

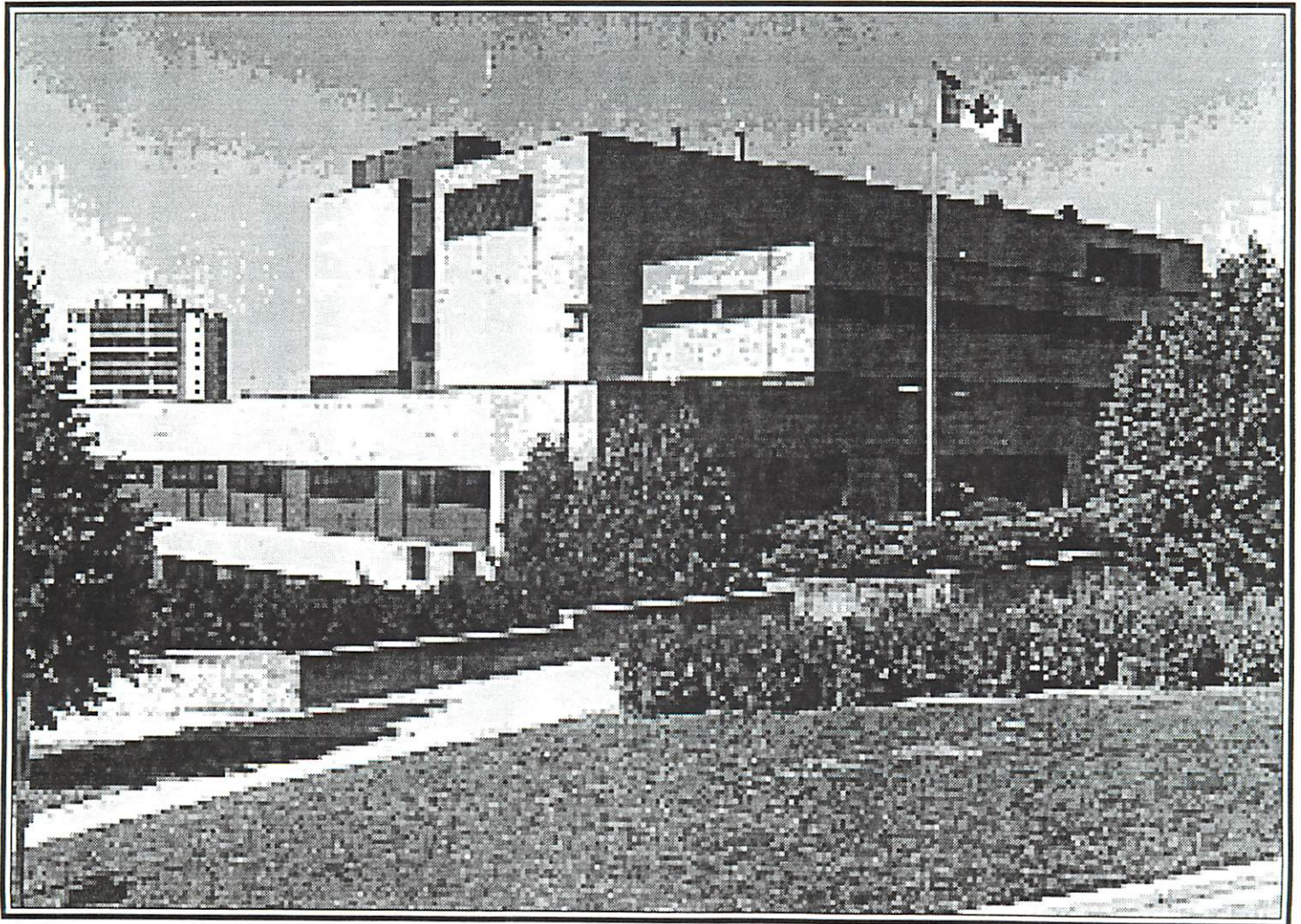
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FILE REPORT

AUTHOR FILE

**A Review of Important
Forest Insect and Disease Problems in the
Maple District of Ontario,
1950 – 1980**



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

Compiled by

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FORESTRY CANADA
ONTARIO REGION
GOVERNMENT OF CANADA
1990

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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 km² = area (sq. mi.) x 2.59 = area km²]. 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

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

1950	R.J. DuBreuil
1951-1961	H.G. McPhee
1962-1966	A.A. Harnden
1967-1975	R.L. Bowser
1976-1980	M.J. Applejohn

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A. aureoargentella and *Coletechnites thujaella*Spruce Budworm, *Choristoneura fumiferana*Larch Casebearer, *Coleophora laricella*Oak Leaf Shredder, *Croesia semipurpurana*Introduced Pine Sawfly, *Diprion similis*Eastern Pine Shoot Borer, *Eucosma gloriola*Birch Leafminer, *Fenusa pusilla*Saddled Prominent, *Heterocampa guttivitta*Forest Tent Caterpillar, *Malacosoma disstria*Balsam Fir Sawfly, *Neodiprion abietis*Redheaded Pine Sawfly, *Neodiprion lecontei*European Pine Sawfly, *Neodiprion sertifer*Yellowheaded Spruce Sawfly, *Pikonema alaskensis*White Pine Weevil, *Pissodes strobi*Larch Sawfly, *Pristiphora erichsonii*European Pine Shoot Moth, *Rhyacionia buoliana*

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INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Maple District between 1950 and 1980. The Maple District was part of the old Lake Simcoe District until 1973 when the Lake Simcoe District was divided into the Maple and Huronia 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 southern hardwoods and plantation conifers. Also included are pests that cause damage to shade and ornamental trees. The insects and diseases described are capable of causing, or have caused, tree mortality or a reduction in growth. Also included are abiotic conditions that have caused tree damage, i.e., frost, drought and winter drying.

SUMMARY

FOREST INSECTS

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

This destructive pest of pine trees causes severe defoliation of red, Scots and eastern white pine plantations. As a rule, the insect does not feed on the current foliage until the older foliage is devoured, so damage is usually limited to a reduction in increment. The first record of this insect in Ontario was made in Scarborough Township in 1961.

Fall Cankerworm, *Alsophila pometaria* (Harr.) and [Major]
Spring Cankerworm, *Paleacrita vernata* (Peck)
page

Although these insects rarely cause tree mortality, heavy defoliation retards growth and vigor, making host trees susceptible to attack by other pests. Medium-to-heavy infestations were present periodically in the review period.

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

This serious pest of eastern white cedar can cause tree mortality after a number of years of severe defoliation. Medium-to-heavy infestations were reported in most years of the review period since 1961.

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. Sporadic infestations occurred in the district from 1953 until 1980.

Larch Casebearer, *Coleophora laricella* (Hbn.) [Major]
page

A serious pest of both native and European larch, this insect can cause reduced tree growth and tree mortality after two consecutive years of complete defoliation. Medium-to-heavy infestations occurred from 1950 to 1952, from 1965, 1969 and from 1972 to 1980.

Oak Leaf Shredder, *Croesia semipurpurana* (Kft.) [Major]
page

This insect has caused varying degrees of defoliation since 1960. Several successive years of severe defoliation will severely weaken red oak and allow secondary insects and pathogens to cause mortality.

Introduced Pine Sawfly, *Diprion similis* (Htg.) [Major]
page

This sawfly has two generations per year. Heavy defoliation by second-generation larvae after buds are formed causes considerable branch mortality and occasional tree mortality. Most pine species are susceptible to attack. Sporadic infestations were reported frequently but were generally at low levels.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr. [Major]
page

This insect usually infests lateral shoots and causes aesthetic damage. When high populations develop, some leaders are infested and killed, causing deformity of infested trees. Varying degrees of infestation were reported in most years of the review period.

Birch Leafminer, *Fenusa pusilla* (Lep.) [Major]

page

Defoliation by this insect 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. Moderate-to-severe defoliation has occurred during the years 1961 to 1967 and again from 1972 to 1980.

Saddled Prominent, *Heterocampa guttivitta* (Wlk.) [Major]

page

Larvae of this species is a serious defoliator of hardwoods, particularly maple, birch and beech. Severe defoliation for 2 to 3 years can cause branch and tree mortality. Medium-to-heavy infestations occurred in 1968 and 1969.

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

page

This caterpillar is widely distributed throughout North America. Infestations usually last an average of five years and high populations denude large areas of susceptible stands. The principle host attacked is aspen and maple; however, many other deciduous species also suffer severe defoliation. Repeated defoliation retards tree growth and reduces vigor, leaving the tree susceptible to attack by other pests. High populations were present in the district from 1951 to 1953 and in 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. Sporadic infestations were present for many years but no serious damage occurred.

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. Varying degrees of infestation have been reported in about half of the years of the review period.

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

This introduced sawfly was first recorded in North America in 1925. The first record of this insect in the district was in 1957 and it has since spread throughout the district.

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

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. This sawfly caused varying amounts of damage in the district.

White Pine Weevil, *Pissodes strobi* (Peck) [Major]
page

This weevil is considered the most destructive pest of eastern white pine in North America. Successive weeviling over a period of years results in multiple-stemmed trees. Medium-to-heavy infestations occurred from 1955 to 1957, from 1961 to 1975 and again in 1978.

Larch Sawfly, *Pristophora erichsonii* (Htg.) [Major]
page

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. Moderate and high populations occurred in most years from 1956 to 1980.

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

Young, open-grown pines are most susceptible to attack and damage. The most significant damage occurs in the spring when larvae tunnel the shoots. Weakened shoots sometimes bend but continue growing, resulting in crooked stems. Infestations have been reported at numerous locations over the past 30 years.

Other Noteworthy Insects

[Major and Minor]

pages

Insects with the potential for causing varying amounts of damage to stands, regeneration and plantations.

FOREST DISEASES

Armillaria Root Rot, *Armillaria ostoyae* (Romagn.) Herink

[Major]

page

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. Low levels of infections have occurred in the district, especially to red and Scots pine trees.

Scleroderris Canker, *Ascocalyx abietina* (Lagerb.)
Schläpfer-Bernhard

[Major]

page

This canker is a very serious problem on planted trees and on natural regeneration and is capable of causing considerable mortality. This disease has not been a problem in the district.

Anthracnose of Maple, *Aureobasidium apocryptum* (Ell. & Ev.)
Hermanides-Nijhof
Discula campestris (Pass.) v. Arx.

[Major]

page

Anthracnose begins as irregular areas of dead tissue along the midribs and veins of infected leaves. Severely infected leaves become curled and twisted and premature leaf fall may occur. Varying degrees of foliar damage have been reported since 1955.

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

[Major]

page

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. First district recorded occurred in 1957 in parts of Peel, York and Durham counties.

Pine Needle Rust, *Coleosporium asterum* (Dietel) Sydow [Major]
page

Repeated medium-to-heavy infections weakens trees, causes a loss of increment and predisposes them to secondary insect attack and disease. Light infections of this needle rust have occurred in the district since 1955.

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

White pine blister rust is the most serious disease of eastern white pine. The disease has caused top killing and mortality of trees in all age classes since 1955.

Cytospora Canker, *Cytospora kunzei* Sacc. [Major]
page

Cytospora canker of spruce is caused by the fungus *Cytospora kunzei*. Branch cankers disfigure the trees but rarely kills them. Trunk cankers sometimes girdles and kills the trees. Although young trees can be attacked, it is more common in trees 13 years of age and older. Since 1962, branch cankers caused by this disease were widespread in the district, however, incident levels were light.

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

This organism causes root rot and will eventually cause mortality. In 1955, this disease was found for the first time in Whitchurch Township and established the first record for Ontario.

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 to trees of greater diameters. Since 1953, mortality did not exceed 5%.

Tip Blight, *Sphaeropsis sapinea* (Fr.) Dyko & B. Sutton

[Major]

page

Repeated attacks by this disease organism can cause mortality of mature trees. Since 1978 to 1980 foliar damage has ranged from 10% to 25% on Scots pine plantings in Whitchurch, Uxbridge and Scotts townships.

Diebacks and Declines (Maple Diebacks)

page

Since 1958, deterioration of maple, especially roadside trees, much tip and branch mortality has occurred in the district. In 1966, the incidence of affected trees ranged from 36% to 75% throughout parts of Albion, Chinguacousy, Vaughan and Scotts townships.

ABIOTIC DAMAGE

page

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.

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	first record of the insect in Ontario was made in Scarborough Twp
1962-1975	not reported
1976	light populations
1977	Moderate numbers occurred on planted red pine south of Mono Mills.
1978	A light infestation was reported in Uxbridge Twp.
1979-1980	light populations

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

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	Moderate-to-severe defoliation of elm occurred at several locations in the York and Peel regions.
1953	Medium-to-heavy infestations recurred. Particularly heavy damage was evident on 80 ha at Forks of the Credit, Caledon Twp, and at numerous points in the Don and Humber river valleys.
1954-1955	Moderate-to-severe damage was reported along the Credit River from Forks of the Credit to Terra Cotta. High numbers occurred on single trees at several locations throughout the district.
1956	High populations were reported on single trees in the York and Durham regions.
1957-1958	Medium-to-heavy infestations occurred in the Regional Municipality of Peel south of Highway 7.
1959-1960	Open-grown fencerow trees sustained moderate-to-severe defoliation at numerous locations throughout the district.
1961	Moderate-to-severe damage occurred in Caledon Twp and in Mississauga.
1962	Light populations were reported in Peel Region.
1963	A light infestation occurred in Caledon Twp.

(cont'd)

Fall Cankerworm, *Alsophila pometaria* (Harr.) and
Spring Cankerworm, *Paleacrita vernata* (Peck) (concl.)

<u>Year</u>	<u>Remarks</u>
1964-1967	trace populations
1968	not reported
1969	Light defoliation was reported in Mississauga and in Uxbridge and Caledon twps.
1970	trace populations
1971-1974	not reported
1975	Moderate-to-severe damage occurred in Albion Twp.
1976	High numbers occurred in Albion Twp and at several locations in the south portion of the district.
1977	trace populations
1978-1980	not reported

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

Host(s): cedar

[Major]

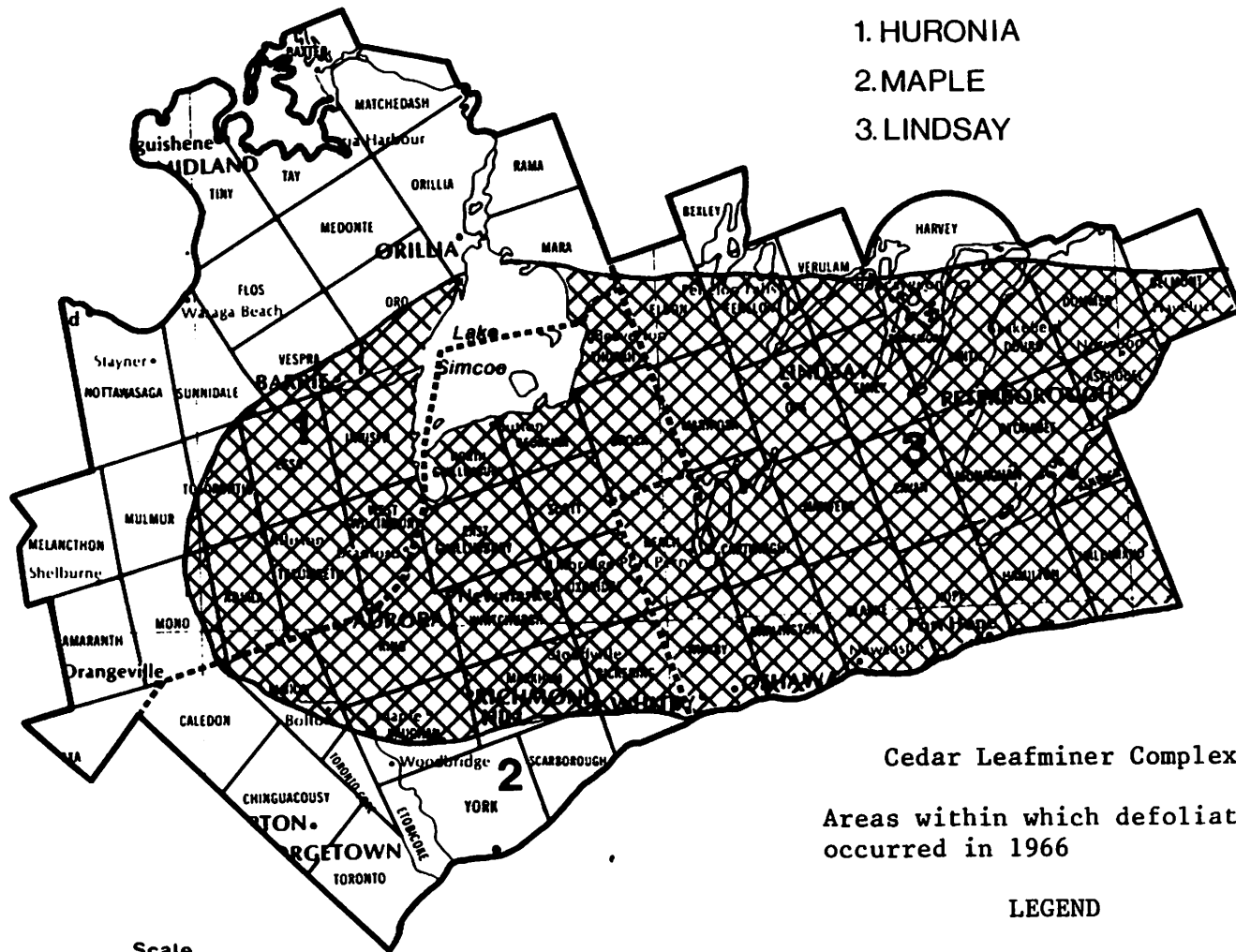
<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957-1960	trace populations
1961-1963	Medium-to-heavy infestations occurred in the north half of the district.
1964-1965	Moderate-to-severe damage recurred in the north part of the district. Branch and tree mortality was evident in Uxbridge Twp.
1966	Moderate-to-severe damage persisted in a 40 mile band throughout the central portion of the district (see map, page).
1967-1968	Medium-to-heavy infestations were reported through most of the district.
1969	Populations declined except in the southeastern part of the district.
1970	Moderate-to-severe damage persisted in the southeastern part of the district. Light infestations were common elsewhere (see map, page).

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1971	High populations occurred through the south and central parts of the district (see map, page).
1972	High populations persisted throughout the southern and central portion of the district south of a line from Orangeville east to the Uxbridge area.
1973	Populations remained much the same as in 1972 (see map, page).
1974	High populations occurred throughout the southern portion of the district from Uxbridge west to Orangeville.
1975	Moderate-to-severe damage was recorded across most of the district (see map, page).
1976	The infestation was greatly reduced (see map, page).
1977-1978	light populations
1979	Populations increased and caused moderate-to-severe damage over a large area of the district (see map, page).
1980	Medium-to-heavy infestations recurred over most of the district (see map, page).

HURONIA, MAPLE and LINDSAY DISTRICTS



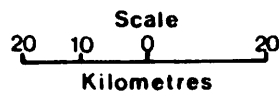
- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY

Cedar Leafminer Complex

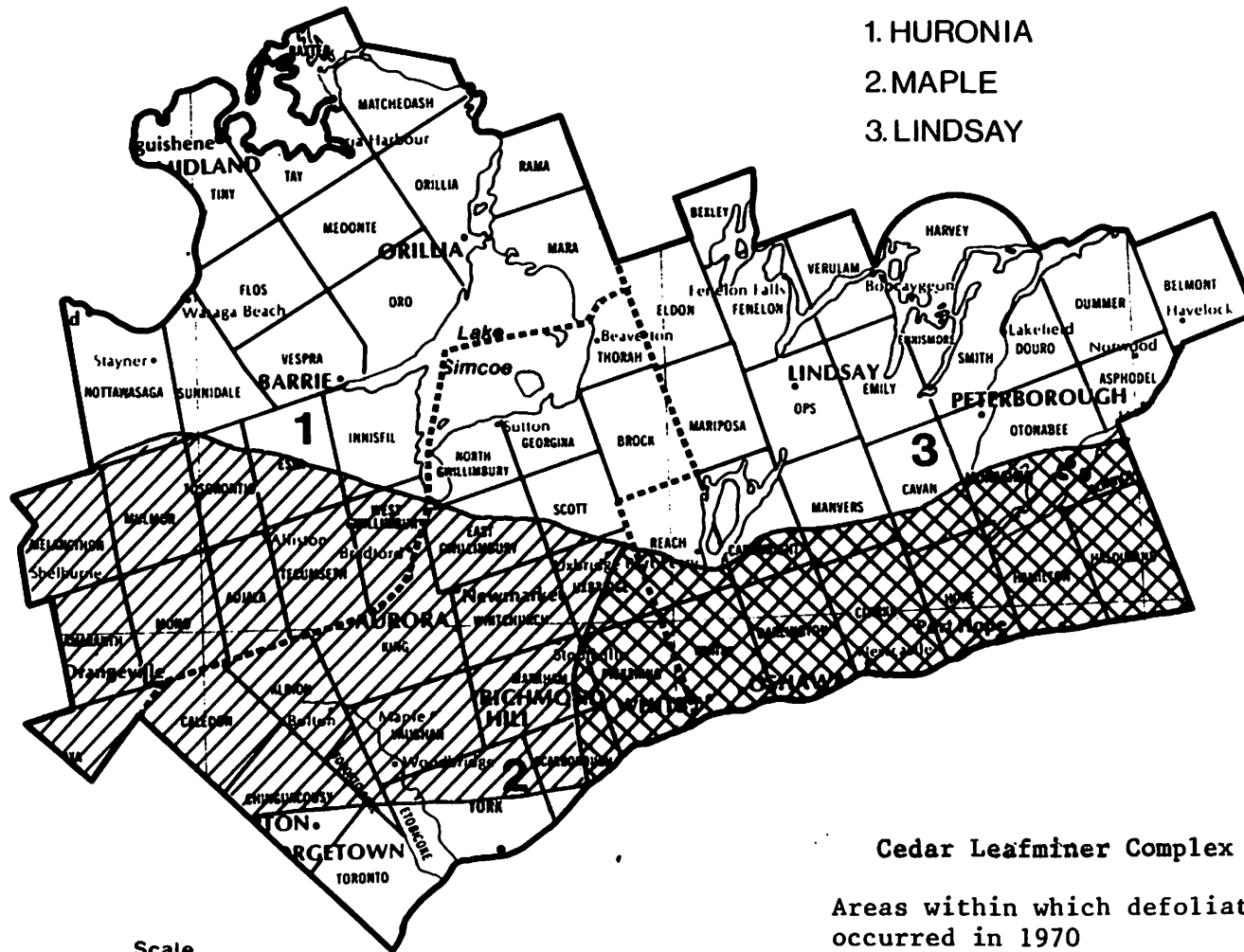
Areas within which defoliation occurred in 1966

LEGEND

Moderate-to-severe defoliation



HURONIA, MAPLE and LINDSAY DISTRICTS




- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY

Cedar Leafminer Complex

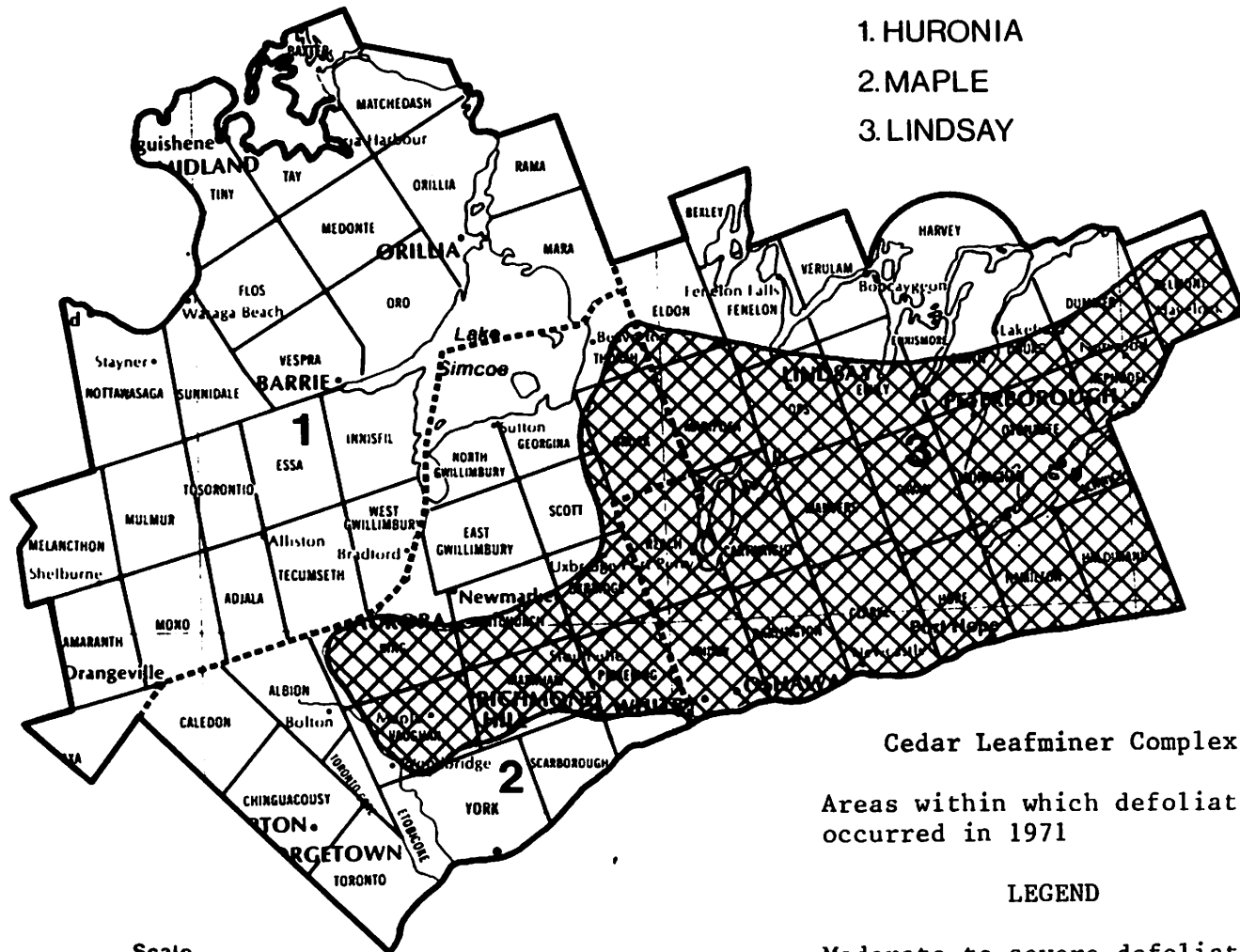
Areas within which defoliation occurred in 1970

LEGEND

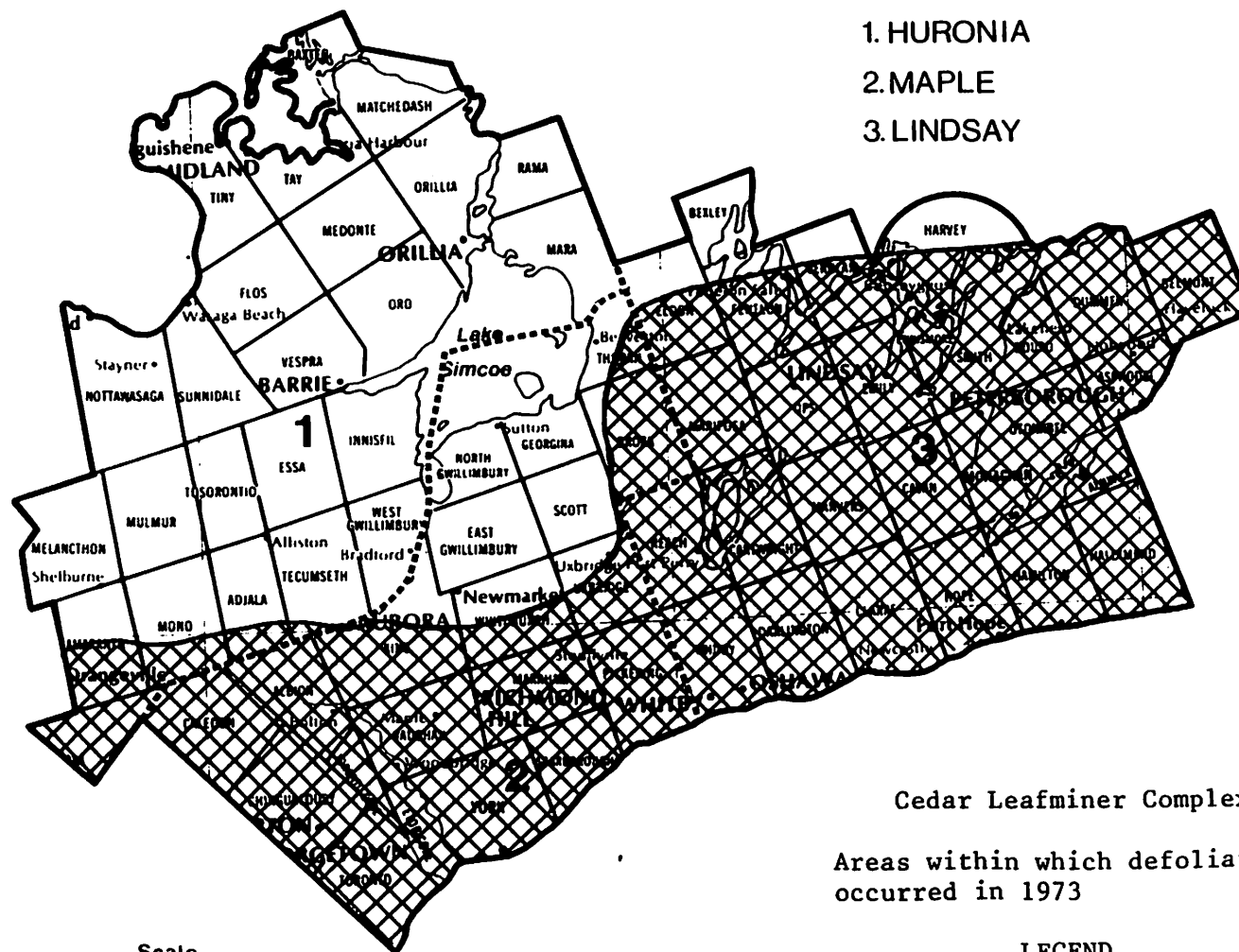
Light defoliation 

Moderate-to-severe defoliation 

HURONIA, MAPLE and LINDSAY DISTRICTS

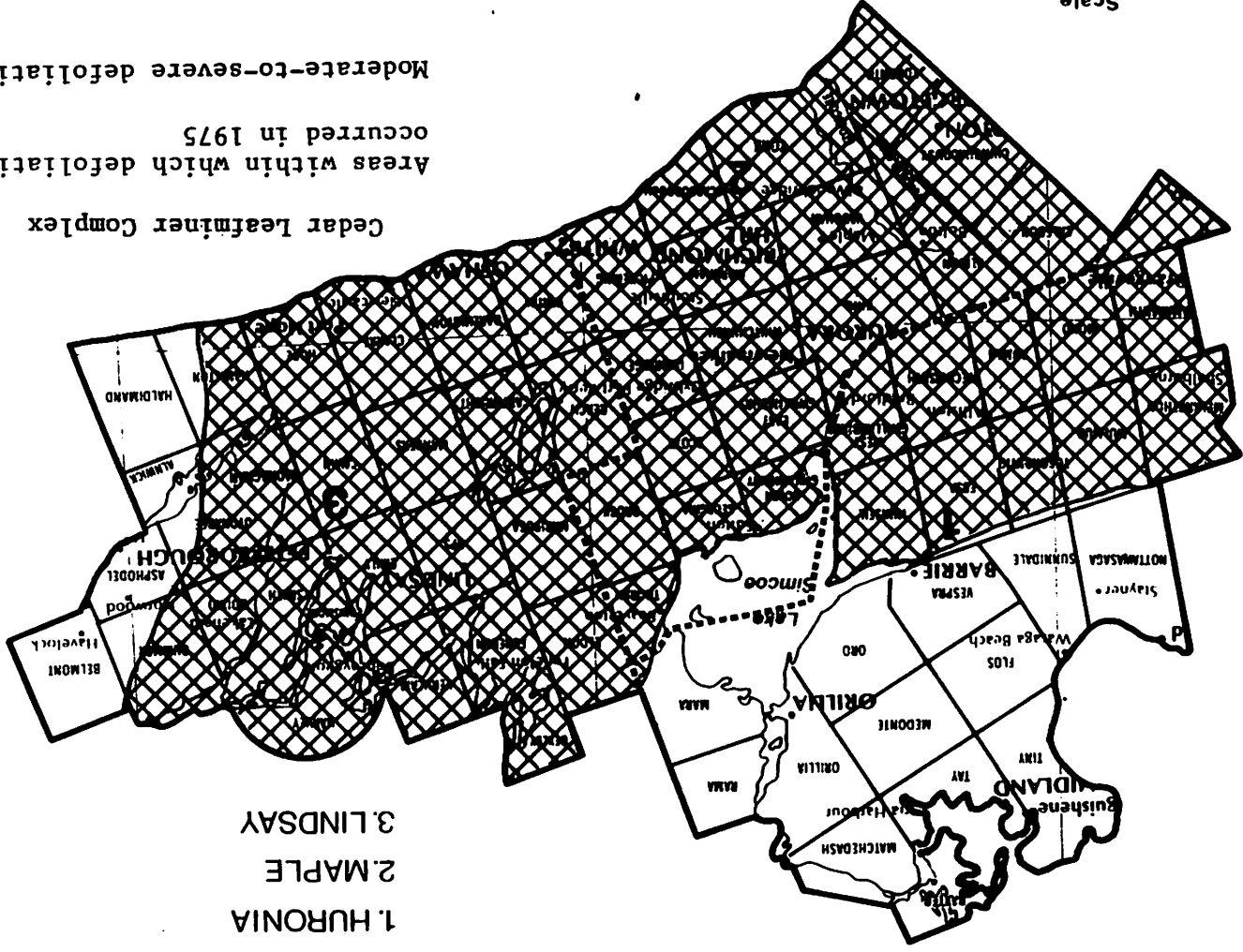


HURONIA, MAPLE and LINDSAY DISTRICTS



HURONIA, MAPLE and LINDSAY DISTRICTS

- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY



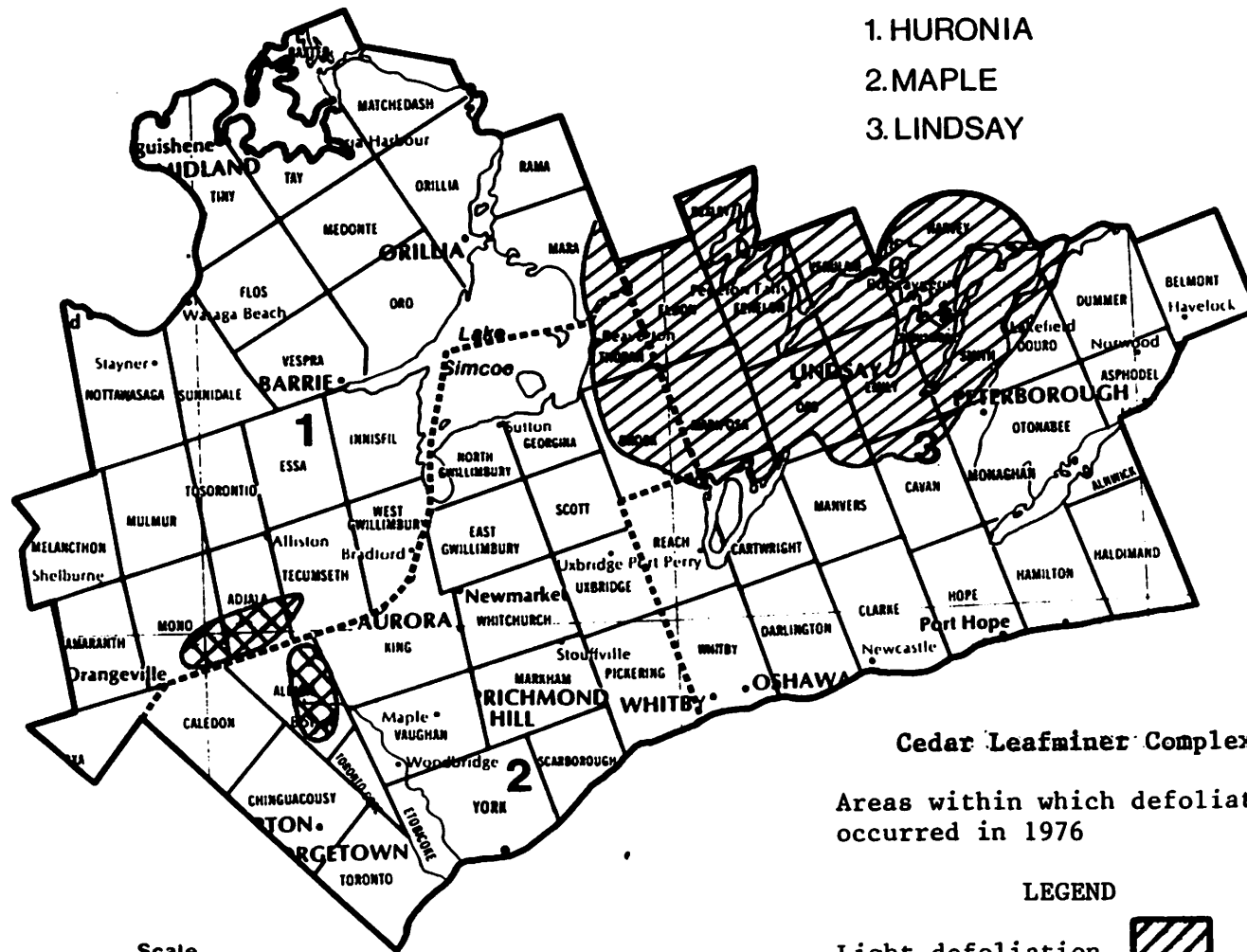
Cedar Leafminer Complex
 Areas within which defoliation
 occurred in 1975



Moderate-to-severe defoliation

Scale
 20 10 0 20
 Kilometres
 Forest Insect and Disease Survey
 Great Lakes Forestry Centre

HURONIA, MAPLE and LINDSAY DISTRICTS





- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY

Cedar Leafminer Complex

Areas within which defoliation occurred in 1976

LEGEND

- Light defoliation 
- Moderate-to-severe defoliation 

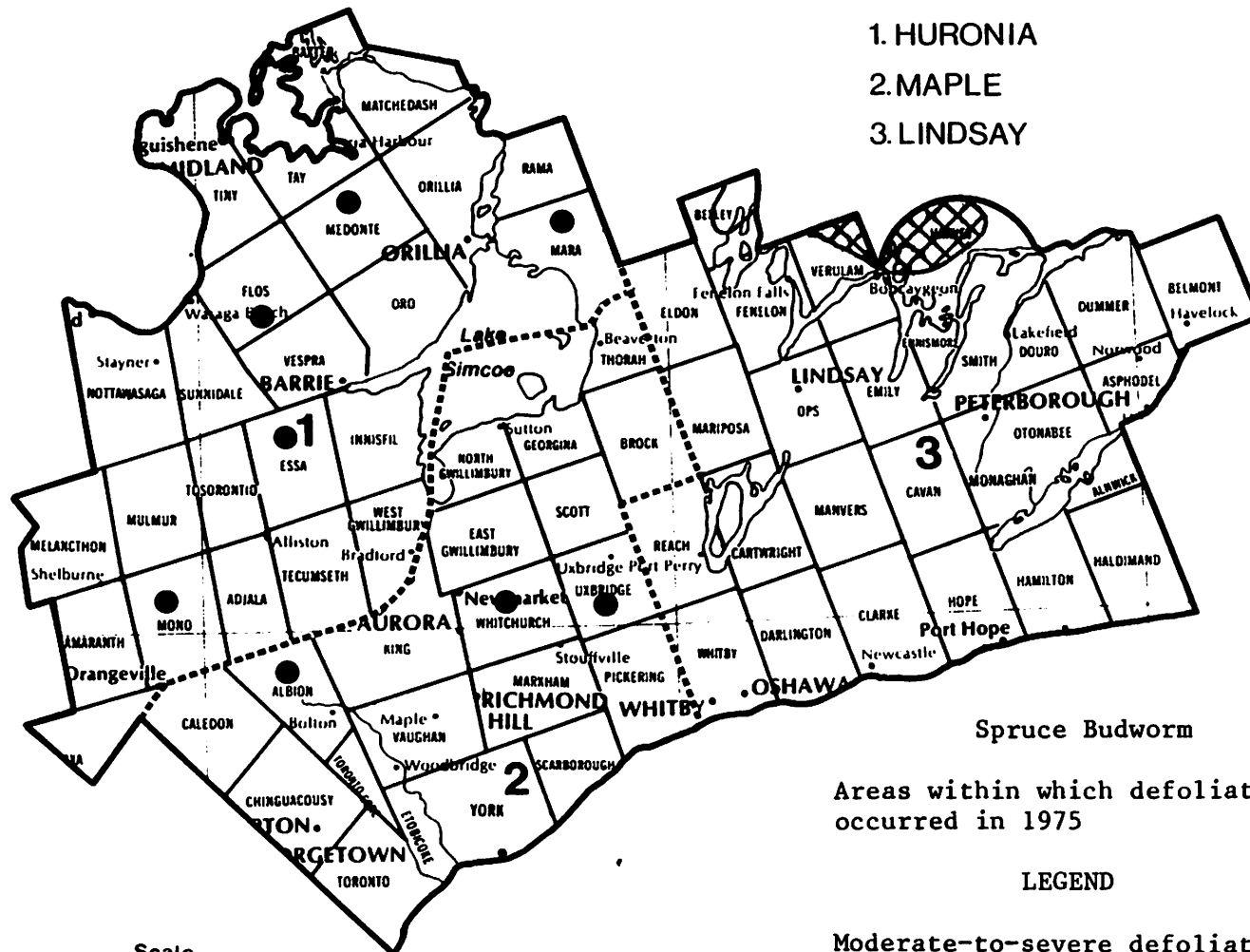
Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): balsam fir, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	trace populations
1953	average defoliation level of 56% in a 32-ha white spruce plantation in Uxbridge Twp
1954-1959	Moderate-to-severe damage recurred in Uxbridge Twp. Defoliation averaged 77% in 1954; 50% in 1955; 46% in 1956; 36% in 1957; 90% in 1958; and 53% in 1959.
1960	Populations declined to trace levels in Uxbridge Twp.
1961	Light infestations occurred in Chinguacousy, King and Vaughan twps, and in Mississauga; 44% defoliation was recorded in Uxbridge Twp.
1962	Moderate populations recurred in Uxbridge Twp; defoliation averaged 34%.
1963-1965	Populations increased in Uxbridge Twp; defoliation averaged 78% in 1963, and 55% in 1964 and 1965.
1966-1967	Medium-to-heavy infestations continued in Uxbridge Twp.
1968	Light populations occurred in Uxbridge, Brock and Whitchurch twps.
1969	Moderate populations were reported in a small plantation in Chinguacousy Twp.
1970-1973	light populations
1974	59% foliar damage was recorded in Uxbridge Twp
1975-1976	Small pockets of moderate-to-severe defoliation were recorded in Uxbridge, Whitchurch and Albion twps (see maps, page 5).
1977	Moderate-to-severe damage recurred in Uxbridge Twp.
1978	Medium-to-heavy infestations occurred in Albion and Uxbridge twps.
1979-1980	Moderate-to-severe defoliation was reported in Uxbridge Twp and near Newmarket.

HURONIA, MAPLE and LINDSAY DISTRICTS



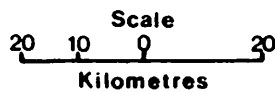
- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY

Spruce Budworm

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation  or 

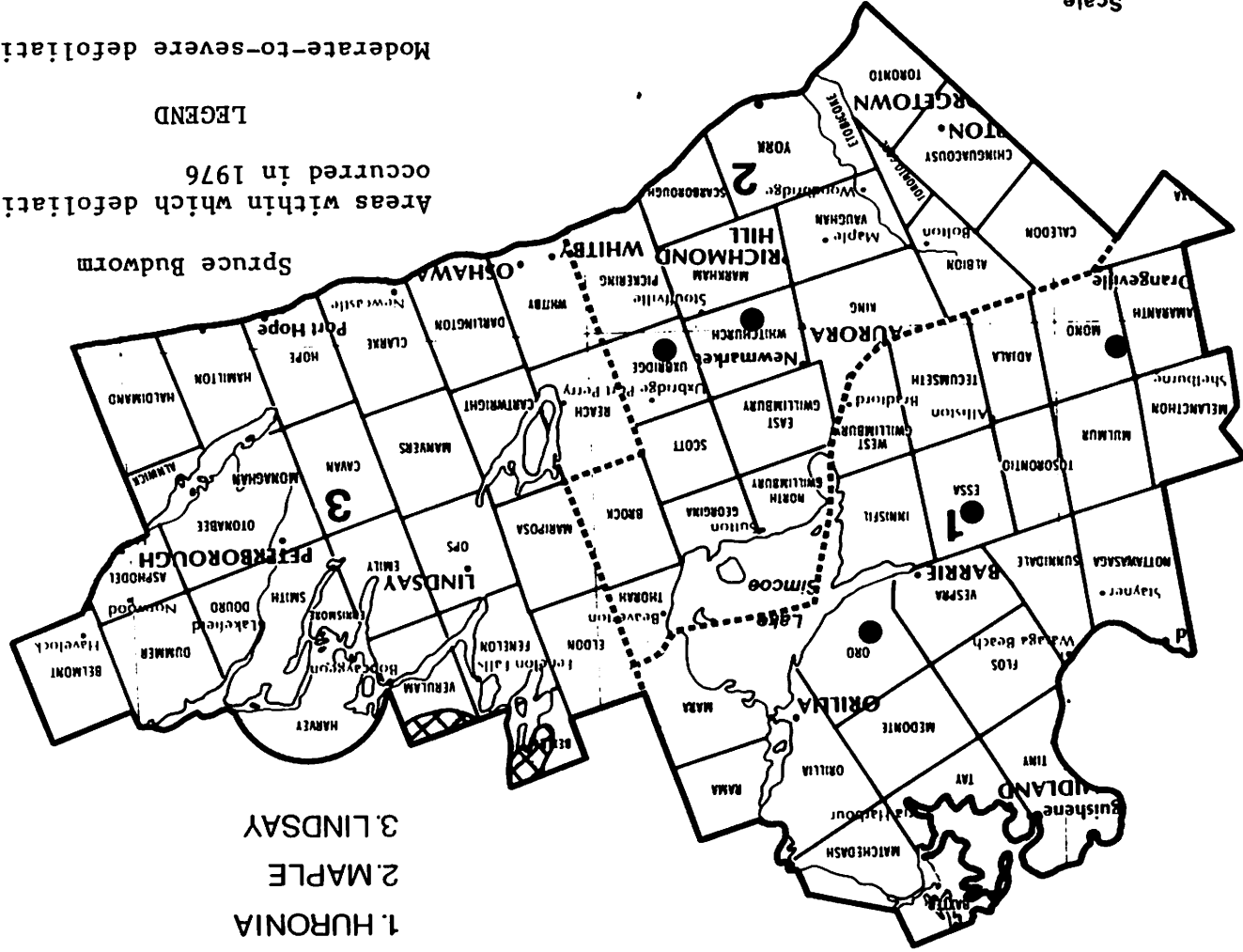


HURONIA, MAPLE and LINDSAY DISTRICTS

1. HURONIA

2. MAPLE

3. LINDSAY

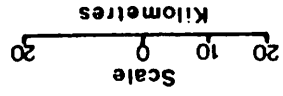


Spruce Budworm

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation or



Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950	Moderate-to-severe damage occurred to European larch in Whitchurch and Uxbridge twps; noticeable discoloration was also evident in most tamarack stands in the district.
1951	Medium-to-heavy infestations continued in both natural stands and in plantations.
1952	Populations declined; moderate numbers persisted on European larch in Whitchurch and Uxbridge twps.
1953	light populations
1954	trace populations
1955	not reported
1956-1959	trace populations
1960	Low populations occurred in Whitchurch and Uxbridge twps.
1961	Light defoliation was evident on European larch in Albion Twp.
1962-1964	trace populations
1965	A small area of moderate-to-severe damage was reported in Whitchurch Twp on European larch.
1966-1967	Moderate populations were sampled in Whitchurch and Albion twps.
1968	Populations increased and caused moderate-to-severe damage in Whitchurch and Albion twps.
1969	In Whitchurch Twp a medium-to-heavy infestation on European larch recurred; elsewhere populations declined.
1970-1971	low numbers
1972	Moderate populations occurred in Whitchurch Twp.
1973	Medium-to-heavy infestations were reported in Whitchurch and Albion twps.
1974-1976	High populations recurred in Whitchurch Twp; elsewhere low numbers were common.
1977	Moderate-to-severe damage in European larch stands was evident in Whitchurch and Pickering twps.
1978-1979	Moderate populations persisted in Pickering Twp; elsewhere low numbers were common.
1980	Medium-to-heavy infestations were observed in European larch plantations in Uxbridge, Pickering and Georgina twps.

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

Host(s): oak

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1959	not reported
1960-1961	Light infestations were reported in Uxbridge Twp.
1962	Medium-to-heavy infestations occurred over a large area; from Vaughan Twp east to the Lindsay District border and north to the Huronia District boundary.
1963-1964	Populations declined to low levels.
1965	trace populations
1966	Moderate-to-severe damage occurred in Whitchurch Twp; light populations were common elsewhere.
1967	Foliage damage of up to 100% occurred in a large area of Uxbridge Twp.
1968	Moderate-to-severe damage recurred in Uxbridge Twp and new areas of similar infestation were recorded in Pickering and Vaughan twps.
1969	Moderate numbers recurred in Uxbridge Twp.
1970-1971	light populations, Uxbridge Twp
1972	Populations increased to high in Uxbridge Twp.
1973	High numbers occurred near Cedar Valley in Whitchurch Twp; pockets of moderate numbers persisted in Uxbridge Twp.
1974	moderate-to-severe damage, Uxbridge Twp
1975	High populations occurred in Uxbridge and Whitchurch twps.
1976	Populations declined to moderate levels in areas infested in 1975.
1977	Patches of moderate-to-severe damage was reported in Uxbridge and Whitchurch twps.
1978	low populations
1979-1980	Medium-to-heavy infestations occurred in Uxbridge and Whitchurch twps and in the Richmond Hill area; aerial chemical control measures were carried out on the Uxbridge Main Tract of the Durham Regional Forest.

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	trace populations at several points in Regional Municipality of Peel
1952-1953	Low populations were encountered along Highway 7 from Unionville east to the district boundary on Scots and mugho pines.
1954	Trace populations were common.
1955	populations collapsed
1956-1957	not reported
1958	Low populations were again reported along Highway 7 from Unionville east to the district boundary.
1959-1960	Low numbers recurred along Highway 7 and a new area of light populations was found in Scarborough Twp.
1961	Light populations were collected in Markham, Pickering and Caledon twps.
1962-1963	Numbers increased but remained at low levels in Markham and Pickering twps.
1964-1965	low numbers, Pickering Twp
1966	trace populations
1967	Moderate populations caused noticeable defoliation in Pickering Twp.
1968	Populations declined to light.
1969	Increased numbers were noted in Pickering Twp.
1970	not reported
1971-1972	High numbers occurred in Pickering Twp.
1973	Low numbers were collected in Pickering, Whitchurch and Uxbridge twps.
1974	trace populations
1975	light populations, Whitchurch Twp
1976-1979	not reported
1980	trace populations

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	trace populations
1954-1955	not reported
1956	trace populations
1957-1958	not reported
1959	trace populations
1960-1961	not reported
1962	The number of infested shoots averaged six per tree in East Gwillimbury Twp.
1963	light infestations
1964	10% of terminal shoots were infested in a eastern white pine plantation in Albion Twp
1965	Light populations were common.
1966	not reported
1967	light infestations
1968-1969	Moderate numbers occurred in Whitchurch Twp.
1970-1980	light damage

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	small areas of medium-to-heavy infestation
1962	Moderate-to-severe damage was reported in Brampton.
1963	A medium-to-heavy infestation occurred at Newmarket.
1964	several areas with high populations
1965	Medium-to-heavy infestations were reported in the townships of Georgina, Uxbridge, Whitchurch and Vaughan, and in Mississauga.
1966-1967	Moderate-to-severe damage recurred to ornamentals; forested areas of white birch were similarly affected for the first time.
1968-1971	not reported
1972-1973	Occasional moderate-to-severe damage occurred to ornamentals.
1974-1977	White birch in mixed stands was moderate-to-severely damaged in Uxbridge Twp. High numbers recurred on ornamentals in many areas.
1978-1980	Moderate-to-severe damage commonly occurred to ornamentals.

Saddled Prominent, *Heterocampa guttivitta* (Wlk.)

Host(s): sugar maple, beech

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1967	not reported
1968	Medium-to-heavy infestations occurred in Whitchurch and Uxbridge twps.
1969	High numbers recurred in Uxbridge Twp but populations declined to light in Whitchurch Twp.
1970	trace populations, Uxbridge Twp
1971-1979	not reported
1980	trace populations

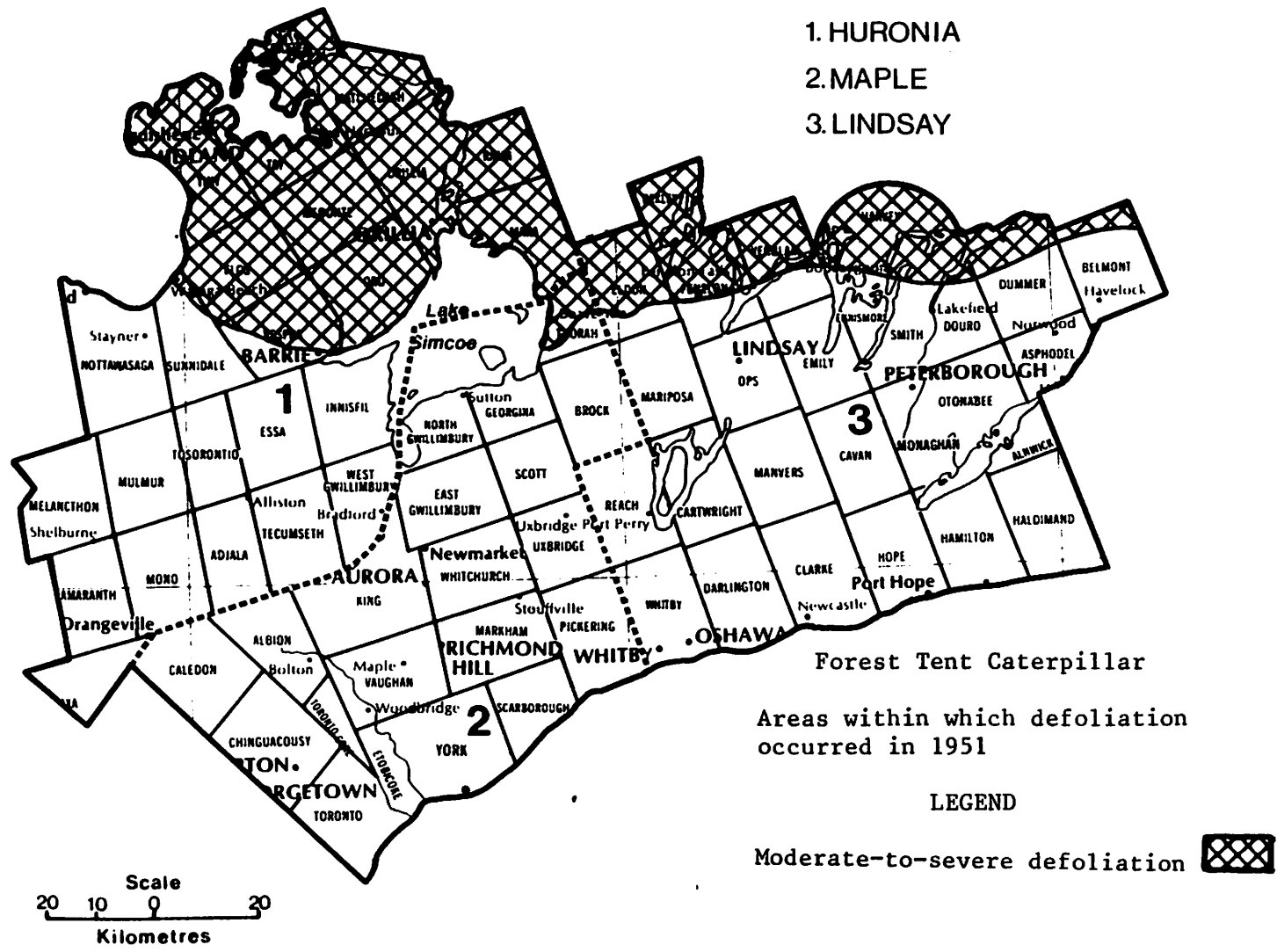
Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): deciduous

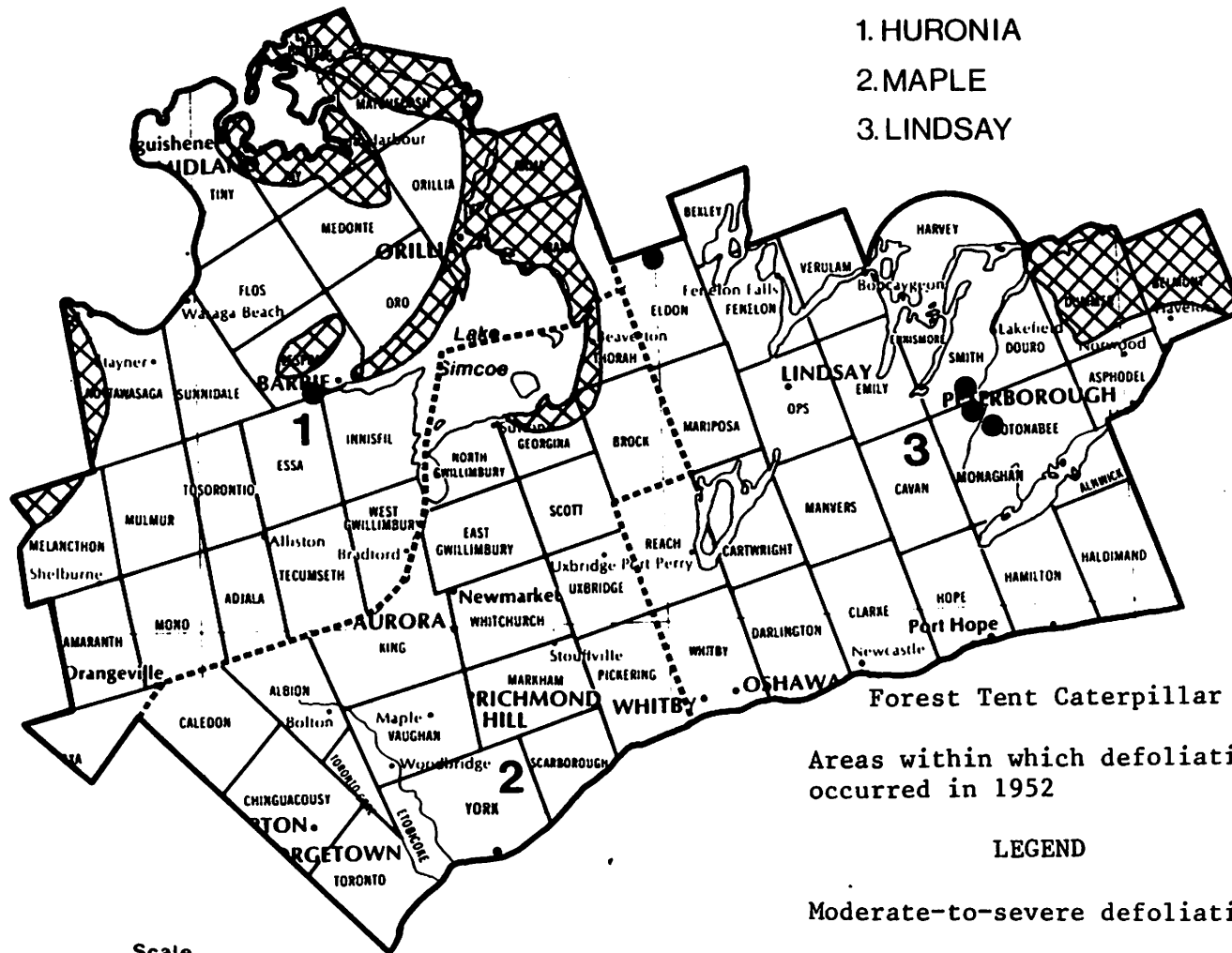
[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	Moderate-to-severe defoliation occurred in Thorah Twp; elsewhere low numbers were common (see map, page).
1952	The area of medium-to-heavy infestation extended along the southeast shore of Lake Simcoe (see map, page).
1953	An area of moderate-to-severe defoliation persisted in North Gwillimbury and Georgina twps (see map, page).
1954	infestations collapsed
1955	trace populations
1956-1960	not reported
1961-1962	trace populations
1963-1975	not reported
1976	trace populations
1977	Medium-to-heavy infestations spread south from the Huronia District into Thorah Twp (see map, page).
1978	Light infestations occurred near Pefferlaw and Beaverton.
1979	trace populations
1980	not reported

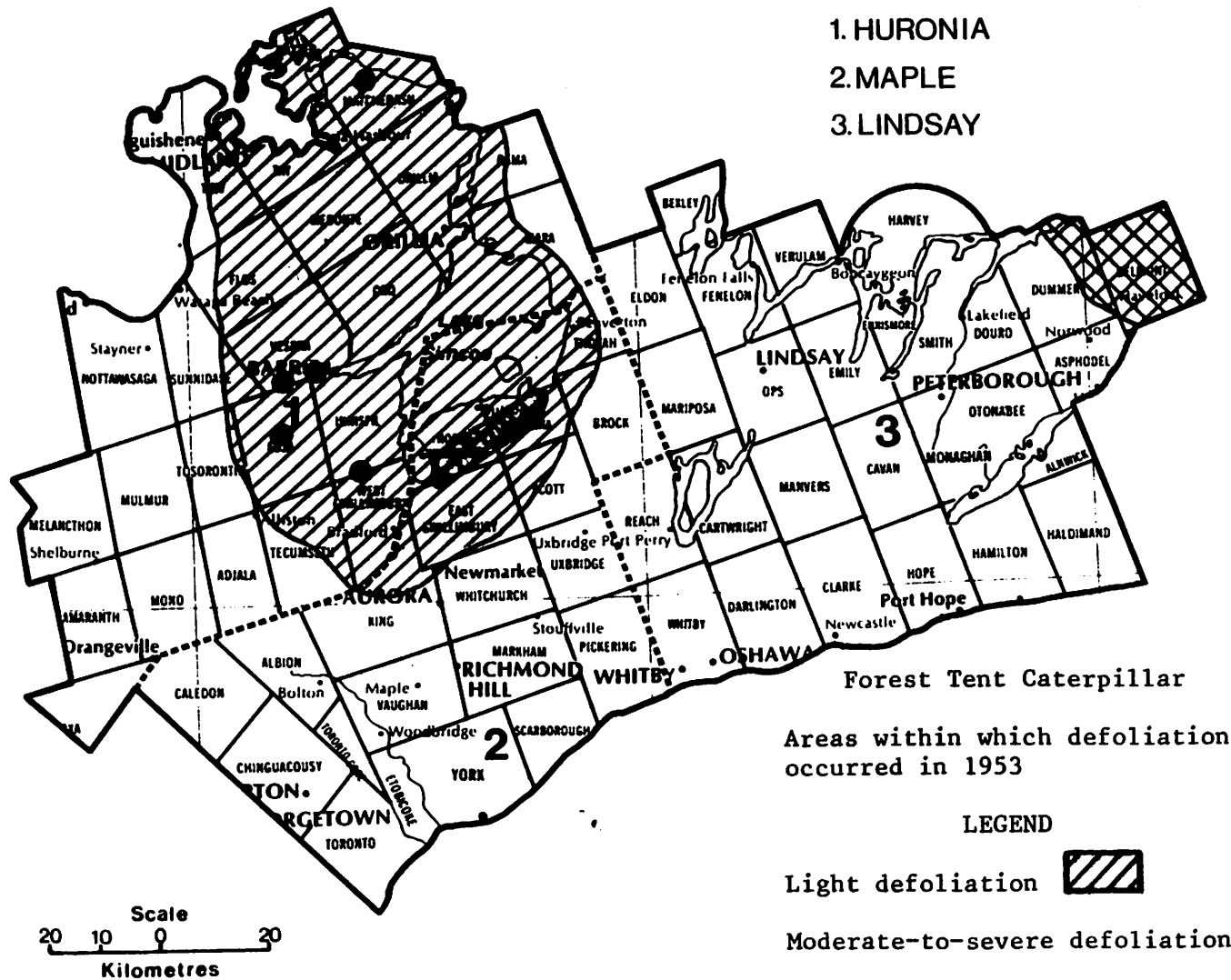
HURONIA, MAPLE and LINDSAY DISTRICTS



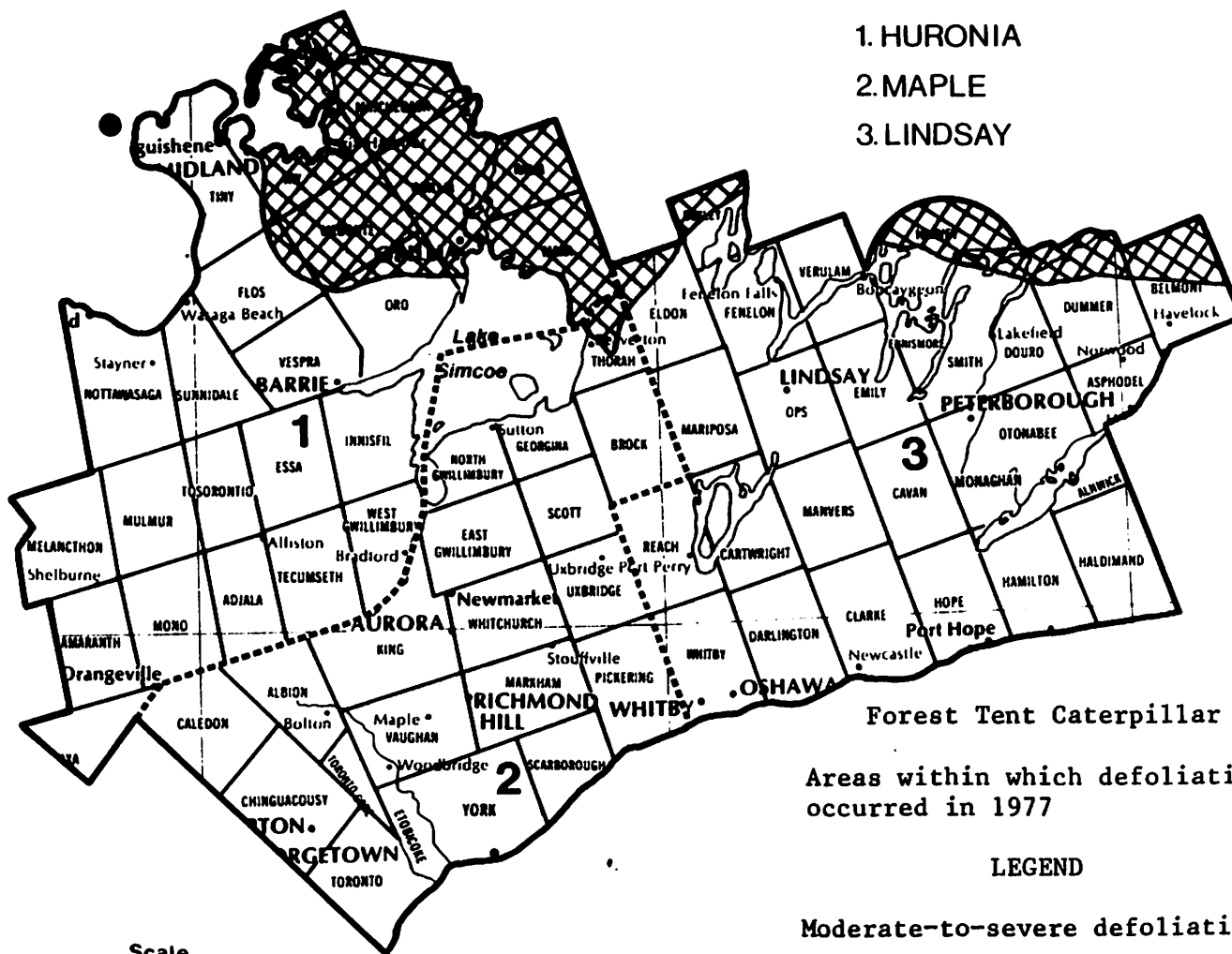
HURONIA, MAPLE and LINDSAY DISTRICTS



HURONIA, MAPLE and LINDSAY DISTRICTS



HURONIA, MAPLE and LINDSAY DISTRICTS

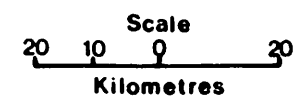


- 1. HURONIA
- 2. MAPLE
- 3. LINDSAY

Forest Tent Caterpillar
 Areas within which defoliation
 occurred in 1977

LEGEND

Moderate-to-severe defoliation  or 



Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): balsam fir, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	collected from several locations in the district
1951-1953	not reported
1954	light populations
1955-1956	not reported
1957-1963	trace populations
1964-1965	not reported
1966	light infestations
1967	not reported
1968	low numbers
1969-1972	not reported
1973	Moderate populations were recorded in the Bradford-Aurora-Uxbridge area.
1974-1978	not reported
1979	trace populations
1980	not reported

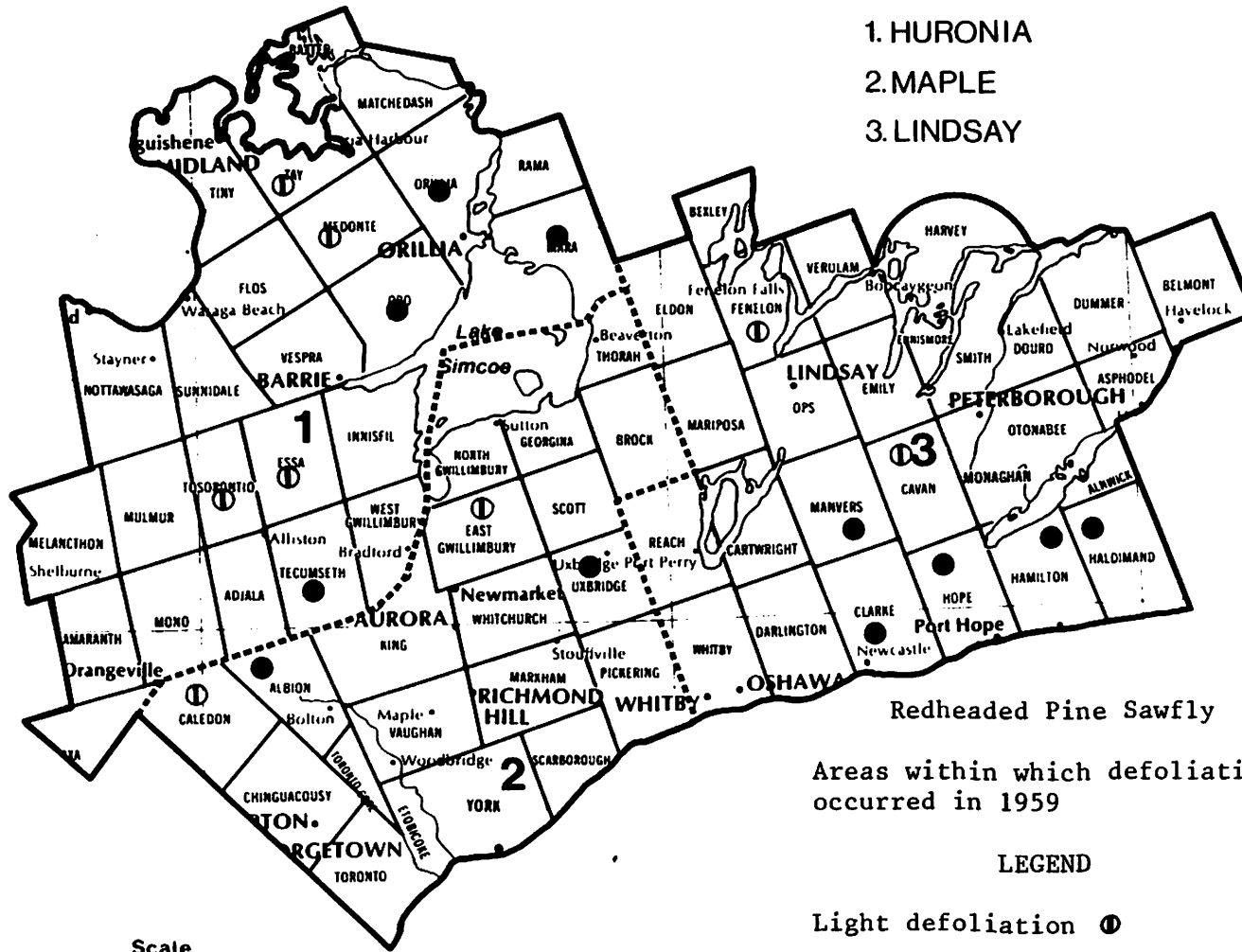
Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	High numbers occurred in jack pine in Brock Twp.
1952	Light infestations were reported at several locations in the district.
1953-1955	trace populations at numerous points in York and Durham regions
1956	Moderate numbers were recorded on red pine in Caledon Twp.
1957	Populations increased; medium-to-heavy infestations occurred in Caledon and East Gwillimbury twps.
1958	not reported
1959	Medium-to-heavy infestations occurred in 40 ha in both Uxbridge and Albion twps; successful chemical controls were carried out in these areas (see map, page).
1960	Moderate populations occurred in Albion Twp (see map, page).
1961	Small pockets of moderate numbers occurred in Albion, Whitchurch and Uxbridge twps.
1962	A medium-to-heavy infestation was reported in East Gwillimbury Twp.
1963-1976	not reported
1977-1980	trace populations

HURONIA, MAPLE and LINDSAY DISTRICTS



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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	Trace populations of this insect were found for the first time in the west part of the district.
1958-1959	low populations along the western border of the district
1960	Medium-to-heavy infestations occurred in the Caledon area and in what is now the City of Mississauga.
1961	Populations were light, however, the range of the sawfly continued eastward.
1962	Moderate numbers were recorded in Caledon Twp.
1963	Moderate numbers recurred in Caledon Twp and a new medium-to-heavy infestation was reported south of Uxbridge. The distribution of the insect continued in the district.
1964	Medium-to-heavy infestations occurred in Caledon and Pickering twps.
1965	Populations increased; medium-to-heavy infestations were common in many areas; range of the insect continued to increase to include almost the entire district.
1966-1967	Moderate-to-severe defoliation was evident in many unsprayed plantations in the south part of the district.
1968	Medium-to-heavy infestations persisted in Uxbridge, Whitchurch and Brock Twps.
1969-1971	High populations occurred in numerous plantations in the Vivian-Uxbridge area and in Albion Twp.
1972	Moderate-to-severe defoliation occurred in the northern part of the Regional Municipality of Peel.
1973	Populations declined to low levels.
1974	Moderate numbers were recorded in small areas in Whitchurch and Albion twps.
1975	Except for one small area where high populations occurred, low numbers prevailed.
1976	low populations
1977	one small area of moderate number, Uxbridge Twp
1978-1980	low populations

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

Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	light populations
1952	high numbers in Durham Region
1953-1960	light populations
1961	moderate numbers in Caledon Twp
1962-1965	not reported
1966-1968	trace populations
1969-1973	not reported
1974	Populations increased to moderate levels at several locations.
1975	not reported
1976	Moderate numbers occurred in Whitchurch Twp.
1977	trace populations
1978	not reported
1979-1980	trace populations

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955-1957	Moderate numbers were reported in Whitchurch Twp.
1958	not reported
1959-1960	light populations
1961	Medium-to-heavy infestation occurred in Whitchurch, East Gwillimbury and Uxbridge twps.
1962	Moderate-to-severe damage persisted in many areas where no control measures were taken.
1963	Trees attacked were 32% and 34% in Whitchurch and Uxbridge twps, respectively.
1964-1966	Moderate and high number were recorded in King, East Gwillimbury and Whitchurch twps.
1967-1968	Moderate numbers recurred in Whitchurch and King twps.
1969-1970	Populations increased to high levels in Whitchurch and King twps.
1971-1972	Moderate numbers were recorded in Whitchurch, East Gwillimbury and Uxbridge twps.
1973	Populations declined; moderate numbers persisted in Whitchurch Twp.
1974	Moderate and high populations occurred in East Gwillimbury and Whitchurch twps, respectively.
1975	High populations persisted in Whitchurch Twp.
1976-1977	light populations
1978	moderate populations, Whitchurch Twp
1979-1980	light populations

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): larch

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	trace populations
1952-1955	not reported
1956	Populations increased; light and moderate numbers were found in several areas of the district.
1957-1958	light populations
1959-1961	Moderate-to-severe damage of European larch occurred in Uxbridge Twp.
1962	European larch sustained moderate-to-severe damage in Uxbridge and Whitchurch twps.
1963-1966	High populations persisted in European and Japanese larch plantations; numbers were generally light in tamarack stands.
1967	light populations occurred in Uxbridge Twp
1968	Moderate-to-severe defoliation was reported in Whitchurch Twp.
1969	Medium-to-heavy infestations occurred in Uxbridge, Whitchurch and Pickering twps.
1970-1971	Moderate-to-severe damage occurred in Uxbridge, Whitchurch and Albion twps.
1972	High and moderate populations were found in Whitchurch and Albion twps, respectively.
1973	Moderate numbers recurred in Whitchurch Twp.
1974	Populations increased causing moderate-to-severe damage in the Newmarket-Uxbridge area.
1975	high numbers, Whitchurch Twp
1976	high populations recurred in Whitchurch Twp; new areas of medium-to-heavy infestation occurred in Albion and Uxbridge twps.
1977	Medium-to-heavy infestations recurred in Albion, Whitchurch and Uxbridge twps; aerial chemical control measures were applied in Uxbridge Twp.
1978	Small pockets of high populations persisted in Uxbridge Twp requiring a repeat of aerial control measures.
1979	Populations varied from light to high in Uxbridge Twp.
1980	Populations increased to high in several areas in the Durham and York regional forest; aerial control operations were again carried out in Uxbridge Twp.

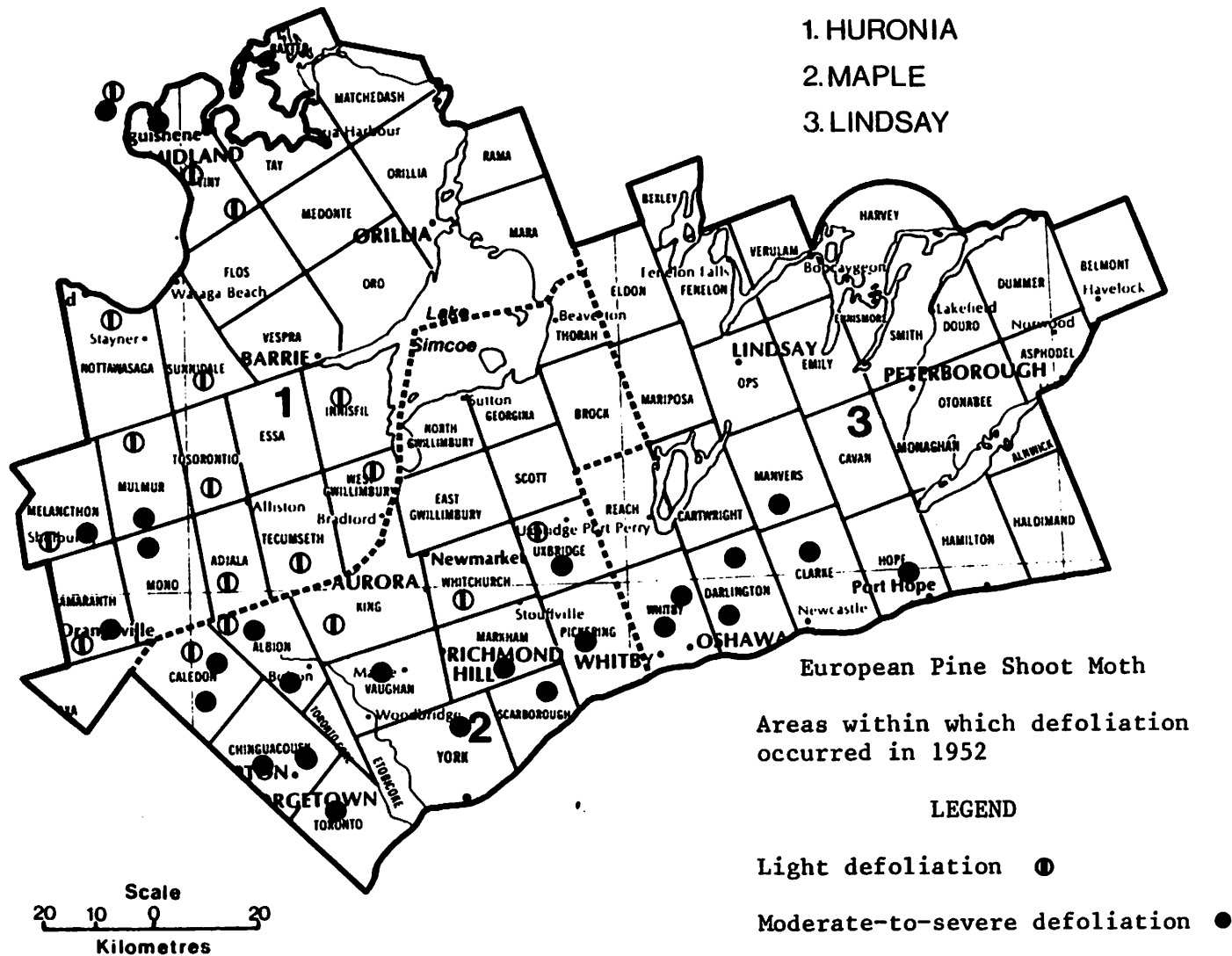
European Pine Shoot Moth, *Rhyacionia buoliana* (D. & S.)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	Moderate-to-severe damage has been limited to the southern part of the district.
1951	Medium-to-heavy infestations were reported throughout the district.
1952	Both light and medium-to-heavy infestations were reported (see map, page).
1953	Moderate-to-severe damage occurred in Albion Twp and in the Vivian and Uxbridge areas.
1954	Medium-to-heavy infestations occurred in several areas.
1955	Counts revealed high populations in Uxbridge, Whitchurch and Albion twps.
1956	The shoot moth continued to cause moderate-to-severe damage through the district.
1957	Populations declined to light.
1958-1959	Populations continued to decline, particularly in the south part of the district; high populations occurred in Albion Twp.
1960	Populations continued to decline.
1961	A medium-to-heavy infestation was reported in young red pine, Uxbridge Twp.
1962	light populations
1963	Moderate-to-severe bud damage occurred in a private plantation in Markham Twp.
1964-1965	Moderate populations, Markham Twp, light infestations were common in the south portion of the district.
1966-1975	not reported
1976	trace populations
1977-1980	not reported

HURONIA, MAPLE and LINDSAY DISTRICTS



Other Noteworthy Insects

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

Host(s): spruce, balsam fir, hemlock

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958-1959	trace populations
1960-1961	increased numbers in Uxbridge Twp
1962-1965	trace populations
1966-1967	low numbers, Uxbridge Twp
1968-1969	moderate numbers, Whitchurch Twp
1970-1972	trace populations
1973	moderate numbers, Albion Twp
1974-1975	trace populations
1976-1980	not reported

Pine Spittlebug, *Aphrophora cribrata* (Wlk.)

Host(s): conifers

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1955	not reported
1956-1959	Medium-to-heavy infestations in 15-20 year old Scots pine plantations caused severe browning of foliage and branch mortality in Whitchurch and Uxbridge twps. Accumulated tree mortality at a study plot in the Vivian Forest, Whitchurch Twp, was 45% by 1959.
1960-1961	Populations declined to low levels throughout the district. There was no increase in tree mortality at the Vivian Forest plot.
1962-1968	Generally light infestations prevailed with the occasional instance of moderate-to-severe damage recorded on Scots and eastern white pine.
1969	moderate numbers, Albion and East Gwillimbury twps
1970-1971	light populations
1972-1973	not reported
1974	moderate populations, East Gwillimbury Twp
1975-1977	light populations
1978	moderate-to-severe damage to Scots pine Christmas trees, Whitchurch Twp
1979	low numbers, Whitchurch Twp
1980	not reported

Oak Skeletonizer, *Bucculatrix ainsliella* Murt.

Host(S): oak

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	low numbers on understory trees at scattered locations
1959	high populations on understory trees, Uxbridge Twp
1960-1967	not reported
1968-1969	Medium-to-heavy infestations occurred in Uxbridge and Whitchurch twps.
1970	Populations declined to trace levels.
1971-1973	not reported
1974	low numbers, Uxbridge Twp
1975-1980	not reported

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1959	not reported
1960-1961	Populations increased; medium-to-heavy infestations occurred throughout the district.
1962	Numbers declined but moderate-to-severe damage continued throughout the district.
1963	Populations declined to light.
1964	light populations
1965	trace populations
1966-1969	not reported
1970	high populations, East Gwillimbury Twp
1971-1972	Medium-to-heavy infestations occurred in Uxbridge, Scott and East Gwillimbury twps.
1973	light populations
1974-1980	not reported

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

Host(s): walnut, hickory

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	A general increase in population levels; numerous walnut and butternut trees were severely defoliated in Peel, York and Ontario counties, colonies common elsewhere.
1954-1957	Populations continued to increase and expand through the range of walnut and butternut. Moderate-to-severe defoliation of single trees and groups of trees was common, particularly in the southern part of the district.
1958	general population collapse; only single scattered colonies found
1959	trace populations
1960-1961	occasional colonies through the southern part of the district
1962-1963	Infestations increased to small pockets of medium-to-heavy.
1964	Infestations declined to light intensity.
1965-1966	low numbers
1967-1968	Moderate-to-severe defoliation on occasional trees through the southern part of the district.
1969	not reported
1970-1974	moderate-to-severe defoliation on scattered trees in the district
1975	Defoliation generally declined to light intensity.
1976-1977	trace populations
1978	light and medium-to-heavy infestations observed at a number of locations in Markham and Pickering twps
1979	low numbers of colonies found at numerous locations
1980	Substantially increased populations were observed in the Mississauga-Bramalea and in Markham areas of the district.

Walking Stick, *Diapheromera femorata* (Say)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	Moderate-to-severe defoliation of red oak, white elm and basswood was observed in Vivian Forest, Whitchurch Twp.
1954	not reported
1955	Moderate-to-severe defoliation of red oak, basswood and white ash recurred in the Vivian Forest, Whitchurch Twp. Noticeable defoliation of oak and basswood was observed in several other woodlots in the vicinity.
1956	not reported
1957	A heavy infestation was again recorded in Vivian Forest, Whitchurch Twp, where moderate-to-severe defoliation of basswood, black cherry, trembling aspen and red oak was noted in a 25-ha area. Light defoliation of basswood was observed in a tract of Uxbridge Forest, Uxbridge Twp.
1958-1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	Small numbers of white elm, basswood, red oak and sugar maple. Polyhedrosis, a type of virus disease, was found in larval samples collected in the northern Regional Municipality of York.
1954-1955	not reported
1956-1960	small numbers
1961	moderate-to-heavy infestations in Toronto Twp
1962	light infestations common
1963-1968	trace populations
1969-1974	not reported
1975	light infestation in mixed hardwood stands in Albion Twp
1976-1980	not reported

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

Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1951	Low populations occurred throughout the district on white and Norway spruce.
1952-1953	trace populations
1954-1959	not reported
1960	trace populations, Whitchurch Twp
1961	Trace populations occurred in Whitchurch and Markham twps.
1962	Trace populations were reported in Whitchurch and Pickering twps.
1963-1966	trace populations
1967	Light populations occurred in Whitchurch Twp.
1968	Low numbers were collected in Uxbridge Twp.
1969-1975	trace populations
1976-1980	not reported

Native Elm Bark Beetle, *Hylurgopinus rufipes* (Eich.) and
Smaller European Elm Bark Beetle, *Scolytus multistriatus* (Marsh.)

Host(s): elm

[Major]

<u>Yea</u>	<u>Remarks</u>
1956	These two species of elm bark beetles are the principal vectors of Dutch elm disease, <i>Ceratocystis ulmi</i> (Buism.) C. Moreau. To obtain a more accurate record of the distribution of these bark beetles, elm trap logs were set out through the region. The native elm bark beetle appears to be well distributed through the district. The most northerly distribution of the European species was in Nassagaweya Twp, Cambridge District.
1957-1959	Surveys continued and the European elm bark beetle was found to be present in the area south of Highway 7 from Toronto to Oshawa.
1960-1964	not reported
1965-1967	Populations of the Smaller European bark beetle increased and spread through the district in proportion to numbers of elm trees dying from Dutch elm disease infection. Heavy infestations occurred in the area between Lake Ontario, Orangeville and Markham, declining in intensity to the northern boundary of Brock Twp. Populations of the native species were high through the entire district.
1969-1980	not reported

Fall Webworm, *Hyphantria cunea* (Drury)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	light infestations
1951	not reported
1952-1953	light populations
1954	not reported
1955-1957	Light infestations were recorded at numerous locations.
1958	moderate numbers
1959-1966	trace populations
1967-1968	Moderate populations occurred in Pickering Twp.
1969	trace populations
1970	not reported
1971	Localized pockets of medium populations were noted in the district.
1972-1973	light populations
1974-1978	trace populations
1979	Light infestations occurred in the western part of the district.
1980	trace populations

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

Host(s): cherry, apple

<u>Year</u>	<u>Remarks</u>
1950-1953	Medium-to-heavy infestations were common, particularly in the east part of the district on roadside trees.
1954	Populations declined to light.
1955-1958	trace populations
1959-1962	Light infestations were common.
1963	High numbers occurred in North Gwillimbury Twp.
1964-1967	light populations
1968	Moderate-to-severe damage occurred in Scott Twp.
1969	Medium-to-heavy infestations recurred in Scott Twp; similar damage was evident in Uxbridge Twp.
1970-1971	light populations
1972	Medium-to-heavy infestations were common in the Newmarket-Uxbridge area.
1973-1974	light populations
1975	not reported
1976-1979	light populations
1980	not reported

Early Birch Leaf Edgeminer, *Messa nana* (Klug)

Host(s): birch

[Minor]

<u>Year</u>	<u>Remarks</u>
1968-1969	light incidence of leafmining in Uxbridge Twp; new distribution point of this introduced insect
1970-1974	Populations increased to light and moderate levels in Uxbridge Twp.
1975	found at scattered locations through the district
1976-1980	not reported

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

Host(s): jack pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	trace populations
1953-1961	not reported
1962	Moderate populations occurred in East Gwillimbury Twp.
1963	Populations declined to light in East Gwillimbury Twp.
1964-1966	not reported
1967	trace populations
1968	not reported
1969-1970	Moderate-to-severe damage occurred in a small plantation in King Twp.
1971	not reported
1972-1974	Moderate populations were reported in Albion Twp.
1975	Low numbers occurred in Albion and Uxbridge twps.
1976-1977	not reported
1978	light infestation at one point in Albion Twp
1979	not reported
1980	Light infestation occurred near Palgrave in Albion Twp.

Northern Pine Weevil, *Pissodes approximatus* Hopk. and
Pales Weevil, *Hylobius pales* (Hbst.)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	High populations occurred in Whitchurch Twp.
1959-1966	Damage by these two weevils became increasingly serious in Christmas tree plantations throughout the district. The extent of the adult feeding damage to living trees was usually proportionate to the number of stump, dying trees and amount of slash available for brood material. Experimental and operational control measures were carried out at a number of locations.
1966	Moderate-to-severe damage and mortality occurred to 10 year old, red pine adjacent to a small, clear-cut area in Uxbridge Twp.
1967	A general population decline occurred.
1968-1972	not reported
1973	Medium-to-heavy infestations of <i>H. pales</i> were common in older Christmas tree plantations.
1974-1980	not reported

Early Aspen Leafroller, *Pseudexentera oregonana* (Wlsm.)

Host(s): tA, lA

1950-1955	not reported
1956	small numbers
1957-1958	not reported
1959	common in small numbers
1961	small numbers
1962	small pockets of medium-to-heavy infestations
1963-1964	Infestations declined.
1965-1966	Scattered medium-to-heavy infestations recurred in East Gwillimbury, North Gwillimbury, Scott and Georgina twps.
1967-1972	not reported
1973-1975	Moderate populations occurred in a 40-ha stand in King Twp.
1976-1978	not reported
1979	Medium-to-heavy infestations occurred at several locations in King and Vaughan twps.
1980	not reported

D I S E A S E S

Armillaria Root Rot, *Armillaria ostoyae* (Romagn.) Herink

Host(s): deciduous, coniferous

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	All dead trees were removed and stumps were pulled in a control experiment in a 30 year old red pine plantation in Uxbridge Forest.
1964	not reported
1965	No spread of tree mortality was observed in the red pine plantation in Uxbridge Forest.
1966	not reported
1967-1974	light incidence at several locations in the district
1975	Mortality of individual red pine and Scots pine trees was common in numerous plantations in the district. Rhizomorphs of this root rot were commonly found on young red oak and other recently killed deciduous trees.
1977-1978	associated with red oak mortality at several locations in the district
1979	red oak mortality most conspicuous in the Durham Regional Forest, Uxbridge Twp; low levels of infection common through the district
1980	not reported

Scleroderris Canker, *Ascocalyx abietina* (Lagerb.) Schläpfer-Bernhard

Host(s): coniferous

<u>Year</u>	<u>Remarks</u>
1950-1970	not reported
1971	Extensive surveys were carried out for this disease, however, all suspected samples showed negative results.
1972-1977	not reported
1978-1980	Extensive surveys were carried out to detect the European race of this disease. All results were negative.

Anthracnose of Maple, *Aureobasidium apocryptum* (Ell. & Ev.) Hermanides-Nijhof
and *Discula campestris* (Pass.) v. Arx

Host(s): maple

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	light infection levels
1956-1958	not reported
1959-1960	light infection levels
1961	not reported
1962-1964	widespread infections on roadside trees throughout the district
1965-1969	not reported
1970	A high incidence occurred on roadside trees.
1971-1972	not reported
1973	common along major highways
1974-1975	not reported
1976	common throughout the district
1977	caused 10% foliar damage on 25% of sugar maple, Whitchurch Twp
1978-1980	Moderate-to-severe defoliation occurred in Pickering and Markham twps.

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

Host(s): wE

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	first records of this disease in parts of Peel, York and Durham counties
1958	disease well established through the district
1959-1961	The area of light tree mortality extended north to a line from Orangeville to Uxbridge; north of this line only scattered trees were killed.
1962	Symptoms of the disease and tree mortality increased; new infections were usually confined to a few trees adjacent to one or more previously killed.
1963-1964	A pronounced increase in tree mortality was particularly evident in the Toronto-Brampton area and may be attributed to the progressive build-up of elm bark beetle populations. In the old areas of infection cumulative mortality over a period of years has reached 75-80%.
1965	Surveys showed up to 100% incidence of infection in scattered clumps of white elm in Caledon Twp, and 52% in Toronto Twp.
1966	A general increase in infection levels, particularly between Lake Ontario, Orangeville and Markham; for example, the incidence of infection increased from 25% to 80% at a sample point west of Toronto. The degree of infection gradually diminished in the northern part of the district.
1967	The highest incidence recurred in the Toronto-Brampton area where current infections ranged as high as 76% and mortality reached 92%.
1968	The degree of tree mortality was less evident than in recent years because most townships and municipalities have a program to remove dead and diseased trees. However, 76 and 98% incidence of infection was recorded in the municipalities of Aurora and Brampton, respectively.
1969-1970	Mortality and infection rates remained high, 96% in Pickering Twp, 90% in Albion Twp and 78% in Markham Twp.
1971-1972	The highest incidence of this disease occurred in the central and northern part of the Regional Municipality of Durham.
1973-1974	Mortality rates declined to a lesser degree in accordance with the lower elm content.
1975-1978	continues to kill residual elms and small reproduction through the district
1979-1980	not reported

Pine Needle Rust, *Coleosporium asterum* (Dietel) Sydow

Host(s): rP, jP

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	common in the district
1956-1957	not reported
1958	light incidence common
1959-1962	not reported
1963	light incidence
1964-1969	not reported
1970	varying levels of infection at scattered plantations
1971	not reported
1972	trace infections
1973-1976	not reported
1977	medium-to-heavy infections on red pine in Uxbridge Twp
1978	light infections on red pine in Albion Twp
1979	common on red pine in Uxbridge Twp
1980	not reported

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

Host(s): WP

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	infections in scattered, mature, eastern white pine stands in the north part of the Regional Municipality of Durham
1956-1958	not reported
1959-1963	common in the northern part of the district
1964	New infections were noted in East Gwillimbury Twp. Infections were generally heaviest where <i>Ribes</i> spp. were most numerous.
1965-1967	no changes in the status of this disease
1968	Infection levels of 3, 4 and 22.5% were recorded in East Gwillimbury, Whitchurch and Albion twps, respectively.
1969-1970	not reported
1971-1972	no significant changes
1973-1974	All levels of infection common through the district; this disease was most prevalent in unthinned, unpruned, pure stands of eastern white pine.
1975	Surveys carried out in two randomly selected, juvenile eastern white pine plantations revealed infection rates of 6.6 and 0.7% in Albion and Uxbridge twps. respectively.
1976-1977	not reported
1978	little change in overall status
1979	not reported
1980	little change in overall status

Cytospora Canker, *Cytospora kunzei* Sacc.

Host(s): spruce

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962-1963	Branch cankers caused by this disease were widespread in the district.
1964	contributed to Norway spruce deterioration in Markham Twp
1965-1966	common in the district
1967-1972	not reported
1973	light infection levels recorded in a white spruce plantation, East Gwillimbury Twp
1974	Light infection levels occurred in East Gwillimbury and Uxbridge twps.
1975-1980	not reported

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

Host(s): rP, wP, ScP, jP

<u>Year</u>	<u>Remarks</u>
1955	first record in Ontario
1957	disease well established in Vivian Forest, Whitchurch Twp
1958-1962	not reported
1963-1964	very light incidence of tree mortality in Vivian Forest, Whitchurch Twp
1965-1966	no additional tree mortality in Vivian Forest, Whitchurch Twp
1967	Fruiting bodies of this organism were found in a small red pine plantation in Brock Twp where mortality has occurred for several years.
1968	The known distribution was extended approximately 15 km to the east when an infection center was found in Uxbridge Twp.
1969	Light tree mortality occurred in the infection center in a mixed pine plantation in Uxbridge Twp. No new mortality was recorded in infection centers in Whitchurch and Brock twps.
1971-1972	no change in status
1973	Infections remained active in Uxbridge Twp; rate of mortality unchanged. Infected and suspect trees are being cut out by the OMNR and stumps treated with wood-destroying fungus <i>Peniophora gigantea</i> (Fr.) Mass.
1974-1975	no new infections observed; OMNR continues to cut out and treat known infection centers
1976	Two new infection centers were detected in unthinned jack pine plantations in Albion Twp. OMNR continues to cut out known infection centers and to use the wood-destroying fungus on the cut stumps.
1977-1980	several new infection centers detected; little change in distribution

Hypoxyton Canker, *Hypoxyton mammatum* (Wahlenb.) J. Miller

Host(s): tA

1950-1952	not reported
1953-1954	infected trees common through the district
1955	Areas of highest infection rates were noted on dry, shallow soil sites in the northern part of the Regional Municipality of Durham. A 65% infection rate was recorded in a study plot established in Uxbridge Twp.
1956-1963	not reported
1964	this disease generally present in aspen stands throughout the district with incidence varying from low to high at different locations
1965-1968	no noticeable changes in status
1969-1972	not reported
1973	5% tree mortality recorded in East Gwillimbury Twp
1974-1980	not reported

Tip Blight, *Sphaeropsis sapinea* (Fr.) Dyko & B. Sutton

Host(s): pine

<u>Year</u>	<u>Remarks</u>
1950-1977	not reported
1978	Foliage damage of 10% was recorded on Scots pine at locations in Whitchurch and Uxbridge twps.
1979	not reported
1980	Foliage damage of 20-25% was reported on Scots pine at points in Uxbridge and Scott twps.

DIEBACKS AND DECLINES

Deterioration of Maple (Maple Dieback 1977-1980)

1950-1957	not reported
1958	A survey was carried out in the Central Region to assess the extent of deterioration of sugar maple. At all sample plots the symptoms varied from premature discolouration and leaf drop to stages of twig and branch mortality; however, no significant tree mortality was observed.
1959	mortality of scattered branch tips and occasional branches not uncommon even in healthy stands examined
1960	Dead and dying branch tips of sugar maple common through the district; collections submitted to the Forest Pathology Laboratory revealed the presence of numerous organisms of which <i>Steganosporium pyriforme</i> was the most common associated with dead and dying branches.
1961	The mortality rate of branch tips of sugar maple attributed to pathological organisms declined considerably.
1962	no changes
1963-1964	not reported
1965	Maple trees along paved highways have deteriorated alarmingly at many points through the district. Symptoms of damage included leaf scorch, curled and stunted leaves, premature shedding, dead and dying branches in the crown, loss of vigour and eventual death of the tree. The highest rate, 80% of trees damaged and 17% tree mortality was recorded at one sample point in Caledon Twp.
1966	For the second consecutive year, the numbers of trees affected by this condition along major highways remained very high. The tree mortality rate increased to 67% in Caledon Twp.
1967	A general decline in incidence of roadside maple deterioration; the affected tree counts were as follows: Albion Twp 72%; Chinguacousy 36%; Vaughan 75%; and Scott Twp 46%.
1968-1969	no changes in condition observed
1970-1976	not reported
1977	44% incidence of damaged roadside sugar maple trees at one sample point in Whitchurch Twp
1978-1980	not reported

Drought

Host(s): coniferous and deciduous

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	Heavy mortality occurred to spring planted trees and the drought contributed to mortality of young plantation trees up to the 6 year age class.
1956-1965	not reported
1966	Up to 95% mortality was recorded in late spring pine and spruce plantings.
1967	Small pockets of mortality occurred in older red pine plantations due to bark beetles and the previous drought.
1968-1980	not reported

Frost

Host(s): coniferous and deciduous

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	Widespread damage occurred to a wide variety of hosts following below freezing temperatures on 17 and 18 May.
1958-1962	not reported
1963	Late spring frosts caused severe mortality in low lying areas throughout the district to a variety of hosts.
1964-1965	Up to 90% shoot mortality was recorded in frost pockets to both coniferous and deciduous hosts.
1966	Bud damage averaged 5% to white spruce and balsam fir in low lying areas; damage was also reported on white ash, sumac and red oak.
1967-1968	not reported
1969	Red oak suffered moderate-to-severe leaf and bud damage in East Gwillimbury and Uxbridge twps; varying degrees of damage occurred to spruce plantings near Vivian and Uxbridge.
1970-1971	not reported
1972	An average shoot mortality of 55% occurred to white and Norway spruce in low lying areas; heavy damage reported over 20 ha of white spruce, Whitchurch Twp.
1973-1979	not reported
1980	Moderate damage occurred on white spruce near the village of Maple.

Salt Damage

Host(s): coniferous

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Moderate-to-severe foliar damage was prevalent along Hwy 400.
1967	Moderate-to-severe foliar damage recurred along Hwy 400.
1968-1972	varying degrees of damage along major highways
1973-1974	not reported
1975	Moderate-to-severe foliar damage occurred at several locations.
1976-1977	Varying degrees of damage were reported along highways 400 and 401.
1978	not reported
1979-1980	Moderate-to-severe foliar damage was again reported along highways 400 and 401.

Semimature Tissue Needle Blight

Host(s): wP

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	Damage was evident on all age categories throughout the district.
1956-1963	not reported
1964-1965	Moderate-to-severe damage occurred on sporadic trees in scattered plantations.
1966-1971	not reported
1972	Light-to-moderate damage occurred to all age classes over a large part of the district (see map, page). Incidence at one location in Uxbridge Twp was 15%.
1973-1975	not reported
1976	moderate-to-severe damage at several locations
1977-1980	not reported

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>Aesculu 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

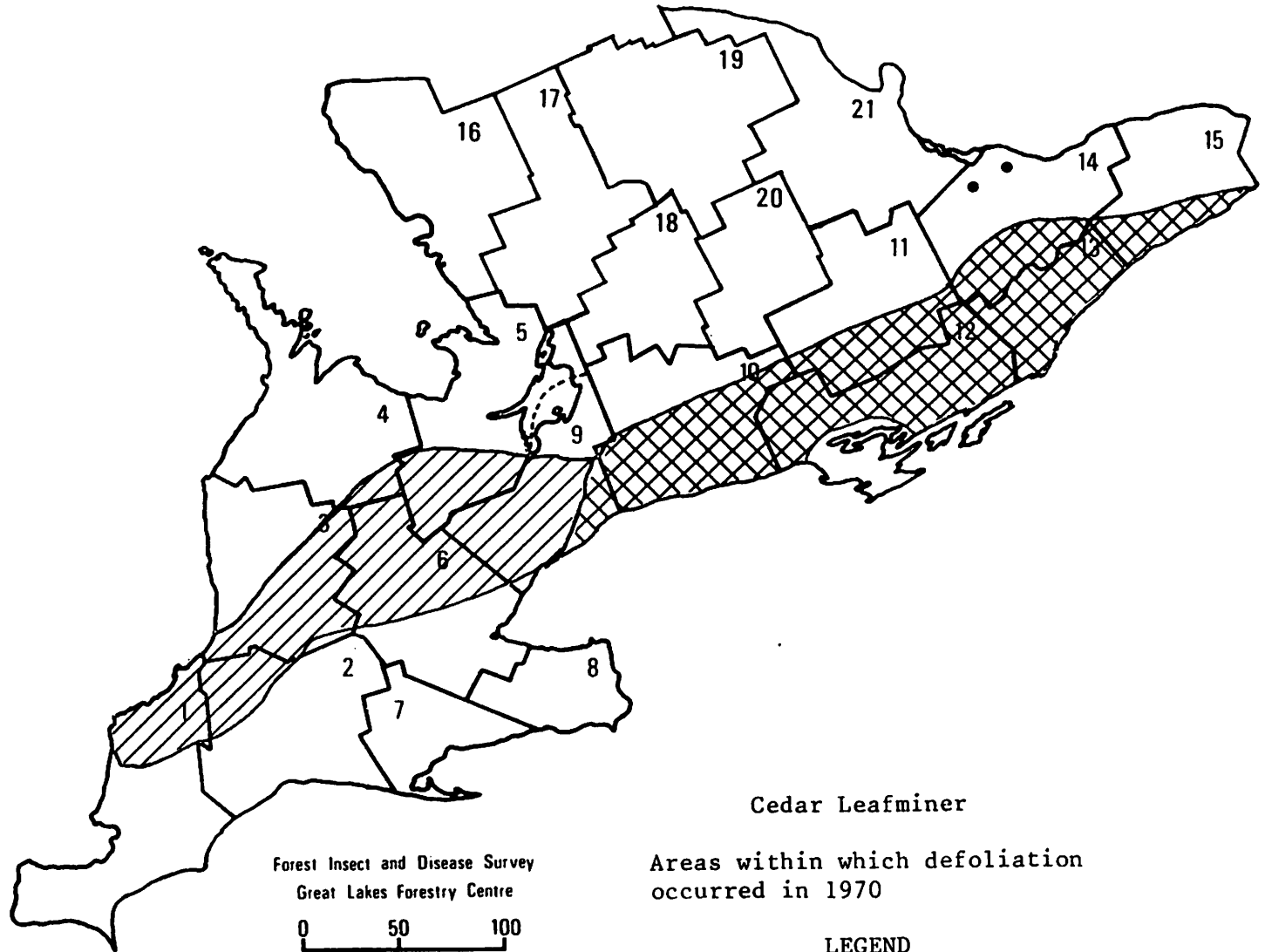
<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Cedar, eastern white	<i>Thuja occidentalis</i> L.	eC
Fir, balsam	<i>Abies balsamea</i> (L.) Mill.	bF
Larch, European	<i>Larix decidua</i> Mill.	eL
Pine, Austrian	<i>Pinus nigra</i> Arn.	auP
eastern white	<i>strobus</i> L.	ewP
jack	<i>banksiana</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
M A P S - S O U T H E R N O N T A R I O

SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
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20. BANCROFT
21. PEMBROKE



Cedar Leafminer

Areas within which defoliation occurred in 1970

LEGEND

Light defoliation



Moderate-to-severe defoliation

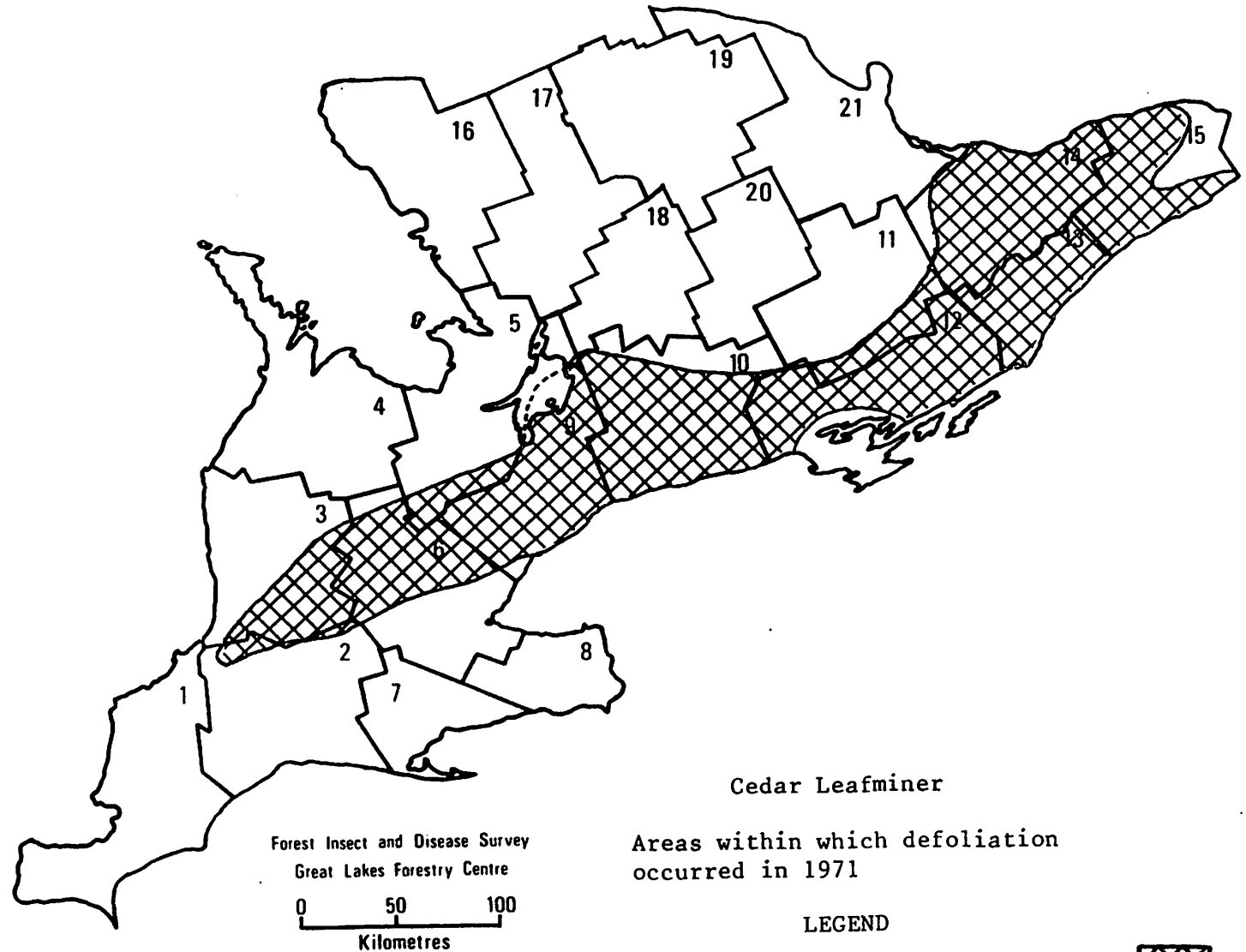
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SOUTHERN ONTARIO

DISTRICTS

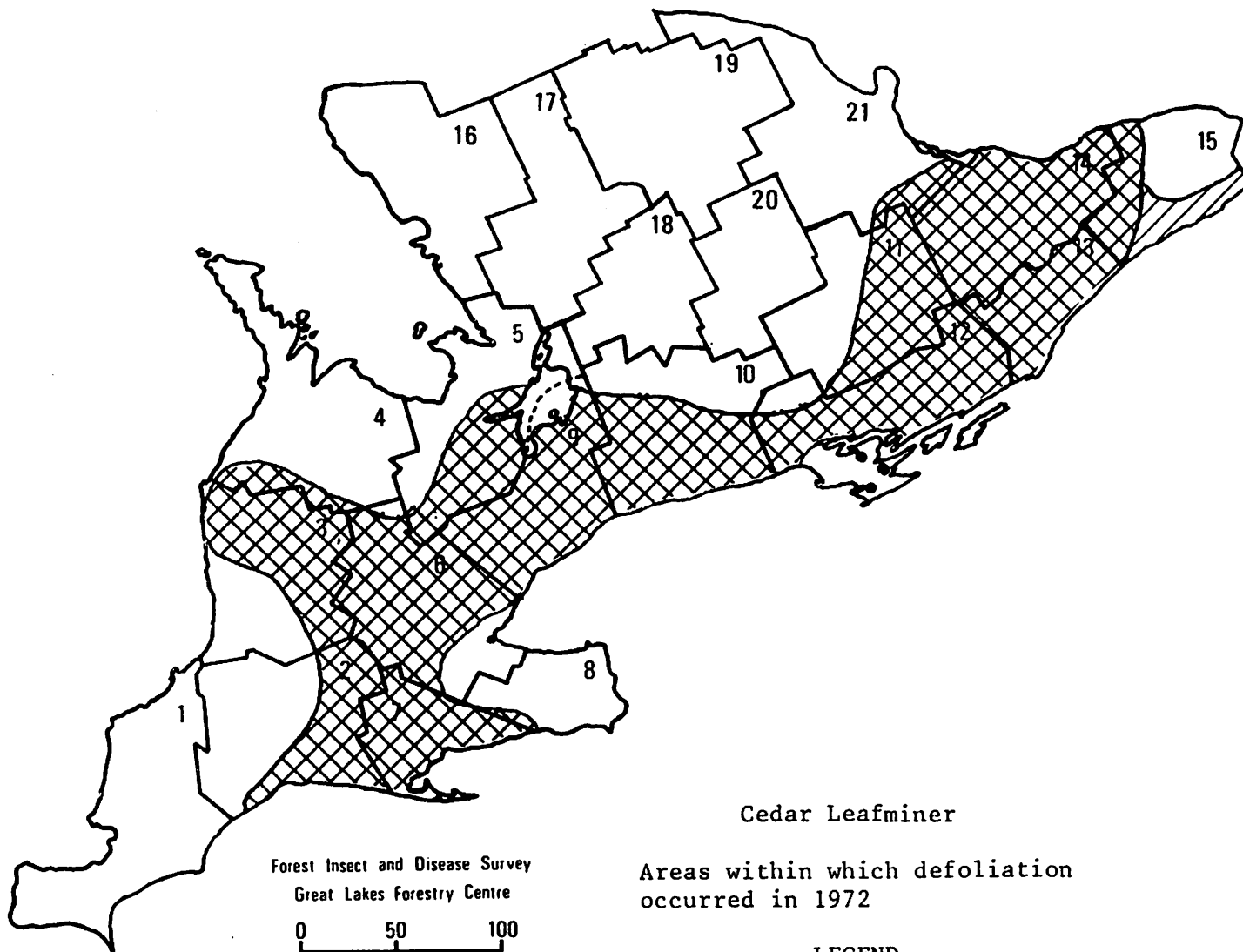
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LEGEND

Light defoliation



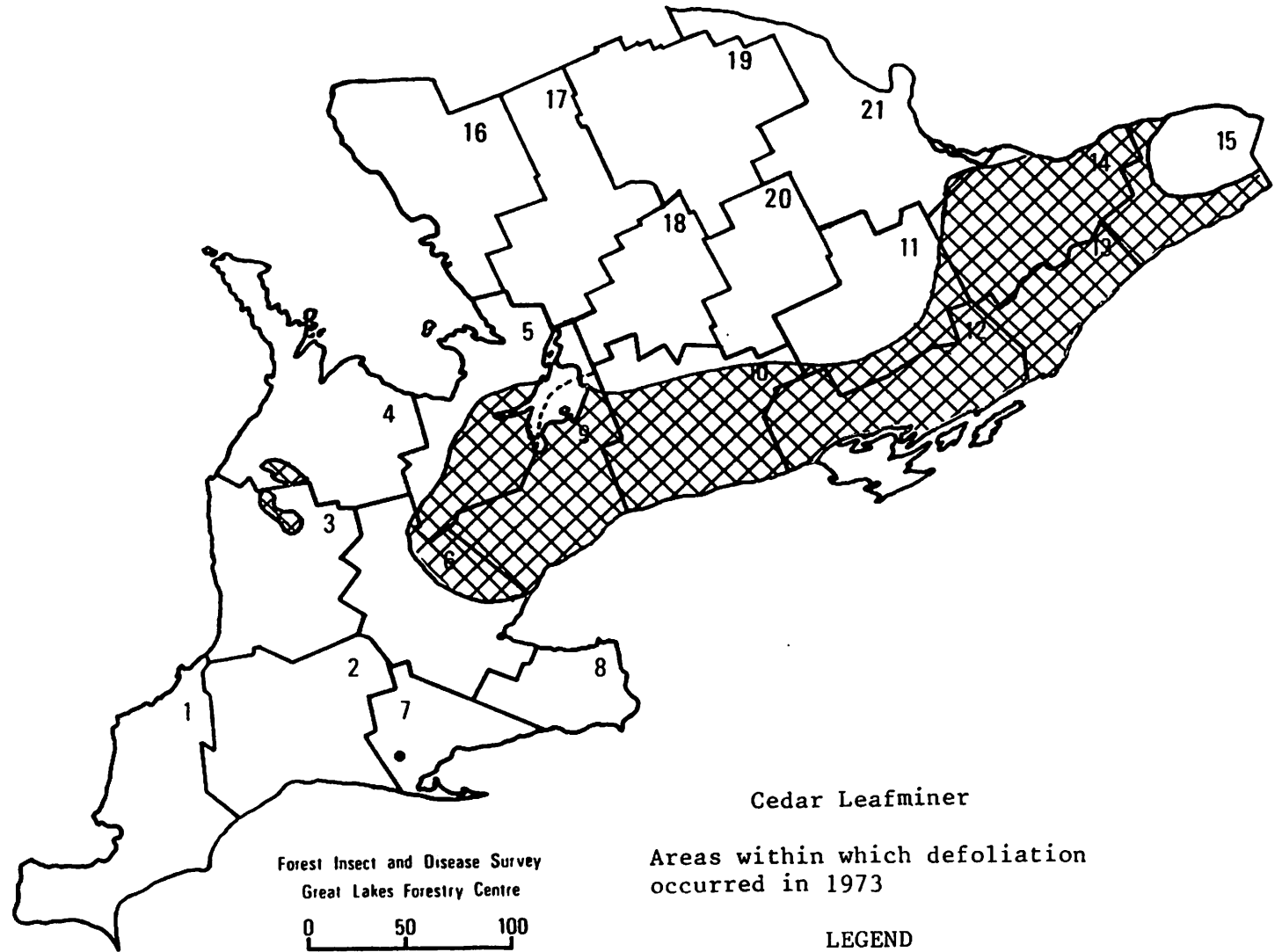
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

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Cedar Leafminer

Areas within which defoliation occurred in 1973

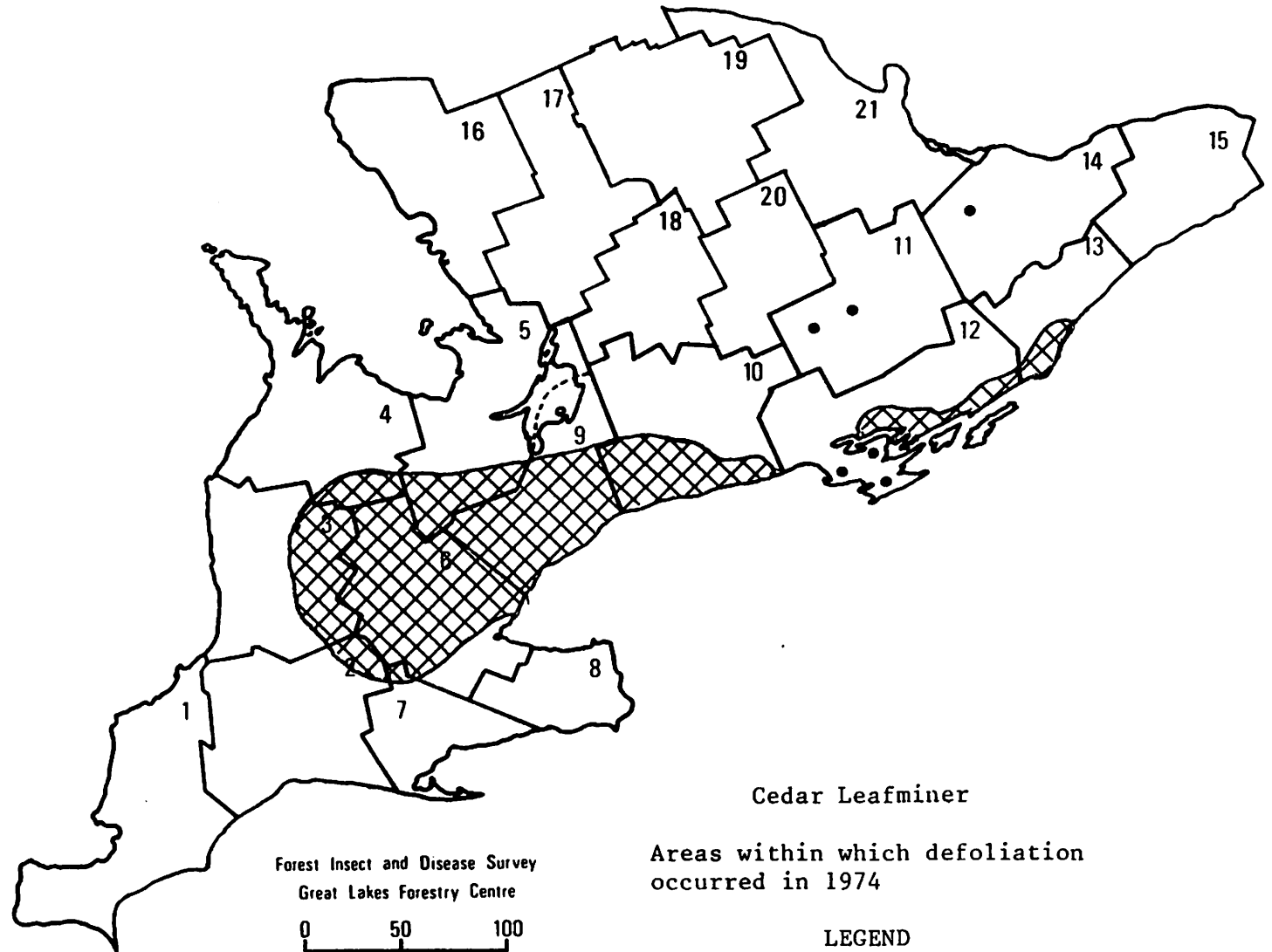
LEGEND

Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

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Cedar Leafminer

Areas within which defoliation
occurred in 1974

LEGEND

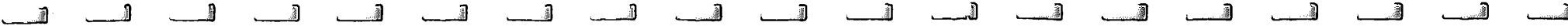
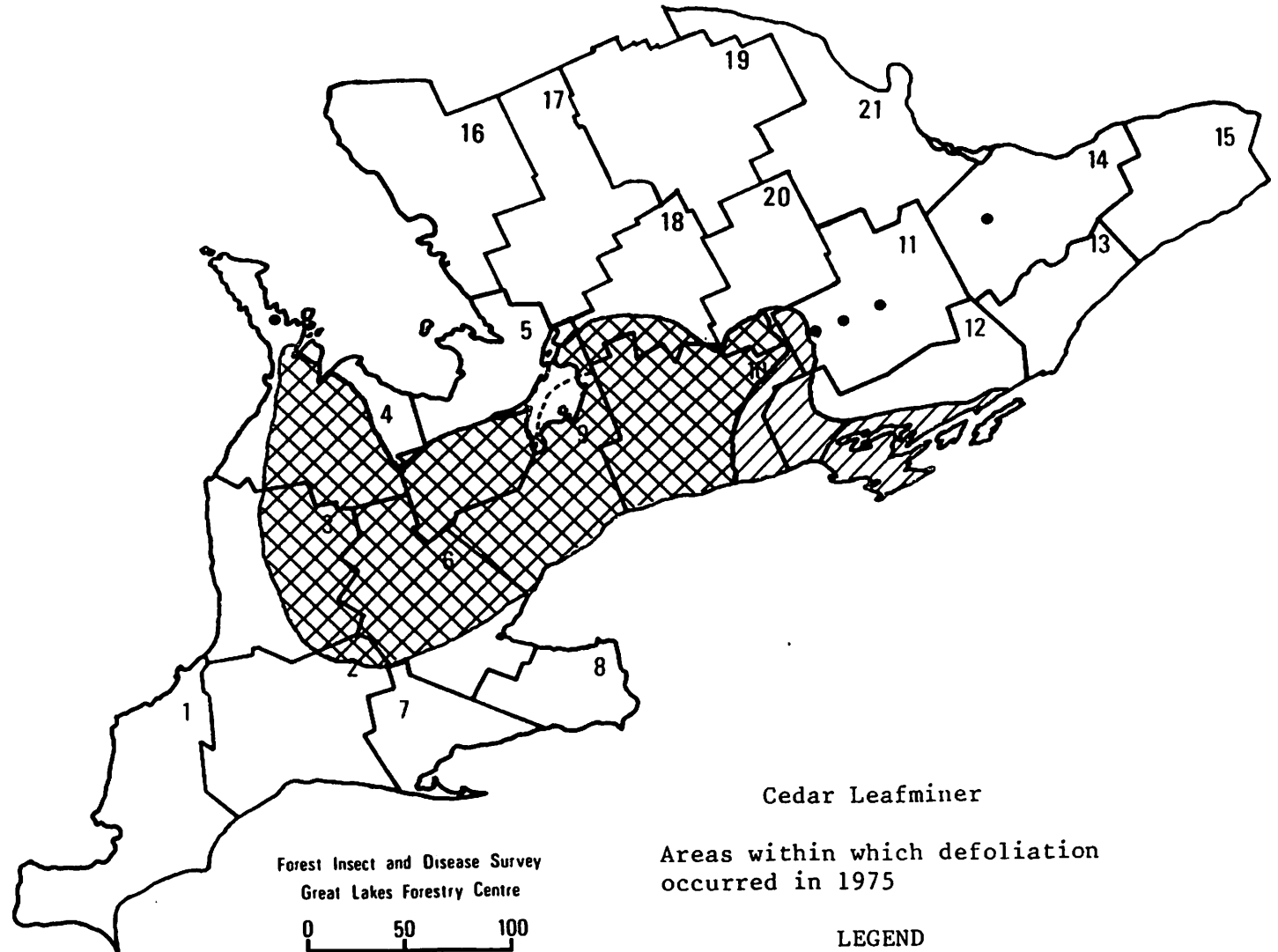
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

DISTRICTS

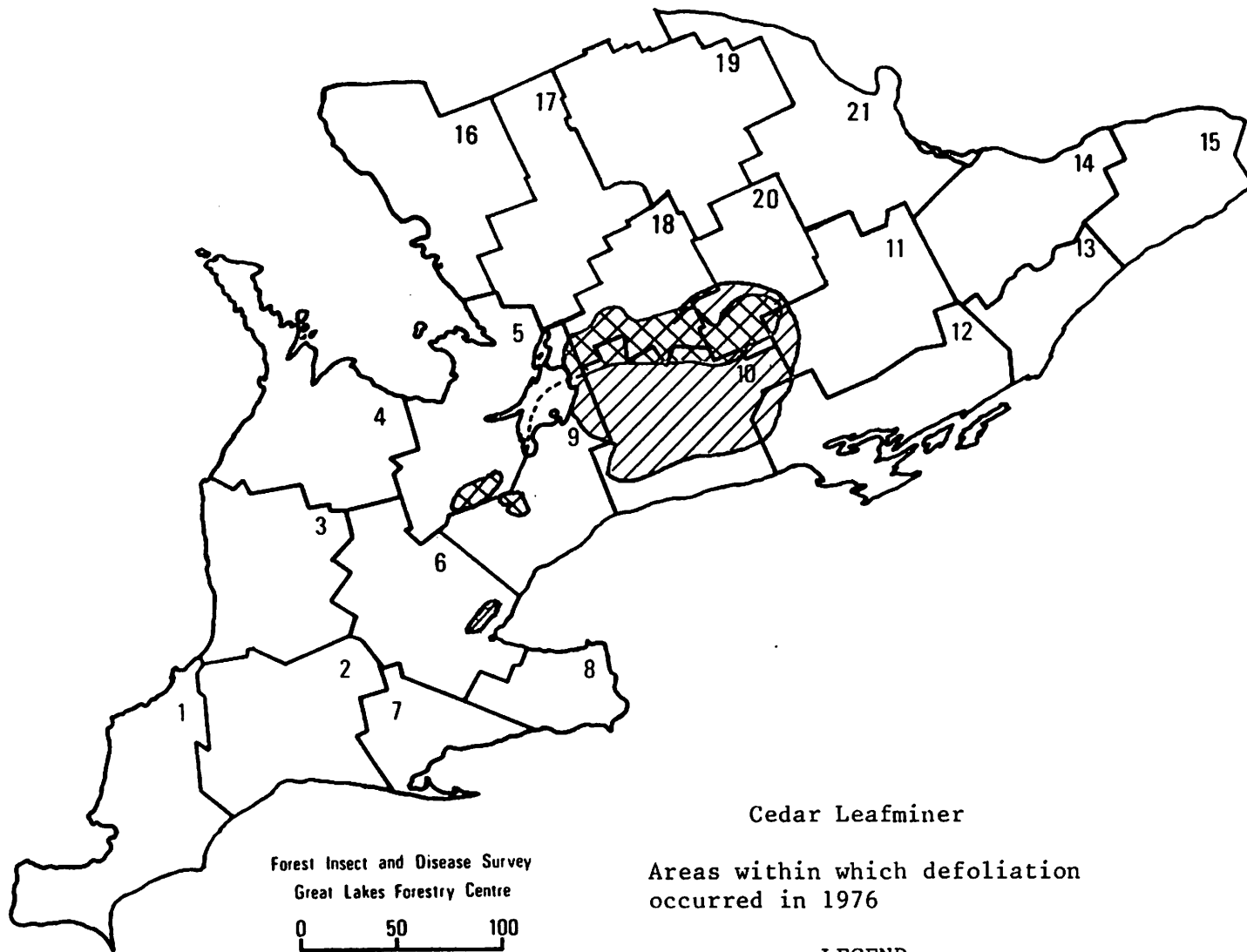
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Cedar Leafminer

Areas within which defoliation occurred in 1976

LEGEND

Light defoliation

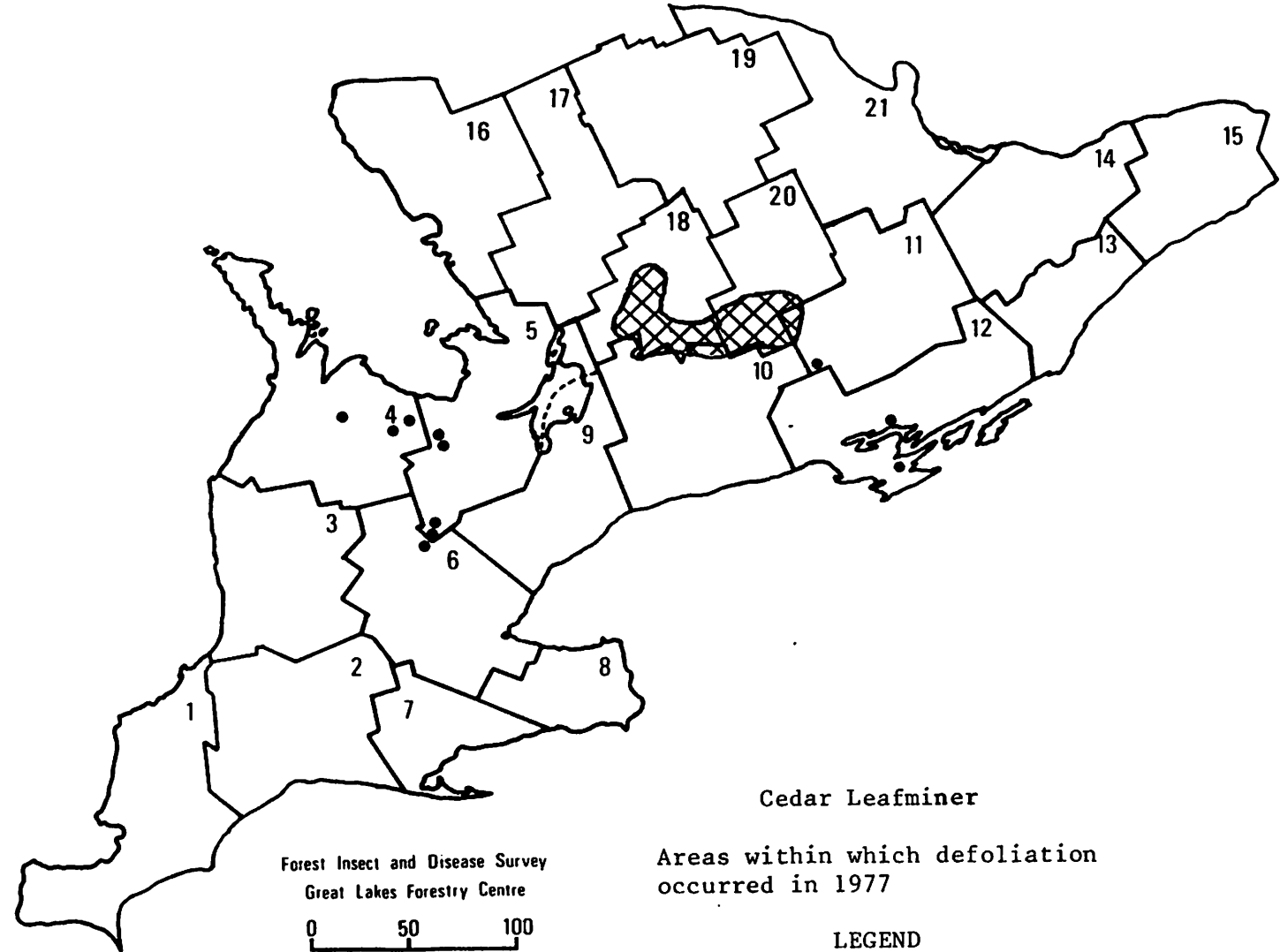
Moderate-to-severe defoliation



SOUTHERN ONTARIO

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Forest Insect and Disease Survey
Great Lakes Forestry Centre
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Kilometres

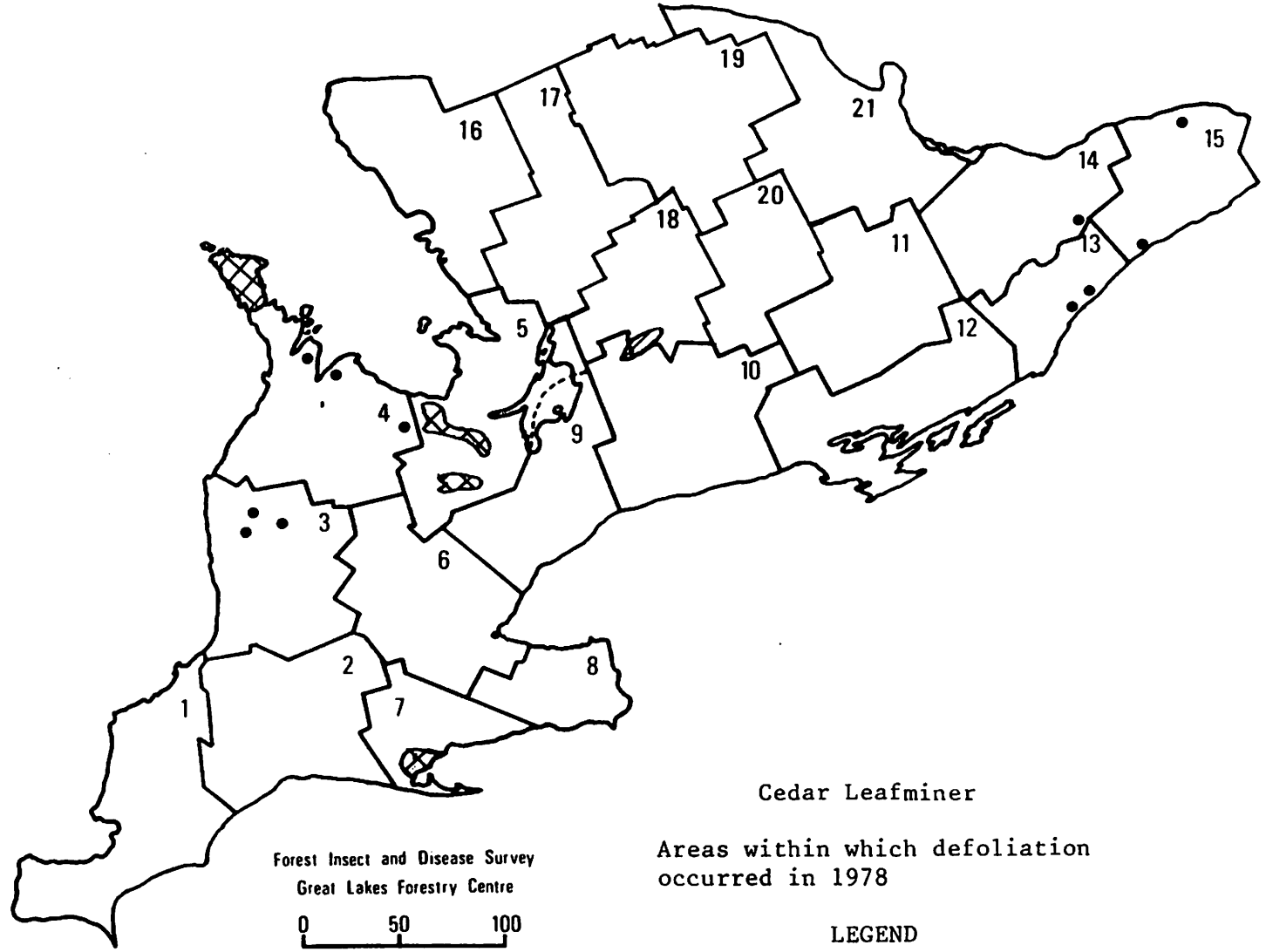
Cedar Leafminer
Areas within which defoliation
occurred in 1977

LEGEND
Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

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Cedar Leafminer

Areas within which defoliation occurred in 1978

LEGEND

Light defoliation



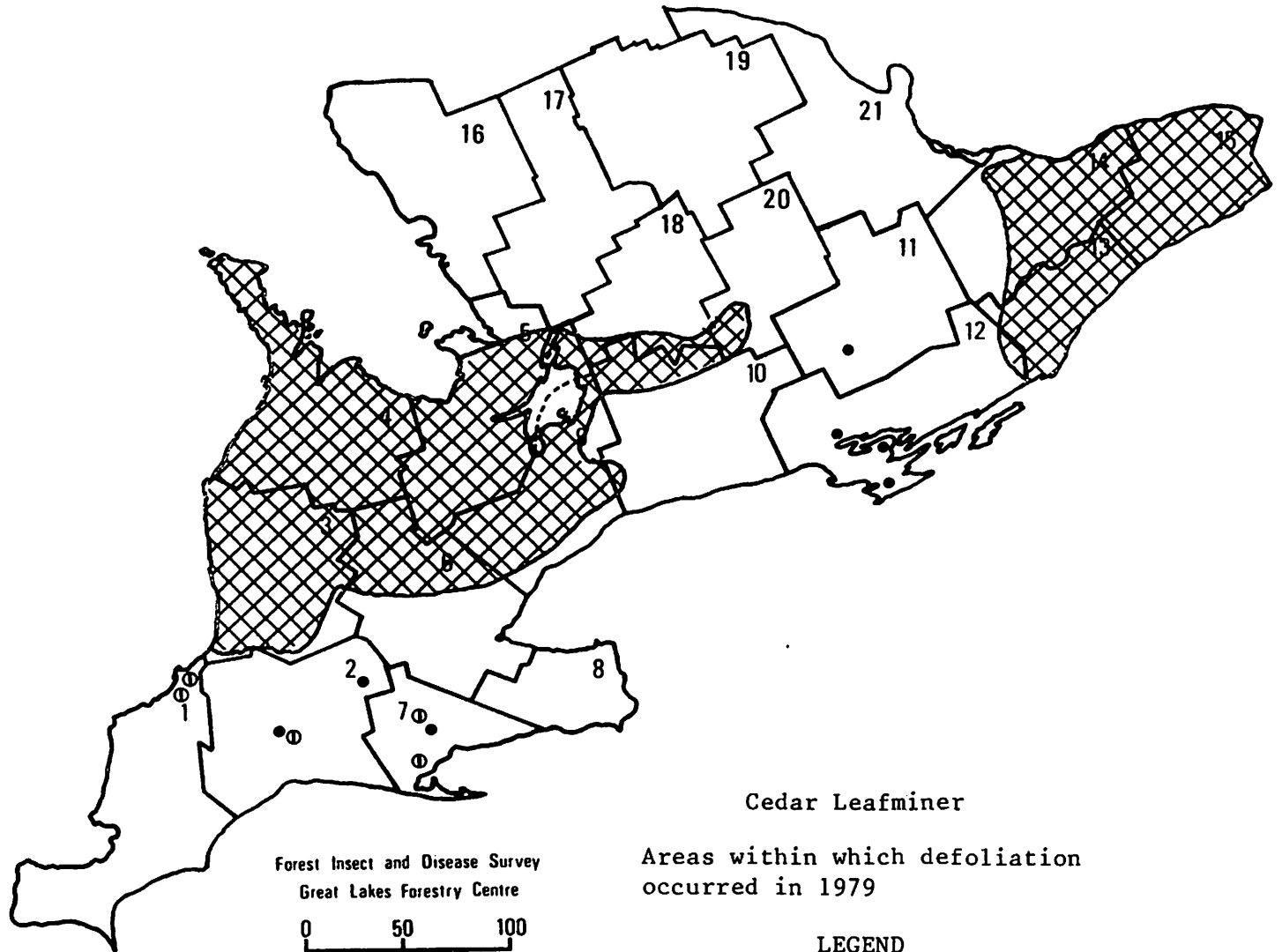
Moderate-to-severe defoliation • or



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Cedar Leafminer

Areas within which defoliation
occurred in 1979

LEGEND

Light defoliation

Moderate-to-severe defoliation



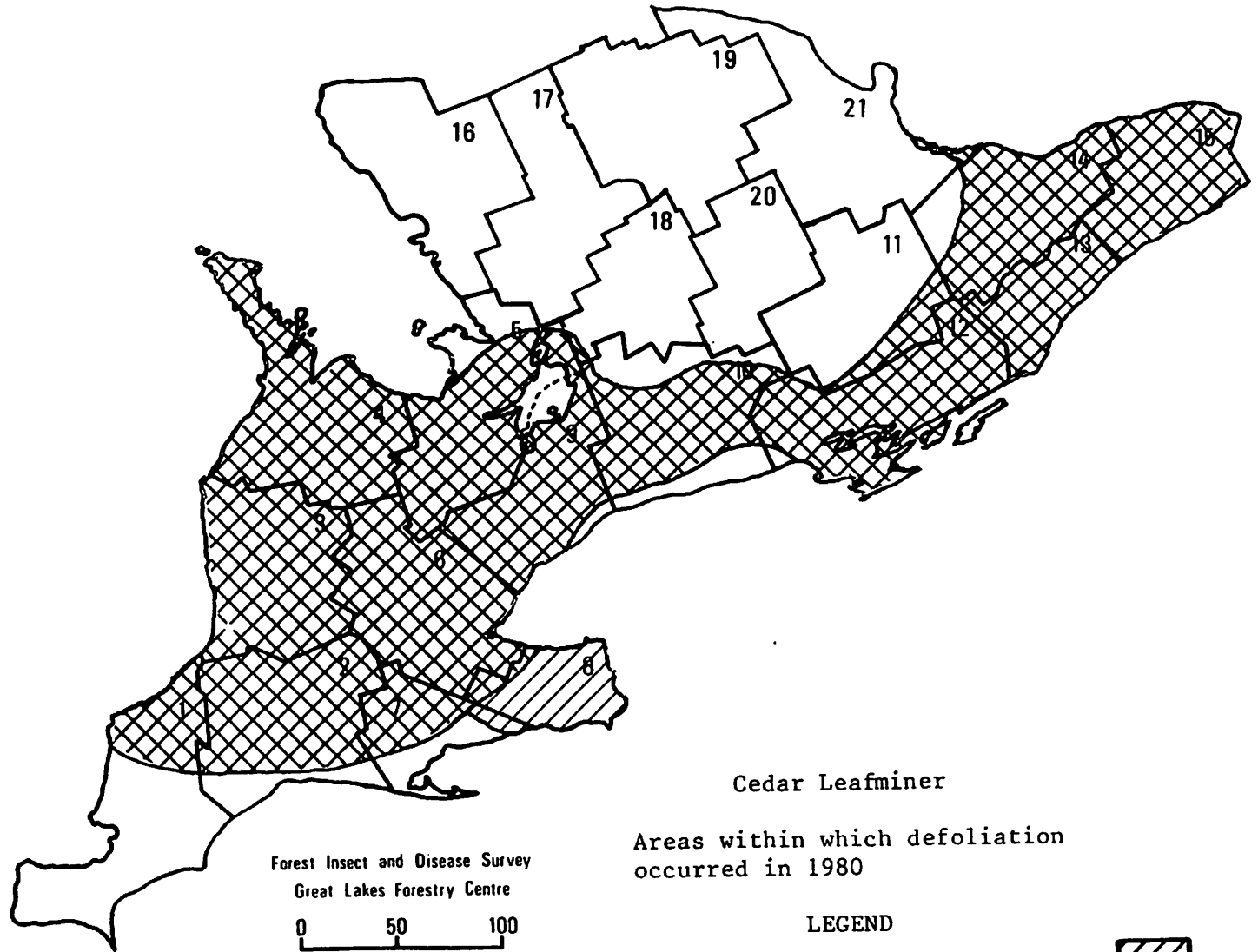
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20. BANCROFT
21. PEMBROKE



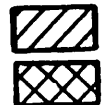
Cedar Leafminer

Areas within which defoliation
occurred in 1980

LEGEND

Light defoliation

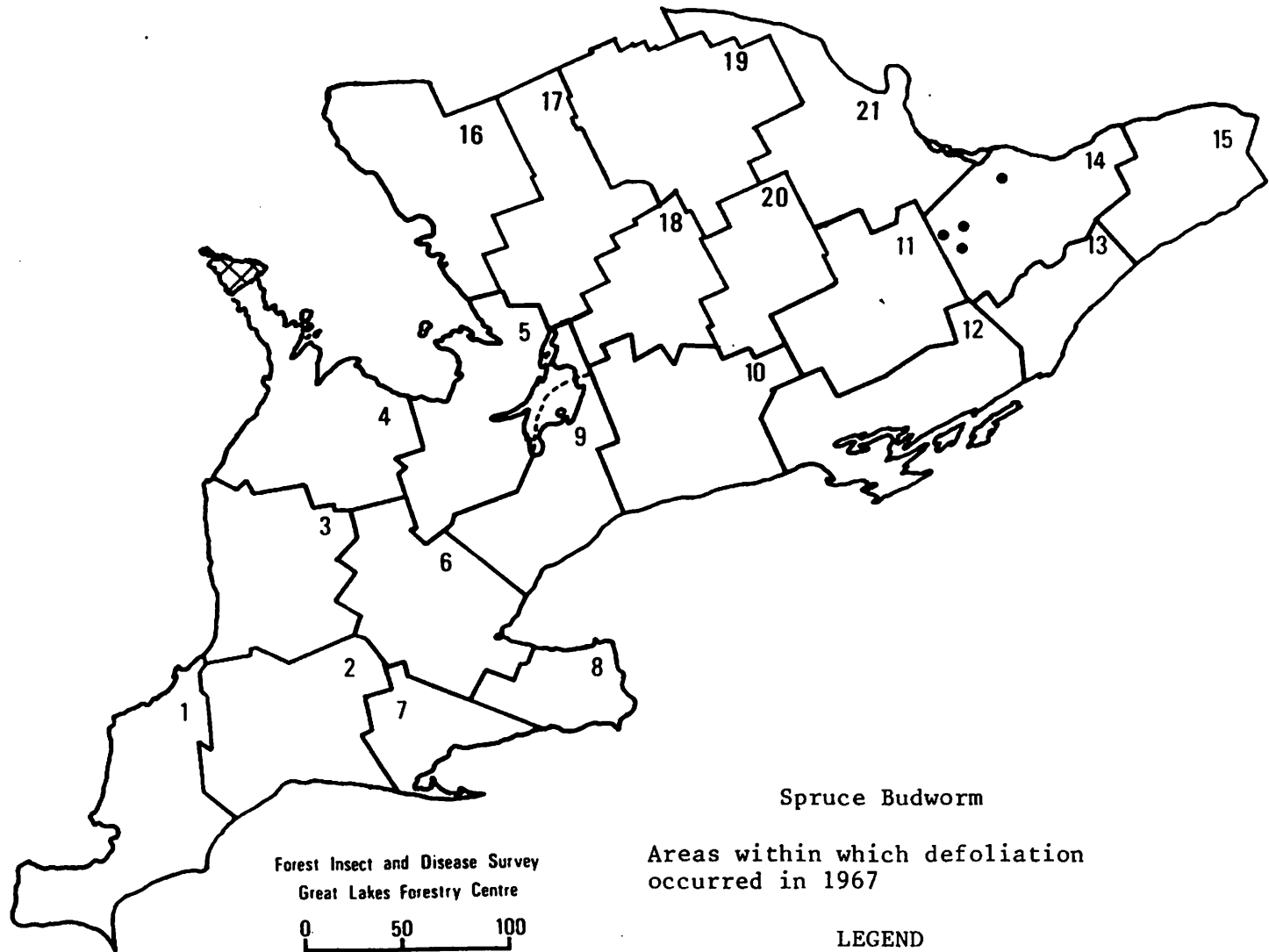
Moderate-to-severe defoliation



SOUTHERN ONTARIO

DISTRICTS

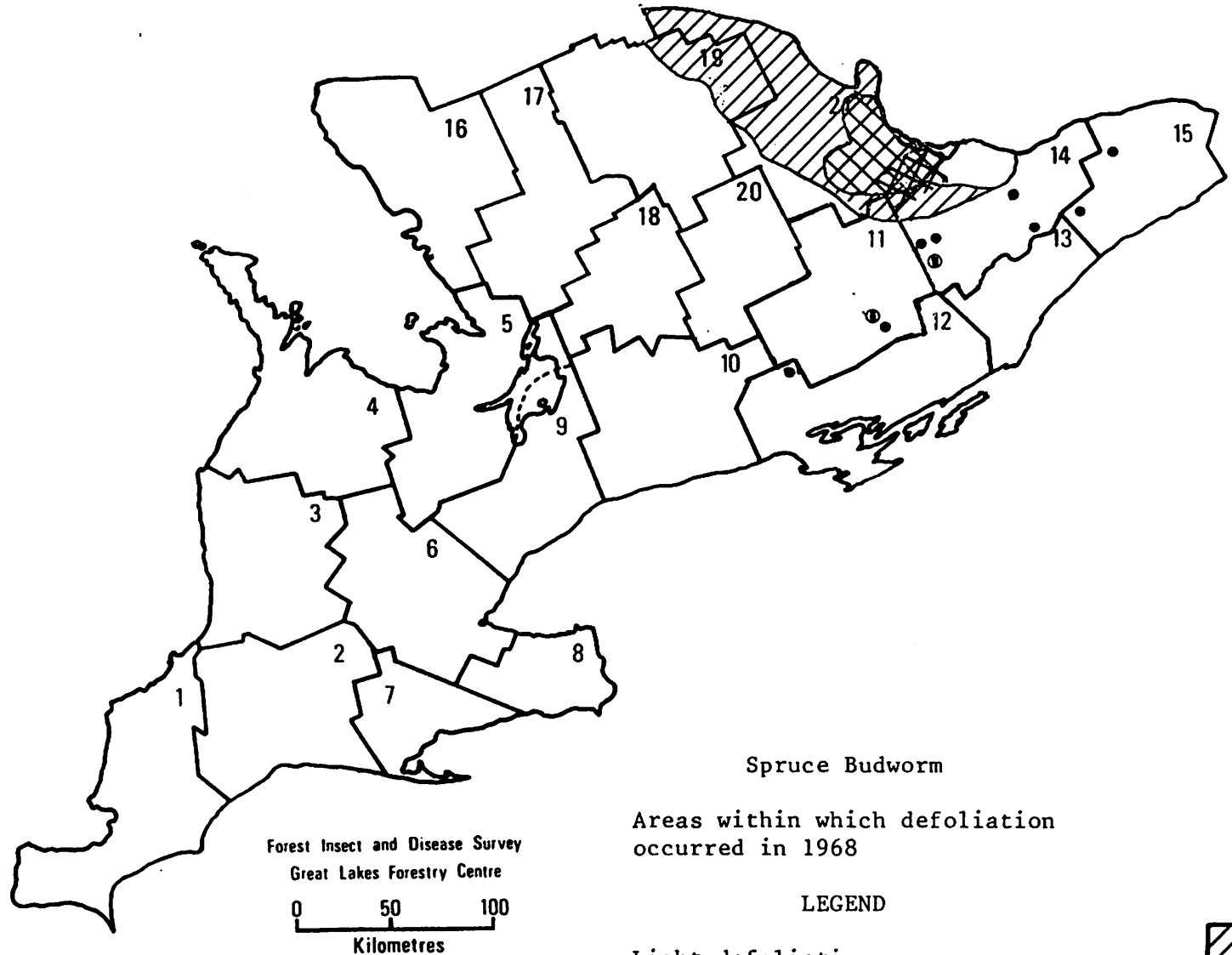
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

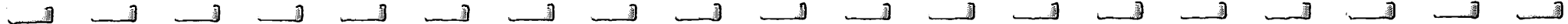
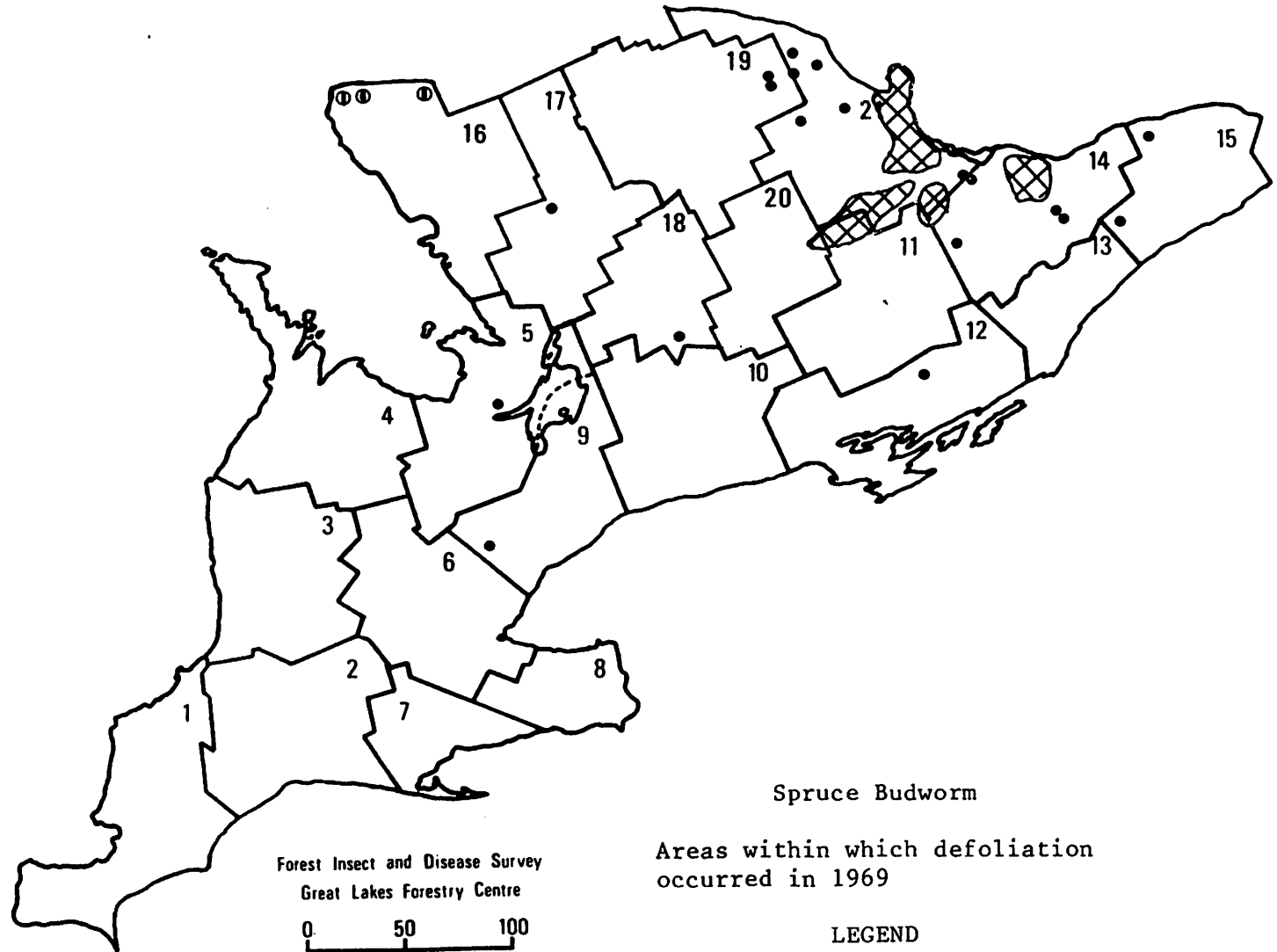
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5. HURONIA
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7. SIMCOE
8. NIAGARA
9. MAPLE
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17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

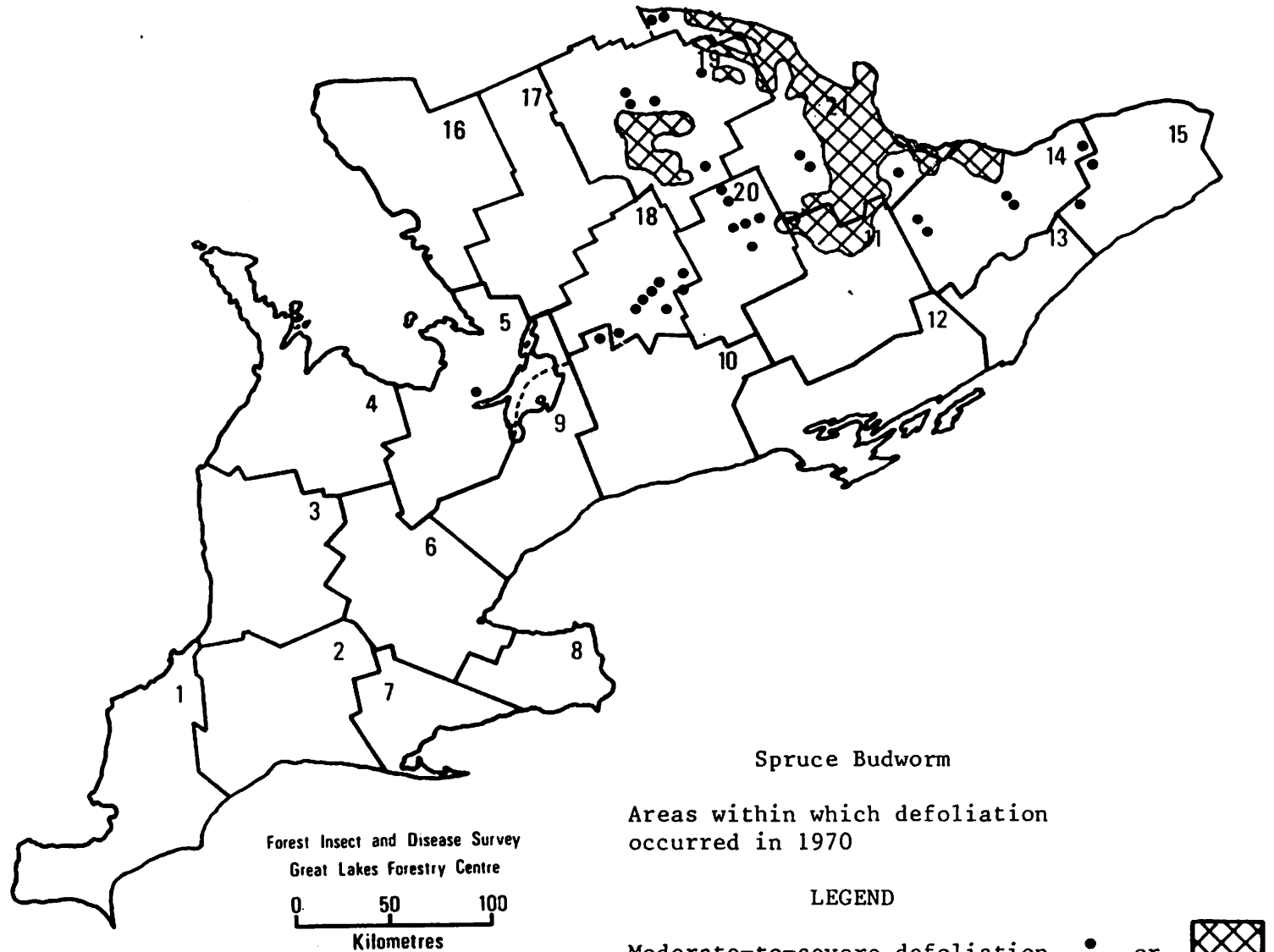
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3. WINGHAM
4. OWEN SOUND
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7. SIMCOE
8. NIAGARA
9. MAPLE
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17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

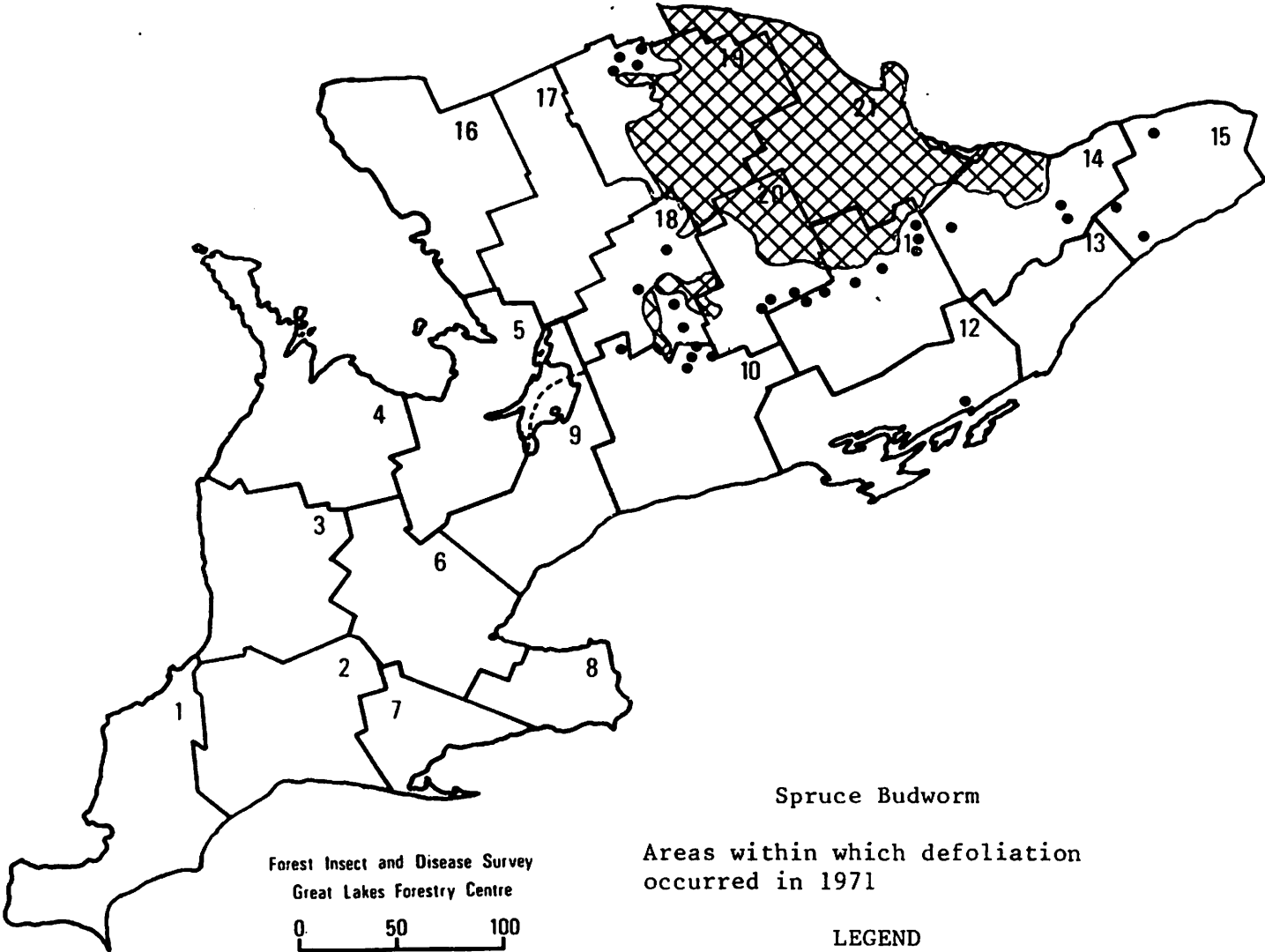
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SOUTHERN ONTARIO

DISTRICTS

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- 18. MINDEN
- 19. ALGONQUIN PARK
- 20. BANCROFT
- 21. PEMBROKE



Spruce Budworm

Areas within which defoliation occurred in 1971

LEGEND

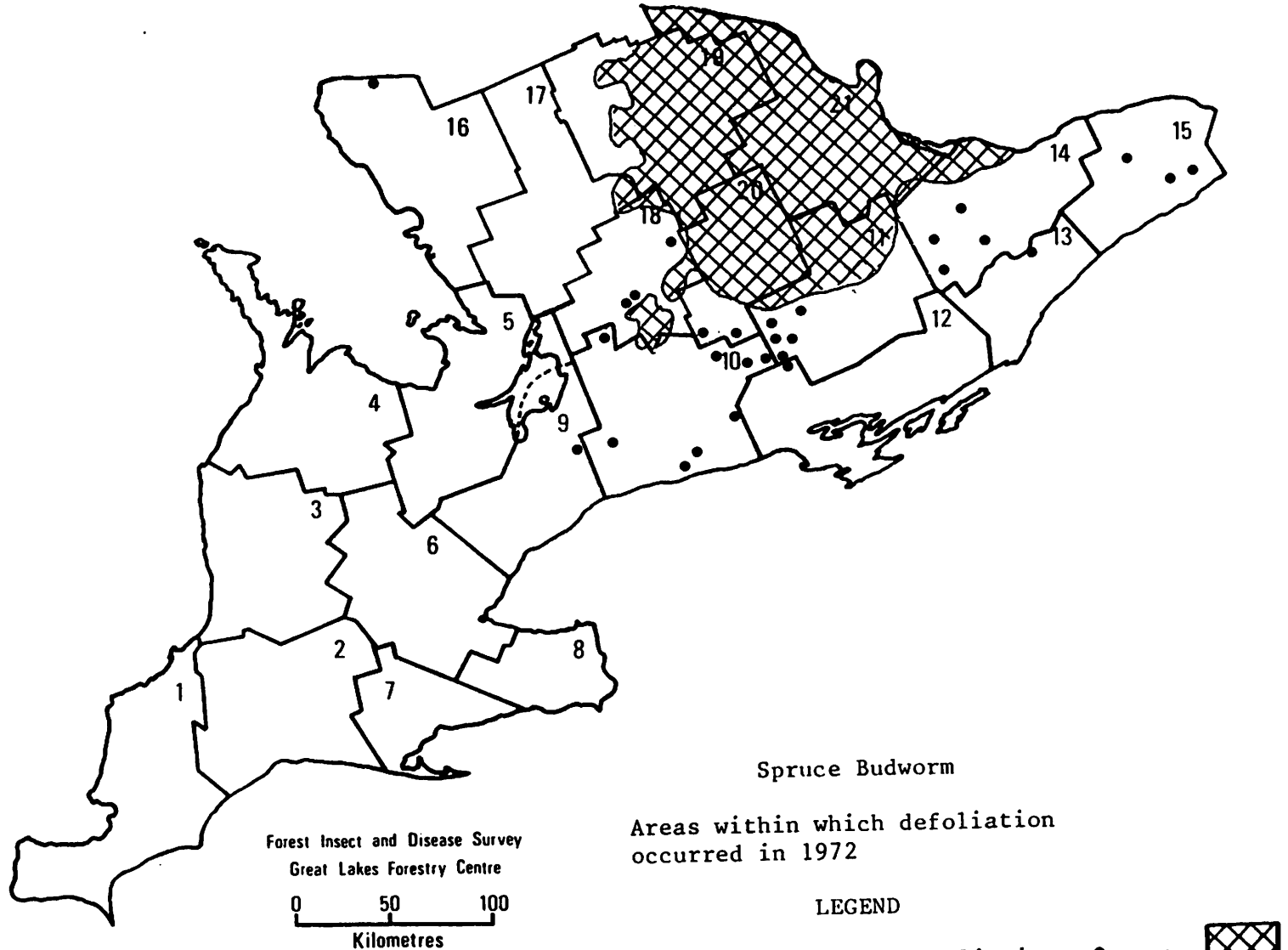
Moderate-to-severe defoliation • or 

Forest Insect and Disease Survey
Great Lakes Forestry Centre
0 50 100
Kilometres

SOUTHERN ONTARIO


DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
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17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Areas within which defoliation occurred in 1972

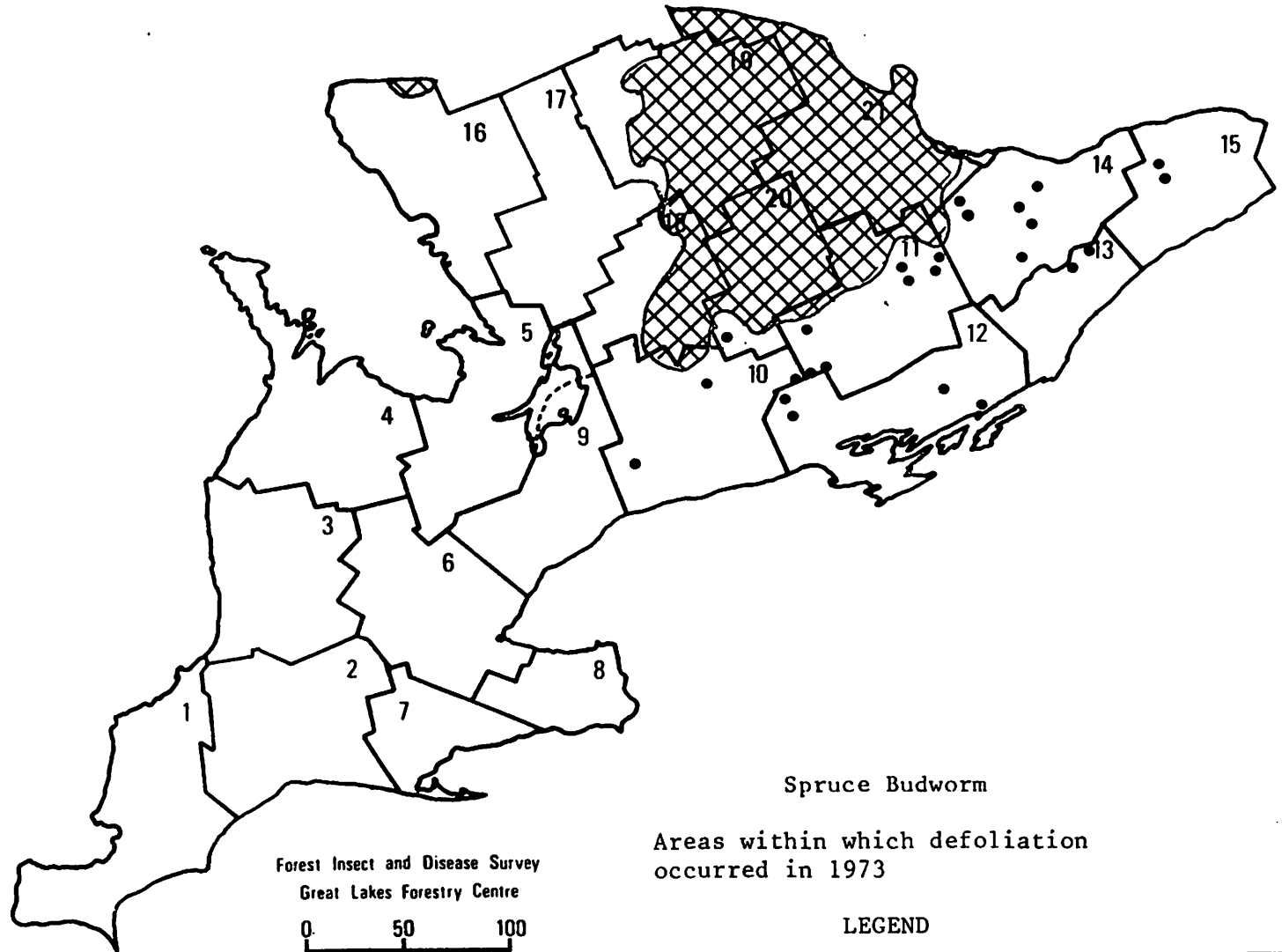
LEGEND

Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

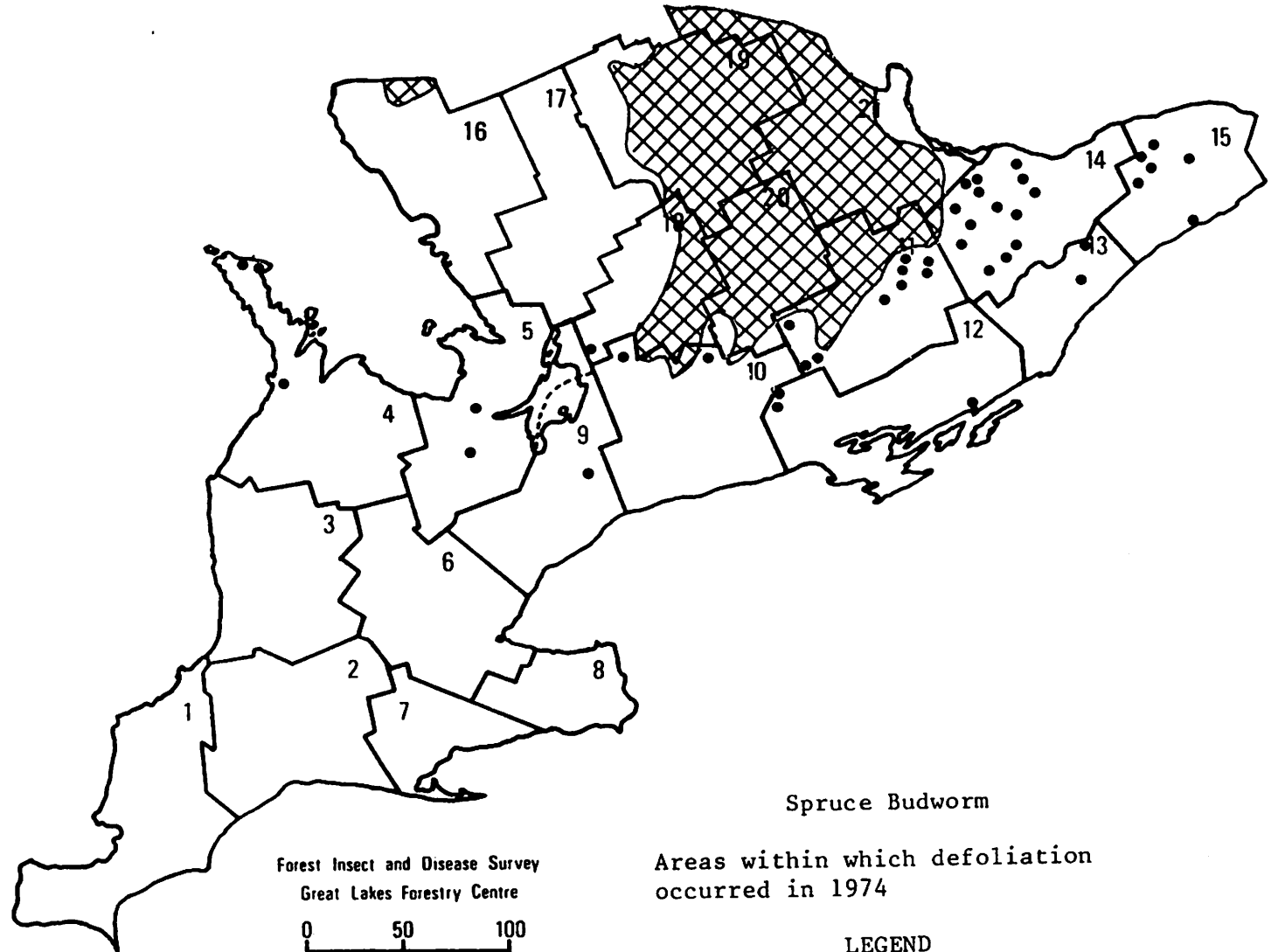
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7. SIMCOE
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9. MAPLE
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SOUTHERN ONTARIO

DISTRICTS


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18. MINDEN
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21. PEMBROKE



Spruce Budworm

Areas within which defoliation
occurred in 1974

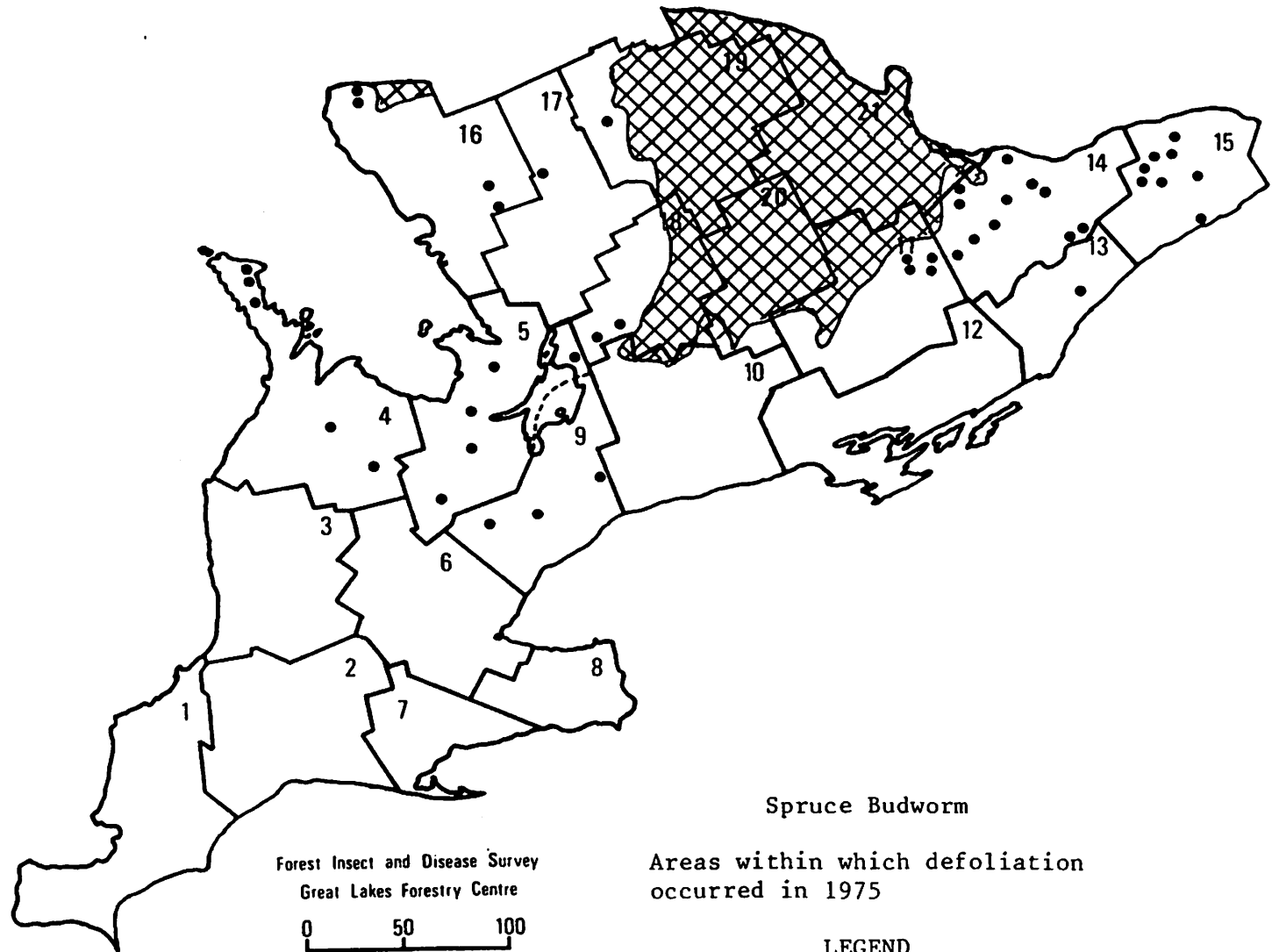
LEGEND

Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

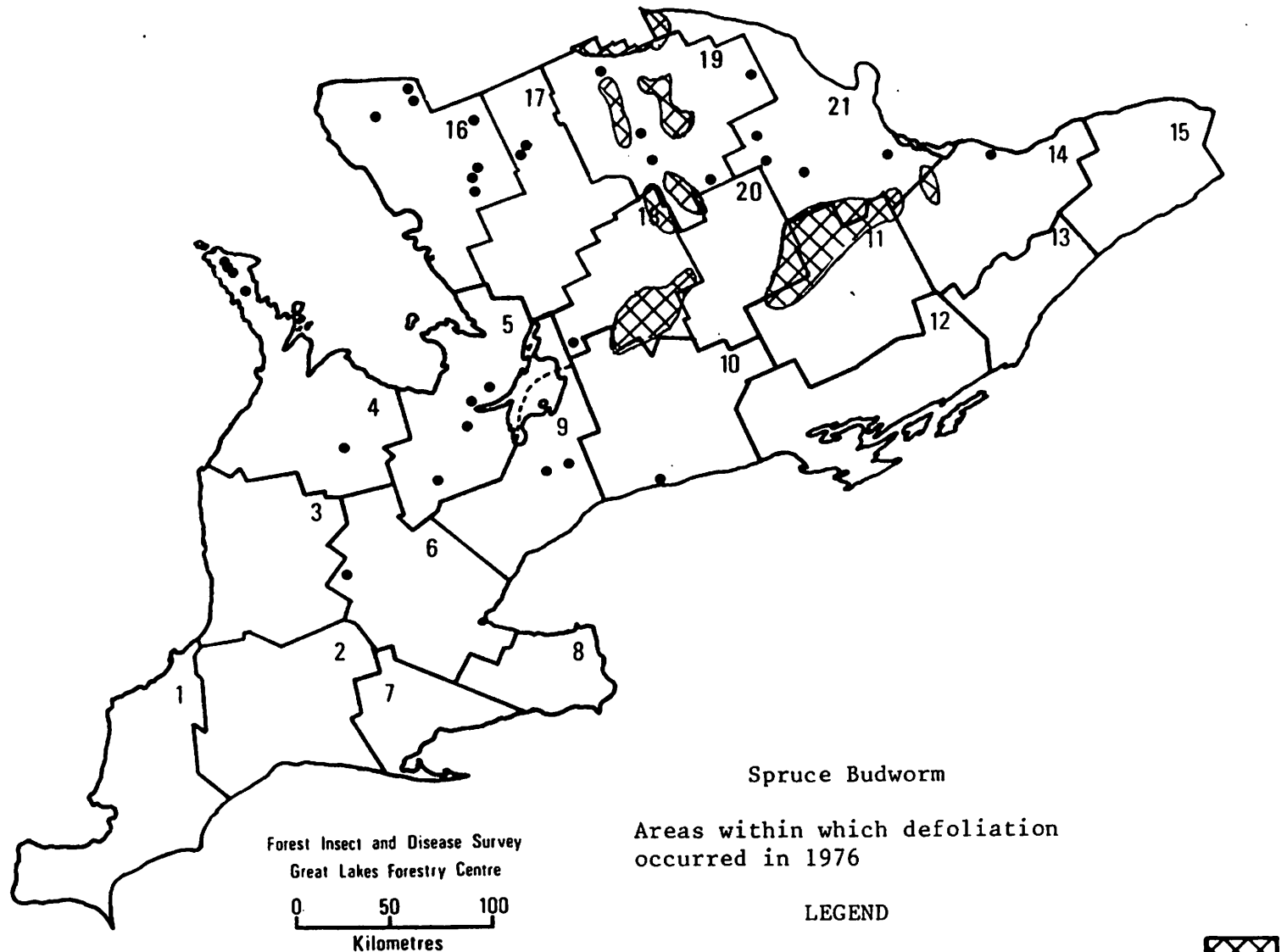
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9. MAPLE
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17. BRACEBRIDGE
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21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

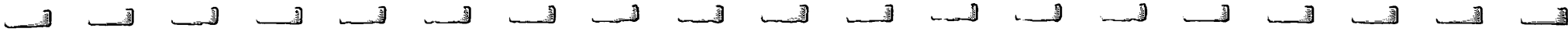
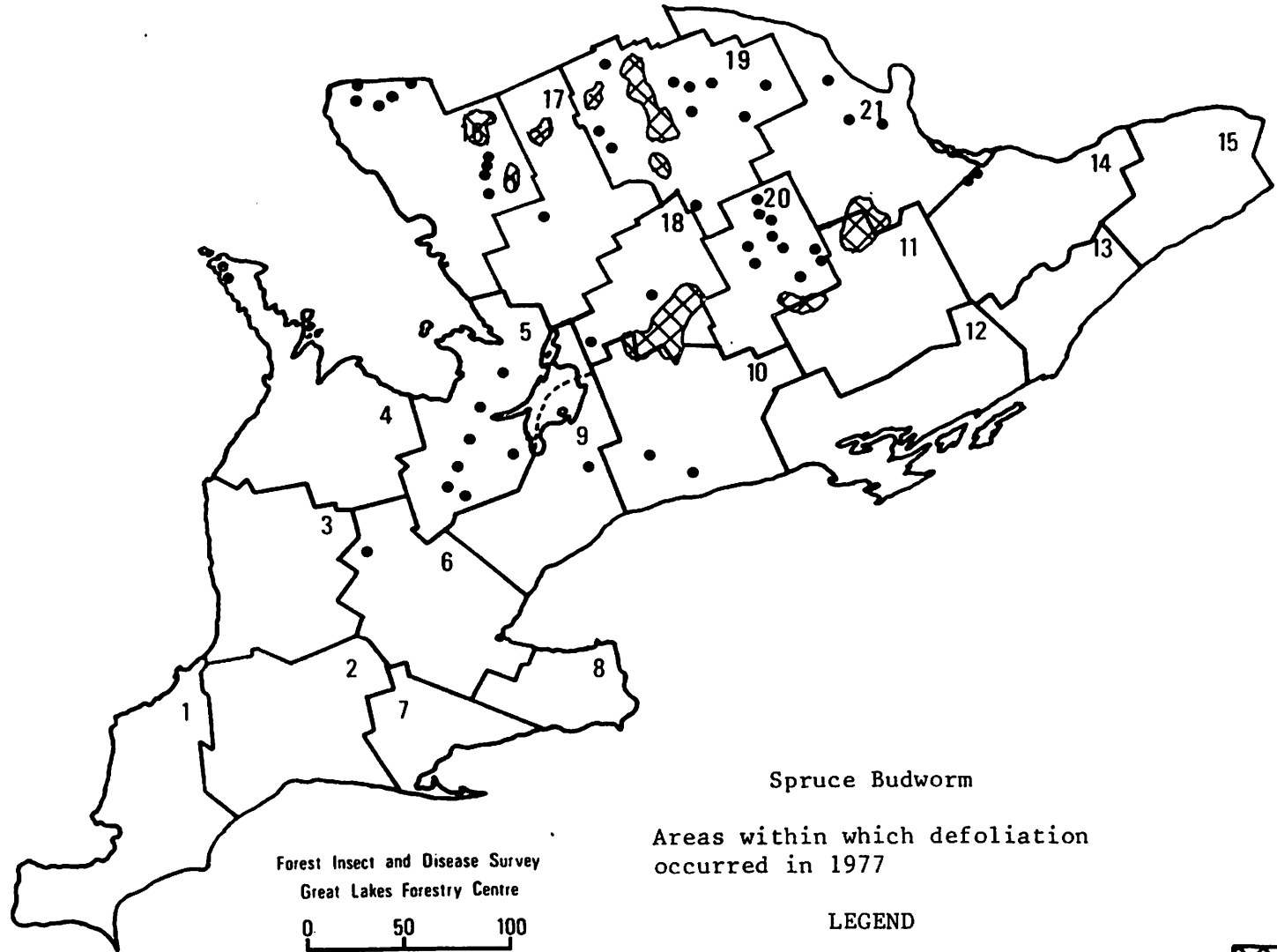
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20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

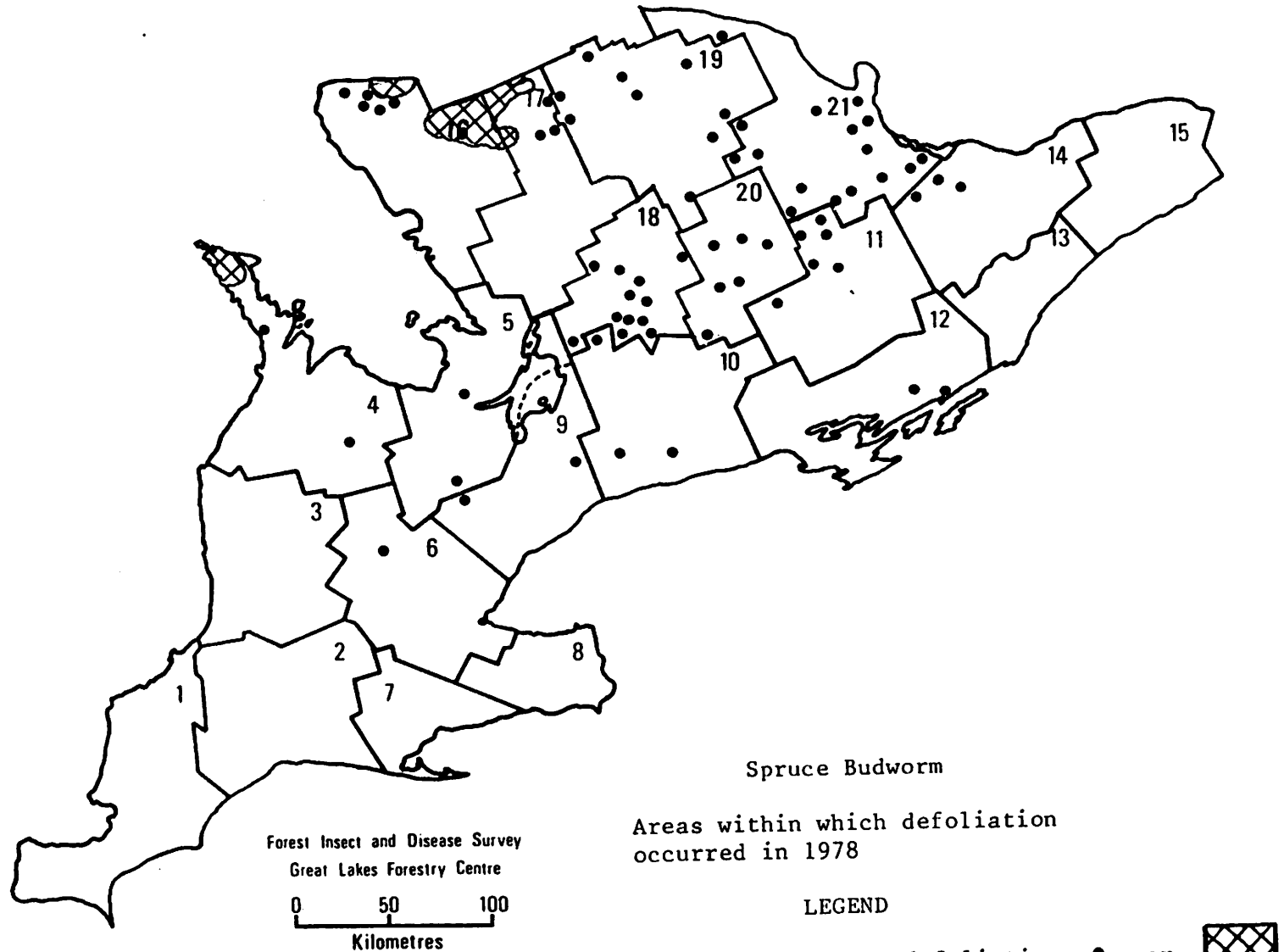
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7. SIMCOE
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SOUTHERN ONTARIO

DISTRICTS

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6. CAMBRIDGE
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19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE

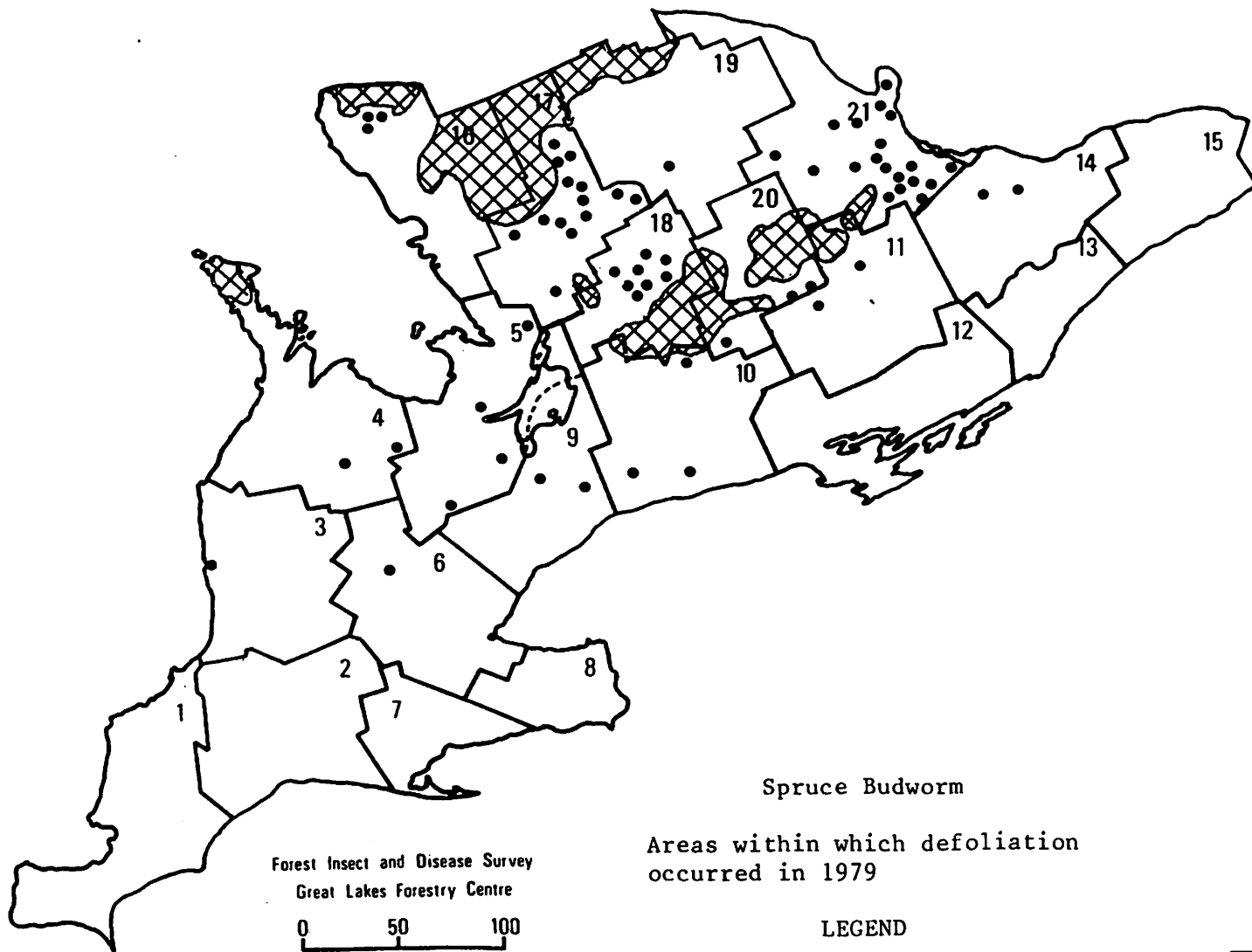



Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
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18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE

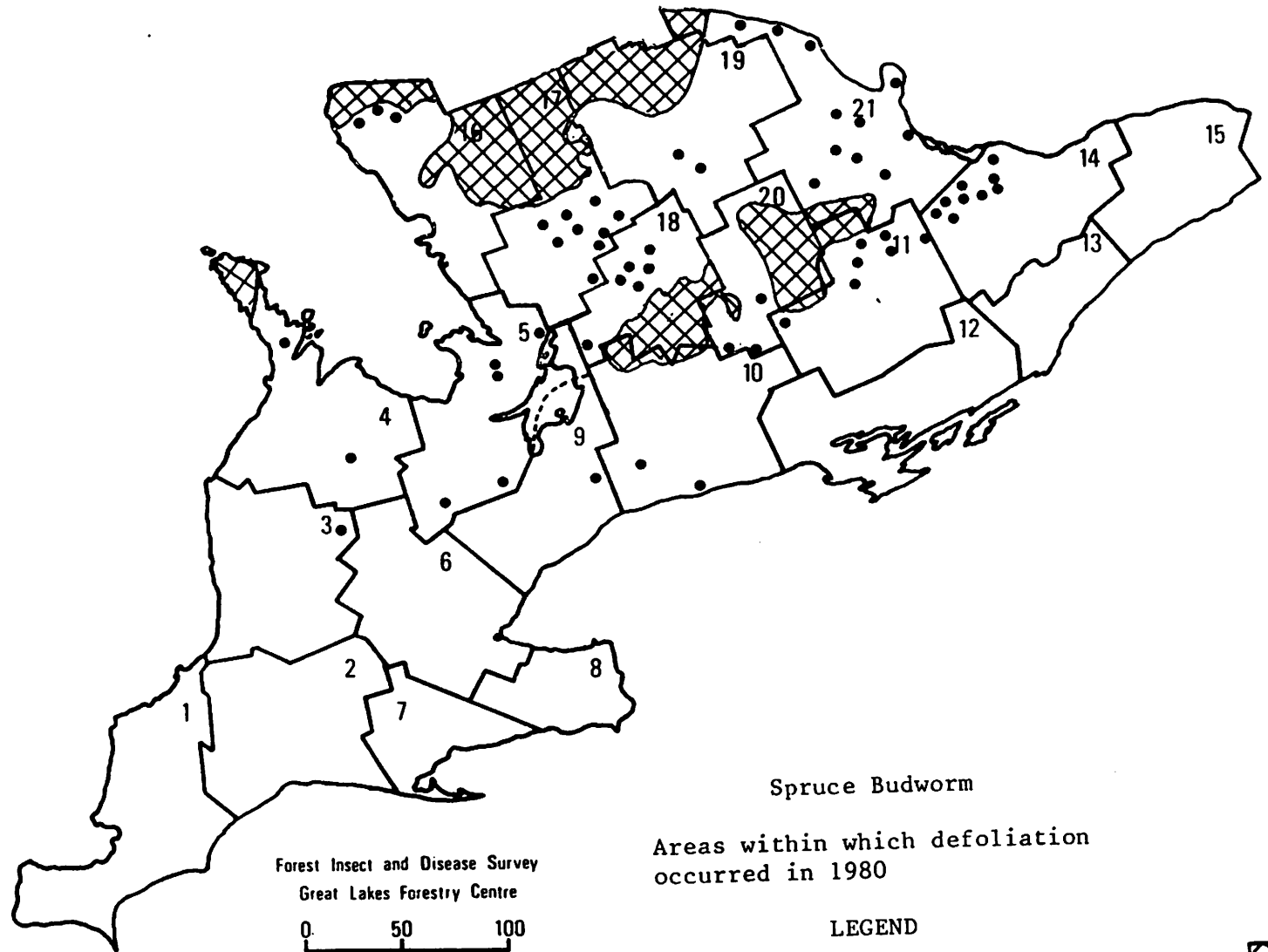


Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS


1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
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18. MINDEN
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21. PEMBROKE



Spruce Budworm

Areas within which defoliation occurred in 1980

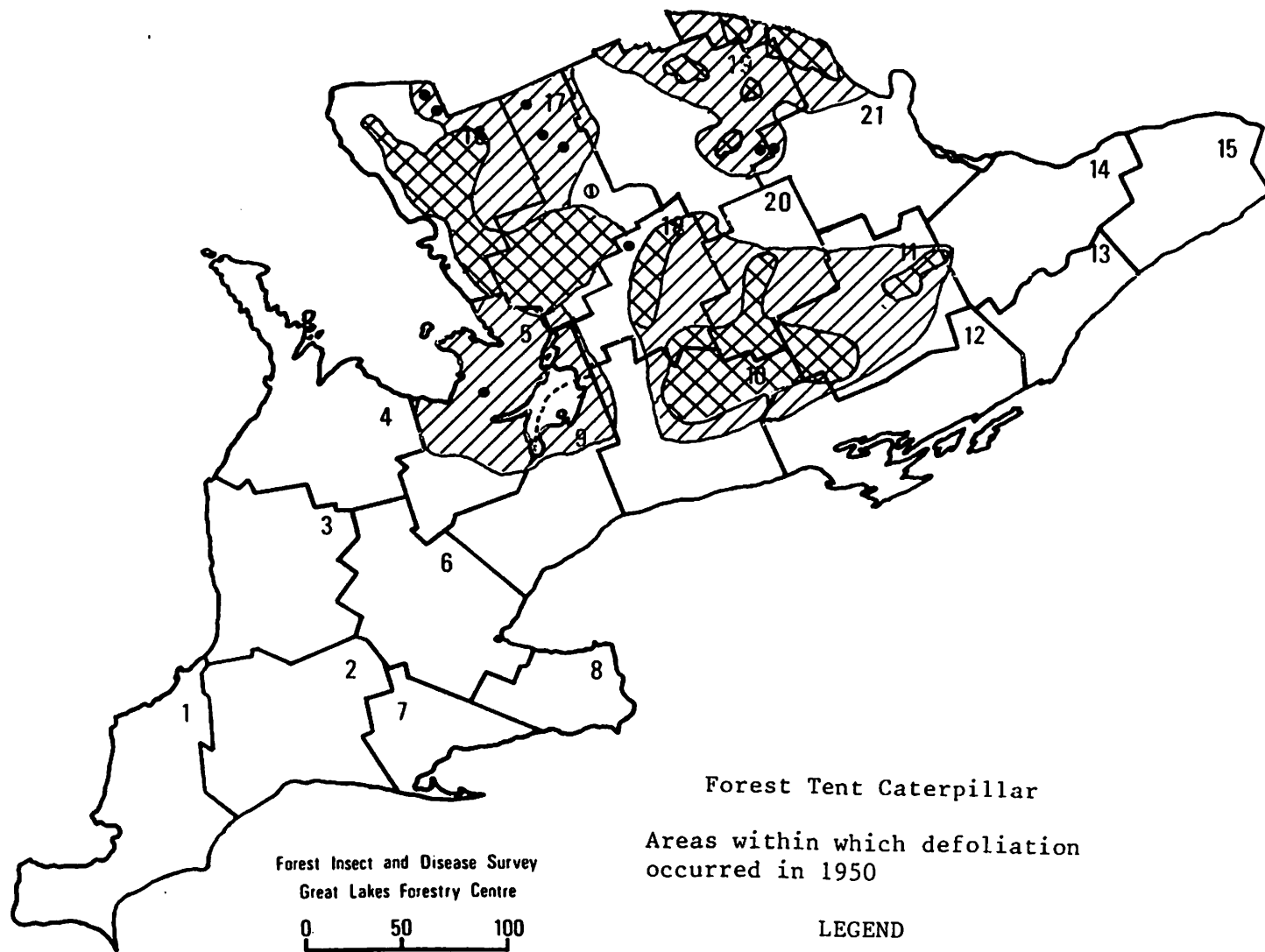
LEGEND

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
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18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation
occurred in 1950

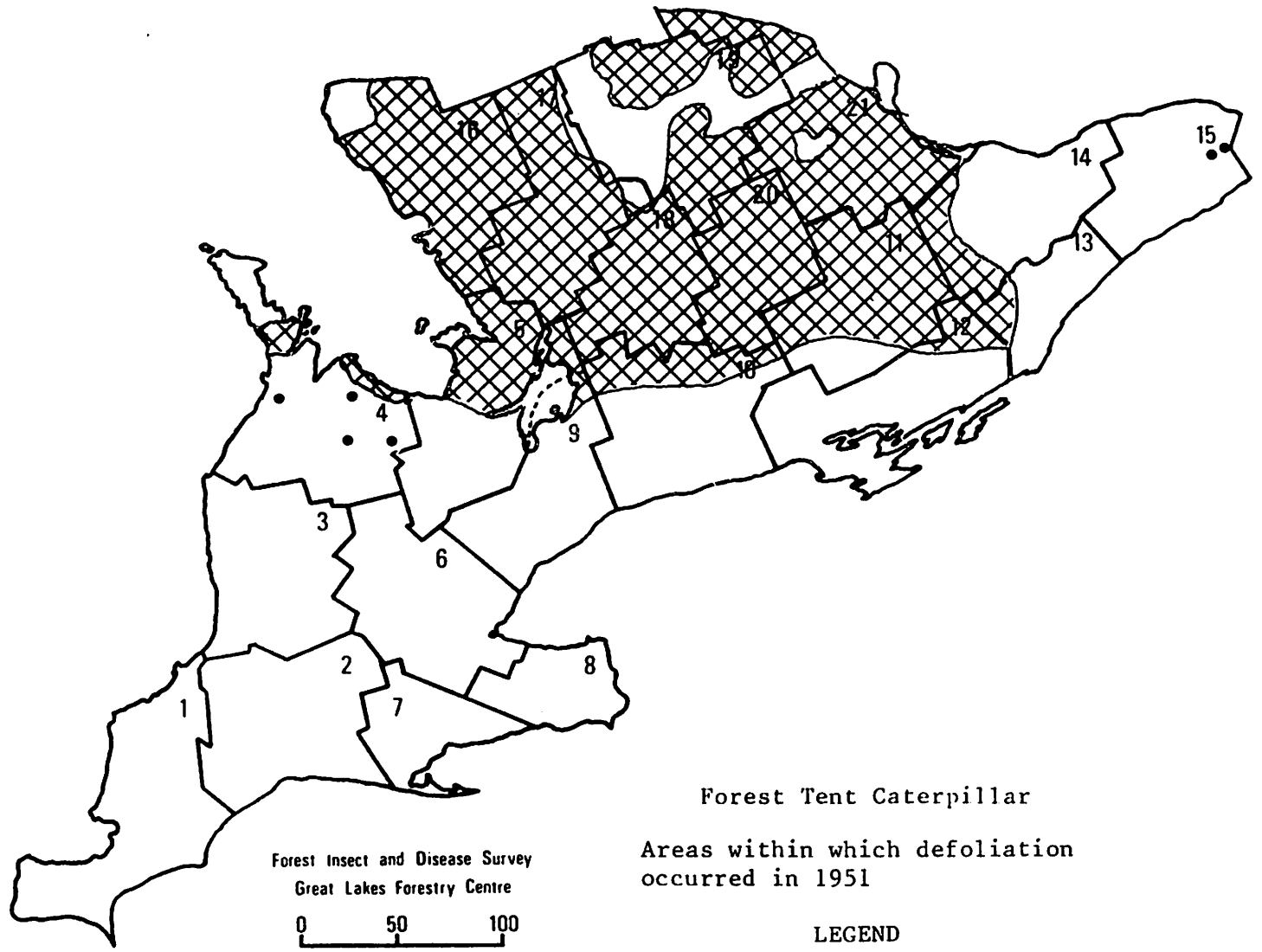
LEGEND


- | | | | |
|--------------------------------|---|----|---|
| 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
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- 17. BRACEBRIDGE
- 18. MINDEN
- 19. ALGONQUIN PARK
- 20. BANCROFT
- 21. PEMBROKE

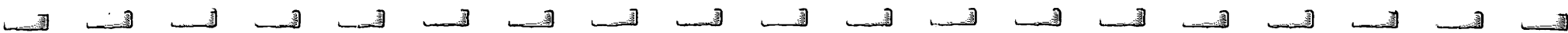
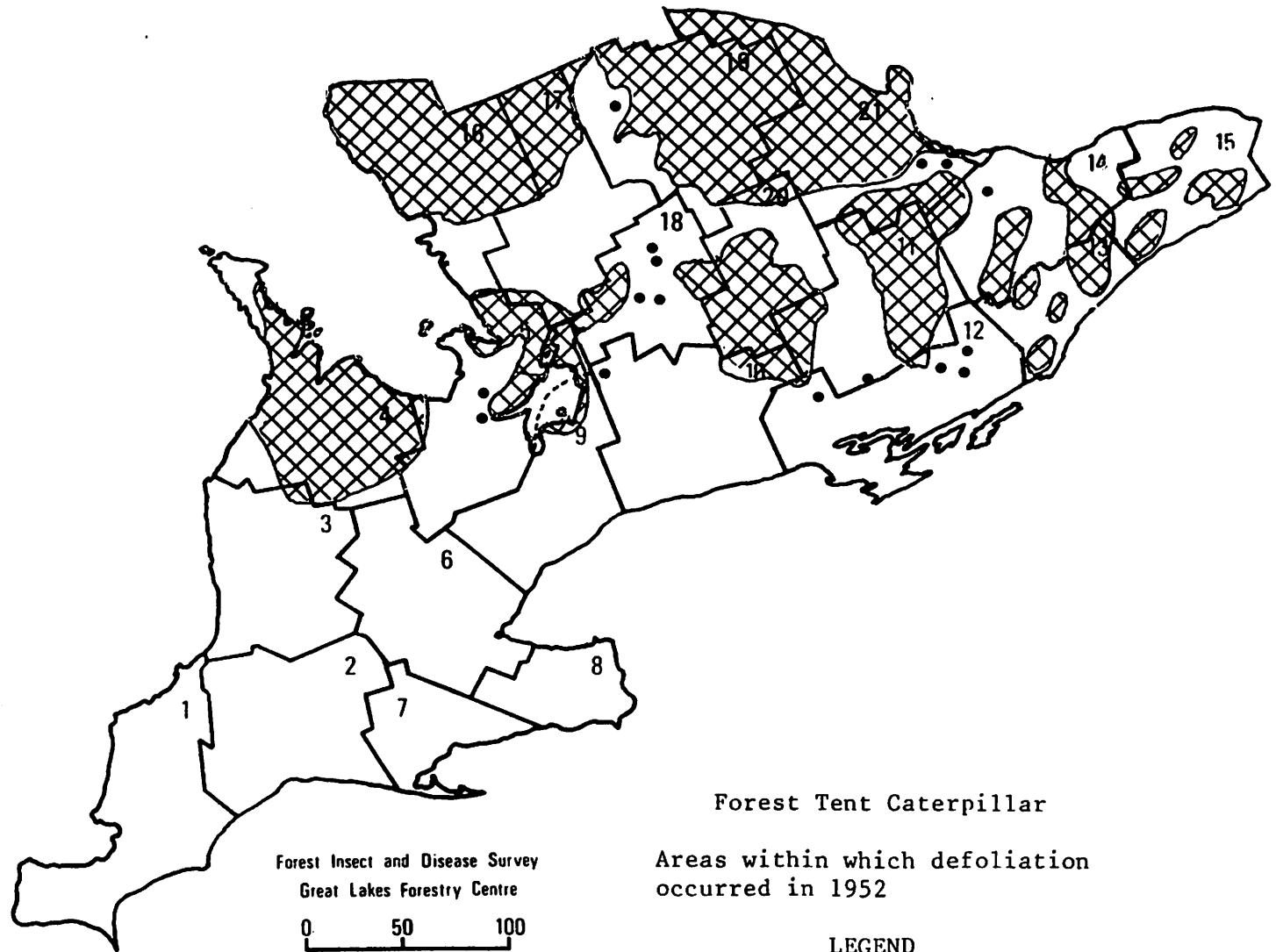


Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

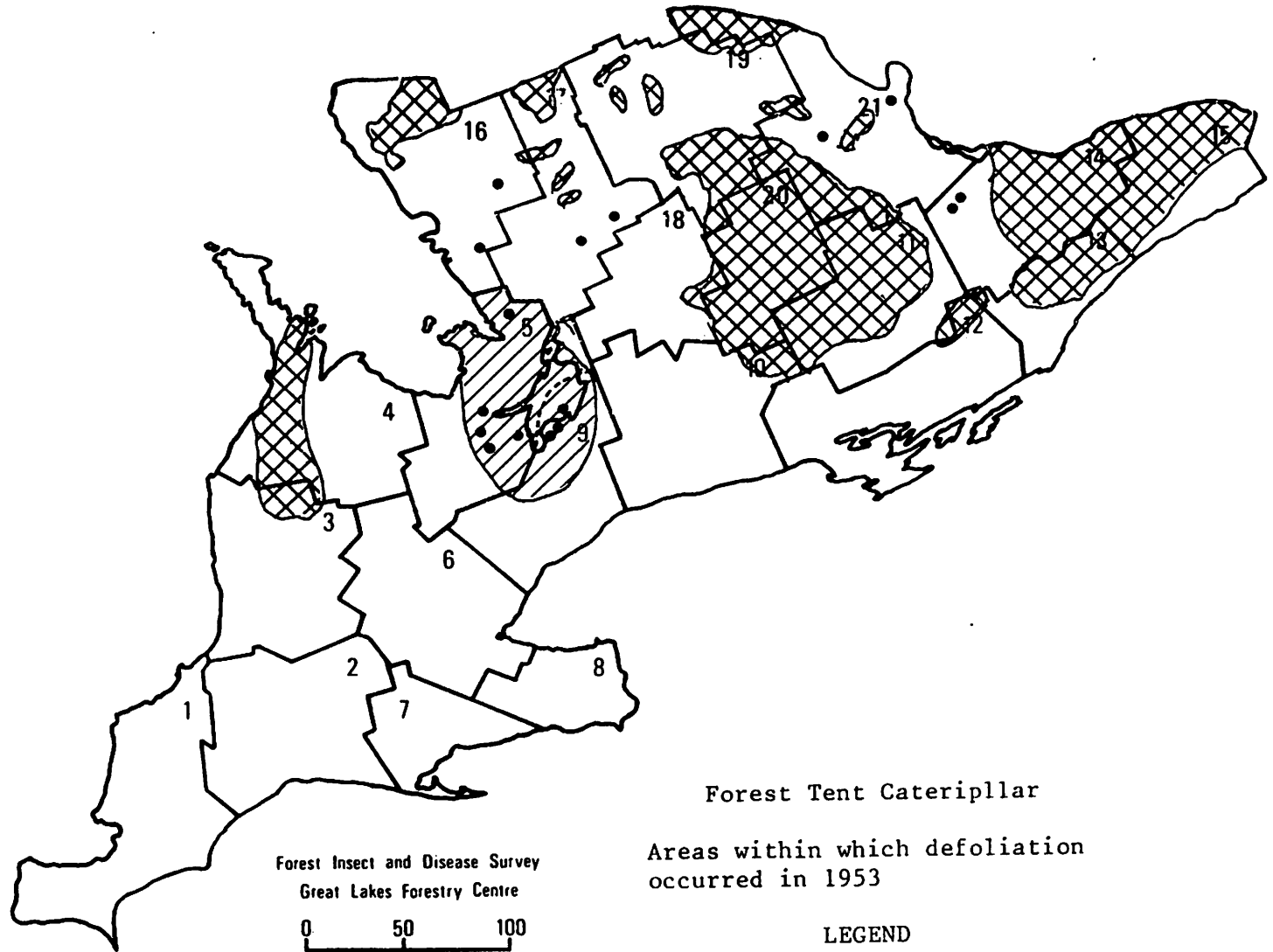
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5. HURONIA
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7. SIMCOE
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SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
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6. CAMBRIDGE
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8. NIAGARA
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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

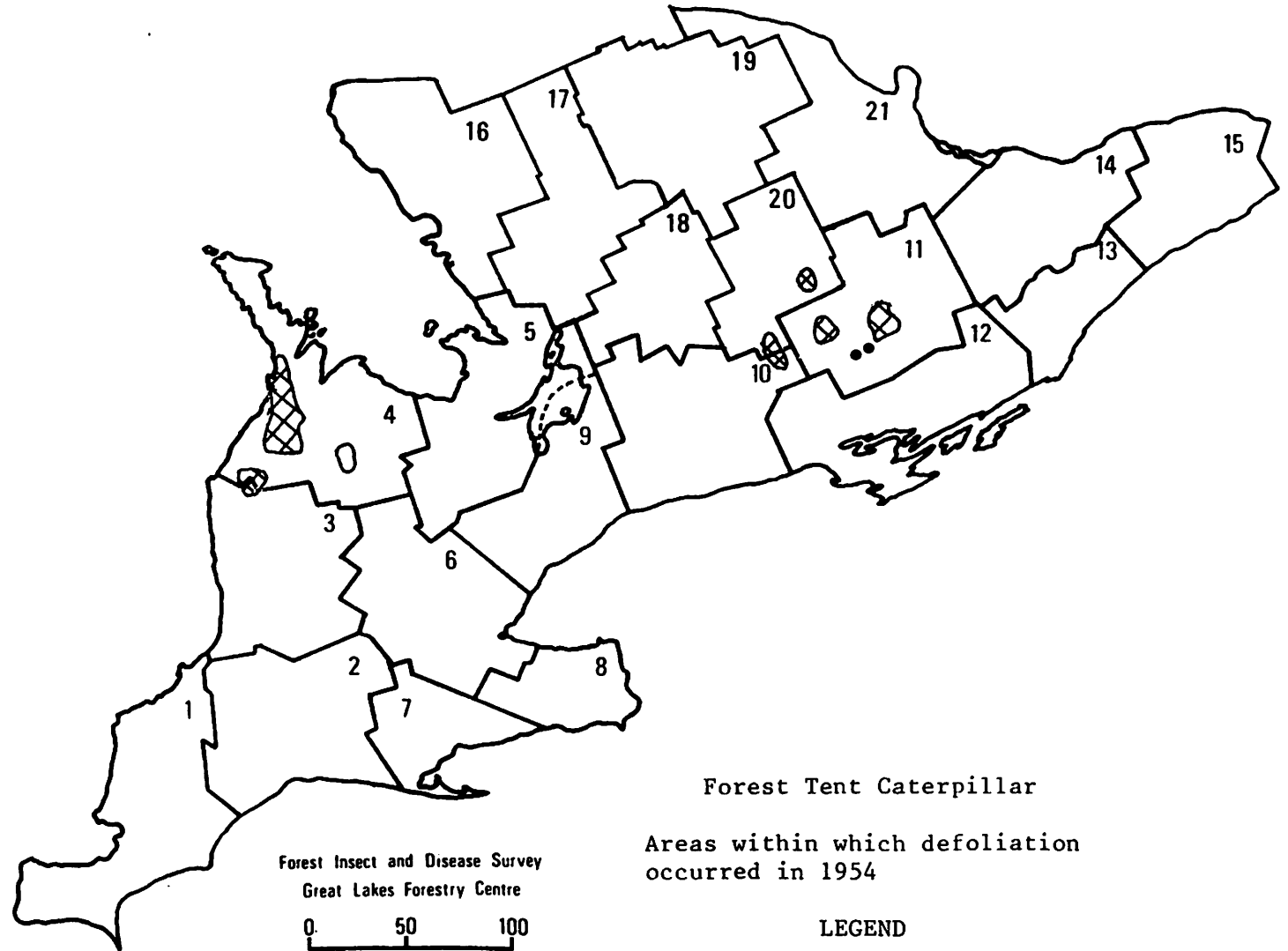
• or



SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
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4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
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21. PEMBROKE



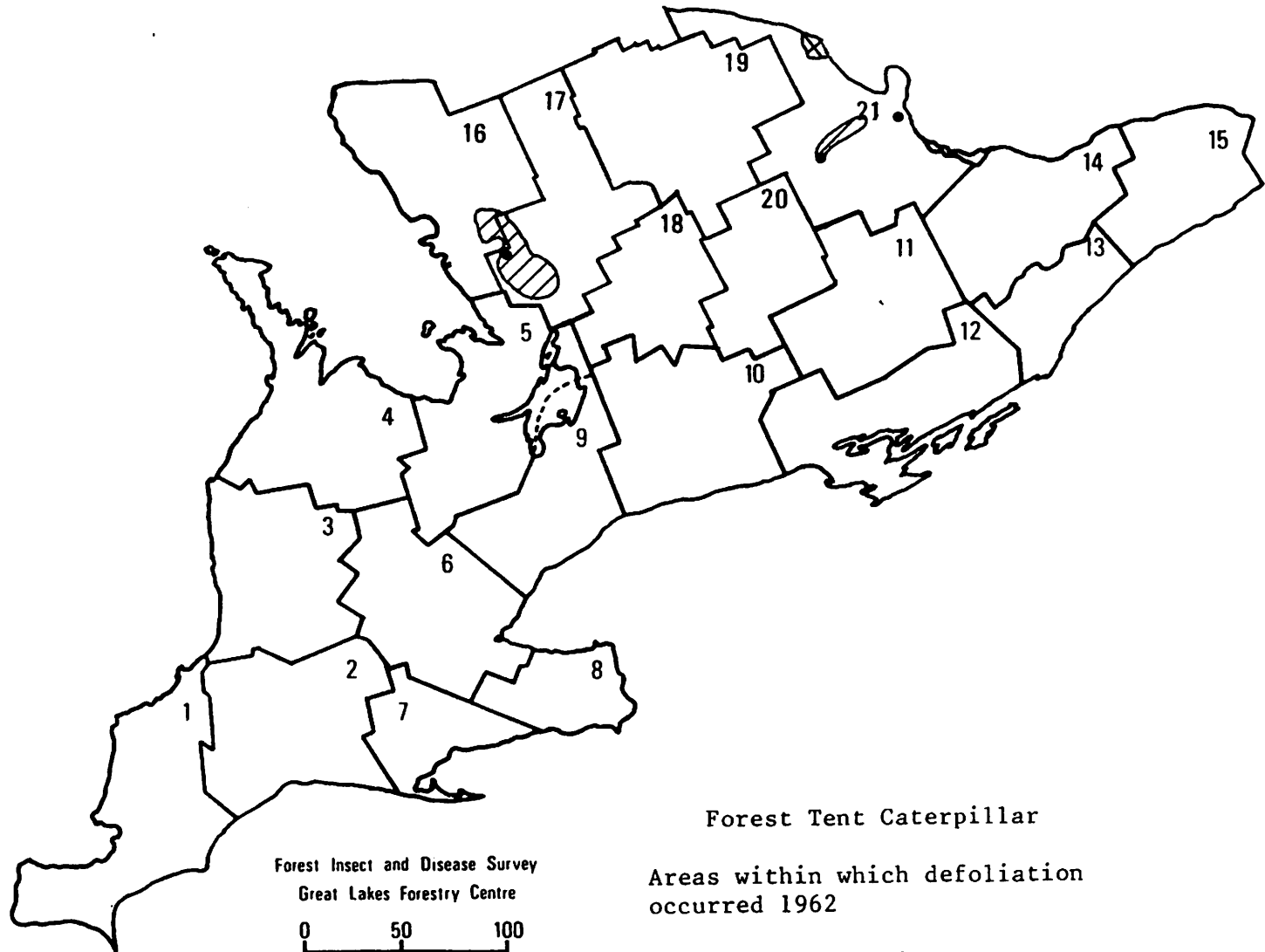
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
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8. NIAGARA
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20. BANCROFT
21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation
occurred 1962

LEGEND

Light defoliation



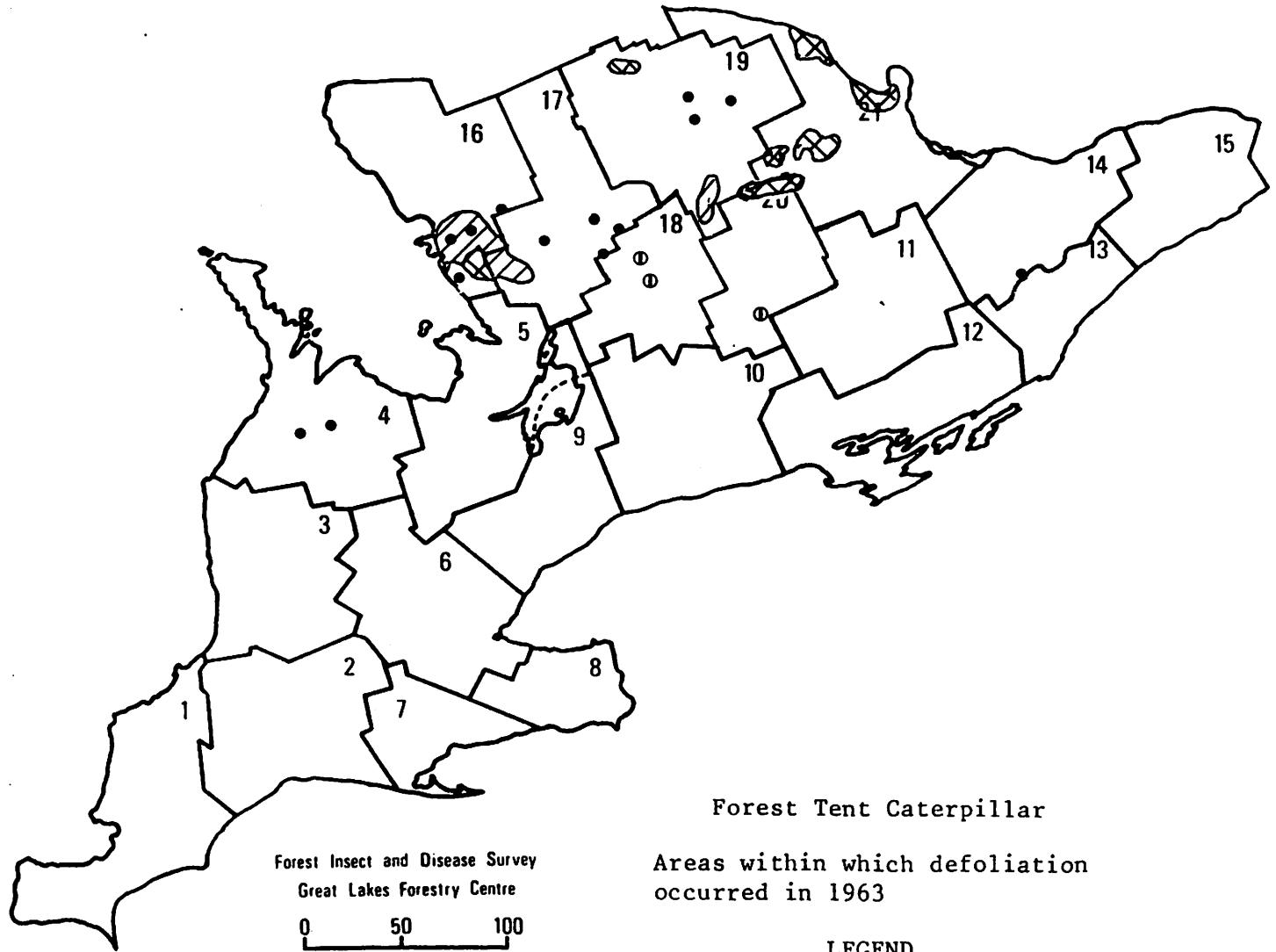
Moderate-to-severe defoliation

• or

SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
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17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



Light defoliation

⊙ or



Moderate-to-severe defoliation

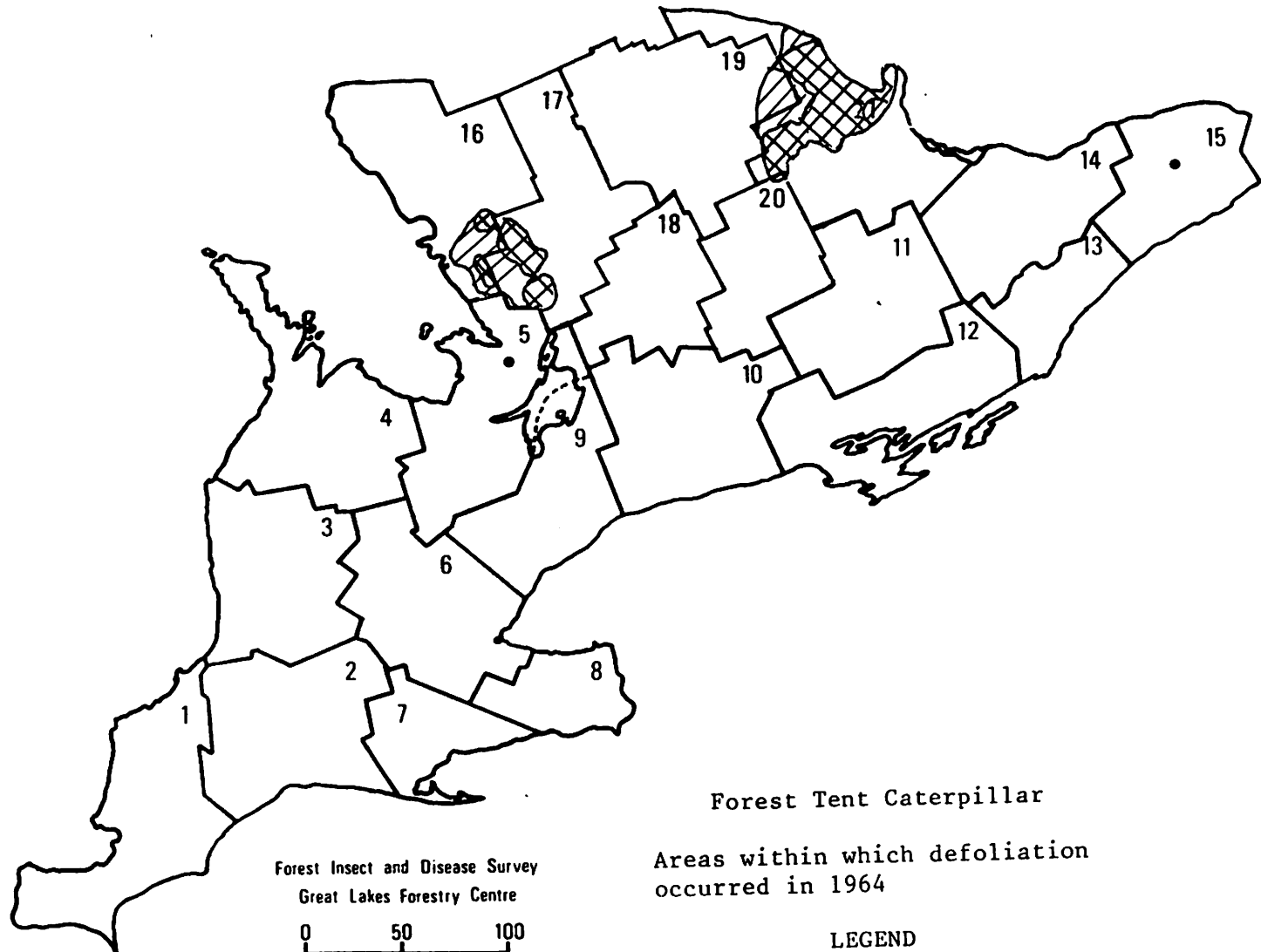
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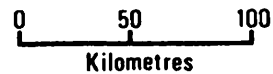
SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
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Forest Insect and Disease Survey
Great Lakes Forestry Centre



Forest Tent Caterpillar

Areas within which defoliation
occurred in 1964

LEGEND

Light defoliation

Moderate-to-severe defoliation



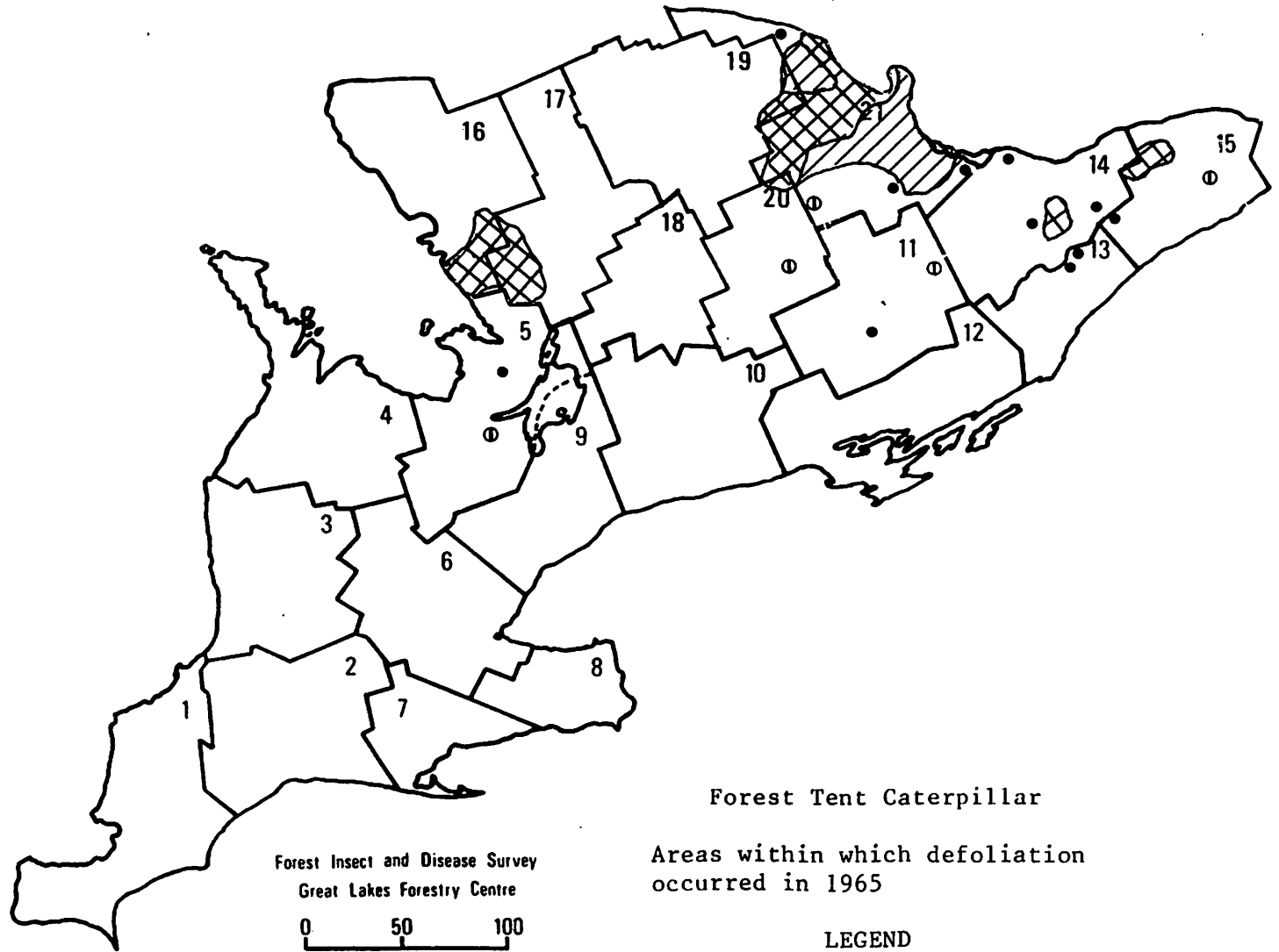
• or



SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
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19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



LEGEND

Light defoliation

⊙ or

Moderate-to-severe defoliation

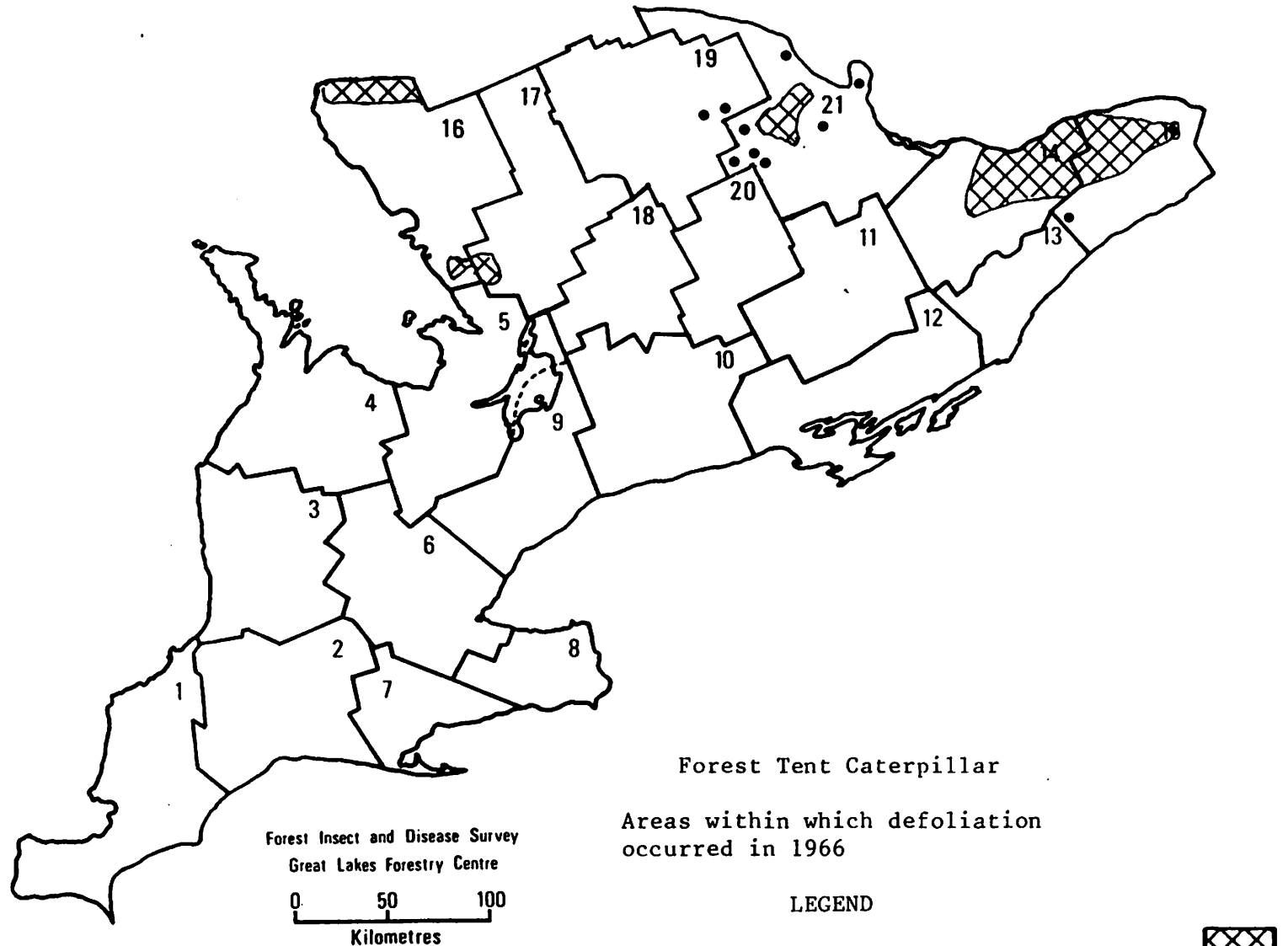
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SOUTHERN ONTARIO

DISTRICTS

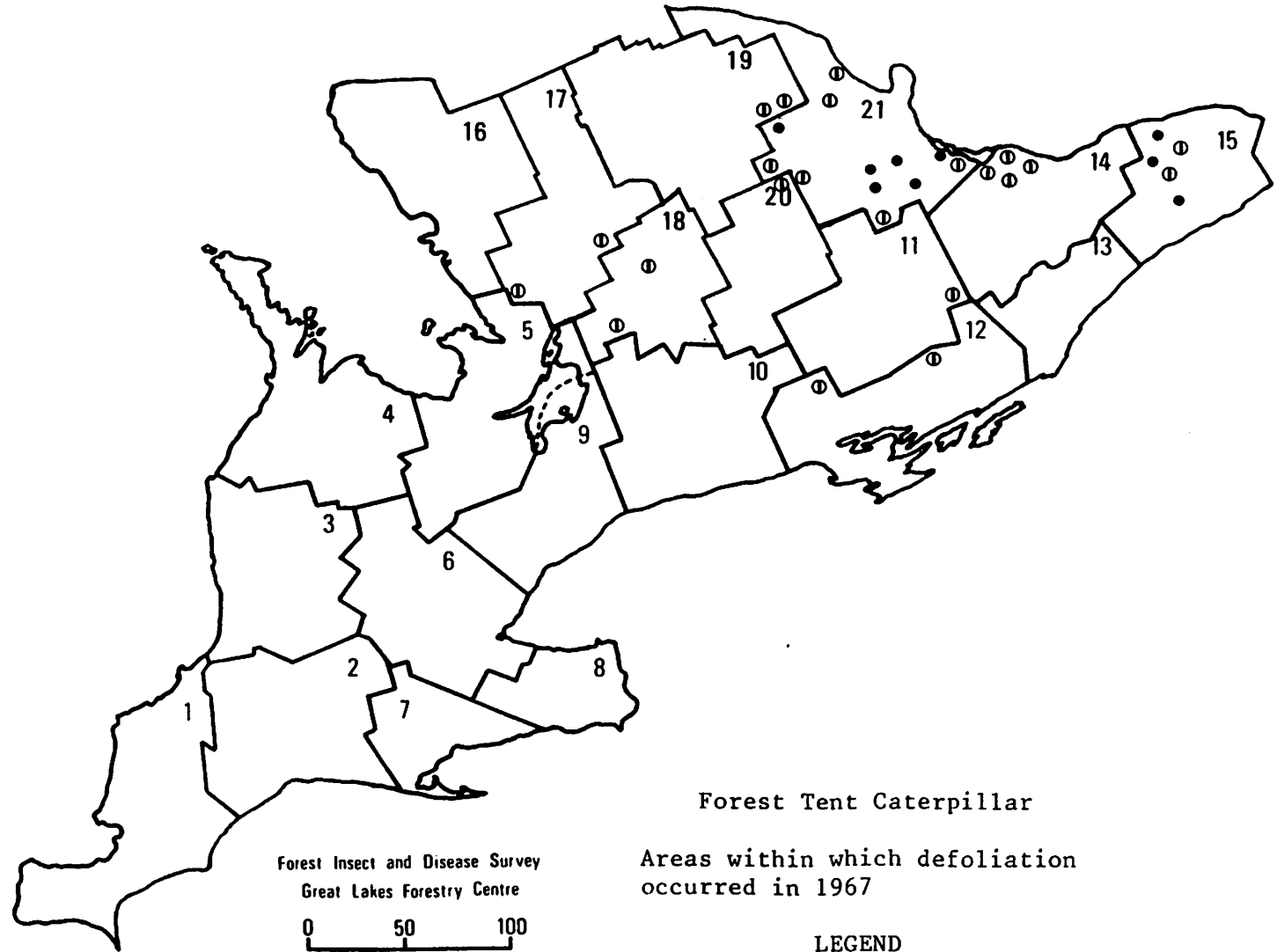
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SOUTHERN ONTARIO

DISTRICTS

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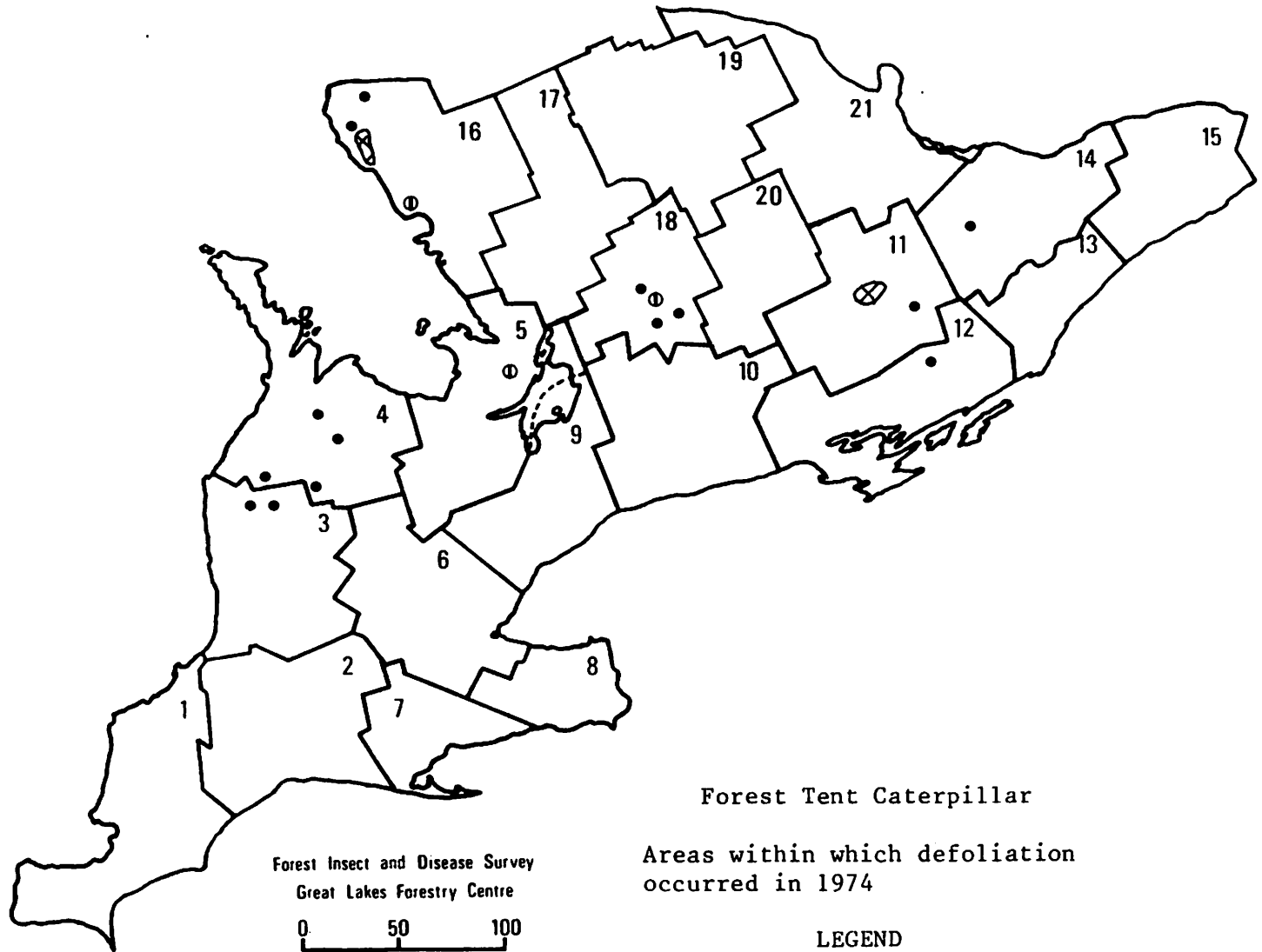
Light defoliation ○

Moderate-to-severe defoliation ●

SOUTHERN ONTARIO

DISTRICTS

1. CHATHAM
2. AYLMER
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4. OWEN SOUND
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21. PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

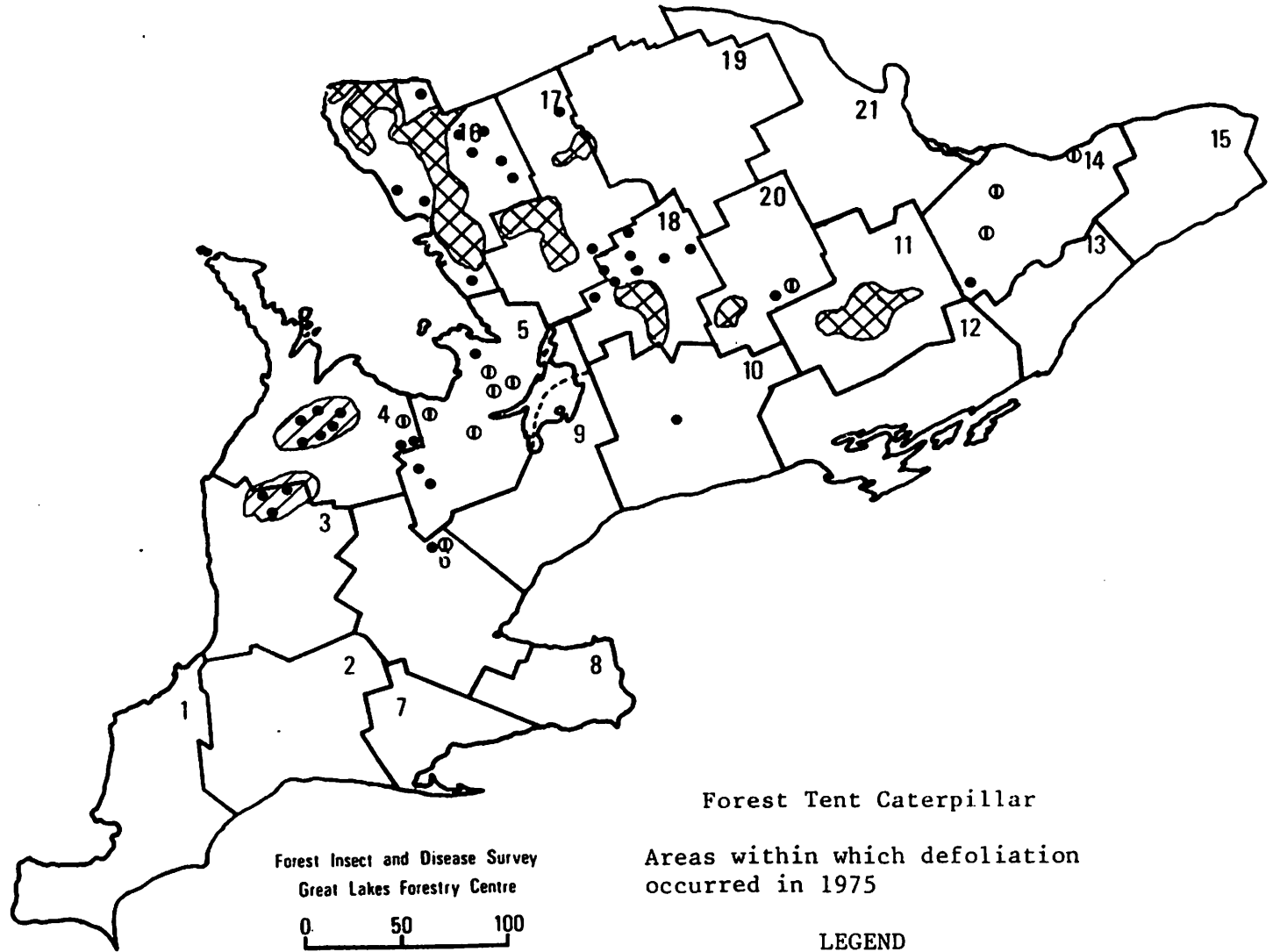
LEGEND

- Light defoliation ⊕
- Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

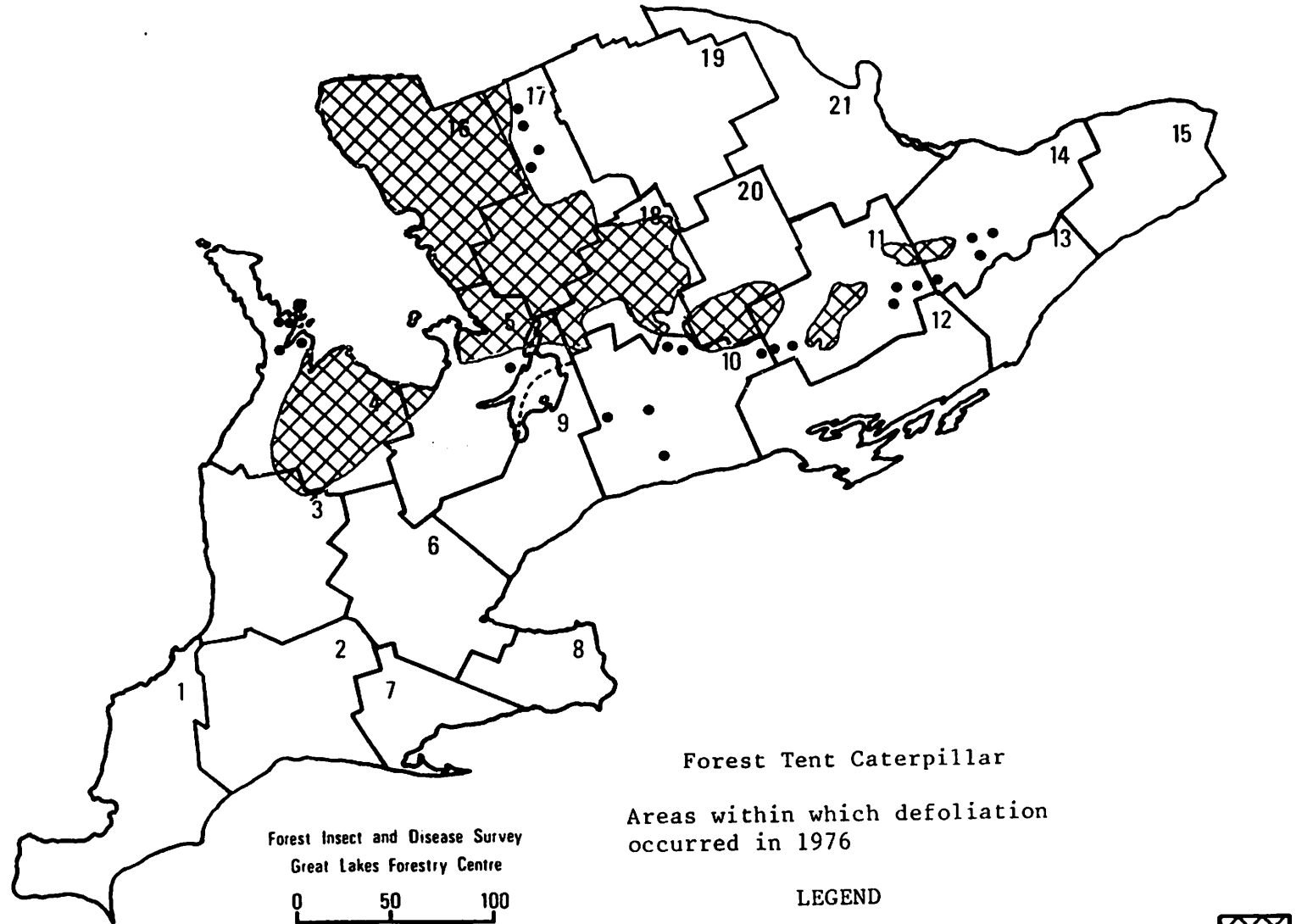
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE




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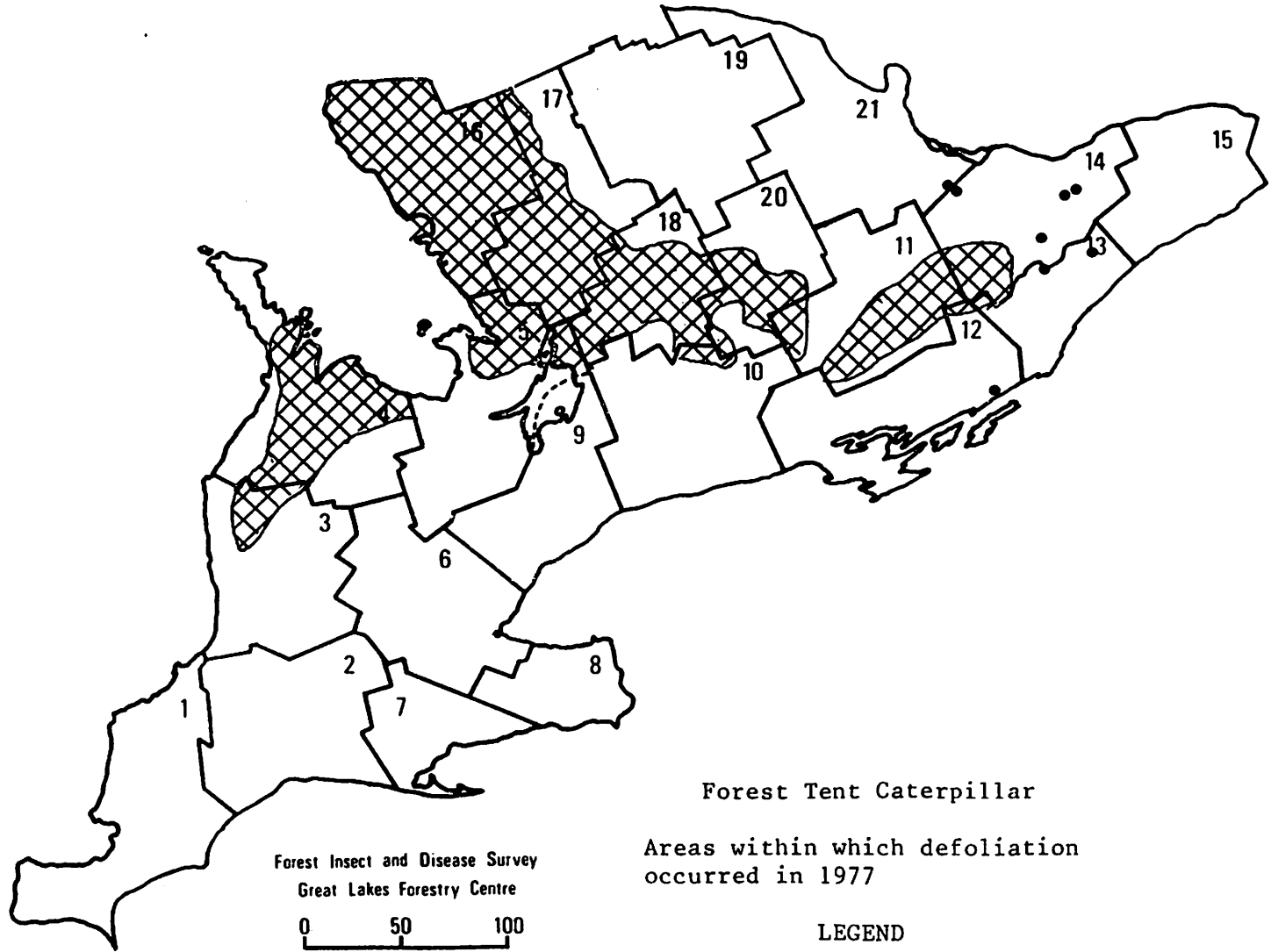


Moderate-to-severe defoliation • or 

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LEGEND

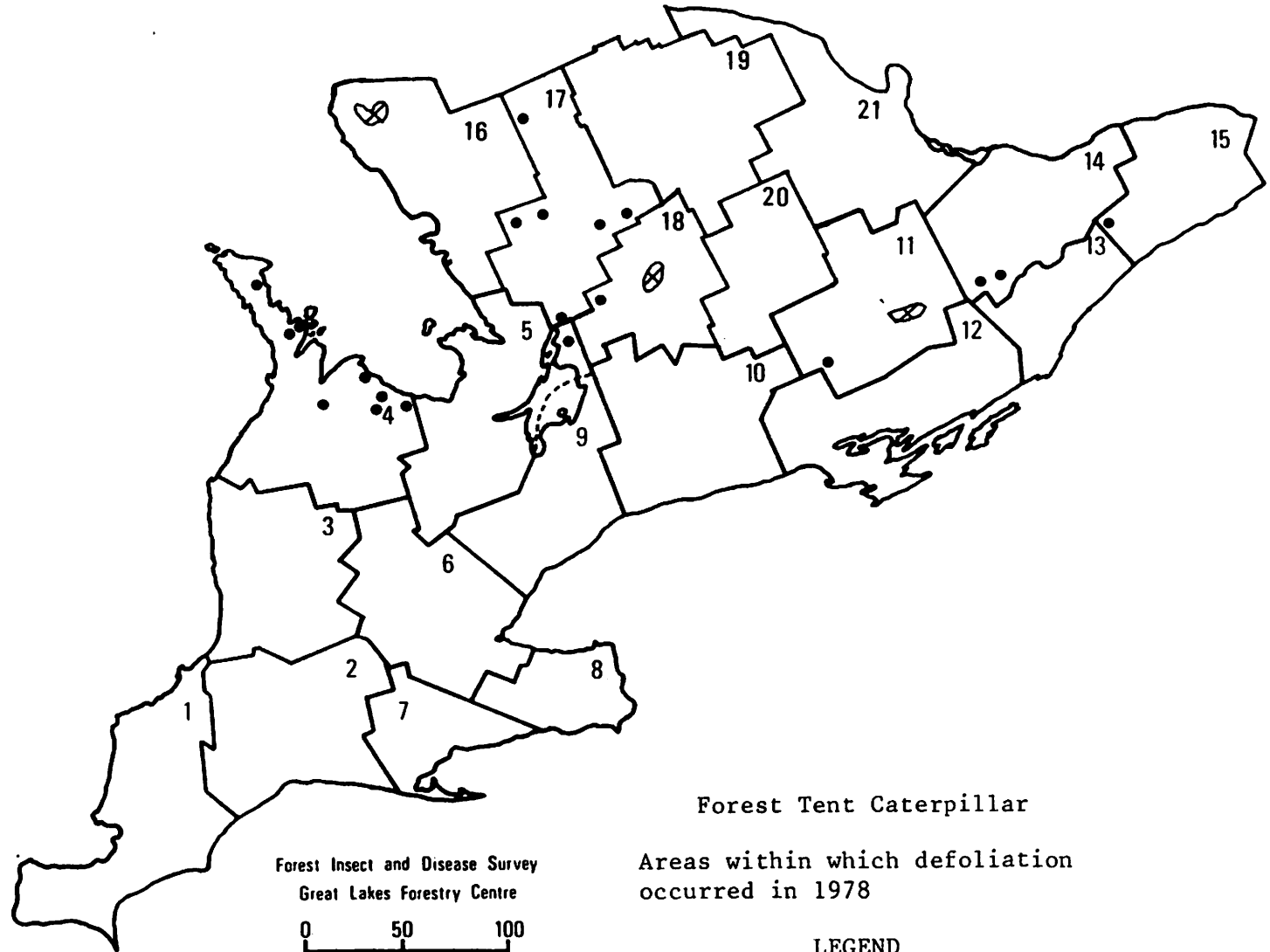
Moderate-to-severe defoliation • or



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