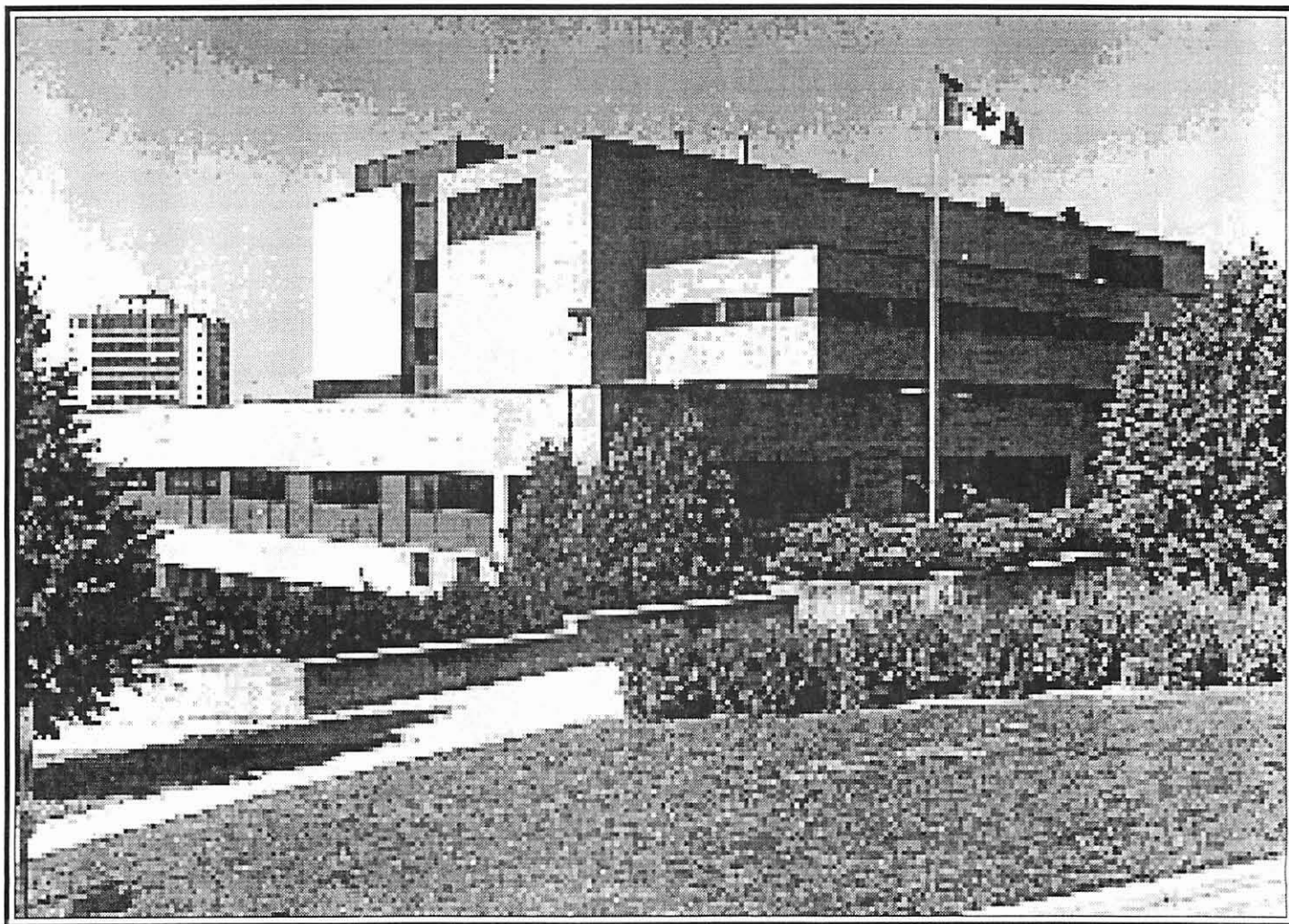




A Review of Important Forest Insect and Disease Problems in the Cambridge District of Ontario, 1950 – 1980



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

Compiled by
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FORESTRY CANADA
ONTARIO REGION
GOVERNMENT OF CANADA
1990

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FOREWORD

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

Major Insects or Diseases

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

Minor Insects or Diseases

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

Abiotic Damage

Damage caused by non-living factors.

All measurements in this review are in metric form and conversions from Imperial measurements from the earliest reports are taken to the second decimal point, i.e., [sq. mi. to km² = area (sq. mi.) x 2.59 = area km²]. Infestation maps in this review were copied from the original maps in the FIDS technicians' reports. Abbreviations for the common names of the host tree species, along with the scientific names, are shown in Appendices A and B. To facilitate the location of hosts, deciduous and coniferous species have been separated and listed alphabetically under the common names.

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

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1950-1953	A.S. Daynard
1954-1958	D.F. Lynn
1959-1966	R.L. Bowser
1967-1975	V. Janson
1976-1980	M.J. Applejohn

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INTRODUCTION

This is a review of significant forest insects and diseases in the area covered by the Cambridge District from 1950 to 1980. Cambridge District was formerly part of the Lake Huron District prior to 1971. In the selection of pests for this report, particular attention was paid to the major host species in the area, namely red pine, Scots pine, maple and larch as well as some ornamentals and shade trees. The insects and diseases included are capable of causing or have caused, tree mortality or a reduction in growth. Also included are abiotic problems that can cause damage.

SUMMARY

FOREST INSECTS

Fall Cankerworm, *Alsophila pometaria* (Harr.) [Major]
page

Although this insect rarely caused tree mortality, heavy defoliation retards growth and vigor making host trees susceptible to attack by other pests. Varying levels of infestation have been reported in the majority of years covered by this report.

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

pages

Repeated defoliation by this complex of miners has caused some mortality in cedar stands in southern Ontario. Severe damage was recorded in 1961-1962, 1966-1968, 1971-1973, 1975, 1979-1980.

Jack Pine Budworm, *Choristoneura pinus pinus* Free. [Major]
pages

This is a destructive pest of pines that can cause mortality after about two years of severe defoliation. Moderate-to-severe damage was recorded in a plantation in 1961. Light infestations were found during various years during the period of 1962-1980.

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

This serious pest of larch causes reduced growth and occasionally tree mortality after to successive years of moderate-to-severe defoliation. Moderate-to-severe damage was found in 1963-1965 and 1975.

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

[Major]

pages

This sawfly has two generations per year. Heavy defoliation caused by second generation larva after buds are formed caused considerably branch and occasional tree mortality. Most pine species are susceptible to attack. Low levels have been recorded during most of the years covered by this report.

Linden Looper, *Erannis tiliaria* (Harr.)

[Major]

page

Defoliation by this insect will rarely cause mortality but tree growth may be retarded. Moderate-to-severe defoliation was present in the district in 1951-1952 and 1976.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

[Major]

page

This insect usually infests lateral shoots and causes only aesthetic damage. When high populations develop, some leaders are infested and killed causing deformity of infested trees. Heaviest damage occurred in 1965 in Puslinch Twp where 15% of the leaders were attacked.

Saddled Prominent, *Heterocampa guttivitta* (Wlk.)

[Major]

page

Infestations of this insect can cause moderate-to-severe defoliation of hardwood stands, weakening trees and predisposing them to attack by other insects and diseases. Infestations were present in 1954 in West Garafraxa Twp.

Fall Webworm, *Hyphantria cunea* (Drury)

[Major]

page

Hardwood stands have been severely defoliated by these unsightly feeders causing branch mortality and contributing to the deterioration of stands. Varying levels of damage occurred during this time period.

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 the susceptible to attack by other pests. High populations were found in 1975 and 1977.

Balsam Fir Sawfly, *Neodiprion abietis* complex

[Major]

pages

Severe defoliation can cause mortality of balsam fir and white spruce trees when an infestation persists over a period of years. Moderate-to-severe damage was recorded in 1964 and 1976-1977.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

[Major]

page

This destructive pest of pine plantations can cause mortality after several years of severe defoliation. The preferred hosts are Scots pine, red pine and jack pine planted in pure stands. Moderate-to-severe damage was reported in the district in 1954.

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

[Major]

page

This sawfly feeds on many species of pine but is a particular pest of Scots pine plantations and consequently a threat to Christmas tree growers. Severe damage was recorded in Beverly Twp in 1974-1975.

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

[Major]

page

This destructive insect has been categorized as a serious pest of young spruce plantations and open-growing ornamentals. High mortality can occur after successive years of severe defoliation. A moderate infestation occurred in Wellington County in 1955 to 1957.

White Pine Weevil, *Pissodes strobi* (Peck)

[Major]

page

This weevil is considered the most destructive pest of eastern white pine in North America. Successive weeviling over a period of years results in multiple-stemmed trees. Severe leader damage was reported in Dumfries Twp from 1960 to 1962.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

[Major]

page

The larch sawfly is the primary defoliating insect of native and most exotic species of larch. On good sites, larch trees can withstand six to nine years of severe defoliation before mortality occurs; on less favourable sites, mortality may follow three or more years of complete defoliation. Moderate-to-severe defoliation was recorded at various locations in the district from 1967 to 1974, and 1976 to 1980.

FOREST DISEASES

Leaf Anthracnose of Maple, *Aureobasidium apocryptum* (Ell. & Ev.) [Major]
Hermanides-Nijhof

page

This foliage disease will cause early leaf fall and can retard tree growth. High levels of damage were found from 1976 to 1980.

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. This disease is present throughout the district.

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

page

Repeated medium-to-heavy needle infection weakens trees, causes a loss of increment and predisposes them to secondary insect attack and disease. High infection levels were recorded in 1969 and 1970.

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

page

White pine blister rust is the most serious disease of eastern white pine. The disease caused top killing and mortality in trees of all ages. High infection levels were surveyed in Woolwich Twp in 1963-1964.

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. Damage was reported in the district in 1968 and 1973.

DECLINES AND DIEBACKS

Ash Dieback

page

This condition was reported from 1977 to 1980.

Maple Dieback

page

This condition was reported in 1965-1966 and 1980.

ABIOTIC DAMAGE

page

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

Fall Cankerworm, *Alsophila pometaria* (Harr.)

Host(s): deciduous

[Major]

Year	Remarks
1950	not reported
1951	collections made in Dumfries Twp
1952	moderate-to-severe damage through Halton and Wentworth counties
1953	moderate-to-severe damage through Halton and Wentworth counties; light damage found in Waterloo County
1954	not reported
1955	moderate-to-severe defoliation in Barton and Binbrook twps
1956	moderate-to-severe damage in the northern townships of Wentworth County and the northwestern townships of Halton County
1957	small numbers of larvae in Halton and Wentworth counties
1958	not reported
1959	moderate-to-severe damage in West Flamborough and Waterloo twps
1960	recurrence of moderate-to-severe damage in West Flamborough Twp
1961	light defoliation found in Halton, Wentworth and Wellington counties
1962	light-to-moderate damage at several locations in Halton and Wentworth counties
1963	moderate-to-severe defoliation at scattered points in Halton and Wentworth counties
1964	Light infestations were noted commonly in Waterloo, Wentworth and Halton counties.
1965	marked decline across the district
1966-1973	not reported
1974-1975	very light damage in the district
1976	moderate-to-severe defoliation reported in Blenheim Twp
1977	reduction in populations
1978	not reported
1979	low numbers at several locations
1980	moderate-to-severe damage found on Manitoba maple in Brantford Twp

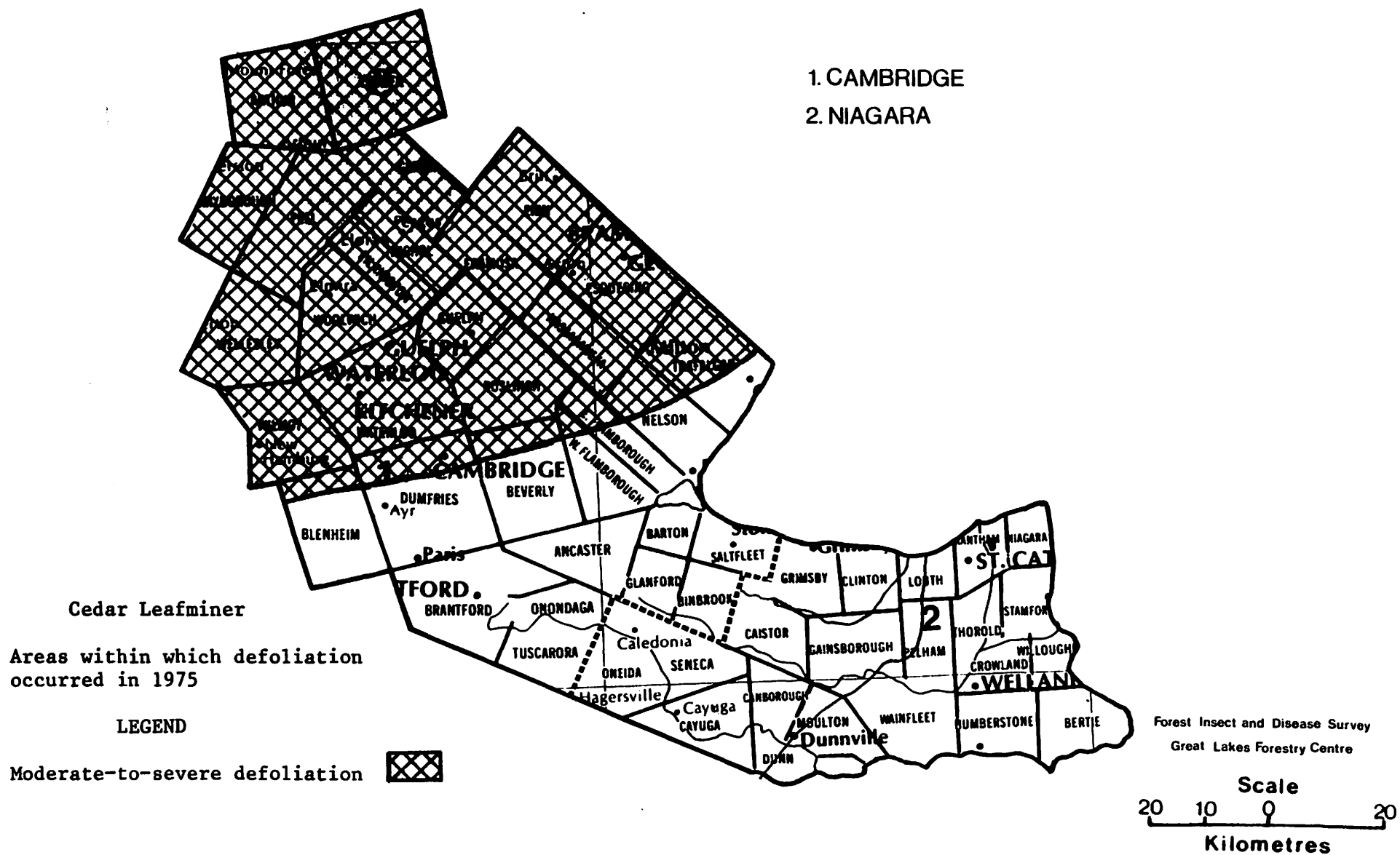
Cedar Leafminer, *Argyresthia canadensis* Free., *A. thuiella* (Pack.),
A. aureoargentella Brower, and *Coleotechnites thujaella* (Kft.)

Host(s): cedar

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	light infestation found in Trafalgar Twp
1959-1960	not reported
1961	High populations in Waterloo and Wellington counties caused severe mining in several localized locations.
1962	high population found in Puslinch Twp
1963	not reported
1964	moderate-to-severe infestation recorded in Arthur Twp
1965	not reported
1966-1968	Heavy branch tip mortality occurred locally in Waterloo, Wellington and Halton counties.
1969	Infestations decline to light levels.
1970	not reported
1971	heavy damage common in Halton County
1972	moderate-to-severe leaf mining common in Wellington County
1973	pockets of moderate-to-severe damage found in Erin and Puslinch twps
1974	Severe twig and branch mortality occurred in Luther and Dumfries twps.
1975	moderate-to-severe damage across the northern half of the district (see map, page)
1976	populations reduction; light damage in Beverly and Dumfries twps
1977-1978	not reported
1979	population increase; moderate-to-severe damage across northern half of district (see map, page)
1980	entire district infested at moderate-to-severe levels (see map, page)

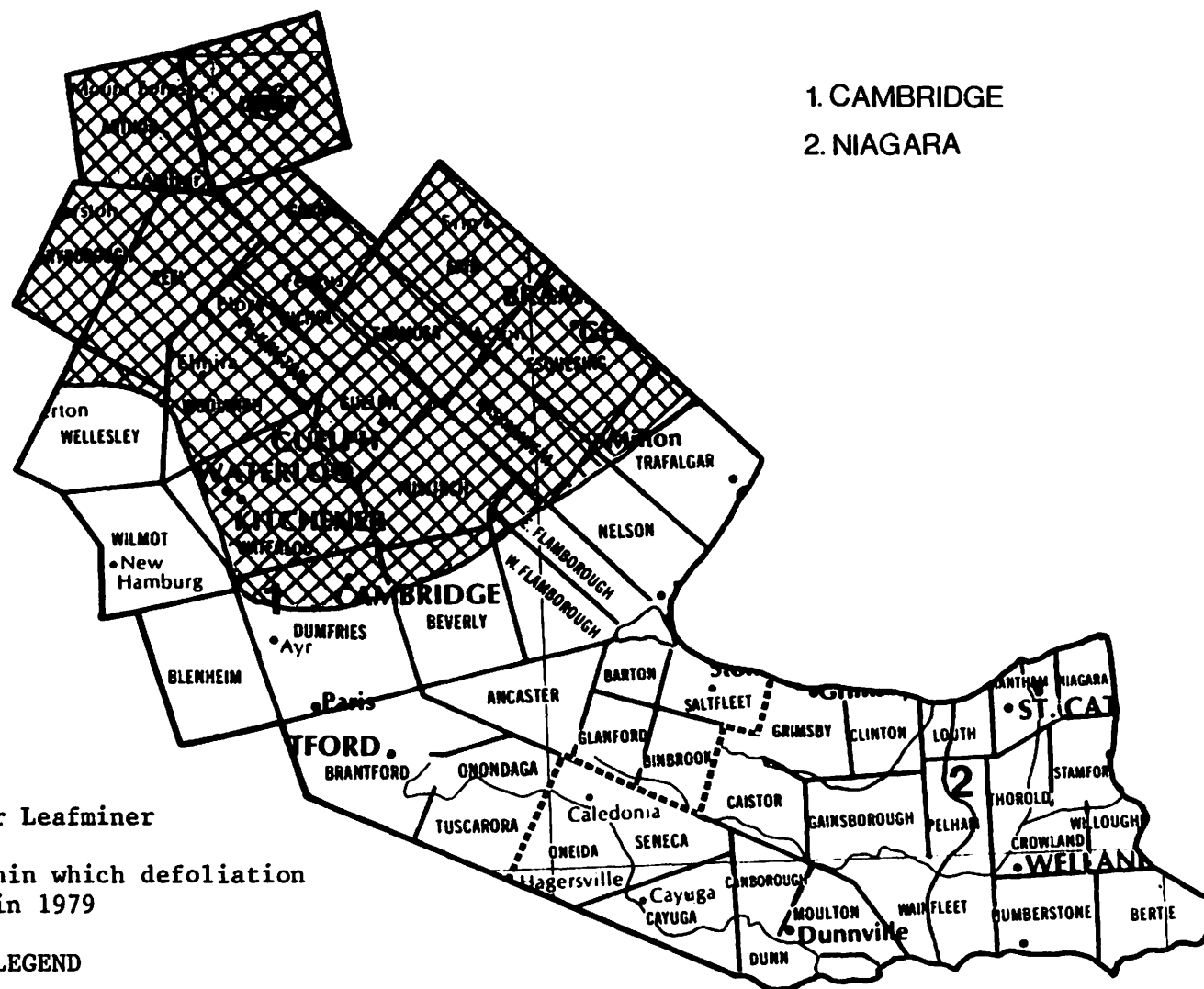
CAMBRIDGE and NIAGARA DISTRICTS



CAMBRIDGE and NIAGARA DISTRICTS

1. CAMBRIDGE

2. NIAGARA



Cedar Leafminer

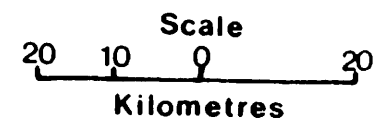
Areas within which defoliation
occurred in 1979

LEGEND

Moderate-to-severe defoliation



Forest Insect and Disease Survey
Great Lakes Forestry Centre



1. CAMBRIDGE
2. NIAGARA

Leafminer
in which defoliation
n 1980

LEGEND

Areas within which defoliation occurred in 1980

Moderate-to-severe defoliation

2. NIAGARA

Scale

20 10 0 20

Kilometres

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Host(s): jack pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	moderate-to-severe damage in a plantation in Dumfries Twp
1962	population decline, light damage, Dumfries Twp
1963	moderate populations, Beverly Twp
1964	population decline, light damage, Beverly Twp
1965-1968	not reported
1969	low levels in Beverly Twp
1970-1976	not reported
1977	light infestation, Puslinch and Ancaster twps
1978	light infestation, Blenheim Twp
1979	low populations, Beverly, Blenheim and Woolwich twps
1980	not reported

Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	light damage, Wellington and Halton counties
1954	light damage, Ancaster Twp
1955	light browning of foliage, Halton, Wellington and Wentworth counties
1956	trace populations, Ancaster Twp
1957-1958	light damage, Dumfries Twp
1959	population levels increased, Dumfries Twp
1960	moderate-to-severe damage, Dumfries Twp
1961	population decrease to low levels, Dumfries Twp
1962	infestation increased to moderate levels, Dumfries Twp
1963-1965	moderate-to-severe damage, Dumfries Twp

(cont'd)

Larch Casebearer, *Coleophora laricella* (Hbn.) (concl.)

<u>Year</u>	<u>Remarks</u>
1966-1968	decreased to low levels, Dumfries Twp
1969	trace populations, Dumfries Twp
1970-1974	not reported
1975	moderate-to-severe damage, Luther Twp
1976-1977	light damage, Luther Twp
1978	not reported
1979-1980	heavy infestations on European larch in the Cambridge-Guelph area

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

Host(s): pine [Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	Collections were made in Wellington, Waterloo, and Wentworth counties.
1953	Numbers declined in the above counties.
1954	Light infestations occurred in the Peacock and Victory tracts of the Wellington County forests and in the Finney tract of the Halton County forest.
1955	not reported
1956	light defoliation in Arthur Twp and in Erin Twp
1957-1959	not reported
1960	low levels collected on beating mat samples from eastern white, Scots and Austrian pine trees in Waterloo and Wellington counties
1961	low levels reported in eastern white pine plantations in the Hyde Tract, Beverly Twp
1962	low levels in Waterloo and Wentworth counties
1963-1965	low levels reported in Woolwich and Beverly twps
1966	population increase in Woolwich Twp
1967	population decline in Woolwich Twp
1968	Fourteen larvae were collected on a 15-tray beating sample in Eramosa Twp.
1969-1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	high populations in Waterloo County
1952	moderate-to-severe damage, Wentworth, Wellington, Halton and Waterloo counties
1953	larvae numerous, Halton and Waterloo counties
1954	moderate-to-severe damage, Wentworth and Wellington counties
1955-1974	not reported
1975	light infestation, Erin Twp
1976	moderate-to-severe damage, Erin Twp
1977-1980	not reported

Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	light damage Wentworth and Waterloo county
1953	not reported
1954	light damage, Waterloo County
1955-1956	not reported
1957	light damage, Wellington County
1958	light infestation, Beverly Twp
1959-1960	medium infestation, Beverly Twp
1961	average of 4.7 infested shoots per tree, Beverly Twp
1962	10% leaders attacked, Puslinch Twp
1963	4% leaders attacked, Puslinch Twp
1964	8% leaders attacked, Puslinch Twp
1965	15% leaders attacked, Puslinch Twp
1966	4% leaders attacked, Puslinch Twp

(cont'd)

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1967	4% leader damage, Puslinch Twp; 76% of trees attacked, Nassagaweya Twp
1968	light damage in white pine plantations in Nassagaweya and Puslinch twps
1969	light damage to white pine in Eramosa and Nassagaweya twps
1970-1972	not reported
1973	light damage to white pine in Eramosa Twp
1974-1975	not reported
1975	light damage in Scots pine plantations in Maryborough and Peel twps
1977	not reported
1978	heavy infestations in Beverly, Puslinch and Flamborough twps
1979-1980	not reported

Saddled Prominent, *Heterocampa guttivitta* Wlk.

Host(s): sugar maple, beech

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	moderate-to-severe damage in a 3-ha woodlot, West Garafraxa Twp
1955	infestation in West Garafraxa Twp reduced to light levels
1956-1980	not reported

Fall Webworm, *Hyphantria cunea* (Drury)

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	light populations, Wellington and Halton counties
1954-1955	not reported
1956	light populations across the district
1957-1958	not reported

(cont'd)

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

Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1959-1960	low levels, Nassagaweya and Eramosa twps
1961-1969	not reported
1970	high populations on black walnut in town of Paris
1971	reduced to light populations in Paris
1972	Light infestations continued in Paris; moderate-to-severe damage, southern Halton County.
1973-1974	moderate damage in southern half of district
1975-1977	not reported
1978	moderate population in town of Paris
1979	not reported
1980	moderate-to-severe damage in southern half of district

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): aspen, deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951-1952	larvae collected in Waterloo and Halton counties
1953-1973	not reported
1974	larvae collected on sugar maple and trembling aspen
1975	moderate-to-severe damage in 20 ha of hardwoods in Erin Twp
1976	Single colonies could be found in most of the district.
1977	heavy infestation in 100-ha sugar maple woodlot in Wilmot Twp
1978	infestation in Wilmot Twp declined to trace levels
1979-1980	not reported

Balsam Fir Sawfly, *Neodiprion abietis* Complex

Host(s): balsam fir, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	collection made in Puslinch Twp
1952	larvae collected in Halton and Wellington counties
1953-1958	not reported
1959	light infestation in Beverly Twp
1960	not reported
1961	light infestation in Beverly Twp
1962	several small pockets of light infestation at scattered locations in Wellington County
1963	not reported
1964	moderate-to-severe defoliation found in the area surrounding the town of Arthur, Arthur Twp
1965-1972	not reported
1974	light infestation occurred in a partially cut-over area in Puslinch Twp
1975	not reported
1976-1977	moderate-to-severe infestation observed in the Grand Valley Forest in Erin Twp
1978-1979	infestation in Erin Twp reduced to low levels
1980	light infestation in Puslinch and Erin twps

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	light infestation in Wellington and Waterloo counties
1951	moderate-to-severe damage in Puslinch Twp
1952	heavy infestation in 8-ha plantation in the Little Tract of the Wellington County Forest
1953	infestations continues in Wellington County Forest
1954	moderate-to-severe damage in Wellington, Wentworth and Waterloo counties
1955	populations declined sharply
1956	small numbers of colonies observed
1957	Larval colonies were scattered in 80 ha of the Little Tract in Puslinch Twp.
1958	not reported
1959	light infestation in a small stand in the Turner Tract in Nassagaweya Twp
1960	Chemical control measure reduced populations in Turner Tract to trace levels.
1961	light infestation in the Turner Tract, Nassagaweya Twp
1962-1963	light infestation in Waterloo Twp
1964-1965	light-to-moderate infestation in Waterloo Twp
1966-1967	not reported
1968	one colony found in Waterloo Twp
1969-1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950	one collection made in Dumfries Twp
1951	low population in Waterloo County
1952	range of insect increased to include Woolwich Twp
1953	insects found through Wentworth and Waterloo counties
1954-1968	not reported
1969	light defoliation to Scots pine in Nassagaweya Twp
1970	not reported
1971-1973	light defoliation to Scots pine in Eramosa Twp
1974-1975	Severe defoliation was recorded in a plantation of 2.4-m Scots pine trees in Beverly Twp.
1976	Damage to Scots pine in Beverly Twp declined to light intensity.
1977-1980	not reported

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

Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	One collection was made at Fergus in Wellington County.
1951-1953	not reported
1954	Low numbers of trees in Erin and Eramosa twps were infested.
1955-1956	medium-to-heavy infestation occurred in the Victory Tract, Wellington County
1957	Continuation of infestation in Wellington County; light populations occurred on several trees in a windbreak in the Grand River Conservation Authority nursery near Fergus.
1958	light infestation in Arthur Twp
1959	infestation in Arthur Twp increased to moderate levels
1960-1964	infestation in Arthur Twp decreased to light levels
1965	low numbers in Waterloo and Halton counties
1966-1974	not reported

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1975	Numbers increased substantially in young, white spruce plantations in parts of Cambridge District.
1976-1980	not reported

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce [Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	weevilled shoots numerous in the Cox tract of the Halton County forests; light infestation in the Sudden Tract, Dumfries Twp
1955	light infestation, Halton and Waterloo counties
1956	not reported
1957	10% leader damage, Sudden Tract, Dumfries Twp
1958-1959	population reduction, 1% leaders infested, Sudden Tract, Dumfries Twp
1960	10% leader damage, Sudden Tract, Dumfries Twp
1961	12% leader damage, Sudden Tract, Dumfries Twp
1962	7% leader damage, Sudden Tract, Dumfries Twp
1963-1964	not reported
1965	light damage, Guelph and Cambridge area
1966-1968	not reported
1969	5% leader damage, Waterloo Twp
1970	3% damage, Waterloo Twp
1971	5% damage, Dumfries Twp
1972-1973	3% damage, Dumfries Twp
1974-1977	not reported
1978	medium infestation, Beverly Twp
1979-1980	not reported

Larch Sawfly, *Pristiphora erichsonii* Htg.

Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1966	not reported
1967	medium infestation in 4-ha European larch plantation in Dumfries Twp
1968	50% defoliation for second consecutive years, Dumfries Twp
1969	infestation continued in Dumfries Twp
1970	infestation continued in Dumfries Twp; severe defoliation in pockets of tamarack, Puslinch Twp
1971	light-to-medium infestations in Dumfries, Puslinch and Woolwich twps
1972	moderate defoliation, Dumfries and Puslinch twps
1973	medium infestation continued, Dumfries Twp
1974	medium-to-heavy infestations, Wilmot, Dumfries and Woolwich twps
1975	populations declined to light levels
1976	heavy infestation, Luther Marsh, Luther Twp
1977	heavy infestations, Luther Beverly, Dumfries and Woolwich twps
1978	medium infestations, Luther and Beverly twps; heavy infestation, Woolwich, Garafraxa and Maryborough twps
1979	light infestation, Luther Twp; medium infestation Beverly and Woolwich twps
1980	41 ha severely defoliated, Luther Twp; heavy infestations Beverly, Blenheim and Woolwich twps

Other Noteworthy Insects

Uglynest Caterpillar, *Archips cerasivorana* (Fitch)

Host(s): cherry

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	severe damage to roadside shrubs in the Hamilton area
1956	severe damage to roadside shrubs in East Flamborough Twp
1957-1965	not reported
1966	medium-to-heavy infestation to clumps of choke cherry, Puslinch Twp
1967-1980	not reported

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

Host(s): maple

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962	caused mortality of regeneration in Puslinch Twp varying from 8 to 51%
1963	mortality in Puslinch Twp ranged from 9 to 53%
1964	damage ranged from 5 to 31% in Puslinch Twp
1965	mortality averaged 20.8% in Puslinch Twp
1966-1980	not reported

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

Host(s): walnut, hickory

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	defoliation ranged from 10 to 100% in Halton and Wentworth counties
1953	heavy defoliation common in the district
1954	moderate-to-severe defoliation in Halton and Wentworth counties
1955-1956	not reported
1957	heavy defoliation in Wentworth, Waterloo and Halton counties

(cont')

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

<u>Year</u>	<u>Remarks</u>
1958	10% defoliation in Waterloo and Dumfries twps
1959	light defoliation, Halton County
1960-1961	population increase, moderate-to-severe damage, Huron and Wentworth counties
1962	heavy defoliation, Esquesing and Nelson twps
1963	light defoliation, Halton and Wentworth counties
1964	moderate-to-severe defoliation, Glanford Twp
1965	population increase, Halton and Wentworth counties
1966-1967	moderate-to-severe damage, Dumfries Twp
1968-1969	100% defoliation to low numbers of trees, Dumfries and Eramosa twps
1970-1975	not reported
1976	scattered, moderate infestations in the Cambridge-Brantford area
1977-1980	moderate-to-severe defoliation scattered across the district

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

Host(s): maple

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	light population, Waterloo Twp
1970	high numbers, Puslinch and Waterloo twps
1971	not reported
1972	heavy infestations, Waterloo Twp
1973	heavy infestation, Waterloo and Pilkington twps
1974-1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962	63% of buds in Scots pine plantation infested, Dumfries Twp
1963	population decline in Dumfries Twp, 35% of buds infested
1964	sharp decrease in Dumfries Twp, 9% of buds infested
1965-1966	light infestation continued, Dumfries Twp
1967-1980	not reported

Pine Needleminer, *Exoteleia pinifoliella* (Cham.)

Host(s): jack pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	heavy infestation in plantations, Little Tract, Puslinch Twp
1962	heavy infestation in the Little Tract, Puslinch Twp declined to light levels
1963	light infestation recurred, Puslinch Twp
1964	light infestation, Sandy Hill Tract, Woolwich Twp
1965	light infestation persisted, Woolwich Twp
1966-1980	not reported

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

Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	larvae collected in Wellington and Wentworth counties
1952	larvae collected in Wellington and Waterloo counties but at reduced levels
1953-1960	not reported
1961	low numbers were collected from white spruce beating samples in Nassagaweya and Dumfries twps
1962	low levels recorded in Nassagaweya Twp
1963	low population levels found in Waterloo Twp
1964-1965	not reported
1966	trace levels in Woolwich Twp
1967	not reported
1968-1969	trace levels in Woolwich Twp
1970-1980	not reported

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

Host(s): deciduous

[Major]

1950-1954	not reported
1955	moderate populations on roadside trees, Dumfries Twp
1956-1957	populations decline across district
1958	slight increase in population levels
1959-1960	moderate populations, Guelph Twp
1961	medium-to-heavy infestations in Waterloo and Wellington counties
1962	moderate damage, Dumfries and Guelph twps
1963	general population increase across the district
1964	slight decrease in populations across the district
1965-1968	light infestations scattered across the district
1969	Populations decreased to trace levels.
1970-1971	not reported

(cont'd)

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

<u>Year</u>	<u>Remarks</u>
1972	medium-to-heavy infestations in Waterloo, Wentworth and Wellington counties
1973	Populations declined to light levels across the district.
1974	light populations continued
1975	not reported
1976	light-to-medium infestations in northern part of district
1977	tents found at numerous locations in the district
1978	not reported
1979	increased populations in district
1980	not reported

Spring Cankerworm, *Paleacrita vernata* (Peck)

Host(s): elm, sugar maple [Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	moderate-to-severe damage found in Nassagaweya and Esquesing twps
1958	population decrease; light defoliation in Halton and Wentworth counties
1959-1960	not reported
1961	light defoliation, Puslinch Twp
1962	not reported
1963	light defoliation, Wellington County
1964-1980	not reported

Oak Leafmining Sawfly, *Profenusa lucifex* (Ross)

Host(s): oak

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1975	not reported
1976	light-to-moderate damage, Brant and Onondaga twps
1977	heavy infestation, Brant Twp; light infestation, Onondaga Twp
1978	light infestation, Dumfries Twp
1979	low numbers, Brant Twp
1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	high populations found in the southern and western portions of the district
1952	marked decline due to winter mortality
1953	continued decline in Halton and Wentworth counties
1954-1965	not reported
1966	moderate infestation in Dumfries Twp
1967	not reported
1968	low numbers found in Dumfries Twp
1969	low numbers of infested shoots in Waterloo and Wellington counties
1970-1971	not reported
1972	16% of red pine bud clusters infested in the Benham Tract, Eramosa Twp
1973	not reported
1974	Larval numbers increased substantially; heaviest damage in Dumfries Twp where 80% of the bud clusters were infested.
1975	Shoot moth numbers increased in Puslinch, Eramosa and Dumfries twps.
1976	high populations persisted
1977	populations somewhat reduced across district
1978	not reported
1979	varying degrees of infestation in district
1980	heavy infestation at several locations totaling about 4 ha

DISEASES

REPORT

1. Name of patient: _____

2. Age: _____ Sex: _____

3. Date of admission: _____

4. Ref. by: _____

5. Present illness: _____

6. Past history: _____

7. Family history: _____

8. Social history: _____

9. Physical examination: _____

10. Laboratory examinations: _____

11. Pathology: _____

12. Microbiology: _____

13. Radiology: _____

14. Other: _____

15. Summary: _____

16. Discharge: _____

17. Follow-up: _____

18. Prognosis: _____

19. Treatment: _____

20. Remarks: _____

Leaf Anthracnose of Maple, *Aureobasidium apocryptum* Hermanides-Nijhof

Host(s): maple [Major]

<u>Year</u>	<u>Remarks</u>
1950-1975	not reported
1976	commonly observed in the district
1977	70% of trees in city of Cambridge infected with an average of 25% foliage damage
1978	heavy defoliation, Puslinch, Trafalgar and West Flamborough twps
1979	high infection levels, Puslinch, Flamborough and Nassagaweya twps
1980	90% infection level, Pilkington Twp; pockets of heavy infection, southeast of Guelph

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

Host(s): elm [Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	new infections in city of Hamilton and neighbouring Ancaster Twp
1956	not reported
1957	present in Halton and Wentworth counties
1958	not reported
1959-1963	present throughout most of the district
1964	26% infection rate, Nassagaweya Twp
1965-1966	not reported
1967	98.4% tree mortality in a small swamp in Woolwich Twp
1968-1980	not reported

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

Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	high infection, Dumfries Twp
1970	high infection on red pine, Dumfries Twp
1971	sharp decline in infection, Dumfries Twp
1972-1975	not reported
1976	light damage, Erin, East Flamborough, Luther and Ancaster twps
1977-1980	not reported

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

Host(s): eastern white pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	20% infection rate in a young plantation, Woolwich Twp
1964	16% infection rate, 4% mortality, Woolwich Twp
1965-1972	not reported
1973	light infection, Puslinch, Waterloo, Woolwich twps
1974	All levels of infection occurred commonly across the district.
1975	light infection, Luther Twp
1976	infection similar to previous years
1977	not reported
1978	single heavy infection in young plantations near Ariss
1979-1980	not reported

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

Host(s): aspen

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1967	not reported
1968	20% incidence, Puslinch Twp
1969-1972	not reported
1973	2.5% mortality, West Luther Twp
1974-1980	not reported

DIEBACKS AND DECLINES

Ash Dieback

Host(s): white and green ash

<u>Year</u>	<u>Remarks</u>
1950-1976	not reported
1977	found much more commonly than usual in Cambridge-Brantford-Paris area and in the Kitchener-Waterloo area
1978	severe top-killing and light tree mortality observed in several woodlots in Arthur Twp
1979	Severe damage was again noted in woodlots in Arthur Twp.
1980	severe damage, Arthur and Nassagaweya twps

Maple Dieback

Host(s): maple

<u>Year</u>	<u>Remarks</u>
1950-1964	not reported
1965	37% roadside trees affected, Dumfries Twp
1966	65% roadside trees affected, 6% mortality, Dumfries Twp
1967-1979	not reported
1980	single pocket of mortality in a mature sugar maple bush one ha in size, Wilmot Twp

ABIOTIC DAMAGE

Winter Drying

Host(s):

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1975	not reported
1976	moderate damage to red pine plantations, Erin, East Flamborough and Ancaster twps
1977	moderate damage in red pine plantations, Erin and East Flamborough twps
1978	severe damage on planted eastern white pine south of Paris
1979	not reported
1980	moderate damage to red pine, Erin Twp; moderate damage to eastern white pine, Blenheim and West Garafraxa twps

APPENDICES

APPENDIX I

APPENDIX II

APPENDIX III

APPENDIX IV

APPENDIX V

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APPENDIX XIII

APPENDIX XIV

APPENDIX XV

APPENDIX XVI

APPENDIX XVII

APPENDIX XVIII

APPENDIX XIX

APPENDIX XX

APPENDIX XXI

APPENDIX XXII

APPENDIX XXIII

APPENDIX A

DECIDUOUS HOST

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

(continued)

APPENDIX A (continued)

DECIDUOUS HOST

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

APPENDIX B

CONIFEROUS HOST

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

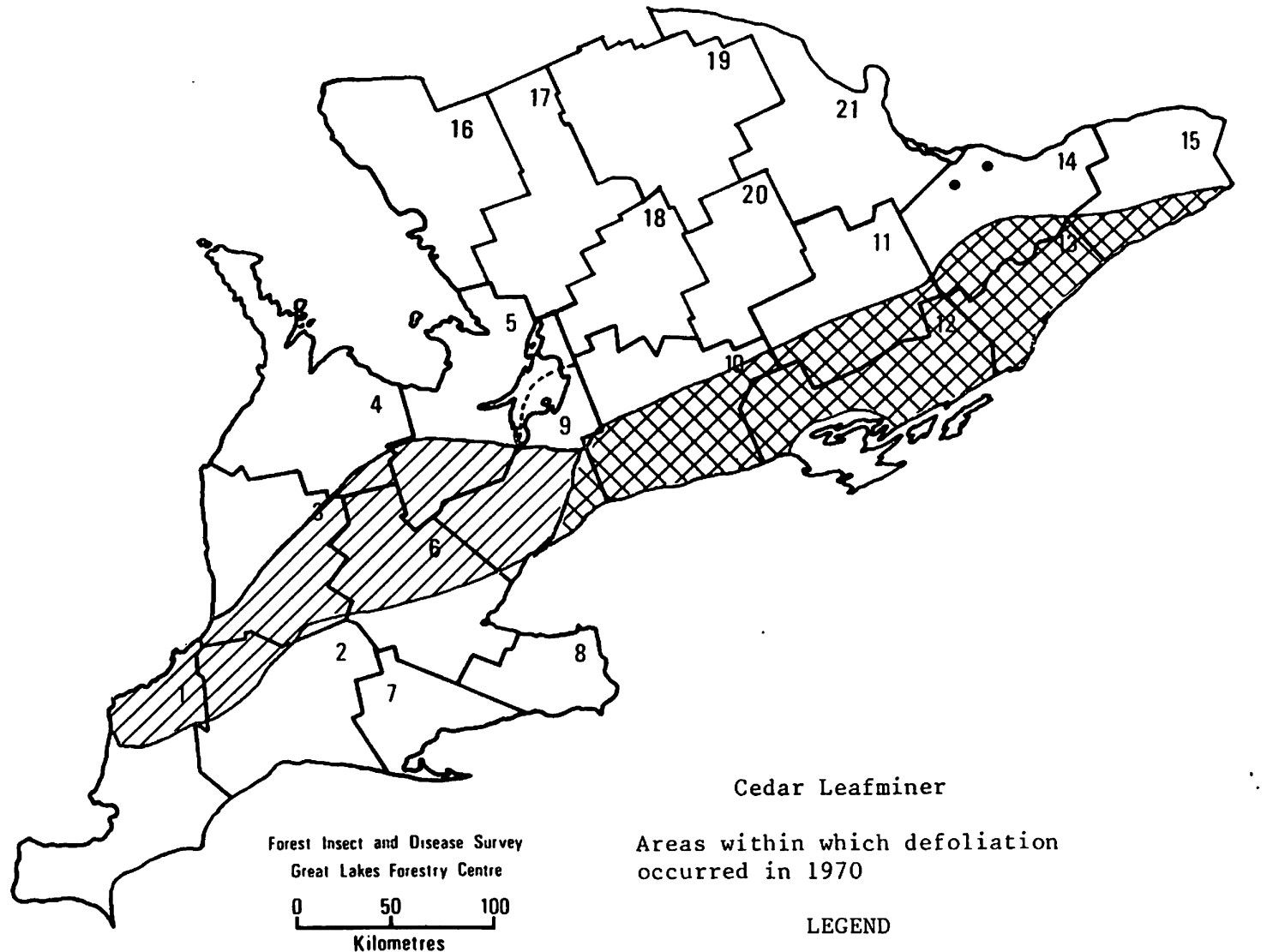
APPENDIX C

MAPS - SOUTHERN ONTARIO

SOUTHERN ONTARIO

DISTRICTS

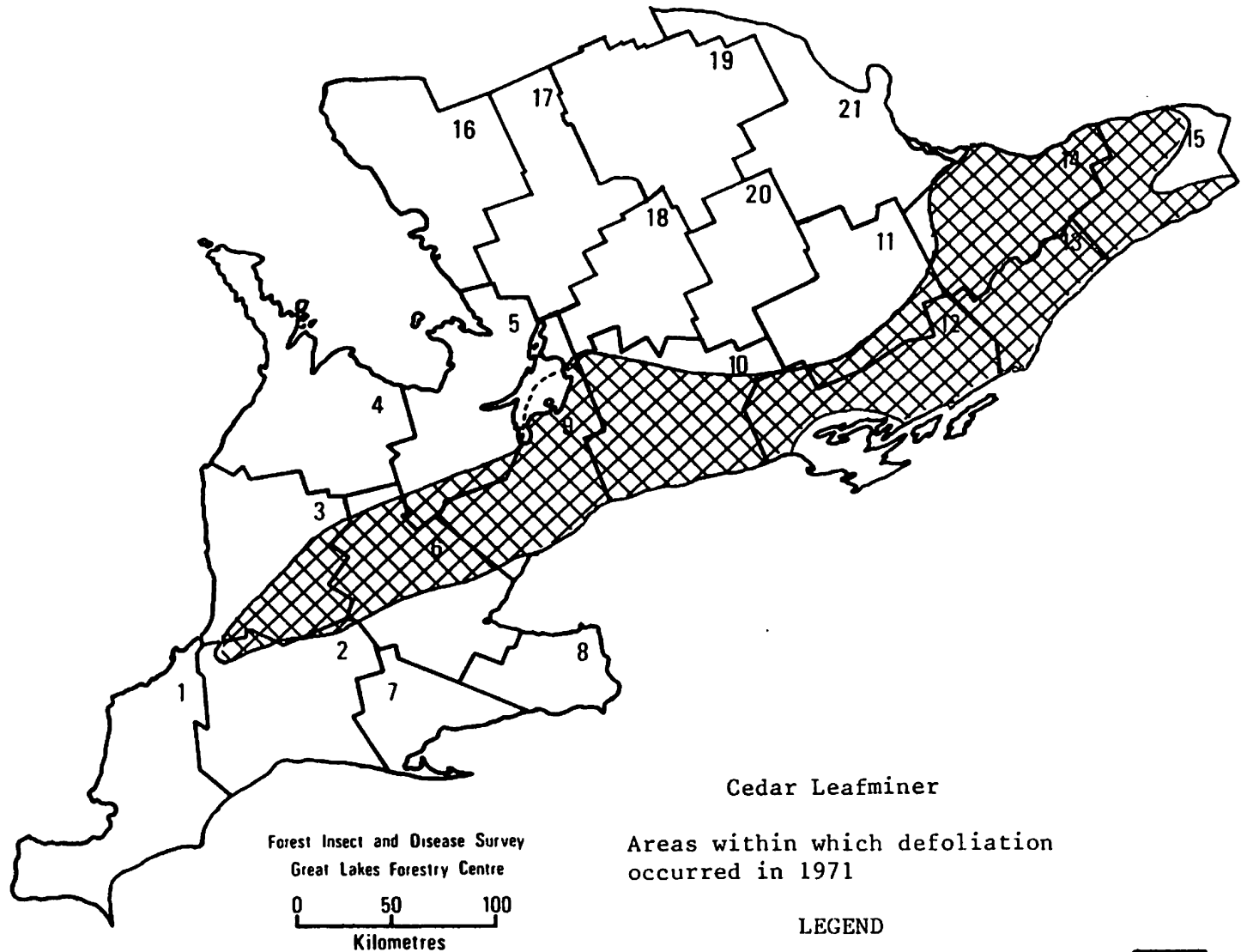
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21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

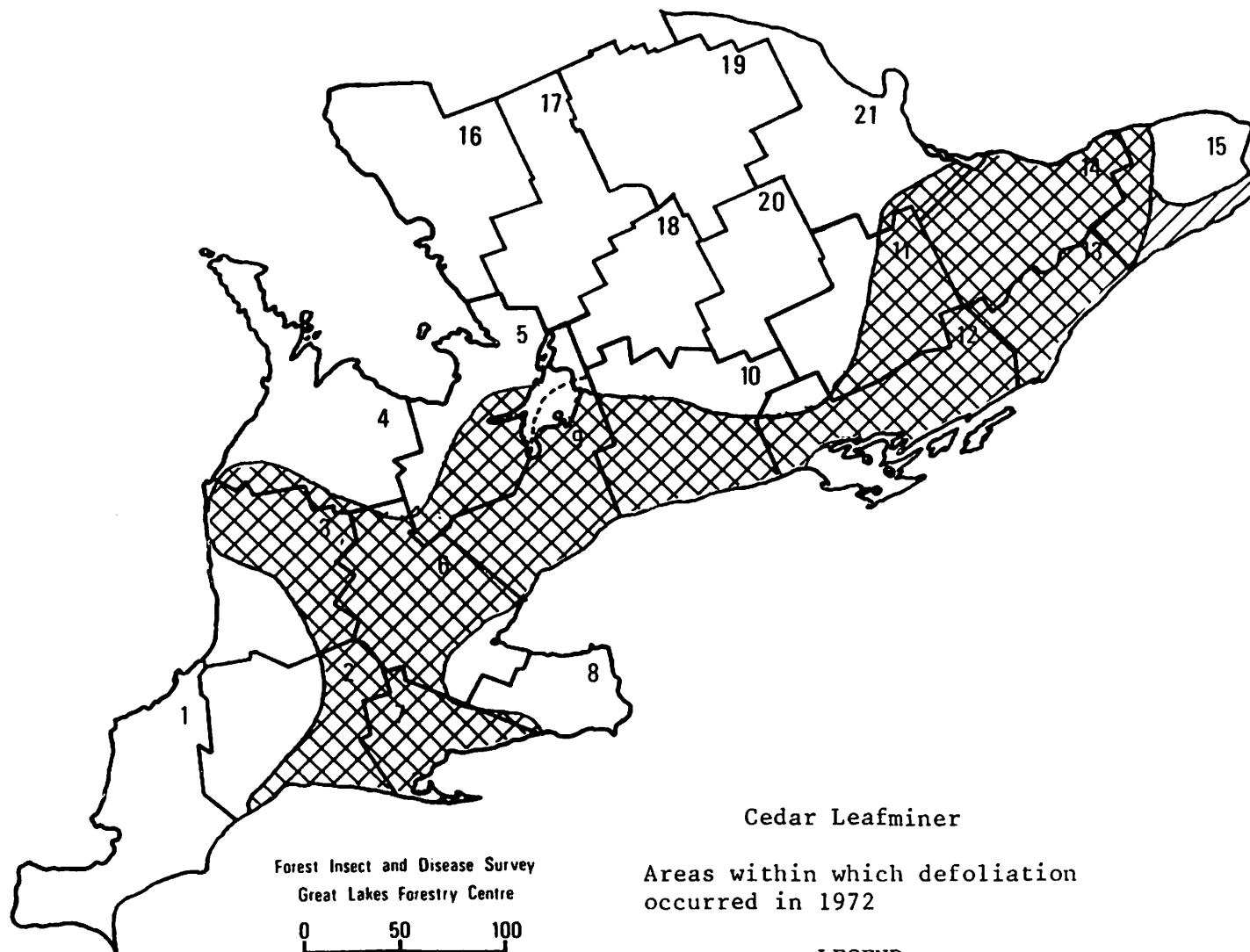
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LEGEND

Light defoliation



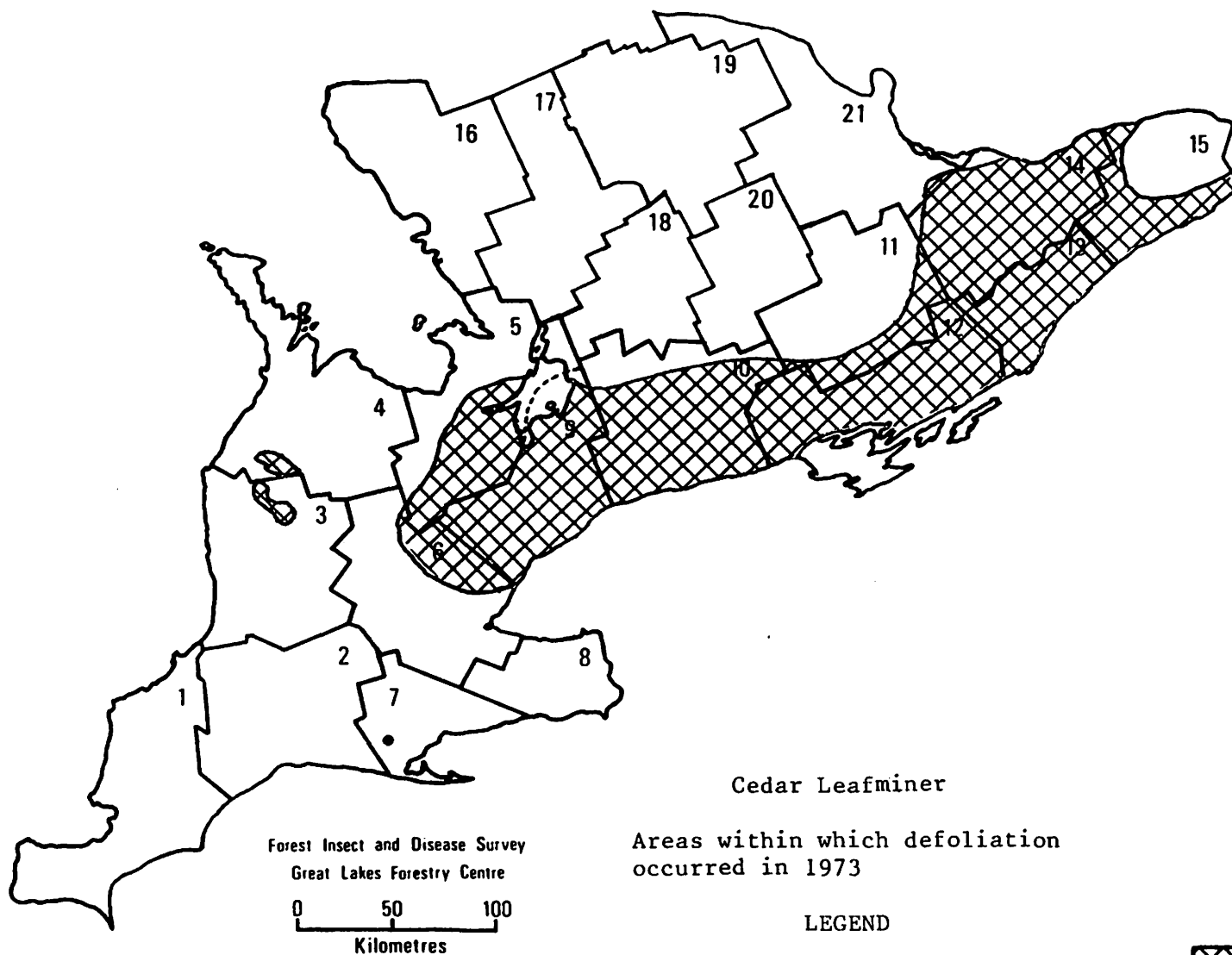
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

DISTRICTS

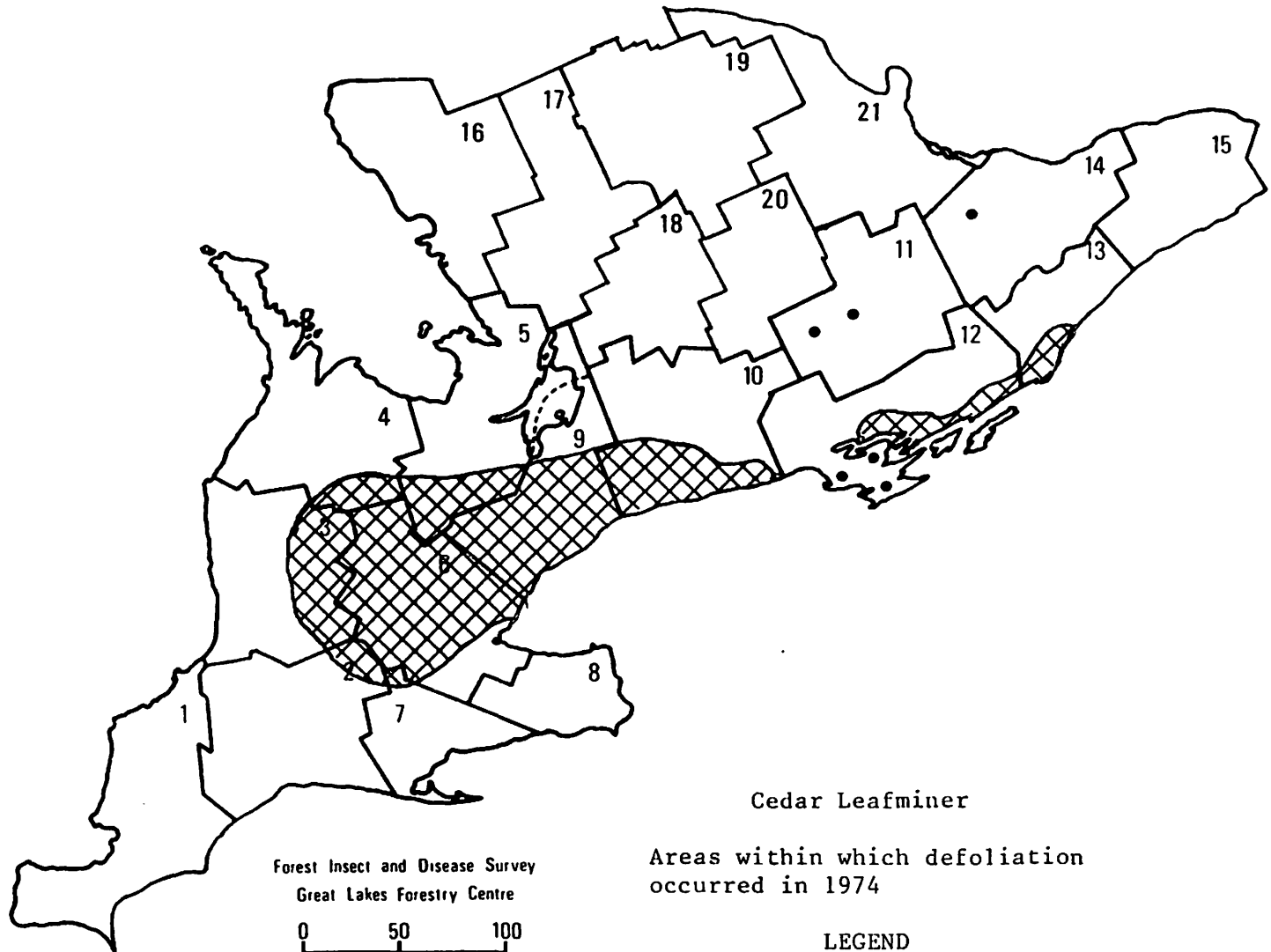
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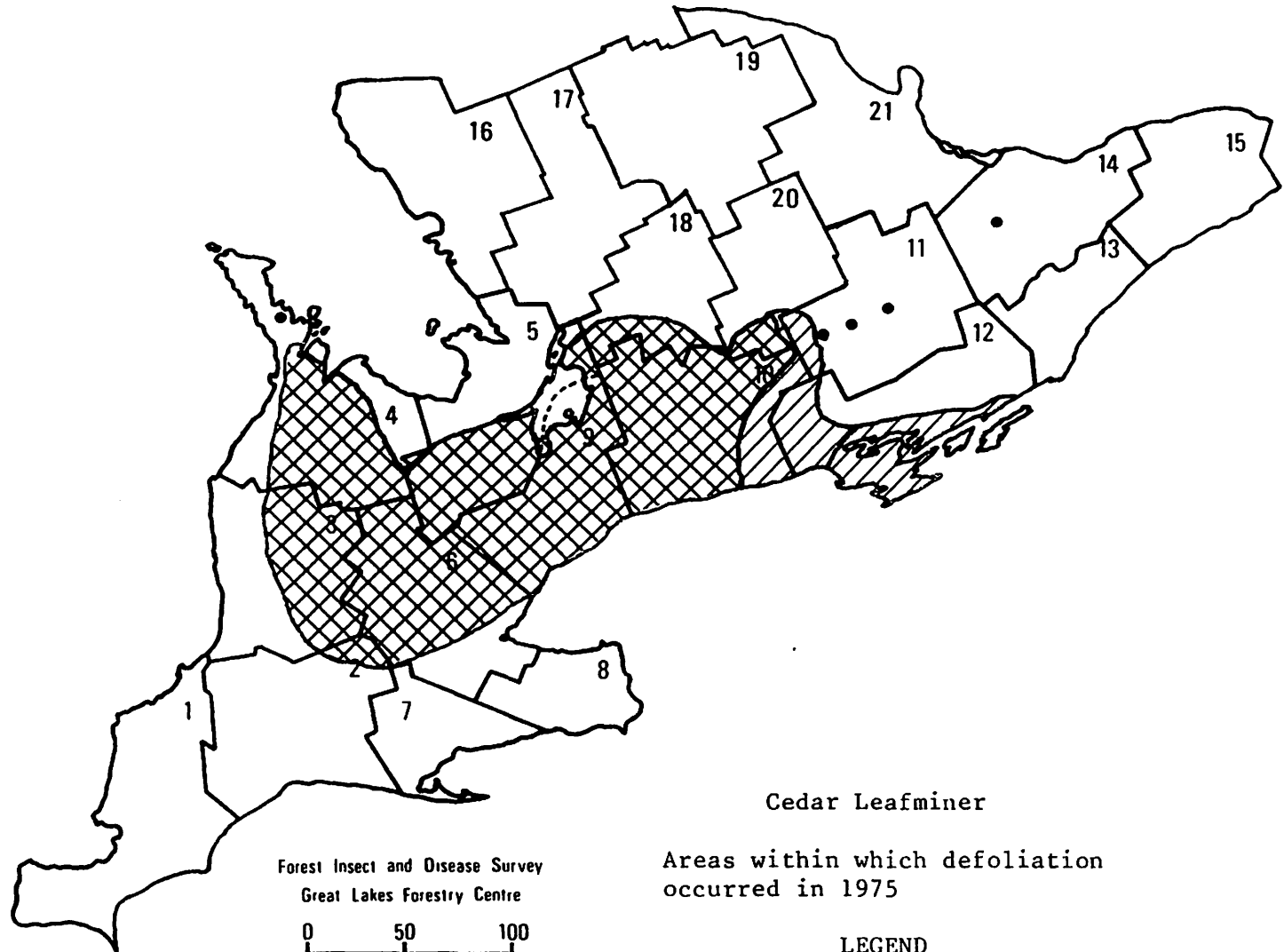
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Cedar Leafminer

Areas within which defoliation
occurred in 1975

LEGEND

Light defoliation



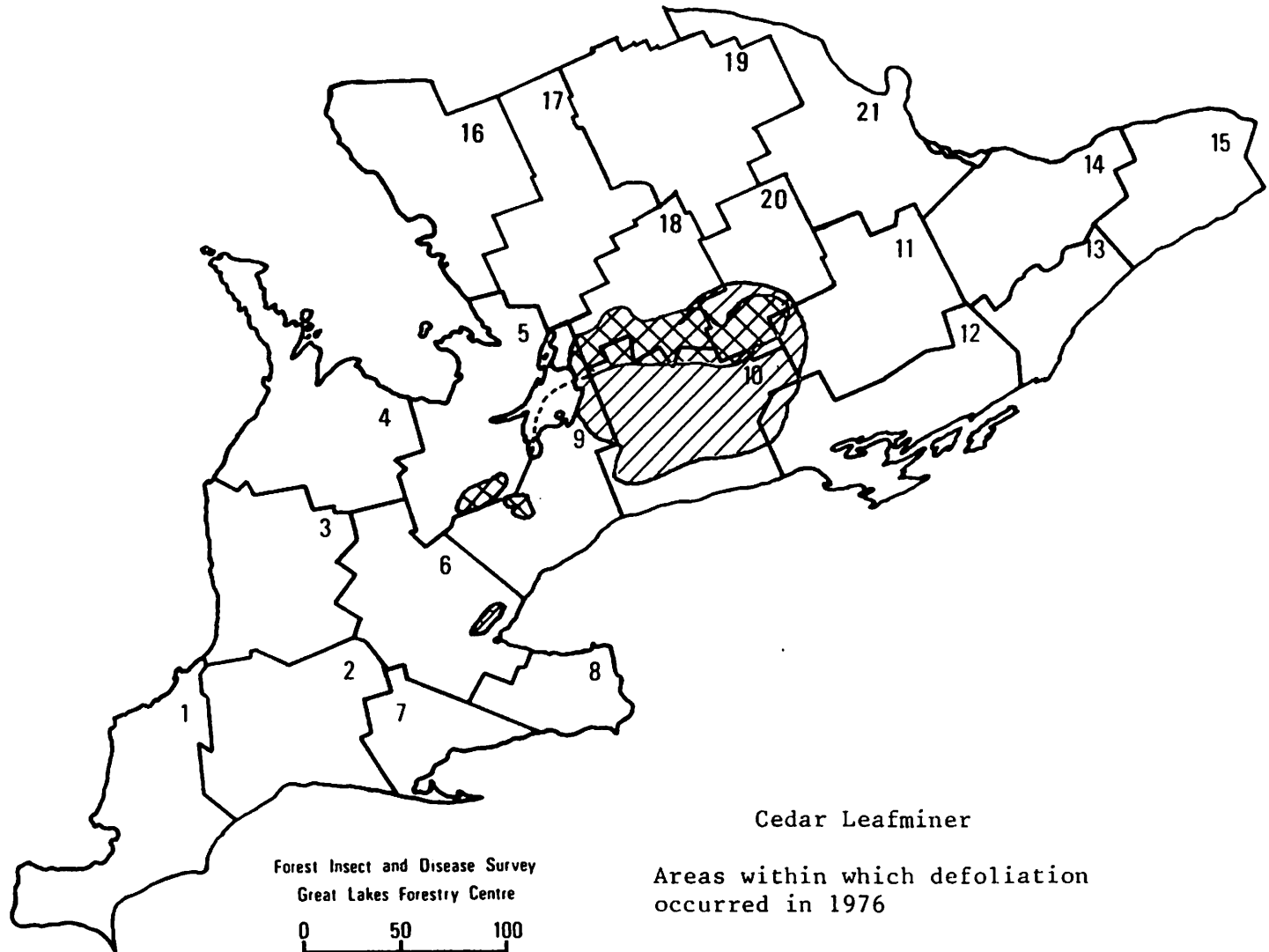
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

DISTRICTS

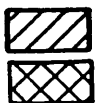
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LEGEND

Light defoliation

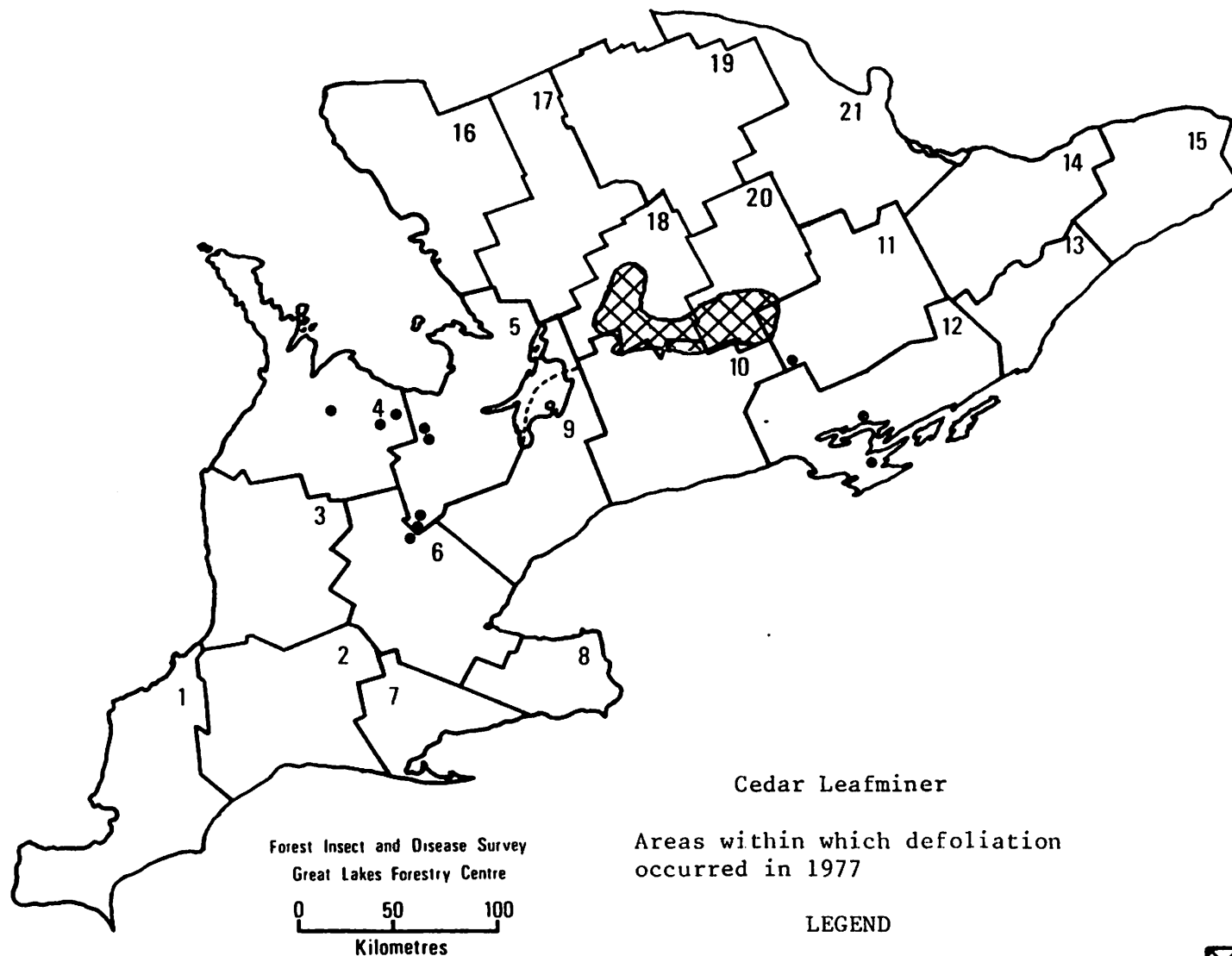
Moderate-to-severe defoliation



SOUTHERN ONTARIO

DISTRICTS

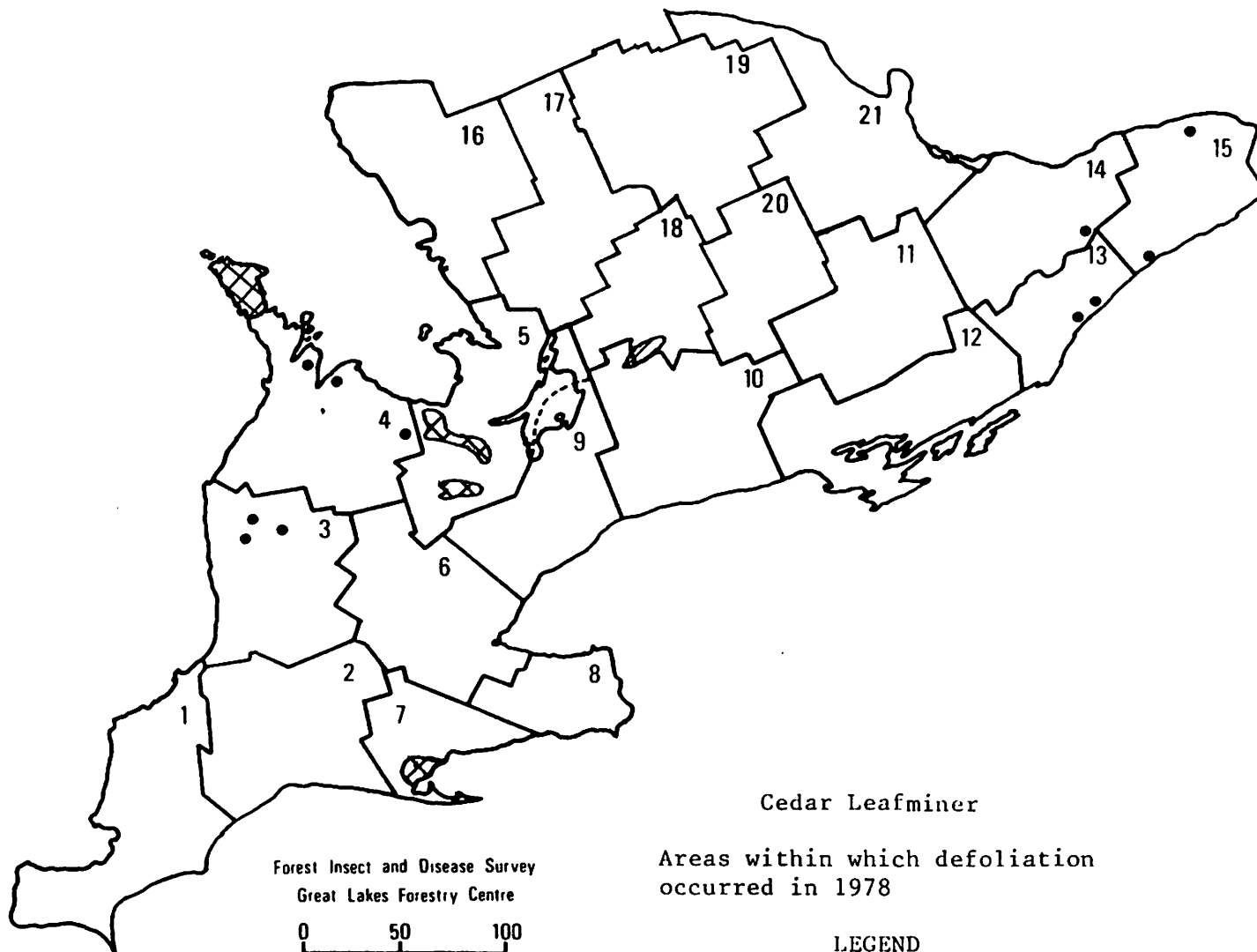
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Cedar Leafminer

Areas within which defoliation
occurred in 1978

LEGEND

Light defoliation



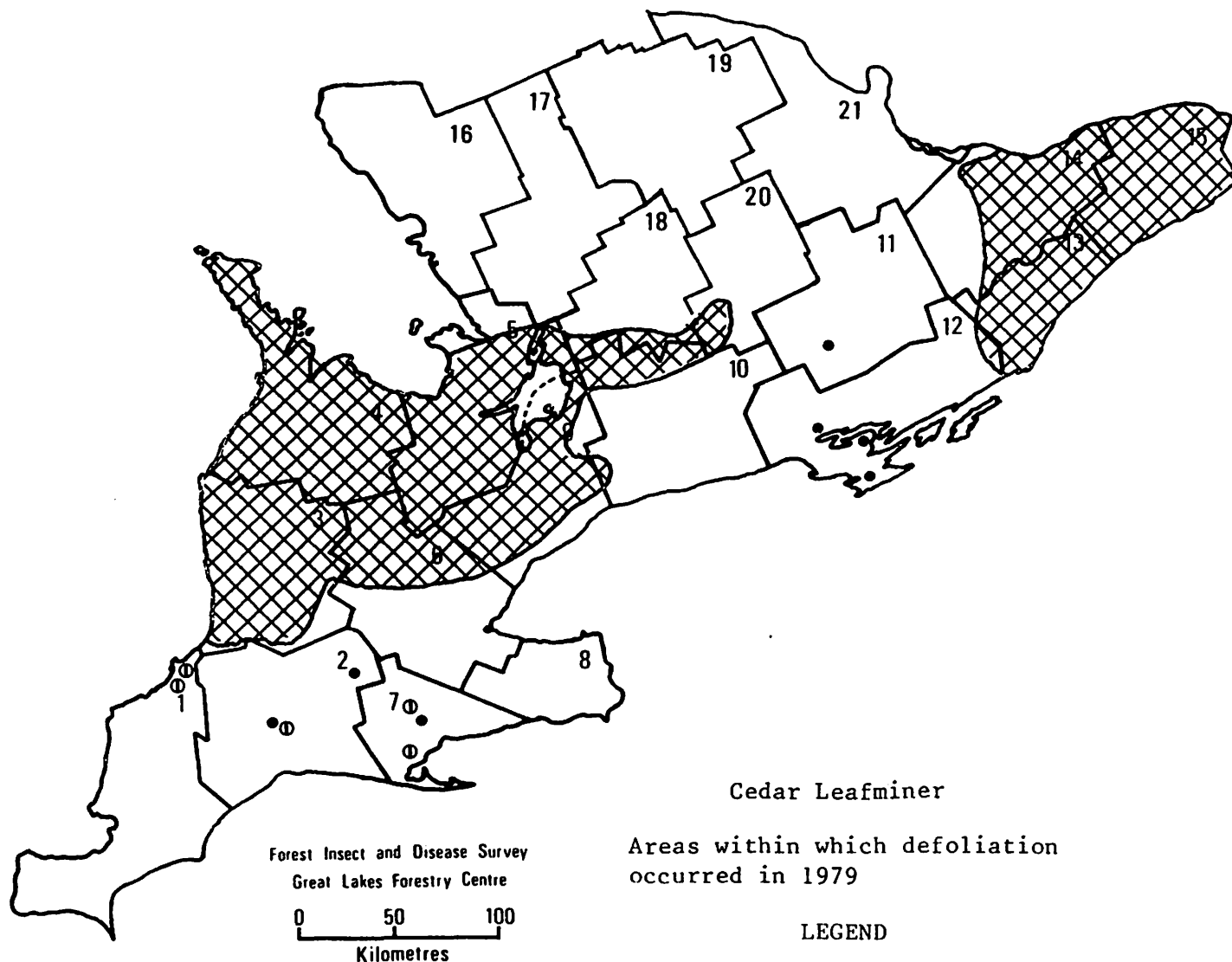
Moderate-to-severe defoliation • or



SOUTHERN ONTARIO

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19. ALGONQUIN PARK
20. BANCROFT
21. PEMBROKE



SOUTHERN ONTARIO

DISTRICTS

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

