

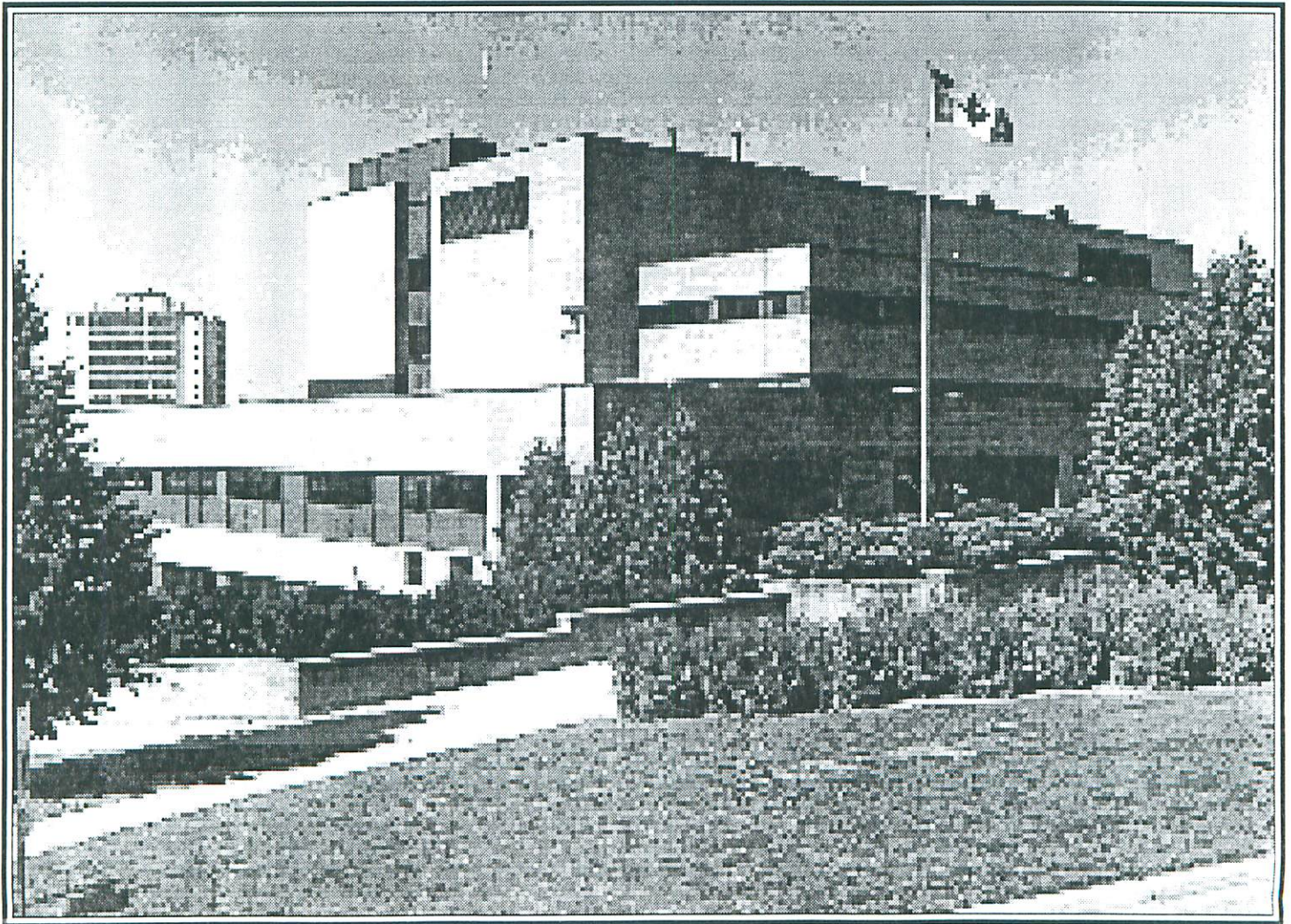


FILE REPORT

1990

AUTHOR FILE

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



This file report, a historical summary of district data gathered by the Forest Insect and Disease Survey, is not intended for publication and should not be cited in whole or in part. Material contained in this report is reproduced as submitted and has not been subjected to peer review or editing by the staff of the Canadian Forest Service and, therefore, is not intended for general use.

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

Compiled by

L.S. MacLeod, D.C. Constable, H.J. Evans, and C.J. Jones¹

FORESTRY CANADA
ONTARIO REGION
GOVERNMENT OF CANADA
1990

¹*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 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

The author wish to acknowledge Dr. G.M. Howse, Head, Forest Insect and Disease Survey; 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 also wish to acknowledge the following authors of the FIDS district and the regional reports from which this review was abstracted.

1950-1952	R. Daynard
1953-1958	D.F. Lynn
1959-1966	R. Bowser
1967-1975	V. Jansons
1976	M.J. Applejohn
1977-1979	D.C. Constable
1980	C.A. Barnes

TABLE OF CONTENTS

Page

INTRODUCTION

SUMMARY

FOREST INSECTS

Cedar Leafminers, *Argyresthia aureoargentella*, *A. canadensis*,
A. thuiella and *Coleotechnites thujaella*

Spruce Budworm, *Choristoneura fumiferana*

Walnut Caterpillar, *Datana integerrima*

Eastern Pine Shoot Borer, *Eucosma gloriola*

Birch Leafminer, *Fenusa pusilla*

Fall Webworm, *Hyphantria cunea*

Forest Tent Caterpillar, *Malacosoma disstria*

European Pine Sawfly, *Neodiprion sertifer*

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*

Other Noteworthy Insects

FOREST DISEASES

Dutch Elm Disease, *Ceratocystis ulmi*

Pine Needle Rust, *Coleosporium asterum*

White Pine Blister Rust, *Cronartium ribicola*

Western Gall Rust, *Endocronartium harknessii*

Hypoxylon Canker, *Hypoxylon mammatum*

(continued)

TABLE OF CONTENTS (concluded)

	<i>Page</i>
FOREST DISEASES (cont'd)	
Other Noteworthy Diseases	
ABIOTIC DAMAGE	
Drought Injury	
Frost	
Salt	
Limestone Chlorosis	
DIEBACKS AND DECLINES	
Maple Dieback	
APPENDICES	

INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Wingham District throughout the period 1950 to 1980. Wingham District was formed in 1973 and prior to this period was part of the old Lake Huron District. In the selection of pests for this report, particular attention was paid to major working groups of host species in the area, namely oak, maple, birch, pines, spruces, balsam fir and larch as well as shade and ornamental trees. The insects and diseases included are capable of causing, or have caused tree mortality or a reduction in tree growth. Also included are abiotic problems that cause damage i.e., frost, wind, hail, and winter drying, etc.

SUMMARY

FOREST INSECTS

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

page

This serious pest of eastern white cedar can cause tree mortality after a number of years of severe defoliation. From the period 1966 to 1975, moderate-to-severe defoliation occurred throughout the eastern townships of the district.

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 infestations were reported. Varying degrees of defoliation were reported at sample points for the period 1974 to 1980, but caused no tree mortality.

Walnut Caterpillar, *Datana integerrima* G. & R. [Major]
page

The walnut caterpillar feeds mainly on the foliage of walnut, butternut, hickory and several other species. Severe defoliation after a number of years can cause branch and whole-tree mortality. Varying degrees of defoliation have been observed over the past 30 years at a wide range of locations in the district.

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

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. Damage over the past 30 years has varied and in 1966 23% of the leaders were attacked at one location.

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

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. Since 1958, moderate-to-severe defoliation was reported at numerous locations in the district.

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

This insect attacks a wide variety of deciduous hosts, however, because defoliation comes late in the growing season, damage is usually considered serious where aesthetic values are important. Varying degrees of defoliation have occurred since 1950 in the district.

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 defoliate large areas of susceptible stands. The principal host attacked is aspen, however, many other deciduous species also suffer severe defoliation. Moderate-to-severe defoliation occurred during 1952 to 1954 and again in 1974 to 1977 in the district.

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

This sawfly was first recorded in North America in 1925. It feeds on all species of pine, however, its preferred host is Scots pine and is a threat to Christmas tree plantations. Trees of all sizes are defoliated, causing growth reduction but rarely tree mortality. Varying amounts of damage have been recorded during the period 1950 to 1980.

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. Moderate-to-severe defoliation persisted from 1959 to 1963 in Minto Twp, and since this period low populations were recorded.

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

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. During the period 1963 to 1980, damage by this insect has averaged 5%.

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

The larch sawfly is the primary defoliation 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.

Mountain-ash Sawfly, *Pristiphora geniculata* Htg. [Major]
page

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 or diseases.

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

This important pest attacks all species of pine but red and Scots pine are preferred. Repeated attacks on red pine have been especially damaging because of resulting deformity. High numbers of damaged shoots were reported in Turnberry Twp in 1976, 1977 and again in 1980.

Other Noteworthy Insects [Major and Minor]
pages

Insects that have the potential for causing damage to stands, regeneration and plantations.

FOREST DISEASES

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

This major disease organism, which affects all species of elm, was first recorded in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. This disease was commonly observed killing elms since 1960.

Pine Needle Rust, *Coleosporium asterum* (Dieterl) Sydow [Major]
pages

Repeated medium-to-heavy needle infection weakens tree, causes a loss of increment and predisposes them to secondary insect attack and disease. Light infections have been reported in 1964, 1973 and 1974. In 1975, 38% incidence was reported in Turnberry Twp.

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

This pathogen is a serious pest of white pine and causes extensive tree mortality in all age classes; commonly observed in the district since 1961.

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

This pathogen infects trees in all age classes, however, serious damage generally occurs only in small-diameter, regeneration trees in stands or in plantations. When stems are girdled by the gall, partial or whole-tree mortality results. Varying degrees of infection have been recorded for most years since 1954.

Other Noteworthy Diseases [Major and Minor] pages

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

ABIOTIC DAMAGE
pages

Abiotic damage is caused by a variety of factors such as frost, winter drying, etc. Weakened trees are then susceptible to disease and insect attacks. Abiotic damage has been reported periodically since 1957.

I N S E C T S

The insects of the region are very numerous and diverse. They are found in all parts of the country, and are especially abundant in the lowlands and along the coast. The most common insects are the flies, mosquitoes, and beetles. The flies are particularly annoying, and are found in great numbers in the lowlands and along the coast. The mosquitoes are also very numerous, and are especially abundant in the lowlands and along the coast. The beetles are found in all parts of the country, and are especially abundant in the lowlands and along the coast.

The insects of the region are very numerous and diverse. They are found in all parts of the country, and are especially abundant in the lowlands and along the coast. The most common insects are the flies, mosquitoes, and beetles. The flies are particularly annoying, and are found in great numbers in the lowlands and along the coast. The mosquitoes are also very numerous, and are especially abundant in the lowlands and along the coast. The beetles are found in all parts of the country, and are especially abundant in the lowlands and along the coast.

The insects of the region are very numerous and diverse. They are found in all parts of the country, and are especially abundant in the lowlands and along the coast. The most common insects are the flies, mosquitoes, and beetles. The flies are particularly annoying, and are found in great numbers in the lowlands and along the coast. The mosquitoes are also very numerous, and are especially abundant in the lowlands and along the coast. The beetles are found in all parts of the country, and are especially abundant in the lowlands and along the coast.

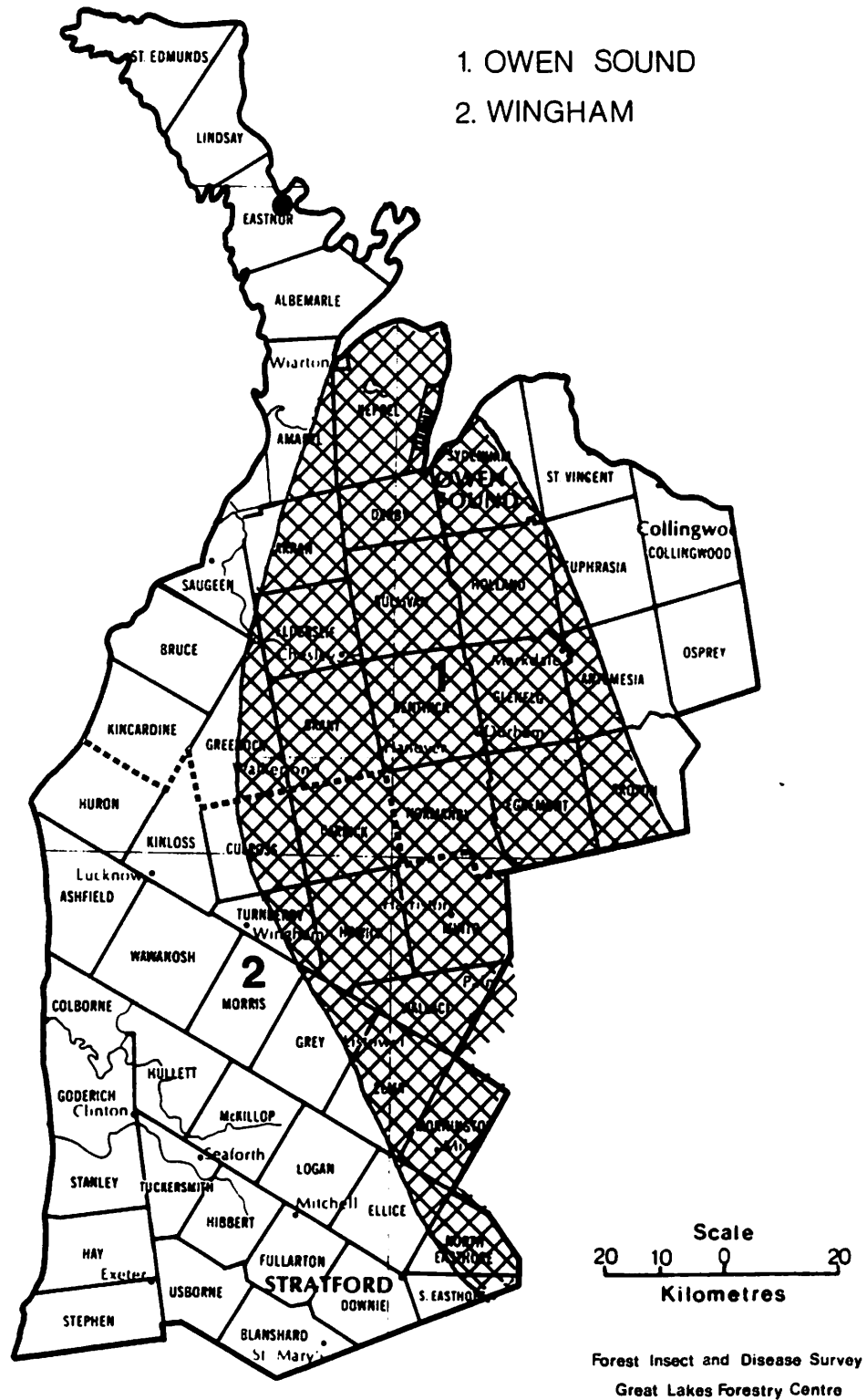
Cedar Leafminers, *Argyresthia aureoargentella* Braun,
A. canadensis Free., *A. thuiella* Pack,
Coleotechnites thujaella (Kft.)

Host(s): eC

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961-1963	low populations
1964-1965	not reported
1966-1972	Moderate-to-severe defoliation occurred at several points in the district.
1973	Moderate-to-severe infestations occurred in the Clifford-Harriston area.
1974	Moderate-to-severe defoliation continued in the Clifford-Harriston area. Some branch and top mortality occurred near Clifford as a result of repeated defoliation.
1975	Moderate-to-severe defoliation continued in the eastern section of the Wingham District (see map, page). Considerable top mortality was evident especially in Minto and Carrick Twps.
1976	Infestations collapsed in the eastern portion of the Wingham District.
1977	not reported
1978	Light defoliation was observed at scattered locations in Turnberry, Kinloss and East Wawanosh twps.
1979	Population levels increased. Severe leafmining was observed throughout Ashfield, East Wawanosh, West Wawanosh twps and especially in Goderich, Saltford and Falls Reserve in Colborne Twp.
1980	Moderate-to-severe leafmining was common throughout the entire district (see map, page).

OWEN SOUND and WINGHAM DISTRICTS



Cedar Leafminer

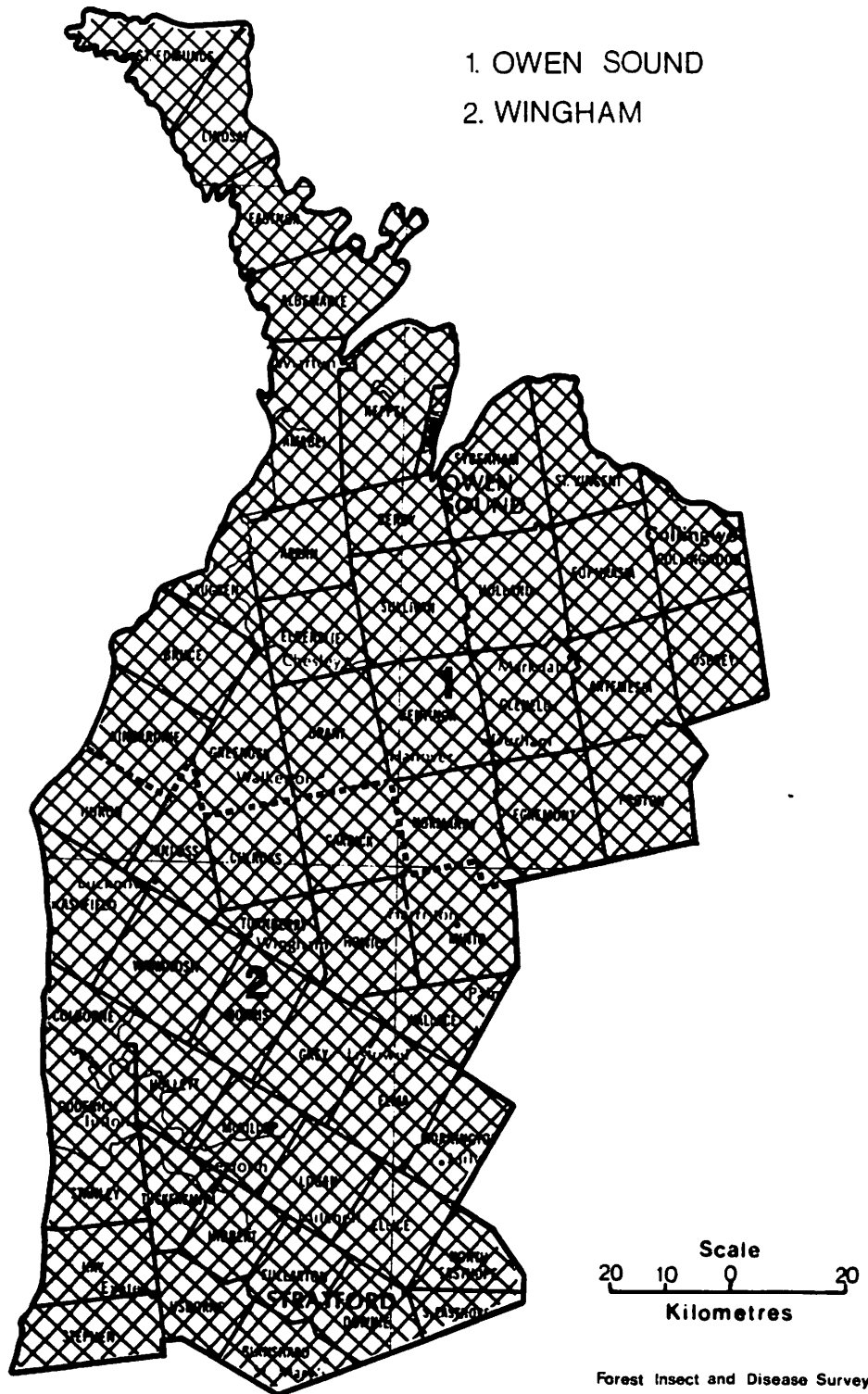
Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ● or



OWEN SOUND and WINGHAM DISTRICTS



Cedar Leafminer

Areas within which defoliation
occurred in 1980

LEGEND

Moderate-to-severe defoliation



Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): balsam, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1973	no infestations reported
1974	Defoliation at sample plots in Downie and Colborne twps ranged from 1% to 21%.
1975	Estimated per cent of defoliation in Downie and Colborne twps ranged from 95% to 100%.
1976	Populations collapsed in Downie and Colborne twps with no defoliation recorded.
1977	10% defoliation reported at 2 sample plots in Downie and Colborne twps
1978	25% defoliation reported at the sample plot in Colborne Twp
1979	Defoliation at Ellice, Downie and Colborne twps was 0, 5, and 54%, respectively.
1980	Defoliation at sample plots in Ellice, Colborne, Minto and Downie twps was 1, 5, 51 and 53%, respectively.

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

Host(s): Wa, Hi, Ba

[Major]

<u>Year</u>	<u>Remarks</u>
1950	low numbers
1951	High numbers were observed in Hay and Usborne twps.
1952	Light defoliation occurred in the district.
1953-1955	Severe defoliation occurred in the district.
1956	moderate numbers
1957	not reported
1958	Light defoliation occurred in the western parts of Huron County.
1959-1961	Moderate numbers occurred on shade trees near Exeter in Usborne Twp.
1962	75% defoliation occurred along Highway 83 in Hay Twp and in Stephen and Hullett twps.
1963-1964	Defoliation ranged from 5% to approximately 50% in the district.
1965	Defoliation at one location in Downie Twp ranged from 35% to 100%.

(cont'd)

Walnut Caterpillar, *Datana integerrima* G. & R. (concl.)

<u>Year</u>	<u>Remarks</u>
1966	Severe defoliation occurred on black walnut trees east of Grand Bend in Stephen Twp.
1967-1969	Moderate-to-severe defoliation occurred to single and small groups of trees in Stephen and Hay twps.
1970	moderate populations
1971	trace populations
1972-1973	not reported
1974	moderate populations
1975	Populations increased. Moderate-to-severe damage occurred on small groups and individual walnut trees in Stanley, Hay, Stephen and Goderich twps.
1977-1978	trace populations
1979	Varying degrees of defoliation occurred in the district.
1980	high numbers observed in the Stratford-St. Marys area in Downie Twp

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	low populations
1957-1958	not reported
1959-1960	low populations
1961	Moderate populations occurred in Morris and Ashfield twps.
1962	15% of leaders attacked in Ashfield Twp
1963-1965	Leader damage averaged 5% at a sample point in Ashfield Twp.
1966	Population levels increased; 23% of leaders were attacked in Ashfield Twp.
1967	20% of leaders destroyed in Ashfield Twp
1968-1969	low populations
1970	less than 5% of leaders attacked at all sample points
1971	9% of leaders attacked in a white pine plantation
1972-1974	not reported

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1975	Leader damage did not exceed 1% in Downie and Turnberry twps.
1976	2% leader damage occurred in Downie and Turnberry twps
1977	3% and 5% leader damage occurred in Downie and Turnberry twps
1978	not reported
1979	Leader damage did not exceed 2% in Downie and Turnberry twps.
1980	small numbers throughout the district

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch . [Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	High populations occurred on young white birch trees in a private plantation in Colborne Twp.
1959	small pockets of moderate-to-severe defoliation reported in the district
1960	not reported
1961	Light defoliation occurred in Colborne Twp.
1962-1973	not reported
1974	Moderate populations occurred in Minto Twp.
1975-1977	not reported
1978	High populations occurred in Colborne Twp.
1979	Severe browning of foliage occurred at Point Farms Provincial Park, and in the towns of Seaforth, Mitchell and Stratford.
1980	Varying degrees of leafmining was observed in Stratford, St. Marys, Goderich and Clinton areas.

Fall Webworm, *Hyphantria cunea* (Dru.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	observed frequently on a wide variety of deciduous trees
1951-1952	not observed
1953	commonly observed throughout Huron County
1954-1958	not reported
1959-1961	low populations
1962	numerous tents observed at one location near Bayfield in Goderich Twp
1963-1966	low populations
1967-1969	not reported
1970-1974	low populations
1975	numerous tents observed in Stephen, Colborne and Goderich twps
1976	commonly observed throughout the district
1977-1980	not reported

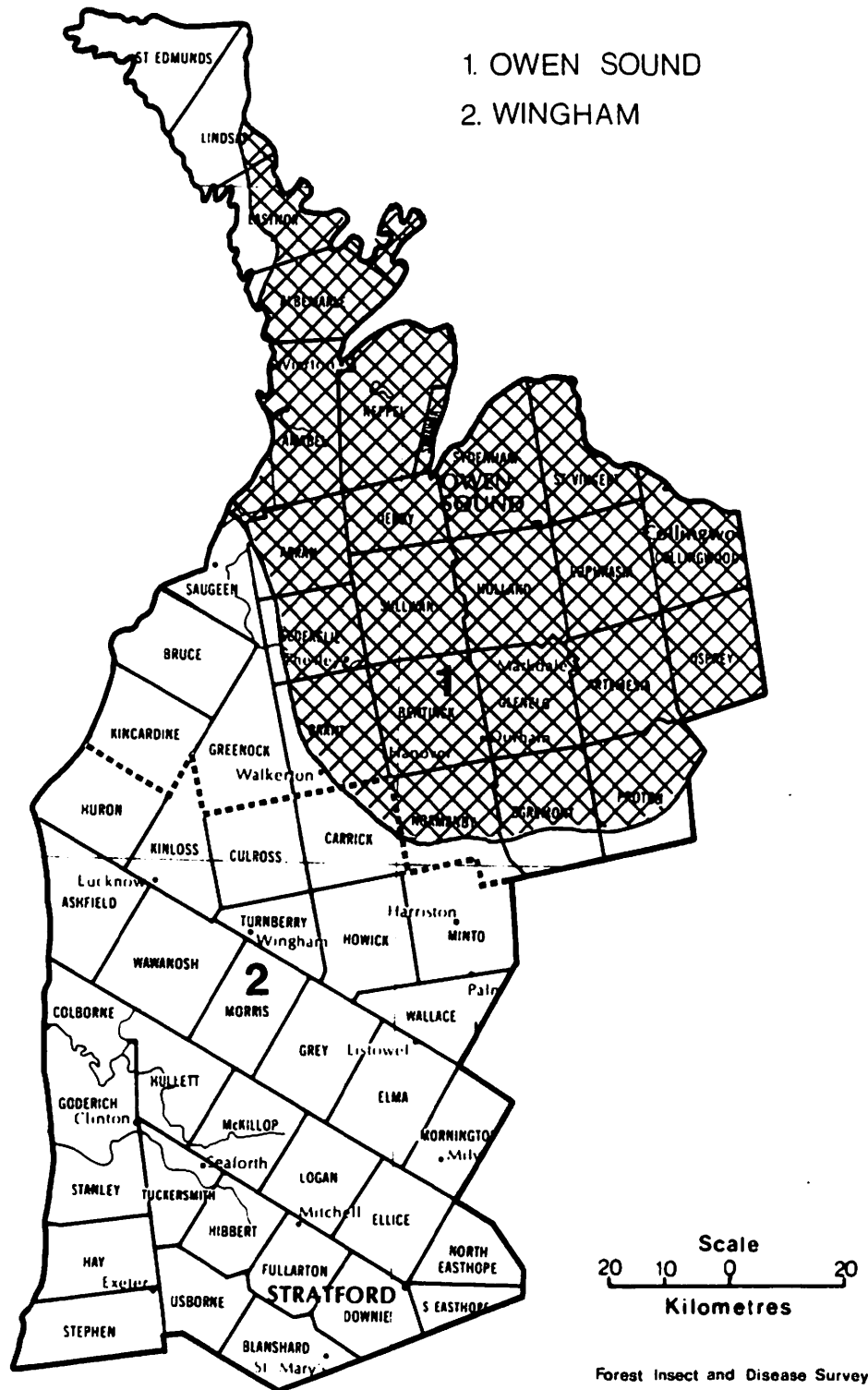
Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): aspen, deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	The moderate-to-severe infestation that is occurring in the Owen Sound District, has advanced into the northeast corner of Carrick Twp (see map, page).
1953	Moderate-to-severe defoliation has now occurred in parts of Culross, Minto and all of Carrick twps (see map, page).
1954	Population levels decreased in the district. Moderate-to-severe defoliation only occurred in the extreme northern part of Kinloss Twp and into the Owen Sound District (see map, page).
1955-1961	not reported
1962	Light defoliation occurred in West Wawanosh Twp.
1963-1973	not reported
1974	Pockets of moderate-to-severe defoliation occurred in parts of Culross and Carrick twps (see map, page).
1975	Moderate-to-severe defoliation continued in Culross and Carrick twps (see map, page).
1976	Moderate-to-severe defoliation occurred throughout most of Carrick Township (see map, page).
1977	Populations increased in the district. Moderate-to-severe defoliation occurred in East and West Wawanosh and north to encompass Kinloss, Culross and parts of Turnberry and Carrick twps (see map, page).
1978	A total collapse occurred.
1979-1980	not reported

OWEN SOUND and WINGHAM DISTRICTS



Forest Tent Caterpillar

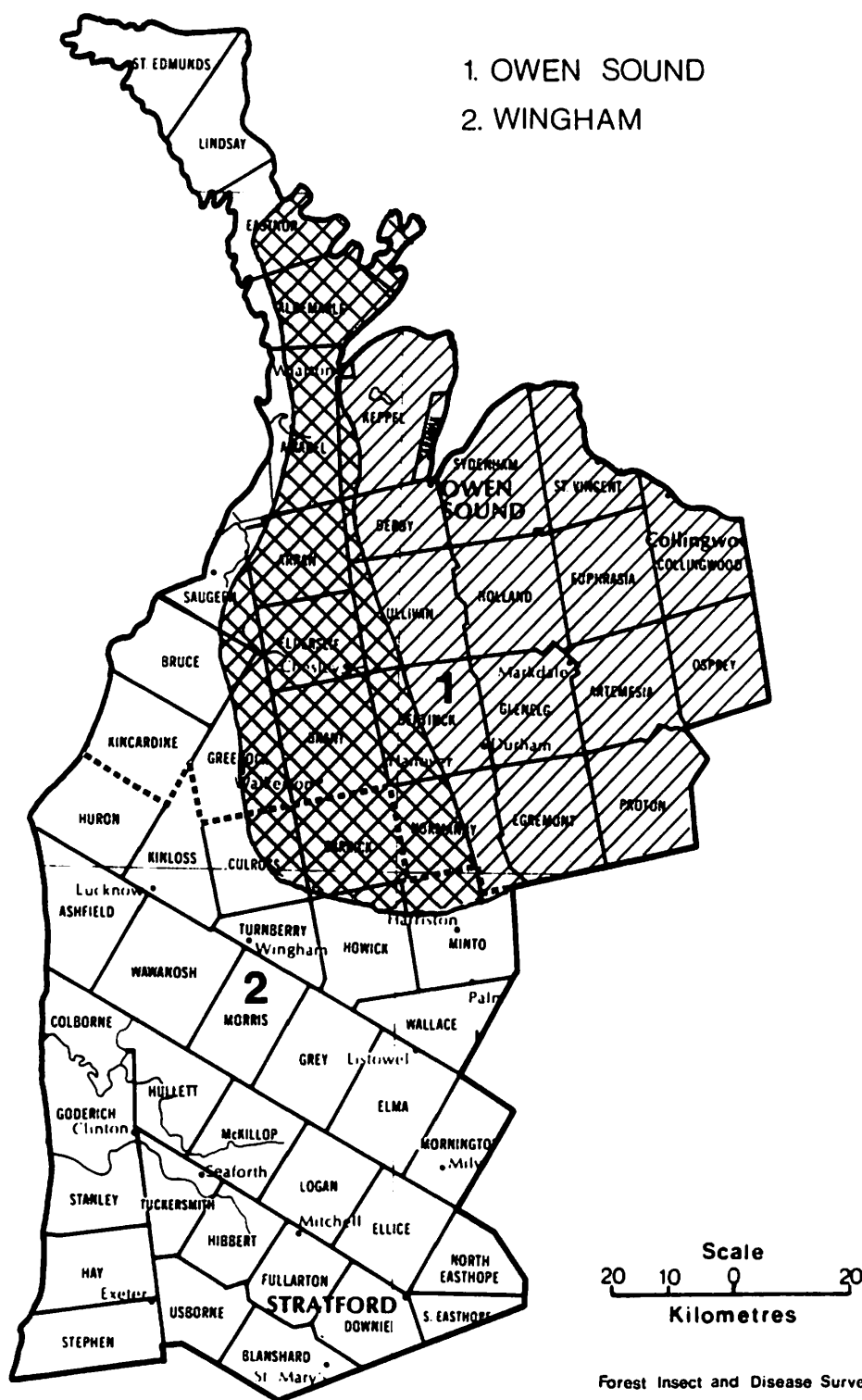
Areas within which defoliation occurred in 1952

LEGEND

Moderate-to-severe defoliation



OWEN SOUND and WINGHAM DISTRICTS



Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

LEGEND

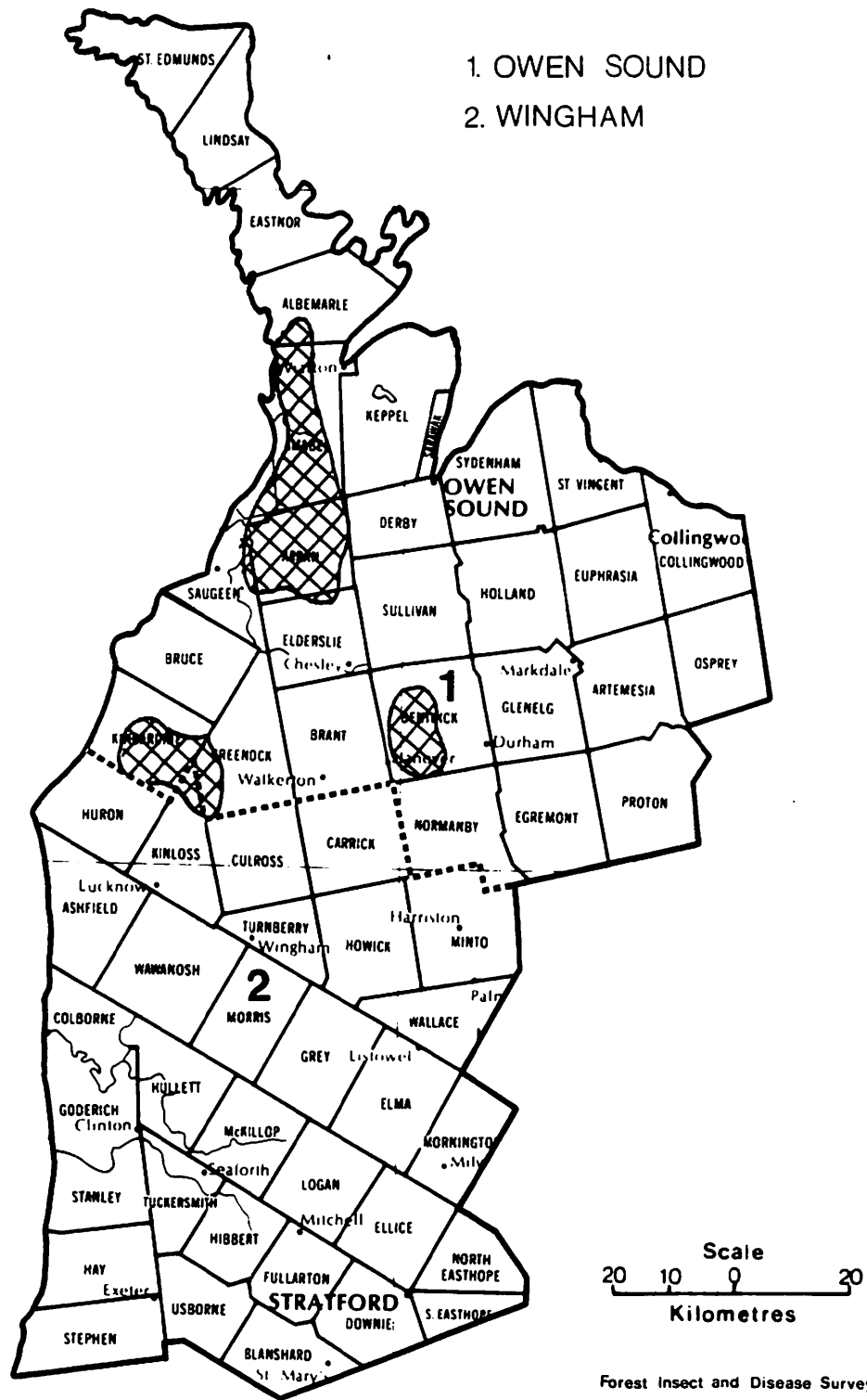
Light defoliation



Moderate-to-severe defoliation



OWEN SOUND and WINGHAM DISTRICTS



Forest Tent Caterpillar

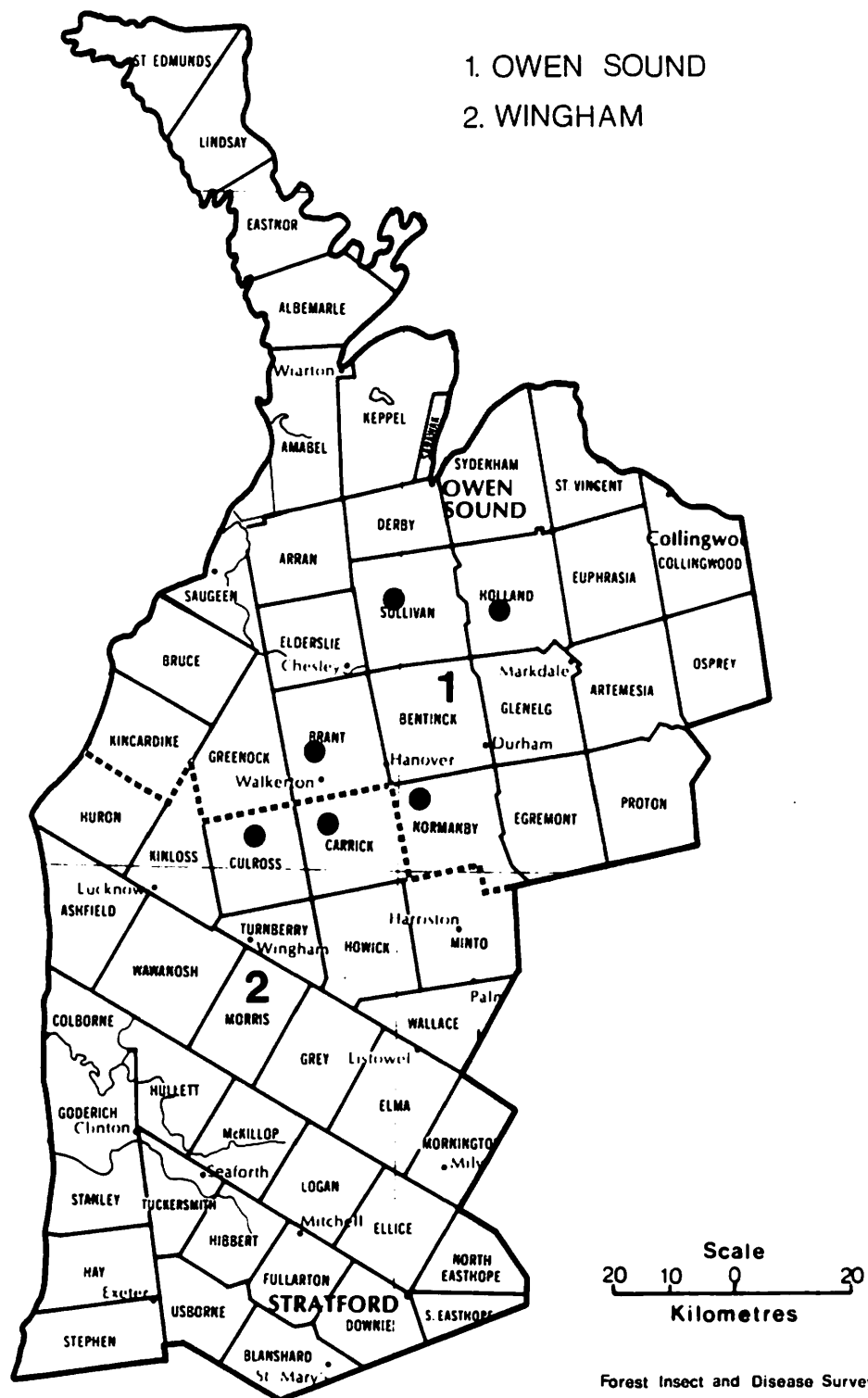
Areas within which defoliation occurred in 1954

LEGEND

Moderate-to-severe defoliation



OWEN SOUND and WINGHAM DISTRICTS



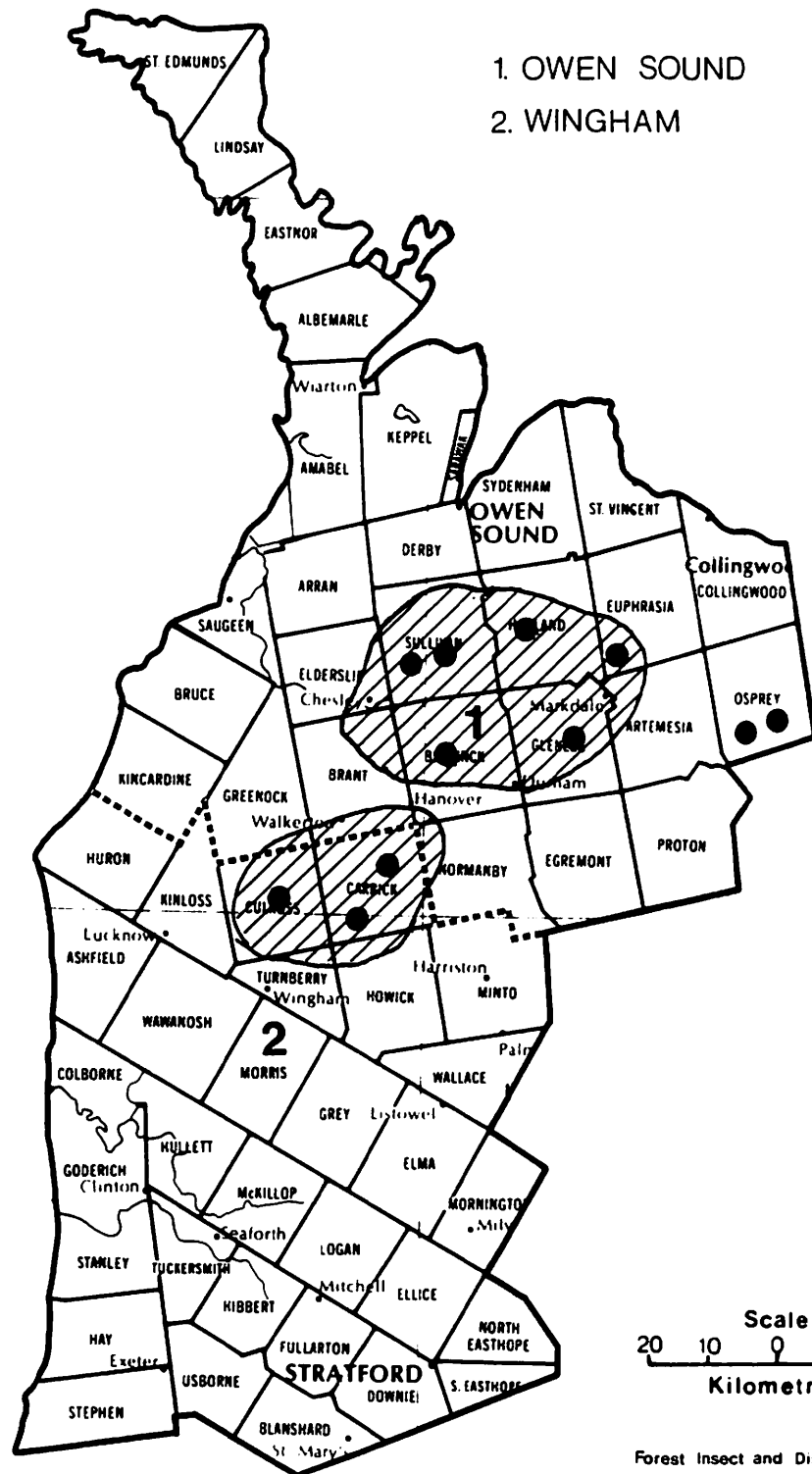
Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation ●

OWEN SOUND and WINGHAM DISTRICTS



Forest Insect and Disease Survey
Great Lakes Forestry Centre

Forest Tent Caterpillar

Areas within which defoliation occurred in 1975

LEGEND

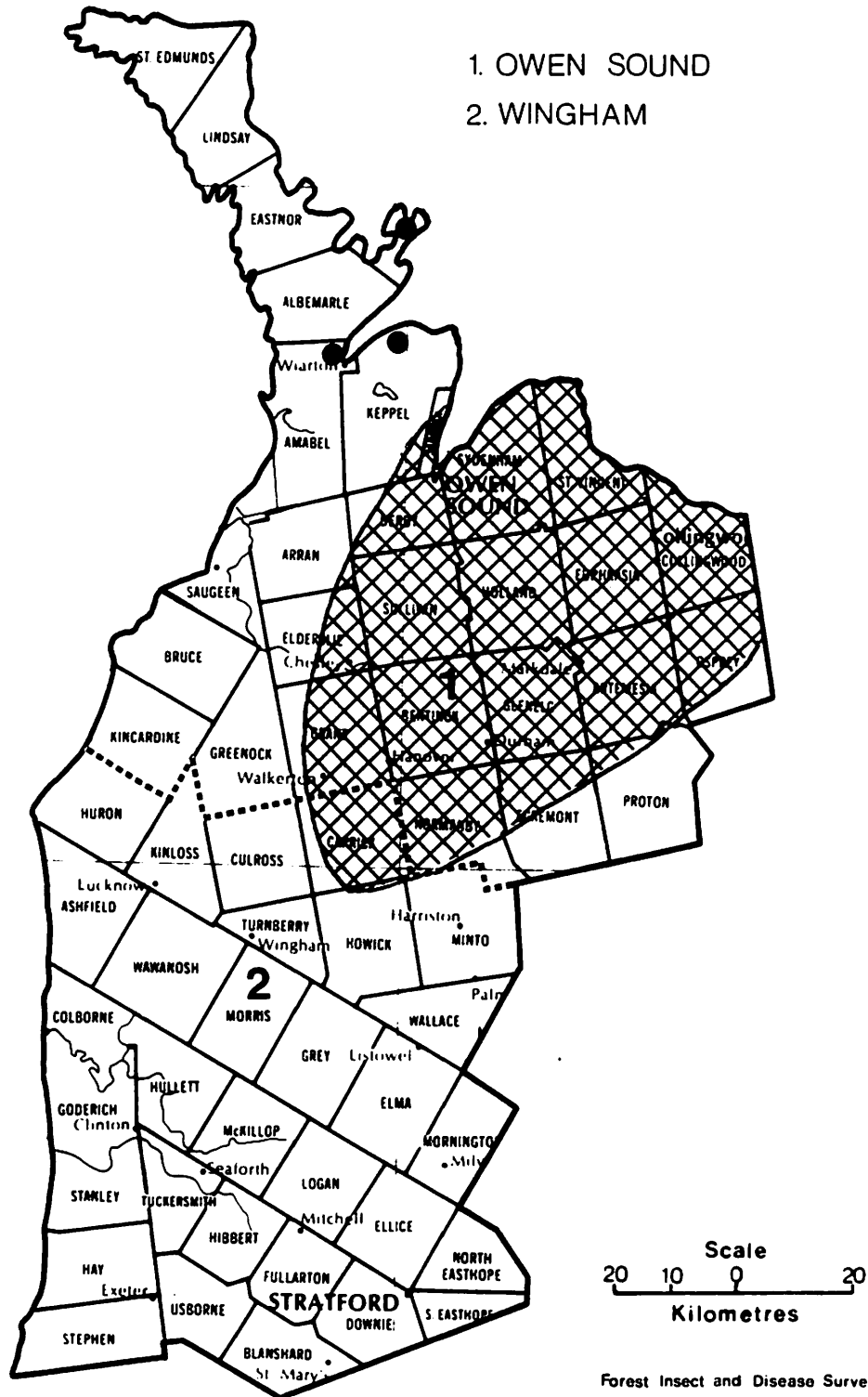
Light defoliation



Moderate-to-severe defoliation




OWEN SOUND and WINGHAM DISTRICTS



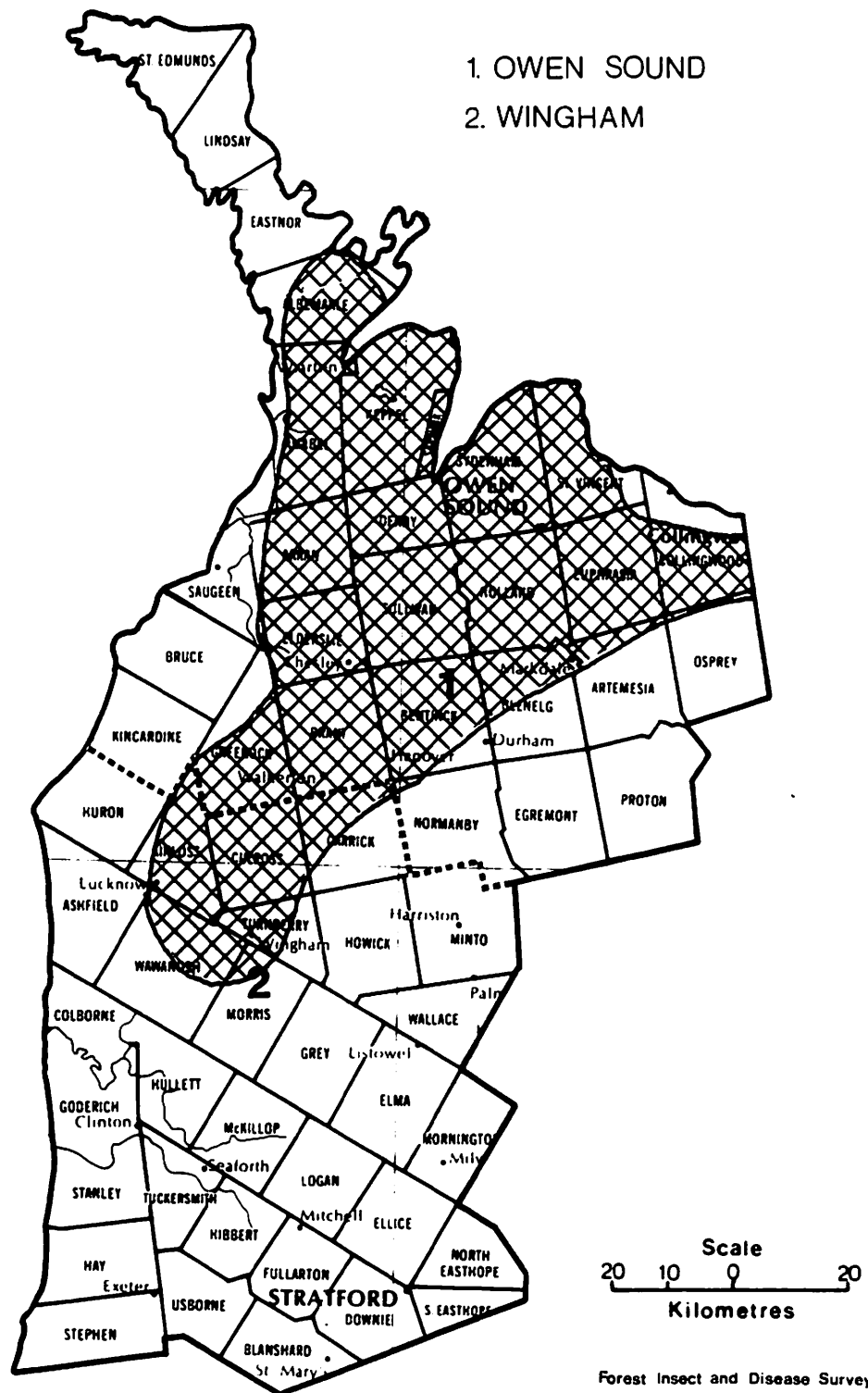
Forest Tent Caterpillar

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or 

OWEN SOUND and WINGHAM DISTRICTS



Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation



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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	low numbers found in East Wawanosh Twp
1951	low numbers collected in East Wawanosh and Ashfield twps
1952	Moderate-to-severe defoliation occurred in Colborne and McKillop twps.
1953	Moderate-to-severe defoliation occurred in Colborne, Hay, Minto and Wallace twps. High numbers were also noted in Hibbert and Downie twps (see map, page).
1954	Found throughout the district, 65% defoliation occurred at one location in Colborne Twp.
1955	No change in the infestation occurred across the district.
1956	Defoliation ranged from 25% to 100% in six townships across the district.
1957	Defoliation averaged 54% at quantitative sample points.
1958	Moderate-to-severe defoliation was observed in Stanley, East Wawanosh, Goderich, Colborne and Ashfield twps.
1959	High populations continued (see map, page). The number of infested trees ranged from 52% to 90%.
1960	percentage of trees infested at six sample points ranged from 31% to 95%
1961	percentage of trees infested ranged from 5% to 100% at five sample points
1962	Pockets of moderate-to-severe defoliation occurred on Scots , red and jack pine trees at many locations; percentage of trees infested ranged from 17% to 100%.
1963	an average of 67% of trees at Stanley, Goderich and East Wawanosh twps infested
1964	percentage of trees infested ranged from 17% to 93%
1965	High populations continued in the district.
1966	100% of Scots pine trees infested in Stanley and East Wawanosh twps
1967	percent of trees infested ranged from 10% in Goderich Twp to 50% in Stanley Twp
1968	Population levels declined; 4% and 16% of trees were infested in East Wawanosh and Stanley twps, respectively.
1969	Light defoliation continued in Stanley Township.

(cont'd)

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

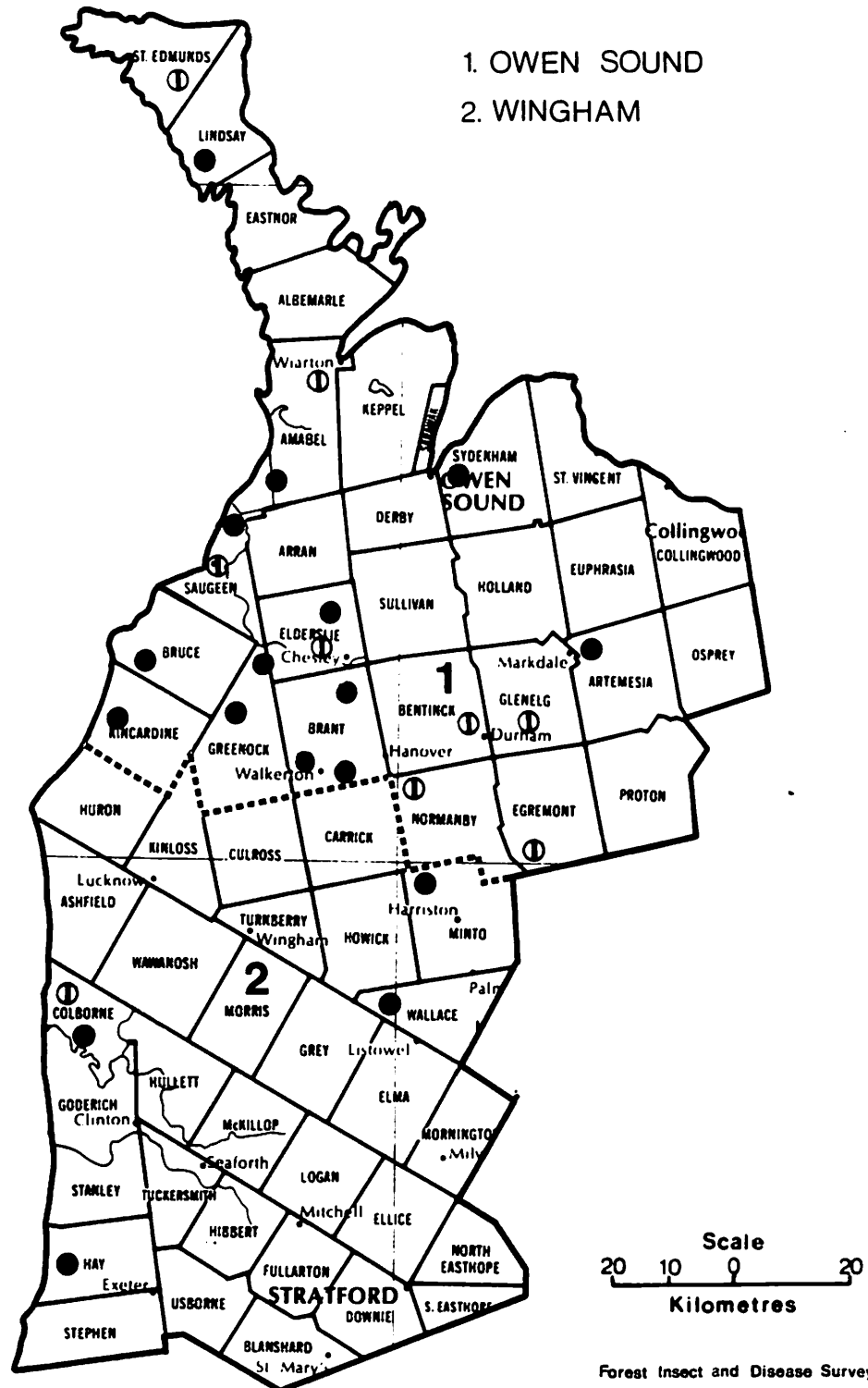
<u>Year</u>	<u>Remarks</u>
1970-1977	not reported
1978-1980	low populations

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

Host(s): spruce [Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959-1961	During this period, the number of infested trees ranged from 38% to 53% at a sample point in Minto Twp.
1962	Light defoliation occurred in Minto Twp.
1963	Population levels declined. The percentage of trees infested in Minto Twp was 20%.
1964	17% of trees infested in Minto Twp
1965	Further declines occurred in Minto Twp; 4% of trees were infested.
1966	Trace populations occurred in Minto Twp.
1967-1973	not reported
1974	low populations
1975-1976	not reported
1977	Moderate-to-severe defoliation occurred at several locations.
1978-1979	not reported
1980	low populations

OWEN SOUND and WINGHAM DISTRICTS



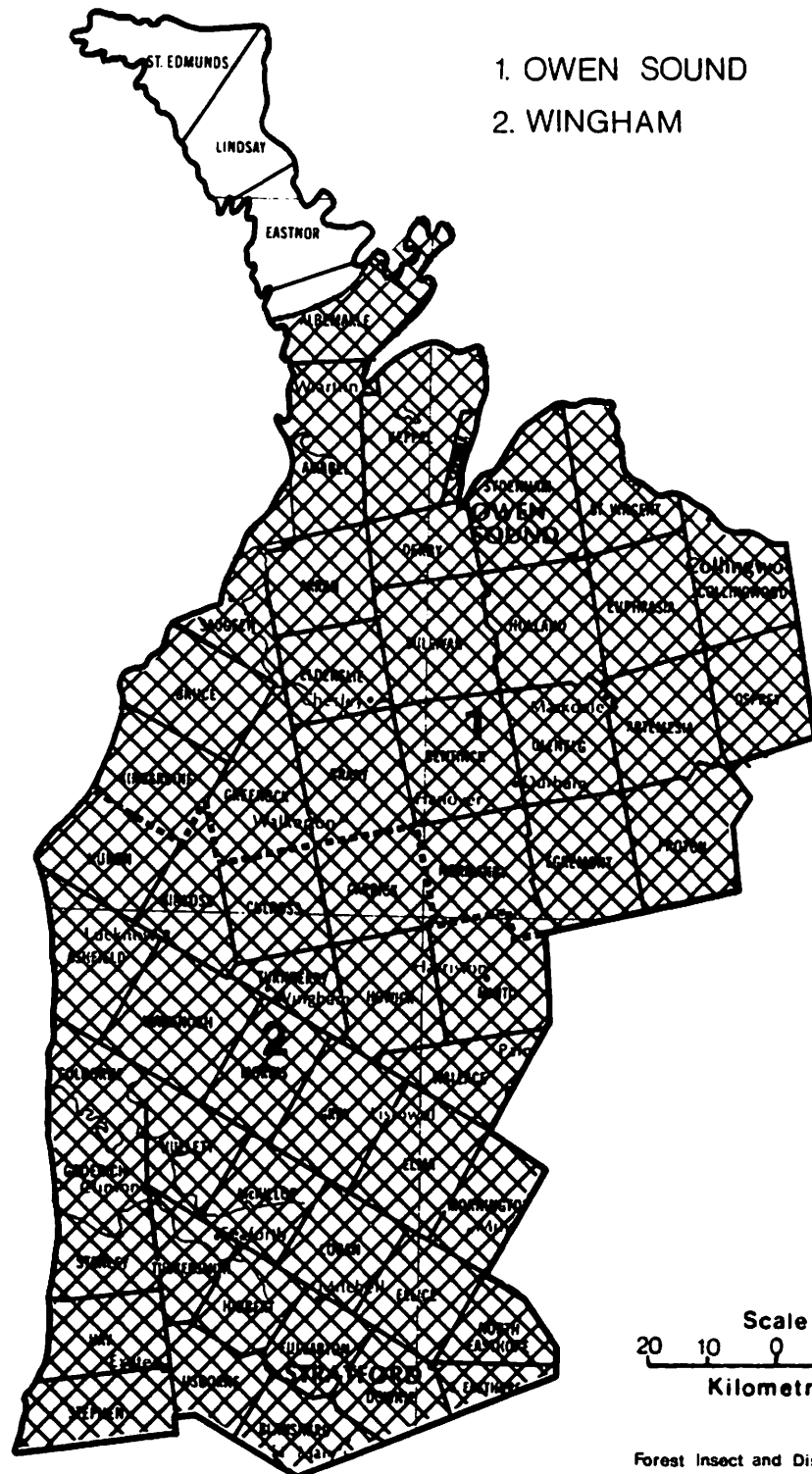
European Pine Sawfly

Areas within which defoliation occurred in 1953

LEGEND

- Light defoliation ①
- Moderate-to-severe defoliation ●

OWEN SOUND and WINGHAM DISTRICTS



European Pine Sawfly

Areas within which defoliation
occurred in 1959

LEGEND

Moderate-to-severe defoliation



White Pine Weevil, *Pissodes strobi* Peck

Host(s): pine, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	low populations observed in Culross Twp
1960-1962	not reported
1963	4% of the trees were infested at one location in Culross Twp
1964	5% of trees were infested in Culross Twp
1965	Populations increased in Culross Twp to 15%.
1966	Further increases occurred in Culross Twp; 24% of trees were attacked.
1967	Population levels declined in Culross Twp to 8%. In Kinloss Twp, 6% leader damage also occurred.
1968	7% of shoots infested in Culross Twp, and 2% in Kinloss Twp
1969	3% and 12% of trees were infested in Kinloss and Culross twps
1970	4% and 8% of trees were infested in Kinloss and Culross twps
1971	1% and 4% of trees were infested at Turnberry and Culross twps
1972	5% leader damage occurred in Turnberry Twp
1973	leader damage averaging 2% in Turnberry and Kinloss twps
1974	1% leader damage reported in Turnberry Twp
1975	Populations declined in Turnberry and Kinloss twps. No leader damage was reported.
1976-1978	not reported
1979	leader damage ranged from 2% to 9% in four townships
1980	trace populations

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	high number of egg deposition scars observed in Stephen Twp
1952-1967	not reported
1968-1969	moderate populations occurred in European larch in Minto Twp
1970	not reported
1971	moderate populations reported in Minto Twp
1972	not reported
1973	light defoliation occurred at scattered locations in the district
1974-1975	moderate populations continued in Minto Twp
1976-1977	Moderate-to-severe defoliation occurred on several plantings of European larch in Colborne Twp and native larch in Kinloss Twp.
1978	Moderate-to-severe defoliation continued in Colborne and Kinloss twps.
1979	Population levels declined to light in Colborne and Kinloss twps. Moderate damage also occurred in Ellice Twp.
1980	not reported

Mountain-ash Sawfly, *Pristiphora geniculata* Htg.

Host(s): aMo

[Major]

<u>Year</u>	<u>Remarks</u>
1950	low populations
1951	not reported
1952	low populations
1953-1954	not reported
1955	Moderate-to-severe defoliation by first generation larvae occurred in the town of Seaforth in McKillop Twp.
1956	low populations
1957	not reported
1958	Light defoliation occurred at several points in the district.
1959-1960	Varying degrees of defoliation occurred in the district.
1961	High populations caused severe defoliation in Culross Twp.
1962-1963	not reported
1964	Varying degrees of defoliation occurred in the district.
1965-1973	not reported
1974	light defoliation on scattered trees in the district
1975-1980	Moderate-to-severe defoliation occurred at numerous locations in the district.

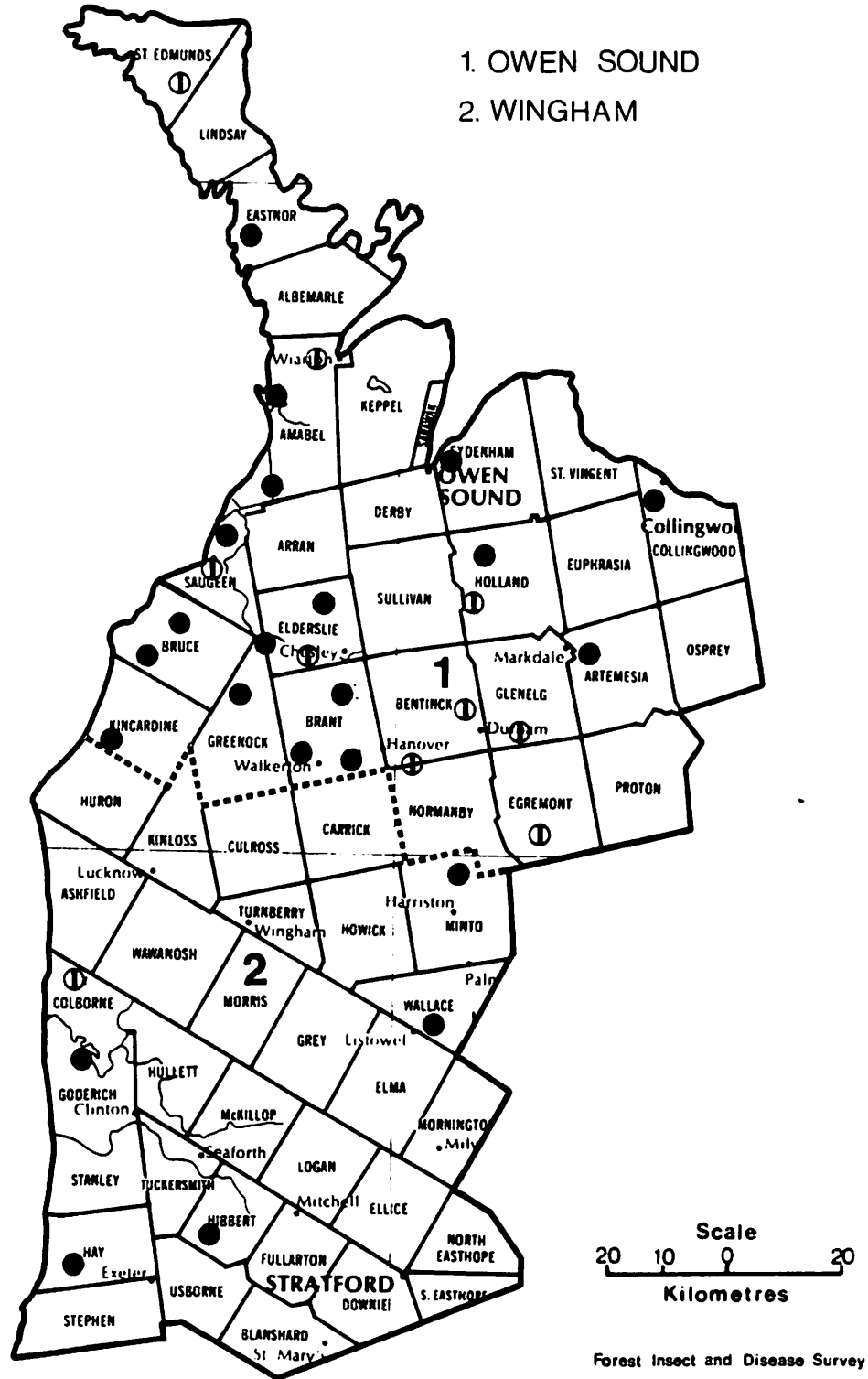
European Pine Shoot Moth, *Rhyacionia buoliana* (Schiff.)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	found commonly in the southern townships along Lake Huron
1953	high numbers occurred in Goderich, Hay, Hibbert and Wallace twps (see map, page)
1954-1969	not reported
1970-1971	low numbers observed in the southern part of the district
1972-1973	not reported
1974	low populations
1975	percentage of trees attacked ranged from 6% to 9% in Turnberry and Goderich twps
1976	Populations increased; 94% of shoots were damaged in Turnberry Twp as compared to 12% the previous year.
1977	high numbers persisted in Turnberry Twp with 72% of current shoots damaged
1978	low numbers
1979	not reported
1980	60% of trees were damaged in Turnberry Twp

OWEN SOUND and WINGHAM DISTRICTS



Forest Insect and Disease Survey
Great Lakes Forestry Centre

European Pine Shoot Moth

Areas within which defoliation
occurred in 1953

LEGEND

Light defoliation ⓪
Moderate-to-severe defoliation ●

Other Noteworthy Insects

Fall Cankerworm, *Alsophila pometaria* (Harr.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	low numbers
1952-1959	not reported
1960	low populations reported in Perth County
1961-1980	not reported

Orangestriped Oakworm, *Anisota senatoria* J.E. Smith

Host(s): oak

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	Light defoliation was observed in Hay and Stephen twps.
1952	Light defoliation continued in the above areas.
1953	trace populations
1954-1980	not reported

Uglynest Caterpillar, *Archips cerasivorana* (Fitch)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	low populations
1955-1956	high populations observed along Highway 21 in Huron County
1957	numerous tents observed throughout the district
1958-1965	low populations
1966	not reported
1967	low populations
1968-1974	not reported
1975	high numbers of tents observed on shrubs at Point Farms Provincial Park in Colborne Twp
1976	numerous tents observed throughout the district
1977-1978	not reported
1979-1980	moderate populations observed throughout the district

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): bF, wS, bS

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1974	not reported
1975	Small pockets of moderate-to-severe damage occurred in Colborne, Downie and South Easthope twps.
1976-1979	not reported
1980	A small pocket of moderate-to-severe damage was reported in Minto Twp.

Larch Casebearer, *Colephora laricella* (Hbn.)

Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1969	not reported
1970-1972	trace levels
1973-1974	not reported
1975-1977	low populations
1978-1980	Moderate-to-severe defoliation occurred in a mature stand of larch at one area in Kinloss Twp.

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

Host(s): pine

[Minor]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	collected at Listowel in Wallace Twp
1952-1954	observed in small numbers
1955	not reported
1956-1961	observed in small numbers
1962	not reported
1963-1968	low populations
1969-1970	not reported
1971-1974	low populations
1975-1976	not reported
1977	low numbers
1978-1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959-1962	low populations throughout the district
1963-1964	not reported
1965	low populations at scattered locations
1966	not reported
1967	trace levels
1968-1974	not reported
1975	light populations common at numerous points in the district
1976-1978	not reported
1979	trace levels throughout the district
1980	low numbers occurred in the Tavistock area

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

Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	small numbers
1954-1963	not reported
1964-1966	low populations
1967-1970	trace populations
1971-1972	low populations
1973-1980	not reported

Eastern Tent Caterpillar, *Malacosoma americana* F.

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	low populations
1956-1969	not reported
1970	high number of tents observed on roadside shrubs
1971	varying degrees of defoliation were observed in the district
1972-1973	high number of tents were observed on black cherry in Culross Twp
1974	low populations
1975	not observed
1976	moderate populations
1977	High populations occurred at numerous locations in the district.
1978	High numbers of tents were observed in Turnberry, Culross and Carrick twps.
1979	not reported
1980	commonly observed

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

Host(s): elm

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1959	not reported
1960	This disease occurred commonly, south of a line from Goderich to Jackson Point on Lake Simcoe.
1961	not reported
1962	Large numbers of elm trees continued to die in the district.
1963	not reported
1964	18% of trees infected at one point in Stanley Twp
1965	34% of trees infected at one point in Stanley Twp
1966	16% infection reported in the Teeswater area
1967	incidence rates comparable to 1966
1968	not reported
1969	Mortality in Howick and Colborne twps were 6% and 37%, respectively.
1970-1972	not reported
1973	6% of trees affected in North Easthope Twp
1974	11% mortality occurring in North Easthope Twp
1975-1977	not reported
1978	mortality continuing in the district
1979-1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1963	not reported
1964	light infections of lower foliage of red and jack pine trees at numerous locations
1965-1972	not reported
1973-1974	trace and light infections observed at scattered locations
1975	not observed
1976	38% of trees affected at one location in Turnberry Twp
1977-1980	not reported

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

Host(s): white pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961-1962	commonly observed in the district
1963	not reported
1964	Pockets of light and moderate infections occurred throughout the district.
1965	The percentage of trees affected ranged from 1% to 15% in the district.
1966	commonly observed
1967	not reported
1968	10% incidence recorded in the district
1969-1970	not reported
1971	commonly found in the district
1972-1973	not reported
1974	2.7% of trees infected in a plantation in Blanshard Twp
1975	1.4% and 2.6% of trees infected in Downie and Colborne twps
1976-1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	high incidence occurred at several locations in East Wawanosh and Ashfield twps on Scots pine trees
1964-1965	not reported
1966	Severe infections caused branch mortality of Scots pine trees in East Wawanosh and Colborne twps.
1967-1969	not reported
1970	light infections found commonly throughout the district with occasional trees heavily infected.
1971-1980	not reported

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J.H. Miller

Host(s): aspen

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	commonly found in the district
1955-1961	not reported
1962	commonly observed throughout the district
1963-1966	Stem cankers and tree mortality were light and moderate at many points in the region.
1967	No change in the status of this disease; in Ellice Twp a high degree of infection occurred with high levels of mortality occurring.
1968-1972	not reported
1973	Moderate infections occurred in Minto and North Easthope twps.
1974	not reported
1975	commonly observed throughout the district
1976-1980	not reported

Other Noteworthy Diseases

Eutypella Canker, *Eutypella parasitica* Davidson & Lorenz

Host(s): sM

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962	cankers observed in several sugar maple stands in the district
1963	not reported
1964	moderate infections reported in the district
1965	not reported
1966	cankers common throughout the district
1967-1972	not reported
1973	incidence did not exceed 7.5% in the district
1974-1980	not reported

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

Host(s): pines

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1980	not reported

ABIOTIC DAMAGE

[The following text is extremely faint and largely illegible. It appears to be a list or a series of notes related to the section header 'ABIOTIC DAMAGE'. Some faint words and phrases are visible, such as 'water', 'air', 'soil', and 'temperature', but the majority of the content cannot be transcribed accurately.]

Drought Injury

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	upwards of 75% to 90% mortality of spring conifer plantings occurring in the district
1967-1980	not reported

Frost

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	Severe damage occurred in the district to white ash, trembling aspen and oak trees.
1958-1962	not reported
1963-1965	severe mortality of new growth on a wide variety of tree species
1966	Damage did not exceed 5% in the district.
1967-1971	not reported
1972	Moderate-to-severe damage occurred on white pine and European larch plantations.
1973-1975	not reported
1976	Severe damage to sugar maple was reported in many stands in the district.
1977-1980	not reported

Salt

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Severe damage occurred on pine, cedar and spruce in several areas of the district. Bud damage in low lying areas average 5%.
1967	Damage was less prevalent than in 1966, however, foliar damage was apparent along main highways in the district.
1968-1975	not reported
1976	commonly observed throughout the district, especially on white, red and Scots pine trees and Norway spruce
1977	Severe damage occurred on both coniferous and deciduous trees along major and secondary roads.
1978	commonly observed throughout the district on a wide variety of hosts
1979	light damage reported in the district
1980	Varying degrees of damage occurred in the district.

Limestone Chlorosis

<u>Year</u>	<u>Remarks</u>
1950-1971	not reported
1972	Small pockets of red pine mortality occurred in the Holmesville area in Goderich Twp.
1973-1979	not reported
1980	Groups of red pine trees were dying in the Robertson Tract in Colborne Twp and in the King Tract in Culross Twp. The pH readings for soil samples in the above areas were in excess of 7.5, typical of calcareous soils that are poor red pine sites.

Maple Dieback

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	Twig and branch mortality was observed at several points in the district.
1959	Maple plots were established at various locations to study the development of maple dieback.
1960	three plots examined for the presence of insect damage in Perth County
1961-1962	low populations of insects observed in maple dieback plots
1963	Insignificant insect damage occurred in maple dieback plots examined.
1964	not reported
1965	2% mortality recorded in East Wawanosh Twp
1966	30% mortality occurred on roadside maple in McKillop Twp
1967	tree mortality averaged 7% in the district
1968-1974	not reported
1975	4% mortality recorded in Colborne Twp
1976	not reported
1977	Small pockets of mortality occurred in Culross, Carrick and Howick twps as a result of moderate-to-severe defoliation by the forest tent caterpillar over the past three years.
1978	Small pockets of mortality, less than 1 ha in size, occurred in Culross and Carrick twps.
1979-1980	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 white	<i>Fraxinus nigra</i> Marsh. <i>americana</i> L.	bAs wAs
Aspen, largetooth trembling	<i>Populus grandidentata</i> Michx. <i>tremuloides</i> Michx.	lA tA
Basswood	<i>Tilia americana</i> L.	Ba
Beech	<i>Fagus grandifolia</i> Ehrh.	Be
Birch, white yellow	<i>Betula papyrifera</i> Marsh. <i>alleghaniensis</i> Britt.	wB yB
Butternut	<i>Juglans cinerea</i> L.	Bu
Catalpa	<i>Catalpa</i> spp.	Ca
Cherry, eastern choke pin	<i>Prunus virginiana</i> L. <i>pensylvanica</i> L.f.	eaCh pCh
Elm, white	<i>Ulmus americana</i> L.	wE
Hackberry	<i>Celtis occidentalis</i> L.	Ha
Hickory, bitternut shagbark	<i>Carya cordiformis</i> (Wang.) K. Koch <i>ovata</i> (Mill.) K. Koch	bHi sHi
Horse-chestnut	<i>Aesculus carnea</i> Hayne	hChe
Ironwood	<i>Ostrya</i> spp.	I
Maple, Manitoba red silver sugar	<i>Acer negundo</i> L. <i>rubrum</i> L. <i>saccharinum</i> L. <i>saccharum</i> Marsh.	mM rM siM sM

(continued)

APPENDIX A (continued)

<u>Common Name</u>	DECIDUOUS HOST <u>Scientific Name</u>	<u>Abbreviations</u>
Mountain-ash, American	<i>Sorbus americana</i> Marsh.	aMo
Oak, black	<i>Quercus velutina</i> Lam.	b1O
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

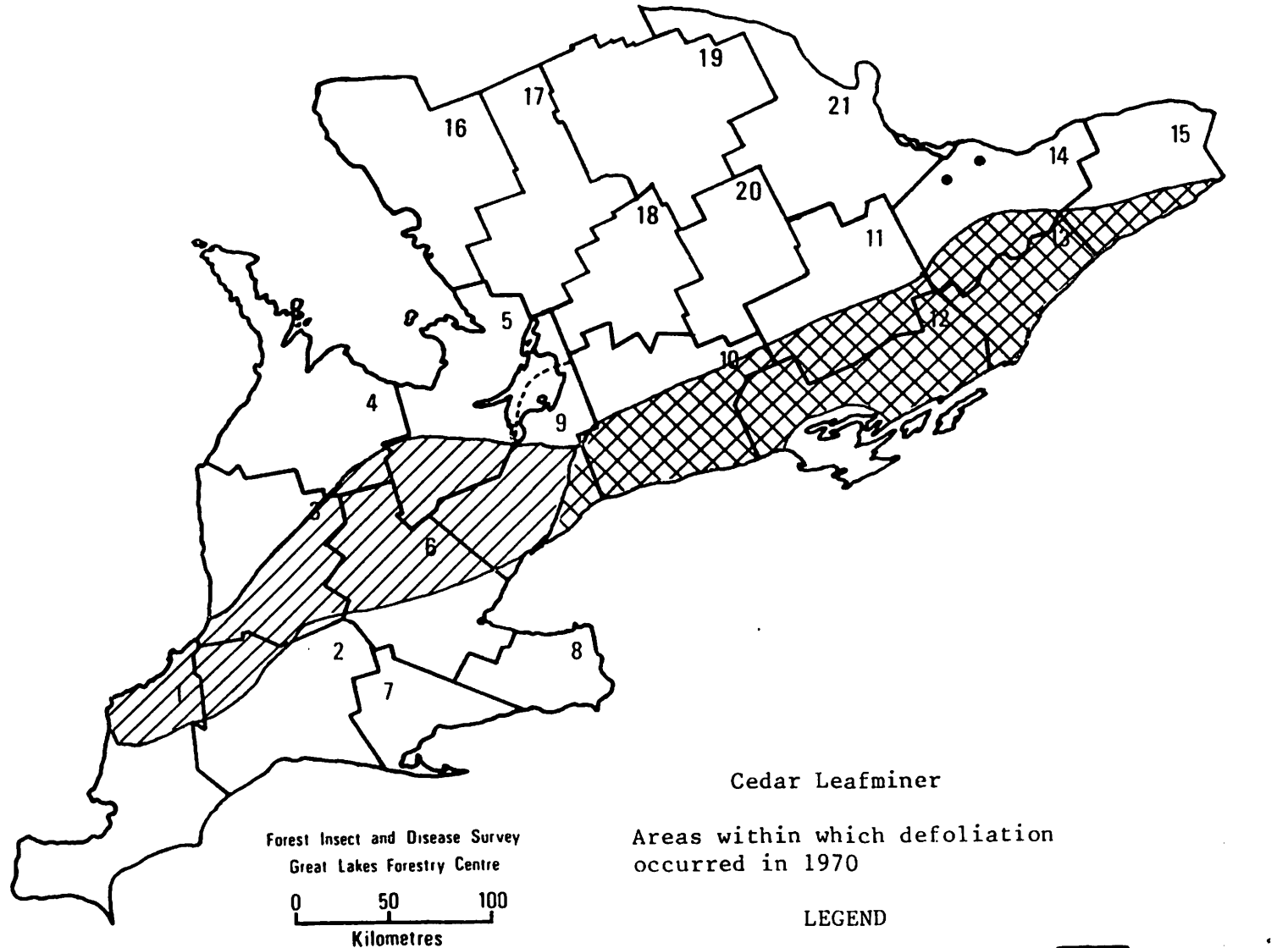
A P P E N D I X C
M A P S - S O U T H E R N O N T A R I O



SOUTHERN ONTARIO

DISTRICTS

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



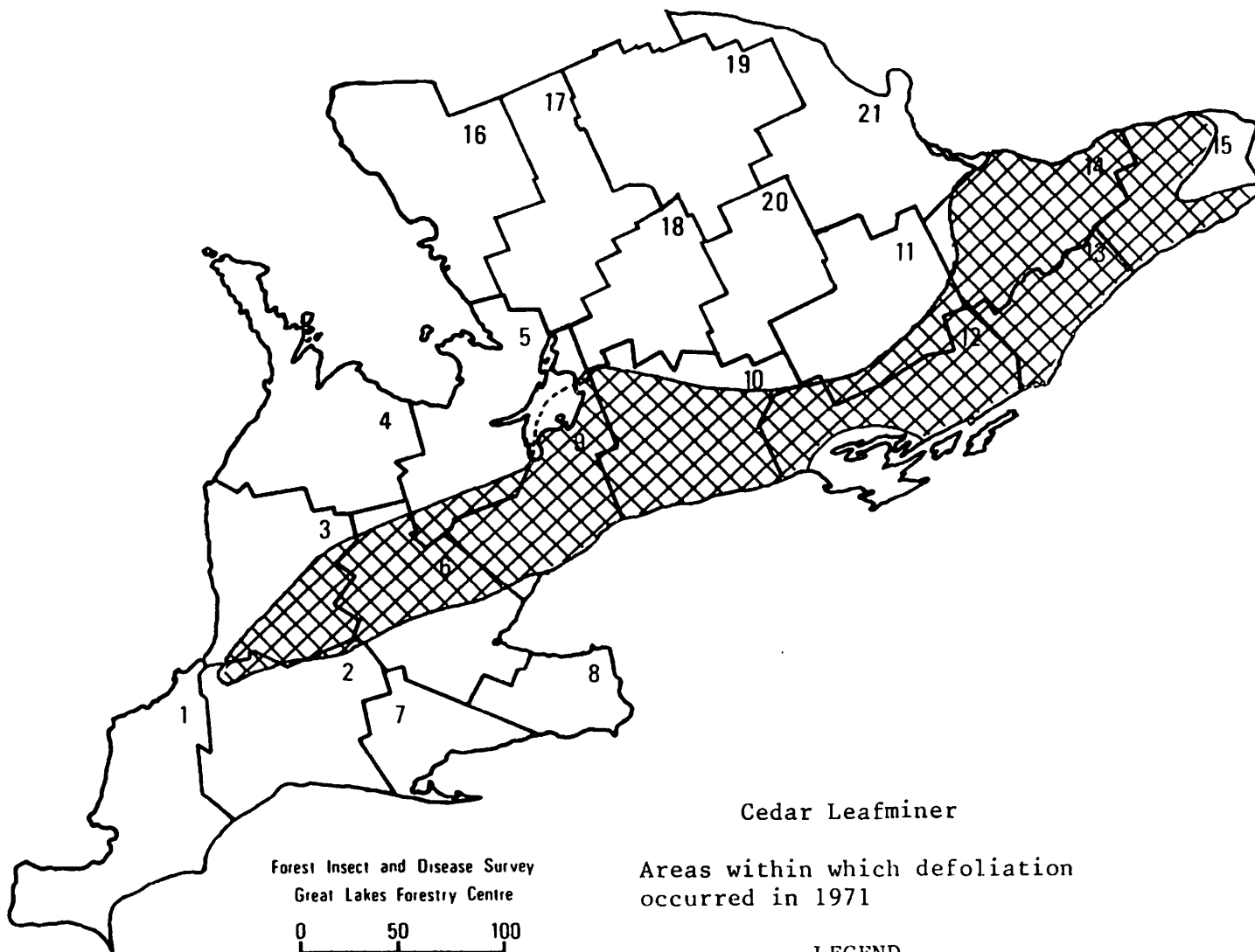
Moderate-to-severe defoliation • or



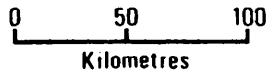
SOUTHERN ONTARIO

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



Forest Insect and Disease Survey
Great Lakes Forestry Centre



Cedar Leafminer

Areas within which defoliation
occurred in 1971

LEGEND

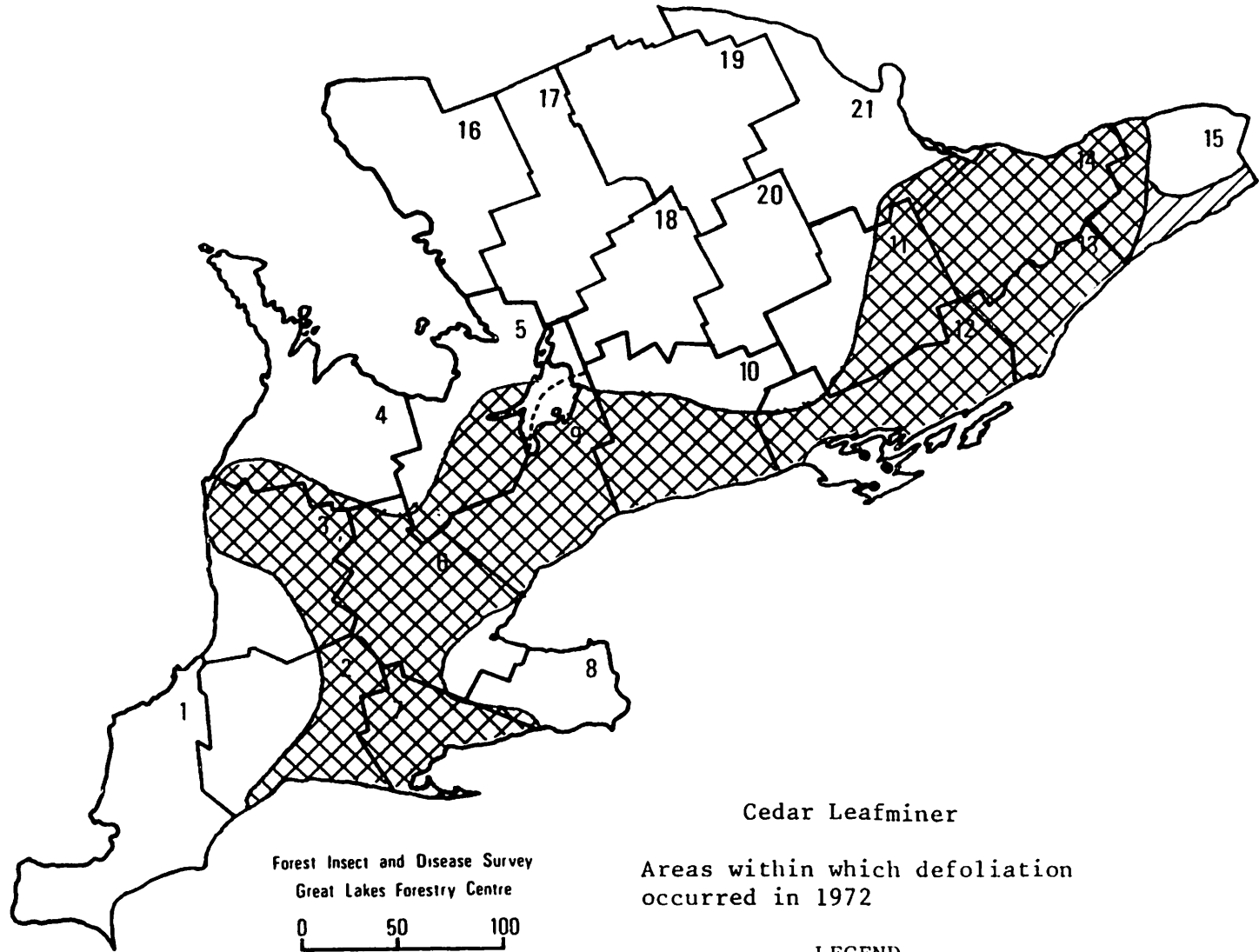
Moderate-to-severe defoliation



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



Cedar Leafminer

Areas within which defoliation occurred in 1972

LEGEND

Light defoliation



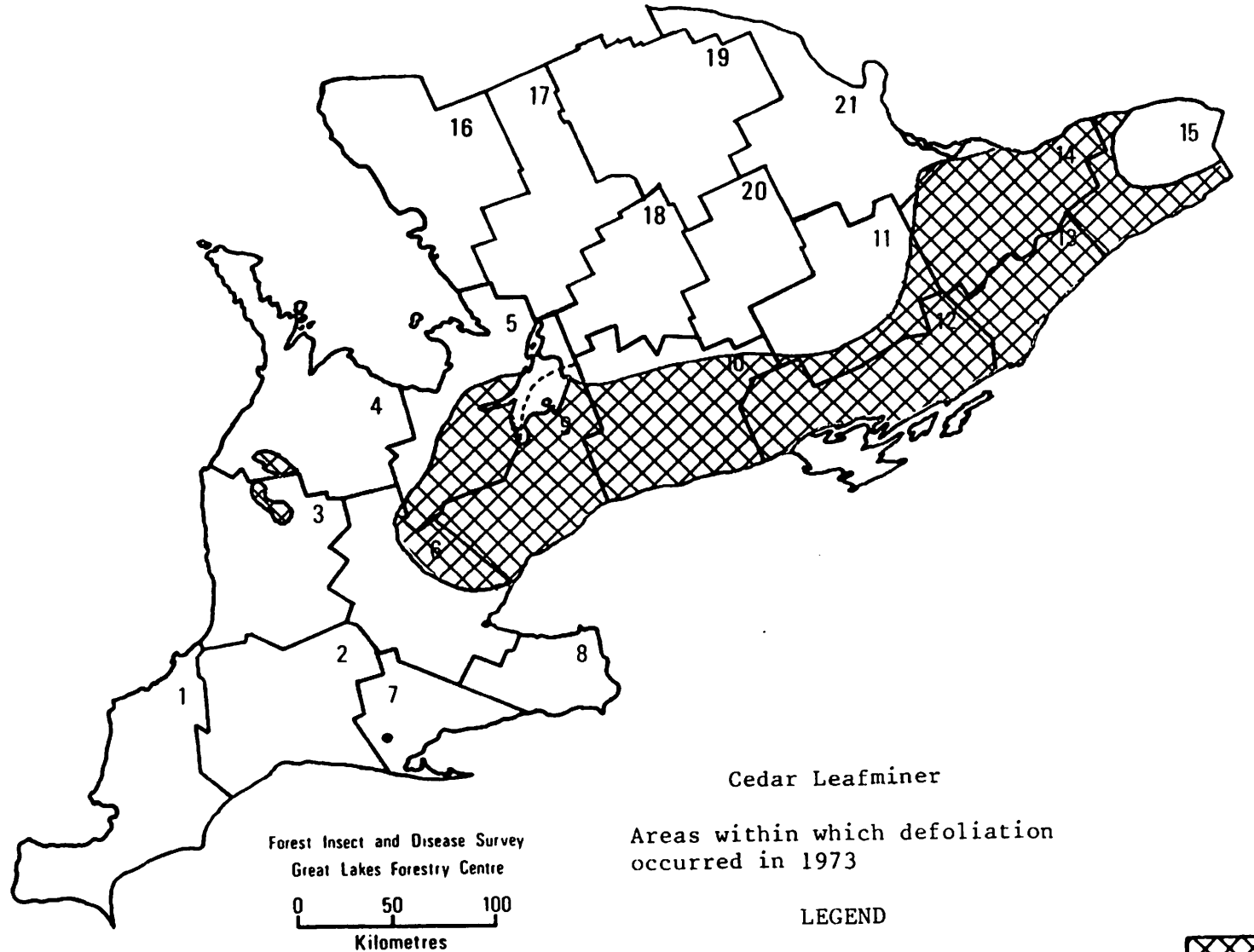
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

DISTRICTS

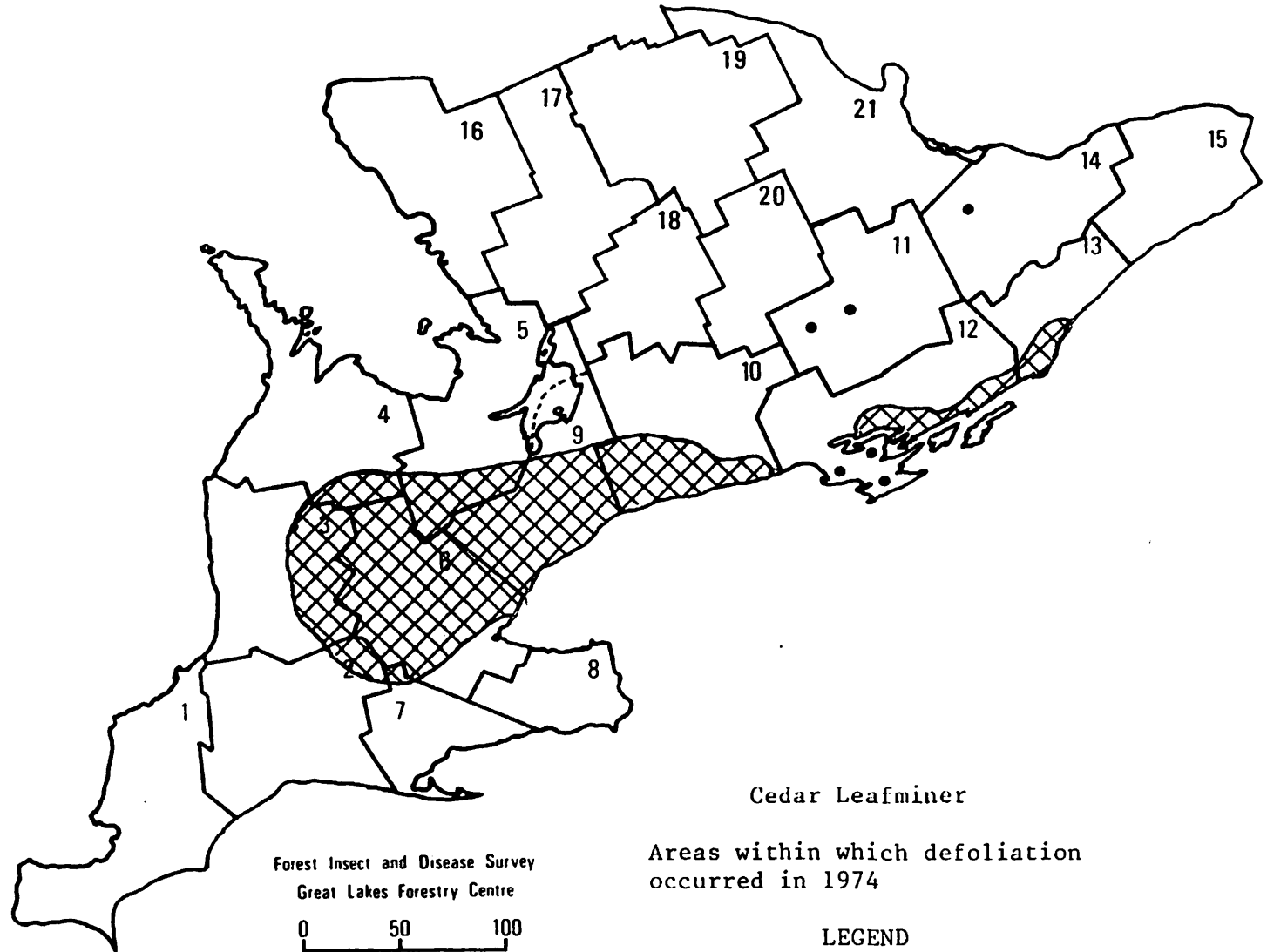
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



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



Cedar Leafminer

Areas within which defoliation occurred in 1974

LEGEND

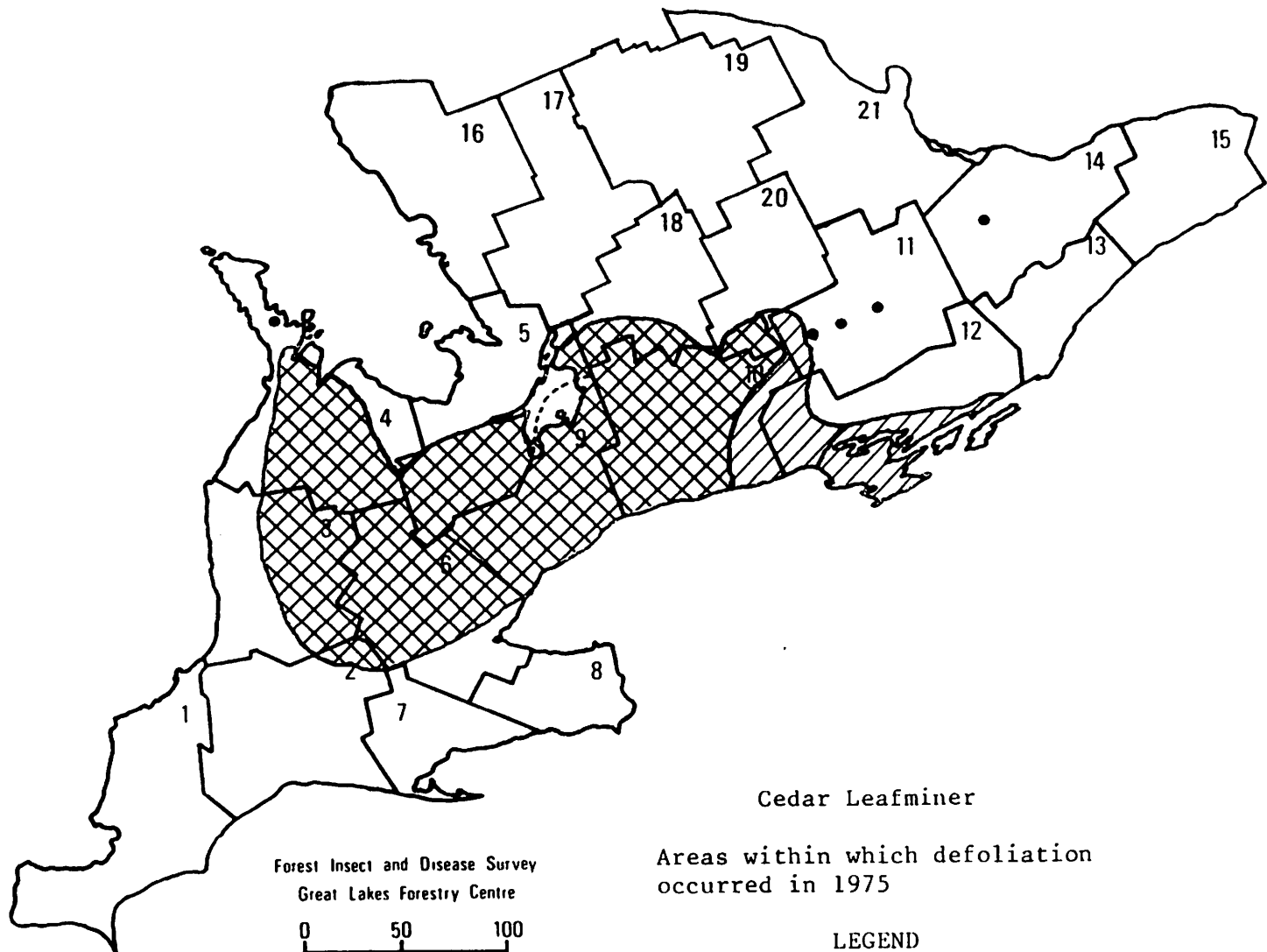
Moderate-to-severe defoliation • or



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



Cedar Leafminer

Areas within which defoliation
occurred in 1975

LEGEND

Light defoliation



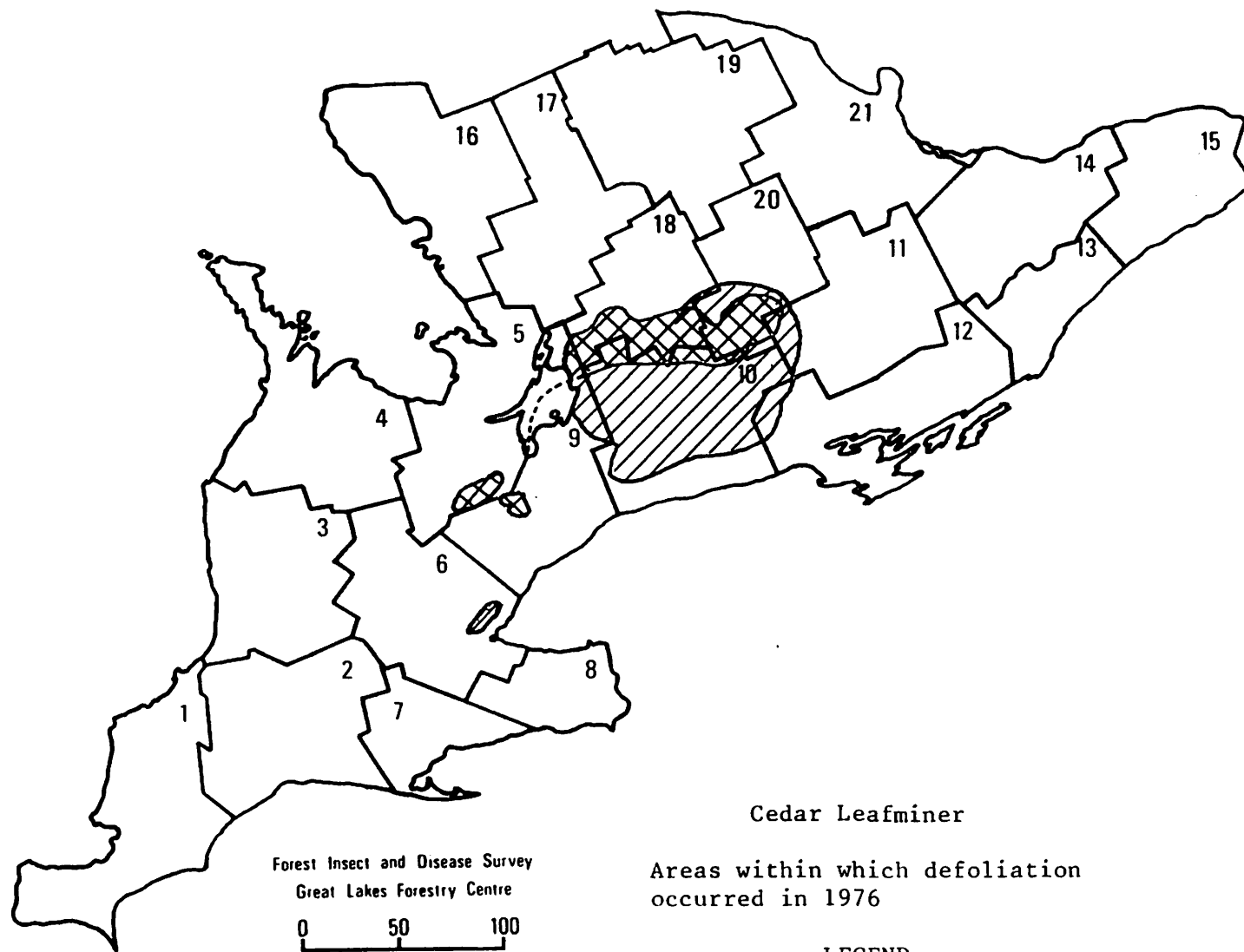
Moderate-to-severe defoliation • or



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



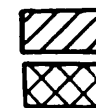
Cedar Leafminer

Areas within which defoliation
occurred in 1976

LEGEND

Light defoliation

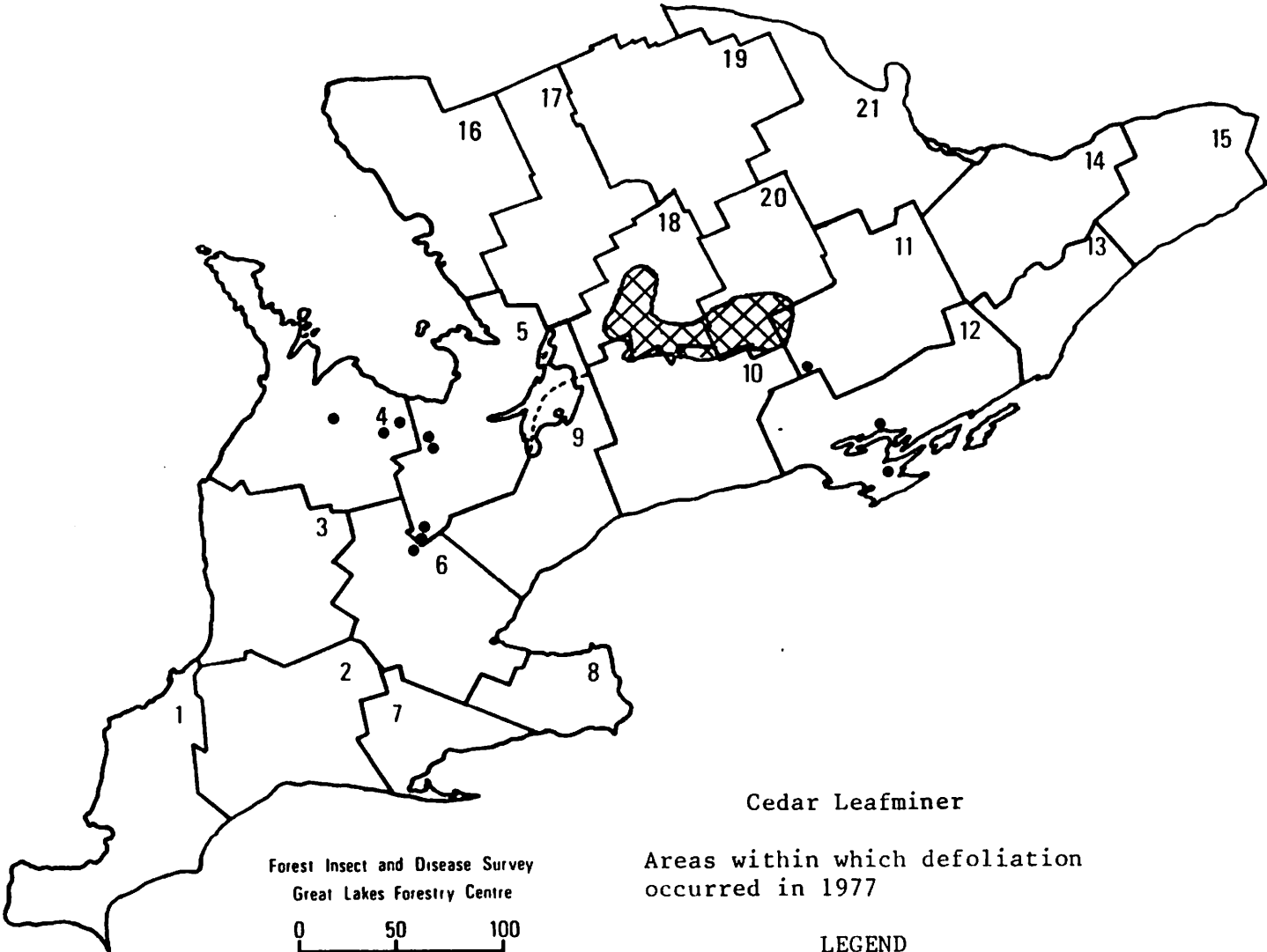
Moderate-to-severe defoliation



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



Cedar Leafminer

Areas within which defoliation occurred in 1977

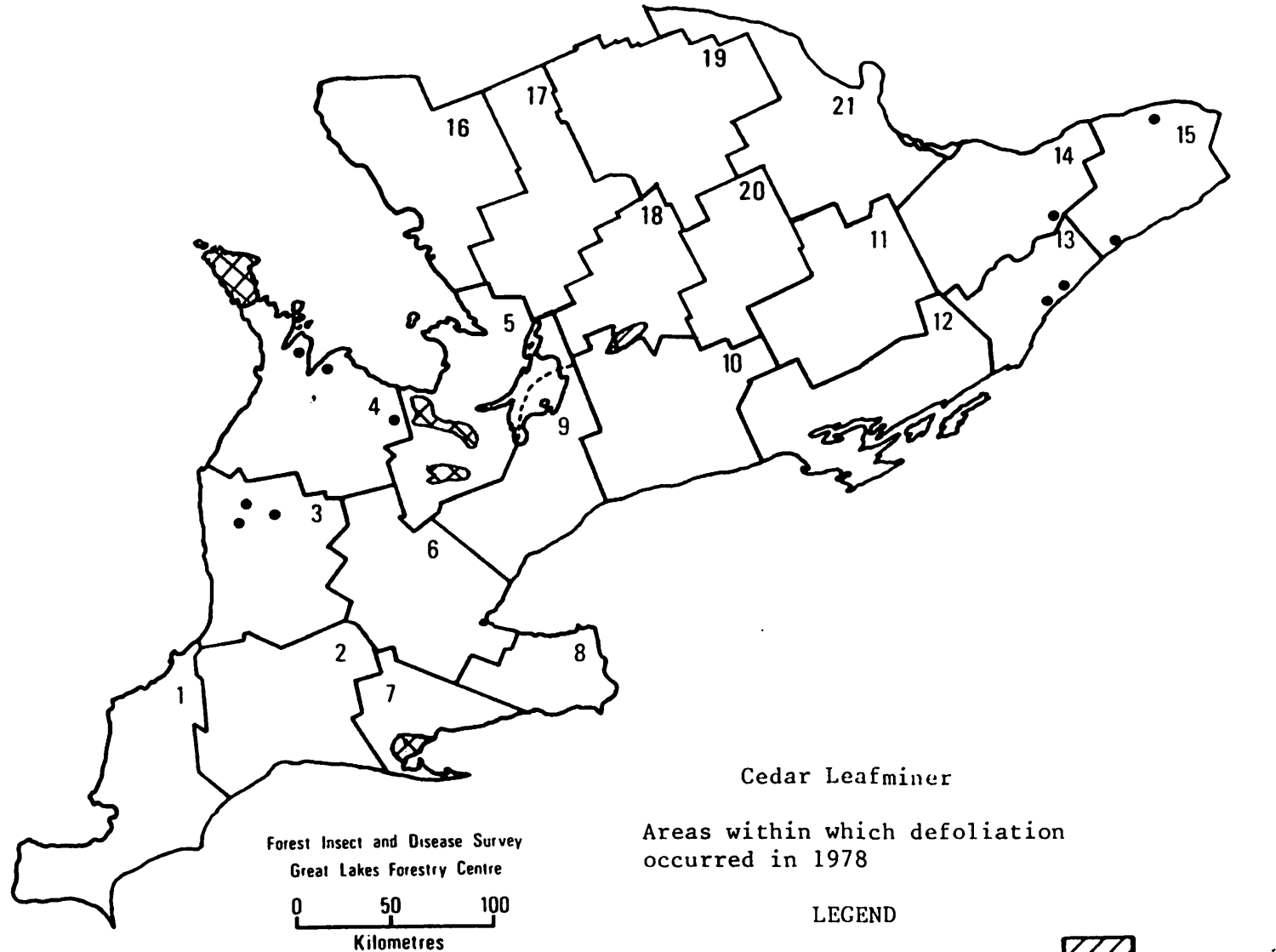
LEGEND

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



Cedar Leafminer

Areas within which defoliation occurred in 1978

LEGEND

Light defoliation



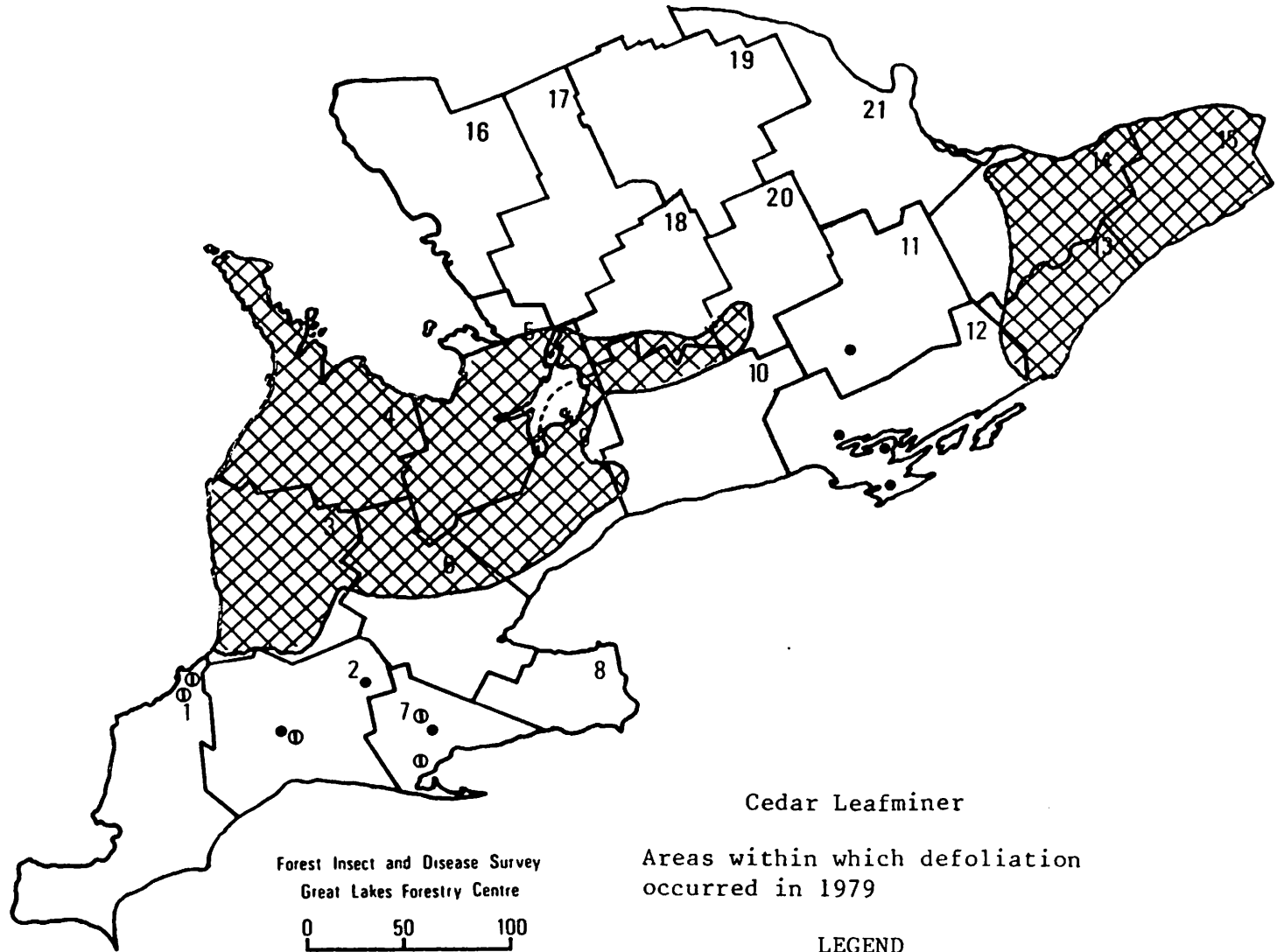
Moderate-to-severe defoliation • or



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



LEGEND

Light defoliation



Moderate-to-severe defoliation

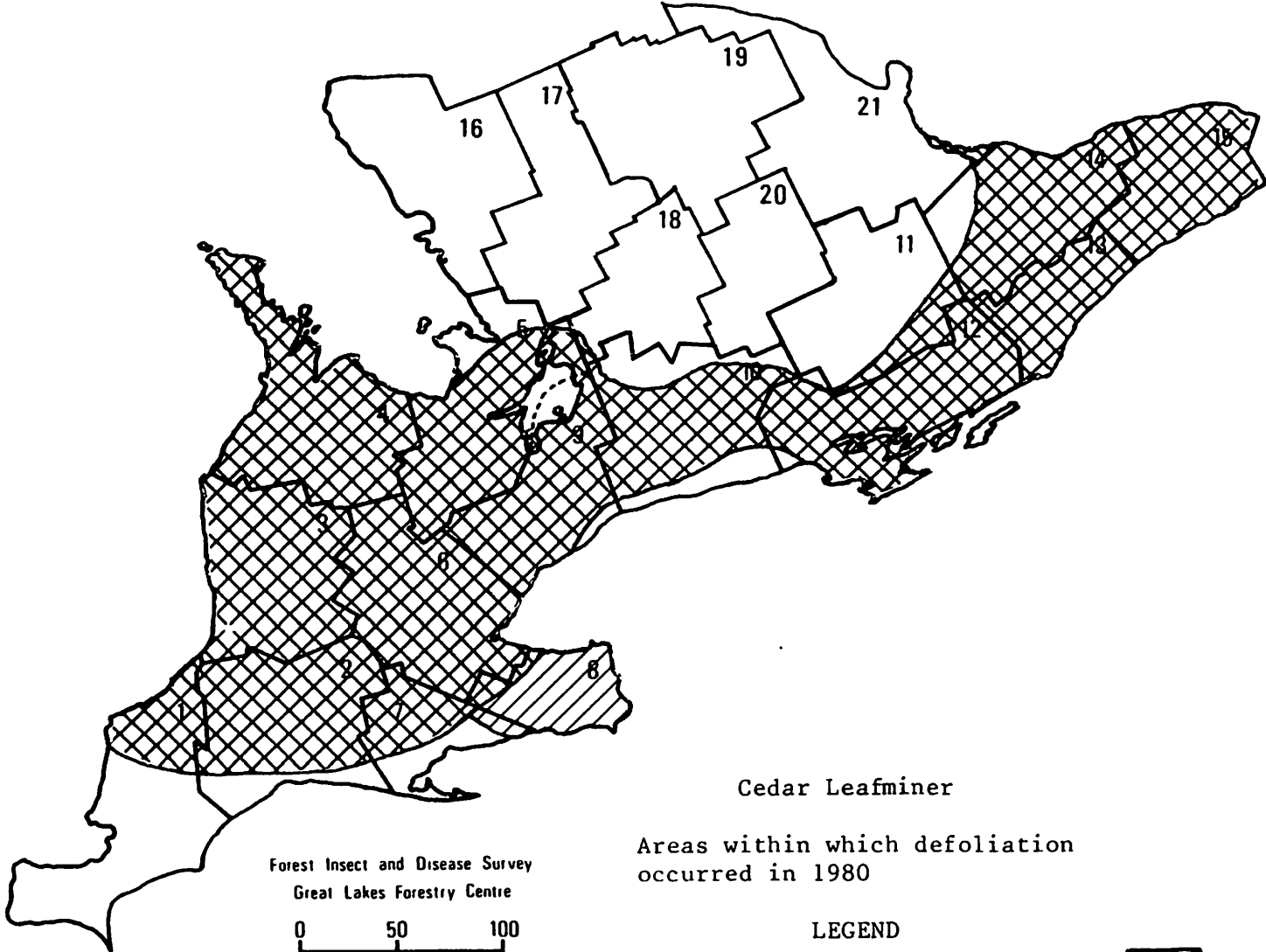
• or



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



Cedar Leafminer

Areas within which defoliation occurred in 1980

LEGEND

Light defoliation

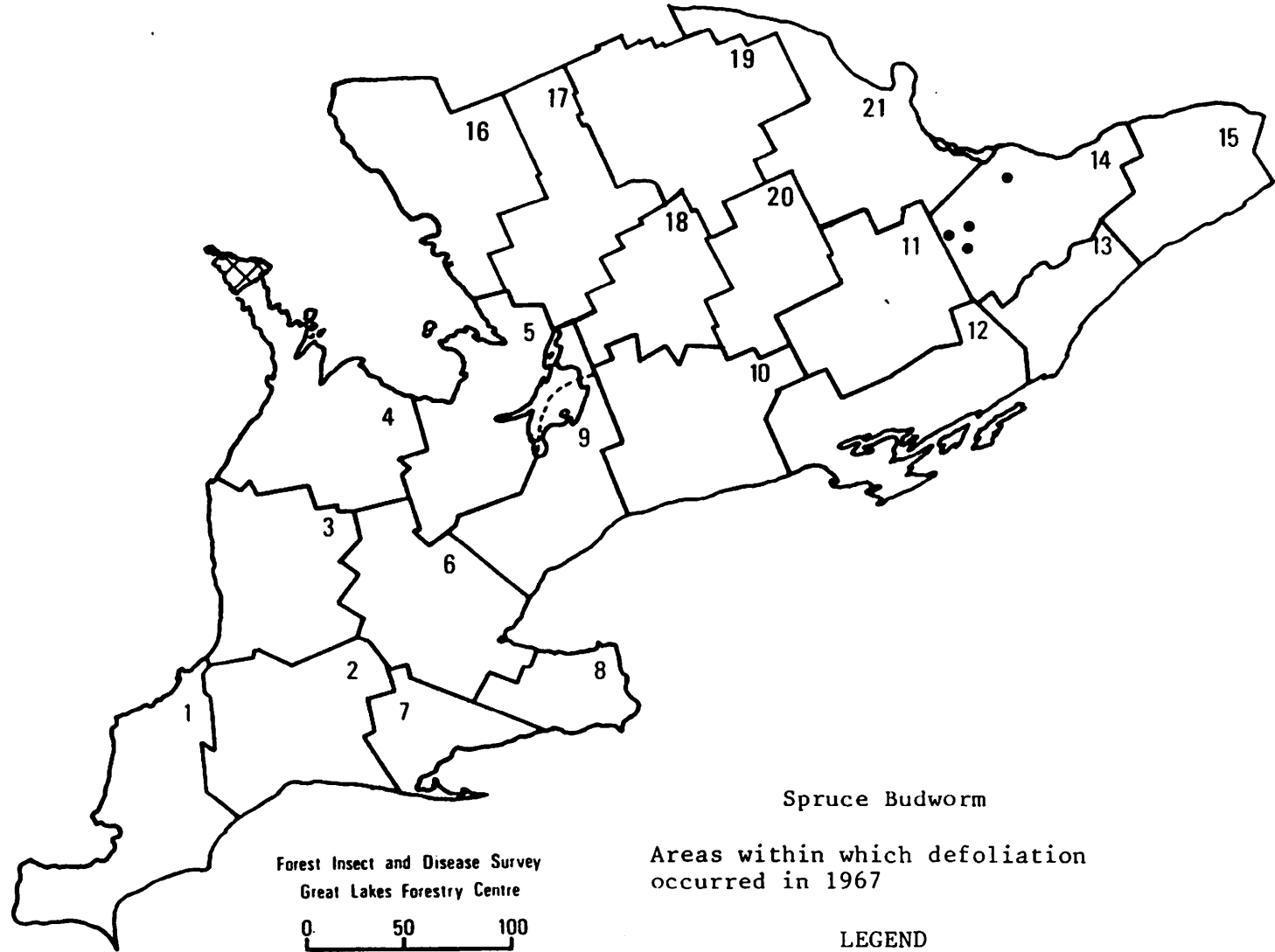
Moderate-to-severe defoliation



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



Spruce Budworm

Areas within which defoliation occurred in 1967

LEGEND

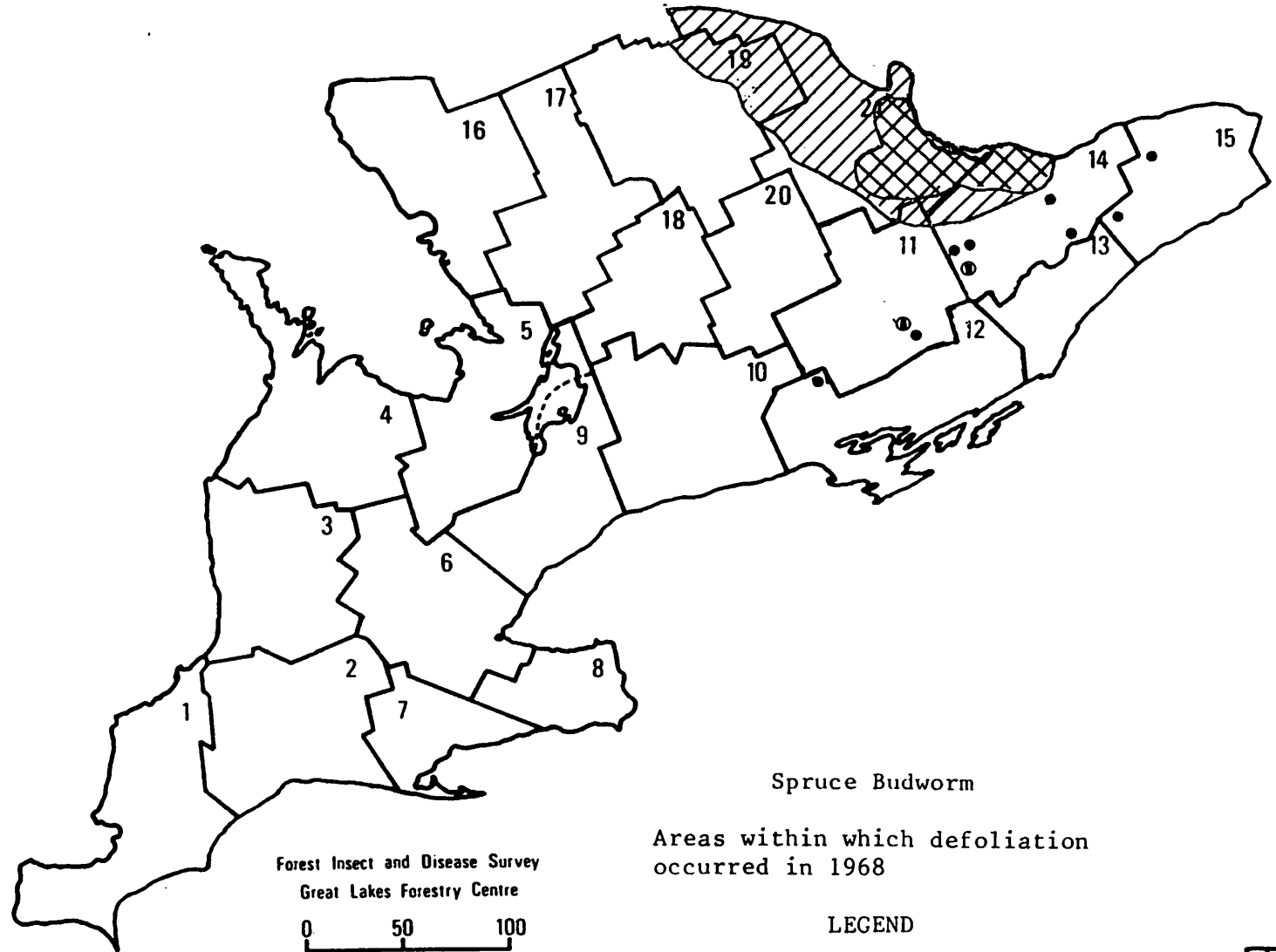
Moderate-to-severe defoliation • or




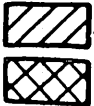
SOUTHERN ONTARIO

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



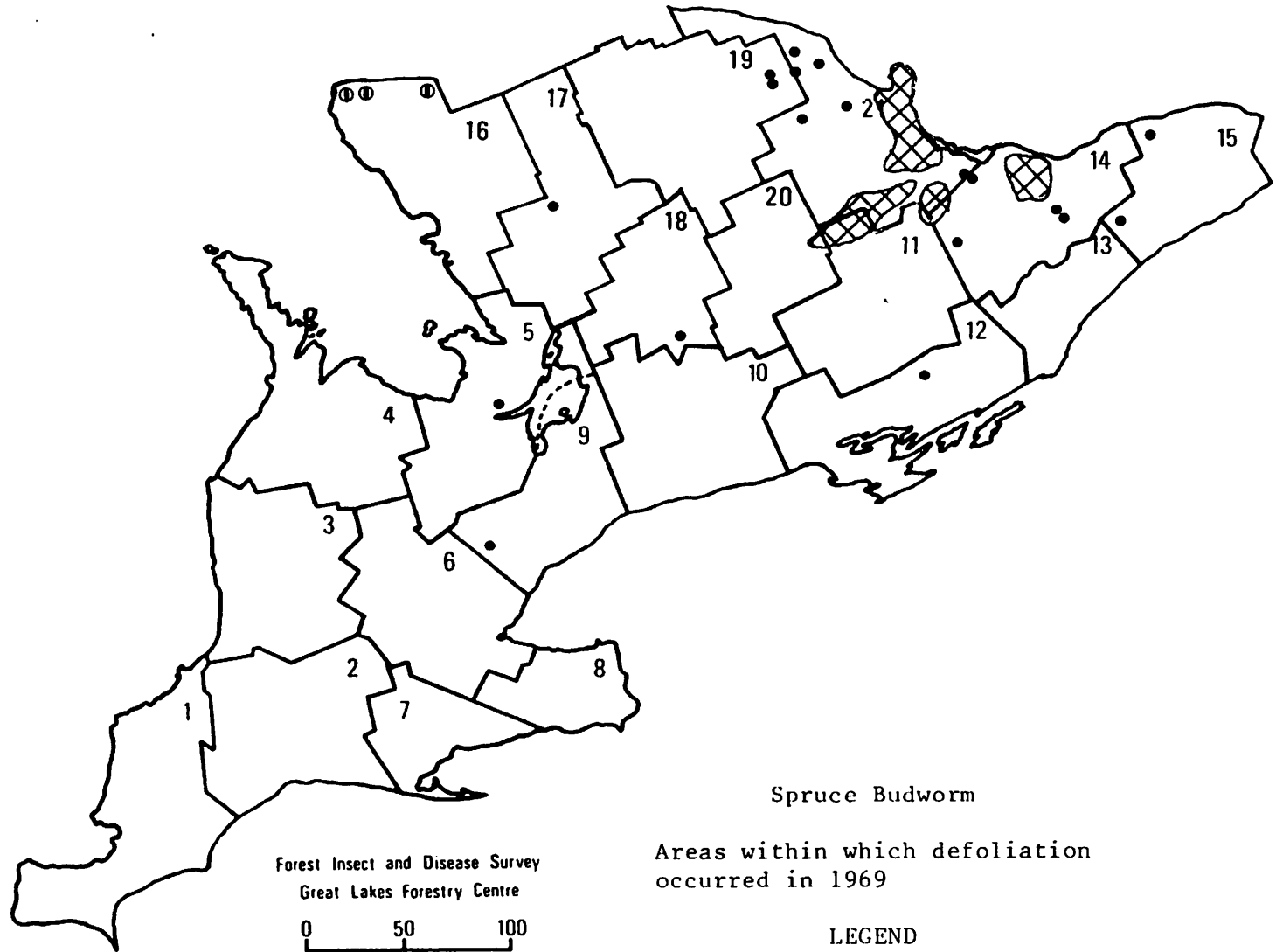
LEGEND

- | | | | |
|--------------------------------|---|----|---|
| 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



Spruce Budworm

Areas within which defoliation occurred in 1969

LEGEND

Light defoliation



Moderate-to-severe defoliation

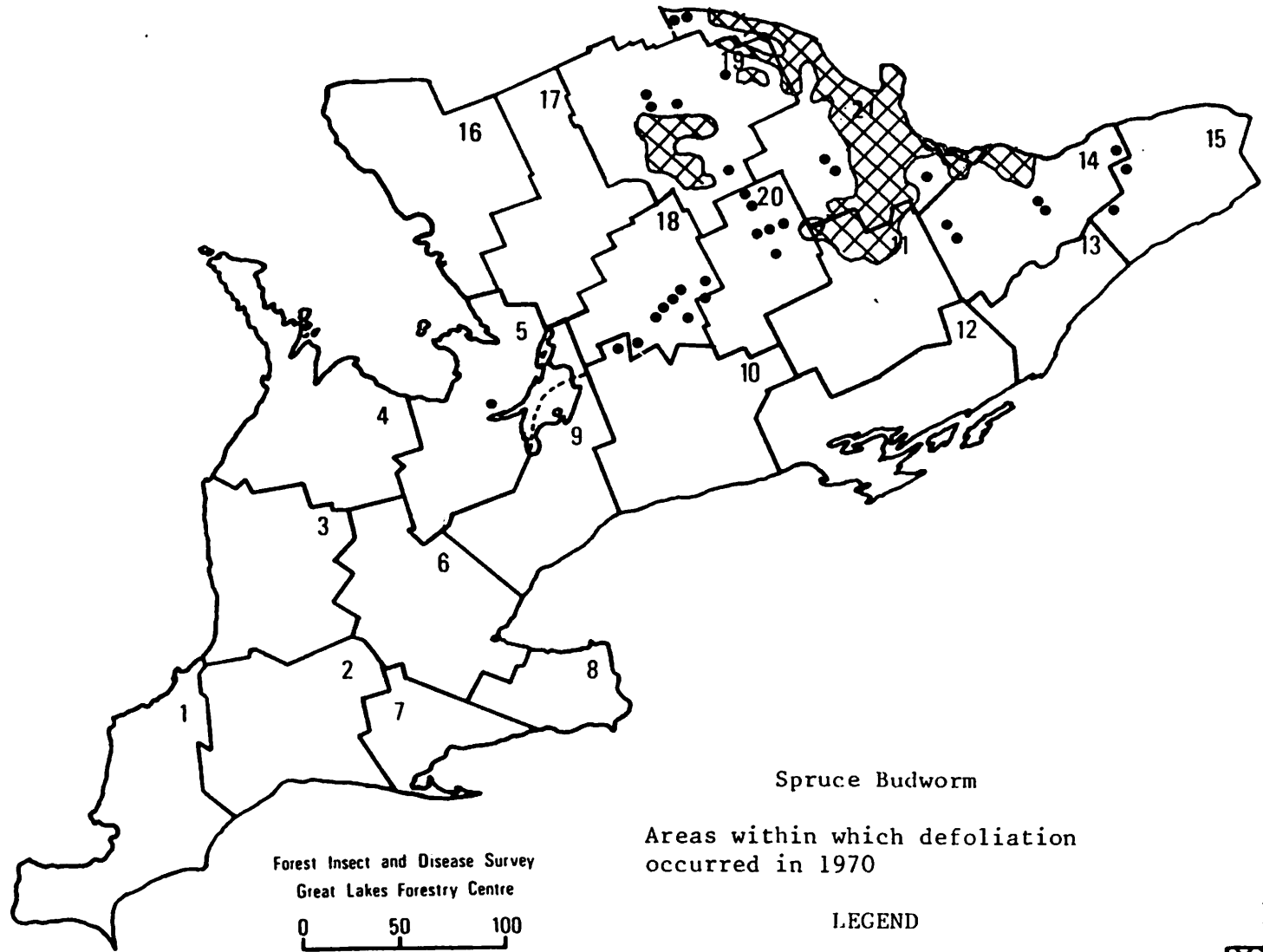
• or




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

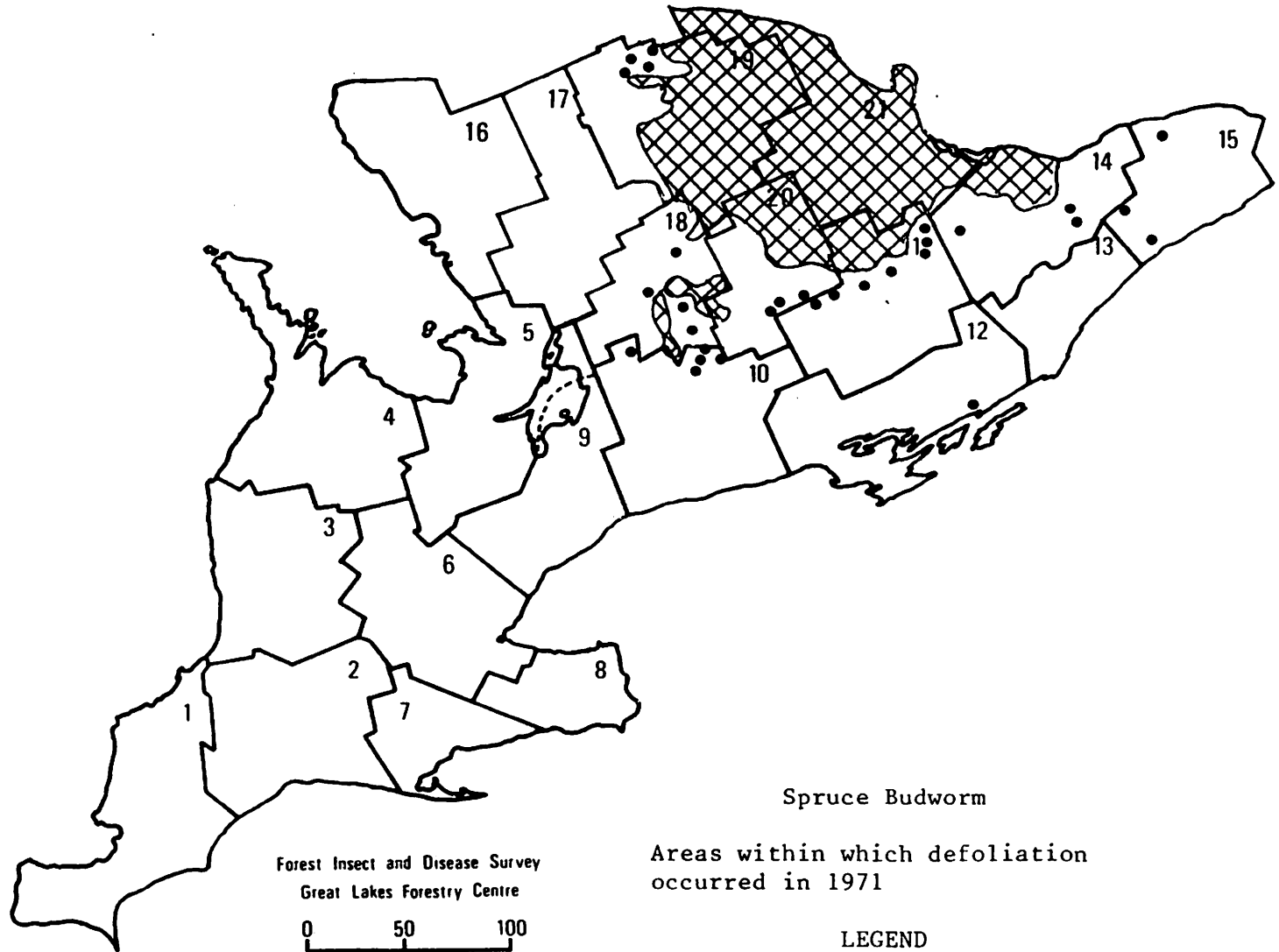


Moderate-to-severe defoliation • or 


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



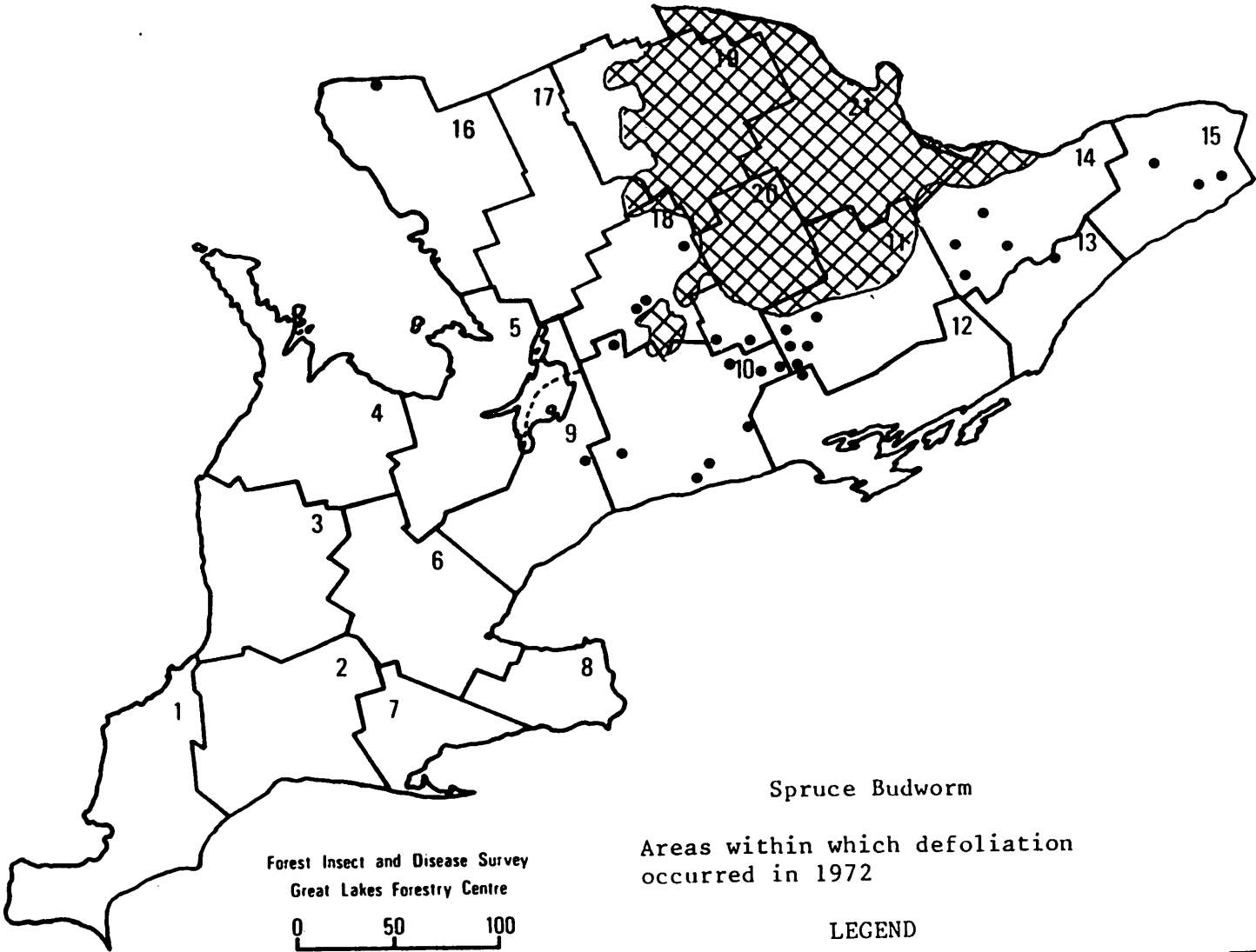
LEGEND

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



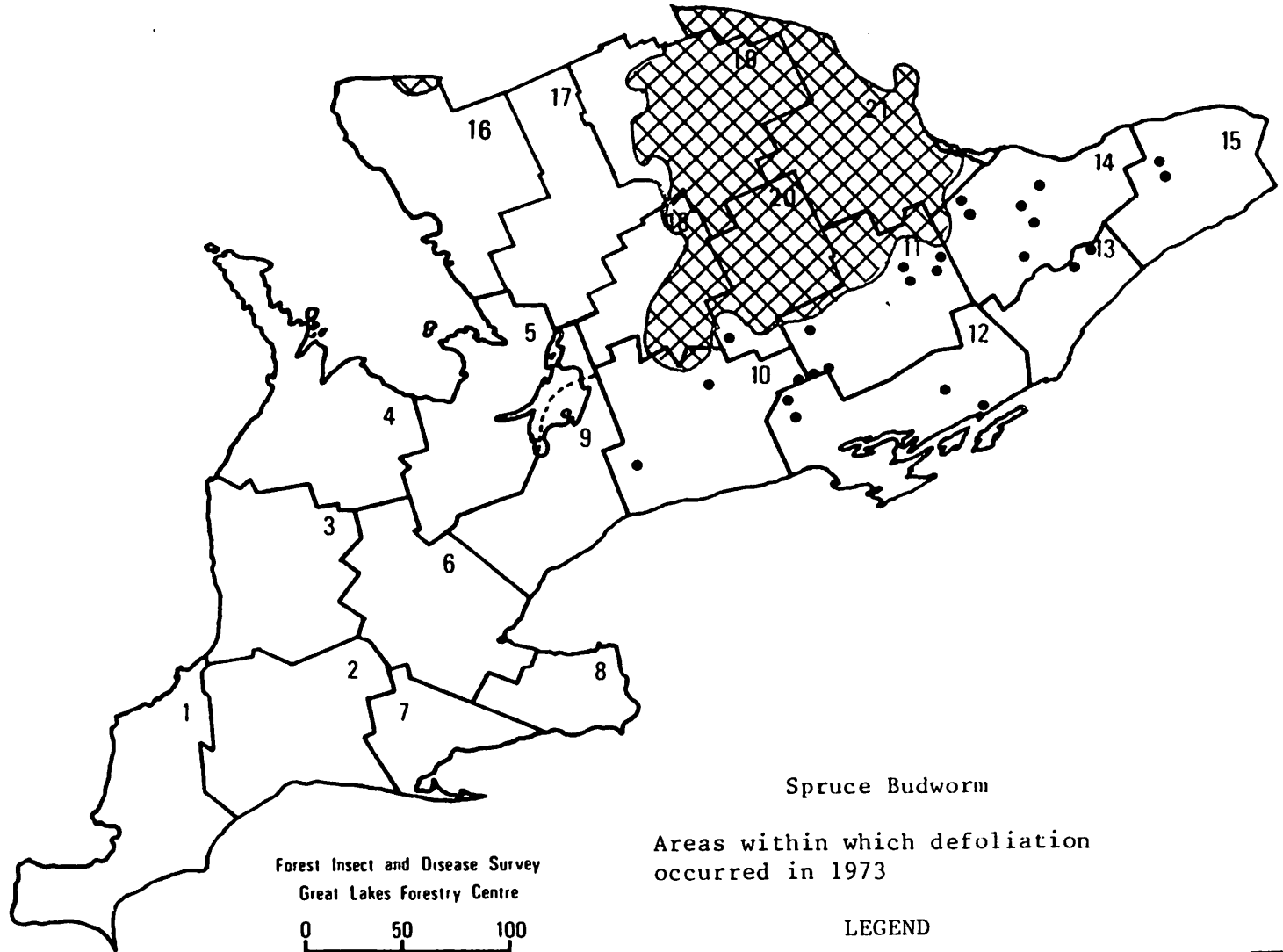
Moderate-to-severe defoliation • or



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



Spruce Budworm

Areas within which defoliation
occurred in 1973

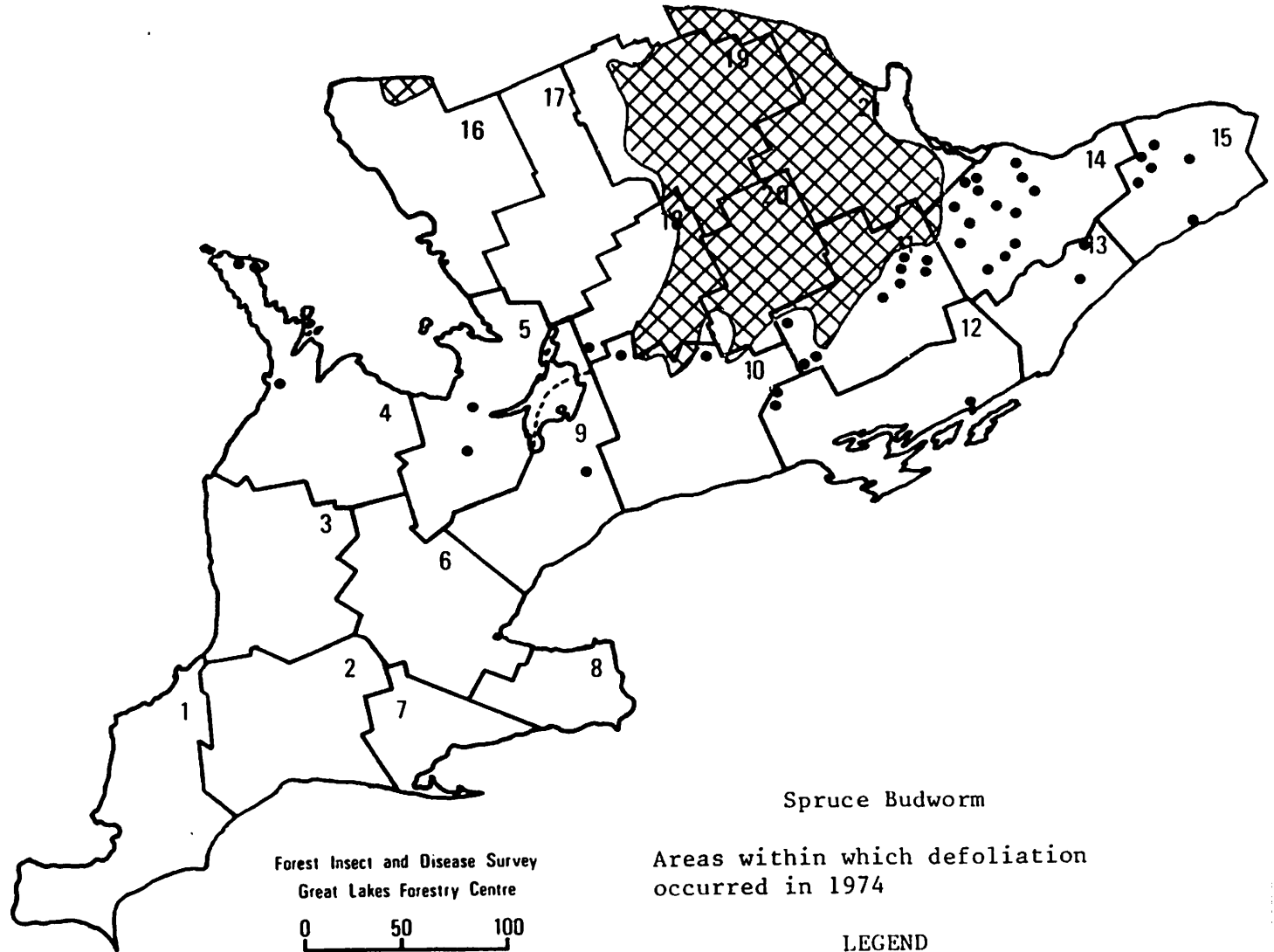
LEGEND

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



Spruce Budworm

Areas within which defoliation
occurred in 1974

LEGEND

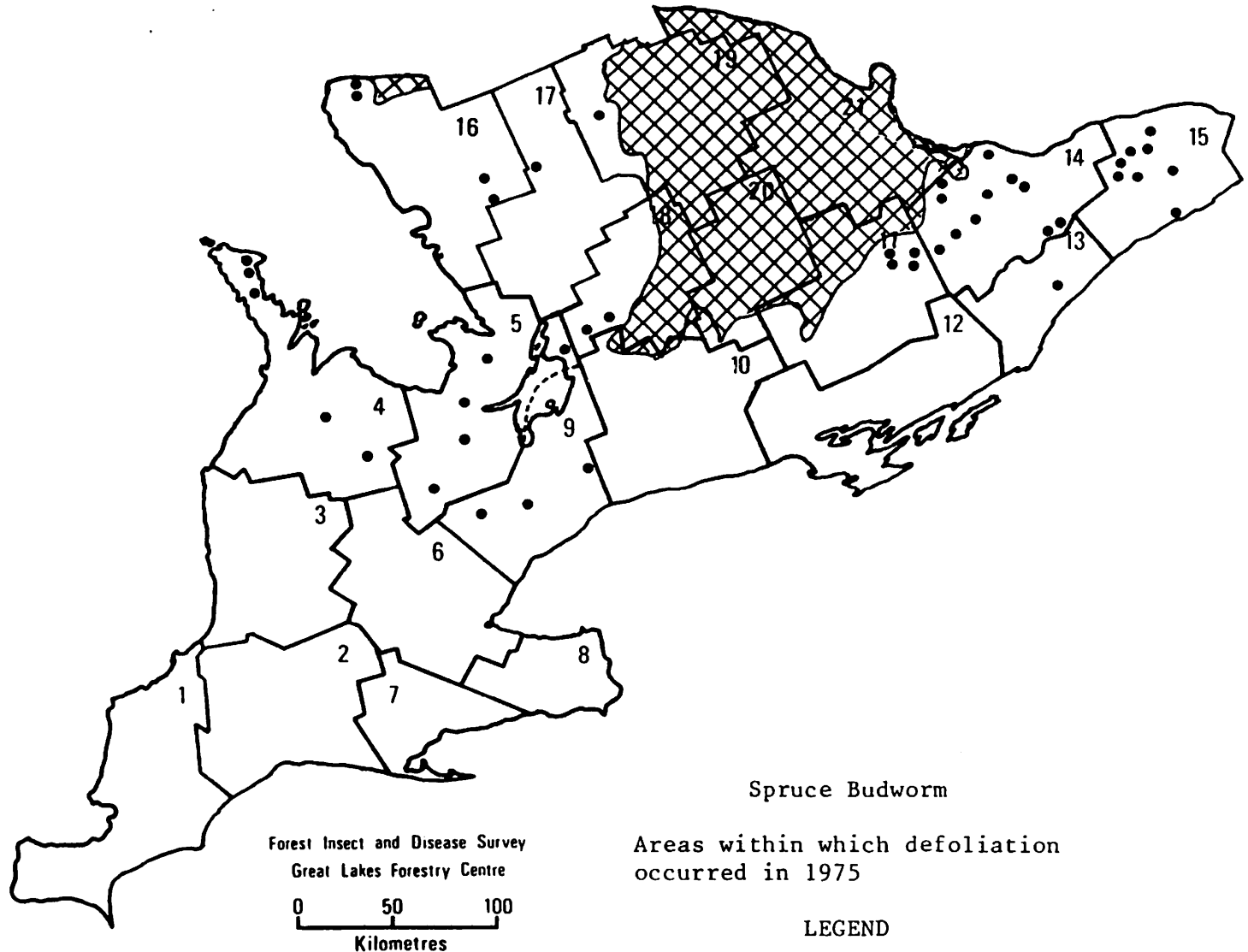
Moderate-to-severe defoliation • or




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

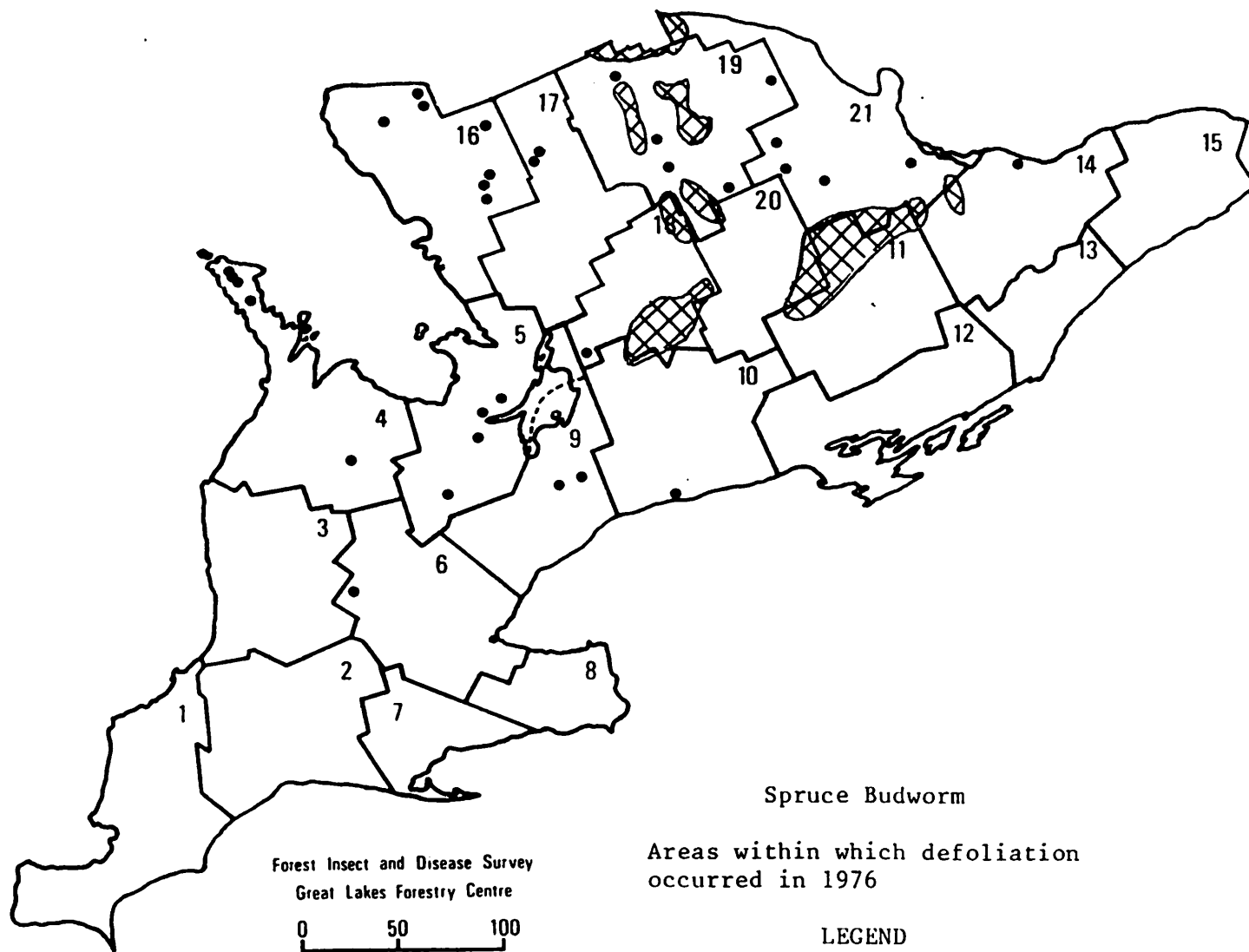



Moderate-to-severe defoliation • or 

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

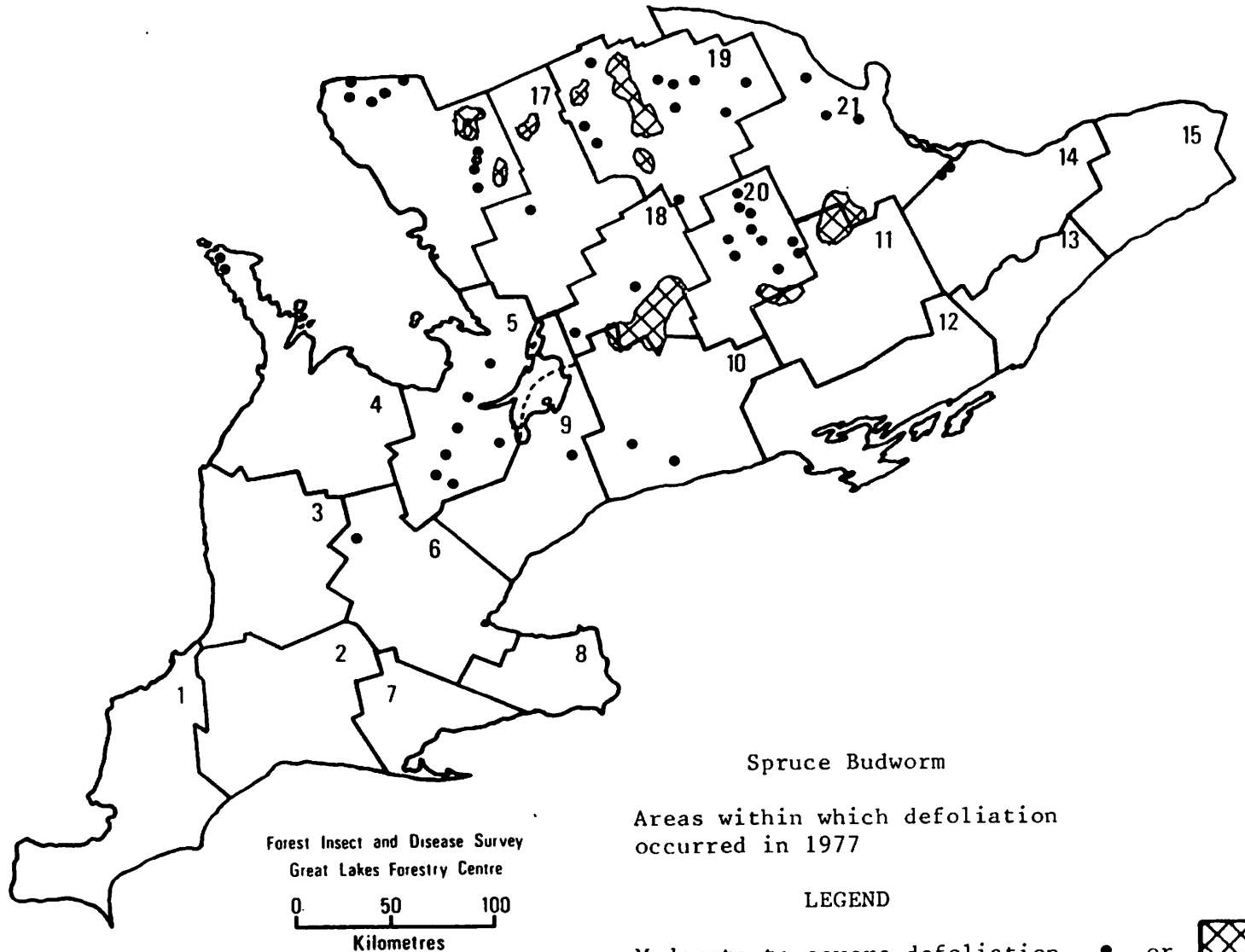


Moderate-to-severe defoliation • or 

SOUTHERN ONTARIO

DISTRICTS

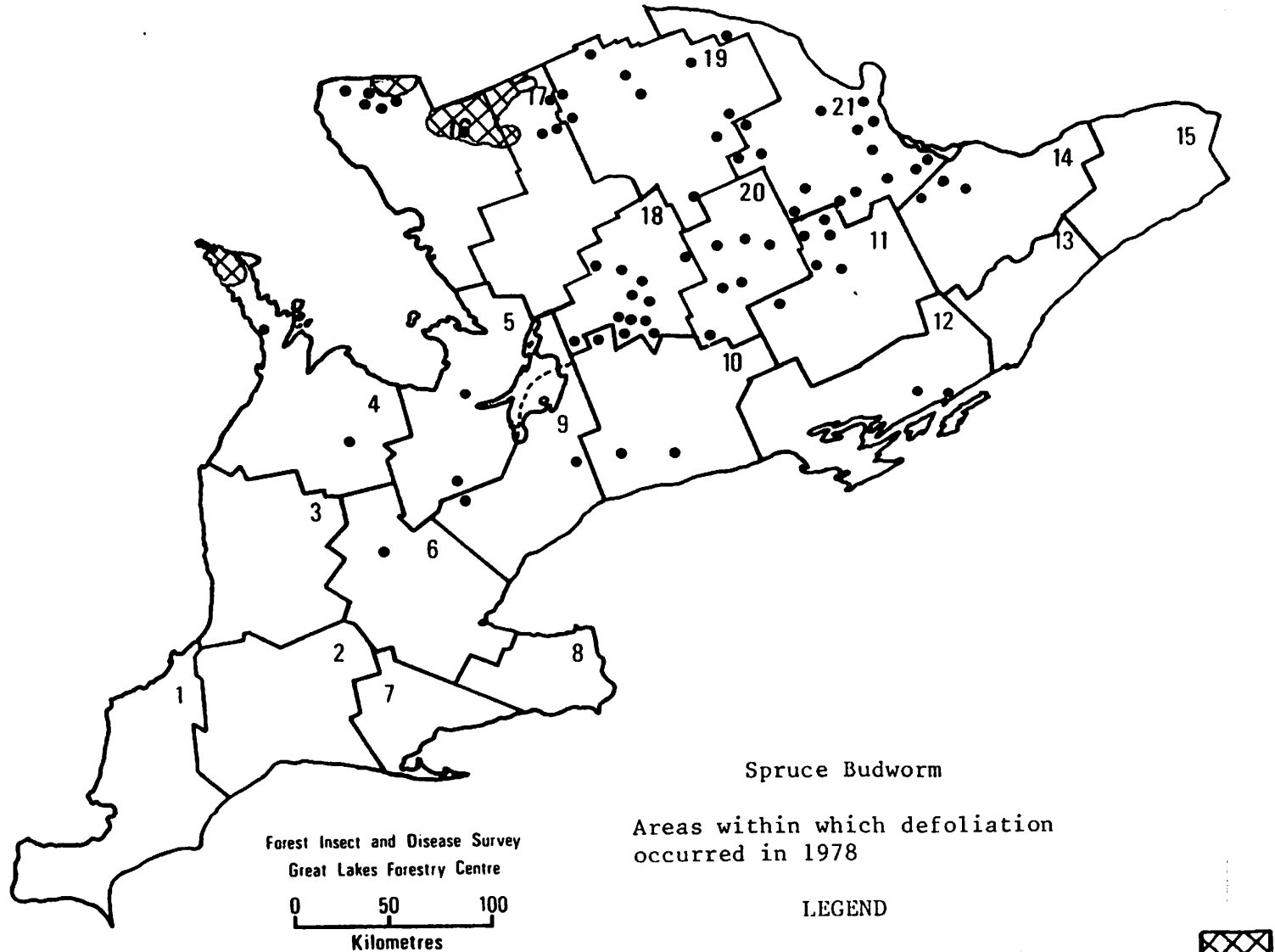
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

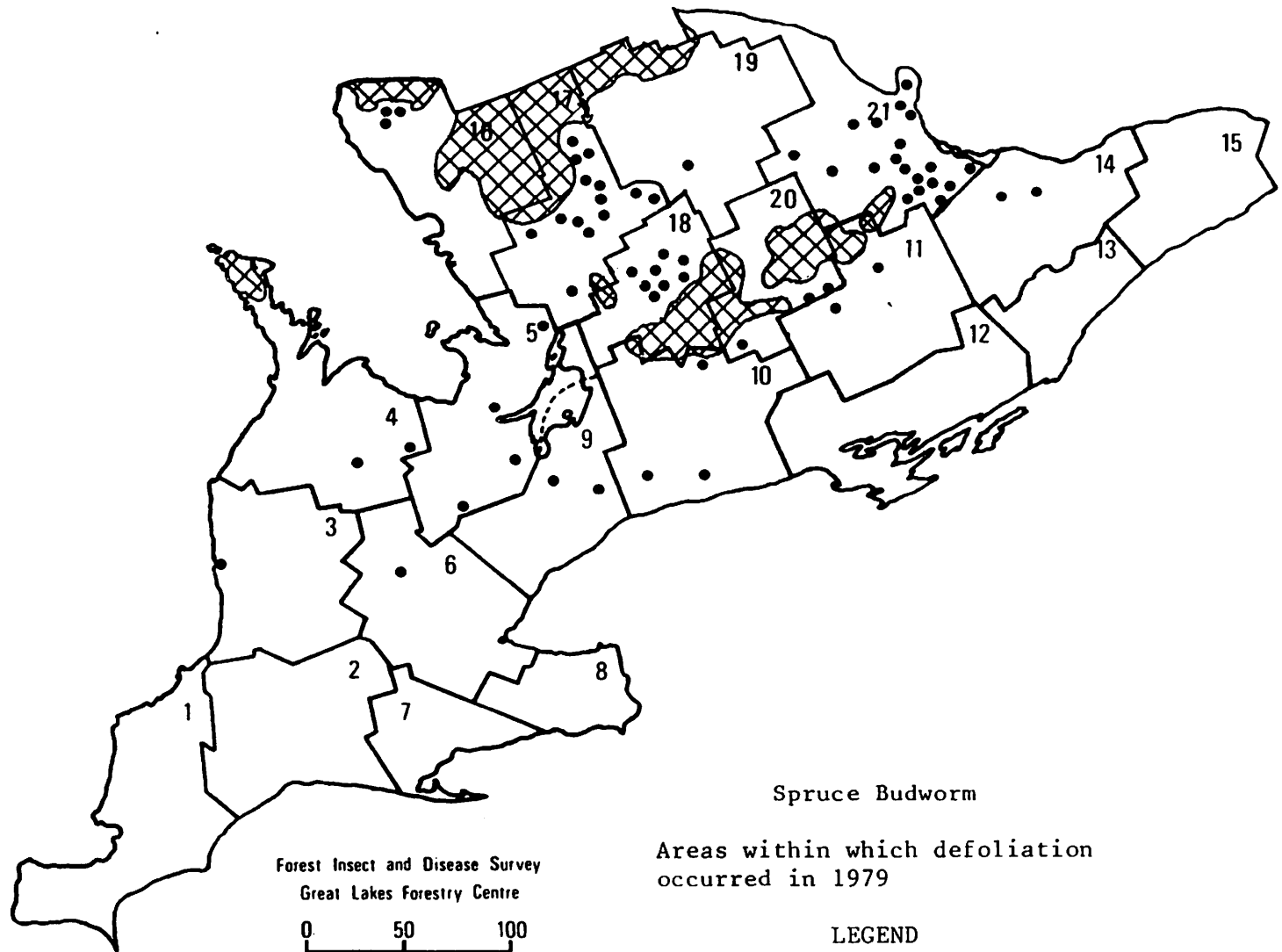
1. CHATHAM
2. AYLMER
3. WINGHAM
4. OWEN SOUND
5. HURONIA
6. CAMBRIDGE
7. SIMCOE
8. NIAGARA
9. MAPLE
10. LINDSAY
11. TWEED
12. NAPANEE
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16. PARRY SOUND
17. BRACEBRIDGE
18. MINDEN
19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE




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

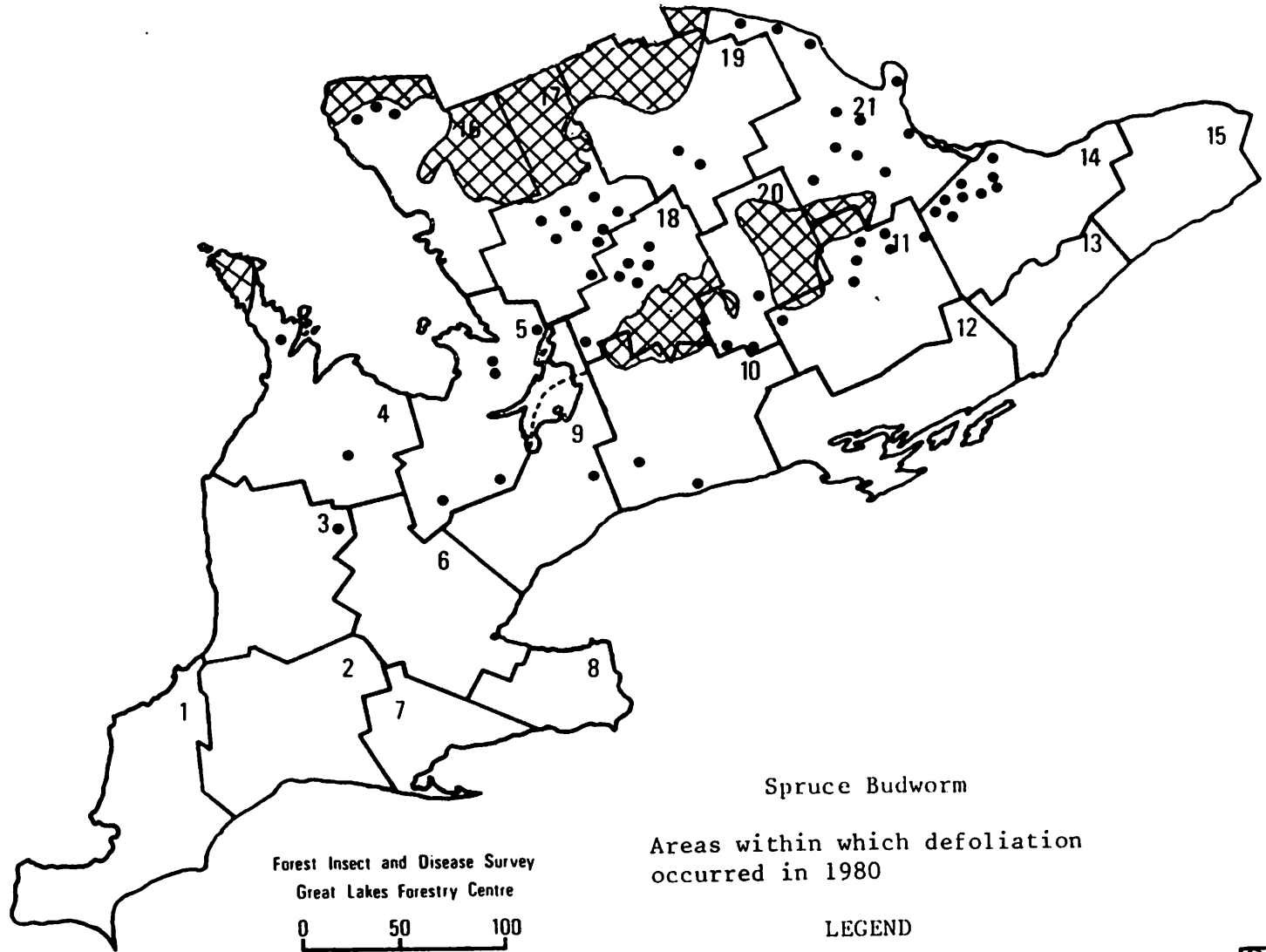



Moderate-to-severe defoliation • or 

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

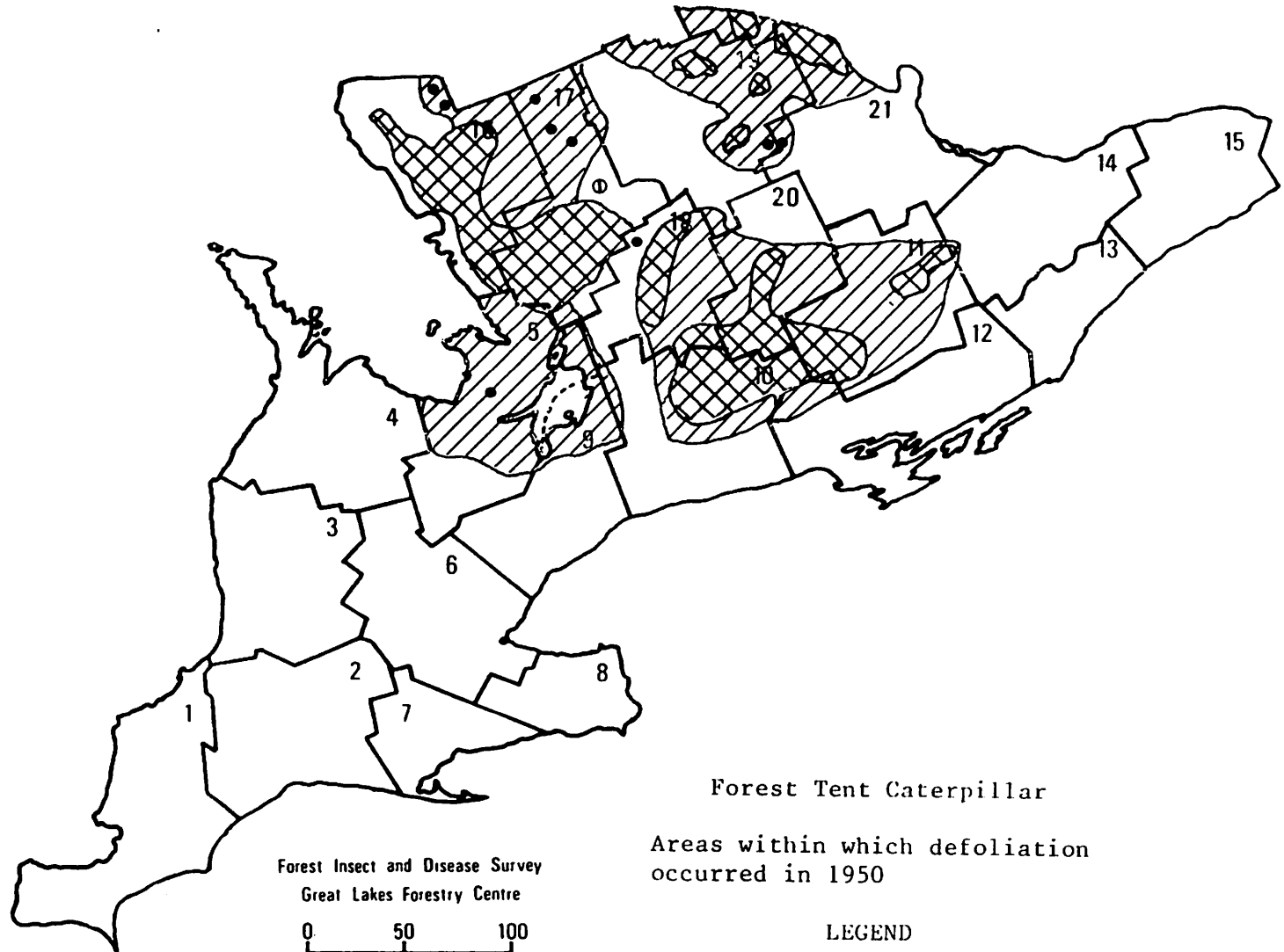


• or 

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 1950

LEGEND

Light defoliation

○ or



Moderate-to-severe defoliation

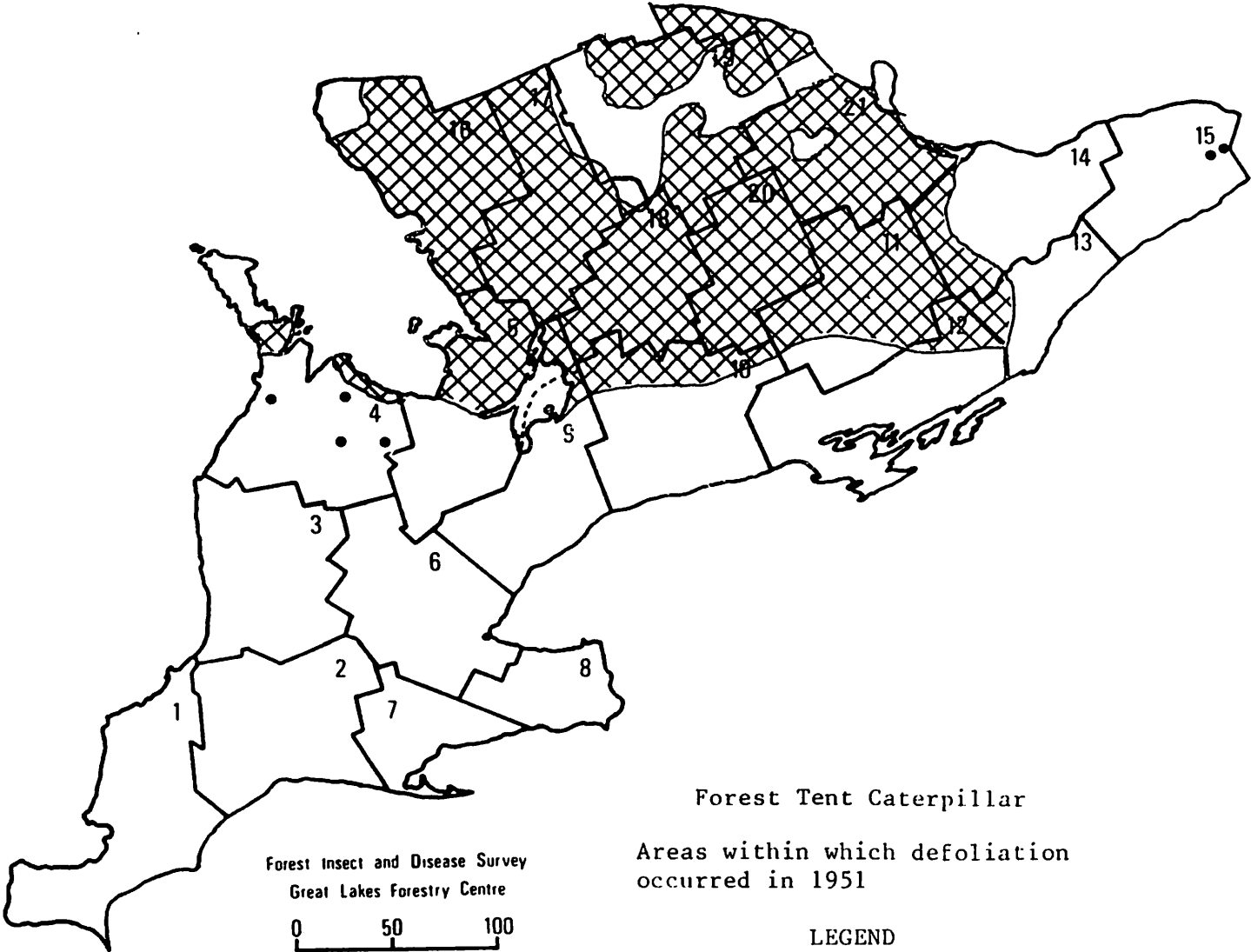
• or



SOUTHERN ONTARIO

DISTRICTS


- 1. CHATHAM
- 2. AYLMER
- 3. WINGHAM
- 4. OWEN SOUND
- 5. HURONIA
- 6. CAMBRIDGE
- 7. SIMCOE
- 8. NIAGARA
- 9. MAPLE
- 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 1951

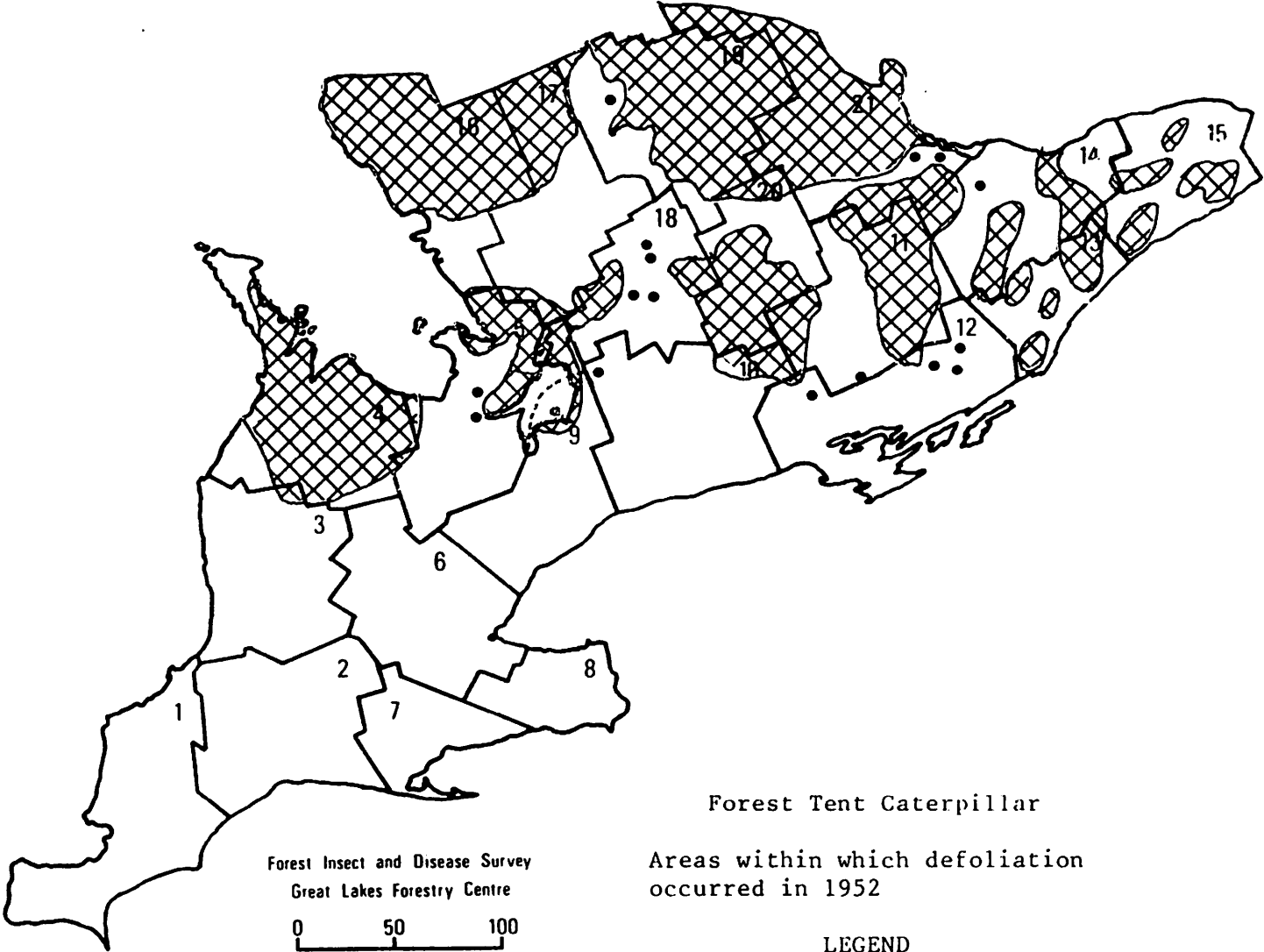
LEGEND

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



Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

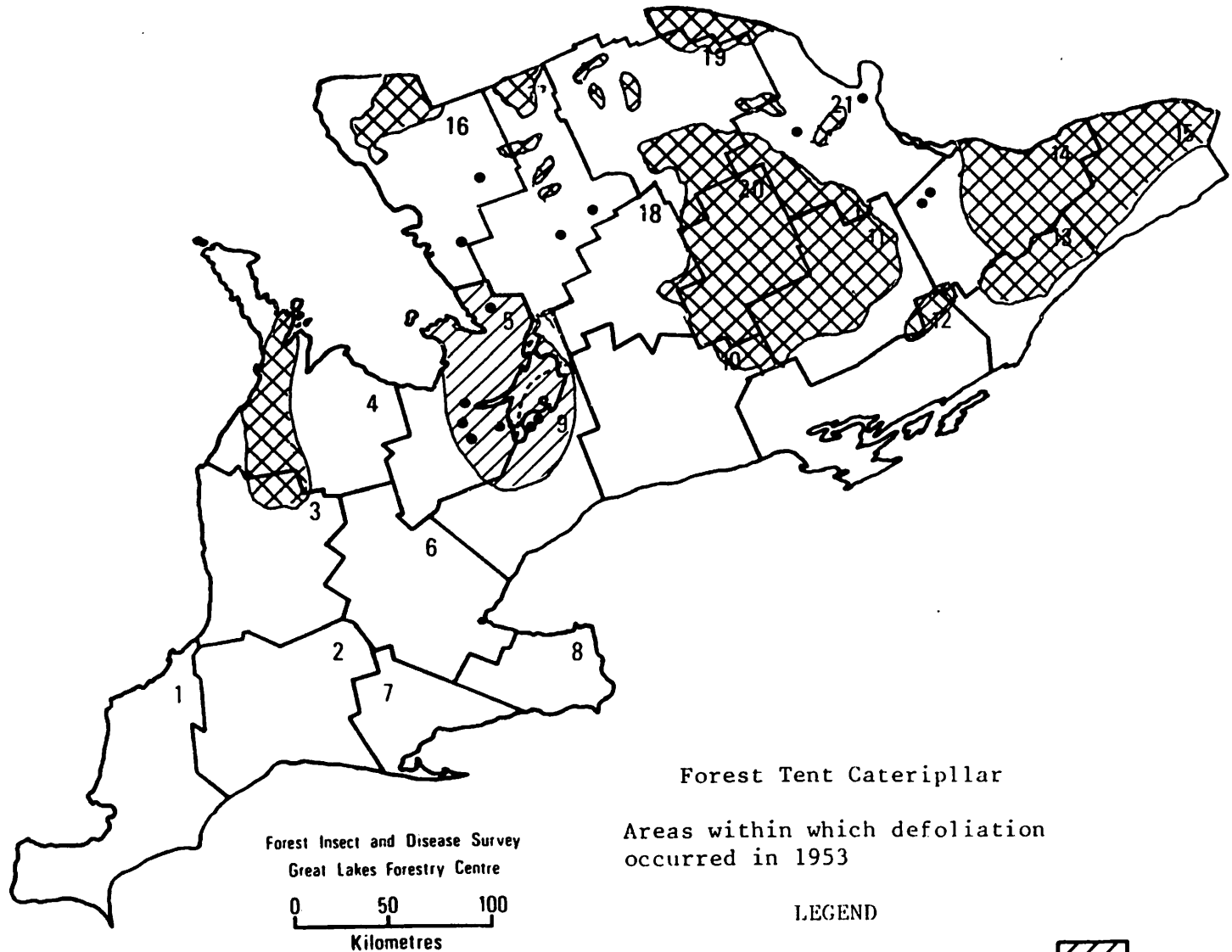
LEGEND

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



Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

LEGEND

Light defoliation



Moderate-to-severe defoliation

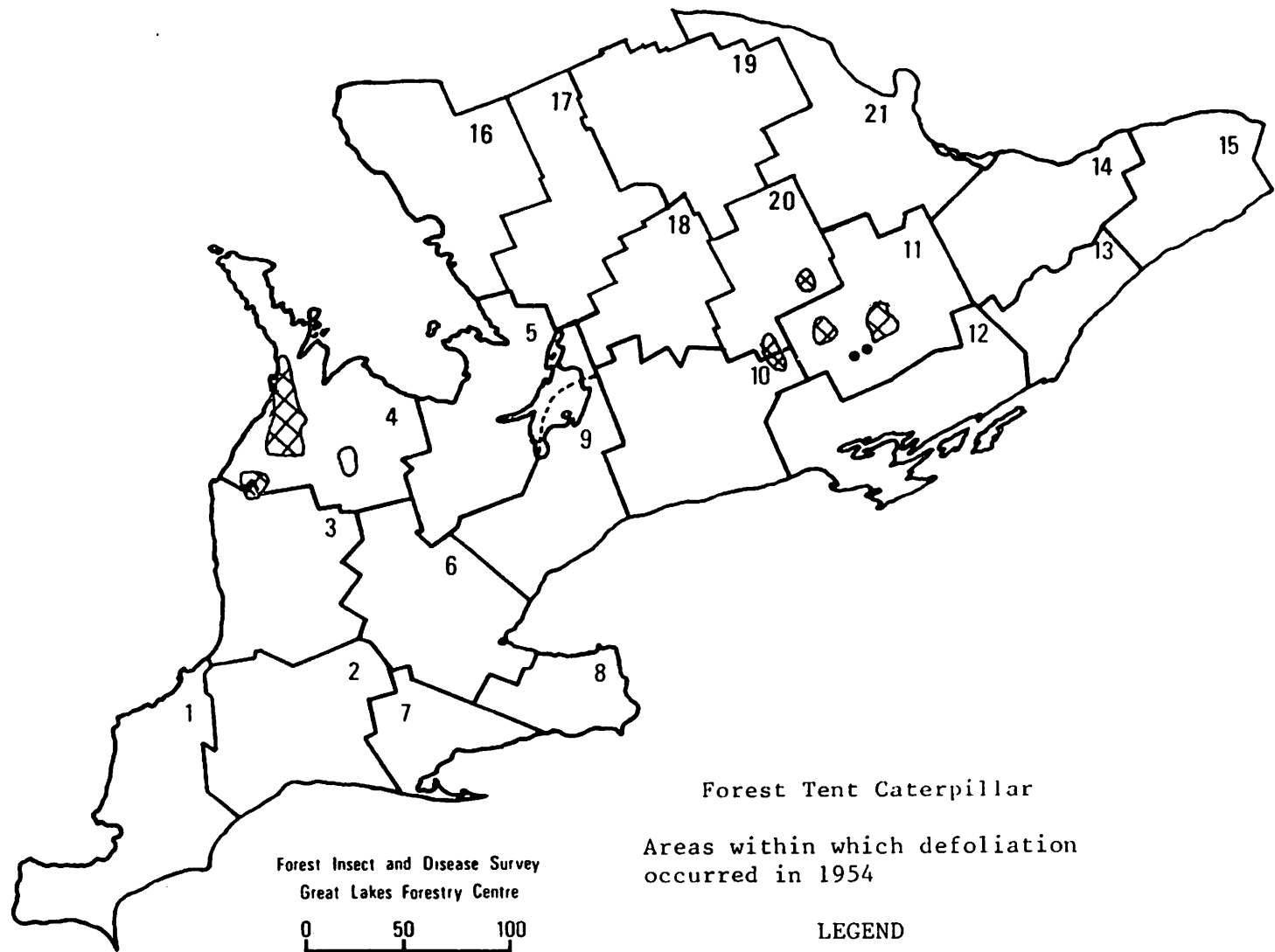
• or




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

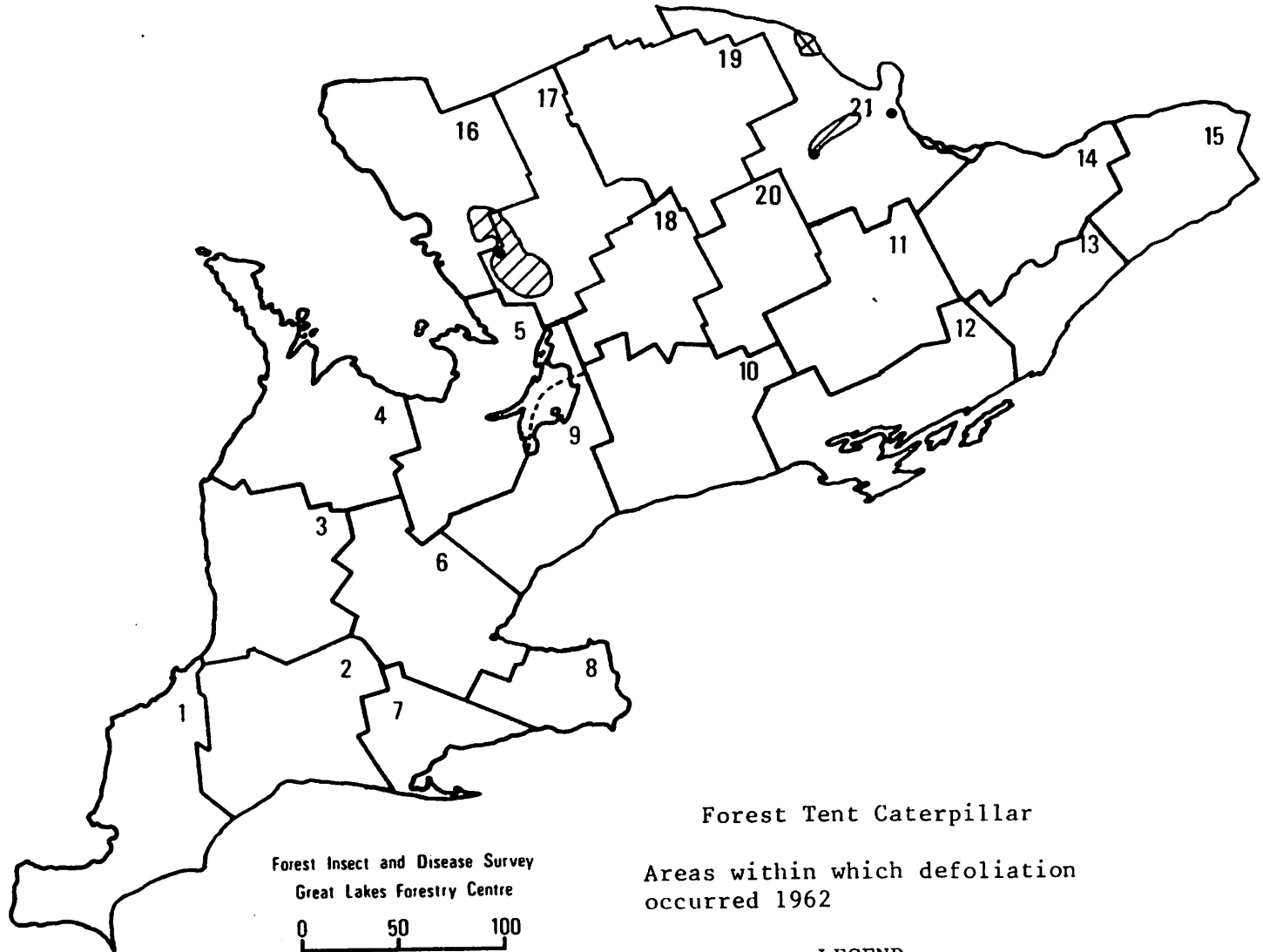


Moderate-to-severe defoliation • or 

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



LEGEND

Light defoliation

Moderate-to-severe defoliation



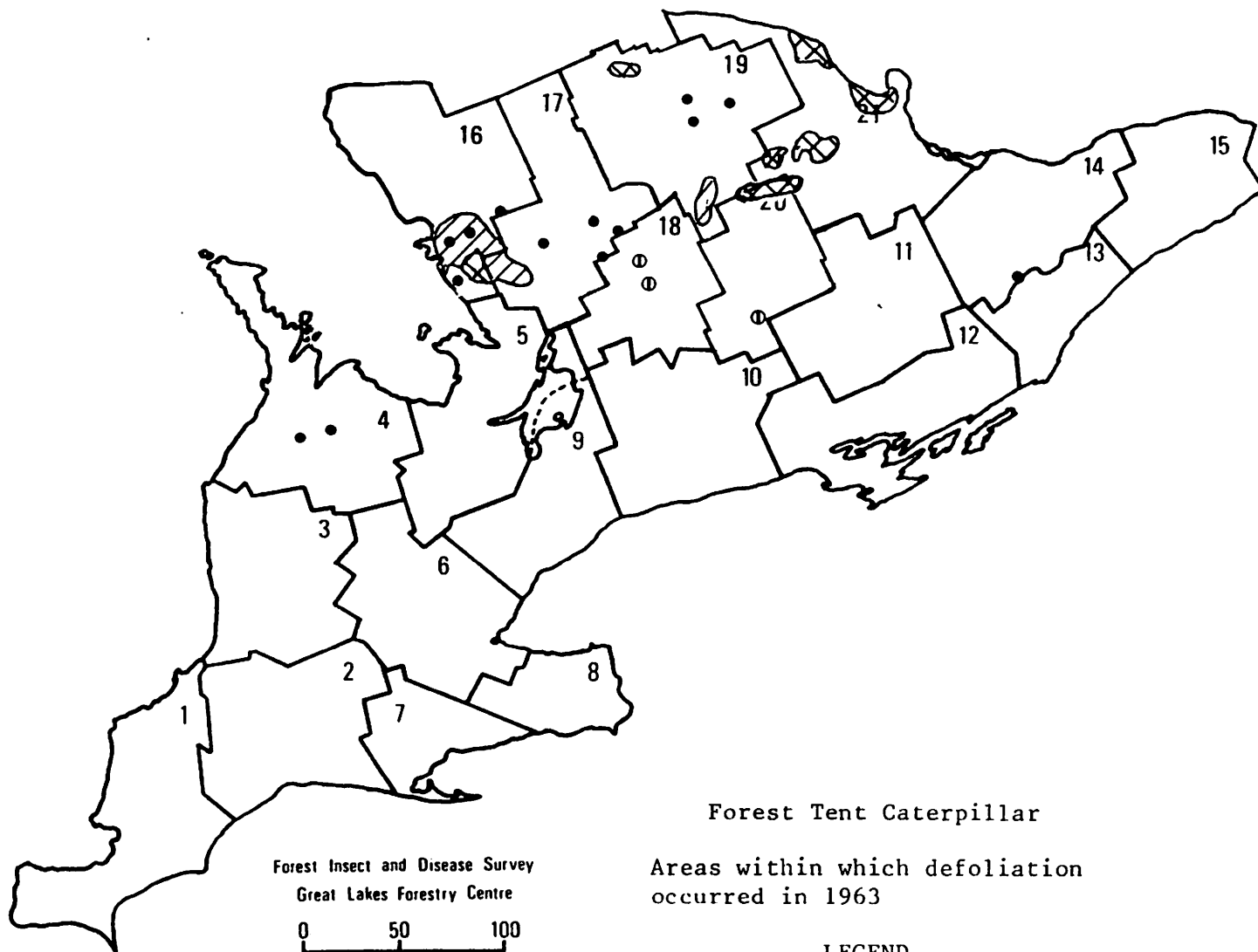
• or



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



Light defoliation

○ or



Moderate-to-severe defoliation

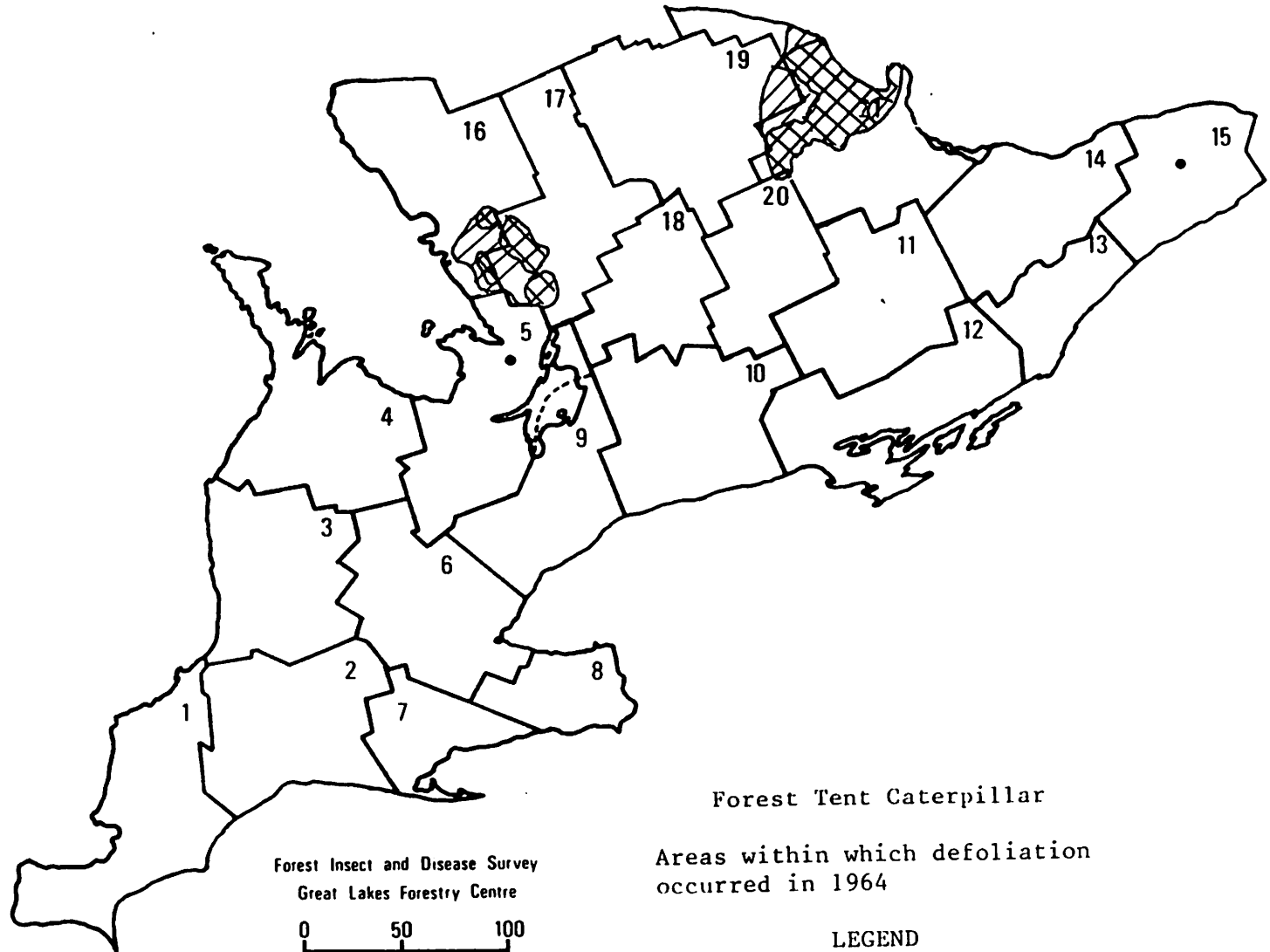
• or



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



Forest Tent Caterpillar

Areas within which defoliation
occurred in 1964

LEGEND

Light defoliation

Moderate-to-severe defoliation



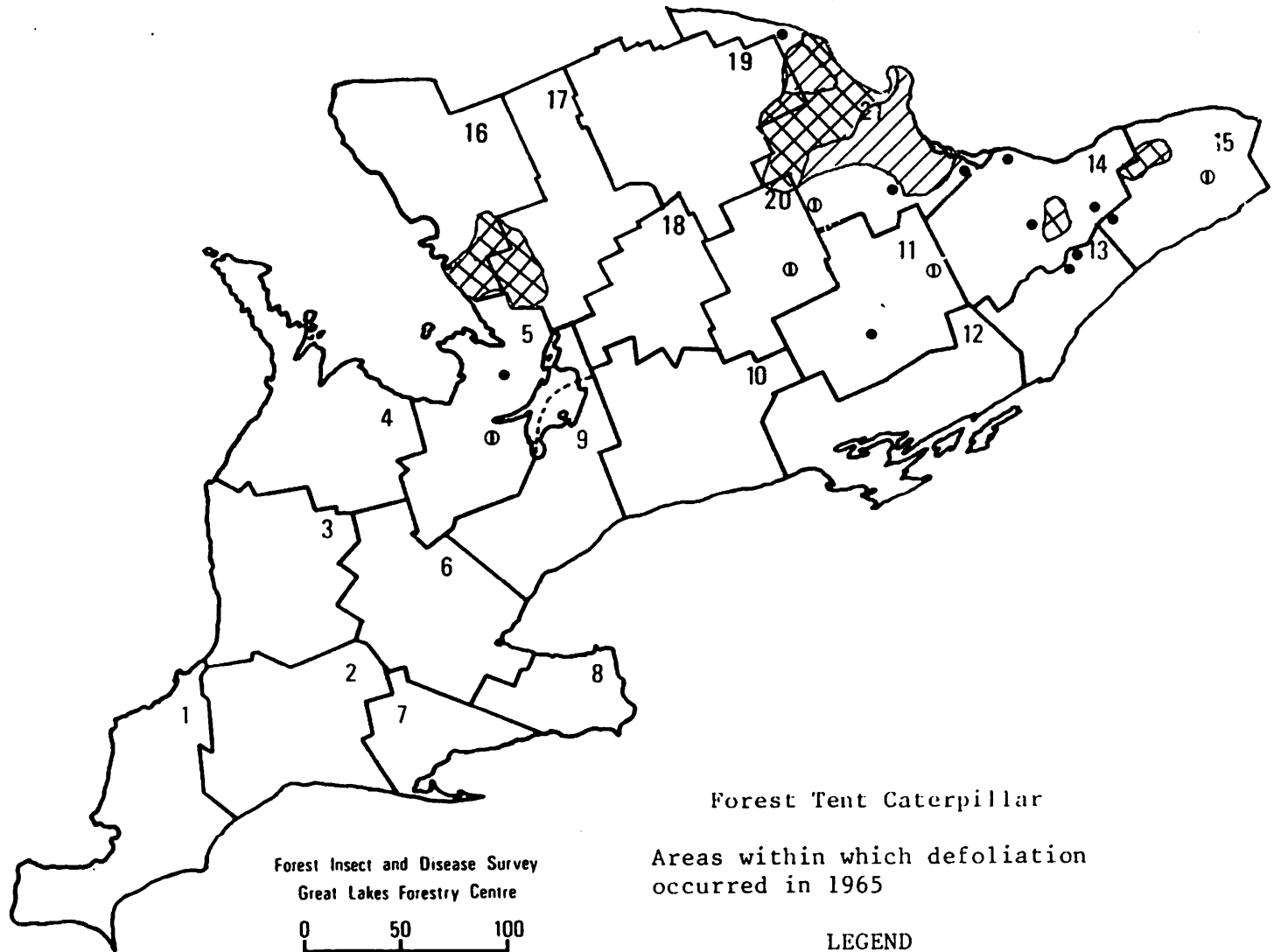
• or



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



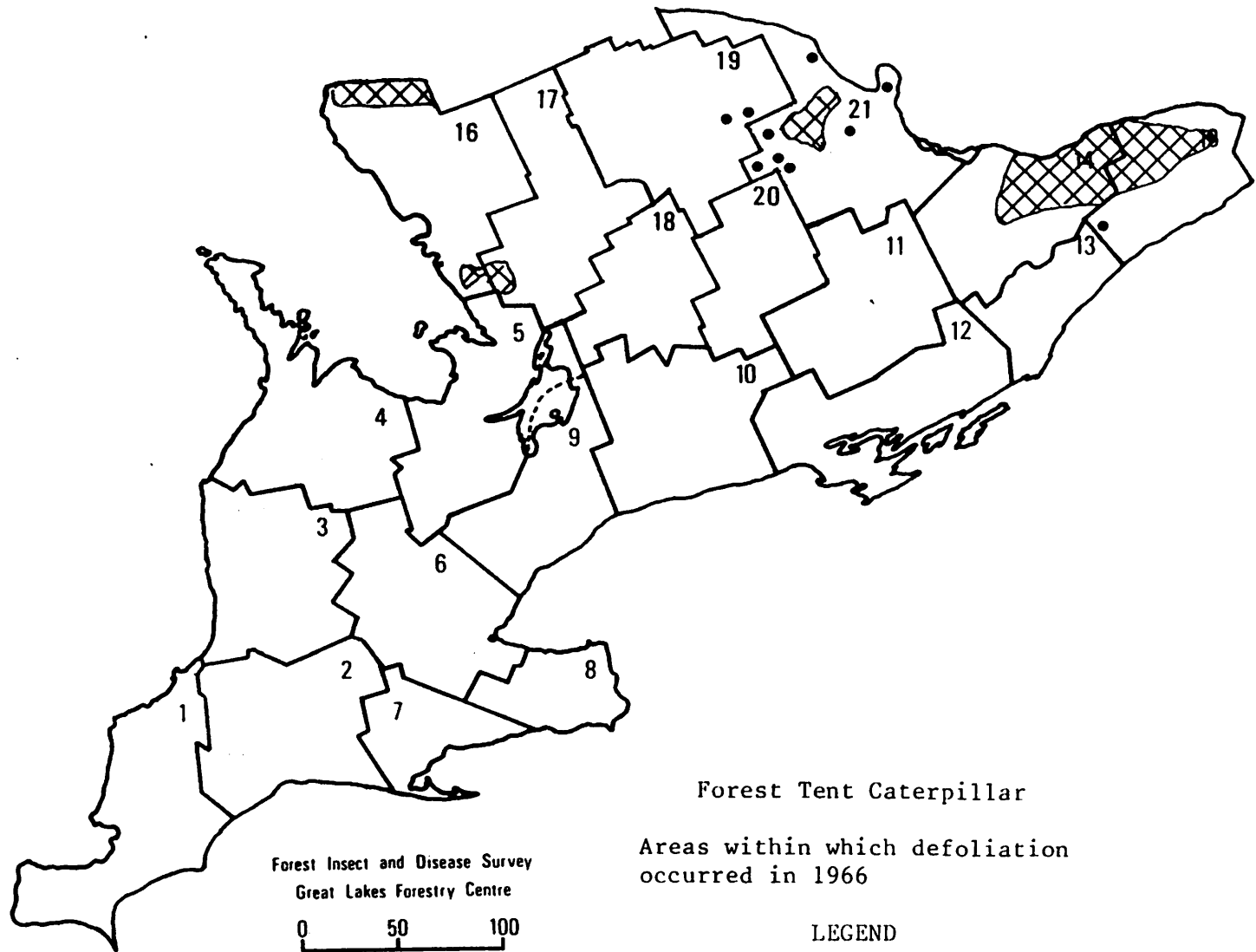
Light defoliation ⊕ or [diagonal lines]


Moderate-to-severe defoliation • or [cross-hatch]

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

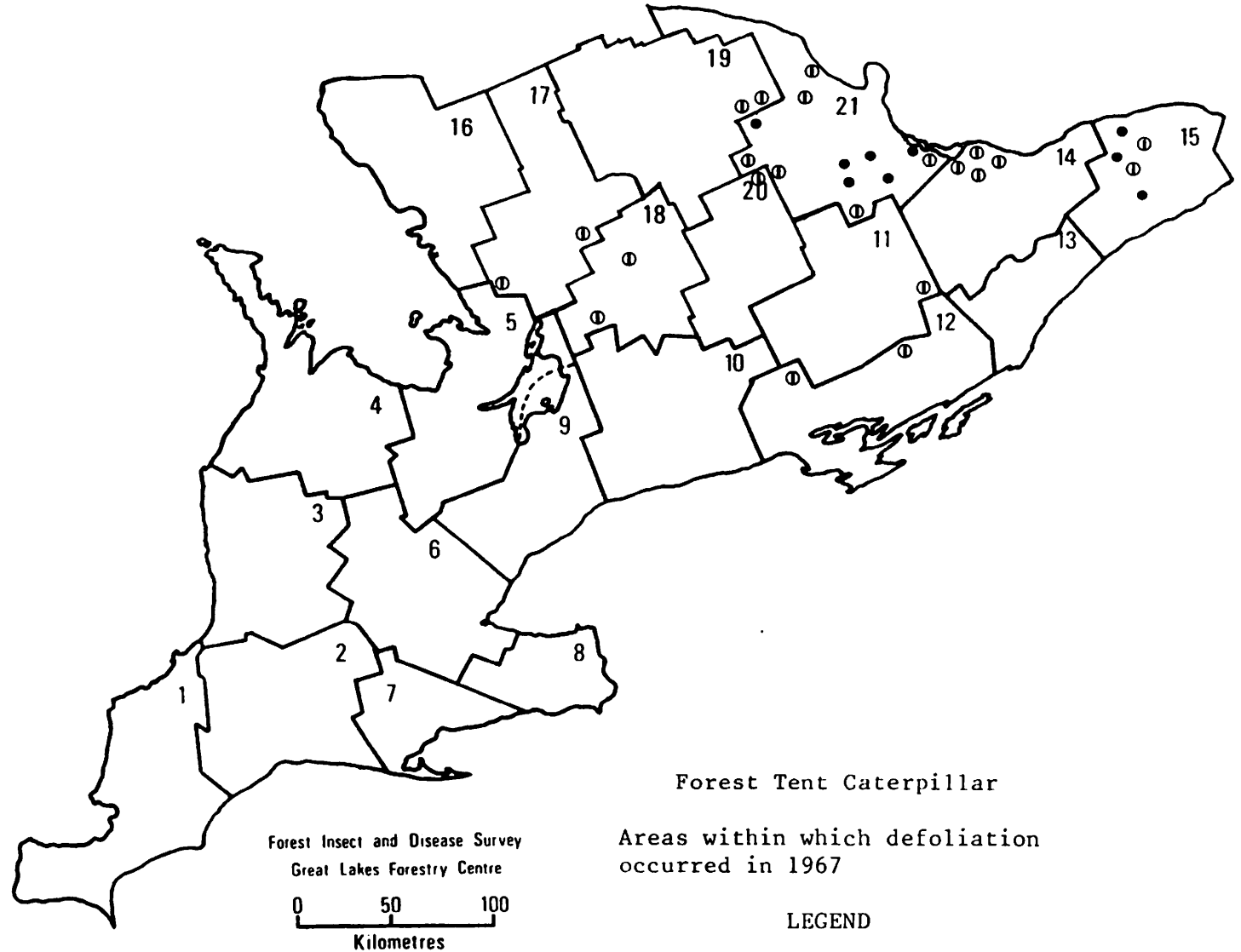


Moderate-to-severe defoliation • or 

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



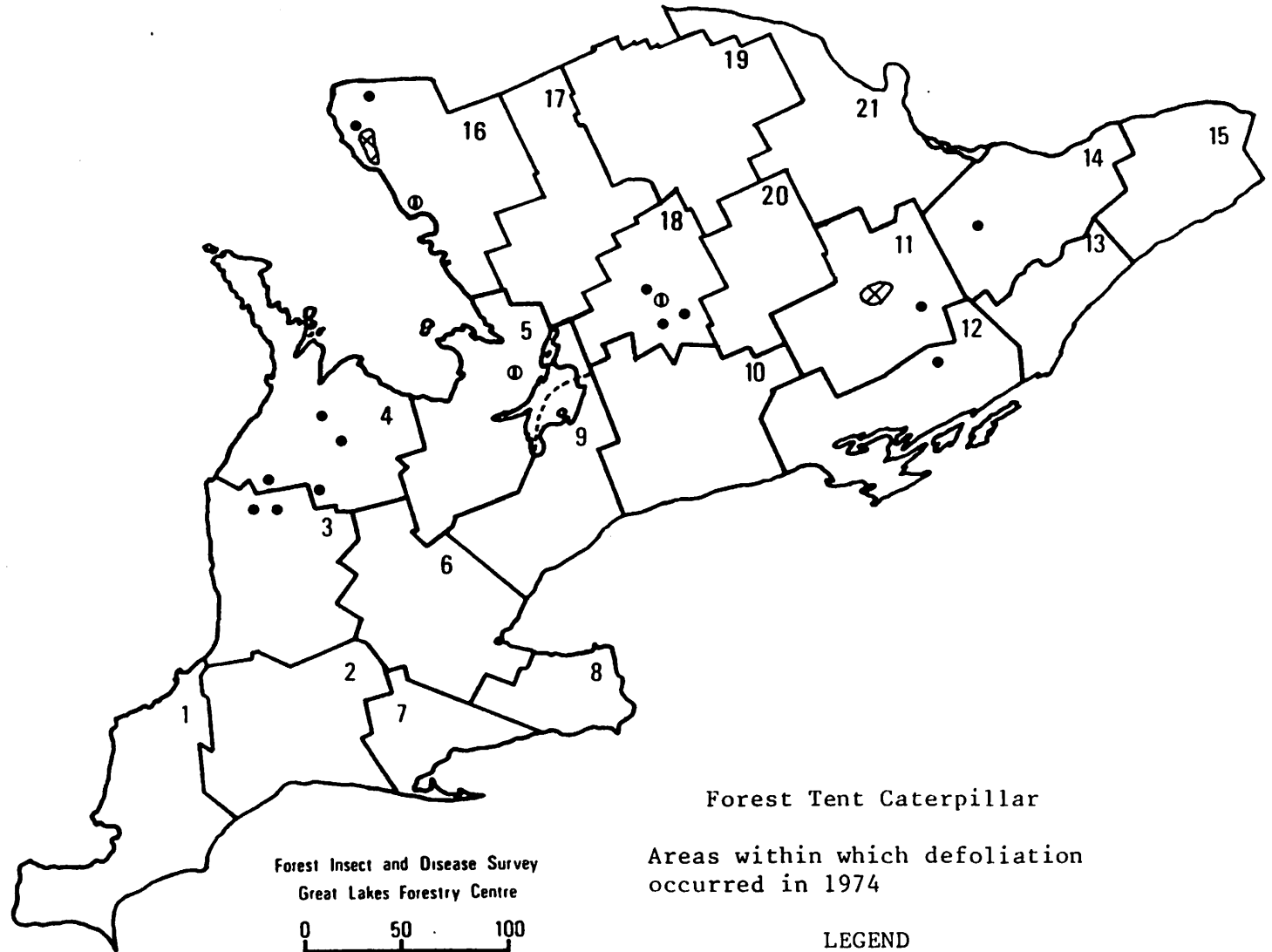
Light defoliation ⊕

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



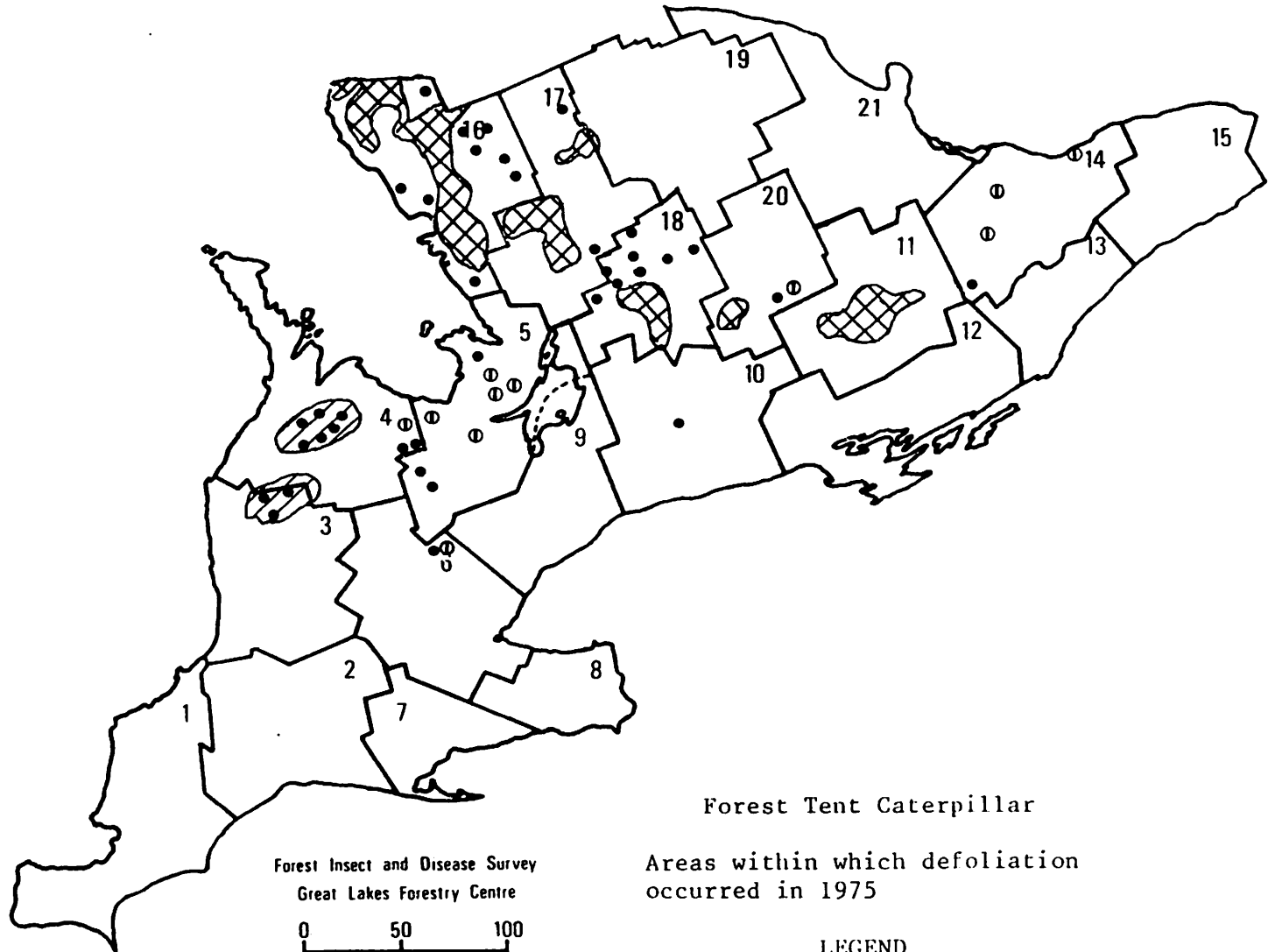
Light defoliation ⊕

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



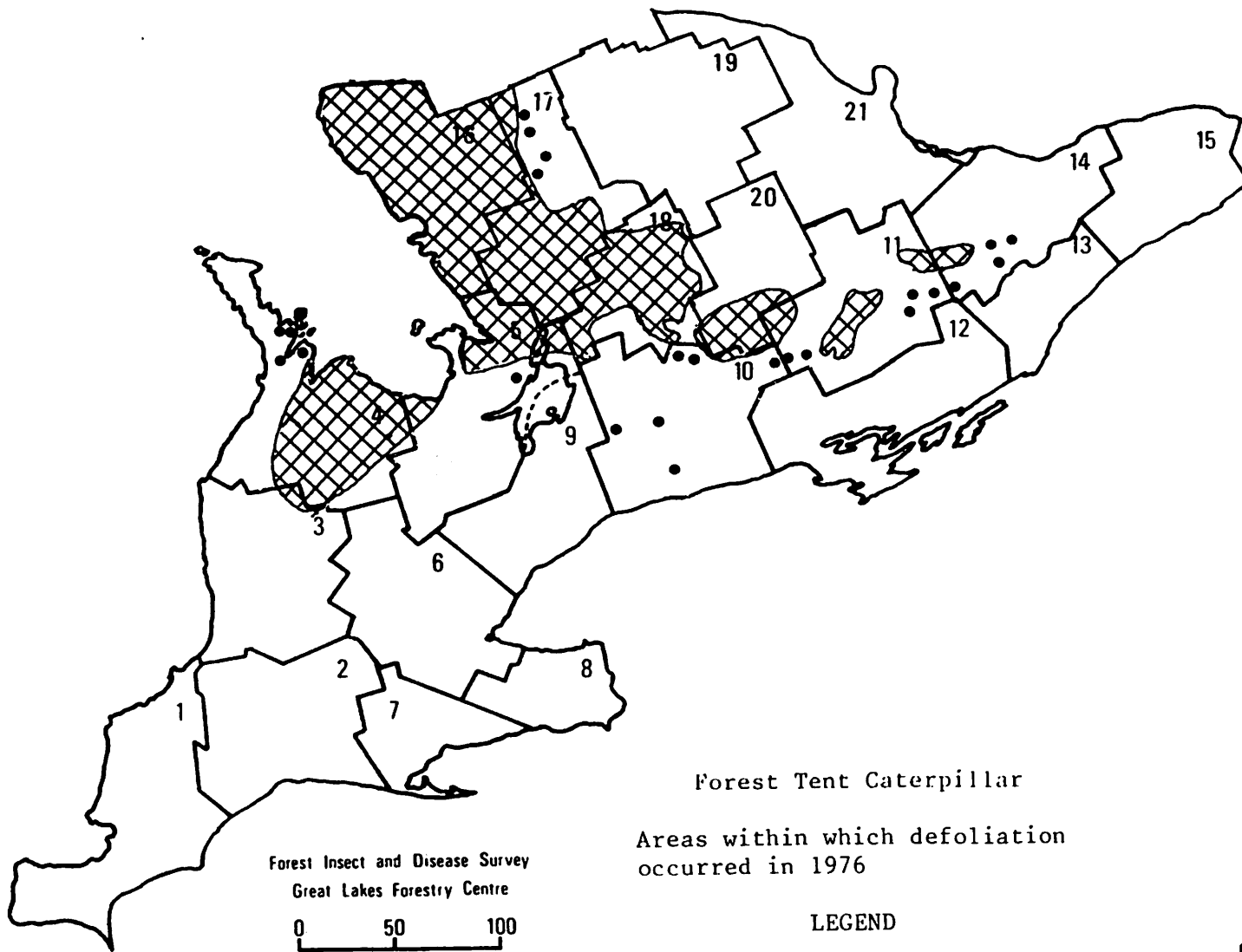
Moderate-to-severe defoliation

• 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



Forest Tent Caterpillar

Areas within which defoliation
occurred in 1976

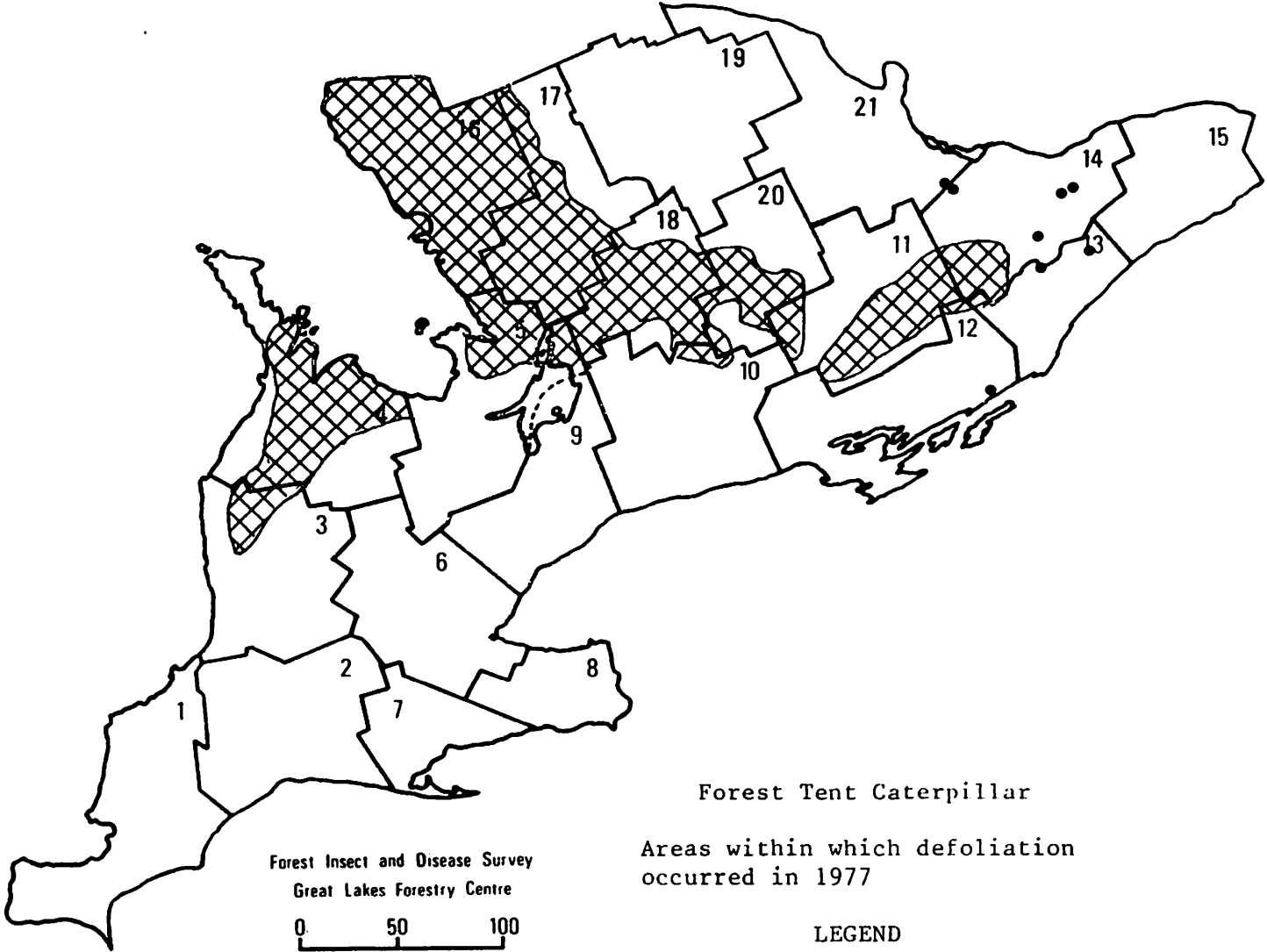
LEGEND

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



Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

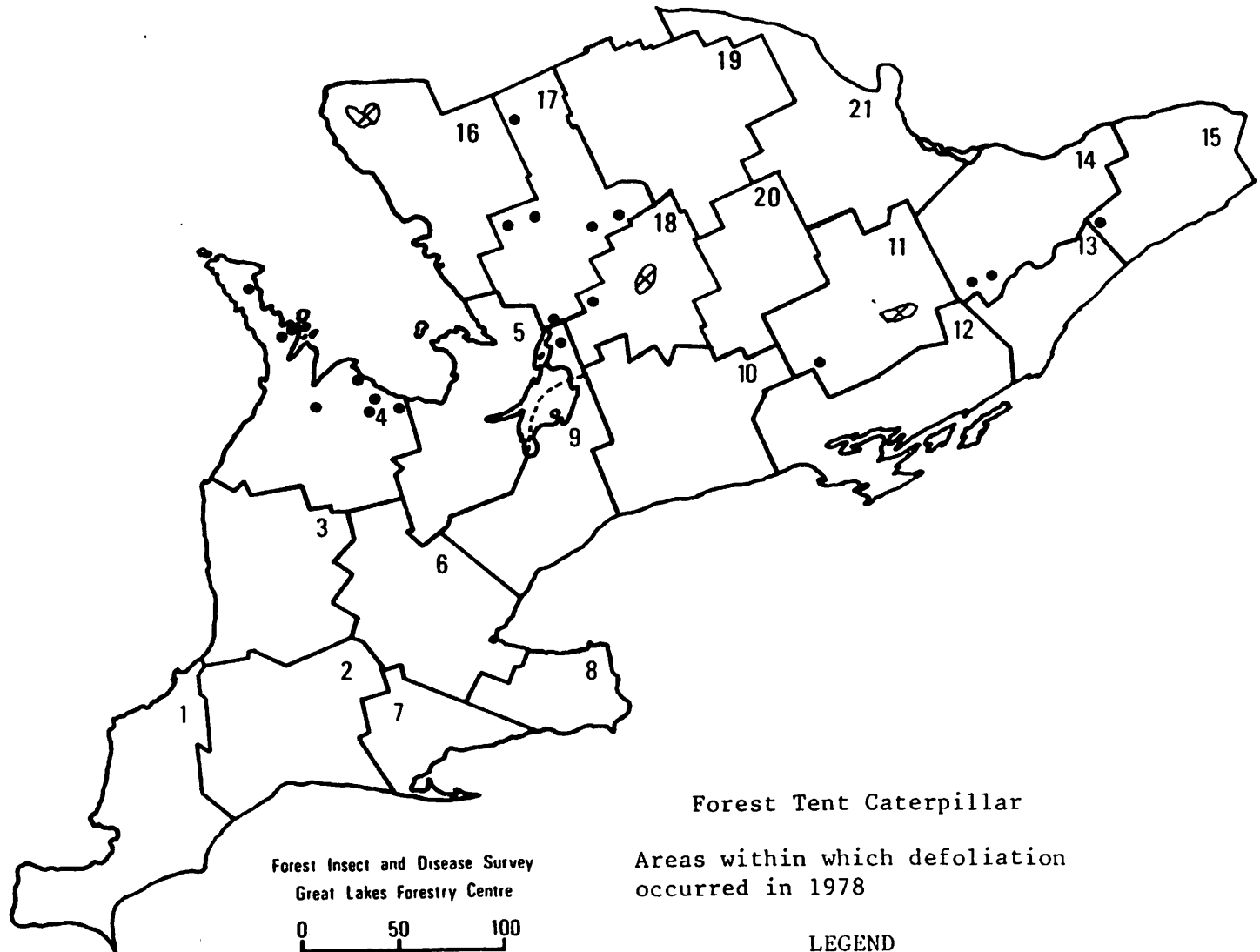
LEGEND

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



Moderate-to-severe defoliation • or 