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

Compiled by

M.J. Thomson, L.S. MacLeod, H.J. Evans, D.C. Constable and C.G. Jones[1]

FORESTRY CANADA

ONTARIO REGION

GOVERNMENT OF CANADA

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[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 km^2 = area (sq. mi.) x 2.59 = area km^2]. 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 wish to acknowledge the following authors of the annual FIDS district and regional reports from which this review was abstracted.

1950-1951	R.J. Du Breuil, J.C. Charbonneau
1952-1953	J.C. Charbonneau
1954-1955	A.S. Danard
1956-1960	M.J. Thomson
1961	W.J. Miller
1962-1966	J. Hook
1967-1970	M.J. Applejohn
1971-1972	M.J. Applejohn and H.J. Weir
1973	W. Biggs and H.J. Weir
1974	C.A. Barnes and H.J. Weir
1975-1979	C.A. Barnes
1980	R.J. Sajan

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INTRODUCTION

This is a review of significant forest insects and diseases in the area covered by the Carleton Place District from 1950 to 1980. The district was formed in 1980 when the Ottawa and Lanark districts were combined. In the selection of pests for this report, particular attention was paid to the major working groups of host species in the area. The insects and diseases included are capable of causing, or have caused, tree mortality or a reduction in growth. Also included are abiotic problems that cause damage, i.e., frost, hail, wind, winter drying, etc.

SUMMARY

FOREST INSECTS

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

This group of leafminers causes serious damage to host trees in the form of thinned foliage, dead twigs or branches and after several years of medium-to-heavy infestation considerable tree mortality will occur. All of the above species have been found intermingled on affected trees. Medium-to-heavy infestations were reported in 1962 and 1963, from 1969 to 1975 and in 1979 and 1980.

Birch Skeletonizer, *Bucculatrix canadensisella* Clem. [Major]
pages

Defoliation by this insect seldom caused mortality of the host but weakened trees are subject to attack by secondary insects and diseases. Large outbreaks of this insect unusually last 3 to 4 years, then decline rapidly. Medium-to-heavy infestations were recorded from 1960 to 1964.

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

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. Moderate-to-severe damage occurred in the district each year from 1967 to 1976.

Oak Leaf Shredder, *Croesia semipurpurana* Kft. [Major]
pages

Repeated moderate-to-severe defoliation over a period of years causes severe damage to red oak trees, leaving them predisposed to secondary insect and disease attack. Medium-to-heavy infestations occurred in 1971 and from 1973 to 1976.

Pine Bud Moth, *Exoteleia dodecella* (Linn.)
pages

Medium-to-heavy infestations kill a high proportion of buds on Scots pine trees causing malformation of branches and sparse foliage after successive attacks. Moderate-to-severe damage was recorded in Scots pine plantations at scattered locations in 1962 and 1963 and in 1969.

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

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. Moderate-to-severe defoliation was recorded from 1965 to 1969, in 1971 and 1972, in 1975, 1977, 1979 and 1980.

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

Outbreaks of this pest can cause complete defoliation of many host trees species. Repeated moderate-to-severe defoliation weakens affected trees, leaving them predisposed to secondary insect and disease attack. Medium-to-heavy infestations were reported in the district in 1959, 1961 to 1963, in 1971 to 1976 and in 1979.

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

This caterpillar is widely distributed through North America. Infestations usually last an average of five years and high populations denude large areas of susceptible stands. The principal host attacked is aspen, however, many other deciduous species also suffer severe defoliation. Repeated defoliation retards tree growth and vigor leaving them susceptible to attack by other pests. Medium-to-heavy infestations were present in the district from 1951 to 1953, in 1965 and 1966 and from 1975 to 1977.

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

Moderate-to-severe defoliation can cause mortality of balsam fir and white spruce trees when an infestation persists over a period of years. Moderate-to-severe defoliation was recorded at scattered locations in 1954, from 1957 to 1959 and from 1967 to 1974.

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

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. Medium-to-heavy infestations were reported at scattered locations in 1954 and 1955, in 1958 and 1959, in 1961 and in 1966 and 1967.

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

This sawfly is capable of causing serious damage and mortality of semimature and plantation jack pine trees when high populations occur over a period of years. Moderate-to-severe defoliation was recorded at scattered points in the district in 1954, 1963 to 1976 and from 1978 to 1980.

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

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. Medium-to-heavy infestations were recorded at numerous locations from 1956 to 1959, in 1963, 1964 and 1967, in 1971, 1972 and in 1975 and 1979.

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

This weevil is considered the most destructive pest of white pine in North America. Successive weevilling over a period of years results in multiple-stemmed trees. The insect also causes serious damage to other pine species and spruce. High populations were recorded in 1951 and 1955, from 1967 to 1973, and from 1975 to 1978.

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

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. Pockets of medium-to-heavy infestation occurred in 1954, 1960, 1961 and 1963 and from 1967 to 1969, and in 1976, 1977 and 1978.

Other Noteworthy Insects [Major and Minor]
pages

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

FOREST DISEASES

Armillaria Root Rot, *Armillaria ostoyae* Romagn.) Herink [Major]
pages

This root rot disease often kills trees previously stressed by drought, insects, other pathogens or unfavourable environment. However, under some circumstances the fungus, or certain strains of the fungus, can kill vigorous trees. Both deciduous and coniferous trees are attacked. Varying degrees of damage were reported at numerous locations through the district, the most serious generally occurred in plantations.

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

This major disease organism, which affects all species of elm, was first recorded in Ontario in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. In 1952, infected trees were found at seven locations in the eastern part of the district. Since these records were established, the disease spread rapidly causing serious damage in elm stands through the district.

Ink Spot, *Ciborinia whetzelli* (Seaver) Seaver [Major]
pages

This ink spot disease is widespread throughout the range of aspen. Many poplar species and hybrids are susceptible, but trembling aspen is most commonly affected. Heavily infected trees may be defoliated prematurely and repeated attacks can reduce increment and even kill regeneration. Moderate-to-severe damage was recorded in 1964.

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur [Major]
pages

This rust is capable of causing tree mortality in juvenile stands and leaving affected trees in more mature stands susceptible to insects, decay and wind breakage, depending on the degree of infection. Only light infection could be found in the district.

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

White pine blister rust is the most serious disease of eastern white pine. The disease caused top killing and mortality in trees of all ages. The disease caused top killing and mortality in trees of all ages. The pathogens can be found in any white pine stand and in many plantations through the district.

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

Mortality caused by this disease is usually restricted to trees in the 7-cm to 13-cm class, growing on poor sites, but branch and top mortality may occur in trees of greater diameter. Surveys have revealed that the pathogen is present in most aspen stands through the district.

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

Reduced stocking of regeneration aspen occurs when the incidence of this disease is high. Trees more than 5 years old are seldom affected and, therefore, the disease is of little economic importance in natural stands. Small areas of moderate-to-severe damage were recorded from 1964 to 1966 and from 1975 to 1977.

Other Noteworthy Diseases [Major and Minor]
pages

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

ABIOTIC DAMAGE
pages

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

I N S E C T S

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

Host(s): eC [Major]

Year	Remarks
1950-1956	not reported
1957-1958	low populations at scattered points
1959-1960	not reported
1961	low populations at scattered points
1962	A marked increase in populations occurred and caused moderate-to-severe defoliation through parts of the southern and eastern portion of the district (see map, page).
1963	high population recurred
1964	Populations declined; only light damage occurred.
1965	light damage recurred
1966-1967	trace populations
1968	Populations increased and caused light defoliation at several points in the western half of the district.
1969	High populations occurred and caused moderate-to-severe defoliation at numerous points in the southwestern part of the district.
1970	high populations in the southern part of the district (see map, page).
1971	Moderate-to-severe defoliation occurred through the southern two-thirds of the district (see map, page).
1972	The area of infestation increased and caused moderate-to-severe damage through all of the district (see map, page).
1973	High populations recurred through most of the district (see map, page).
1974	The area of infestation decreased, however, high populations recurred at scattered points.
1975	The area of infestation decreased for the second consecutive year, leaving a small pocket of heavy damage in Lanark Twp.
1976	Populations collapsed; only trace levels of damage could be found.
1977	trace populations

(cont'd)

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

Year	Remarks
1978	Populations increased and caused light damage in the Ottawa area.
1979	A marked increase in populations occurred and caused moderate-to-severe defoliation through the eastern two-thirds of the district (see map, page).
1980	The distribution of the insect increased. Moderate-to-severe damage was evident through all but a small area in the northwest part of the district (see map, page).

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch [Major]

Year	Remarks
1950-1959	not reported
1960	pocket of moderate-to-severe defoliation in South Sherbrooke Twp, light pockets in Lanark and Dalhousie twps
1961	Infestations increased and caused moderate-to-severe defoliation throughout the entire district (see map, page).
1962	High populations recurred throughout the district.
1963	Populations declined, leaving pockets of moderate-to-severe defoliation at scattered points in the northern part of the district.
1964	Pockets of moderate-to-severe defoliation recurred in the northern part of the district.
1965	populations collapsed
1966-1969	not reported
1970	light damage observed in Osgoode Twp
1971-1980	not reported

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): bF, spruce [Major]

Year	Remarks
1950	trace populations
1951	A small light infestation was found in Pakenham Twp.

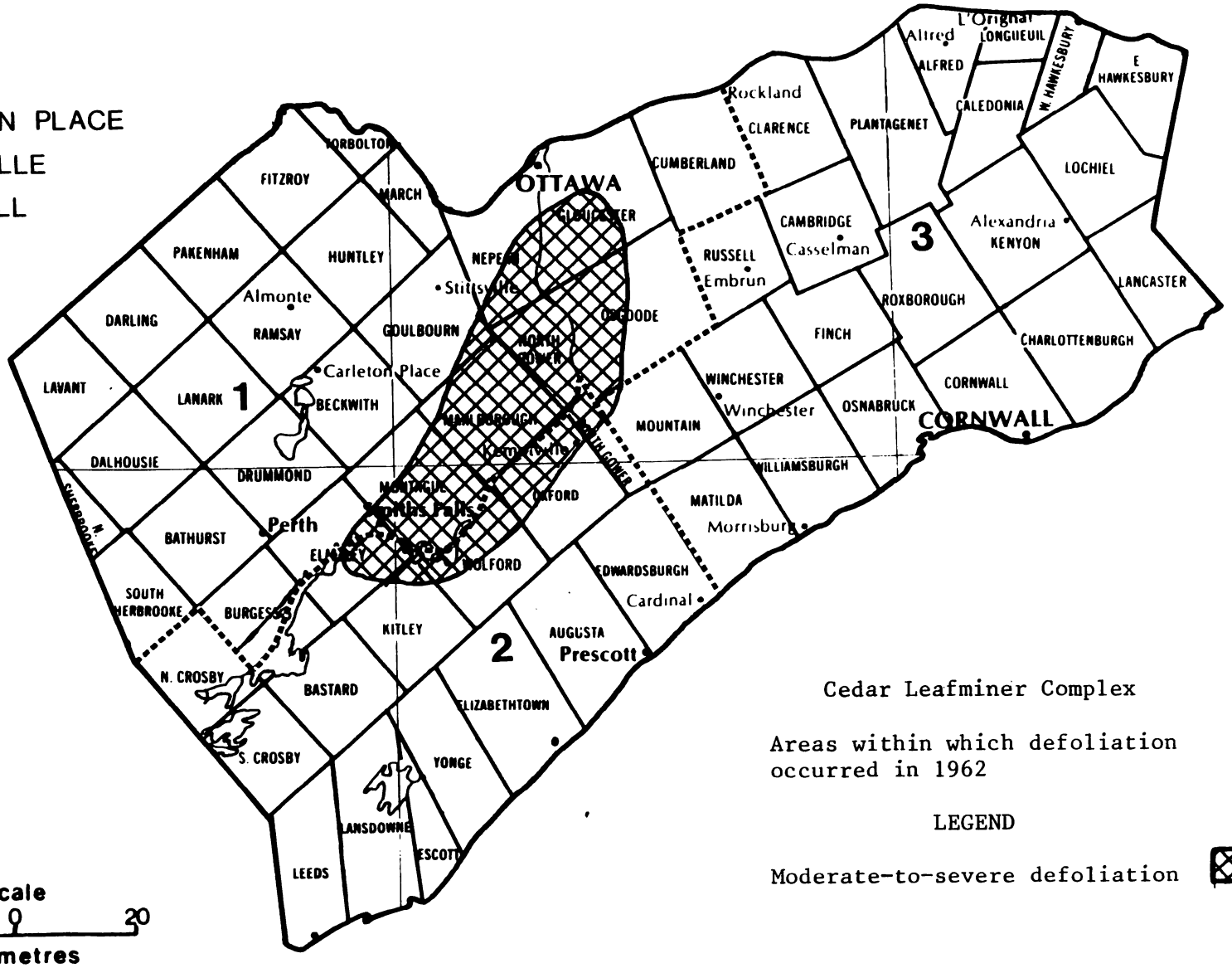
(cont'd)

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

Year	Remarks
1952-1960	not reported
1961	trace population in Lanark and Fitzroy twps
1962-1966	not reported
1967	A new infestation in an area of approximately 8.0 km^2 caused moderate-to-severe defoliation in parts of Fitzroy and Huntley twps, encompassed by a light infestation through an area of approximately 32 km^2. Small areas of medium-to-heavy infestation were also recorded in Dalhousie and Lavant twps (see map, page).
1968	A marked increase in the extent of the budworm infestation over the previous year was evident when damage was found at many points in the northwestern part of the district (see map, page).
1969	Varying degrees of damage recurred in the western part of the district (see map, page).
1970	Little change in population levels or area of infestation occurred (see map, page).
1971	medium-to-heavy infestations recurred (see map, page)
1972	Little change in the area of infestation occurred (see map, page).
1973	A marked decrease in the area of infestation was recorded when only small pockets of damage were confined to Lavant, Darling, Ramsay, Beckwith, Huntley and Goulbourn twps (see map, page).
1974	small areas of medium-to-heavy infestations persisted (see map, page)
1975	Little change in the area of infestation could be determined (see map, page).
1976	Populations declined, leaving small areas of medium-to-heavy infestation confined to Pakenham, Torbolton and Lavant twps (see map, page).
1977	Populations continued to decline, leaving a small pocket of damage at one point in Pakenham Twp.
1978-1979	Small pockets of medium-to-heavy infestations were recorded in Pakenham, Darling and Ramsay twps.
1980	Populations increased and caused moderate-to-severe defoliation at nine points in the northwestern part of the district (see map, page).

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Cedar Leafminer Complex

Areas within which defoliation occurred in 1962

LEGEND

Moderate-to-severe defoliation

Scale
20 10 0 20
Kilometres

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1. CARLETON PLACE
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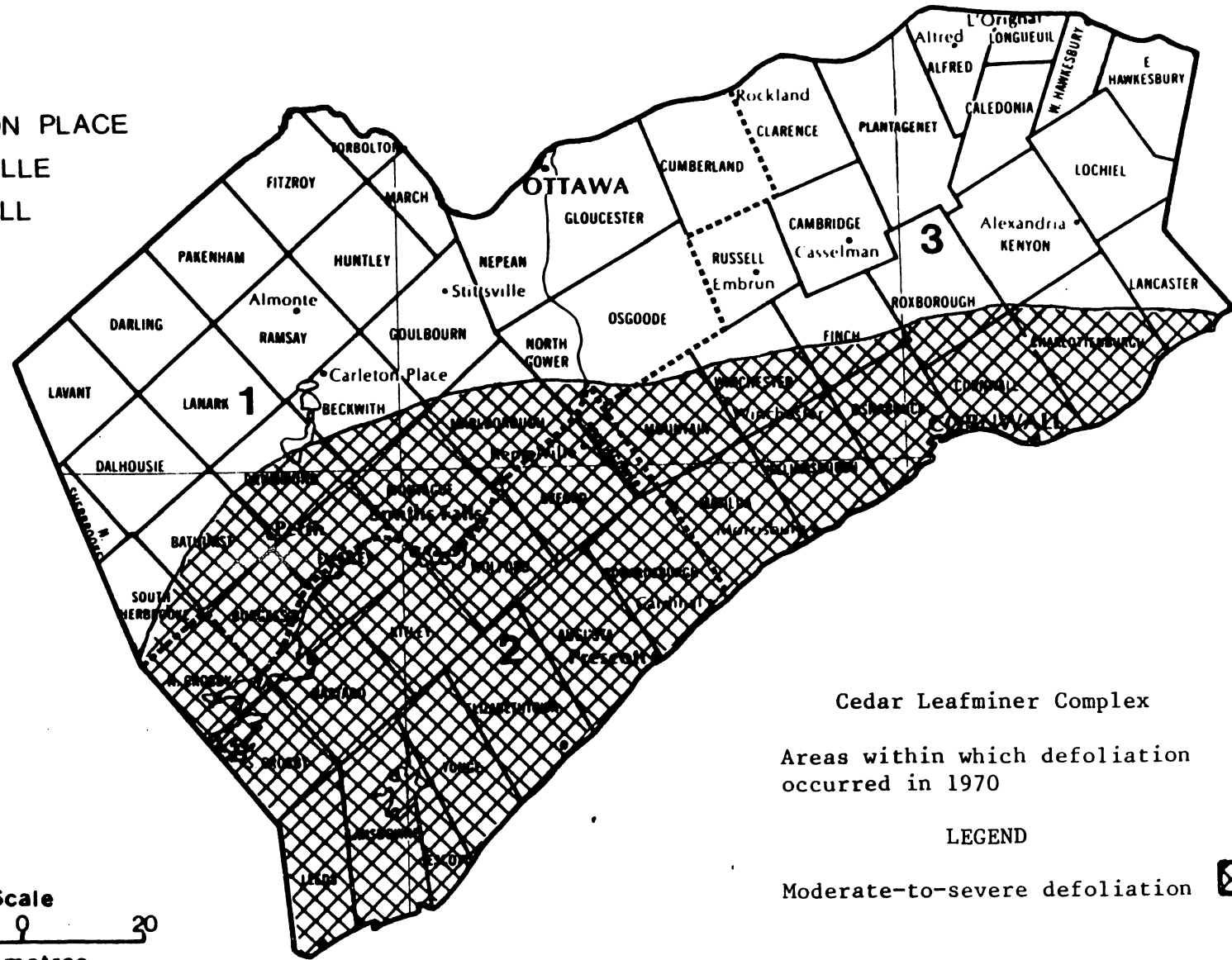

Cedar Leafminer Complex

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation

Scale

20 10 0 20

Kilometres

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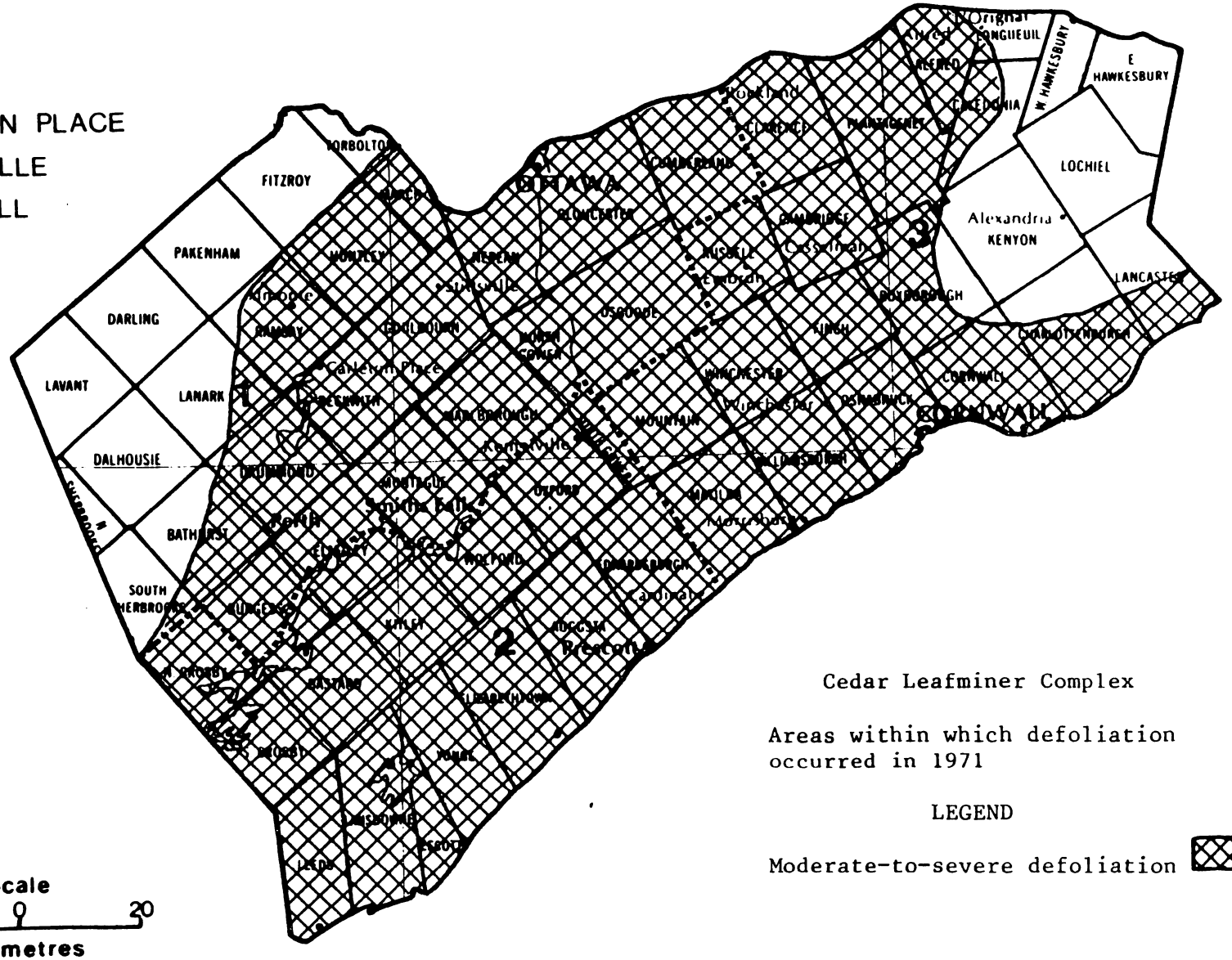

Cedar Leafminer Complex

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation

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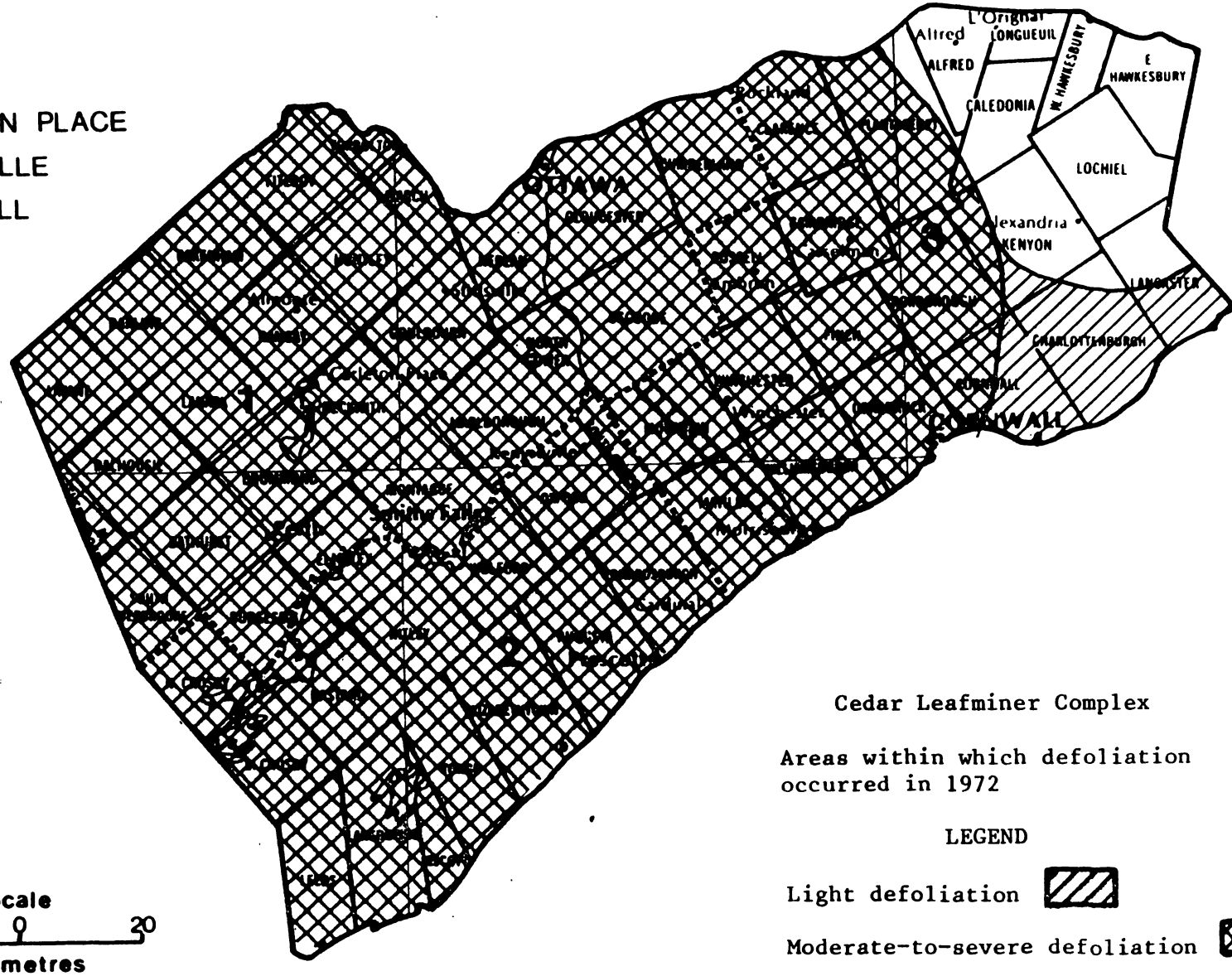

Scale
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Kilometres

Cedar Leafminer Complex

Areas within which defoliation occurred in 1972

LEGEND

Light defoliation

Moderate-to-severe defoliation

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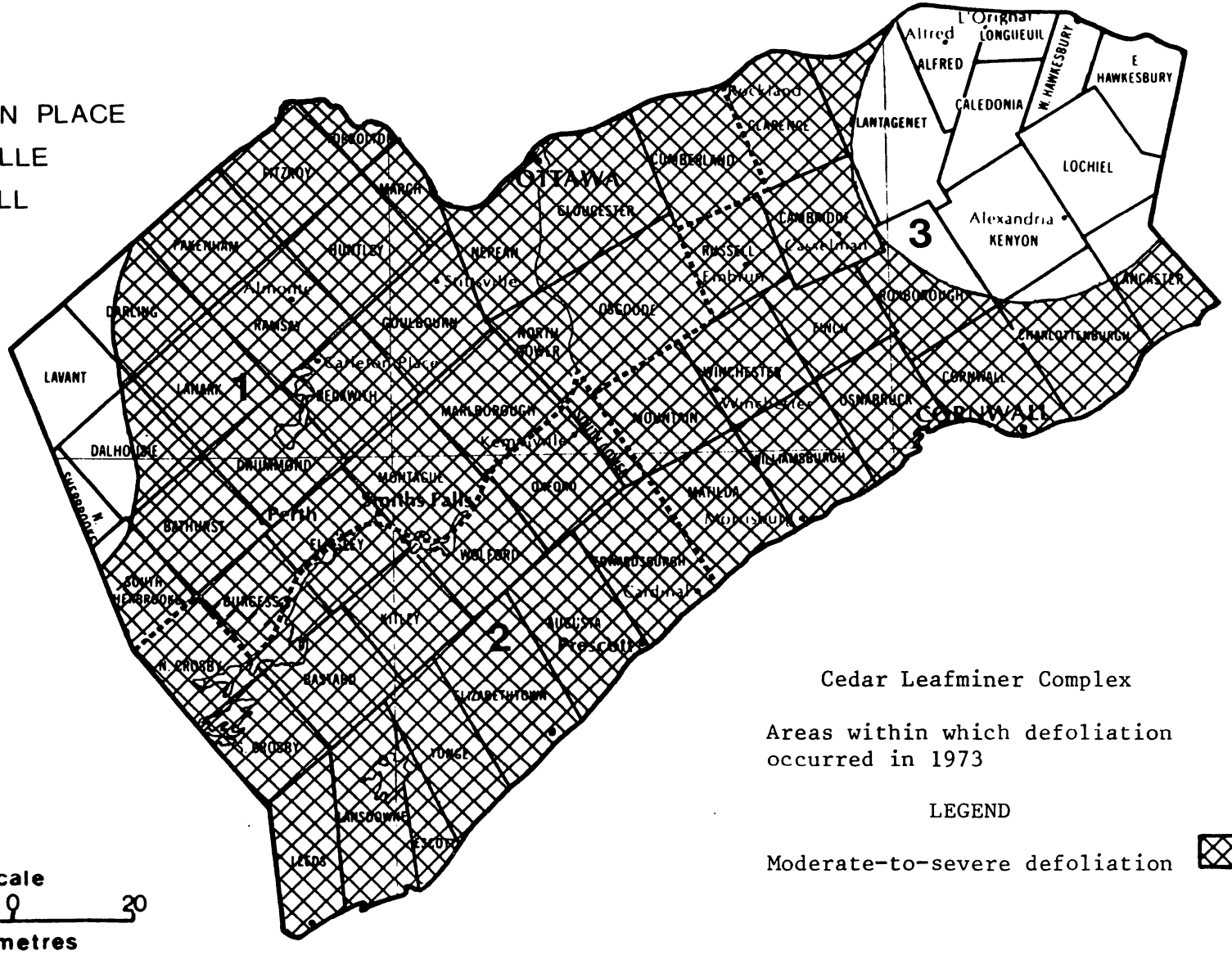

Scale
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Kilometres

Cedar Leafminer Complex

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation

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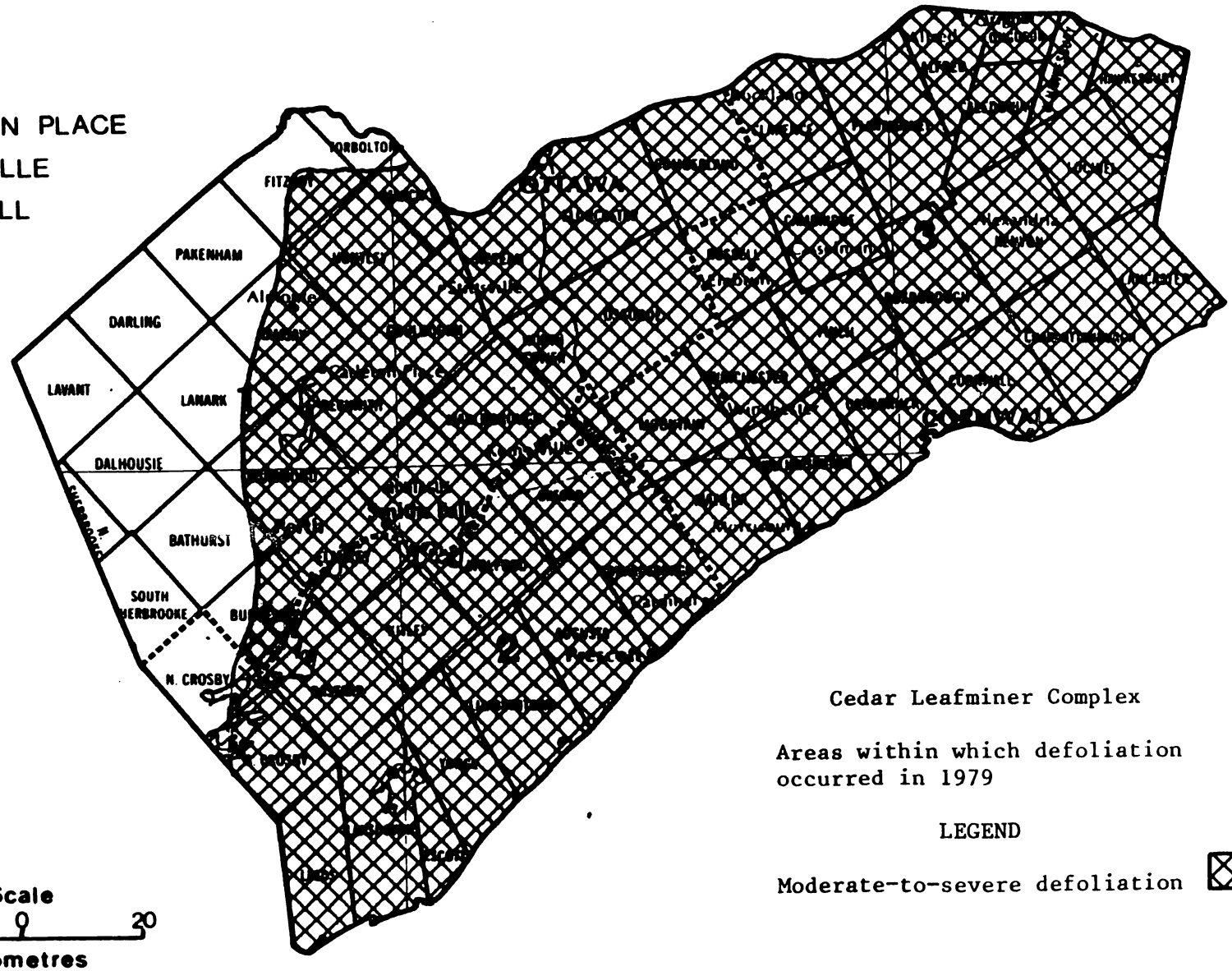

Cedar Leafminer Complex

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation

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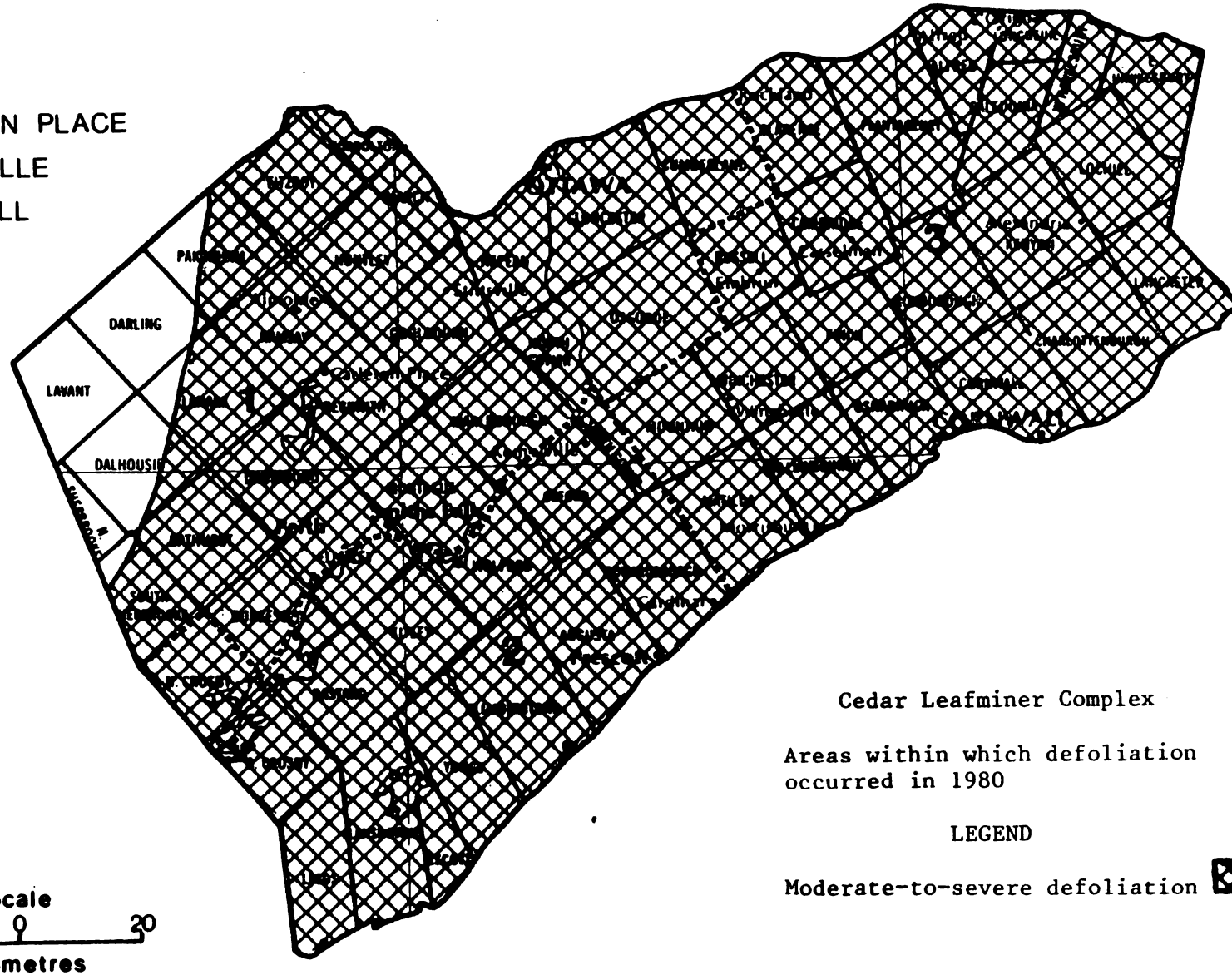

Cedar Leafminer Complex

Areas within which defoliation occurred in 1980

LEGEND

Moderate-to-severe defoliation

Scale

20 10 0 20

Kilometres

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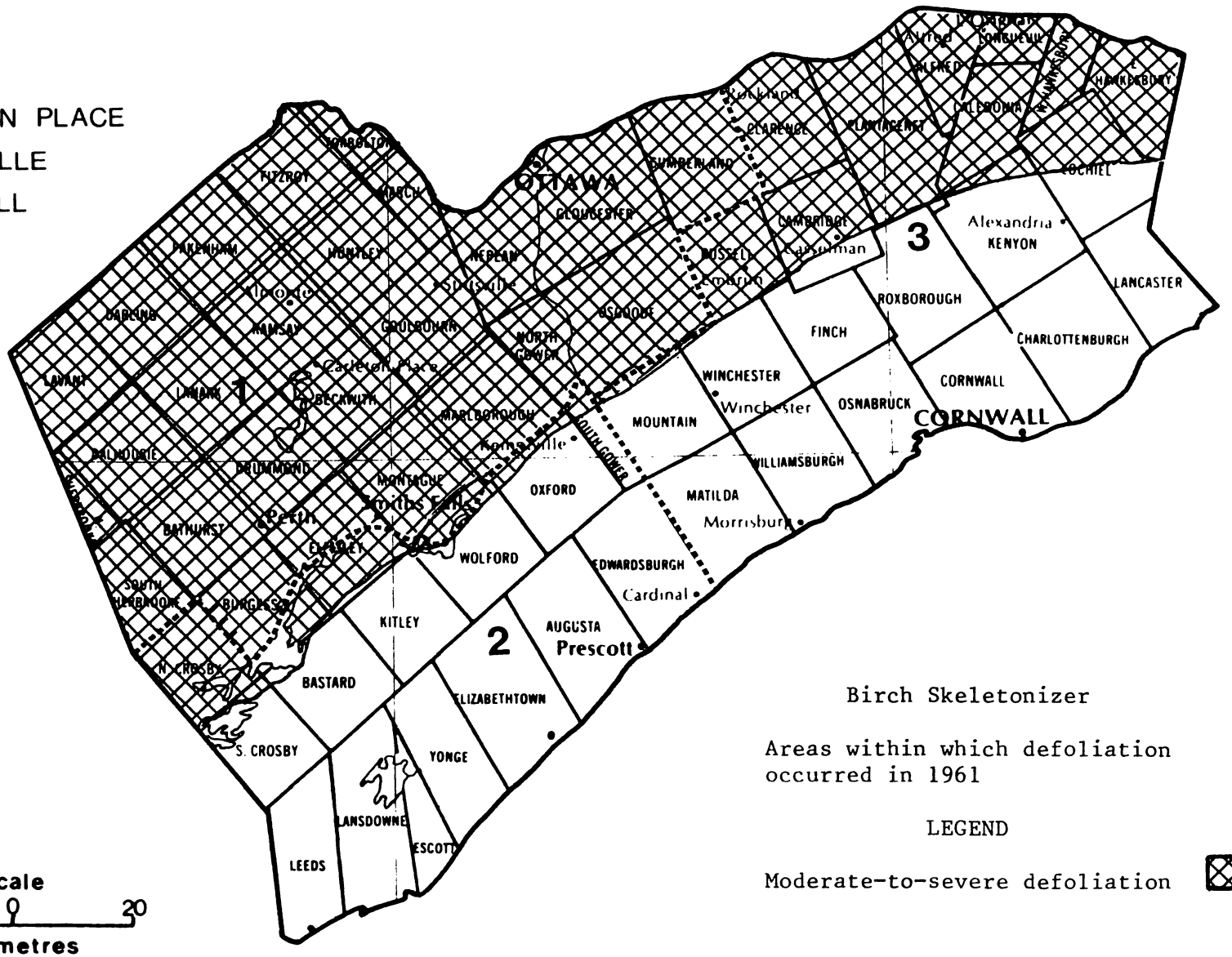

Scale
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Kilometres

Birch Skeletonizer

Areas within which defoliation occurred in 1961

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
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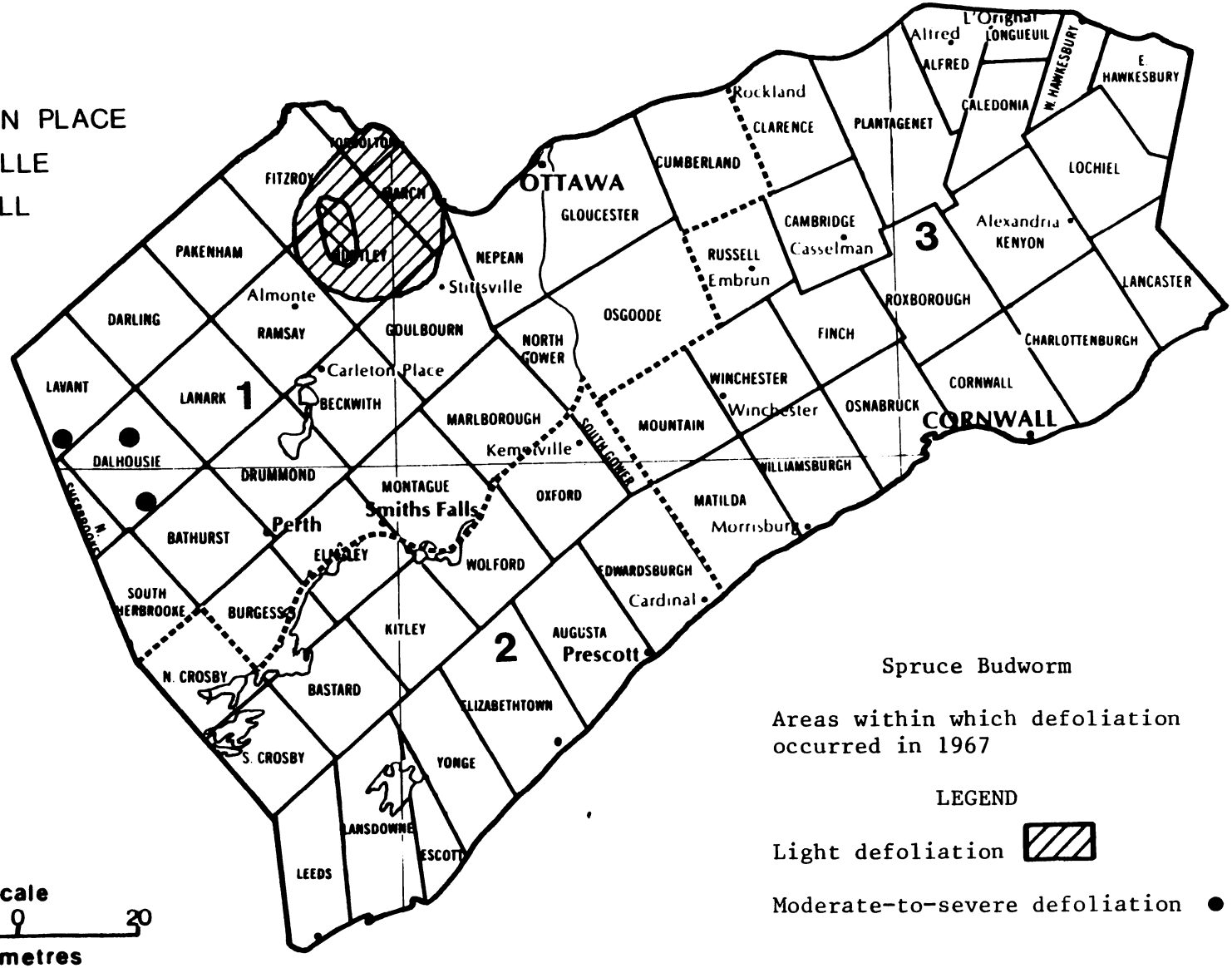

Scale
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Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1967

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

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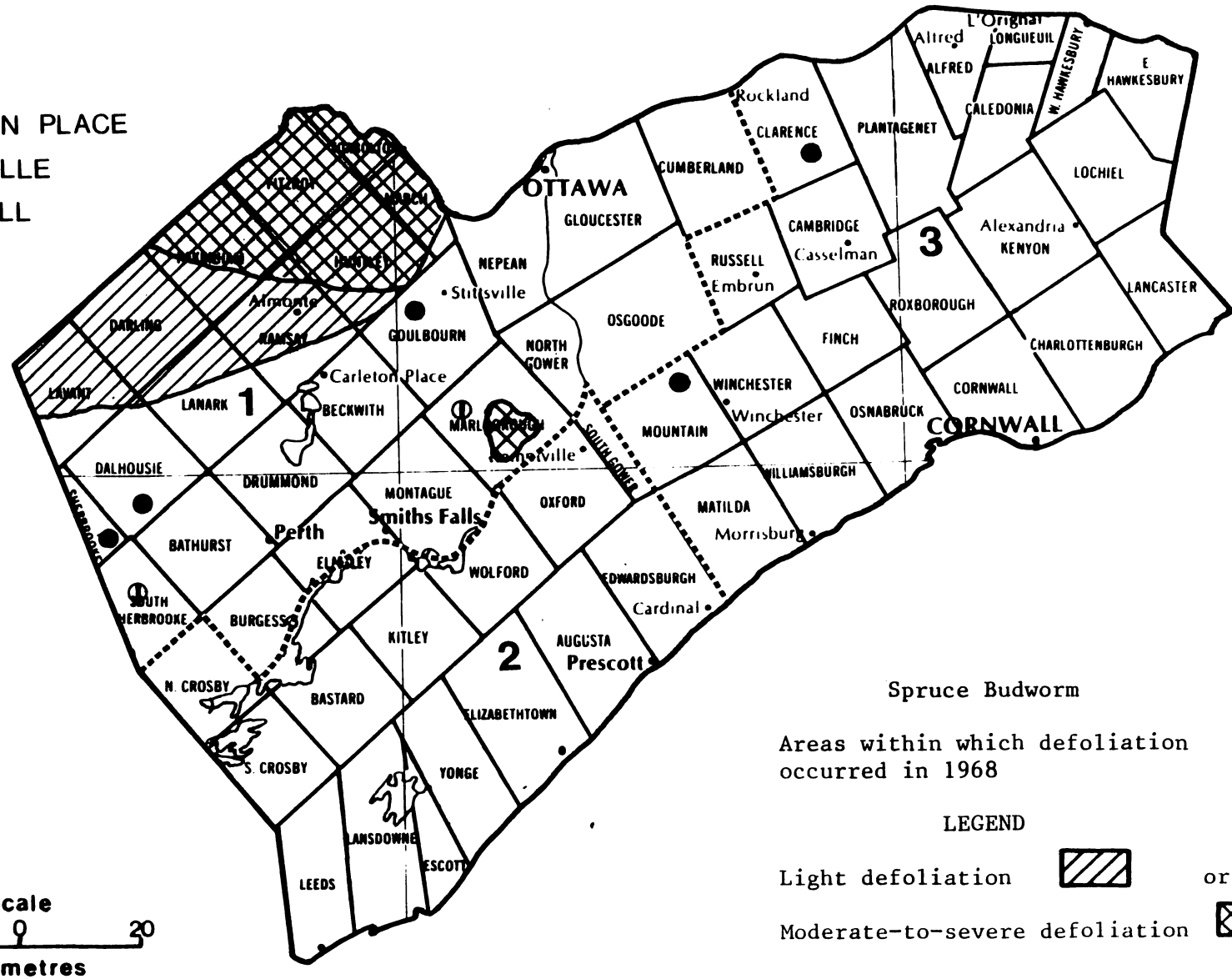

Scale
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Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1968

LEGEND

Light defoliation or

Moderate-to-severe defoliation or

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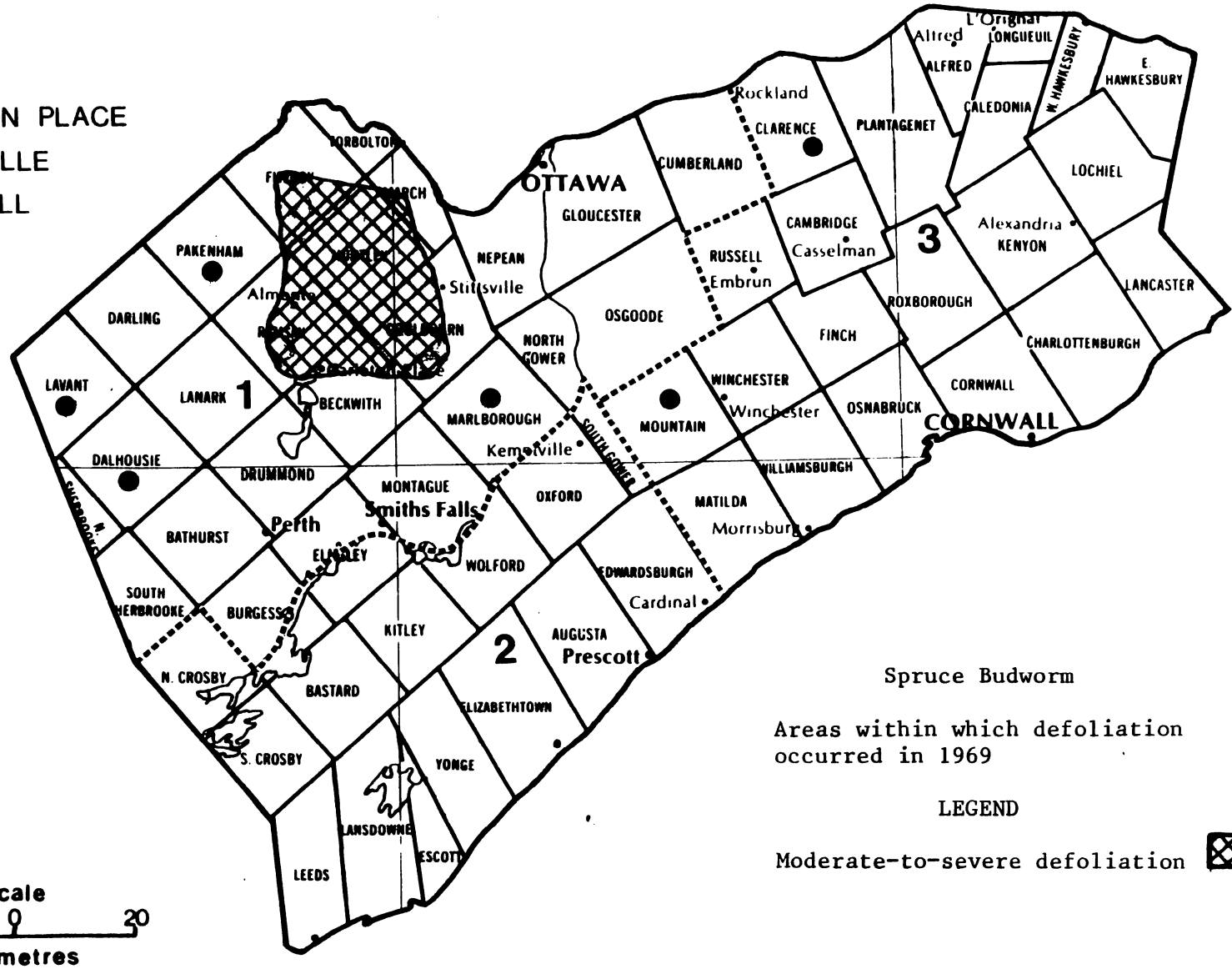
3. CORNWALL



Scale
20 10 0 20
Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1969

LEGEND

Moderate-to-severe defoliation or ●

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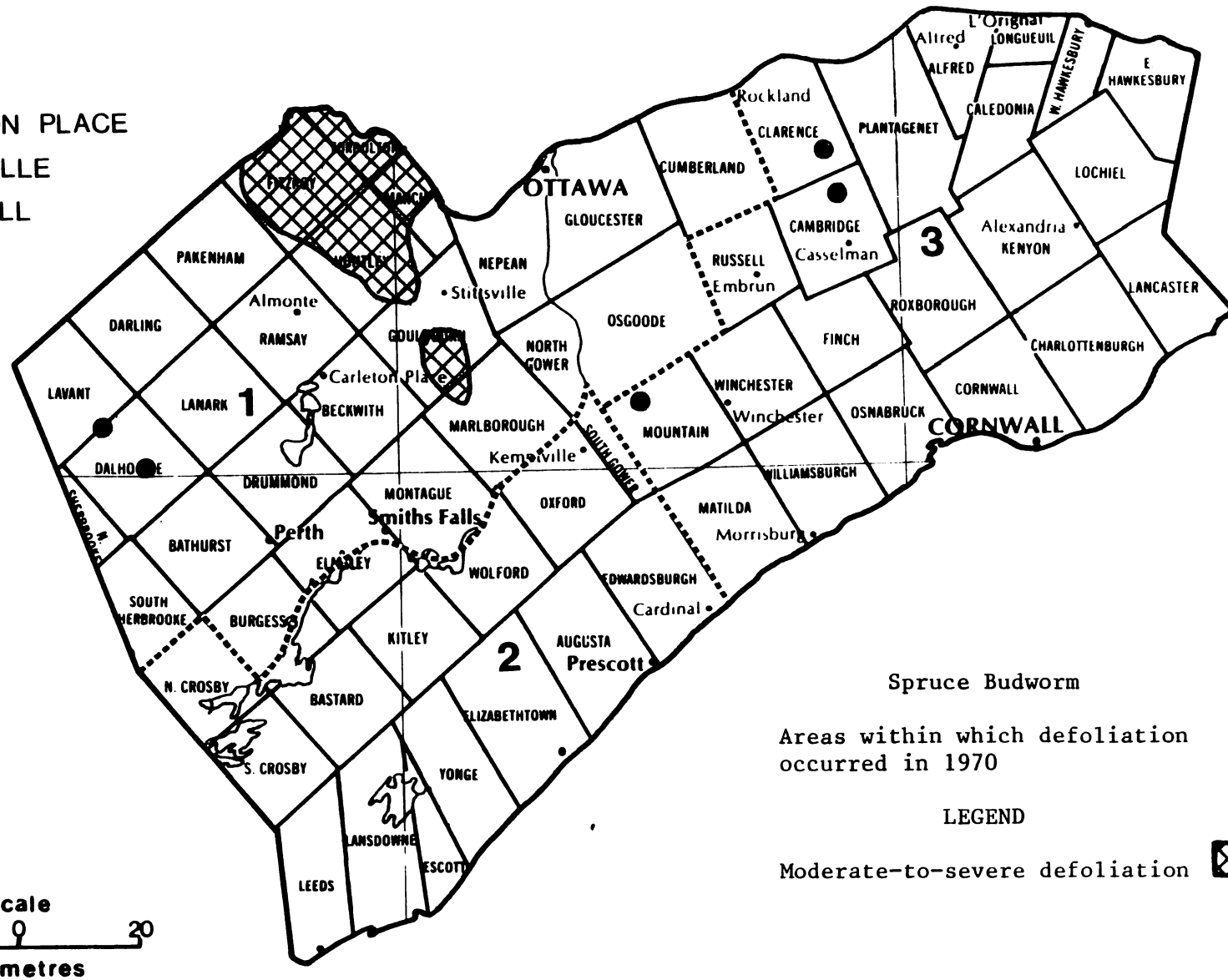

Scale
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Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ▨ or ●

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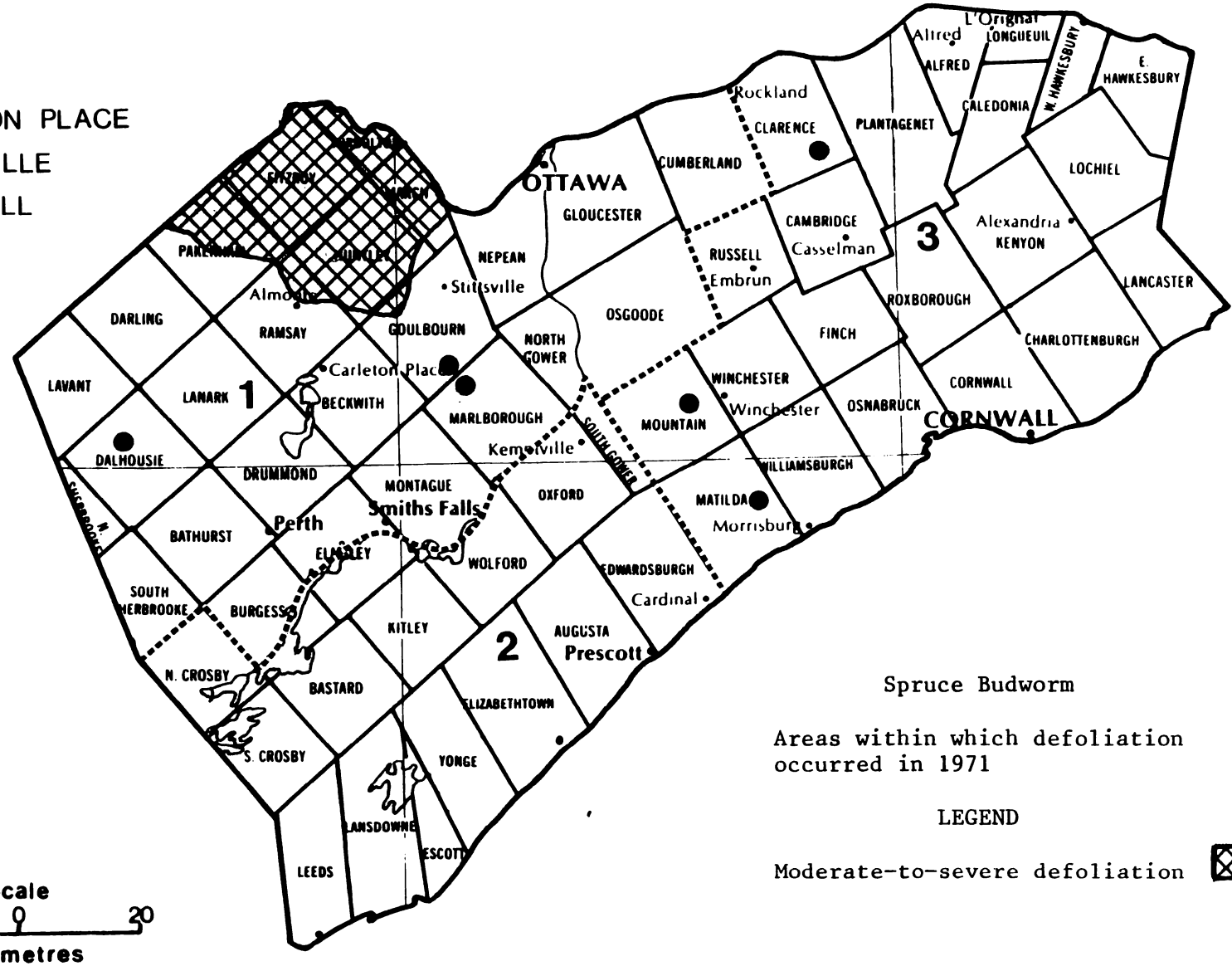

Scale
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Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation ▨ or ●

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CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

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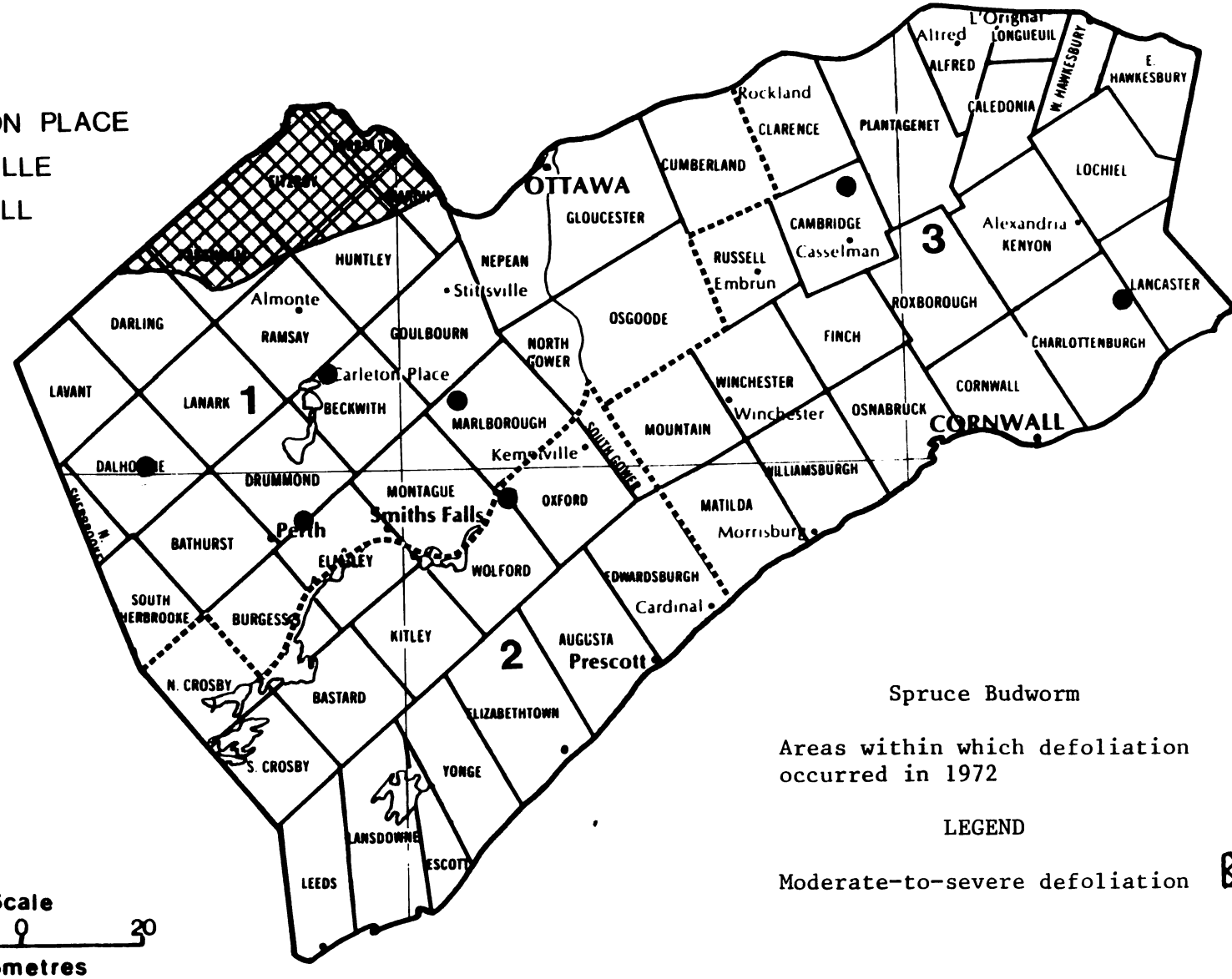

Scale
20 10 0 20
Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation or ●

Fc sect ease
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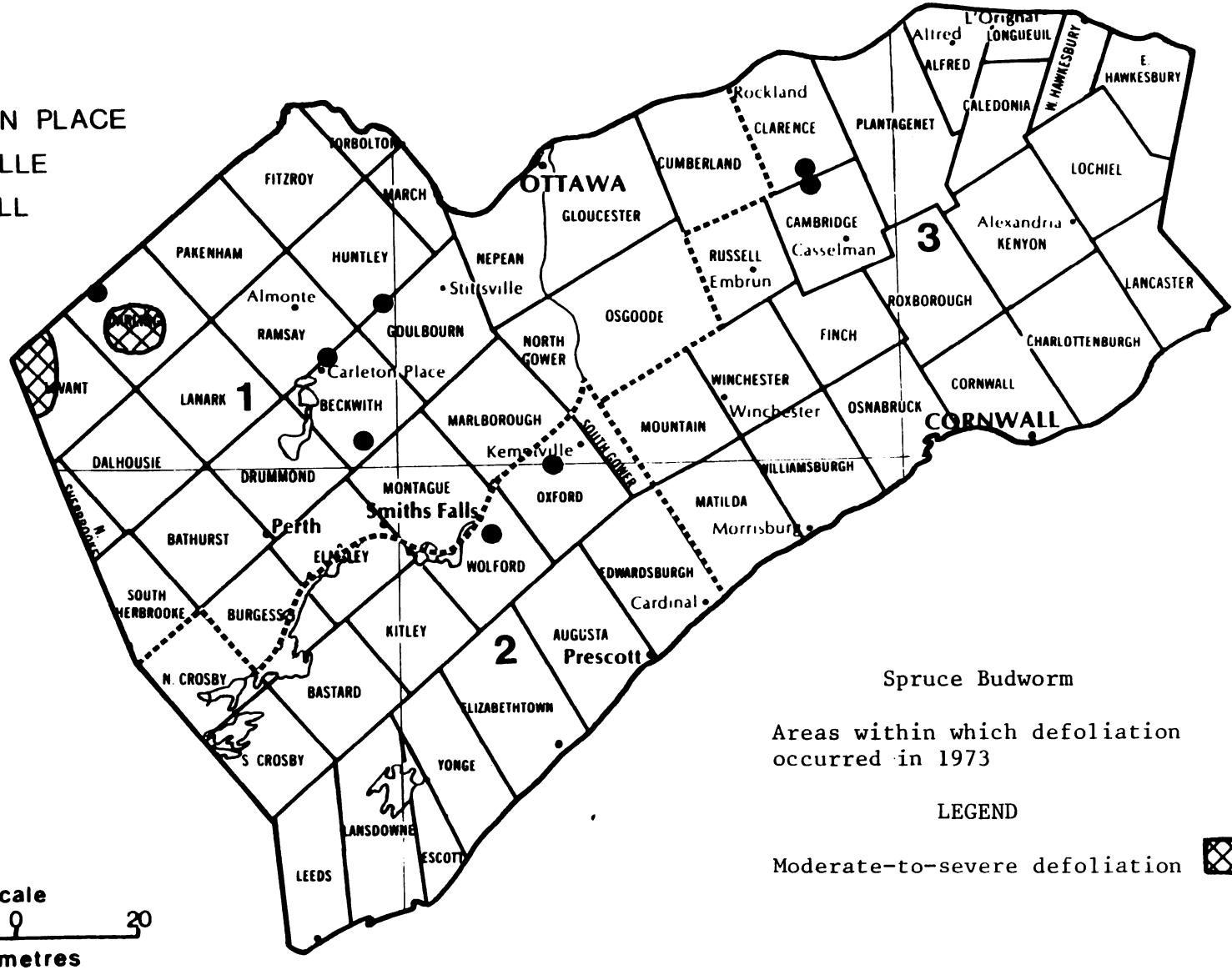


Spruce Budworm

Areas within which defoliation occurred in 1973

LEGEND

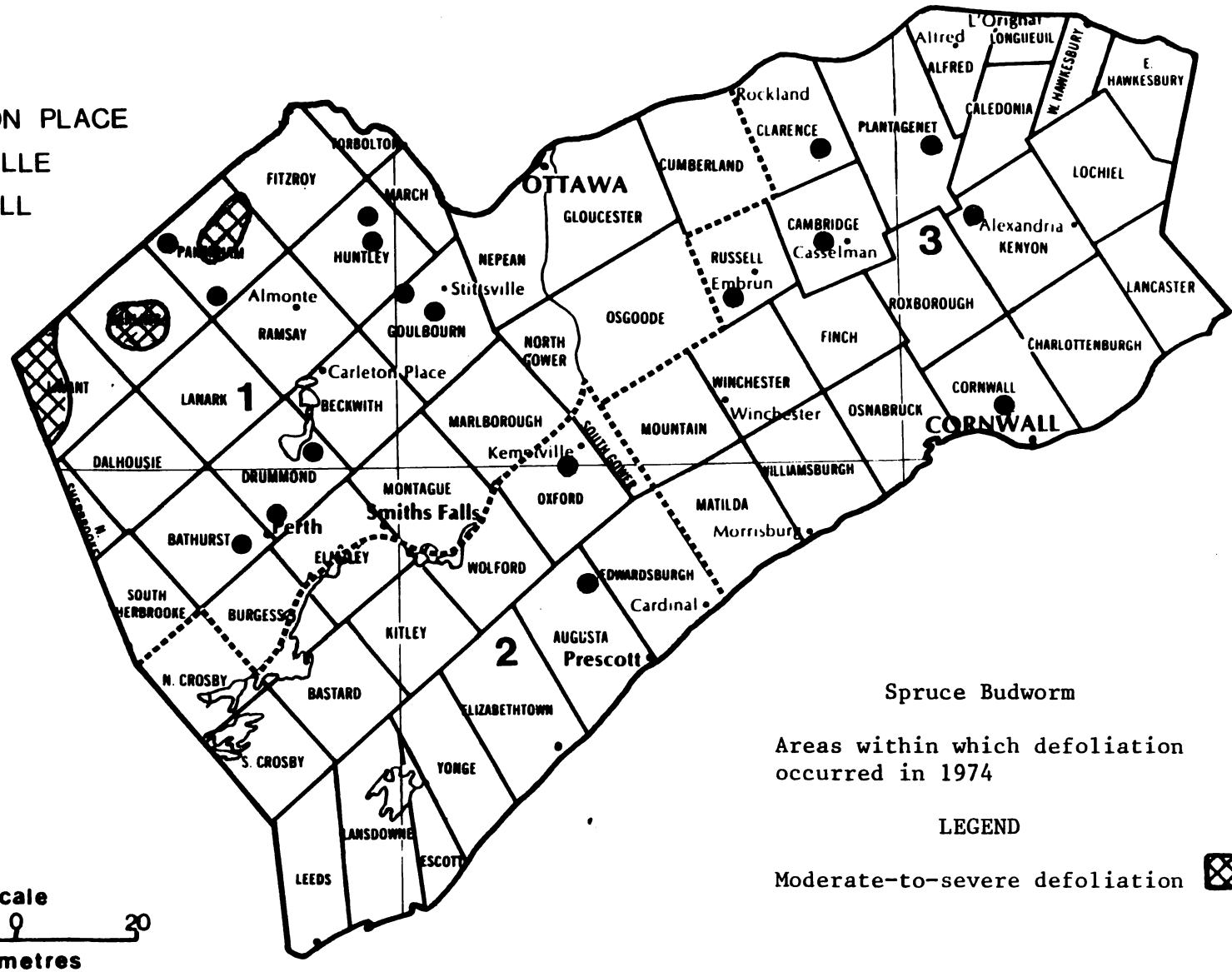
Moderate-to-severe defoliation ▨ or ●

Scale
20 10 0 20
Kilometres

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Spruce Budworm

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation or

Scale

20 10 0 20

Kilometres

Fo ject a ase
Great Lakes Forestry Centre

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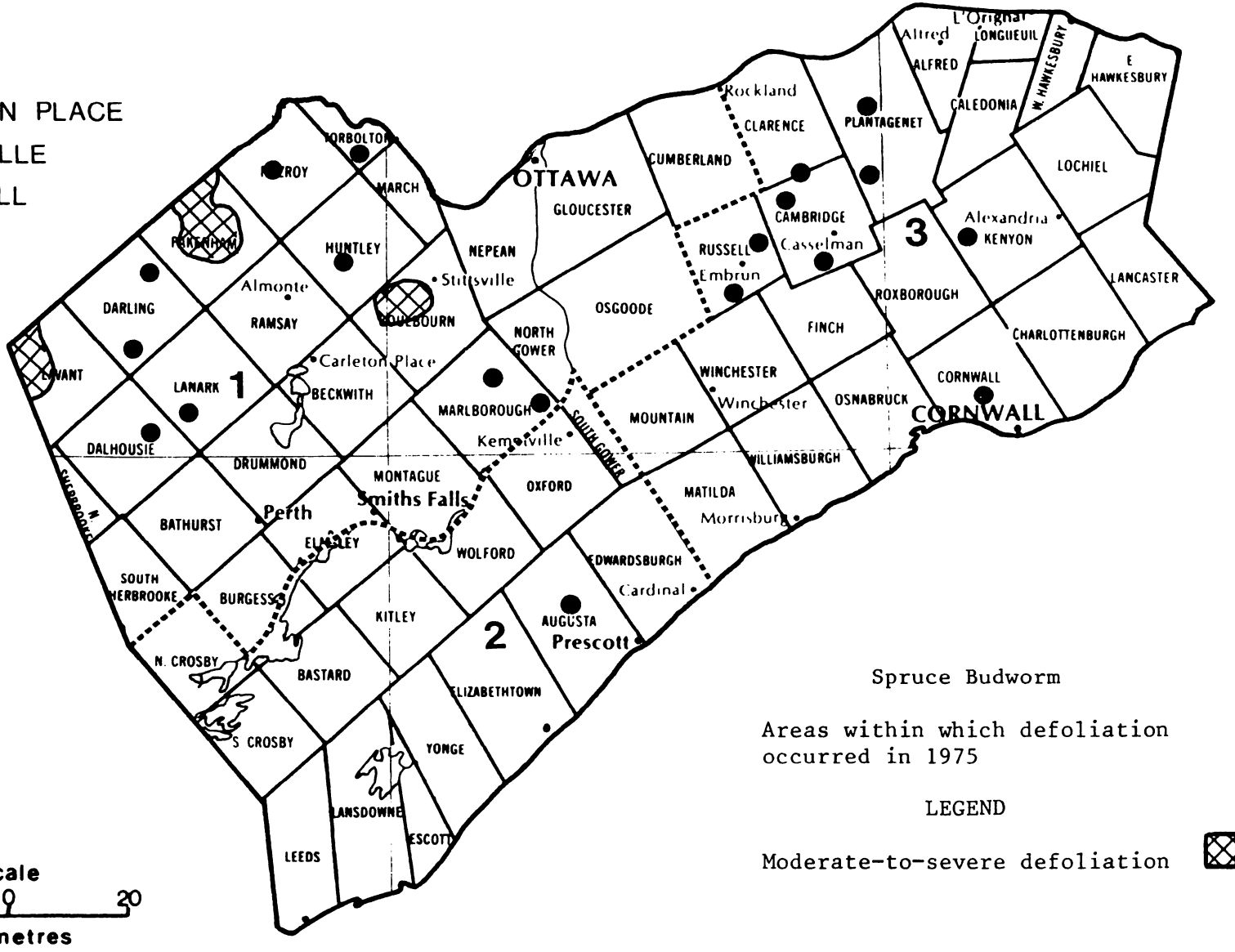

Scale
20 10 0 20
Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ▨ or ●

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
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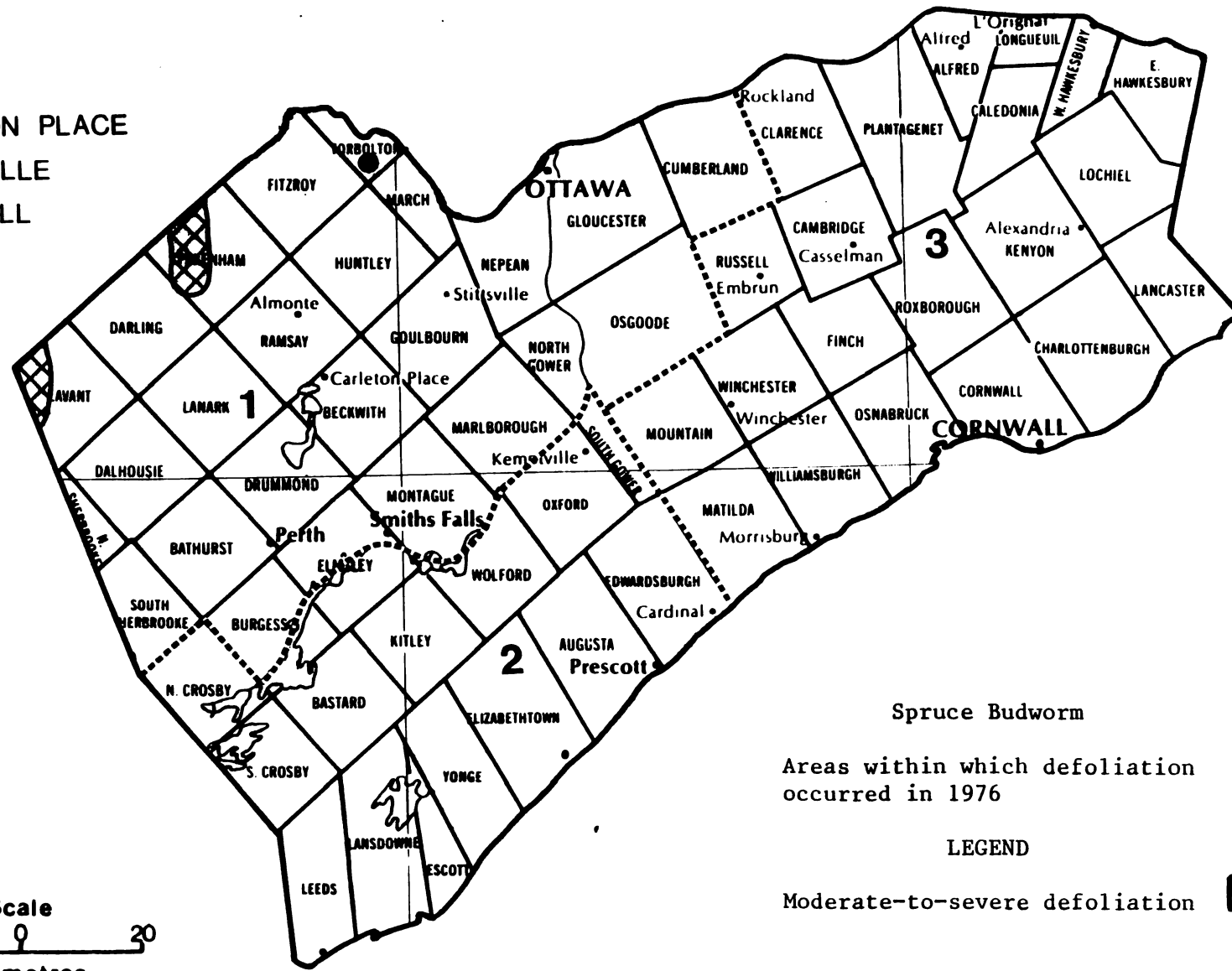
3. CORNWALL



Scale
20 10 0 20
Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1976

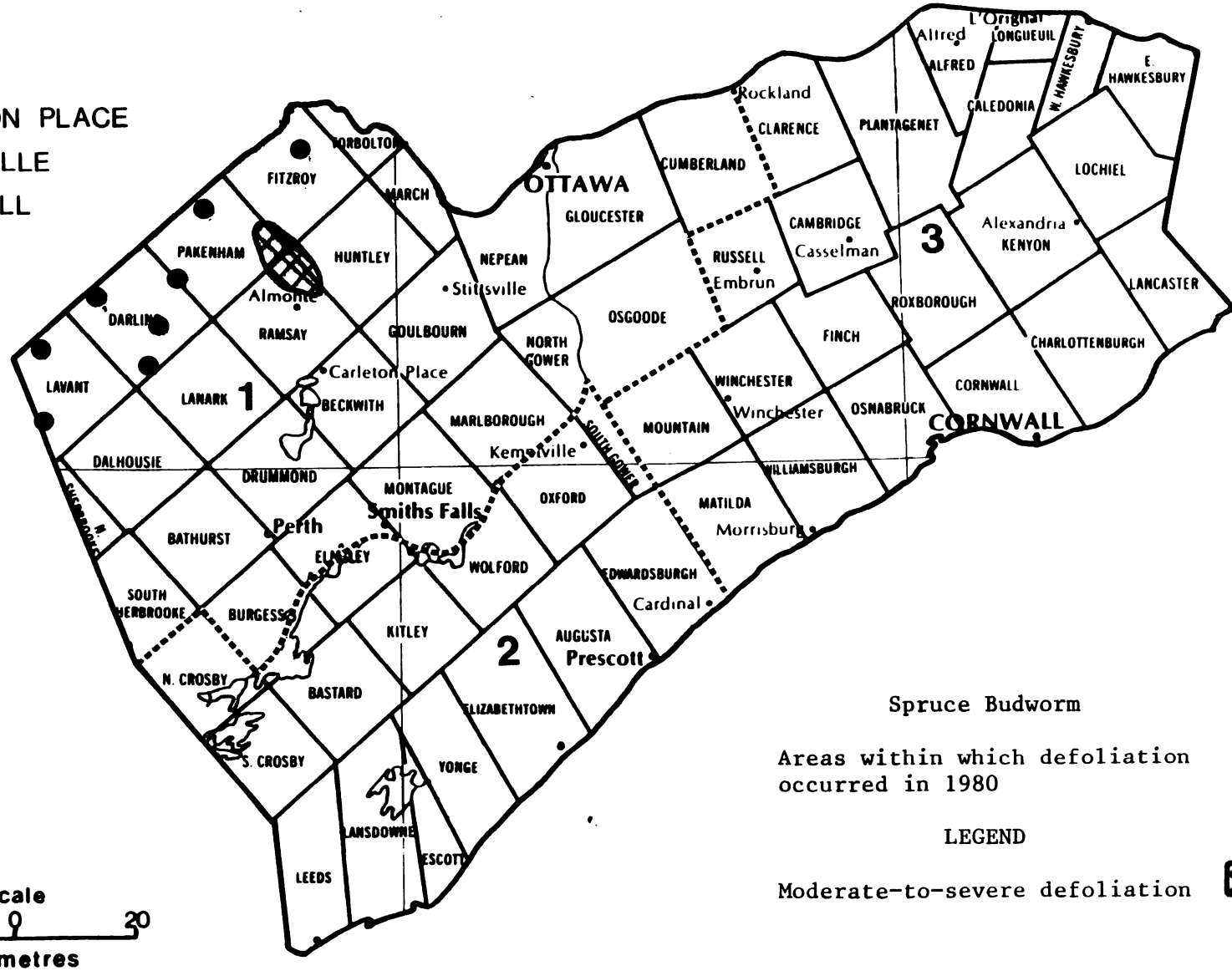
LEGEND

Moderate-to-severe defoliation ▨ or ●

Fo ject ease
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Scale
20 10 0 20
Kilometres

Spruce Budworm

Areas within which defoliation occurred in 1980

LEGEND

Moderate-to-severe defoliation ▨ or ●

Forest Insect and Disease Survey
Great Lakes Forestry Centre

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

Host(s): oak [Major]

Year	Remarks
1950-1970	not reported
1971	Moderate-to-severe defoliation caused by this serious pest of oak was recorded in Lavant Twp.
1972	not reported
1973	New medium-to-heavy infestations were recorded in Nepean, Darling and Pakenham twps.
1974	High populations recurred in Darling and Pakenham twps and caused moderate-to-severe defoliation in oak stands through an area of approximately 260 km^2.
1975	Moderate-to-severe defoliation was evident in Lavant, Nepean and Drummond twps.
1976	High populations recurred in Lavant and Nepean twps, however, defoliation was less severe than in the previous year.
1977	Populations declined to a generally low level.
1978	little change in populations over the previous year
1979	Small pockets of light infestation were recorded in Nepean and Lavant twps.
1980	A small pocket of moderate-to-severe defoliation was recorded in South Sherbrooke Twp.

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

Host(s): pine [Major]

Year	Remarks
1950-1957	not reported
1958-1959	A low population occurred in Drummond Township.
1960	A new light infestation occurred in Goulbourn Twp.
1961	Pockets of light damage were observed at numerous points in the district.
1962	Little change occurred in population levels except in Huntley Twp where more than 55% of the buds on infested trees were damaged.
1963	Populations increased in Cumberland, Fitzroy, Gloucester, Goulbourn and North Elmsley twps, bud damage ranged from 8% to 47% in affected areas.
1964	Little change in population levels could be determined.
1965	Populations declined to a low level.
1966	trace population
1967	A light infestation occurred in Cumberland Twp, small numbers were observed at several points elsewhere.
1968	not reported
1969	A medium-to-heavy infestation was recorded in Goulbourn Twp, small numbers were observed at scattered points elsewhere.
1970-1980	not reported

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch [Major]

Year	Remarks
1950-1955	not reported
1956-1960	trace population
1961-1962	not reported
1963	Light leafmining occurred in Ramsay Twp.
1964	Light damage occurred in Beckwith and Goulbourn twps.
1965	Populations increased and caused moderate-to-severe defoliation through most of the eastern half of the district.
1966	Moderate-to-severe damage recurred in the eastern part of the district (see map, page).
1967	High populations persisted through most of the eastern half of the district (see map, page).
1968	The area of medium-to-heavy infestation decreased, however, high numbers persisted in the southeastern part of the district (see map, page).
1969	High populations persisted in the southeastern part of the district (see map, page).
1970	populations declined to a trace level.
1971	Populations increased and caused moderate-to-severe damage at scattered points in the eastern part of the district.
1972	High populations persisted in the eastern part of the district.
1973	populations declined to a trace level
1974	not reported
1975	High populations occurred on ornamental and shade trees in Ottawa.
1976	Pockets of light infestation occurred at widely scattered points.
1977	High populations recurred on ornamental and shade trees in Ottawa.
1978	trace populations
1979	Populations increased and caused moderate-to-severe damage in the Ottawa area and in Lavant and Dalhousie twps.
1980	High populations occurred at scattered points.

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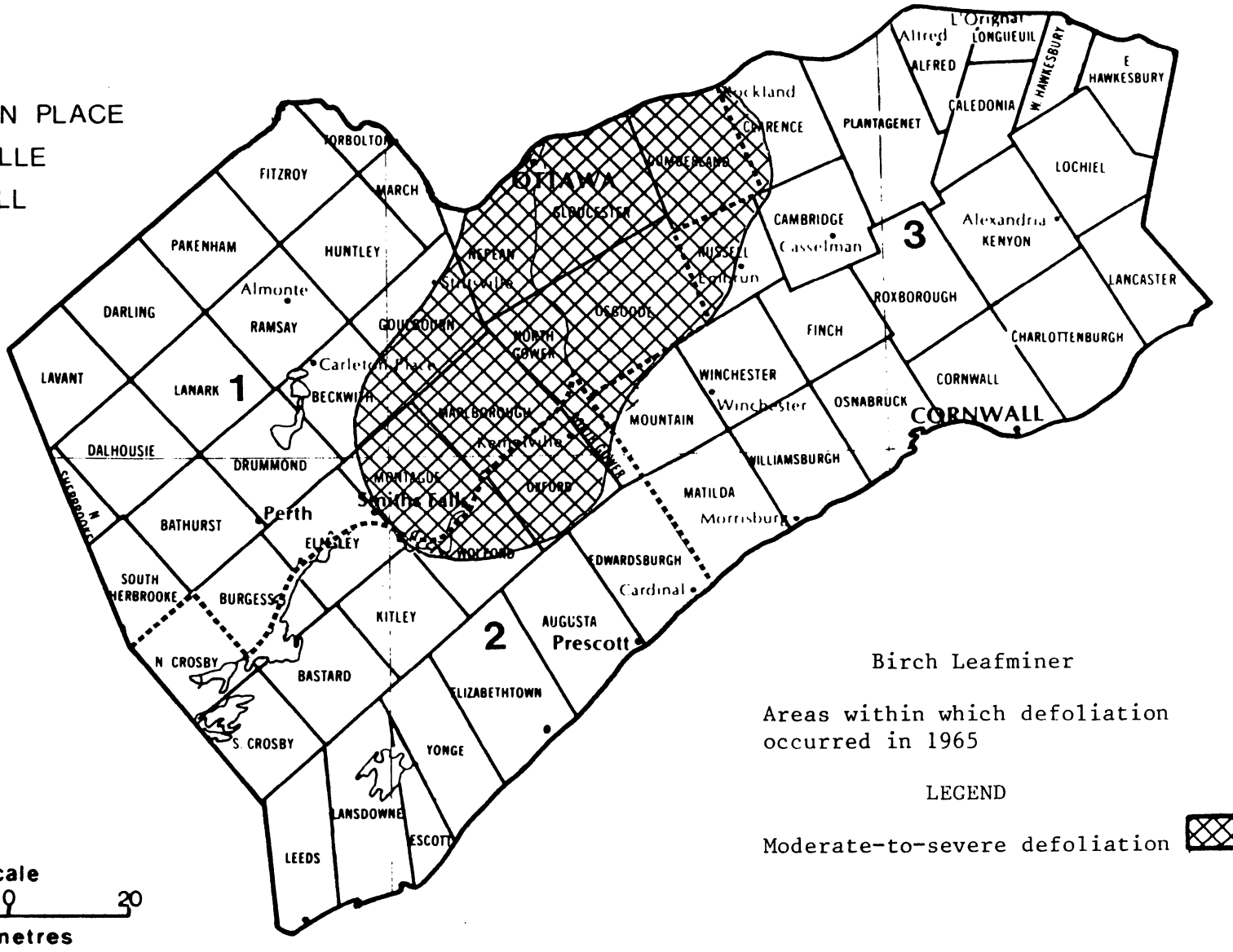

Scale
20 10 0 20
Kilometres

Birch Leafminer

Areas within which defoliation occurred in 1965

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

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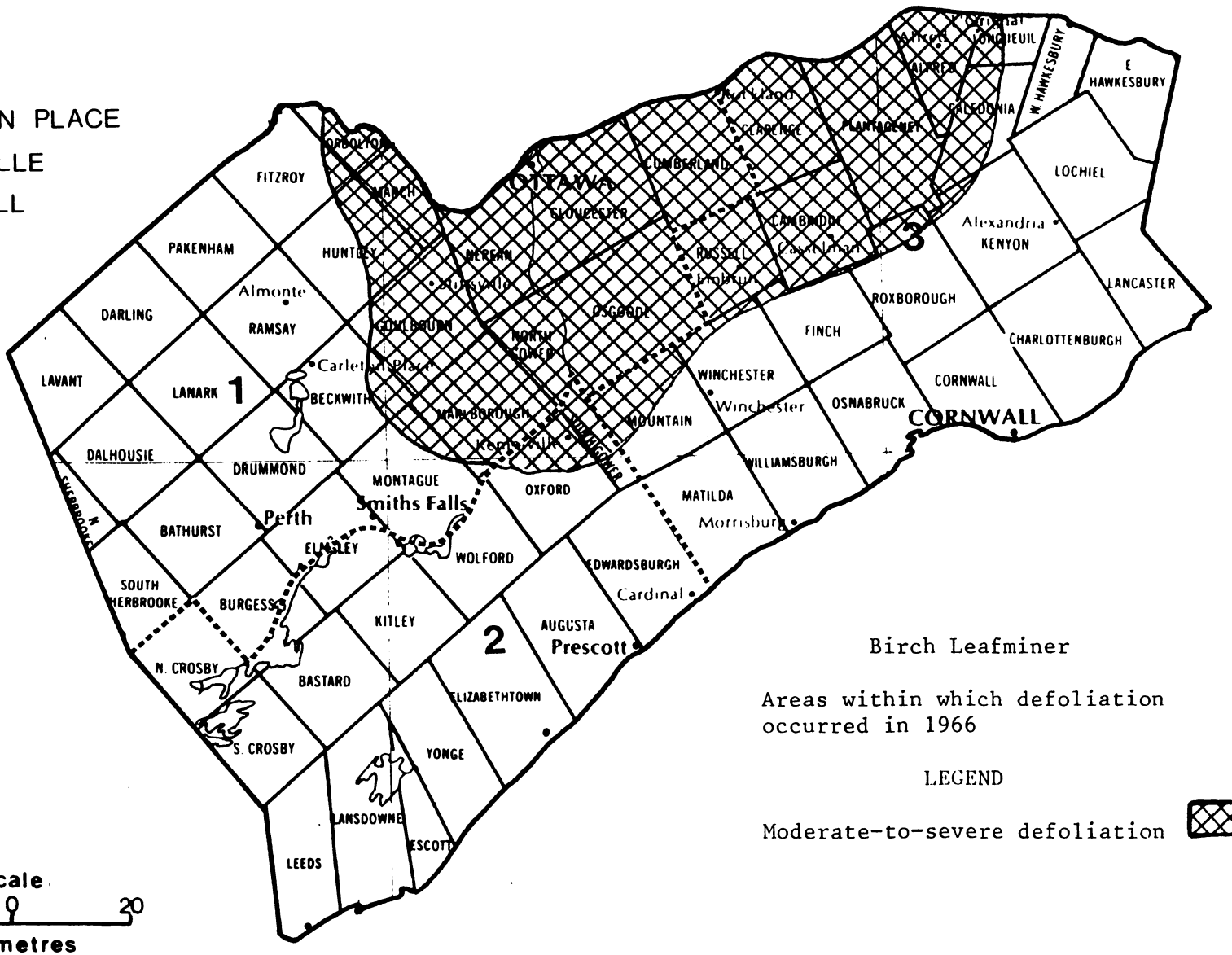
3. CORNWALL



Scale
20 10 0 20
Kilometres

Birch Leafminer

Areas within which defoliation occurred in 1966

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

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1. CARLETON PLACE
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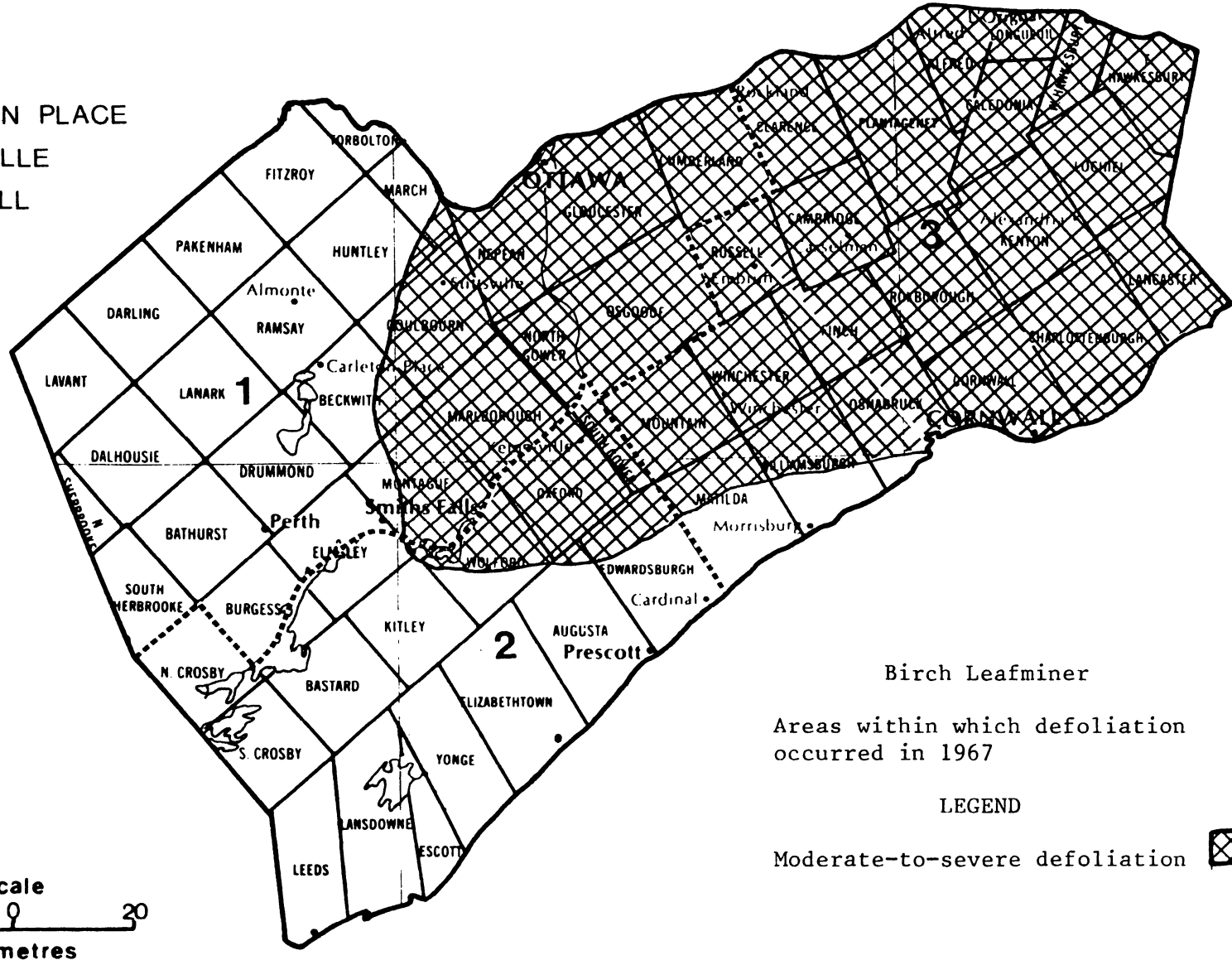
3. CORNWALL



Scale
20 10 0 20
Kilometres

Birch Leafminer

Areas within which defoliation occurred in 1967

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
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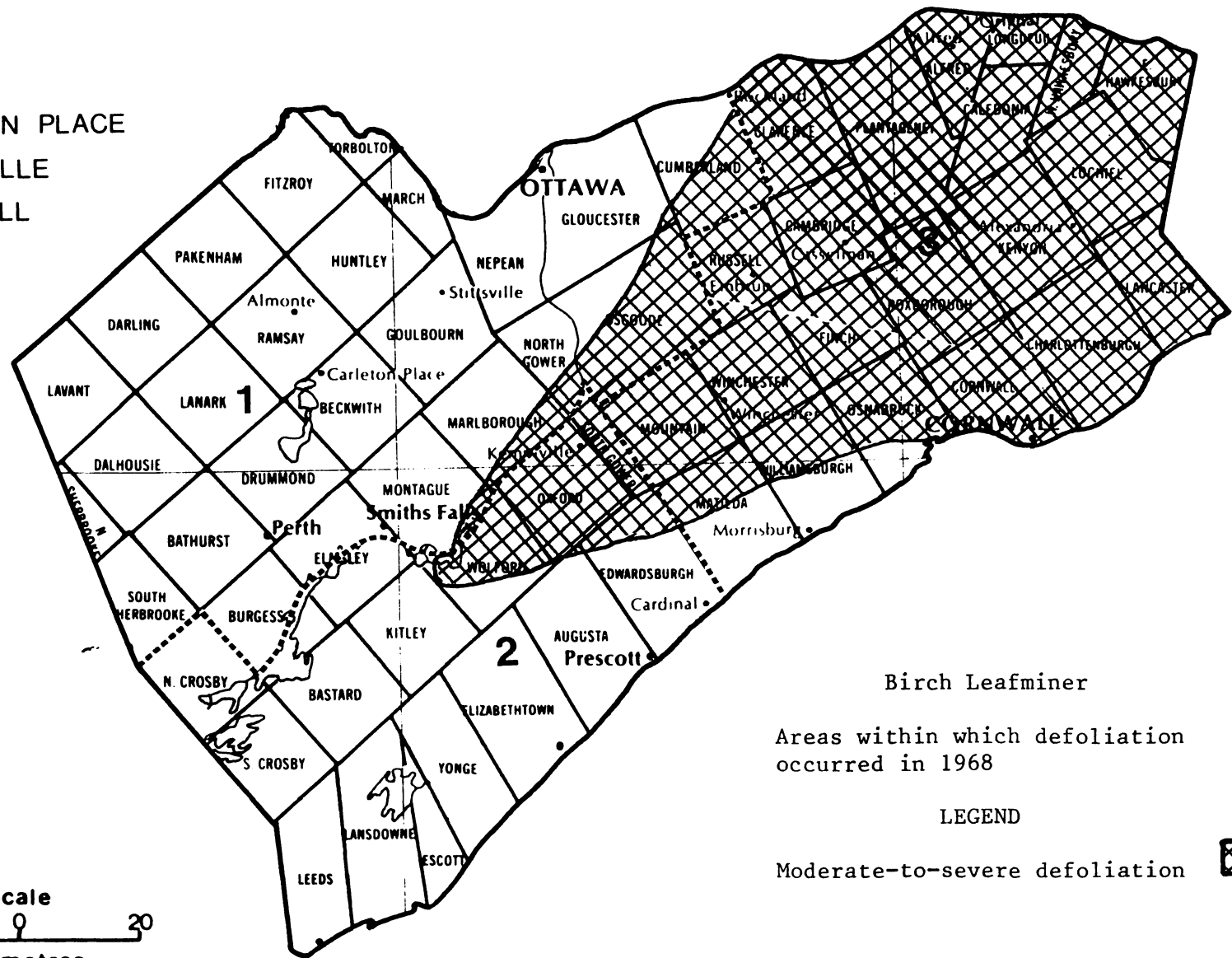
3. CORNWALL



Birch Leafminer

Areas within which defoliation occurred in 1968

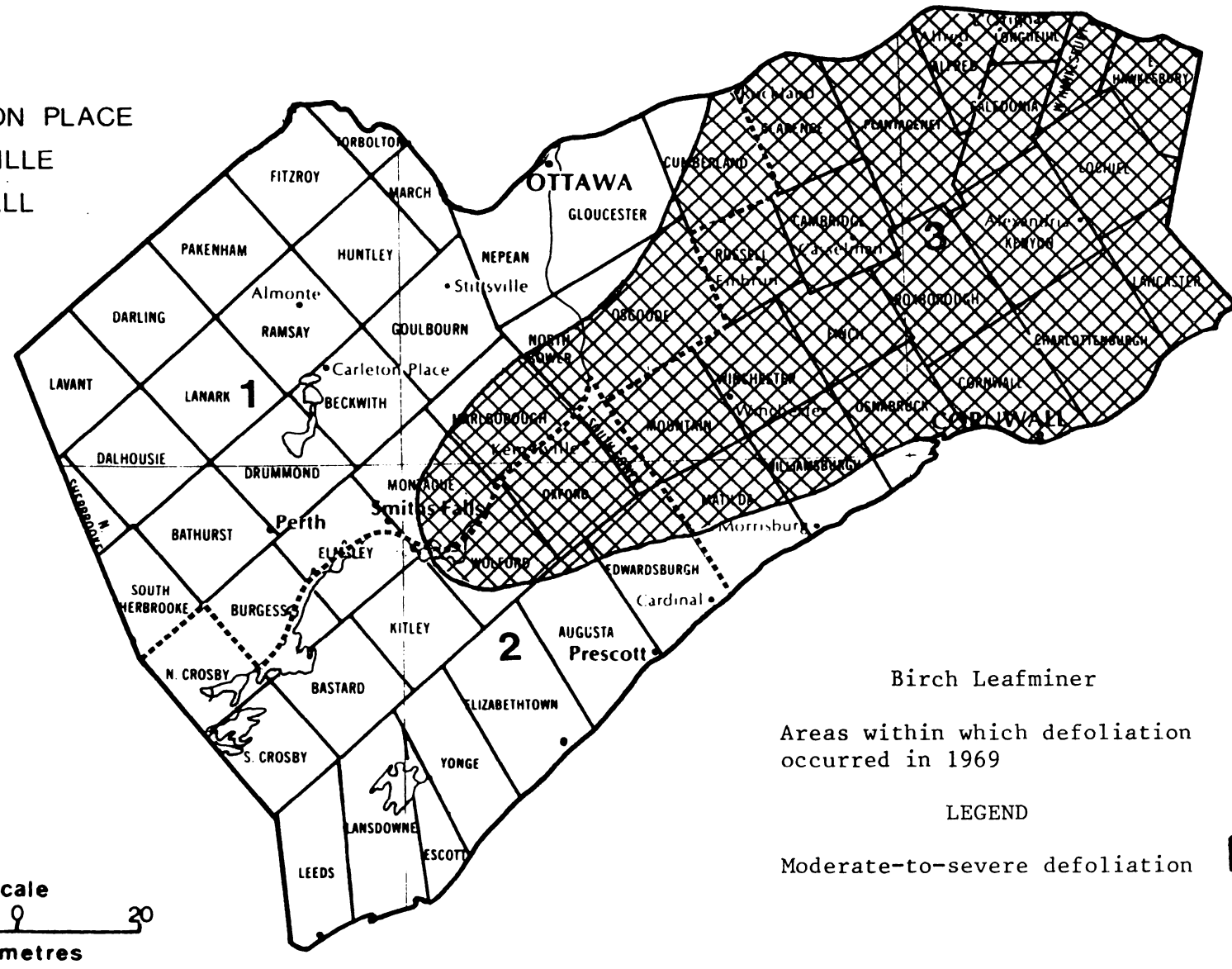
LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Birch Leafminer

Areas within which defoliation occurred in 1969

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

Fall Webworm, *Hyphantria cunea* (Dru.)

Host(s): deciduous [Major]

Year	Remarks
1950-1951	not reported
1952	light infestations at scattered locations
1953	not reported
1954	Light defoliation occurred at scattered points in Cumberland, Montague, Osgoode and Lanark twps.
1955	not reported
1956	Populations increased and caused light defoliation at numerous points in the district.
1957-1958	little change in populations evident
1959	Populations increased and caused moderate-to-severe defoliation in North Elmsley Twp. Small numbers of colonies were observed at many points elsewhere.
1960	low populations
1961	Populations increased markedly and caused moderate-to-severe defoliation in North Elmsley, Drummond and Beckwith twps. Small numbers were observed at numerous points elsewhere.
1962	Populations increased for the second consecutive year and caused moderate-to-severe defoliation at many locations.
1963	high populations recurred
1964	population declined to a low level
1965-1969	low populations
1970	not reported
1971	A medium-to-heavy infestation was recorded in Fitzroy Twp.
1972	The distribution of the insect increased resulting in pockets of medium-to-heavy infestations at numerous points.
1973	Pockets of moderate-to-severe defoliation were recorded in Huntley, Goulbourn twps, scattered colonies were observed at numerous points elsewhere.
1974	Medium-to-heavy infestations recurred and caused moderate-to-severe defoliation in Huntley, Goulbourn, Nepean, Gloucester and Lanark twps.
1975-1976	Medium-to-heavy infestations persisted at scattered points.
1977	Populations declined to low numbers.

(cont'd)

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

Year	Remarks
1978	low populations recurred
1979	Populations increased and caused moderate-to-severe defoliation in Fitzroy Twp. Colonies of the insect were observed at numerous points through the district.
1980	low populations at scattered points

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): deciduous [Major]

Year	Remarks
1950	Light defoliation occurred through an area of approximately 2,300 km^2 in the northwestern part of the district. Small pockets of damage were also evident in Nepean, Torbolton, Beckwith and Lanark twps (see map, page).
1951	A large area of medium-to-heavy infestation occurred in the western third of the district (see map, page).
1952	A marked increase in the area of infestation was recorded when moderate-to-severe defoliation was mapped through an area of approximately 7,400 km^2 (see map, page).
1953	Moderate-to-severe defoliation in host stands through most of the eastern half of the district (see map, page).
1954	Populations declined to a trace level.
1955-1964	not reported
1965	New medium-to-heavy infestations occurred in Goulbourn, Marlborough, Torbolton, Montague and Beckwith twps (see map, page).
1966	The area of infestation increased extending from the eastern district boundary, westward to Beckwith, Ramsay and Fitzroy twps (see map, page).
1967	Populations decreased markedly, leaving only one small area of light damage confined to Torbolton Twp.
1968-1969	trace population
1970-1971	not reported
1972	trace population in Lanark Twp
1973	not reported

(cont'd)

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. (concl.)

Year	Remarks
1974	A small pocket of light defoliation was found in Lanark Twp.
1975	A new pocket of medium-to-heavy infestation was found in South Sherbrooke Twp, light damage was evident in Lanark and Pakenham twps.
1976	Populations increased, moderate-to-severe defoliation occurred through an area of approximately 180 km^2 as well as in four small pockets at scattered points all in the western part of the district (see map, page).
1977	The area within which defoliation occurred increased in the western part of the district (see map, page). Moderate-to-severe defoliation occurred on aspens, red oak and sugar maple in the affected area.
1978	A marked decrease in the population level and area of infestation was evident when only light defoliation was found, confined to small areas in South Sherbrooke and Bathurst twps.
1979	populations collapsed
1980	not reported

Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF, spruce [Major]

Year	Remarks
1950-1953	not reported
1954	Moderate-to-severe defoliation occurred at widely scattered points.
1955-1956	not reported
1957	High populations caused moderate-to-severe defoliation in Gloucester Twp and light damage was observed in Lanark, Ramsay and Fitzroy twps.
1958	Moderate-to-severe defoliation was evident in Bathurst, Lanark and Fitzroy twps. Small numbers of colonies were observed elsewhere.
1959	Medium-to-heavy infestations persisted in Bathurst and Fitzroy twps. Light infestations were recorded in Beckwith and North Elmsley twps and scattered colonies were observed at numerous points elsewhere.
1960	Population declined to a low level except in North Elmsley Twp where a light infestation persisted.
1961-1965	not reported

(cont'd)

Balsam Fir Sawfly, *Neodiprion abietis* complex (concl.)

Year	Remarks
1966	trace numbers in Bathurst Twp
1967	A marked increase in populations occurred and caused moderate-to-severe defoliation in Pakenham, Torbolton and South Sherbrooke twps and light damage in Drummond Twp.
1968	High populations recurred and caused moderate-to-severe defoliation in Fitzroy, Pakenham, March, Torbolton, Lanark, Darling and Bathurst twps. Trace populations were observed at several points elsewhere.
1969	High populations persisted in the above townships and new medium-to-heavy infestations were recorded in Huntley, Lavant, Beckwith and Cumberland twps. New, light infestations were observed in Drummond, Montague and South Sherbrooke twps as well.
1970-1974	High populations persisted in the northwestern part of the district.
1975	A marked decrease in the area of infestation was evident when only very small pockets of damage could be found.
1976	populations collapsed.
1977-1980	not reported.

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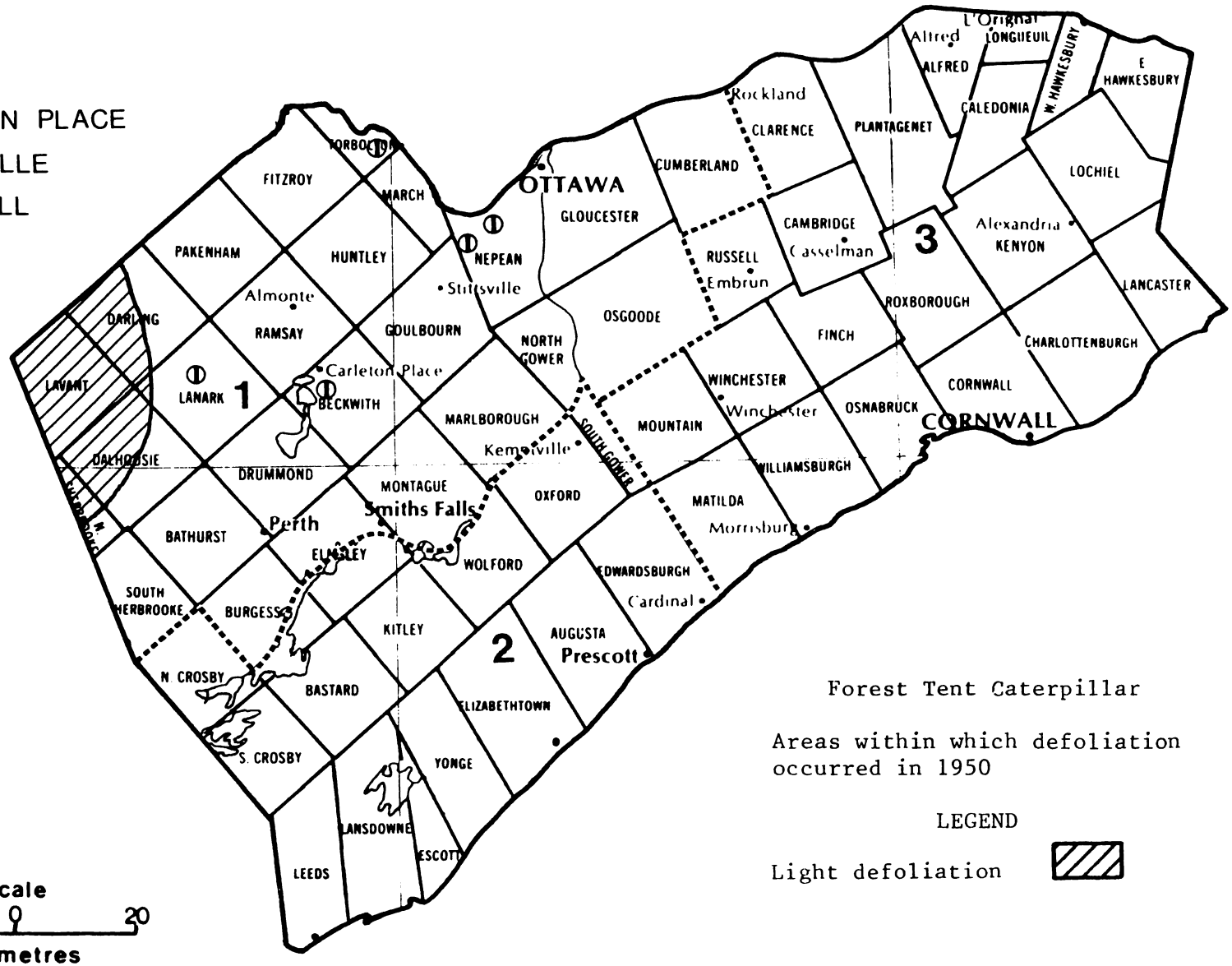

Forest Tent Caterpillar

Areas within which defoliation occurred in 1950

LEGEND

Light defoliation

Scale

20 10 0 20

Kilometres

Forest Insect and Disease Survey
Great Lakes Forestry Centre

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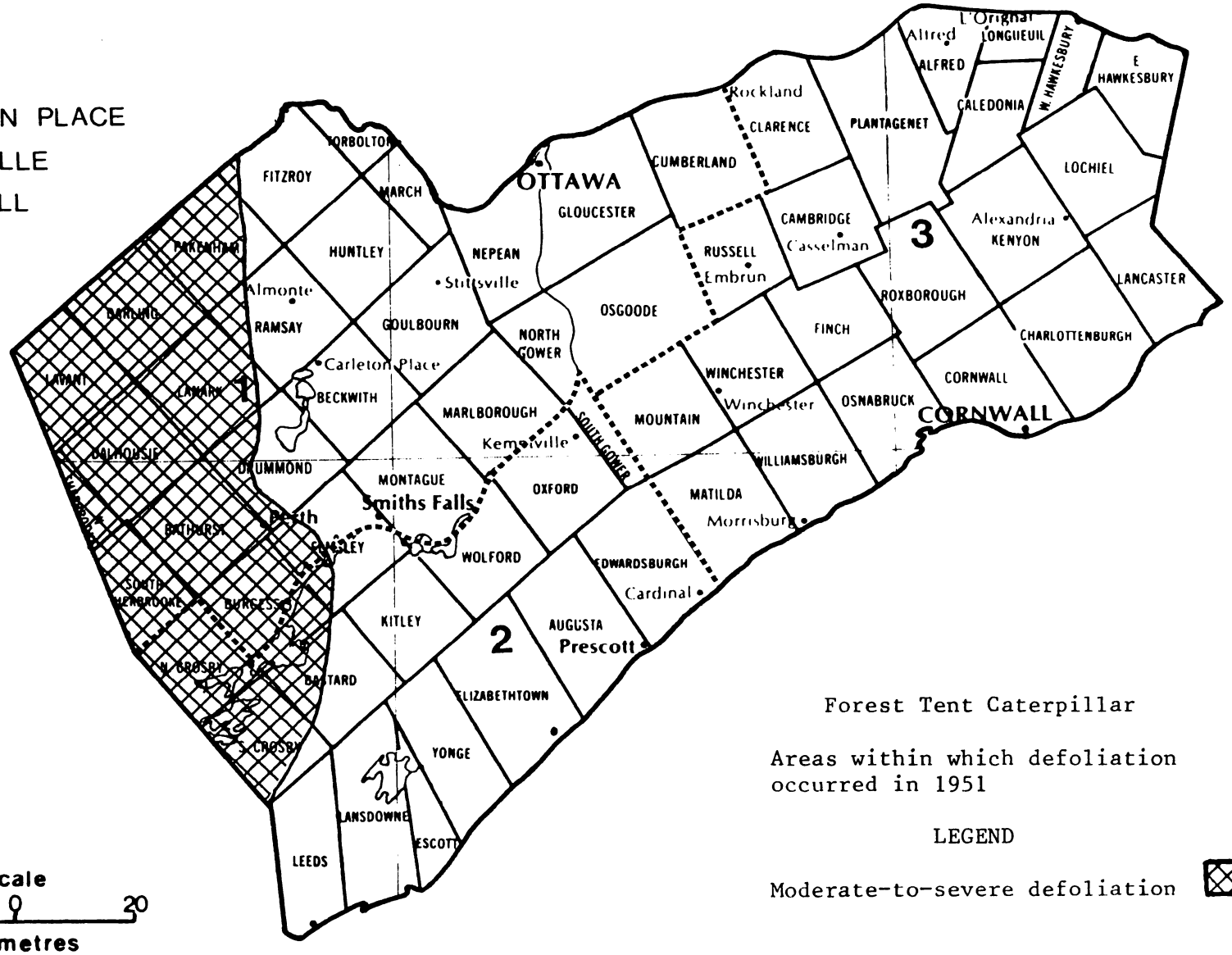

Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation

Scale

20 10 0 20

Kilometres

Forest Insect and Disease Survey
Great Lakes Forestry Centre

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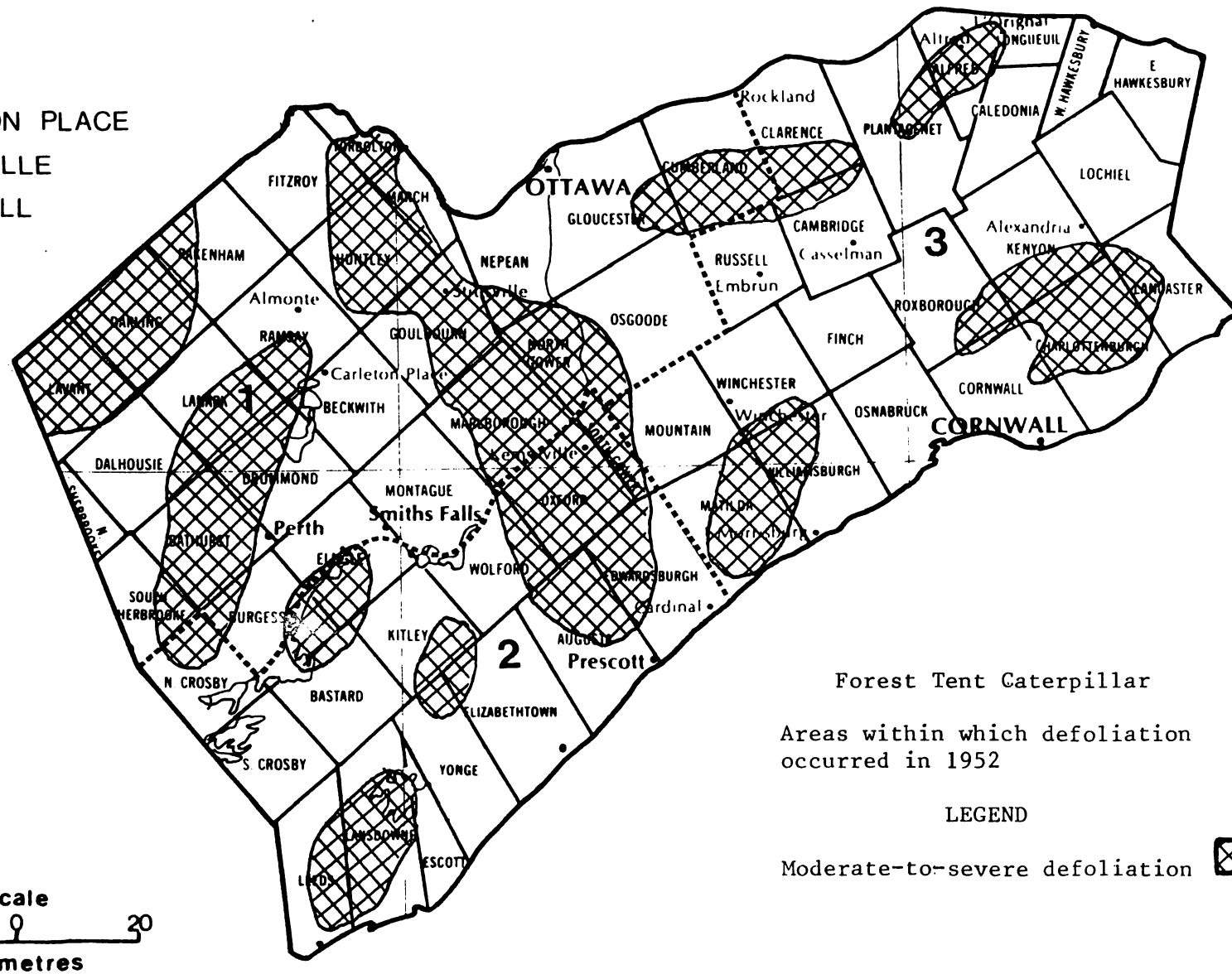

Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

LEGEND

Moderate-to-severe defoliation

Scale

20 10 0 20

Kilometres

Forest Insect and Disease Survey

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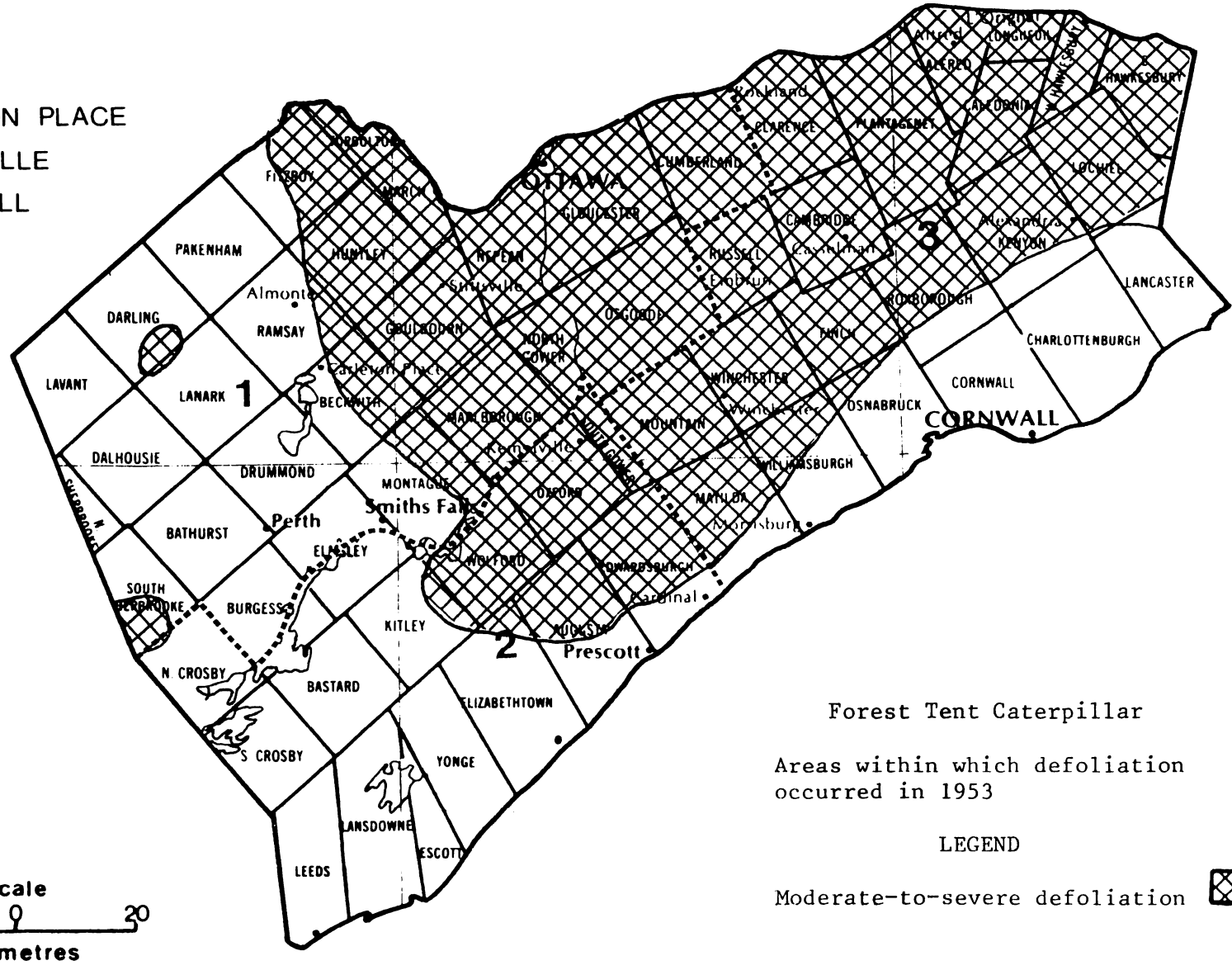
1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

LEGEND

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
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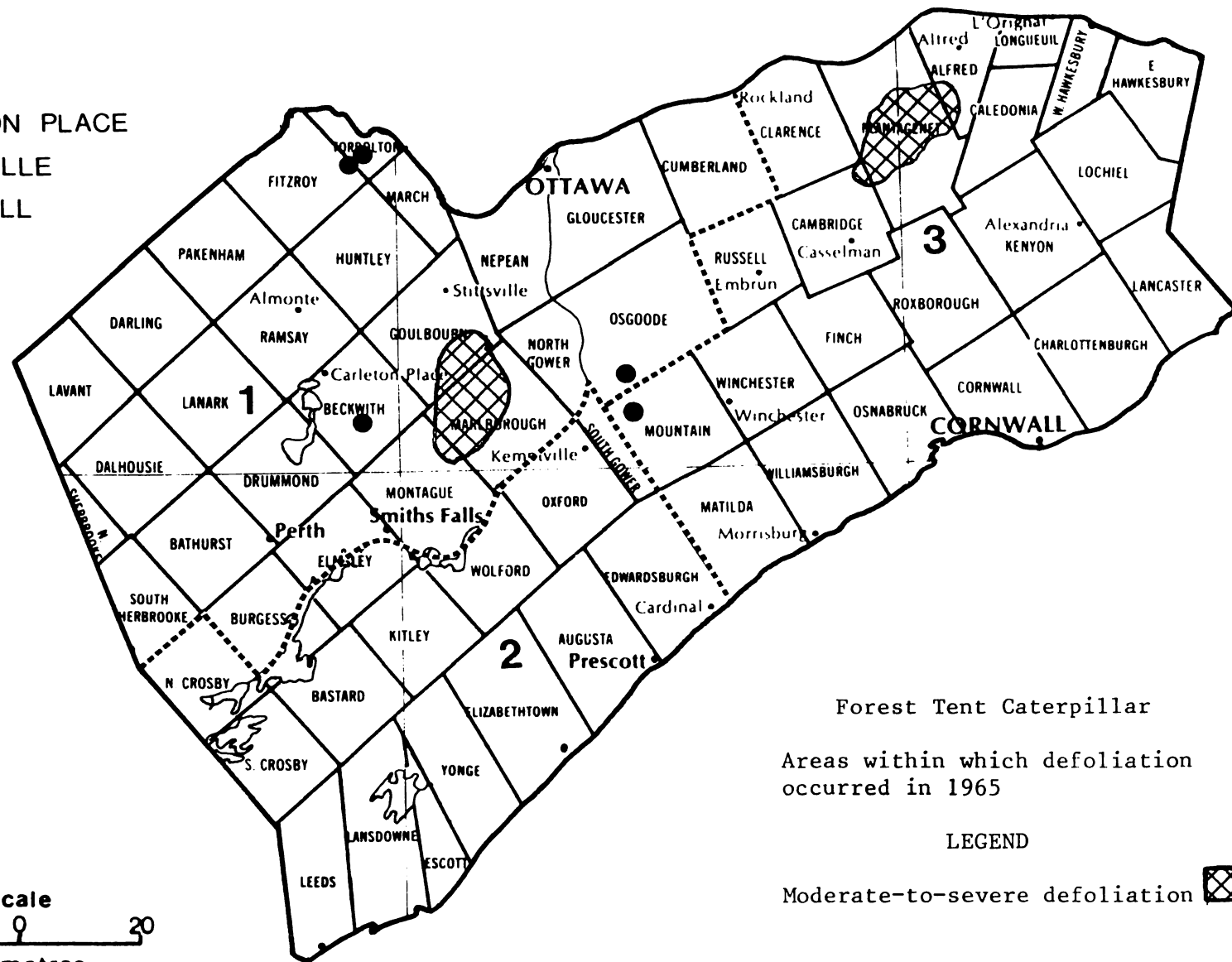
3. CORNWALL



Scale
20 10 0 20
Kilometres

Forest Tent Caterpillar

Areas within which defoliation occurred in 1965

LEGEND

Moderate-to-severe defoliation ▨ or ●

Forest Insect and Disease Survey
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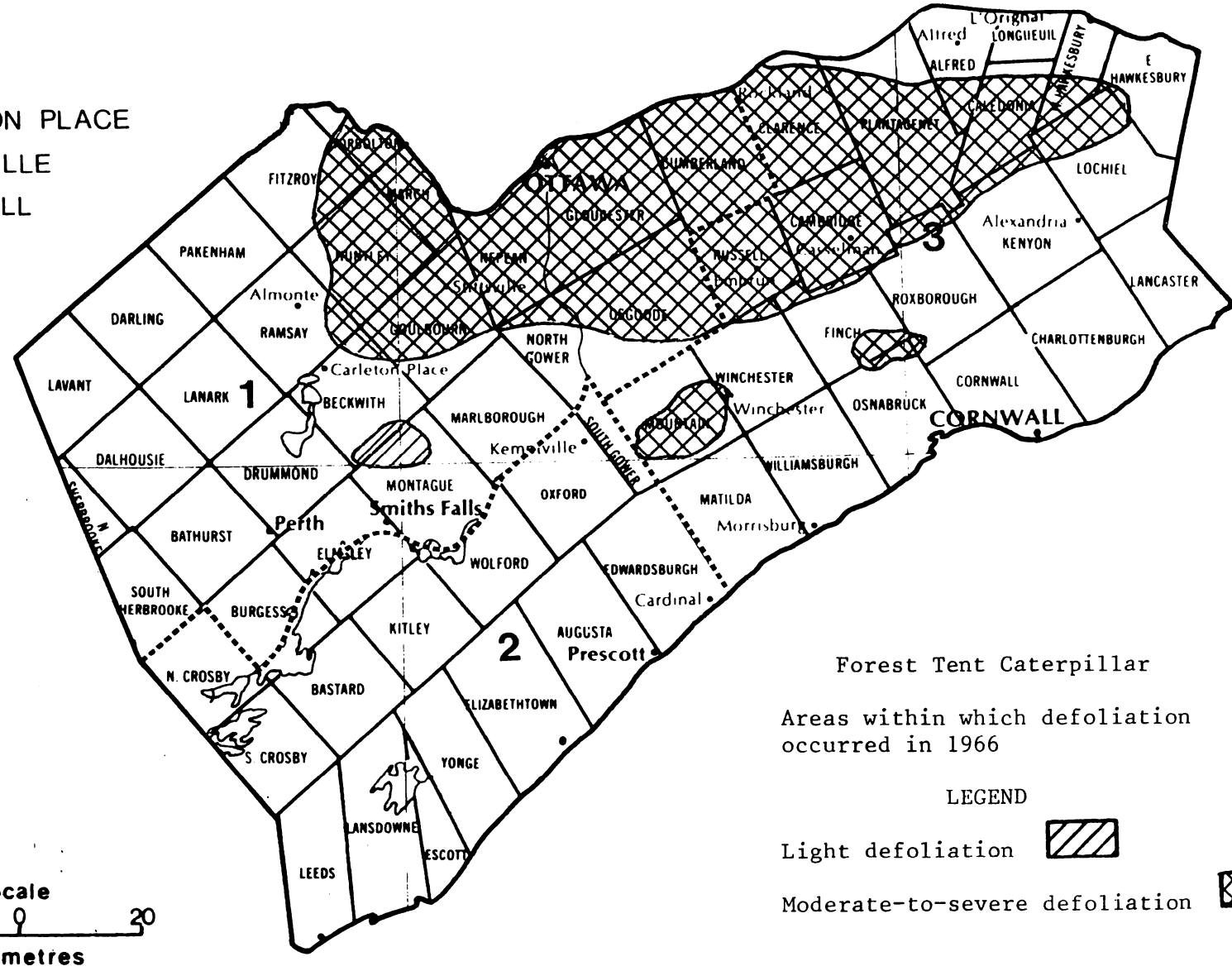
CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
2. BROCKVILLE
3. CORNWALL



Scale
20 10 0 20
Kilometres

Forest Tent Caterpillar

Areas within which defoliation occurred in 1966

LEGEND

Light defoliation

Moderate-to-severe defoliation

Forest Insect and Disease Survey
Great Lakes Forestry Centre

CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

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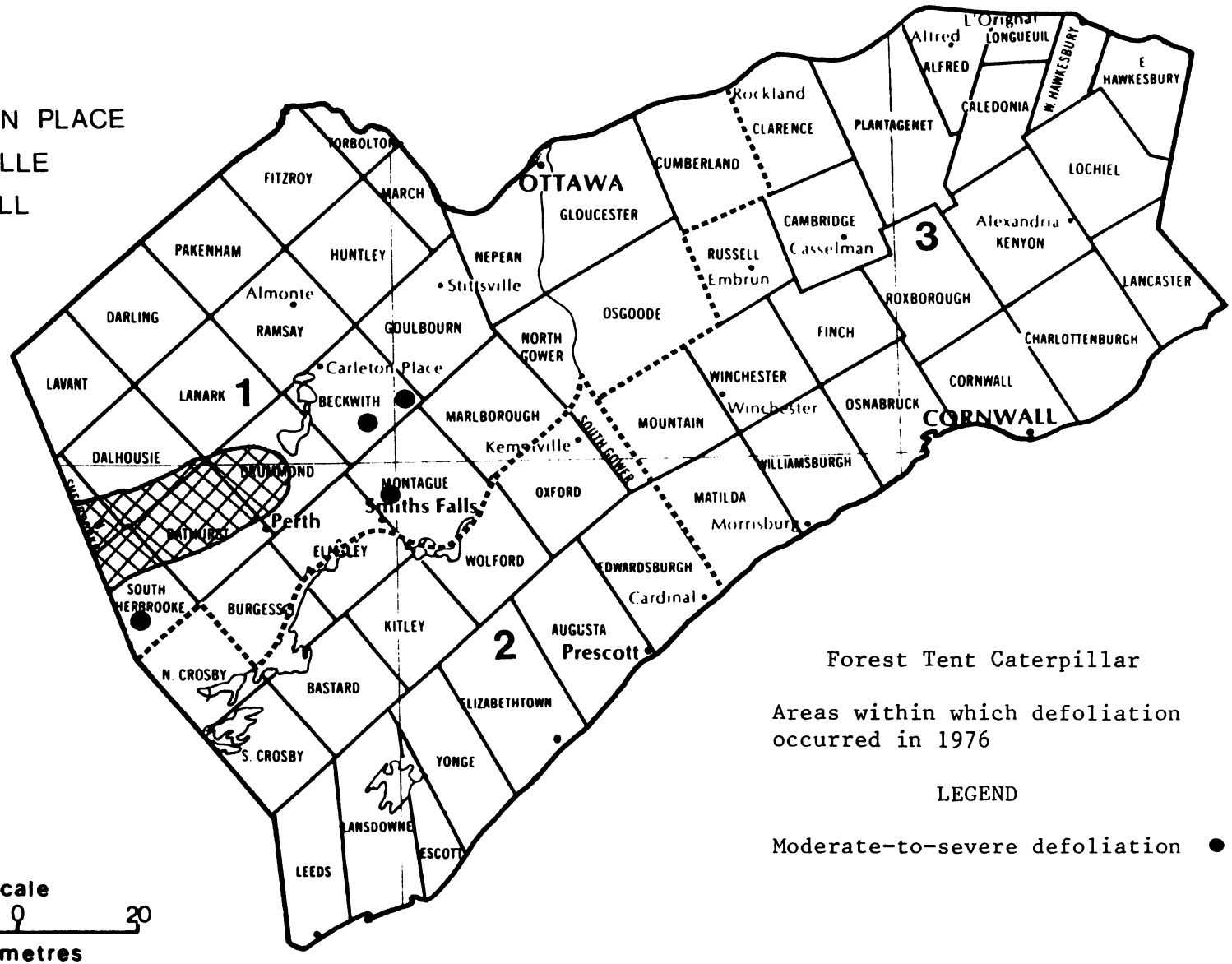

Scale

20 10 0 20

Kilometres

Forest Tent Caterpillar

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or ▨

Forest Insect and Disease Survey

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CARLETON PLACE, BROCKVILLE and CORNWALL DISTRICTS

1. CARLETON PLACE
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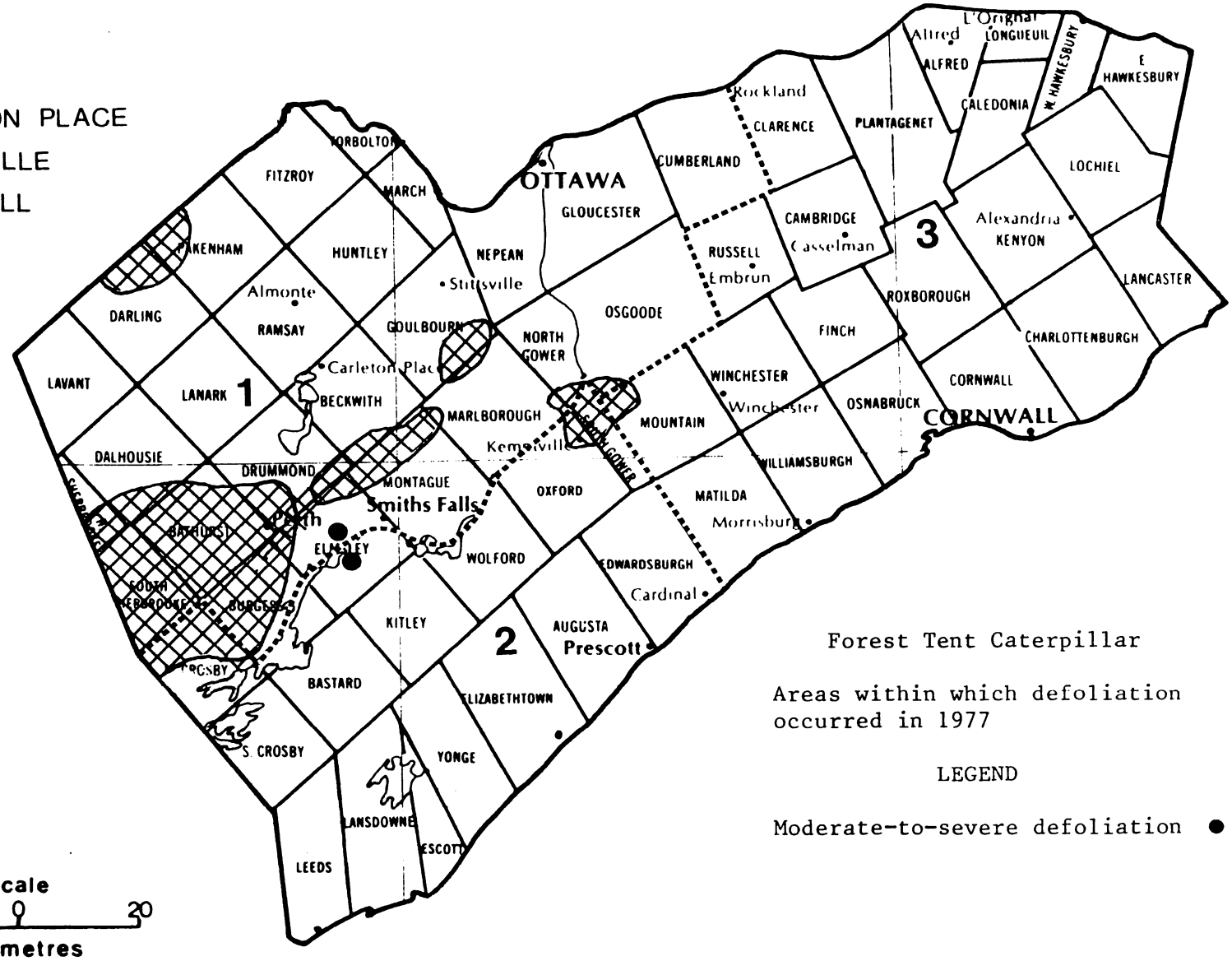
3. CORNWALL



Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation ● or

Scale

20 10 0 20

Kilometres

Forest Insect and Disease Survey

Great Lakes Forestry Centre

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Host(s): pine [Major]

Year	Remarks
1950	Light infestations of this serious pest of pines were widely distributed in plantations in the central part of the district (see map, page).
1951	Populations declined to a trace level.
1952	trace populations
1953	Light damage was observed at scattered locations (see map, page).
1954	Populations increased and caused moderate-to-severe damage in three areas and light damage at four points (see map, page).
1955	High populations recurred at four points and light defoliation was observed at scattered points elsewhere (see map, page).
1956	Populations decreased markedly; only one area of light infestation could be found.
1957	A low population persisted at scattered points.
1958	Populations increased and caused moderate-to-severe defoliation in Dalhousie, Lanark and Gloucester twps. Light damage was evident at scattered points elsewhere.
1959	A marked decline in the populations was recorded; only one small pocket of medium-to-heavy infestation was found.
1960	trace population
1961	Populations increased and caused moderate-to-severe damage in Lanark Twp and light damage in Bathurst and Dalhousie twps.
1962	Light defoliation recurred in Bathurst and Dalhousie twps and a new, light infestation was found in Elmsley Twp. Trace populations were evident at scattered points elsewhere.
1963	No appreciable change in populations could be determined.
1964	Populations decreased to a trace level.
1965	trace population
1966	Populations increased and caused moderate-to-severe damage in Darling Twp and light defoliation in Elmsley, Bathurst and Dalhousie twps.
1967	Populations increased for the second consecutive year and caused moderate-to-severe defoliation was recorded in Dalhousie, Darling and Lavant twps. Small numbers of colonies were observed at numerous points elsewhere.
1968	Populations declined to a trace level.

(cont'd)

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

Year	Remarks
1969	Populations remained low except in South Sherbrooke Twp where a medium-to-heavy infestation was recorded.
1970	not reported
1971	trace population
1972	A new pocket of medium-to-heavy infestation was found in Bathurst Twp.
1973	A medium-to-heavy infestation was found in North Burgess Twp.
1974	Moderate-to-severe damage occurred in Beckwith Twp.
1975	Light defoliation was recorded in Dalhousie and Lanark twps.
1976	Populations increased and caused close to 100% defoliation at one point in Marlborough Twp. Light defoliation was observed at scattered points elsewhere.
1977	High populations occurred at several points.
1978	A medium-to-heavy infestation caused serious damage in Dalhousie Twp.
1979	Light infestations were observed at numerous locations.
1980	Populations declined to a trace level.

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

Host(s): jP [Major]

Year	Remarks
1950-1951	A light infestation occurred in the Ottawa area.
1952	not reported
1953	light defoliation in the Ottawa area
1954	Moderate-to-severe defoliation occurred at one point in North Gower Twp.
1955	trace population at scattered points
1956	Light defoliation occurred in Ramsay Twp; trace damage was evident at scattered points elsewhere.
1957	Light defoliation occurred in Goulbourn Twp; small numbers of colonies were observed at widely separated points elsewhere.
1958	not reported
1959-1960	Light defoliation was evident in Goulbourn and Marlborough twps.
1961	trace populations
1962	not reported
1963-1964	A small pocket of medium-to-heavy infestation caused moderate-to-severe defoliation in Bathurst Twp.
1965	A small pocket of medium-to-heavy infestation occurred in Drummond Twp and small numbers were found at widely separated points.
1966	Marked increased in populations and distribution of this sawfly was evident when medium-to-heavy infestations were found in North Gower, Marlborough, Goulbourn and Lanark twps.
1967	Medium-to-heavy infestations recurred in Lanark and Marlborough twps and a new, medium-to-heavy infestation and a light infestation were recorded in Drummond and Ramsay twps, respectively.
1968	Moderate-to-severe defoliation recurred in Drummond and Lanark twps.
1969	Moderate-to-severe damage recurred in Drummond and Lanark twps and a new, medium-to-heavy infestation was recorded in Bathurst Twp.
1970	Medium-to-heavy infestations persisted in Drummond, Lanark and Bathurst twps.

(cont'd)

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross (concl.)

Year	Remarks
1971	High populations recurred in Drummond, Lanark and Bathurst twps and new pockets of medium-to-heavy infestations were recorded in Ramsay and Goulbourn twps.
1972-1974	High populations recurred at scattered points.
1975	Populations declined except in Lanark Twp where moderate-to-severe defoliation was evident.
1976	Pockets of medium-to-heavy infestations were found in Nepean Twp.
1977	Populations declined to a light intensity in Nepean Twp.
1978	Numbers increased and caused moderate-to-severe damage in Marlborough, Ramsay and Lavant Twps.
1979	High populations recurred in Ramsay and Lavant twps.
1980	A high population recurred in Ramsay Twp.

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

Host(s): spruce [Major]

Year	Remarks
1950	Varying degrees of damage were observed at several points.
1951-1955	Varying degrees of damage occurred on roadside windbreaks.
1956	A medium-to-heavy infestation caused moderate-to-severe damage in Lanark Twp and light defoliation was evident at numerous locations as well.
1957	Moderate-to-severe defoliation recurred in Lanark Twp and small numbers were commonly observed at scattered points through the district.
1958	Populations increased, high numbers were recorded at four points and light damage was observed at seven additional points.
1959	Varying degrees of damage recurred.
1960	Population decreased to a trace level.
1961	Light damage was observed in Marlborough, Osgoode and North Sherbrooke twps.
1962	trace population
1963	Moderate-to-severe defoliation was recorded in Beckwith Twp and trace numbers were evident at other points.

(cont'd)

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

Year	Remarks
1964	A pocket of moderate-to-severe defoliation was found in North Sherbrooke Twp and light damage was evident in South Sherbrooke Twp.
1965-1966	Varying degrees of damage was observed on ornamentals, shade trees and roadside windbreaks at scattered locations.
1967	Populations increased and caused moderate-to-severe damage in Fitzroy, Goulbourn, Lanark and South Sherbrooke twps. Pockets of light defoliation were evident at numerous locations elsewhere in the district.
1968	trace levels
1969	not reported
1970	A new, medium-to-heavy infestation was found in Bathurst Twp.
1971-1972	High numbers occurred at scattered points.
1973	Populations declined to a trace level.
1974	not reported
1975	Populations increased and caused moderate-to-severe defoliation at scattered locations.
1976	Populations decline, only light defoliation occurred.
1977-1978	not reported
1979	Moderate-to-severe defoliation was recorded in Lavant Twp.
1980	not reported

White Pine Weevil, *Pissodes strobi* (Peck)

Host)s): pine, spruce [Major]

Year	Remarks
1950	not reported
1951	High populations occurred in white pine plantations at several locations.
1952-1953	not reported
1954	Varying numbers occurred in white pine plantations and reproduction areas throughout the district.
1955	A high population was recorded in Torbolton Twp; light damage was observed at many points elsewhere.
1956	Populations declined to a low level.
1957-1966	Low populations persisted at several locations.
1967	Populations increased markedly and caused moderate-to-severe damage in Fitzroy, Torbolton and Dalhousie twps. In the latter mentioned township, 49% of the leaders were destroyed in one plantation.
1968	High populations recurred in Fitzroy and Dalhousie twps and a new, heavy infestation was recorded in Bathurst Twp.
1969	High populations recurred in the above townships where leader mortality ranged from 17% to 50% in stands examined. Small numbers were observed at many points elsewhere.
1970	High populations recurred in Fitzroy, Bathurst and Dalhousie twps; leader mortality ranged from 35% to 45% in stands examined.
1971	High populations recurred for the fifth consecutive year in Fitzroy and Dalhousie twps.
1972	High populations recurred in Fitzroy Twp and a new heavy infestation was recorded in Torbolton. Light damage was evident at several points elsewhere.
1973	High populations recurred in Fitzroy Twp and new, medium-to-heavy infestations were observed in Dalhousie and Bathurst twps.
1974	populations declined
1975	Moderate-to-severe damage occurred in Dalhousie Twp, small numbers occurred at scattered points elsewhere.
1976	Little change in population levels could be determined.
1977	Moderate-to-severe damage was recorded in Lanark Twp, elsewhere low numbers were commonly observed.

(cont'd)

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

Year	Remarks
1978	Moderate-to-severe damage occurred in Bathurst, North Sherbrooke and Lavant twps; light damage was evident at numerous points elsewhere.
1979-1980	not reported

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): tL [Major]

Year	Remarks
1950	trace populations in the Ottawa area
1951-1953	not reported
1954	Small pockets of medium-to-heavy infestations occurred in North Sherbrooke and Dalhousie twps.
1955-1958	not reported
1959	Light infestations occurred in South Sherbrooke, Dalhousie, Lanark, Huntley and Goulbourn twps.
1960	The distribution of the insect increased markedly and caused light defoliation at numerous points from Gloucester Twp westward to the district boundary.
1961	A pocket of medium-to-heavy infestation was recorded in Huntley Twp. Light damage was evident at scattered points elsewhere in the western part of the district.
1962	Populations declined to a trace level.
1963	Populations increased and caused light defoliation in Marlborough, Ramsay, South Sherbrooke and Dalhousie twps.
1964-1966	low populations at scattered points
1967	Moderate-to-severe defoliation occurred in Montague Twp. Low populations persisted at scattered points elsewhere.
1968	A slight increase in populations was noted when moderate-to-severe defoliation was recorded in Montague and Dalhousie twps. Small numbers were observed at numerous points elsewhere.
1969	Moderate-to-severe defoliation recurred in Montague and Dalhousie twps. Trace numbers were observed at scattered points elsewhere.
1970	not reported
1971-1975	trace populations at scattered points

(cont'd)

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Year	Remarks
1976	Populations increased and caused moderate-to-severe defoliation in Dalhousie, Lanark and Ramsay twps.
1977-1978	Pockets of medium-to-heavy infestations occurred at scattered points.
1979	Populations declined to a trace level.
1980	not reported

Other Noteworthy Insects

Birch Sawfly, *Arge pectoralis* (Leach)

Host(s): birch [Major]

Year	Remarks
1950-1951	not reported
1952	Light defoliation occurred in North Elmsley Twp.
1953	not reported

(cont'd)

Birch Sawfly, *Arge pectoralis* (Leach) (concl.)

Year	Remarks
1954	Light defoliation was observed in Ramsay Twp.
1955-1958	not reported
1959	Light defoliation occurred on open-grown white birch trees in Lanark Twp.
1960	The distribution of the insect increased and caused light defoliation in Lanark, Beckwith and Goulbourn twps. Defoliation was approximately 10% at each location.
1961	Populations declined; small numbers were recorded in Beckwith Twp.
1962-1967	not reported
1968-1970	trace populations
1971-1980	not reported

Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): larch [Major]

Year	Remarks
1950-1955	not reported
1956	Low populations occurred in Darling, Dalhousie, Montague and Goulbourn twps.
1957	low populations recurred
1958-1961	trace populations
1962	A light infestation occurred at one point in Montague Twp. Trace populations were observed at scattered points elsewhere.
1963	A light infestation recurred in Montague Twp and trace numbers were present at other points examined.
1964-1965	No change in population levels could be determined.
1966-1967	A light infestation persisted in Montague Twp and increased numbers were evident at numerous points elsewhere.
1968	Populations increased and caused moderate-to-severe defoliation in Goulbourn, Ramsay and Lavant twps.
1969-1980	not reported

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine [Major]

Year	Remarks
1950-1958	not reported
1959-1960	Small numbers were observed on white pine at widely separated points.
1961-1962	not reported
1963	Light shoot damage occurred in a red pine plantation in Lanark Twp.
1964-1966	not reported
1967	A medium-to-heavy infestation occurred in a Scots pine plantation in Beckwith Twp; small numbers were observed elsewhere.
1968	not reported
1969	Light infestations occurred in Beckwith and Marlborough twps.
1970	trace population at scattered points
1971	Populations increased and caused light damage at several locations.
1972-1973	not reported
1974	A new medium-to-heavy infestation occurred in a red pine plantation in Goulbourn Twp.
1975-1980	not reported

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

Host(s): jP [Major]

Year	Remarks
1950	High populations occurred at one point in Montague Twp.
1951-1953	not reported
1954	low populations at scattered points
1955-1957	not reported
1958	trace population
1959-1980	not reported

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

Host(s): spruce [Minor]

Year	Remarks
1950	not reported
1951	trace populations
1952	not reported
1953	A light population occurred in Pakenham Twp; small numbers were recorded at scattered points elsewhere.
1954	trace population
1955	not reported
1956-1958	Small numbers were observed in South Sherbrooke, Drummond and Ramsay twps.
1959	Although populations remained at a low level, the sawfly was found at numerous points in the district.
1960-1968	populations remained low
1969	not reported
1970	low population
1971	not reported
1972	trace population in Beckwith Twp
1973	trace population at scattered points
1974-1980	not reported

Sugar Maple Borer, *Glycobius speciosus* (Say)

Host(s): maple [Major]

Year	Remarks
1950	not reported
1951	Light damage was observed in maple woodlots at scattered points in the western part of the district.
1952-1956	not reported
1957	Varying degrees of damage occurred in several maple woodlots in the western part of the district.
1958-1980	not reported

Eastern Tent Caterpillar, *Malacosoma americanum* F.

Host(s): cherry, apple [Major]

Year	Remarks
1950	not reported
1951	pockets of light infestation widely distributed through district
1952	not reported
1953-1954	light infestations observed at many locations
1955	Populations declined to low numbers.
1956-1960	trace population at widely separated points
1961	Populations increased and caused light defoliation at numerous points in the western part of the district.
1962	Populations increased for the second consecutive year and caused moderate-to-severe defoliation of host trees at scattered points.
1963	Little change in numbers were observed over the previous year.
1964	Little change in population levels; moderate-to-severe defoliation occurred at scattered points.
1965	A general increase in the population of the caterpillar was evident in the district.
1966	High populations persisted and caused moderate-to-severe defoliation at several locations in the north central part of the district.
1967	High populations recurred at several locations.
1968-1969	not reported
1970-1978	Small pockets of medium-to-heavy damage was evident at scattered points.
1979-1980	Populations declined to a low level.

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

Host(s): birch [Minor]

Year	Remarks
1950-1970	not reported
1971	The first time recorded in the district, a new infestation in Bathurst Twp caused moderate-to-severe damage to white birch in the area.
1972-1973	Populations declined to a low level in Bathurst Twp.
1974-1980	not reported

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

Host(s): deciduous [Major]

Year	Remarks
1950	not reported
1951	A medium-to-heavy infestation of the spring cankerworm caused moderate-to-severe defoliation in white elm stands in March and Drummond twps.
1952	Moderate-to-severe defoliation by the spring cankerworm recurred in March Twp.
1953	Moderate-to-severe defoliation ranging up to 100% by the fall cankerworm occurred at scattered points in Ramsay, Beckwith, Bathurst, North Sherbrooke and South Sherbrooke twps.
1954	Medium-to-heavy infestations of the fall cankerworm occurred in Ramsay and Bathurst twps. Elsewhere populations declined to low numbers.
1955	populations collapsed
1956	trace populations of cankerworms at scattered locations
1957-1958	not reported
1959	trace population of fall cankerworm
1960-1966	not reported
1967	Moderate-to-severe defoliation caused by the above cankerworms was recorded in Goulbourn Twp. Light damage occurred in Pakenham, Fitzroy and Huntley twps.
1968	High populations persisted and caused moderate-to-severe defoliation in Fitzroy, Pakenham, North Gower, Goulbourn and Beckwith twps.
1969	The cankerworms caused moderate-to-severe defoliation in Lavant, Pakenham and North Gower twps.
1970	Moderate-to-severe defoliation recurred in Pakenham Twp and heavy damage was evident in Fitzroy Twp.
1971-1975	not reported
1976	Moderate-to-severe defoliation by the fall cankerworm was observed on roadside and fencerow elms at several points in Fitzroy, Nepean, Ramsay and Drummond twps.
1977	High populations of the fall cankerworm recurred and caused moderate-to-severe defoliation at many locations in the western half of the district.
1978	populations collapsed, only small numbers observed
1979-1980	not reported

Maple Leafcutter, *Paraclemensia acerifoliella* (Fitch)

Host(s): maple [Major]

Year	Remarks
1950-1958	not reported
1959	A pocket of moderate-to-severe damage was recorded in South Sherbrooke Twp.
1960	A marked increase in the population and distribution of this casebearer occurred. Medium-to-heavy infestations were recorded in North Sherbrooke, South Sherbrooke and Bathurst twps. Light damage was evident in Dalhousie and Montague twps.
1961	A small area of moderate-to-severe defoliation was recorded in South Sherbrooke Twp and light damage was evident at several points elsewhere in the western part of the district.
1962	Pockets of moderate-to-severe damage occurred in Dalhousie, Drummond, Montague and March twps.
1963	Populations declined to low numbers causing only light damage at scattered points in the western half of the district.
1964-1965	Light infestations persisted at scattered points.
1966	trace populations
1967-1980	not reported

Mountain Ash Sawfly, *Pristiphora geniculata* (Htg.)

Host(s): mountain-ash [Major]

Year	Remarks
1950-1951	not reported
1952	High populations caused moderate-to-severe defoliation of ornamentals in the Ottawa area.
1953	not reported
1954	trace damage evident in Drummond Twp
1955	Moderate-to-severe defoliation occurred on ornamentals in the Ottawa area.
1956	Populations declined to a trace level.
1957	not reported
1958	trace population
1959	Light defoliation was observed in Cumberland Twp.
1960-1961	not reported
1962-1964	trace population in Bathurst Twp
1965	trace populations in Bathurst and Goulbourn Twps
1966-1968	Although populations remained low, small numbers were observed at numerous points through the district.
1968-1970	not reported
1971	low population at scattered points
1972-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1951	trace population in the Ottawa area
1952	not reported
1953	trace population in the Ottawa area
1954-1980	not reported

D I S E A S E S

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

Host(s): coniferous, deciduous [Major]

Year	Remarks
1950-1953	not reported
1954	A low incidence of infections was evident at widely scattered points.
1955-1956	not reported
1957	Low levels of infection occurred in plantations at scattered locations.
1958	not reported
1959	Light tree mortality occurred in jack pine plantations in Ramsay and Torbolton twps.
1960-1963	not reported
1964	Light infection occurred at widely scattered points in the district.
1965	Pockets of infections occurred in Bathurst and Ramsay twps. Disease evaluations in these areas revealed an incidence of 7% and 23% mortality in the above townships, respectively.
1966	Small pockets of infection and light tree mortality was evident at scattered points.
1967	Light mortality occurred in a mixed pine plantation in Nepean Twp.
1968-1970	not reported
1971	Moderate-to-severe damage occurred in a beech stand in Lavant Twp.
1972-1974	not reported
1975	light tree mortality recorded in Torbolton and Dalhousie twps
1976-1980	low infections

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

Host(s): pines [Major]

Year	Remarks
1950-1966	not reported
1967	The first record of this serious disease of pines causing damage in the district was established when a pocket of infected trees was found in a juvenile, red pine plantation in Lanark Twp. The area was sanitized.
1968-1980	not reported

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

Host(s): elm [Major]

Year	Remarks
1950-1951	not reported
1952	collected at seven locations in the eastern part of the district
1953-1955	small numbers of new infections recorded in the eastern part of the district
1956-1958	No change in the distribution of this pathogen could be determined.
1959	The first record of the disease was obtained in the western part of the district when one infected tree was found in Bathurst Twp.
1960-1963	The incidence of this pathogen increased throughout the district.
1964	Diseased trees are present throughout the district. Two per cent tree mortality was recorded in Drummond and Goulbourn twps.
1965	The incidence of infection increased throughout the district. Tree mortality caused by the pathogen averaged 2% and 4% in Goulbourn and Drummond twps, respectively.
1966	The incidence of infection and tree mortality continued to increase.
1967	The incidence of infection continued to increase.
1968	The incidence of infection continued to increase; considerable tree mortality occurred.
1969	The pathogen continued to cause serious damage in stands throughout most of the district. Disease evaluations in March, Bathurst and Drummond twps revealed that the incidence of infection was 39%, 9% and 27%, respectively.
1970	Serious damage continued; an incidence of 11% infection was recorded in Pakenham Twp.
1971	An incidence of 11% infection was recorded in North Elmsley Twp.
1972-1980	Varying levels of infection continued and widespread mortality was evident.

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

Host(s): tA [Major]

Year	Remarks
1950-1957	not reported
1958-1960	low infection level at scattered points
1961-1963	not reported
1964	Pockets of moderate-to-severe defoliation occurred at scattered locations.
1965	not reported
1966-1968	Light defoliation occurred at a small number of points.
1969-1980	not reported

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur

Host(s): pines [Major]

Year	Remarks
1950-1966	not reported
1967	Light infection occurred in a jack pine stand in Torbolton Twp, marking the first record of this pathogen in the district.
1968	Surveys in Torbolton Twp revealed an incidence of 5% infection in one of the stands examined.
1969-1980	not reported

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

Host(s): wP [Major]

Year	Remarks
1950-1952	not reported
1953	Light damage occurred in the Fitzroy Harbour area.
1954	Surveys revealed a 50% incidence of infection in a plantation in Gloucester Twp.
1955-1958	not reported
1959-1965	varying amounts of infection present in most white pine stands in the district
1966	An incidence of 10% infection was recorded in Torbolton Twp; elsewhere varying degrees of infection occurred in many white pine stands.
1967	Little change in the incidence of infection could be determined. Disease evaluations in March and Darling twps revealed an incidence of 7.5%.
1968	The incidence of infection remained at 7.5% in March Twp, however, it increased to 12.5% in Darling Twp, an increase of 5% over the previous year.
1969-1974	not reported
1975	An incidence of 21.5% infection was recorded in a juvenile, white pine plantation in Nepean Twp; varying degrees of infection observed elsewhere.
1976-1978	not reported
1979-1980	common throughout the district

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

Host(s): Poplar [Major]

Year	Remarks
1950-1952	not reported
1953	A survey to determine the distribution of this pathogen revealed that the pathogen was present in most aspen stands in the district.
1954	Little change in the incidence of this disease could be determined.
1955	common throughout the district
1956-1959	not reported
1960-1964	common throughout the district
1965	common throughout the district; light tree mortality observed at numerous points
1966	not reported
1967	low levels of infection
1968	common throughout the district; an incidence of 30% infection was recorded in Darling Twp
1969-1974	not reported
1975-1980	light damage widespread throughout the district

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

Host(s): tA [Major]

Year	Remarks
1950-1960	not reported
1961-1963	light defoliation through the district
1964-1965	Small areas of moderate-to-severe defoliation was evident at scattered locations.
1966	Moderate-to-severe defoliation occurred in Bathurst and Marlborough twps.
1967-1968	trace damage on fringes of stands at widely separated points
1969	trace in Lavant Twp
1970-1973	not reported
1974	Light shoot mortality was evident in most stands.
1975	A high incidence of infection occurred on fringes of stands throughout the district.
1976-1977	Pockets of light or moderate-to-severe damage was observed at numerous locations.
1978-1980	not reported

Other Noteworthy Diseases

Anthracnose, *Aureobasidium apocryptum* (Ell. & Ev.) Hermanides-Nijof
Discula quercina (Westend.) v. Arx

Host(s): [Minor]

Year	Remarks
1979-1980	*A. apocryptum* - Moderate-to-severe foliage damage occurred at scattered points in sugar maple stands in Lavant Twp.
1961	*D. quercina* - Light damage was recorded in red oak stands in North Elmsley Twp.
1974	*D. quercina* - Light damage was recorded in red oak stands in Beckwith Twp.

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

Host(s): pines [Major]

Year	Remarks
1950-1968	not reported
1969	Moderate-to-severe foliage damage occurred in Darling Twp and traces of infection were observed at scattered locations elsewhere.
1970	not reported
1971	Moderate-to-severe foliage occurred in a 15-ha red pine plantation in Nepean Twp.
1972-1973	not reported
1974-1975	Light damage was observed at widely separated points.
1976	Light defoliation occurred in Nepean and Fitzroy twps.
1977	Moderate-to-heavy foliage damage was recorded in red pine plantations in Lanark, Dalhousie and Nepean twps.
1978	The level of infection decreased, leaving only light damage confined to a red pine plantation in Nepean Twp.
1979	trace in a jack pine plantation in Huntley Twp
1980	not reported

Eutypella Canker, Eutypella parasitica Davidson & Lorenz

Host(s): sM, rM [Major]

Year	Remarks
1950-1968	not reported
1969	A high incidence of infection was recorded in Drummond, South Sherbrooke, Dalhousie and Lavant twps.
1970-1980	not reported

A B I O T I C D A M A G E

Frost

Year	Remarks
1950-1962	not reported
1963	Late spring frosts caused moderate-to-severe damage to the current foliage of most tree species in the district.
1964	More than 90% of the current shoots on balsam fir and white spruce trees were damaged by late frosts. Varying degrees of damage also occurred in black ash and sugar maple stands at scattered points as well.
1965-1966	not reported
1967	Light foliage damage was evident on deciduous and coniferous tree species at scattered points in Beckwith Twp.
1968-1979	not reported
1980	Light foliage damage occurred on most tree species in the western part of the district.

Ice

Year	Remarks
1950-1952	not reported
1953	An ice storm in the winter of 1952-1953 caused serious damage to many deciduous hosts, causing many broken branches in tree crowns. Open-grown elms were generally the most seriously damaged.
1954-1968	not reported
1969	Moderate-to-severe branch damage occurred in Scots pine plantations, eastern cedar and deciduous stands at several locations.
1970-1978	not reported
1979-1980	Occasional red pine plantations in Lanark and Marlborough twps were seriously damaged. Many sprung or broken branches were evident.

A P P E N D I C E S

APPENDIX A

DECIDUOUS HOST

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

(continued)

APPENDIX A (continued)

DECIDUOUS HOST

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

APPENDIX B

CONIFEROUS HOST

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

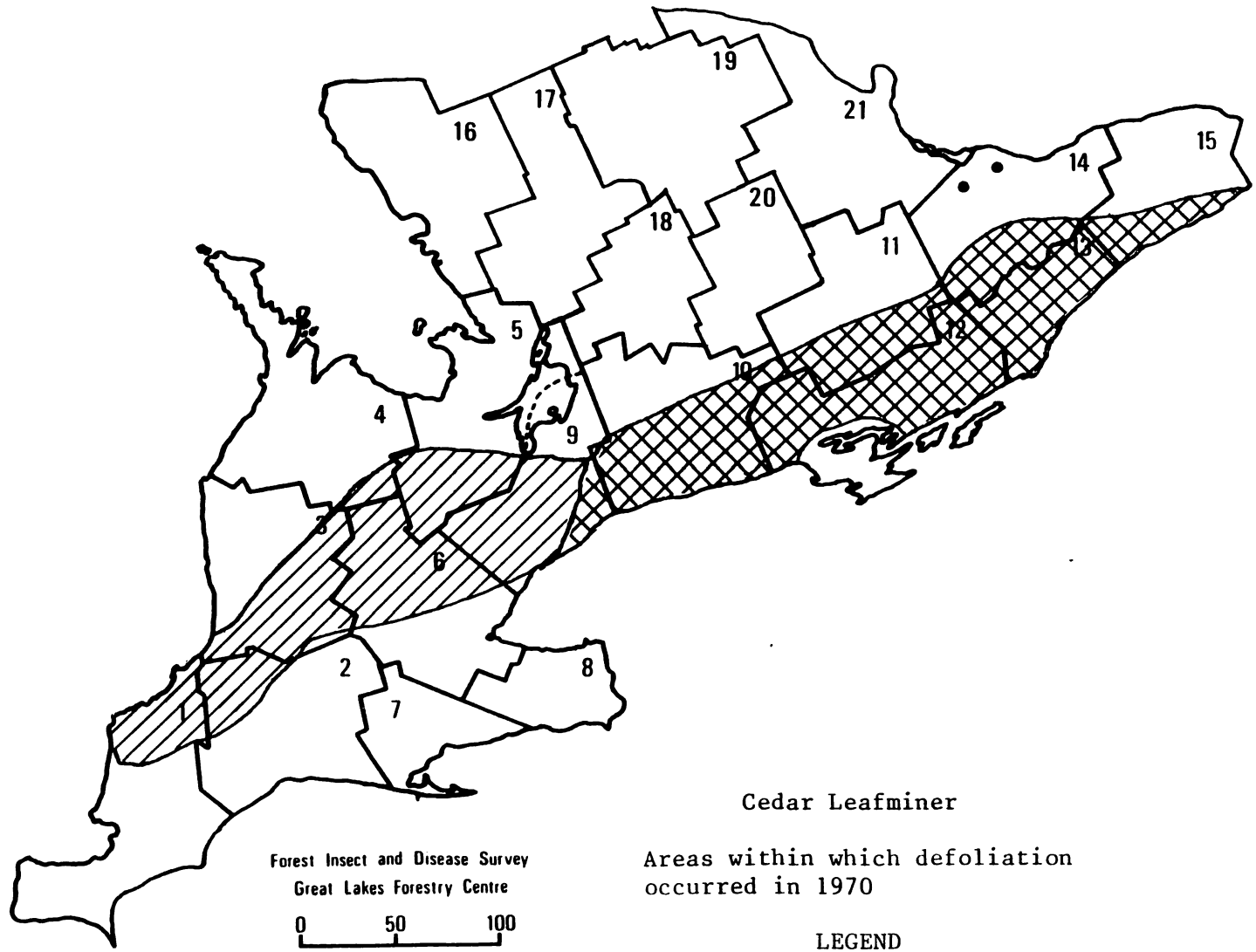
A P P E N D I X C

MAPS - SOUTHERN ONTARIO

SOUTHERN ONTARIO

DISTRICTS

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



Forest Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Cedar Leafminer

Areas within which defoliation occurred in 1970

LEGEND

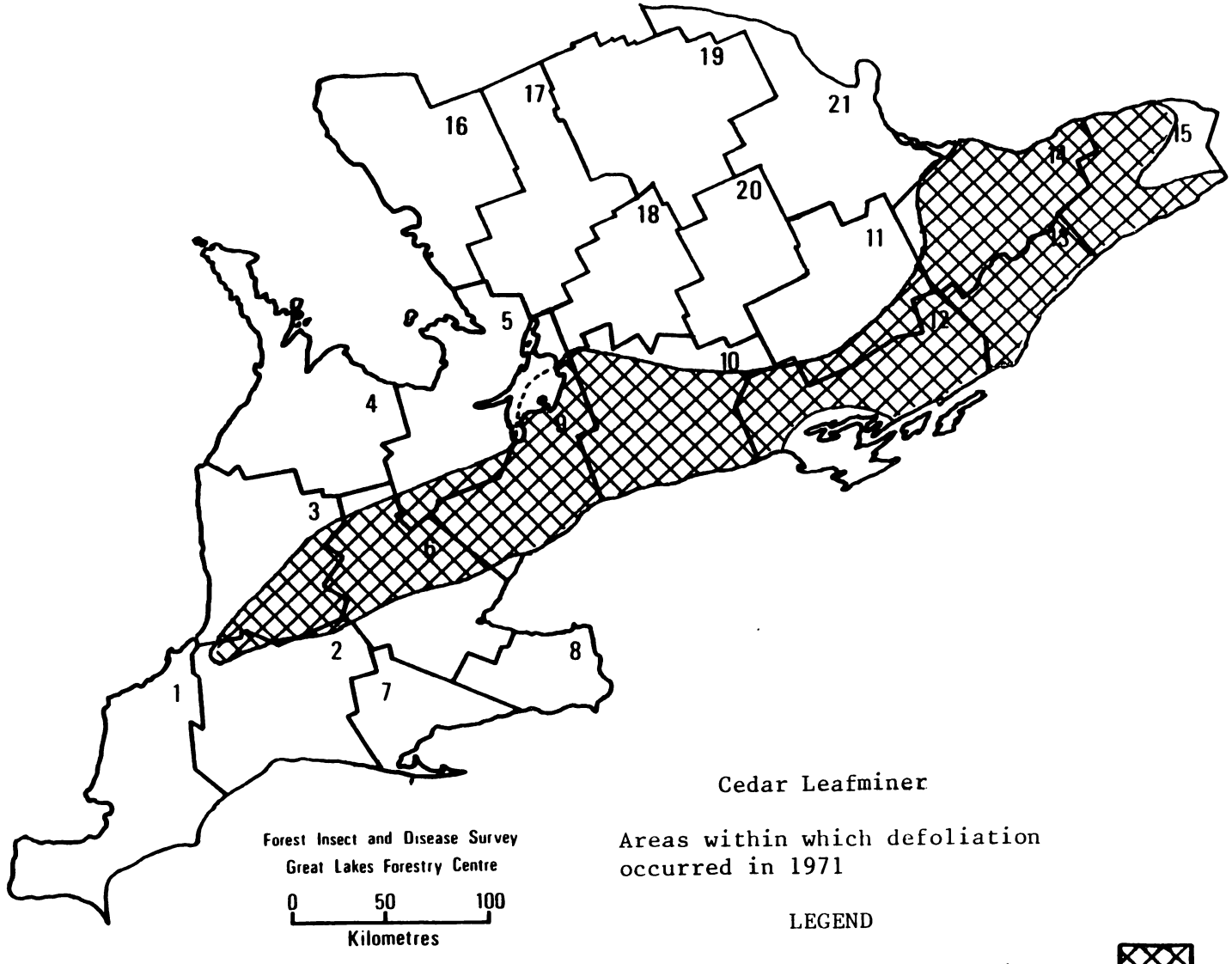
Light defoliation

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



Cedar Leafminer

Areas within which defoliation occurred in 1971

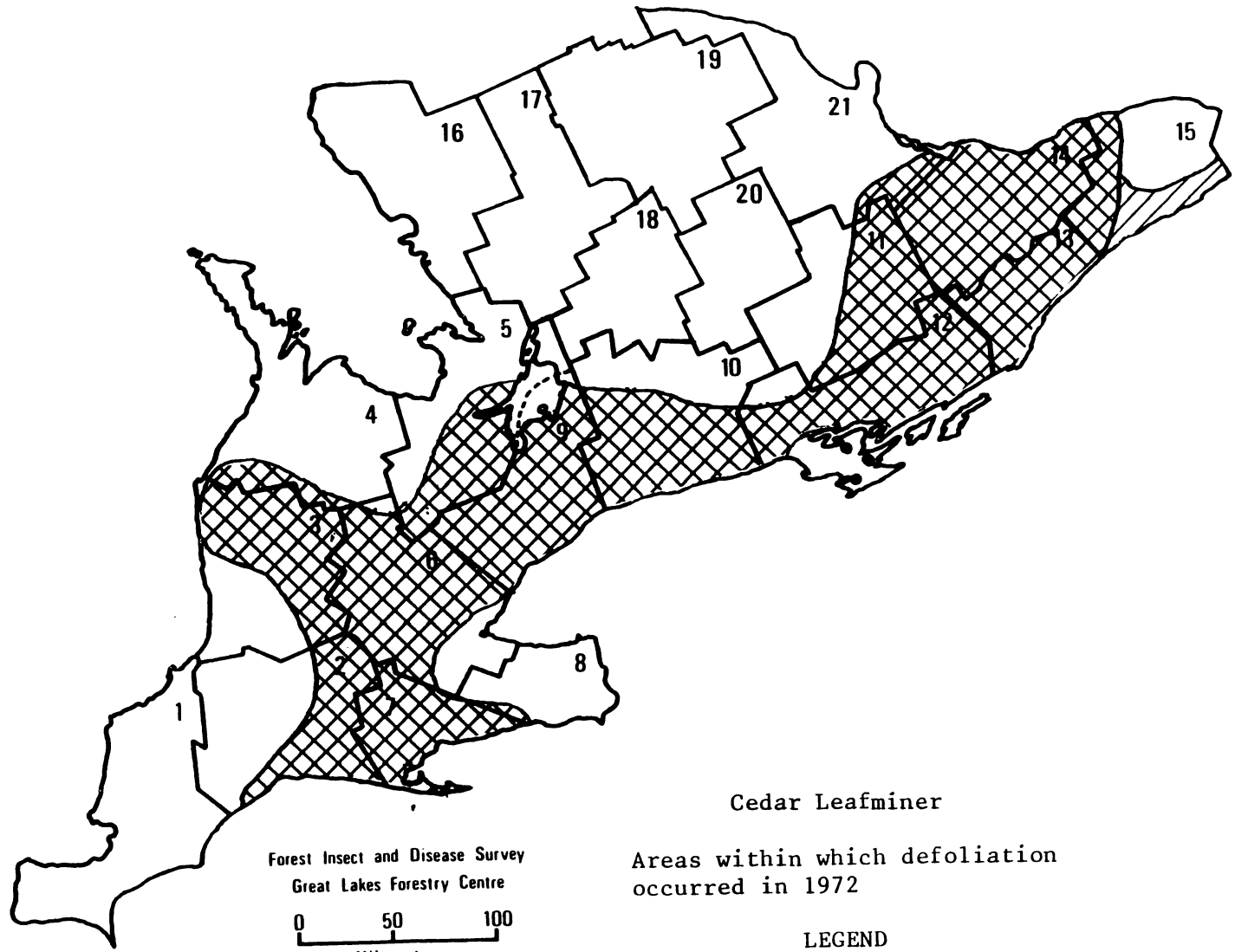
LEGEND

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

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
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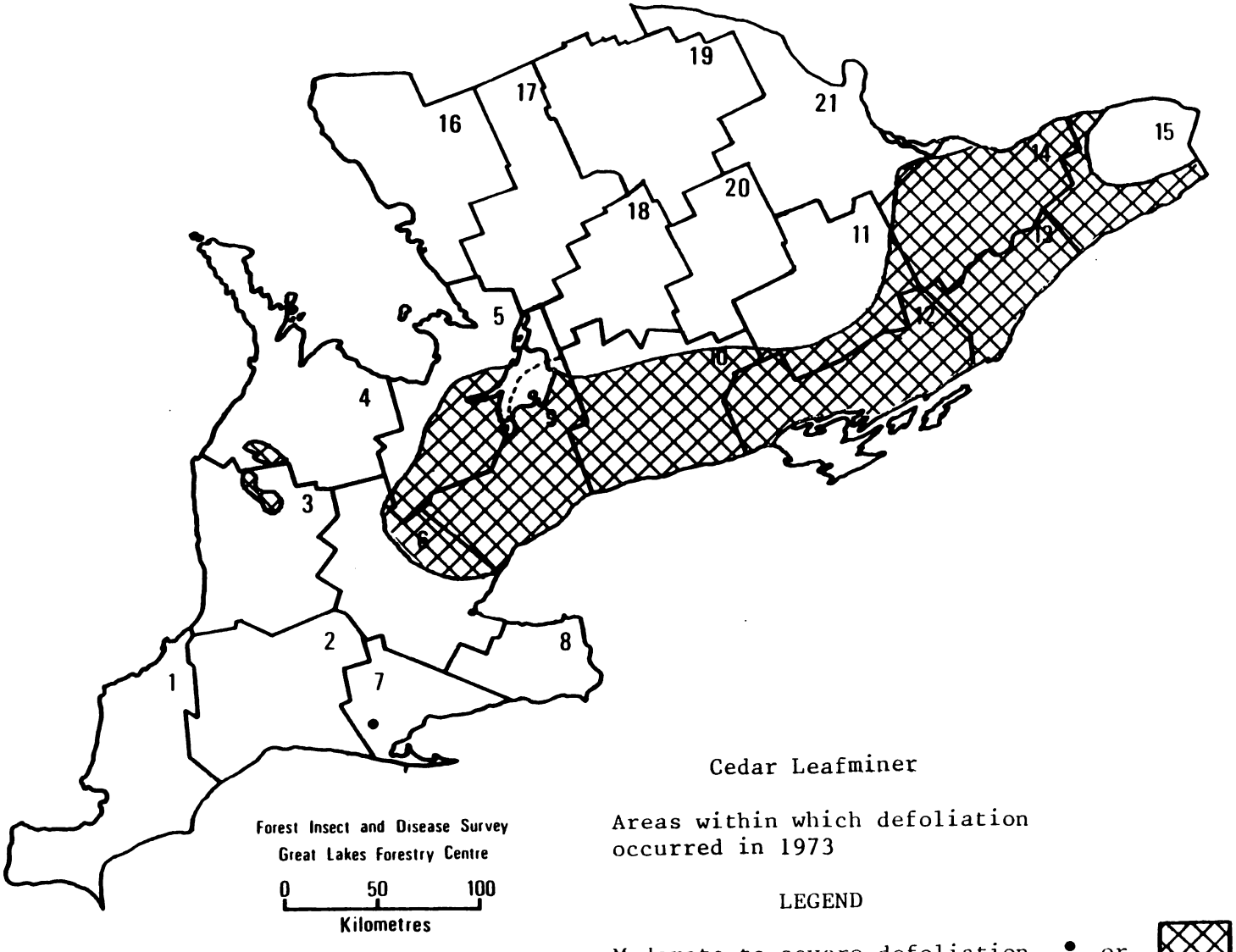
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Cedar Leafminer

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
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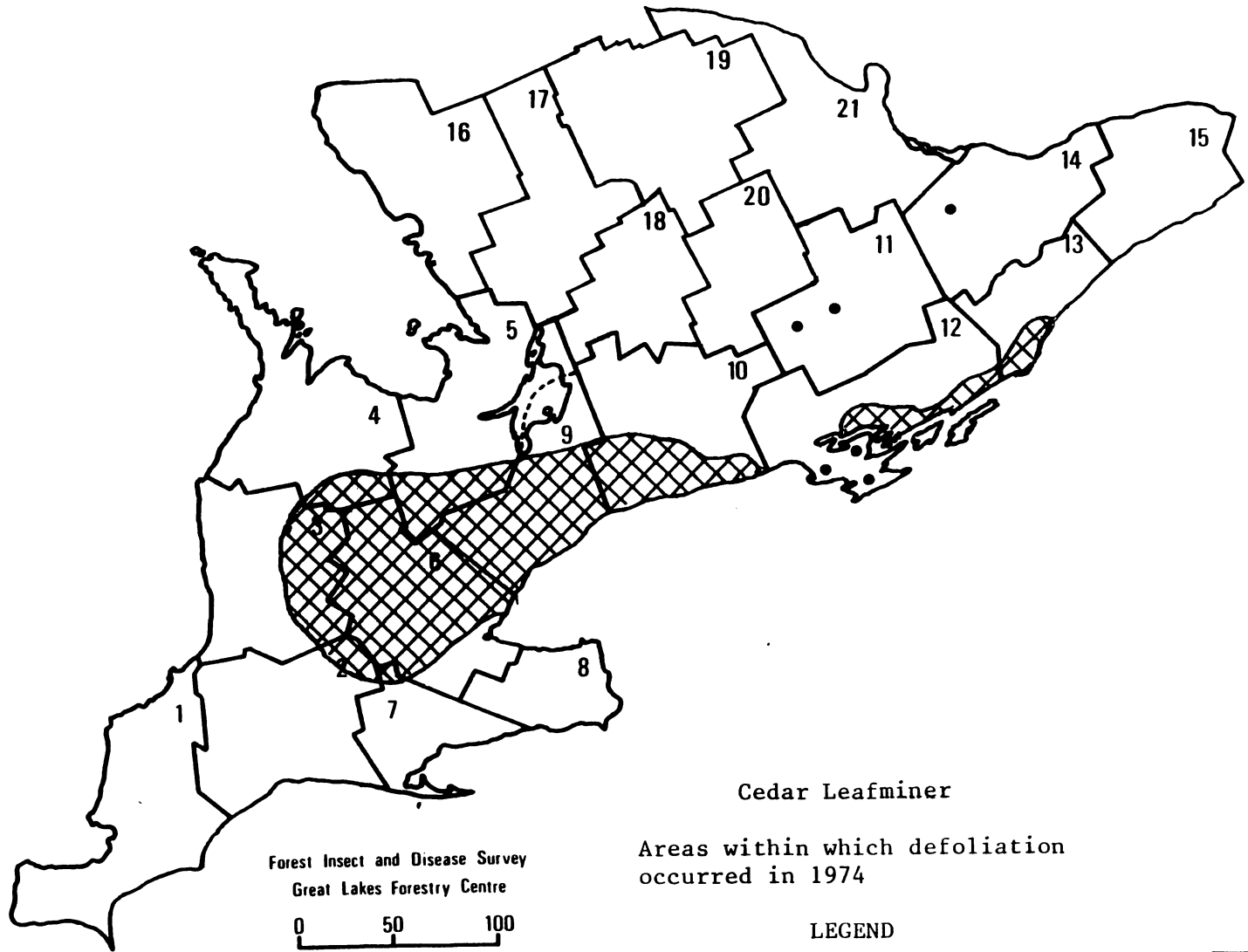
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



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
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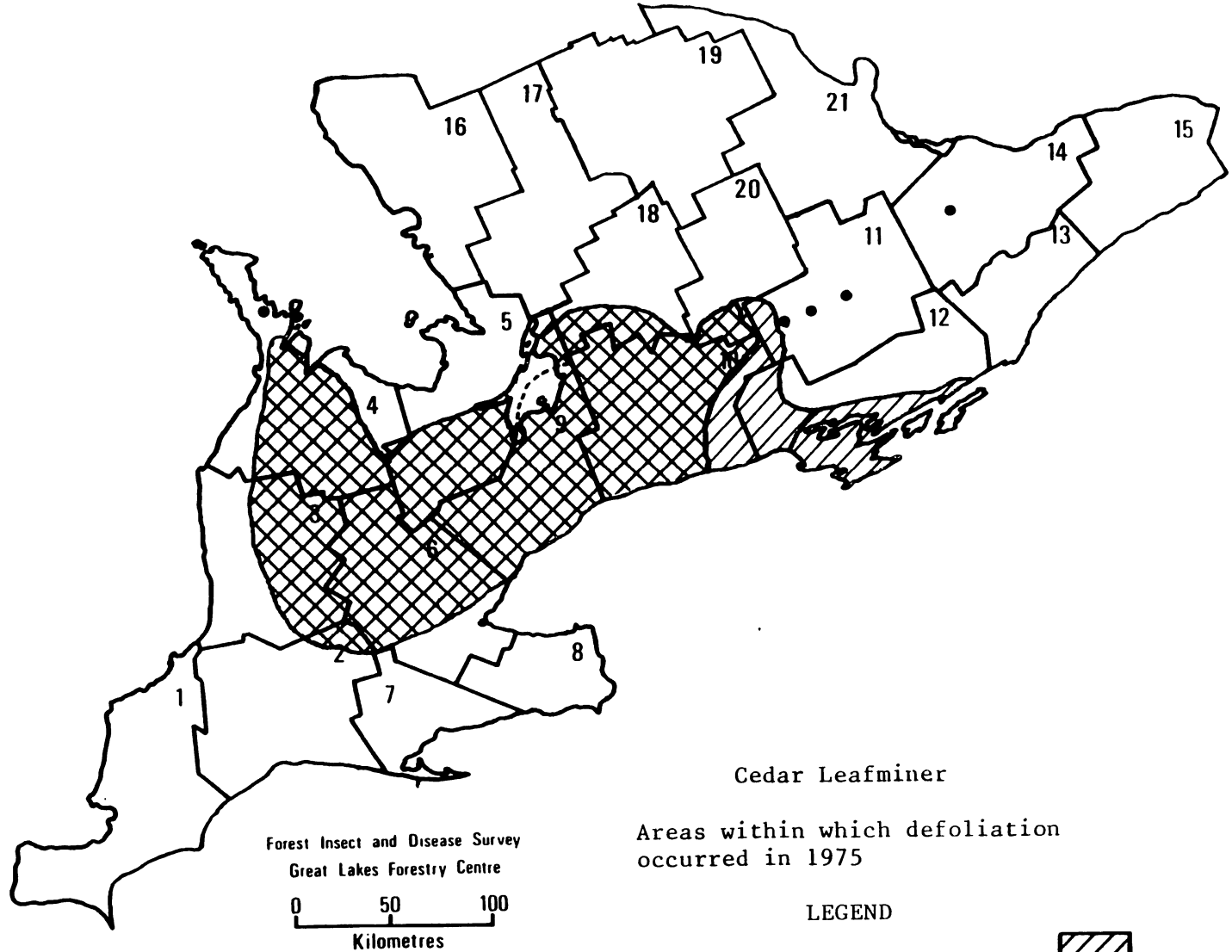
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



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
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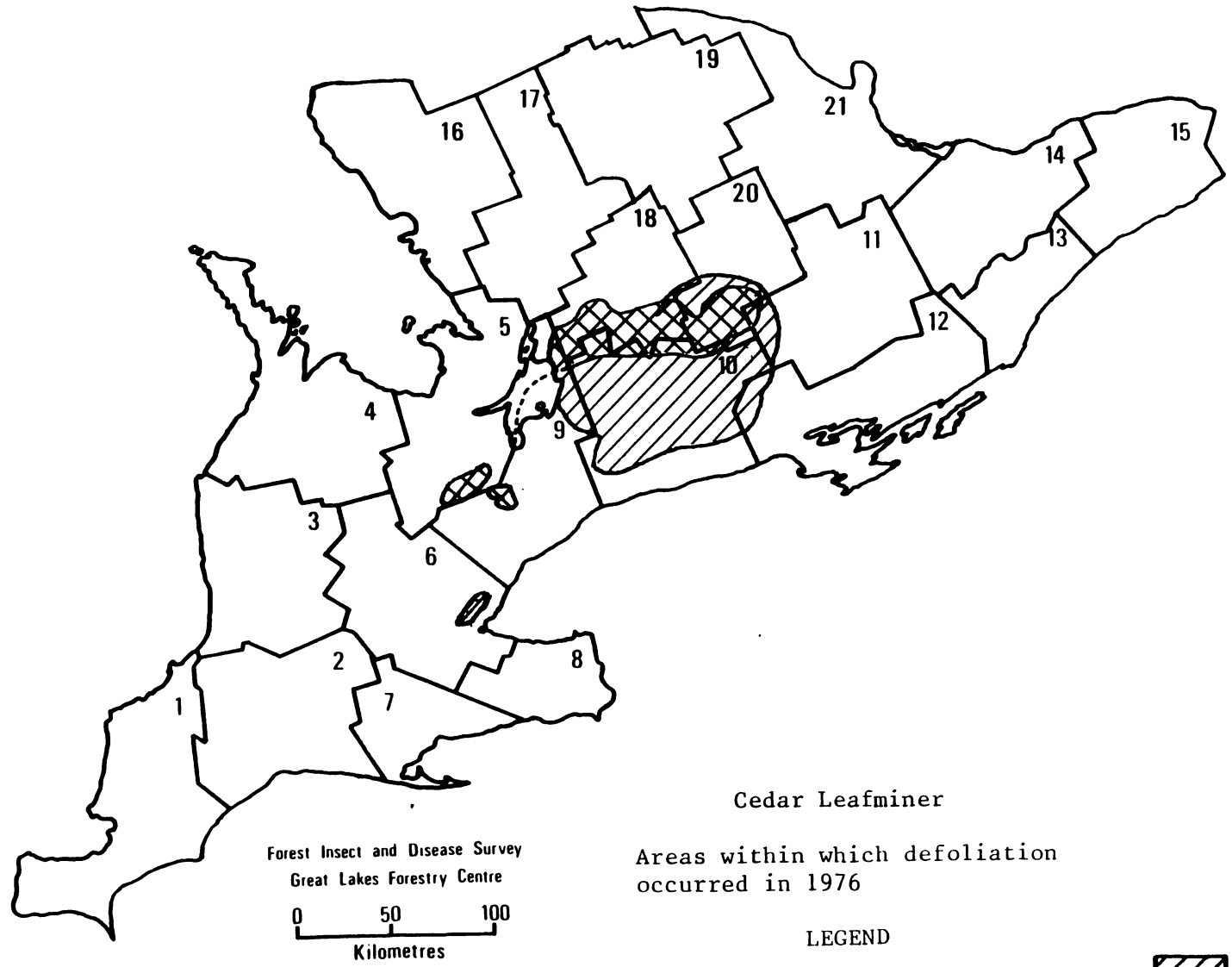
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Cedar Leafminer

Areas within which defoliation occurred in 1976

LEGEND

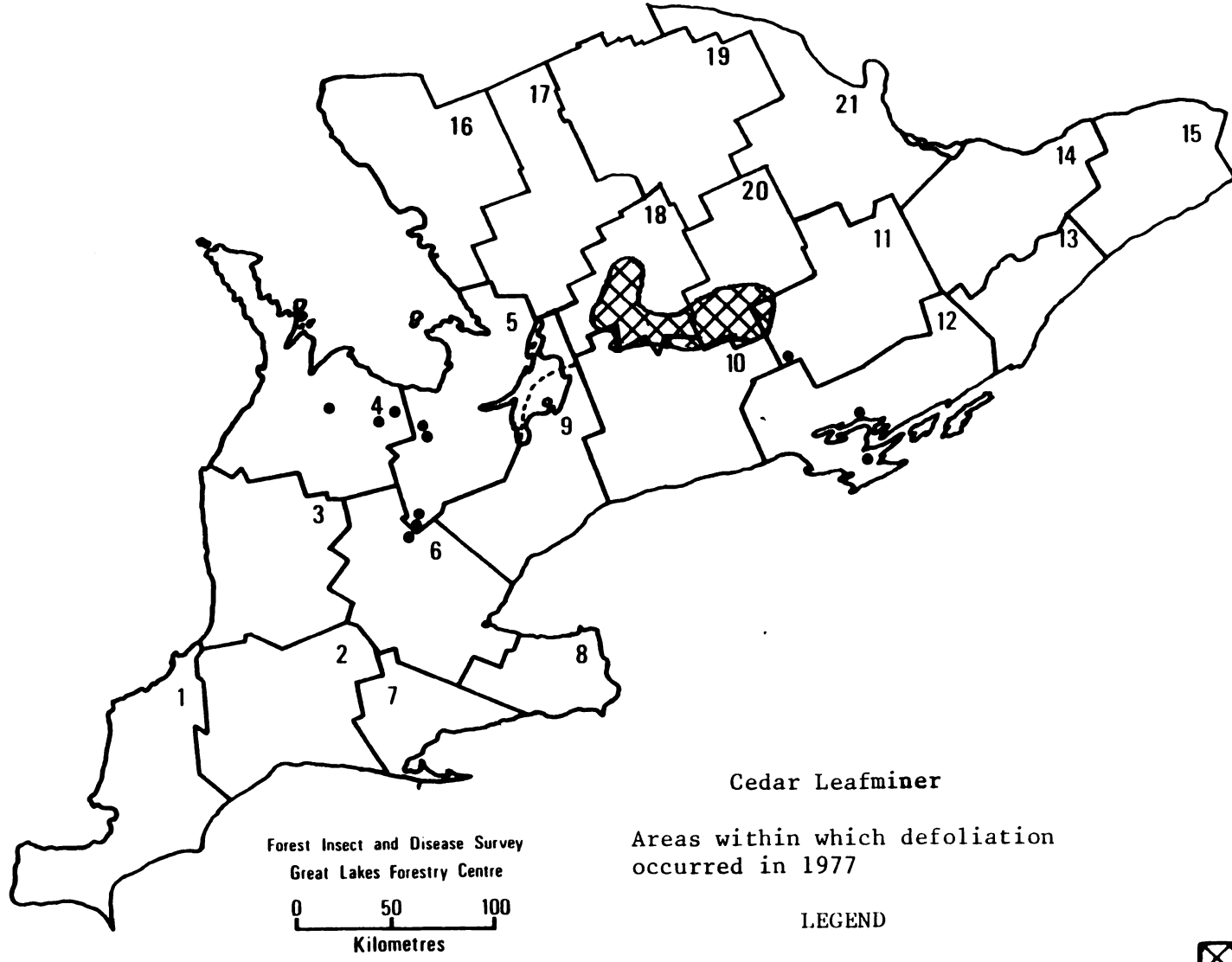
Light defoliation

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

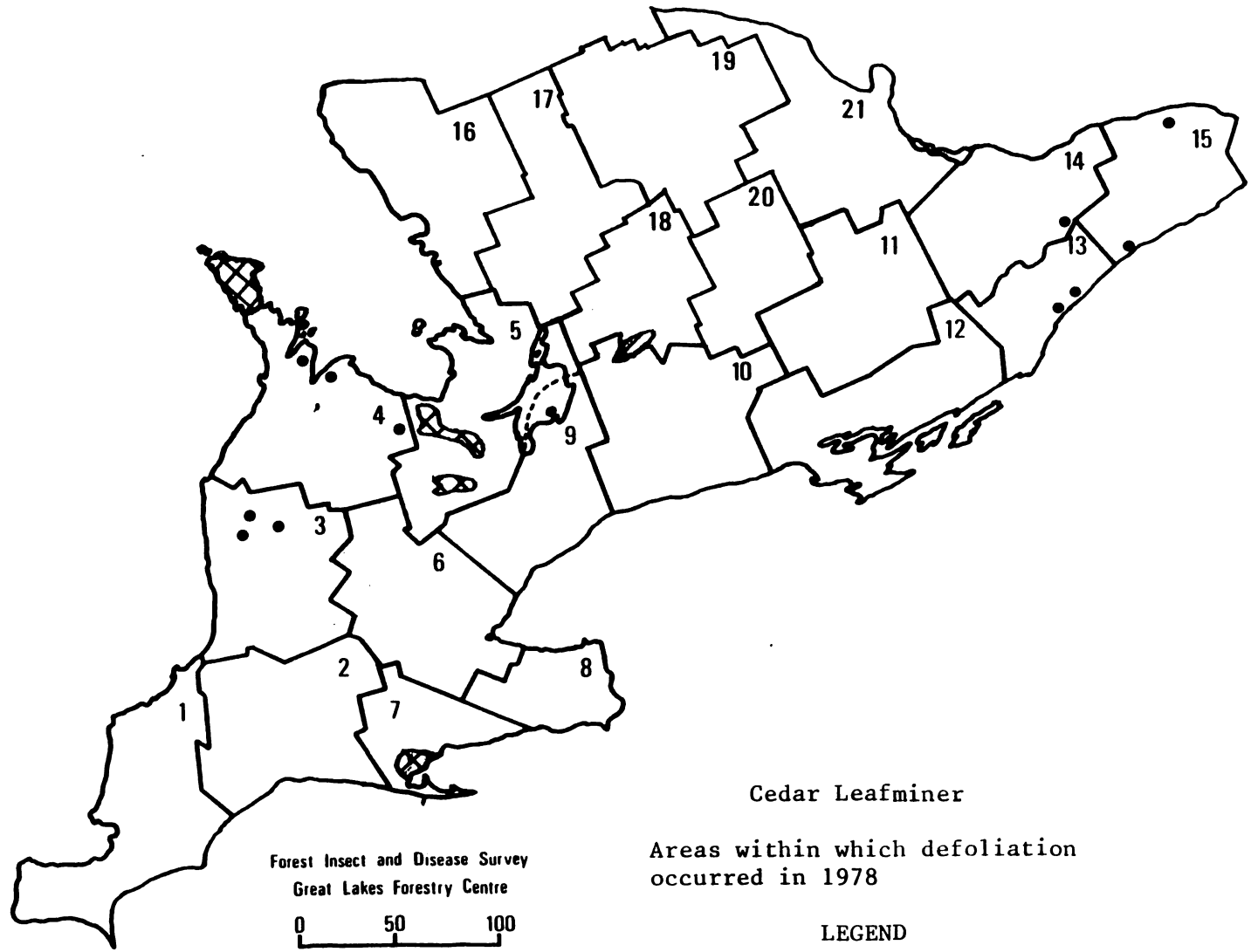
LEGEND

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



Forest Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Cedar Leafminer

Areas within which defoliation occurred in 1978

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
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15. CORNWALL
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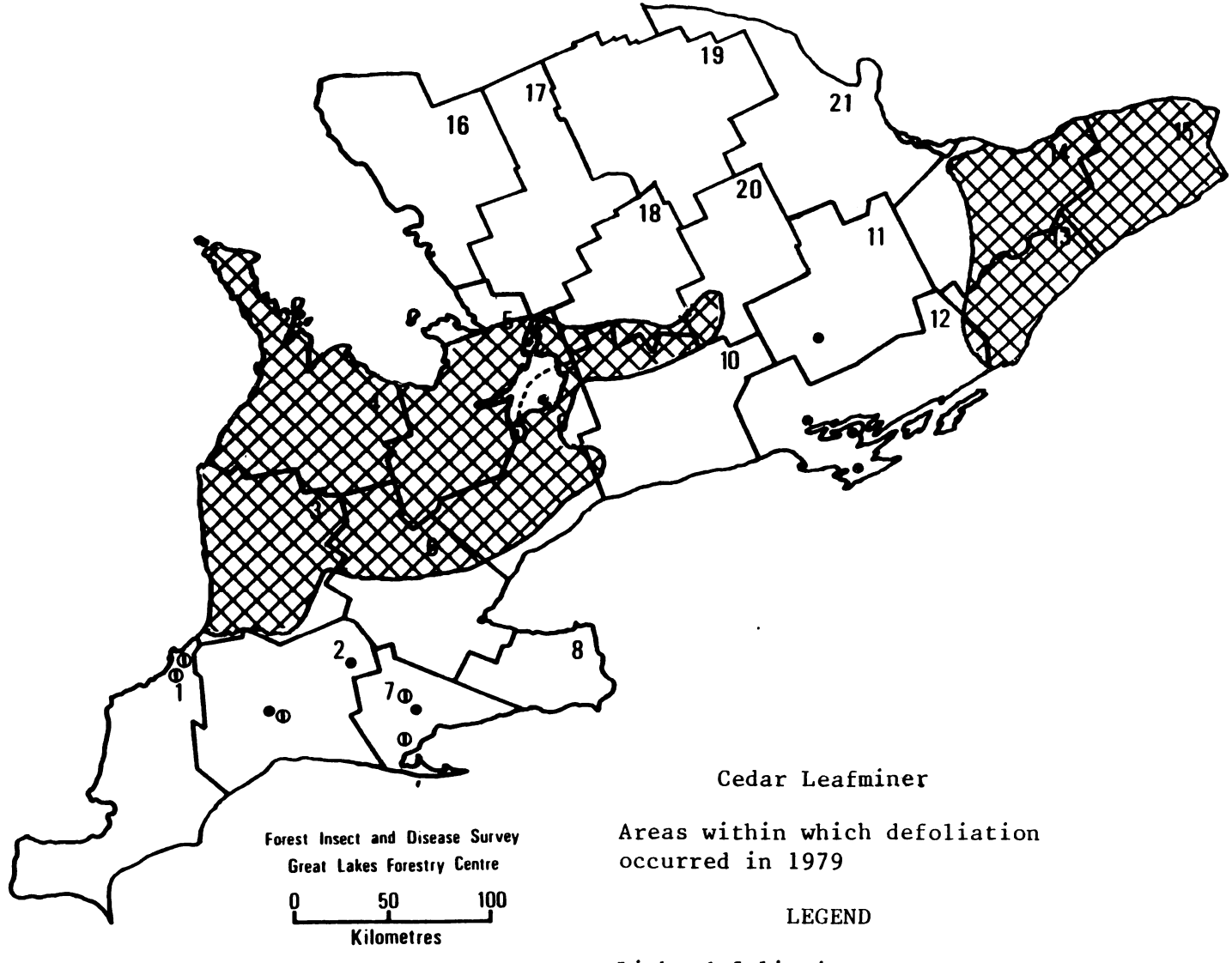
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Cedar Leafminer

Areas within which defoliation occurred in 1979

LEGEND

Light defoliation Φ

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
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12. NAPANEE
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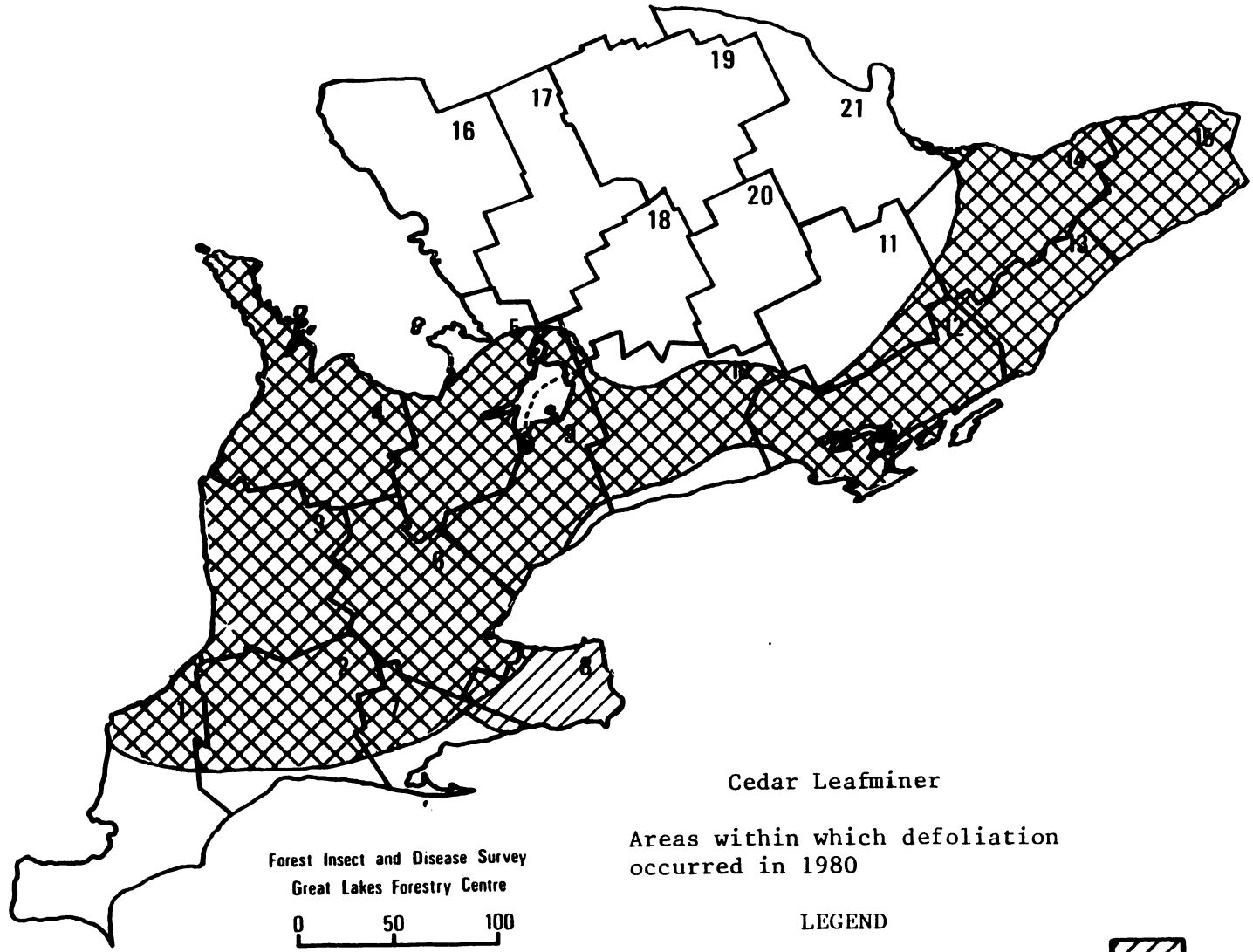
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Cedar Leafminer

Areas within which defoliation occurred in 1980

LEGEND

Light defoliation

Mod[illegible]e-t [illegible]ver [illegible]efo[illegible]ion

SOUTHERN ONTARIO

DISTRICTS

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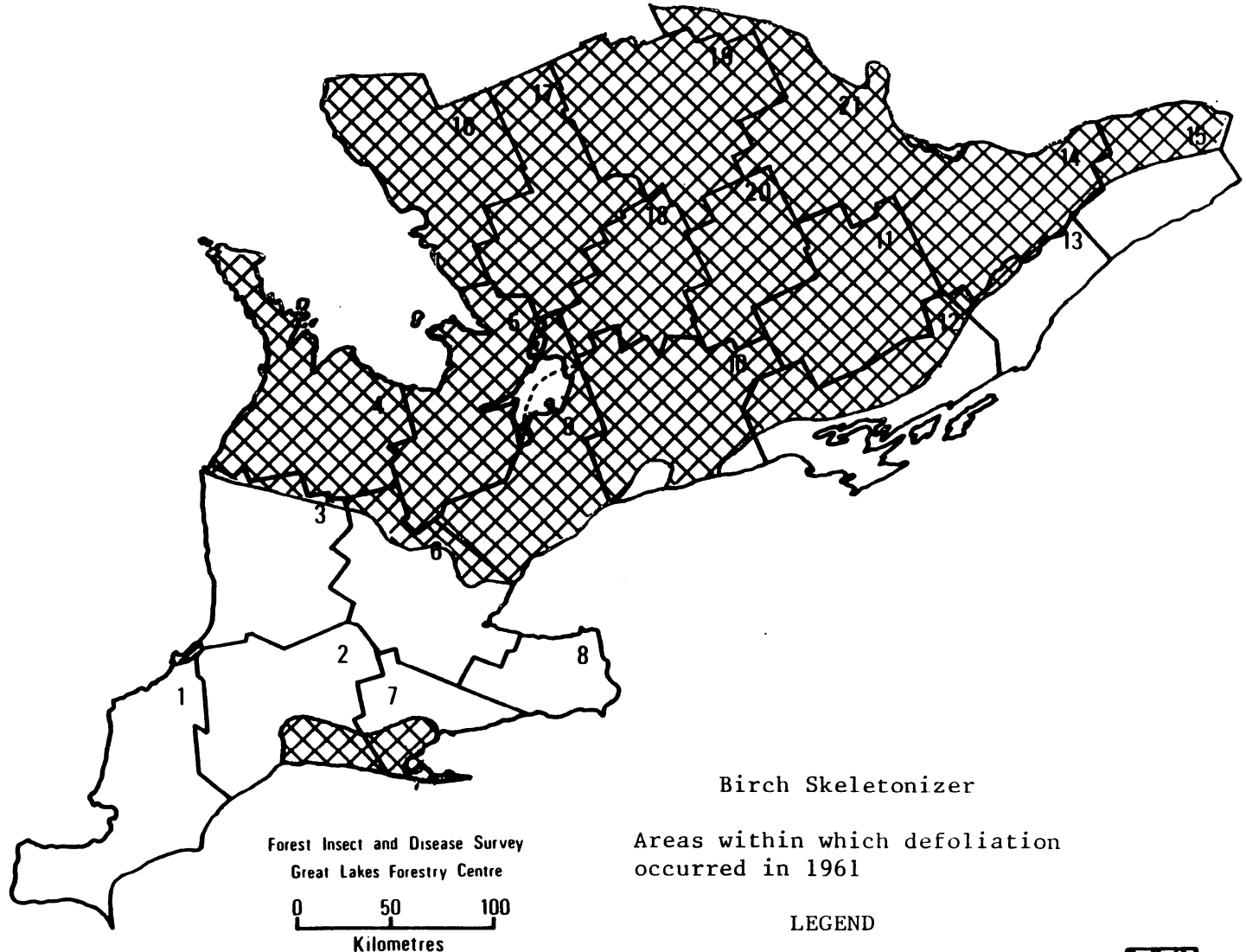
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Birch Skeletonizer

Areas within which defoliation occurred in 1961

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
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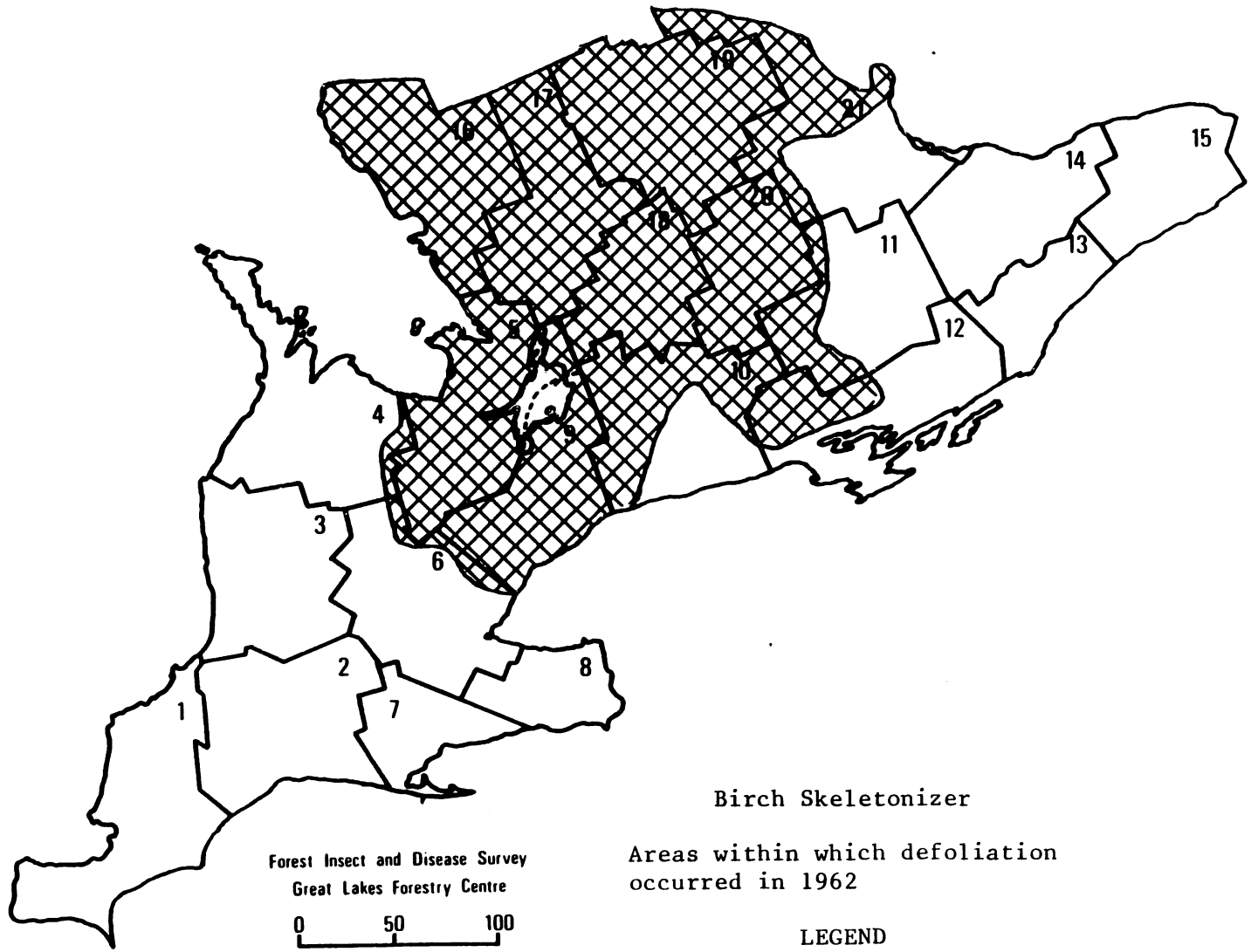
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Birch Skeletonizer

Areas within which defoliation occurred in 1962

LEGEND

Moderate-to-severe defoliation

SOUTHERN ONTARIO

DISTRICTS

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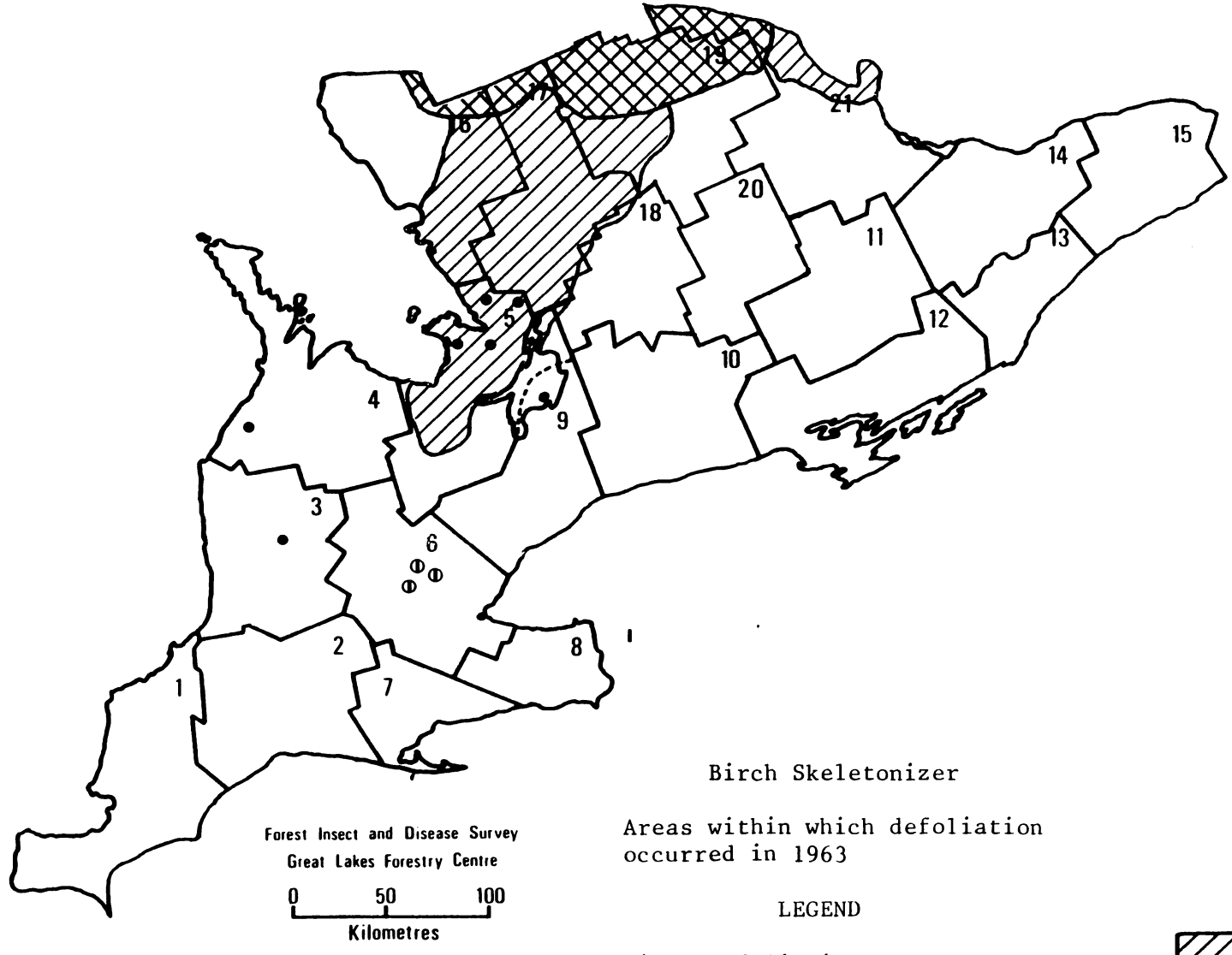
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Birch Skeletonizer

Areas within which defoliation occurred in 1963

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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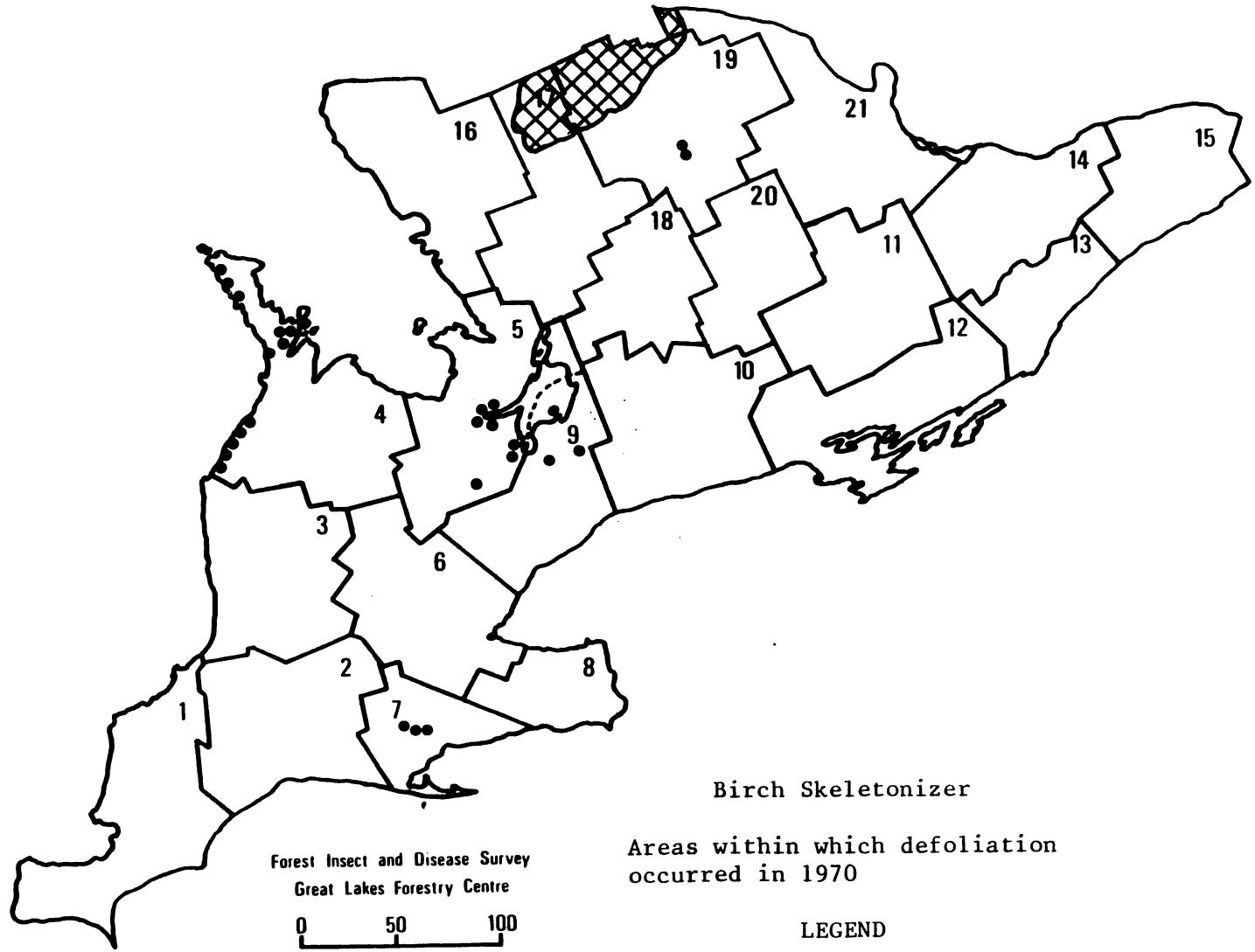
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Birch Skeletonizer

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation • or

SOUTHERN ONTARIO

DISTRICTS

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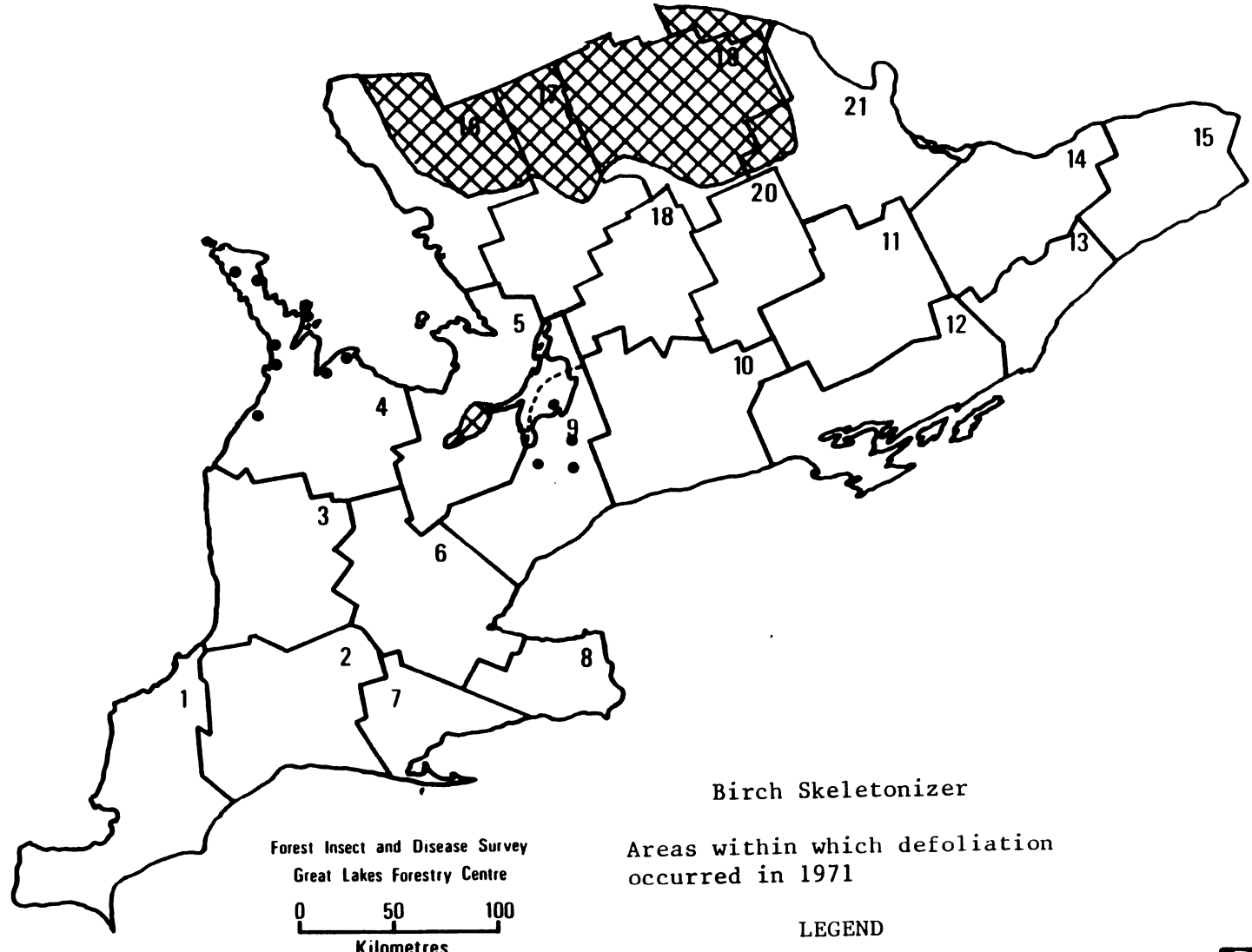
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Birch Skeletonizer

Areas within which defoliation occurred in 1971

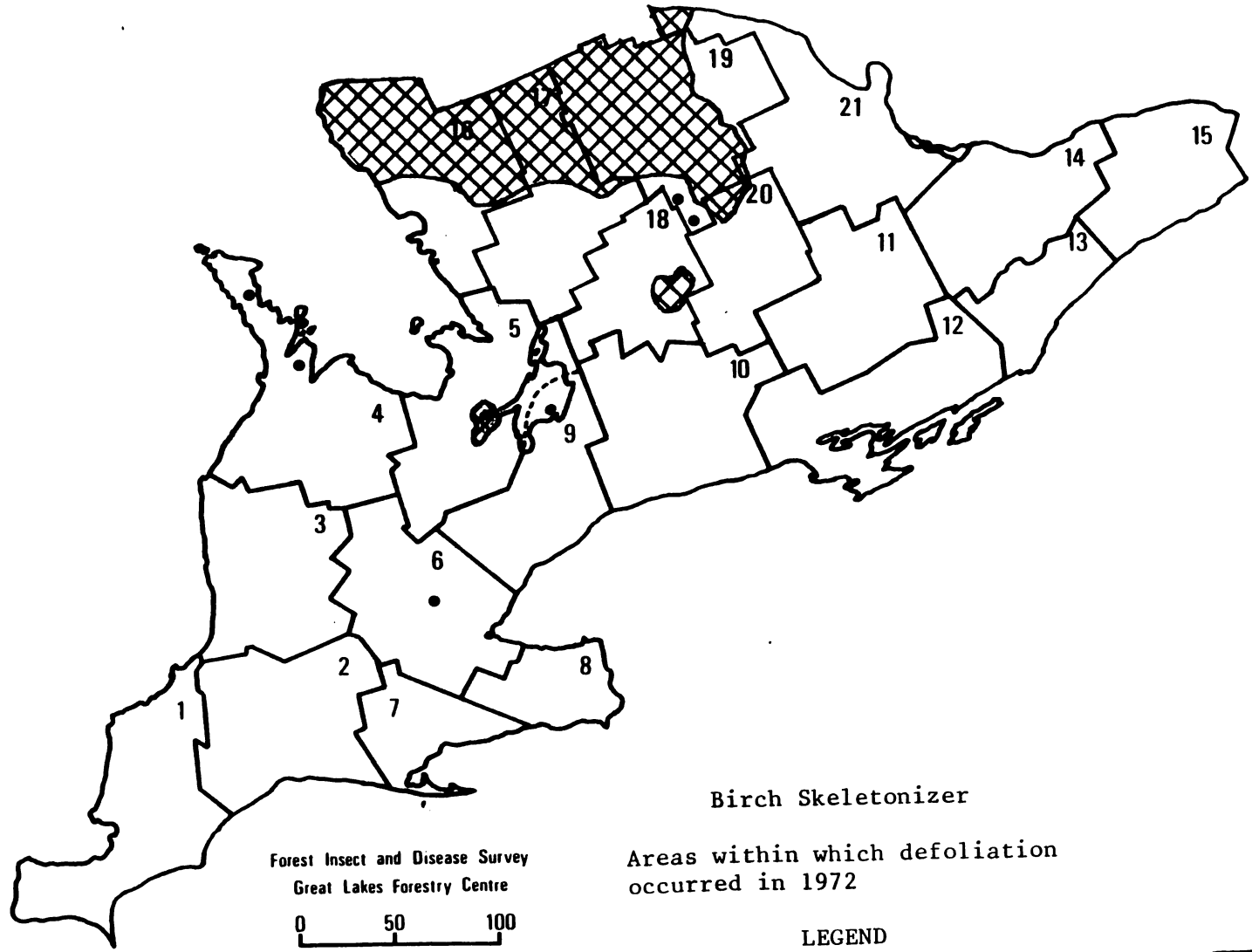
LEGEND

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 Insect and Disease Survey
Great Lakes Forestry Centre

0 50 100
Kilometres

Birch Skeletonizer

Areas within which defoliation occurred in 1972

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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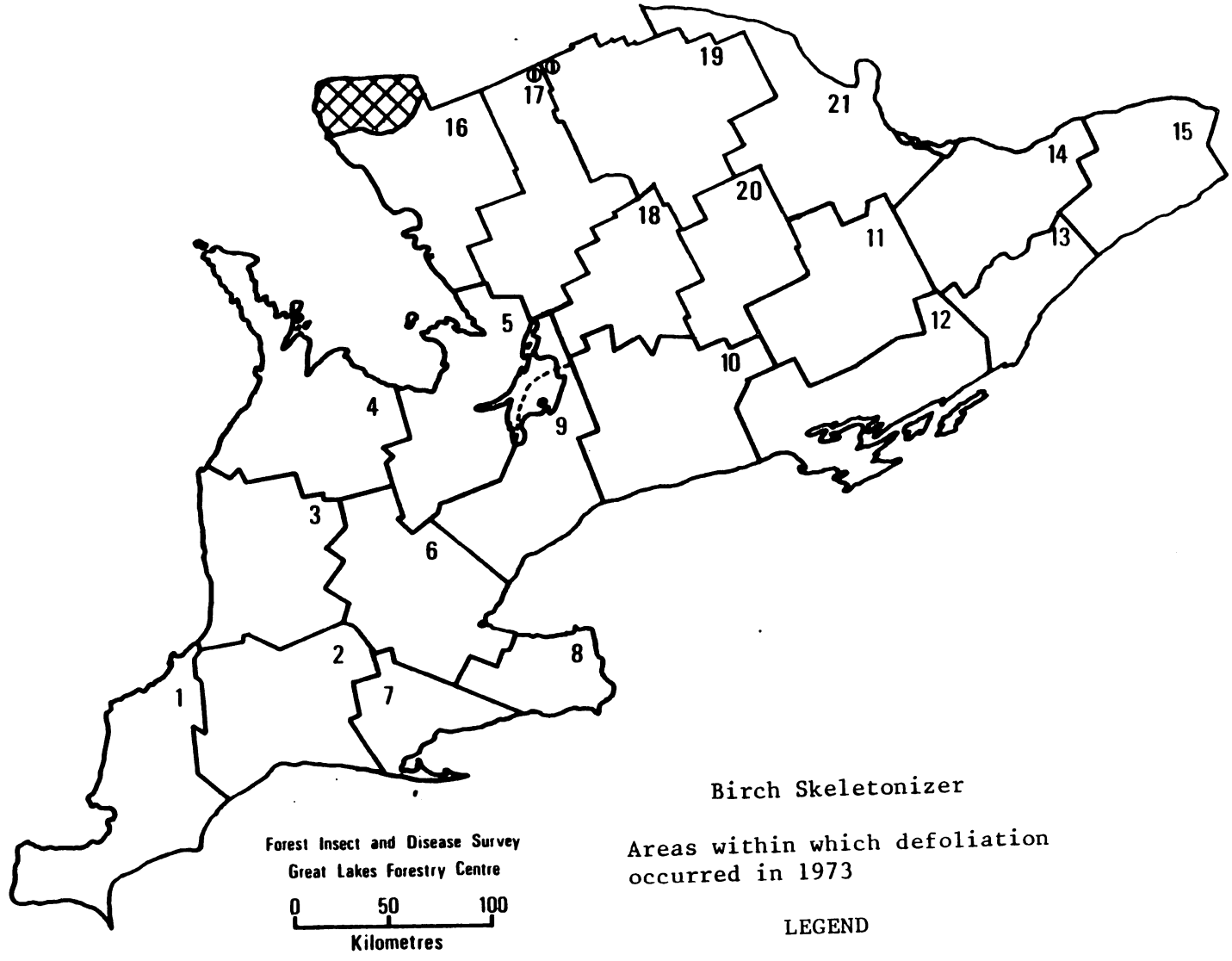
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Birch Skeletonizer

Areas within which defoliation occurred in 1973

LEGEND

Light defoliation Φ

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
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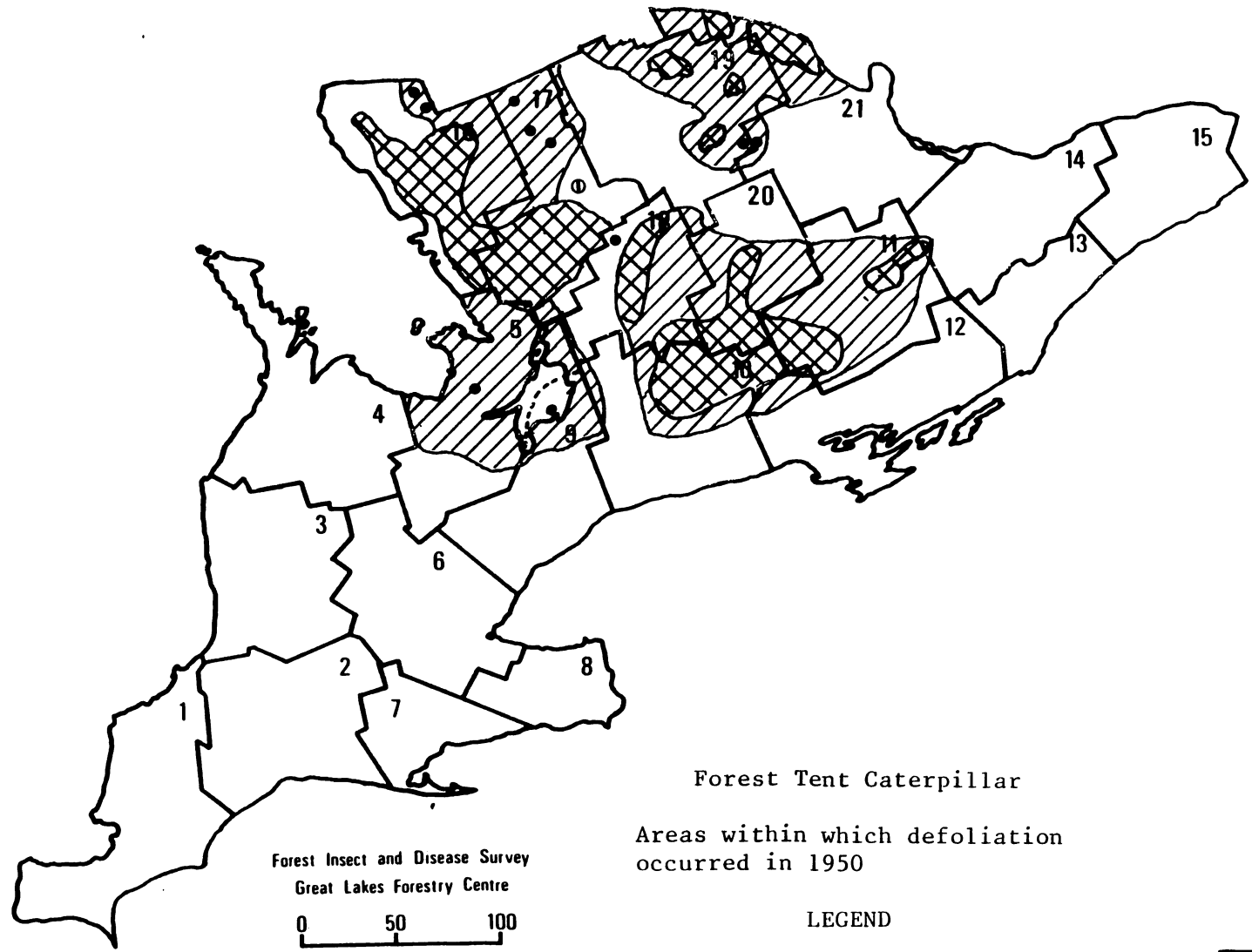
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1950

LEGEND

Light defoliation Φ 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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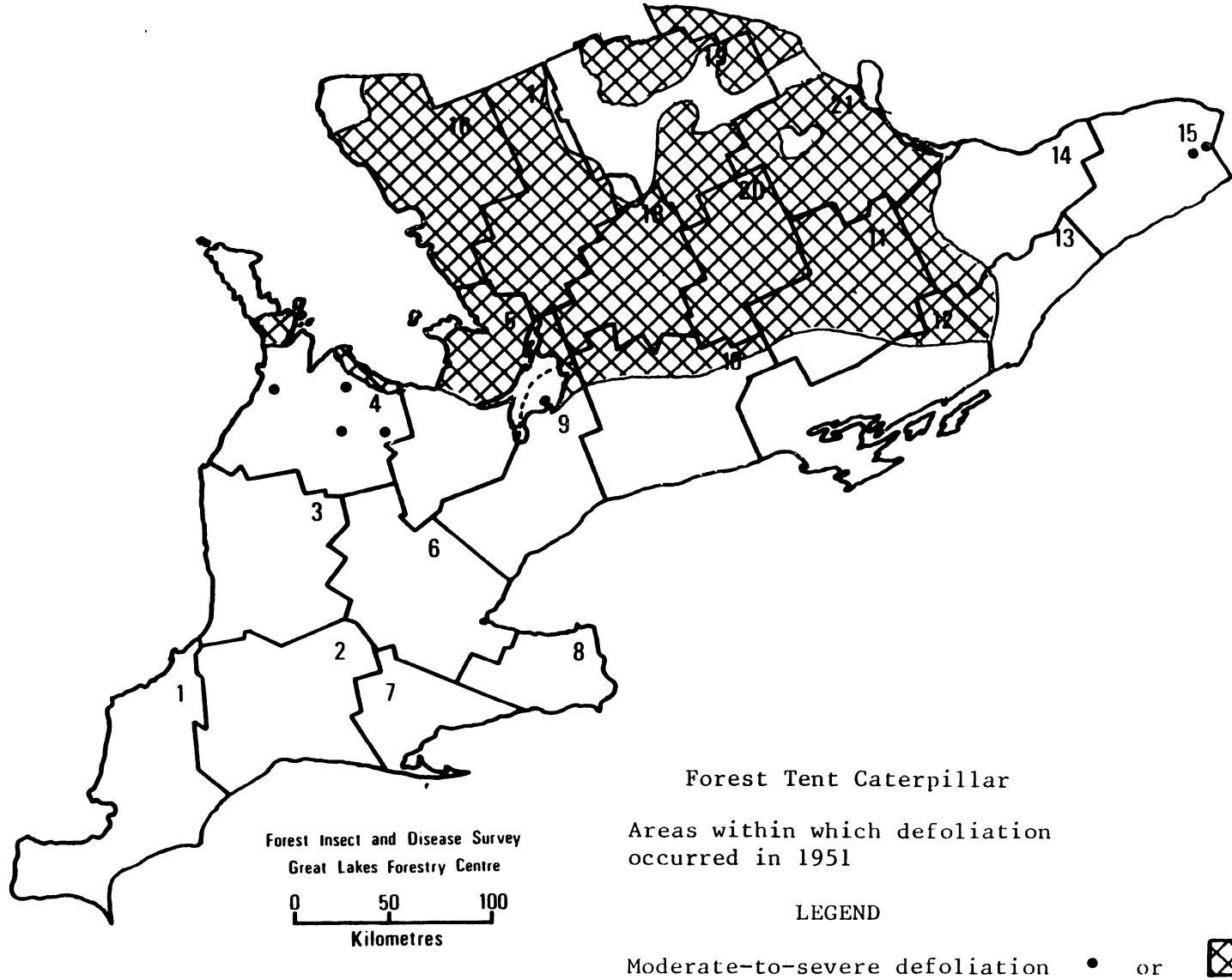
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

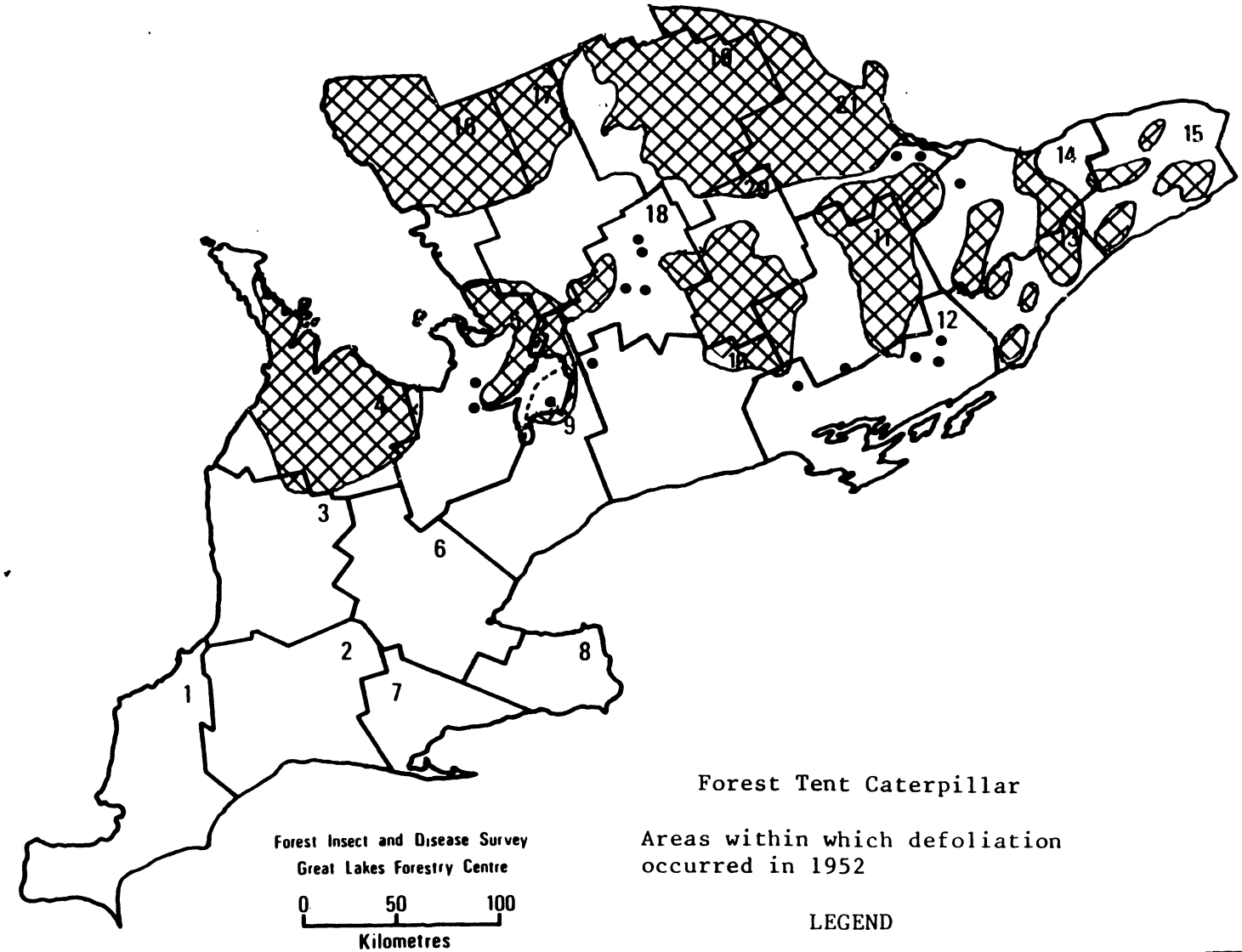
LEGEND

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

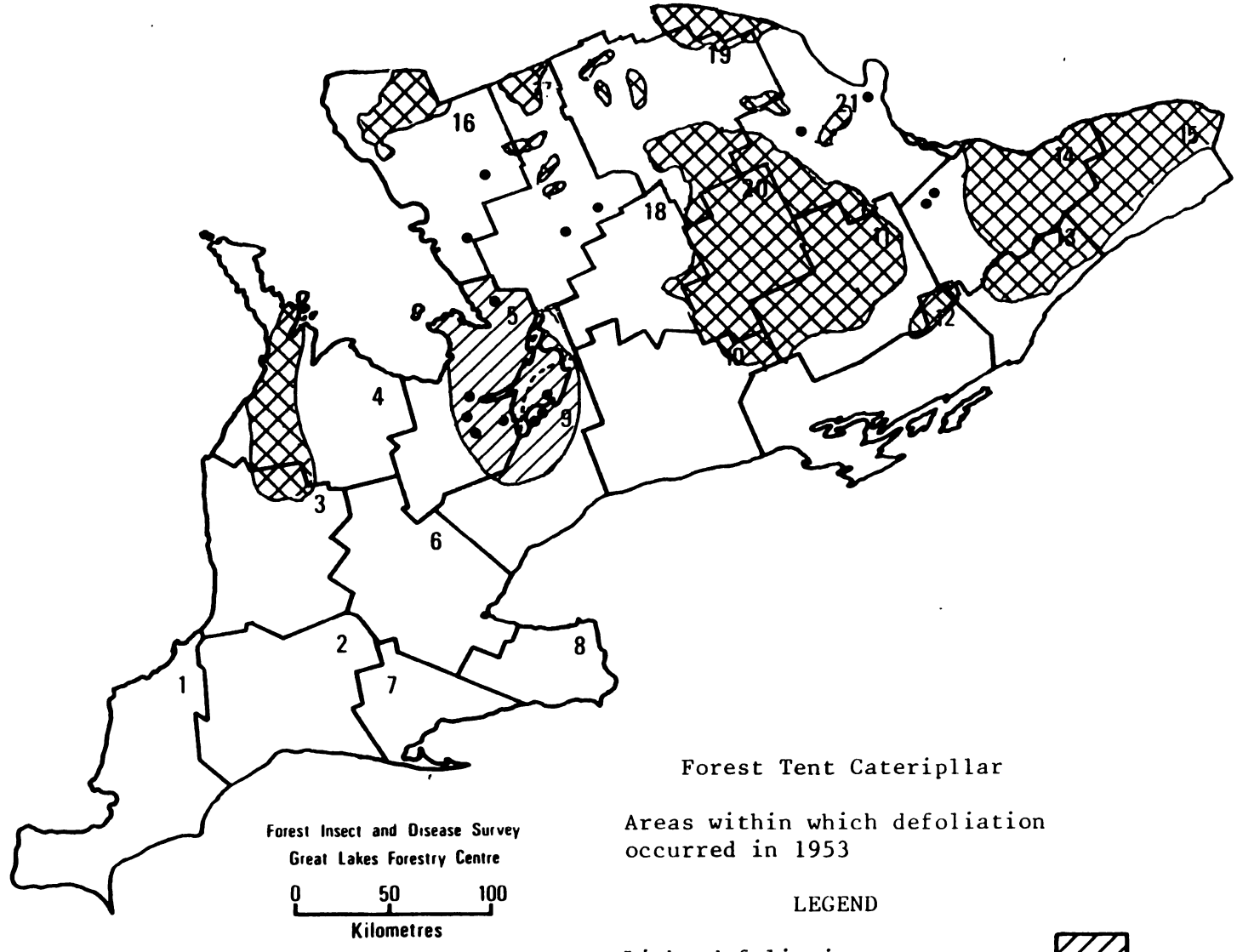
LEGEND

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

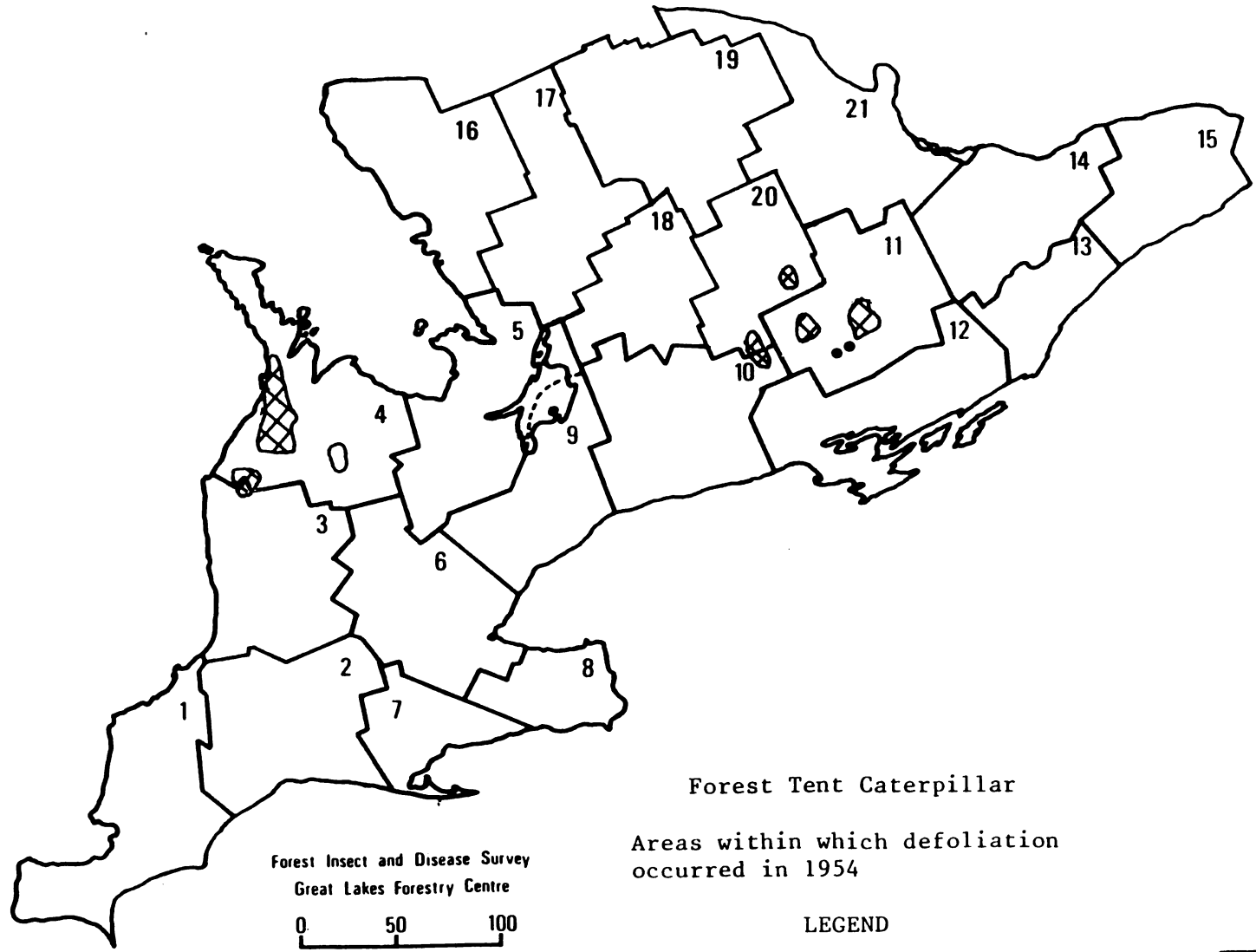
Light defoliation

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



Forest Tent Caterpillar

Areas within which defoliation occurred in 1954

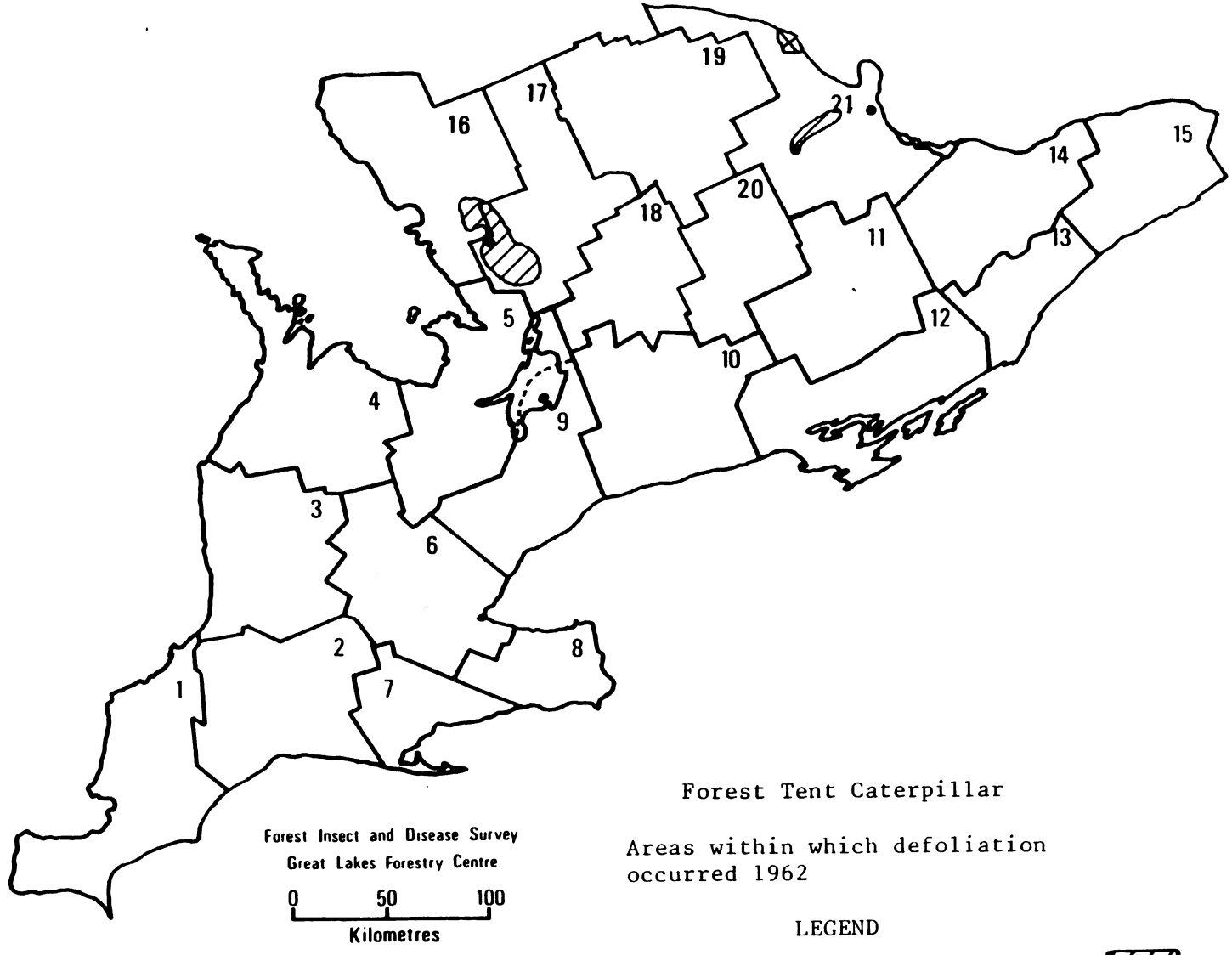
LEGEND

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 1962

LEGEND

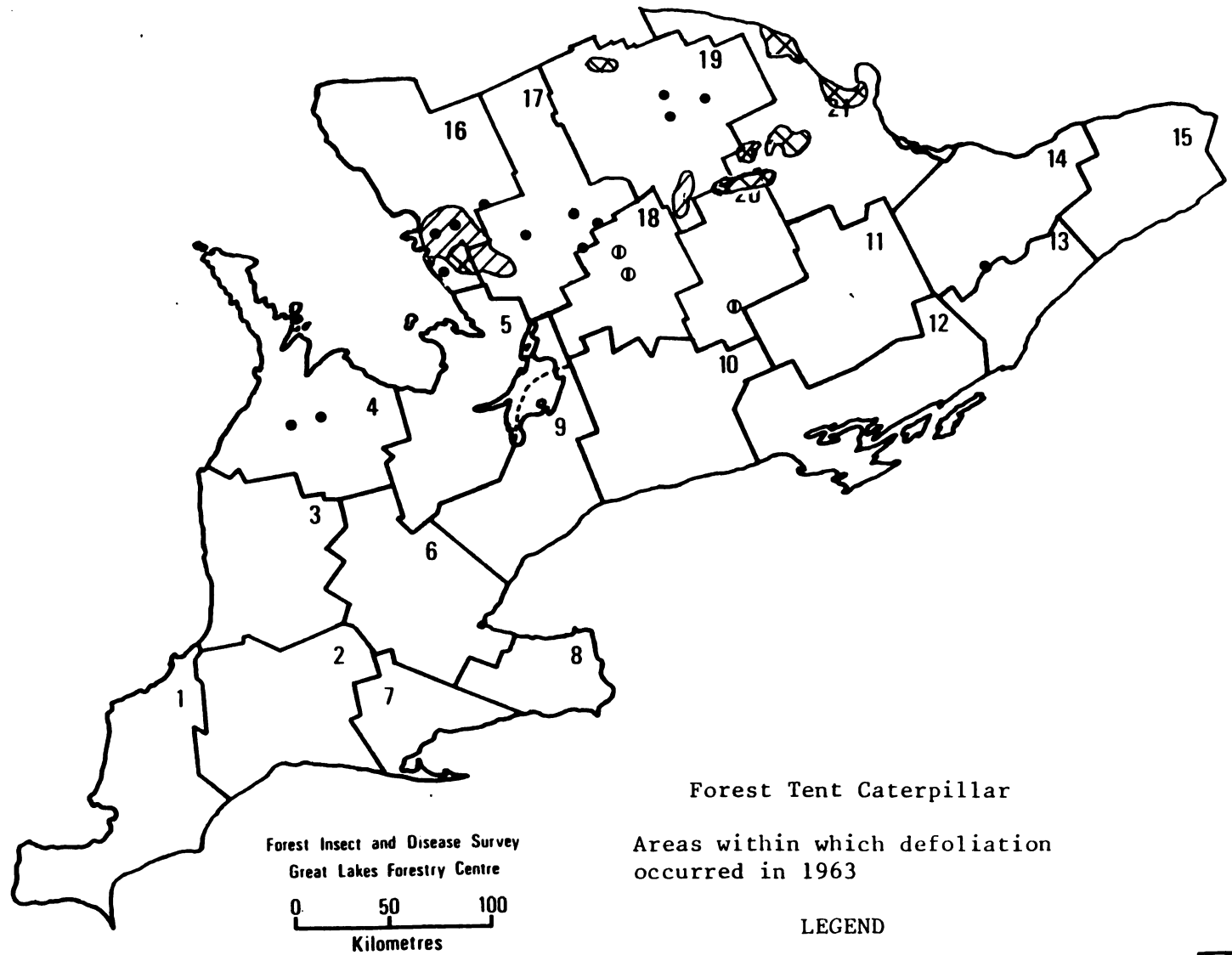
Light defoliation

Moderate-to-severe defoliation • or

SOUTHERN ONTARIO

DISTRICTS

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



Forest Tent Caterpillar

Areas within which defoliation occurred in 1963

LEGEND

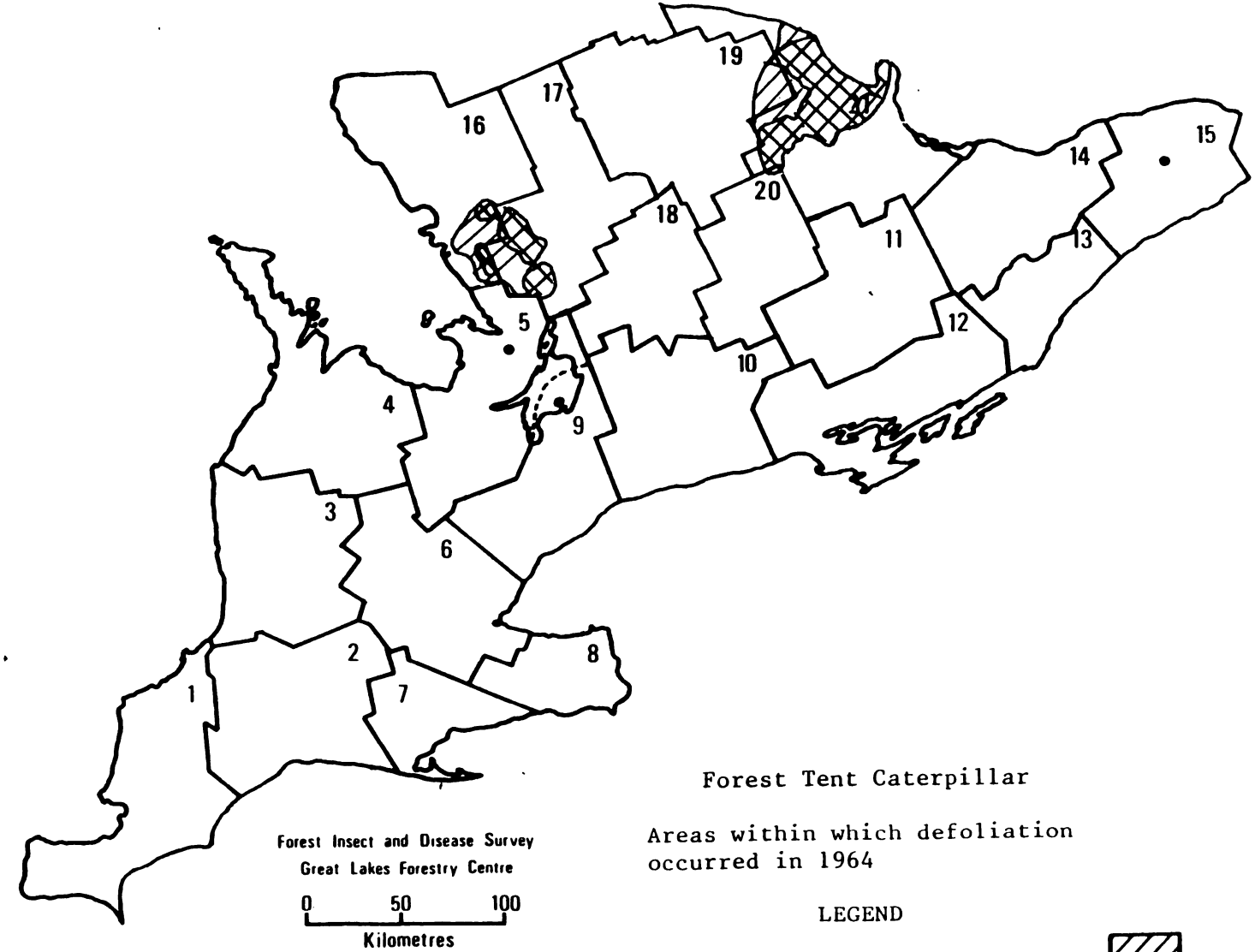
Light defoliation Φ or

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



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
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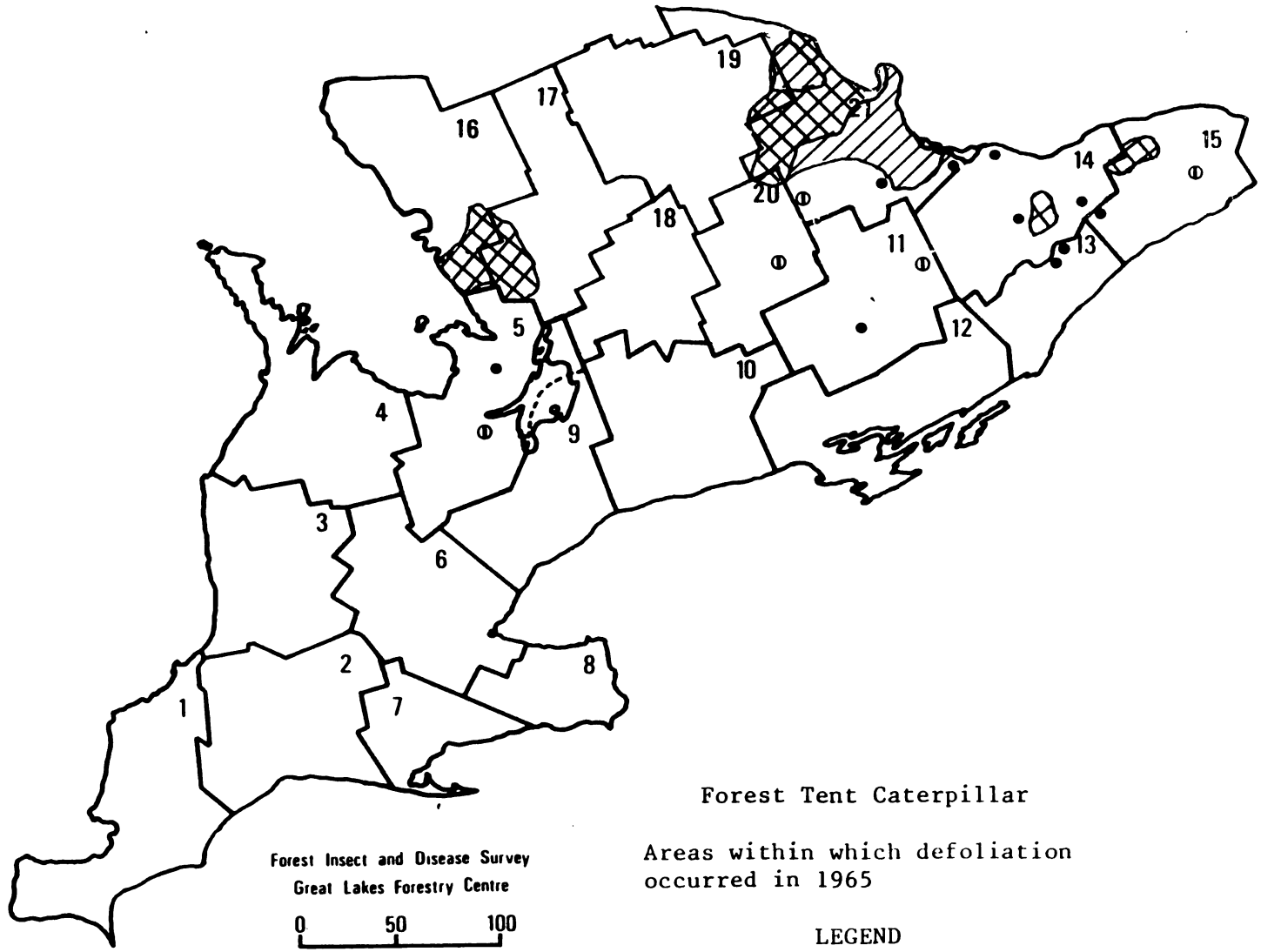
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1965

LEGEND

Light defoliation Φ or

Mode-to-over 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
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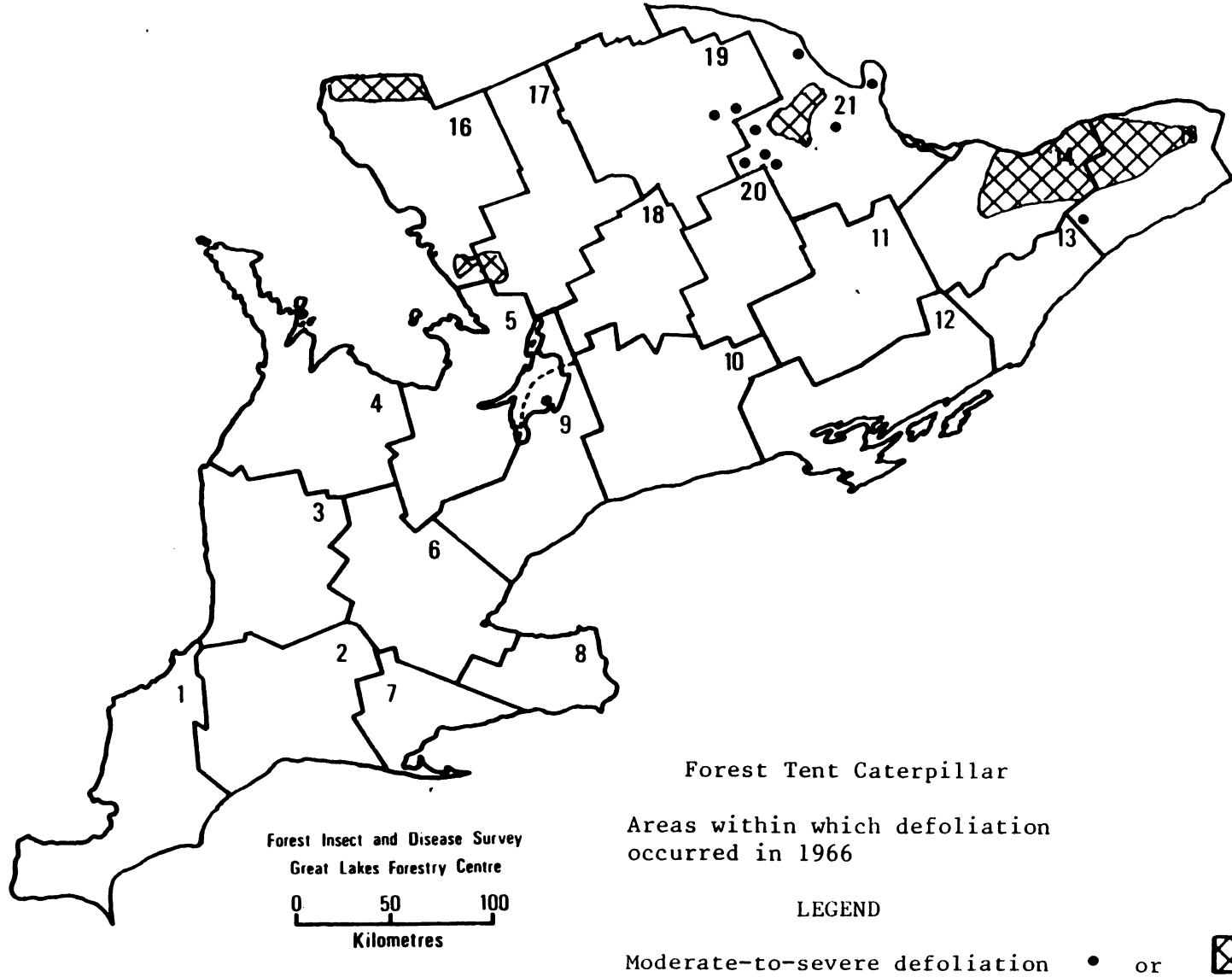
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1966

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
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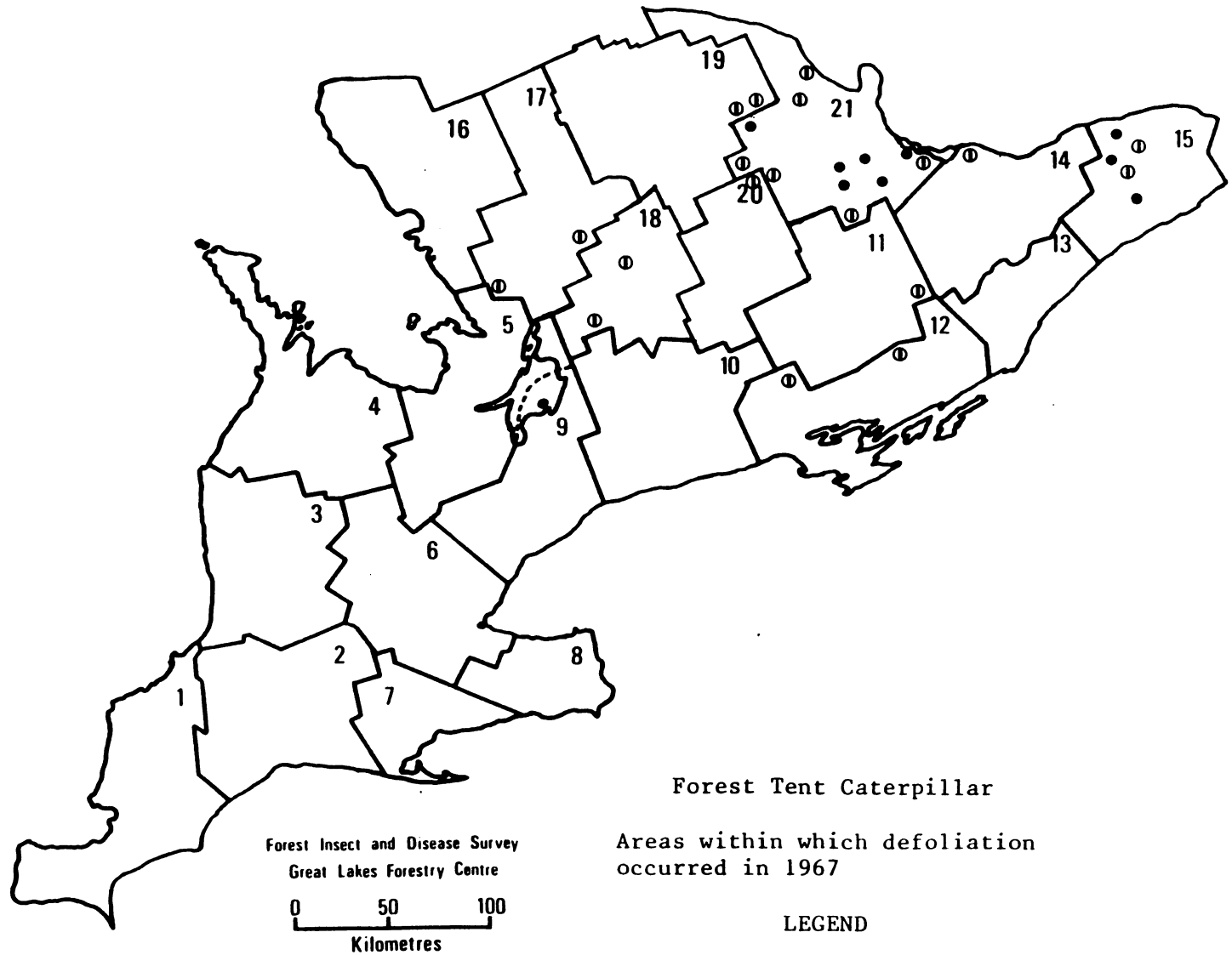
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

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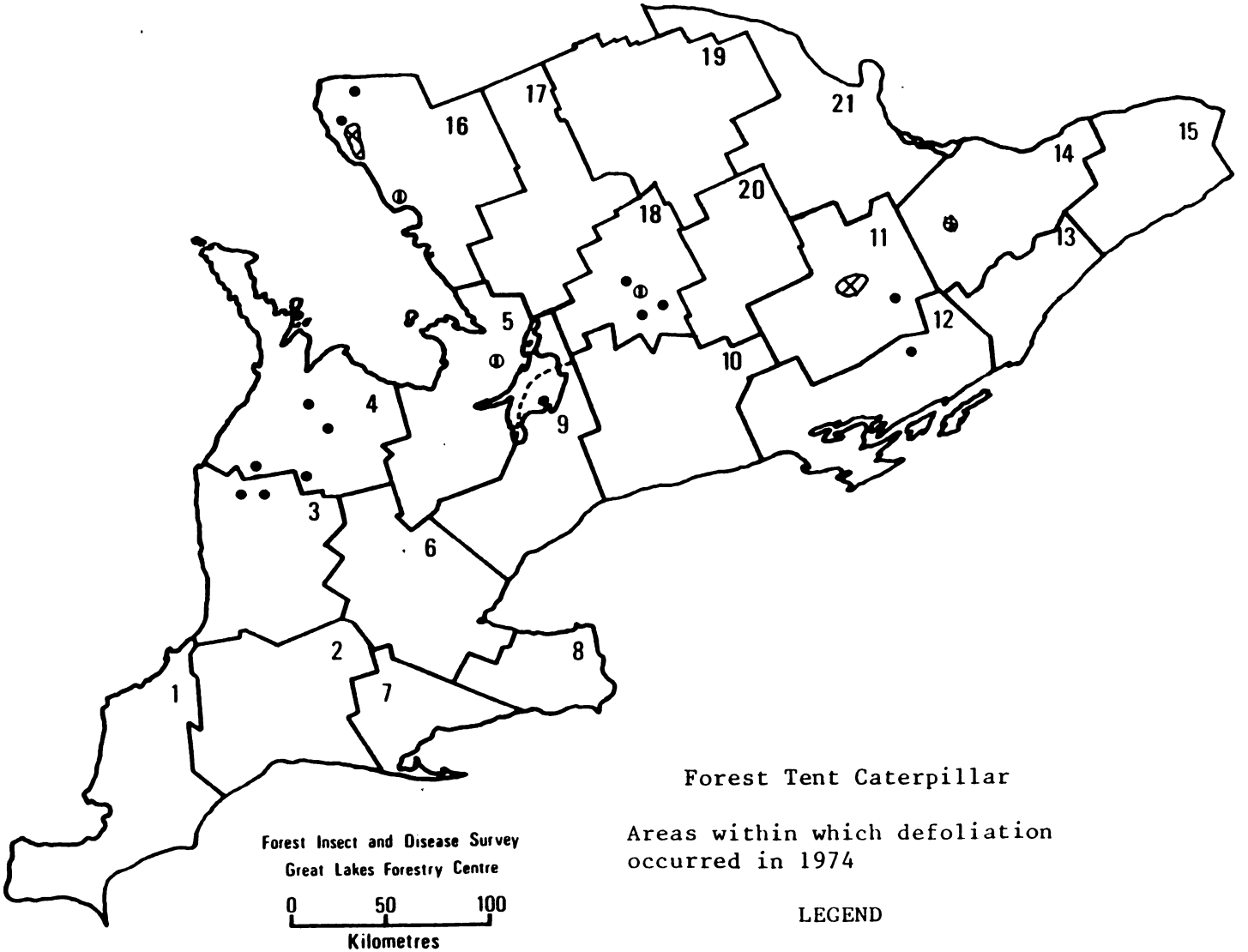
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

LEGEND

Light defoliation ⊕

Moderate-to-severe defoliation • or

SOUTHERN ONTARIO

DISTRICTS

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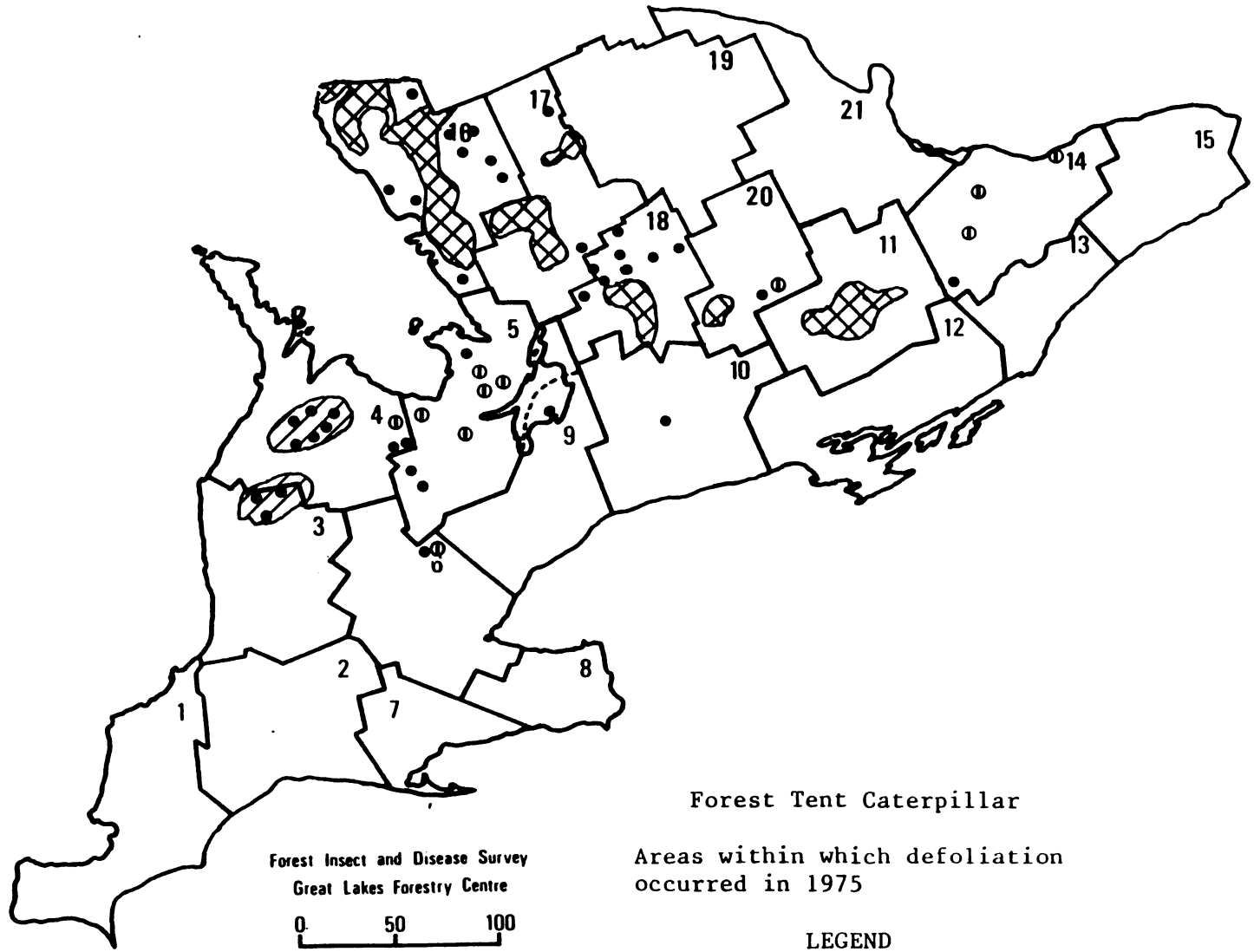
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



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
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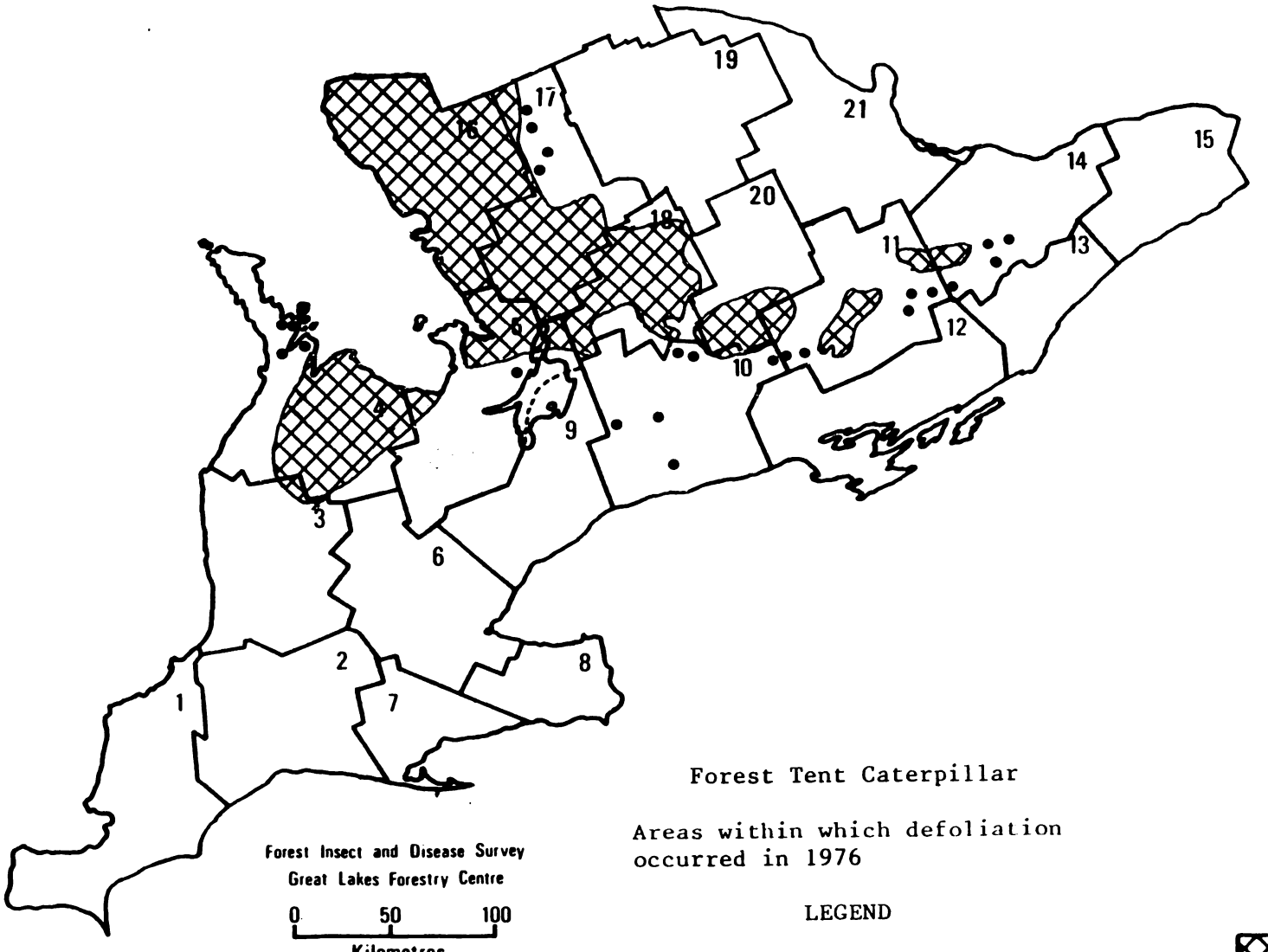
13. BROCKVILLE
14. CARLETON PLACE
15. CORNWALL
16 PARRY SOUND
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



Forest Tent Caterpillar

Areas within which defoliation occurred in 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
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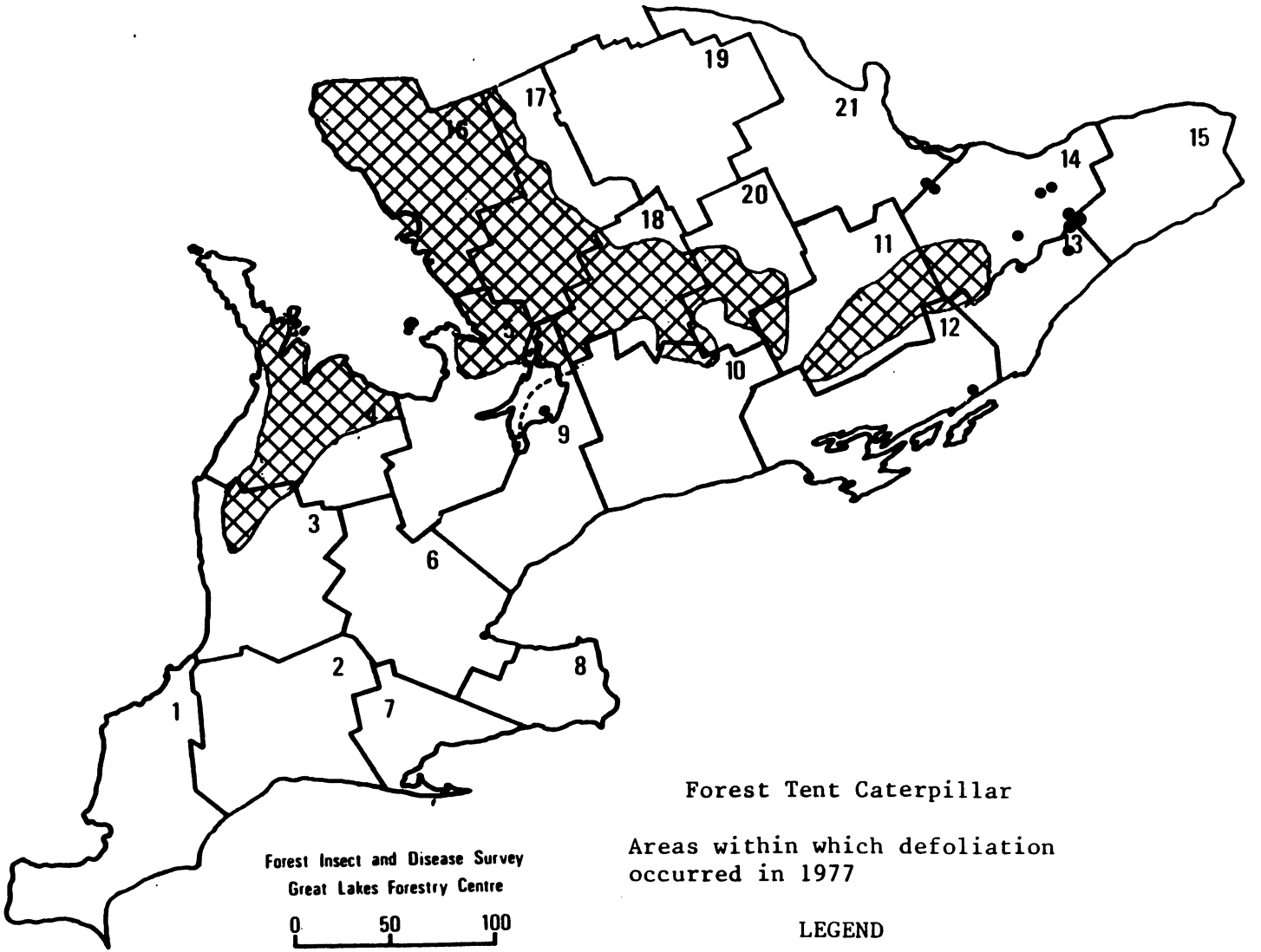
17 BRACEBRIDGE
18 MINDEN
19 ALGONQUIN PARK
20 BANCROFT
21 PEMBROKE



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
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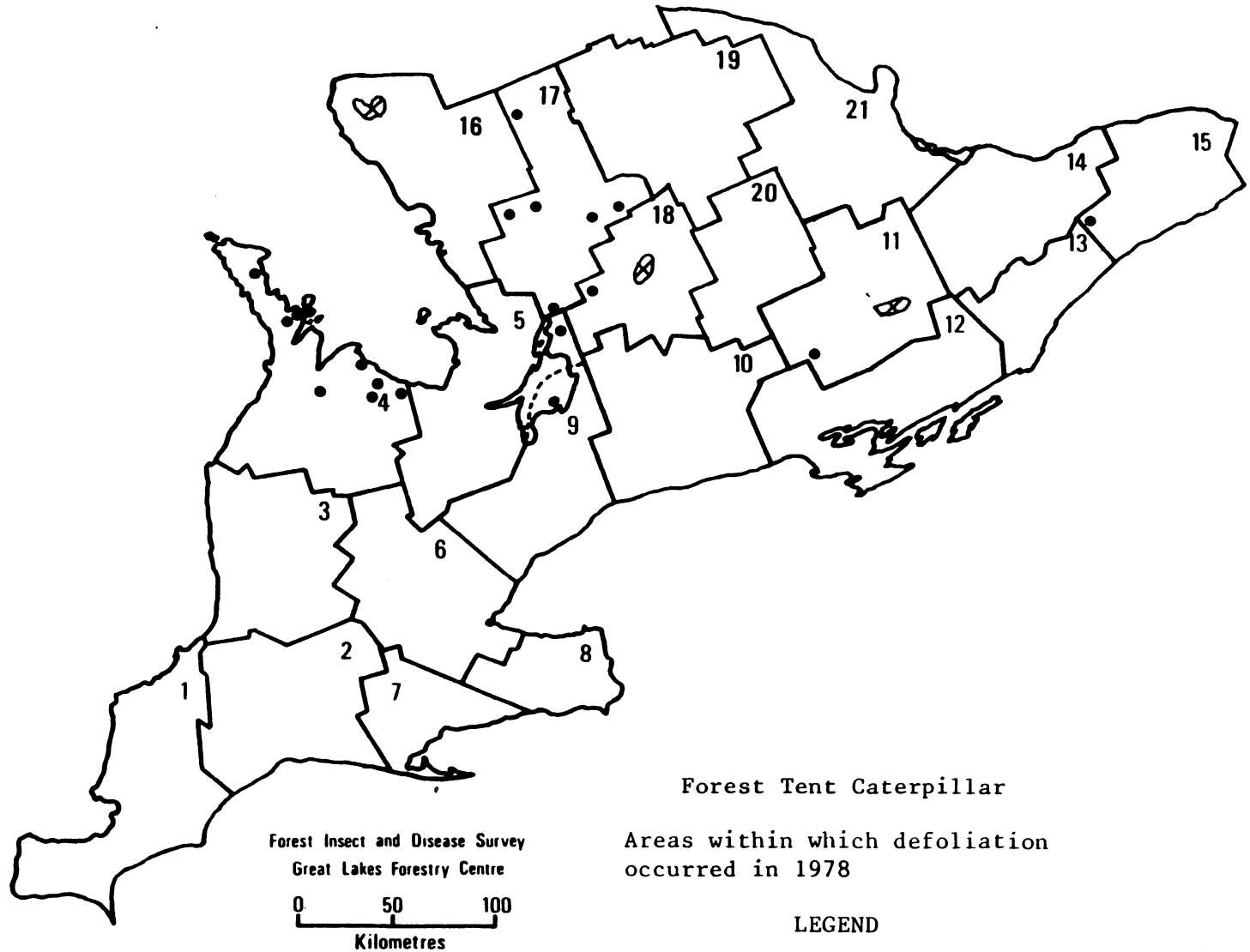

Forest Tent Caterpillar

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation • or