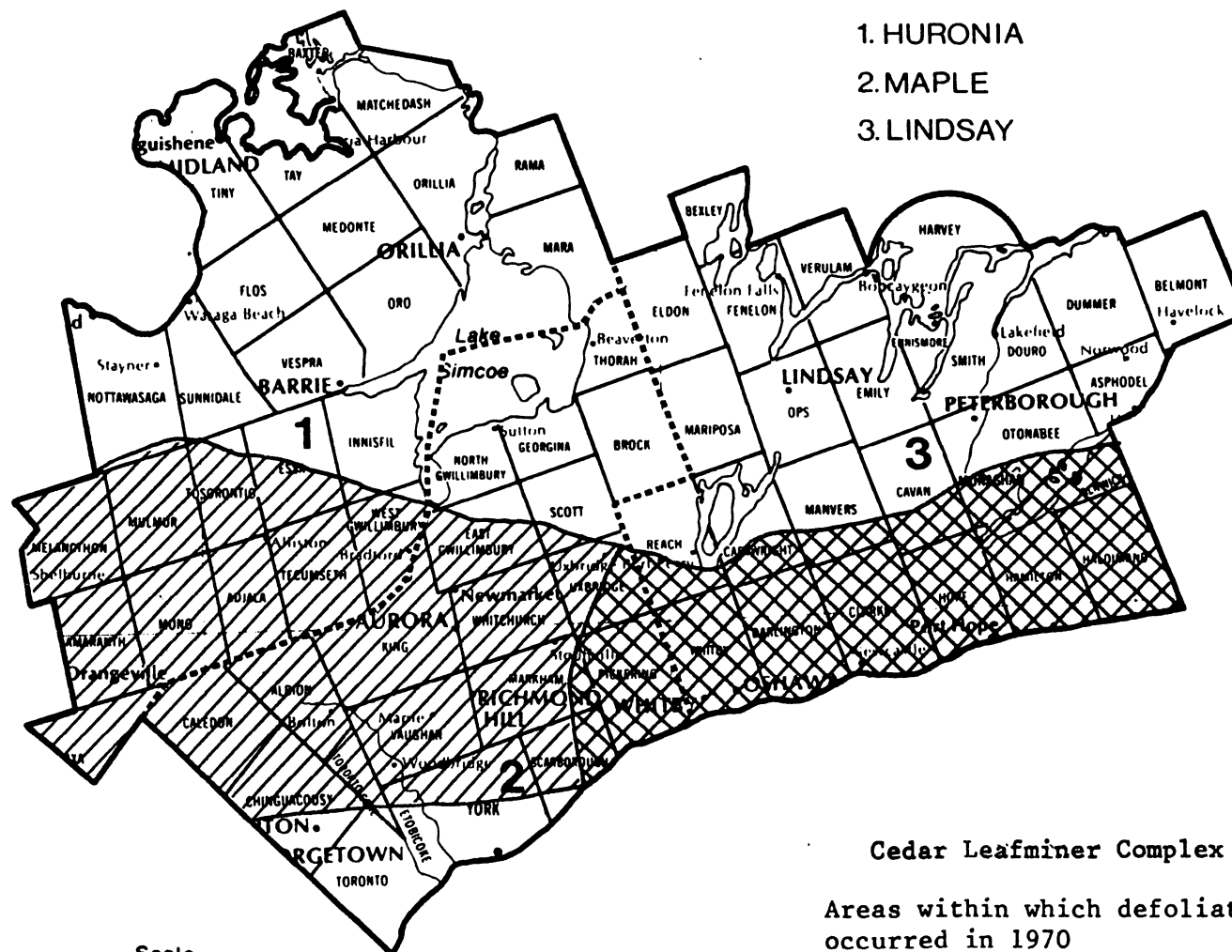
<u>Year</u>	<u>Remarks</u>
1967	Heavy infestations recurred for the sixth consecutive year. Marked thinning of tree crowns and considerable branch mortality has occurred through the district. In 1967, scattered tree mortality was observed on the fringes of stands and on open-grown trees.
1968	Populations declined to low levels in 1968. Tree and branch mortality was observed commonly through the district.
1969	High numbers of miners again caused conspicuous browning of foliage through Durham and Northumberland counties. Tree mortality continued to increase.
1970	Medium-to-heavy infestations persisted south of the Trent Canal from Oshawa to Colborne (see map, page ).
1971	Moderate-to-severe discoloration occurred throughout the district (see map, page ).
1972	Little change occurred in the degree of infestation or the area affected.
1973	Moderate-to-severe damage was again recorded through the district (see map, page ).
1974	Moderate-to-severe discoloration was observed throughout the district. Tree mortality intensified in the Peterborough-Lindsay area and along Highway 45 north of Cobourg.
1975	Medium-to-heavy infestations were again present except in the area north and east of Cobourg (see map, page ).
1976	A widespread decline in populations occurred (see map, page ).
1977	Populations declined to low levels.
1978	Light infestations were recorded on windbreaks at the Orono Forest Station in Clarke Twp. Elsewhere numbers were low.
1979	Medium-to-heavy infestations were again present in the northern part of the district (see map, page ). Treatment with chemical insecticides successfully controlled the leafminers in windbreaks at the Orono Forest Station.
1980	Moderate-to-severe foliar damage was again mapped through the central part of the district (see map, page ).

# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS

1. HURONIA
2. MAPLE
3. LINDSAY



Scale  
20 10 0 20  
Kilometres

Forest Insect and Disease Survey  
Great Lakes Forestry Centre

Cedar Leafminer Complex

Areas within which defoliation  
occurred in 1970

LEGEND

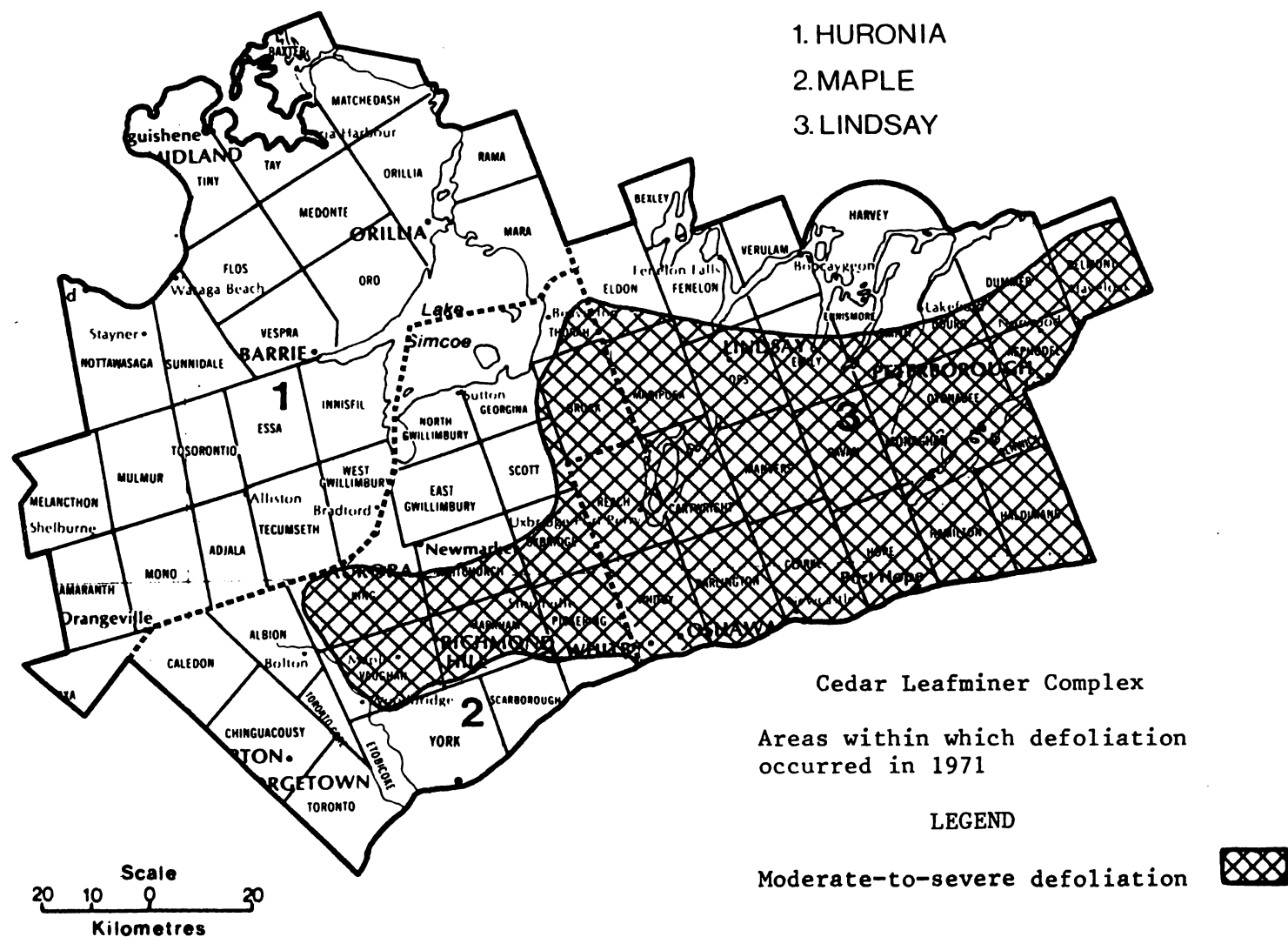
Light defoliation



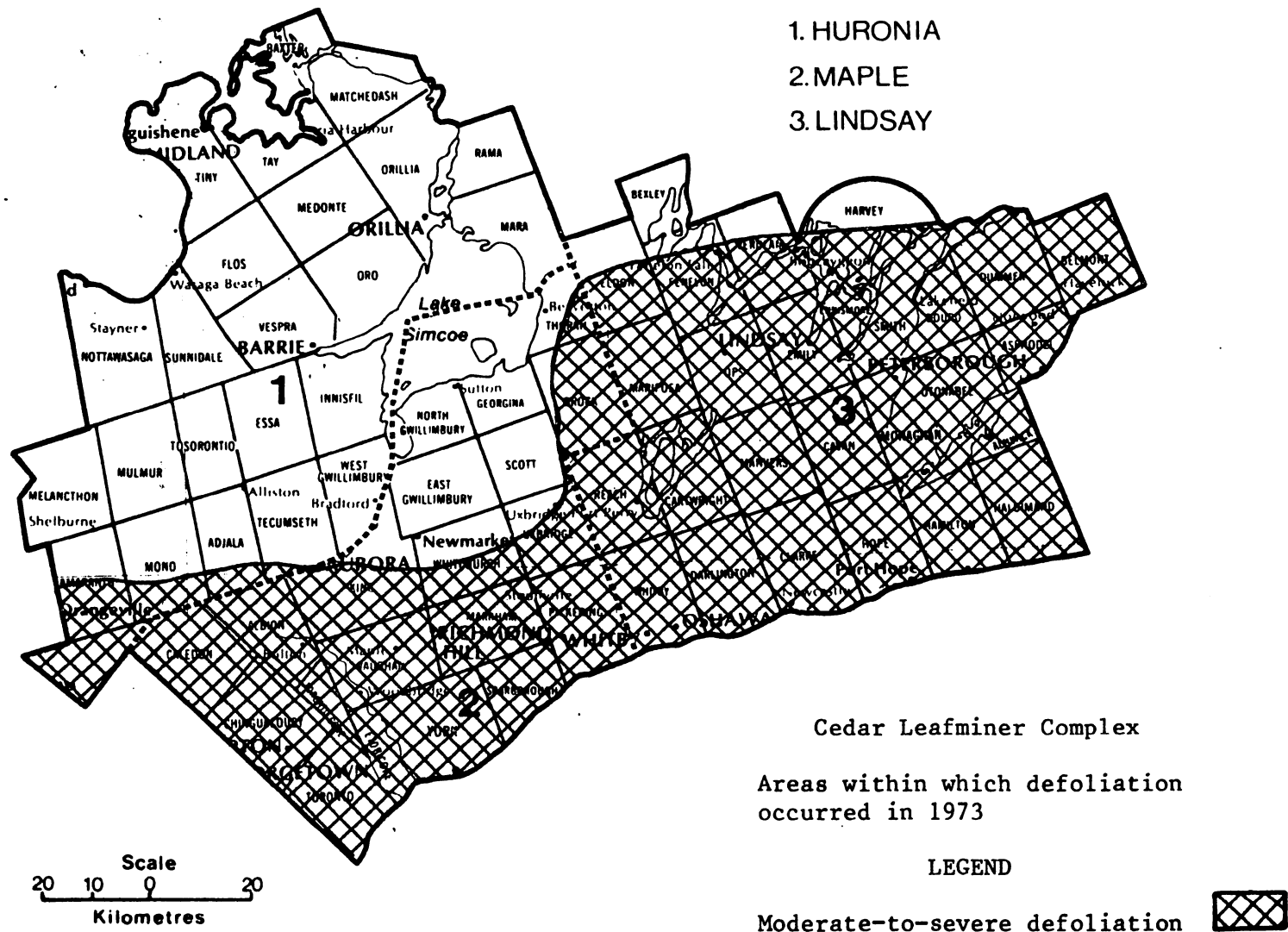
Moderate-to-severe defoliation



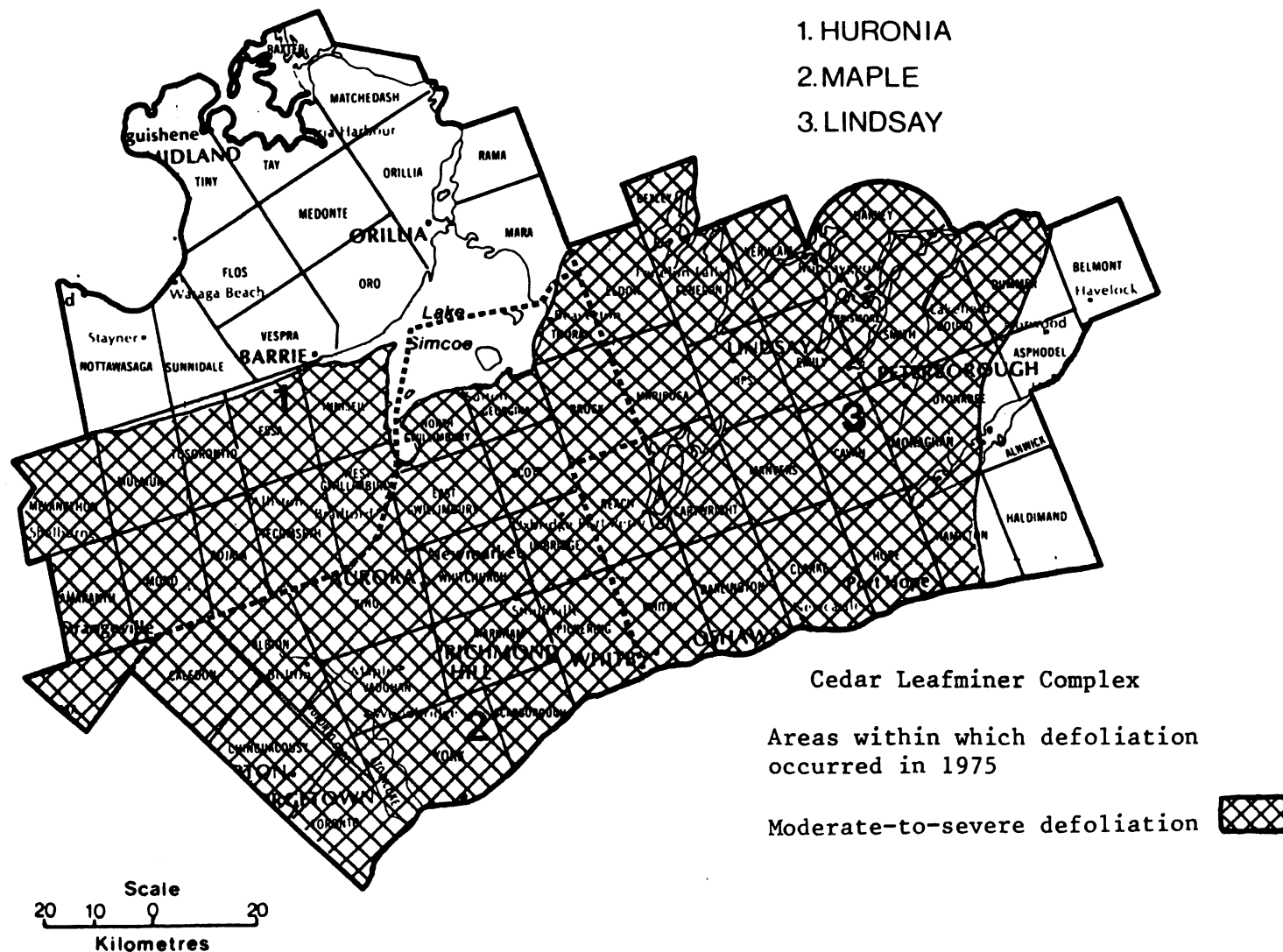
# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS

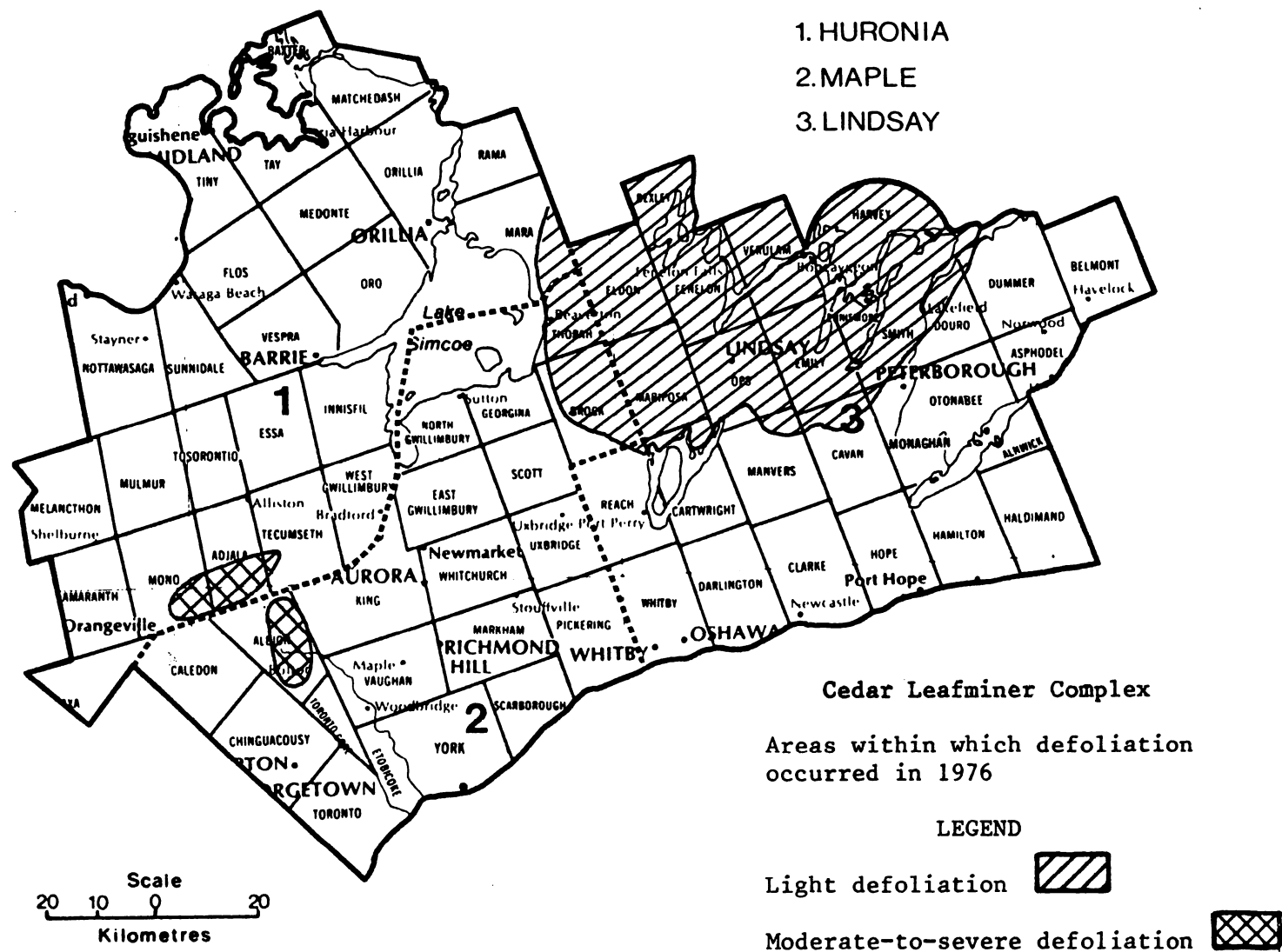


# HURONIA, MAPLE and LINDSAY DISTRICTS

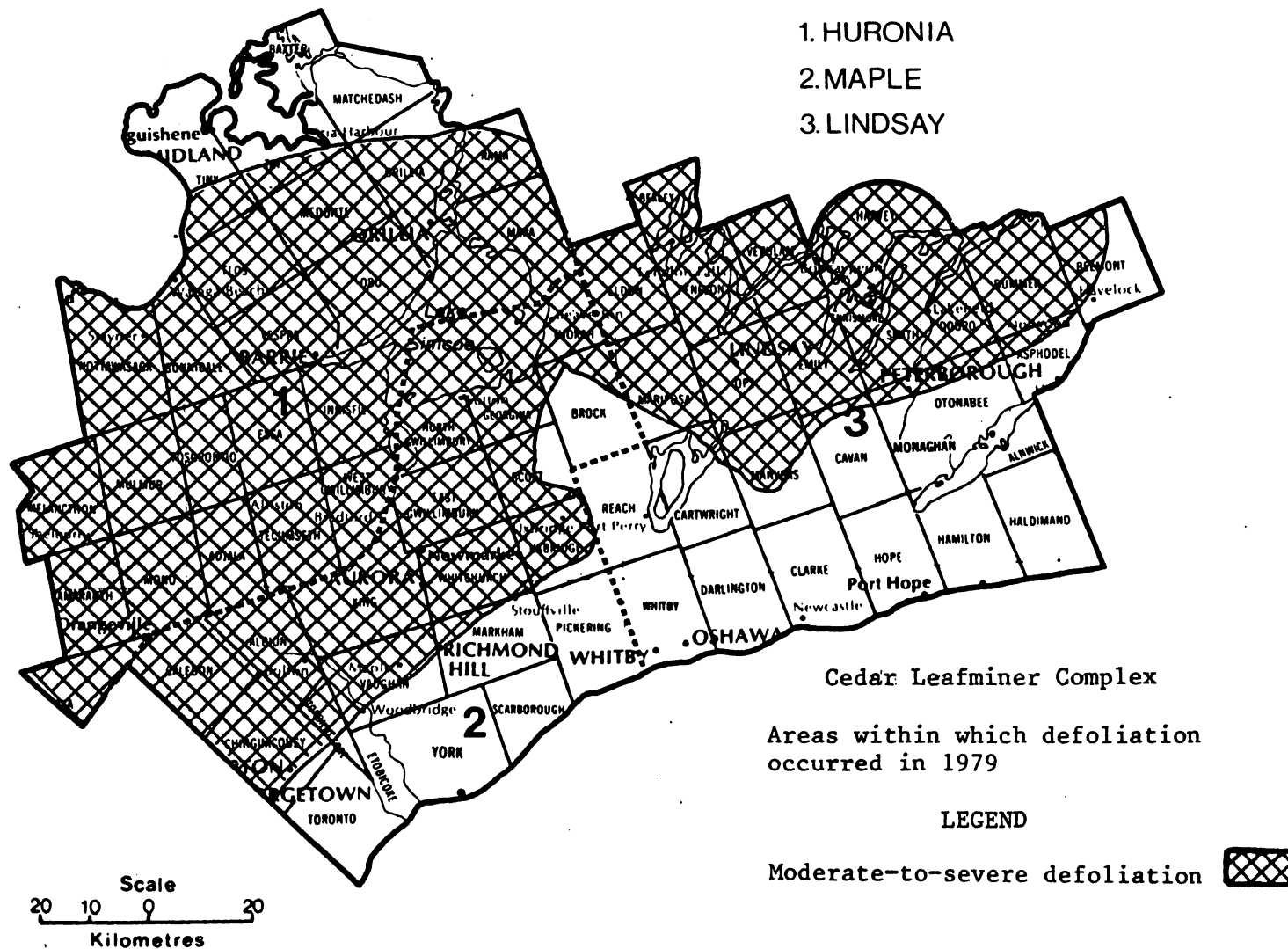


**Forest Insect and Disease Survey**  
**Great Lakes Forestry Centre**

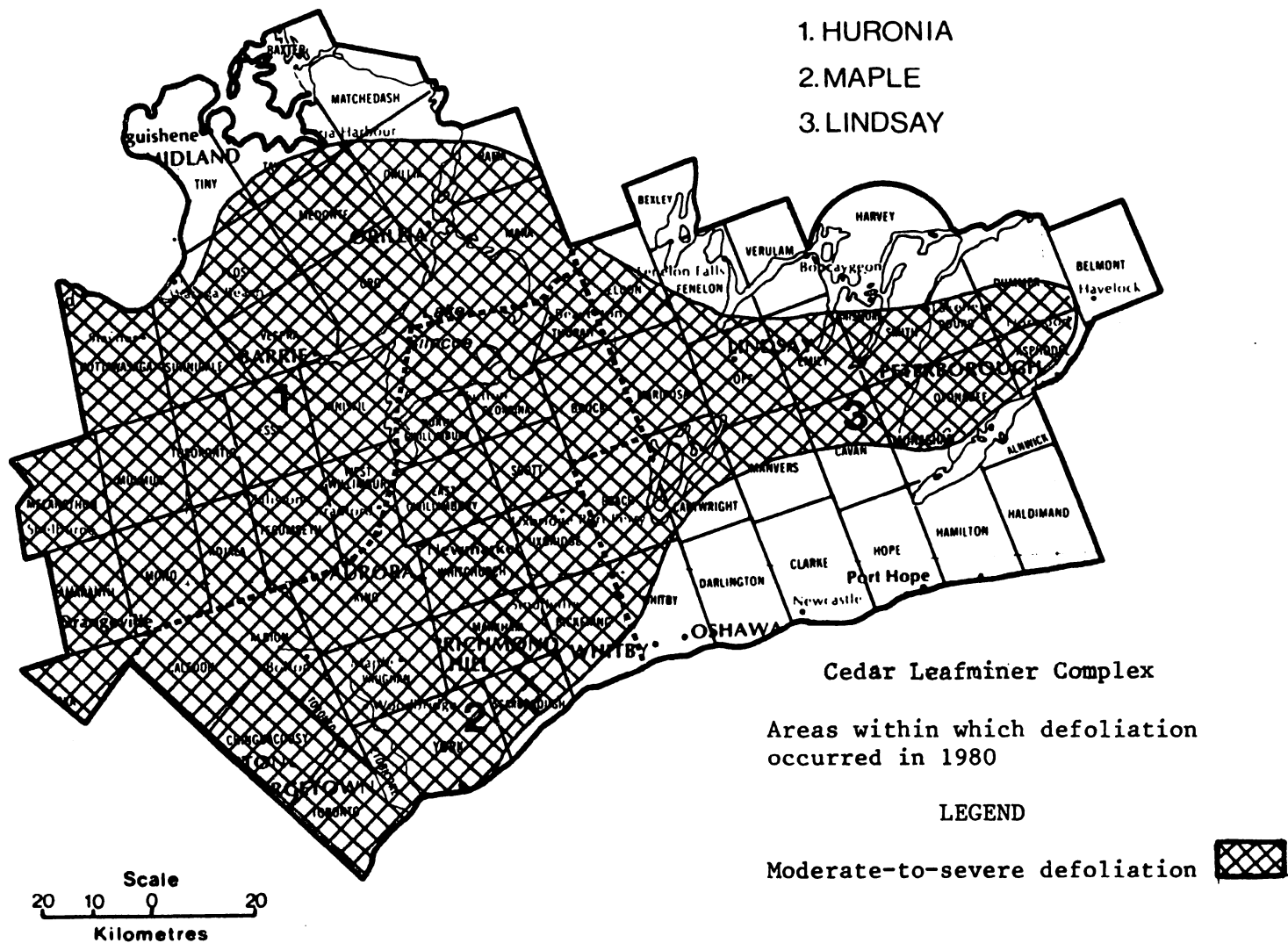
# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	Moderate-to-severe damage occurred over approximately 150 ha of birch in Darling Twp, Durham County.
1960	Moderate-to-severe defoliation was general through Durham and Northumberland counties.
1961	The infestation declined to light levels in the southern part of Durham and Northumberland counties.
1962	Defoliation was generally light with pockets of moderate-to-severe defoliation through the district.
1963-1980	not reported

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): spruce, balsam fir

<u>Year</u>	<u>Remarks</u>
1950-1951	trace levels in district
1952-1954	not reported
1955	trace levels in Clarke Twp
1956	not reported
1957	trace populations
1958	not reported
1959	trace levels in Clarke Twp
1960-1961	trace levels in Cartwright Twp
1962-1965	not reported
1966	low numbers in one white spruce plantation in Cartwright Twp
1967	increased numbers in Cartwright Twp and approximately 4% defoliation in a plantation in Clarke Twp
1968	approximately 28% defoliation in two spruce plantations in Cartwright Twp; low numbers in Clarke Twp (see map, page )
1969	Populations increased in Cartwright Twp and the insect was found commonly through the district.
1970	low numbers through the district

(cont'd)

Spruce Budworm, *Choristoneura fumiferana* (Clem.) (concl.)

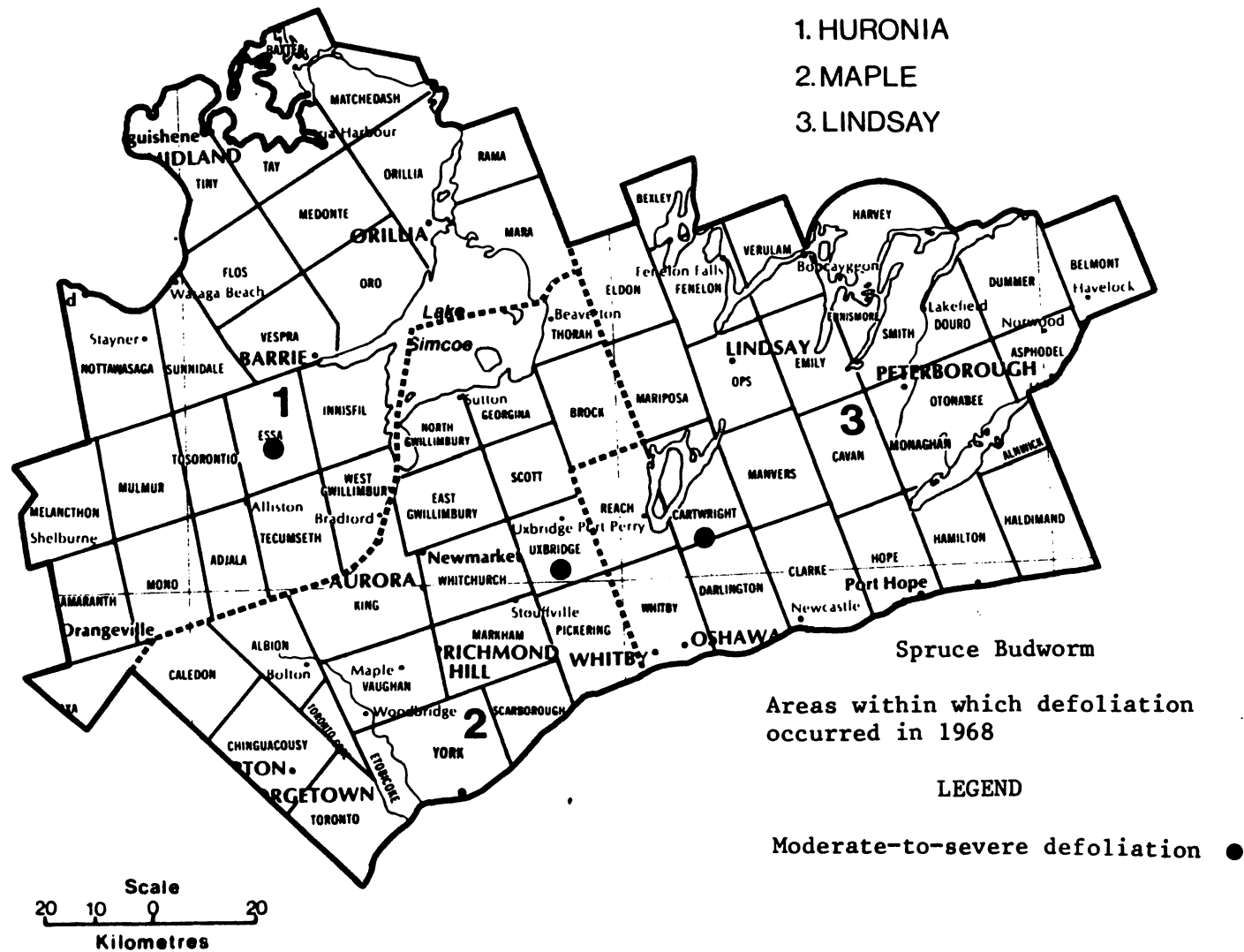
<u>Year</u>	<u>Remarks</u>
1971	small pockets of moderate-to-severe defoliation in Harvey, Verulam and Bexley twps (see map, page )
1972	pockets of moderate-to-severe defoliation in Harvey, Verulam, Dummer, Belmont, Haldimand, Clarke, Cartwright and Bexley twps (see map, page )
1973	moderate-to-severe defoliation in Harvey, Verulam, Smith, Douro and Cartwright twps (see map, page )
1974	little change in infestation boundaries (see map, page )
1975	Moderate-to-severe defoliation expanded in Bexley Twp (see map, page ).
1976	little change in infestation boundaries and intensity (see map, page )
1977	Populations declined (see map, page ).
1978	situation unchanged from 1978 (see map, page )
1979	little change in population levels (see map, page )
1980	damage confined to Cartwright and Clarke twps (see map, page )

Walnut Caterpillar, *Datana integerrima* G. and R.

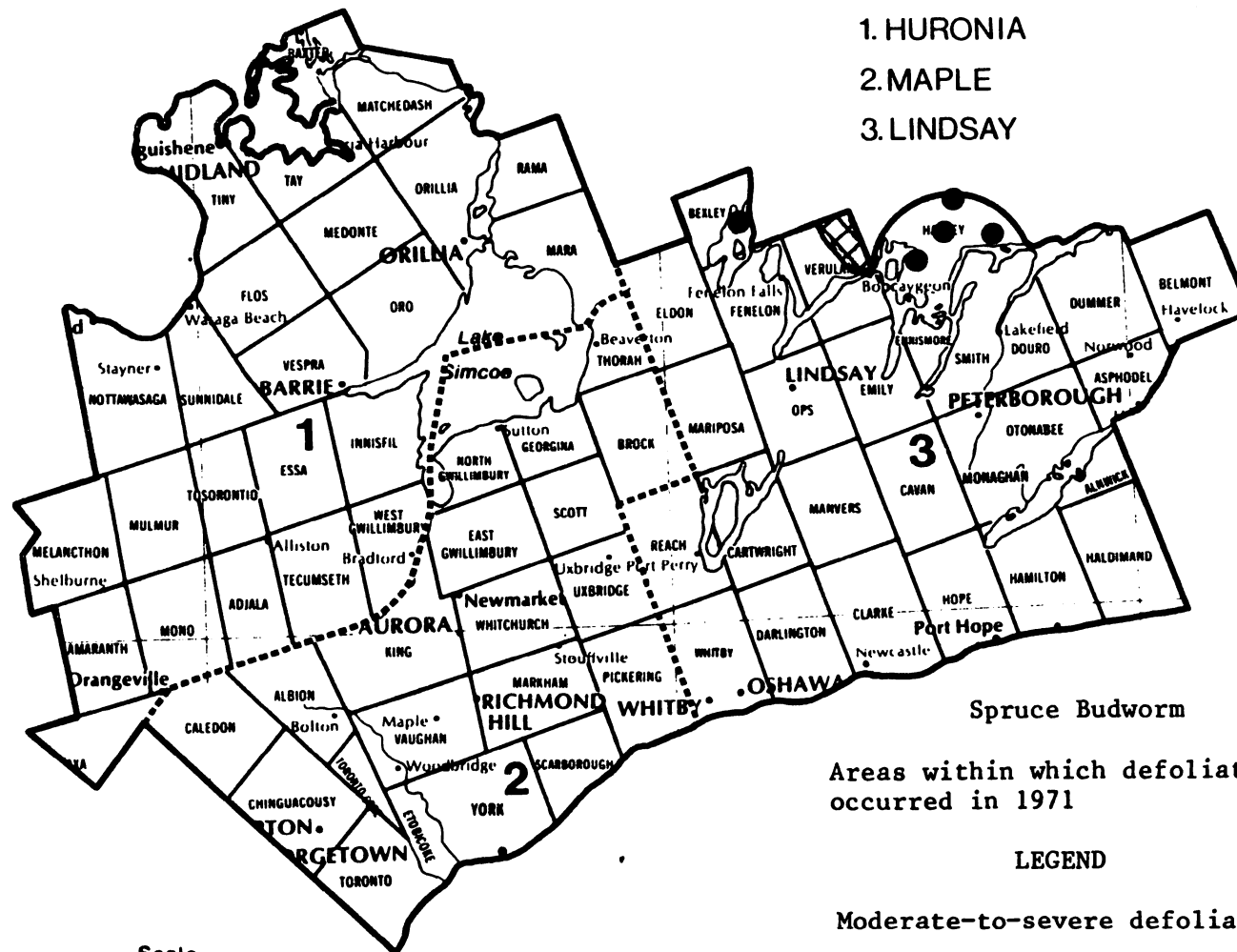
Host(s): walnut, hickory [Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	lightly defoliated black walnut trees in South Monaghan Twp
1954-1958	not reported
1959	trace levels in South Monaghan Twp
1960-1966	not reported
1967	15% defoliation of several black walnut trees at one point in Hope Twp; scattered colonies or roadside butternut were observed in Haldimand Twp
1968	severely defoliated black walnut trees at one location in Haldimand Twp
1969	moderate-to-severe defoliation on scattered black walnut trees at one location in Haldimand Twp
1970-1980	not reported

# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



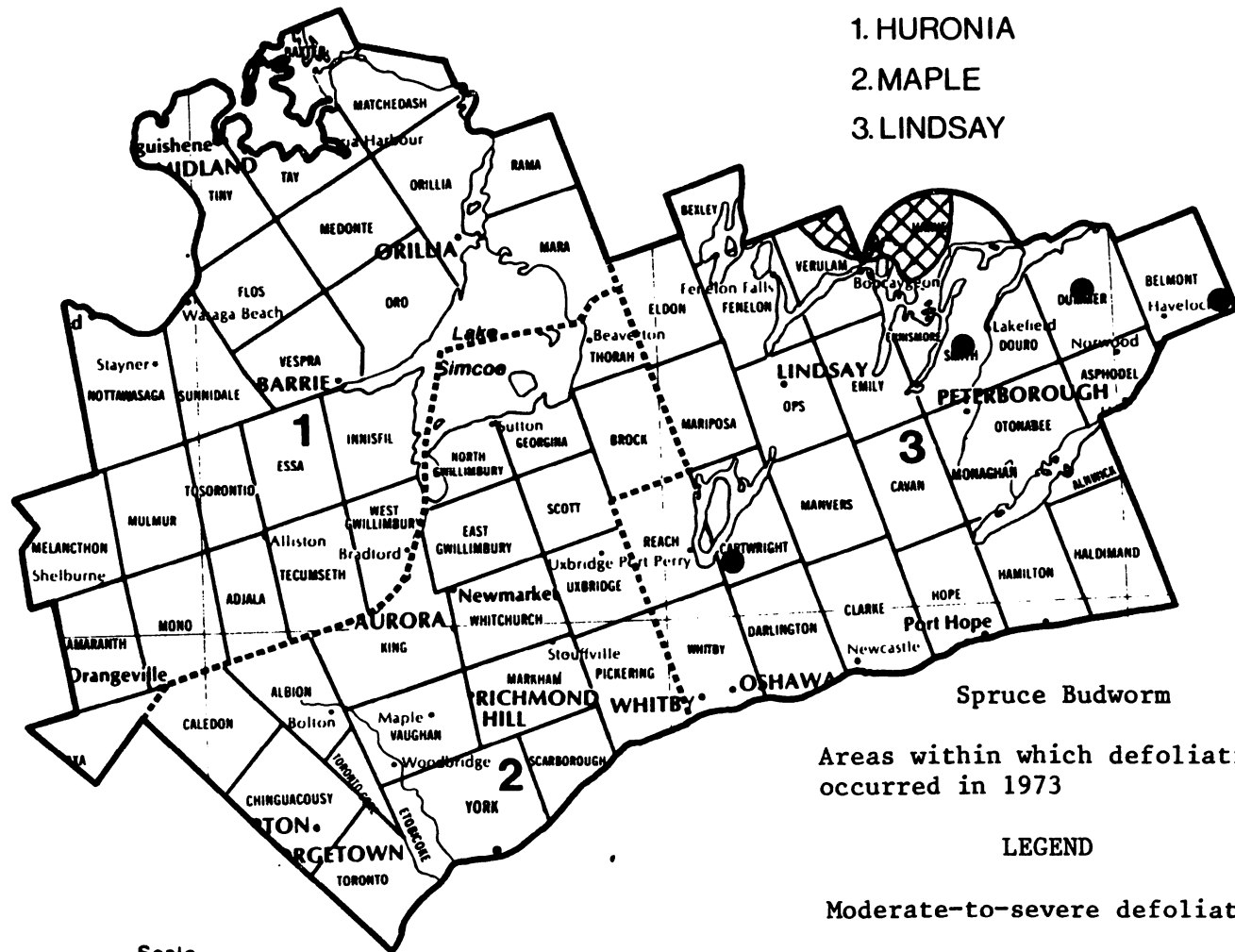
Spruce Budworm

Areas within which defoliation occurred in 1972

## LEGEND



Moderate-to-severe defoliation  or 

# HURONIA, MAPLE and LINDSAY DISTRICTS

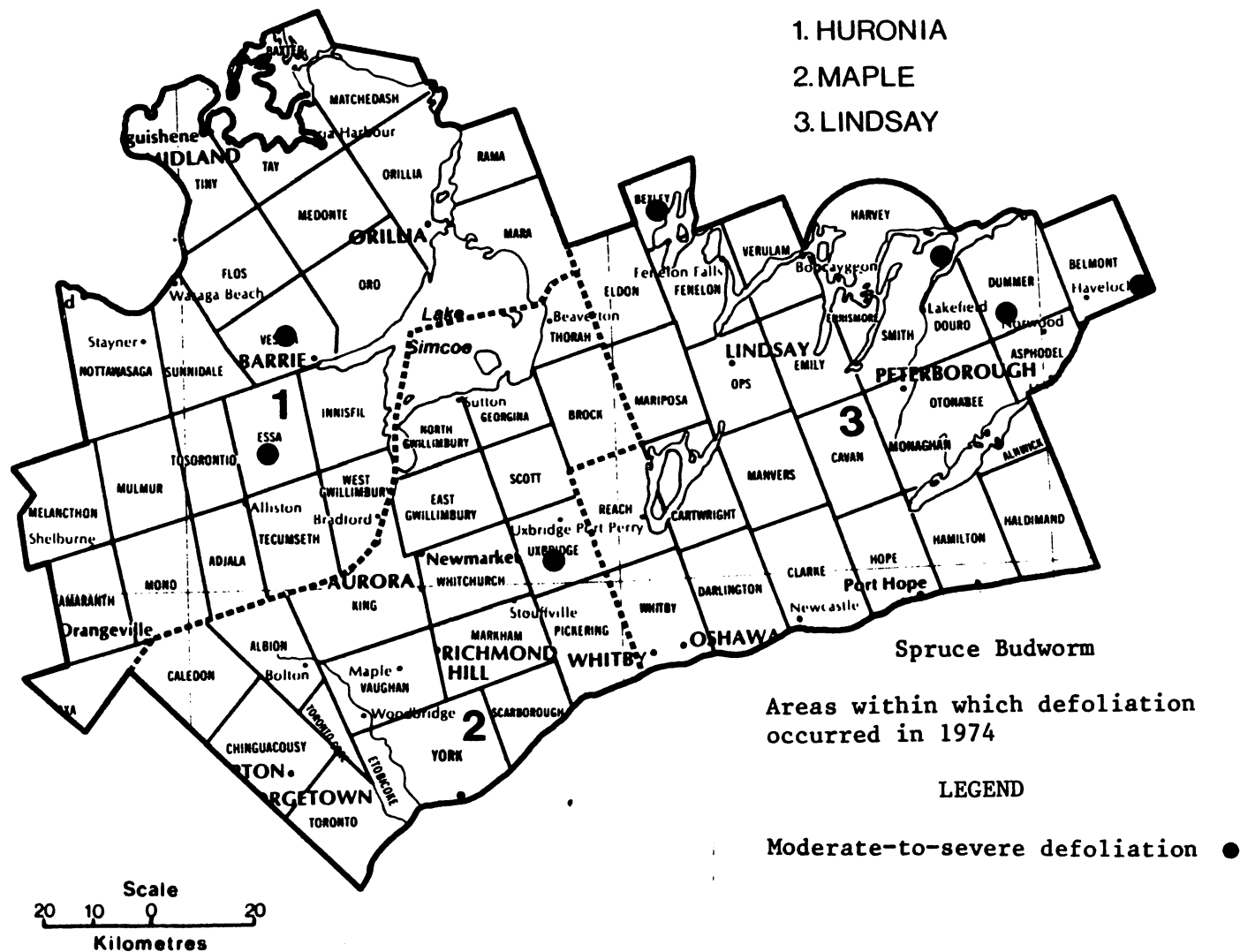


Areas within which defoliation occurred in 1973

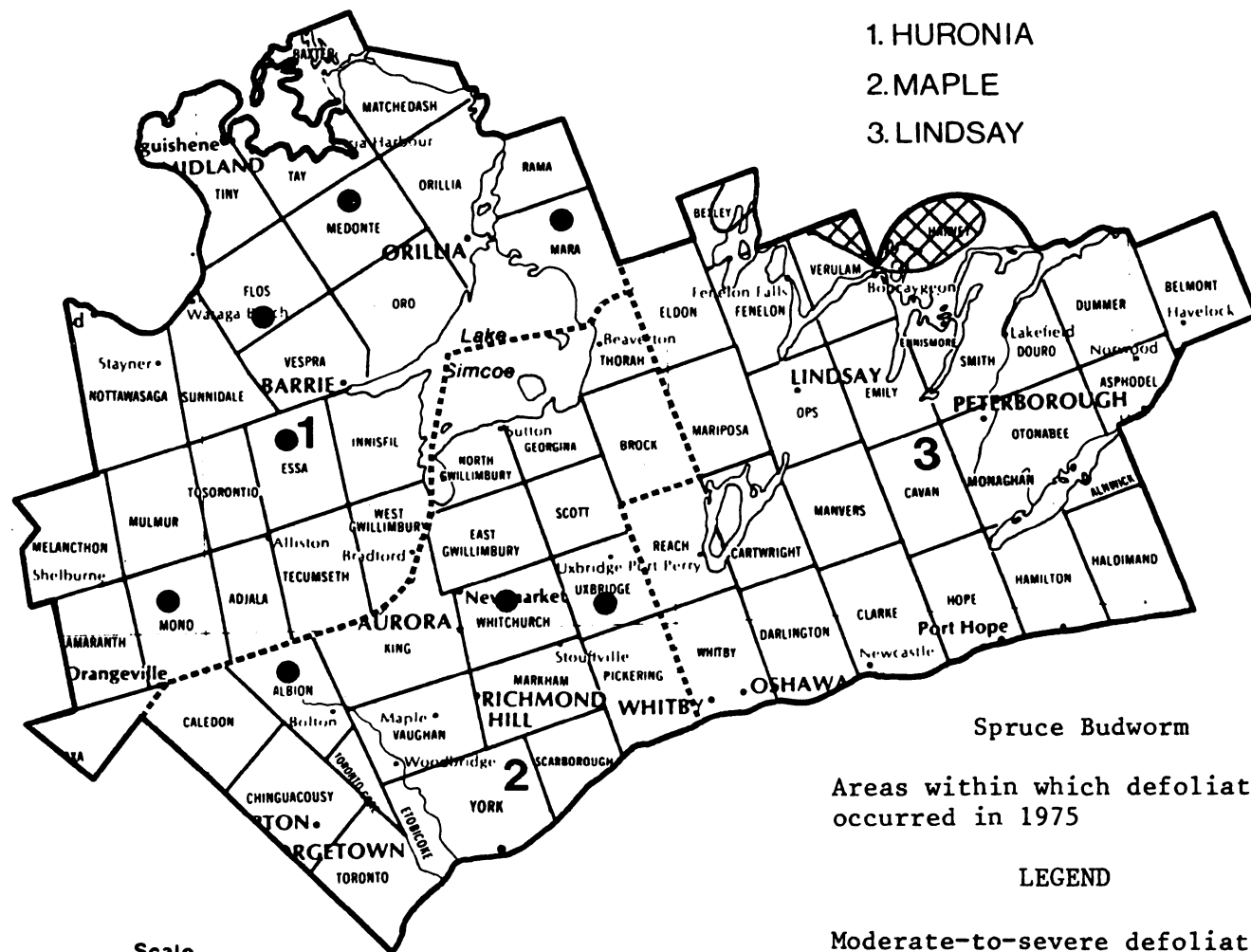
## LEGEND

Moderate-to-severe defoliation  or 

# HURONIA, MAPLE and LINDSAY DISTRICTS

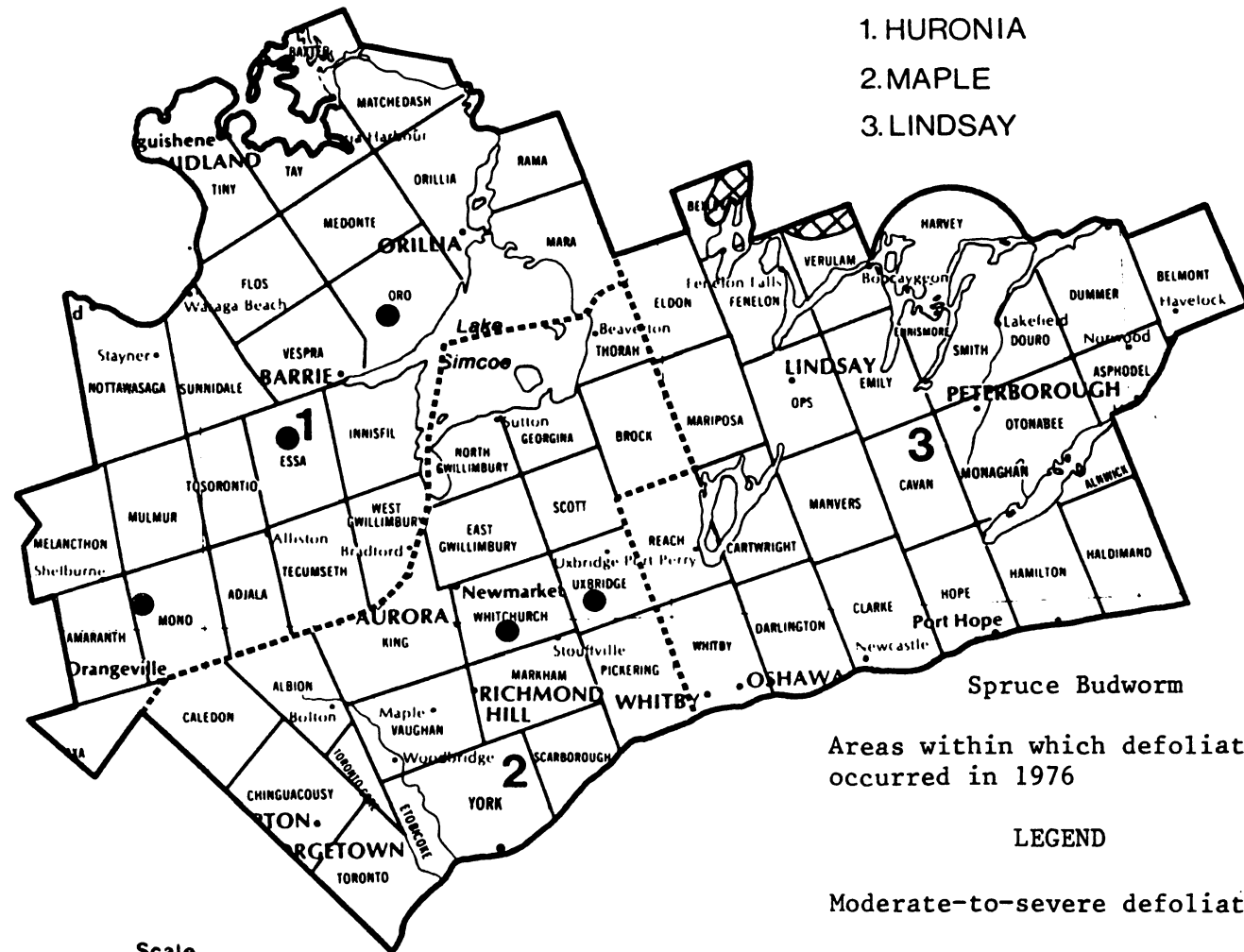


# HURONIA, MAPLE and LINDSAY DISTRICTS

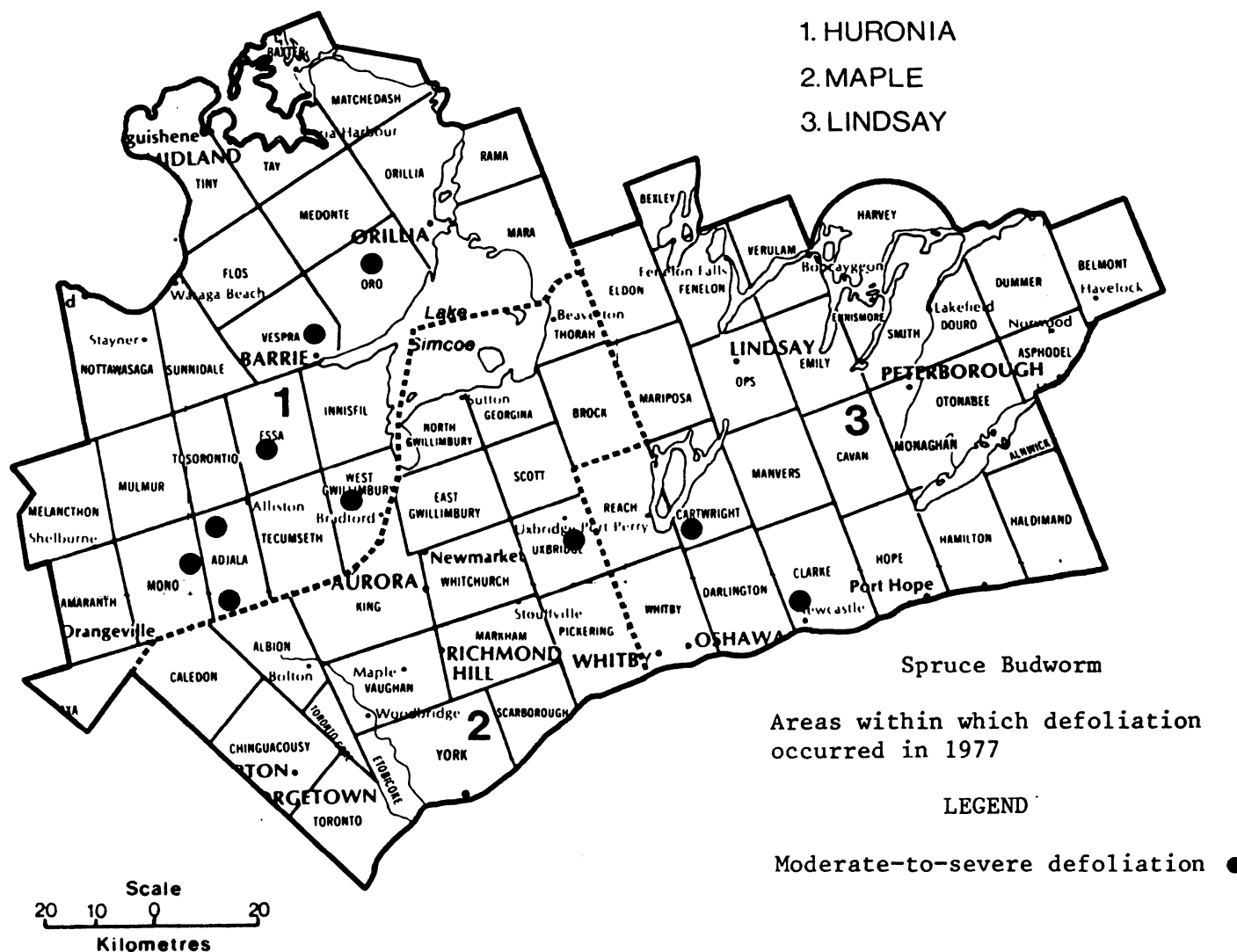


Scale  
20 10 0 20  
Kilometres

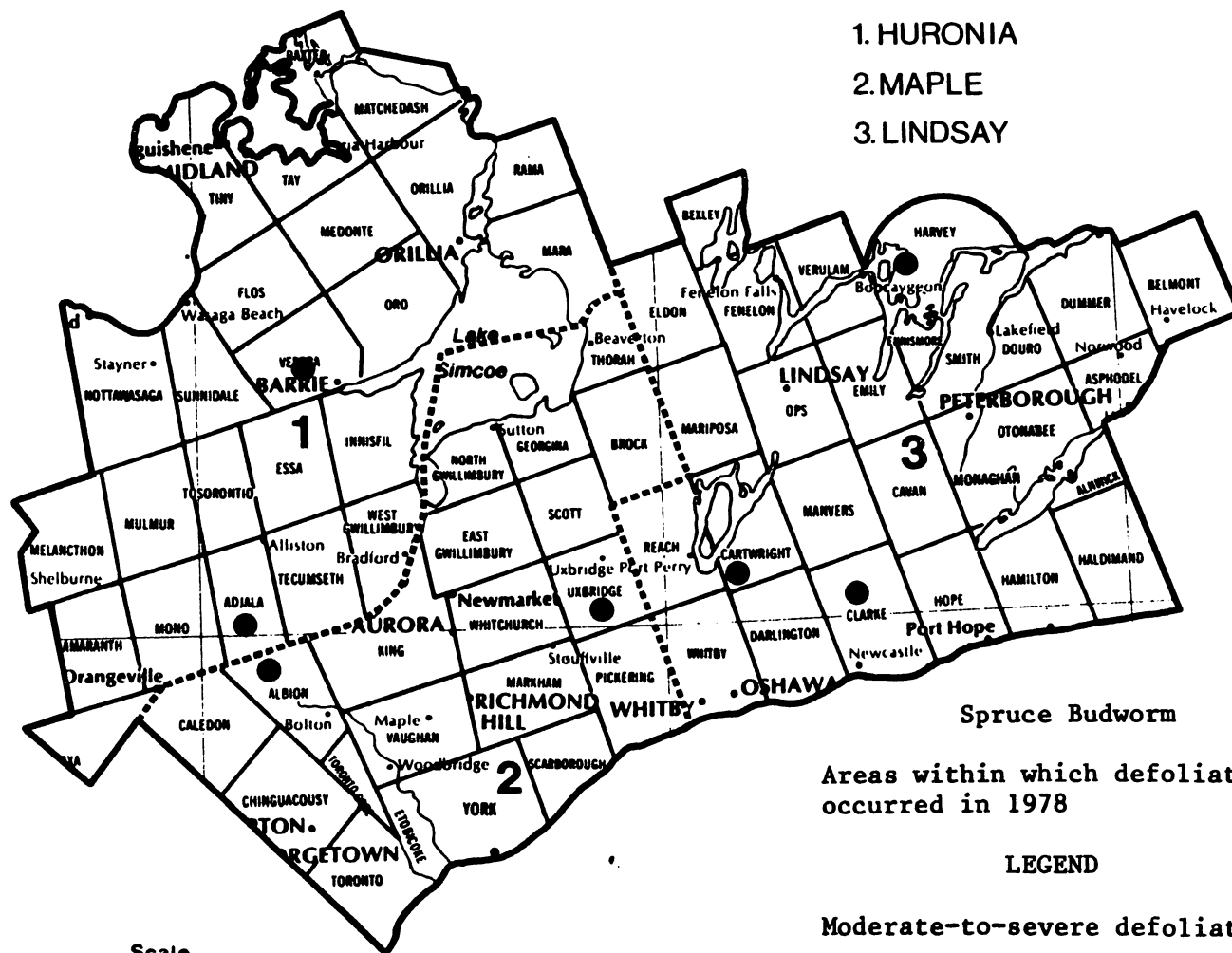
# HURONIA, MAPLE and LINDSAY DISTRICTS



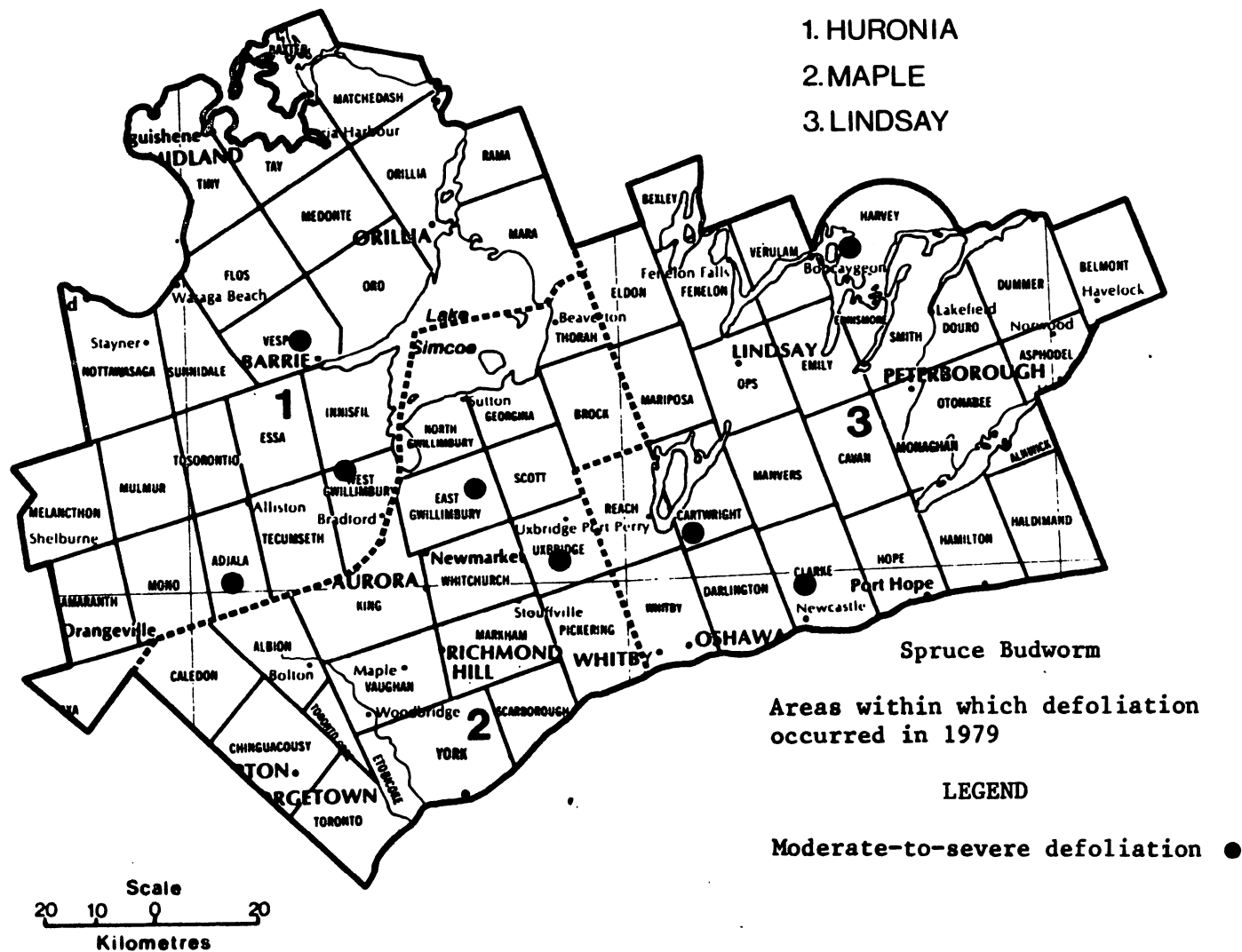
# HURONIA, MAPLE and LINDSAY DISTRICTS



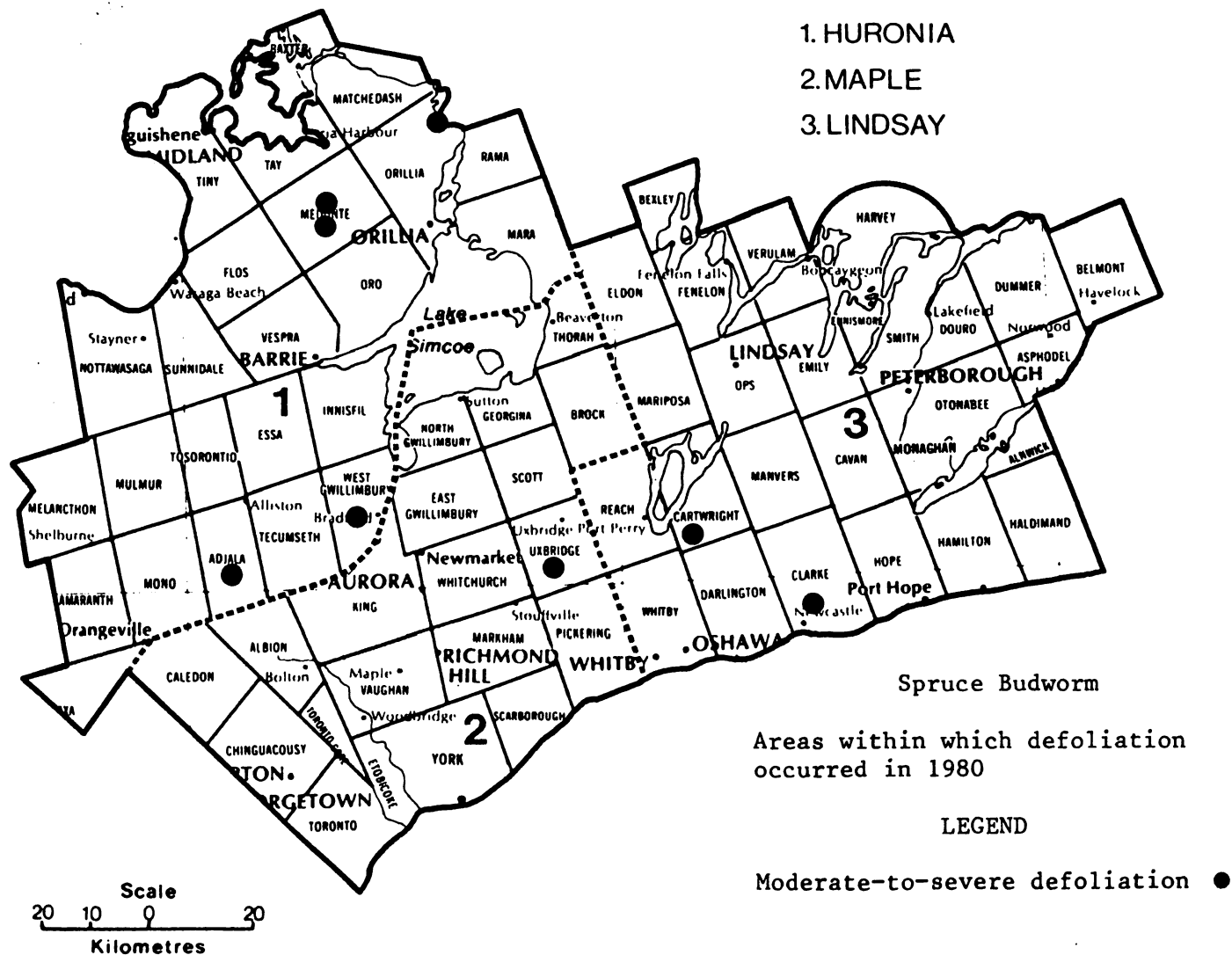
# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



Walking Stick, *Diapheromera femorata* (Say)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	light defoliated 5-ha woodlot in Durham County
1951	severe defoliation of the 5-ha woodlot in Durham County and 1,600 ha in Haldimand Township near Centreton; red oak and black cherry were the preferred hosts
1952	not reported
1953-1955	severe defoliation in Haldimand Twp, Northumberland County and near Pontypool in Durham County
1956	not reported
1957	Moderate-to-severe defoliation recurred in the Durham and Northumberland County Forests.
1958-1960	not reported
1961	Heavy infestations occurred in the Durham and Ganaraska County Forests and in an area of 200 sq. km in Northumberland County.
1962	not reported
1963	Severe defoliation occurred in 5 sq. km in the northeastern part of Haldimand Twp; several small pockets of light defoliation observed in Clarke and Hope twps.
1964-1980	not reported

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine

<u>Year</u>	<u>Remarks</u>
1953	occasional eastern white pine trees lightly infested in Clarke Twp
1954	not reported
1955	Five percent of Scots pine trees in a 2-ha plantation in Northumberland County Forest were lightly infested. Eastern white pine trees near Pontypool and red pine trees at Orono had small numbers of infested shoots.
1956	small numbers of infested trees in plantations in the Durham, Ganaraska and Northumberland Forests
1957	Infested trees were found commonly through Durham and Northumberland counties. Infested shoots in a heavily infested red pine plantation were removed and destroyed by the Ministry of Natural Resources.

(cont'd)

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr. (concl.)

<u>Year</u>	<u>Remarks</u>
1958	quantitative sampling carried out in areas where populations were more common; infested shoots averaged less than one per tree
1959	low numbers found in all red pine plantations examined
1960	lightly infested red pine plantations in Clarke, Hope and Haldimand twps
1961	Light infestations were found in Clarke, Hope and Haldimand twps.
1962	A heavy infestation occurred in mixed plantations of red and eastern white pine in Darlington Twp. Low numbers were found through the remainder of the district.
1963-1966	Low numbers were found throughout the district.
1967	In a eastern white pine seed orchard at Orono Nursery, 20% of the leaders were killed resulting in malformed trees.
1968	Population intensities increased and leader attack became more prevalent. Leader mortality in Clarke and Verulam twps was 38 and 15%, respectively.
1969	Populations were relatively light except in Clarke Twp where leader mortality was 24%.
1970-1971	low numbers through the district
1972-1973	not reported
1974	low numbers through the district
1975	low numbers on eastern white pine at the Orono Tree Nursery
1976-1978	trace populations
1979	A heavy infestation occurred in a red pine plantation at the Orono Forest Station where 87% of the trees were infested; a nearby compartment of 3-0 red pine planting stock was lightly infested.
1980	not reported

Pine Bud Moth, *Exoteleia dodecella* (L.)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	A small infestation was observed in a Scots pine plantation in Clarke Twp; 84% of the bud clusters were infested on some trees.
1959	A medium-to-heavy infestation recurred in Clarke Twp.
1960	light infested trees in Clarke and Belmont twps
1961	heavily infested trees in one plantation in Clarke Twp; low numbers through remainder of Durham County
1962-1963	not reported
1964	low numbers in Darlington and Cartwright twps
1965	not reported
1966	heavy infestation on small clumps of ornamental trees planted along Highway 401
1967	A medium-to-heavy infestation occurred on a Scots pine shelterbelt in Mariposa Twp. Scots pine plantations were lightly infested in Asphodel and Darlington twps.
1968	low numbers of mined needles at widely scattered locations
1969-1973	not reported
1974	low numbers through district
1975-1980	not reported

Jack Pine Needleminer, *Exoteleia pinifoliella* (Cham.)

Host(s): jack pine, Scots pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	Light infestations occurred in several plantations in Durham and Northumberland counties. In several instances the miners were found mining Scots pine needles.
1958	trace populations
1959	a medium-to-heavy infestation in a 12-ha plantation in Haldimand Twp
1960	A small, medium-to-heavy infestation occurred in Hamilton Twp.

(cont'd)

Jack Pine Needleminer, *Exoteleia pinifoliella* (Cham.) (concl.)

<u>Year</u>	<u>Remarks</u>
1961	moderate-to-severe damage in Hamilton and Haldimand twps with up to 90% of the foliage mined
1962	heavy in a small plantation in Haldimand Twp
1963	light infestation in Hamilton Twp
1964-1965	not reported
1966	Light infestation recurred in Hamilton Twp.
1967	Moderate-to-severe mining occurred in two jack pine plantations in Haldimand Twp where up to 90% of the foliage was mined.
1968	low numbers on roadside plantings in the southern part of the district
1969-1980	not reported

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	heavy mining of small open-grown trees in Hope Twp
1956-1957	not reported
1958	pockets of moderate-to-severe mining in Hope, Clarke and Emil twps
1959	light infestations through the districts
1960	small areas of moderate-to-heavy infestations through the district
1961	Light infestations in Hope and Clarke twps; light mining was general through the district.
1962-1963	Pockets of medium-to-heavy infestations were common through the district.
1964	Pockets of moderate-to-severe defoliation were recorded in Clarke and Fenelon twps. Low numbers were present elsewhere.
1965	Scattered clumps of white birch trees were heavily mined at several locations through the district, particularly in Clarke and Havelock twps.
1966	Pockets of heavily infested trees were common through the district; heaviest damage was in Clarke and Cartwright twps.

(cont'd)

Birch Leafminer, *Fenusa pusilla* (Lep.) (concl.)

<u>Year</u>	<u>Remarks</u>
1967-1968	Mining was generally light throughout the district.
1969	Pockets of medium-to-heavy infestation were recorded in Hamilton Twp.
1970	not reported
1971-1972	Light damage occurred at several locations in Belmont Twp.
1973	Moderate-to-severe leaf mining occurred at several locations in Clarke and Mariposa twps.
1974	not reported
1975	low levels in Durham County
1976	not reported
1977	light mining in the Durham and Ganaraska forests
1978	severe browning of white birch foliage at the Orono Forest Station
1979	foliar damage of 100% recorded at the Orono Forest Station and approximately 75% damage in Darlington Twp
1980	light and medium-to-heavy infestations on roadside trees in Cavan, Haldimand, Asphodel and Clarke twps

Saddled Prominent, *Heterocampa guttivitta* (Wlk.)

Host(s): sugar maple, birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	Small pockets of medium-to-heavy infestations occurred in mixed hardwood stands in the northern part of Clarke Twp. Light infestations were observed in Manvers, Darlington and Cartwright twps. Defoliation ranged from 10% in lightly infested areas to 90% in Clarke Twp.
1970	low numbers at several locations
1971-1980	not reported

Native Elm Bark Beetle, *Hylurgopinus rufipes* (Eich.)

Host(s): elm

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	medium-to-heavy populations found through Durham, Northumberland and the south part of Peterborough counties
1960-1962	not reported
1963	numerous on dead and dying elms throughout the district
1964	High numbers were common on elm through the district.
1965-1966	Medium-to-heavy infestations were found throughout the district. The heaviest infestation was found in Asphodel Twp.
1967-1968	common through the district
1969-1980	not reported

Fall Webworm, *Hyphantria cunea* (Drury)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	low numbers through the district
1851	trace populations
1952-1954	not reported
1955	a few tents through the district
1956	more common than in 1955; lightly defoliated trees at several points in Durham and Northumberland counties

(cont'd)

Fall Webworm, *Hyphantria cunea* (Drury) (concl.)

<u>Year</u>	<u>Remarks</u>
1957	tents common, particularly in woodlots and along roads south of Highway 7.
1958	A medium-to-heavy infestation was recorded on black ash trees in Alnwick Twp. Lightly infested black ash and apple trees were observed through the district.
1959	Heavy infestations occurred in Harvey and Otonabee twps near Peterborough where 71 and 255 tents per km of roadside were recorded, respectively.
1960	Heavy infestations were again present in Harvey and Otonabee twps, Peterborough County, and in Alnwick Twp, Northumberland County.
1961	Populations declined to low levels.
1962	one small pocket of heavy infestation in Harvey Twp, low numbers elsewhere
1963-1964	not reported
1965-1966	trace populations
1967	not reported
1968	trace populations
1969	not reported
1970	trace populations
1971	Heavy infestations were recorded in Verulam, Harvey, Fenelon and Clarke twps.
1972	Heavy infestations persisted in Verulam Twp.
1973	moderate-to-severe damage in the Port Hope area
1974-1975	high numbers in the southern part of the district
1976	heavy infestations in Douro and Clarke twps
1977	low numbers through the district
1978-1979	Heavy infestations were reported in Dummer, Harvey and Asphodel twps.
1980	Populations declined to low numbers in Dummer, Harvey and Asphodel twps.

Eastern Tent Caterpillar, *Malacosoma americanum* (F.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	tents common through the district
1952	Populations increased along fencerows in rural areas. Defoliation of cherry trees was 100% at many locations.
1953	Cherry, wild apple and hawthorn supported high populations through the district.
1954	A general reduction in the numbers of tents was observed through the district.
1955	Populations continued to decline. Few tents were observed.
1956-1958	trace populations
1959	A general increase in population levels was noted through the district.
1960	Light infestations were observed commonly on roadside cherry shrubs through the district.
1961-1962	Medium-to-heavy infestations were recorded at several locations in the district.
1963	A general decline in numbers of tents was observed through the district.
1964	little change in numbers observed
1965	low numbers through the district
1966-1967	trace populations
1968	one small area of medium-to-heavy infestation in Haldimand Twp
1969	one small area of medium-to-heavy infestation near Fenelon Falls
1970-1973	medium-to-heavy infestations at several locations through the district
1974	Counts of 500 or more nests per 1.61 km were common through the district.
1975-1976	medium-to-heavy infestations at many points through the central and northern parts of the district
1977	Medium-to-heavy infestations persisted in the Omemee-Peterborough area in the northern part of the district.
1978	High numbers were general through the district.

(cont'd)

Eastern Tent Caterpillar, *Malacosoma americanum* (F.) (concl.)

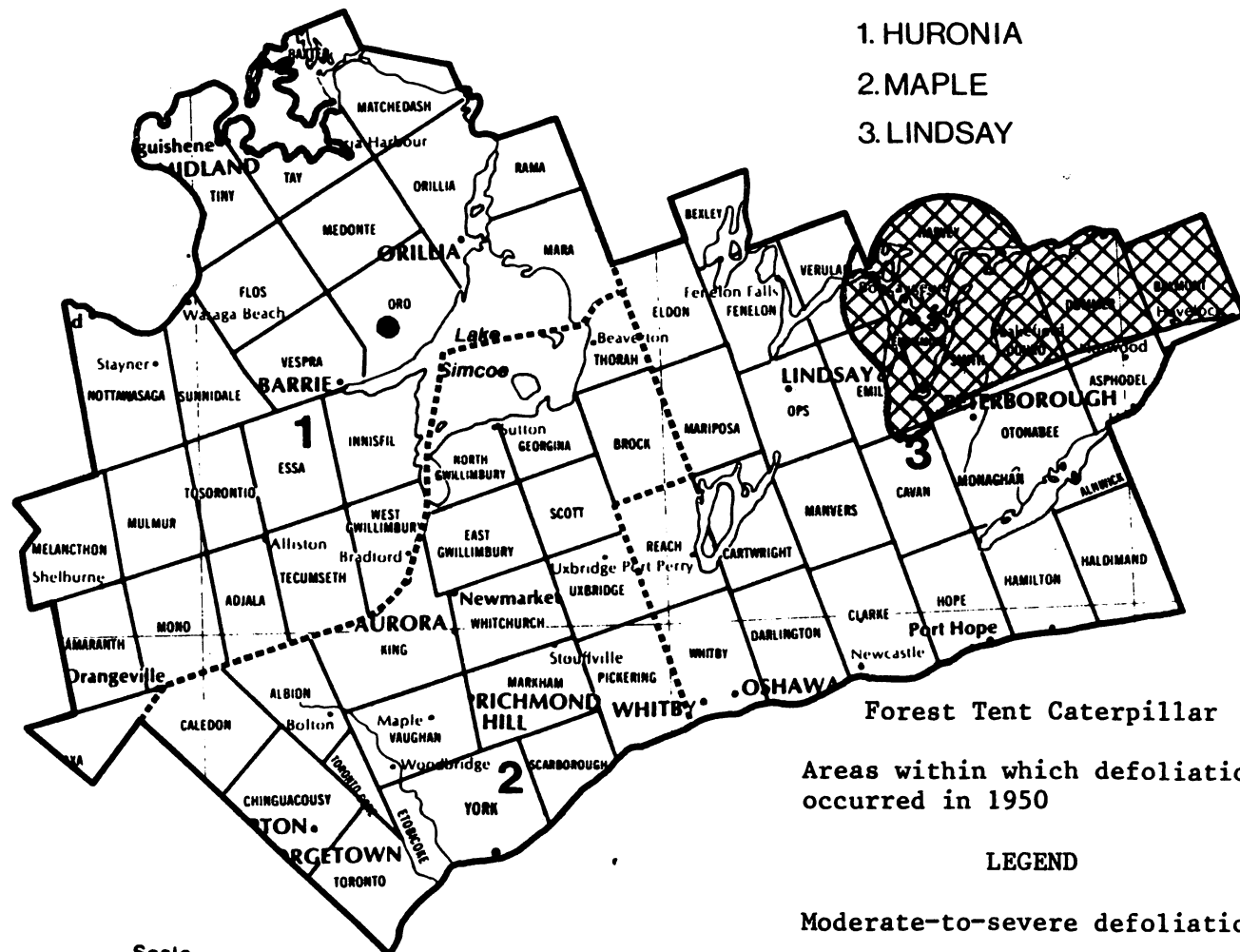
<u>Year</u>	<u>Remarks</u>
1979	Numbers declined compared with 1978.
1980	not reported

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

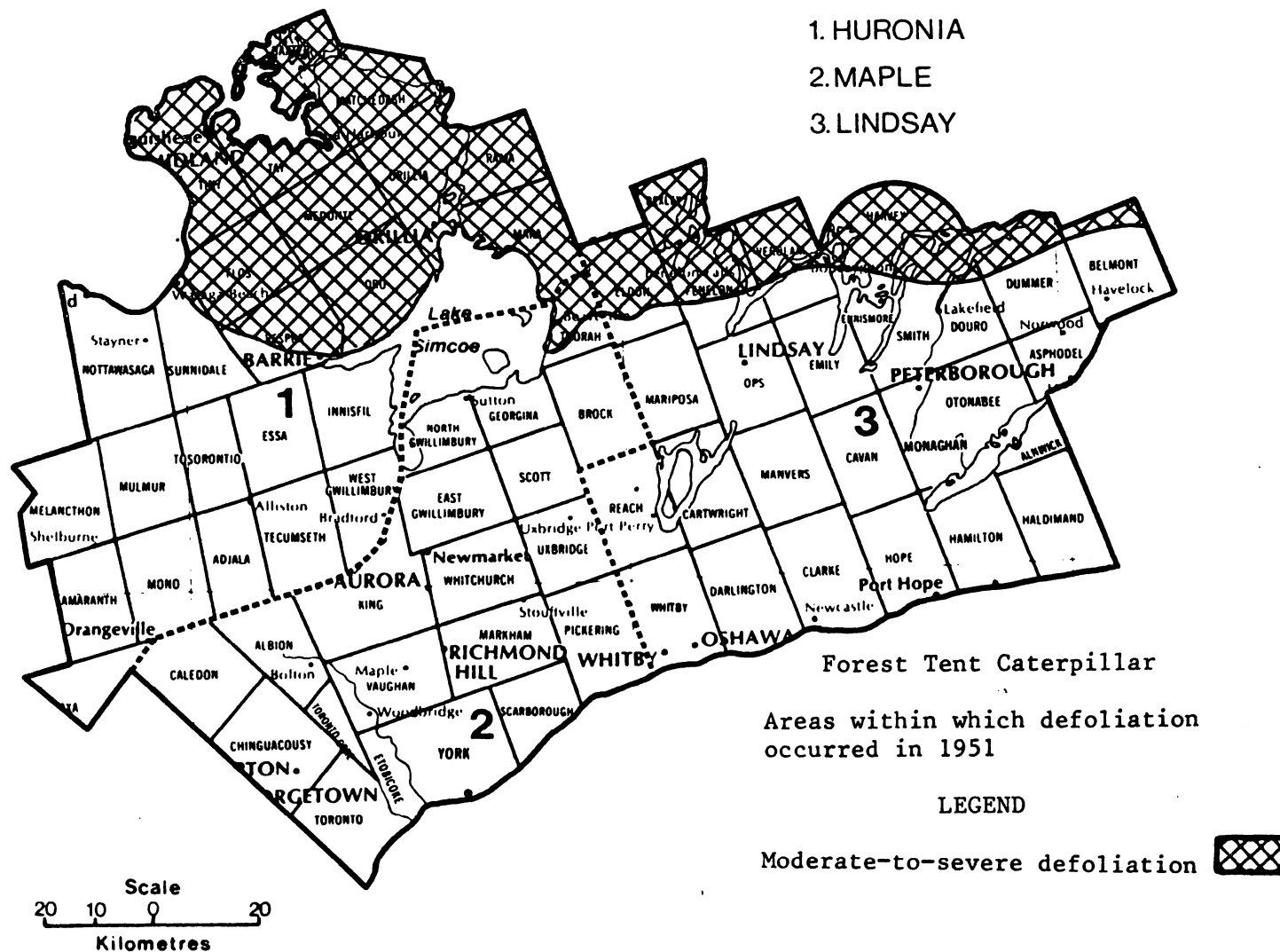
Host(s): aspen, deciduous [Major]

<u>Year</u>	<u>Remarks</u>
1950	Moderate-to-severe defoliation occurred in the northeastern part of the district (see map, page ).
1951	most of the forested area north of Highway 7 severely defoliated; larvae present throughout the district (see map, page )
1952	moderate-to-severe defoliation in Belmont and Dummer twps; larvae common through the northern part of the district (see map, page )
1953	Moderate-to-severe defoliation recurred in Belmont and Dummer twps (see map, page ).
1954-1960	not reported
1961	light defoliation in Belmont Twp (see map, page )
1962-1971	not reported
1972	a few larvae observed in the town of Lindsay
1973-1974	not reported
1975-1976	moderate-to-severe defoliation around Lindsay (see maps, pages )
1977	moderate-to-severe defoliation in Belmont, Bexley, Dummer and Harvey twps (see map, page )
1978-1980	not reported

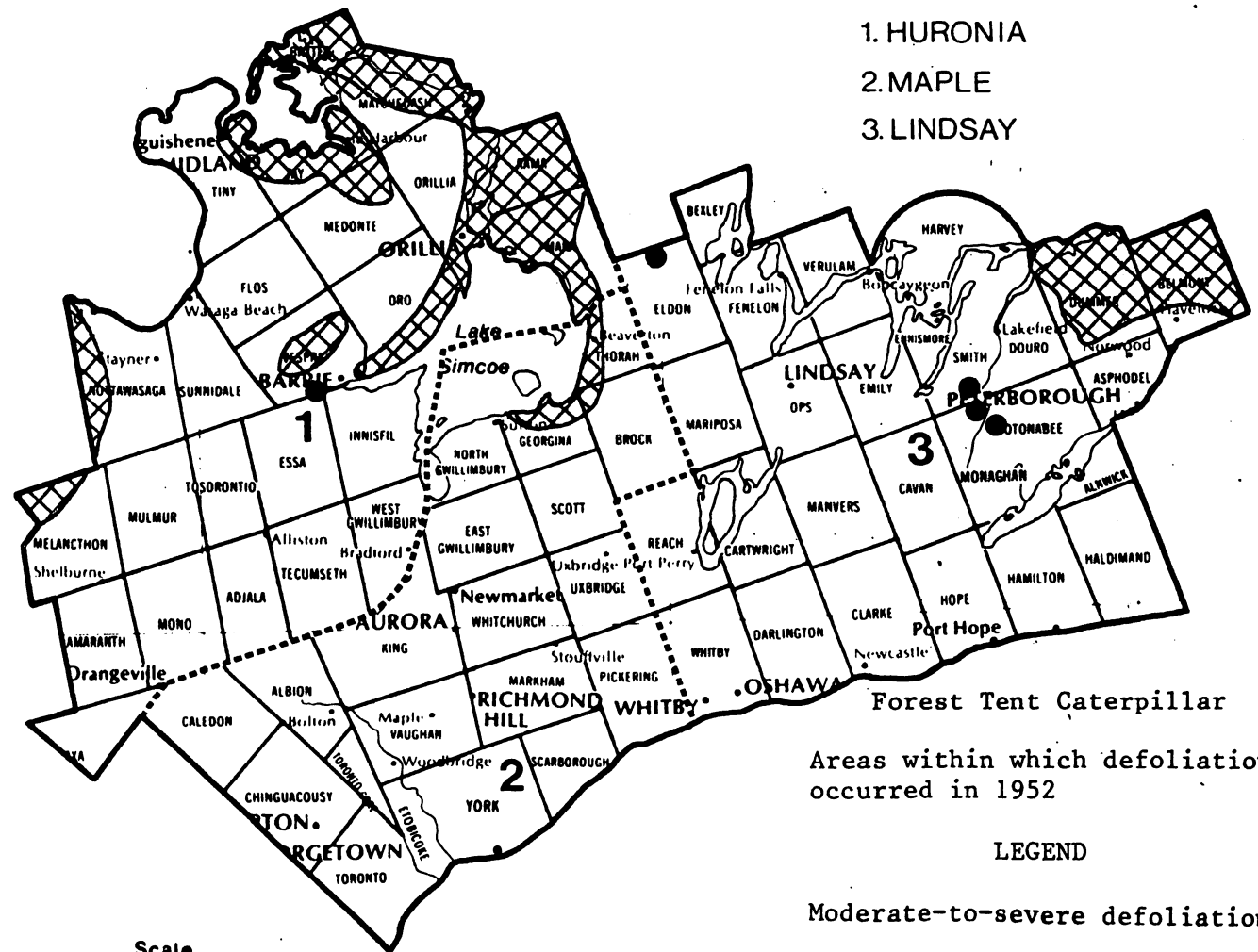
# HURONIA, MAPLE and LINDSAY DISTRICTS



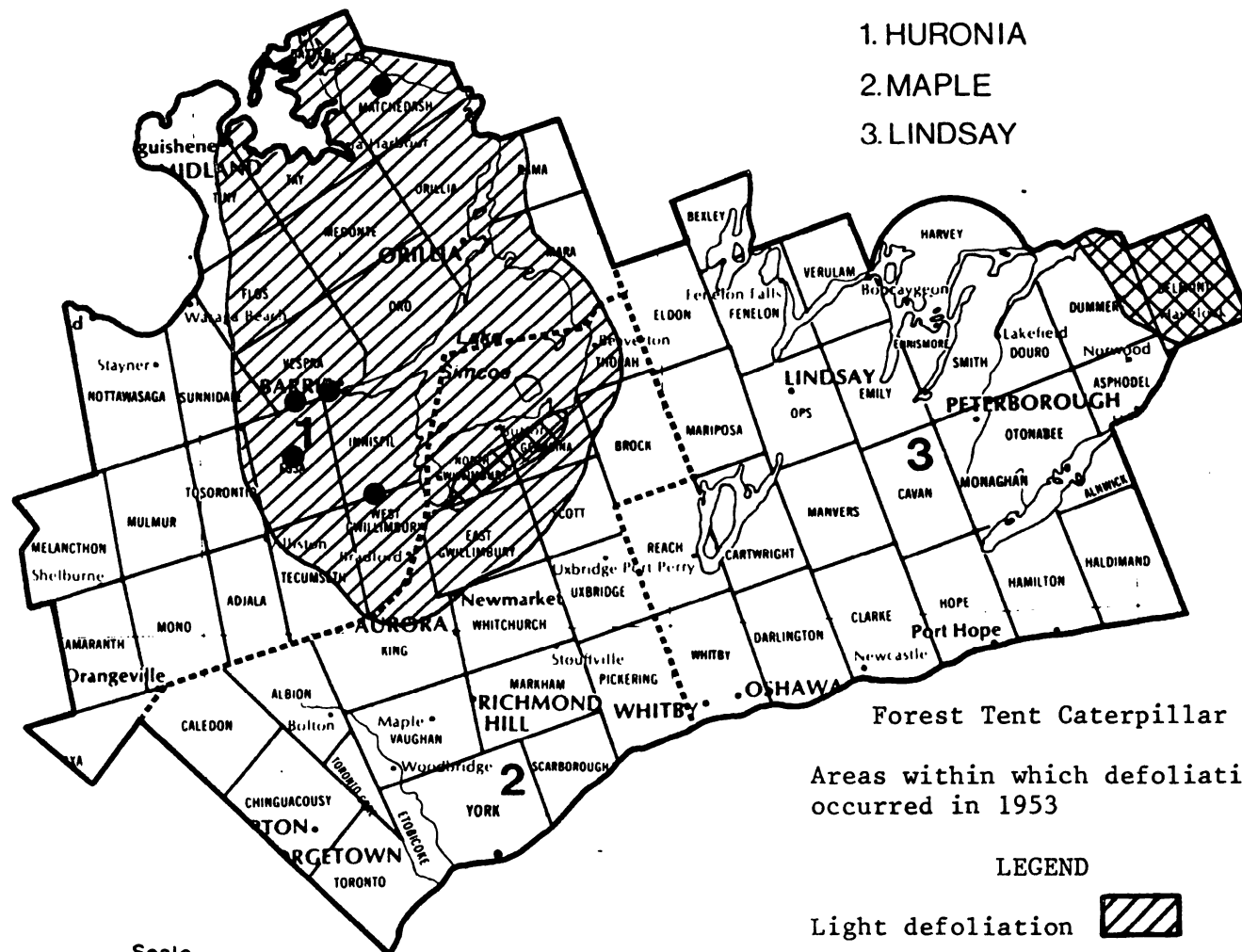
# HURONIA, MAPLE and LINDSAY DISTRICTS



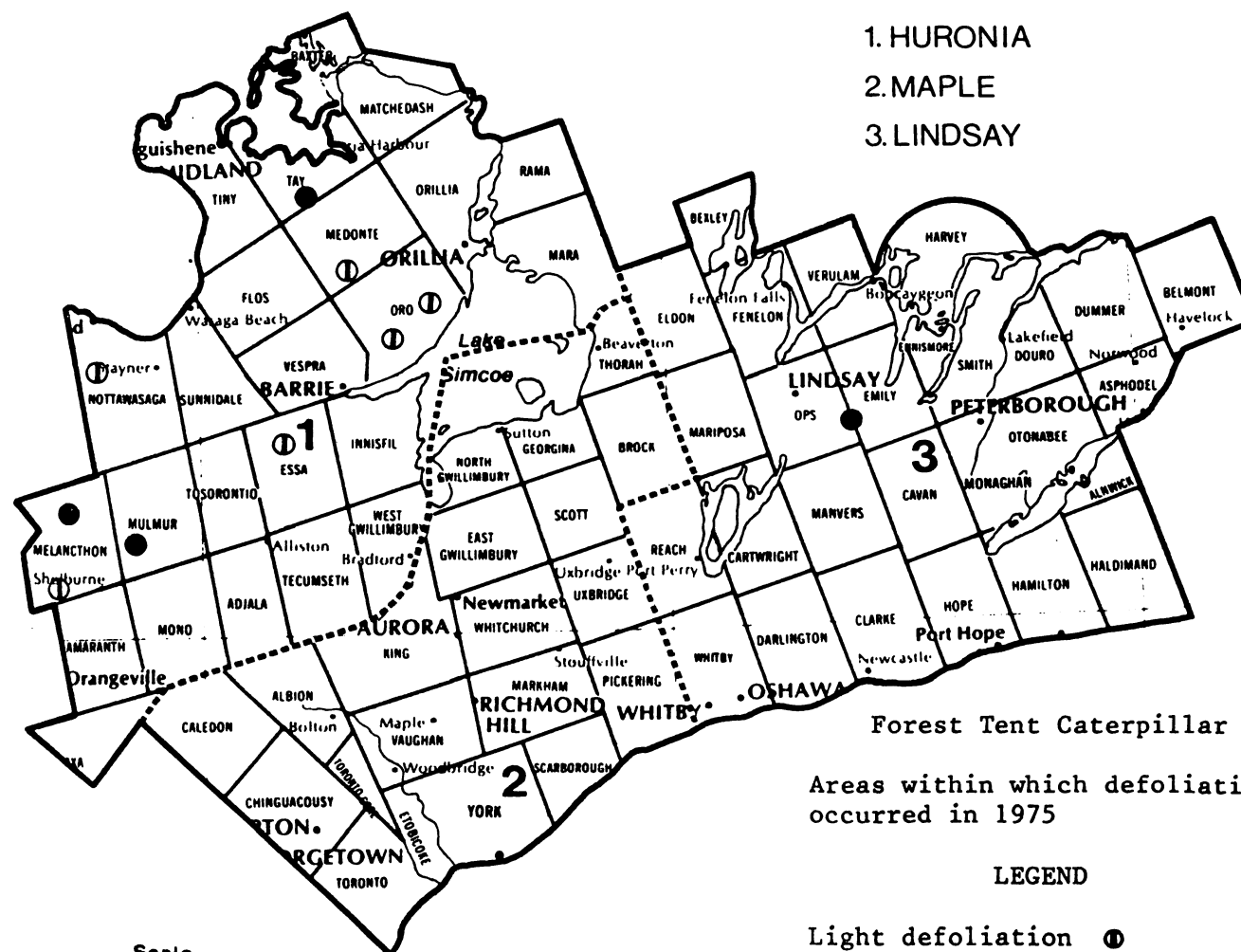
# HURONIA, MAPLE and LINDSAY DISTRICTS



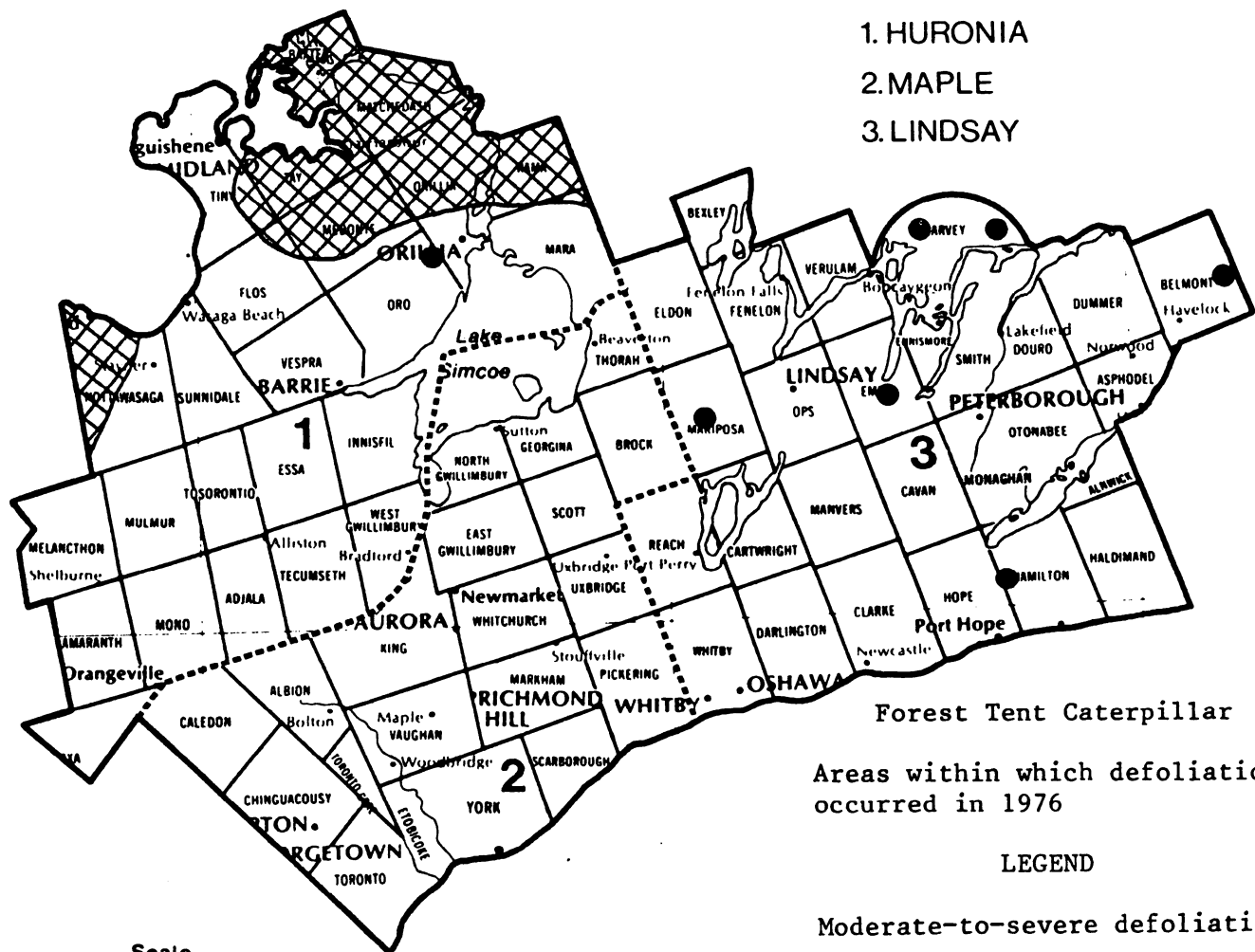
# HURONIA, MAPLE and LINDSAY DISTRICTS



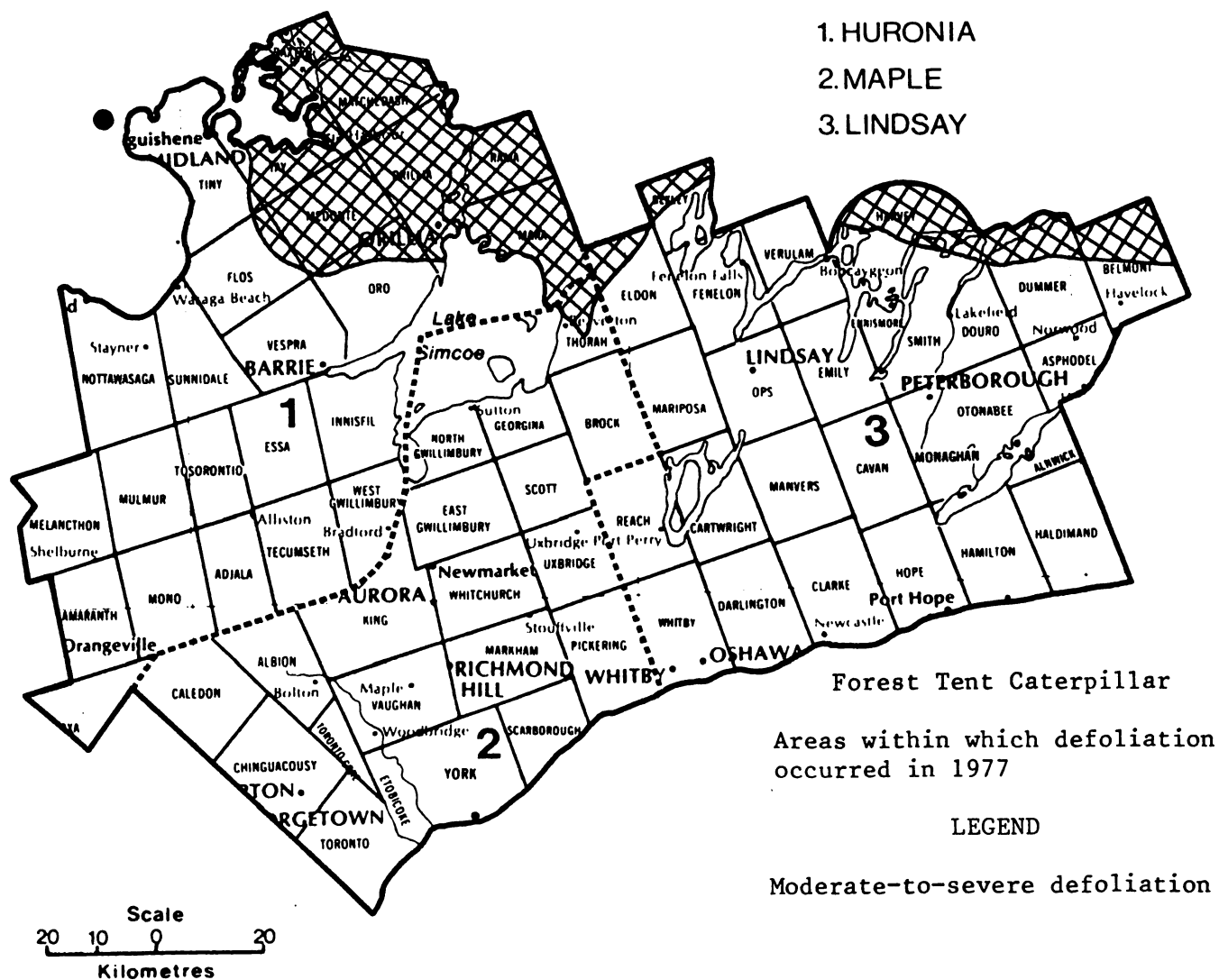
# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	Top sections of open-growing trees in woodlots in Douro Twp sustained moderate-to-severe defoliation.
1954	Moderate-to-severe defoliation recurred in Douro Twp and was reported on open-grown trees in pasture land in Bexley Twp.
1955	75% of the old foliage was destroyed in the Douro Twp woodlot and lightly defoliated trees were observed in Bexley and Asphodel twps.
1956	Populations declined and only lightly defoliated trees were observed in Douro, Bexley and Asphodel twps.
1957-1964	not reported
1965	light infestation over 250 ha of pole-sized balsam fir in Manvers Twp
1966	low numbers through the northern townships
1967-1968	low numbers in Bexley Twp
1969	trace populations
1970-1976	not reported
1977	trace populations
1978-1980	not reported

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

(Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	high numbers in Otonabee, Manvers and Clarke twps
1951-1953	low numbers in the Peterborough area
1954	pockets of moderate-to-severe defoliation in Fenelon, Emily and Haldimand twps (see map, page )
1955	a general decline in population levels; low numbers in Fenelon, Asphodel, Seymour and Haldimand twps (see map, page )
1956	low numbers in Fenelon and Haldimand twps
1957	low numbers in Smith, Douro, Clarke, Hamilton and Haldimand twps (see map, page )
1958	Pockets of moderate-to-severe defoliation were recorded in Fenelon, Darlington, Manvers, Clarke, Cavan, Hope, Hamilton, Haldimand and Cartwright twps (see map, page ).
1959	up to 90% defoliation in pockets over 80-ha red pine plantation in Manvers Twp and high numbers in Clarke, Hamilton and Haldimand twps (see map, page )
1960	Three areas of heavy infestation were recorded in red pine plantations in Manvers Twp, and one in a jack pine plantation in Fenelon Twp. Pockets of light infestation were distributed through the district (see map, page ).
1961	moderate-to-severe defoliation in red pine plantations in Manvers, Clarke and Asphodel twps and light defoliation at other locations (see map, page )
1962	Pockets of moderate-to-severe defoliation persisted in Manvers and Hamilton twps and in a 0.5-ha red pine plantation in Emily Twp (see map, page ).
1963-1964	low numbers through the district (see map, page )
1965	small pockets of heavy infestation reported on red pine trees in Peterborough County
1966	A small, heavy infestation was recorded in a red pine plantation in Asphodel Twp.
1967	A light infestation occurred at one point in Manvers Twp.
1968	low numbers in Hope and Haldimand twps
1969-1971	not reported
1972	light defoliation of red pine trees in Bexley and Eldon twps

(cont'd)

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch) (concl.)

<u>Year</u>	<u>Remarks</u>
1973	A pocket of medium-to-heavy infestation was recorded on red pine in Verulam Twp.
1974	low numbers on Scots and red pine in Clarke, Cartwright, Mariposa and Verulam twps
1975	Severe defoliation of red pine plantations in Harvey and Mariposa twps; ornamentals and plantings were hand sprayed in Balsam Lake Park in Bexley Twp.
1976	An aerial application of NPV virus was made in Harvey and Douro twps in red pine plantations and excellent results were obtained.
1977	No larvae were observed in Harvey and Douro twps where plantations were sprayed in 1976.
1978	small pockets of light infestation recorded in Otonabee Twp
1979-1980	small pockets of light infestation in red pine plantations in Clarke and Haldimand twps

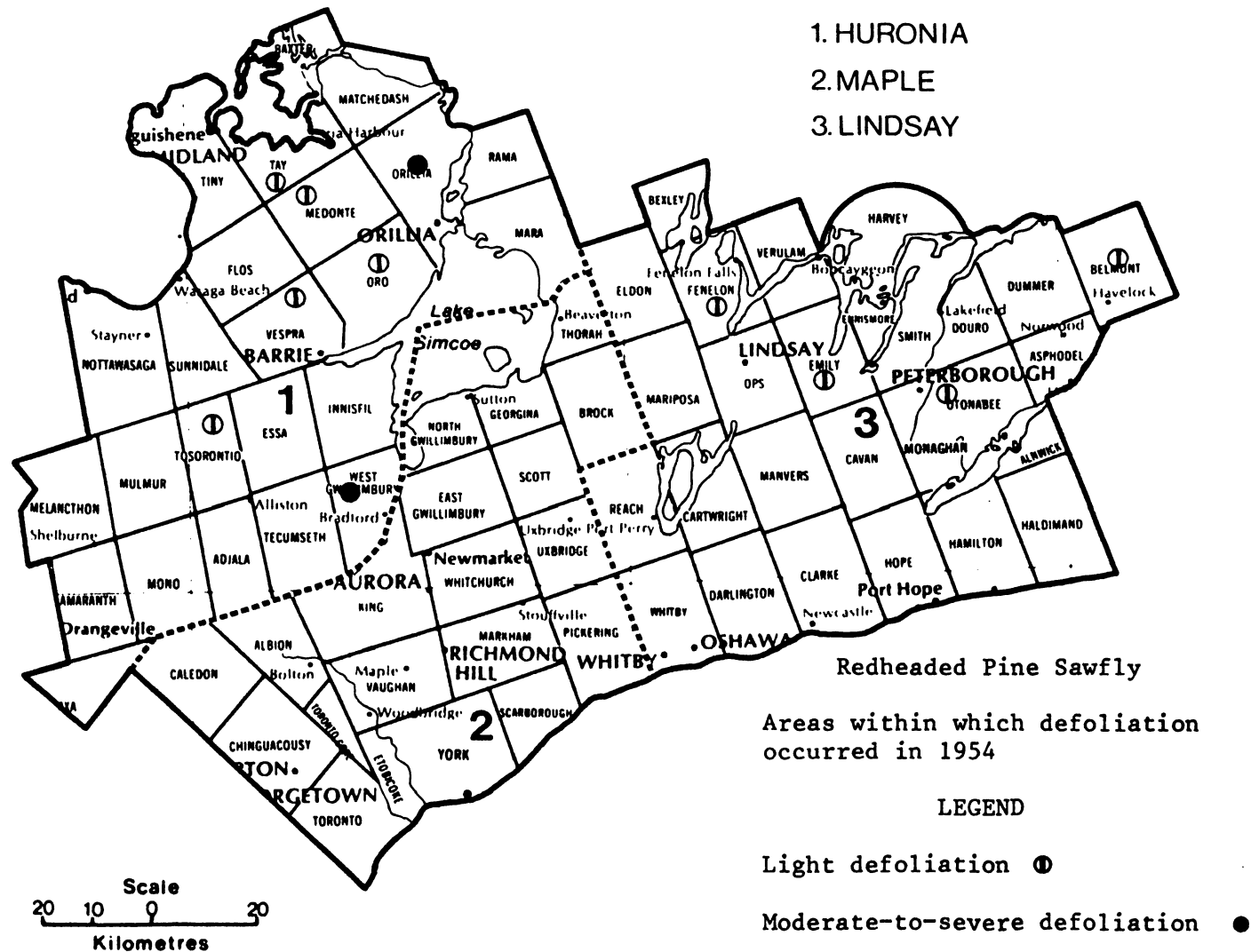
Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross.

Host(s): jack pine

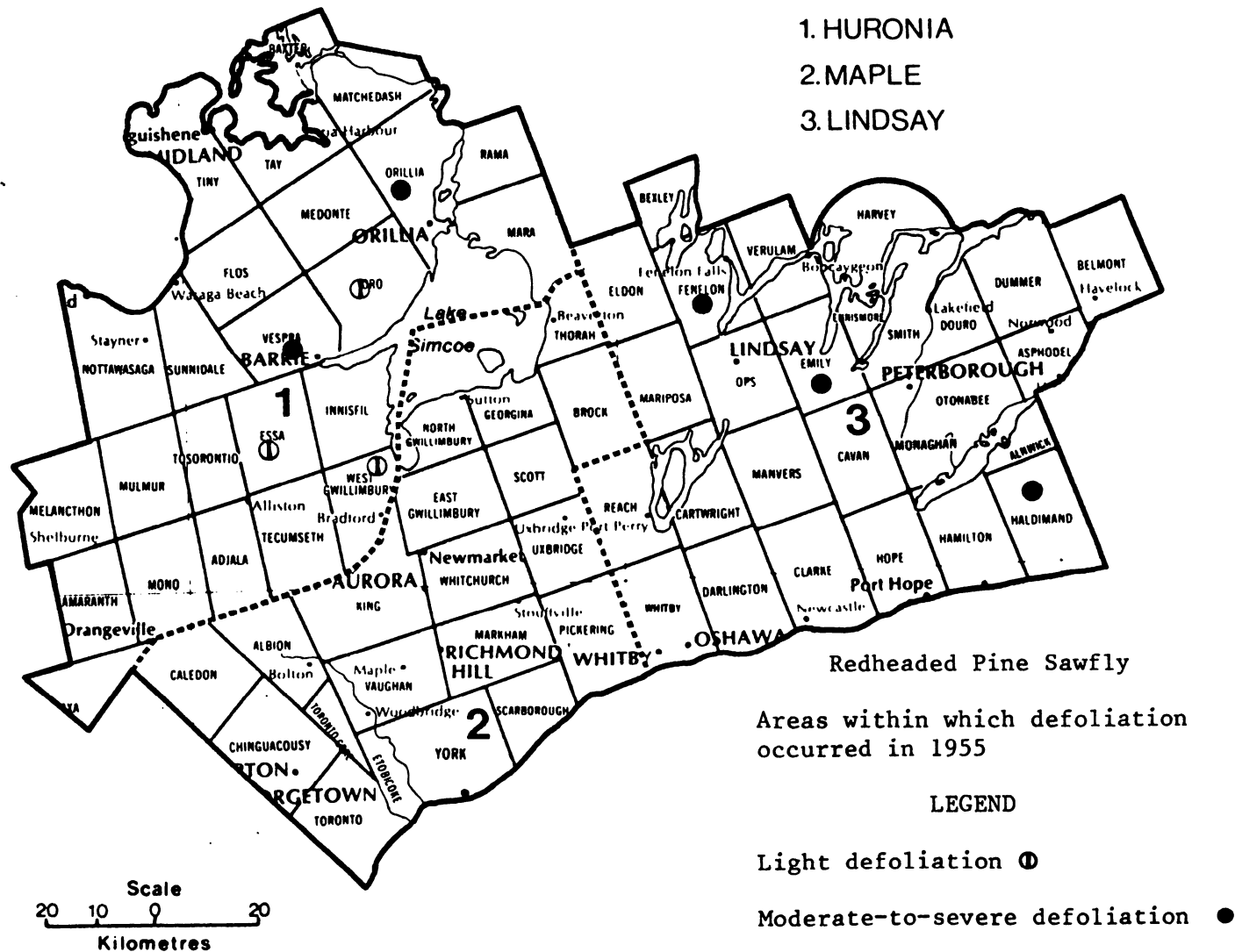
[Major]

<u>Year</u>	<u>Remarks</u>
1950-1959	not reported
1960	small numbers in Belmont Twp
1961	not reported
1962-1963	small pockets of heavy infestation in Belmont Twp averaging 24 colonies per 15 cm DBH tree
1964	Moderate-to-severe defoliation in Belmont Twp; defoliation averaged 50% on 100% of trees in one plantation.
1965-1966	Pockets of moderate-to-severe defoliation persisted in Belmont Twp.
1967	Populations declined to trace levels.
1968-1980	not reported

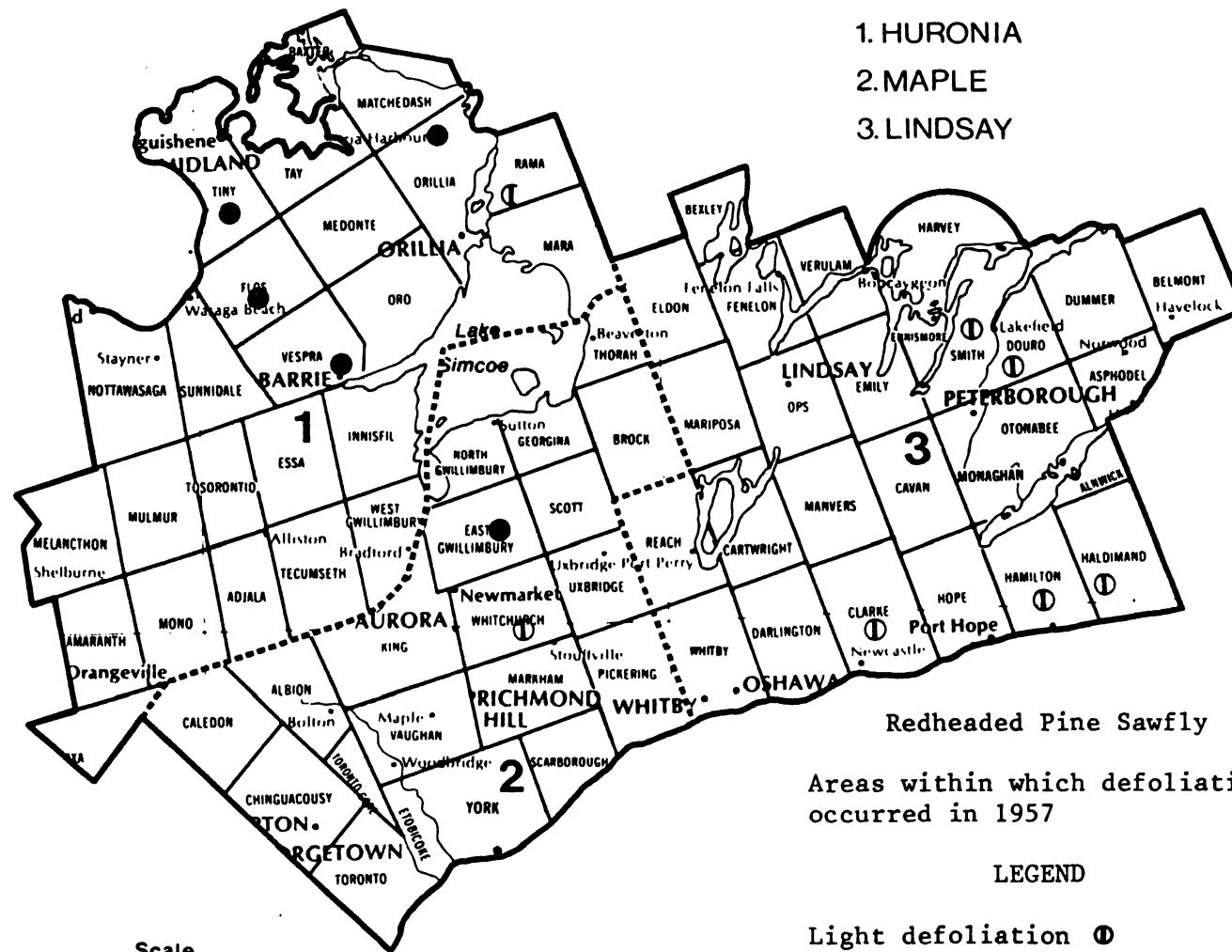
# HURONIA, MAPLE and LINDSAY DISTRICTS



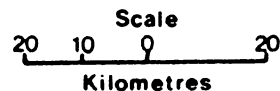
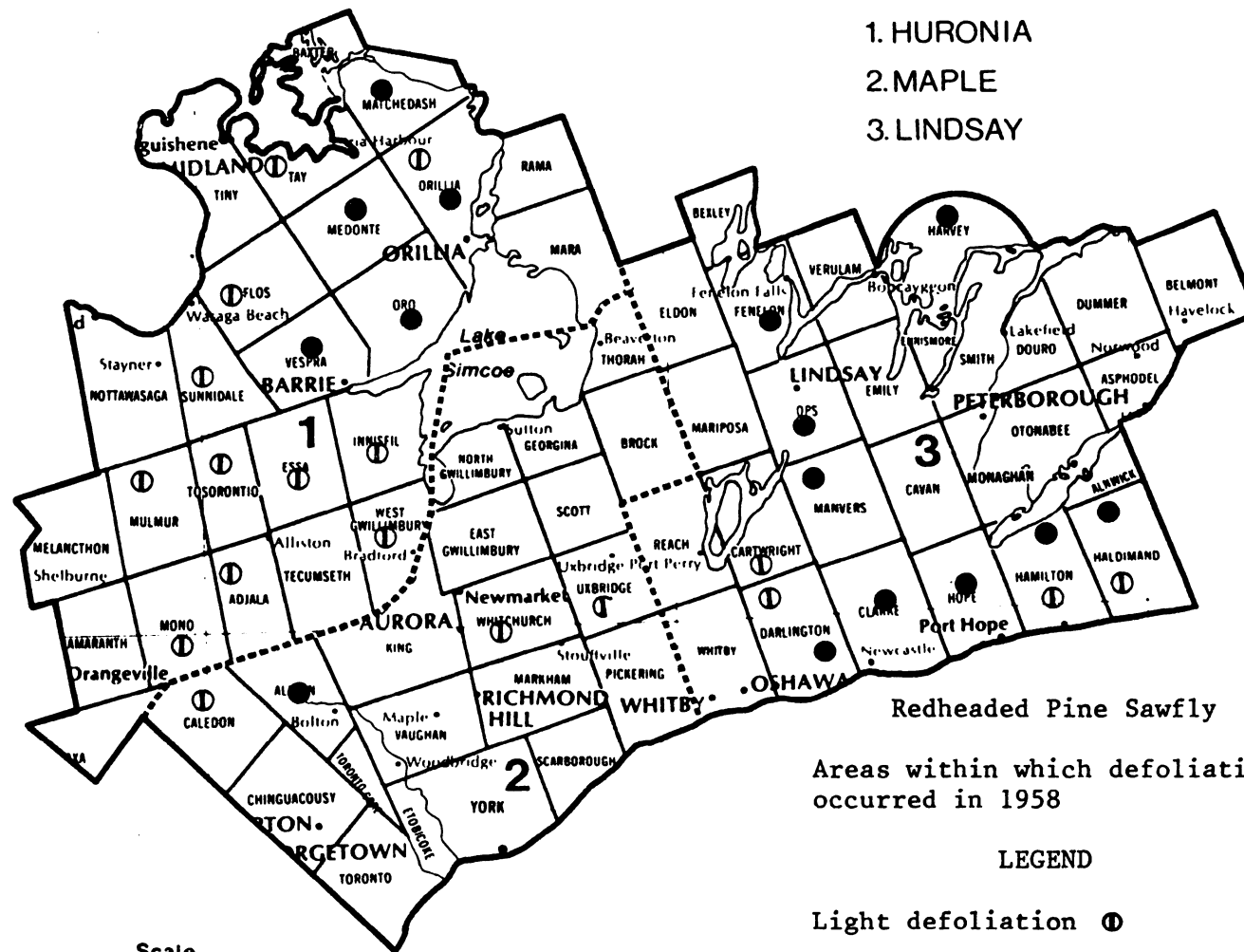
# HURONIA, MAPLE and LINDSAY DISTRICTS



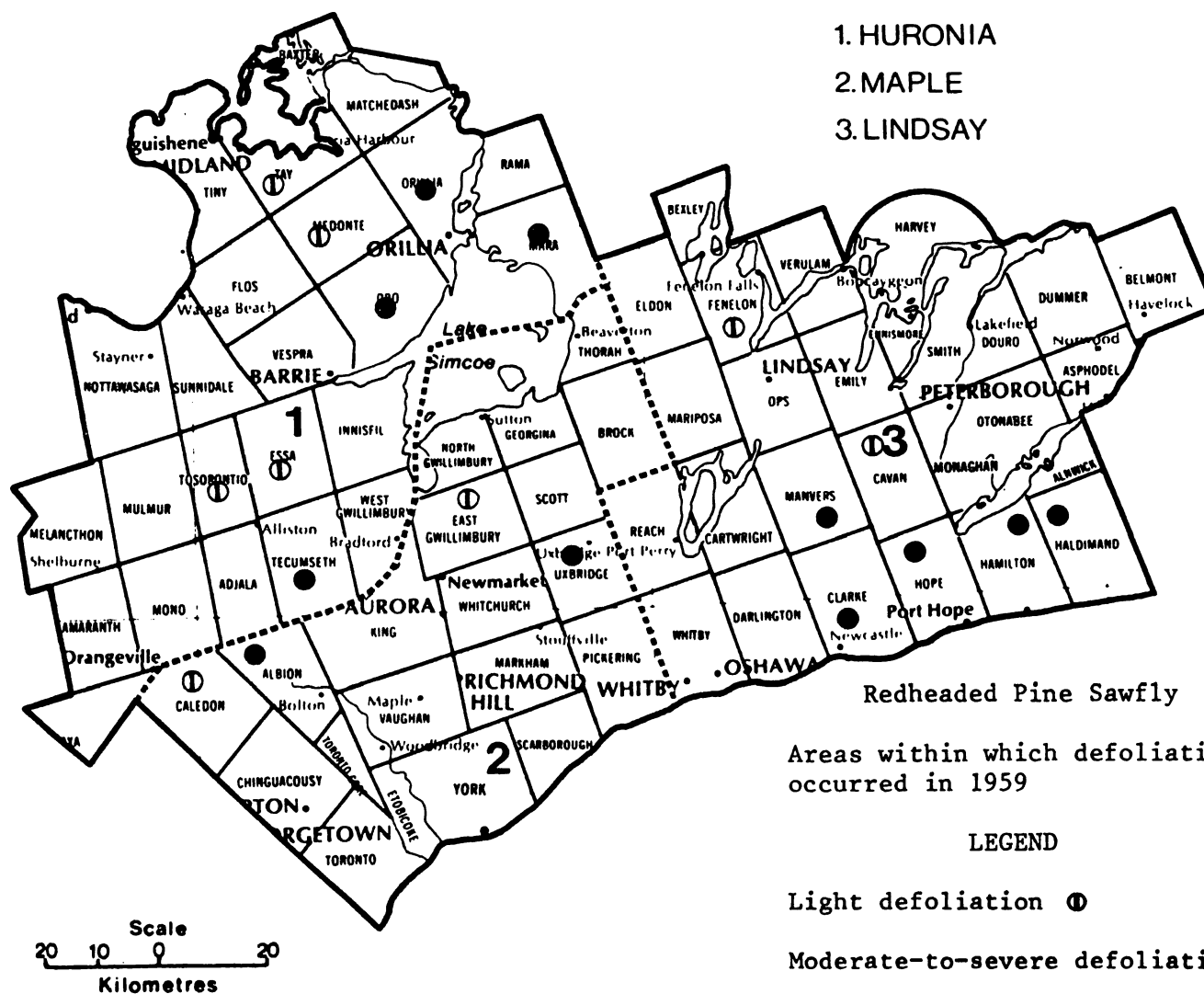
# HURONIA, MAPLE and LINDSAY DISTRICTS



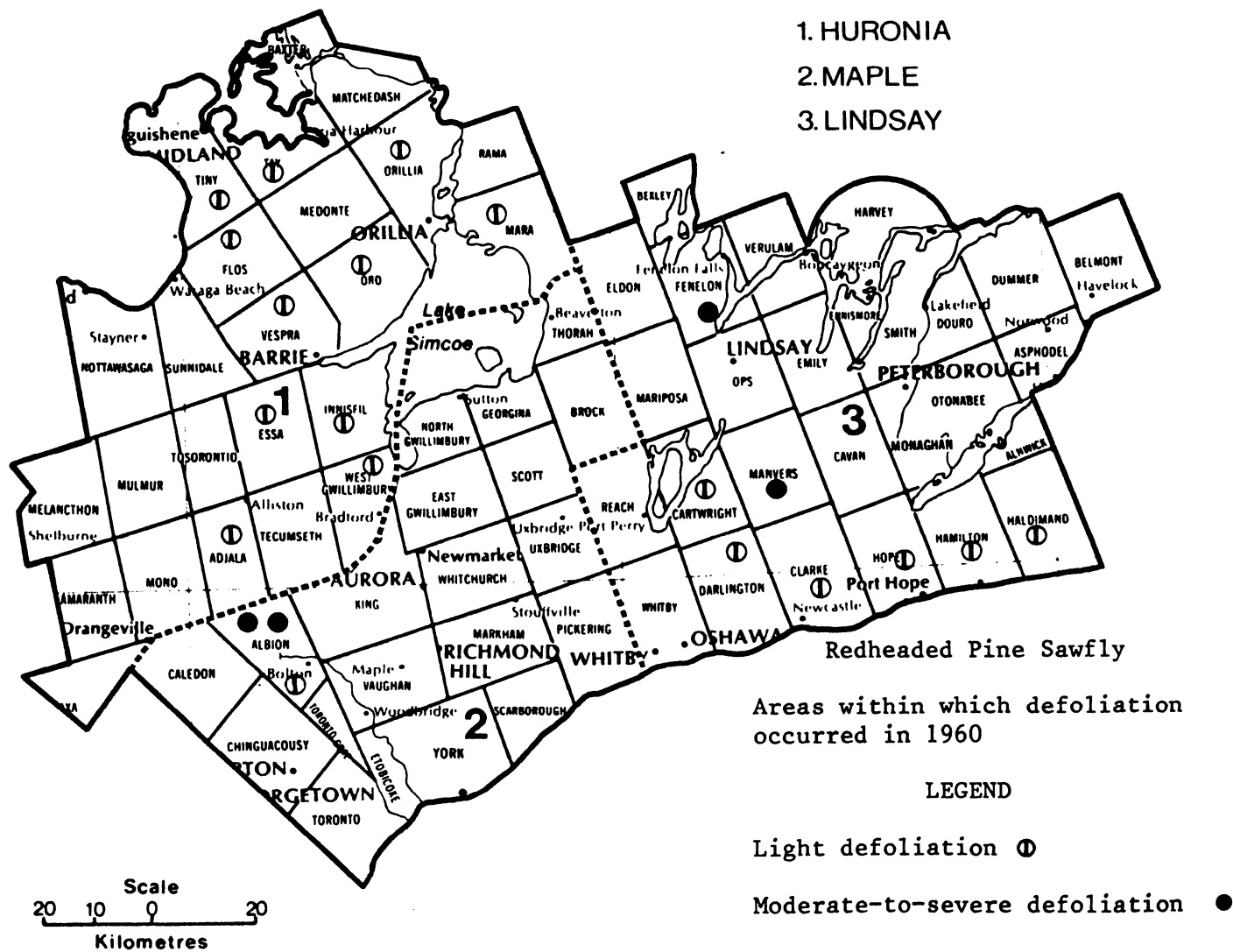
# HURONIA, MAPLE and LINDSAY DISTRICTS



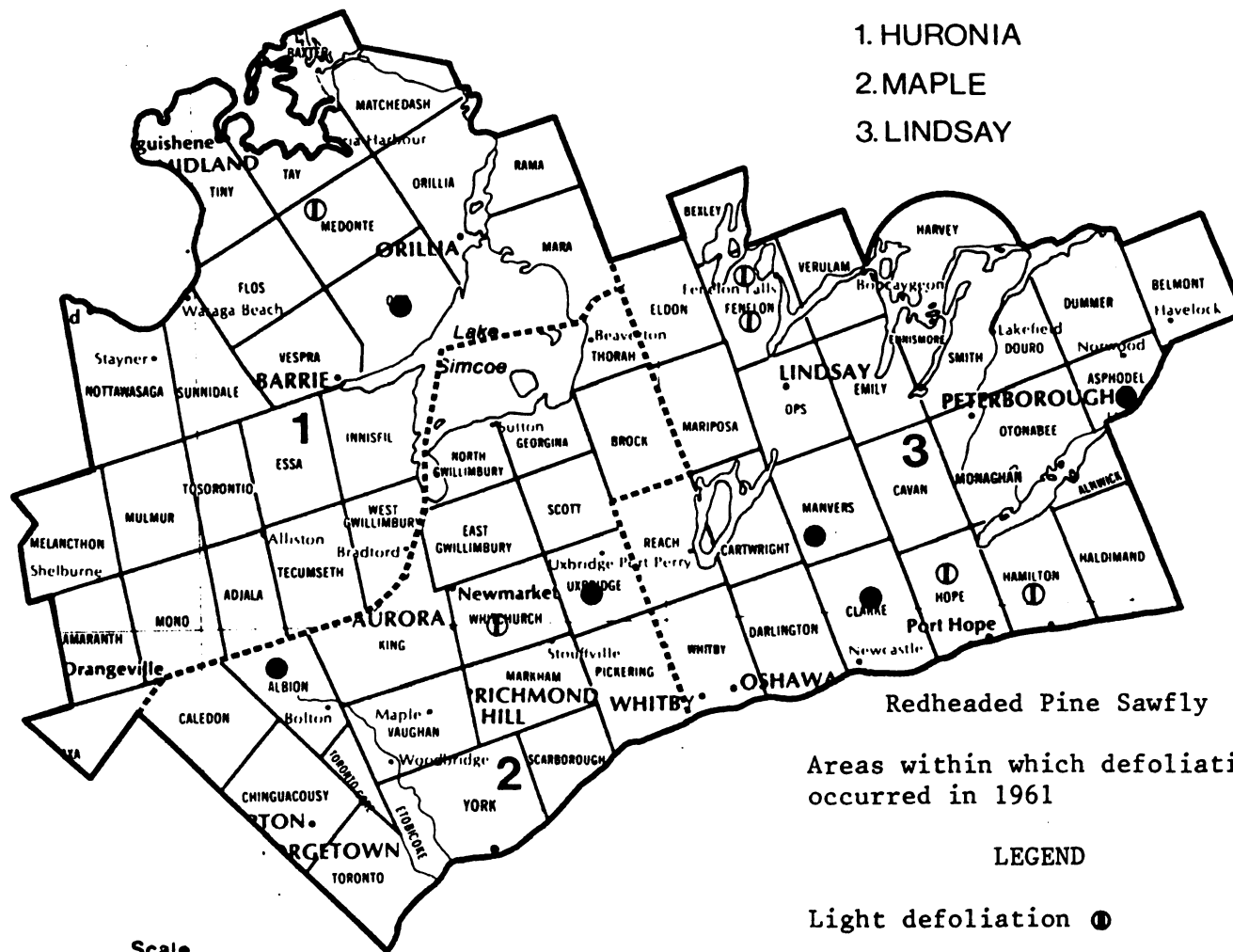
# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



Redheaded Pine Sawfly

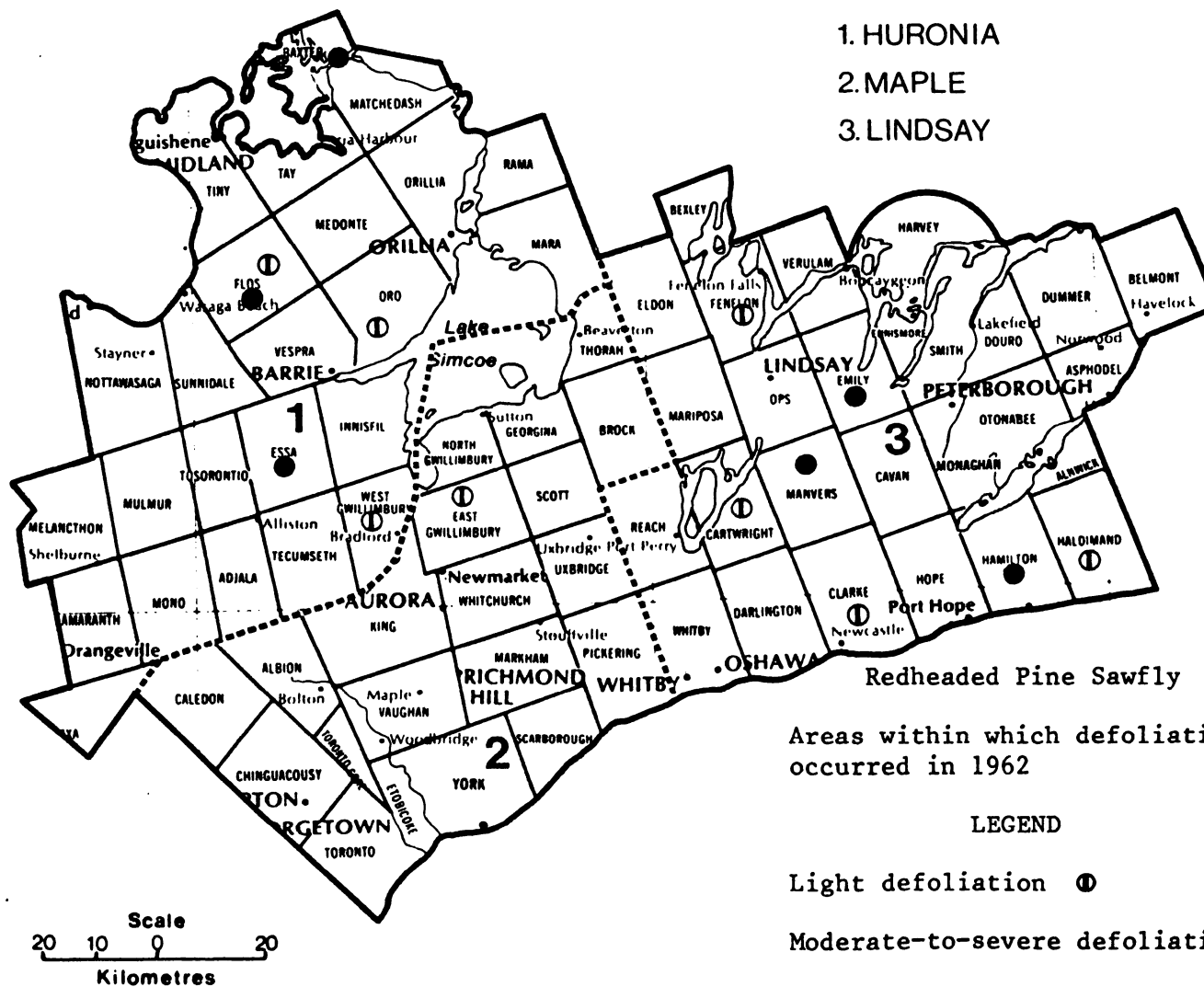
Areas within which defoliation  
occurred in 1961

## LEGEND

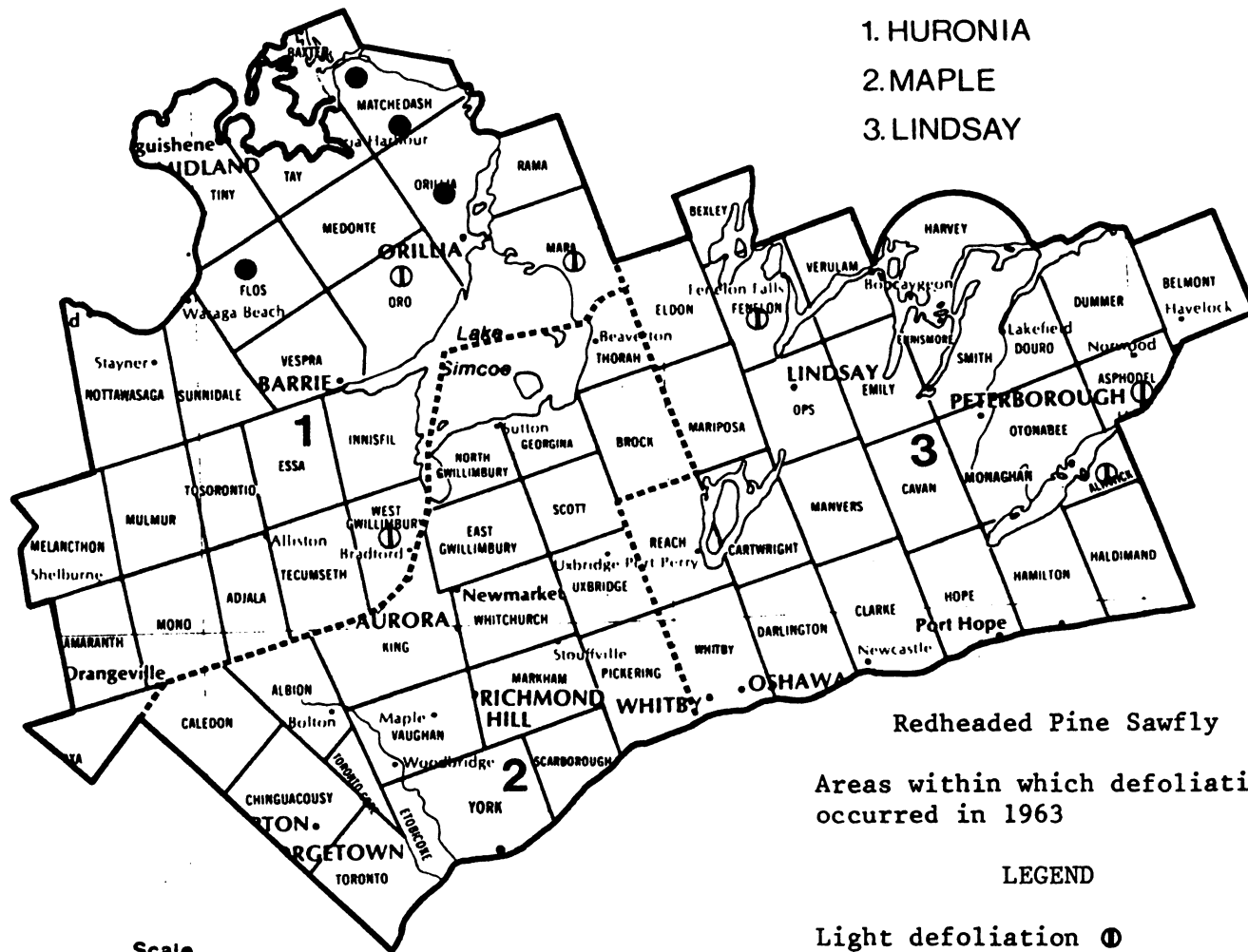
Light defoliation ○

Moderate-to-severe defoliation ●

# HURONIA, MAPLE and LINDSAY DISTRICTS



# HURONIA, MAPLE and LINDSAY DISTRICTS



Redheaded Pine Sawfly

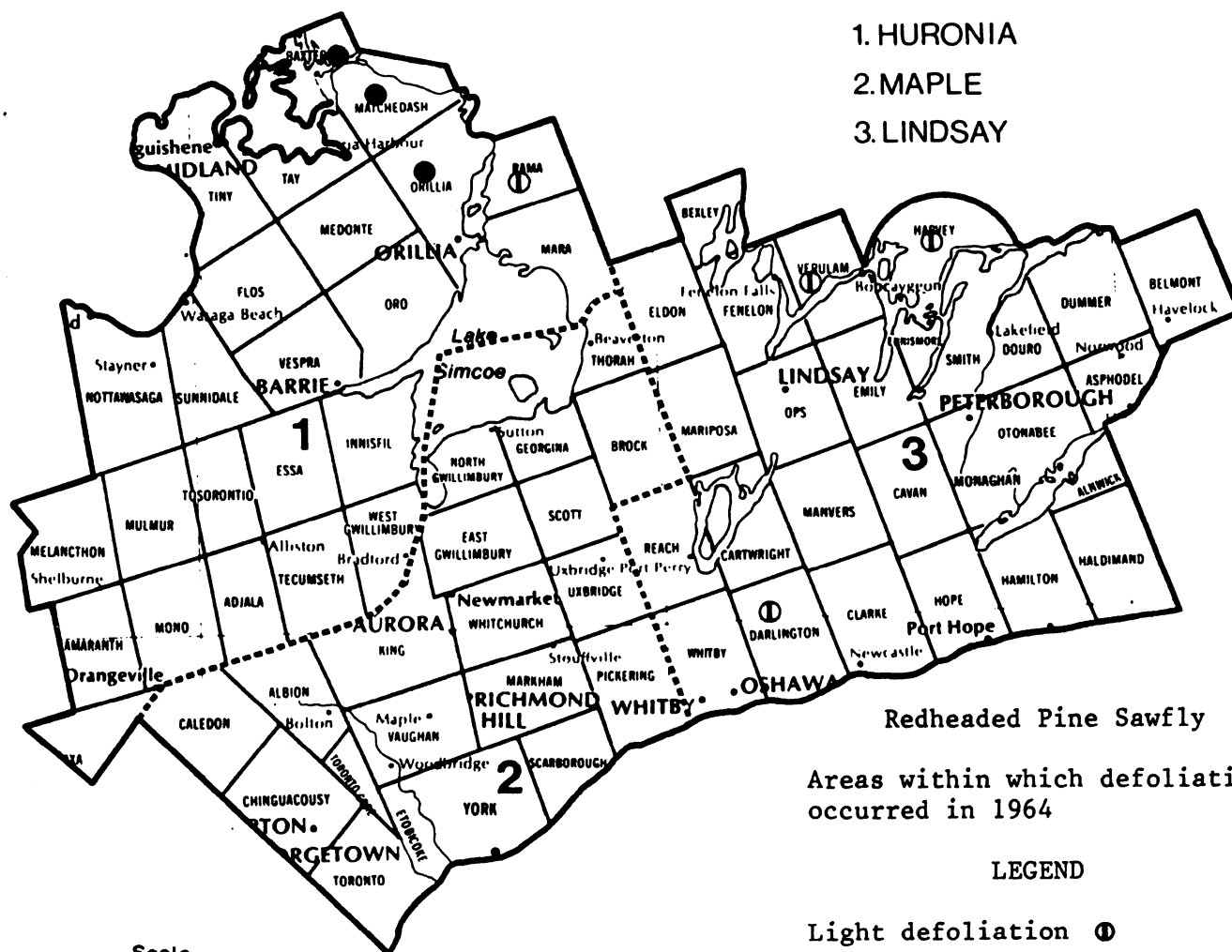
Areas within which defoliation  
occurred in 1963

## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ●

# HURONIA, MAPLE and LINDSAY DISTRICTS



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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	scattered colonies in a Scots pine plantation in Hamilton Twp
1962	Scattered colonies were found in Scots pine plantations in the southern parts of Clarke, Darlington and Haldimand twps.
1963	Two small pockets of medium-to-heavy infestations occurred in plantations in Cartwright and Clarke twps.
1964	Medium-to-heavy infestations occurred throughout Darlington Twp; in the southern part of Cartwright Twp and in the western part of Clarke Twp.
1965	The sawfly infestations extended across the southern three-quarters of Durham County and through Hamilton and Haldimand twps in Northumberland County. Small pockets of moderate-to-severe defoliation occurred throughout this area (see map, page ).
1966	Infestations continued to spread across Durham and Northumberland counties with most severe defoliation occurring in the southern part of the counties.
1967	Heavy infestations recurred in Clarke and Darlington twps and new heavy infestations were observed in Cartwright and Hope twps. Light defoliation occurred in Haldimand, Eldon and Asphodel twps. Distribution increased considerably in 1967.
1968	The sawfly infestation continued to expand and new pockets of moderate-to-severe defoliation were detected in Durham and Northumberland counties. A variety of chemical insecticides and nuclear polyhedrosis virus were used by Christmas tree growers to combat the sawfly.
1969	Continued expansion of the infestation was noted in 1969 and populations increased across the district.
1970	Medium-to-heavy infestations recurred in Hope and Clarke twps but at most other points defoliation was relatively light.
1971	Although populations increased generally there was no significant extension of the infestation. Ground and aerial spraying operations were carried out at the Orono Tree Nursery and in the Durham and Northumberland County Forests.
1972	Little change in population levels was observed. A light infestation was detected 15 km north of Bobcaygeon in Verulam Twp.
1973	Declines in population levels were noted in the southern part of the district.
1974	Low population levels were general through the district.

(cont'd)

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

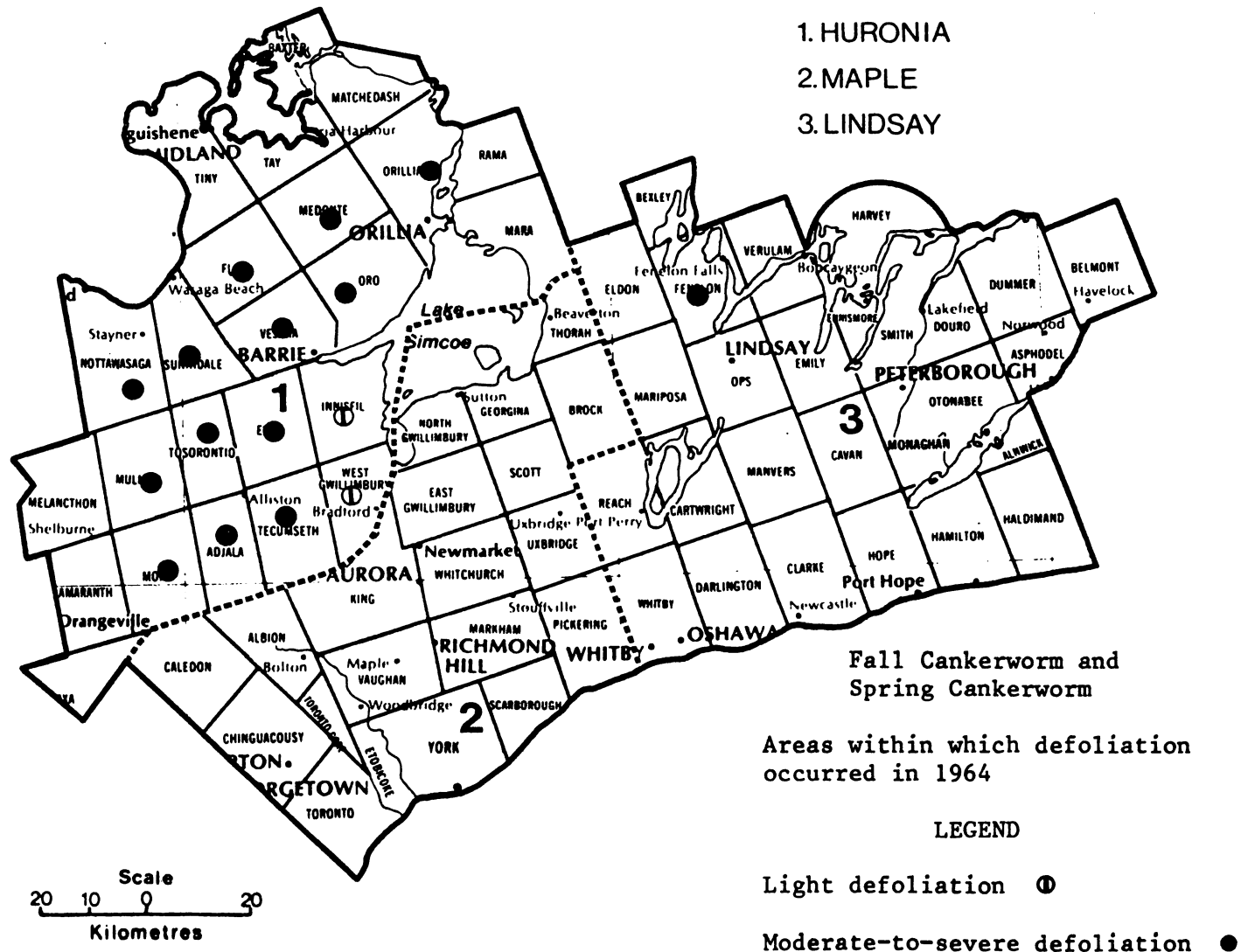
<u>Year</u>	<u>Remarks</u>
1975	Moderate-to-severe defoliation in a red pine plantation in Emily Twp; little change was noted at other locations.
1976	low numbers through the district
1977-1979	low numbers in plantations
1980	Population increases were detected in Haldimand Twp but only trace levels were found at other locations.

Spring Cankerworm, *Paleacrita vernata* (Peck.)  
 Fall Cankerworm, *Alsophila pomataria* (Harr.)

Host(s): deciduous

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	A small infestation of spring cankerworm caused complete defoliation of white elm trees in Asphodel Twp and fall cankerworm caused moderate-to-severe defoliation in a 2-ha mixed woodlot in Bexley Twp.
1956-1957	lightly defoliated elm trees near Norwood in Asphodel Twp
1958-1959	not reported
1960-1962	Small, medium-to-heavy infestations of <i>A. pomataria</i> in the Durham County Forest and in Douro Twp.
1963	not reported
1964	small numbers of <i>P. vernata</i> on white elm in Fenelon Twp (see map, page )
1965-1966	not reported
1967	small numbers of <i>P. vernata</i> at three locations in the southern part of the district
1968-1980	not reported

# HURONIA, MAPLE and LINDSAY DISTRICTS



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

Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	50% defoliation of 400, 2-m white spruce trees near Havelock in Belmont Twp
1953-1954	high numbers in Belmont and Dummer twps
1955-1956	Populations declined.
1957-1969	very low numbers
1970	not reported
1971	low numbers through the district
1972	moderate numbers at Orono Tree Nursery and high numbers at Balsam Lake Park in Bexley Twp
1973-1974	moderate-to-severe defoliation at Balsam Lake Park in Bexley Twp
1975	severe defoliation of a 105-ha white spruce plantation in Bexley Twp; infestation treated with chemical control (Malathion)
1976	small numbers at several locations
1977	Ornamental white spruce at Balsam Lake Park, Bexley Twp, were again infested and aerial spraying with Malathion was used for control.
1978	small numbers at several locations
1979	populations again building in Balsam Lake Park
1980	Severe defoliation in black and white spruce plantations in Bexley and Manvers twps; both plantations (approximately 4 ha) were sprayed with hand sprayers.

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1951-1952	weevilled trees common in plantations through the district
1953-1954	Extensive leader damage in plantations and on natural regeneration continued through the district.
1955	Moderate-to-severe damage was recorded in a eastern white pine plantation in Haldimand Twp where 32% of the leaders were killed.
1956	Ministry of Natural Resources carried out chemical control operations in the Ganaraska County Forest where infested leaders averaged 40% in eastern white pine plantations.
1957	Populations were low, particularly in plantations which were sprayed in 1956.
1958	Damage was relatively light in Manvers and Hamilton twps where four and five per cent of the leaders were infested, respectively.
1959	Quantitative sampling in Manvers and Hamilton twps showed 4 and 11% leader mortality, respectively.
1960	Varying numbers were found through Durham and Northumberland counties. Counts at sample points in Manvers and Hamilton twps were 0 and 9%, respectively.
1961	Little change in populations occurred. Sampling in Manvers and Hamilton twps showed 1 and 8% leaders killed.
1962	Pockets of heavy infestation were recorded in the Ganaraska, Durham and Northumberland county forests. However, sampling in Manvers and Hamilton twps showed only 1 and 6% weeviling.
1963	Although pockets of heavy infestation persisted in the Northumberland County Forest and in Fenelon Twp. Counts at sample points in Manvers and Hamilton were negative.
1964	low numbers through the district
1965	Low numbers were general in the district. A count in a Hamilton Twp plantation showed 2% leaders infested.
1966	Little change in population levels was observed. A count in Hamilton Twp again showed 2% leaders killed.
1967	A moderate infestation occurred in a plantation in Haldimand Twp where 15% of the leaders were killed. At other points district populations were low.
1968	In Haldimand Twp 19% of the leaders were damaged. Little change was noted elsewhere.

(cont'd)

White Pine Weevil, *Pissodes strobi* (Peck) (concl.)

<u>Year</u>	<u>Remarks</u>
1969	Populations increased and pockets of heavy infestation were hand clipped in eastern white pine plantations in the Northumberland County Forest. A count in Haldimand Twp showed 28% leaders killed.
1970	Pockets of heavy infestation recurred in eastern white pine plantations in Haldimand Twp where up to 87% leader damage was recorded. Damage was 8% in Clarke Twp.
1971	High populations persisted in eastern white pine plantations. Quantitative sampling in Clarke and Haldimand twps showed 60 and 30% leaders killed, respectively.
1972	Heavy infestations continued through the district; 23% leader damage was recorded in Clarke Twp. Infested leaders were clipped and burned in Haldimand Twp.
1973	Although populations were lower in Clarke Twp (8%) heavy weeviling occurred in Haldimand Twp where 27% leader mortality was recorded.
1974	Leader mortality in eastern white pine plantations was 37%, 41% and 43% in Haldimand, Clarke and Verulam twps, respectively.
1975	Populations declined to low levels.
1976	Population levels were similar to those observed in 1975.
1977	Quantitative sampling showed that 6, 3 and 9% of eastern white pine leaders were killed in Clarke, Manvers and Bexley twps, respectively.
1978	Populations were low except at Balsam Lake Provincial Park in Bexley Twp where leader mortality was 54%.
1979	High numbers persisted in Bexley Twp where leader damage was 59% in eastern white pine plantings.
1980	Little change in population levels was reported in 1980.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): tamarack, European larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954-1957	scattered colonies at a few locations
1958	light infestations in the Peterborough and Lindsay areas
1959	pockets of heavy infestation in Eldon, Clarke and Hamilton twps and light infestations in South Monaghan Twp
1960	Small pockets of heavy infestation were present in Clarke and Haldimand twps where defoliation exceeded 50%. Light infestations occurred in Eldon, Bexley, Belmont and Darlington twps.
1961	Heavy infestations occurred in Manvers, Clarke, Cavan and Haldimand twps. A European larch plantation in Haldimand Twp was sprayed with chemicals by mistblower by the Ministry of Natural Resources.
1962-1963	Heavy infestations persisted in European larch plantations in Manvers and Haldimand twps.
1964-1965	A 10-ha plantation of European larch in Haldimand Twp severely defoliated and light infestations were present in Manvers and Cartwright twps.
1966	Populations declined to relatively low levels at all locations.
1967-1968	low numbers through the district
1969	Populations increased and severe defoliation again occurred in two plantations in Clarke Twp.
1970	low numbers through the district
1971	moderate numbers on European larch in Clarke Twp
1972	Severe defoliation of Japanese larch in plantations in Clarke Twp and light defoliation of European plantations in the Durham-Ganaraska County Forest.
1973-1978	moderate-to-severe defoliation in European larch plantations in Haldimand Twp in the Northumberland County Forest
1979	moderate-to-severe defoliation in European larch plantations in Haldimand Twp in the Northumberland County Forest
1980	high populations again found in the Durham County Forest

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

Host(s): mountain-ash

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952-1953	moderate-to-severe defoliation of both ornamental and forest mountain-ash trees
1954-1959	not reported
1960-1962	Medium-to-heavy infestations occurred on small clumps of mountain-ash trees in Hamilton and Haldimand twps.
1963	Small pockets of medium-to-heavy infestations were reported in Darlington Twp.
1964	trace populations through the district
1965	Populations increased and small areas of moderate-to-severe defoliation occurred in Hope, Hamilton and Haldimand twps.
1966	Populations declined to light levels in Hope and Haldimand twps.
1967	European mountain-ash trees sustained 30% defoliation at the Orono Forest Station and at several points in Haldimand Twp.
1968	light defoliation observed on the lower crowns of several trees in Clarke Twp; scattered colonies on highway plantings at several other locations
1969-1970	not reported
1971	common on ornamental trees through the district
1972-1973	not reported
1974	moderate-to-severe defoliation on open-grown trees at a few locations
1975	Populations declined to low levels.
1976	trace populations
1977-1978	moderate-to-severe defoliation of ornamentals at several locations
1979-1980	trace populations

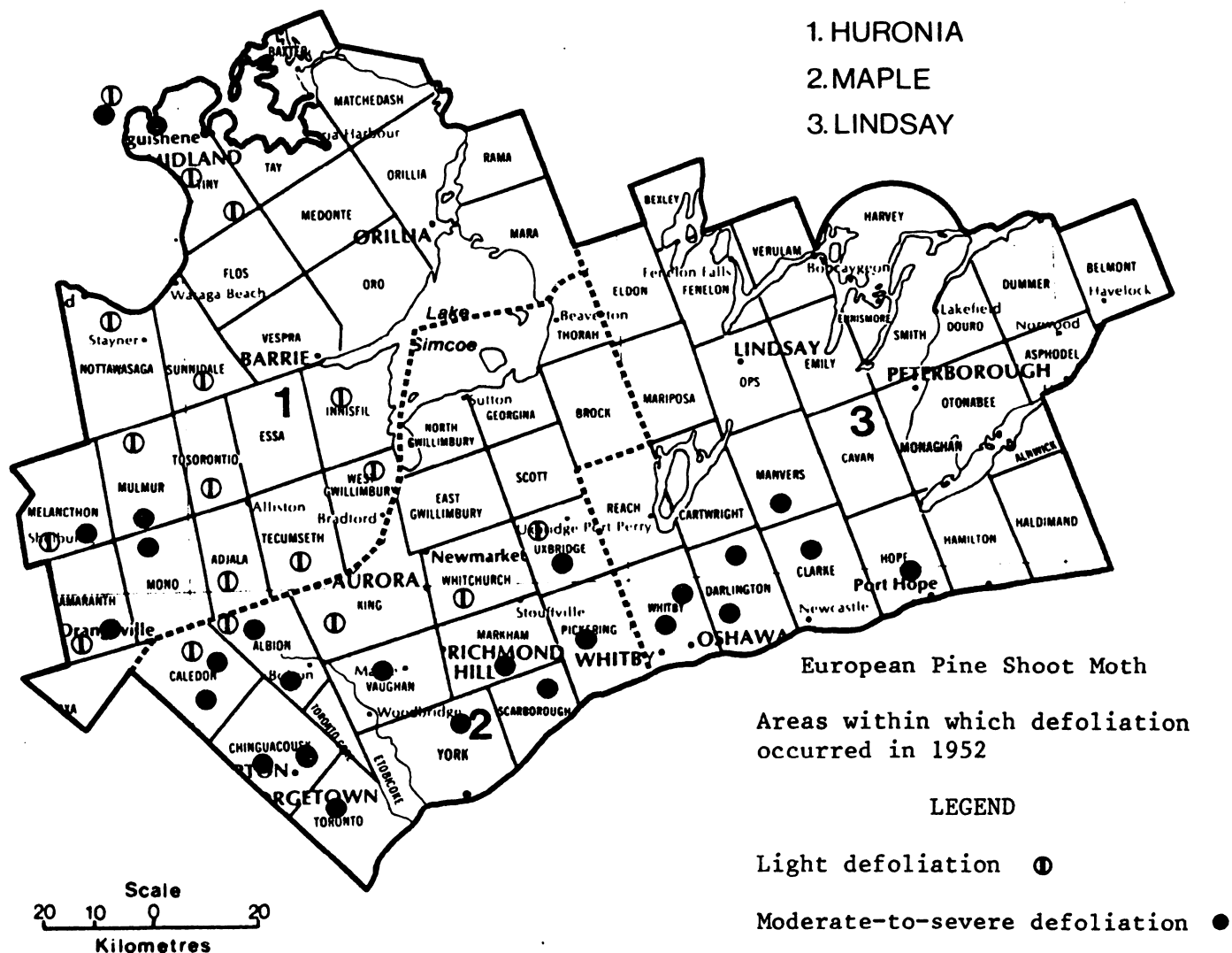
European Pine Shoot Moth, *Rhyacionia buoliana* (D. & S.)

Host(s): rP, ScP, mugho pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	several plantations approximately 0.5 ha in size heavily infested in the Port Hope area, Durham County
1951	found commonly through the southern part of the district
1952-1955	High numbers caused severe damage through the southern part of Durham and Northumberland counties (see map, page ).
1956	lower numbers noted through infested areas
1957	decline noted in 1956 continued in 1957
1958	small, heavy infestations on young red pine trees along Highway 401 and in Darlington, Clarke and Manvers twps
1959	Heavy infestations persisted near Pontypool and Newcastle in Durham County and in Darlington and Clarke twps.
1960	A heavy infestation persisted in a red pine plantation near Pontypool where 46% of the bud clusters were infested. Light infestations were observed in Clarke and Darlington twps.
1961	heavy infestations of roadside plantings in Clarke, Darlington and Cartwright twps
1962	Light and medium infestations occurred on Scots and red pine trees in Clarke Twp and along Highway 401 between Newcastle and Orono.
1963	Light infestations persisted on roadside Scots pine along Highways 115 and 401 in Clarke and Darlington twps.
1964-1965	Medium infestations occurred in Clarke and Darlington twps.
1966	Heavy infestations along Highways 401 and 115 in Clarke and Darlington townships; in a Hamilton Twp, Scots pine plantation 100% of the trees were attacked and 52% of the bud clusters were infested.
1967	no change in population levels or distribution
1968	Heavy infestations of Scots pine windbreaks in Darlington Twp and moderate damage to Scots pine plantation in Hamilton Twp was recorded.
1969	A new infestation caused moderate damage in a Scots pine plantation in Darlington Provincial Park.
1970-1975	not reported
1976	low numbers in the southern part of the district
1977-1980	not reported

# HURONIA, MAPLE and LINDSAY DISTRICTS



Smaller European Elm Bark Beetle, *Scolytus multistriatus* (Marsh.)

Host(s): elm

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	A pile of elm logs in Port Hope was heavily infested with these beetles. Several elm trees in the vicinity were infected with Dutch elm disease. All infected trees and logs were removed and burned.
1958	not reported
1959	Low numbers of beetles were found in dead elm trees in a 2 km band along Lake Ontario across the district. None were found north of this area.
1960-1961	not reported
1962	The area of distribution increased to a strip approximately 10 km wide across the district along the north shore of Lake Ontario.
1963	The area of known distribution again increased to include most of Northumberland and the southern half of Durham County.
1964	High numbers were found through Manvers and Cartwright twps in Durham County and into the southern part of Asphodel Twp increasing the distribution of this introduced species considerably.
1965	The northern boundary of the infestation expanded northward to Manilla in Mariposa Twp on the west and to Peterborough in the east.
1966	Light infestations were found throughout Durham and Northumberland counties and in North Monaghan, Otonabee and Asphodel twps in Peterborough County.
1967	not reported
1968	A slight increase in the northward range of this insect was recorded when small numbers were found near Pigeon Lake in Emily Twp.
1969	not reported
1970-1971	a slight northward extension of the northward range of the insect to Fenelon Twp
1972	no change in distribution
1973-1980	not reported

## Other Noteworthy Insects

Spruce Spittlebug, *Aphrophora parallela* (Say)

Host(s): conifers

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959-1960	medium-to-heavy infestations in Clarke and Darlington twps
1961-1976	not reported
1977-1978	caused light branch and tip mortality in Cartwright, Darlington and Manvers twps
1979-1980	low numbers at scattered locations

Larch Casebearer, *Colephora laricella* (Hbn.)

Host(s): tamarack, European larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954-1958	low populations in Verulam and Asphodel twps
1959-1964	slightly higher populations at monitoring stations
1965-1967	Populations declined to trace levels.
1968-1980	only slight variations in populations at monitoring stations

Pitted Ambrosia Beetle, *Corthylus punctatissimus* (Zimm.)

Host(s): maple

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962	medium-to-heavy infestations in the southern part of Otonabee and Asphodel twps
1963	small pocket of medium-to-heavy infestation in Otonabee Twp; trace populations at other points
1964-1980	not reported

Introduced Pine Sawfly, *Diprion similis* (Htg.)

Host(s): pine

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963-1966	trace populations
1967-1972	not reported
1973-1975	lightly infested red pine trees at Balsam Lake Provincial Park in Bexley Twp
1976	not reported
1977	moderate-to-severe defoliation on eastern white pine trees at Orono Tree Seed Orchard and on red pine at Balsam Lake Provincial Park
1978-1979	Medium-to-high numbers persisted in the Orono Seed Orchard.
1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1959	not reported
1960	a light infestation present in Clarke Twp
1961-1962	pockets of medium-to-heavy infestation in the southern parts of Manvers and Cavan twps, in the northern part of Clarke Twp and through Cartwright and Verulam twps
1963	small pockets of light infestation through the southern parts of Clarke and Cartwright twps
1964-1980	not reported

Nursery Pine Sawfly, *Gilpinia frutetorum* (F.)

Host(s): pine

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962-1967	trace populations at monitoring stations
1968-1980	not reported

European Spruce Sawfly, *Gilpinia hercyniae* (Htg.)

Host(s): spruce

[Minor]

YearRemarks

1950	not reported
1951-1969	trace levels at monitoring stations
1970-1980	not reported

Northern Pine Weevil, *Pissodes approximatus* Hopk.

Host(s): pine

[Major]

YearRemarks

1950-1963	not reported
1964-1966	Medium-to-heavy infestations were found throughout Durham and western Northumberland counties causing twig and branch mortality in pine plantations.
1967-1980	not reported

D I S E A S E S

Anthracnose, *Apiognomonia quercina* (Kleb.) Höhnelt  
*Kabatiella apocrypta* (Ell. & Ev.) v. Arx

Host(s): oak, ironwood, maple

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	Numerous white oak trees were infected in Hamilton and Haldimand twps.
1954-1961	not reported
1962	lightly infected red oak trees in Haldimand Twp
1963	Moderate numbers of oak and maple were infected in the south half of the district.
1964	light infection levels in Manvers Twp
1965-1974	not reported
1975	trace levels at several locations
1976	high levels of infection at several locations
1977	In the city of Peterborough 73% of sugar maple were infected and 100% of the foliage was damaged.
1978	Infection levels declined throughout the district
1979	trace infections
1980	not reported

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

Host(s): all species

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	occasional red pine trees affected in plantations in Hope Twp
1964	trace infections
1965	pockets of dead Scots and red pine trees in Clarke and Darlington townships
1966	trace infections
1967-1968	not reported
1969	single and small groups of red pine trees at three locations in Clarke Township and in a 7 cm diameter red pine plantation in Haldimand Twp

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1970	not reported
1971	light mortality in a Scots pine plantation in Manvers Twp
1972	Approximately 25% mortality of scattered 2 m high red pine trees in a 5-ha plantation in the Durham County Forest. Further mortality was recorded in Manvers Twp.
1973	Moderate-to-high infection levels occurred in 2.5-m red pine plantations in Clarke and Hope twps.
1974	cumulative tree mortality in Hope and Clarke twps averaged 29 and 19%, respectively, in 1974
1975-1978	not reported
1979	Scattered mortality was observed in three red pine plantations in the Durham-Ganaraska County Forest.
1980	not reported

Twig Blight, *Cenangium ferruginosum* Fr. : Fr.

Host(s): Scots pine, jack pine

<u>Year</u>	<u>Remarks</u>
1950-1972	not reported
1973	Terminal and branch mortality caused concern to Christmas tree growers through the southern part of the district. The fungus <i>C. ferruginosum</i> was found in all infected branches. Incidence and damage was high in Cartwright, Clarke, Haldimand, Manvers and Verulam twps.
1974	Some branch mortality occurred in plantations affected in 1973 but no new infection centers were located.
1975	This organism was active in one plantation in Haldimand Twp where 14% of the Scots pine trees had dead tops.
1976-1980	not reported

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

Host(s): elm

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1955	not reported
1956	first record in Durham County
1957	Trees at six locations in Port Hope were infected with the disease. All dead trees and those showing symptoms of deterioration were removed and burned.
1958	Trees continued to die in the area around Port Hope, Durham County.
1959	infected trees found in Peterborough and Northumberland counties
1960-1961	no change detected in distribution and incidence of the disease
1962	diseased trees more numerous; distributed throughout the district
1963	moderate-to-severe tree mortality in the southern part of Peterborough County
1964	Elm mortality in Clarke and Hamilton twps was 66 and 60%, respectively.
1965	Moderate-to-severe elm mortality was recorded in Clarke Twp (70%); Hamilton Twp (70%), Hope Township (90%) and Mariposa Twp (78%).
1966-1968	Moderate-to-severe mortality continued throughout the district.
1969-1970	Little change in infection and mortality levels; highest incidence occurred in the southern part of the district.
1971	Quantitative sampling showed moderate-to-severe mortality in Fenelon Twp (54%); Douro Twp (75%); Darlington Twp (62%) and Haldimand Twp (79%).
1972	Mortality at check points in 1972 was Fenelon Twp (62%); Douro Twp (85%); Belmont Twp (34%); and Darlington Twp (89%).
1973	The disease continued to devastate elms through the district. Mortality at one location in Belmont Twp was 57%.
1974	most of the elm trees in the district killed by the disease
1975	The remaining elms continued to die through the district.
1976	not reported
1977-1978	continued to kill remaining elms
1979-1980	not reported

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

Host(s): trembling aspen

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	trace infections
1959-1960	not reported
1961	trace infections
1962-1963	not reported
1964	moderate-to-severe foliar damage in Darlington Twp; light infections at several other locations
1965-1970	trace infections
1971	not reported
1972-1975	trace infections
1976-1978	not reported
1979	moderate-to-severe infections at one point in Cavan Twp
1980	not reported

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

Host(s): eastern white pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	infected trees found at several points in Durham and Northumberland counties
1955-1958	not reported
1959	rust cankers common in eastern white pine stands in the district
1960	not reported
1961	cankered trees observed through the district
1962-1965	low incidence through the district
1966	A small area of 4-m eastern white pine trees suffered 14% infection and 14% mortality.
1967	Quantitative sampling in the Northumberland County Forest showed 4% infection levels.

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1968	Incidence in eastern white pine plantations in Hope, Harvey and Darlington twps was 35, 20 and 10%, respectively.
1969-1972	not reported
1973	2.5% mortality in a plantation in Clarke Twp
1974	Incidence in a 6-ha plantation of 8 year old eastern white pine in Balsam Lake Park was 25% with 9% of the trees severely diseased.
1975	Moderate damage was recorded in Verulam and Clarke twps wheren mortality averaged 2%.
1976-1980	little change in infection levels

Cytospora Canker, *Cytospora kunzei* Sacc.

Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Medium-to-heavy damage was observed in a Norway spruce fencerow in Ops Twp. A second area of damage was located in a Norway spruce fencerow in Manvers Twp where 36% of the trees were dead and 25% showed symptoms of the disease.
1967	Several Norway spruce trees were infected at the Orono Tree Nursery.
1968	Medium-to-heavy damage was recorded in a Norway spruce plantation at the Orono Tree Nursery in Clarke Twp.
1969-1980	not reported

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

Host(s): jack pine, Scots pine

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	trace levels in a Scots pine plantation in Clarke Twp
1964	trace numbers of galls
1965-1972	not reported
1973	trace levels reported in Clarke, Haldimand and Manvers twps
1974	1-5% incidence was recorded at several locations in Scots pine plantations
1975-1980	not reported

Eutypella Canker, *Eutypella parasitica* Davidson & Lorenz

Host(s): sugar maple

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	generally low incidence in maple stands through the district
1970-1972	not reported
1973	trace incidence
1974-1980	not reported

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx.

Host(s): tA

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	found commonly on small aspen trees throughout the district
1960	not reported
1961-1962	trace infection levels
1963	Small pockets of trembling aspen trees were heavily infected in Darlington Twp.
1964-1965	trace levels through the district
1966-1968	light foliage and twig damage through the district
1969-1974	not reported
1975-1976	trace levels through the district
1976-1980	not reported

#### Other Noteworthy Diseases

Rhizina Root Rot, *Rhizina undulata* Fr.

Host(s): conifers

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1963	not reported
1964	fruiting bodies discovered in Clarke Twp
1965	sample of the fungus found in a plantation adjacent to where the fungus was found in 1964
1966-1980	not reported

Fomes Root Rot, *Heterobasidium annosum* (Fr.) Bref.

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1964	not reported
1965	found in the district for the first time; patches of tree mortality in mixed red and jack pine trees in Haldimand Twp
1966	Five pockets of dead trees were observed in a mixed red and jack pine plantation in the Northumberland County Forest. This plantation was clear cut in 1966. Another area of root rot approximately 40 m in diameter was recorded in a red pine plantation in Cartwright Twp.
1967	Light tree mortality occurred in two areas in the Northumberland County Forest. No new infection centers were located.
1968	Light mortality occurred in two plantations in Northumberland County Forest and in one plantation in Cartwright Twp, Durham County.
1969	Trace mortality recurred in Cartwright and Haldimand twps.
1970	no change in status observed
1971	not reported
1972	prevalent in untreated thinning operations in Clarke and Haldimand twps
1973	no change in distribution
1974	No new infection centers observed; Ministry of Natural Resources continued to remove infected trees and to treat stumps with <i>Peniophora gigantea</i> (Fr.) and sodium nitrate.
1975-1980	no new infections found in the district

Leaf Spot, *Septoria populicola* Peck.

Host(s): balsam poplar

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1972	not reported
1973	Leaf blight caused medium-to-heavy leaf drop in Clarke and Cavan twps.
1974-1976	not reported
1977	Medium-to-heavy defoliation in scattered pockets in Manvers, Ops, Monaghan and Fenelon twps. Defoliation averaged 80% in these areas.
1978-1980	not reported

DIEBACKS AND DECLINES

## Maple Deterioration

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	dead and dying trees observed commonly along Highways 2 and 7
1959-1961	Generally damage remained unchanged and was confined to individual or small groups of trees along roads.
1962-1964	Little change observed; trees within stands seldom showed symptoms of deterioration.
1965	Quantitative sampling at eight locations showed average mortality of 5%.
1966	Roadside deterioration of maple was observed throughout the district but mortality remained low averaging less than 2% at ten locations.
1967	little change noted in 1967
1968	not reported
1969-1976	not reported
1977	Incidence of maple deterioration was common along roads and in urban situations. The decline was less evident in woodlots. Quantitative sampling of roadside trees in Fenelon Twp showed that 5.3% of trees were severely affected.
1978-1980	not reported

## Oak Deterioration

Host(s): oak

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Increasing incidence of oak deterioration and mortality were observed through the district. Heaviest damage occurred in Durham County where foliage discoloration and branch mortality was conspicuous. At one location in the Durham County Forest mortality of large trees was 10%.
1967-1976	not reported
1977	Light mortality was recorded at one location in Fenelon Twp.
1978	Oak mortality ranged from one to eight percent at sample points.
1979	Information recorded at permanent sample plots showed that oak stands continue to deteriorate.
1980	not reported

A B I O T I C

## Drought

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Moderate-to-severe foliage damage caused by drought occurred at many points in the district. The drought condition existed from June to early August, 1966.
1967	Extensive damage occurred in a red pine plantation near Orono in Clarke Twp. Trees averaged 1.5 m in height and mortality was attributed to the drought of 1966.
1968-1980	not reported

## Frost

Host(s): all species

<u>Year</u>	<u>Remarks</u>
1950-1963	not reported
1964	Late frosts caused foliage damage to black ash, sugar maple, balsam fir and white spruce at many points in the district.
1965-1971	not reported
1972	trace damage at a few locations
1973-1979	not reported
1980	Heavy frosts in early June and as late as June 16 caused moderate-to-severe shoot mortality of white spruce and walnut at numerous points in the district.

## Salt Damage

Host(s): conifers

<u>Year</u>	<u>Remarks</u>
1950-1966	not reported
1967	Light mortality of red and eastern white pine plantings occurred along Highway 7 east of Peterborough.
1968-1974	not reported
1975-1977	Light damage was recorded along highways at several points in the district.
1978-1979	not reported
1980	Varying degrees of damage to highway plantings was observed at many points through the district.

## Semimature Tissue Needle Blight

Host(s): eastern white pine

[Major]

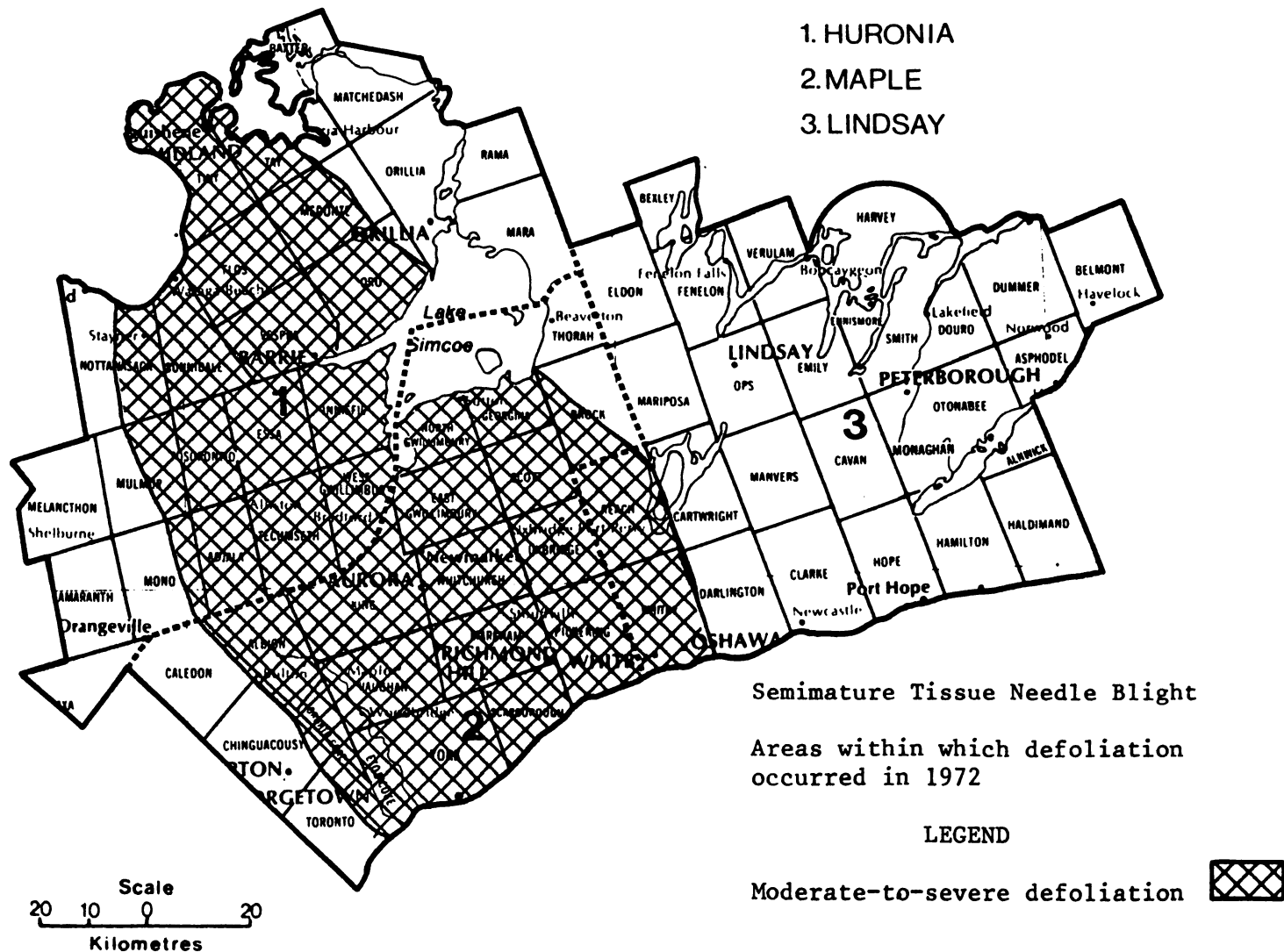
<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	light damage through the district
1954	trace levels
1955-1957	not reported
1958	Incidence of this condition was common in small pockets of eastern white pine trees in Durham County.
1959	trace levels only
1960-1971	not reported
1972	Heavy damage was recorded in the area north of Oshawa in Darlington Twp (see map, page ).
1973-1974	not reported
1975	trace infections
1976-1980	not reported

## Winter Drying

Host(s): conifers

<u>Year</u>	<u>Remarks</u>
1950-1966	not reported
1967	40% mortality of eastern white pine seedlings in one compartment at Orono Tree Nursery
1968-1969	not reported
1970	light damage to red pine in Eldon Twp
1971-1975	not reported
1976	light damage at several locations through the district
1977	Moderate-to-severe damage was recorded in Scots pine plantations in Hope Twp where foliar damage of 90% occurred on some trees.
1978	Moderate-to-severe foliage damage was reported on Scots pine in Manvers Twp and on eastern white pine at Balsam Lake Provincial Park in Bexley Twp where 100% of the trees examined showed 92 and 100% foliar damage, respectively.
1979	Little damage was observed in the district.
1980	not reported

# HURONIA, MAPLE and LINDSAY DISTRICTS



A P P E N D I C E S

## APPENDIX A

## DECIDUOUS HOST

<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Alder	<i>Alnus</i> spp.	Al
Apple	<i>Malus</i> spp.	Ap
Ash, black	<i>Fraxinus nigra</i> Marsh.	bAs
white	<i>americana</i> L.	wAs
Aspen, largetooth	<i>Populus grandidentata</i> Michx.	lA
trembling	<i>tremuloides</i> Michx.	tA
Basswood	<i>Tilia americana</i> L.	Ba
Beech	<i>Fagus grandifolia</i> Ehrh.	Be
Birch, white	<i>Betula papyrifera</i> Marsh.	wB
yellow	<i>alleghaniensis</i> Britt.	yB
Butternut	<i>Juglans cinerea</i> L.	Bu
Catalpa	<i>Catalpa</i> spp.	Ca
Cherry, eastern choke	<i>Prunus virginiana</i> L.	eaCh
pin	<i>pensylvanica</i> L.f.	pCh
Elm, white	<i>Ulmus americana</i> L.	wE
Hackberry	<i>Celtis occidentalis</i> L.	Ha
Hickory, bitternut	<i>Carya cordiformis</i> (Wang.) K. Koch	bHi
shagbark	<i>ovata</i> (Mill.) K. Koch	sHi
Horse-chestnut	<i>Aesculus carnea</i> Hayne	hChe
Ironwood	<i>Ostrya</i> spp.	I
Maple, Manitoba	<i>Acer negundo</i> L.	mM
red	<i>rubrum</i> L.	rM
silver	<i>saccharinum</i> L.	siM
sugar	<i>saccharum</i> Marsh.	sM

(continued)

## APPENDIX A (continued)

## DECIDUOUS HOST

<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Mountain-ash, American	<i>Sorbus americana</i> Marsh.	aMo
Oak, black	<i>Quercus velutina</i> Lam.	blo
bur	<i>macrocarpa</i> Michx.	bO
red	<i>rubra</i> L.	rO
white	<i>alba</i> L.	wO
Poplar, balsam	<i>Populus balsamifera</i> L.	bPo
Carolina	<i>eugenei</i> Simon-Louis	cPo
Lombardy	<i>nigra</i> L. var. <i>italica</i> Muench.	lPo
silver	<i>alba</i> L.	sPo
Sycamore	<i>Platanus occidentalis</i> L.	Sy
Walnut, black	<i>Juglans nigra</i> L.	Wa
Willow	<i>Salix</i> spp.	W

## APPENDIX B

## CONIFEROUS HOST

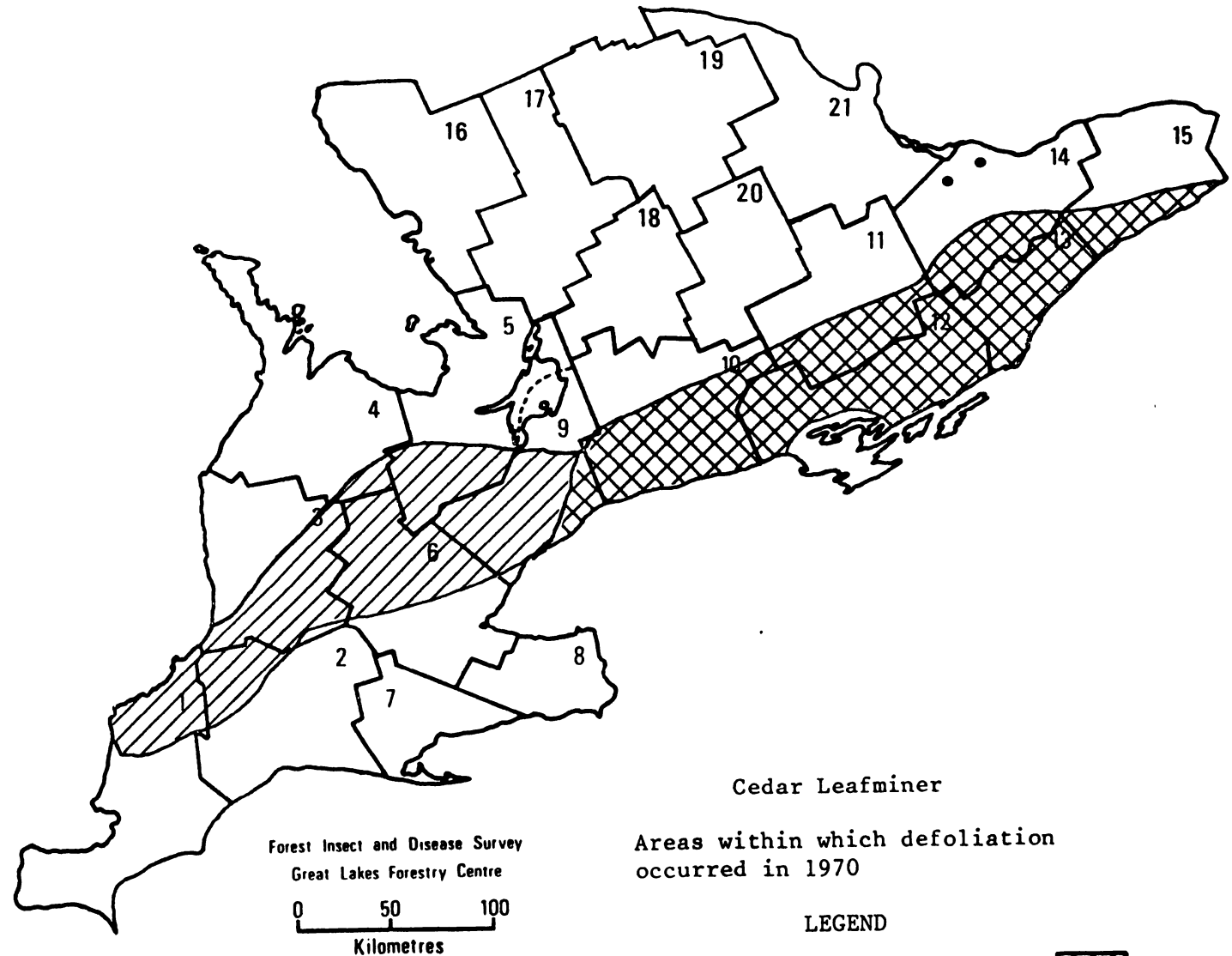
<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Cedar, eastern white	<i>Thuja occidentalis</i> L.	eC
Fir, balsam	<i>Abies balsamea</i> (L.) Mill.	bF
Larch, European	<i>Larix decidua</i> Mill.	eL
Pine, Austrian	<i>Pinus nigra</i> Arn.	auP
eastern white	<i>strobis</i> L.	ewP
jack	<i>banksiana</i> Lamb.	jP
mugho	<i>mugho</i> Turra	mP
red	<i>resinosa</i> Ait.	rP
Scots	<i>sylvestris</i> L.	scP
Spruce, black	<i>Picea mariana</i> (Mill.) B.S.P.	bS
Colorado	<i>pungens</i> Engelm.	colS
Norway	<i>abies</i> (L.) Karst.	nS
red	<i>rubens</i> Sarg.	rS
white	<i>glauca</i> (Moench) Voss	wS
Tamarack	<i>Larix laricina</i> (Du Roi) K. Koch	tL

A P P E N D I X    C  
MAPS - SOUTHERN ONTARIO

# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Cedar Leafminer  
Areas within which defoliation  
occurred in 1970

## LEGEND

Light defoliation

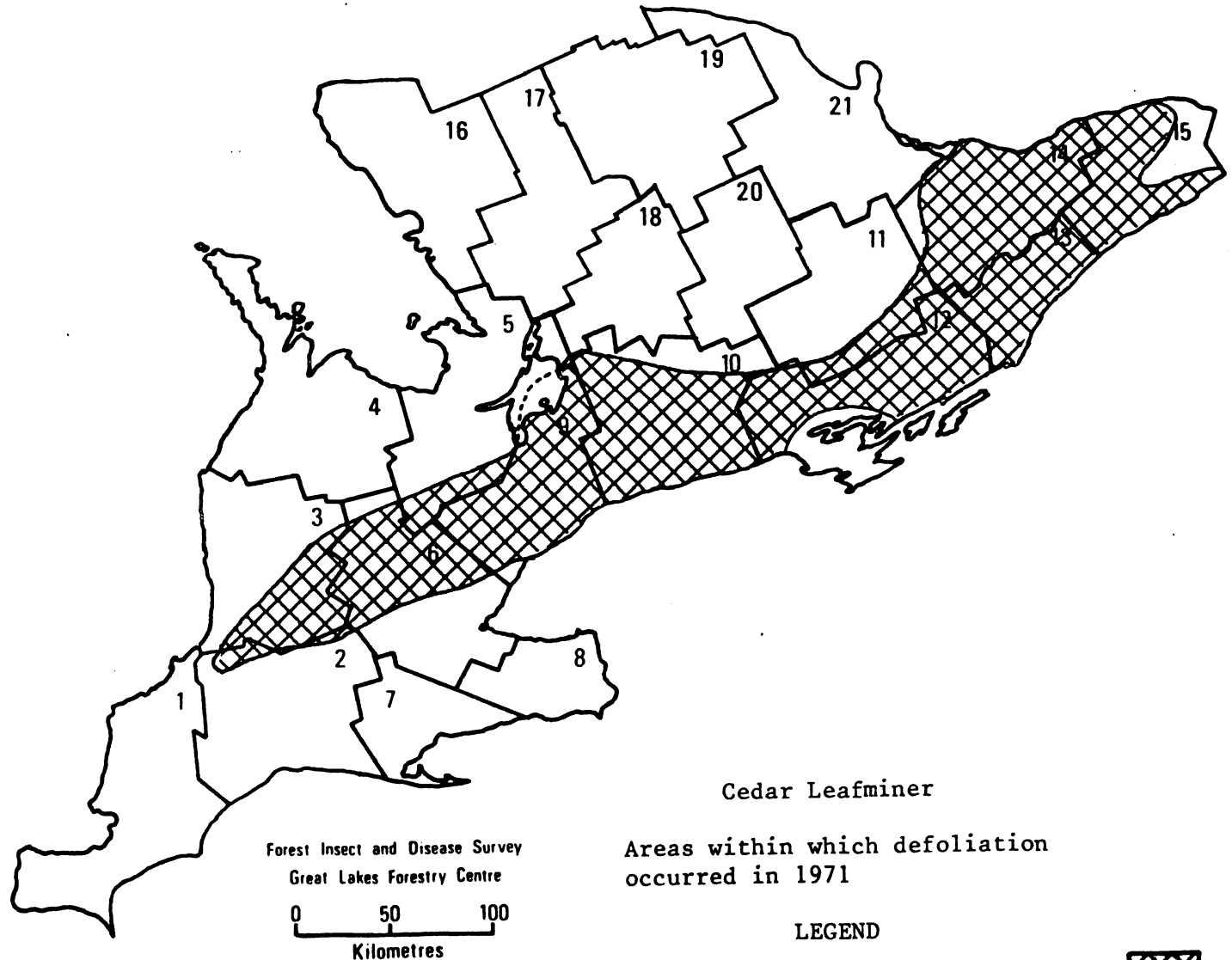
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

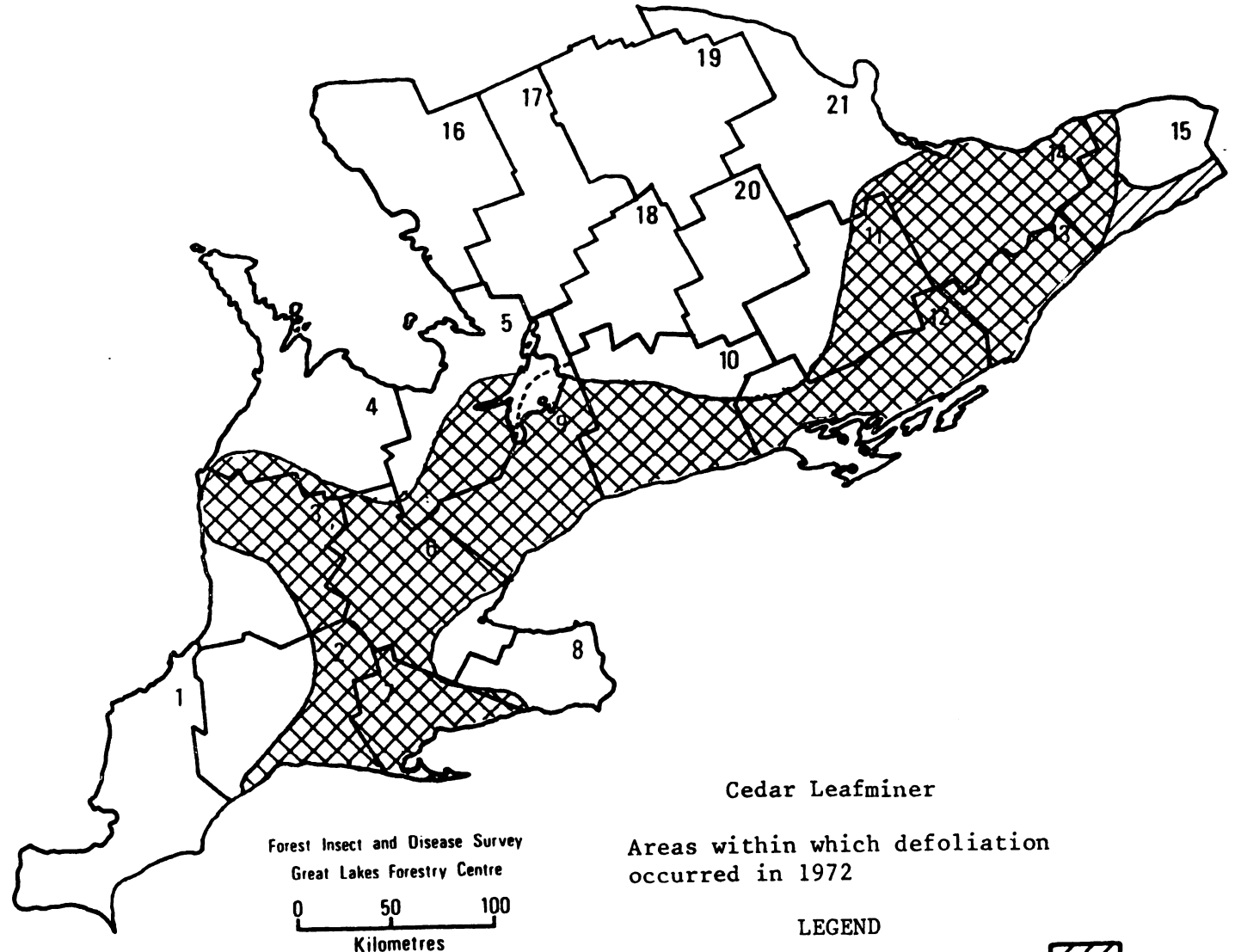
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

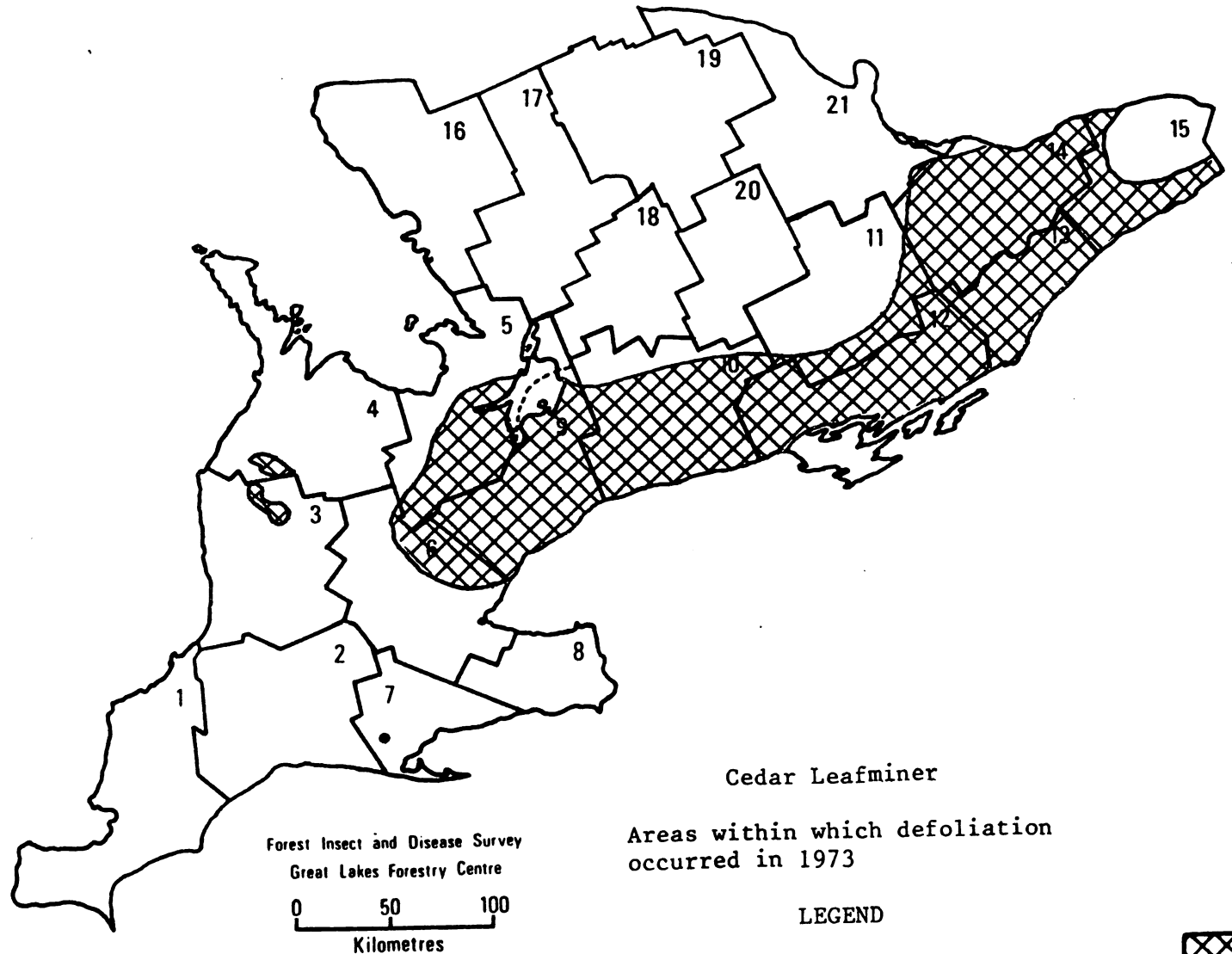
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

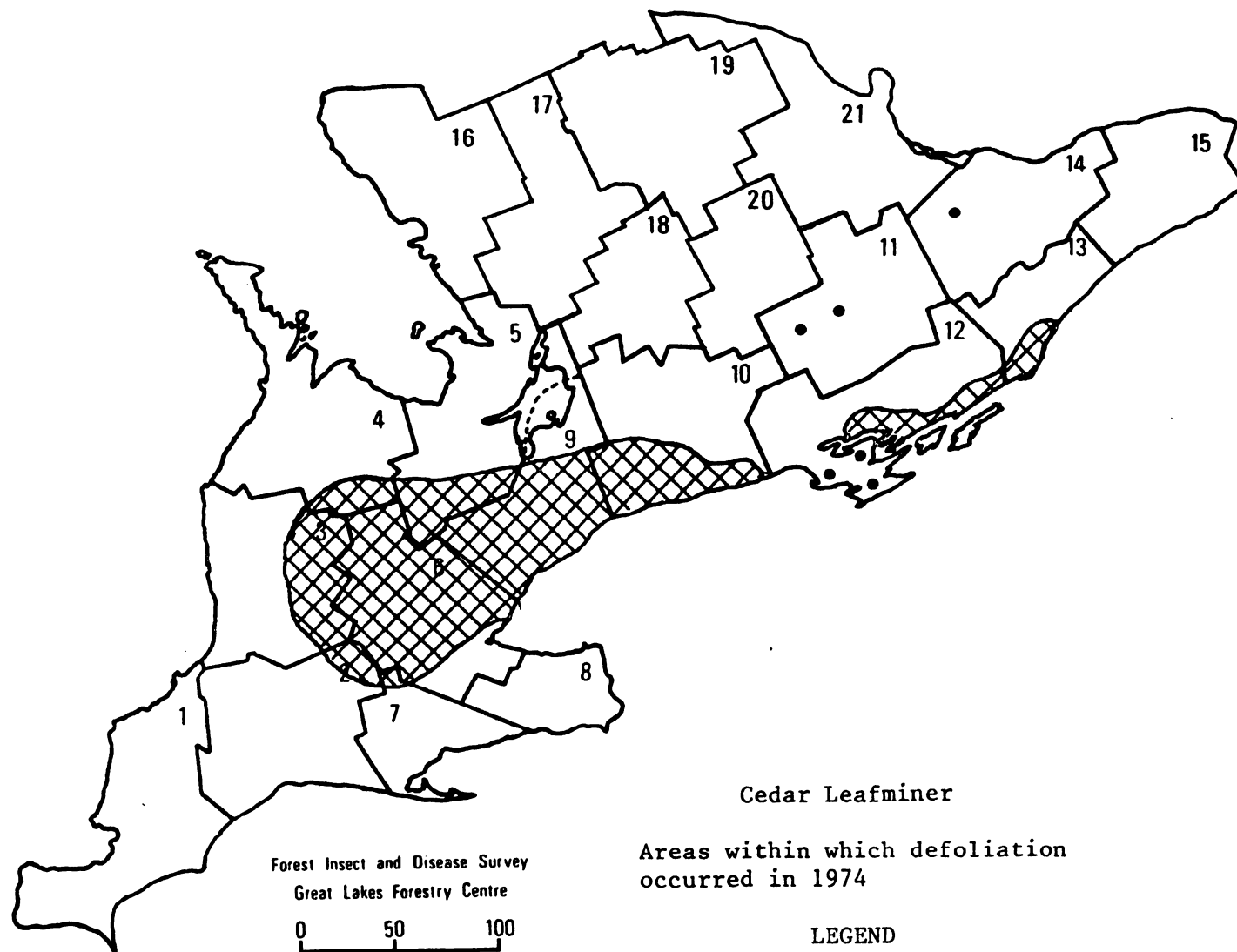
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Cedar Leafminer

Areas within which defoliation  
occurred in 1974

## LEGEND

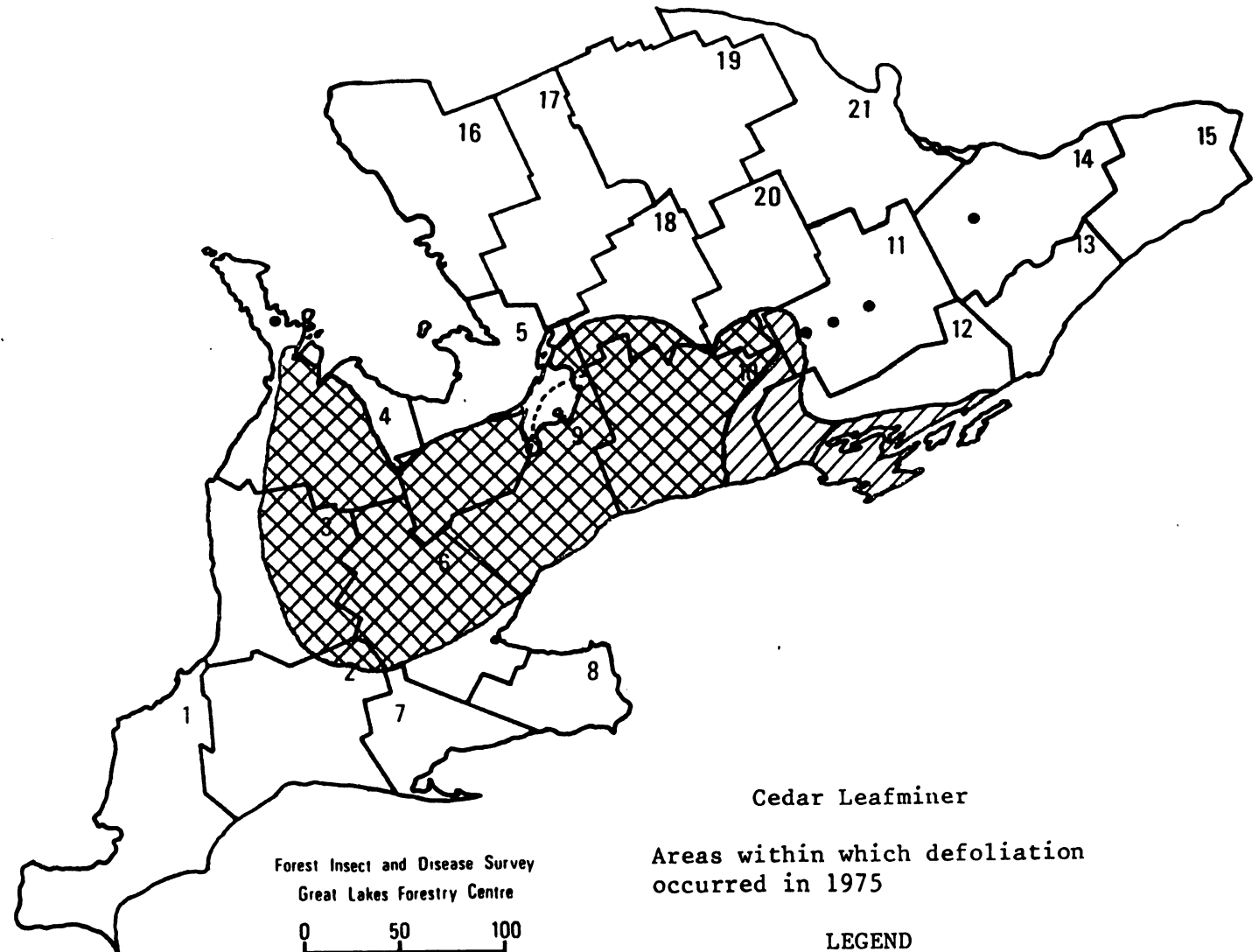
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

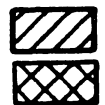
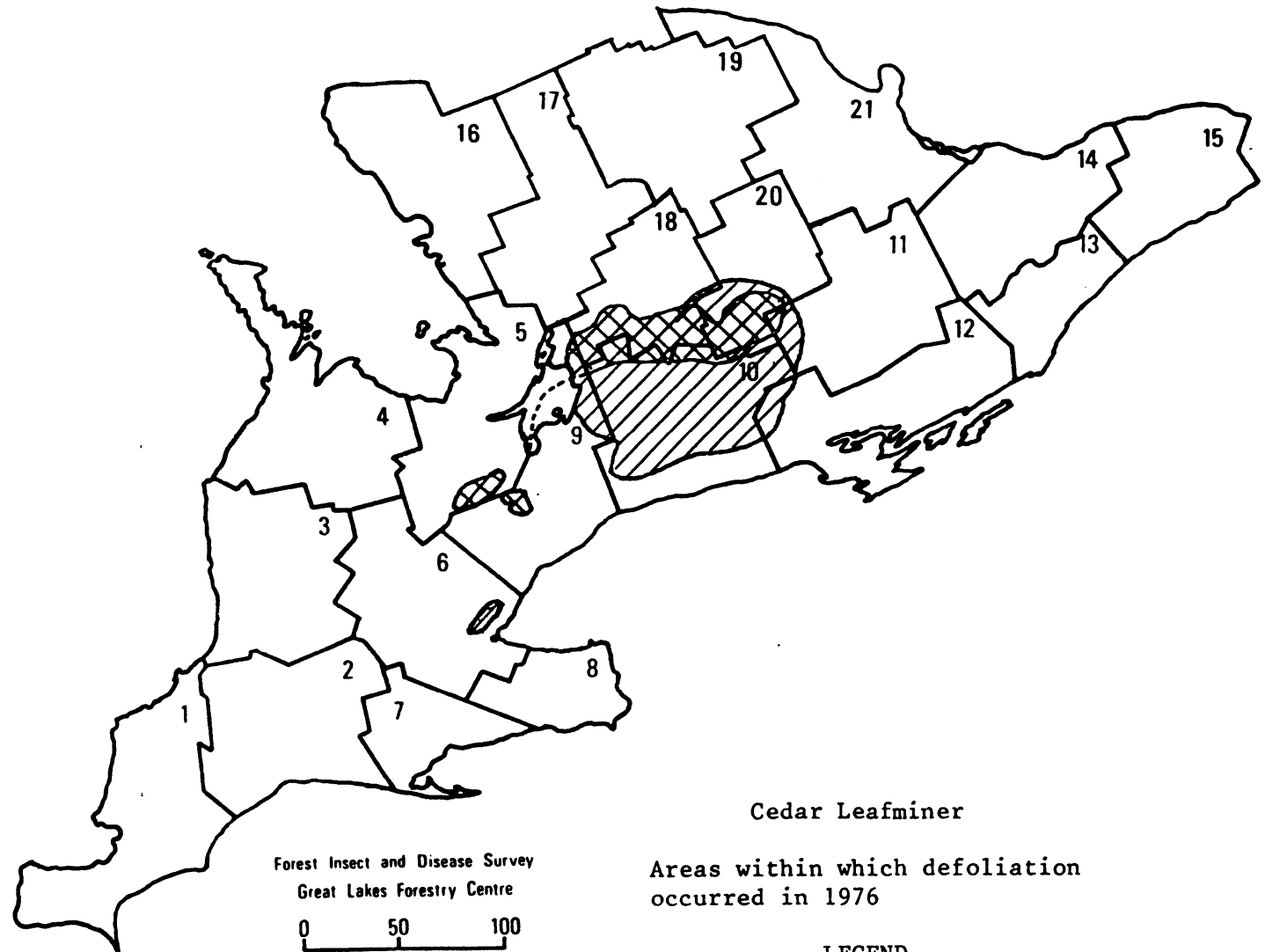
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

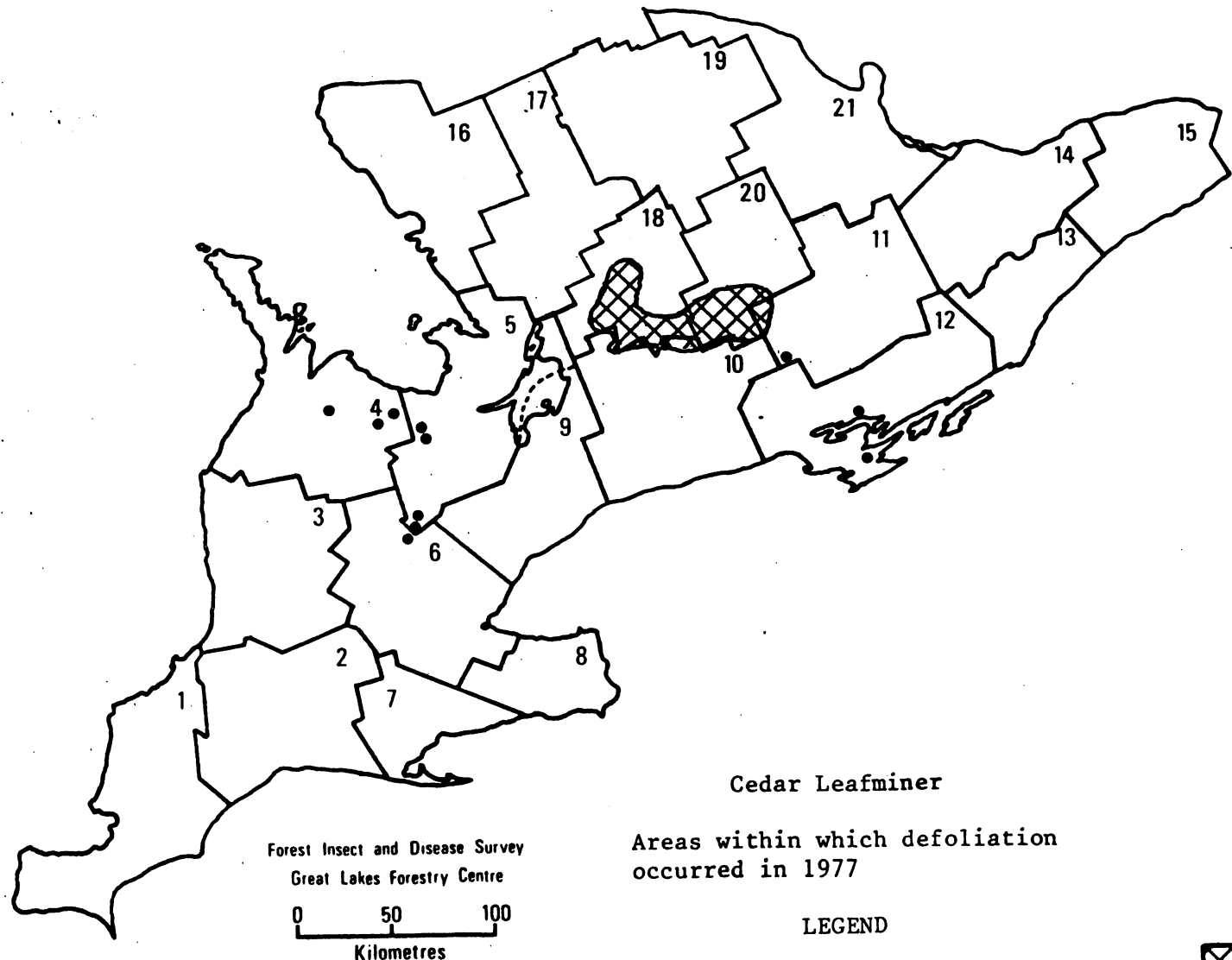
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

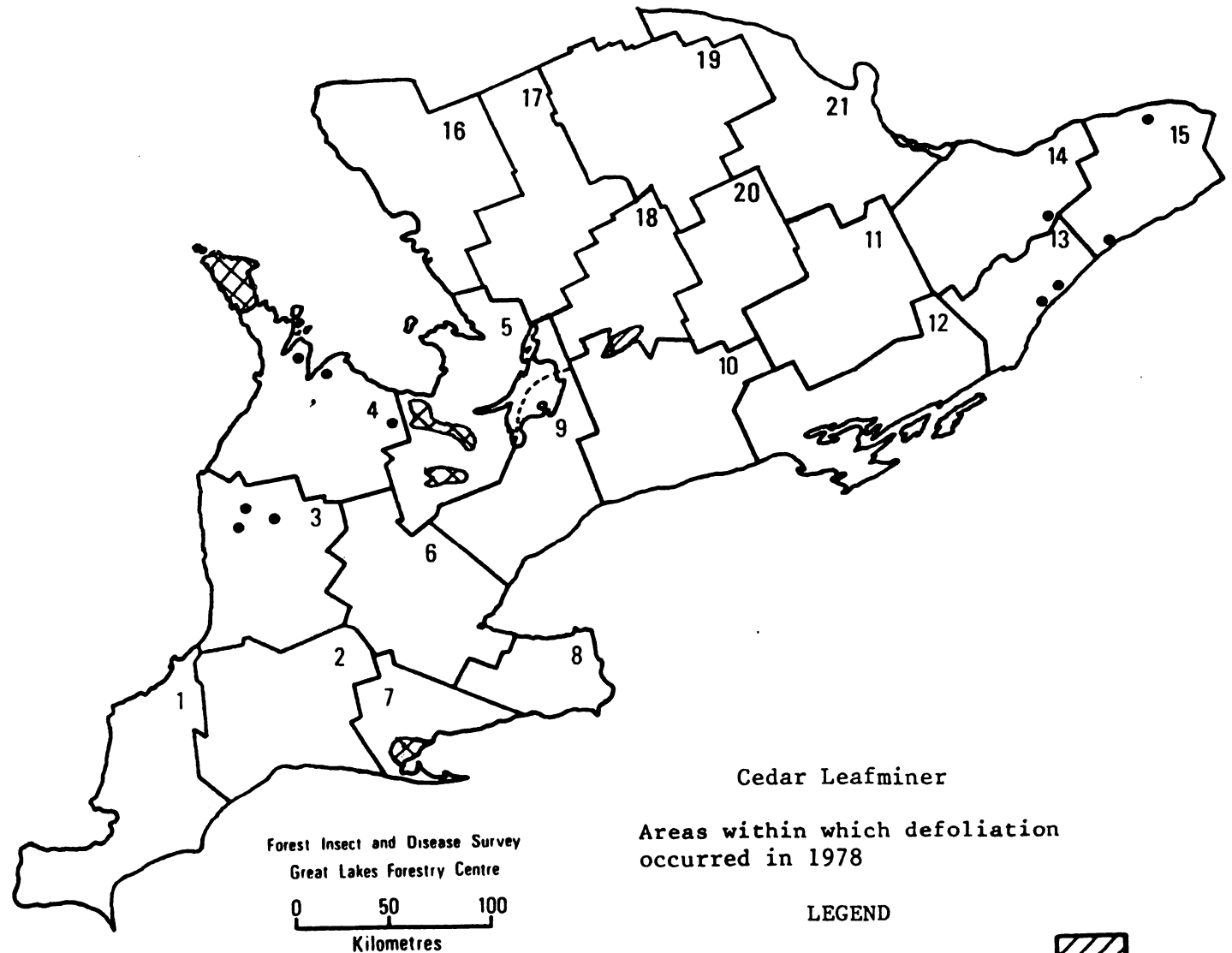
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Cedar Leafminer

Areas within which defoliation  
occurred in 1978

## LEGEND

Light defoliation



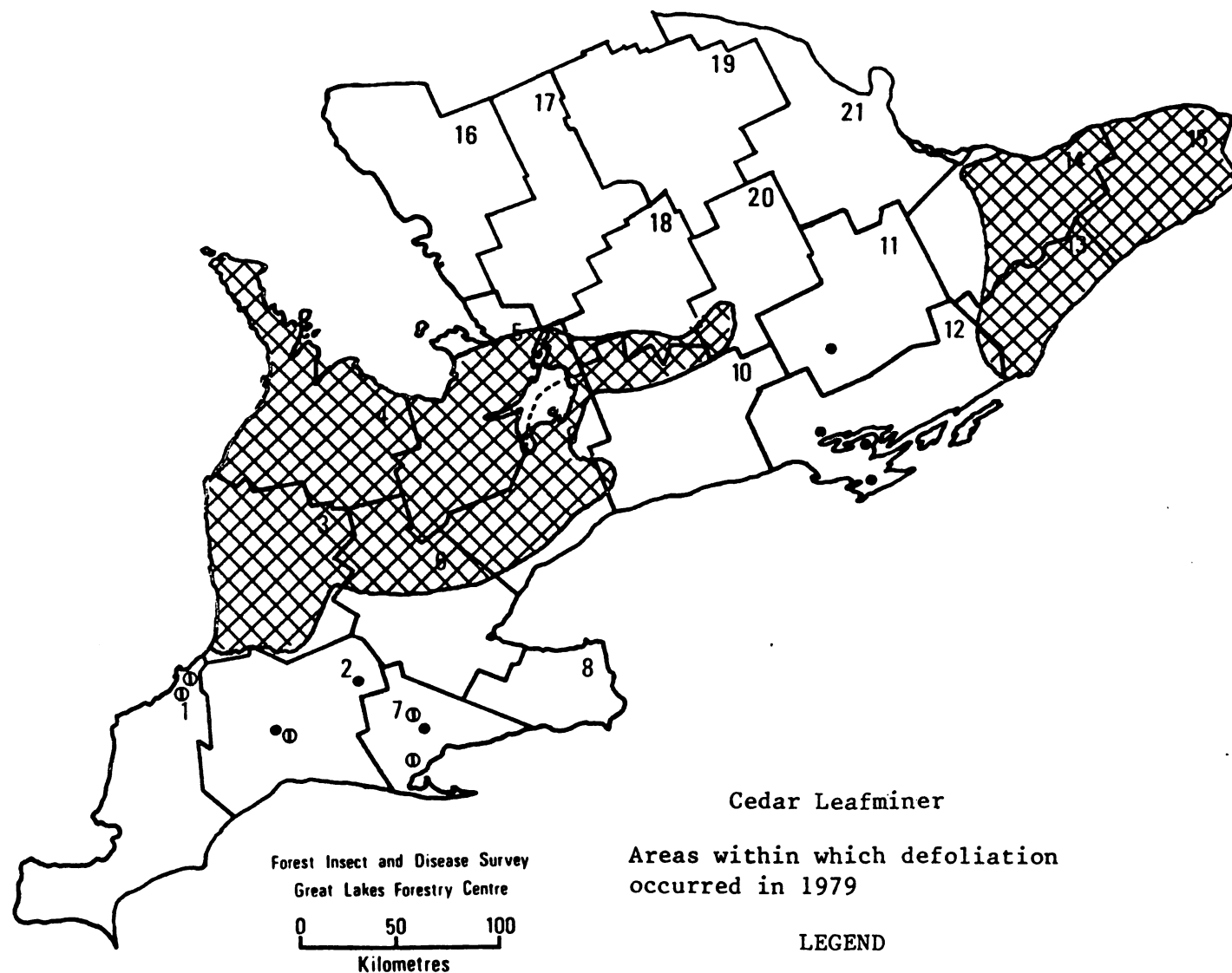
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



⊙

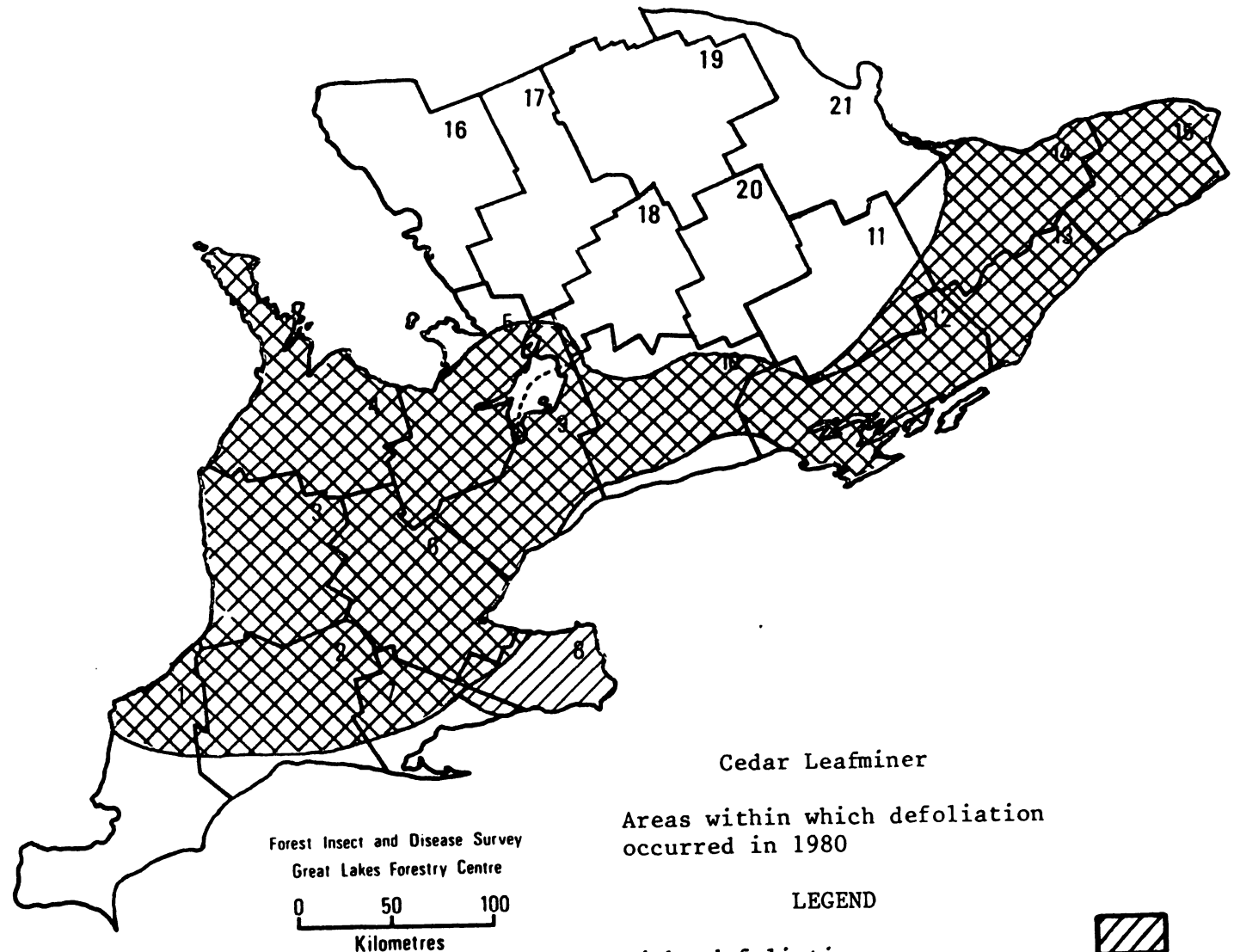
•



# SOUTHERN ONTARIO

## DISTRICTS

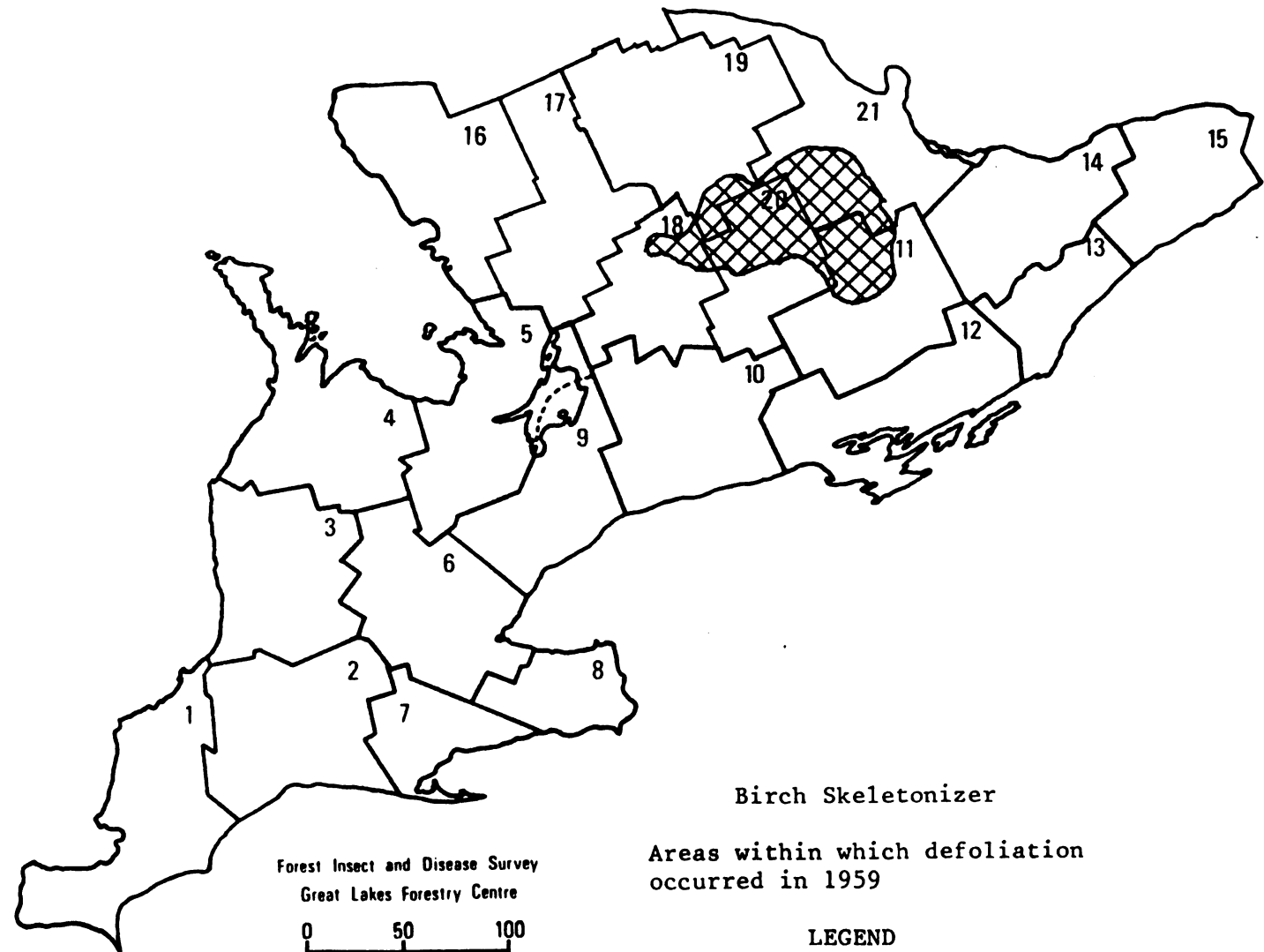
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Birch Skeletonizer

Areas within which defoliation  
occurred in 1959

## LEGEND

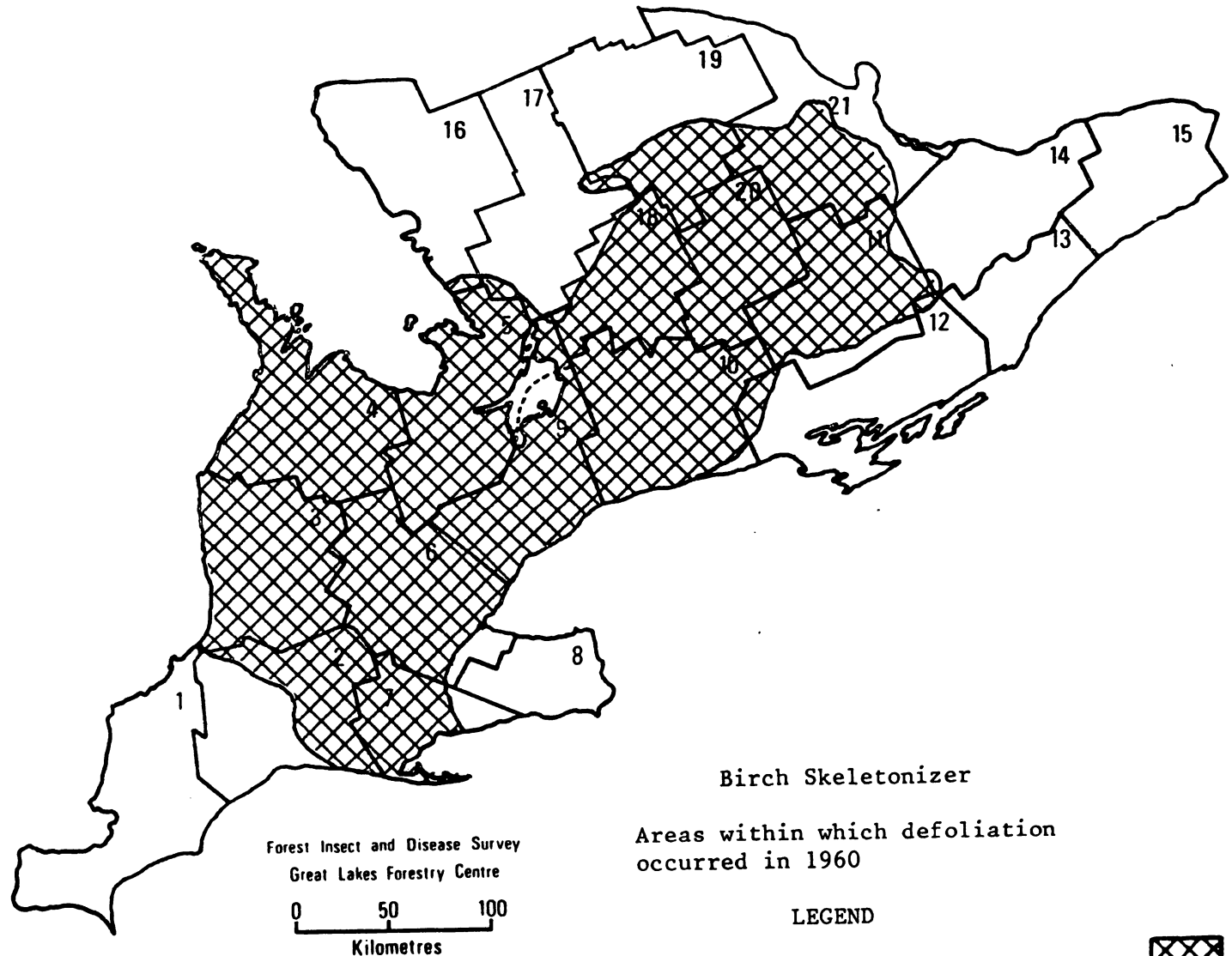
Moderate-to-severe defoliation



# SOUTHERN ONTARIO

## DISTRICTS

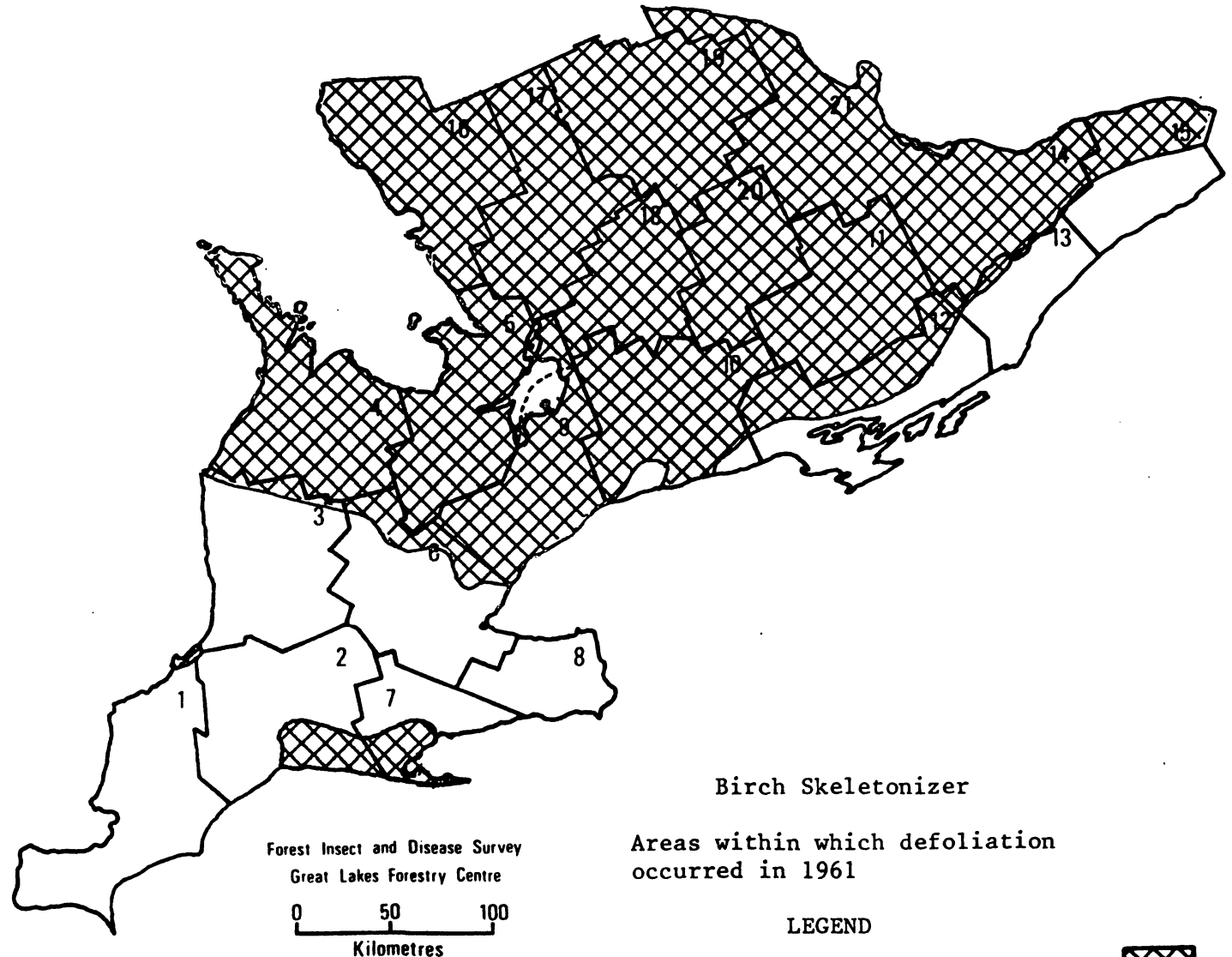
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

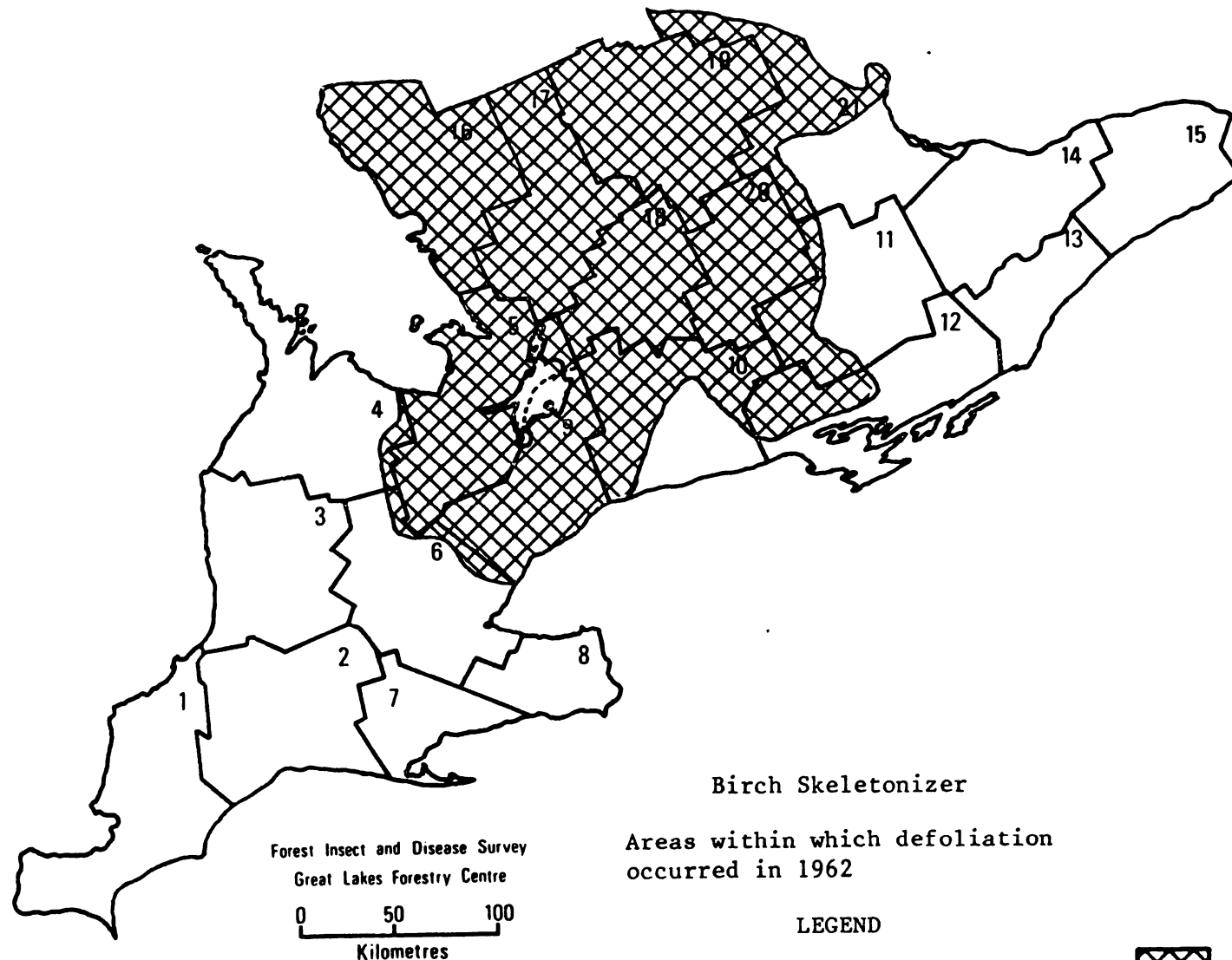
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Birch Skeletonizer

Areas within which defoliation  
occurred in 1962

LEGEND

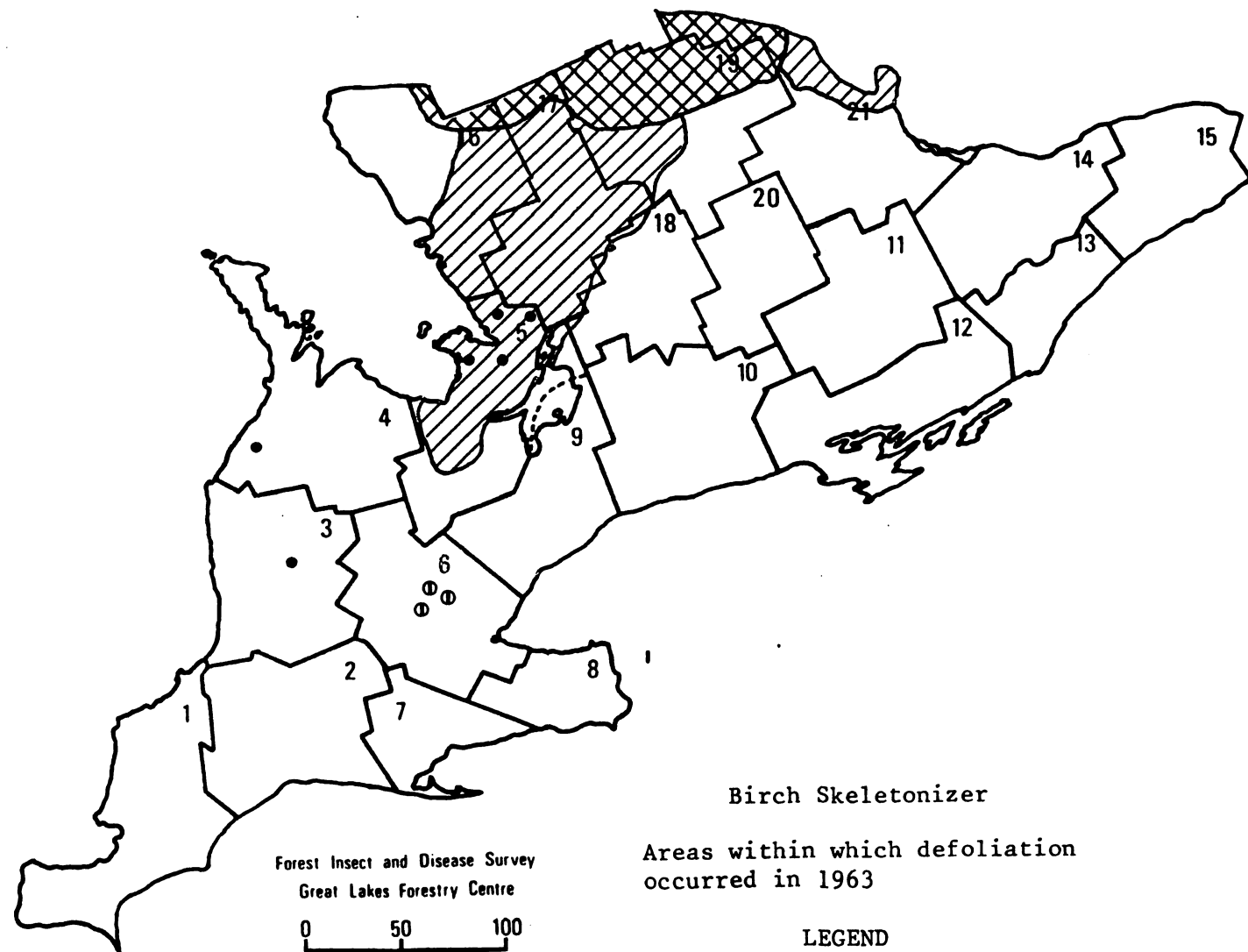
Moderate-to-severe defoliation



# SOUTHERN ONTARIO

## DISTRICTS

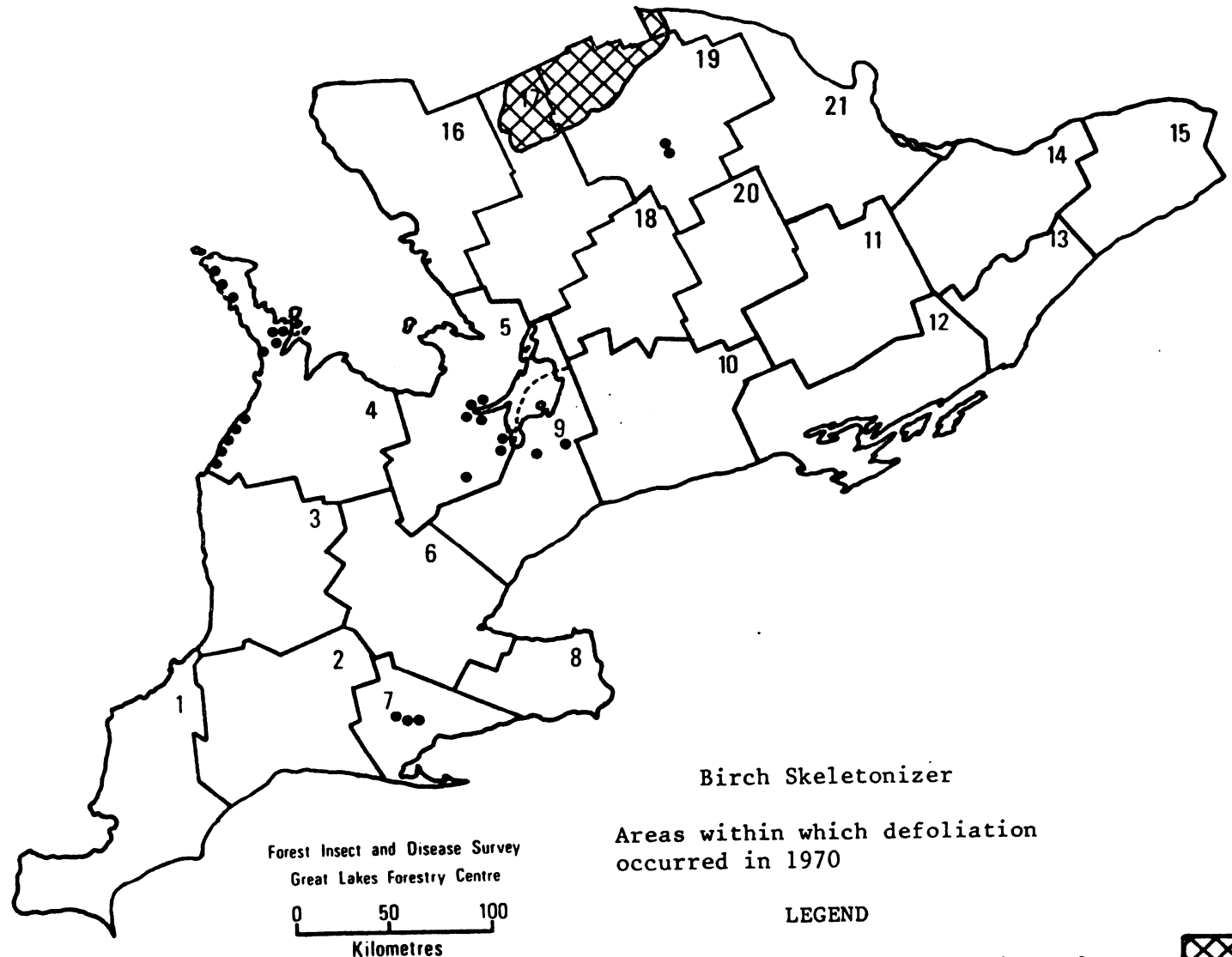
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

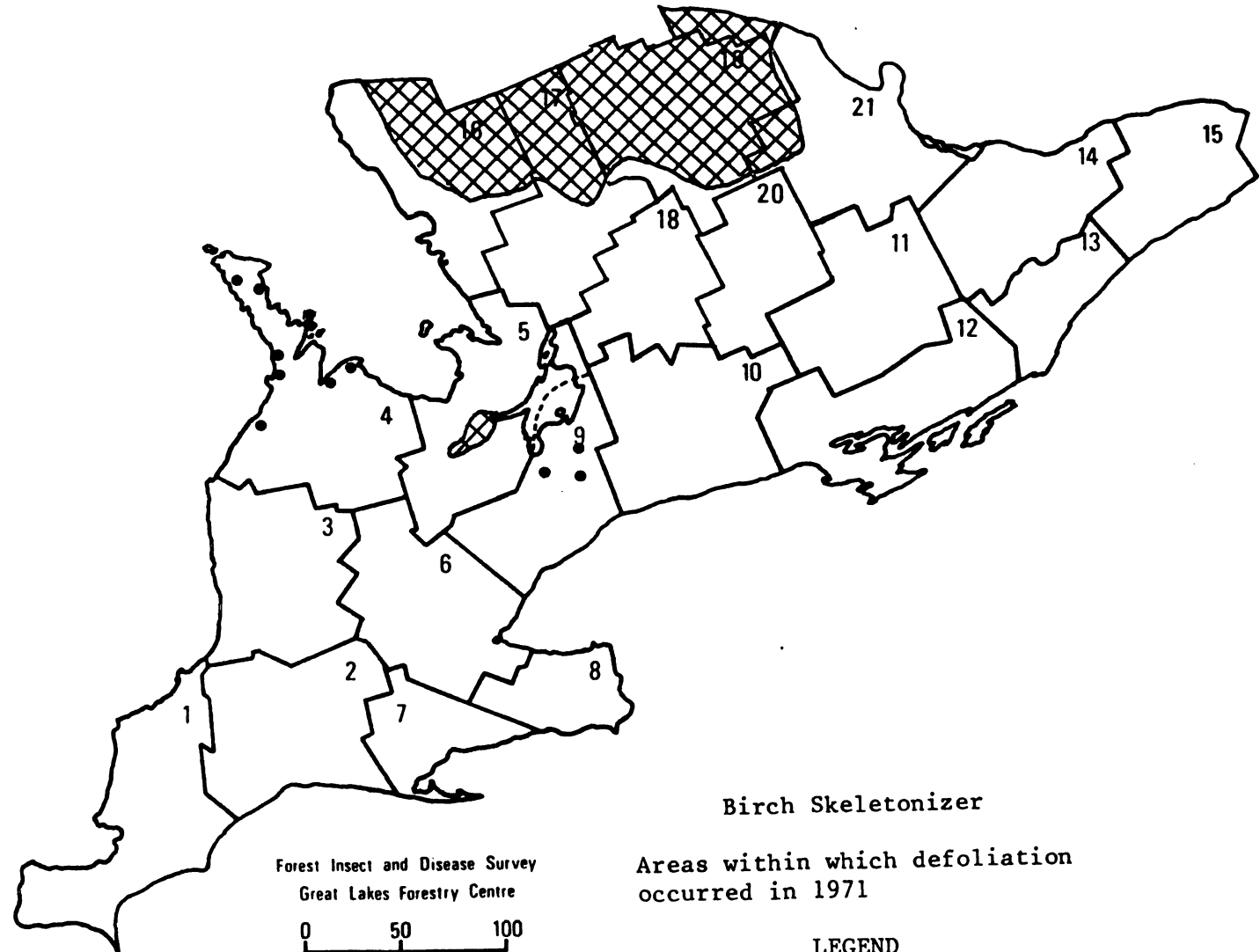
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

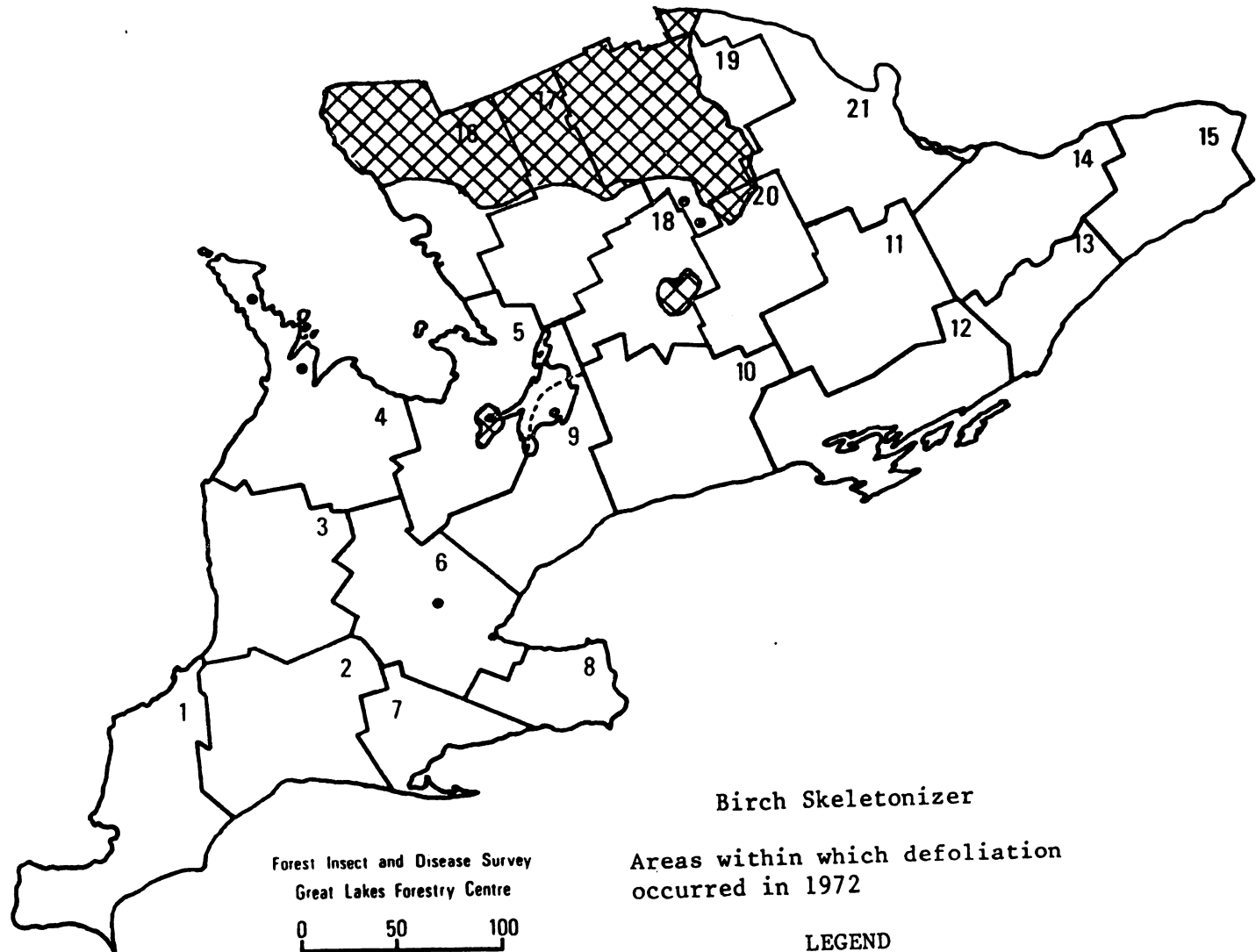
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

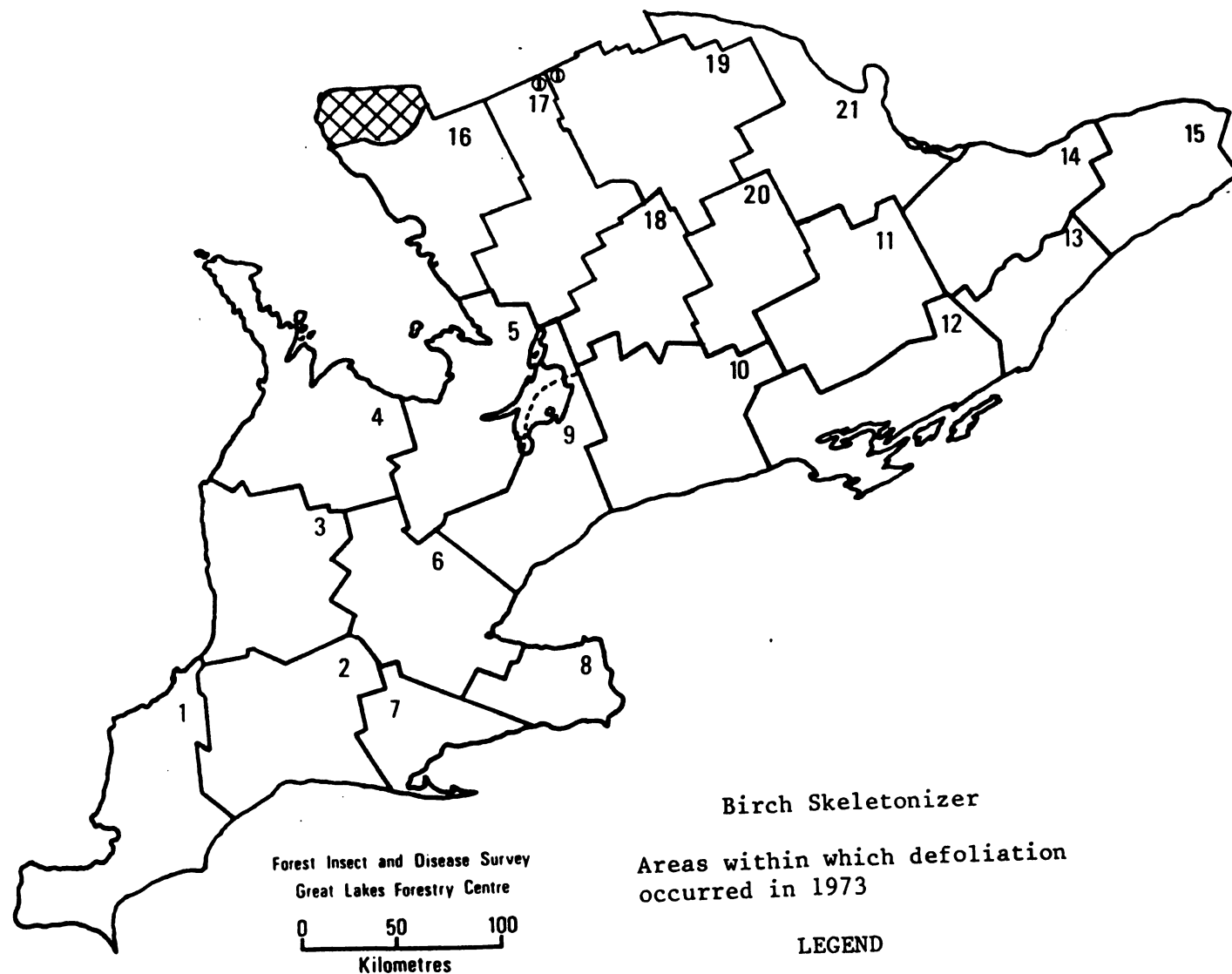
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

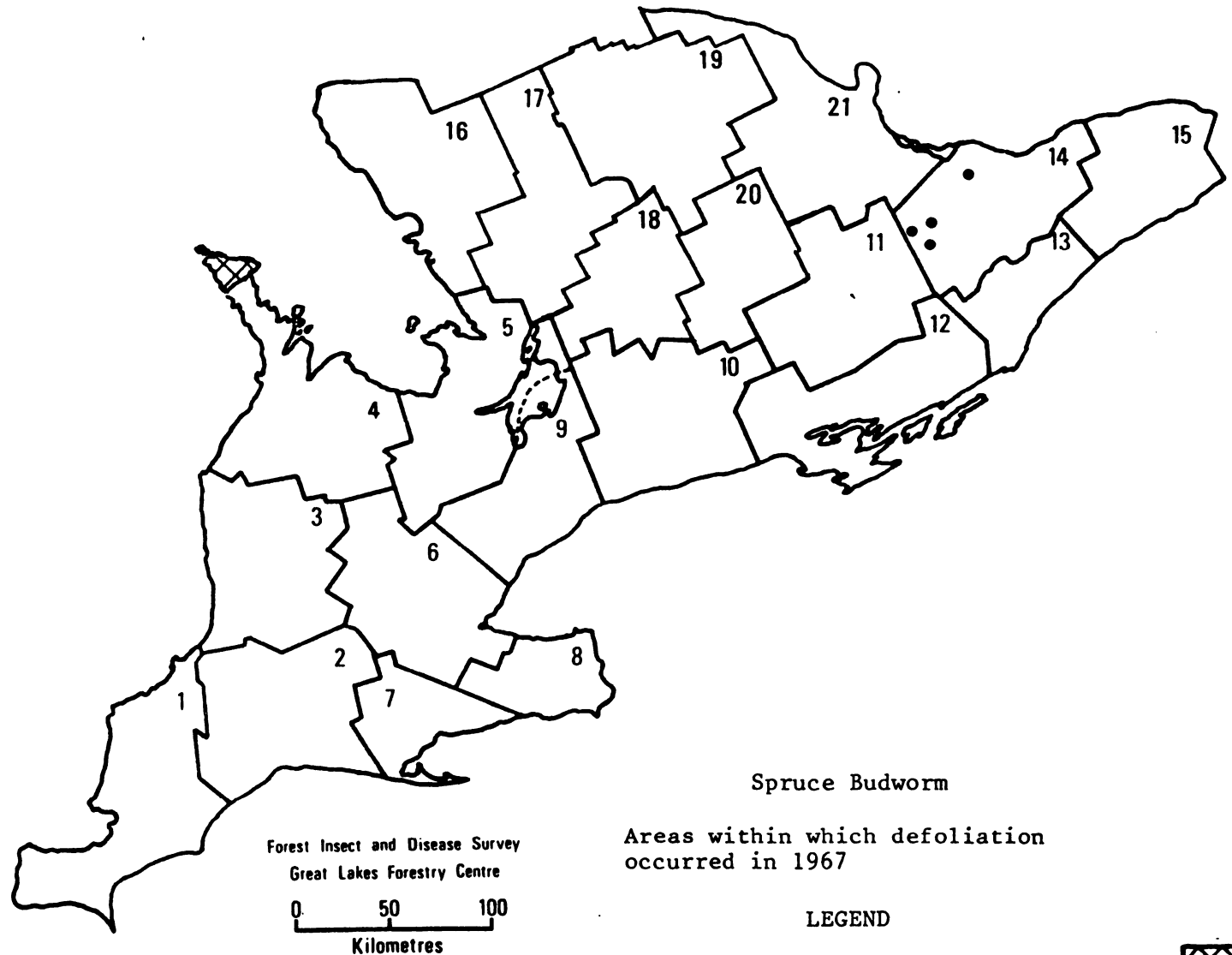
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

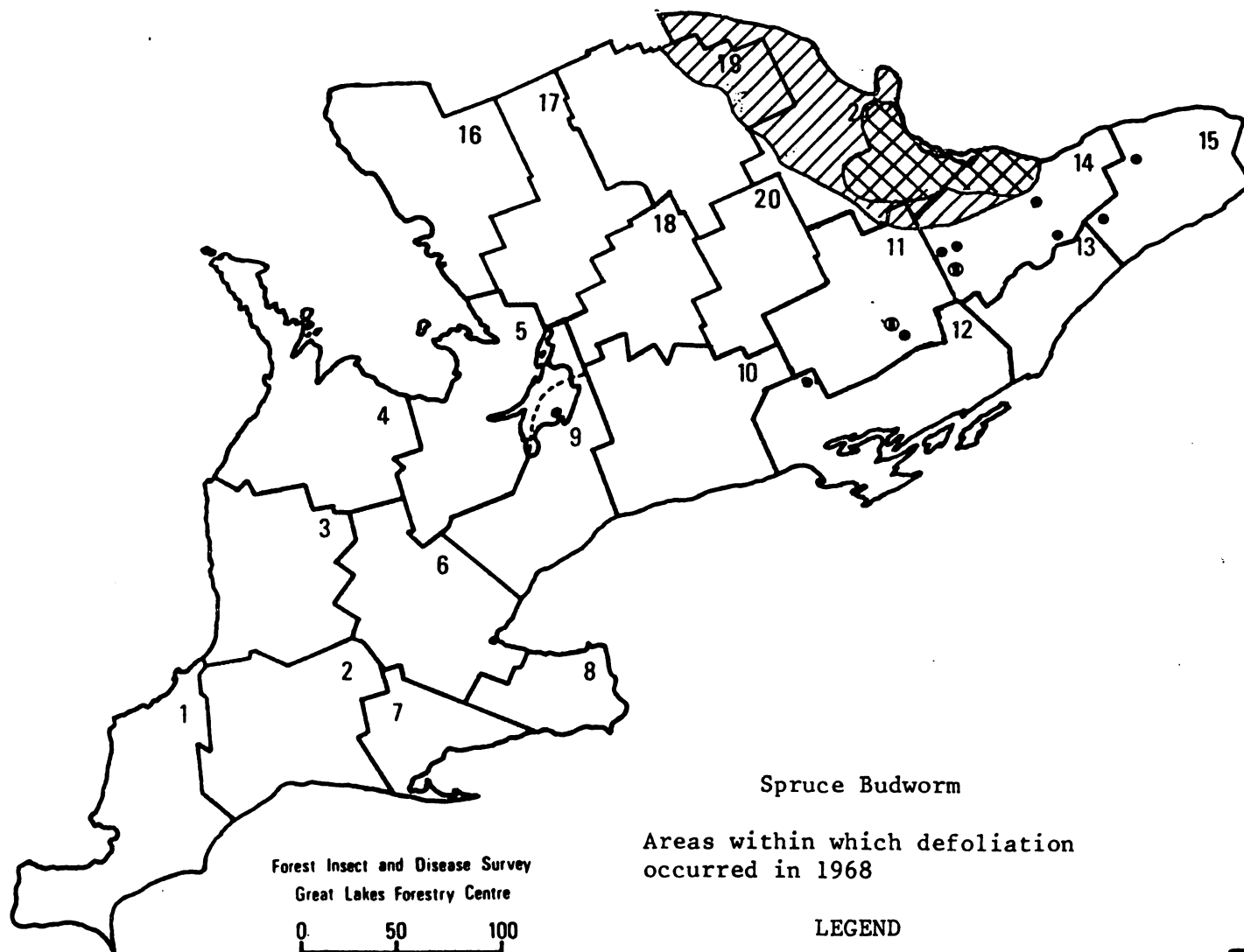
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

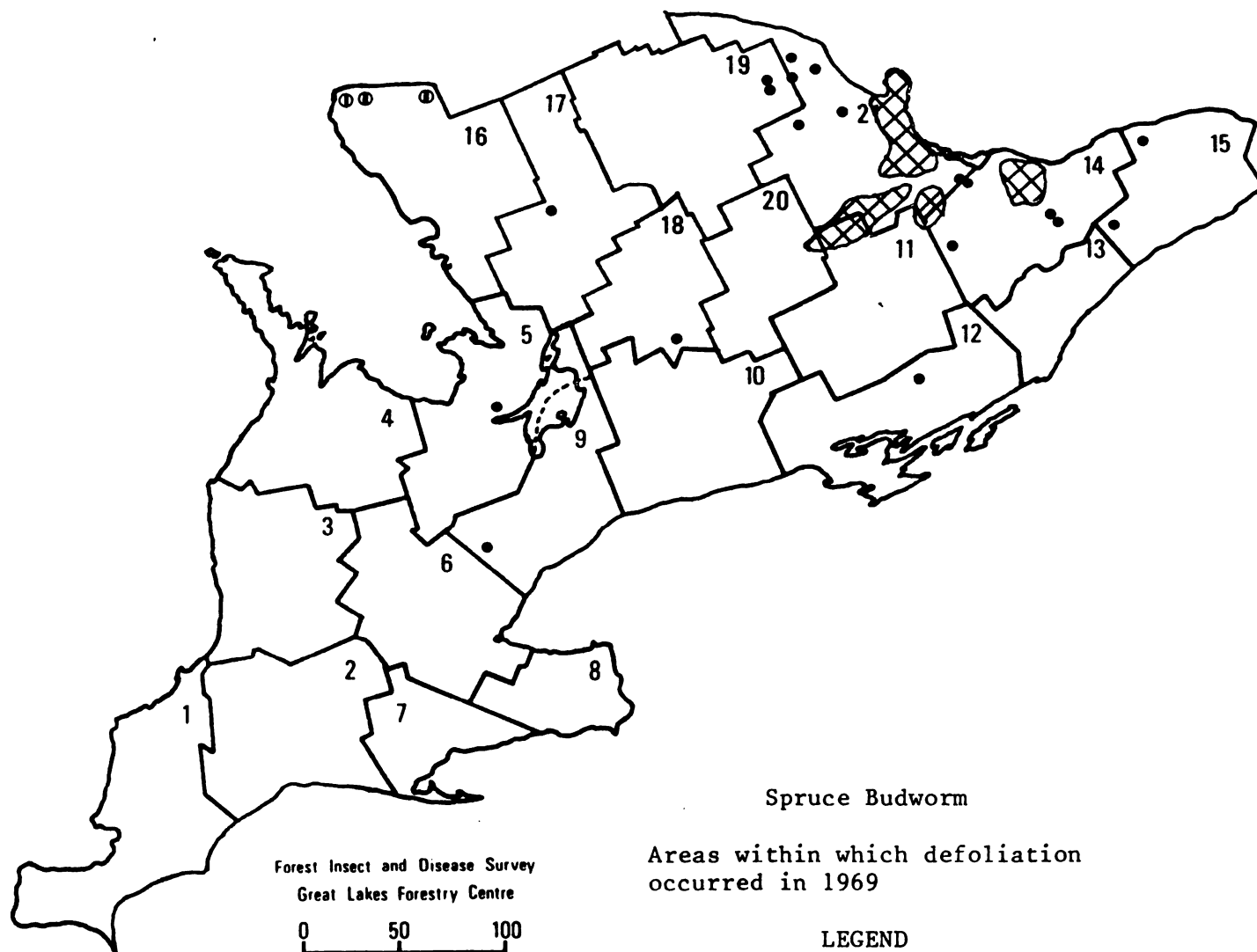
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

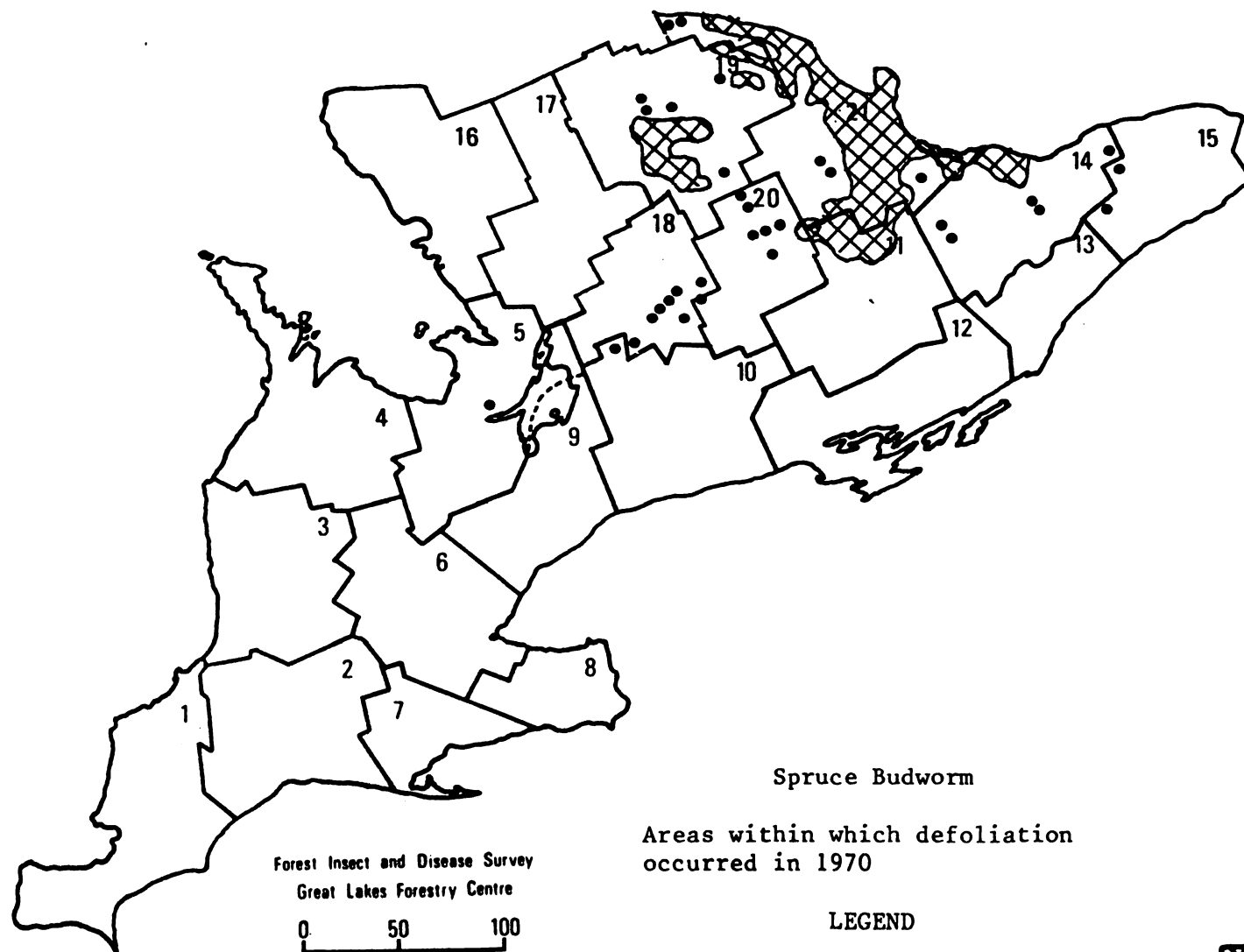
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Spruce Budworm

Areas within which defoliation  
occurred in 1970

## LEGEND

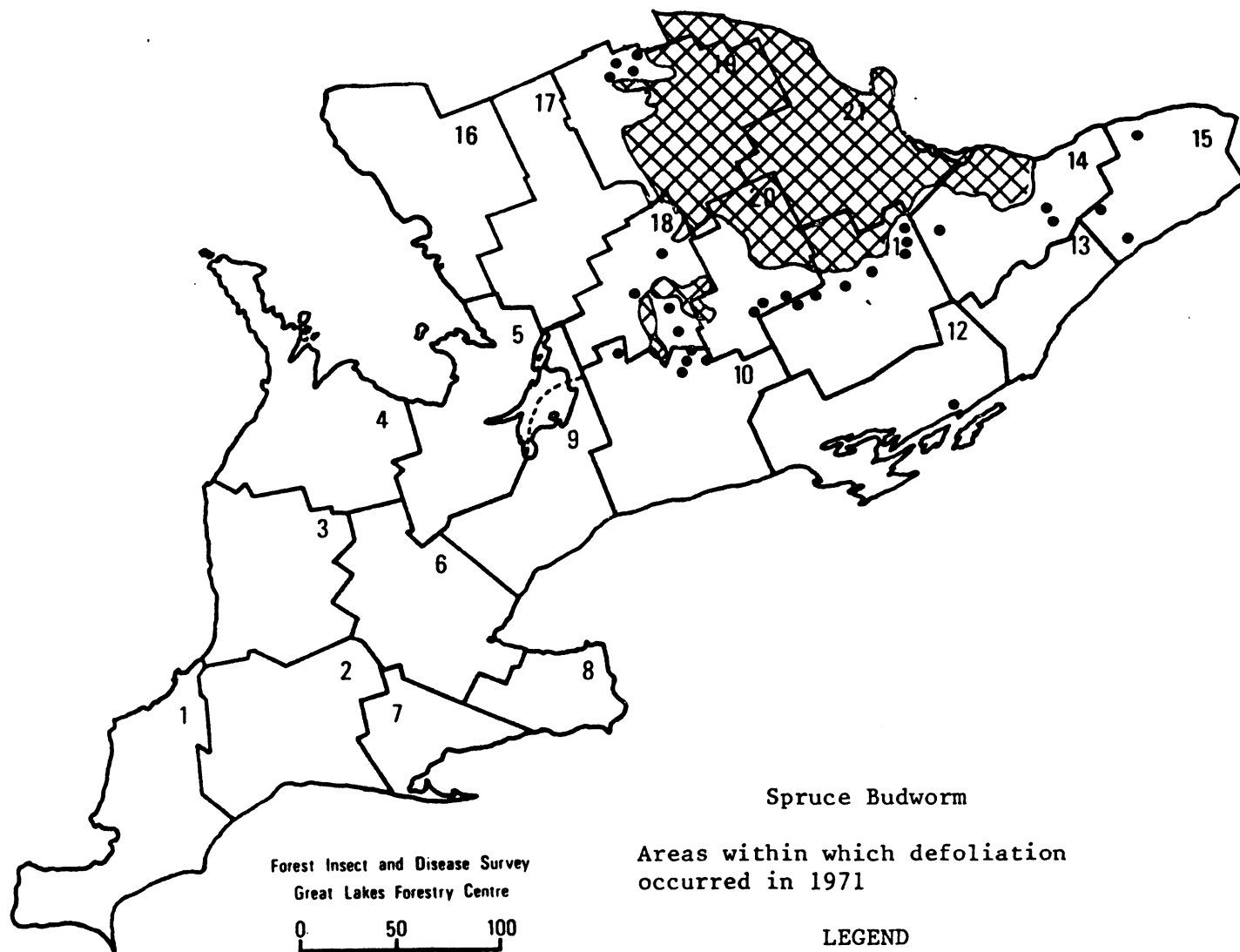
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

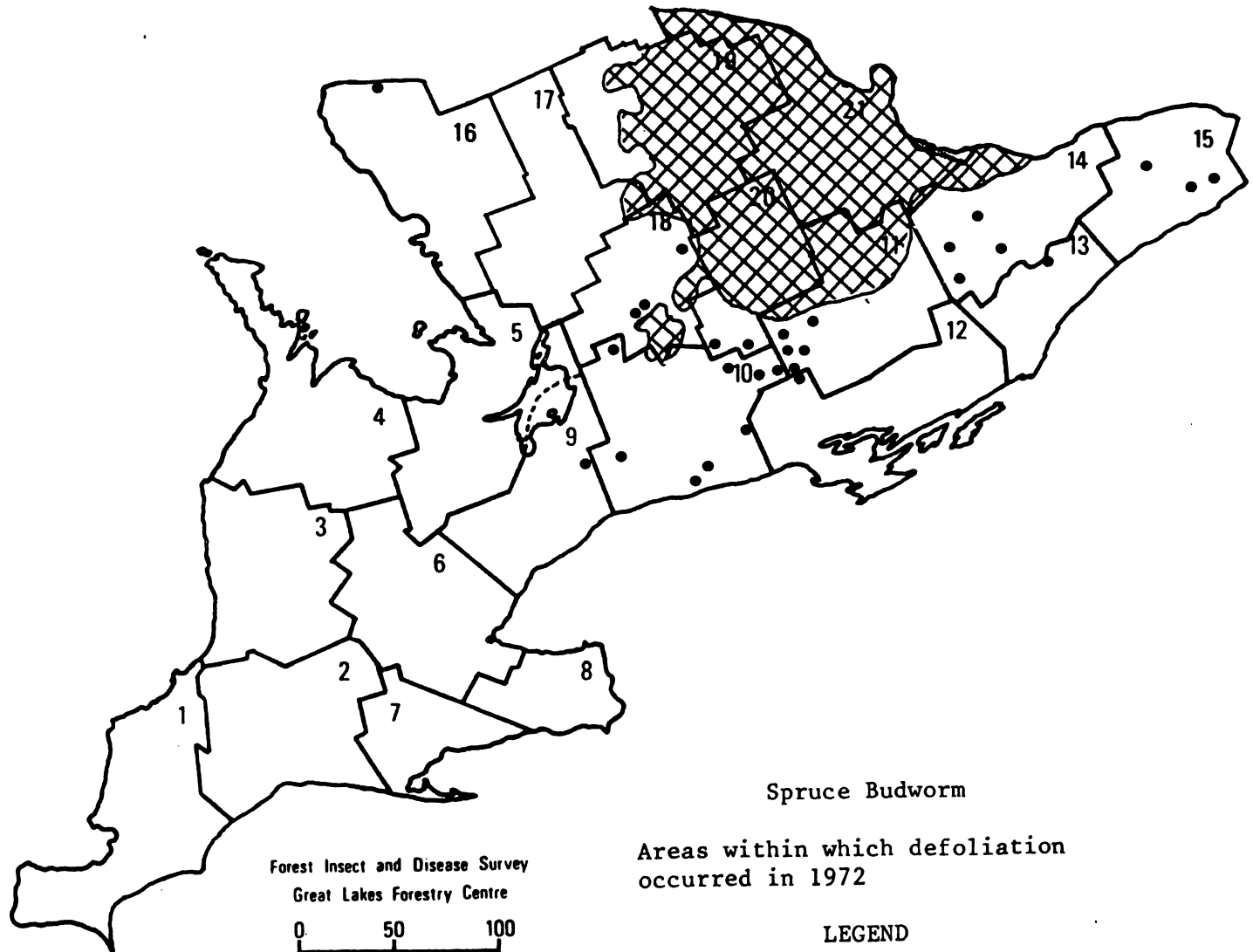
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

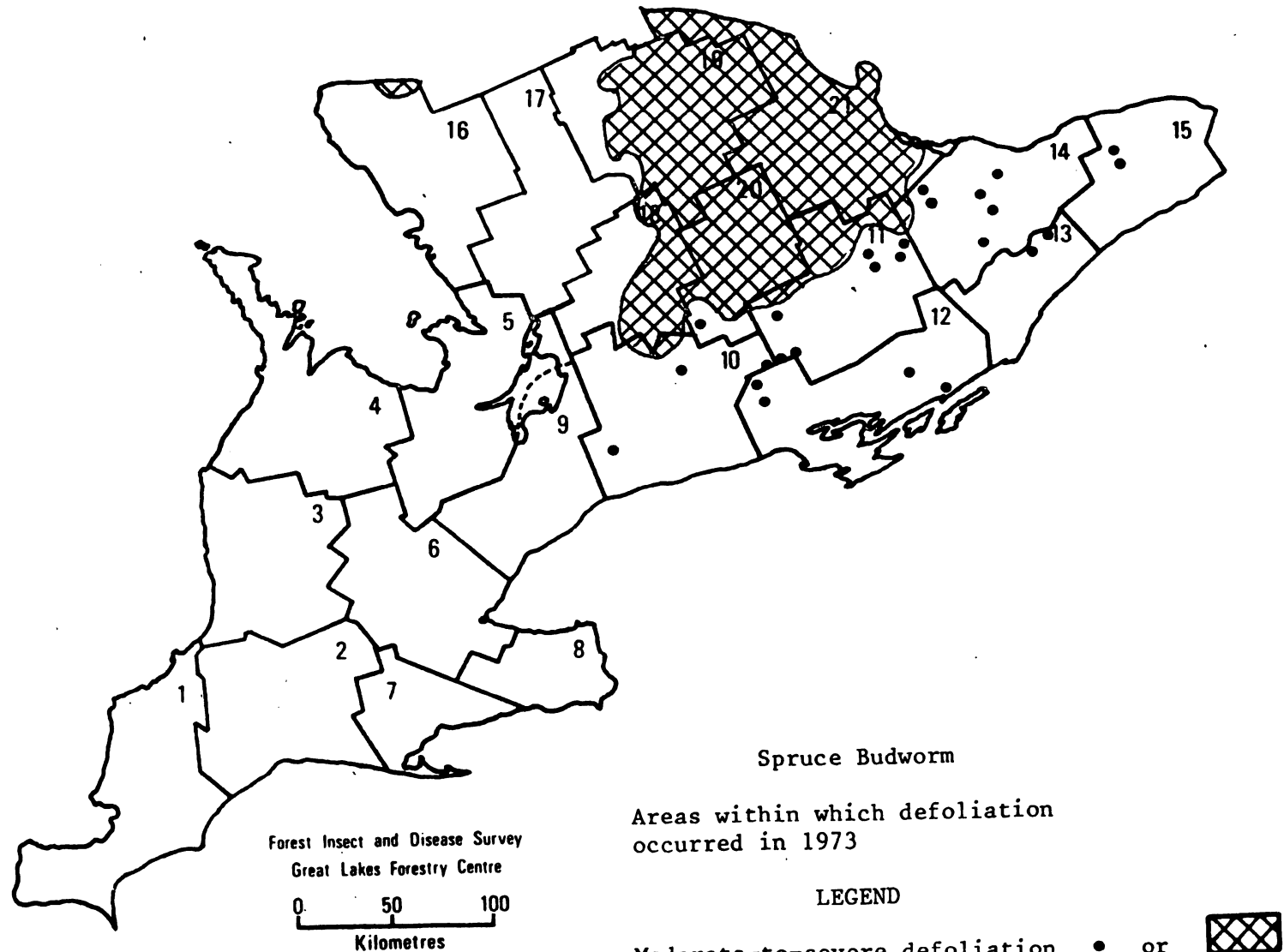
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Spruce Budworm

Areas within which defoliation occurred in 1973

## LEGEND

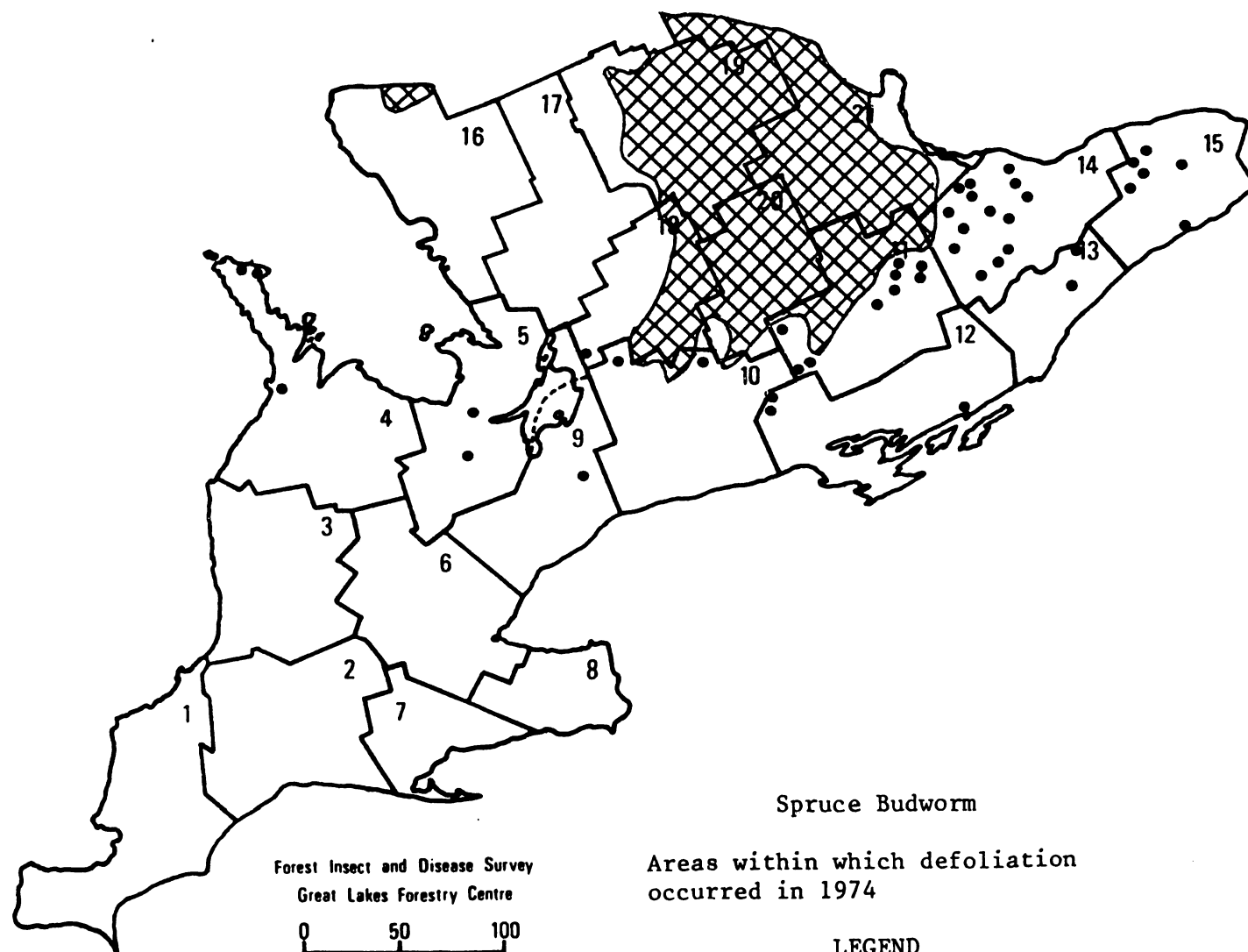
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

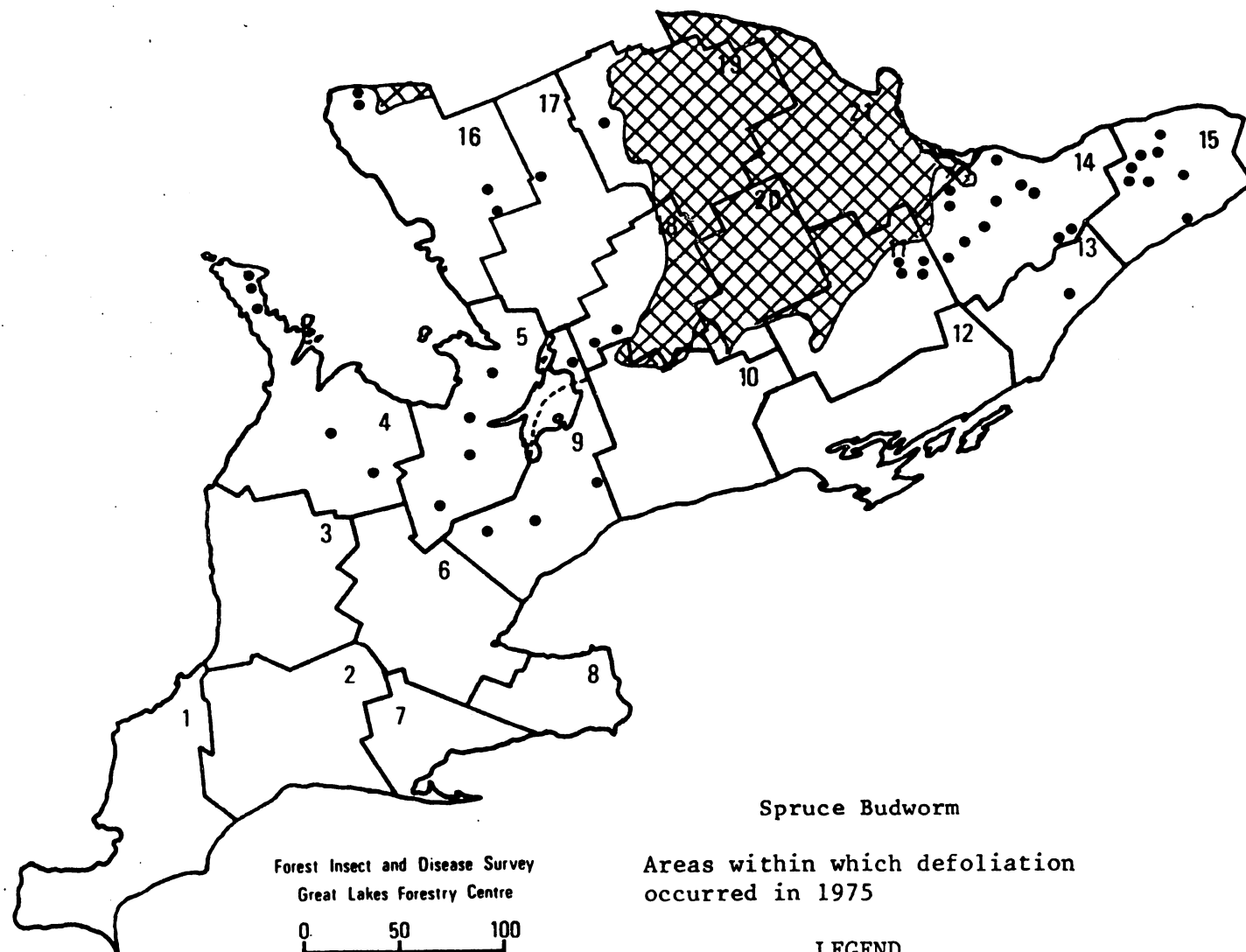
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

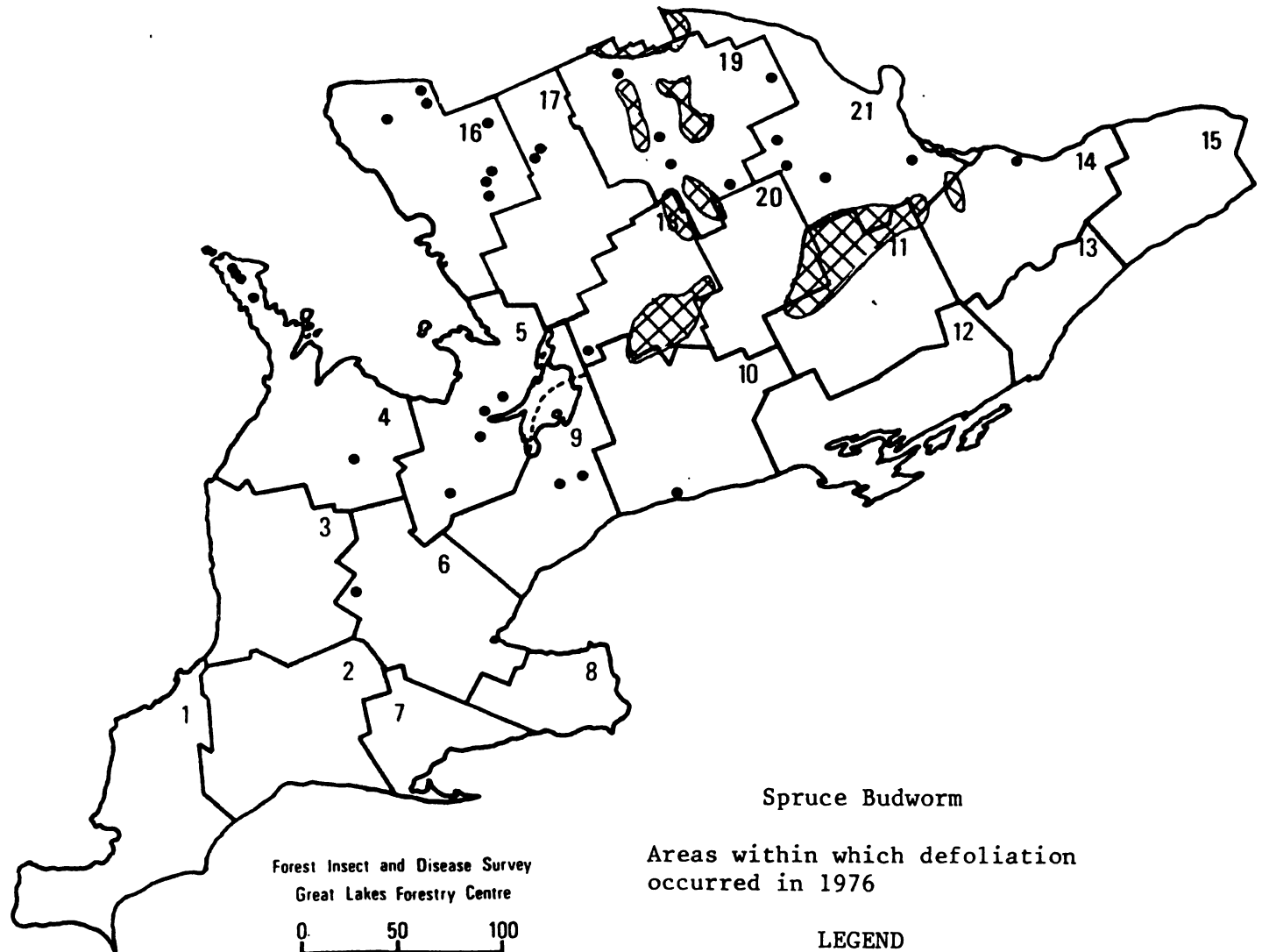
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS


1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Spruce Budworm

Areas within which defoliation  
occurred in 1976

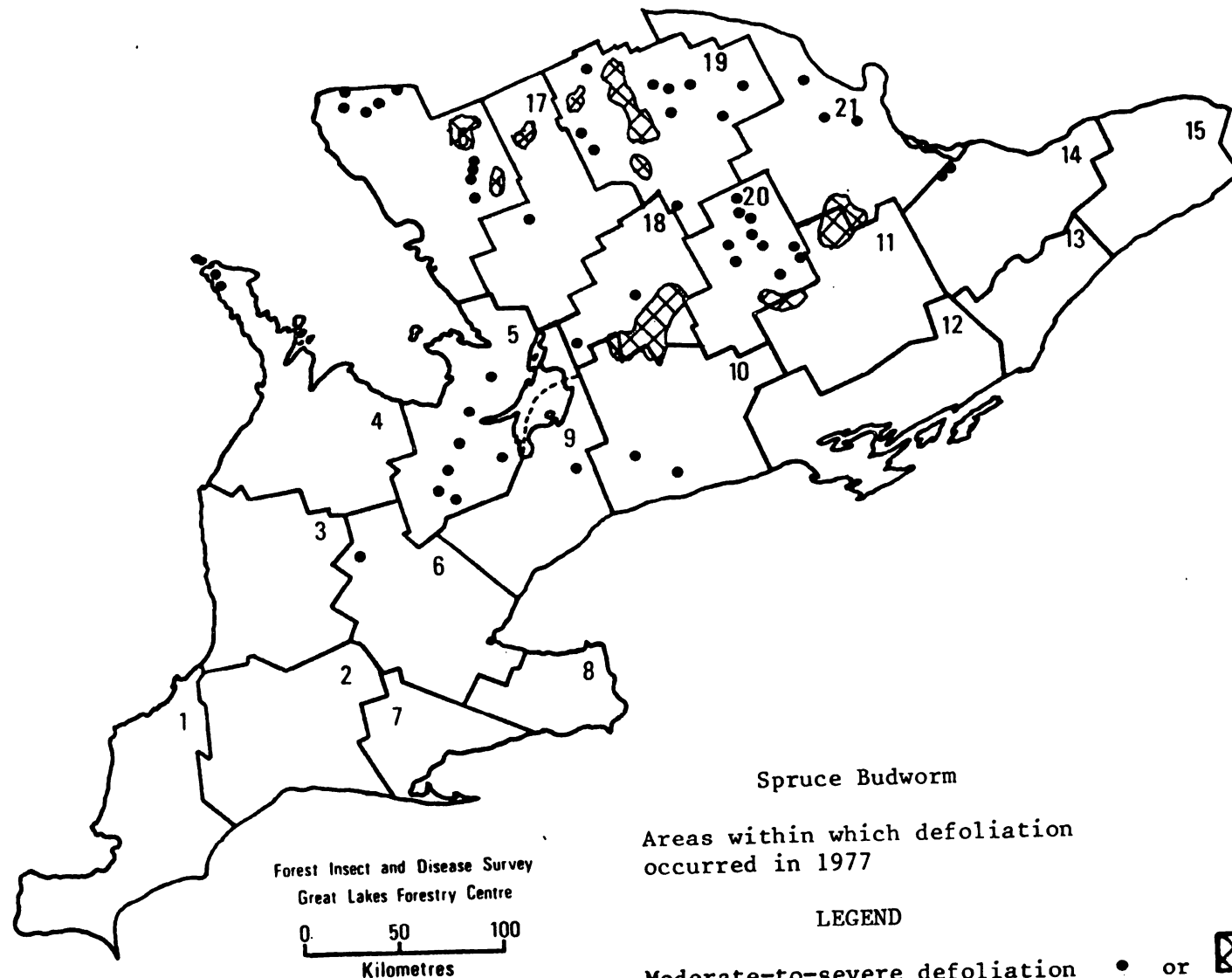
## LEGEND

Moderate-to-severe defoliation • or 

# SOUTHERN ONTARIO

## DISTRICTS

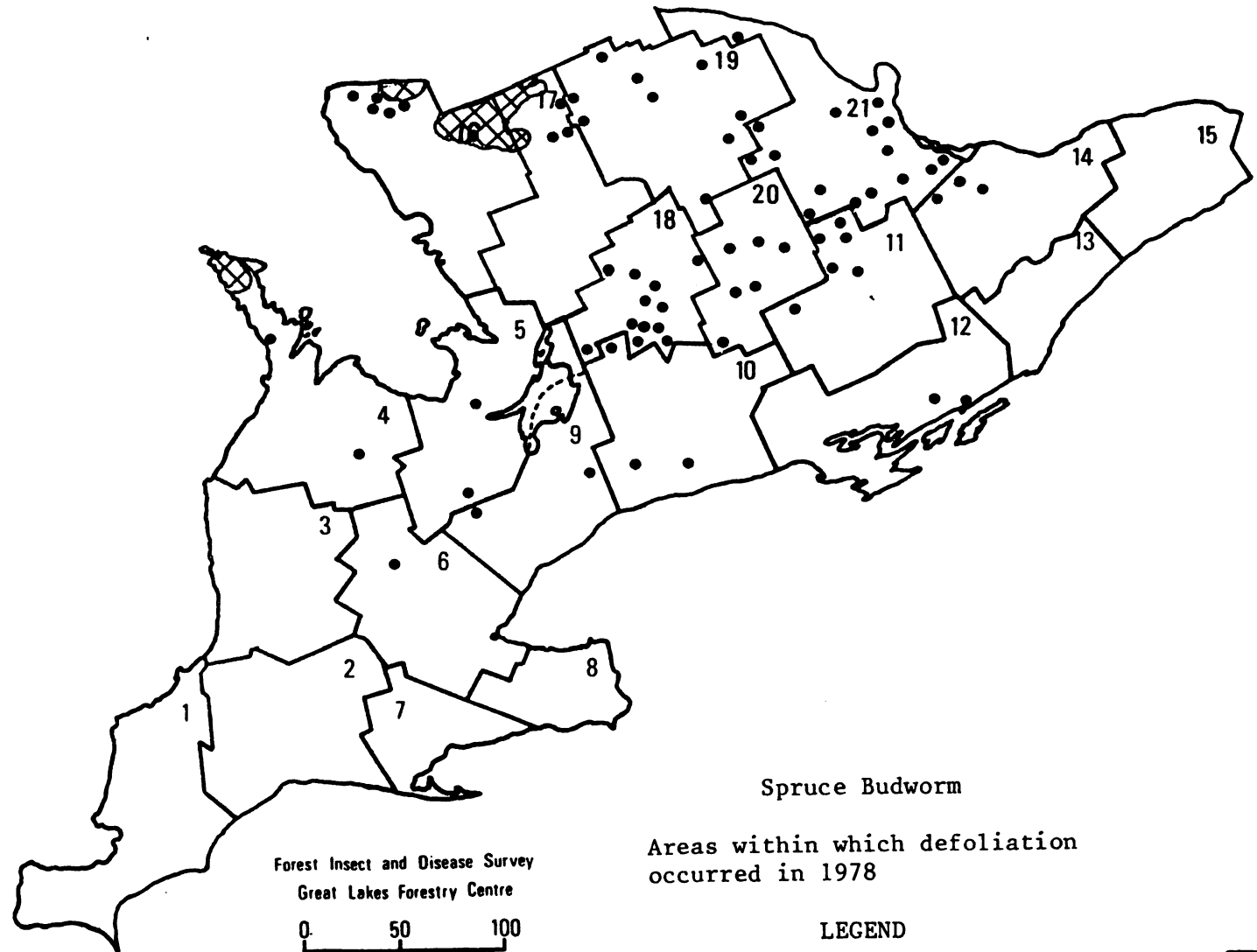
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

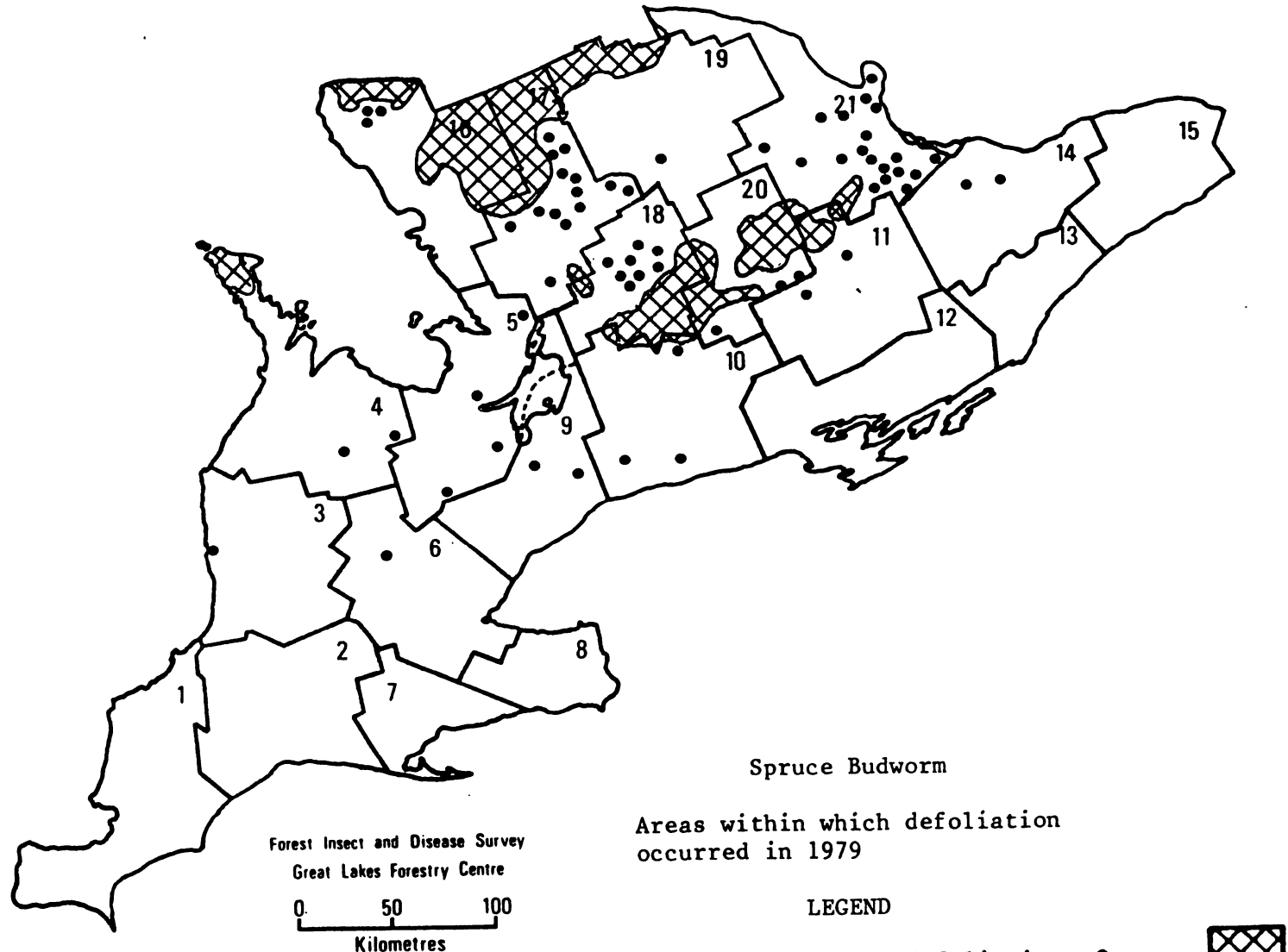
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

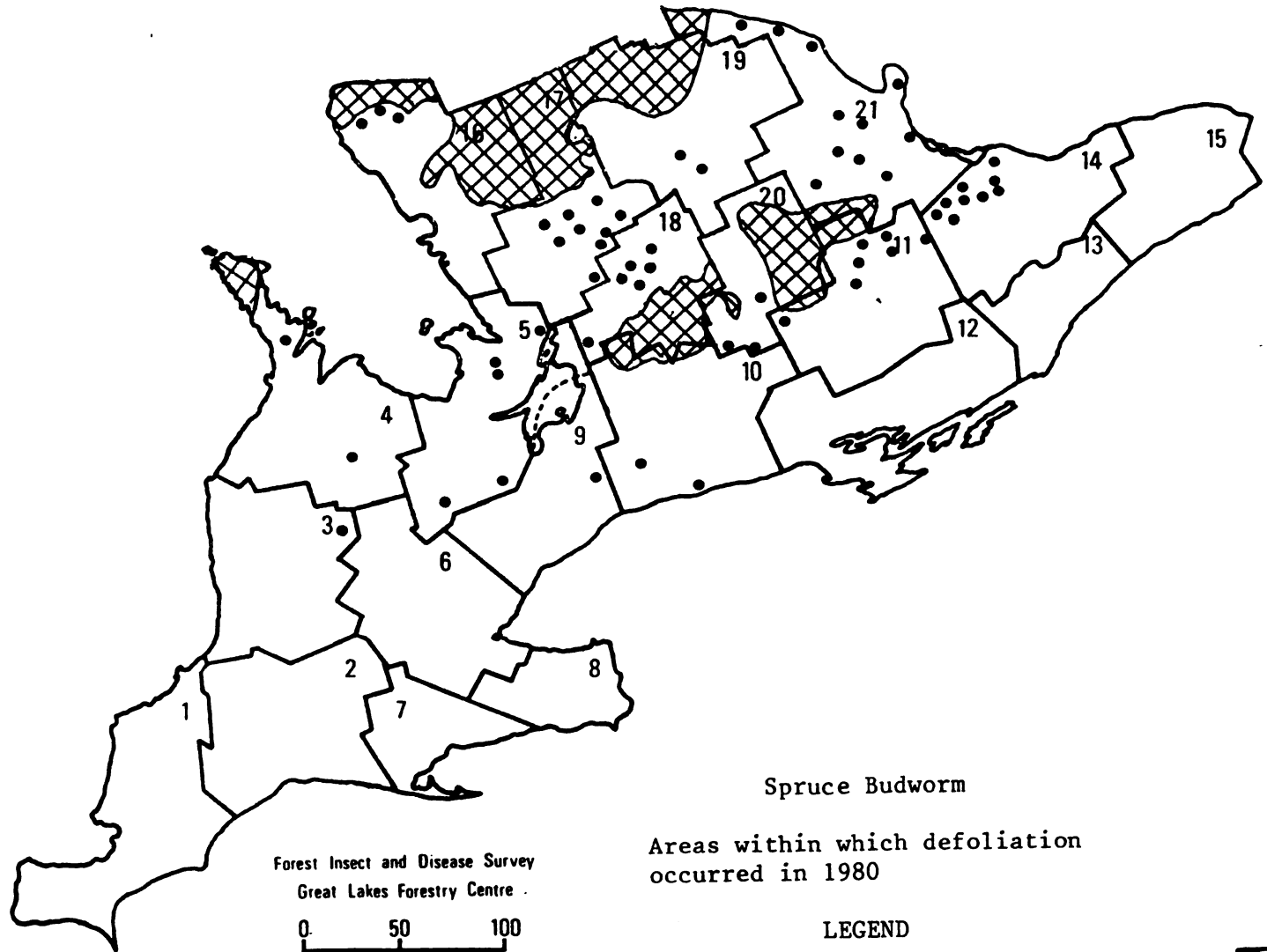
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Spruce Budworm

Areas within which defoliation  
occurred in 1980

## LEGEND

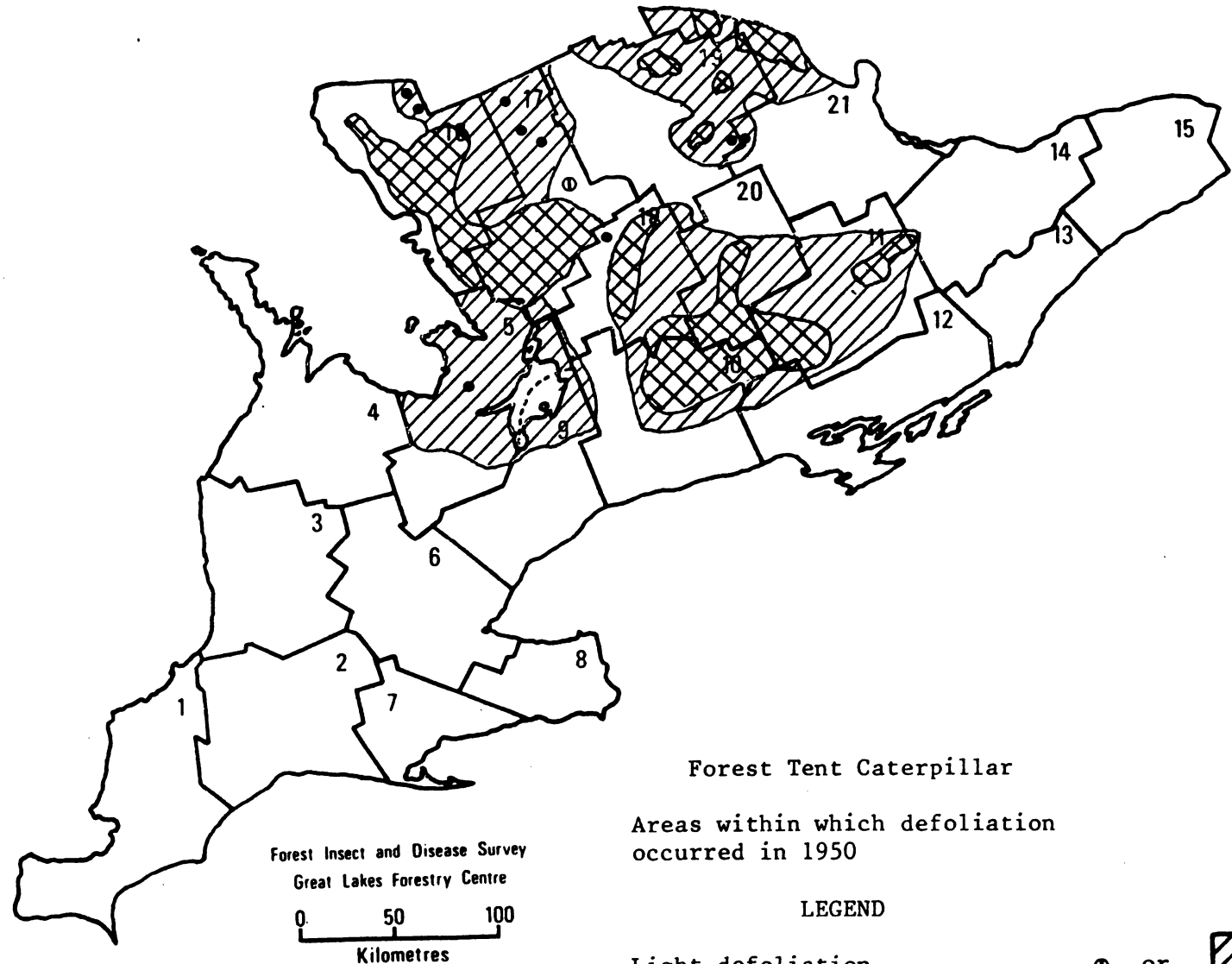
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

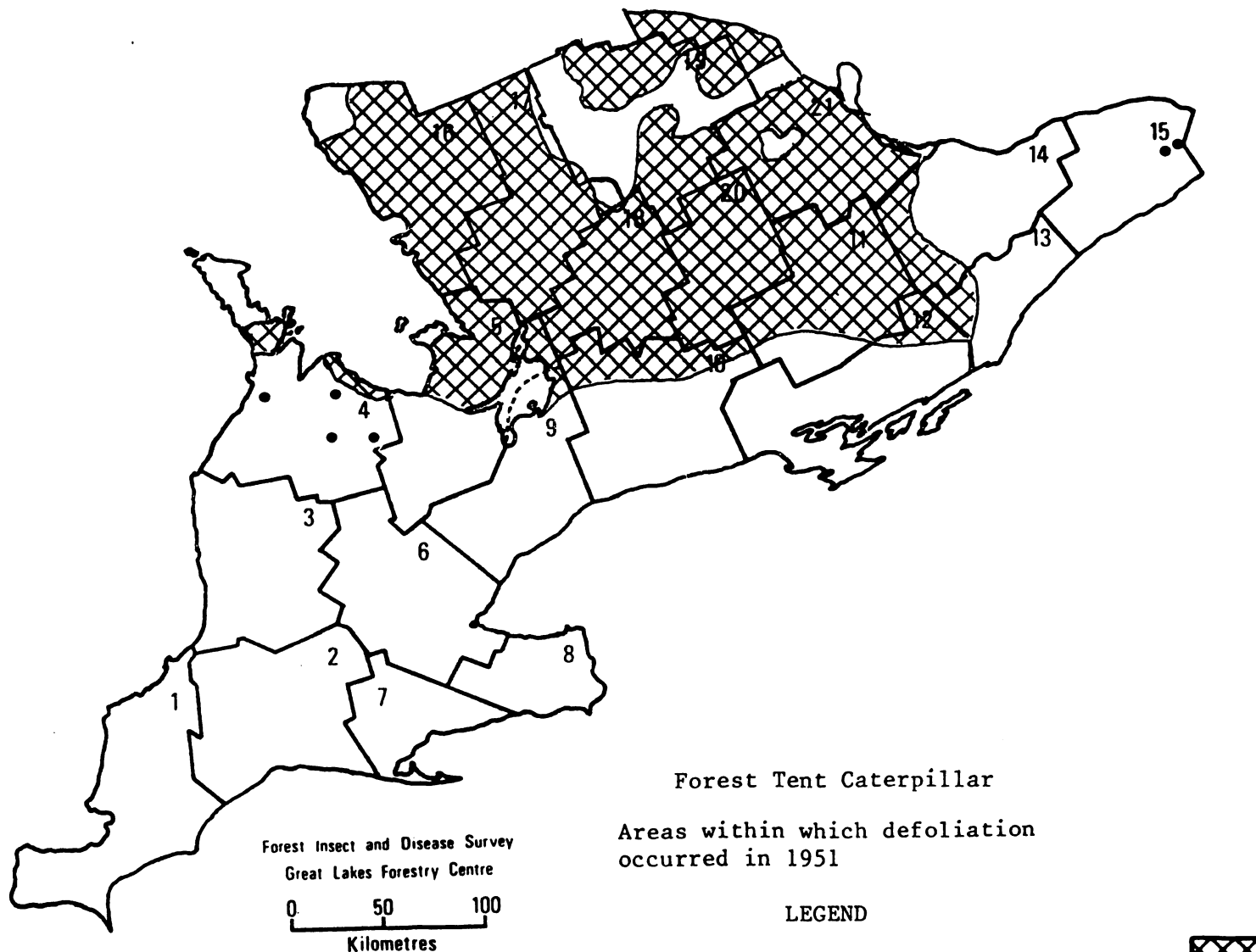
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

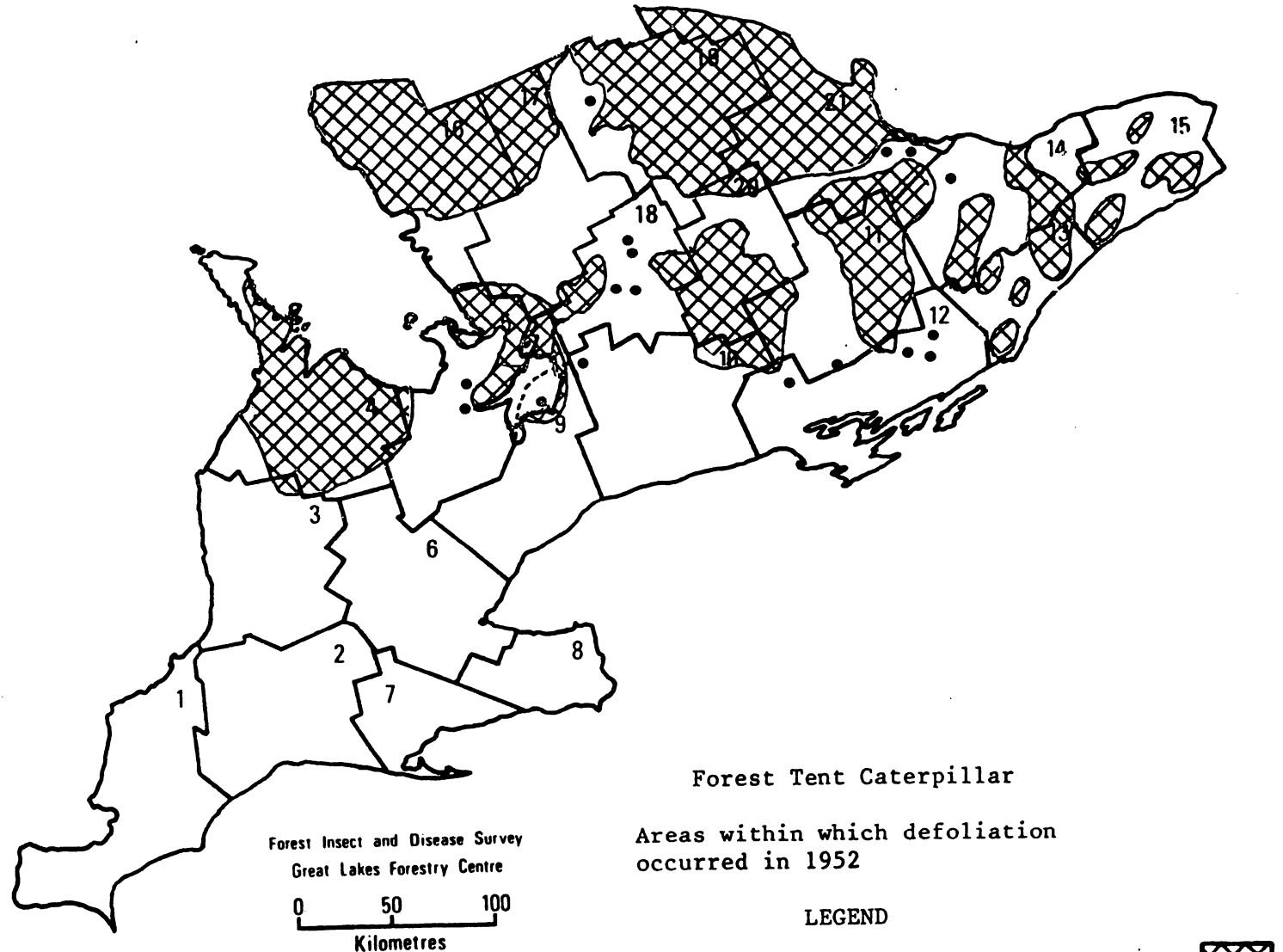
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

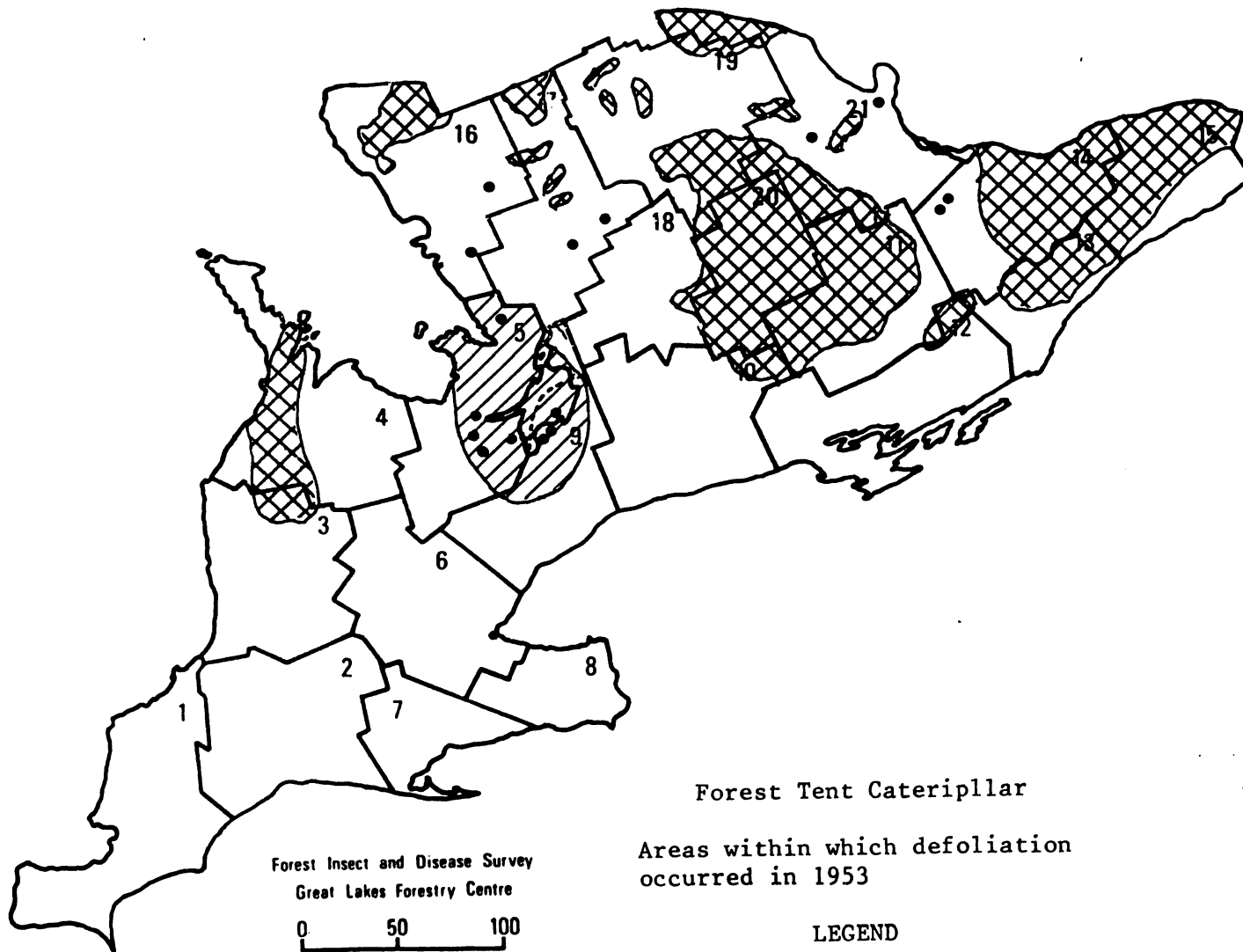
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1953

## LEGEND

Light defoliation

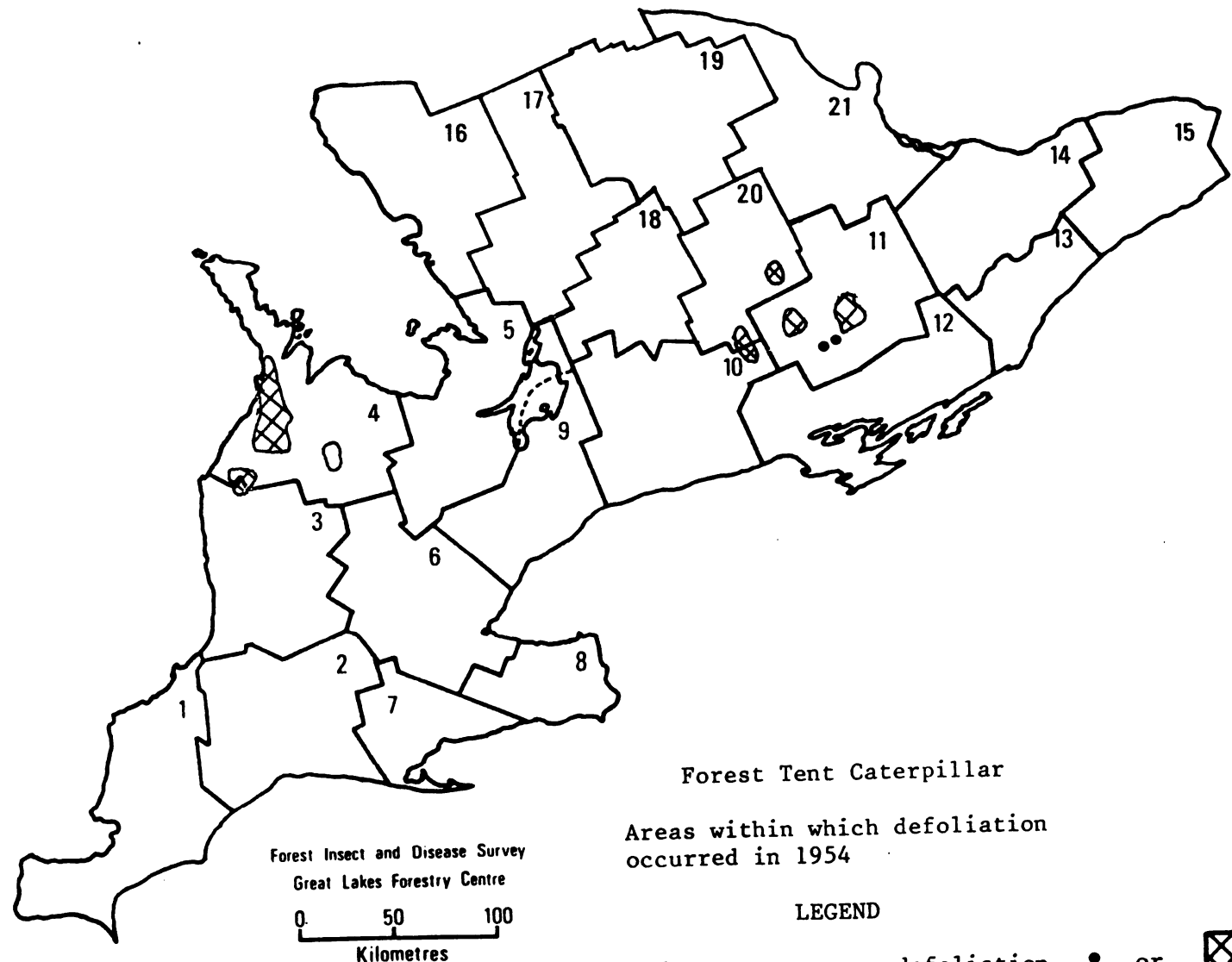
Moderate-to-severe defoliation • or



# SOUTHERN ONTARIO

## DISTRICTS

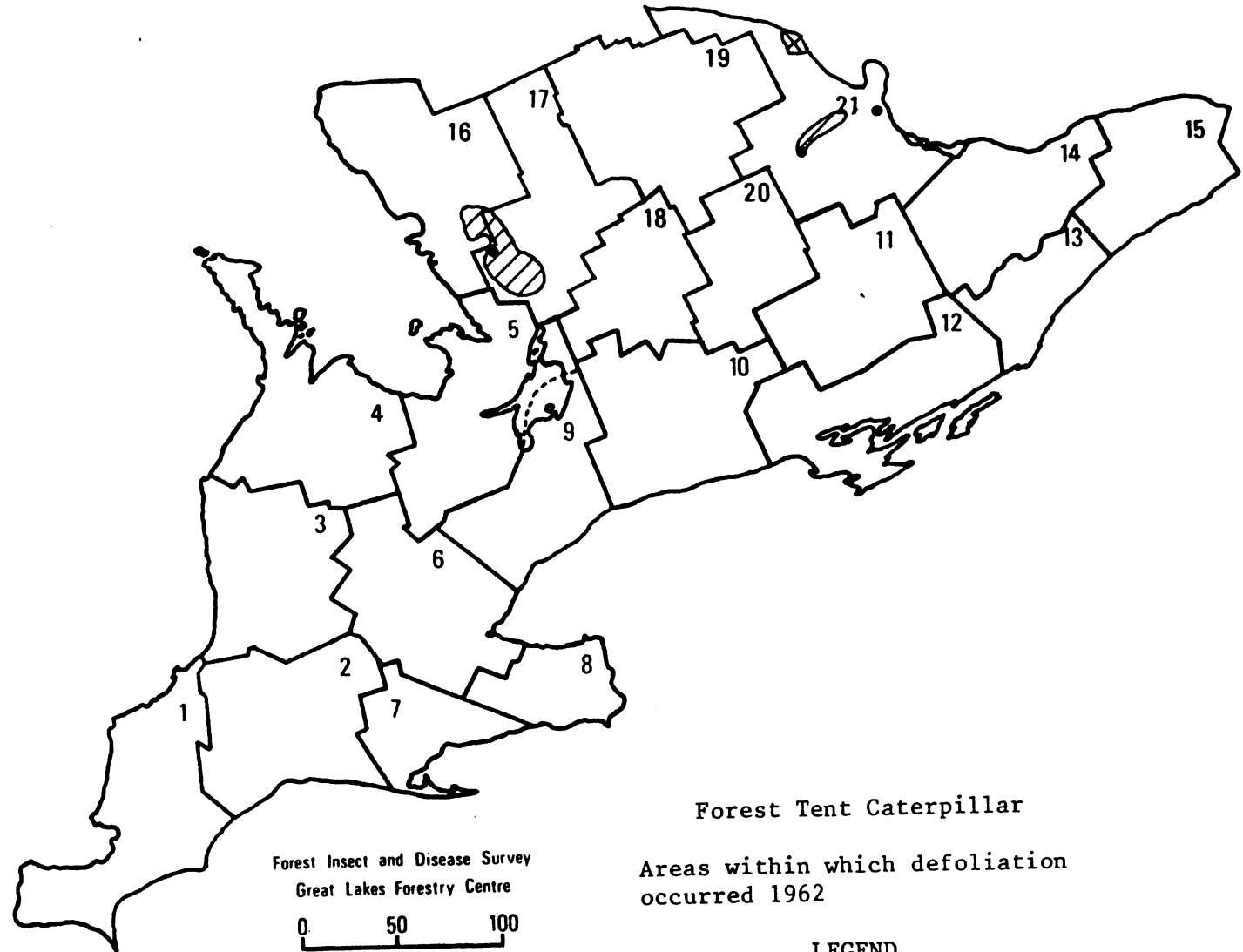
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation  
occurred 1962

## LEGEND

Light defoliation

Moderate-to-severe defoliation



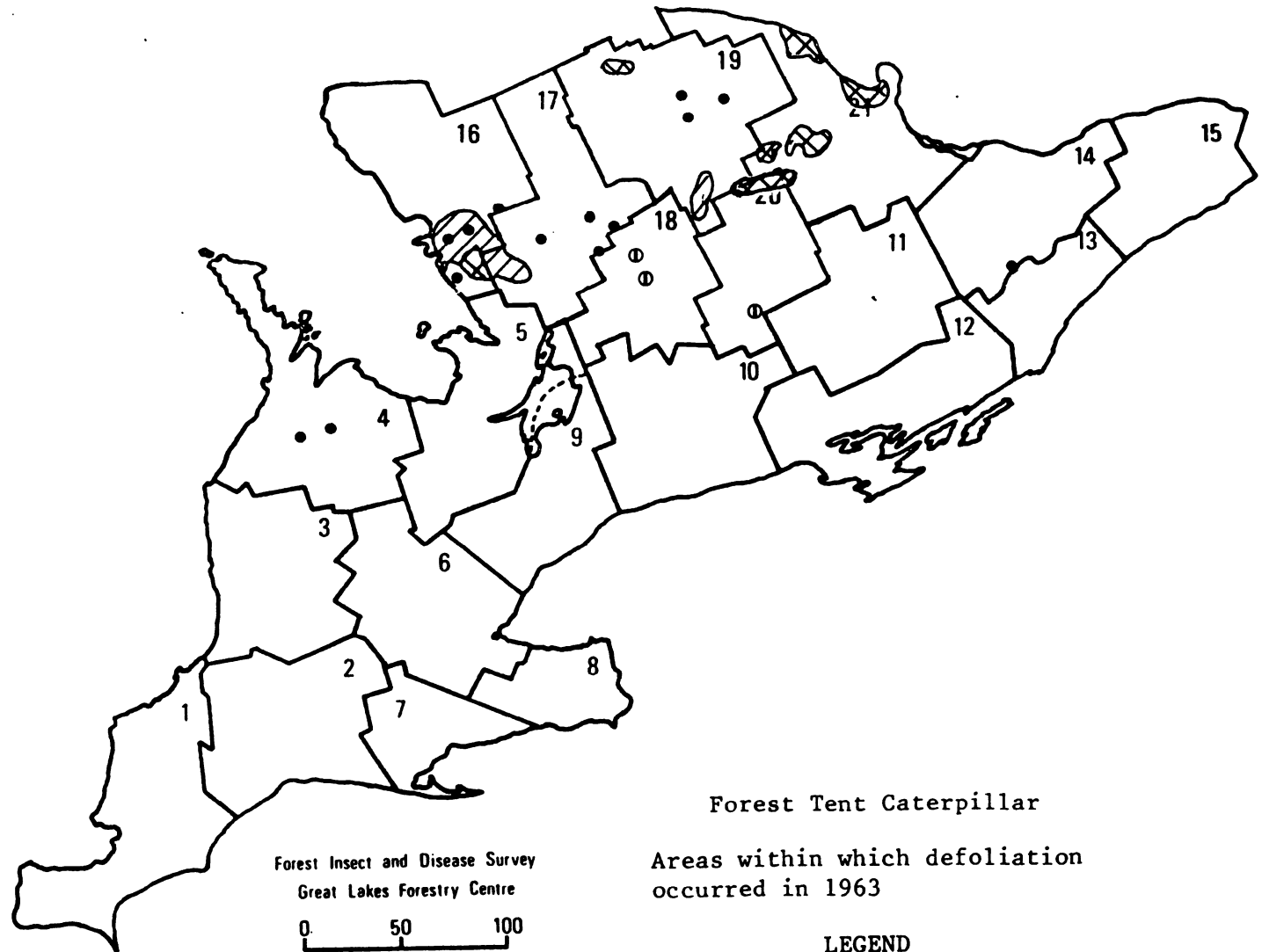
• or



# SOUTHERN ONTARIO

## DISTRICTS

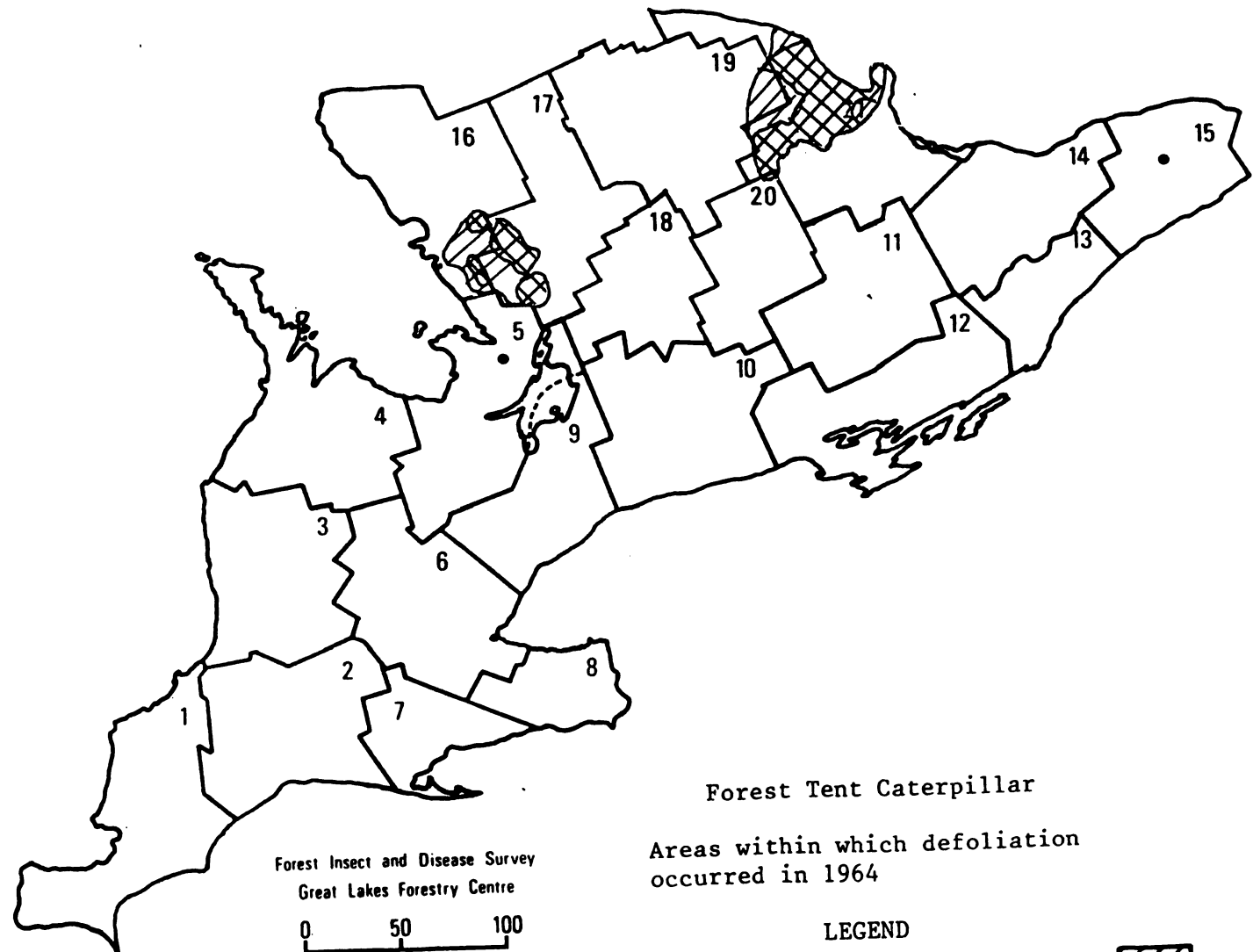
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1964

## LEGEND

Light defoliation

Moderate-to-severe defoliation



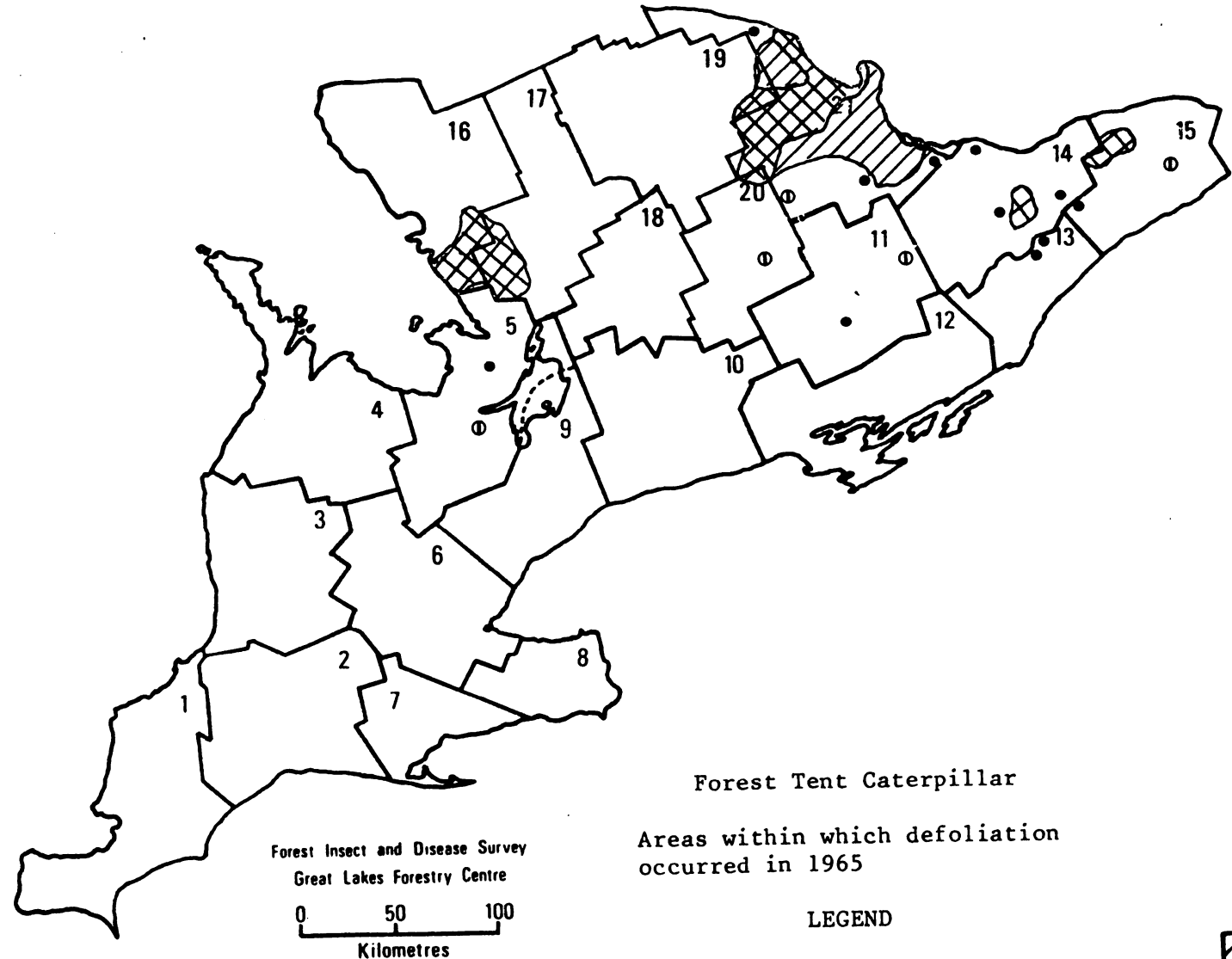
• or



# SOUTHERN ONTARIO

## DISTRICTS

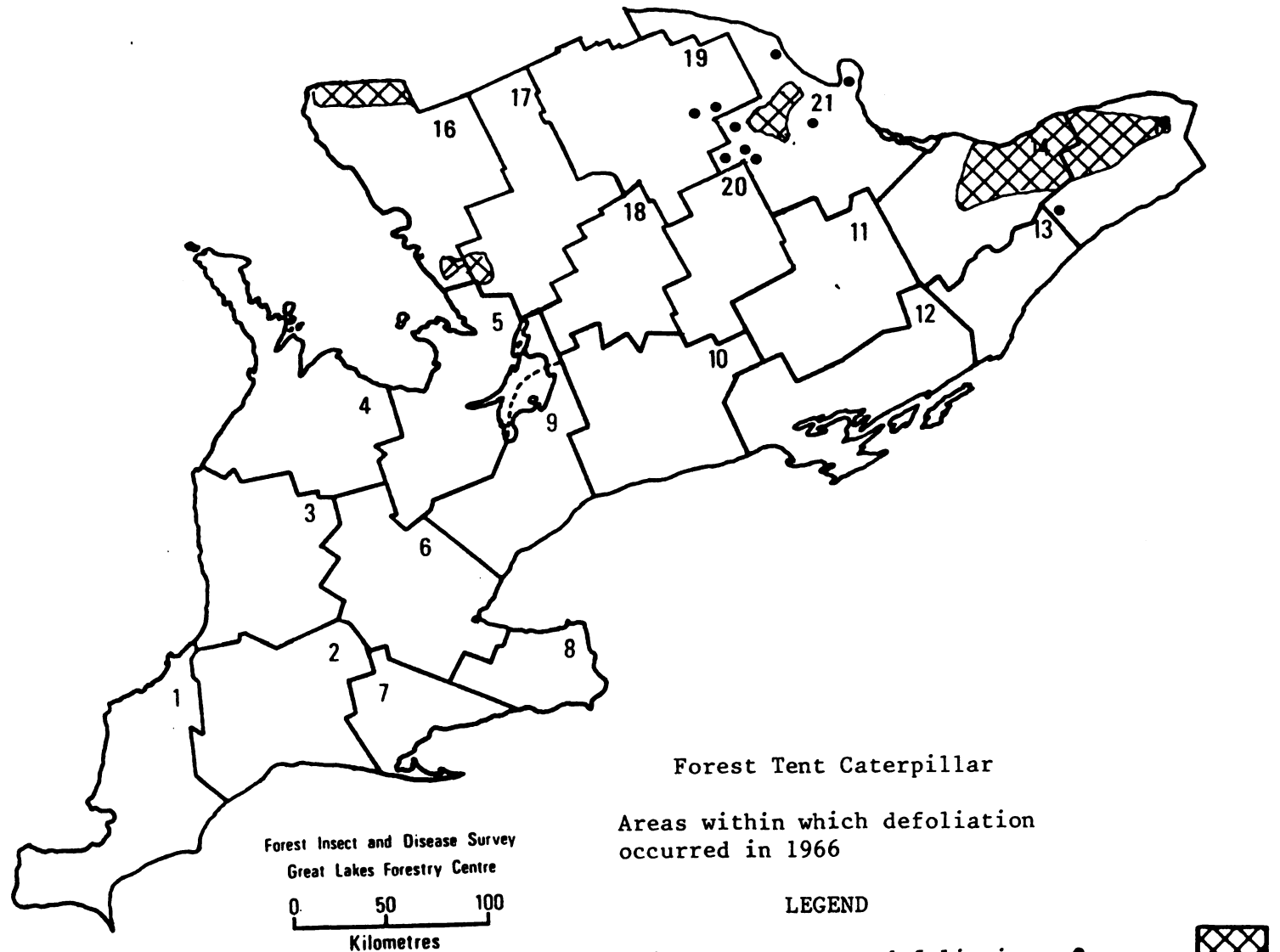
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

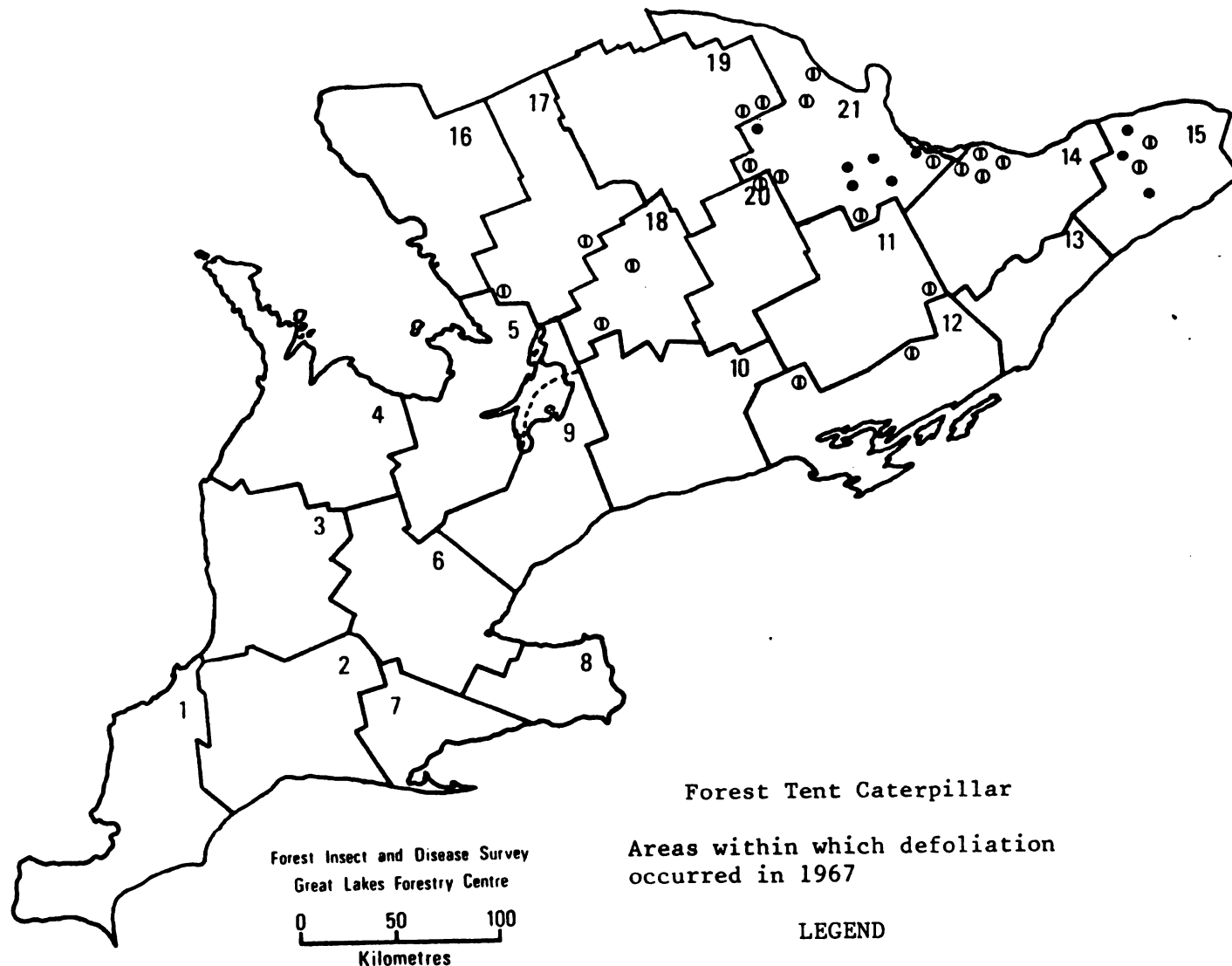
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

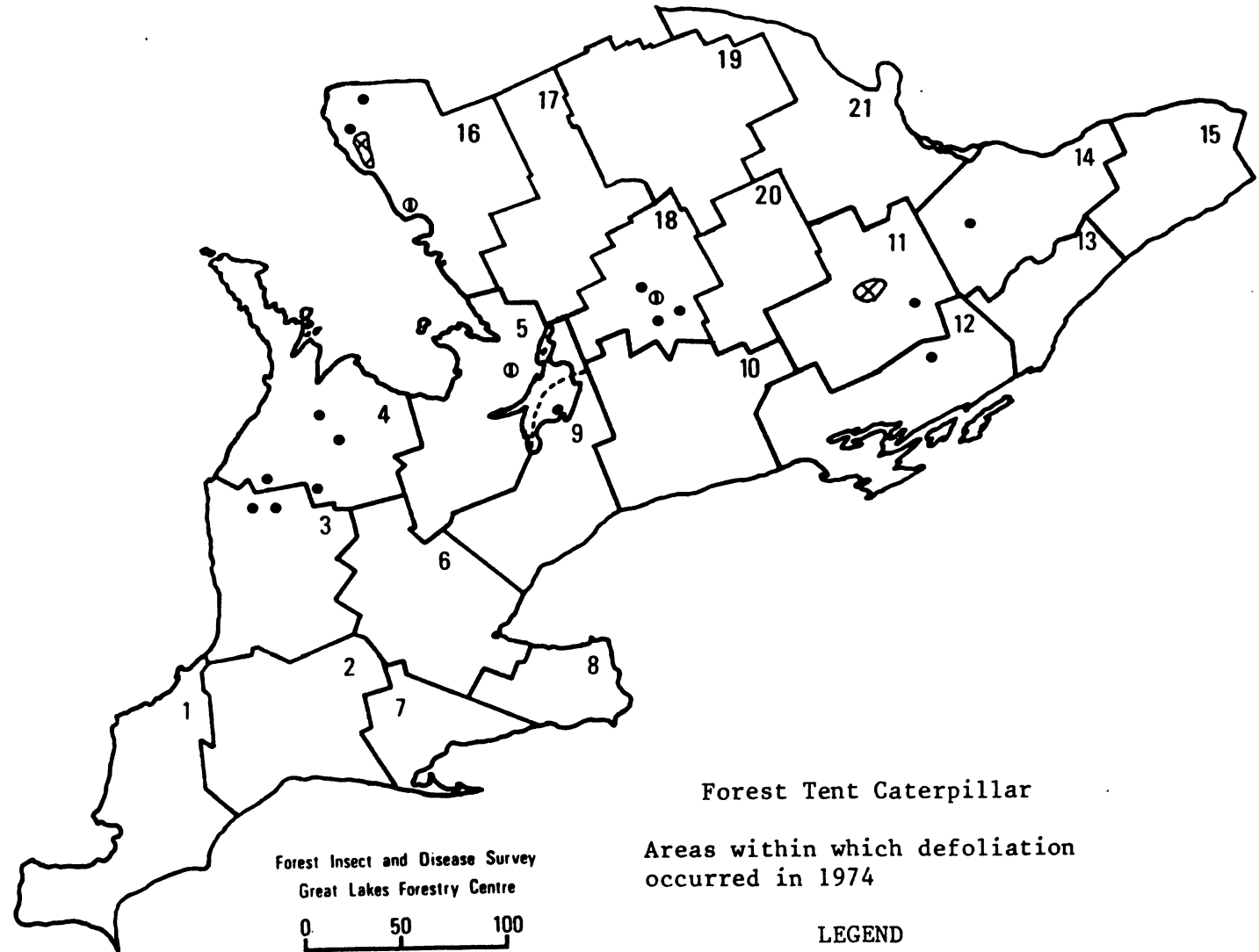
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1974

## LEGEND

Light defoliation

Moderate-to-severe defoliation



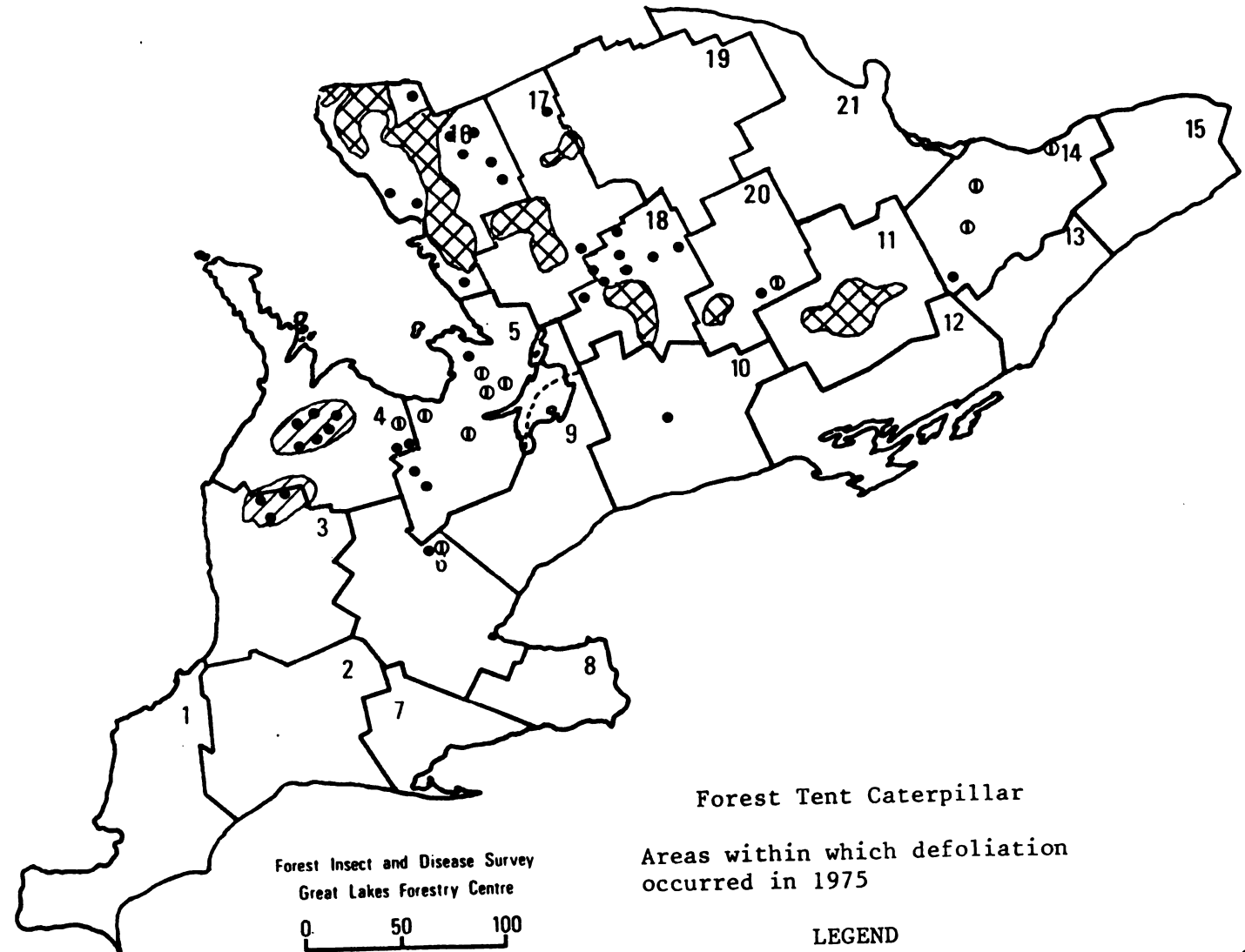
or



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1975

## LEGEND

Light defoliation

○ or

Moderate-to-severe defoliation

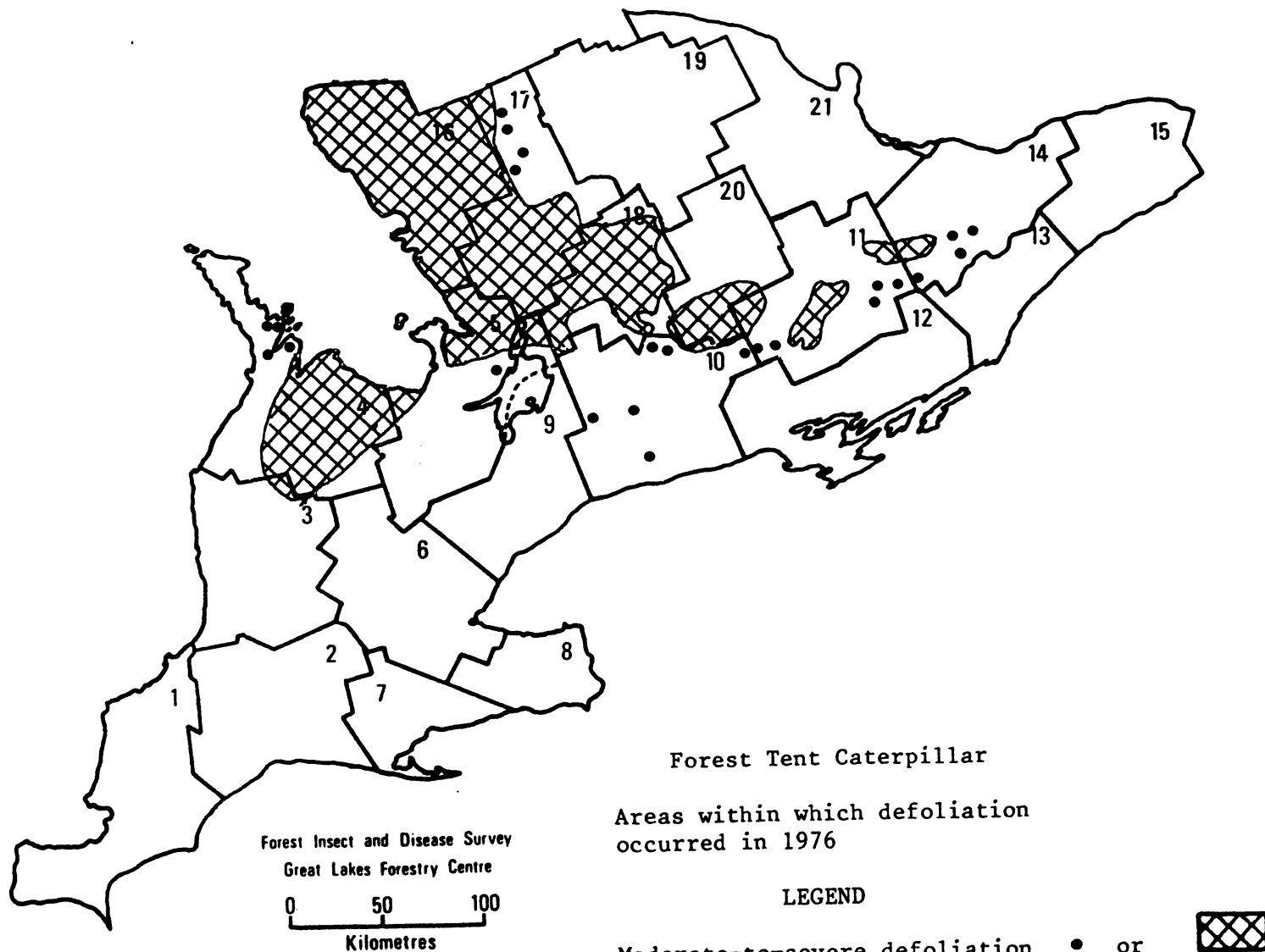
• or



# SOUTHERN ONTARIO

## DISTRICTS

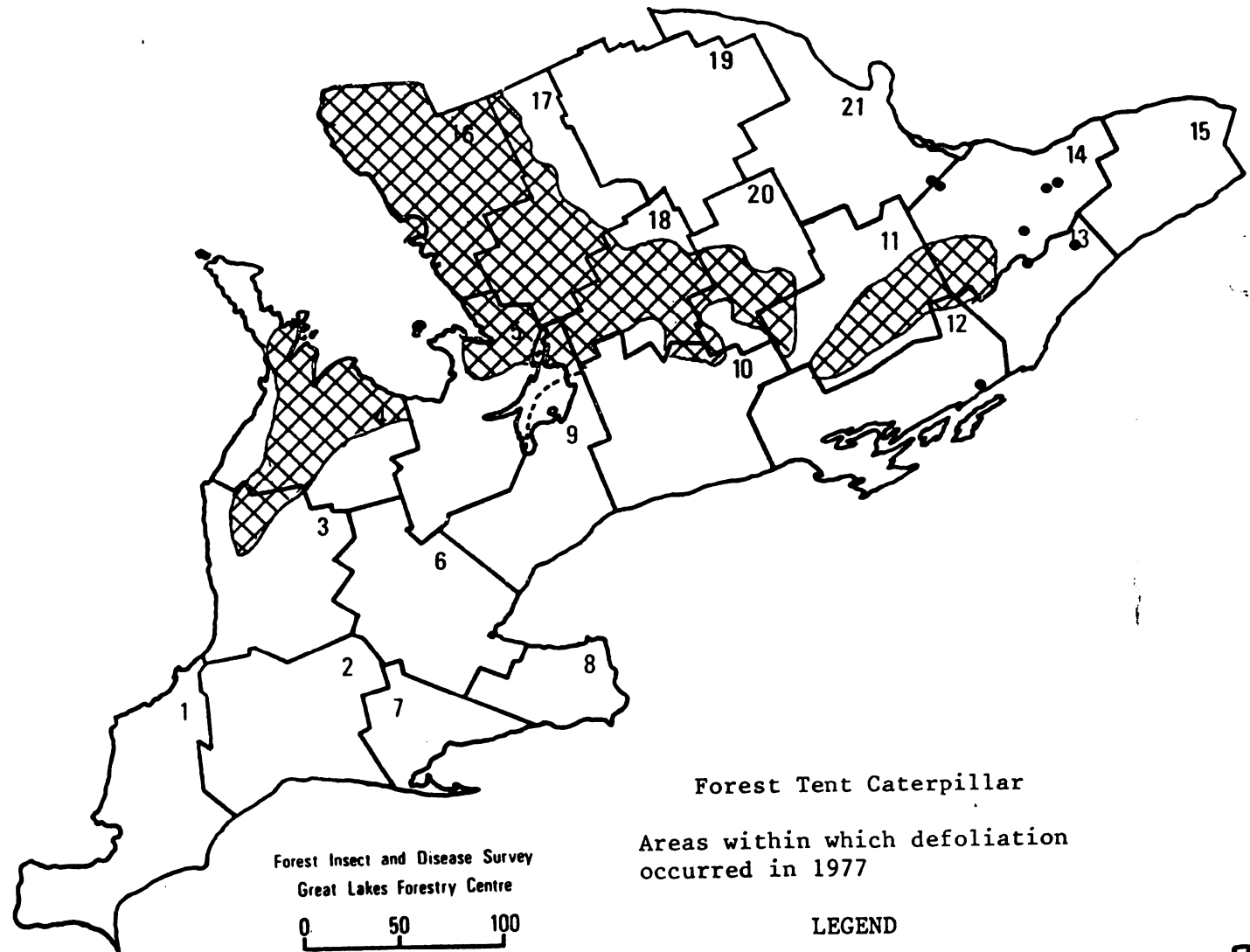
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



# SOUTHERN ONTARIO

## DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE

