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

Compiled by

M.J. THOMSON, L.S. MacLEOD, H.J. EVANS, D.C. CONSTABLE and C.G. JONES[1]

GREAT LAKES FORESTRY CENTRE

CANADIAN FORESTRY SERVICE

GOVERNMENT OF CANADA

MISCELLANEOUS REPORT NO. 62

[1] *Forest Research Technicians, Forest Insect and Disease Survey Unit*

Catalogue No. Fo29-8/62E
ISBN 0-662-15960-8
ISSN 0832-7130

Additional copies of this publication are available at no charge from:

Communications Services
Great Lakes Forestry Centre
Canadian Forestry Service
Government of Canada
P.O. Box 490
Sault Ste. Marie, Ontario
P6A 5M7

Microfiches of this publication may be purchased from:

Micromedia Inc.
Place du Portage
165, Hôtel-de-Ville
Hull, Quebec
J8X 3X2

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 southern parts of the 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 Canadian Forestry Service 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 northwestern Ontario grouped alphabetically by insect species or disease pathogen and showing the location of infestations within a region, or infestation boundaries that extend beyond regions.

ACKNOWLEDGMENTS

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

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

1950-1955	W.J. Miller
1956	P.E. Buchan
1957-1959	D. Bowen
1960-1965	G.G. Jackson
1966	H.J. Weir
1967	P.E. Buchan
1968-1969	J. Mason
1970-1971	M.J. Thomson, C.A. Barnes and C.N. Davis
1972-1973	M.J. Thomson, C.A. Barnes and M.J. Applejohn
1974-1975	M.J. Thomson and E.L. Houser
1976-1979	M.J. Thomson and R.J. Sajan
1980	M.J. Thomson and V. Jansons

TABLE OF CONTENTS

TABLE OF CONTENTS (concl.)

INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Dryden District during the period from 1950 to 1980. The current Dryden District was formed in 1973 from parts of the former Kenora and Sioux Lookout districts. In the selection of pests for this report, particular attention was paid to the major working groups of host species in the district, mainly jack pine, red pine, white pine, black spruce, white spruce, balsam fir, the tolerant hardwoods white birch and poplar, 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 cause damage, i.e., drought, frost, hail, wind and winter drying.

SUMMARY

FOREST INSECTS

Eastern Blackheaded Budworm, *Acleris variana* (Fern.) [Major]
page 9

No tree mortality has been recorded as caused by this defoliator, which affects primarily spruce, balsam fir and eastern hemlock. In 1964 a pocket of medium-to-heavy infestation occurred at Kaoskauta Lake and light defoliation was observed at scattered points elsewhere in the southern half of the district.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham. [Major]
pages 9-10

Defoliation by this insect seldom causes mortality of the host but weakened trees are subject to attack by secondary insects and diseases. Large outbreaks of this insect usually last 3 to 4 years, then decline rapidly. Moderate-to-severe defoliation of white birch occurred in the northern part of the district in 1956 and throughout the entire district from 1970 to 1973.

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.) [Major]
pages 11-12

No tree mortality has been recorded as caused by this defoliator, which affects primarily aspen and poplar. Moderate-to-severe defoliation was recorded in the northwestern part of the district in 1971.

Spruce Budworm, *Choristoneura fumiferana* (Clem.) [Major]
pages 13-28

This insect is considered the most destructive insect pest of several coniferous hosts in eastern Canada, particularly 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 defoliation was recorded in parts of the district from 1950 to 1958 and tree mortality caused by repeated defoliation was observed in several areas from 1955 to 1960, when pockets of mortality were evident throughout the entire district.

Jack Pine Budworm, *Choristoneura pinus pinus* Free. [Major]
pages 29-35

This is a destructive pest of pines that can cause mortality after about two years of severe defoliation. Moderate-to-severe defoliation was recorded in the district in 1950, 1954, 1961, 1962 and each year from 1964 to 1968.

Aspen Twoleaf Tier, *Enargia decolor* (Wlk.) [Major]
page 36

No tree mortality has been recorded as caused by this defoliator, which affects aspen and cottonwood; however, heavy defoliation reduces growth and vigor, and leaves host trees susceptible to attack by other pests. Outbreaks of this insect last only a few years. A medium-to-heavy infestation was recorded in the west-central part of the district in 1959.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr. [Major]
pages 36-37

This insect usually infests lateral shoots and causes only aesthetic damage. When high populations develop some leaders are infested and killed, and this leads to deformity of infested trees. Light infestations or low populations were generally common in the district during the period covered by this report.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. [Major]
pages 37-54

This caterpillar is widely distributed throughout North America. Infestations usually last an average of five years and high populations denude large areas of susceptible stands. The principal host attacked is aspen; however, many other deciduous species also suffer severe defoliation. Repeated defoliation reduces tree growth and vigor and

leaves the tree susceptible to attack by other pests. Medium-to-heavy infestations were recorded in the district from 1950 to 1952, from 1959 to 1966 and from 1972 to 1979.

Balsam Fir Sawfly, *Neodiprion abietis* complex [Major]
page 55

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 points between 1964 and 1966 and in 1976.

Pine Sawflies, Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl., Jack Pine Sawfly, *Neodiprion pratti banksianae* Roh., Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex, Swaine Jack Pine Sawfly, *Neodiprion swainei* Midd. [Major]
pages 55-57

These sawflies are capable of causing mortality of semimature and plantation pine trees when populations are high. No mortality has been recorded in the district.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.) [Major]
pages 58-59

Although this insect has not been known to cause tree mortality, severe browning of foliage over a period of years can cause a reduction in growth. Medium-to-heavy infestations occurred from 1950 to 1952, in 1960 and 1966, from 1968 to 1970, and in 1972, 1977 and 1980.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.) [Major]
pages 59-60

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. Pockets of moderate-to-severe defoliation were recorded in 1962, 1963, 1966, 1967, 1977, 1979 and 1980.

White Pine Weevil, *Pissodes strobi* (Peck) [Major]
pages 61-62

This weevil is considered the most destructive pest of white pine in North America. Successive weeviling over a period of years results in multiple-stemmed trees. Varying degrees of damage occurred in each year except 1959 and 1960.

Larch Sawfly, *Pristiphora erichsonii* (Htg.) [Major]
pages 63-64

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 favorable sites, mortality may follow three or more years of complete defoliation. Populations were recorded in the district every year from 1950 to 1980.

Aspen Leafroller, *Pseudexentera oregonana* Wlshm. [Major]
page 65

No tree mortality has been recorded as caused by this defoliator, which feeds almost exclusively on trembling aspen. Small pockets of light infestation occurred in 1978.

Other Noteworthy Insects [Major and Minor]
pages 65-70

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

FOREST DISEASES

Dwarf Mistletoe, *Arceuthobium americanum* Nutt. ex Engel. [Major]
page 73

This mistletoe is capable of causing tree mortality in jack pine stands in all age classes. The pathogen was first recorded in the district in 1969. Extensive surveys in the affected area in 1970 revealed some tree mortality in mature stands.

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer [Major]
page 73

This root rot disease often kills trees previously stressed by drought, insects, other pathogens or unfavorable environment. However, under some circumstances the fungus, or certain strains of the fungus, can kill vigorous trees. Both deciduous and coniferous trees are attacked. The fungus was reported at low levels in most years from 1955 to 1980. One exception was recorded in 1971, at which time current mortality ranged from 5.0% to 10.0%.

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

page 74

This pathogen of pines is capable of causing serious damage in young planted or regeneration stands. The disease was first recorded in the district in 1970, at which time trace levels of infection were recorded. Trace damage was also recorded in 1971, 1973 and in each year from 1974 to 1978.

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary var. *ledi* and *C. ledicola* (Peck) Lagerh. [Major]

pages 74-75

Severe infections of spruce foliage can cause a loss of increment in stands when prolonged infection occurs. Areas of medium-to-heavy infection were recorded in 1957, 1964, 1966, 1977 and 1978.

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

page 76

Severe infection by this foliar disease results in loss of increment; however, no tree mortality has been reported. Pockets of moderate-to-severe defoliation were recorded in the district in 1955, 1959, 1977 1978 and 1979.

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

pages 76-77

Repeated, heavy infection of foliage weakens trees, causes a loss of increment and predisposes trees to attack by secondary insects and diseases. Medium-to-heavy foliar damage occurred in the district in 1964, 1966 and 1971.

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

page 77

White pine blister rust is the most serious disease of eastern white pine. The disease causes top killing and mortality in trees of all ages. Infection occurred throughout the range of white pine in the district. Moderate-to-severe damage was recorded in 1962 and 1974.

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats. [Major]
pages 78-79

This pathogen infects trees in all age classes; however, serious damage is generally confined to small-diameter regeneration trees in stands or in plantations, where stems are girdled by this gall. Girdling causes partial or whole-tree mortality. Varying degrees of infections have been recorded in the district in most years between 1952 and 1980. Light tree mortality was reported in 1963.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller [Major]
pages 79-80

Mortality caused by this disease is usually restricted to trees in the 7-cm to 13-cm diameter class that grow on poor sites, but branch and top mortality may occur in trees of greater diameter. Infected trees and damage can be found in most aspen stands in the district.

Shoot Blight, *Sirococcus conigenus* (DC.) P. Cannon & Minter [Major]
page 80

This pathogen is capable of killing trees outright in many age classes and is especially severe on young understory regeneration. The principal host is red pine, although other pines are susceptible to attack. Moderate-to-severe damage was recorded at one location in 1974 and 1975.

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx [Major]
page 81

This foliar and shoot disease is particularly damaging to leaders of regeneration aspen, and causes retarded height growth and club tops when leaders are affected. Varying degrees of damage have been evident in the district in most years between 1954 and 1980.

Other Noteworthy Diseases
pages 82-84

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

ABIOTIC DAMAGE
pages 87-89

Abiotic damage is caused by a variety of influences, i.e., drought, frost, hail, wind damage, and winter drying. Weakened trees are susceptible to any of a number of insects and diseases.

INSECTS

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

Host(s): spruce, fir [Major]

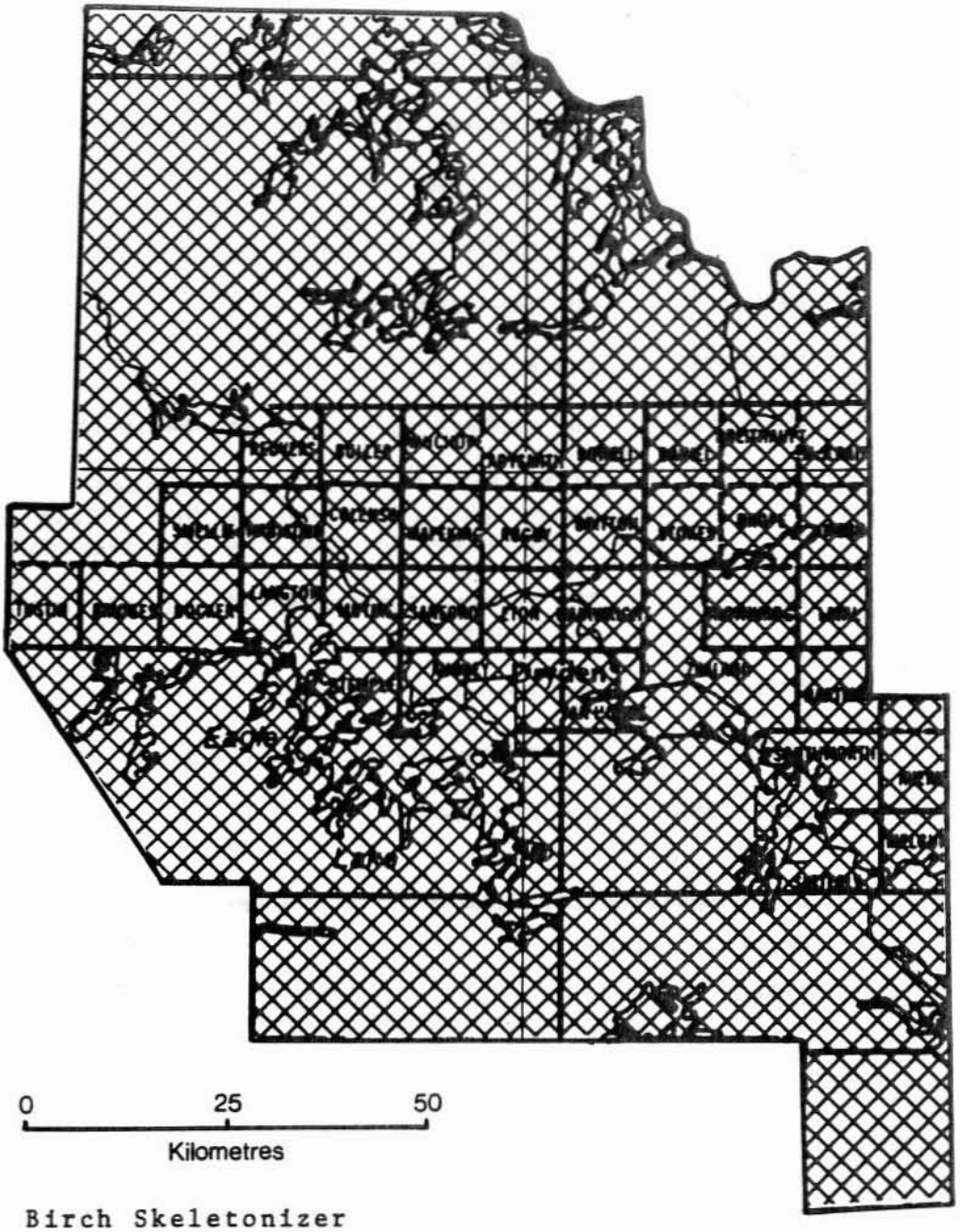
Year	Remarks
1950-1952	not reported
1953	low numbers throughout the district
1954-1956	not reported
1957-1958	low numbers in Langton and Wabigoon twps
1959	not reported
1960-1961	trace populations
1962-1963	low numbers at many locations in the district
1964	Light infestations were recorded in Aubrey, Docker and Wainwright twps, and at Ord, Fluke and Upper Lawrence lakes; heavy infestations were recorded at Kaoskauta Lake.
1965	The infestation collapsed and only small numbers of larvae were found.
1966	not reported
1967	trace populations at a few locations
1968-1980	not reported

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch [Major]

Year	Remarks
1950-1955	not reported
1956	Moderate-to-severe defoliation of white birch was reported throughout the northern part of the district and near Dinorwic.
1957-1969	not reported
1970-1971	Pockets of moderate-to-severe defoliation occurred throughout the entire district (see map, page 10).
1972-1973	Moderate-to-severe defoliation occurred throughout the entire district
1974	The infestation collapsed.
1975-1980	not reported

DRYDEN DISTRICT



Birch Skeletonizer

Areas within which defoliation occurred in 1970-1971

LEGEND

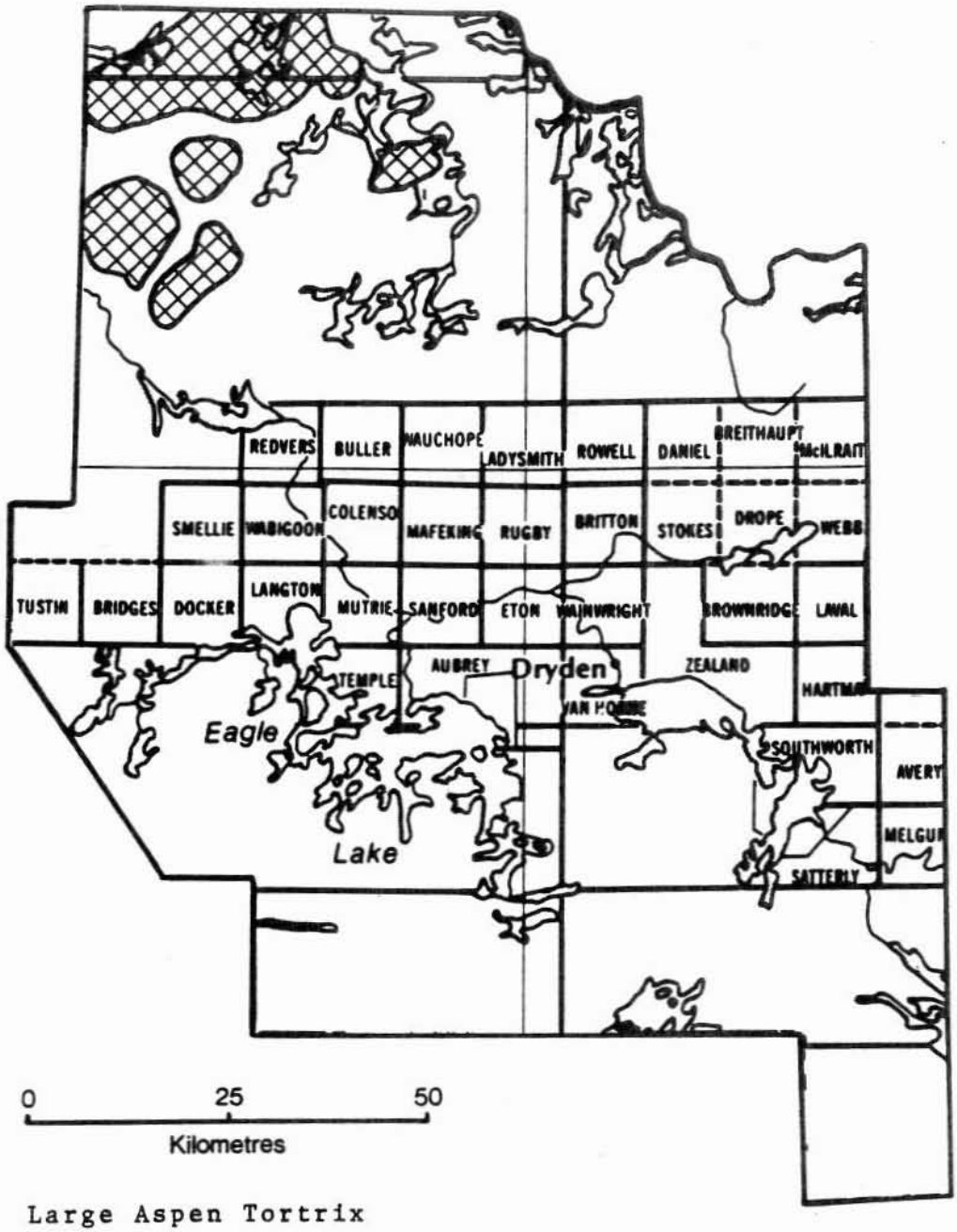
Moderate-to-severe defoliation

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.)

Host(s): poplar [Major]

Year	Remarks
1950-1960	not reported
1961	low numbers in Van Horne Twp
1962-1963	not reported
1964	trace populations
1965-1970	not reported
1971	Moderate-to-severe defoliation occurred in the north-western part of the district (see map, page 12).
1972	The infestation collapsed.
1973-1974	trace populations
1975-1980	not reported

DRYDEN DISTRICT



Large Aspen Tortrix

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): spruce, fir [Major]

Year	Remarks
1950	Moderate-to-severe defoliation occurred from Eagle Lake north to Lac Seul, in the northern part of the district (see map, page 15)
1951	Moderate-to-severe defoliation recurred over the northern part of the district (see map, page 16), and tree mortality occurred in the far northern portion of the district (see map, page 17).
1952	Moderate-to-severe defoliation was common over most of the district (see map, page 18).
1953	Moderate-to-severe defoliation recurred over most of the district (see map, page 19).
1954	The budworm caused moderate-to-severe defoliation in the same areas that had been infested in 1953 (see map, page 20).
1955	Infestations persisted and moderate-to-severe defoliation was common (see map, page 21). Tree mortality was recorded in the northern part of the district (see map, page 22).
1956	In the northern half of the district, defoliation declined to light intensity whereas moderate-to-severe levels of defoliation persisted in the south (see map, page 23). The area of mortality continued to expand (see map, page 24).
1957	Moderate-to-severe defoliation recurred in much of the district (see map, page 25).
1958	Heavy infestations persisted throughout most of the southern part of the district (see map, page 26).
1959	Budworm populations declined sharply; light defoliation was recorded in only a few areas (see map, page 27).
1960	Infestations collapsed totally. Balsam fir mortality that resulted from several years of infestation was evident throughout the entire district (see map, page 28).
1961	light defoliation at Eagle Lake

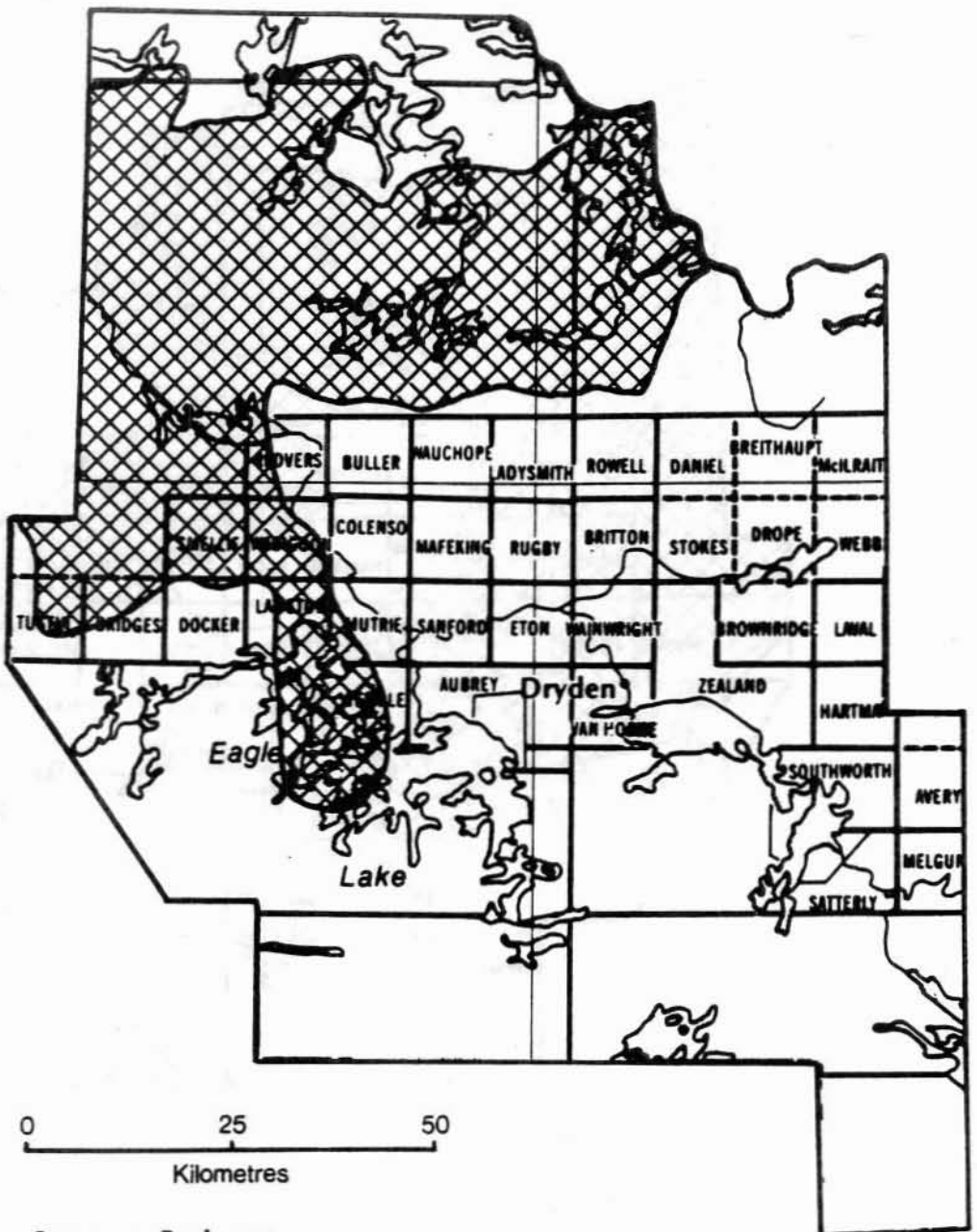
(cont'd)

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

Host(s): spruce, fir [Major]

Year	Remarks
1962	trace populations at Eagle Lake
1963-1964	not reported
1965-1969	trace populations
1970-1974	not reported
1975	Low numbers were common.
1976-1977	trace populations
1978	not reported
1979	trace populations
1980	not reported

DRYDEN DISTRICT



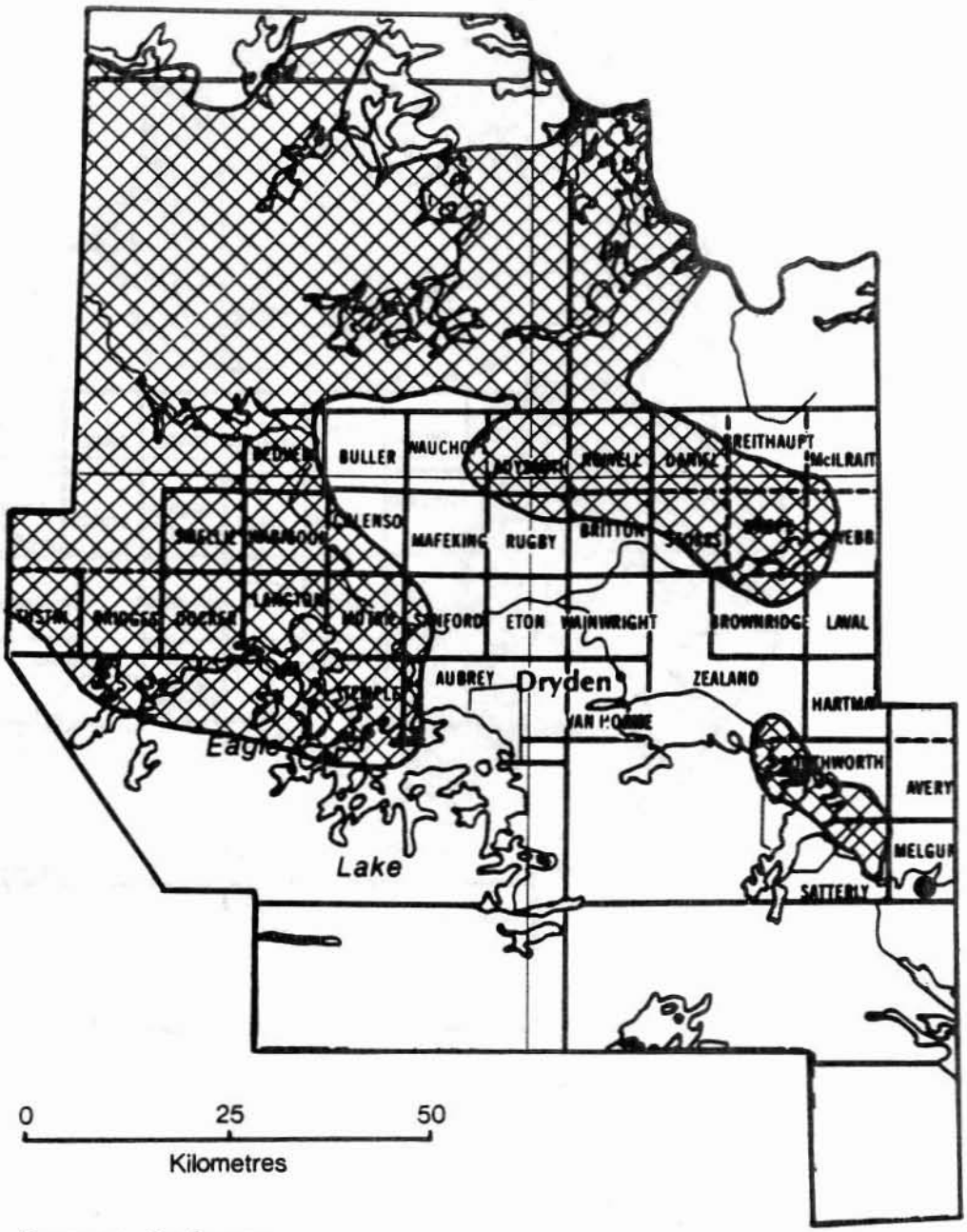
Spruce Budworm

Areas within which defoliation occurred in 1950

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



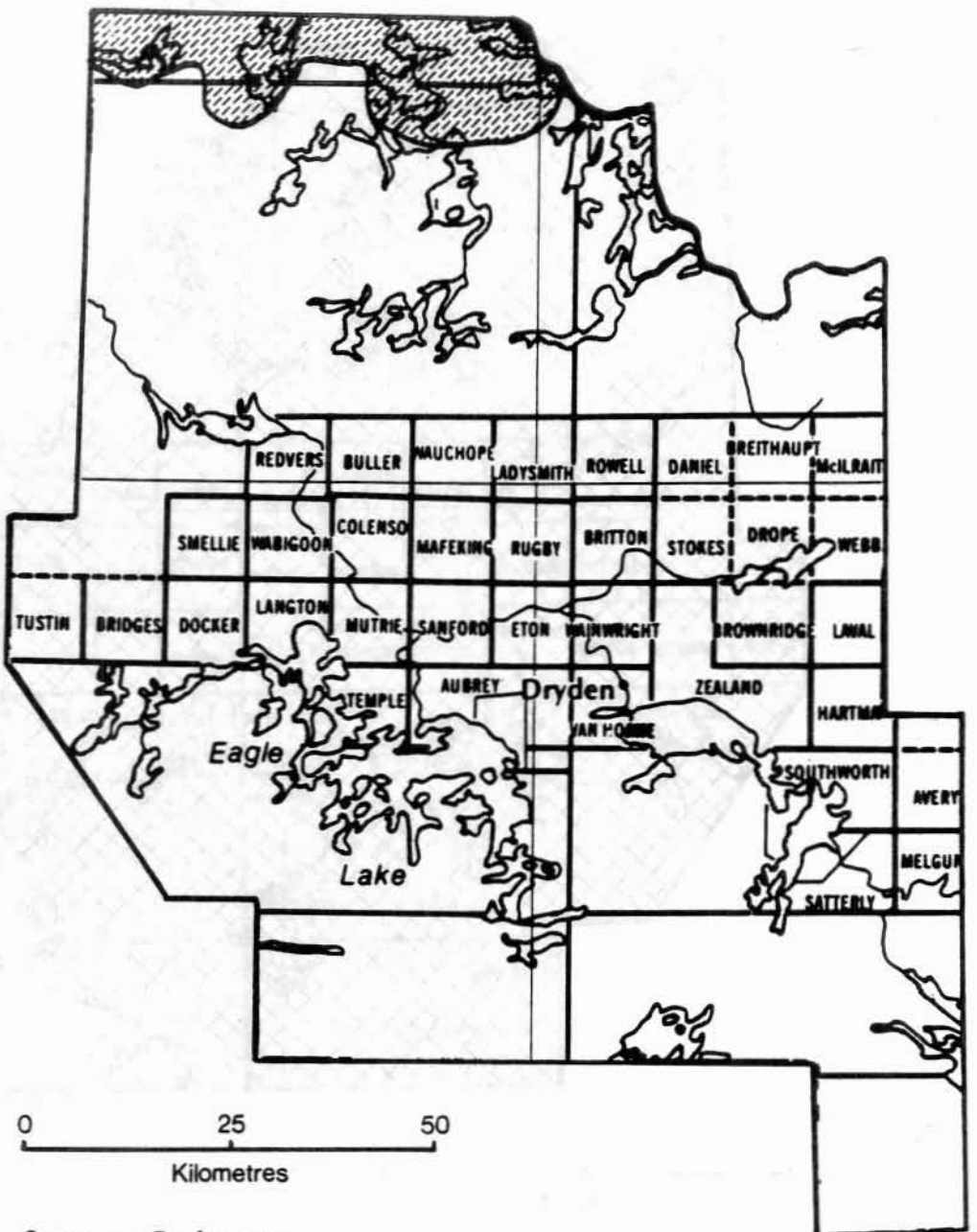
Spruce Budworm

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation ● or ▨

DRYDEN DISTRICT



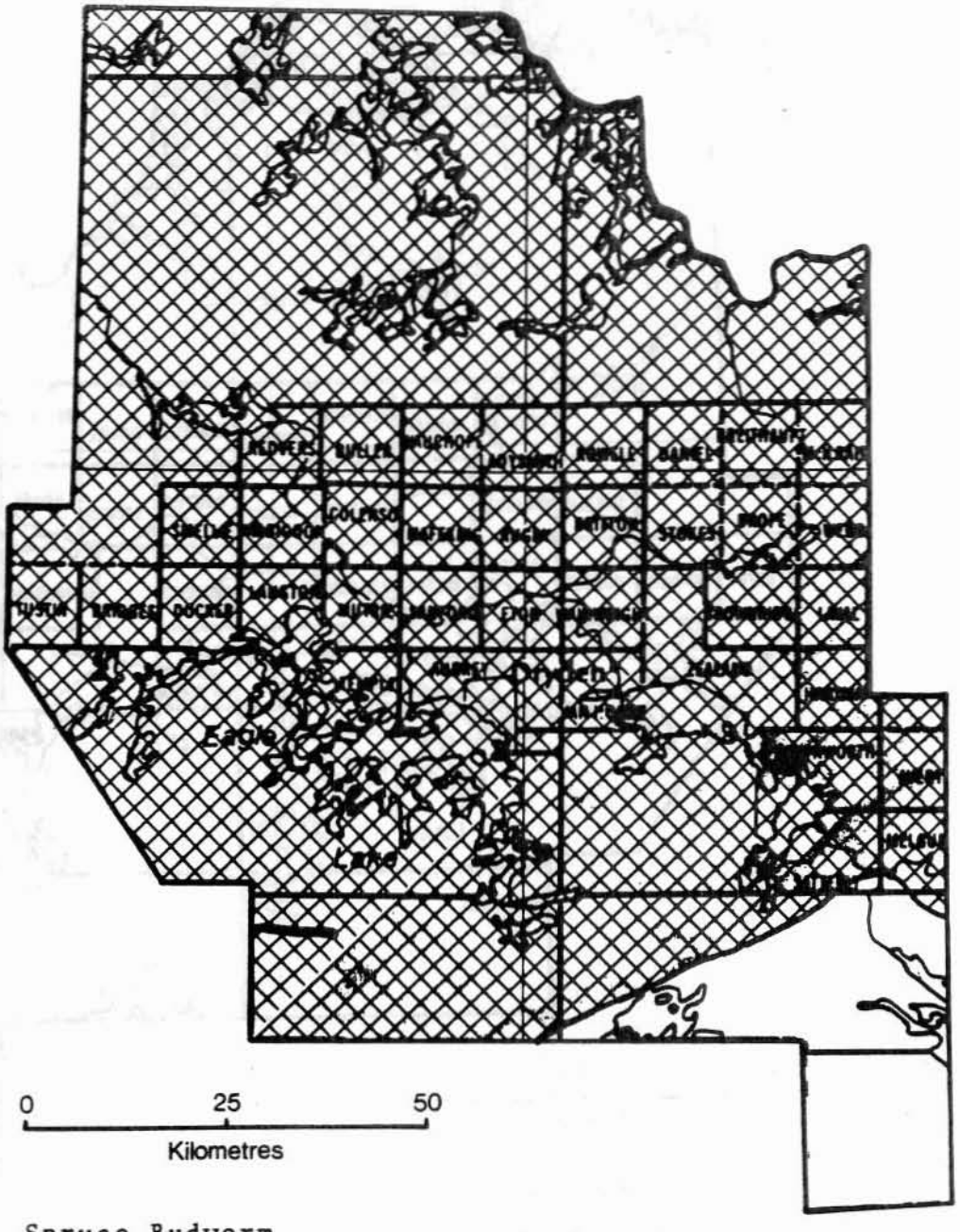
Spruce Budworm

Areas within which balsam fir whole-tree and top mortality occurred in 1951

LEGEND

Mortality

DRYDEN DISTRICT



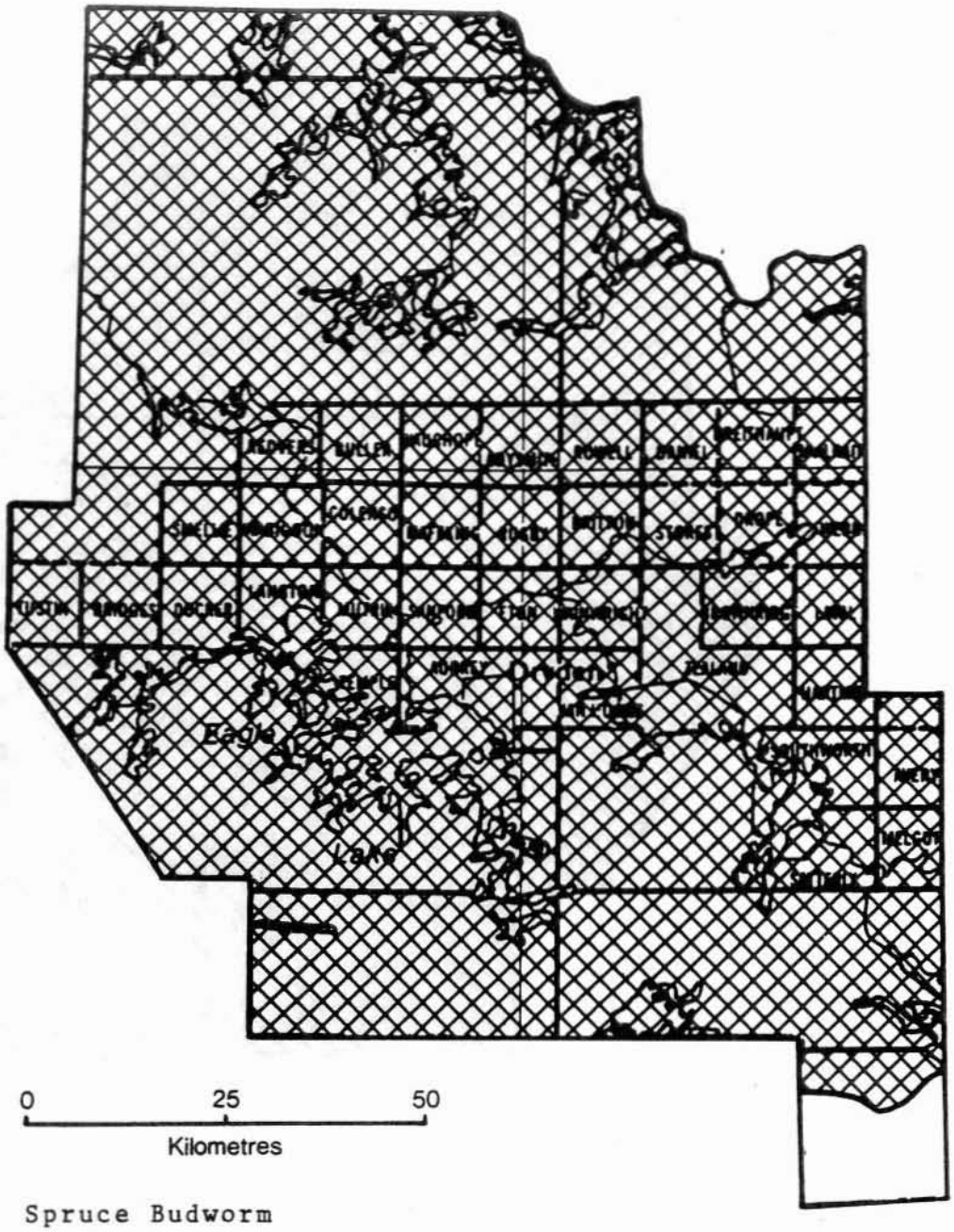
Spruce Budworm

Areas within which defoliation occurred in 1952

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



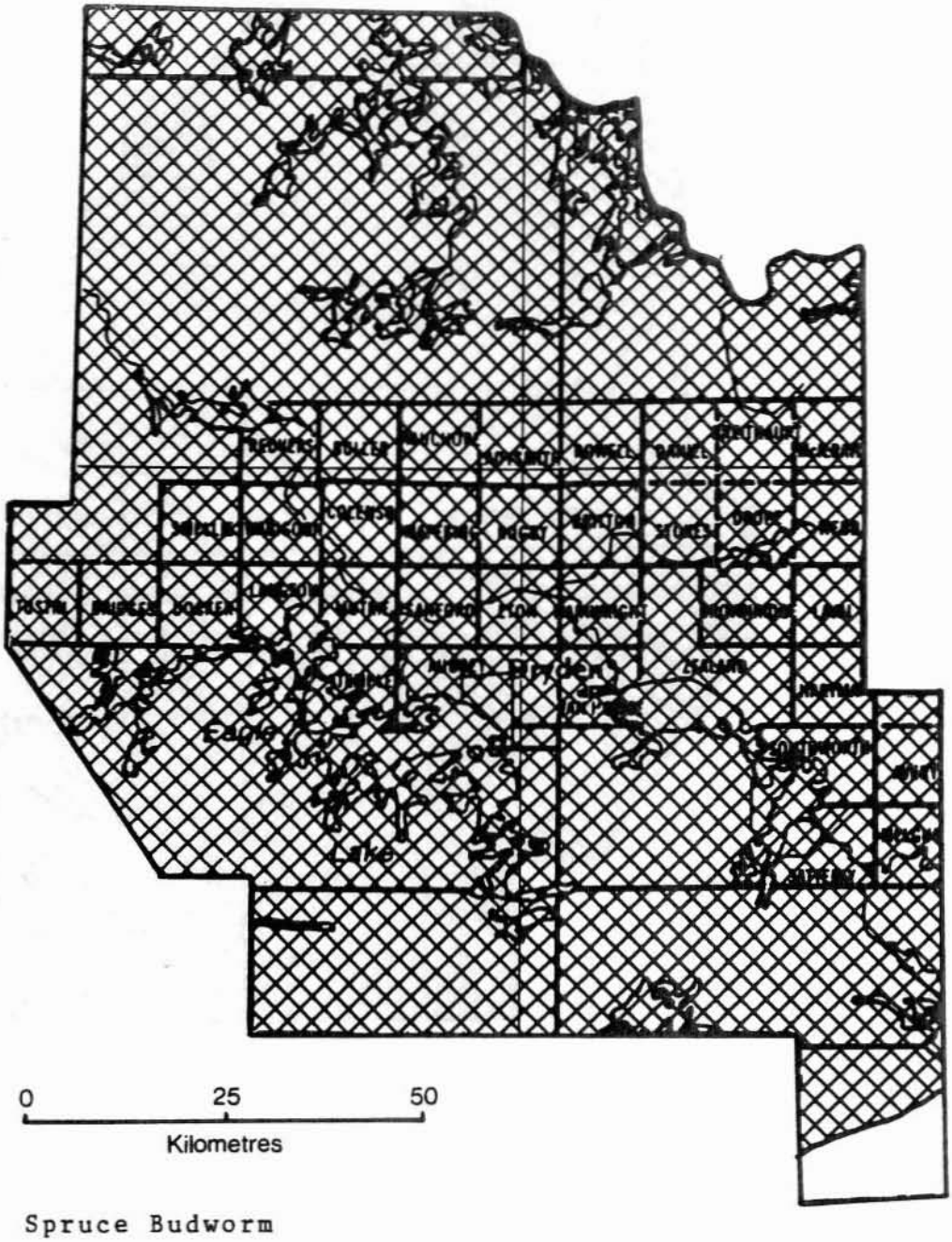
Spruce Budworm

Areas within which defoliation occurred in 1953

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



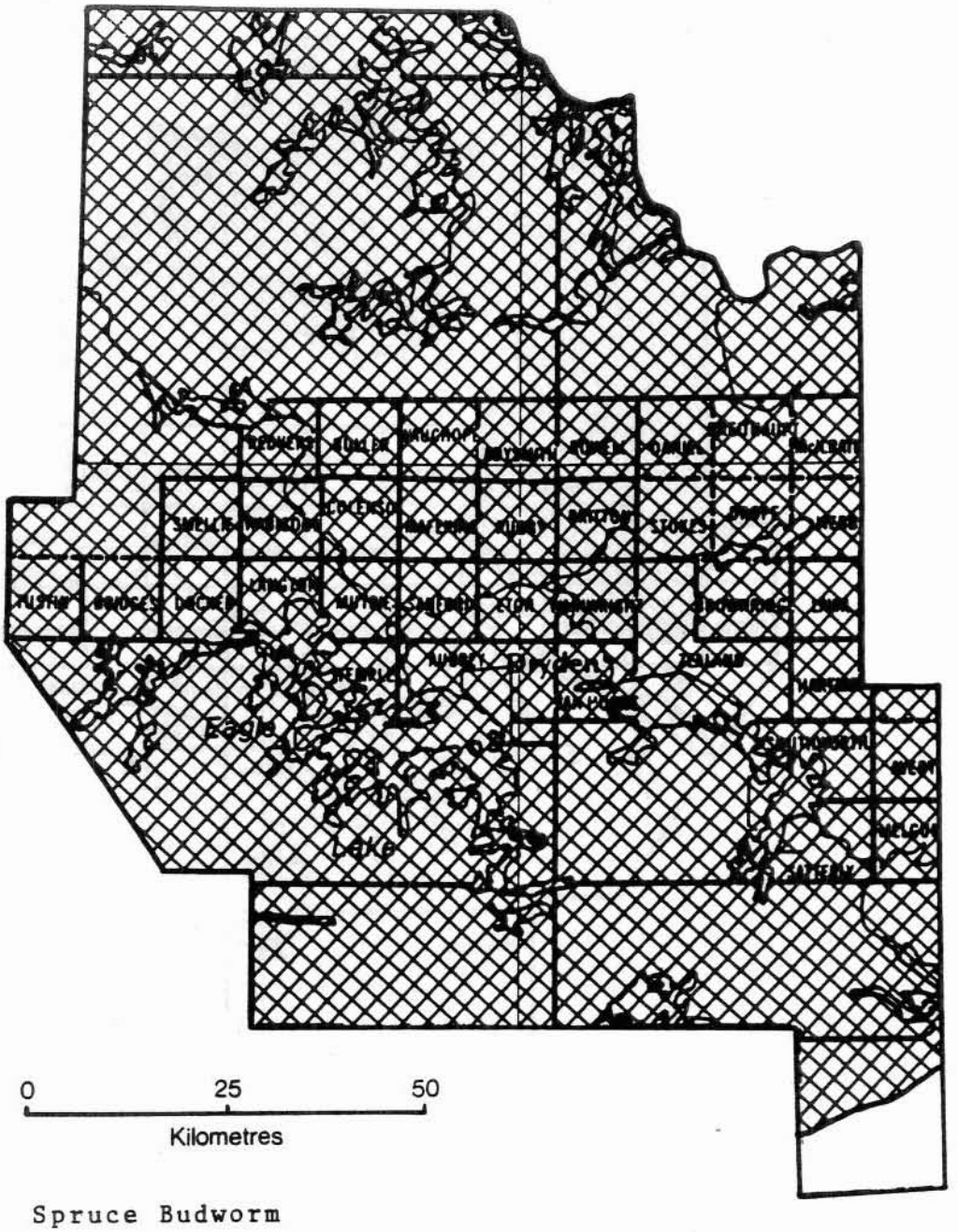
Spruce Budworm

Areas within which defoliation occurred in 1954

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



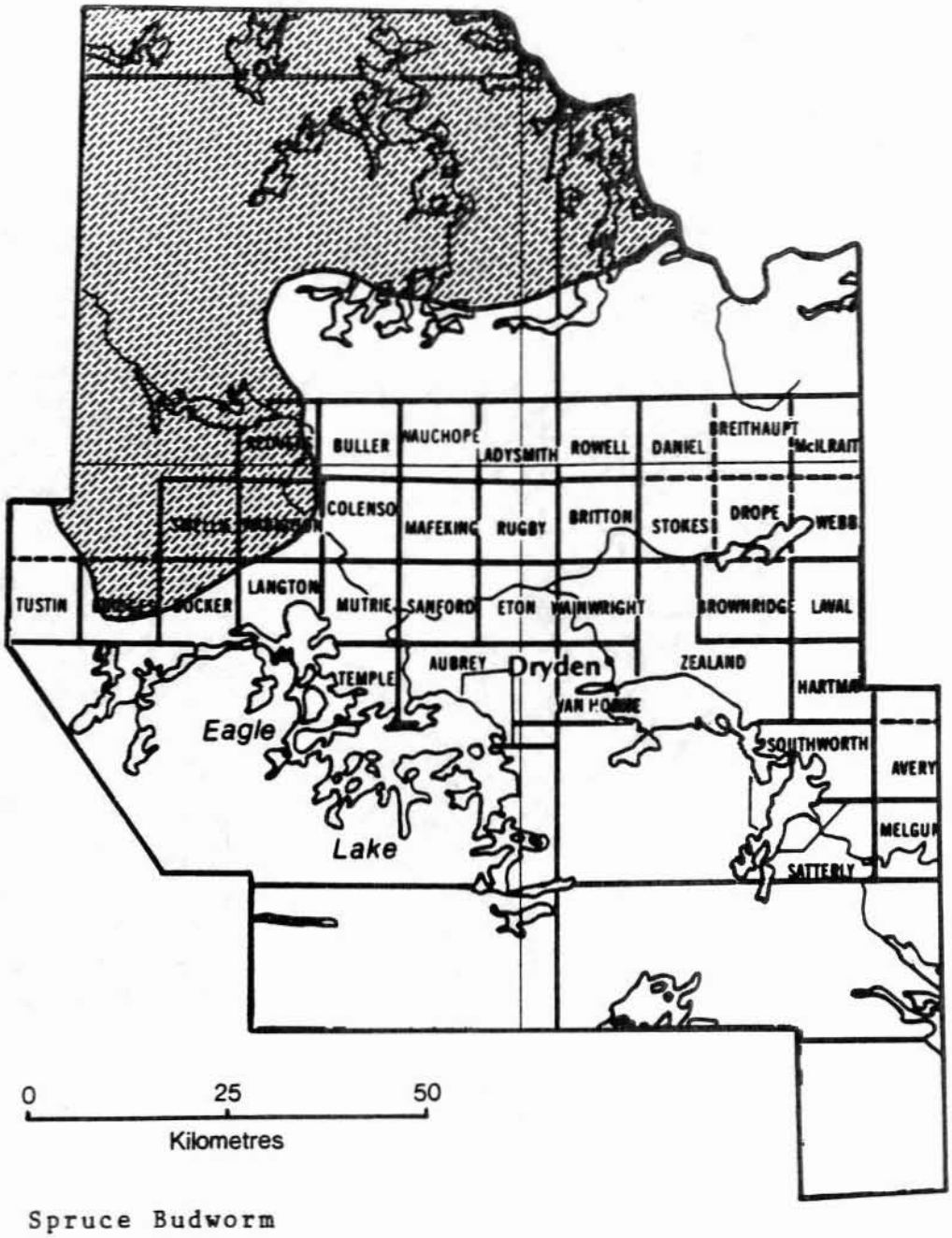
Spruce Budworm

Areas within which defoliation occurred in 1955

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



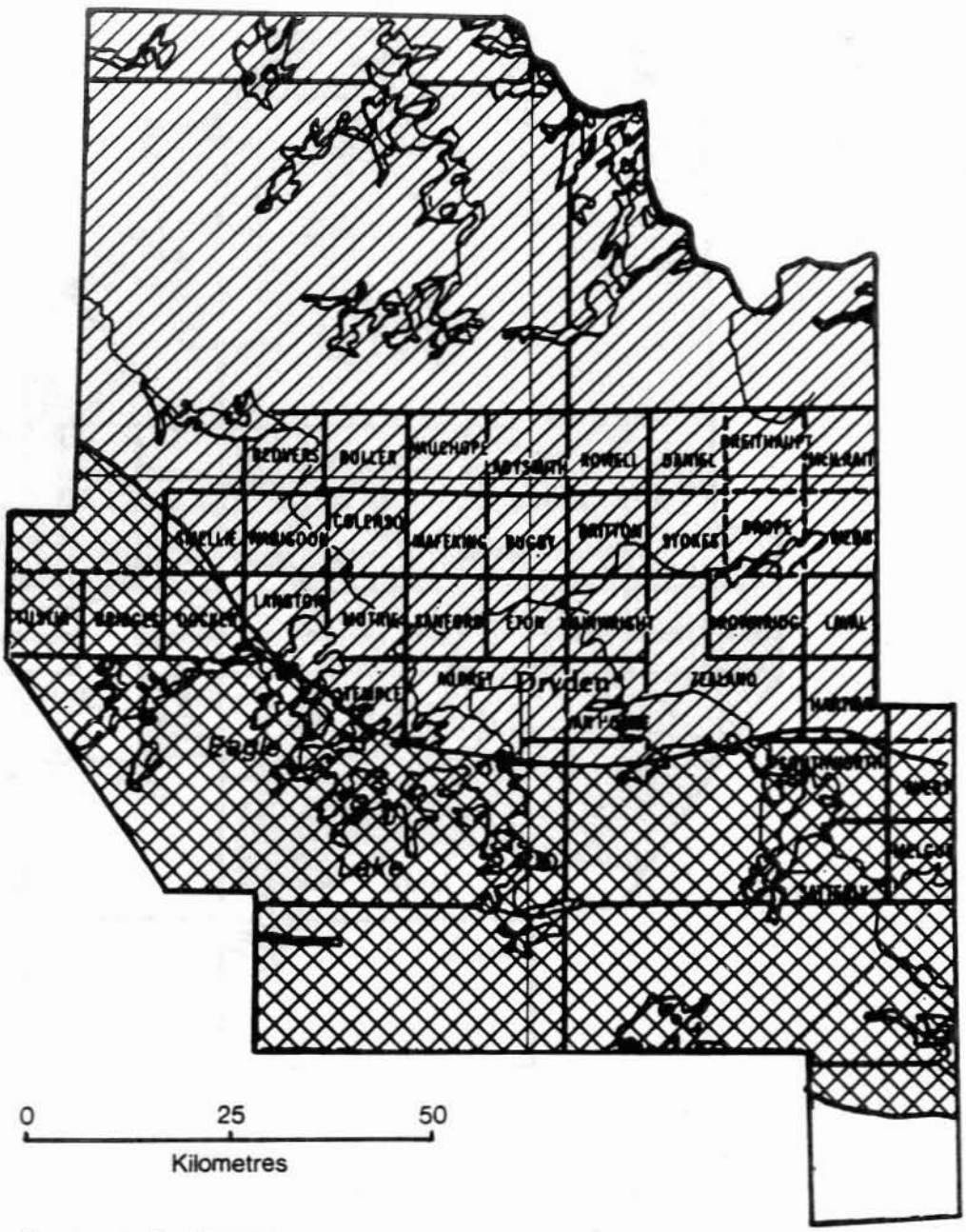
Spruce Budworm

Areas within which balsam fir whole-tree and top mortality occurred in 1955

LEGEND

Mortality

DRYDEN DISTRICT



Spruce Budworm

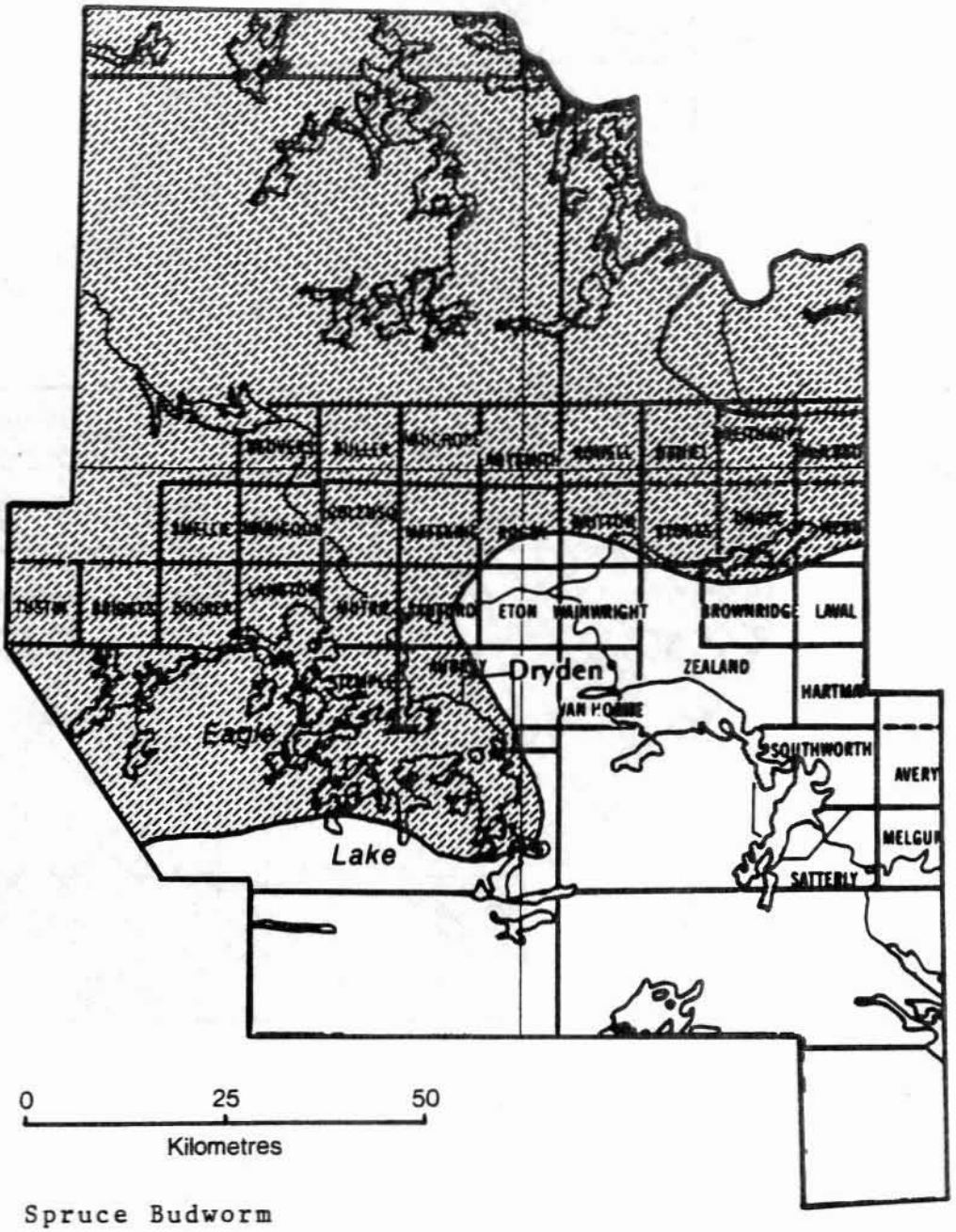
Areas within which defoliation occurred in 1956

LEGEND

Light defoliation

Moderate-to-severe defoliation

DRYDEN DISTRICT



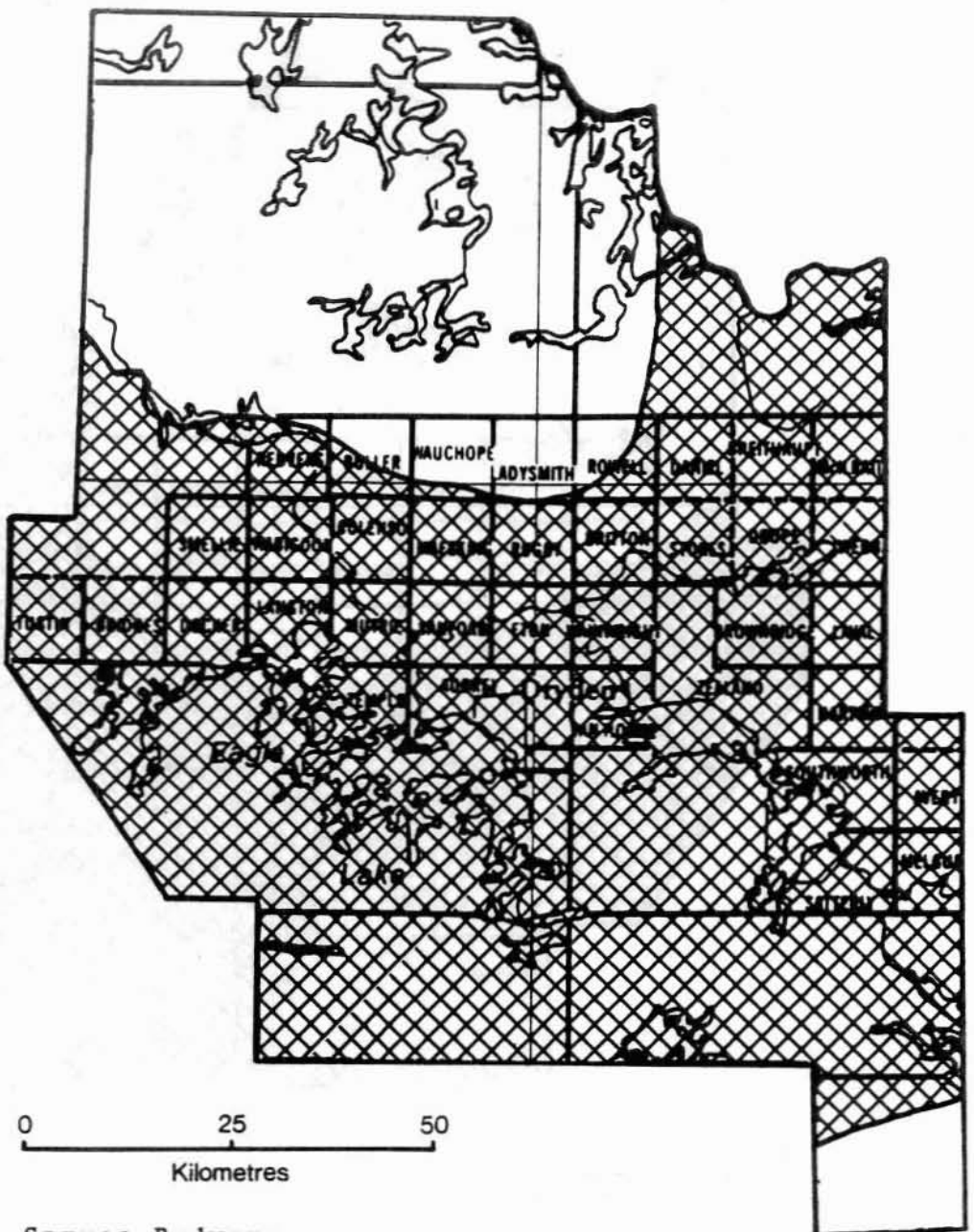
Spruce Budworm

Areas within which balsam fir whole-tree and top mortality occurred in 1956

LEGEND

Mortality

DRYDEN DISTRICT



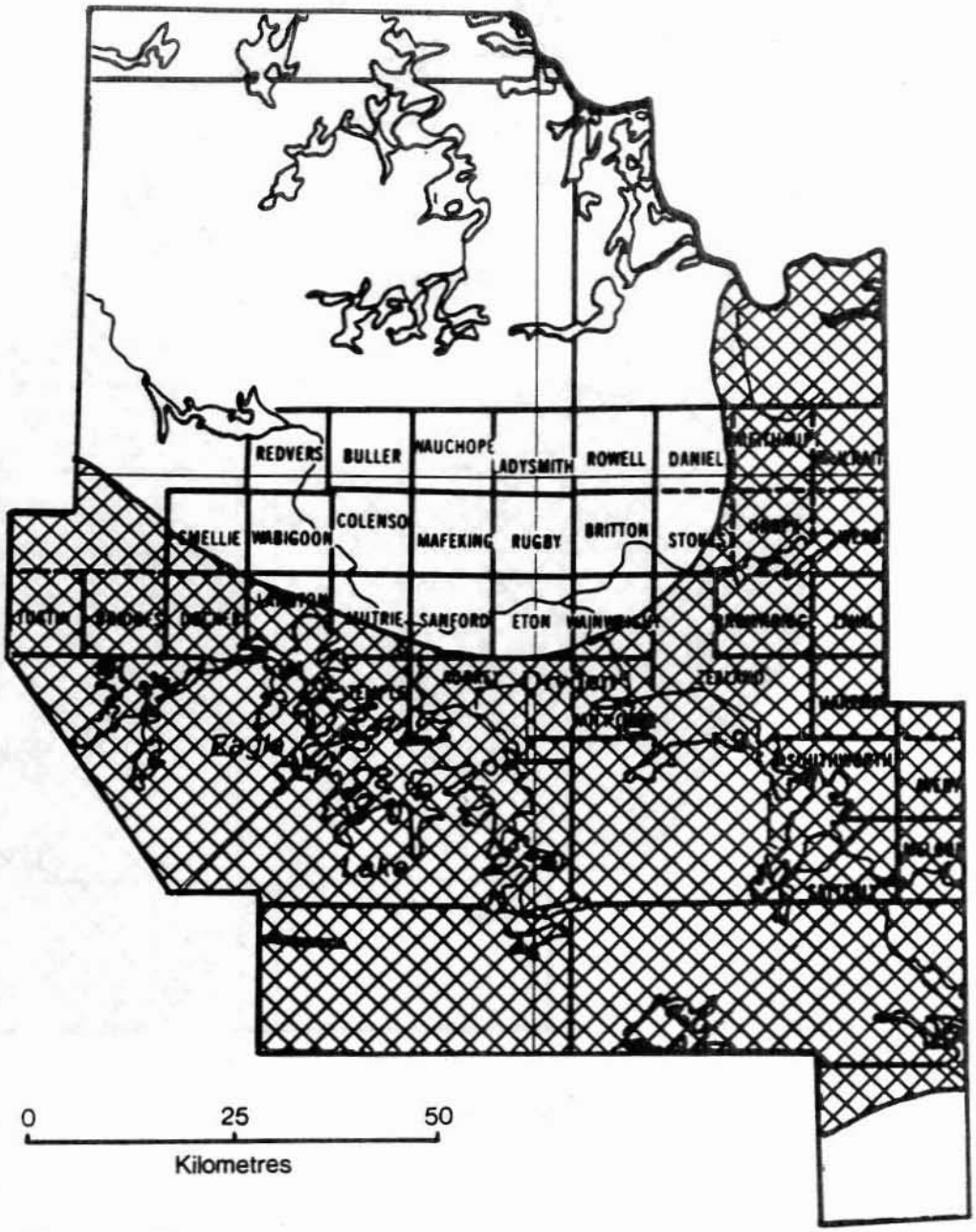
Spruce Budworm

Areas within which defoliation occurred in 1957

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



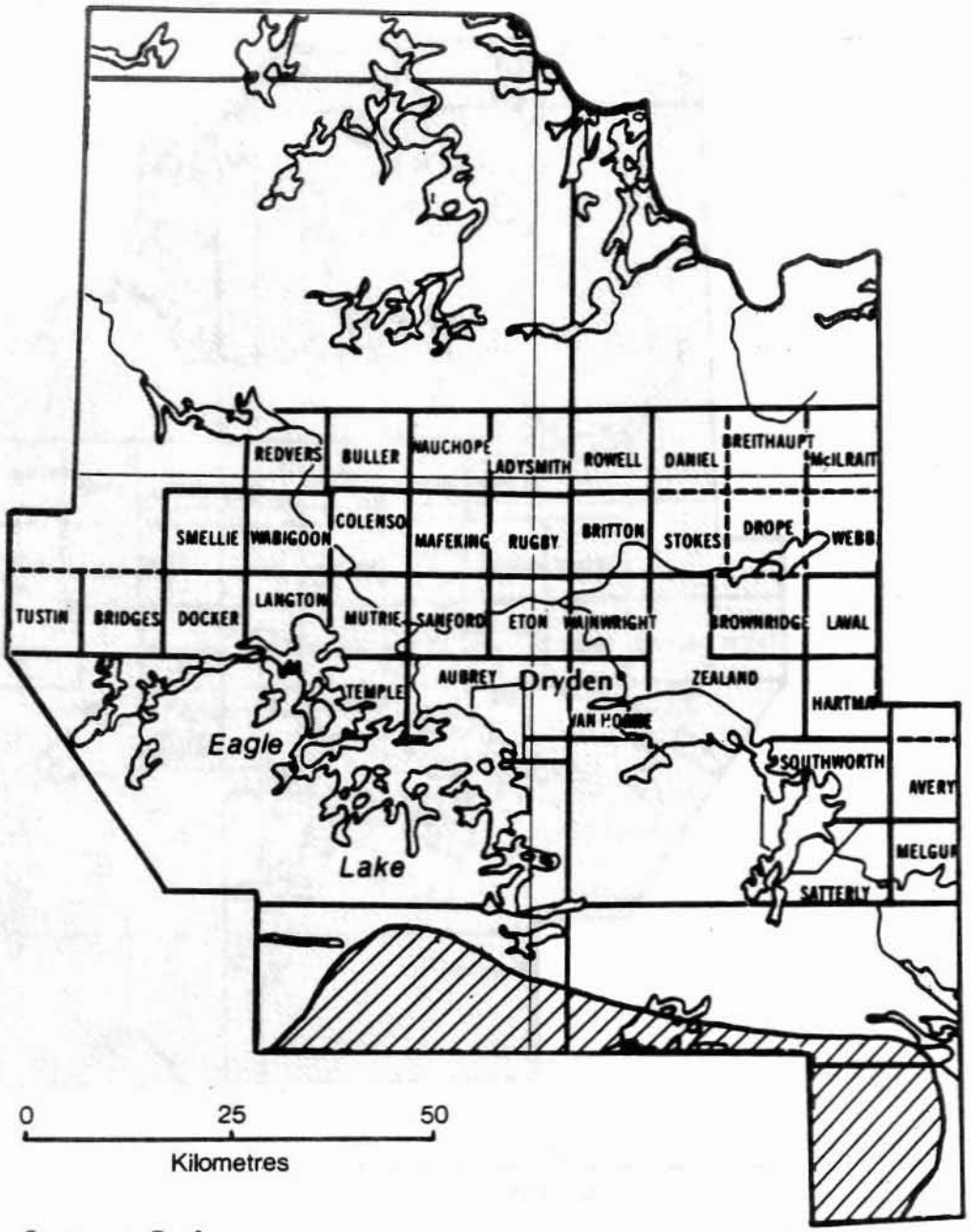
Spruce Budworm

Areas within which defoliation occurred in 1958

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



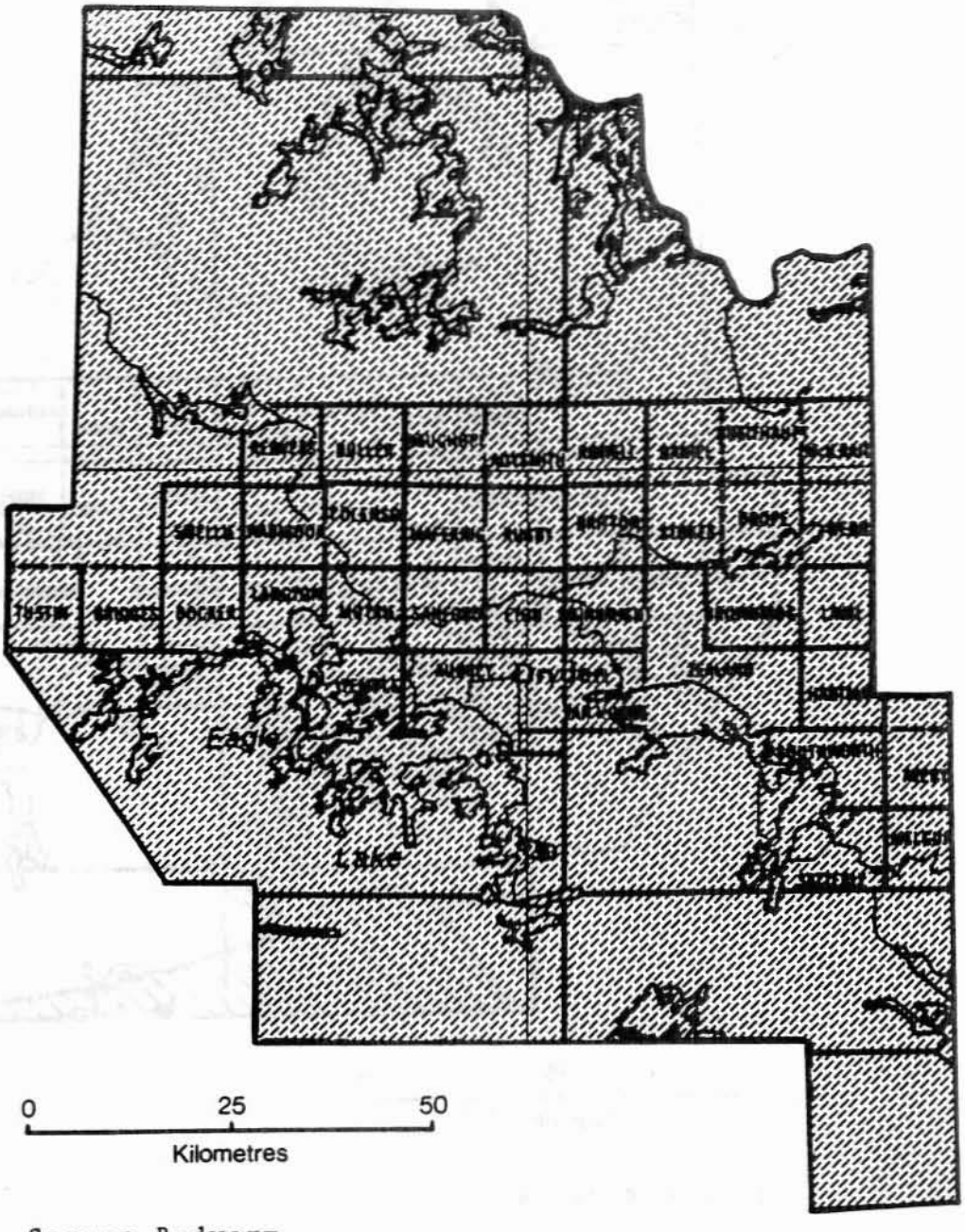
Spruce Budworm

Areas within which defoliation occurred in 1959

LEGEND

Light defoliation

DRYDEN DISTRICT



Spruce Budworm

Areas within which balsam fir whole-tree and top mortality occurred in 1960

LEGEND

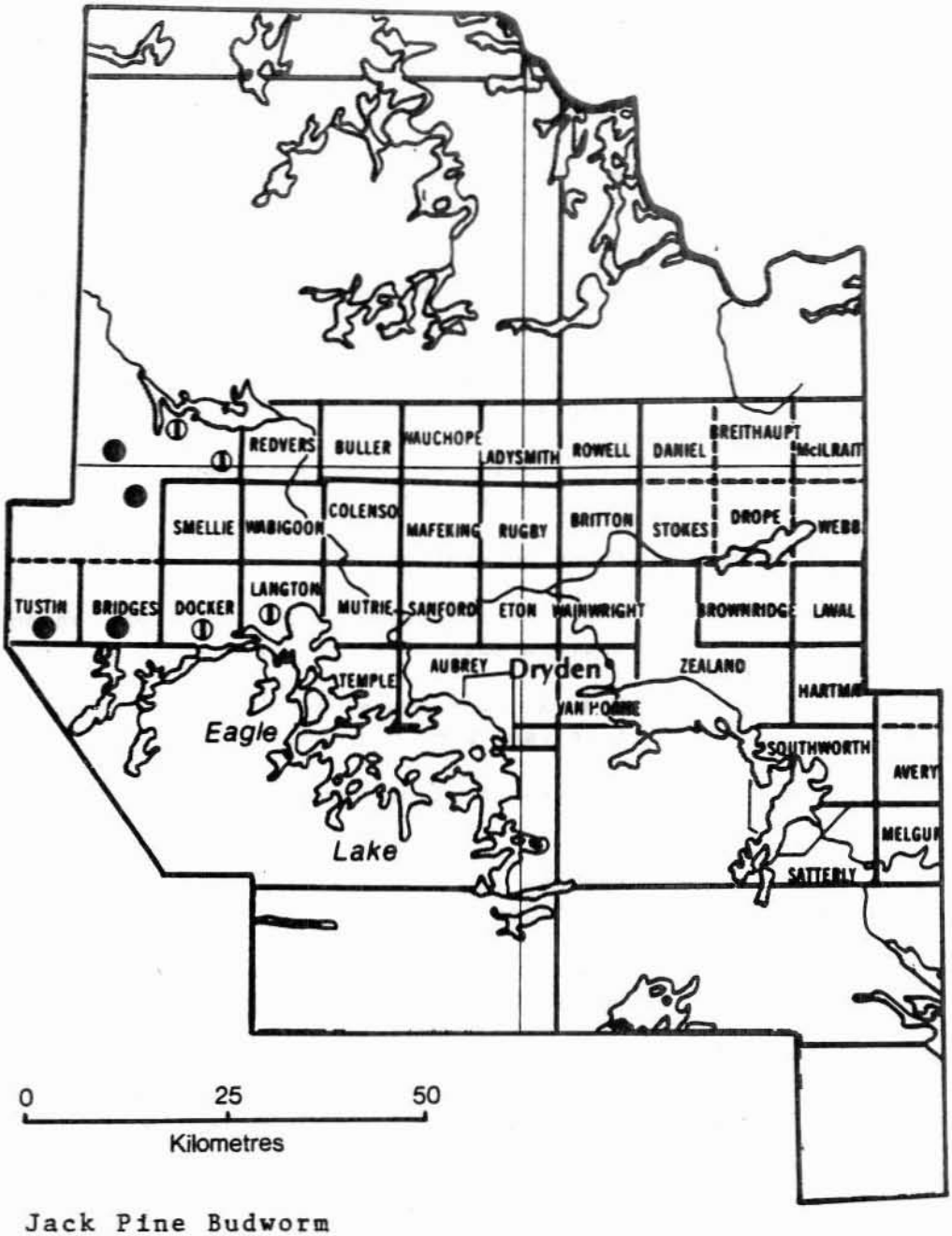
Mortality

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Host(s): jP [Major]

Year	Remarks
1950	Moderate-to-severe defoliation occurred at several points northwest of Vermilion Bay (see map, page 30).
1951	A small, light infestation occurred north of Vermilion Bay near Blue Lake.
1952-1953	Small numbers of larvae were reported between Stewart Lake and Dryden, and near Blue and Indian lakes.
1954	A new, heavy infestation occurred in Mutrie Twp, east of Vermilion Bay. Low numbers persisted in the vicinity of Blue and Indian lakes.
1955	The Mutrie Twp infestation declined to low levels, and low levels persisted at Blue Lake.
1956-1960	trace population
1961	Moderate-to-severe defoliation was mapped in the south-western part of the district (see map, page 31).
1962	Moderate-to-severe defoliation occurred south of Eagle Lake (see map, page 32).
1963	Pockets of light infestation were recorded at Beaverhouse Lake.
1964	Pockets of moderate-to-severe defoliation were mapped in the Tadpole and Kapesakosi lakes area.
1965	A new area of medium-to-heavy infestation occurred in Mutrie Twp.
1966	Moderate-to-severe defoliation was mapped in the south-western section of the district. Light defoliation occurred throughout the Vermilion Bay area (see map, page 33).
1967	A marked increase in moderate-to-severe defoliation occurred (see map, page 34).
1968	Moderate-to-severe defoliation persisted throughout most of the central part of the district (see map, page 35).
1969	The infestation collapsed and defoliation was confined to a small area near the Vermilion Bay airport.
1970-1980	not reported

DRYDEN DISTRICT



Jack Pine Budworm

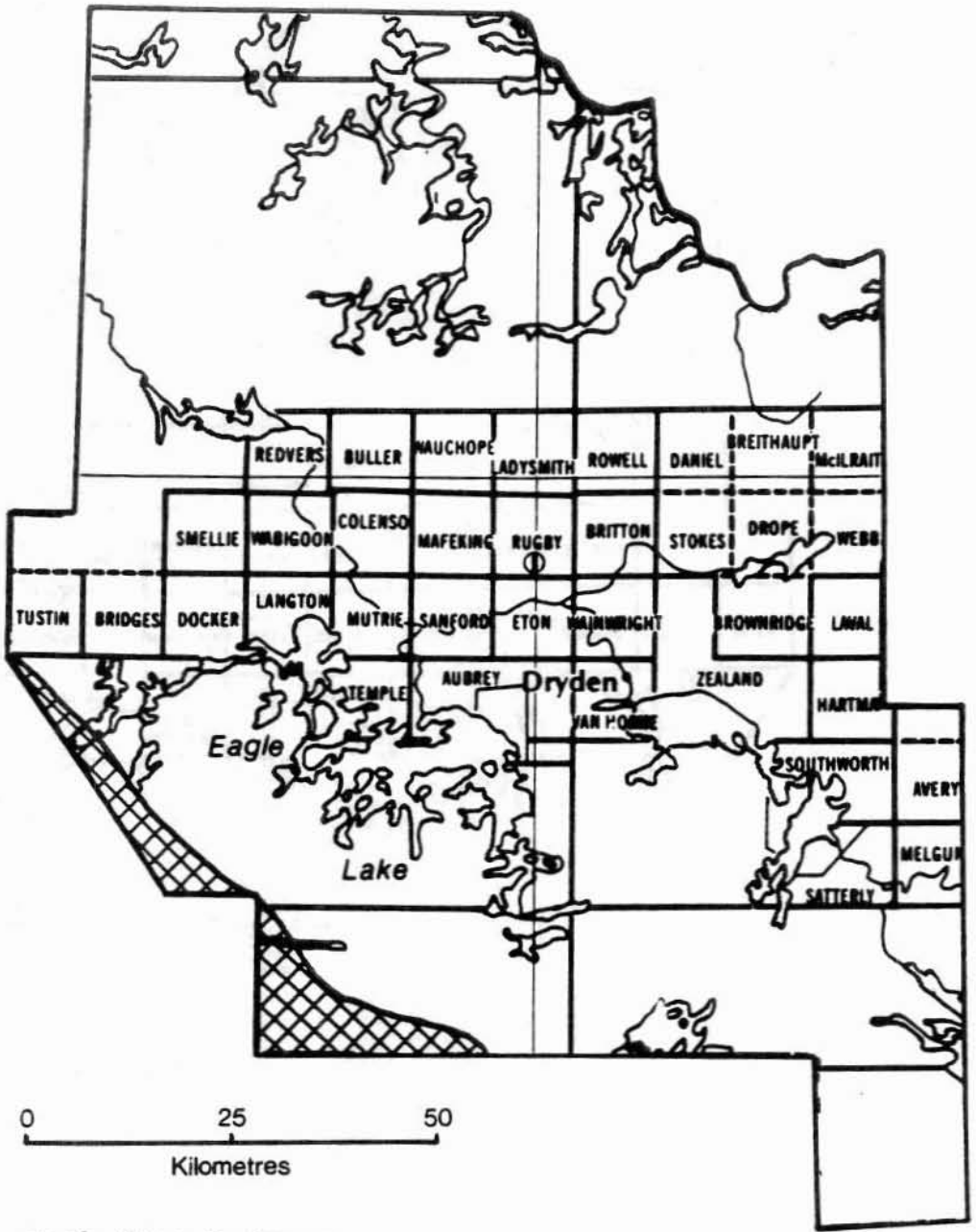
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation ●

DRYDEN DISTRICT



Jack Pine Budworm

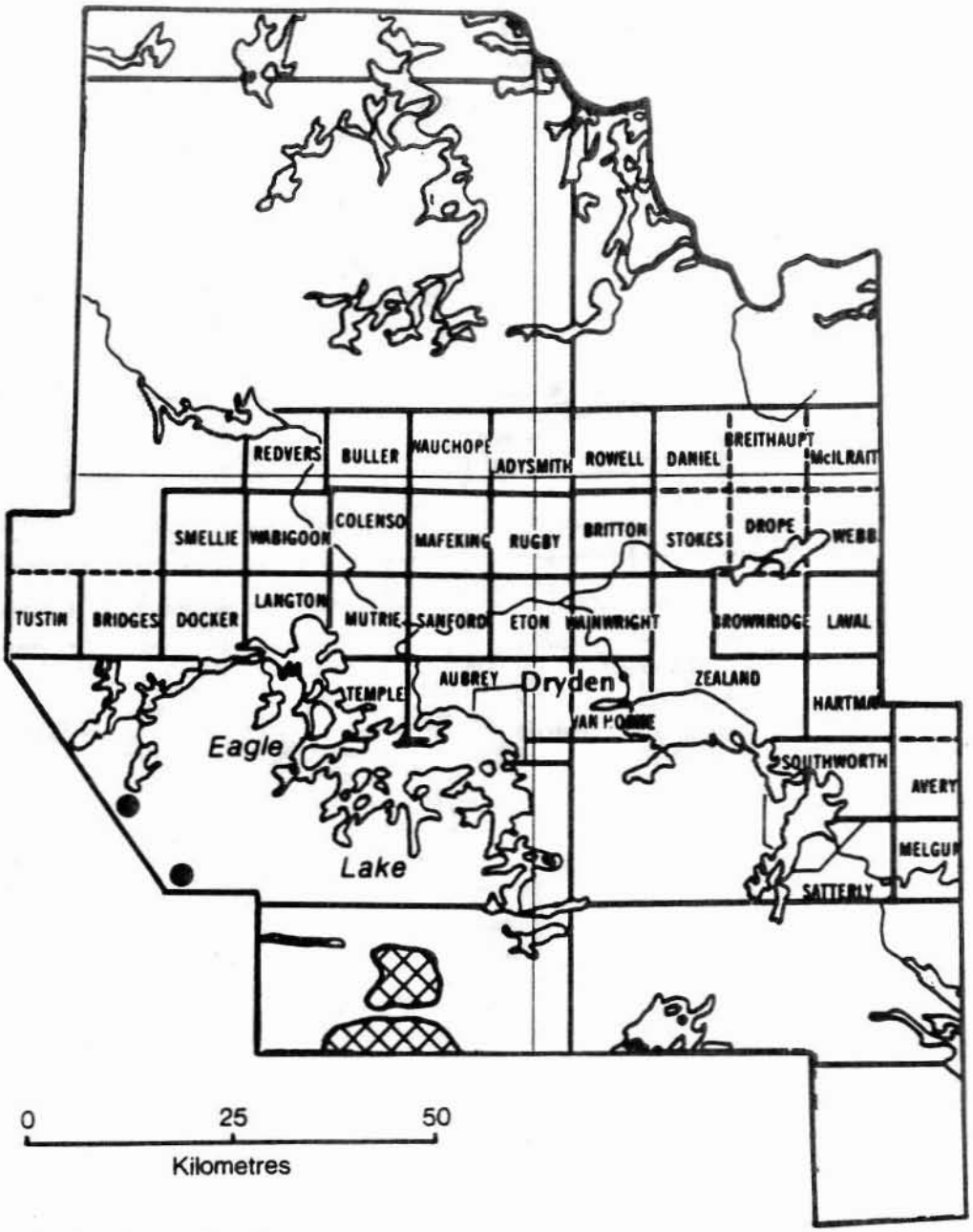
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation

DRYDEN DISTRICT



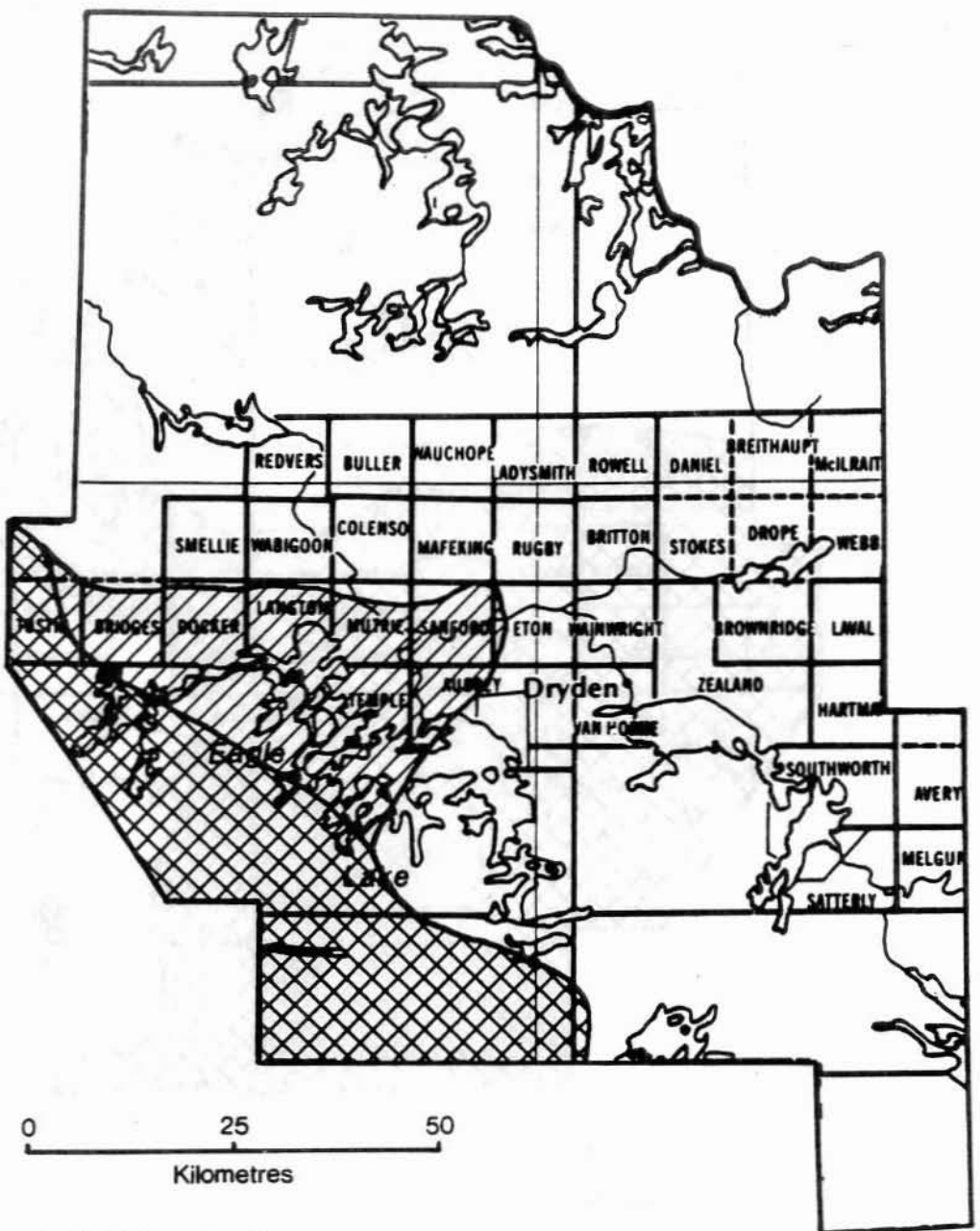
Jack Pine Budworm

Areas within which defoliation occurred in 1962

LEGEND

Moderate-to-severe defoliation ● or ▨

DRYDEN DISTRICT



Jack Pine Budworm

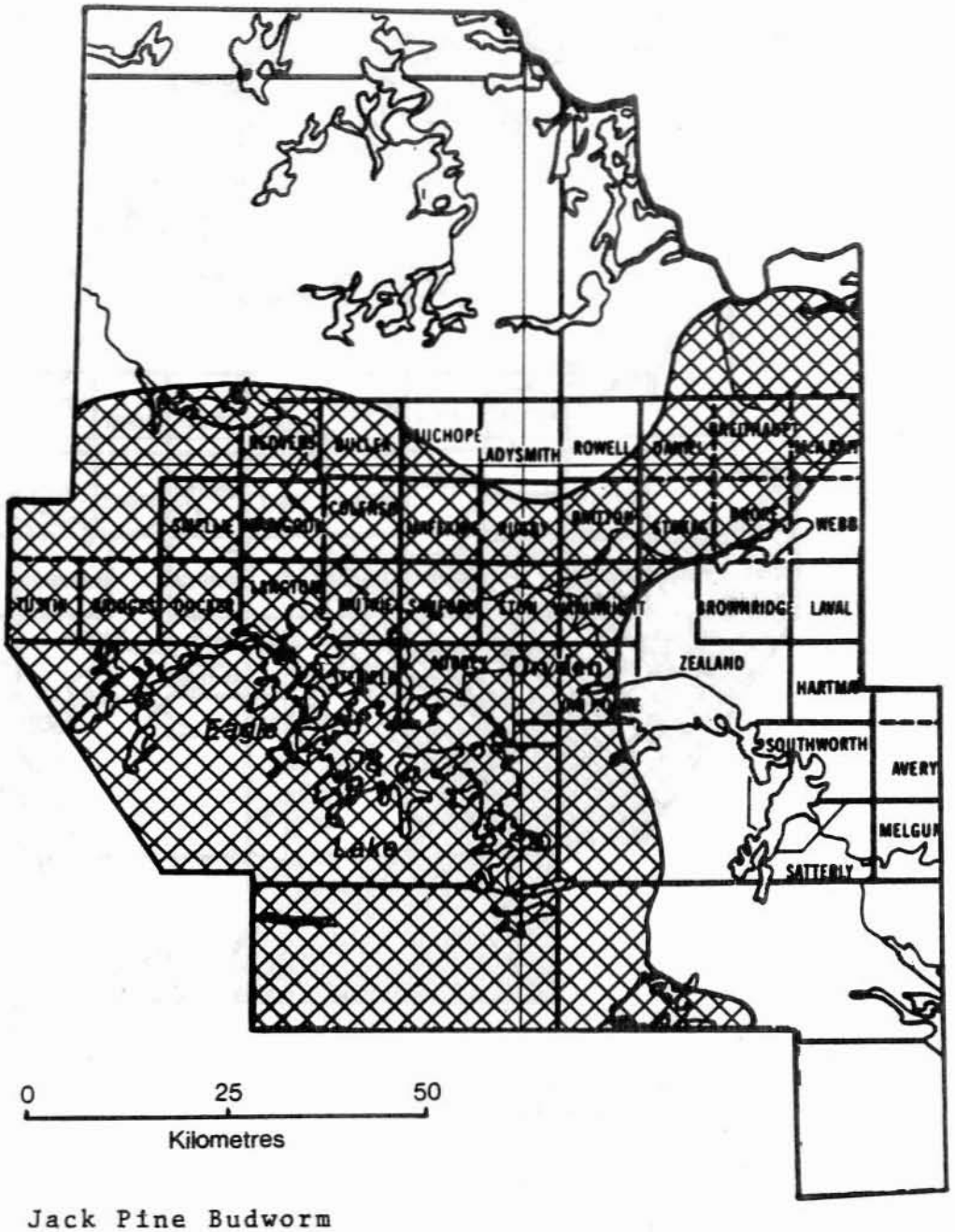
Areas within which defoliation occurred in 1966

LEGEND

Light defoliation

Moderate-to-severe defoliation

DRYDEN DISTRICT



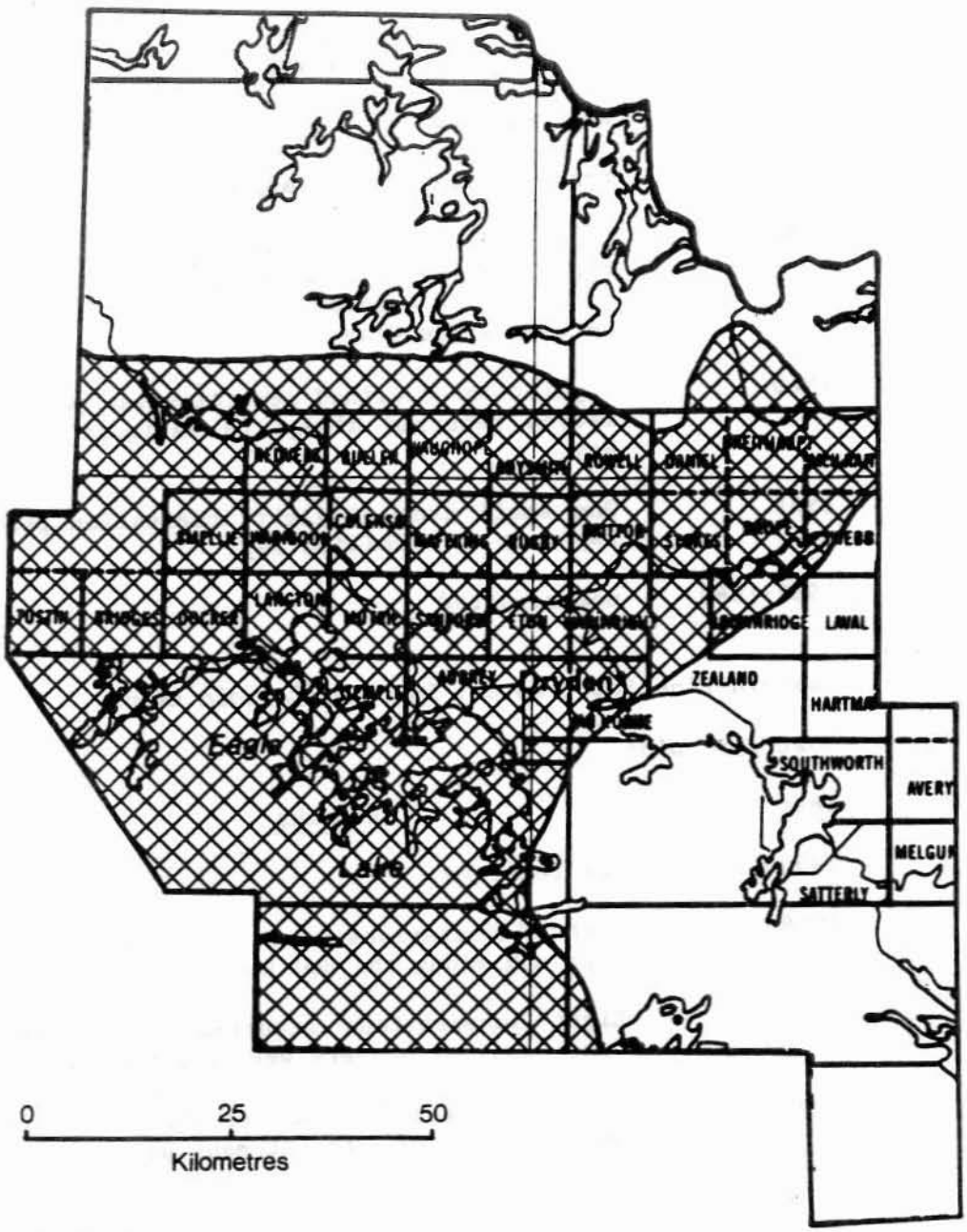
Jack Pine Budworm

Areas within which defoliation occurred in 1967

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



Jack Pine Budworm

Areas within which defoliation occurred in 1968

LEGEND

Moderate-to-severe defoliation

Aspen Twoleaf Tier, *Enargia decolor* (Wlk.)

Host(s): poplar [Major]

Year	Remarks
1950-1957	not reported
1958	trace population in Langton Twp
1959	Light infestations occurred in Smellie, Redvers and Buller twps. Moderate-to-severe defoliation occurred in a band extending in a northwesterly direction from Redvers Twp to encompass the Clay Lake area.
1960	Populations declined generally but pockets of light defoliation recurred along the Wabigoon River near Vermilion Bay.
1961	One small area of light infestation persisted in Bridges Twp west of Vermilion Bay.
1962-1980	not reported

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine [Major]

Year	Remarks
1950-1957	not reported
1958	Light infestations were recorded in Buller and Wabigoon twps and along the Red Lake Road.
1959	Light infestations occurred in Zealand Twp and at Eye Lake, and low numbers were found at many locations.
1960	A light infestation was recorded in Smellie Twp, and low numbers were reported at many points elsewhere.
1961-1962	not reported
1963	low population near Dyment and in Dyment Twp
1964	Moderate numbers were reported in Smellie, Langton and McIlraith twps.
1965	Little change occurred in population levels or in distribution.

(cont'd)

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

Host(s): pine [Major]

Year	Remarks
1966	light infestation at Lee Lake
1967	trace populations
1968	not reported
1969	not reported
1970	low populations near Blue Lake
1971-1973	not reported
1974	low numbers in Tustin Twp
1975	not reported
1976	6% leader damage in Buller Twp
1977	1% leader mortality in Satterly Twp
1978	trace populations
1979	9% leader mortality in Rugby Twp
1980	not reported

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): deciduous [Major]

Year	Remarks
1950	Moderate-to-severe defoliation was common throughout a large section of the southeastern part of the district (see map, page 40).
1951	Defoliation persisted over much of the same area that was infested in 1950 (see map, page 41).
1952	The infestation expanded to include the entire district (see map, page 42).
1953	The infestation collapsed as a result of starvation when late spring frosts killed foliage.

(cont'd)

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. (cont'd)

Host(s): deciduous [Major]

Year	Remarks
1954-1958	not reported
1959	A medium-to-heavy infestation occurred on three small islands in Eagle Lake in Docker Twp.
1960	Pockets of moderate-to-severe defoliation occurred in the Vermilion Bay area (see map, page 43).
1961	The infestation increased in size and intensity (see map, page 44).
1962	The infestation continued to increase (see map, page 45).
1963	Medium-to-heavy infestations were found throughout most susceptible stands in the district (see map, page 46).
1964	Moderate-to-severe defoliation recurred throughout the district.
1965	no change in infestation
1966	The infestation collapsed as a result of unfavorable weather conditions.
1967-1970	not reported
1971	One small pocket of light infestation was recorded in Langton Twp.
1972	Moderate-to-severe defoliation occurred at five points in the Dryden-Vermilion Bay area (see map, page 47).
1973	The infestation continued to expand in the Vermilion Bay-Dryden area (see map, page 48).
1974	The infestation decreased by approximately 50% (see map, page 49).
1975	Moderate-to-severe defoliation recurred in the central part of the district (see map, page 50).
1976	Moderate-to-severe defoliation persisted in the central part of the district (see map, page 51).

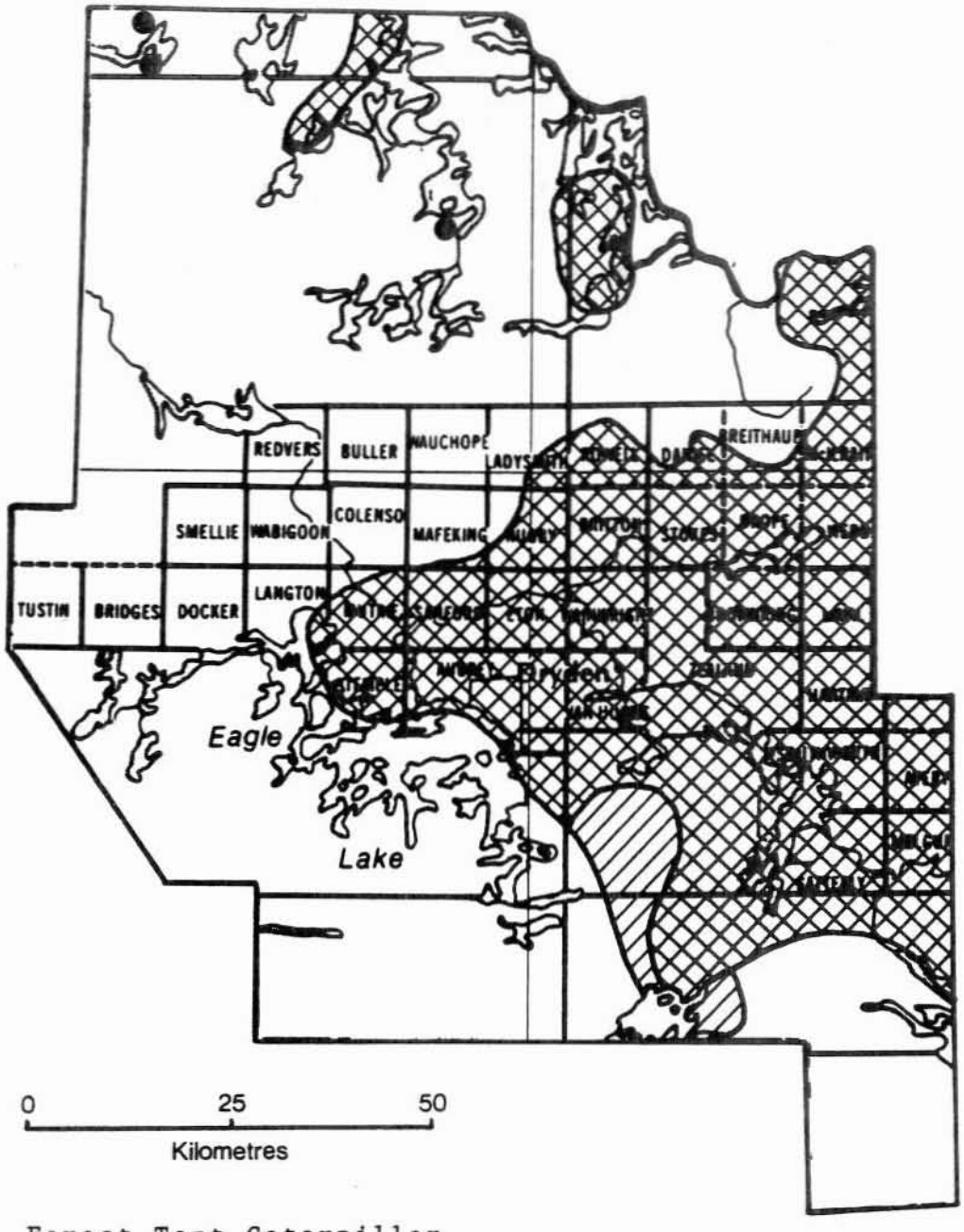
(cont'd)

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

Host(s): deciduous [Major]

Year	Remarks
1977	The infestation expanded throughout the northern part of the district (see map, page 52).
1978	Moderate-to-severe defoliation was found throughout the entire district (see map, page 53).
1979	Populations declined abruptly in the northwestern part of the district (see map, page 54).
1980	The infestation collapsed.

DRYDEN DISTRICT



Forest Tent Caterpillar

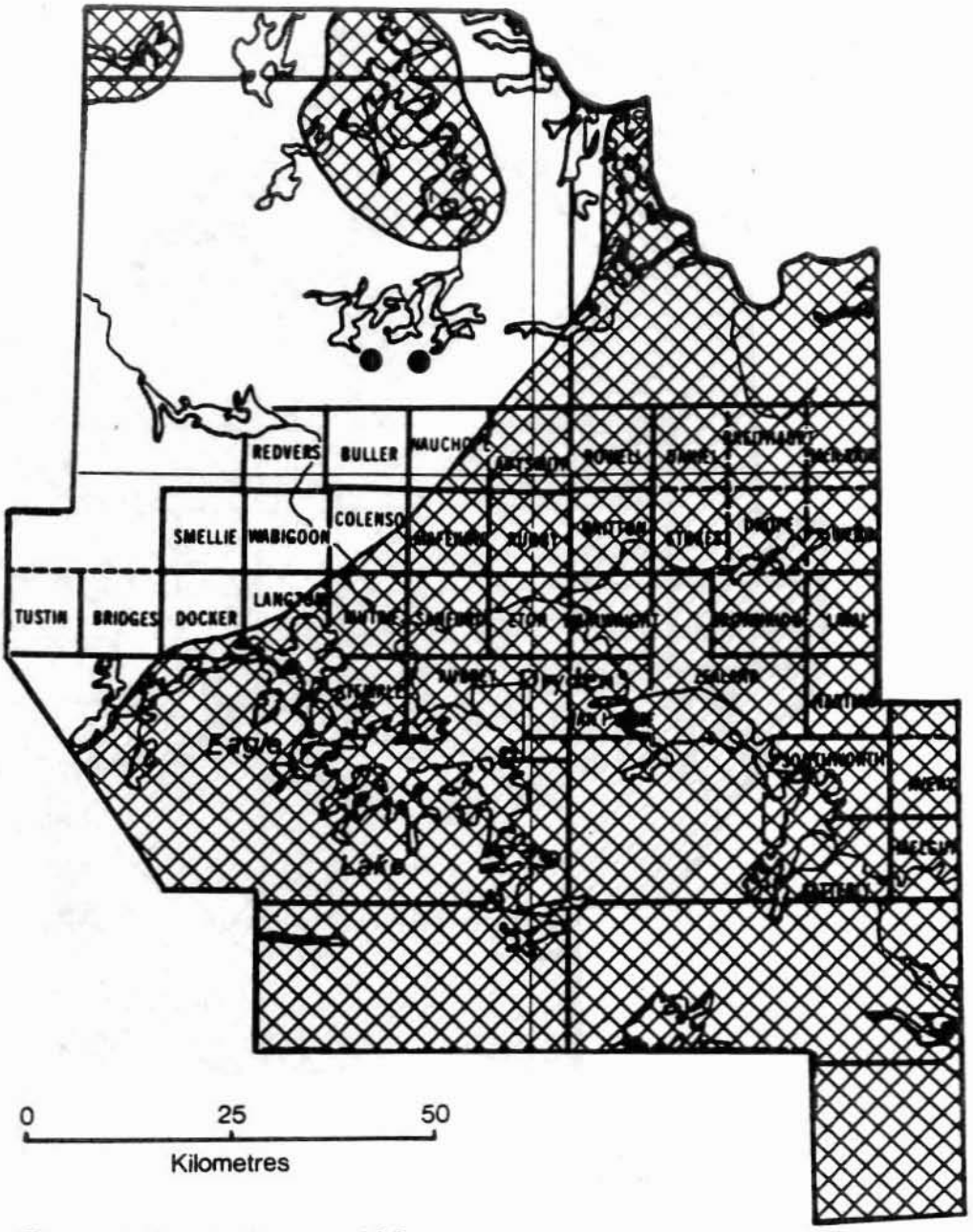
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation

Moderate-to severe defoliation ● or ▨

DRYDEN DISTRICT



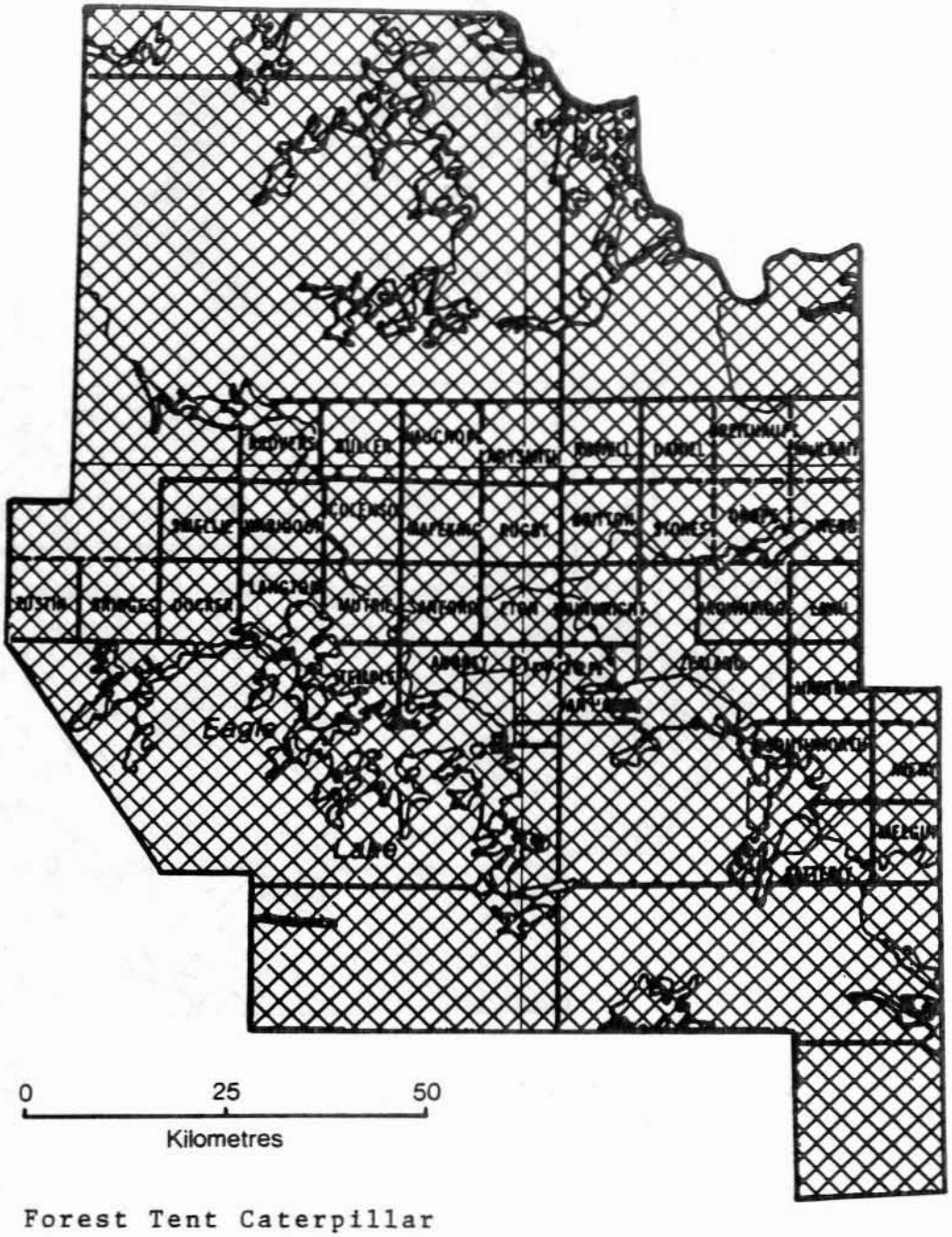
Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation ● or ▨

DRYDEN DISTRICT



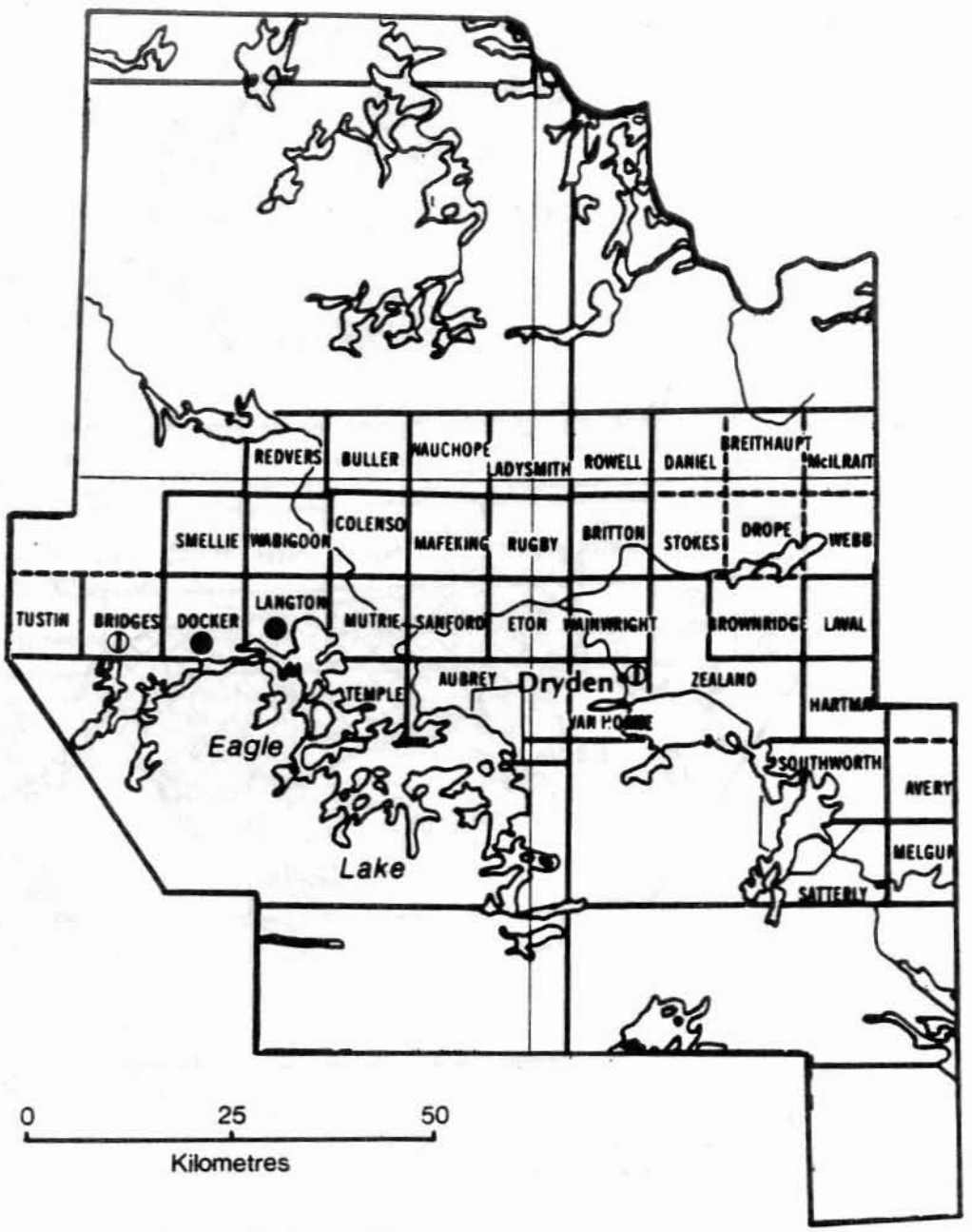
Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



Forest Tent Caterpillar

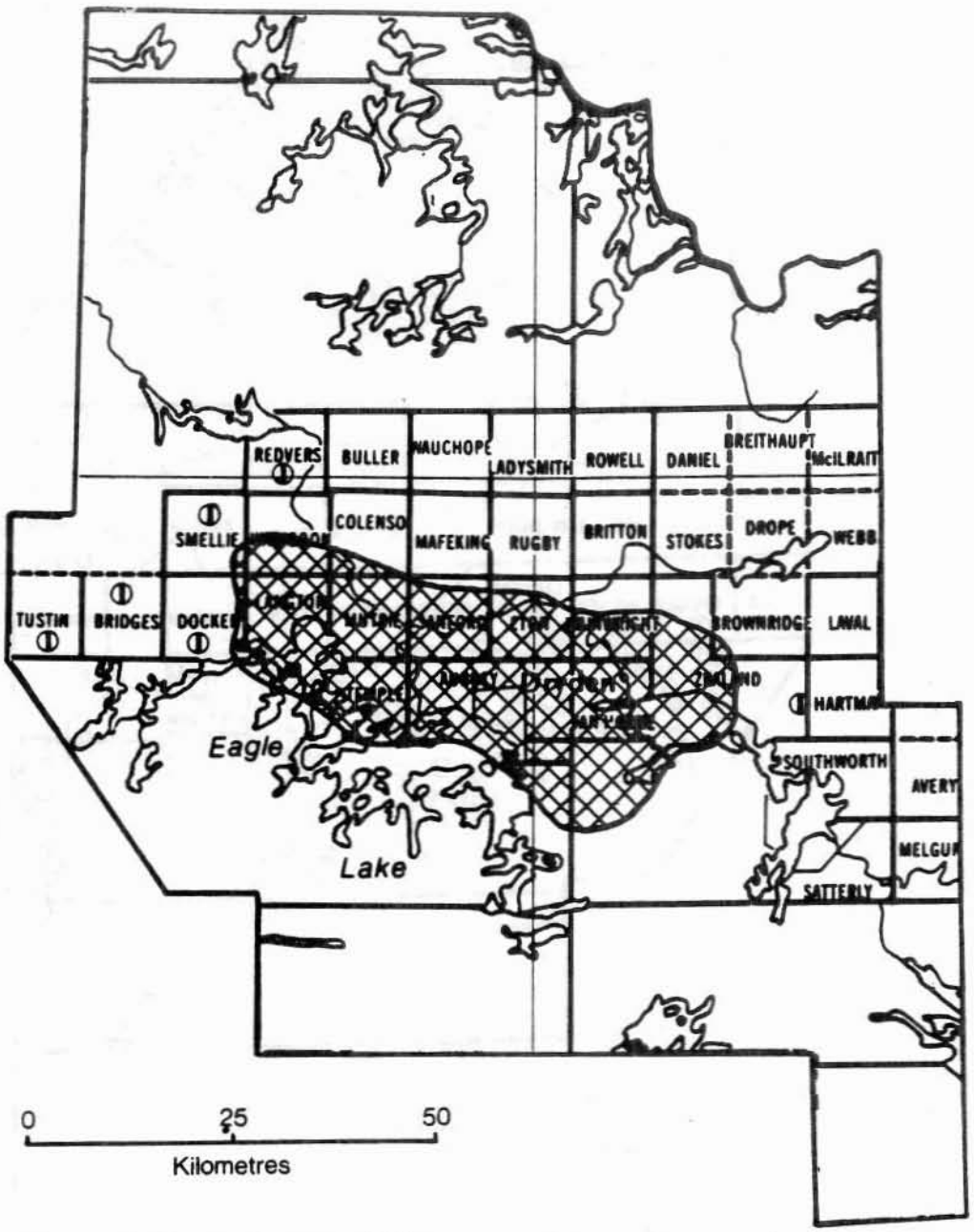
Areas within which defoliation occurred in 1960

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation ●

DRYDEN DISTRICT



Forest Tent Caterpillar

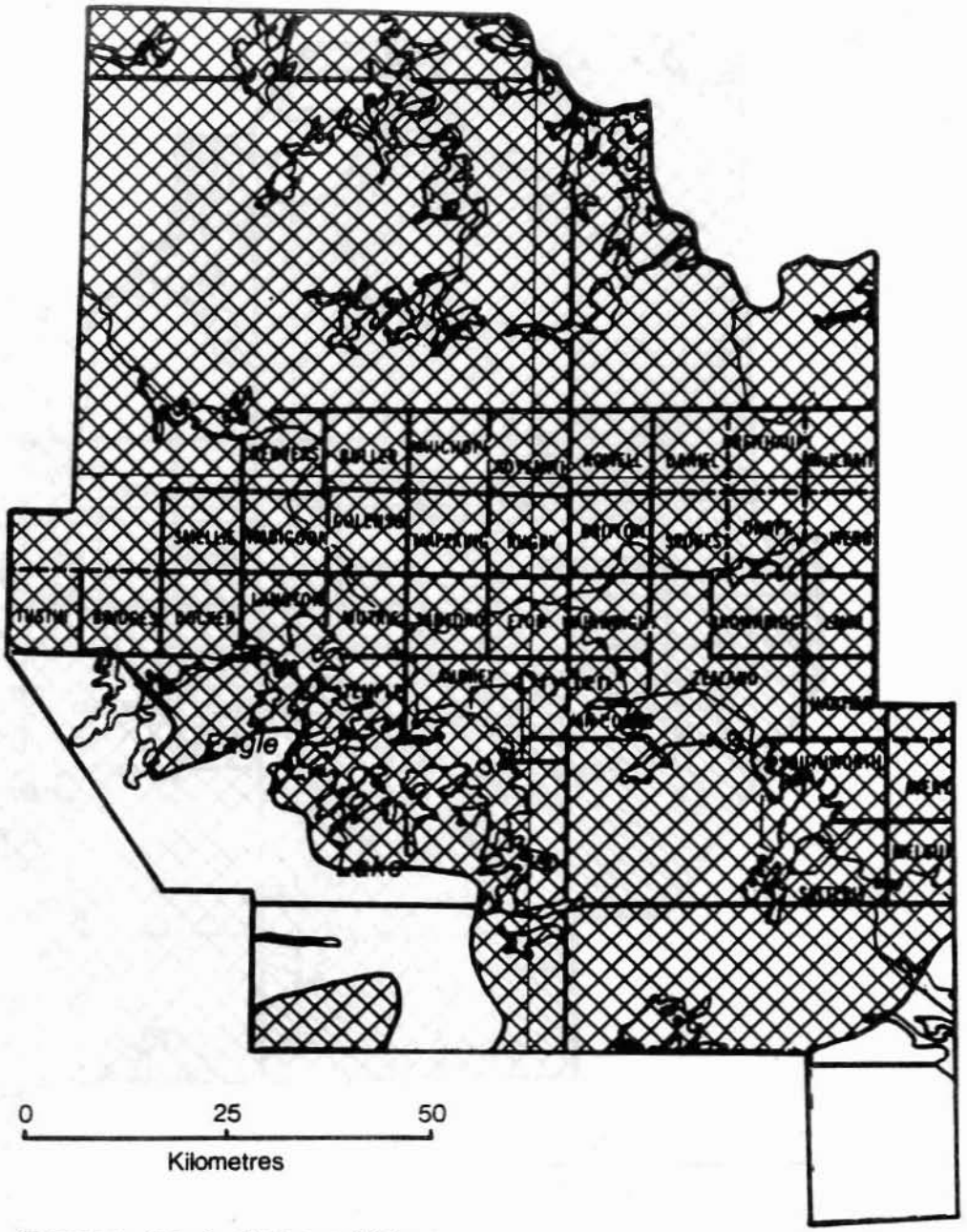
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation

DRYDEN DISTRICT



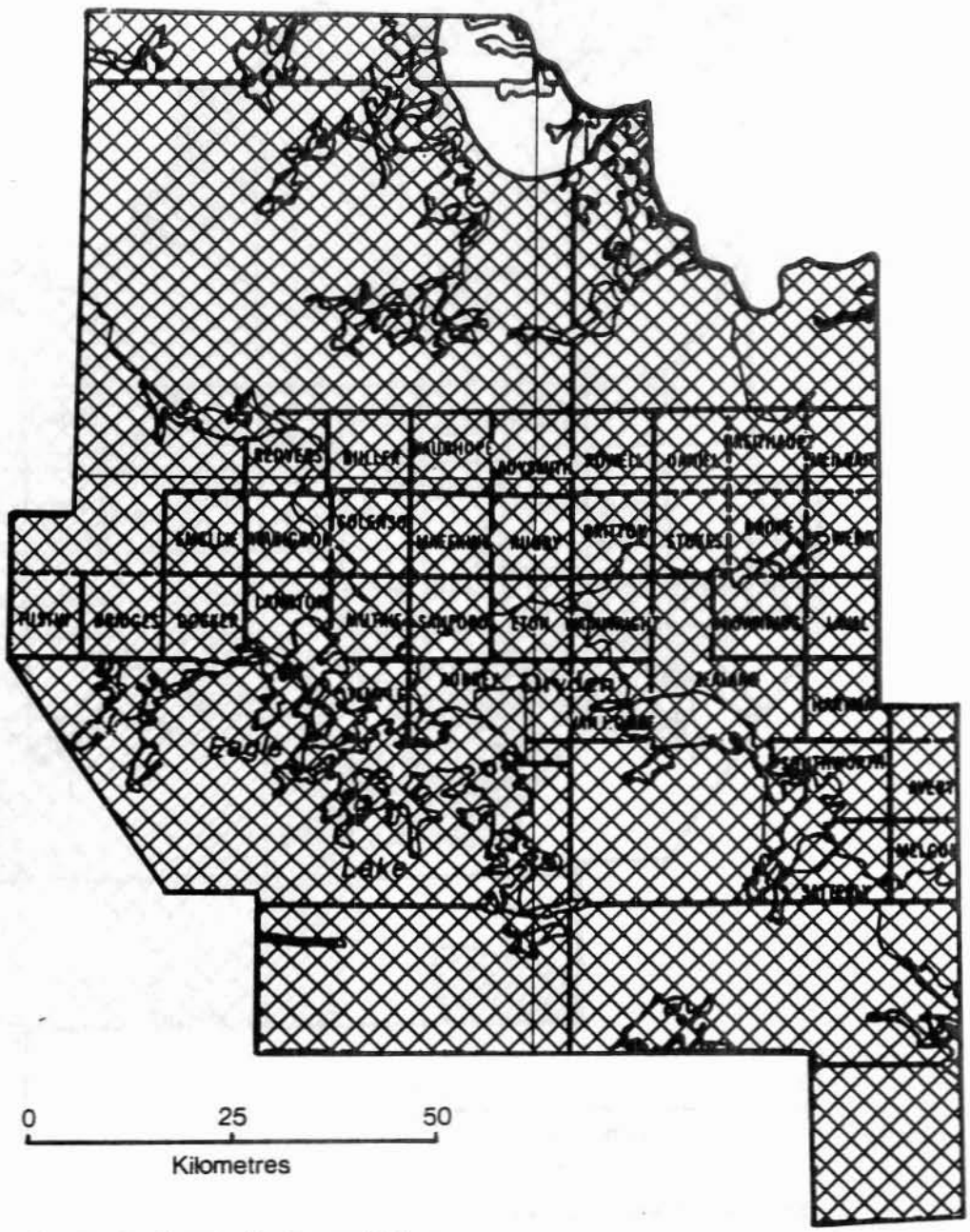
Forest Tent Caterpillar

Areas within which defoliation occurred in 1962

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



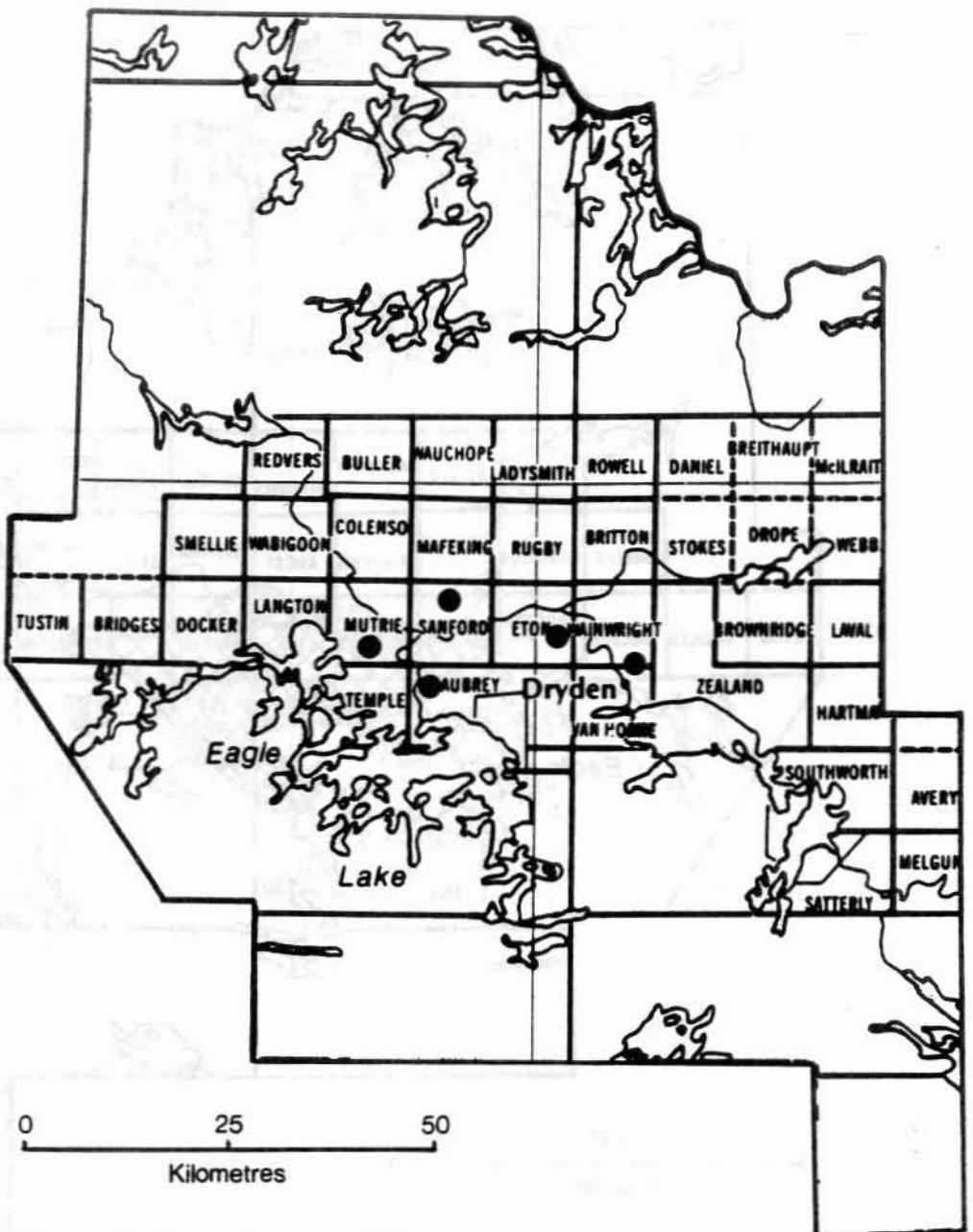
Forest Tent Caterpillar

Areas within which defoliation occurred in 1963

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



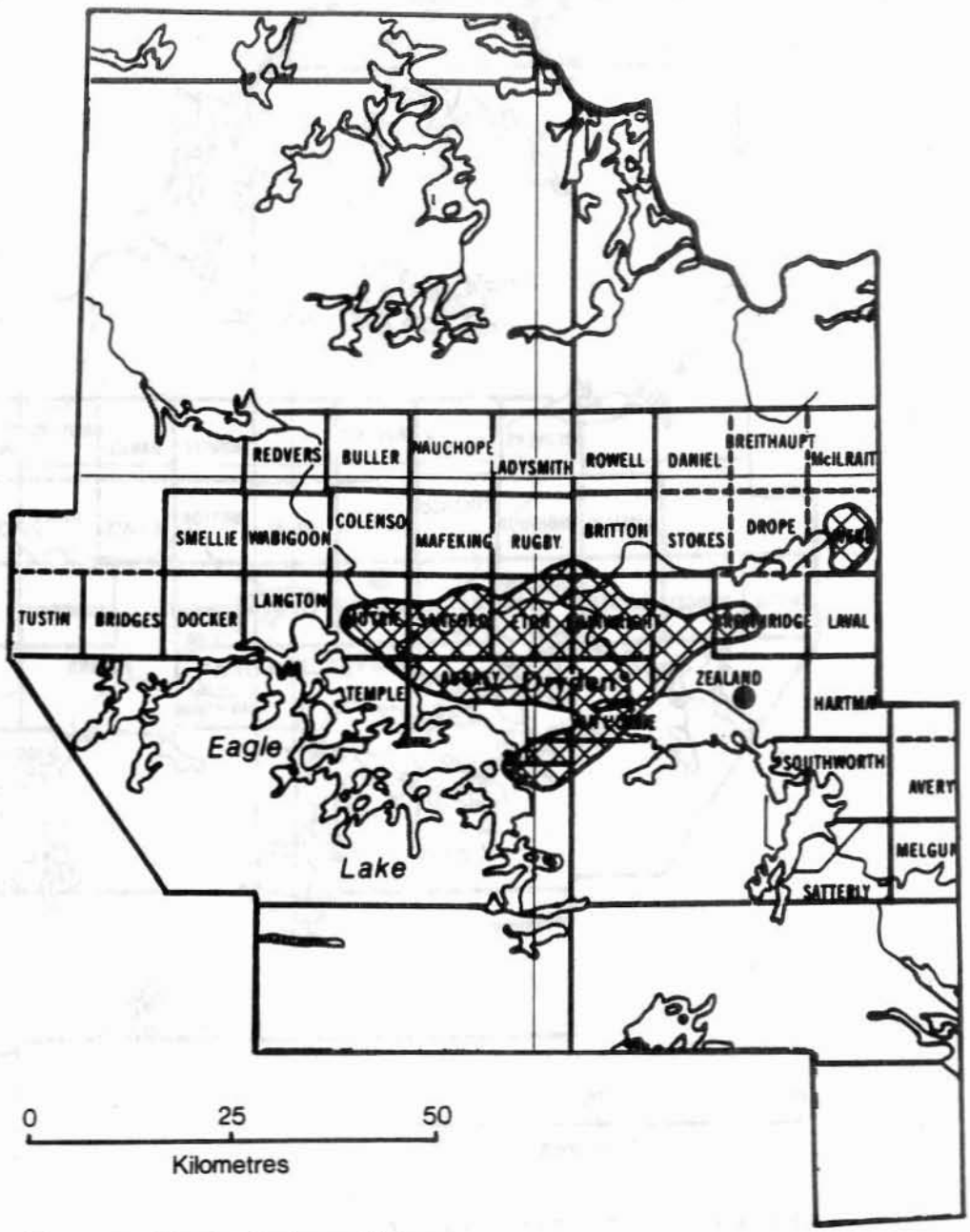
Forest Tent Caterpillar

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation ●

DRYDEN DISTRICT



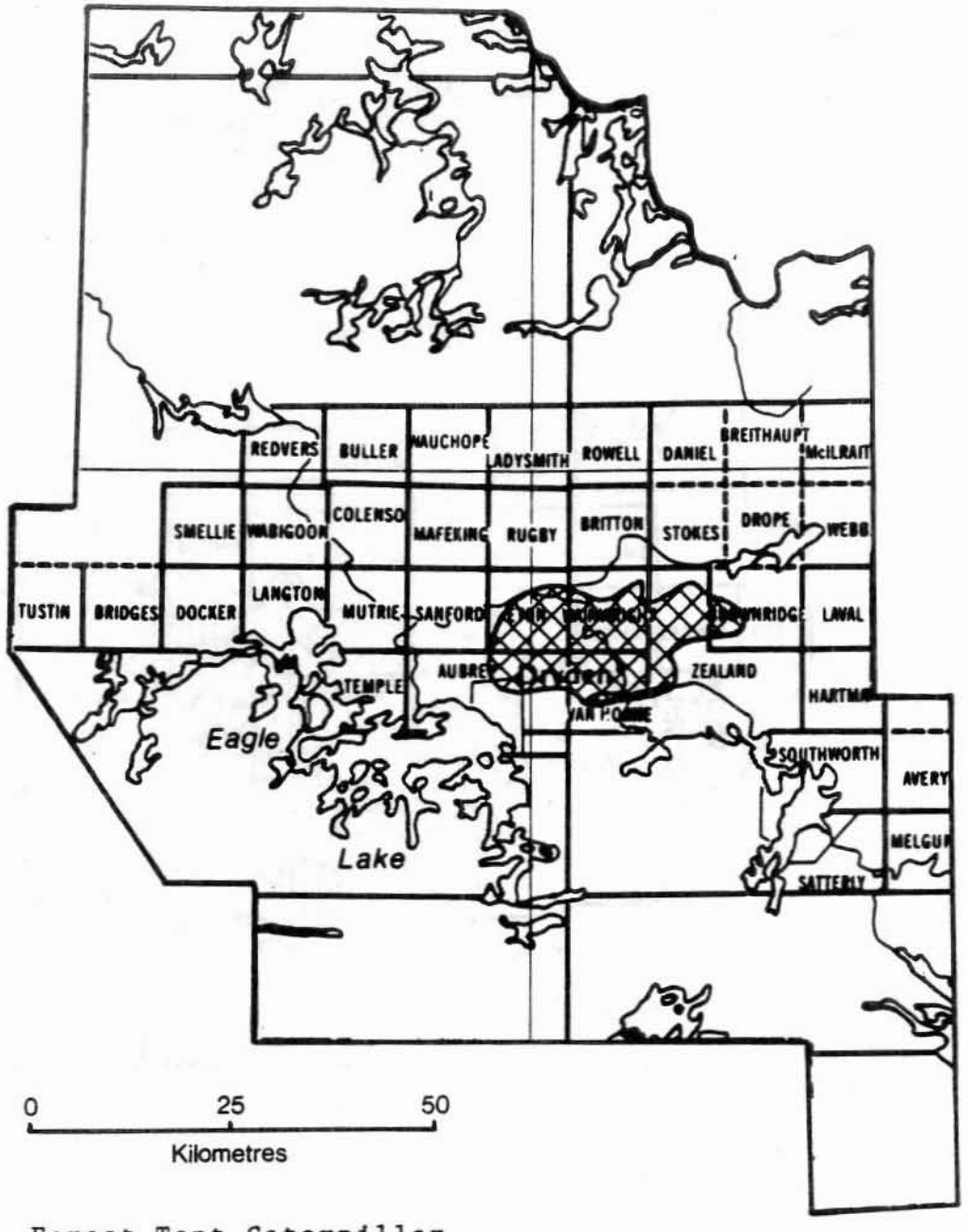
Forest Tent Caterpillar

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation ● or ▨

DRYDEN DISTRICT



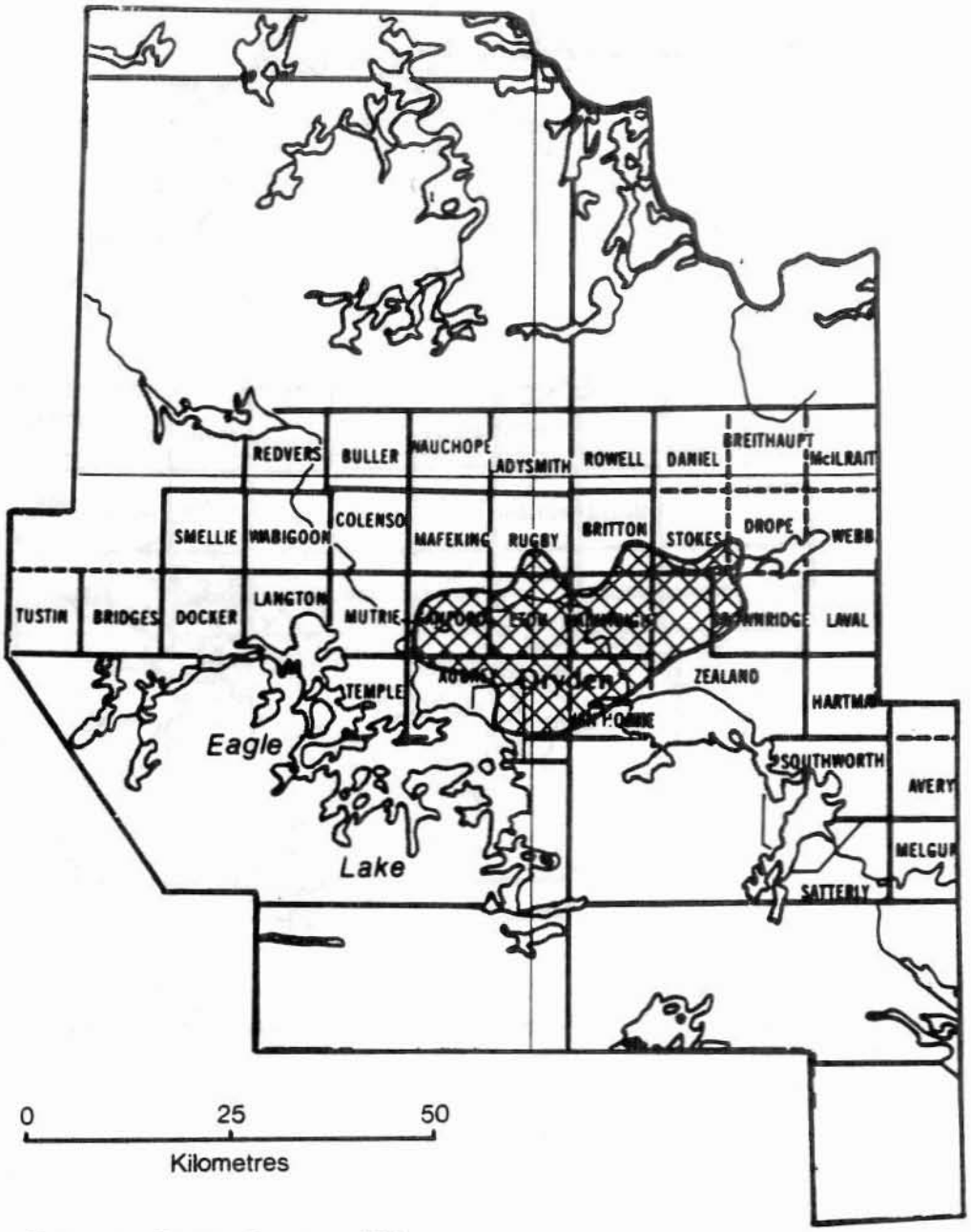
Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation ▨

DRYDEN DISTRICT



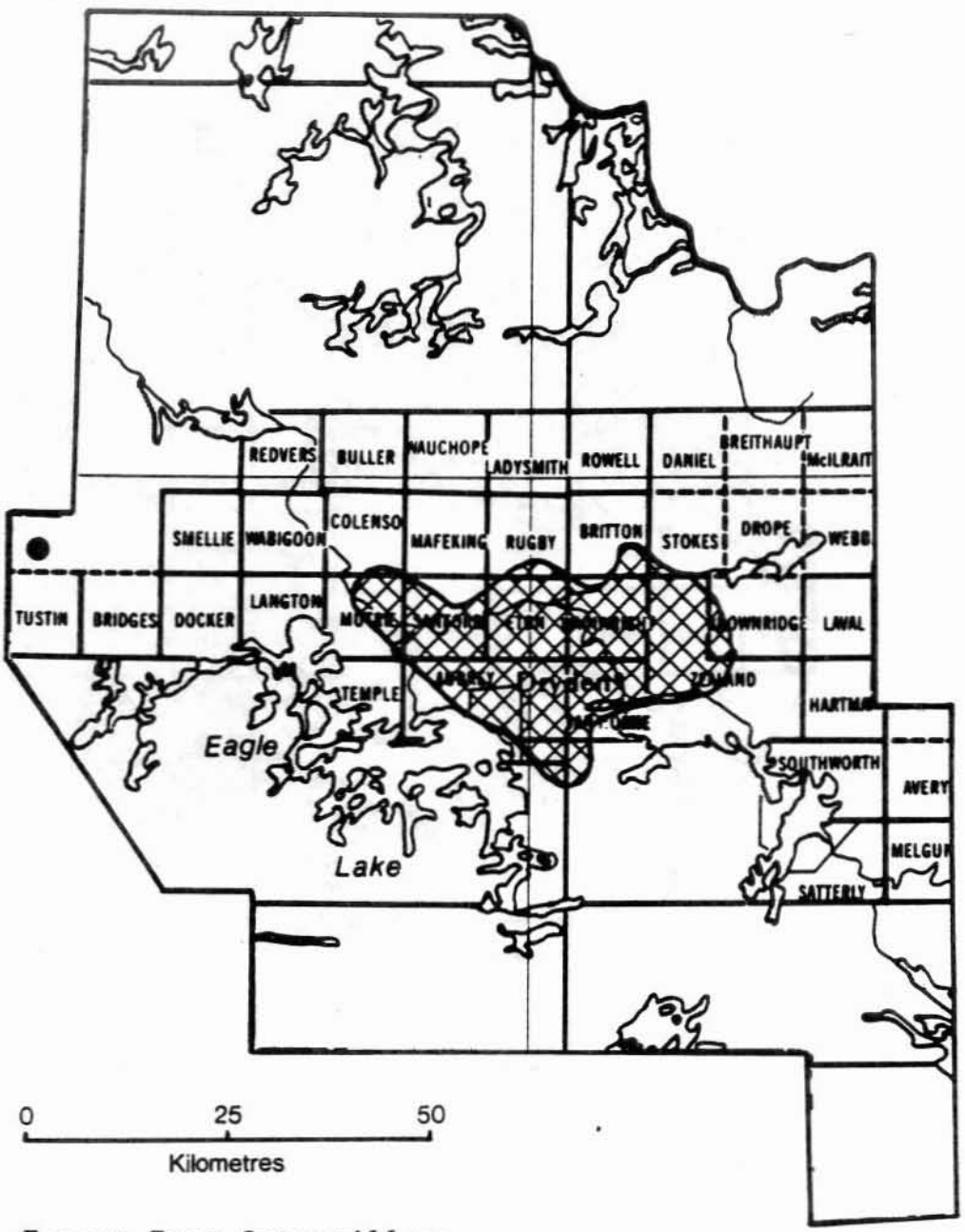
Forest Tent Caterpillar

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



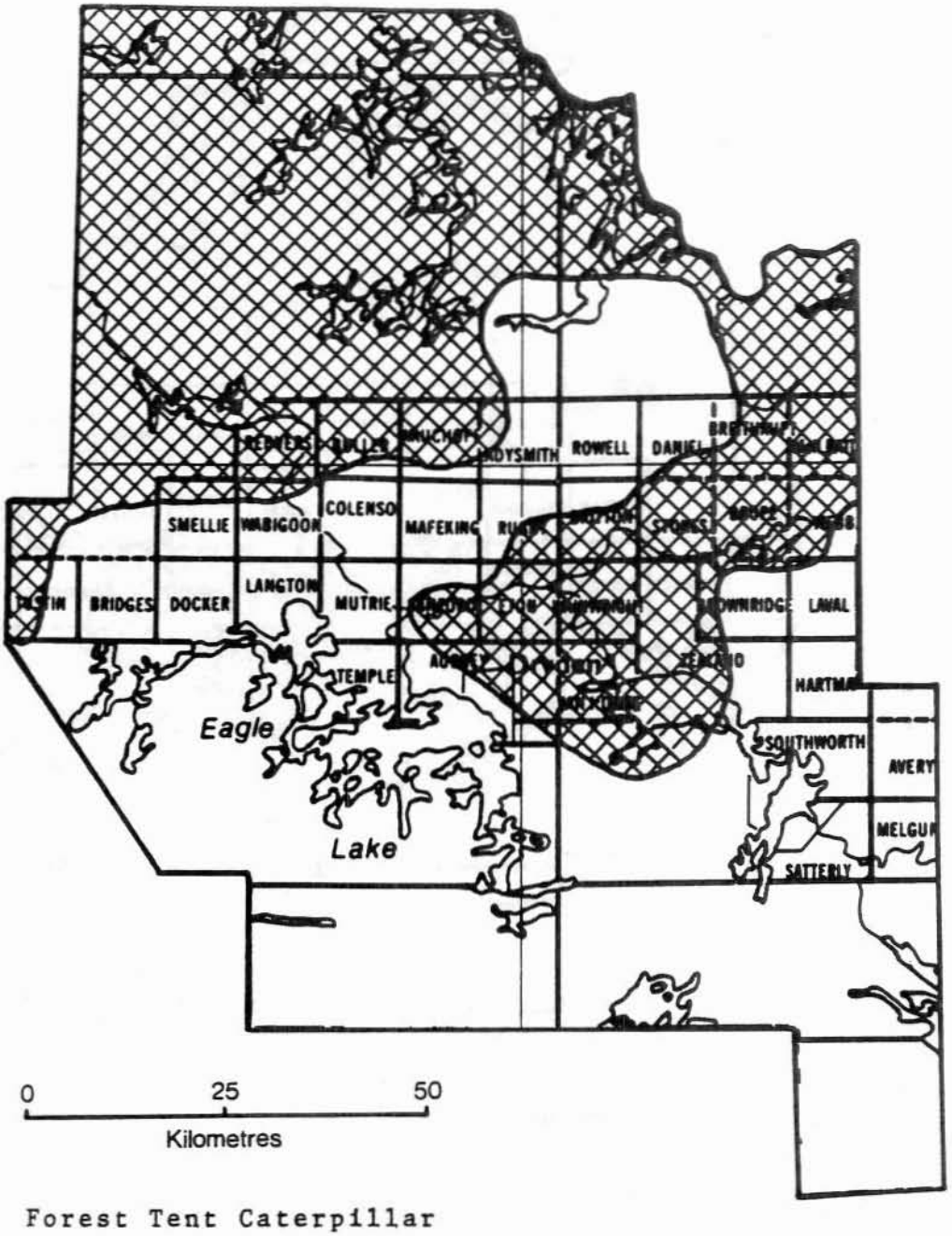
Forest Tent Caterpillar

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or

DRYDEN DISTRICT



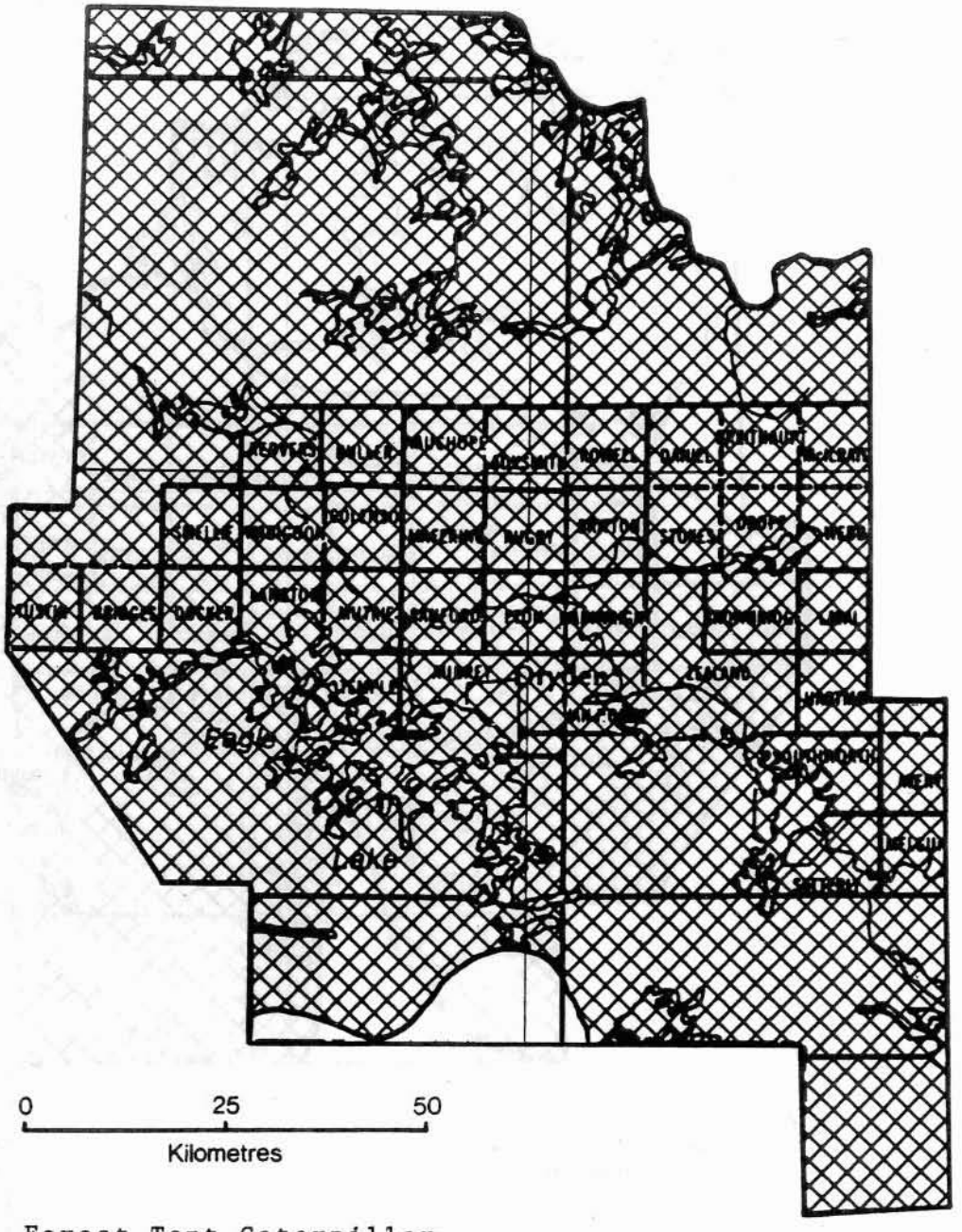
Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



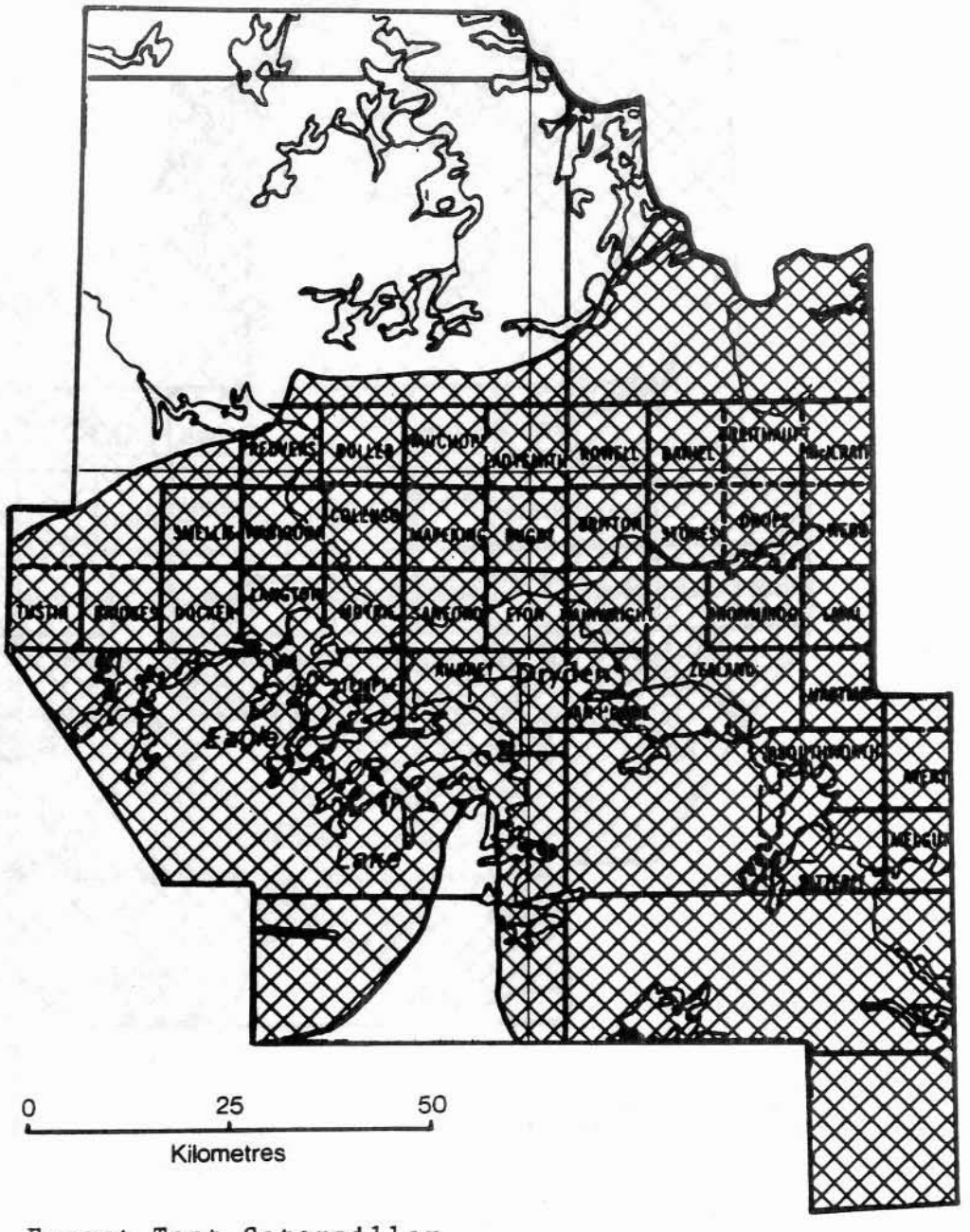
Forest Tent Caterpillar

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation

DRYDEN DISTRICT



Forest Tent Caterpillar

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation

Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF, spruce [Major]

Year	Remarks
1950-1963	not reported
1964-1966	Moderate-to-severe defoliation was reported on a small island in Eagle Lake.
1967	Trace populations were recorded in Aubrey, Temple and Van Horne twps.
1968	Trace populations were reported in Langton and Zealand twps.
1969-1973	not reported
1974	Light defoliation occurred along Highway 105 from Camp Robinson to Ear Falls in the Red Lake District.
1975	trace populations at a few locations
1976	90% defoliation of balsam fir trees in a small area along Highway 105 in Buller Twp
1977-1980	not reported

Pine Sawflies: Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl., Jack Pine Sawfly, *N. pratti banksianae* Roh., Swaine Jack Pine Sawfly, *N. swainei* Midd., Redheaded Jack Pine Sawfly *N. virginianus* complex

Host(s): pine [Major]

Year		Remarks
1950		not reported
1951-1952	*N. nanulus nanulus*	Twenty jack pine trees were heavily defoliated on a small island in Eagle Lake.
1953-1954	*N. virginianus*	trace populations at several points
1955	*N. nanulus nanulus*	Large numbers of larvae were recorded on red pine at Hardrock Island in Eagle Lake.

(cont'd)

Pine Sawflies: Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl., Jack Pine Sawfly, *N. pratti banksianae* Roh., Swaine Jack Pine Sawfly, *N. swainei* Midd., Redheaded Jack Pine Sawfly, *N. virginianus* complex (cont'd)

Host(s): pine [Major]

Year		Remarks
1955 (cont'd)	*N. pratti banksianae*	Medium-to-heavy infestations were reported at Eagle and Clay lakes, and north of Quibell.
	N. virginianus	Medium-to-heavy infestations were reported north of Vermilion Bay.
1956		not reported
1957	*N. nanulus nanulus*	low numbers in Bridges and Docker twps
	N. virginianus	trace populations
1958	*N. nanulus nanulus*	trace population at Kawashegamuk Lake
1959	*N. pratti banksianae*	low numbers in Mutrie and Tustin twps
1960	*N. virginianus*	Light infestations occurred in Tustin and Wainwright twps.
1961		not reported
1962	*N. pratti banksianae*	Light infestations were present near Goldrock and Edison.
	N. virginianus	Lightly infested trees were common around Eagle Lake and in Smellie Twp.
1963	*N. pratti banksianae*	Trace populations were recorded at upper Manitou Lake and at Edison.
1964	*N. nanulus nanulus*	Light infestations occurred in Colenso, Docker and Tustin twps.
	N. virginianus	Small numbers of larvae were reported in Mutrie, Tustin, Rugby, Van Horne, Docker and Redvers twps.

(cont'd)

Pine Sawflies: Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl., Jack Pine Sawfly, *N. pratti banksianae* Roh., Swaine Jack Pine Sawfly, *N. swainei* Midd., Redheaded Jack Pine Sawfly, *N. virginianus* complex (concl.)

Host(s): pine [Major]

Year		Remarks
1965	*N. nanulus nanulus*	low numbers in Tustin, Docker and Colenso twps
	N. virginianus	Low numbers in Zealand, Melgund, Redvers, Van Horne, Docker, Rugby and Tustin twps
1966	*N. nanulus nanulus*	low numbers near Sakwite Lake
	N. pratti banksianae	scattered colonies in Mutrie Twp
	N. swainei	New light infestations were reported on shoreline trees at Partridge Point and Portage Bay on Eagle Lake.
	N. virginianus	colonies in Tustin Twp and in the west arm of Eagle Lake
1967	*N. nanulus nanulus*	trace populations in Pellat Twp
	N. virginianus	Scattered colonies were recorded in Van Horne, Tustin and Zealand twps.
1968	*N. virginianus*	trace population in Temple Twp
1969	*N. virginianus*	trace populations in Aubrey and Temple twps
1970-1973		not reported
1974	*N. virginianus*	15% defoliation of shoreline trees at Sunshine Lake
1975		not reported
1976	*N. virginianus*	scattered colonies on fringe trees at Edison Lake
1977-1978		not reported
1979	*N. virginianus*	trace population in Melgund Twp
1980		not reported

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

Host(s): tA [Major]

Year	Remarks
1950	Medium-to-heavy infestations were found at several locations throughout the district.
1951-1952	High population levels were found in most stands that had escaped defoliation by the forest tent caterpillar.
1953	The infestation was nearly exterminated by late frost.
1954	not reported
1955-1956	trace populations
1957	Light infestations were noted on regeneration in Mutrie and Zealand twps.
1958	Light infestations occurred at Wolf and Eye lakes and near McIntosh.
1959	Light infestations were present in Docker, Bridges and Wabigoon twps.
1960	Medium-to-heavy infestations were recorded on understory trees in Webb Twp.
1961	Pockets of medium-to-heavy infestation occurred in Tustin, Docker and Webb twps.
1962	Light infestations were present in Buller, Mutrie and Smellie twps, and medium-to-heavy infestations were reported at one point in Webb Twp.
1963	Populations declined generally throughout the district.
1964	trace populations
1965	light infestations in Bridges and Langton twps
1966	Medium-to-heavy infestations were found in Tustin Twp and near Stormy Lake.
1967	trace populations
1968	high numbers of mined leaves at several locations

(cont'd)

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.) (concl.)

Host(s): tA [Major]

Year	Remarks
1969	Medium-to-heavy infestations occurred in Zealand and Langton twps.
1970	Medium-to-heavy infestations were observed in the area around Vermilion Bay.
1971	low populations
1972	Medium-to-heavy infestations occurred at several locations.
1973	low populations
1974	low populations
1975	light infestation near Dryden airport
1976	low numbers at a few locations
1977	Medium-to-heavy infestations were recorded in the Edison Lake and Borups Corners areas.
1978	Medium-to-heavy infestations persisted at Borups Corners.
1979	trace populations
1980	Medium-to-heavy infestations were recorded along roadsides at several locations.

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

Host(s): spruce [Major]

Year	Remarks
1950-1957	not reported
1958	Lightly defoliated roadside trees were recorded in Zealand, Melgund and Van Horne twps.
1959-1960	not reported
1961	Lightly defoliated trees were reported along roads in Langton and Bridges twps, and at Osbourne Bay in Eagle Lake.

(cont'd)

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

Host(s): [Major]

Year	Remarks
1962	Medium-to-heavy infestations were found on open-grown trees in Southworth, Wainwright, Van Horne and Brownridge twps. Lightly defoliated trees were common around the west arm of Eagle Lake.
1963	Moderate-to-severe defoliation of roadside trees was common in Wabigoon, Satterly, Zealand and Mutrie twps.
1964-1965	trace populations
1966	Moderate-to-severe defoliation occurred at Eagle River and Vermilion Bay.
1967	Moderate-to-severe defoliation recurred in the Vermilion Bay area, and in Sandford and Redvers twps.
1968	Light infestations were found at numerous points in Aubrey, Temple and Van Horne twps.
1969-1974	trace populations
1975-1976	not reported
1977	New infestations caused moderate-to-severe defoliation in young white spruce plantations in Britton and Rugby twps.
1978	Low populations were reported at four locations.
1979	Medium-to-heavy infestations occurred at scattered points along highways 17 and 105.
1980	Moderate-to-severe damage occurred at two locations east of Dryden.

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce [Major]

Year	Remarks
1950-1955	not reported
1956	trace population
1957	Damage to jack pine regeneration was reported at five locations, leader damage ranged from 4% to 14%. The heaviest damage occurred in Wabigoon Twp.
1958	Leader damage ranged from 2% to 6% at six locations.
1959-1960	not reported
1961	37% leader mortality in a white pine plantation in Van Horne Twp
1962	Quantitative sampling showed a decrease to 11% leader mortality in Van Horne Twp.
1963	There was little change in Van Horne Twp; leader mortality was 10%, but 14.5% mortality was found in a jack pine plantation in Colenso Twp.
1964	Weeviling ranged from 3% to 14% at five locations.
1965	Leader damage in McIlraith Twp reached 6%. Quantitative sampling in Van Horne, Colenso, Redvers and Wabigoon twps showed that the incidence of leader mortality ranged from 6% to 16%, and averaged 13%.
1966	Leader mortality ranged from 3% to 27% at seven locations. The highest count recorded in the district was 80% in a white pine plantation near the Dryden Nursery.
1967	Leader mortality ranged from 3% to 82% at four locations.
1968	Leader mortality ranged from 2% to 26% at five locations.
1969	The proportion of infested leaders averaged 6% at three locations.
1970	8% leader damage at Centrefire Lake
1971	7% leader damage at Centrefire Lake and 20% leader damage in a jack pine plantation in Webb Twp

(cont'd)

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

Host(s): pine, spruce [Major]

Year	Remarks
1972	6%, 19% and 7% leader mortality recorded at Centrefire Lake, in Webb Twp, and at Dryden Forest Station, respectively
1973	Leader mortality averaged 2% at Centrefire Lake and 3% in Webb Twp.
1974	6% and 1% leader mortality recorded in Webb and Langton twps, respectively
1975	low numbers in Webb, Langton and Buller twps
1976	Leader mortality averaged 2% in Buller Twp.
1977	4% and 9% leader mortality recorded in Buller and Satterly twps, respectively
1978	Damage ranged from 1% (in Drope Twp) to 8% (in Webb Twp).
1979	trace populations, with 4% leader mortality in Britton Twp
1980	trace populations

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): tL [Major]

Year	Remarks
1950	Medium-to-heavy infestations were found throughout the north-central part of the district and defoliation ranged as high as 70%.
1951	Although population levels declined slightly, moderate-to-severe defoliation was common in the central part of the district.
1952	Populations were generally moderate, except in Sandford Twp, where moderate-to-severe defoliation occurred.
1953	Population levels increased and moderate-to-severe defoliation was general throughout the northern part of the district.
1954	Populations declined abruptly to low levels throughout the district and moderate-to-severe defoliation was found at only two locations.
1955	Light infestations were found at many locations in the district.
1956	Moderate population levels occurred in Tustin Twp and light defoliation was observed at six locations elsewhere.
1957	Moderate-to-severe defoliation occurred at four locations in the northern part of the district. Light infestations were common.
1958	Light infestations were common throughout the district; there were pockets of moderate-to-severe defoliation at five locations.
1959	Little change in population levels occurred.
1960	Moderate-to-severe defoliation was recorded in Mutrie, Britton, Satterly and Melgund twps.
1961	Only light infestations were found.
1962	A pocket of medium levels of infestation occurred in Wabigoon Twp. Low numbers were found in Southworth Twp and along the west side of Eagle Lake.

(cont'd)

Larch Sawfly, *Pristiphora erichsonii* (Htg.) (concl.)

Host(s): tL [Major]

Year	Remarks
1963	low numbers only in the district
1964	trace populations
1965	Small pockets of medium-to-heavy infestation occurred in Mutrie, Aubrey, Colenso, Bridges, Docker and McIlraith twps.
1966	Population levels increased and moderate-to-severe defoliation occurred in McIlraith, Docker, Aubrey and Zealand twps and near Tobacco Lake.
1967	Medium-to-heavy infestations occurred in Aubrey, Eton, Mutrie, Southworth and Tustin twps.
1968	Moderate numbers were reported in Southworth and Drope twps.
1969	A small area of moderate-to-severe defoliation occurred in Melgund Twp.
1970-1971	moderate-to-severe defoliation at scattered locations
1972	Populations declined to low levels.
1973-1976	Only scattered colonies were observed.
1977	trace populations
1978	Small pockets of moderate-to-severe defoliation occurred in Mutrie Twp, east of Vermilion Bay.
1979	Small pockets of moderate-to-severe defoliation were observed near Borups Corner.
1980	trace populations

Aspen Leafroller, *Pseudexentera oregonana* Wlshm.

Host(s): tA [Major]

Year	Remarks
1950-1973	not reported
1974	low populations at several locations
1975-1976	not reported
1977	trace populations
1978	Small pockets of light defoliation occurred in the south-western part of the district.
1979-1980	trace populations

Other Noteworthy Insects

Fall Cankerworm, *Alsophila pometaria* (Harr.)

Host(s): deciduous [Minor]

Year	Remarks
1950-1966	not reported
1967-1968	medium-to-heavy infestations were recorded on Manitoba maple in Dryden.
1969	up to 90% defoliation in Dryden
1970	Medium-to-heavy infestation levels persisted in Dryden.
1971-1972	not reported
1973	Moderate-to-severe defoliation recurred in Dryden.
1974-1980	not reported

Uglynest Caterpillar, *Archips cerasivorana* (Fitch.)

Host(s): cherry [Minor]

Year	Remarks
1950-1954	not reported
1955	low numbers around Eagle Lake
1956-1957	not reported
1958	high numbers in Zealand Twp
1959	not reported
1960	high numbers in Aubrey Twp
1961-1965	numerous tents in Langton, Bridges and Mutrie twps
1966-1967	not reported
1968-1972	trace populations
1973-1980	not reported

Jack Pine Tip Beetle, *Conophthorus banksianae* McP.

Host(s): . JP [Minor]

Year	Remarks
1950-1959	not reported
1960	trace populations
1961-1962	not reported
1963	Low populations were recorded in Zealand, Hartman, Southworth and Melgund twps; up to 28% of the trees were attacked near Dyment.
1964	Small numbers of beetles were reported at several locations; the heaviest damage occurred in Buller and Melgund twps, where 20% and 32% of the trees were affected, respectively.
1965-1966	trace populations
1967	26% of trees were affected at Centrefire Lake

(cont'd)

Jack Pine Tip Beetle, *Conophthorus banksianae* McPherson (concl.)

Host(s): jack pine [Minor]

Year	Remarks
1968	light populations, Centrefire Lake
1969	low numbers
1970	Moderate numbers occurred at Centrefire Lake, low populations were reported in Webb Twp and near the Dryden Nursery.
1971	not reported
1972	low numbers at Tot Lake and in Webb Twp
1973	not reported
1974	Leader damage of 2% and 3% was reported in Webb and Buller twps, respectively.
1975	average of 2% leader damage at three locations
1976-1980	not reported

Yellownecked Caterpillar, *Datana ministra* (Dru.)

Host(s): deciduous [Minor]

Year	Remarks
1950-1953	not reported
1954	one colony in Zealand Twp
1955-1962	not recorded
1963	lightly infested trees on Canoe Island, Eagle Lake
1964-1969	not reported
1970	occasional colonies near Wabigoon
1971-1980	not reported

Spruce Coneworm, *Dioryctria reniculelloides* Mut. & Mun.

Host(s): spruce, bF [Minor]

Year	Remarks
1950-1954	not reported
1955	low numbers at Eye Lake
1956	not reported
1957	high numbers in Smellie Twp
1958-1970	not reported
1971	The coneworm was common in low numbers throughout the district.
1972-1980	not reported

Sawyer Beetles, *Monochamus* spp.

Host(s): conifers [Major]

Year	Remarks
1950-1963	not reported
1964	North of Dryden, jack pine near areas that had been cut in 1963 and 1964 experienced whole-tree and branch mortality as a result of adult feeding damage. Balsam fir, tamarack and black spruce were also damaged to a lesser degree.
1965-1980	not reported

Northern Pitch Twig Moth, *Petrova albicapitana* (Busck)

Host(s): jP [Minor]

Year	Remarks
1950-1954	not reported
1955	Small numbers of larvae were recorded in Smellie Twp and at points on Eagle and Wabigoon lakes.
1956	not reported
1957-1958	trace populations
1959	not reported
1960-1964	trace populations
1965-1966	not reported
1967	10% of trees affected at Williams Bay, Lac Seul
1968	trace populations
1969	light infestation at Centrefire Lake
1970-1974	not reported
1975	trace populations
1976-1977	widely distributed throughout the district
1978	not reported
1979-1980	low numbers

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.)

Host(s): jP [Major]

Year	Remarks
1950-1957	not reported
1958	trace populations
1959	low number of trees attacked in Langton Twp
1960	light damage in Bridges Twp

(cont'd)

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.) (concl.)

Host(s): jP [Major]

Year	Remarks
1961-1964	trace populations
1965	A pocket of medium-to-heavy infestation occurred near Bell Lake in Temple Twp, where trees averaging 7.6 cm were severely attacked. Light infestations were recorded in Horne, Smellie, Docker and Bridges twps.
1966-1974	not reported
1975	light damage on scattered trees in Revell Twp
1976-1980	not reported

DISEASES

Dwarf Mistletoe, *Arceuthobium americanum* Nutt. ex Engel

Host(s): jP [Major]

Year	Remarks
1950-1968	not reported
1969	recorded at Scout Bay, Lac Seul
1970	Surveys revealed an incidence of 59% infection and 12.5% mortality of host trees throughout 40.5 ha of forest.
1971-1973	Light mortality occurred.
1974-1980	not reported

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

Host(s): hardwoods and conifers [Major]

Year	Remarks
1950-1954	not reported
1955	This pathogen was recovered from dead balsam fir in Bridges Twp and at Canyon Lake.
1956-1958	trace infections
1959-1969	not reported
1970	2.5% mortality in Webb Twp
1971	Current mortality levels of 7.5%, 5.0% and 10.0% were recorded in Buller, McIlraith and Webb twps, respectively.
1972	2.5% mortality at Tot Lake
1973-1974	not reported
1975	trace mortality on a young white spruce windbreak at Dryden Nursery
1976	not reported
1977-1978	not reported
1979	trace mortality in Rugby Twp
1980	light mortality in young jack pine plantations in Mutrie Twp

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

Host(s): pine [Major]

Year	Remarks
1950-1969	not reported
1970	Scleroderris was recorded in the district for the first time: it caused light damage in a red pine plantation at the Dryden Forest Station.
1971	trace damage on red pines near Cedar Lake and at the Dryden Forest Station
1972	not reported
1973	trace damage at the Dryden Forest Station
1974-1978	trace damage in a new infection center in a red pine plantation in Aubrey Twp
1979-1980	not reported

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary and *Chrysomyxa ledicola* (Peck.) Lagerh.

Host(s): spruce [Major]

Year	Remarks
1950	not reported
1951	These rusts were prevalent in the district, but caused little damage.
1952-1953	not reported
1954	trace infections
1955-1956	not reported
1957	moderate-to-severe damage on scattered trees
1958	not reported
1959-1960	Varying degrees of infection occurred at many points.
1961	not reported

(cont'd)

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary and *Chrysomyxa ledicola* (Peck.) Lagerh. (concl.)

Host(s): spruce [Major]

Year	Remarks
1962	light infection at several widely separated locations
1963	not reported
1964	Medium-to-heavy infections occurred on black spruce at Camp Robinson and in Mutrie Twp.
1965	not reported
1966	Medium-to-heavy infections were reported in Wabigoon and Mutrie Twps.
1967	Light damage occurred at Centrefire Lake.
1968	trace infections
1969-1970	not reported
1971	light infection levels along Aerobus Lake Road
1972-1976	trace infections
1977	Foliar damage as high as 22% and incidence as high as 94% were reported on windbreak trees at the Dryden Forest Station.
1978	medium-to-heavy infections at Cliff Lake
1979-1980	trace infections

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

Host(s): tA [Major]

Year	Remarks
1950-1954	not reported
1955	Moderate-to-severe defoliation occurred at Yellow Lake near Quibell; light damage occurred in Hartman and Laval twps and along Hwy 105 north of Perrault Falls.
1956	not reported
1957-1958	trace infections
1959	Medium-to-heavy infections occurred between Vermilion Bay and Dinorwic.
1960-1969	not reported
1970-1972	trace infections
1973-1974	not reported
1975	trace infections
1976	not reported
1977	80% defoliation on 7-m trembling aspen in Melgund Twp
1978-1979	Moderate-to-severe foliar damage recurred in Melgund Twp.
1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1963	not reported
1964	Medium-to-heavy infections were reported on jack pine trees near Dryden and at Blackstone Bay, Eagle Lake.
1965	trace infections
1966	Medium-to-heavy infections occurred in Melgund Twp.

(cont'd)

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

Host(s): pine [Major]

Year	Remarks
1967-1968	not reported
1969-1970	trace infections
1971	Approximately 400 ha of medium-to-heavy infection occurred on 60% of young jack pine trees in an area 24 km north of Vermilion Bay on Hwy 105.
1972	Damage decreased to low levels at the 1971 location; elsewhere, trace levels of infection prevailed.
1973	trace infections
1974-1980	not reported

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

Host(s): wP [Major]

Year	Remarks
1950-1954	not reported
1955	Light damage was reported along shorelines and on islands in Eagle and Wabigoon lakes.
1956-1961	not reported
1962	Moderate-to-severe damage was evident in a plantation in Van Horne Twp.
1963	not reported
1964	Blister rust infection was widely distributed throughout the range of white pine in the district.
1965	not reported
1966-1968	widely distributed
1969-1973	not reported
1974	Moderate-to-high numbers of trees were affected in Wabigoon Twp.
1975-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1951	not reported
1952	Trace infections were recorded on jack pine in Ladysmith and Langton twps.
1953	trace infection, Zealand Twp
1954-1955	trace infections
1956	not reported
1957	trace infections
1958-1959	not reported
1960	trace infections
1961-1962	not reported
1963	Infections that caused tree mortality were observed in Tustin and Mutrie twps.
1964	numerous galls at one point near Dryden
1965	not reported
1966	In McIlraith Twp, 38% of trees were affected and large numbers of infected trees were reported in Mutrie Twp.
1967	The percentage of trees affected in Van Horne and Mutrie twps was 36% and 18%, respectively.
1968	Medium-to-heavy infections were recorded on the majority of trees near Dryden and at Blue Lake Park.
1969	Medium-to-heavy infections occurred in Aubrey Twp and near Amesdale and Eagle River.
1970	Branch mortality was reported north of Dryden in the Watch Lake area; between Millidge and McIntyre Bay on Lac Seul; and in an immature stand at the Dryden Forest Station.
1971	Moderate levels of infection occurred in Webb Twp and along Hwy 105 north of Vermilion Bay.

(cont'd)

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

Host(s): pine [Major]

Year	Remarks
1972-1973	Varying degrees of damage were reported along Highway 105 north of Vermilion Bay.
1974	In Webb and Buller twps, respectively, 1% and 2% of the trees examined were severely infected.
1975	not reported
1976	At the OMNR Forest Station near Dryden, 10% to 15% of 2-0 jack pine stock was affected by small galls at the root collar, which is typical of early infection.
1977	The incidence of galls on nursery stock declined to trace levels.
1978	not reported
1979	On average, 2% of trees were severely affected at locations in Britton and Rugby twps.
1980	The percentage of severely affected trees at locations in Aubrey and Mutrie twps was 8.7% and 3.3%, respectively.

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

Host(s): poplar [Major]

Year	Remarks
1950-1952	not reported
1953	trace infections at several locations
1954	common in aspen stands examined
1955	Up to 69% of aspen trees were cankered at Eagle Lake.
1956-1963	not reported
1964-1967	Cankers were found in most aspen stands in the district.
1968	An incidence of 40%, 62% and 20% was recorded in Wabigoon and Sandford twps, and near McIntosh, respectively.

(cont'd)

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

Host(s): poplar [Major]

Year	Remarks
1969	Varying degrees of infection were present in aspen stands throughout the district.
1970-1974	not reported
1975-1977	infections common through the district.
1978-1980	no detectable change in infection levels

Shoot Blight, *Sirococcus conigenus* (DC.) P. Cannon & Minter

Host(s): rP [Major]

Year	Remarks
1950-1972	not reported
1973	Shoot blight was recorded for the first time in the district; damaged host trees were observed in Smellie, Docker and Webb twps and at one point northwest of Delano Lake.
1974	Moderate-to-severe damage occurred on 64% of 2-m trees in a plantation in Langton Twp.
1975	Moderate-to-severe damage recurred in Langton Twp.
1976-1978	not reported
1979	light damage in Aubrey and Wabigoon twps
1980	not reported

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

Host(s): tA [Major]

Year	Remarks
1950-1953	not reported
1954	trace infections
1955	found commonly on small aspen throughout the district
1956	not reported
1957-1959	commonly observed throughout the district
1960-1961	not reported
1962-1963	trace infections
1964	In Docker and Mutrie twps, respectively, the proportion of trees affected was 67% and 28%.
1965	An average of 38% of shoots were affected at two locations.
1966-1967	trace infections
1968	Medium-to-heavy infections occurred in Wabigoon Twp and near Williams Bay.
1969-1970	trace and light infections
1971	not reported
1972	trace and light infections
1973-1974	not reported
1975-1976	Light infections were common throughout the district.
1977	Terminal shoot mortality levels of 90% and 87% were recorded in Melgund and Britton twps, respectively.
1978	91% terminal shoot mortality in Melgund Twp
1979	Club tops on aspen regeneration resulted from repeated death of terminal shoots in Britton and Melgund twps.
1980	not reported

Other Noteworthy Diseases

Eastern Dwarf Mistletoe, *Arceuthobium pusillum* Peck

Host(s): spruce [Minor]

Year	Remarks
1950-1954	not reported
1955	low incidence of infection in Smellie Twp
1956-1966	not reported
1967	trace infection at widely scattered points
1968	Large numbers of host trees were affected in small areas of Temple and Bridges twps.
1969	A high incidence of infection was reported near Gordon Lake in Tustin Twp.
1970	not reported
1971	light damage in Tustin Twp
1972-1980	not reported

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur

Host(s): jP [Major]

Year	Remarks
1950-1969	not reported
1970	The rust was recorded in the district for the first time: light damage occurred in Zealand Twp.
1971	moderate-to-severe damage in Zealand Twp
1972-1980	not reported

Tar Spot Needle Cast, *Davisomycella ampla* (J. Davis) Darker

Host(s): jP [Minor]

Year	Remarks
1950-1964	not reported
1965	light damage in Temple Twp
1966-1971	not reported
1972-1973	light damage throughout the district
1974-1978	not reported
1979	light damage in Aubrey Twp
1980	not reported

Snow Blight, *Lophophacidium hyperboreum* Lagerb.

Host(s): spruce [Major]

Year	Remarks
1950-1969	not reported
1970	As many as 400,000 black spruce 2-0 seedlings were seriously damaged at the Dryden Forest Station.
1971	Approximately 1,000,000 black spruce 2-0 seedlings were seriously damaged at the Dryden Forest Station.
1972-1974	not reported
1975	Moderate-to-severe damage occurred to black spruce seedlings in Dryden Forest Station.
1976	Serious damage occurred to approximately 6.5 million black and white spruce seedlings in the Dryden Forest Station.
1977	not reported
1978	trace damage in Dryden Forest Station
1979-1980	not reported

Shoot Blight, *Pollaccia elegans* Servit

Host(s): bPo [Minor]

Year	Remarks
1950-1962	not reported
1963	trace levels on understory trees in Langton Twp
1964	not reported
1965	light damage at widely scattered points
1966-1970	not reported
1971	light damage throughout the district
1972-1980	not reported

Fireweed Rust, *Pucciniastrum epilobii* Otth

Host(s): bF [Minor]

Year	Remarks
1950-1962	not reported
1963	Medium levels of infection occurred on shade trees in the town of Dryden.
1966	Small pockets of medium-to-heavy infections occurred near Perrault Falls; light damage was evident in Langton and Smellie twps.
1967	In Aubrey and Redvers twps, respectively, the percentage of shoots infected was 95% and 64%.
1968	light infections
1969	not reported
1970-1971	trace infections
1972-1980	not reported

ABIOTIC DAMAGE

Drought

Year	Remarks
1950-1963	not reported
1964	Moderate-to-severe damage occurred in jack pine stands on high rocky sites in the western part of the district.
1970-1971	Moderate-to-severe damage occurred in white birch stands on high rocky sites at scattered points in the district.
1972-1973	not reported
1974	Moderate-to-severe damage occurred in white birch stands on high rocky sites at scattered points in the district.
1975	Moderate numbers of jack pines on high sites were damaged in the Eagle Lake area.
1976	not reported
1977	Moderate damage occurred in jack pine stands on high sites at scattered points in the western part of the district.
1978-1980	not reported

Frost

Year	Remarks
1950-1963	not reported
1964	Moderate-to-severe damage to current shoots of balsam fir occurred on the fringes of stands and in open areas in Wabigoon Twp.
1965	Moderate-to-severe damage to current shoots of balsam fir and black spruce occurred at scattered points in the northern part of the district.
1966-1967	not reported
1978	Moderate-to-severe damage occurred on the fringes of balsam fir and black spruce stands and in a black spruce plantation in Webb Twp.
1979	not reported
1980	light damage on fringes of balsam fir and black spruce stands in Britton Twp

Hail

Year	Remarks
1950-1974	not reported
1975	Moderate-to-severe damage occurred to seedlings in the Dryden Forest Station.
1976-1980	not reported

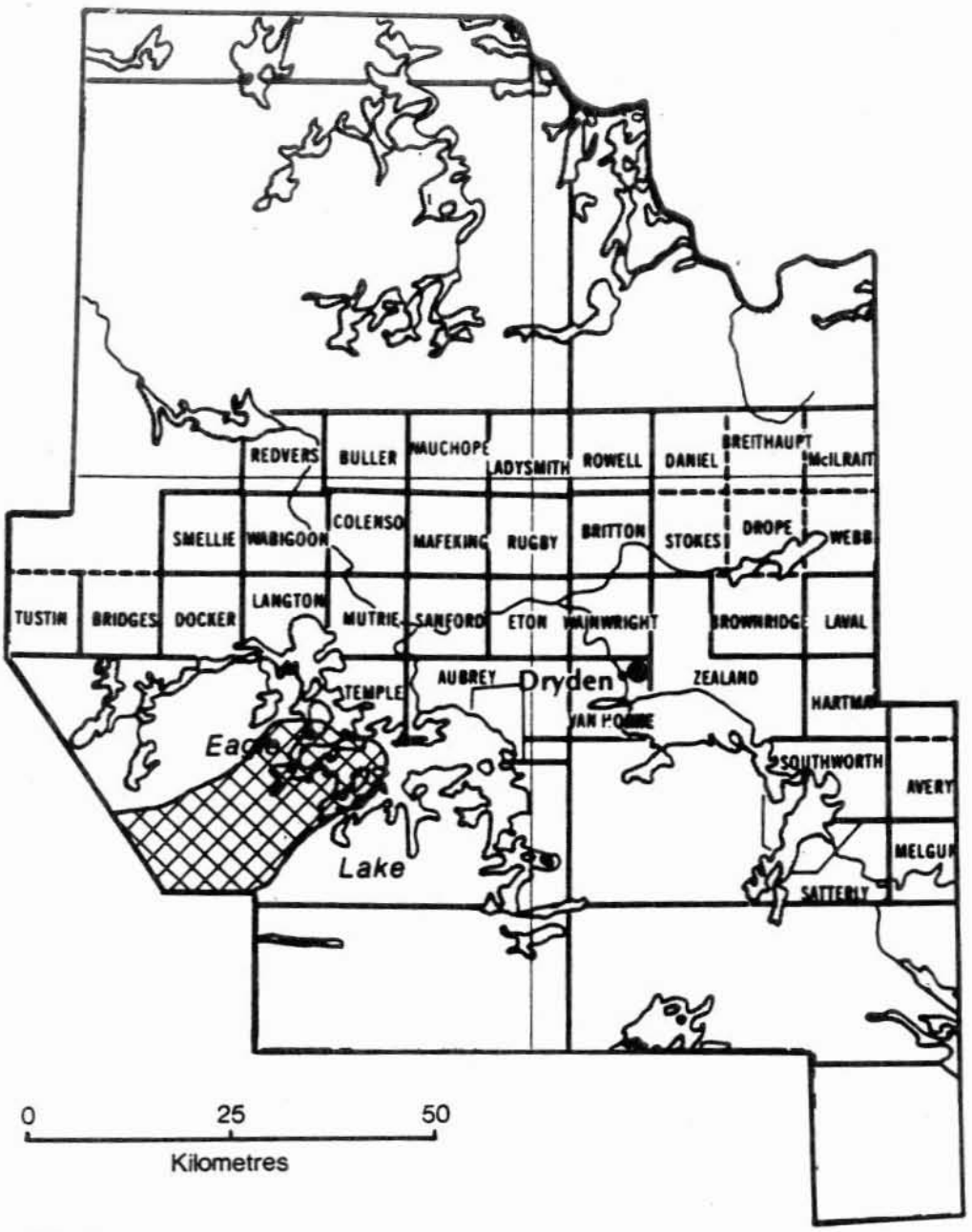
Wind Damage

Year	Remarks
1950-1972	not reported
1973	A windstorm on 7 July caused severe blowdown through an area of approximately 500 km^2 extending from the western boundary of the district in the Dryberry Lake area northeastward to islands and shorelines of Eagle Lake and in the Dryden area (see map, page 89).
1974-1980	not reported

Winter Drying

Year	Remarks
1950-1957	not reported
1958	Moderate-to-severe damage to balsam fir was recorded on the fringes of stands in open areas in the Stoat and Fisher lakes area.
1959-1964	not reported
1965-1967	Moderate-to-severe damage occurred in mixed pine plantations in Zealand and Van Horne twps.
1968-1976	not reported
1977	Light damage occurred in a red pine plantation at the Dryden Forest Station.
1978-1980	not reported

DRYDEN DISTRICT



Wind Damage

Areas within which wind damage occurred in 1973

LEGEND

Moderate-to-severe damage ● or ▨

APPENDICES

APPENDIX A

DECIDUOUS HOST

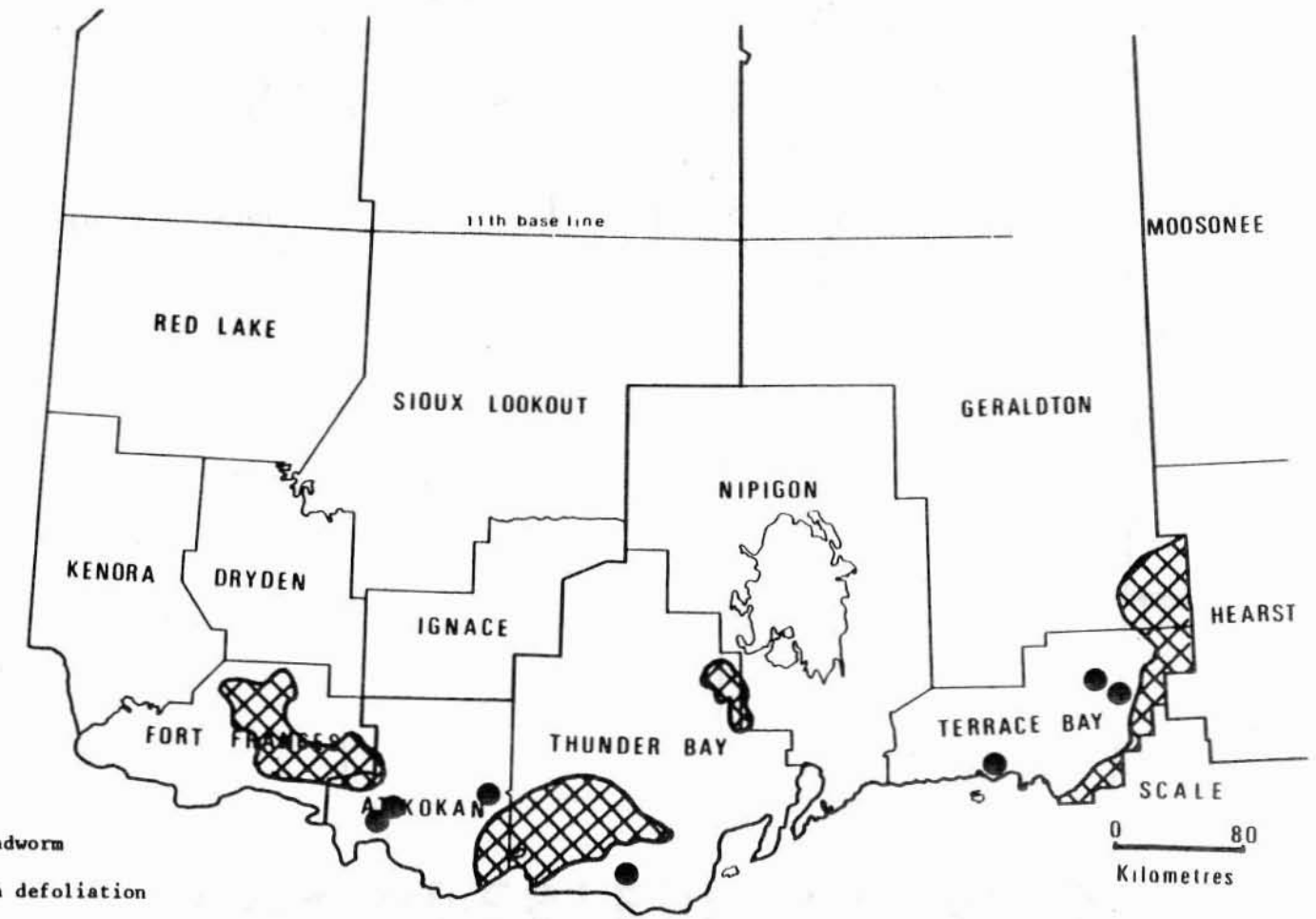
Common Name	Scientific Name	Abbreviations
Alder	*Alnus* spp.	Al
Apple	*Malus* spp.	Ap
Ash, black	*Fraxinus nigra* Marsh.	As
Aspen, largetooth	*Populus grandidentata* Michx.	lA
trembling	*tremuloides* Michx.	tA
Basswood	*Tilia* spp.	Ba
Beech	*Fagus grandifolia* Ehrh.	Be
Birch, white	*Betula papyrifera* Marsh.	wB
yellow	*alleghaniensis* Britt.	yB
Butternut	*Juglans cinerea* L.	Bu
Cherry, eastern choke	*Prunus virginiana* L.	eaCh
pin	*pensylvanica* L.f.	pCh
Elm, white	*Ulmus americana* L.	wE
Horse-chestnut	*Aesculus hippocastanum* L.	hChe
Ironwood	*Ostrya* spp.	I
Maple, Manitoba	*Acer negundo* L.	mM
red	*rubrum* L.	rM
sugar	*saccharum* Marsh.	sM
Mountain-ash, American	*Sorbus americana* Marsh.	aMo
Oak, bur	*Quercus macrocarpa* Michx.	bO
red	*rubra* L.	rM
Poplar, balsam	*Populus balsamifera* L.	bPo
Carolina	X *canadensis* Moench	cPo
Lombardy	*nigra* var. *italica* Muenchh.	lPo
silver	*alba* L.	sPo
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	*Larix laricina* (Du Roi) K. Koch	tL
Pine, Austrian	*Pinus nigra* Arn.	aP
eastern white	*strobus* L.	wP
jack	*banksiana* Lamb.	jP
mugho	*mugho* Turra var. *mugus* Zenari	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

NORTHWESTERN ONTARIO



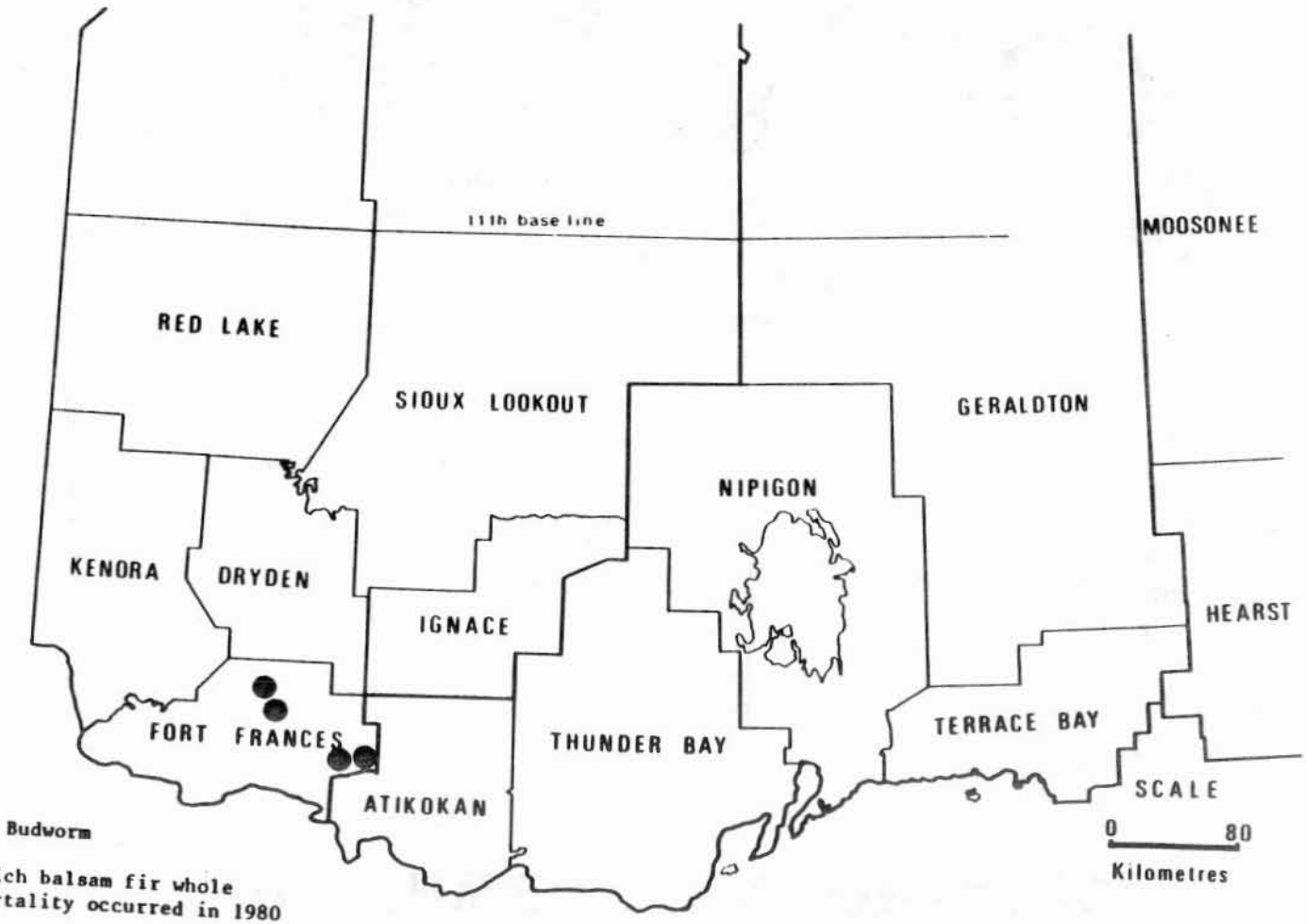
Spruce Budworm

Areas within which defoliation occurred in 1980

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



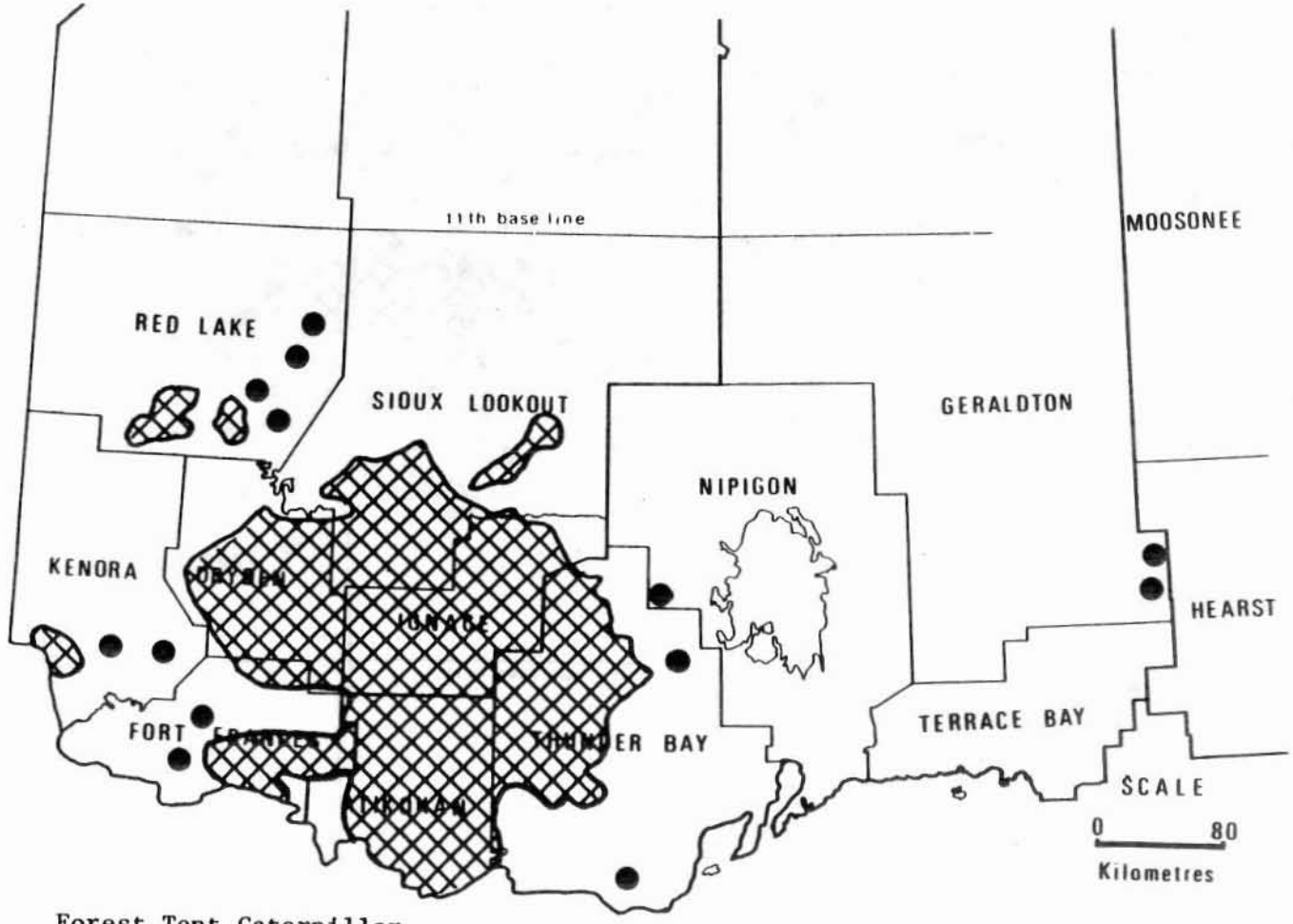
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1980

LEGEND

Mortality ●

NORTHWESTERN ONTARIO



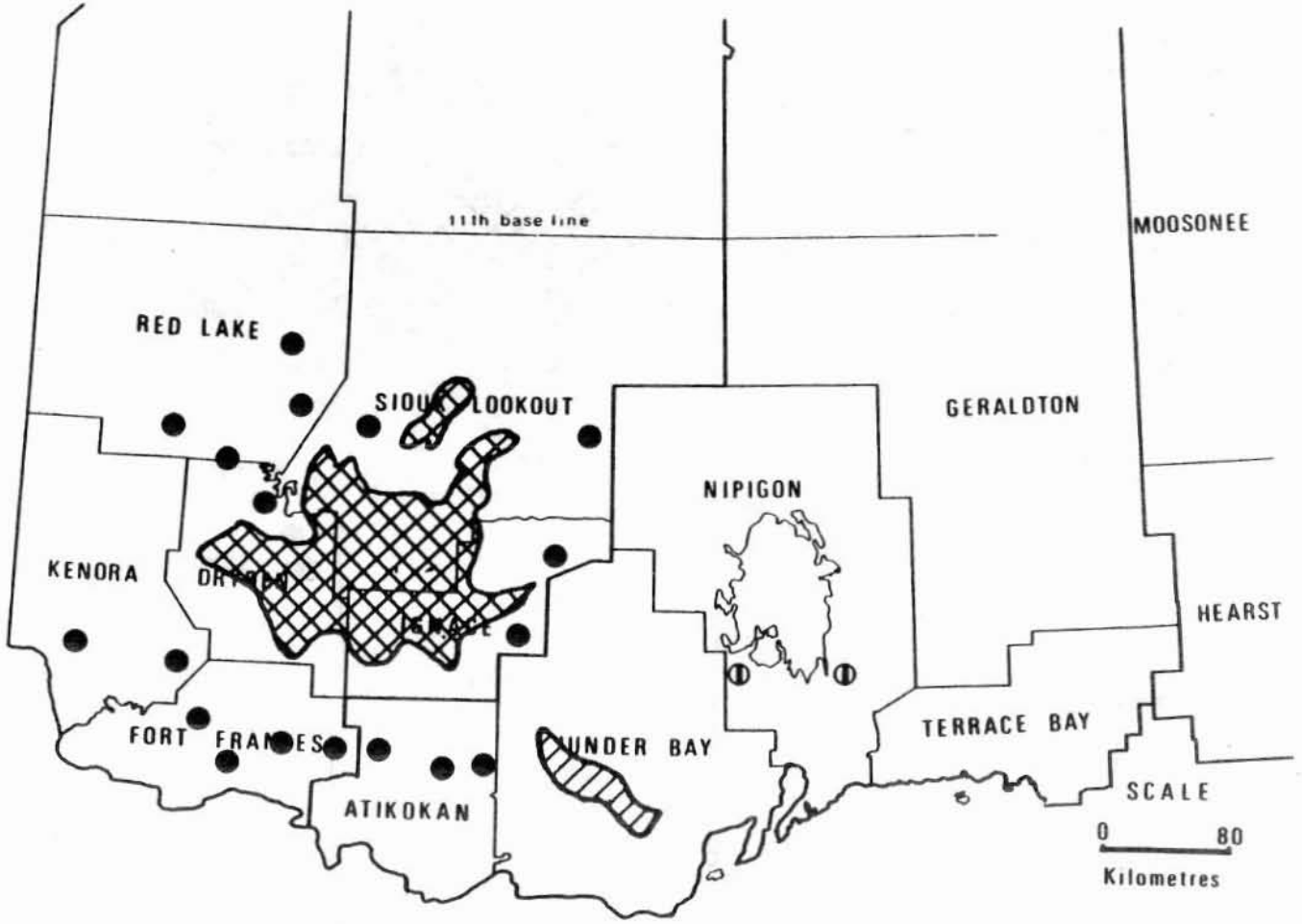
Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

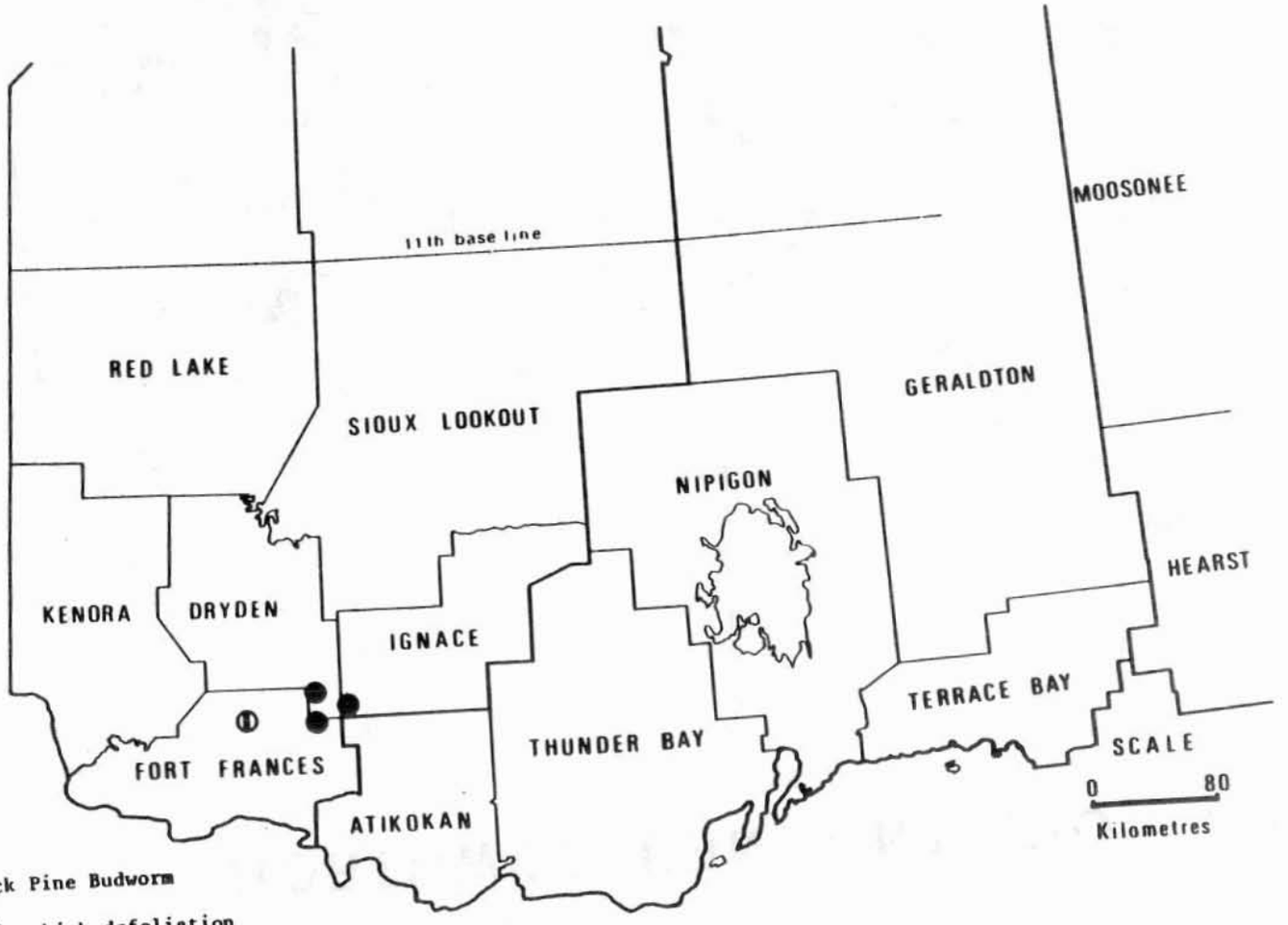
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



Jack Pine Budworm

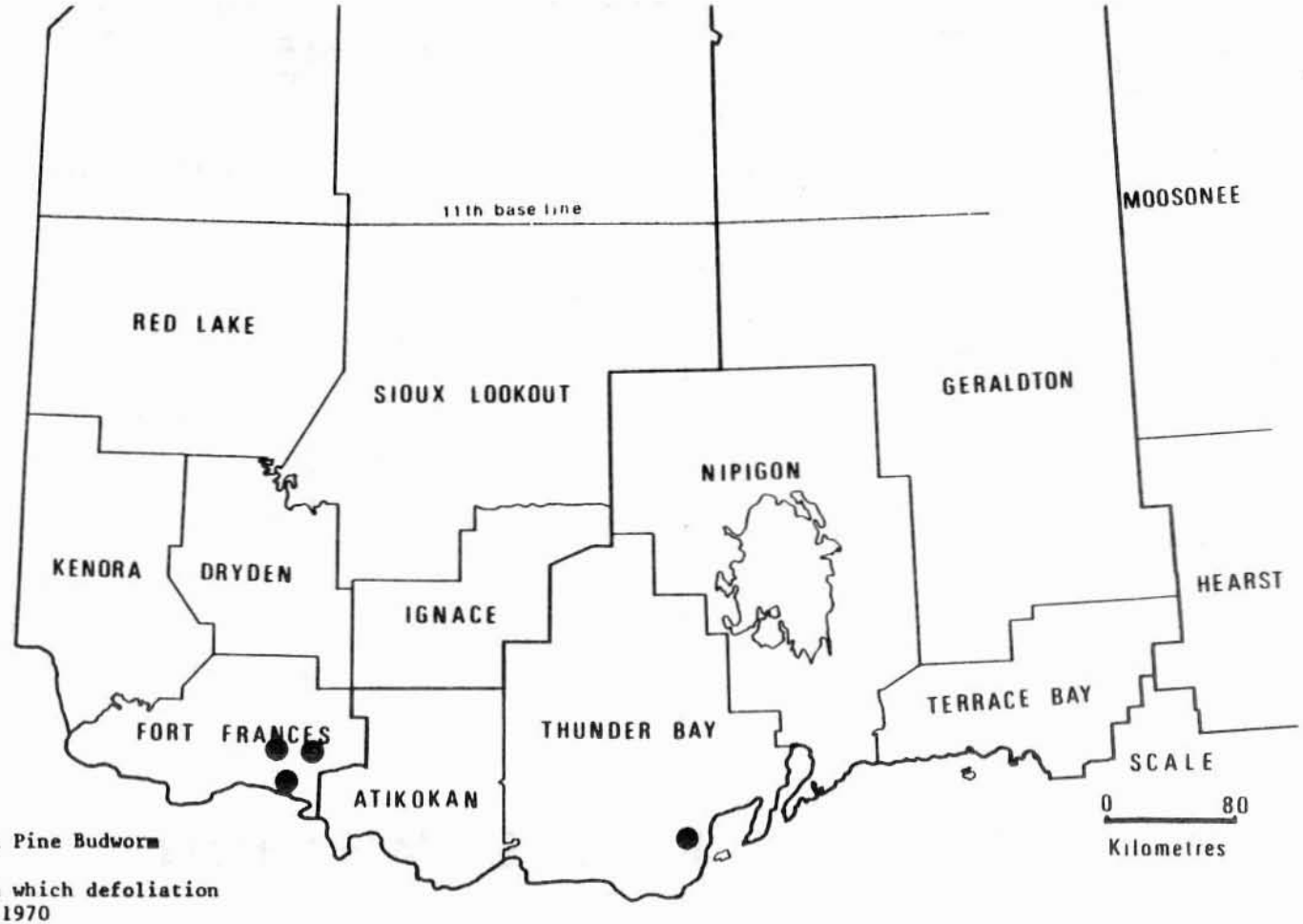
Areas within which defoliation occurred in 1971

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



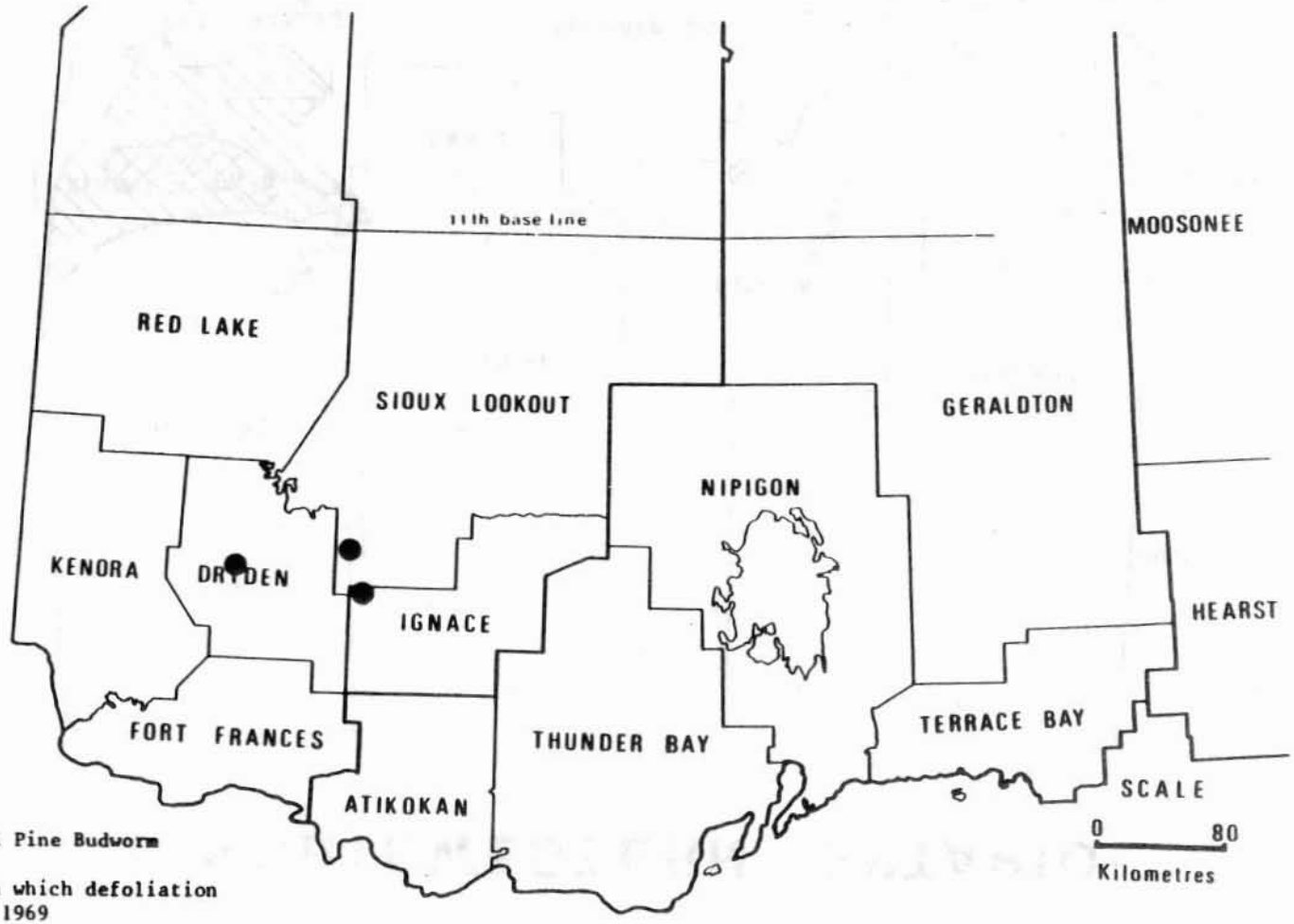
Jack Pine Budworm

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



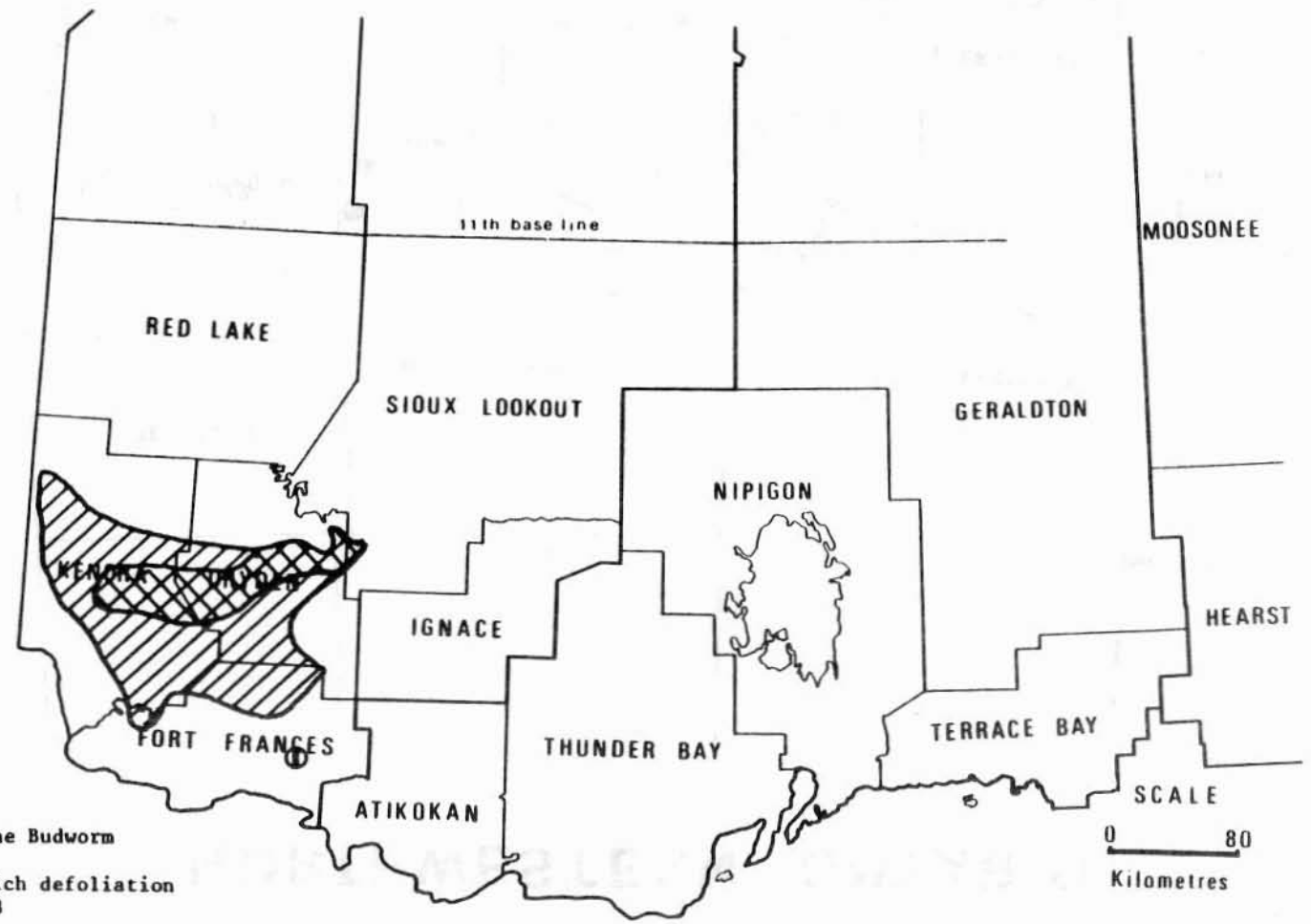
Jack Pine Budworm

Areas within which defoliation occurred in 1969

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Jack Pine Budworm

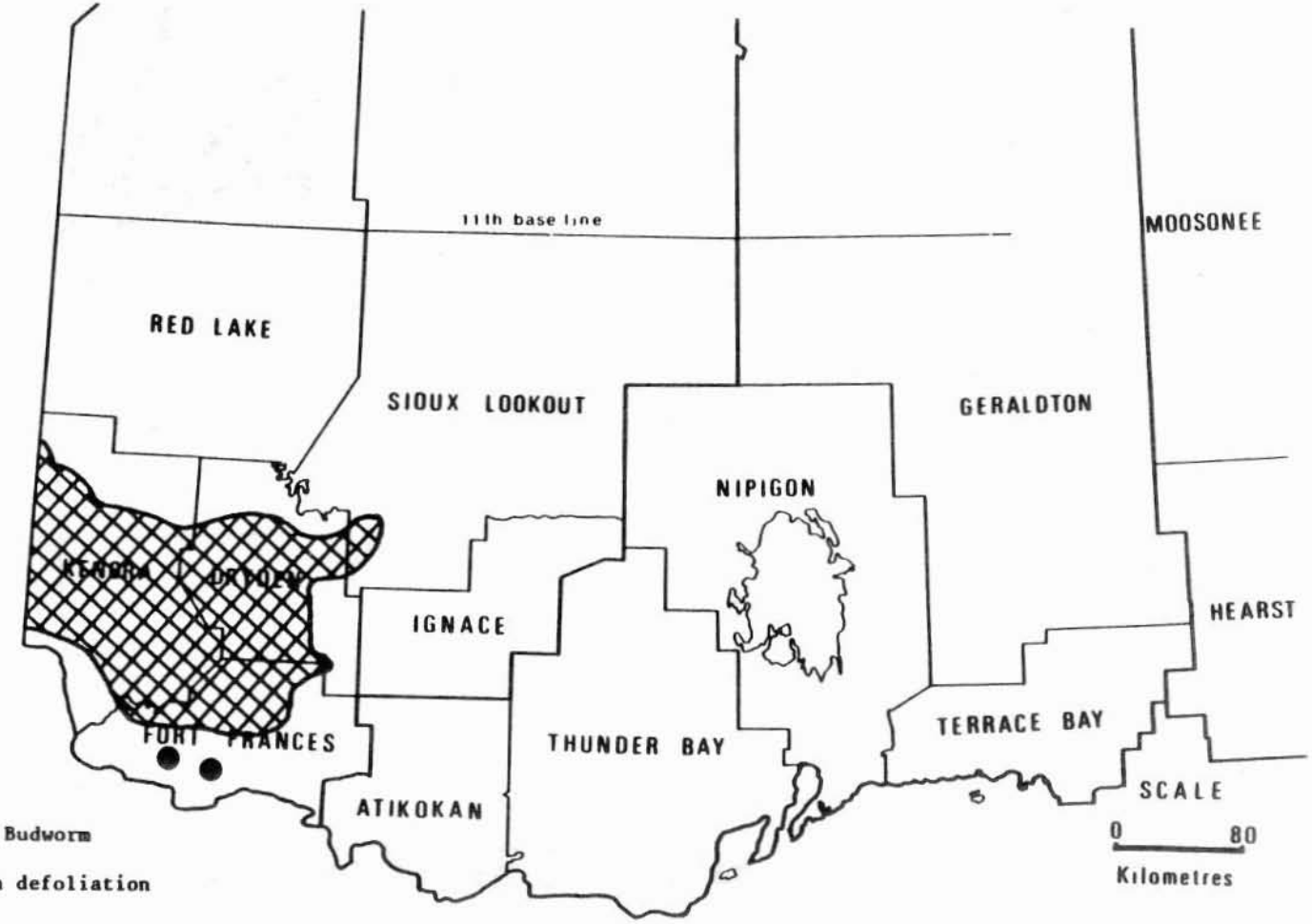
Areas within which defoliation occurred in 1968

LEGEND

Light defoliation ① or

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



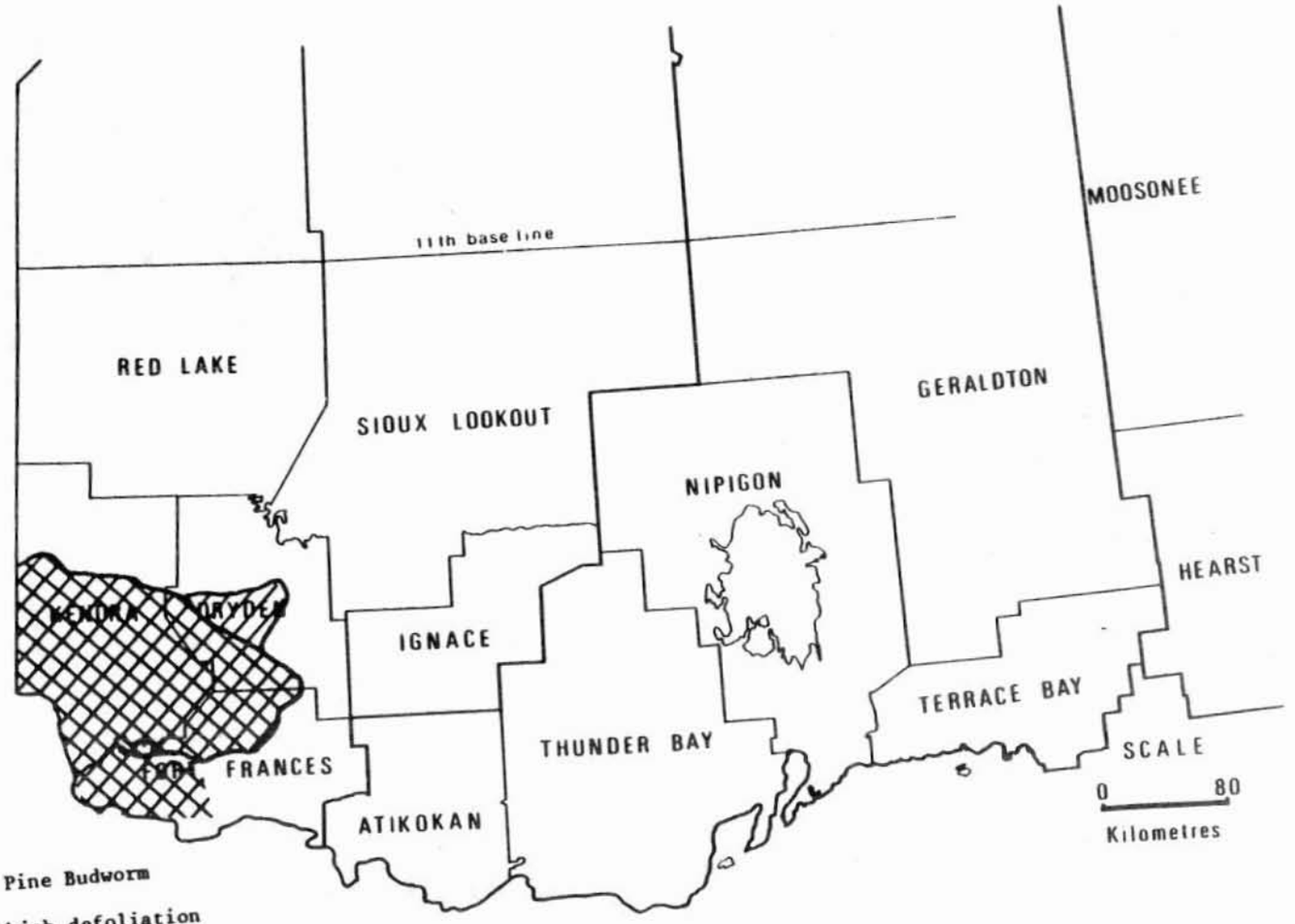
Jack Pine Budworm

Areas within which defoliation occurred in 1967

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Jack Pine Budworm

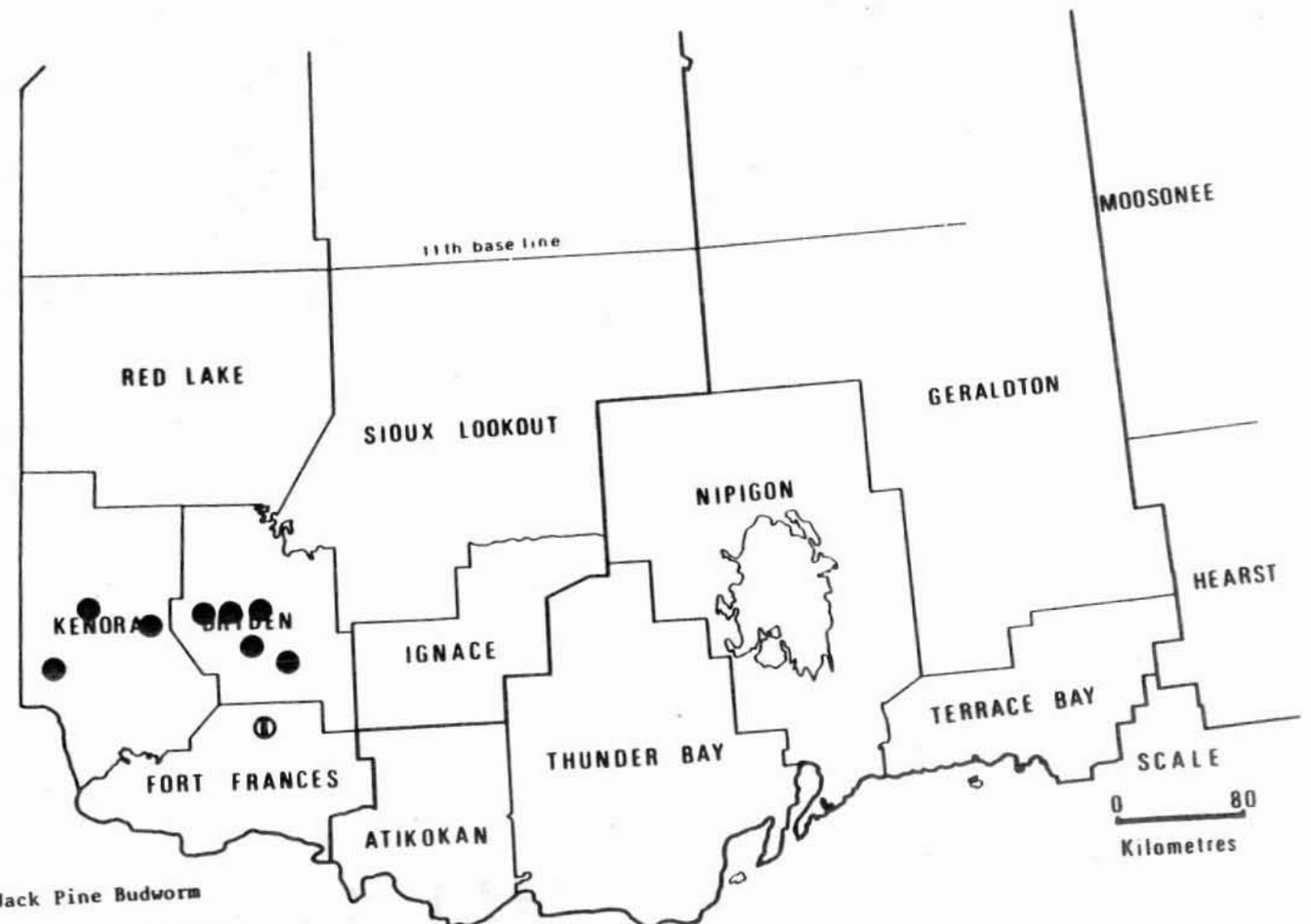
Areas within which defoliation occurred in 1966

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Jack Pine Budworm

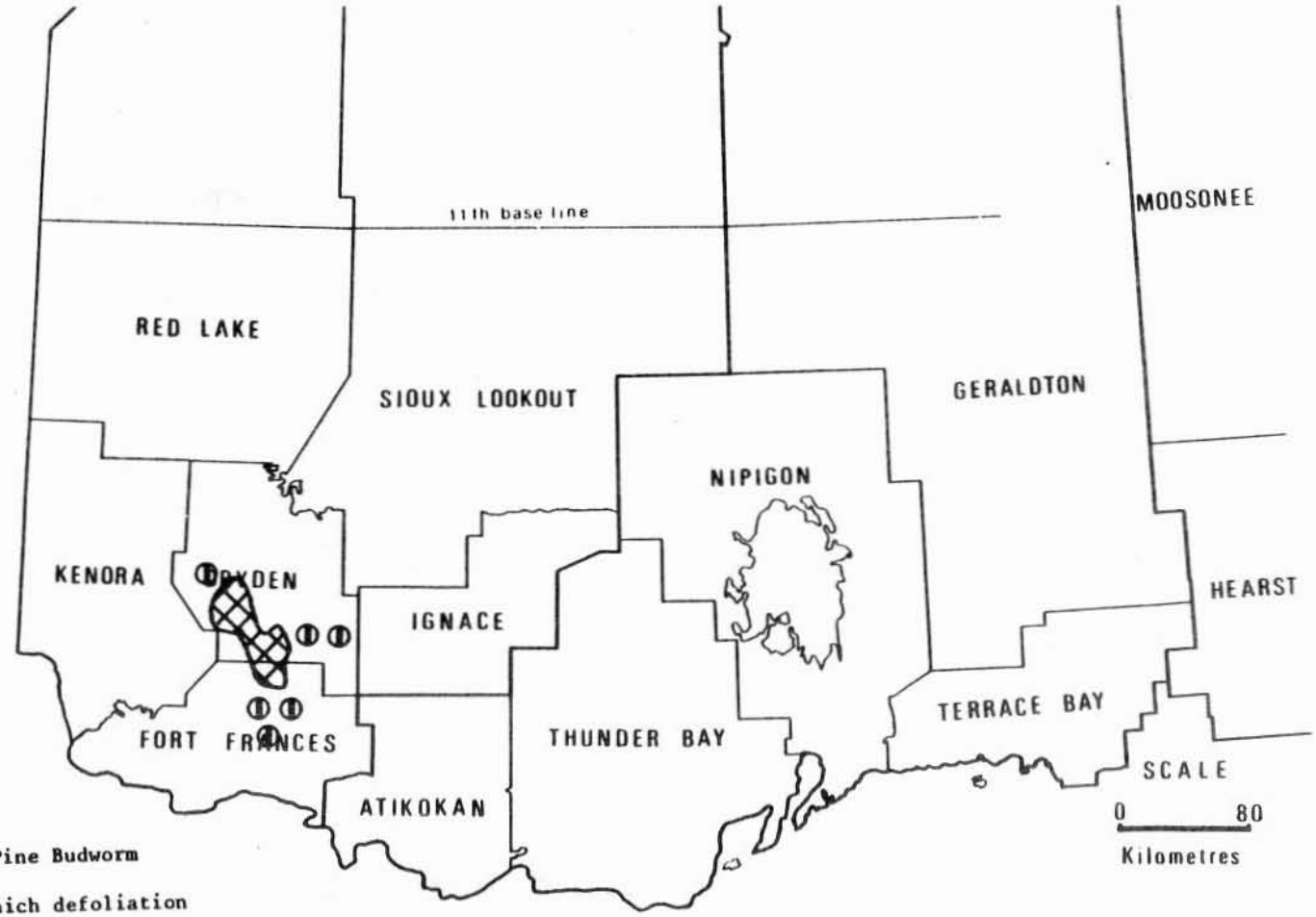
Areas within which defoliation occurred in 1965

LEGEND

Light defoliation ①

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Jack Pine Budworm

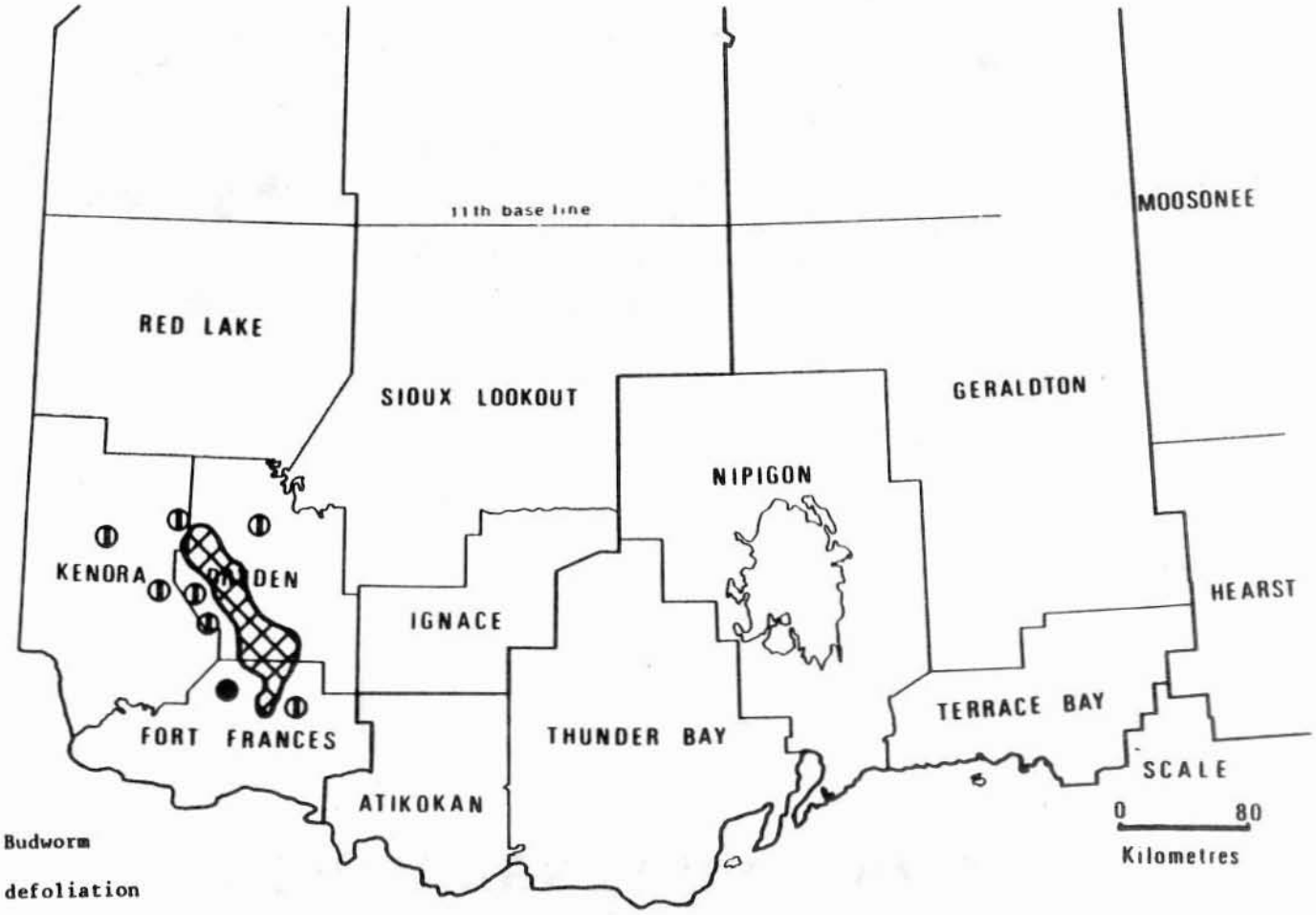
Areas within which defoliation occurred in 1962

LEGEND

Light defoliation ①

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Jack Pine Budworm

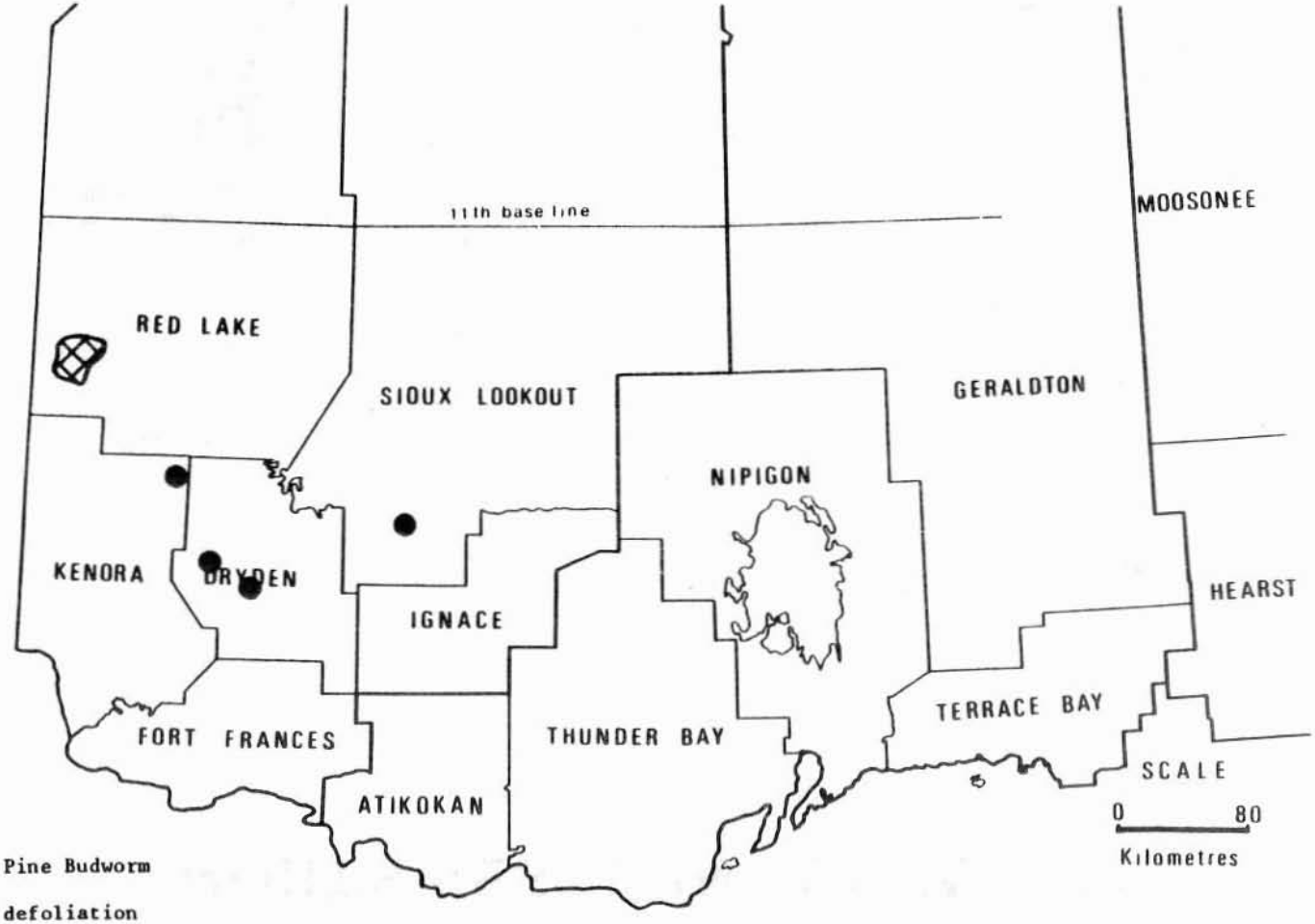
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



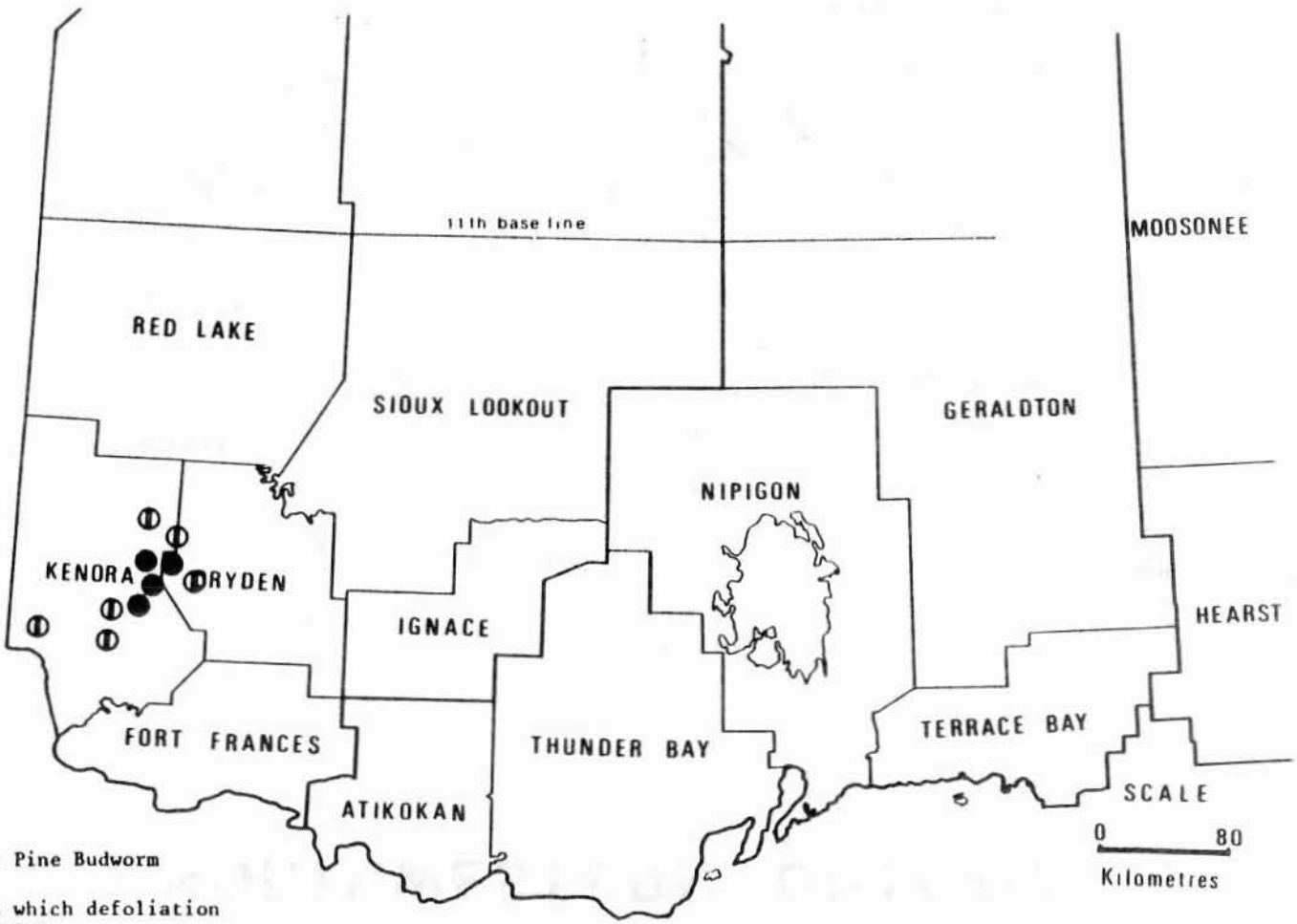
Jack Pine Budworm

Areas within which defoliation occurred in 1954

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Jack Pine Budworm

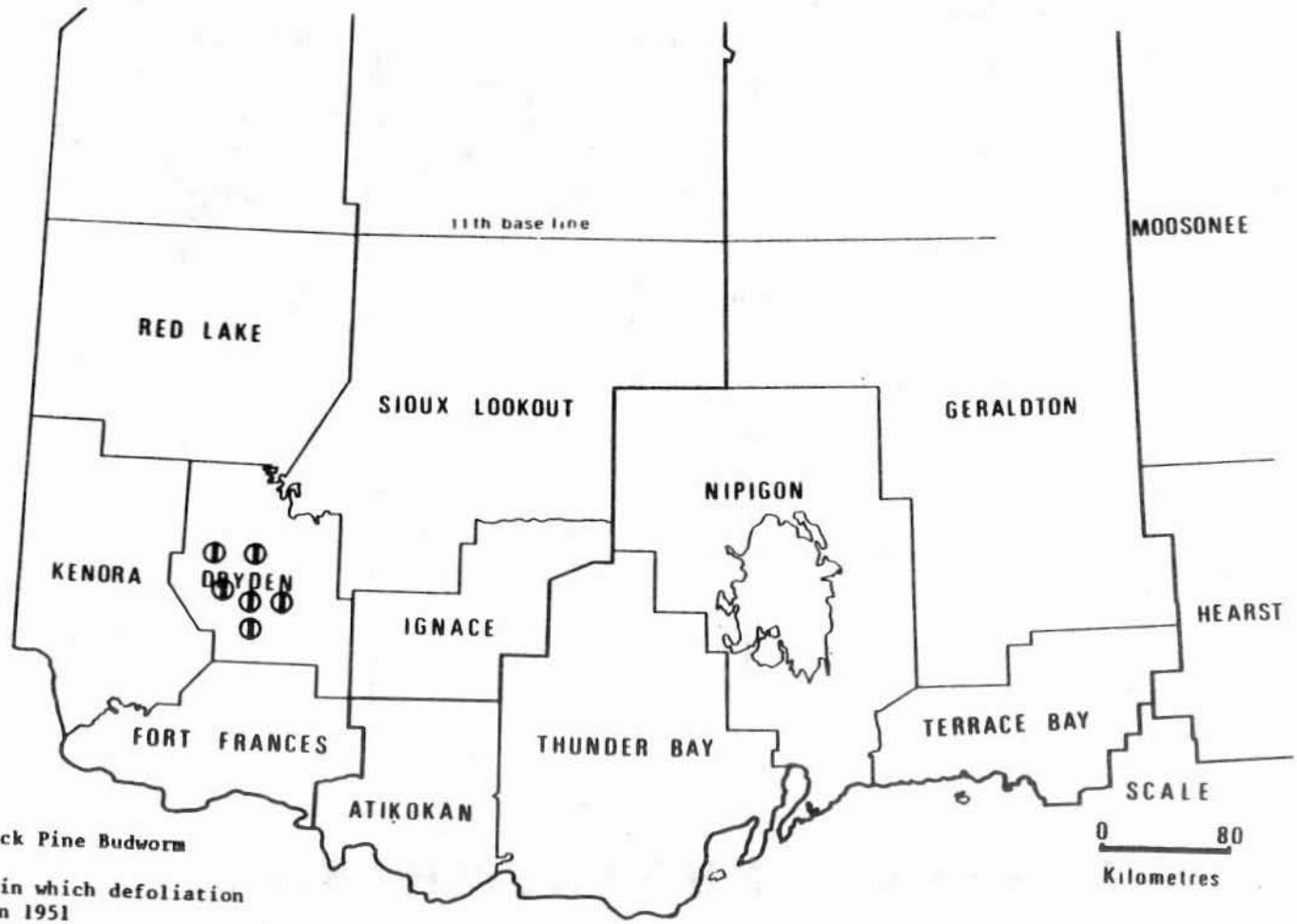
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



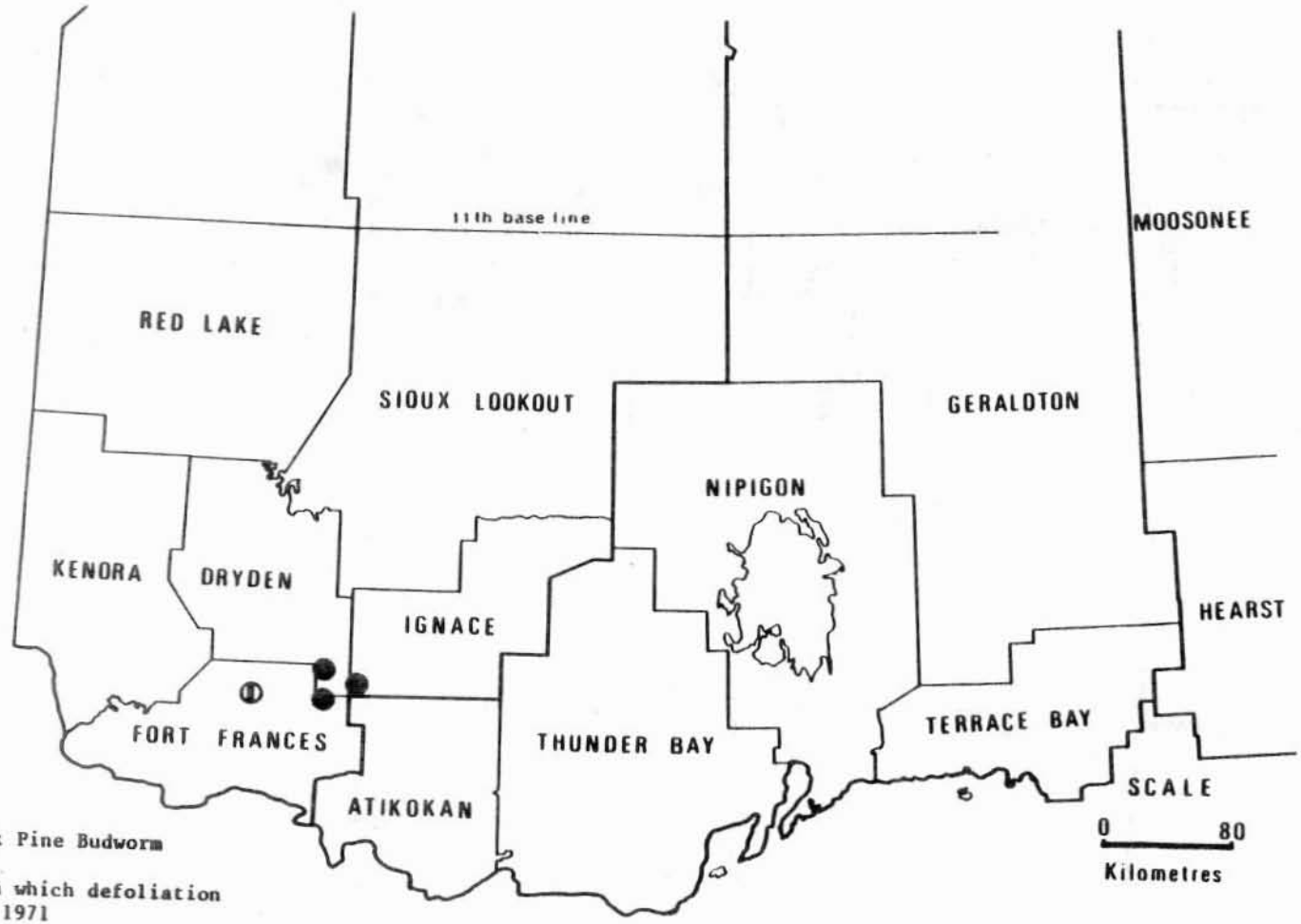
Jack Pine Budworm

Areas within which defoliation occurred in 1951

LEGEND

Light defoliation ◐

NORTHWESTERN ONTARIO



Jack Pine Budworm

Areas within which defoliation occurred in 1971

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO

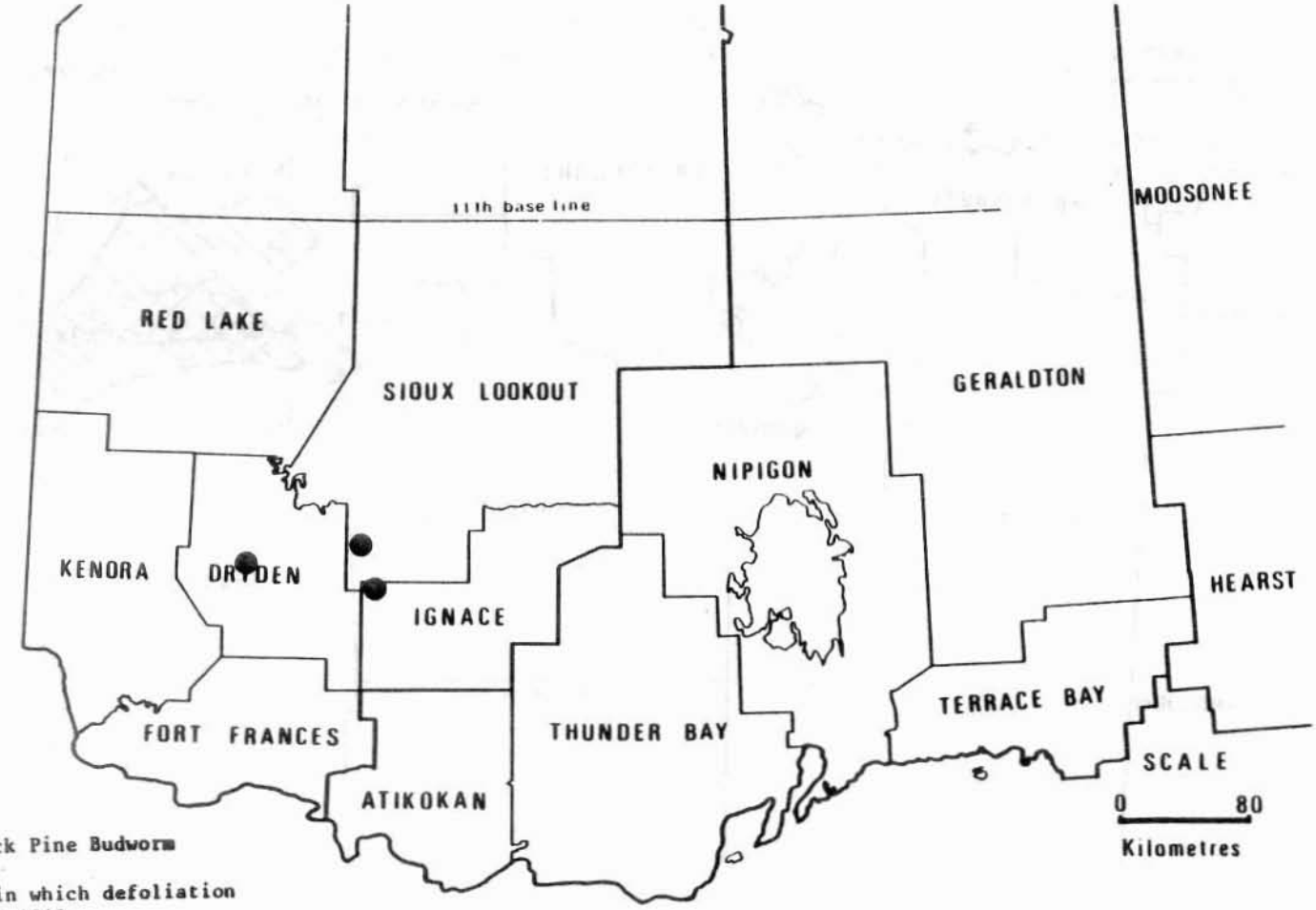
Jack Pine Budworm

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



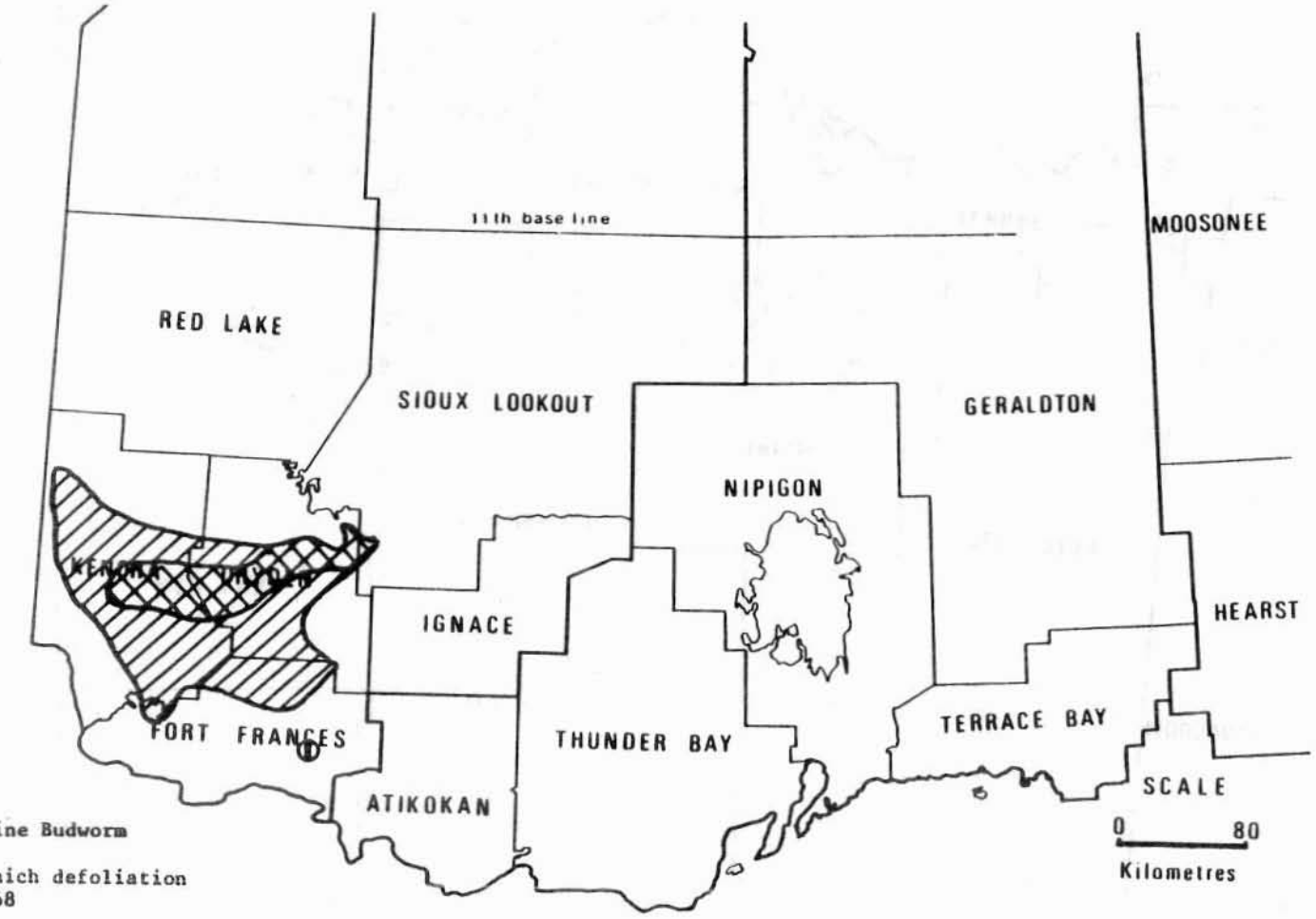
Jack Pine Budworm

Areas within which defoliation occurred in 1969

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Jack Pine Budworm

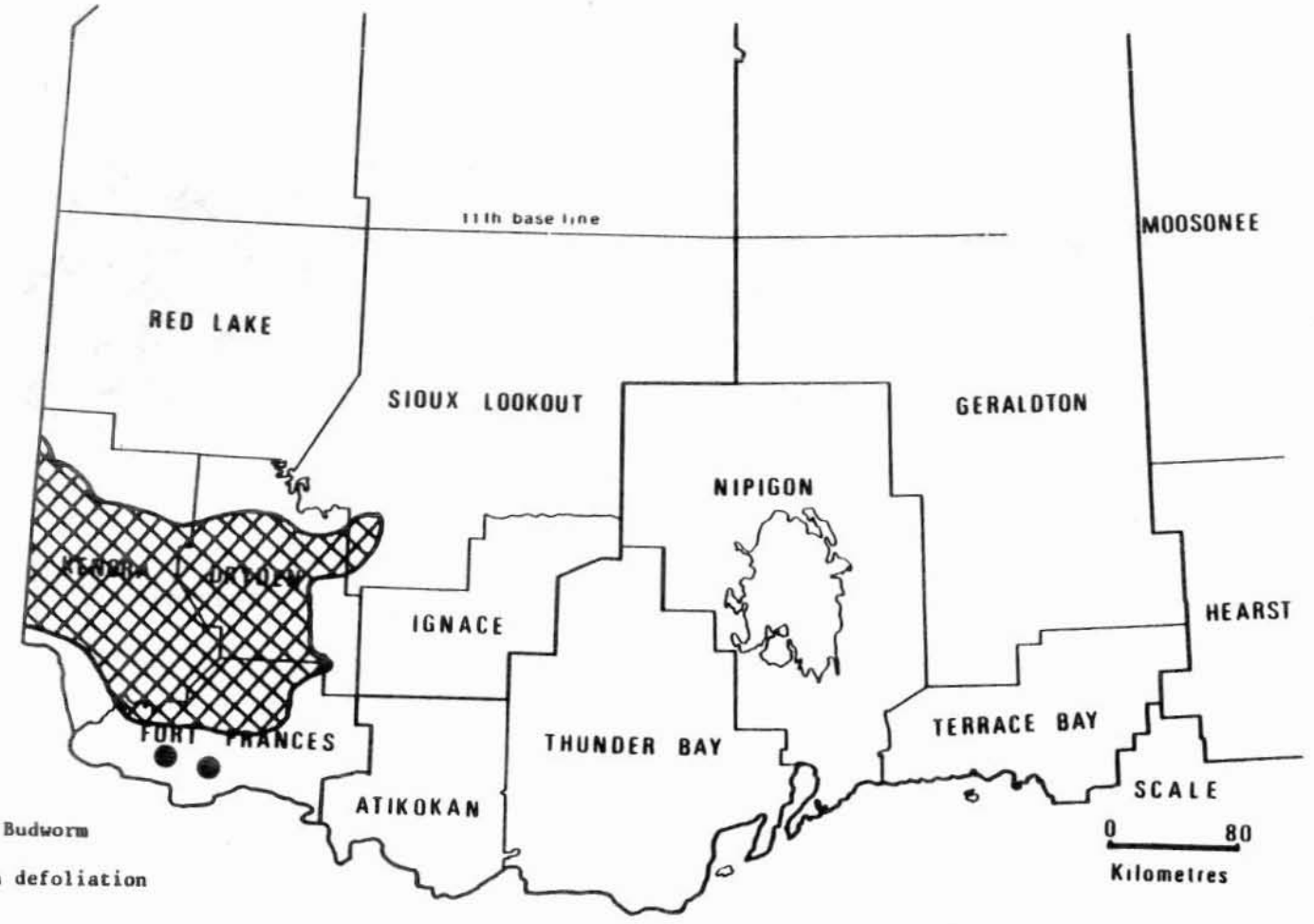
Areas within which defoliation occurred in 1968

LEGEND

Light defoliation ① or

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



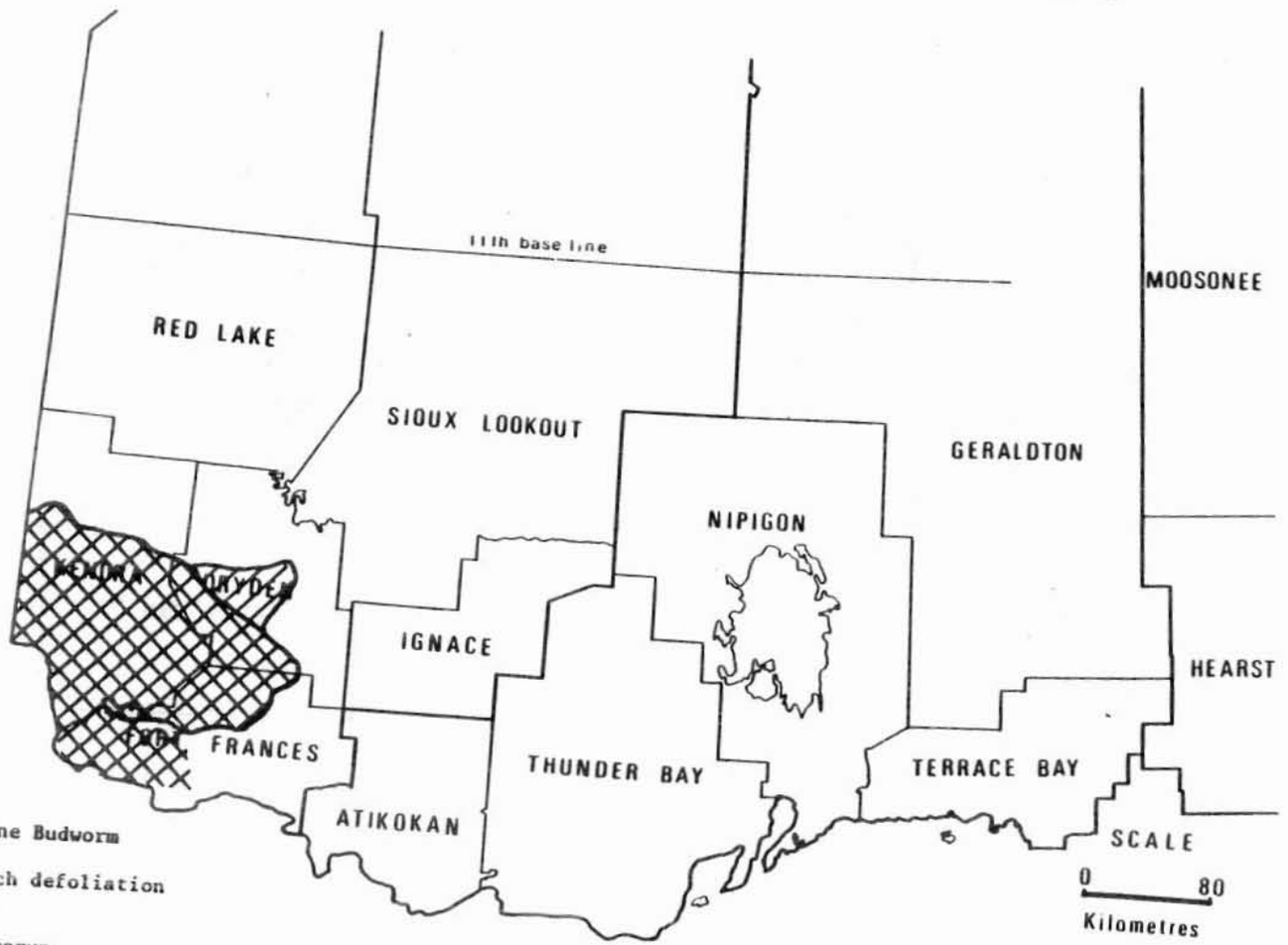
Jack Pine Budworm

Areas within which defoliation occurred in 1967

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Jack Pine Budworm

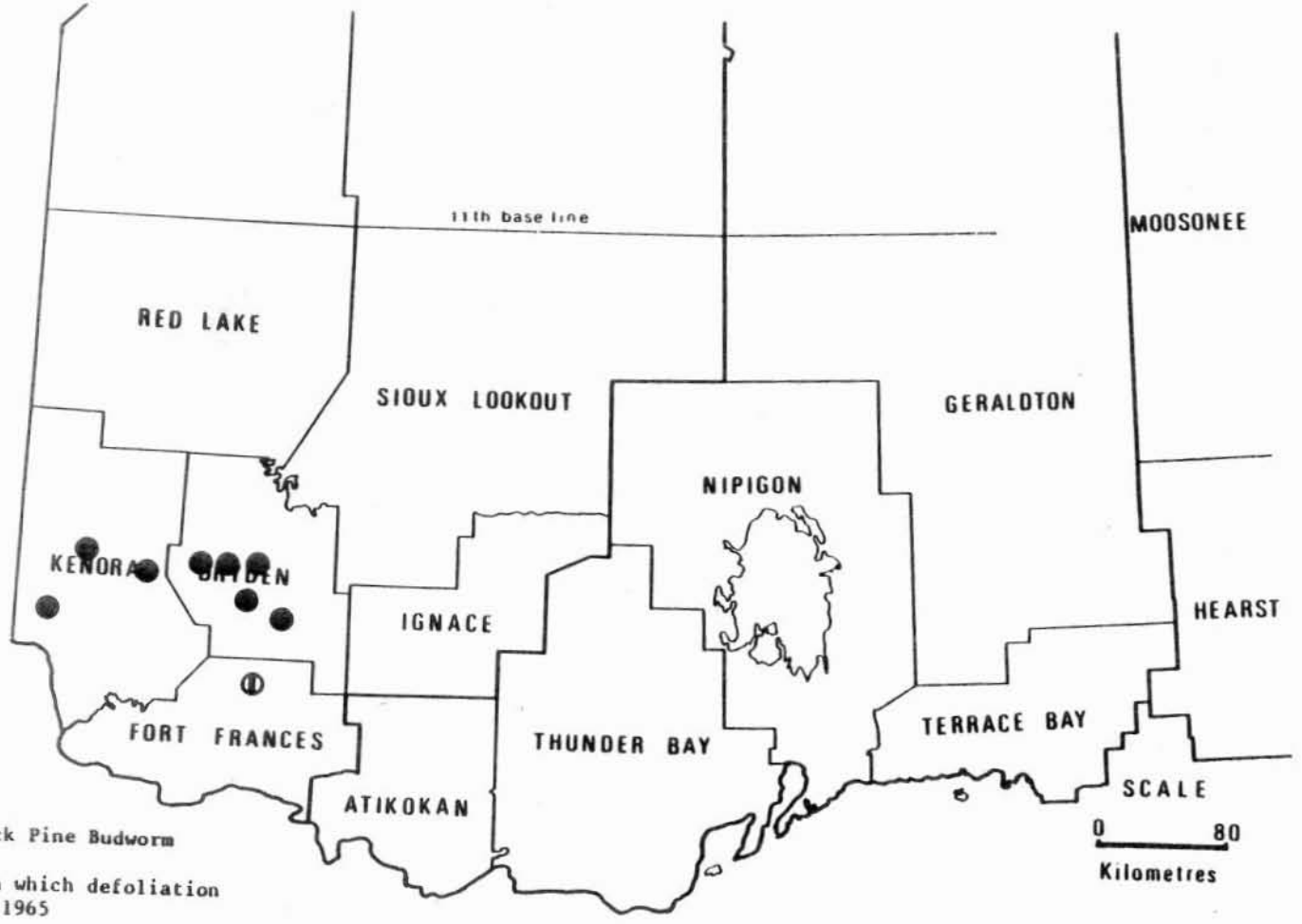
Areas within which defoliation occurred in 1966

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Jack Pine Budworm

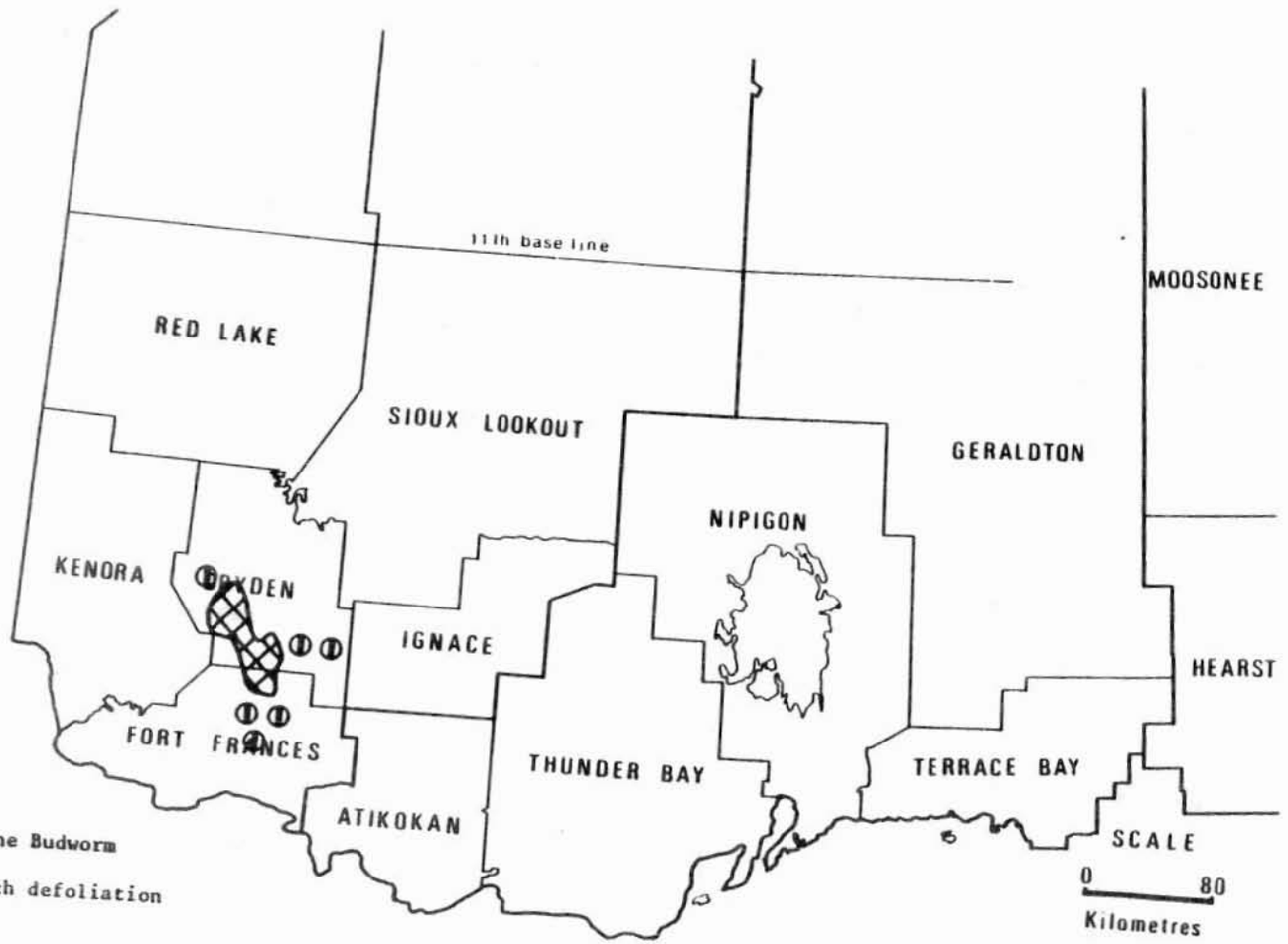
Areas within which defoliation occurred in 1965

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Jack Pine Budworm

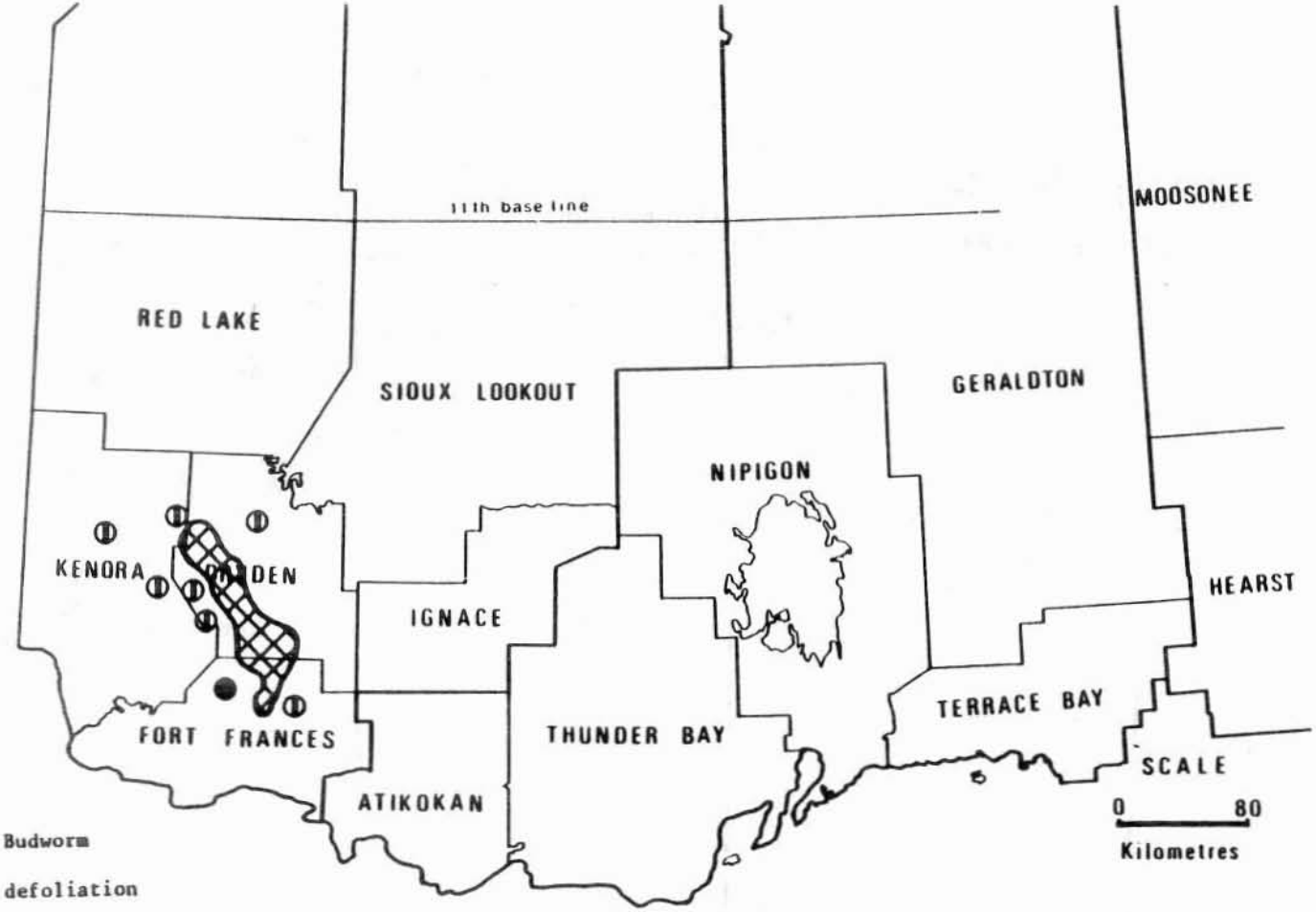
Areas within which defoliation occurred in 1962

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Jack Pine Budworm

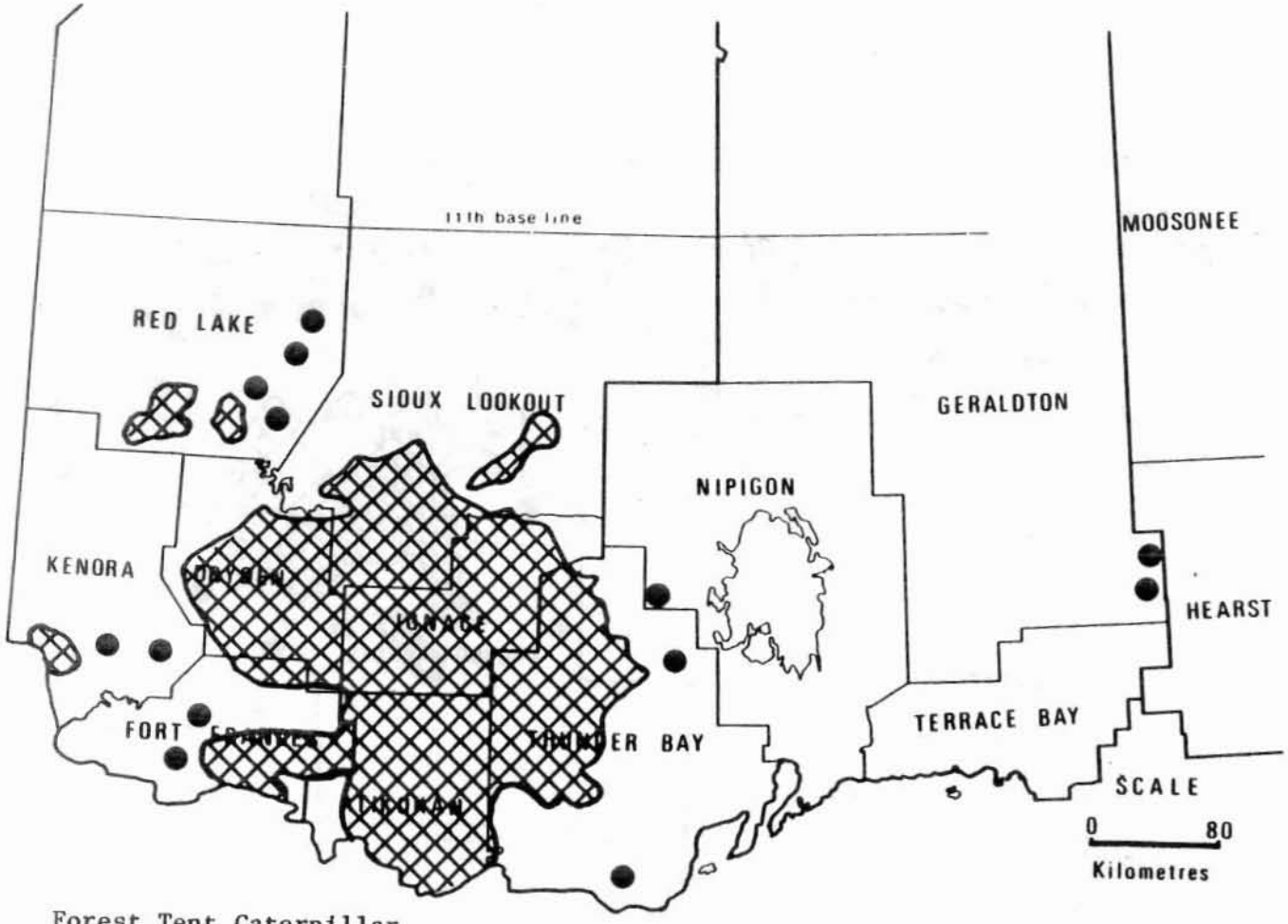
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation ◑ or

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



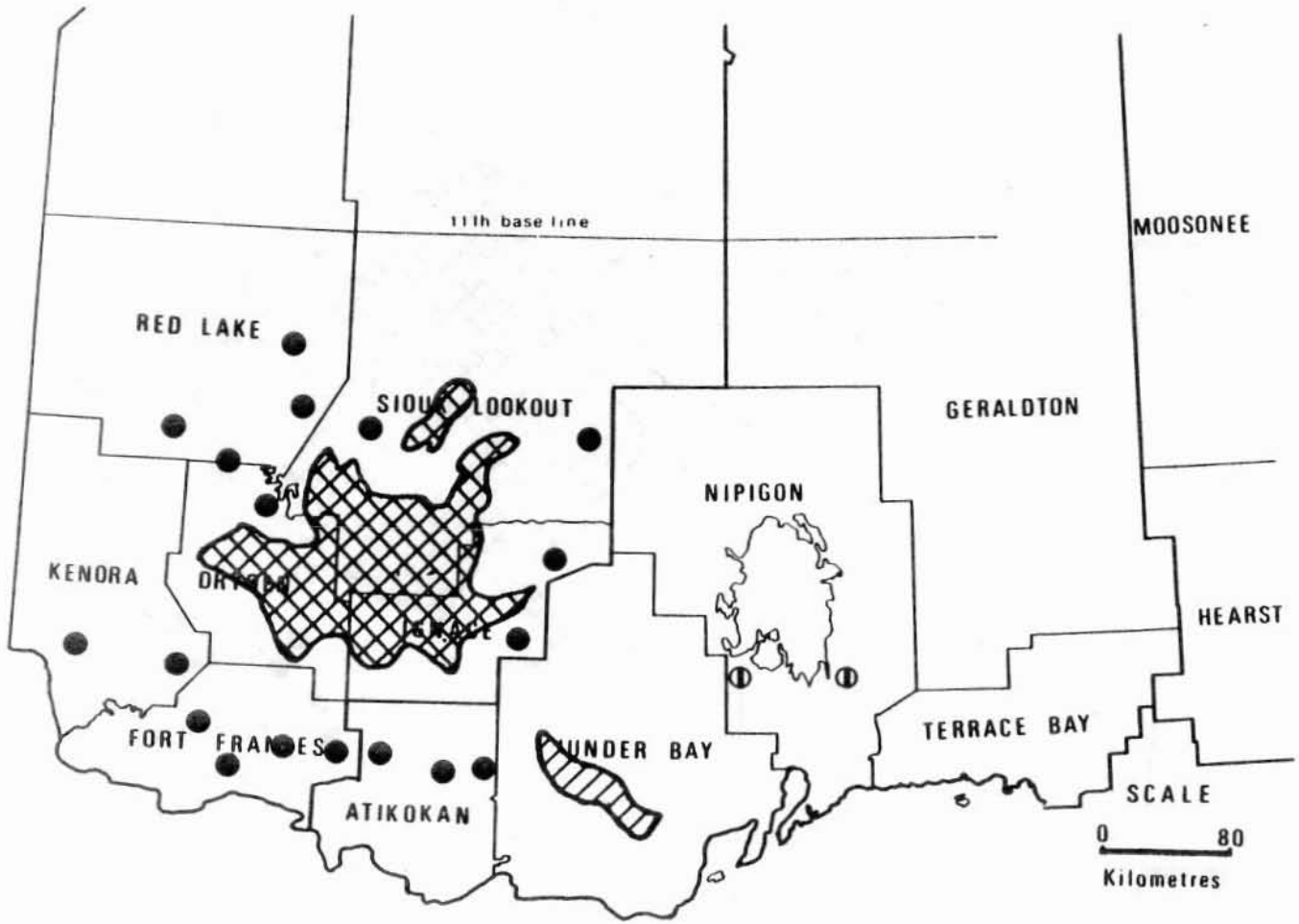
Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

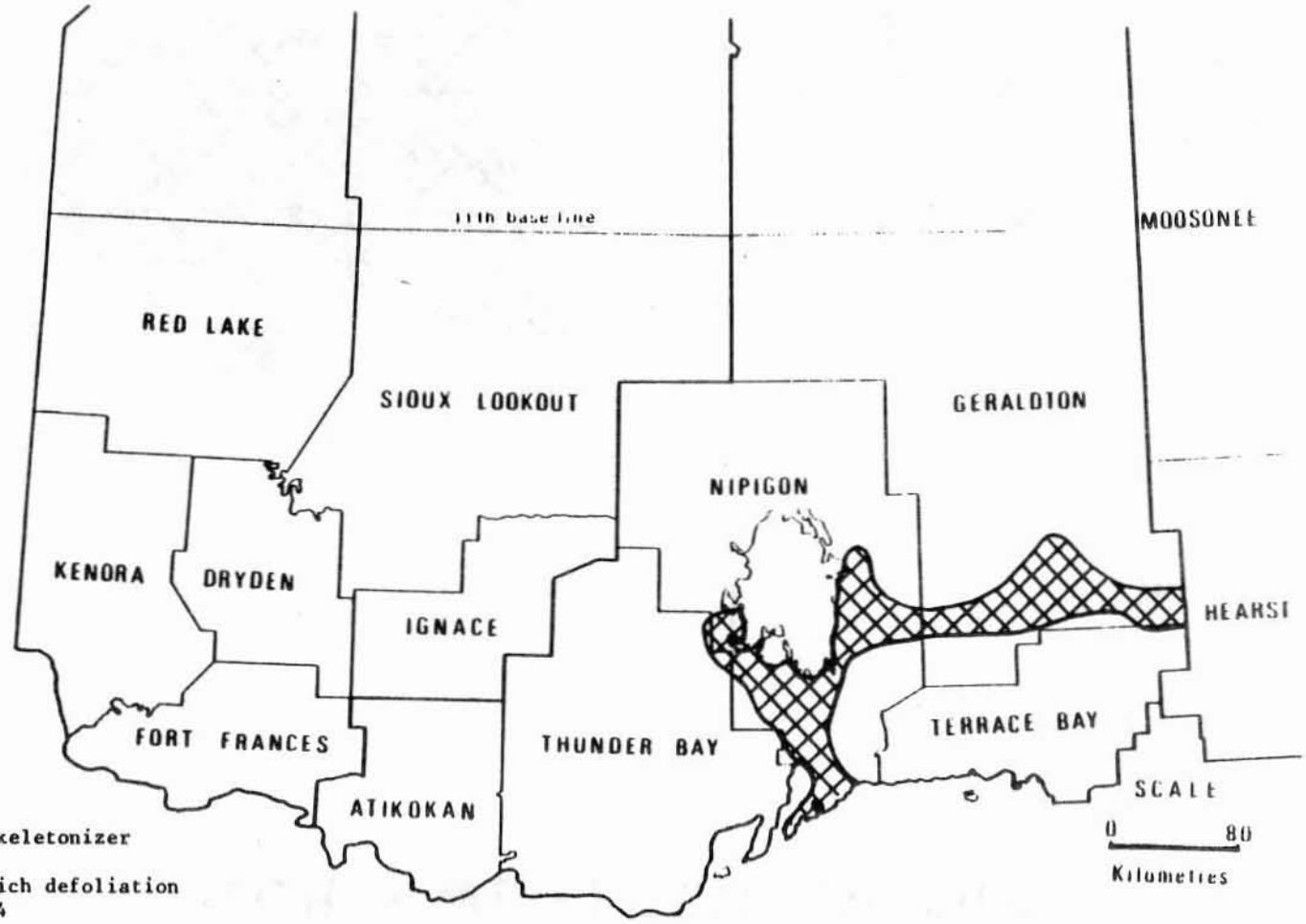
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



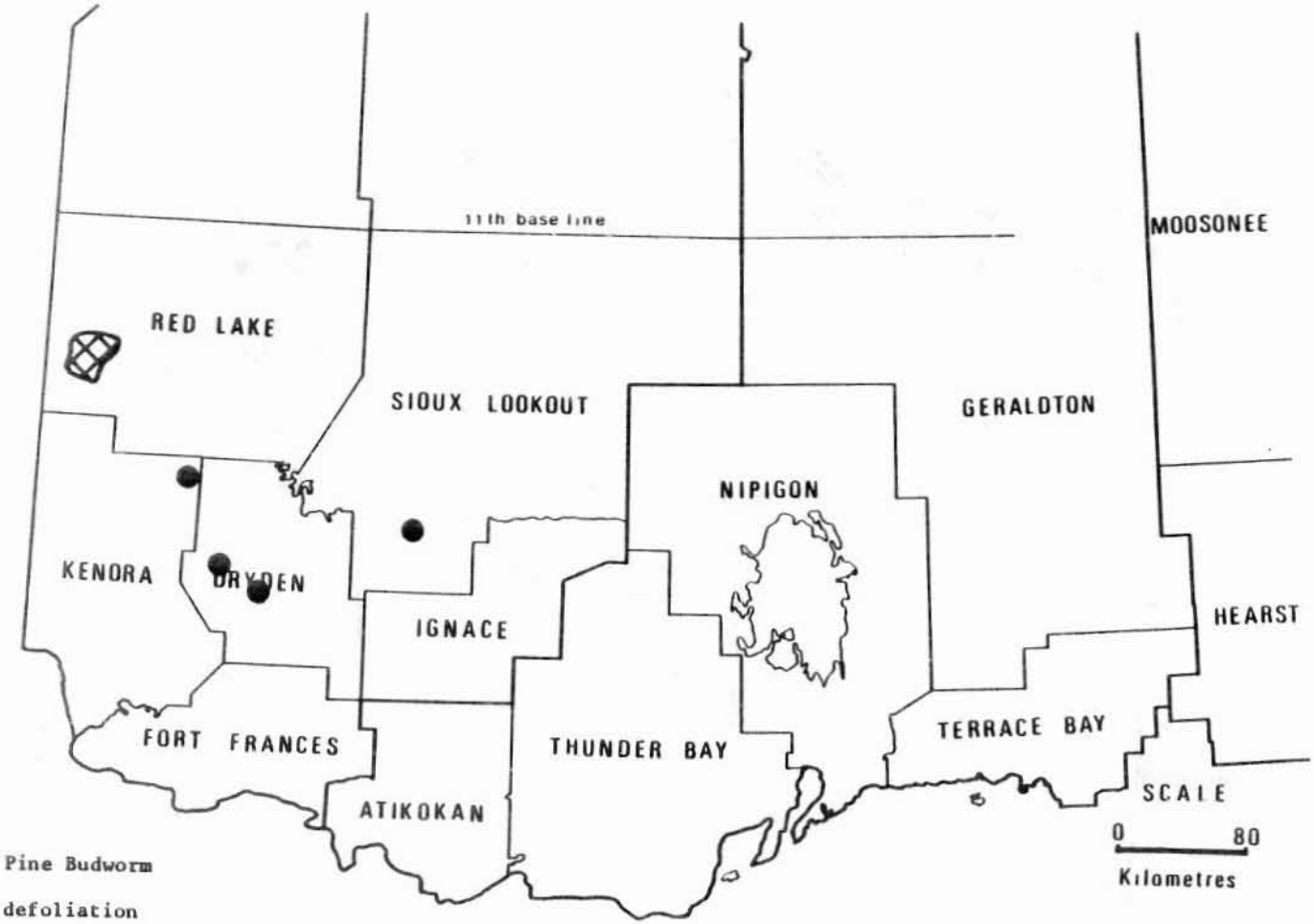
Birch Skeletonizer

Areas within which defoliation occurred in 1964

LEGEND

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Jack Pine Budworm

Areas within which defoliation occurred in 1954

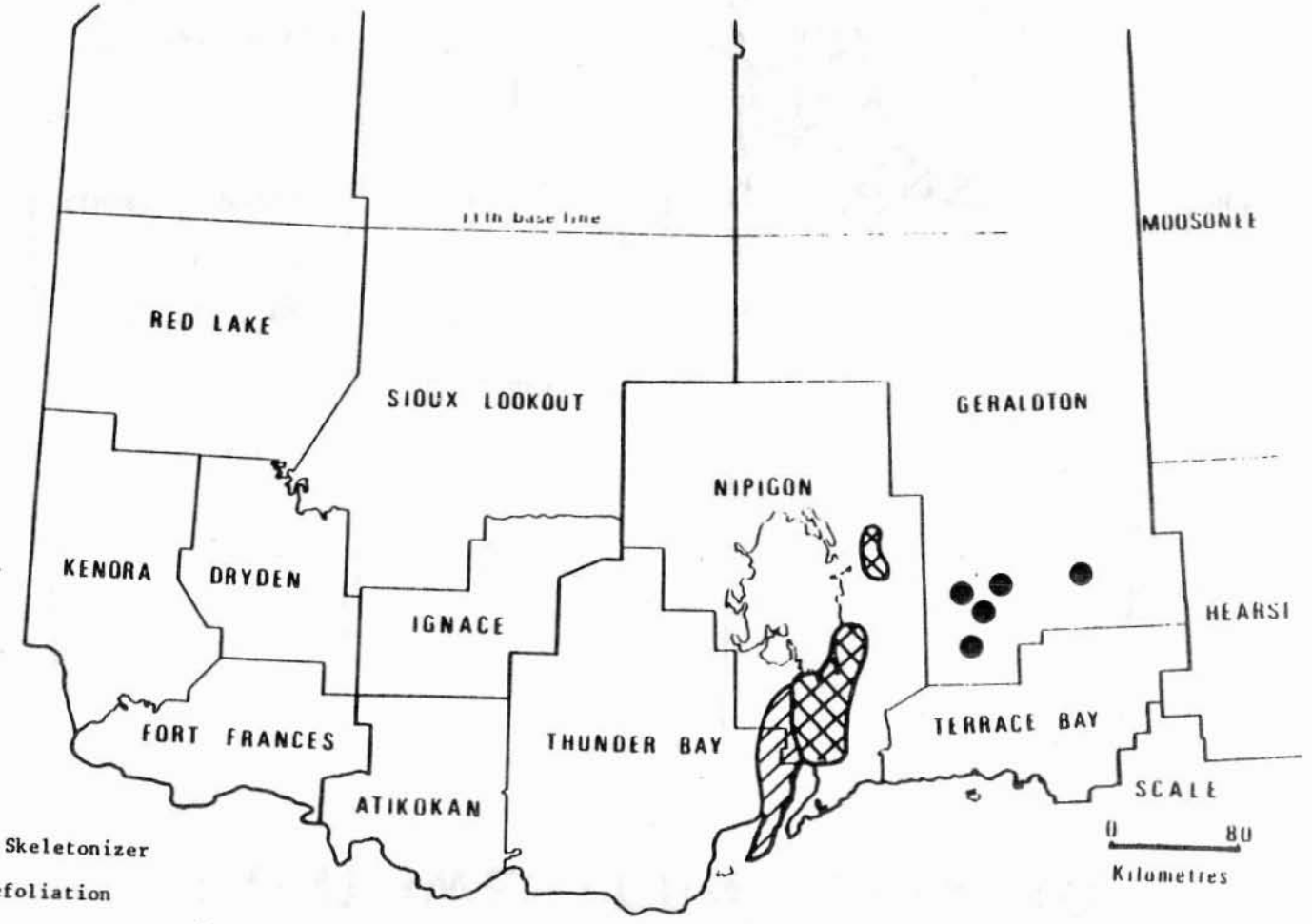
LEGEND

Moderate-to-severe defoliation ● or ▨

APPENDIX C

MAPS - NORTHWESTERN ONTARIO

NORTHWESTERN ONTARIO



Birch Skeletonizer

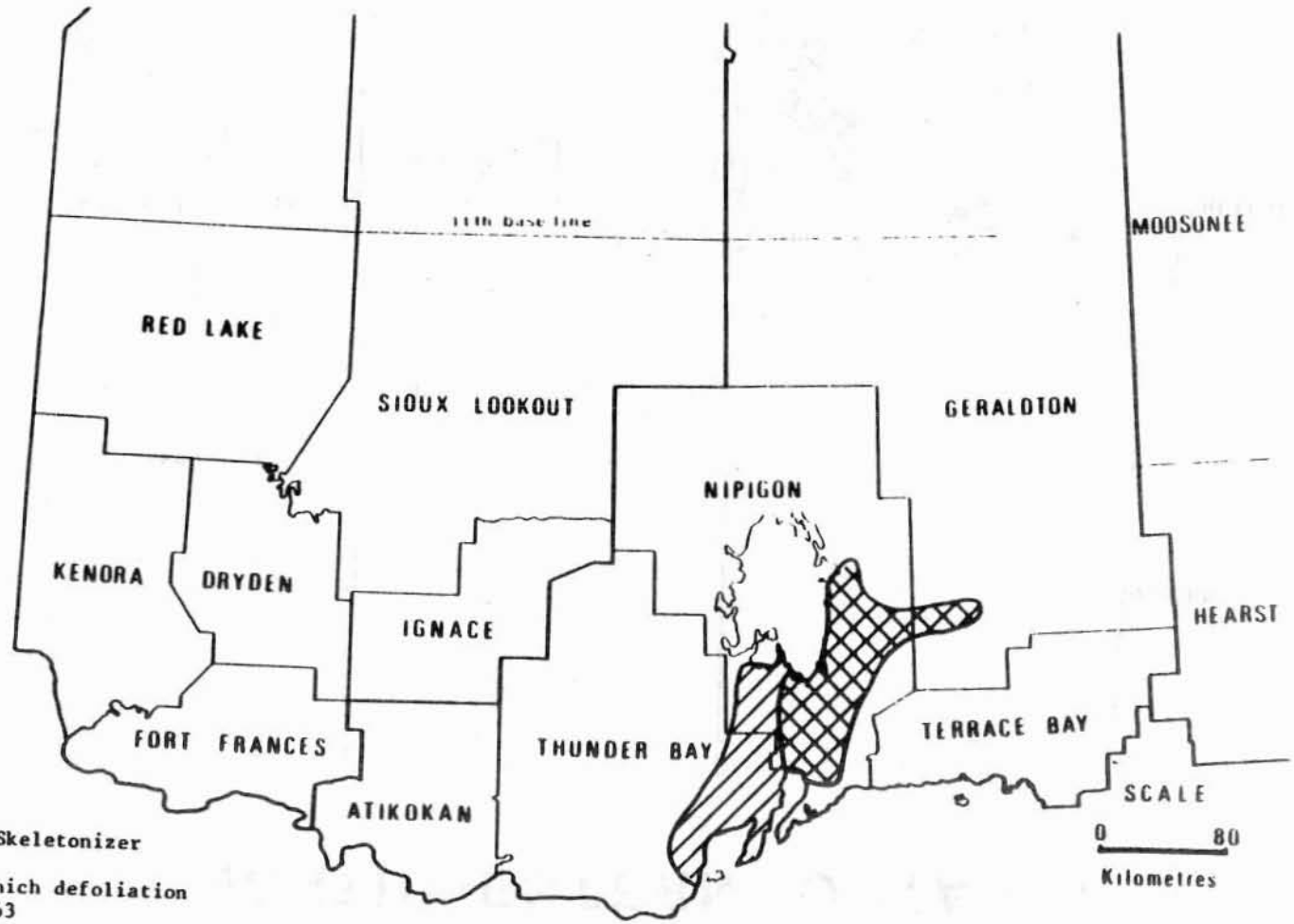
Areas within which defoliation occurred in 1962

LEGEND

Light defoliation

Moderate-to-severe defoliation or

NORTHWESTERN ONTARIO



Birch Skeletonizer

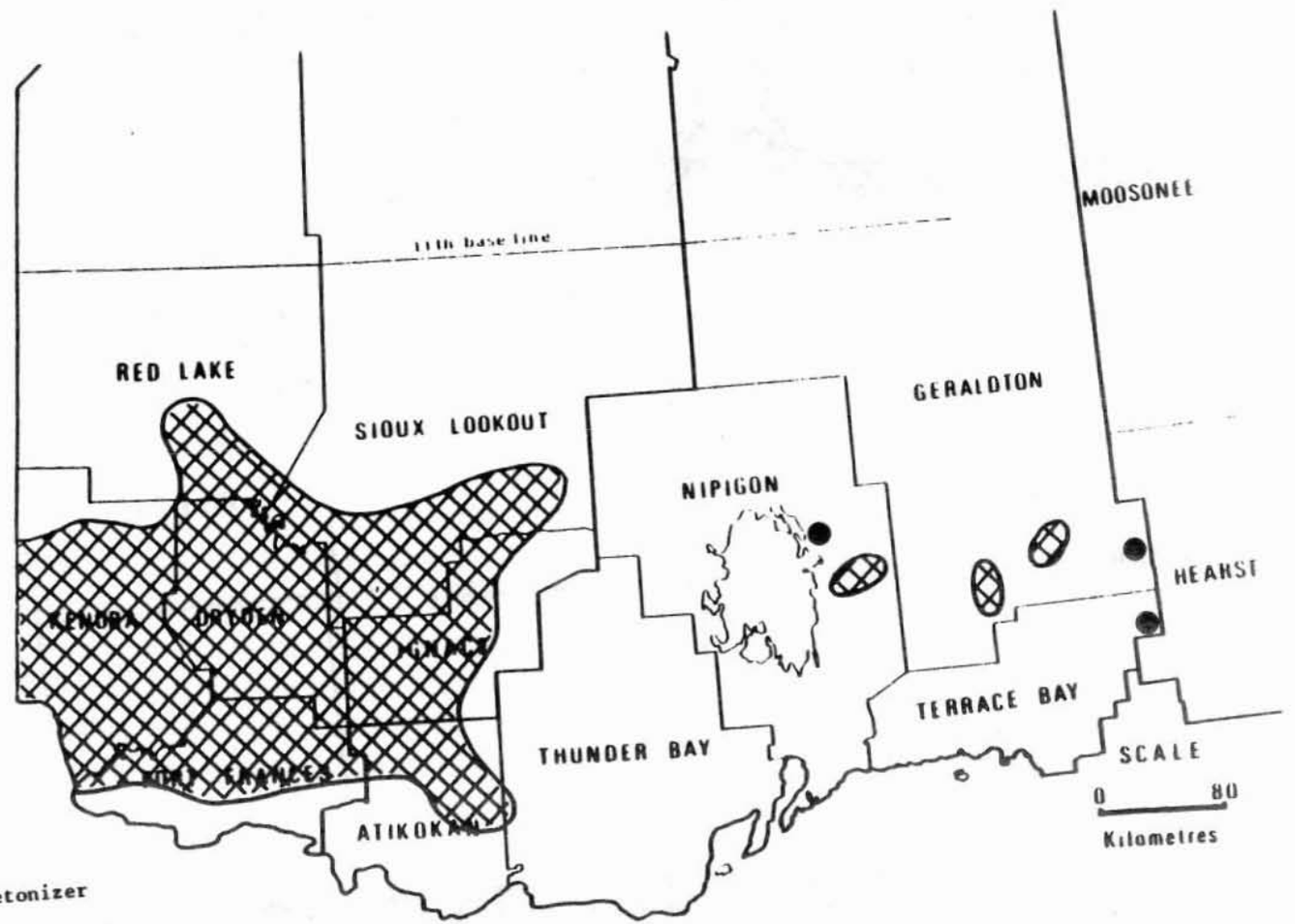
Areas within which defoliation occurred in 1963

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



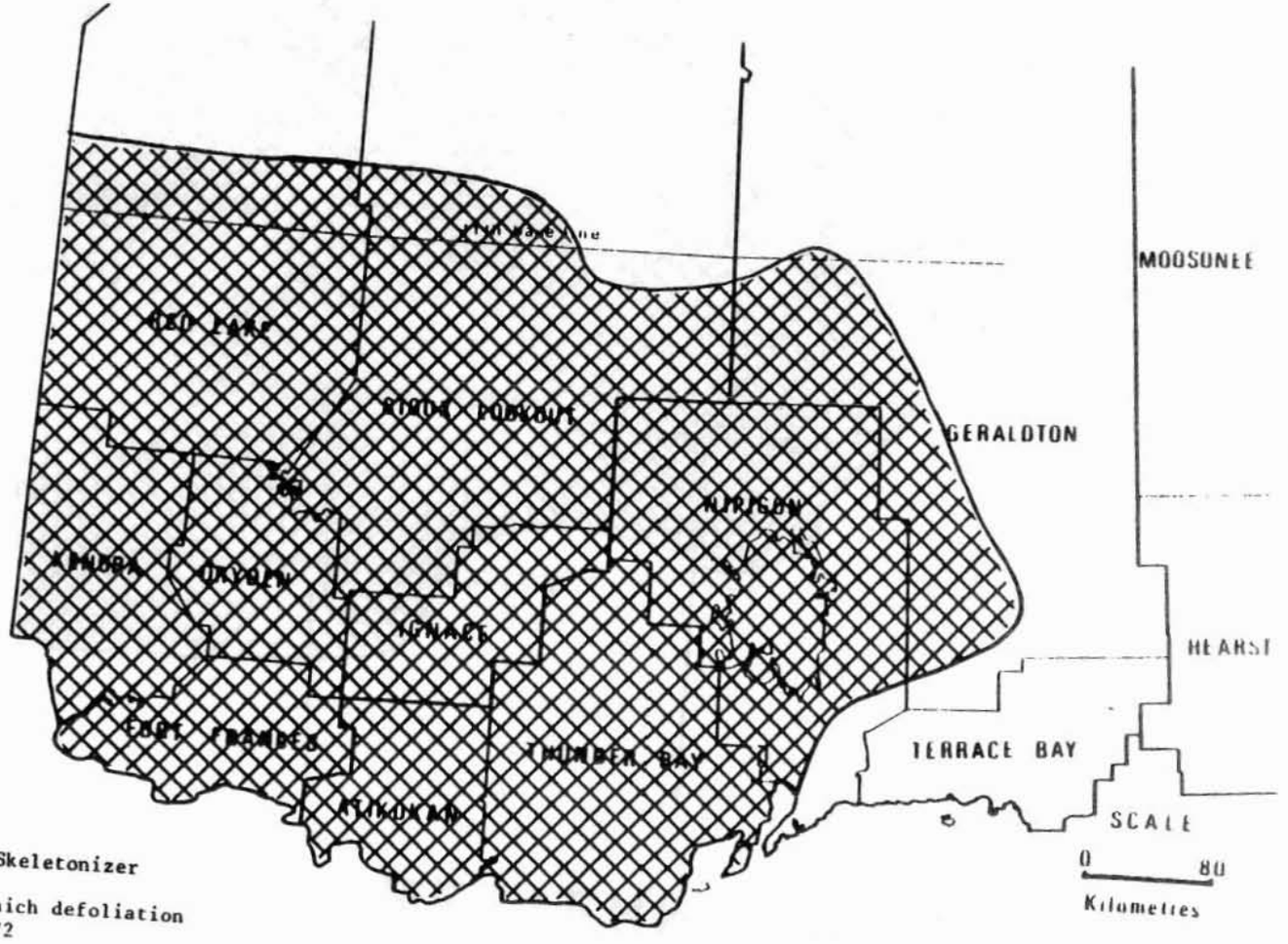
Birch Skeletonizer

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



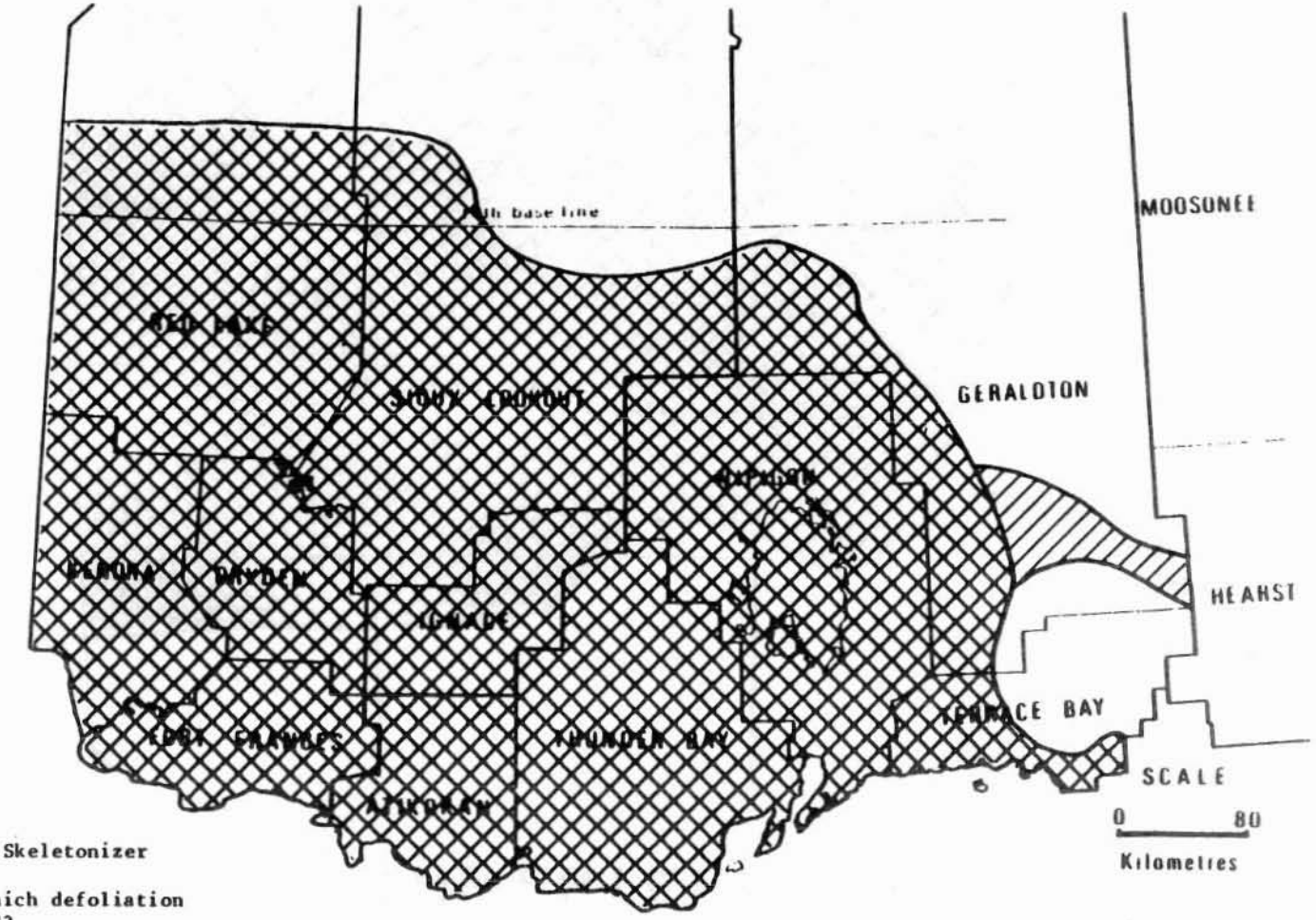
Birch Skeletonizer

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Birch Skeletonizer

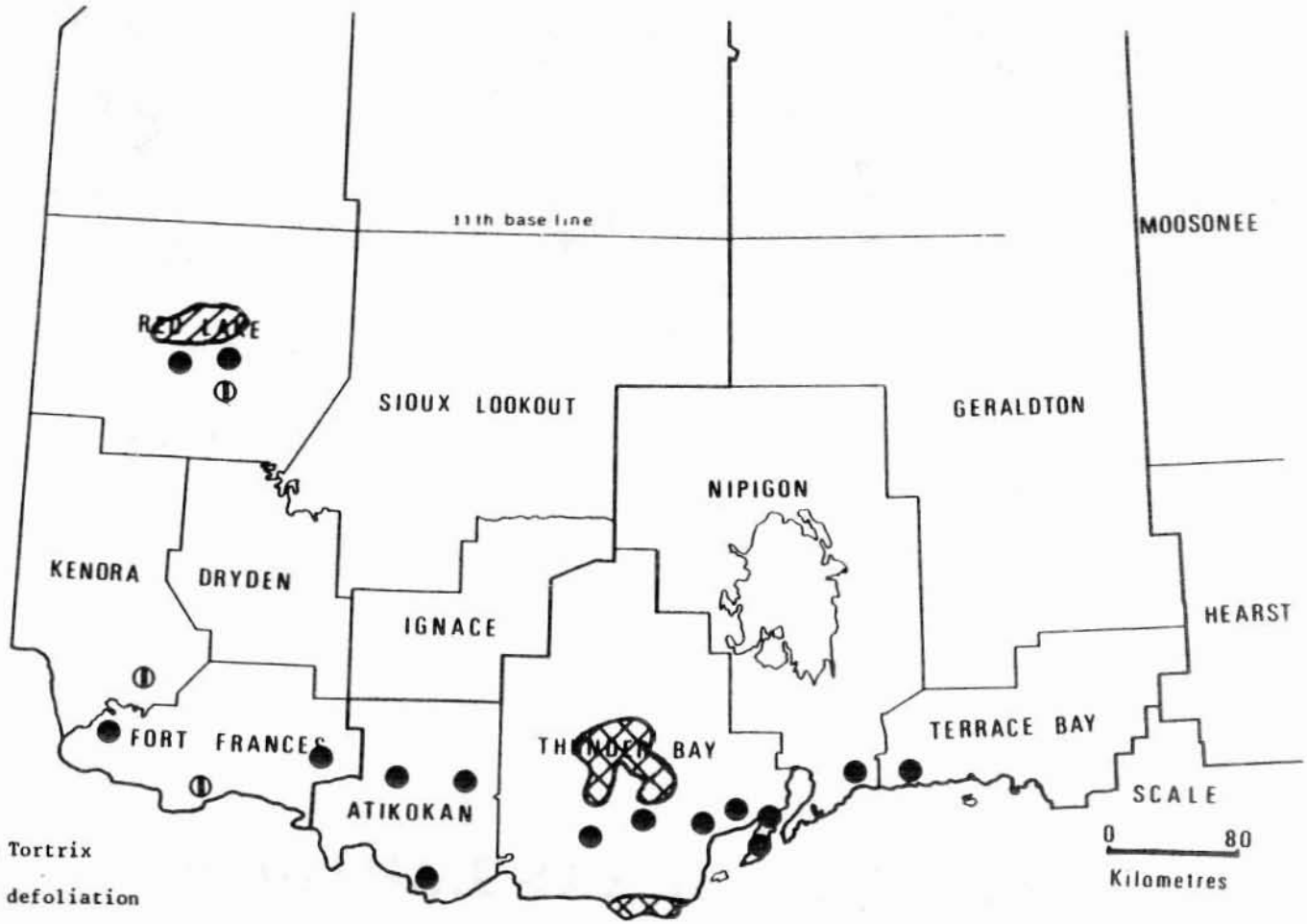
Areas within which defoliation occurred in 1973

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



Large Aspen Tortrix

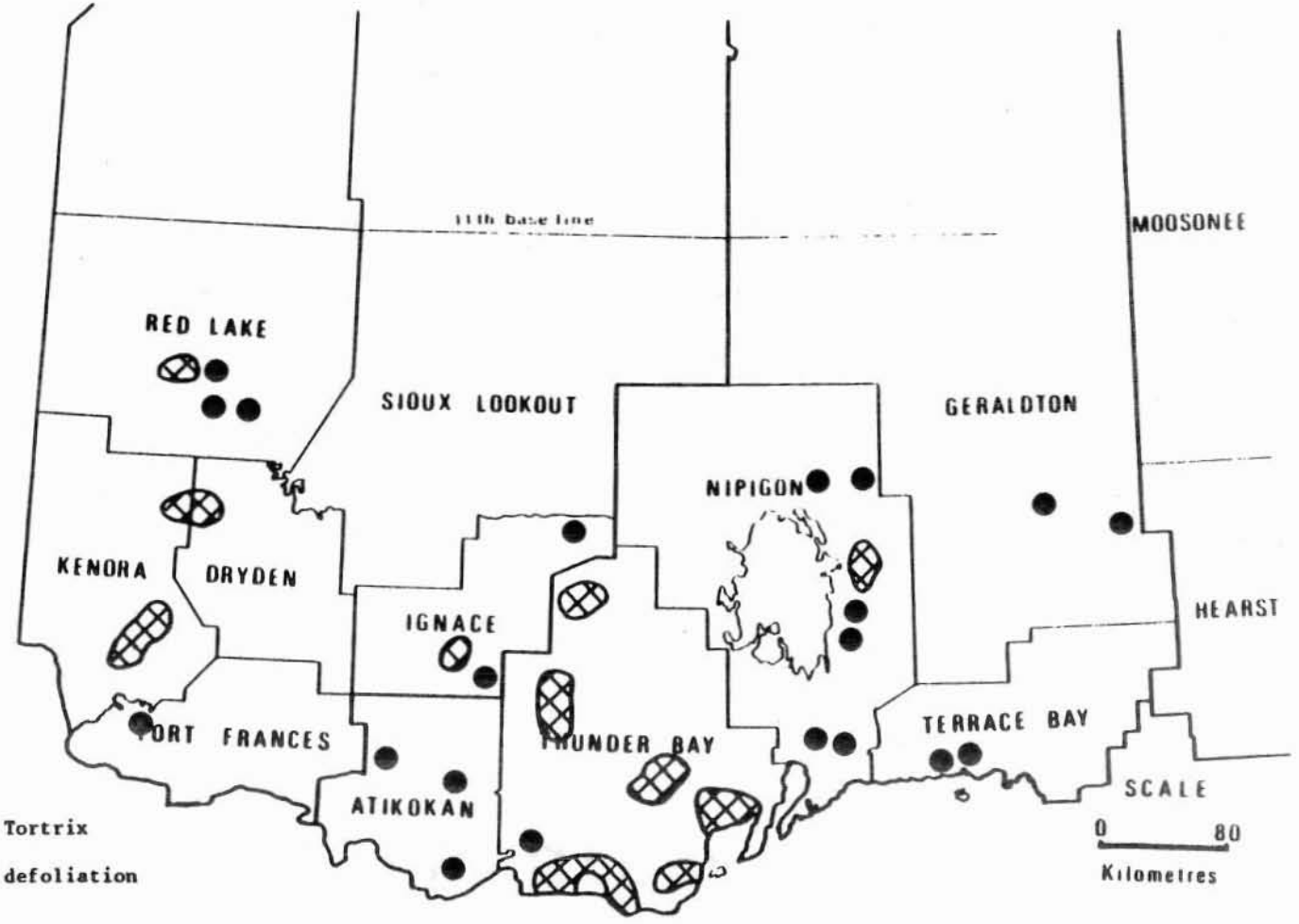
Areas within which defoliation occurred in 1970

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



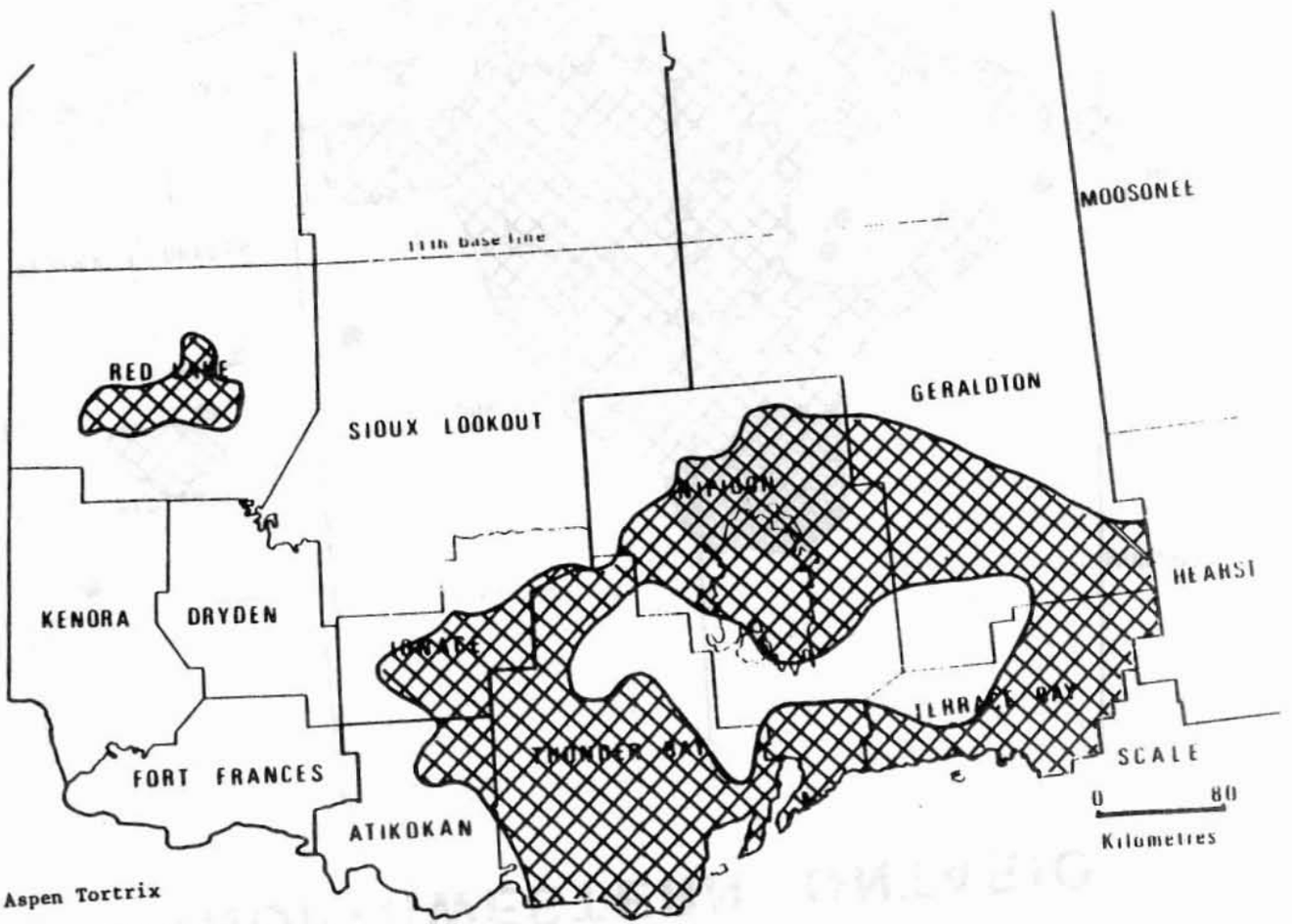
Large Aspen Tortrix

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



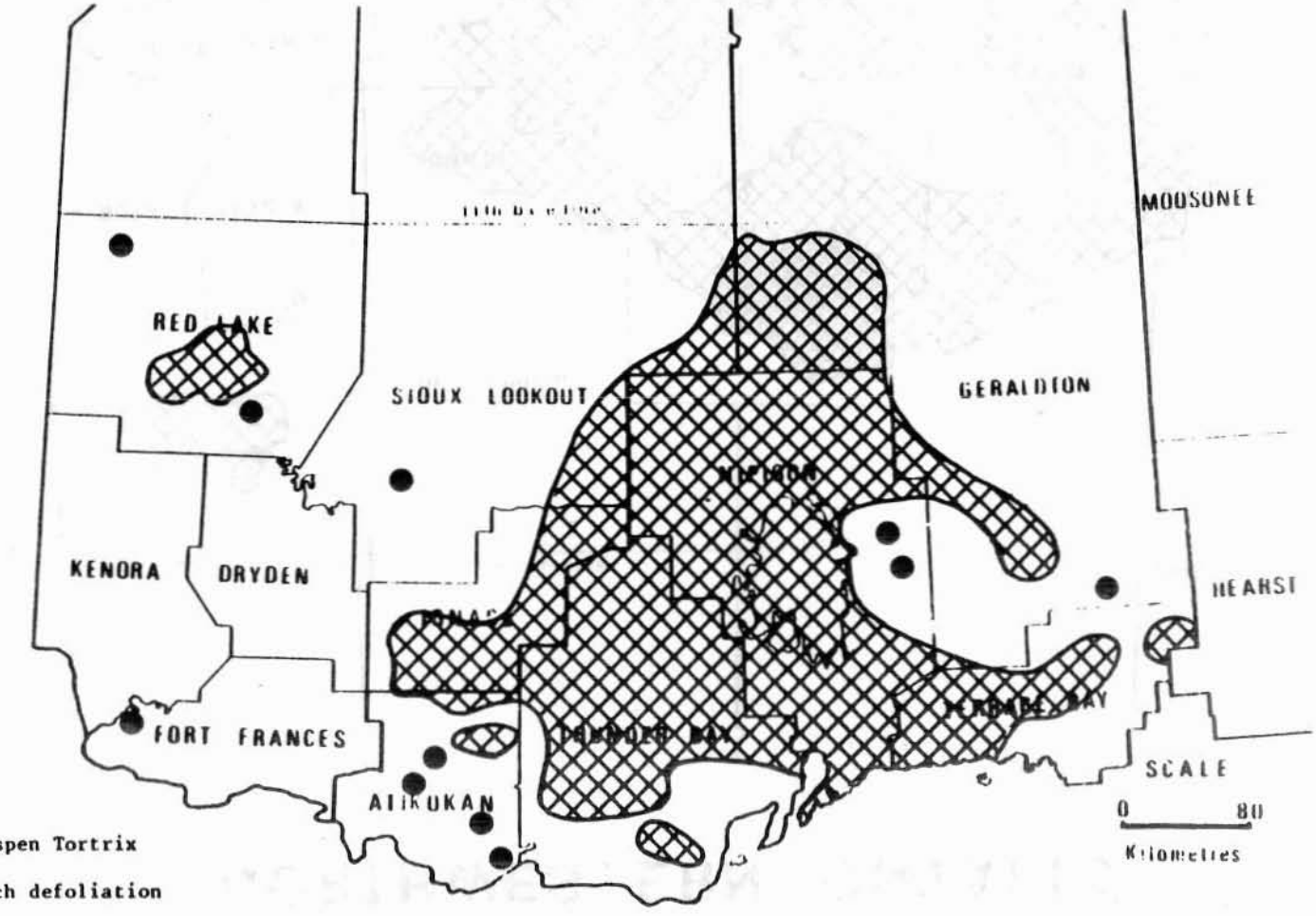
Large Aspen Tortrix

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



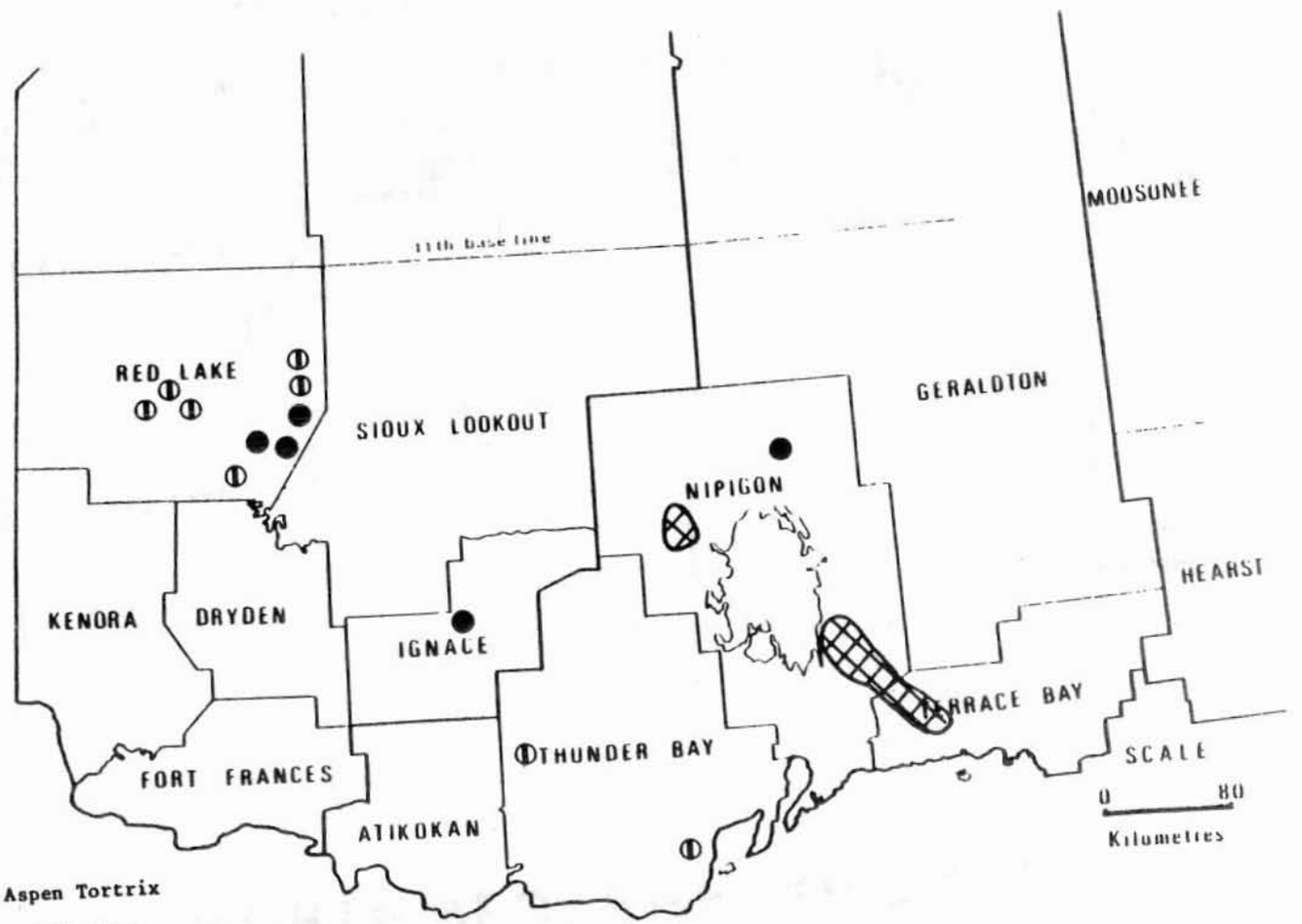
Large Aspen Tortrix

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Large Aspen Tortrix

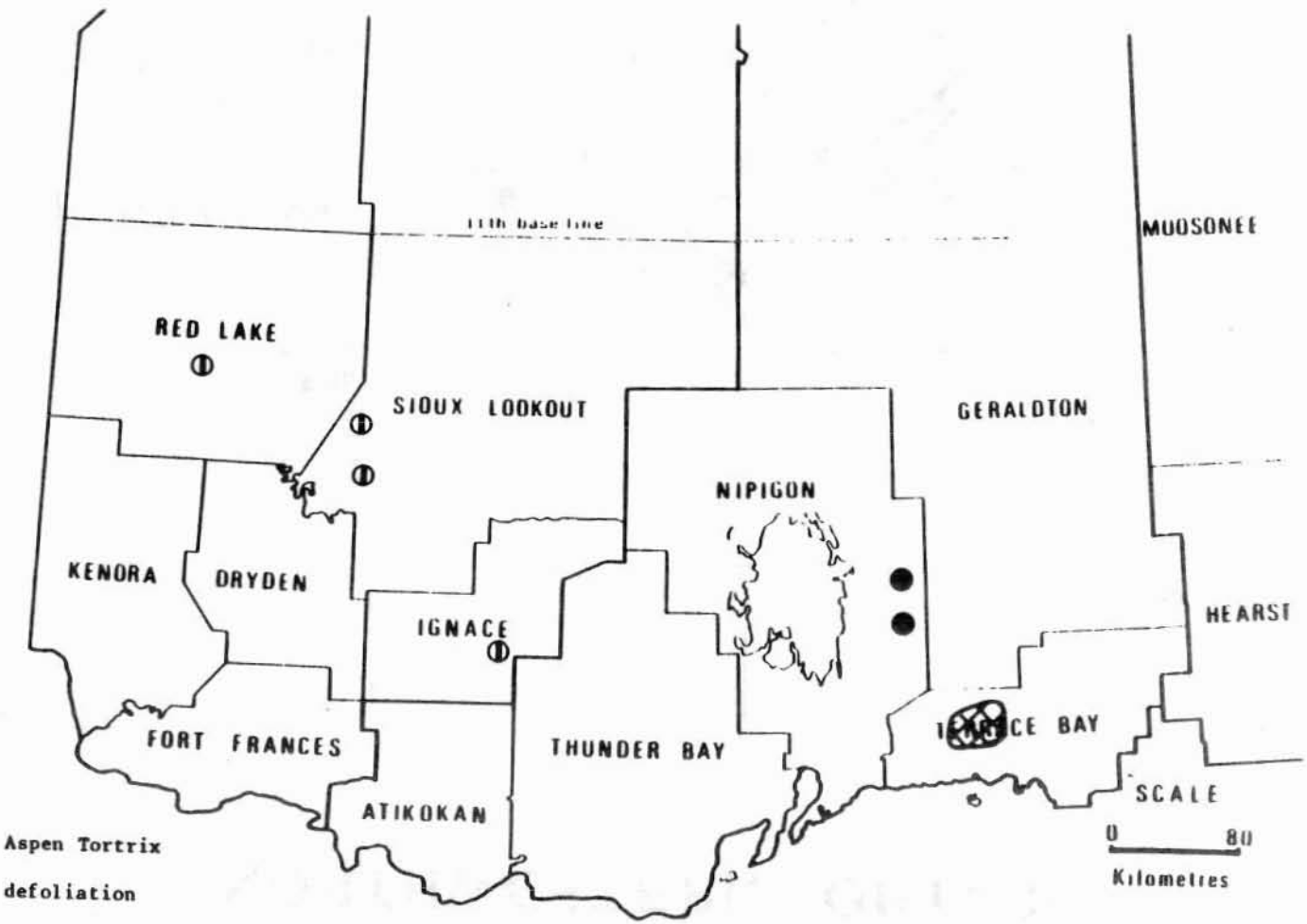
Areas within which defoliation occurred in 1974

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



Large Aspen Tortrix

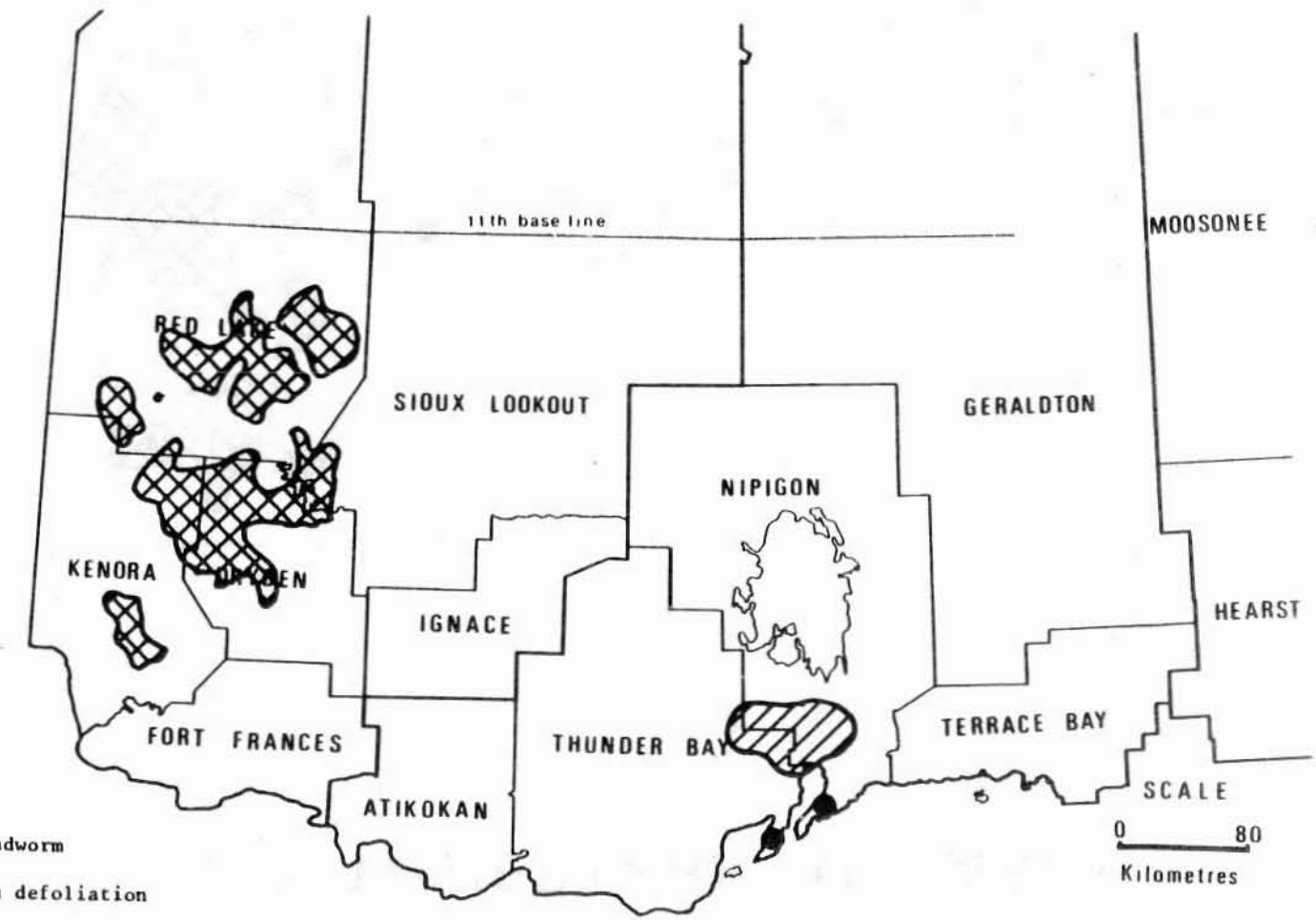
Areas within which defoliation occurred in 1975

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



Spruce Budworm

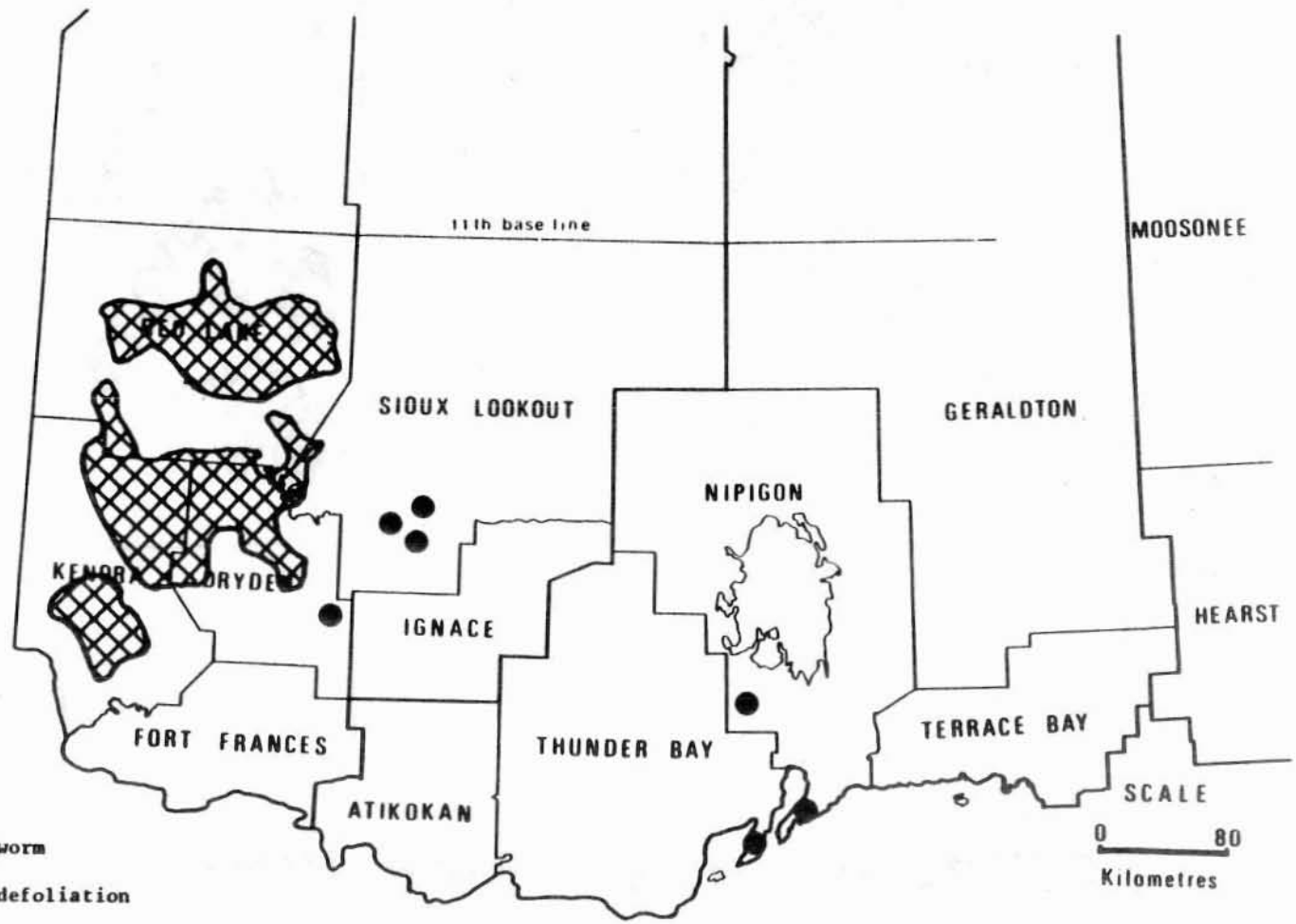
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation

Moderate-to-severe defoliation or

NORTHWESTERN ONTARIO



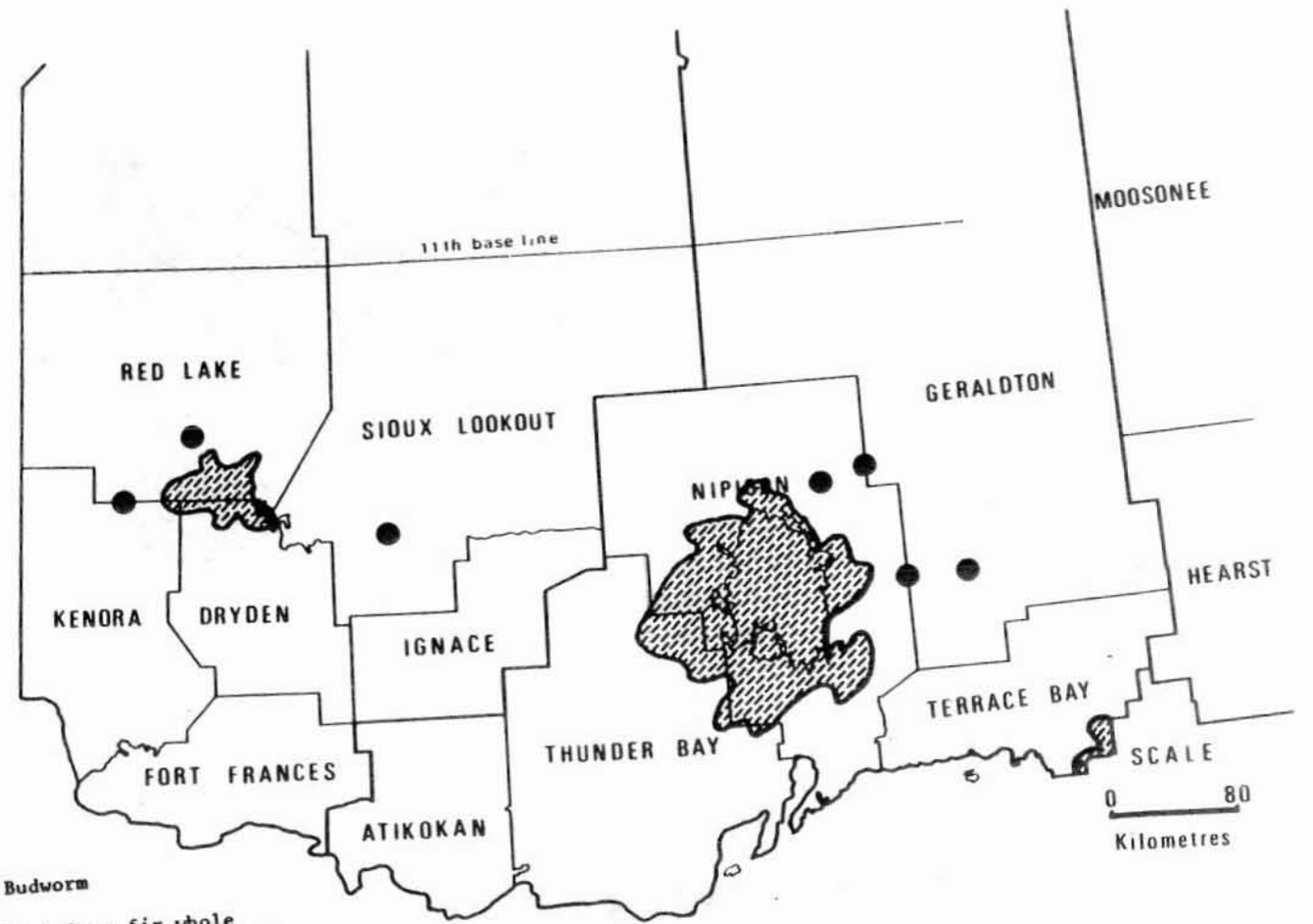
Spruce Budworm

Areas within which defoliation occurred in 1951

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



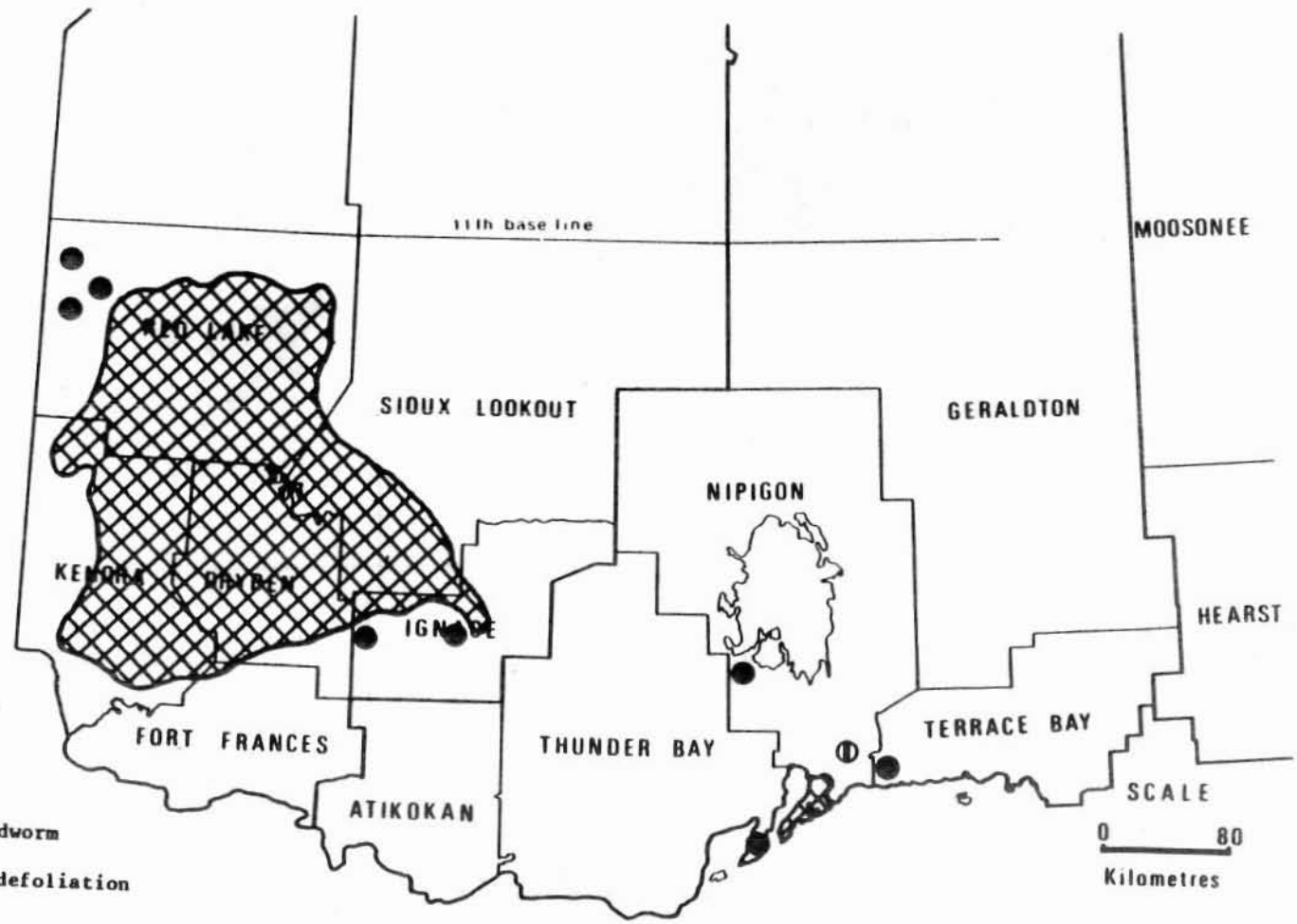
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1951

LEGEND

Mortality ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

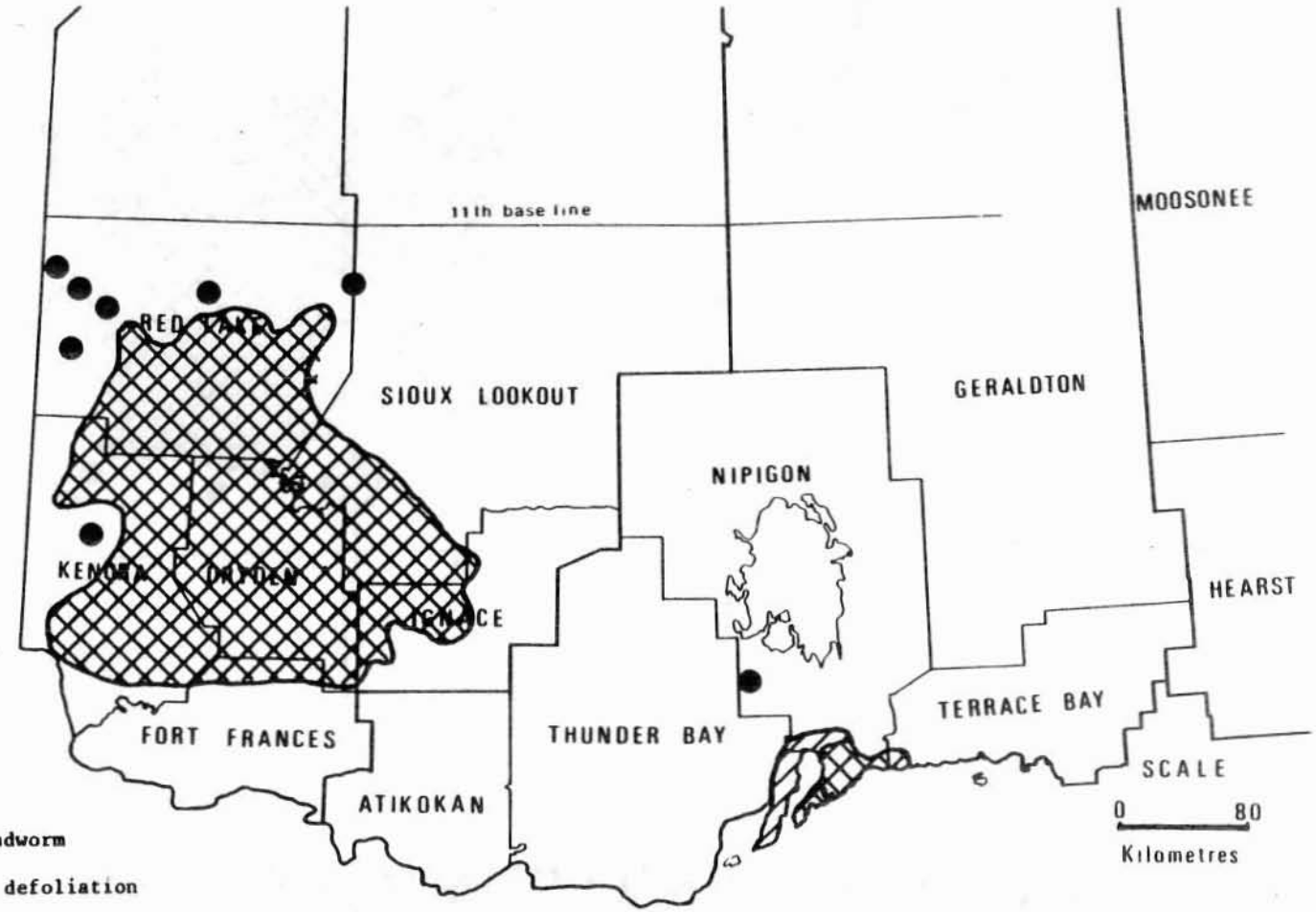
Areas within which defoliation occurred in 1952

LEGEND

Light defoliation ◍

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

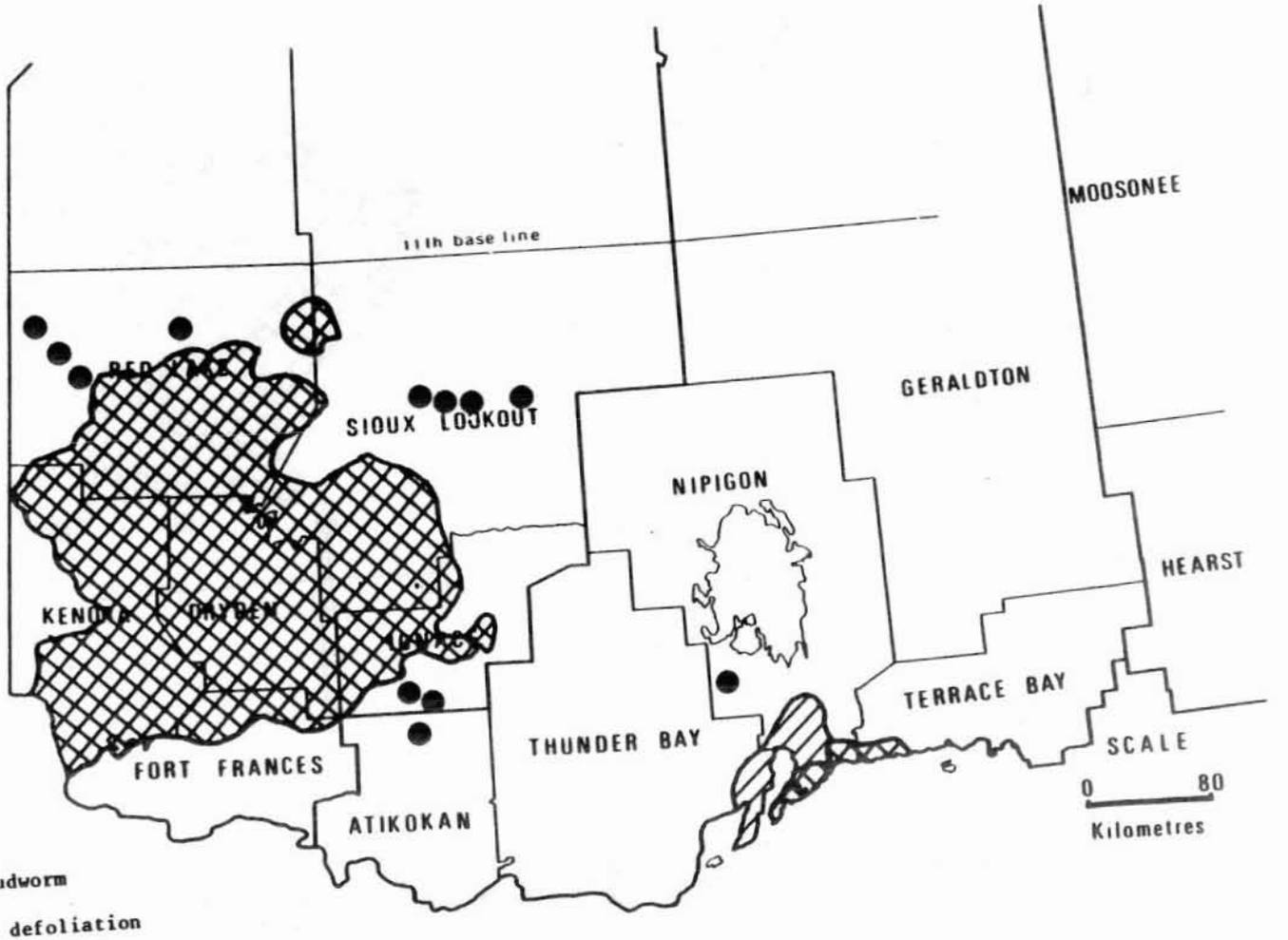
Areas within which defoliation occurred in 1953

LEGEND

Light defoliation

Moderate-to-severe defoliation or

NORTHWESTERN ONTARIO



Spruce Budworm

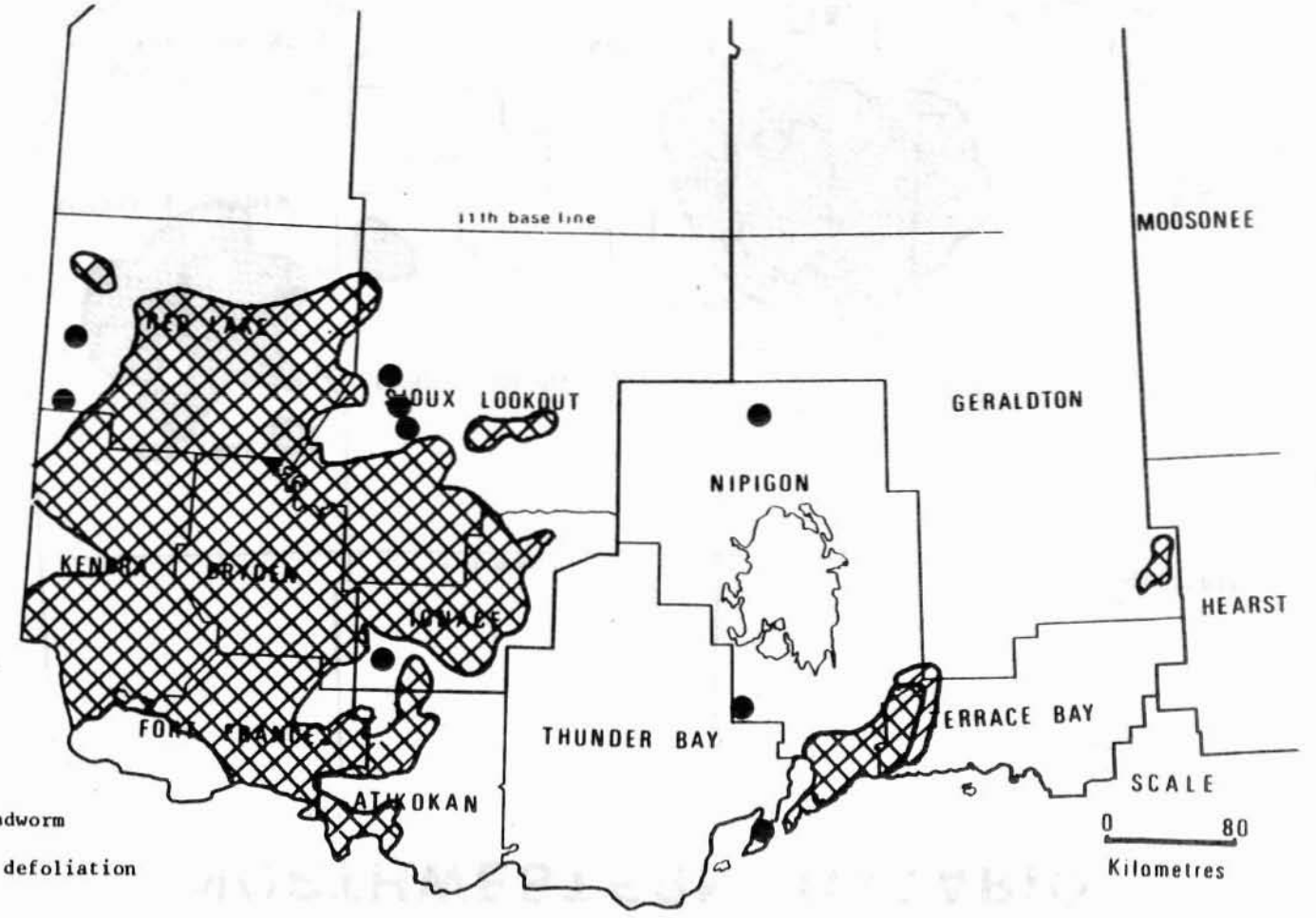
Areas within which defoliation occurred in 1954

LEGEND

Light defoliation

Moderate-to-severe defoliation or

NORTHWESTERN ONTARIO



Spruce Budworm

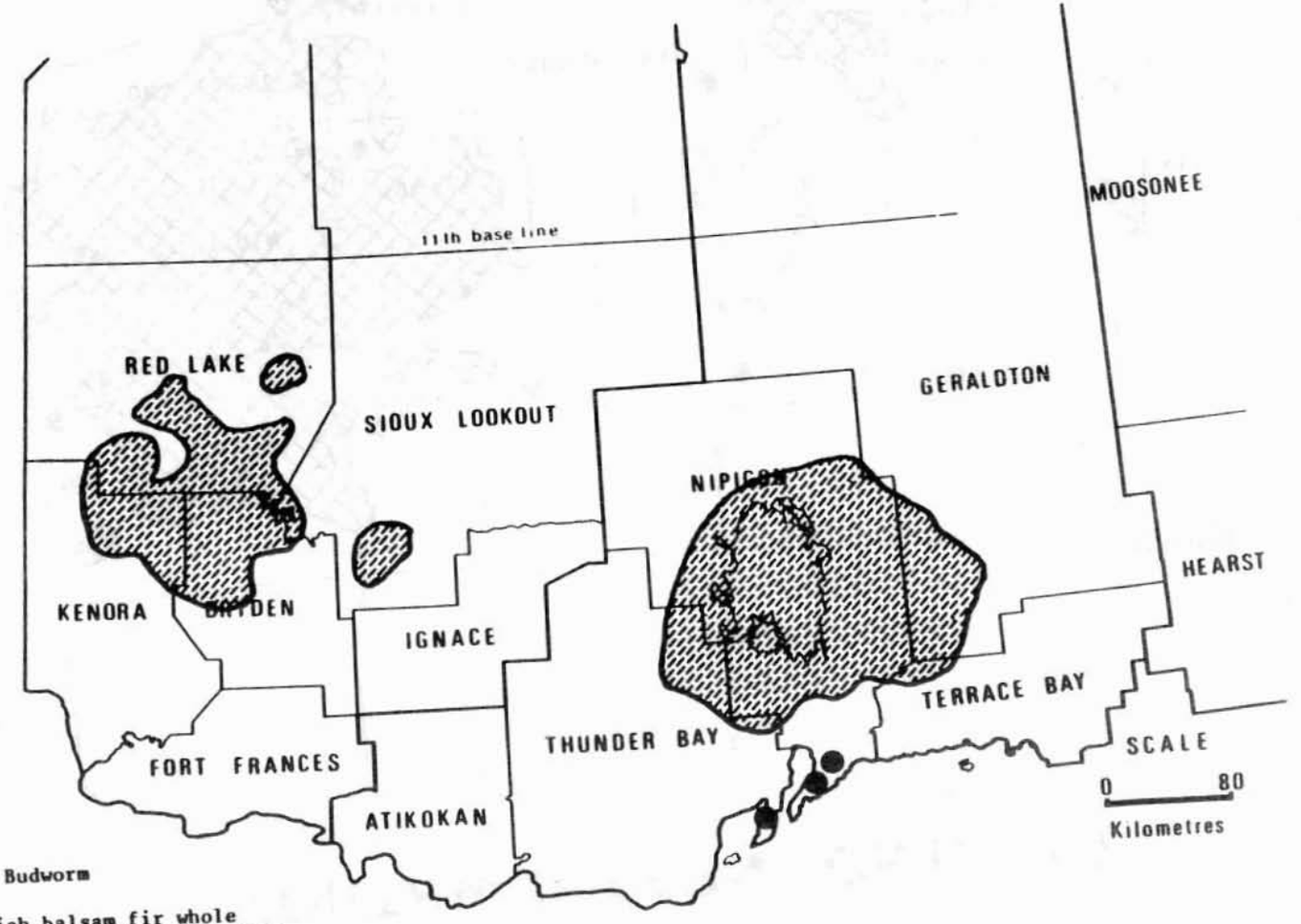
Areas within which defoliation occurred in 1955

LEGEND

Light defoliation

Moderate-to-severe defoliation or

NORTHWESTERN ONTARIO



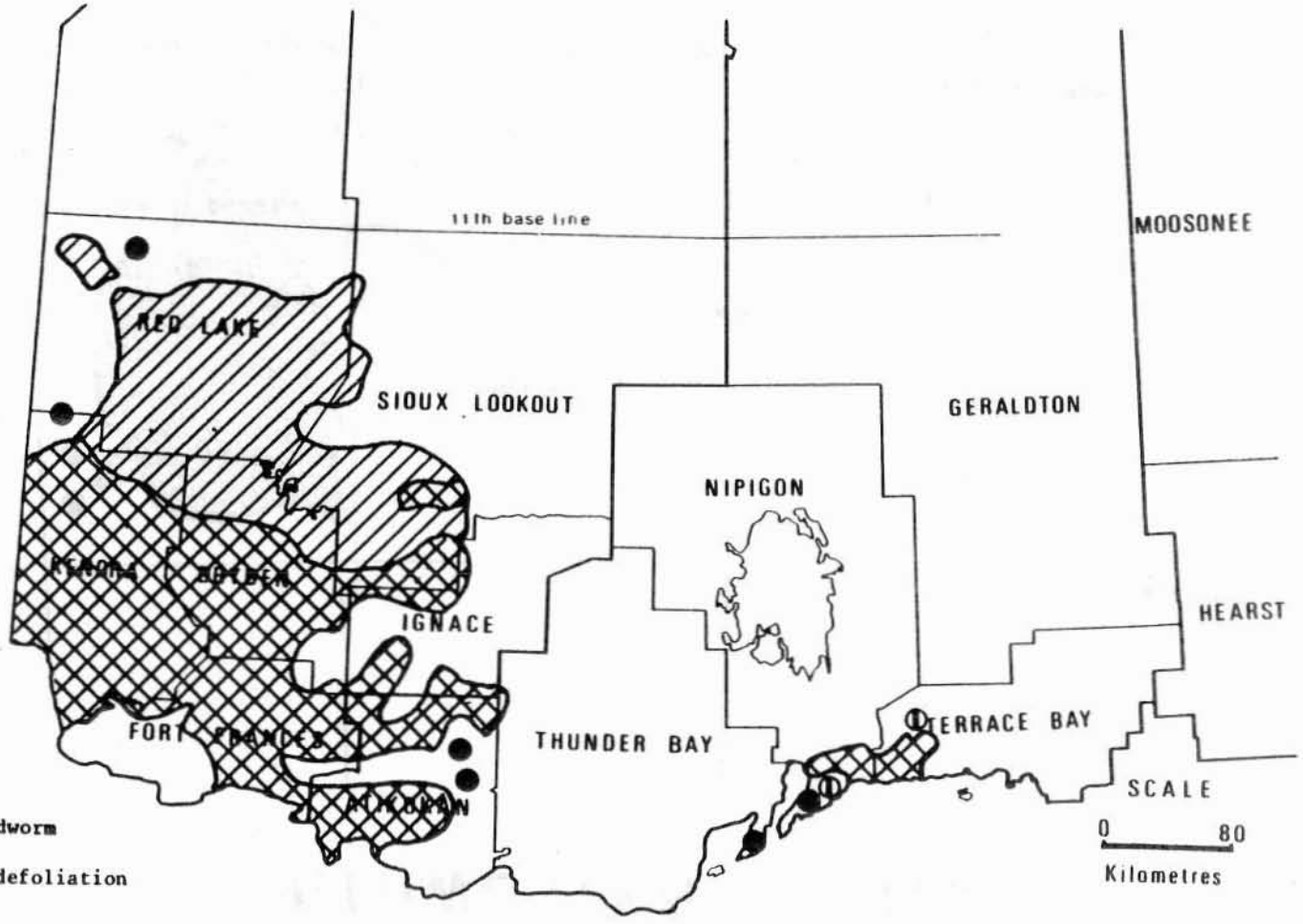
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1955

LEGEND

Mortality ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

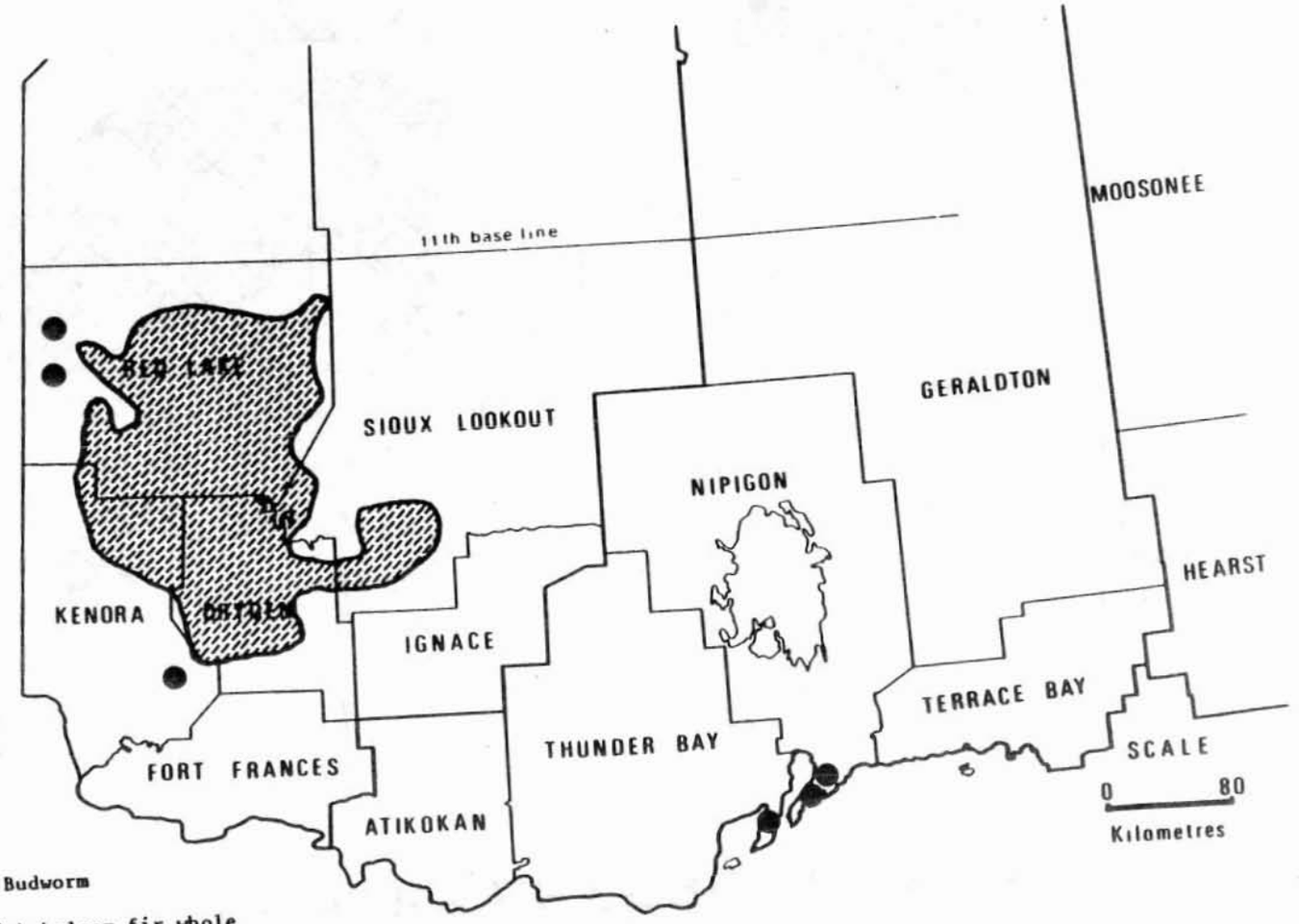
Areas within which defoliation occurred in 1956

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



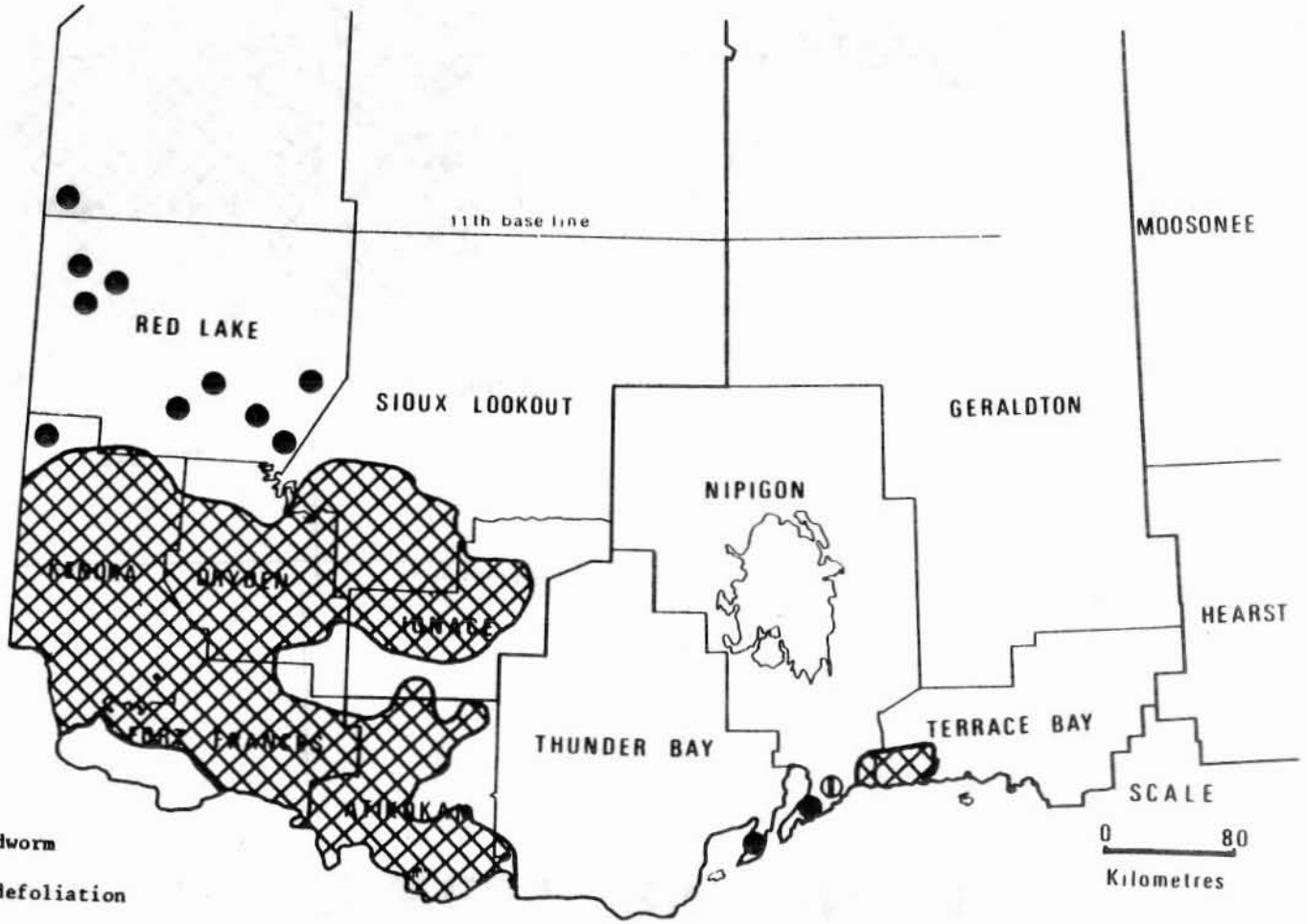
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1956

LEGEND

Mortality ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

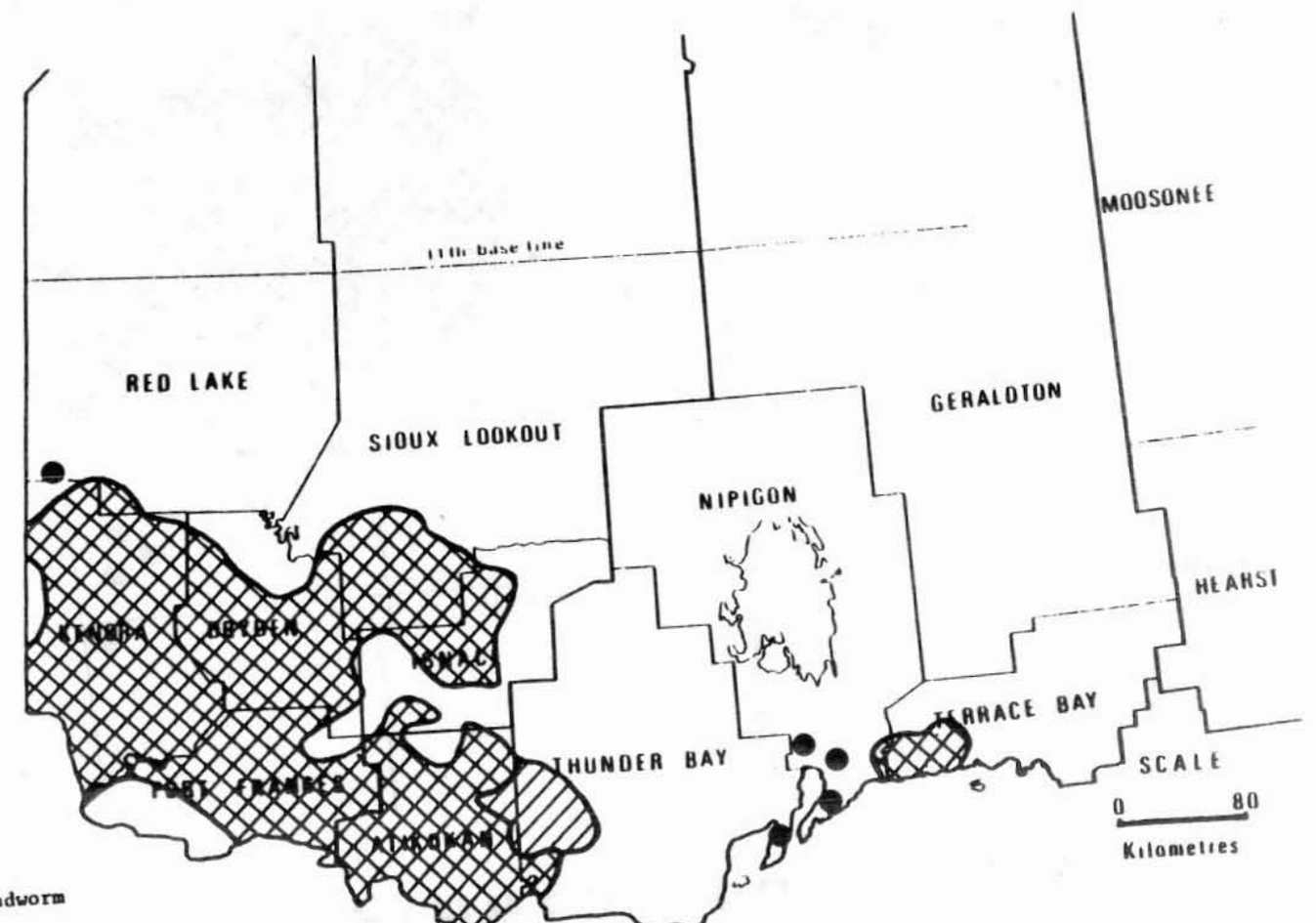
Areas within which defoliation occurred in 1957

LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

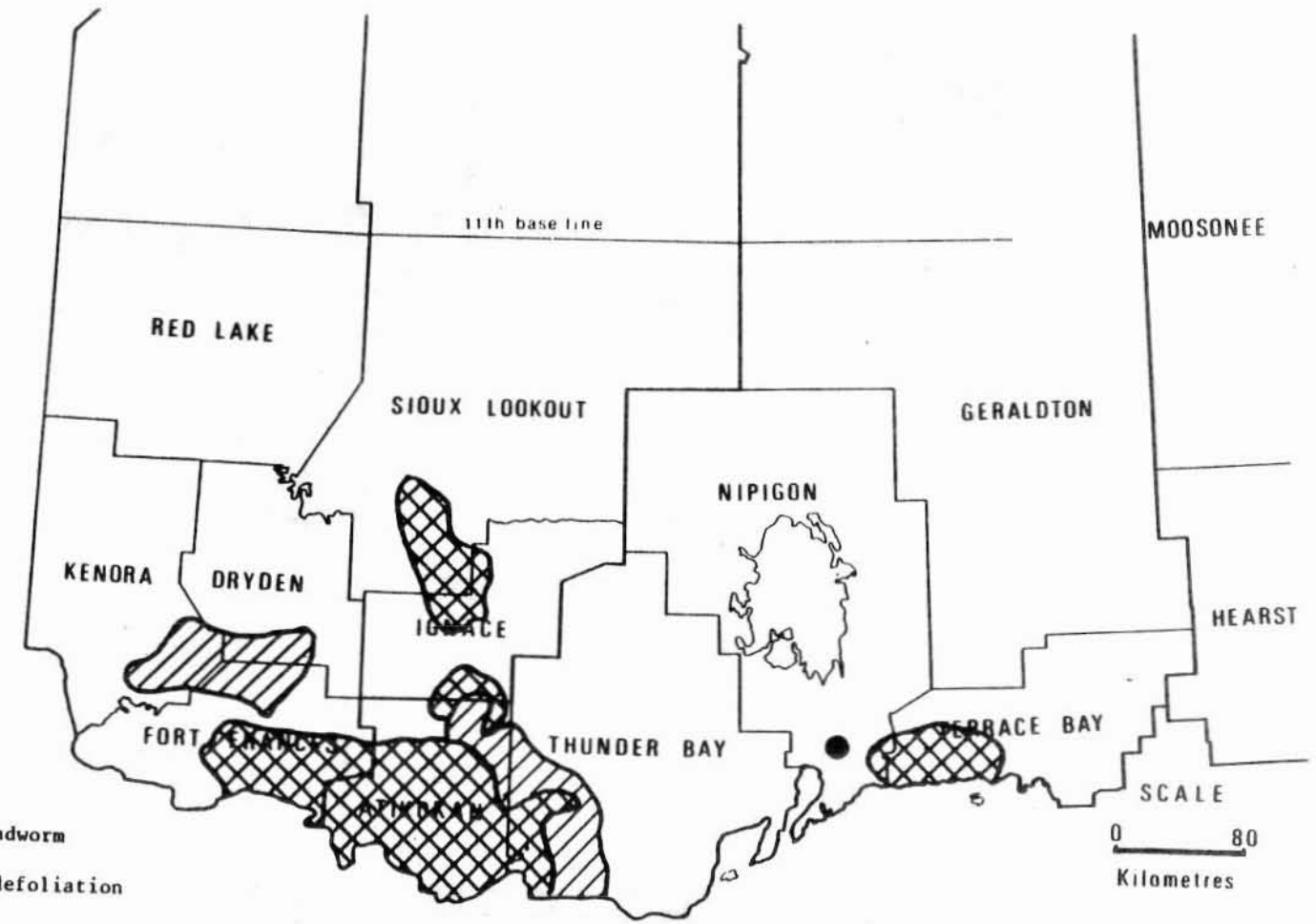
Areas within which defoliation occurred in 1958

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



Spruce Budworm

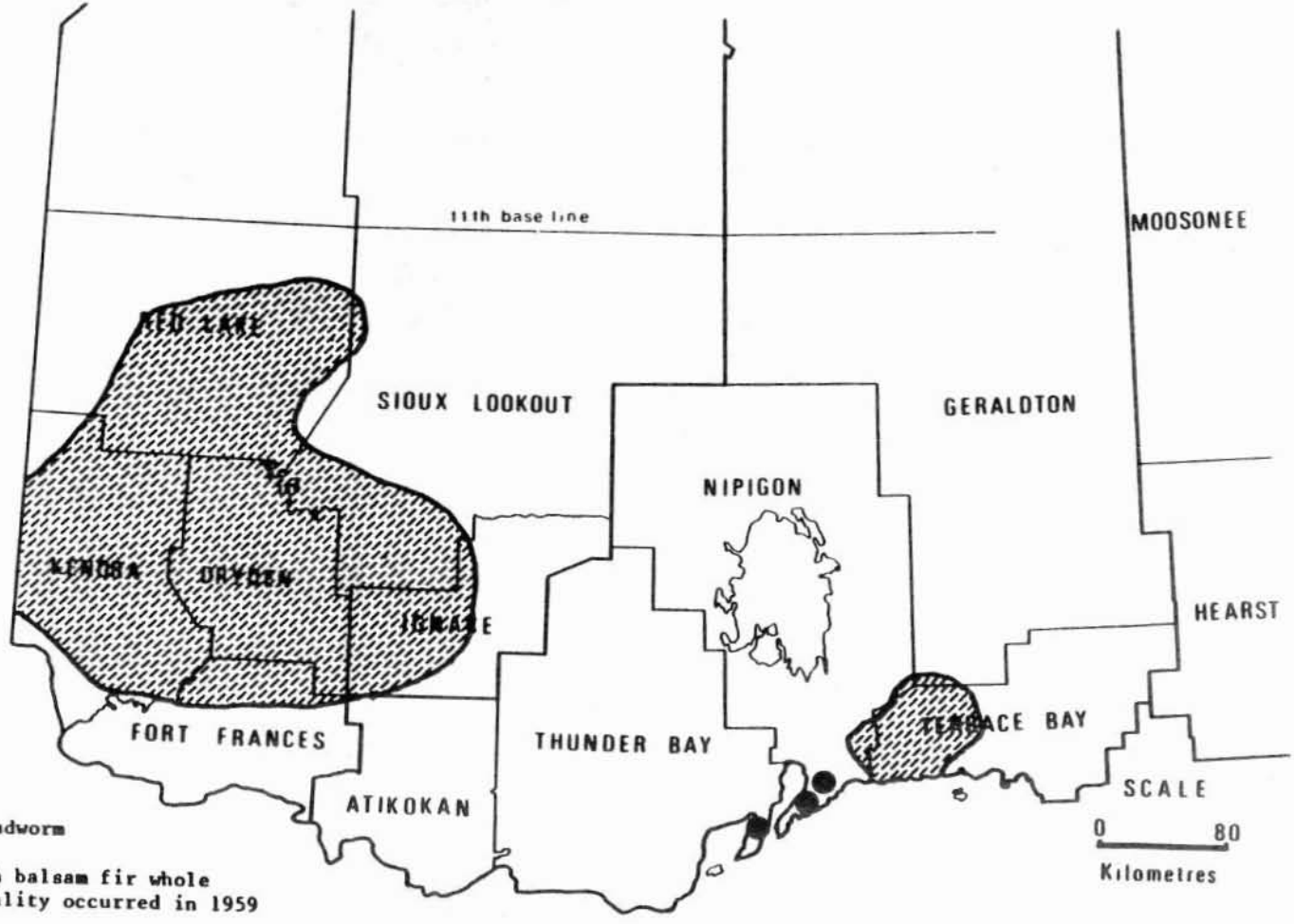
Areas with which defoliation occurred in 1959

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



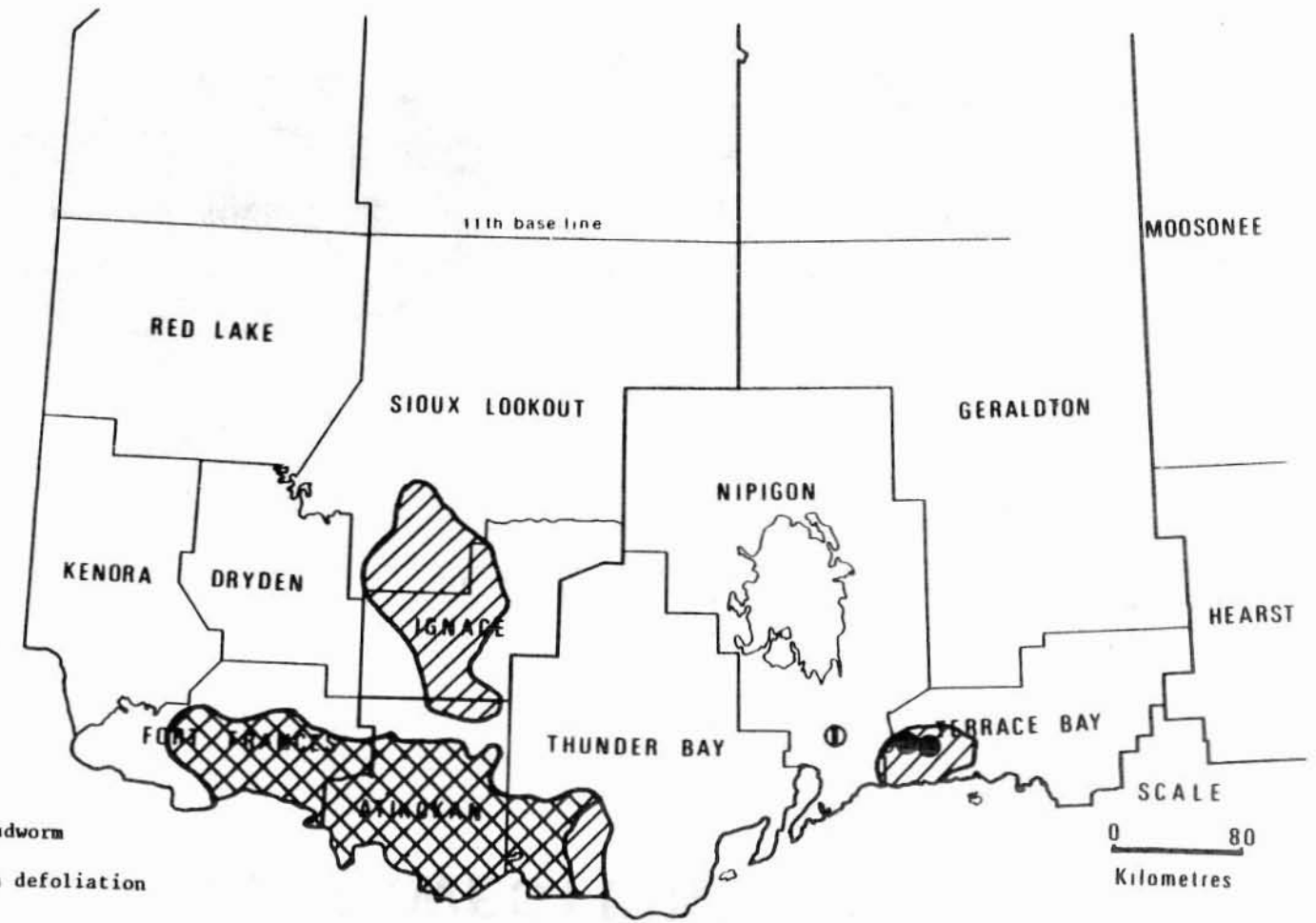
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1959

LEGEND

Mortality ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

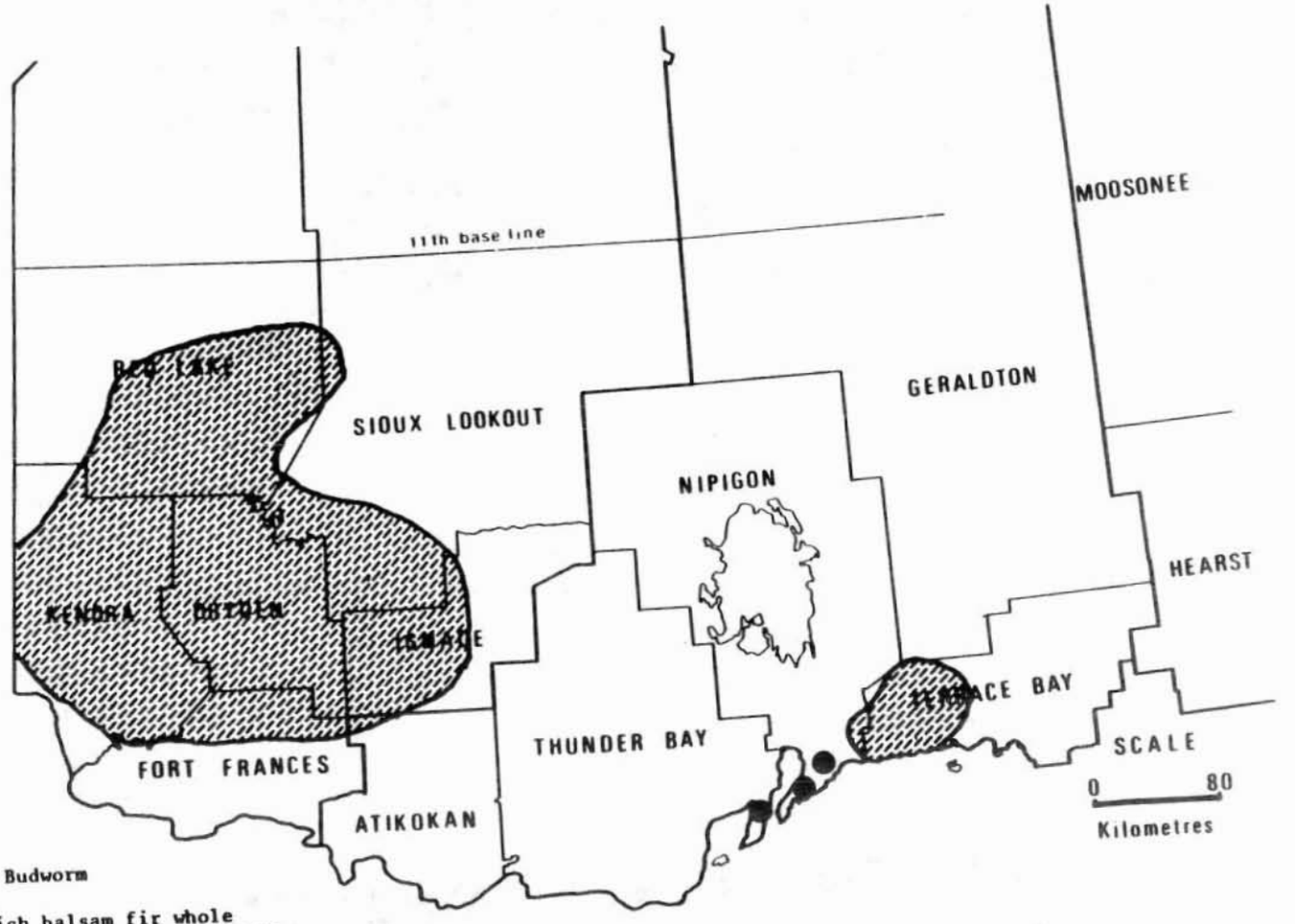
Areas within which defoliation occurred in 1960

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



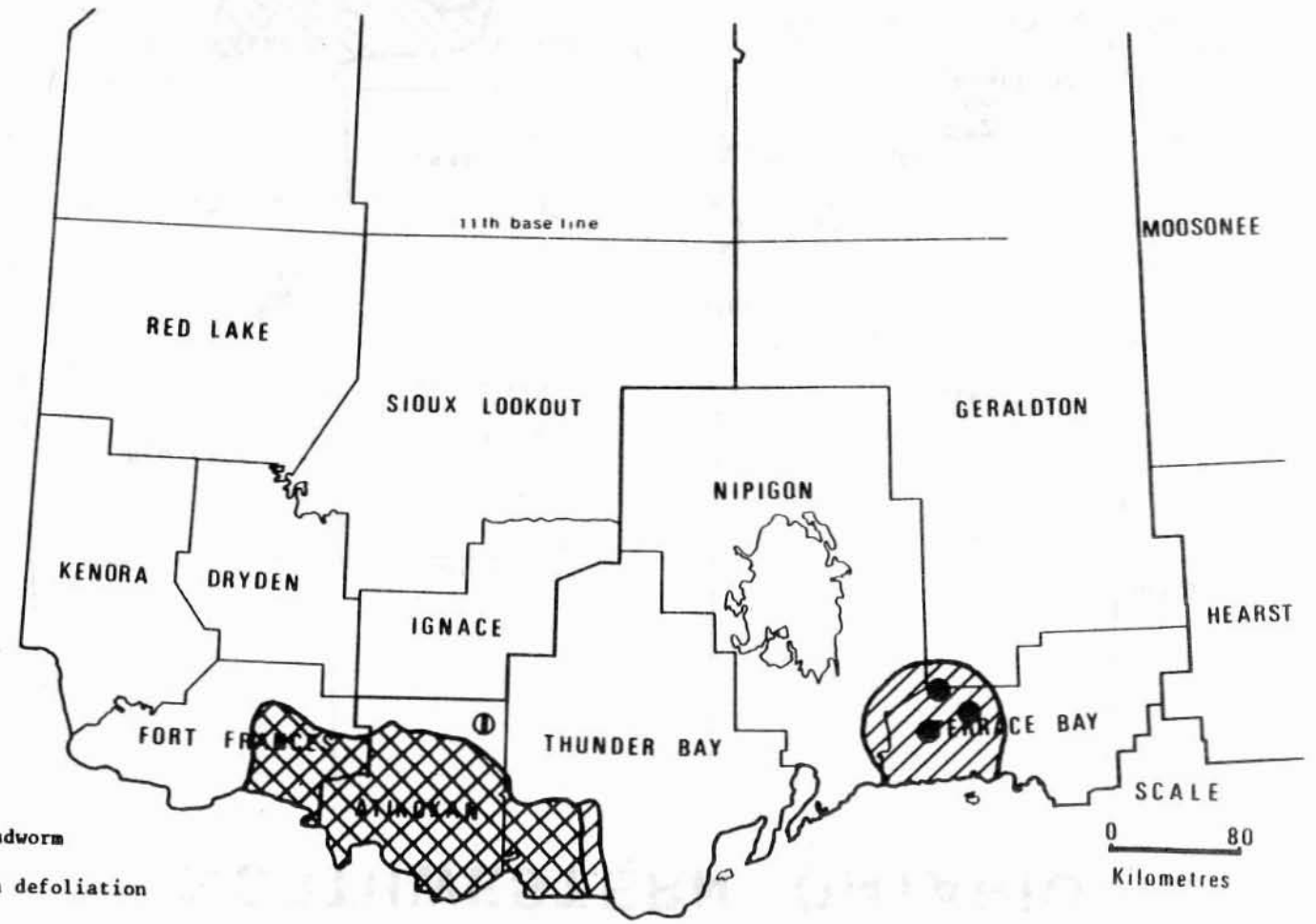
Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1960

LEGEND

Mortality ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

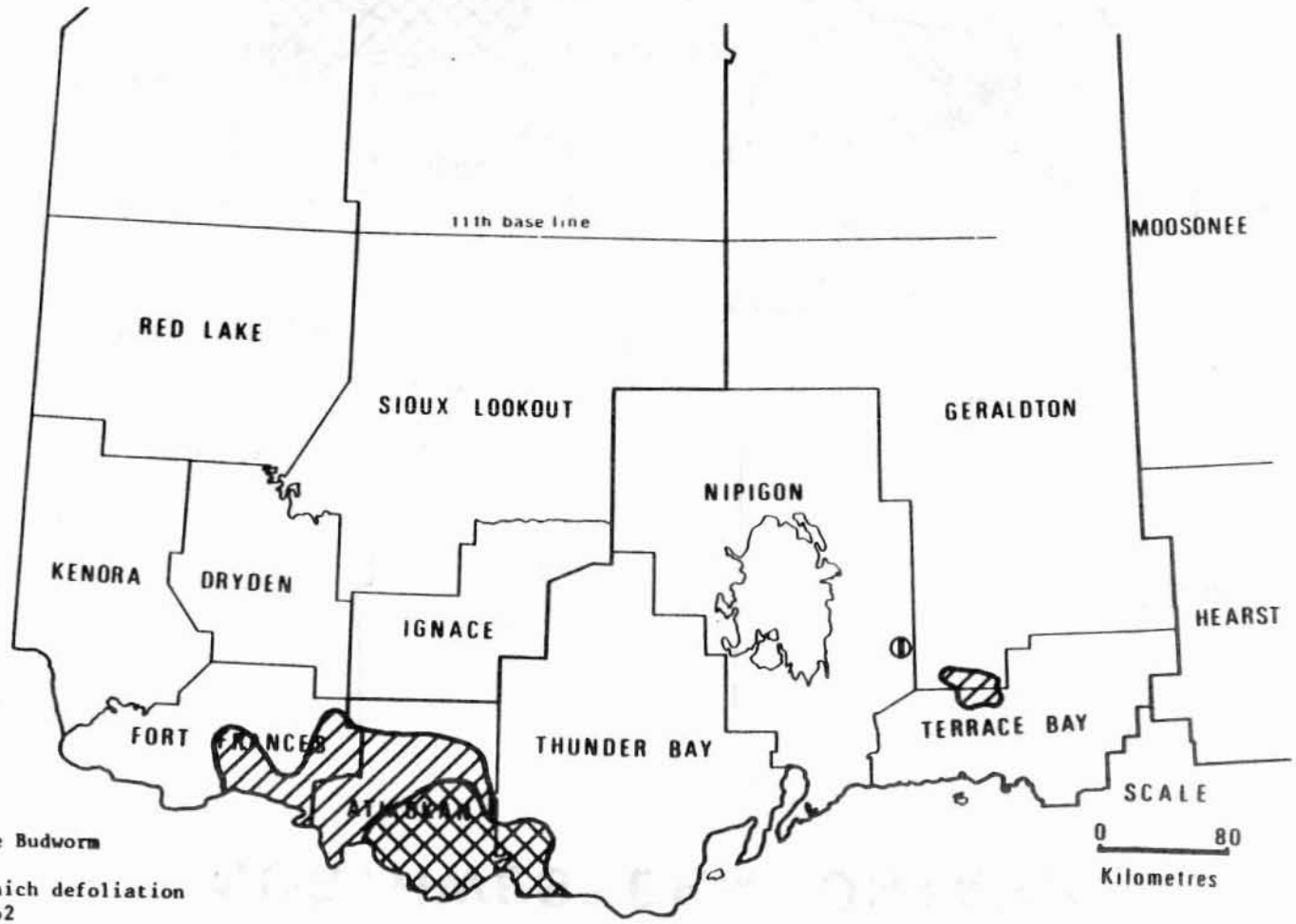
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHWESTERN ONTARIO



Spruce Budworm

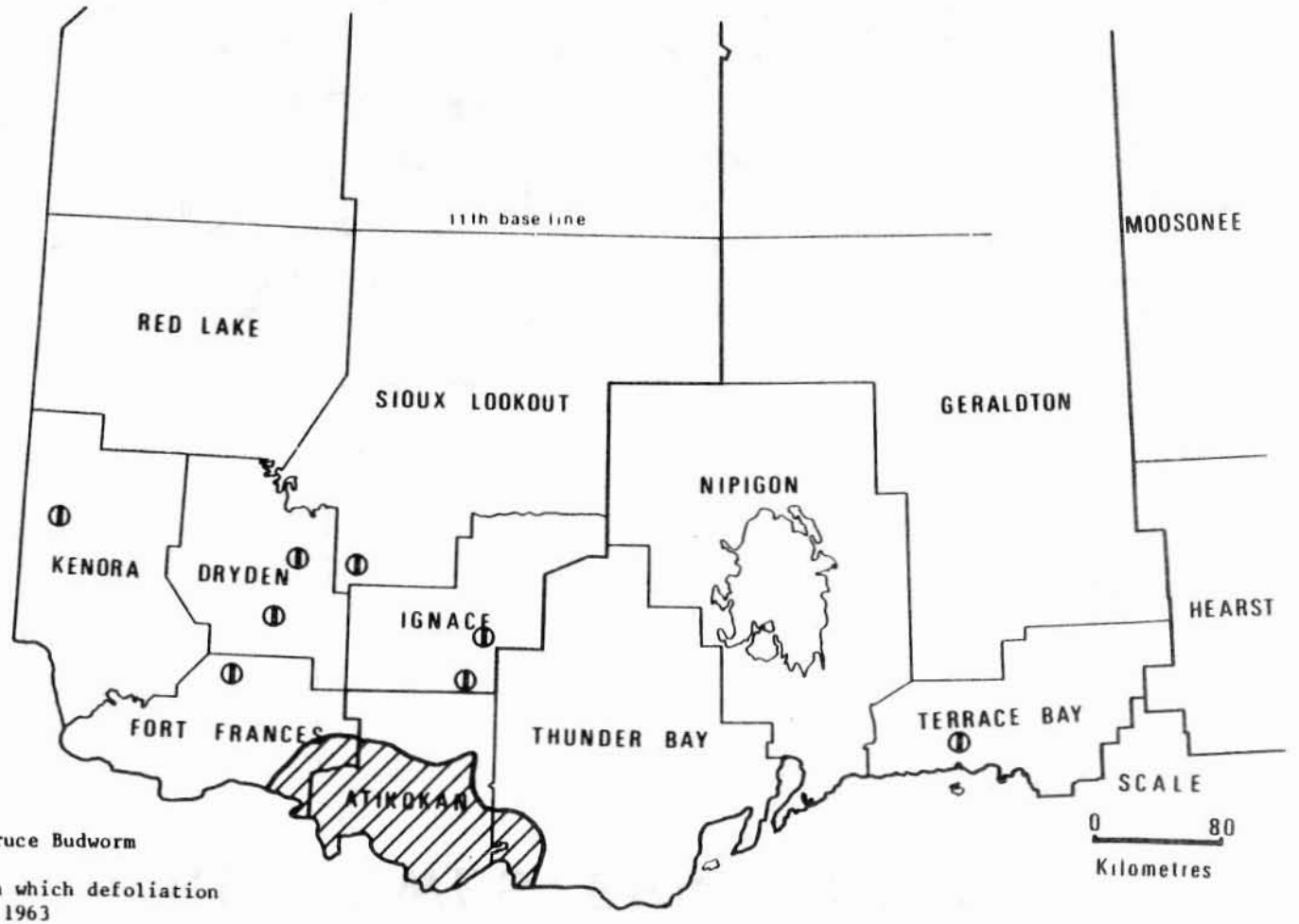
Areas within which defoliation occurred in 1962

LEGEND

Light defoliation ① or ▨

Moderate-to-severe defoliation ▩

NORTHWESTERN ONTARIO



Spruce Budworm

Areas within which defoliation occurred in 1963

LEGEND

Light defoliation ◐ or ▨

NORTHWESTERN ONTARIO

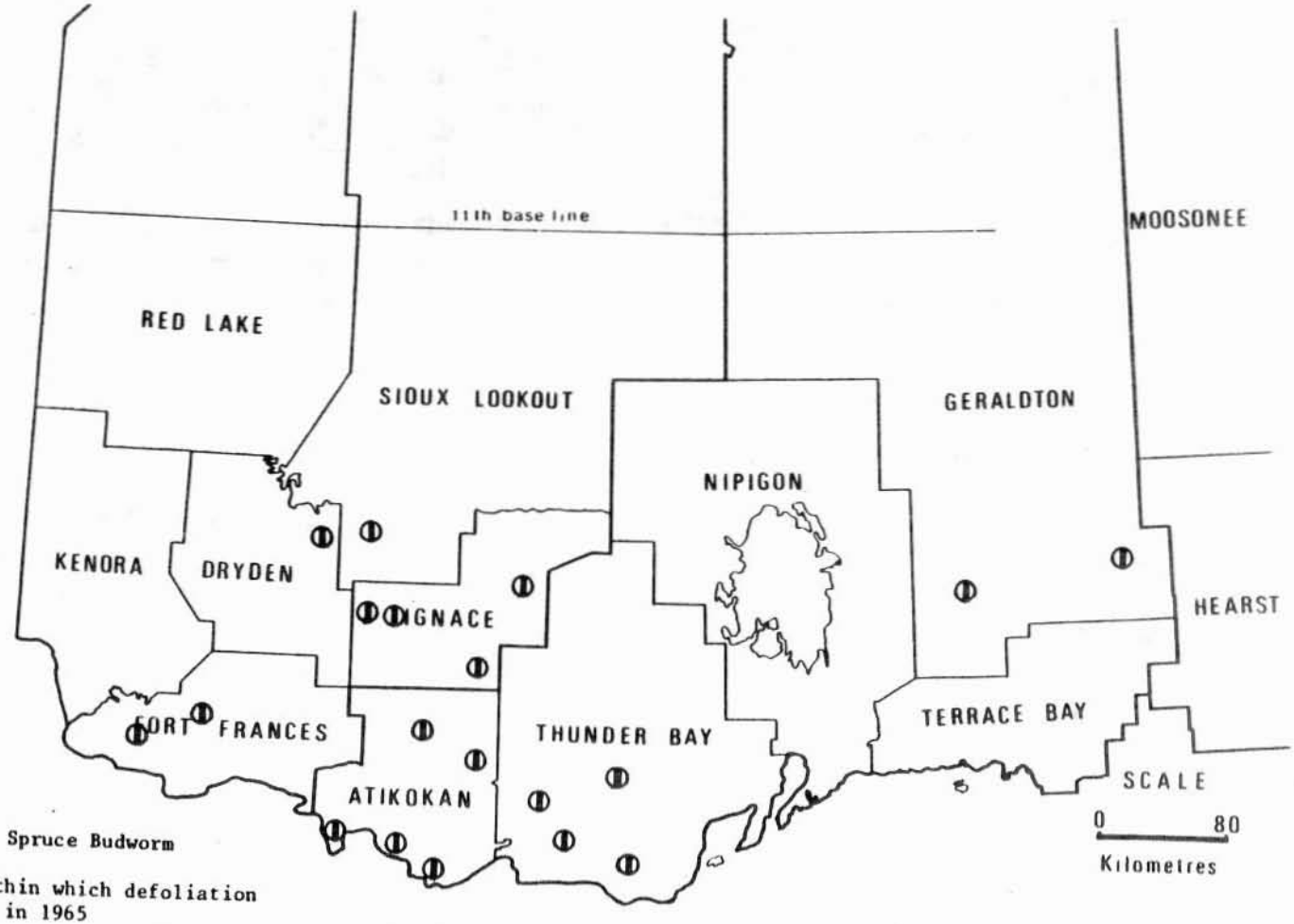
Spruce Budworm

Areas within which defoliation occurred in 1964

LEGEND

Light defoliation ◑

NORTHWESTERN ONTARIO



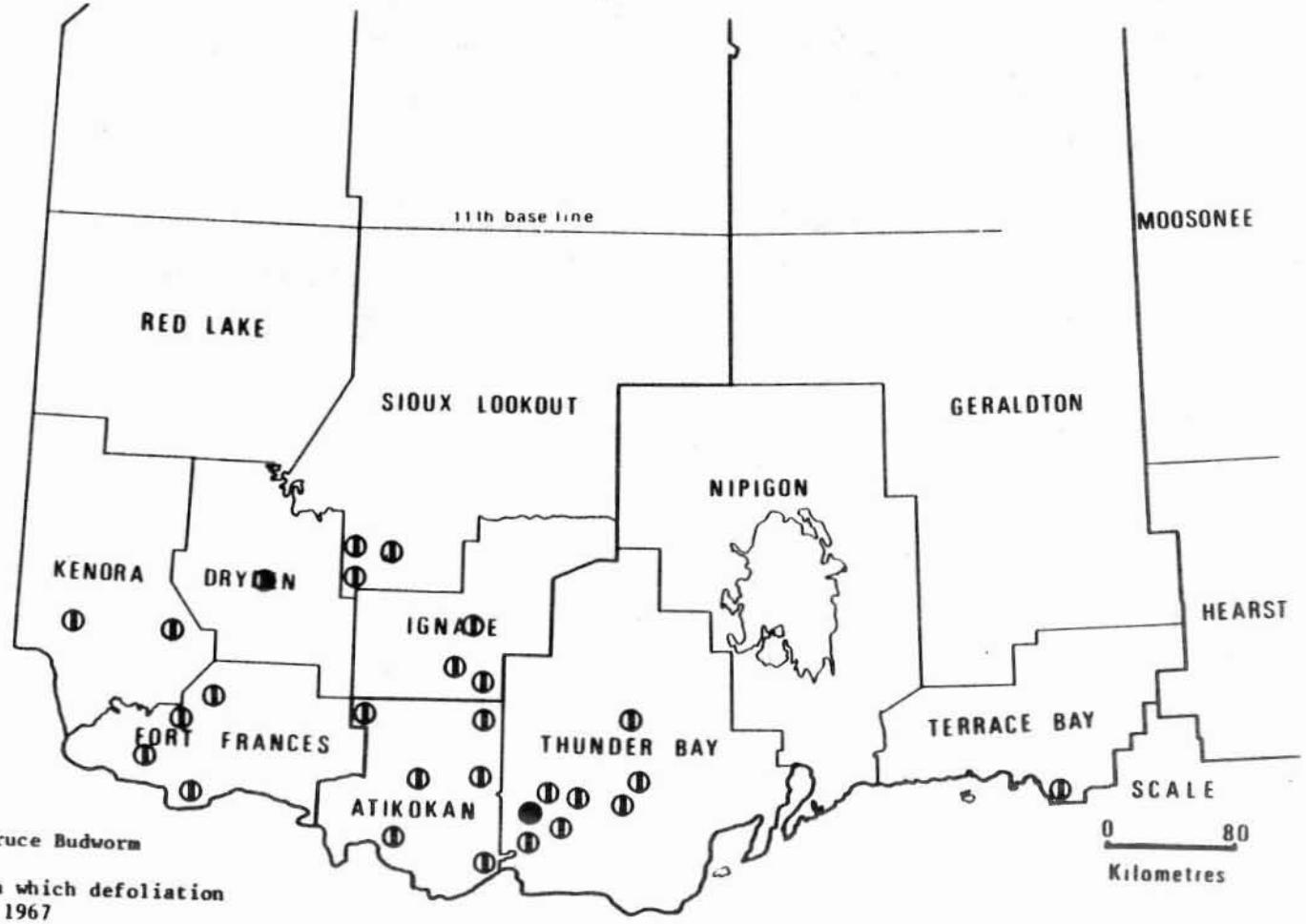
Spruce Budworm

Areas within which defoliation occurred in 1965

LEGEND

Light defoliation ◑

NORTHWESTERN ONTARIO



Spruce Budworm

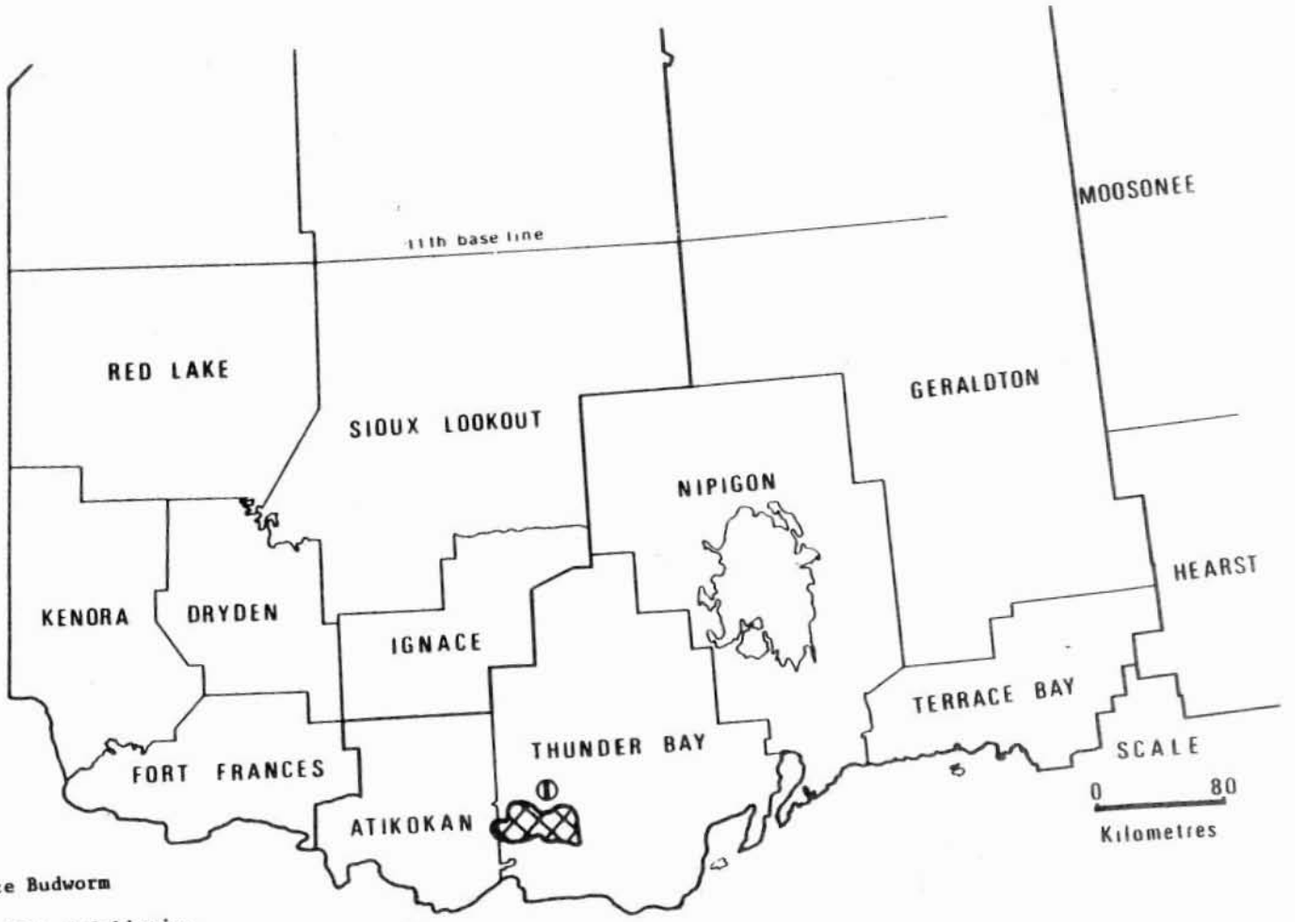
Areas within which defoliation occurred in 1967

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Spruce Budworm

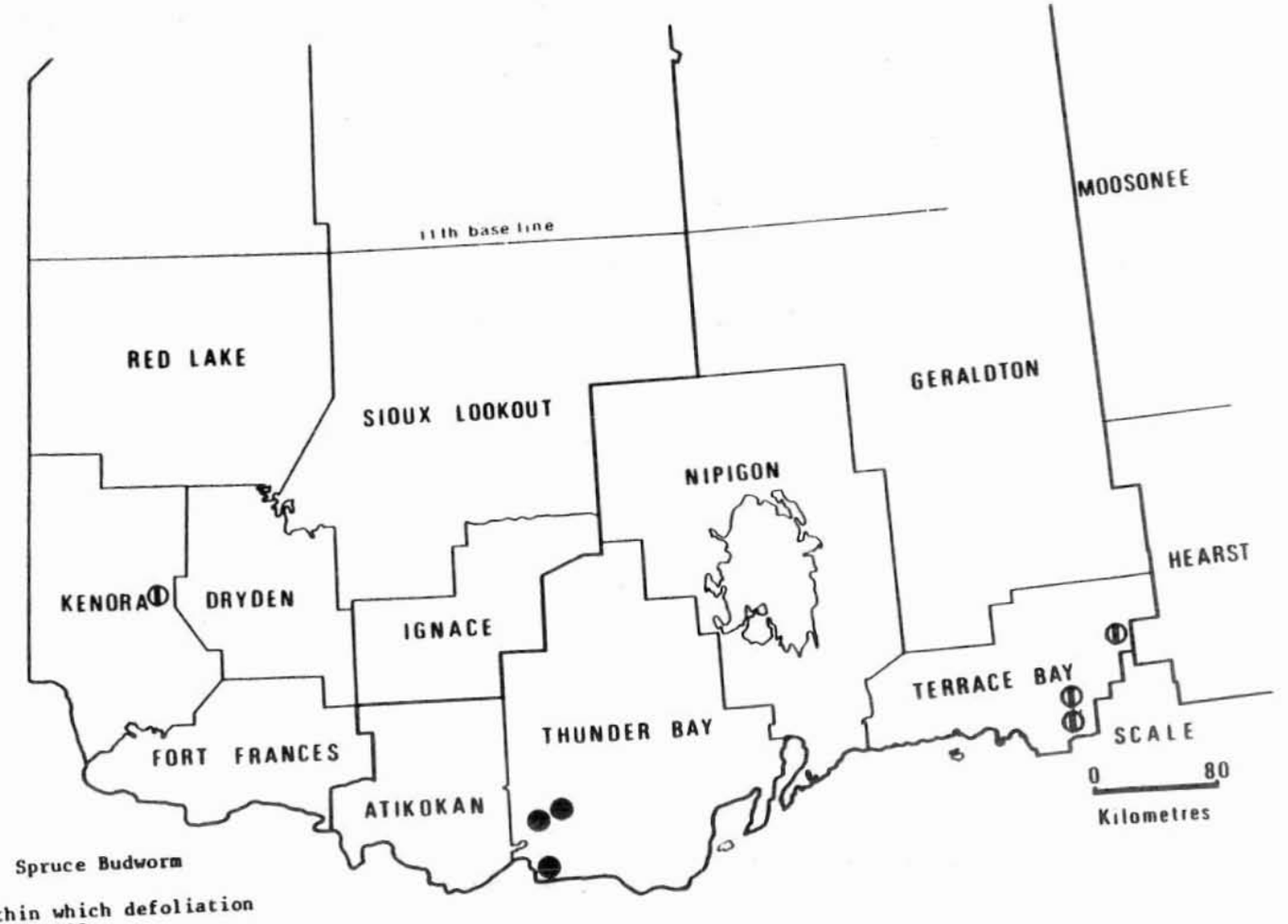
Areas within which defoliation occurred in 1968

LEGEND

Light defoliation ①

Moderate-to-severe defoliation ▨

NORTHWESTERN ONTARIO



Spruce Budworm

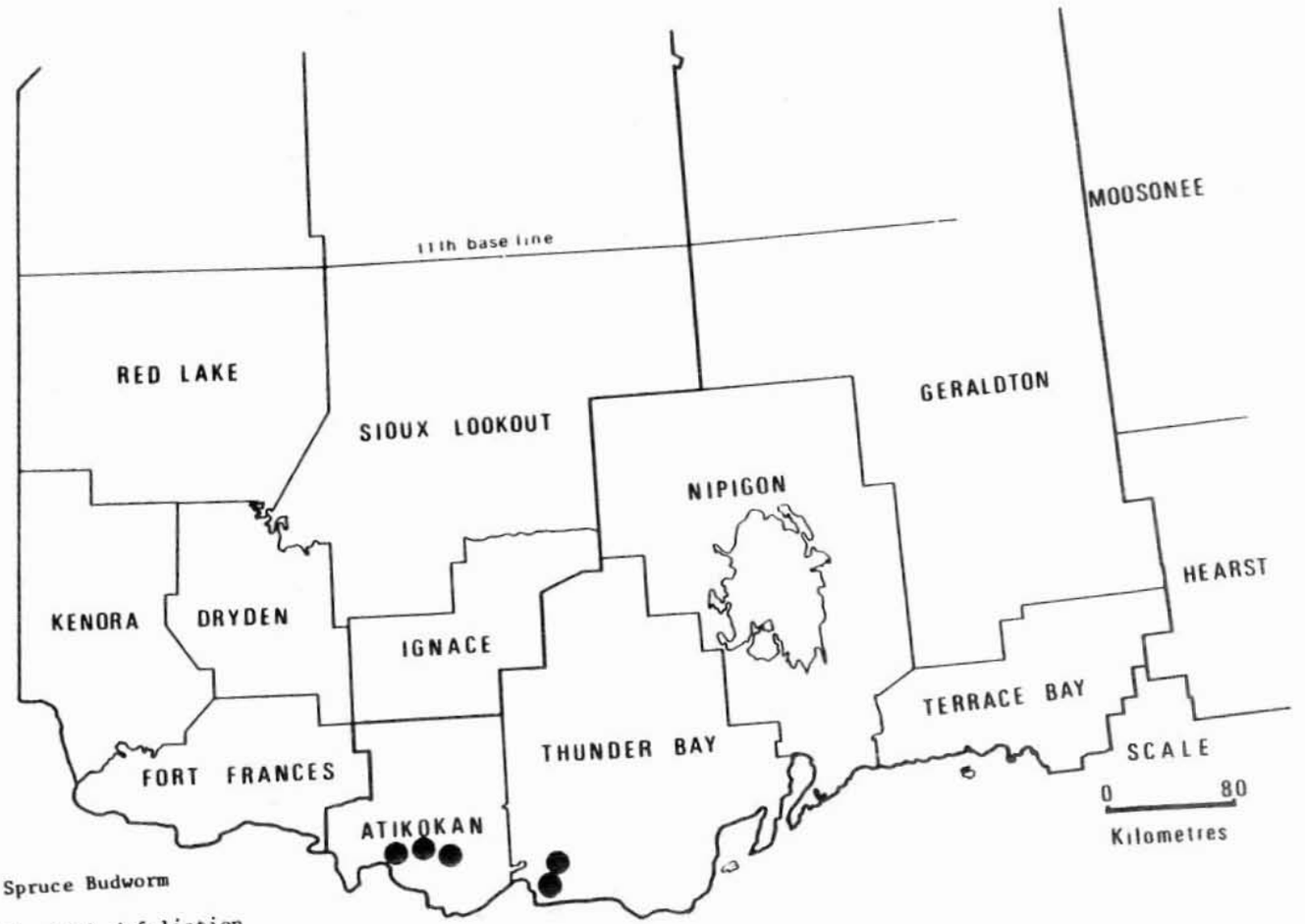
Areas within which defoliation occurred in 1969

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



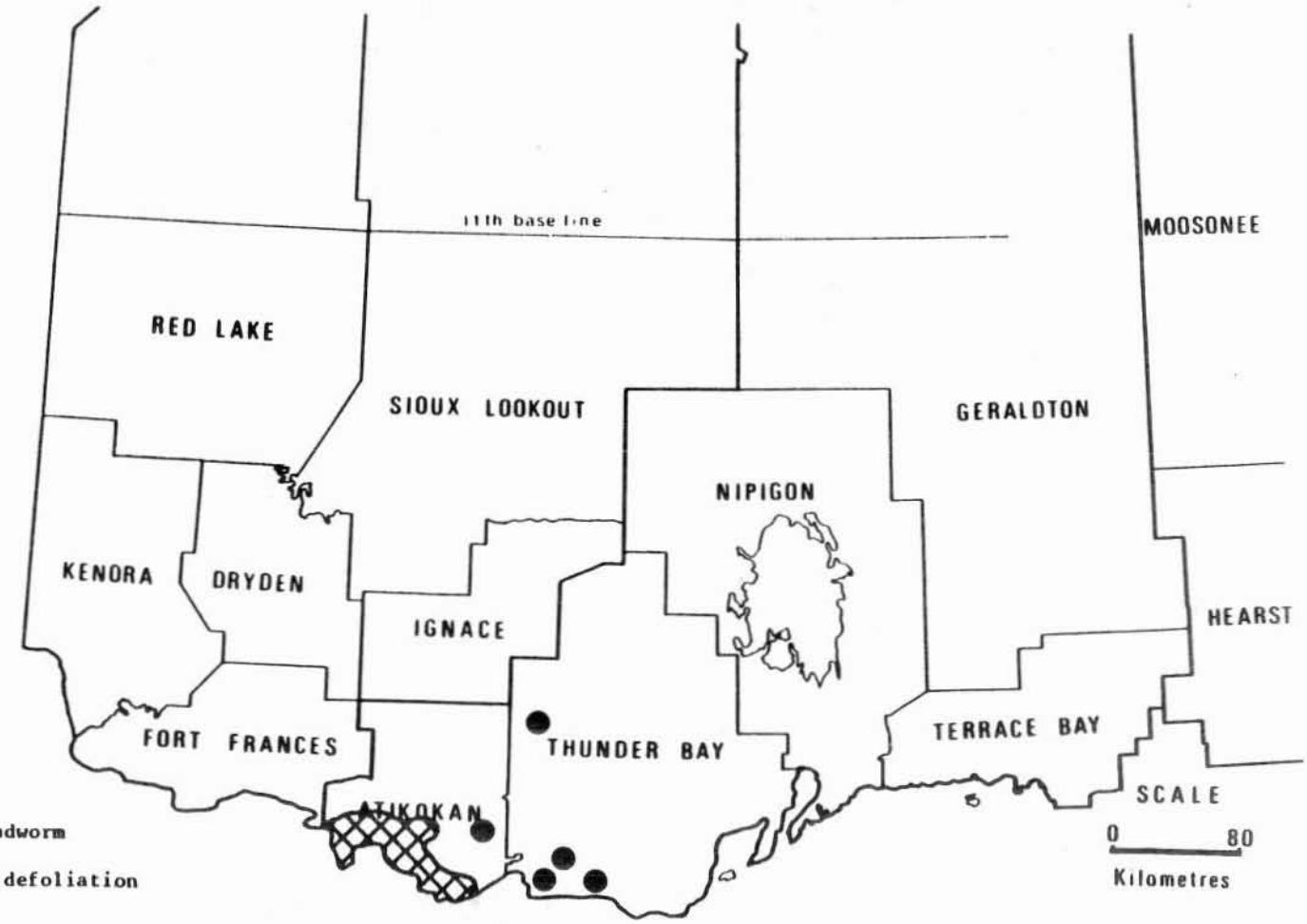
Spruce Budworm

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



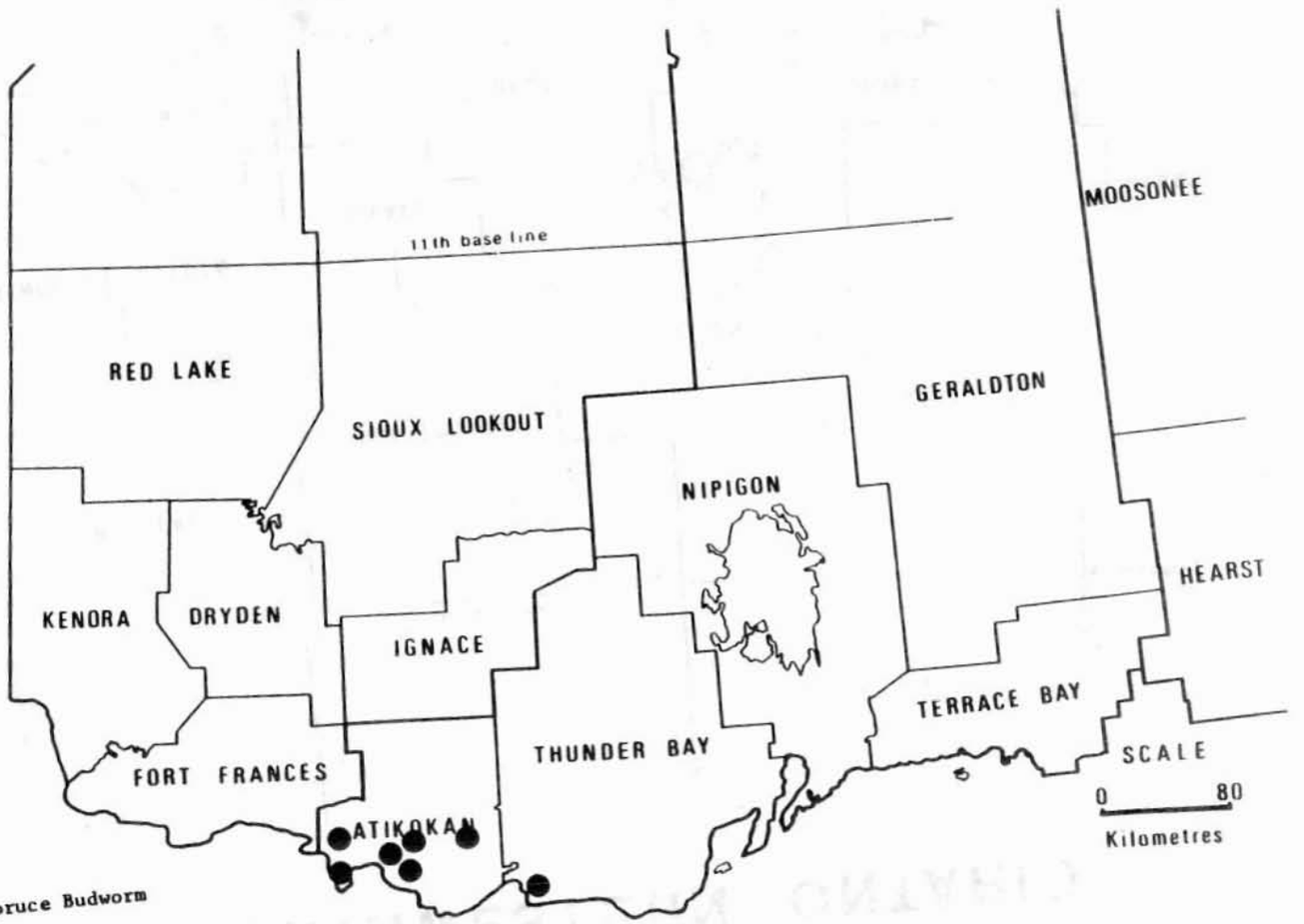
Spruce Budworm

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Spruce Budworm

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO

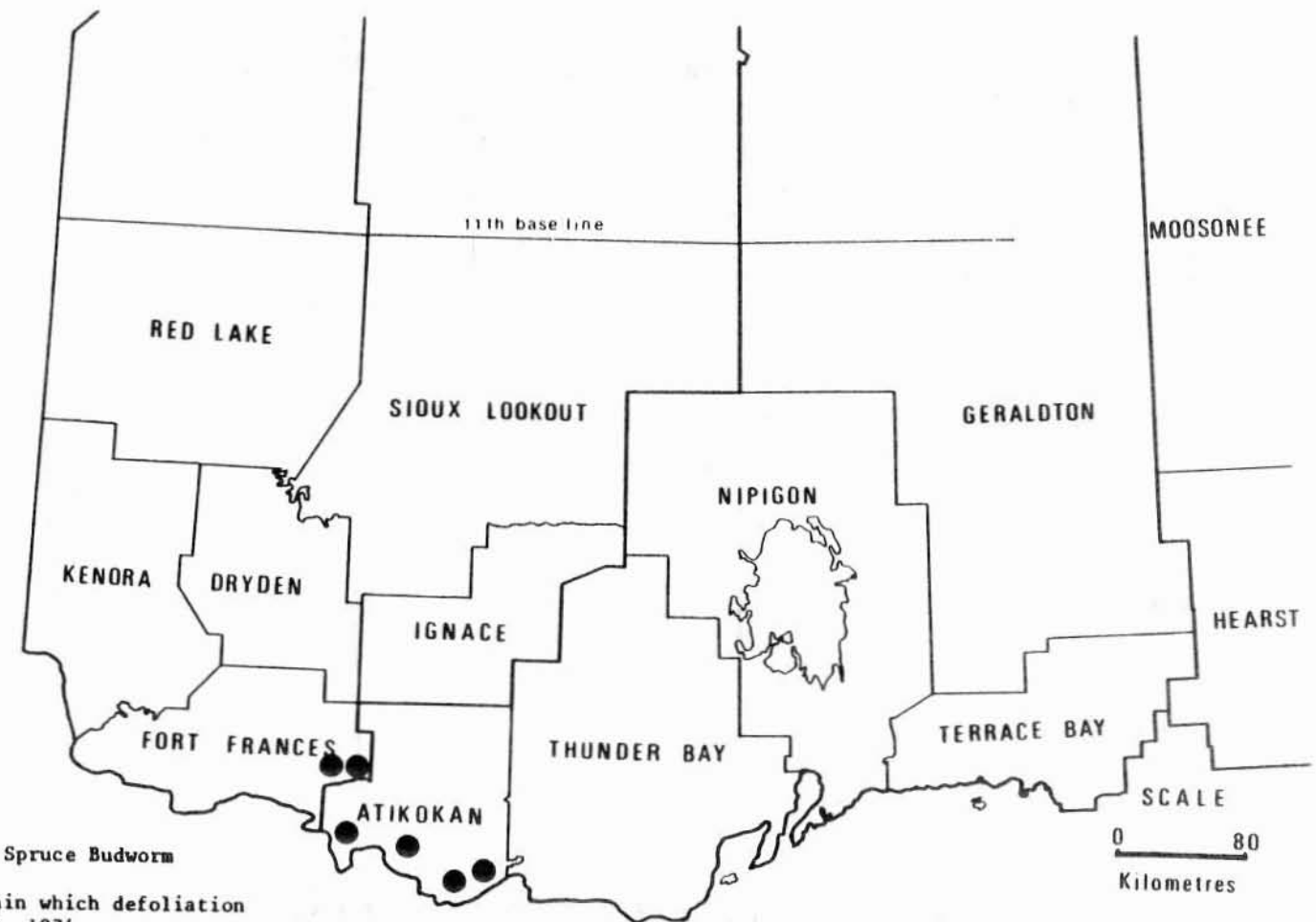
Spruce Budworm

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



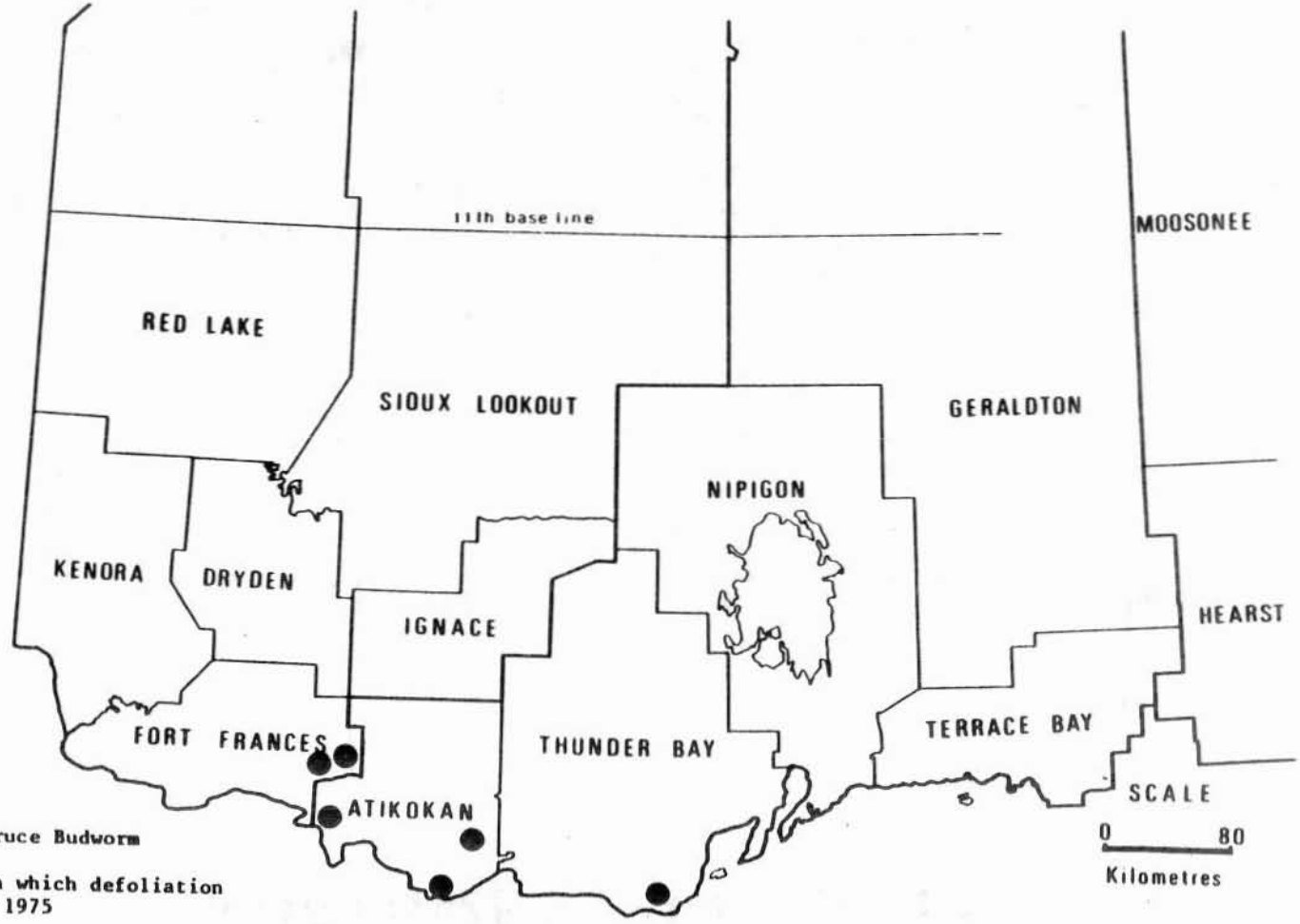
Spruce Budworm

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



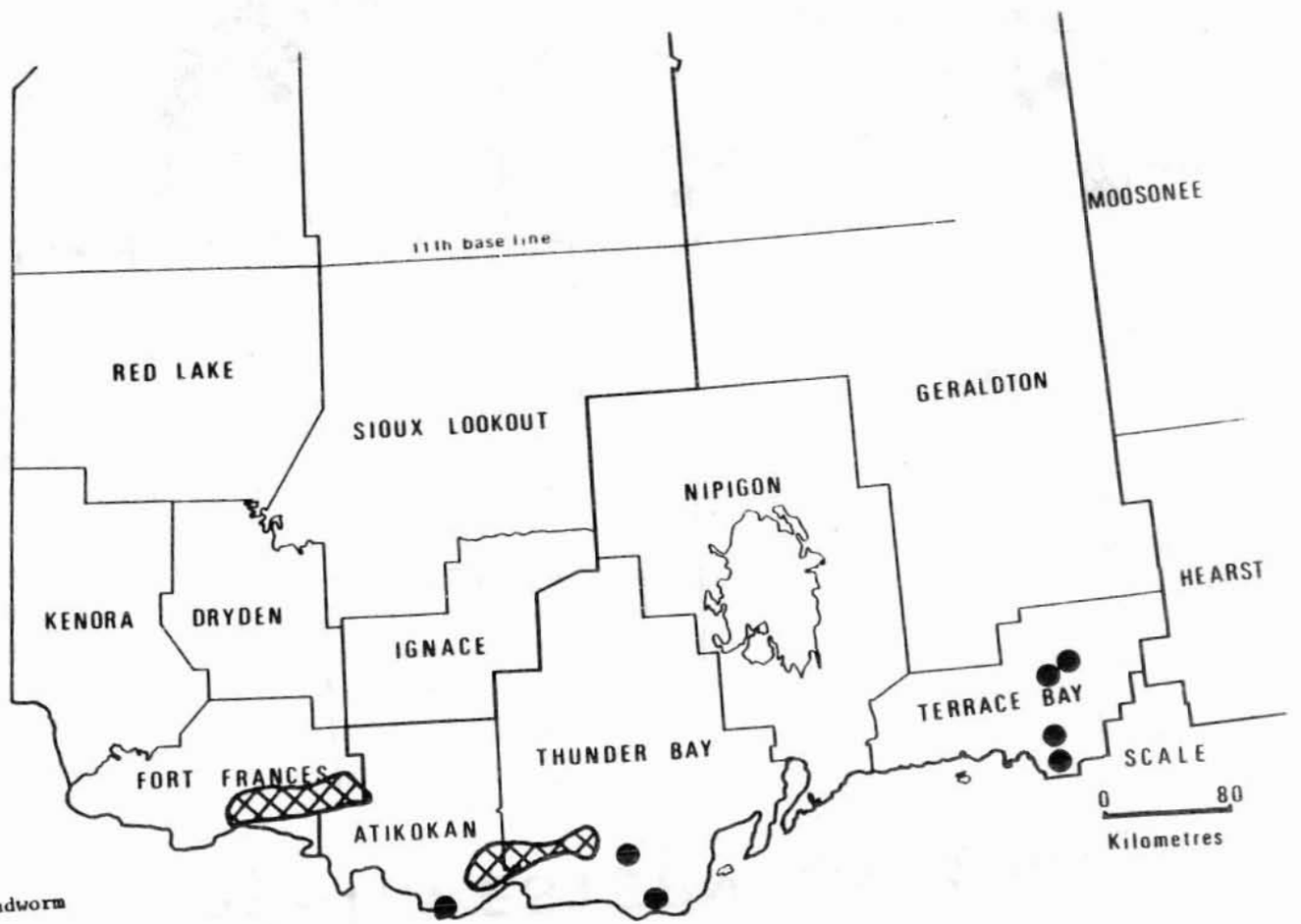
Spruce Budworm

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



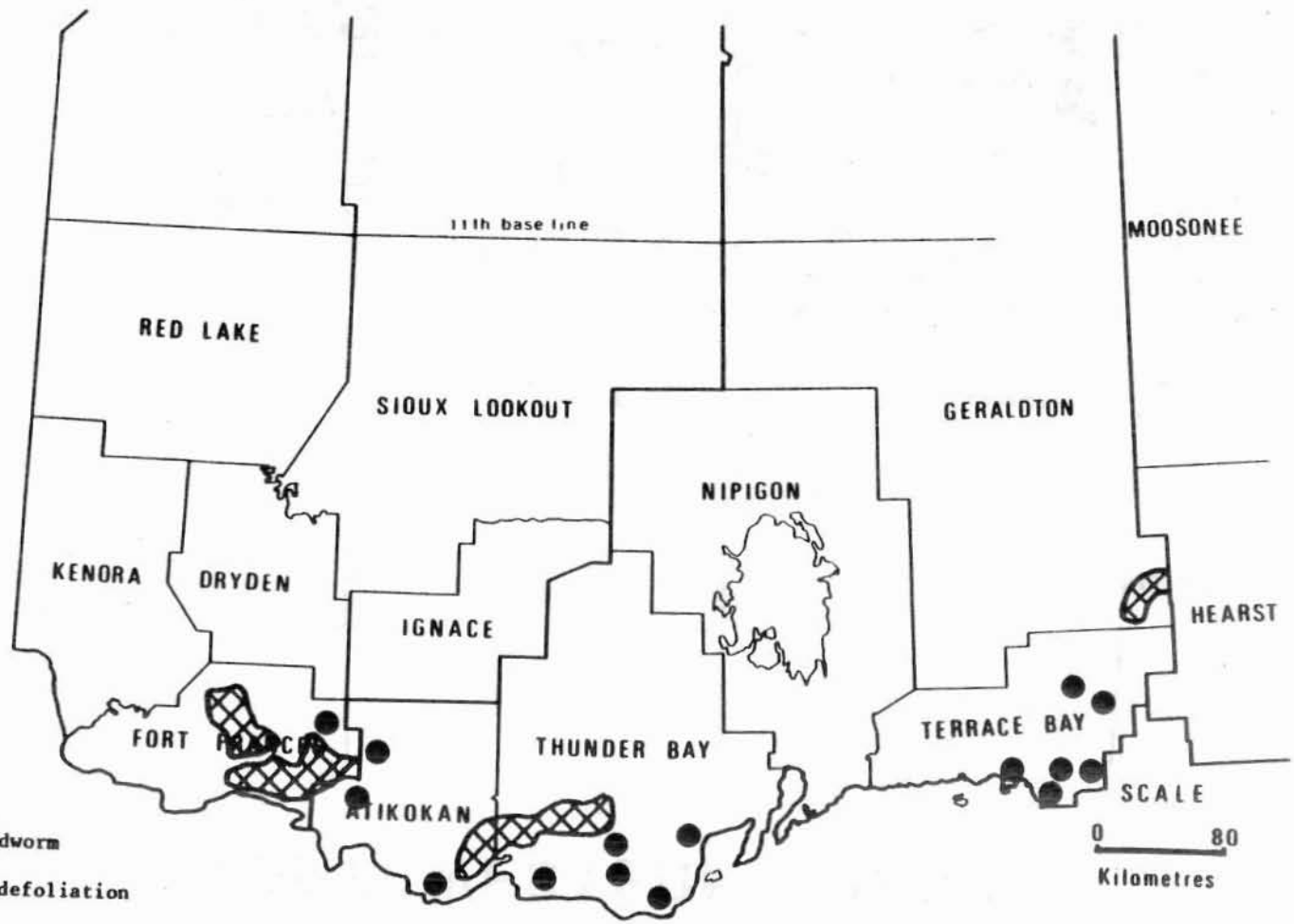
Spruce Budworm

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



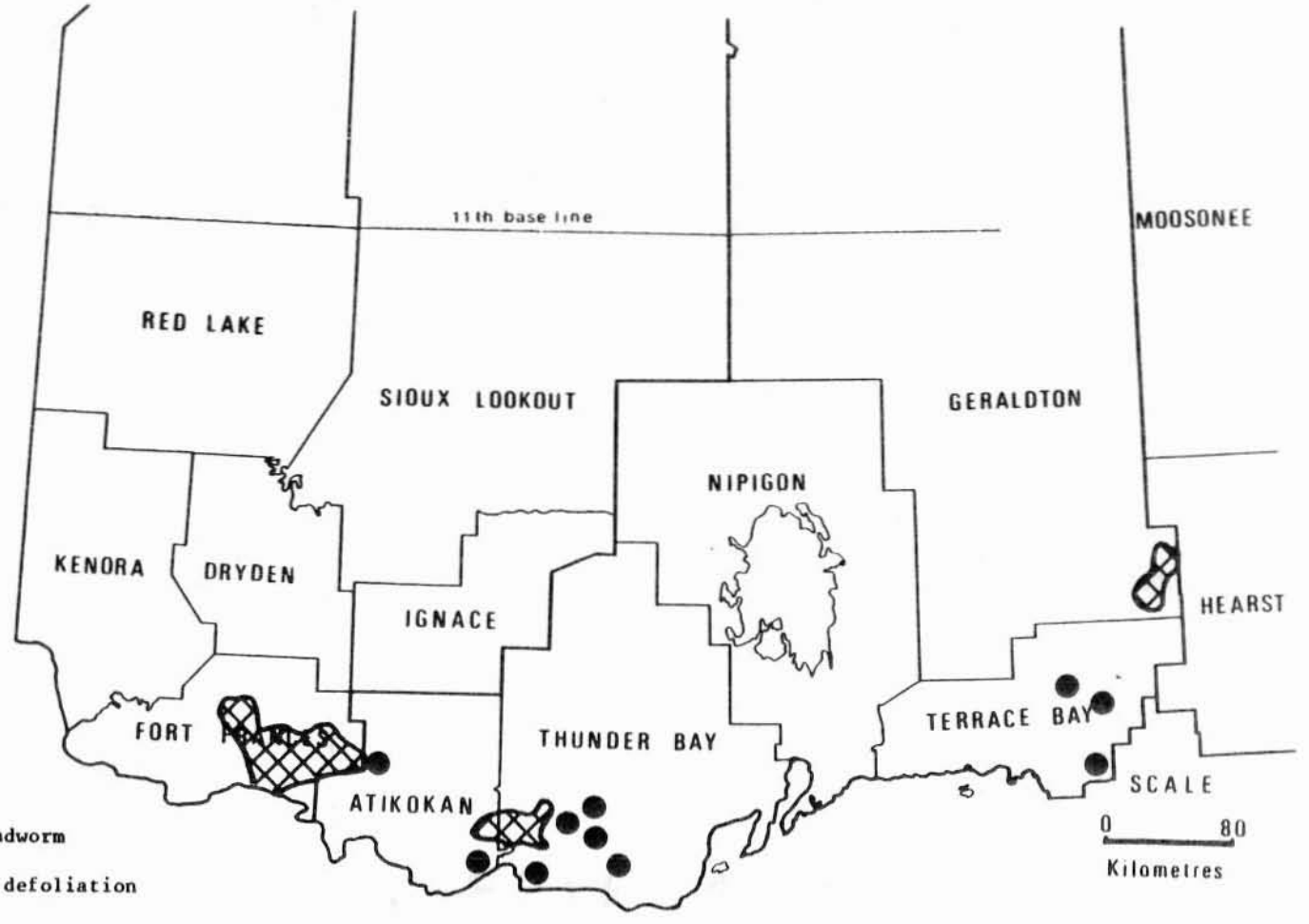
Spruce Budworm

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



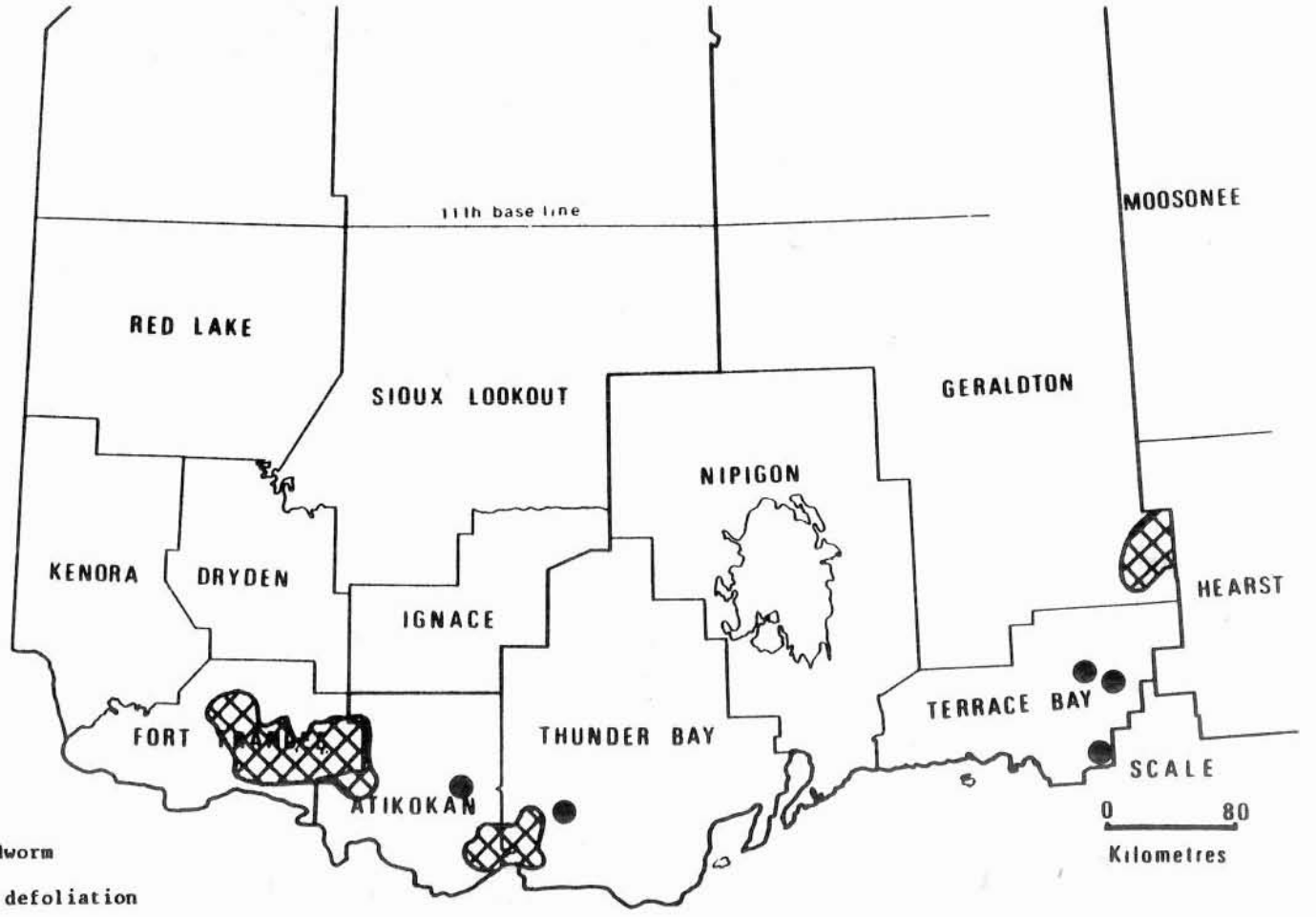
Spruce Budworm

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



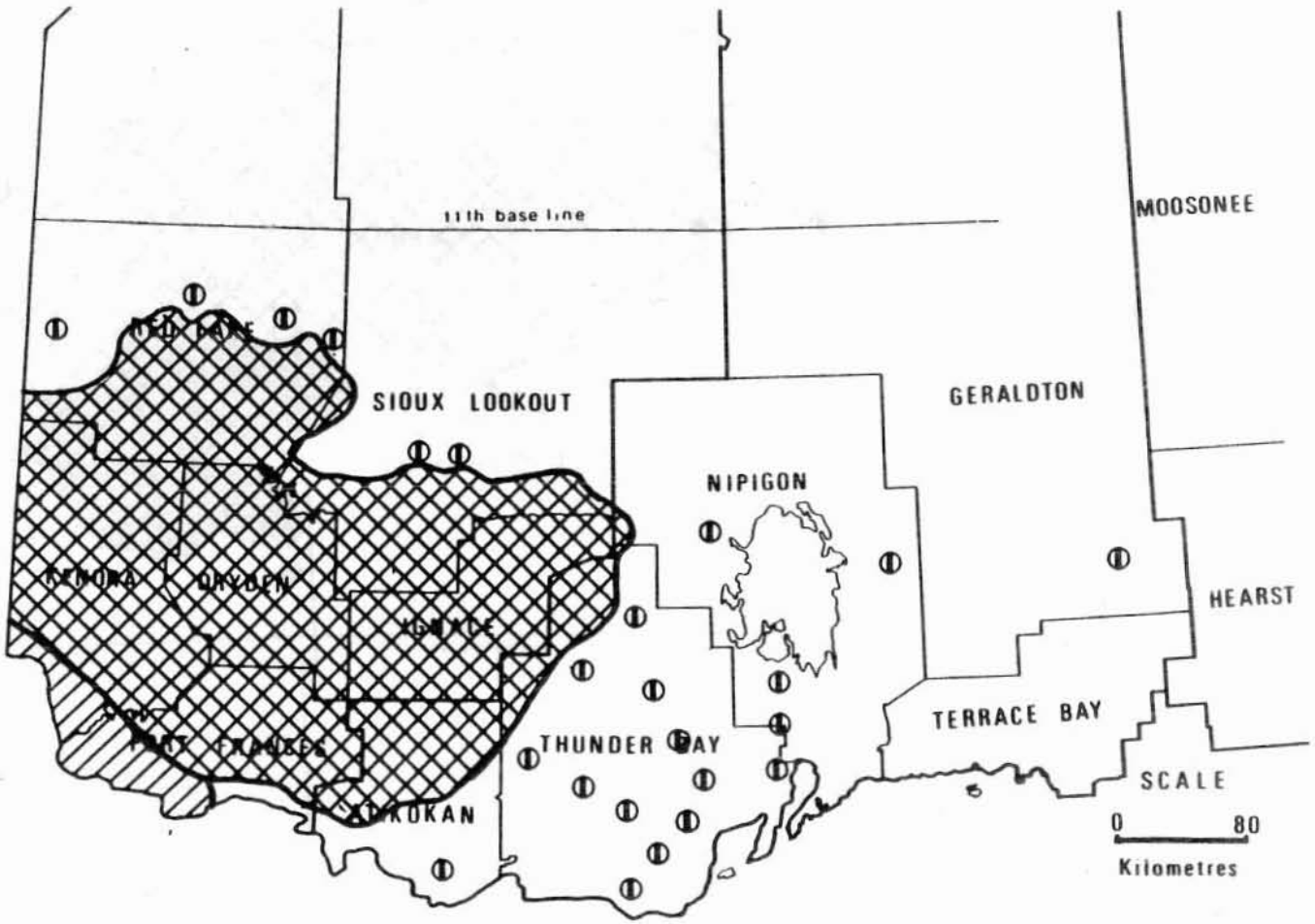
Spruce Budworm

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

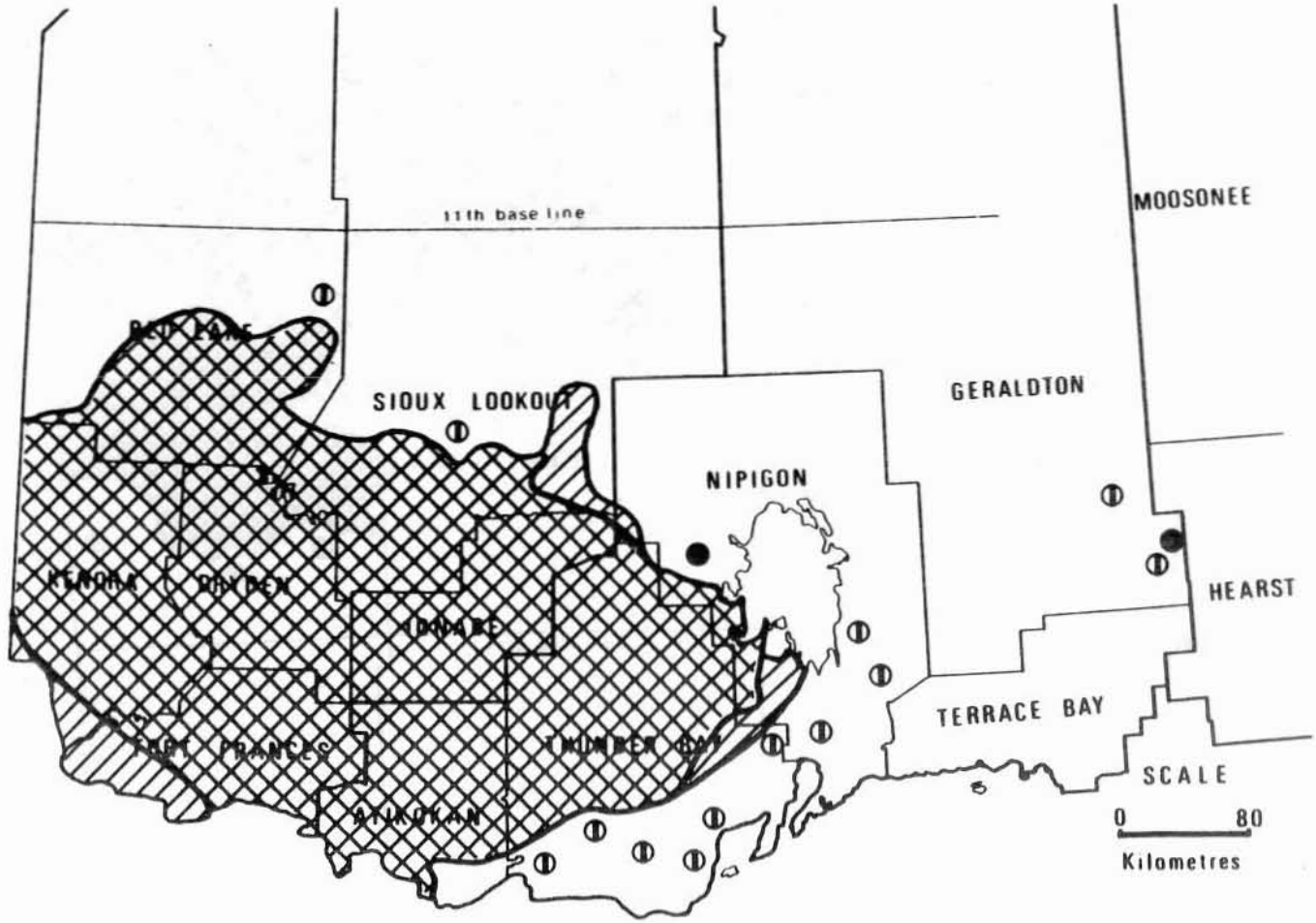
Areas within which defoliation occurred in 1964

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ▩

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1965

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1966

LEGEND

Light defoliation ① or

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO

Forest Tent Caterpillar

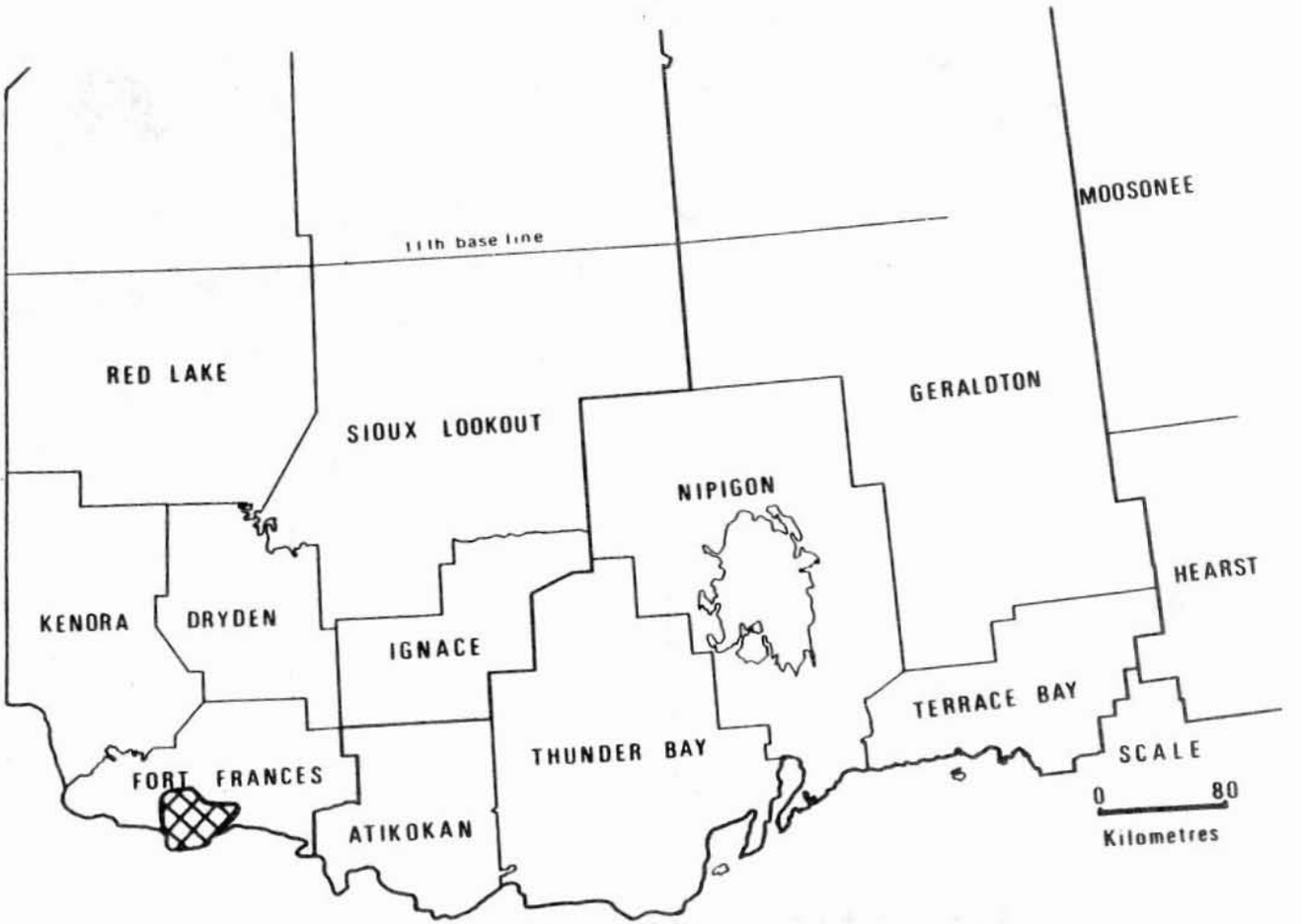
Areas within which defoliation occurred in 1967

LEGEND

Light defoliation ①

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



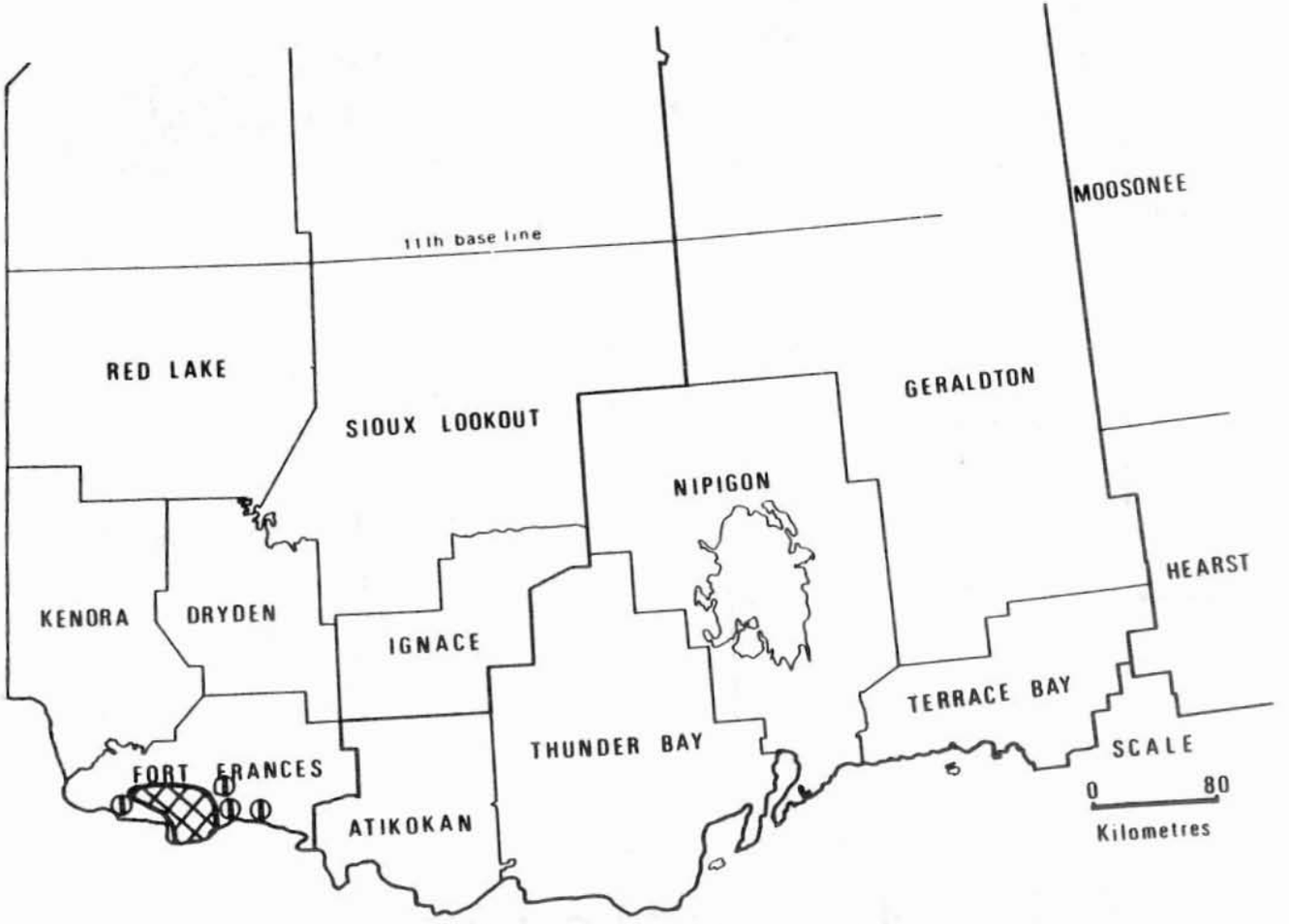
Forest Tent Caterpillar

Areas within which defoliation occurred in 1968

LEGEND

Moderate-to-severe defoliation

NORTHWESTERN ONTARIO



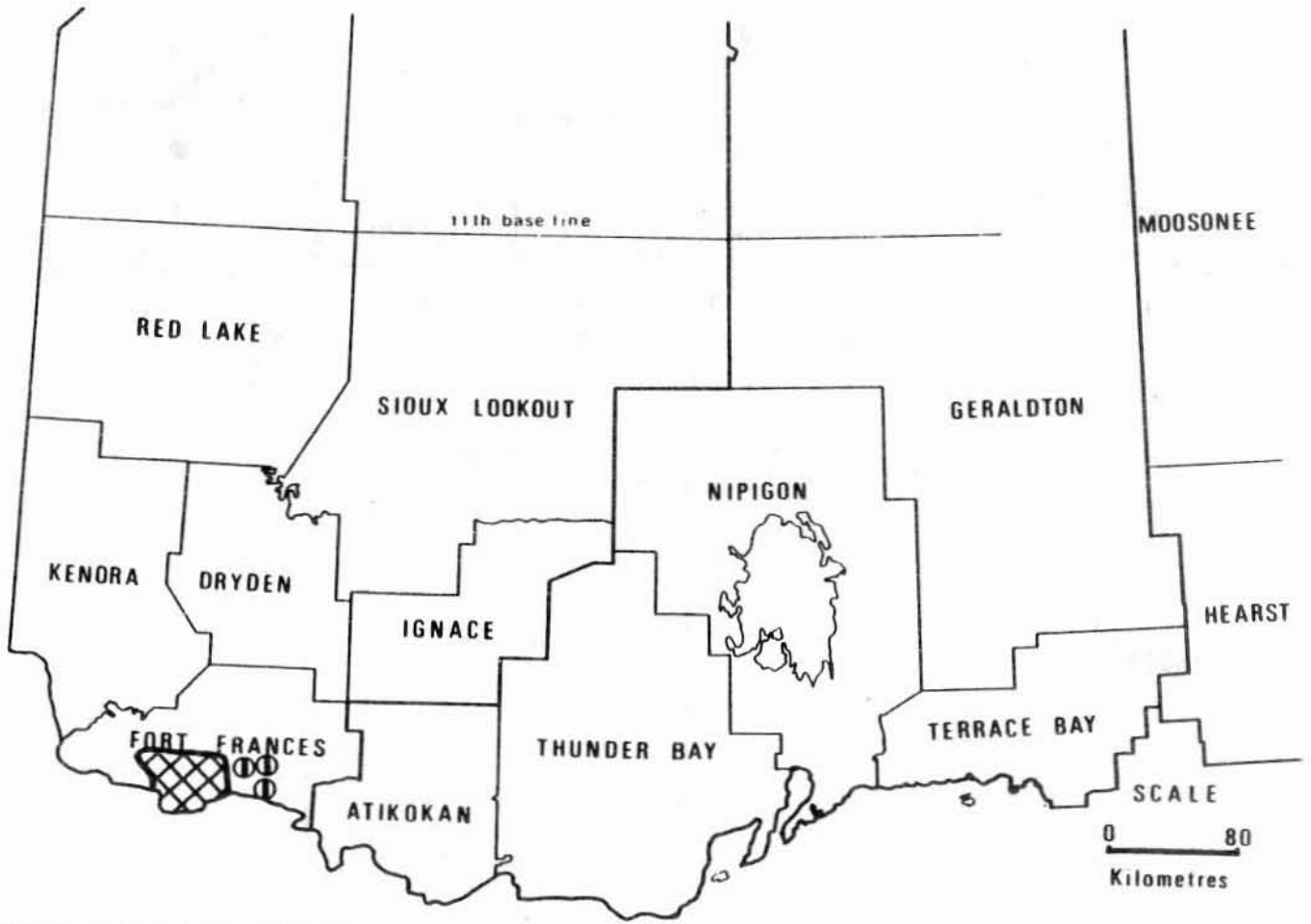
Forest Tent Caterpillar

Areas within which defoliation occurred in 1969

LEGEND

Light defoliation

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

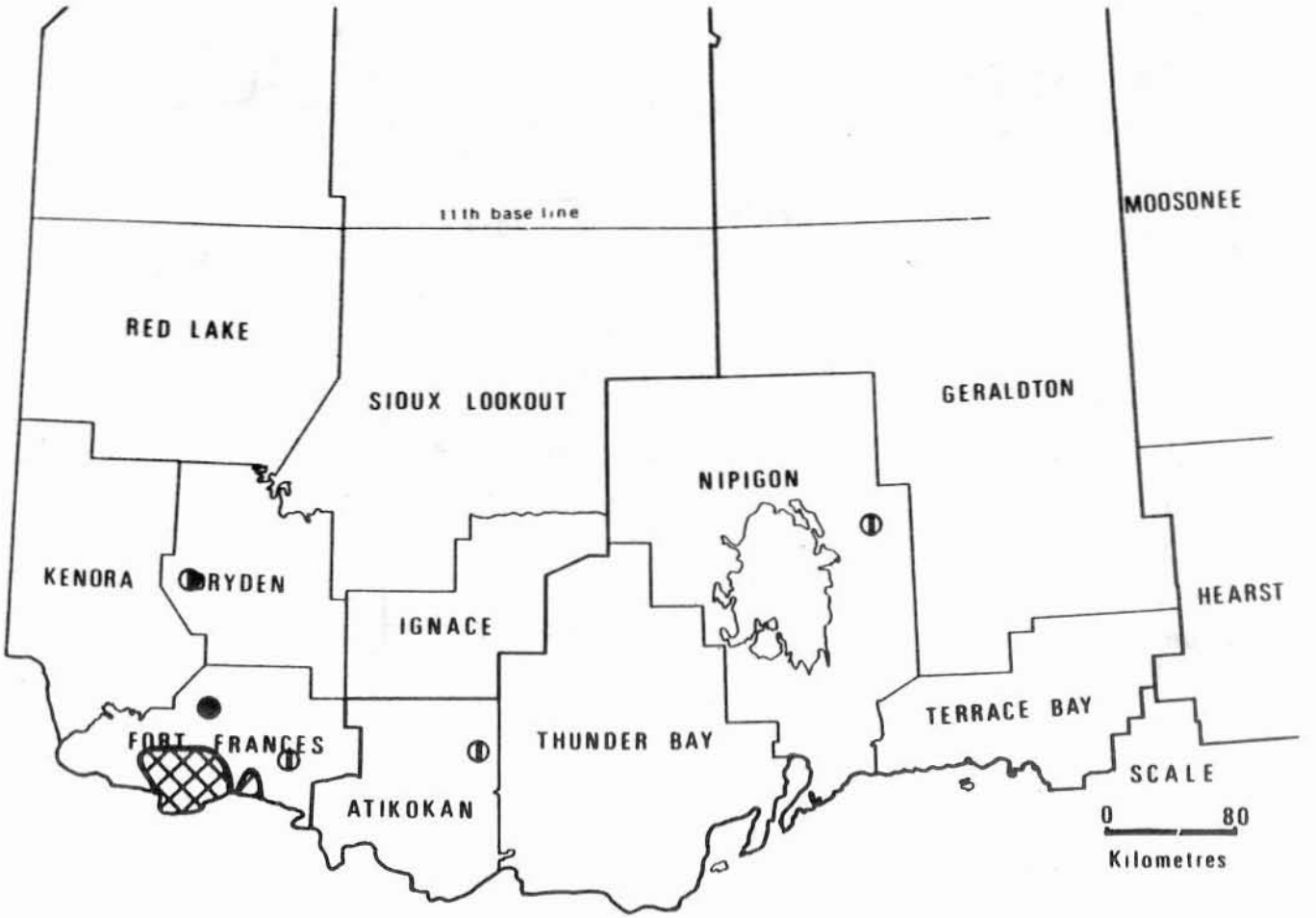
Areas within which defoliation occurred in 1970

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

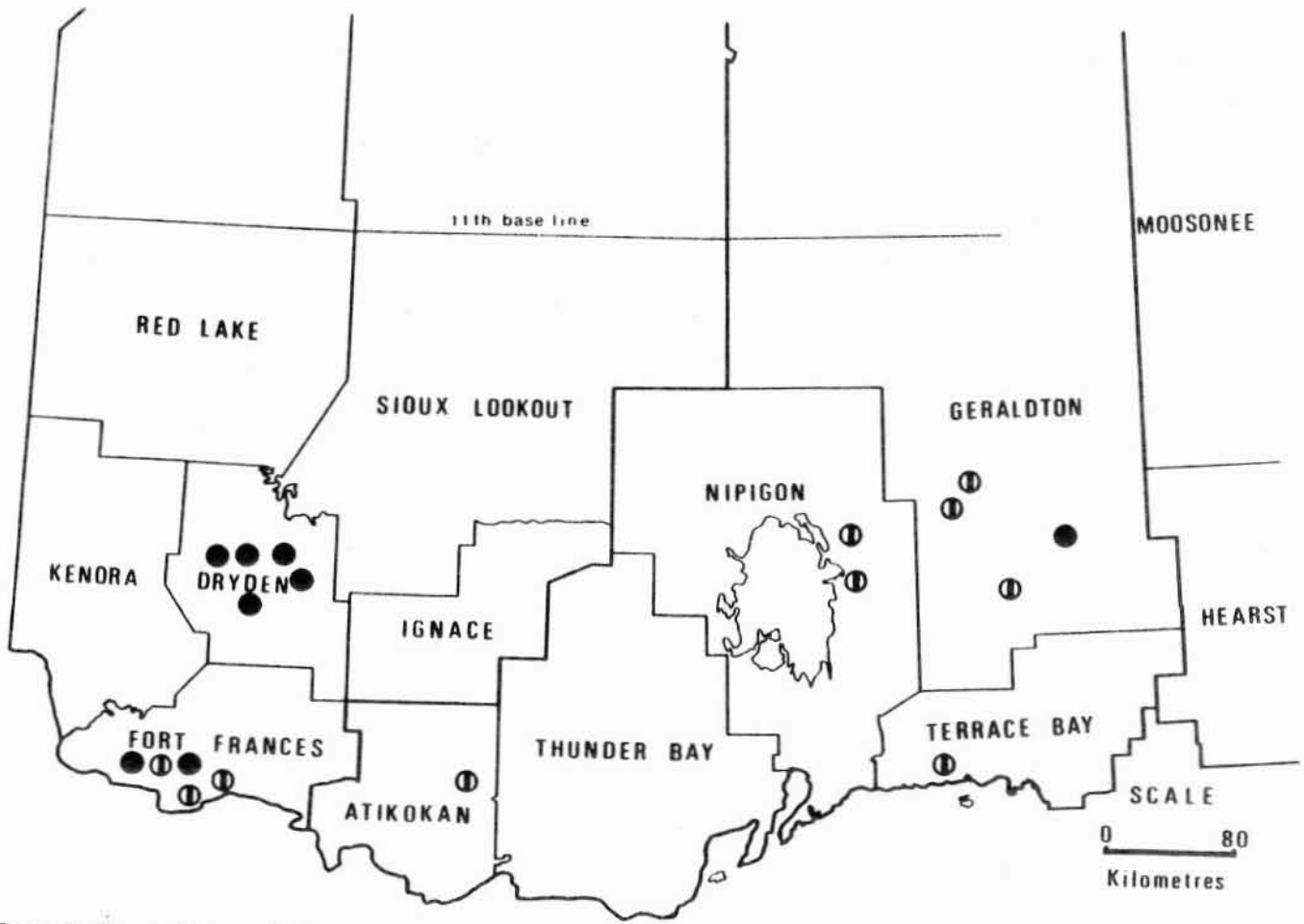
Areas within which defoliation occurred in 1971

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

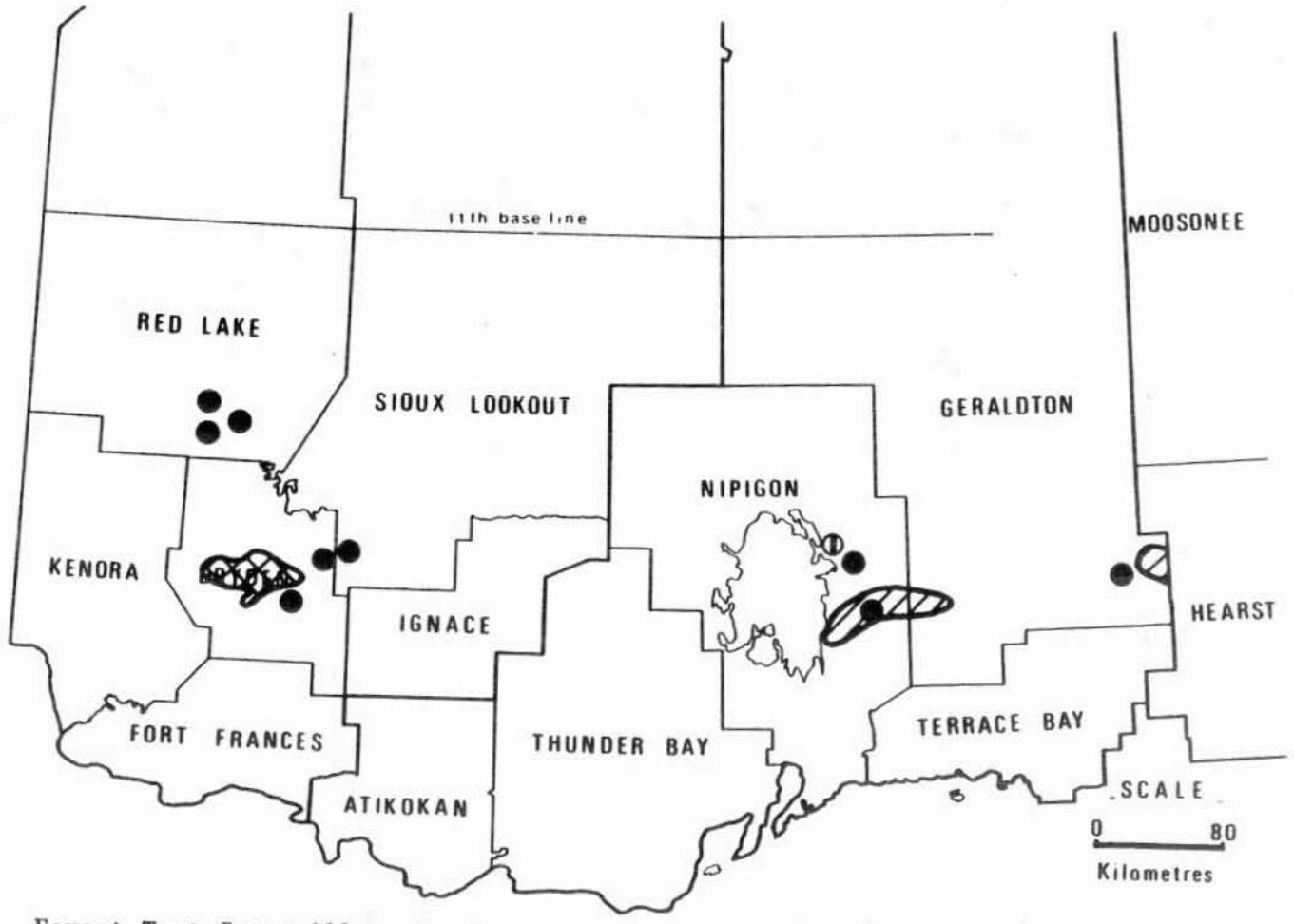
Areas within which defoliation occurred in 1972

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

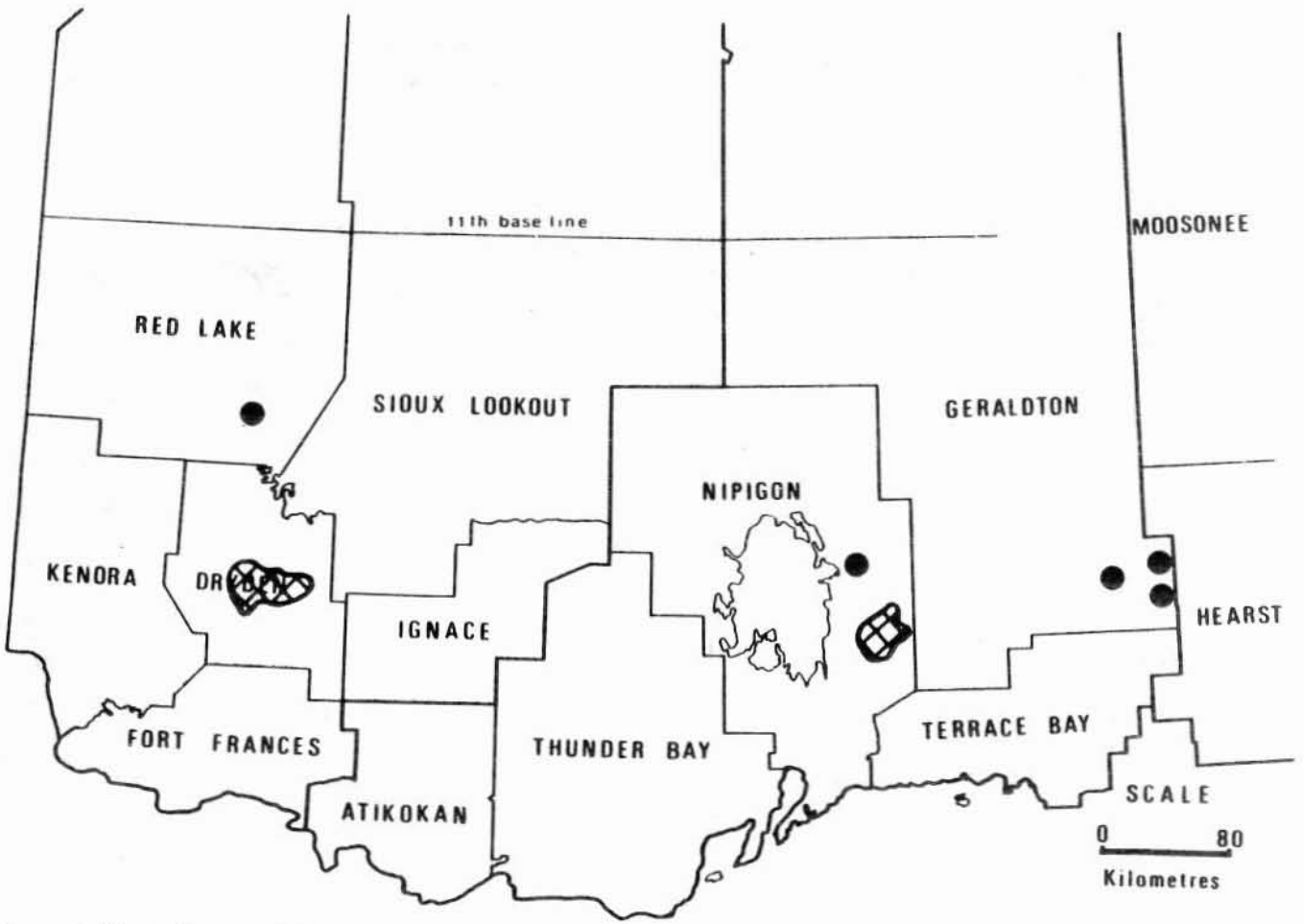
Areas within which defoliation occurred in 1973

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



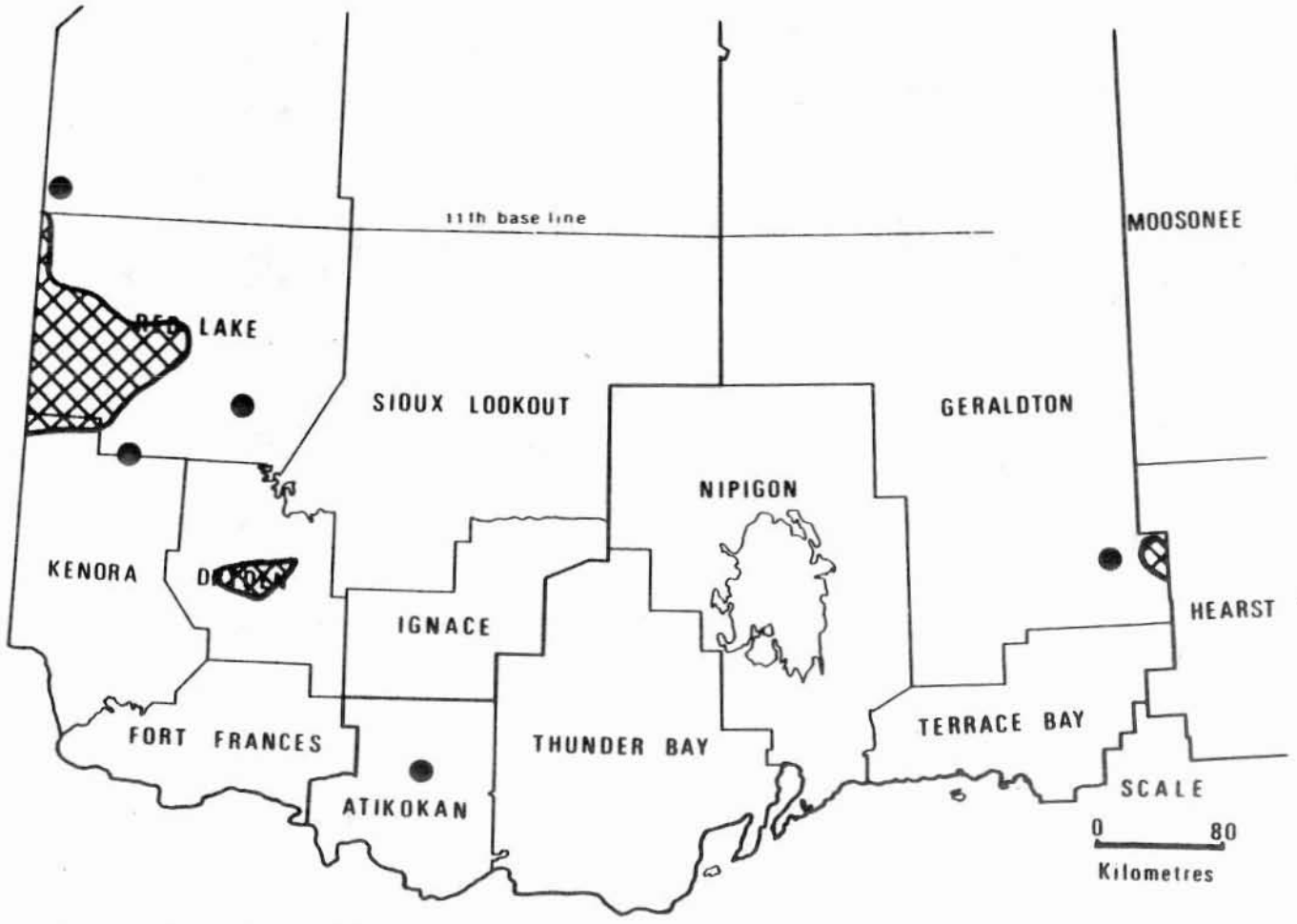
Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



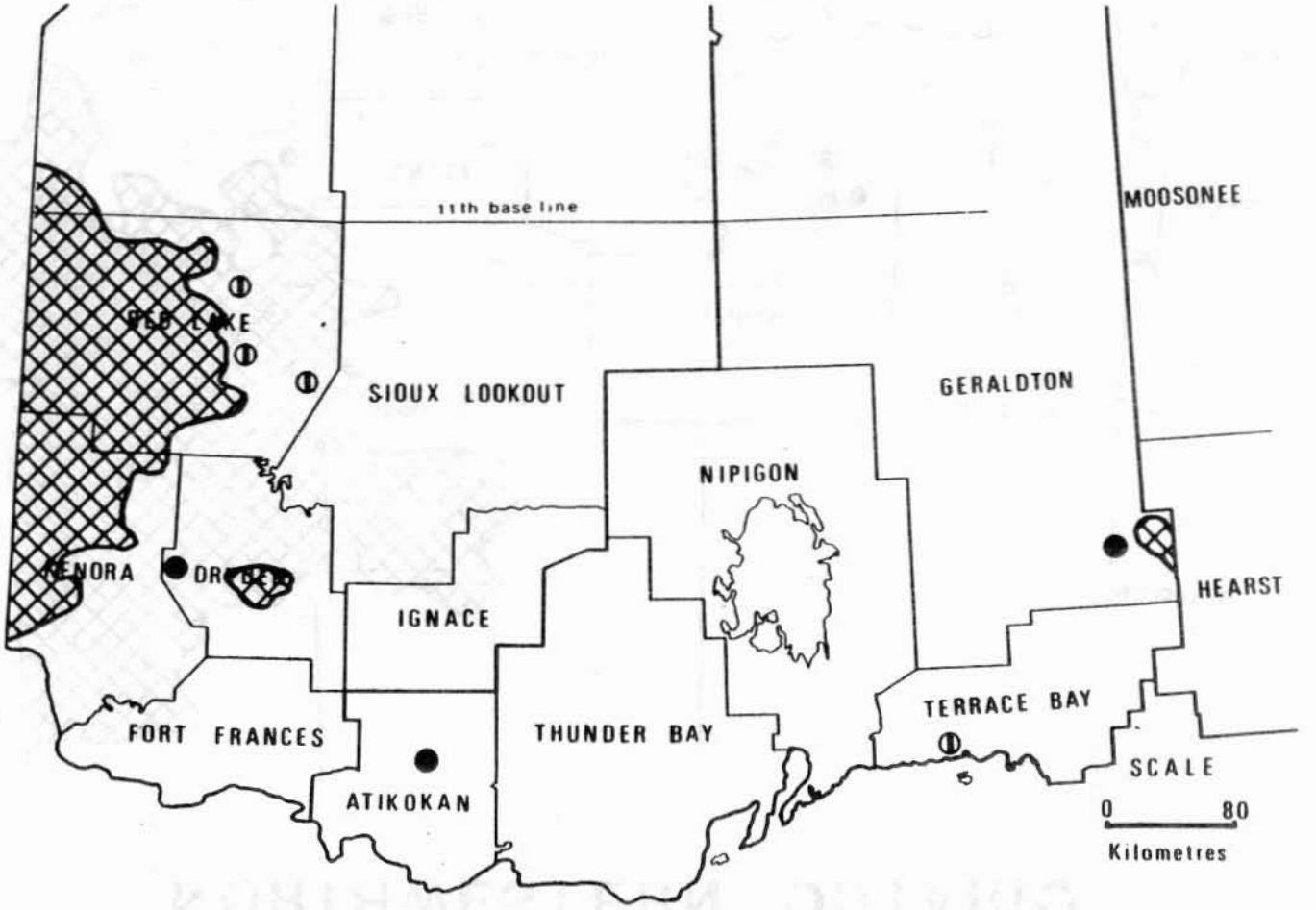
Forest Tent Caterpillar

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

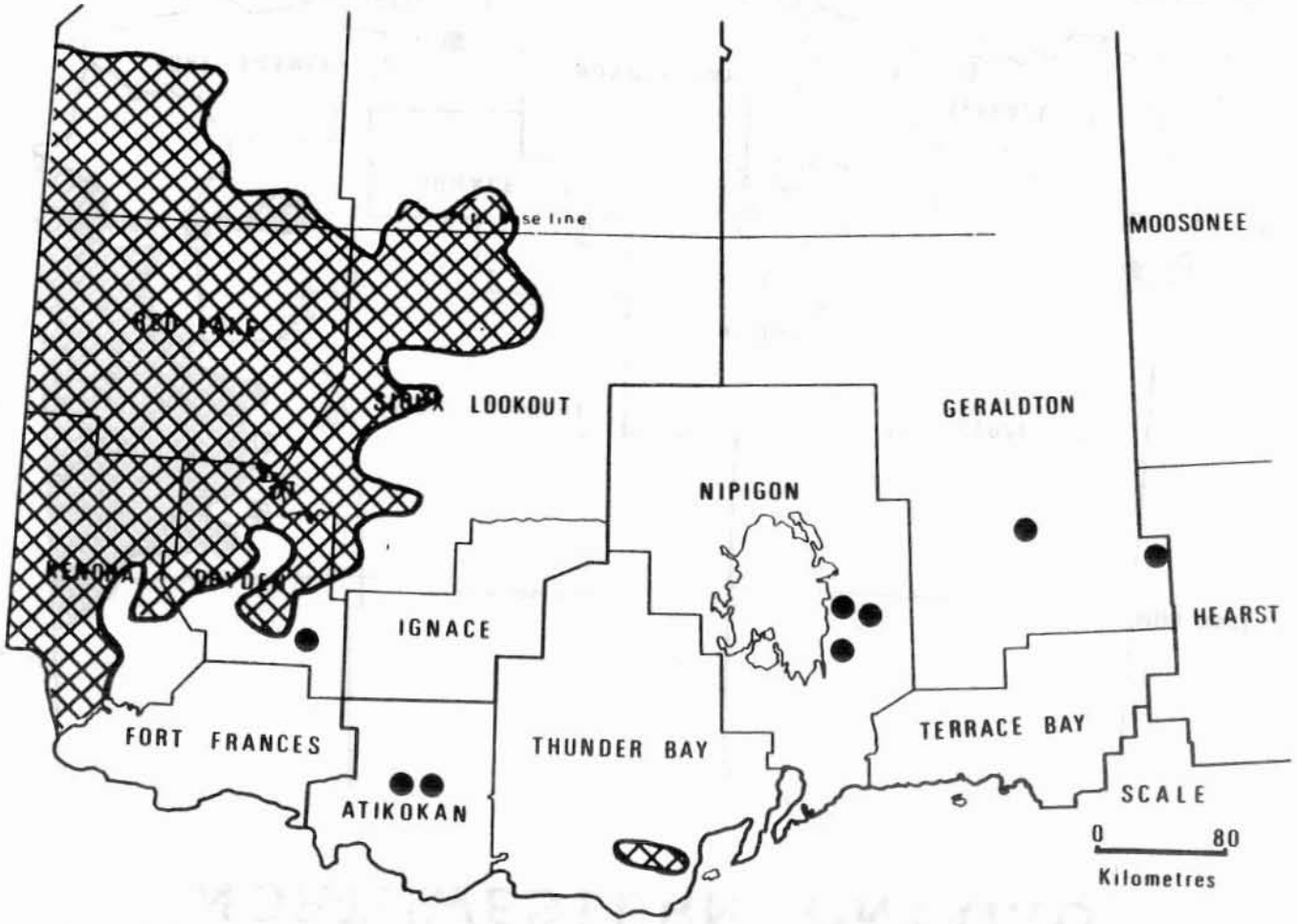
Areas within which defoliation occurred in 1976

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



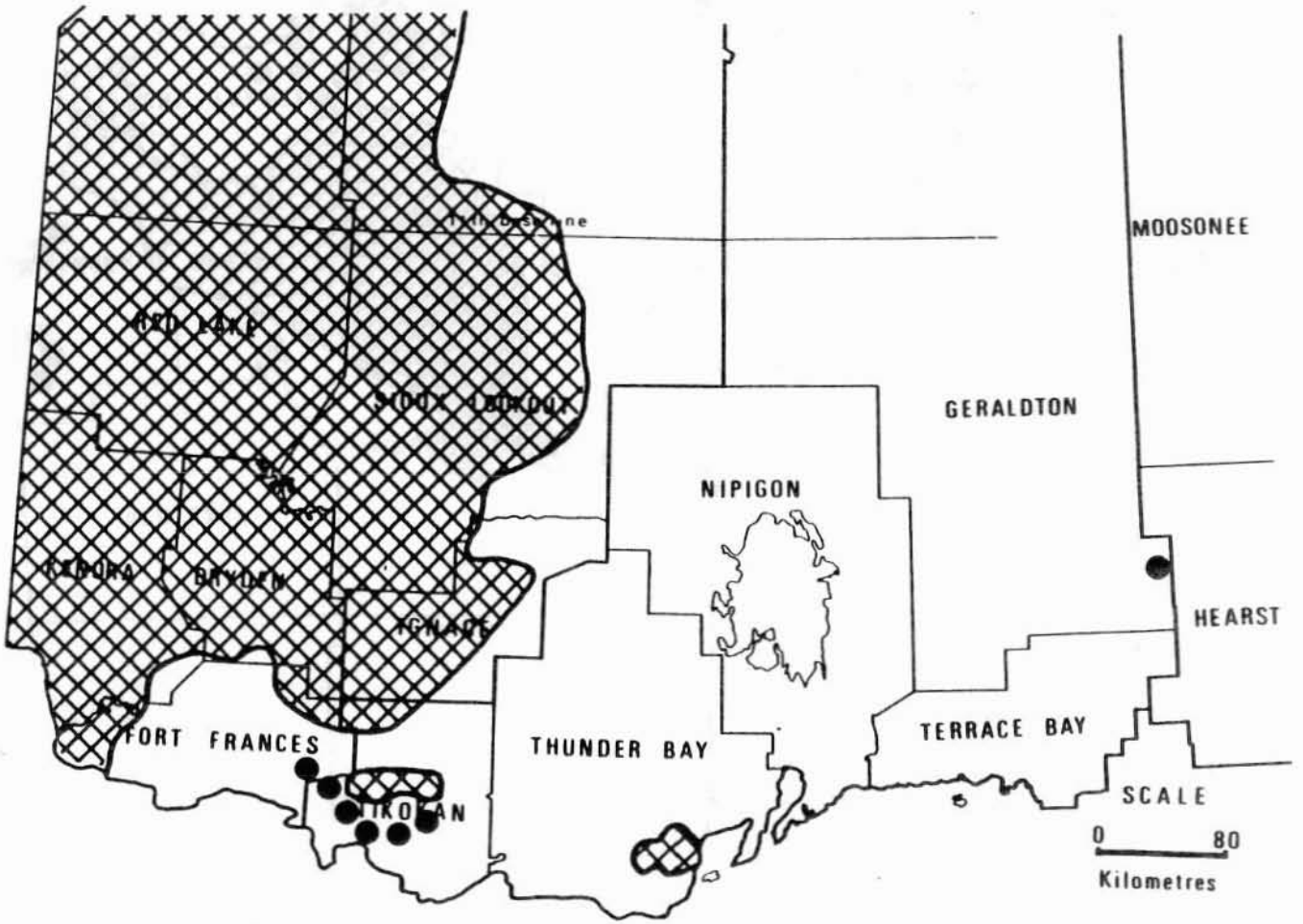
Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



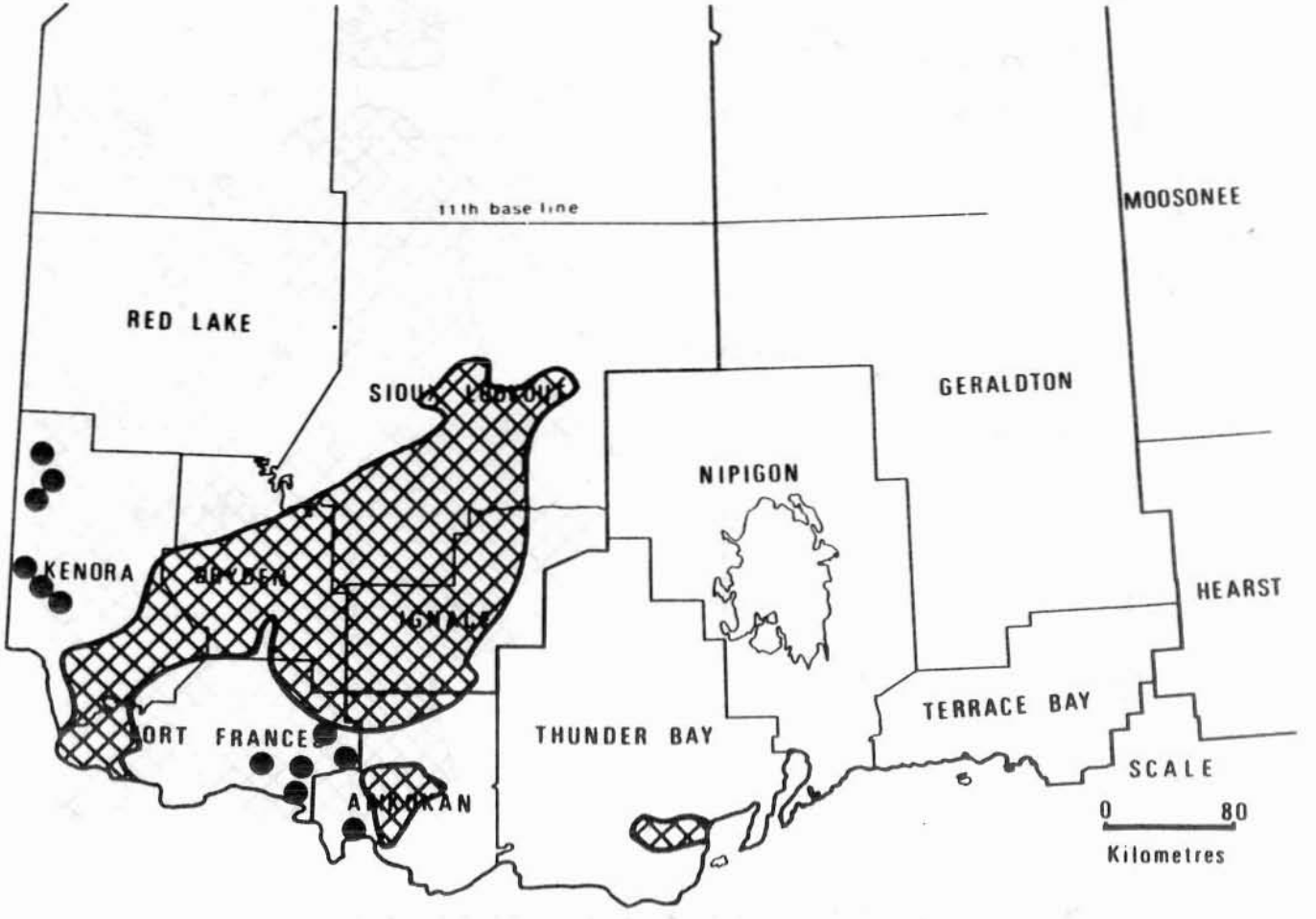
Forest Tent Caterpillar

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



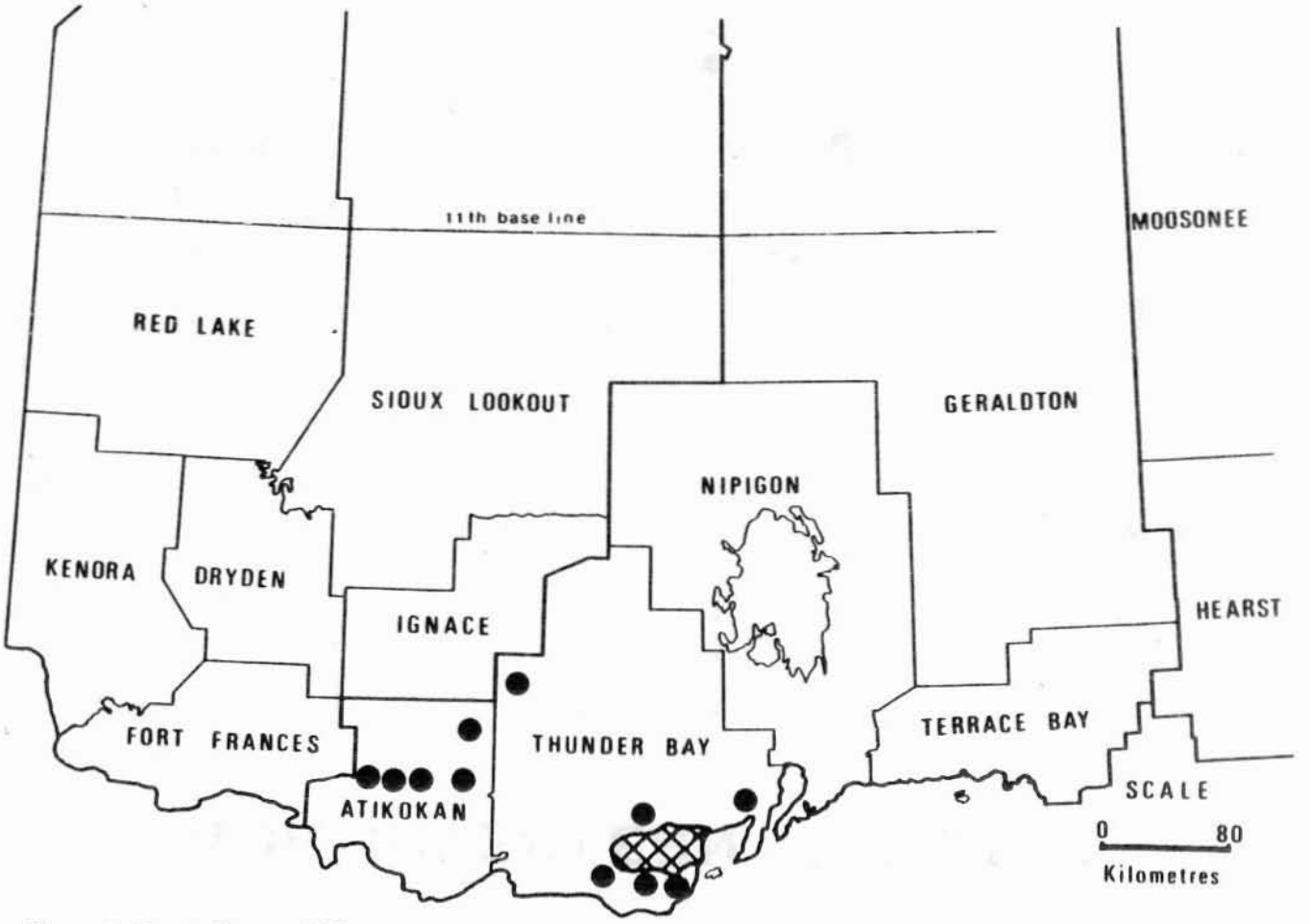
Forest Tent Caterpillar

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



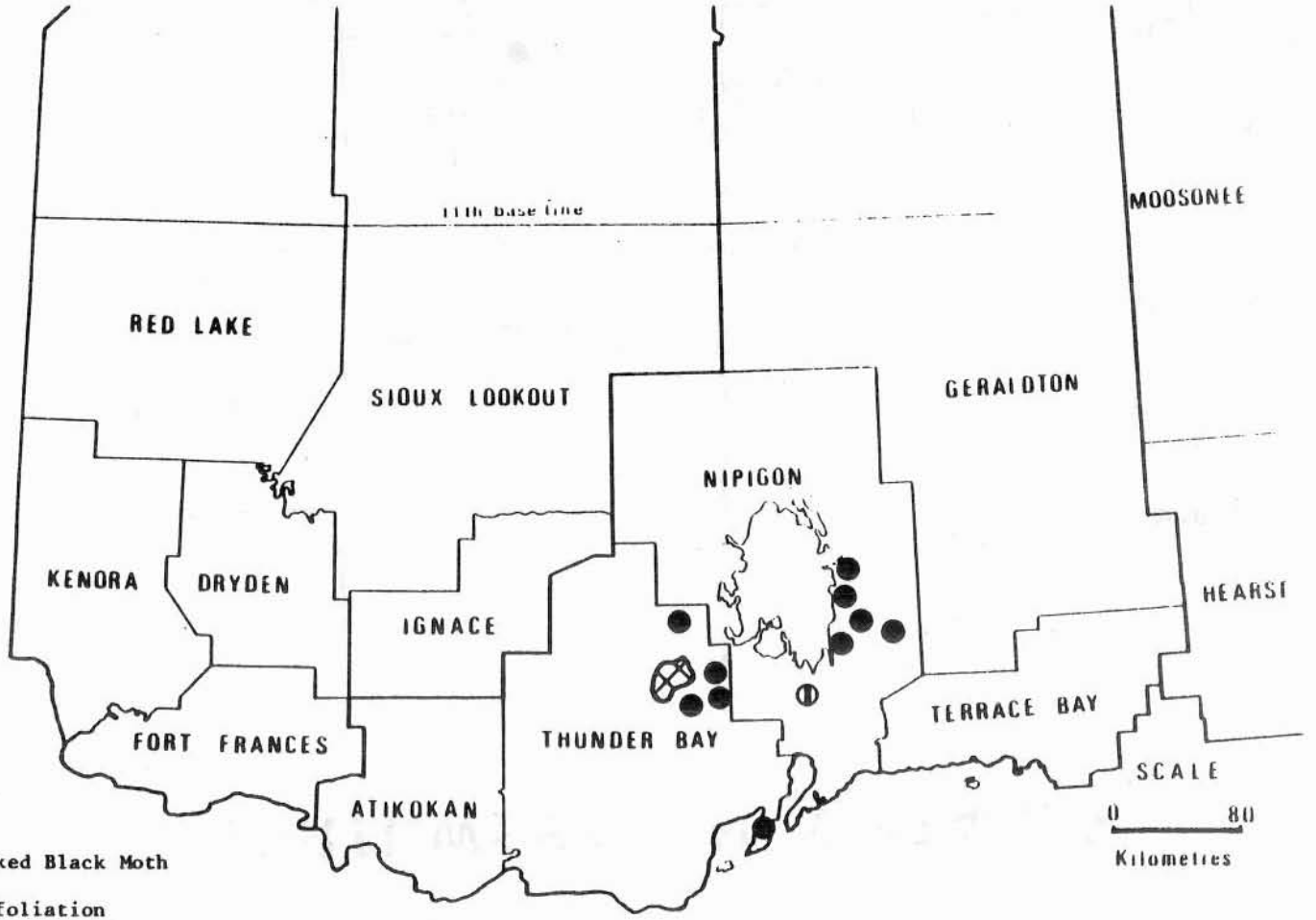
Forest Tent Caterpillar

Areas within which defoliation occurred in 1980

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



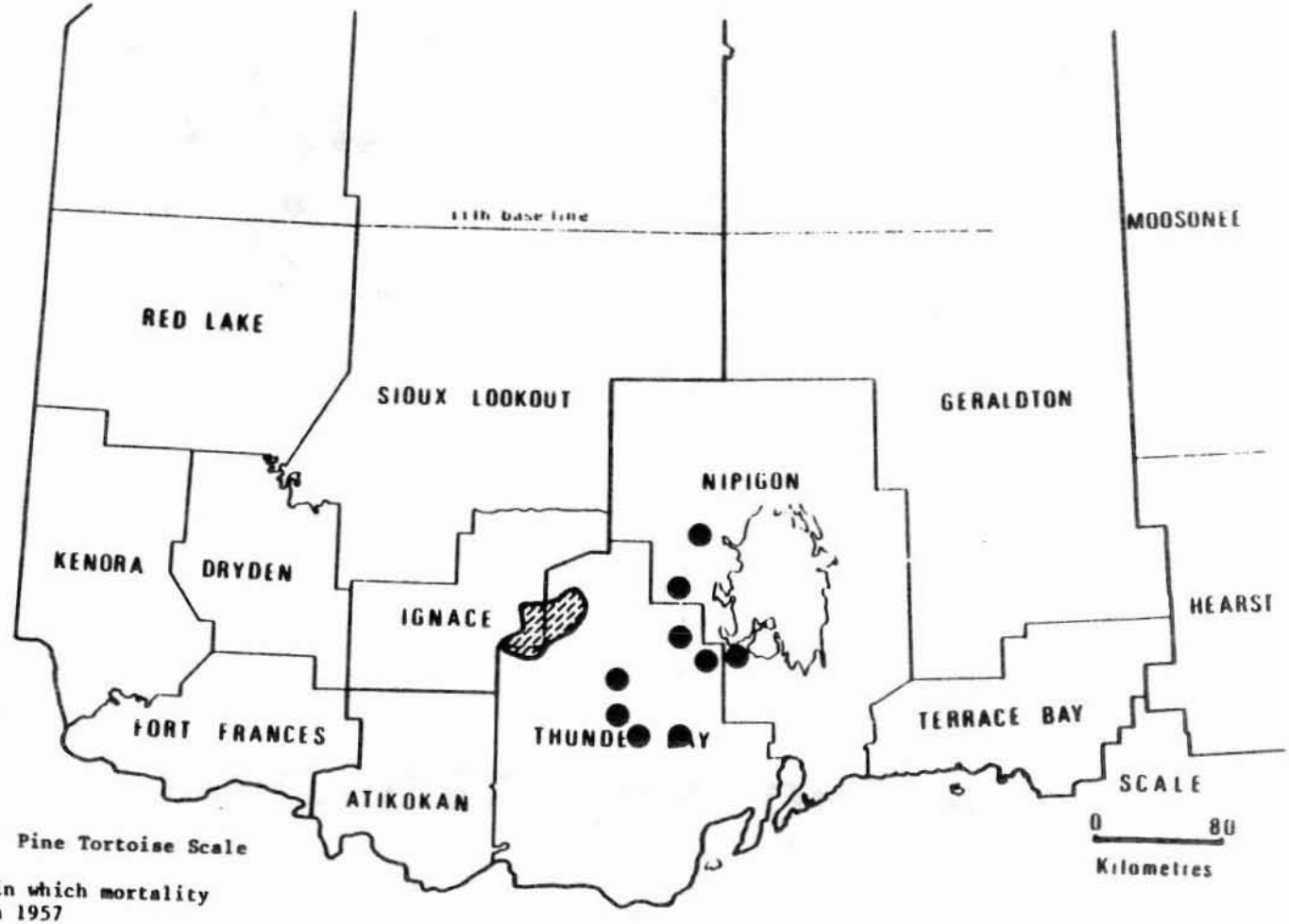
Spearmarked Black Moth

Areas within which defoliation occurred in 1962

LEGEND

Light defoliation ◐

NORTHWESTERN ONTARIO

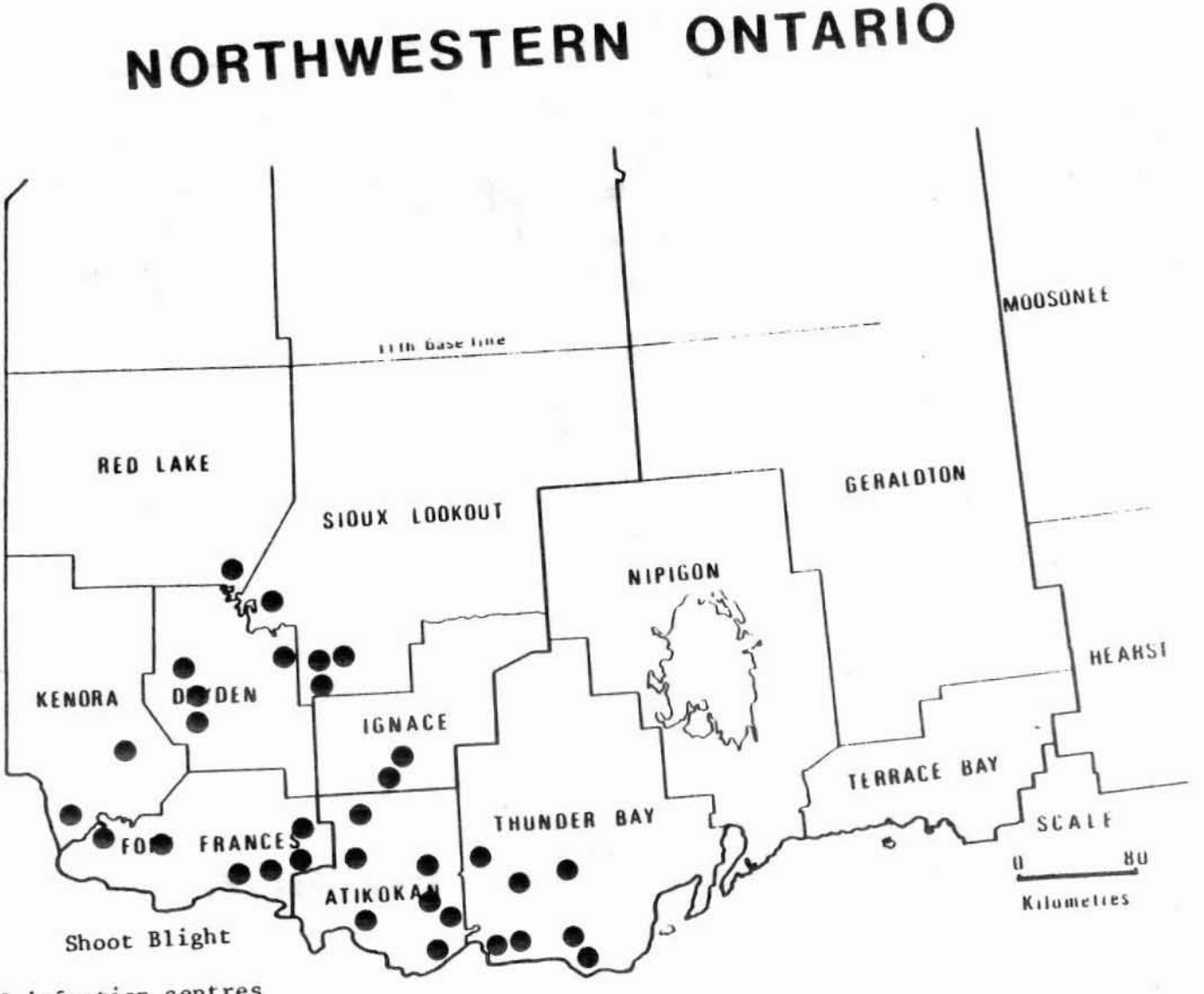


Pine Tortoise Scale

Areas within which mortality occurred in 1957

LEGEND

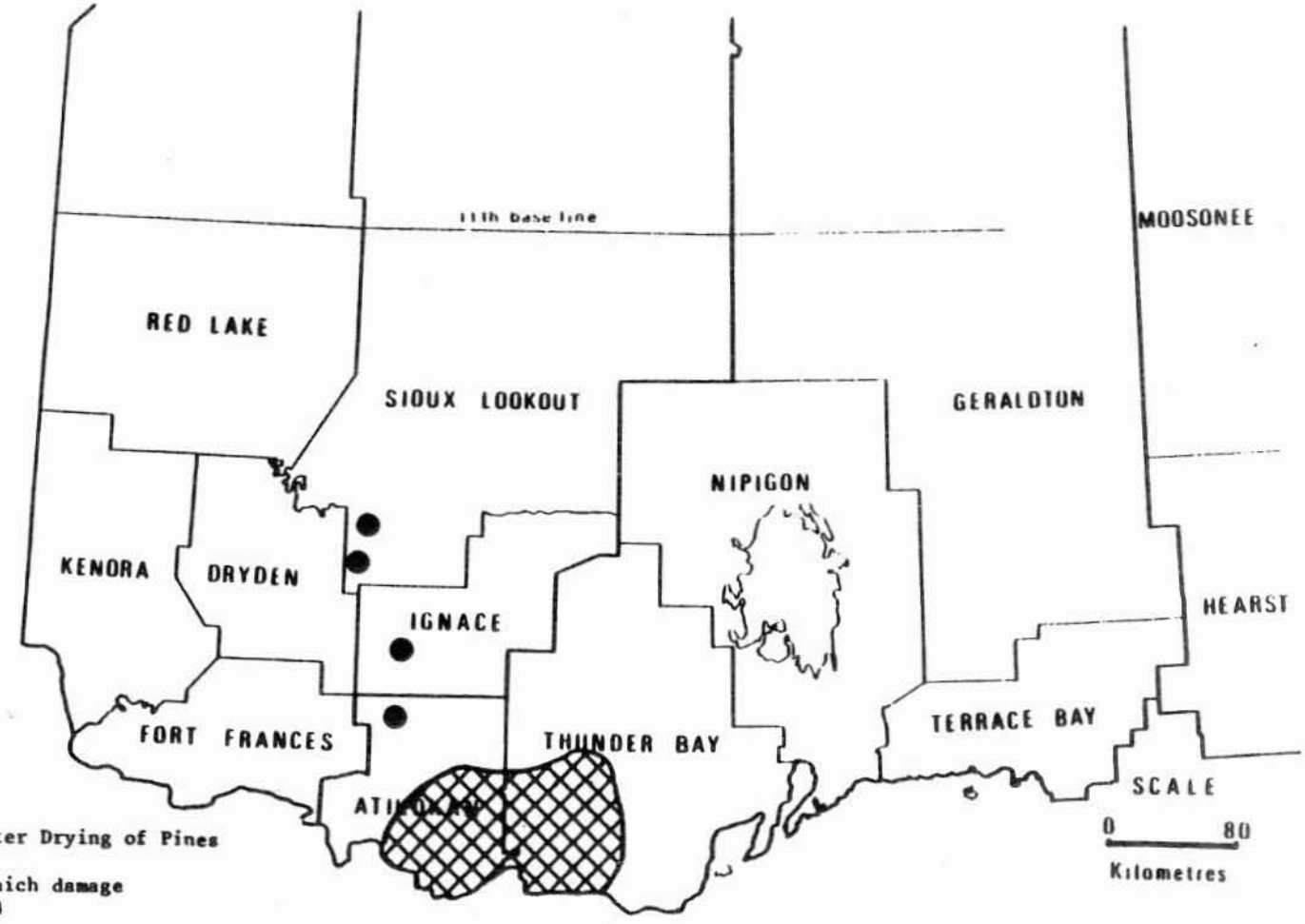
Mortality ● or ▨



Locations of infection centres
in 1973

LEGEND

NORTHWESTERN ONTARIO



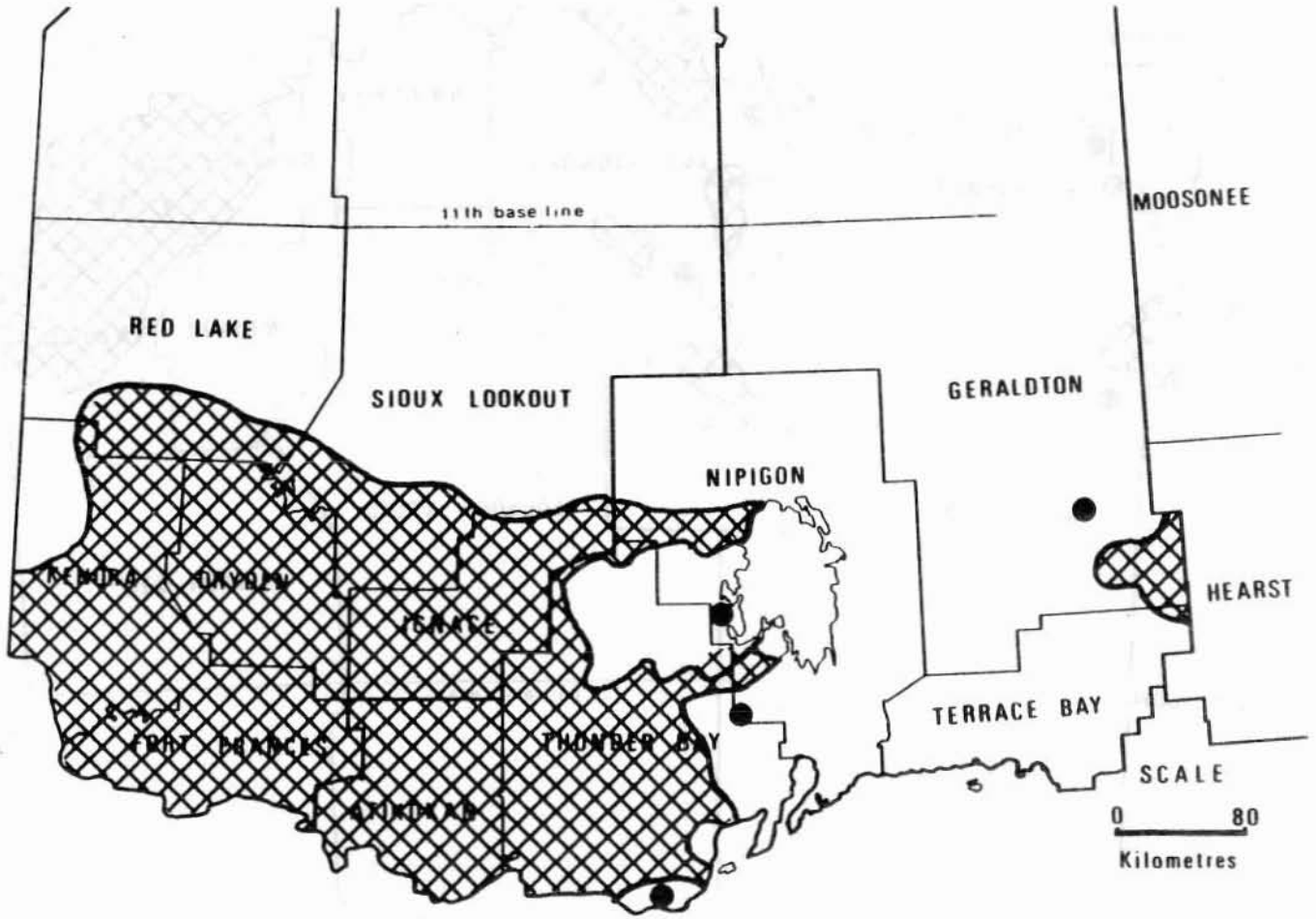
Winter Drying of Pines

Areas within which damage occured in 1973

LEGEND

Moderate-to-severe damage ● or ▨

NORTHWESTERN ONTARIO



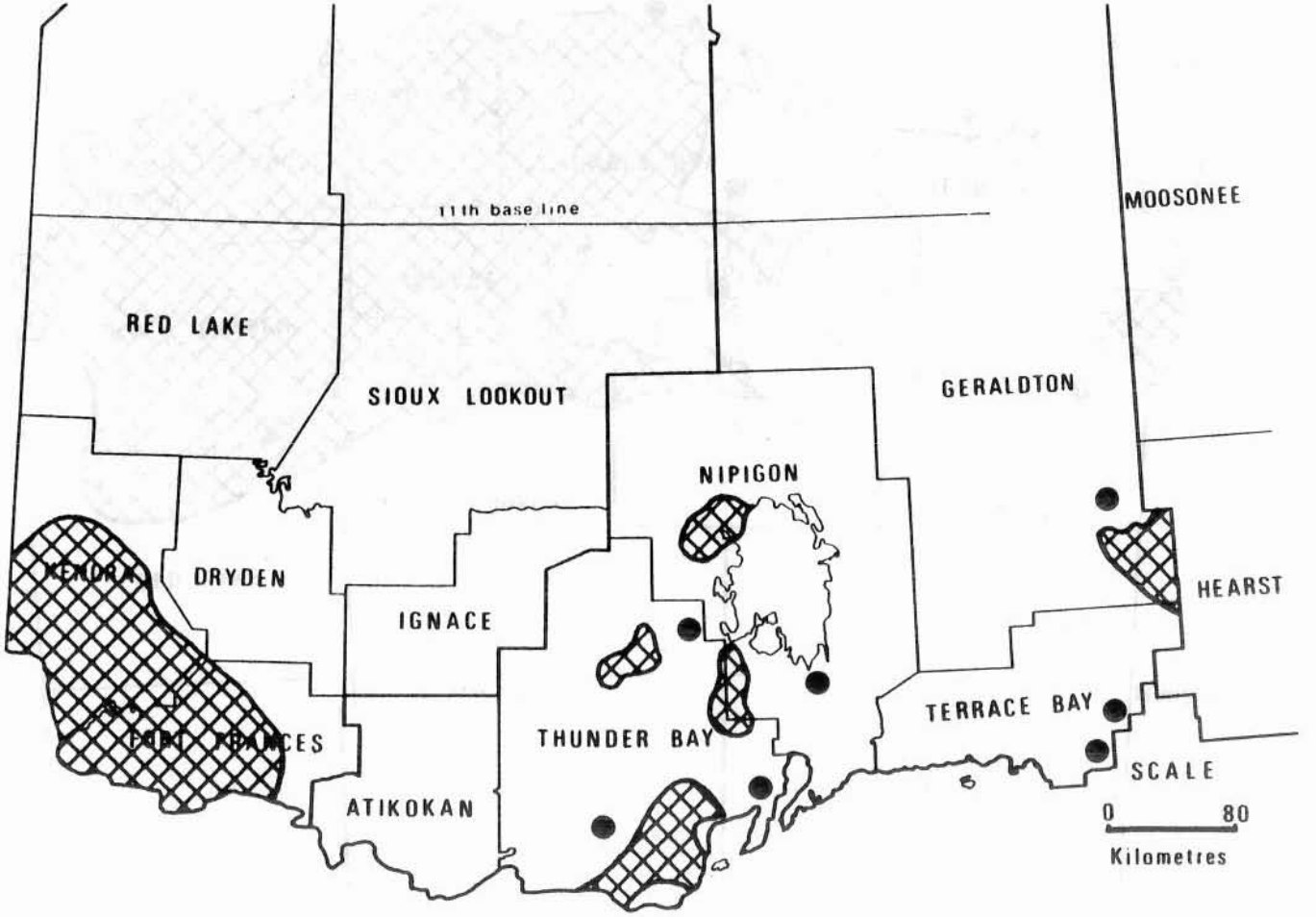
Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



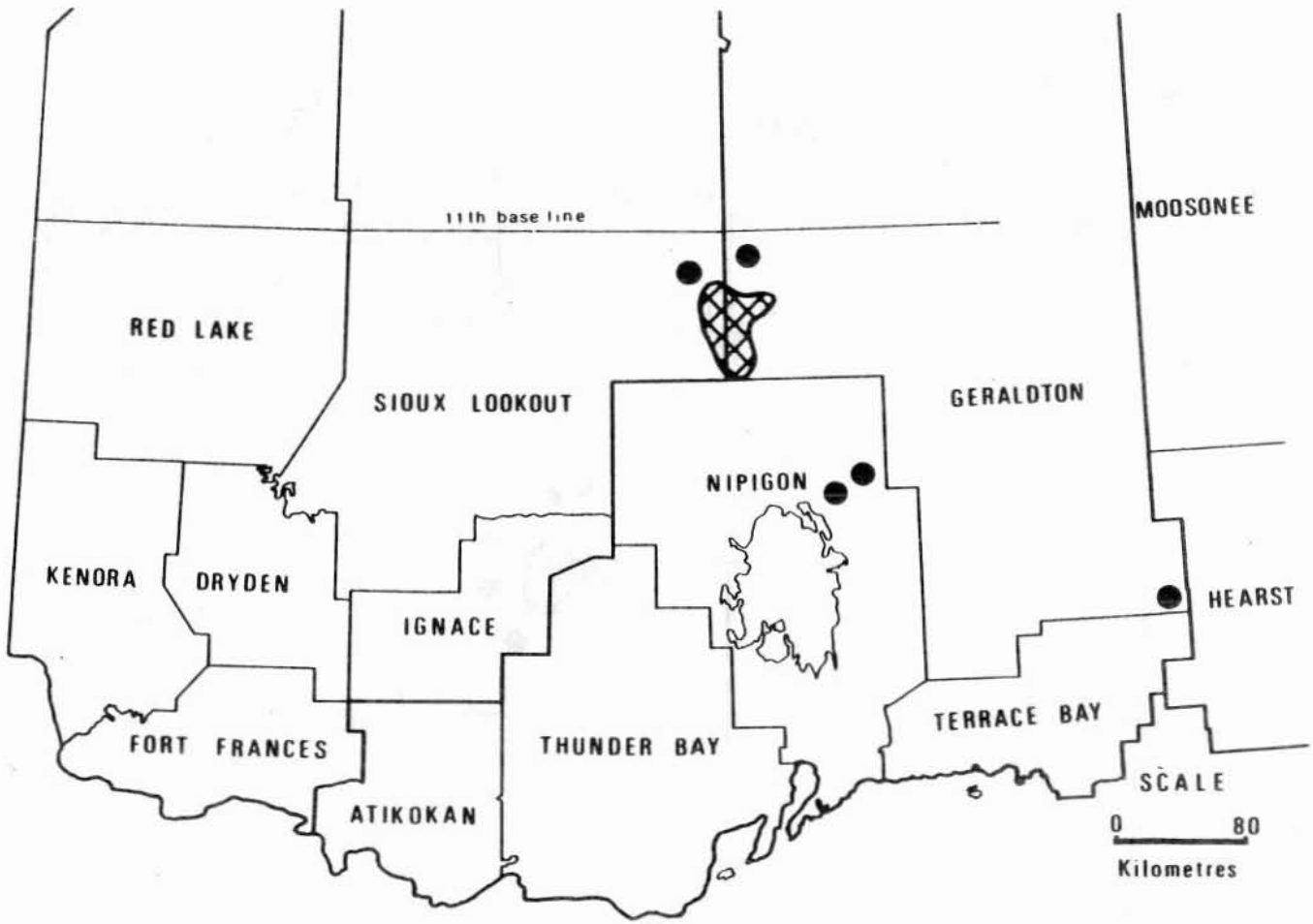
Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



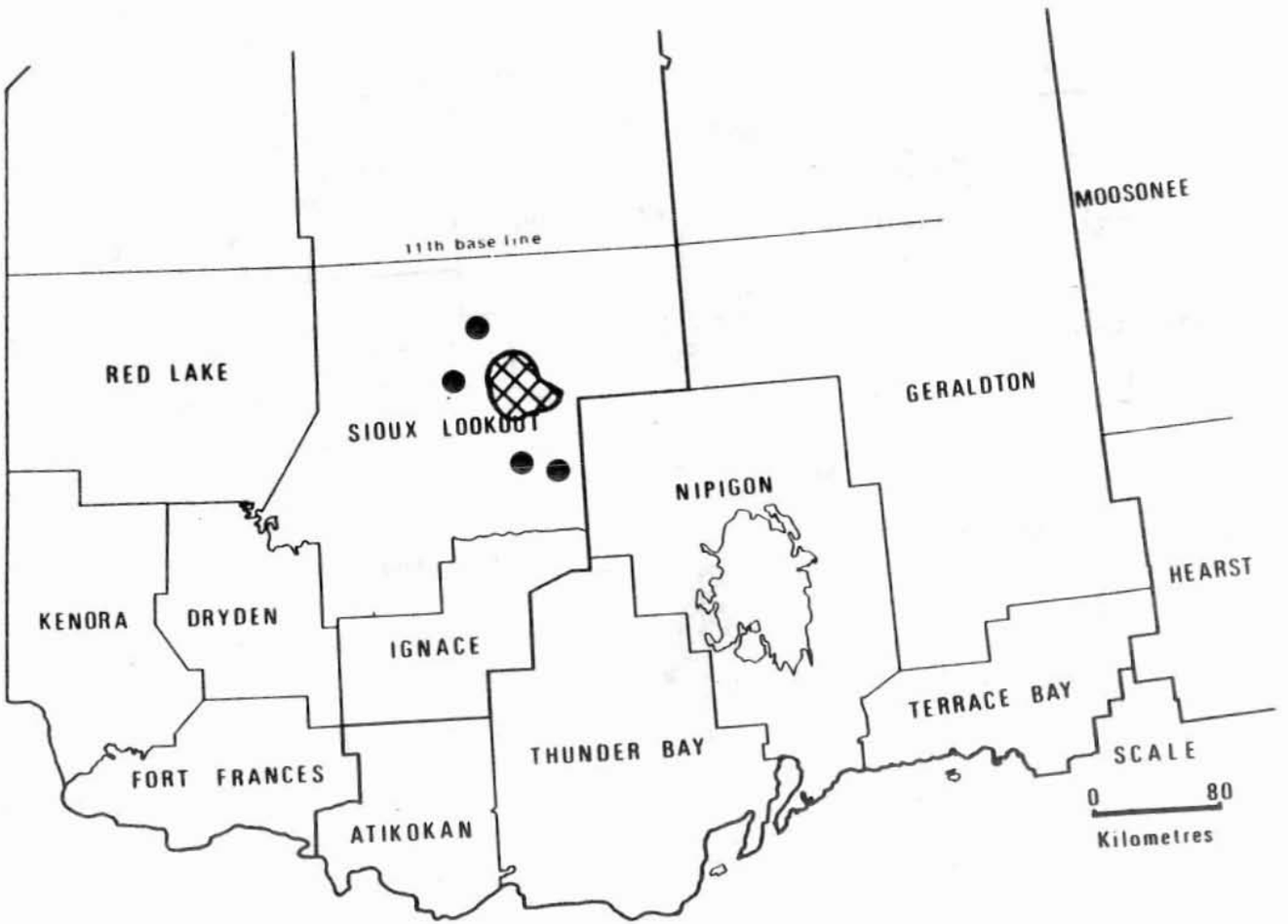
Forest Tent Caterpillar

Areas within which defoliation occurred in 1954

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



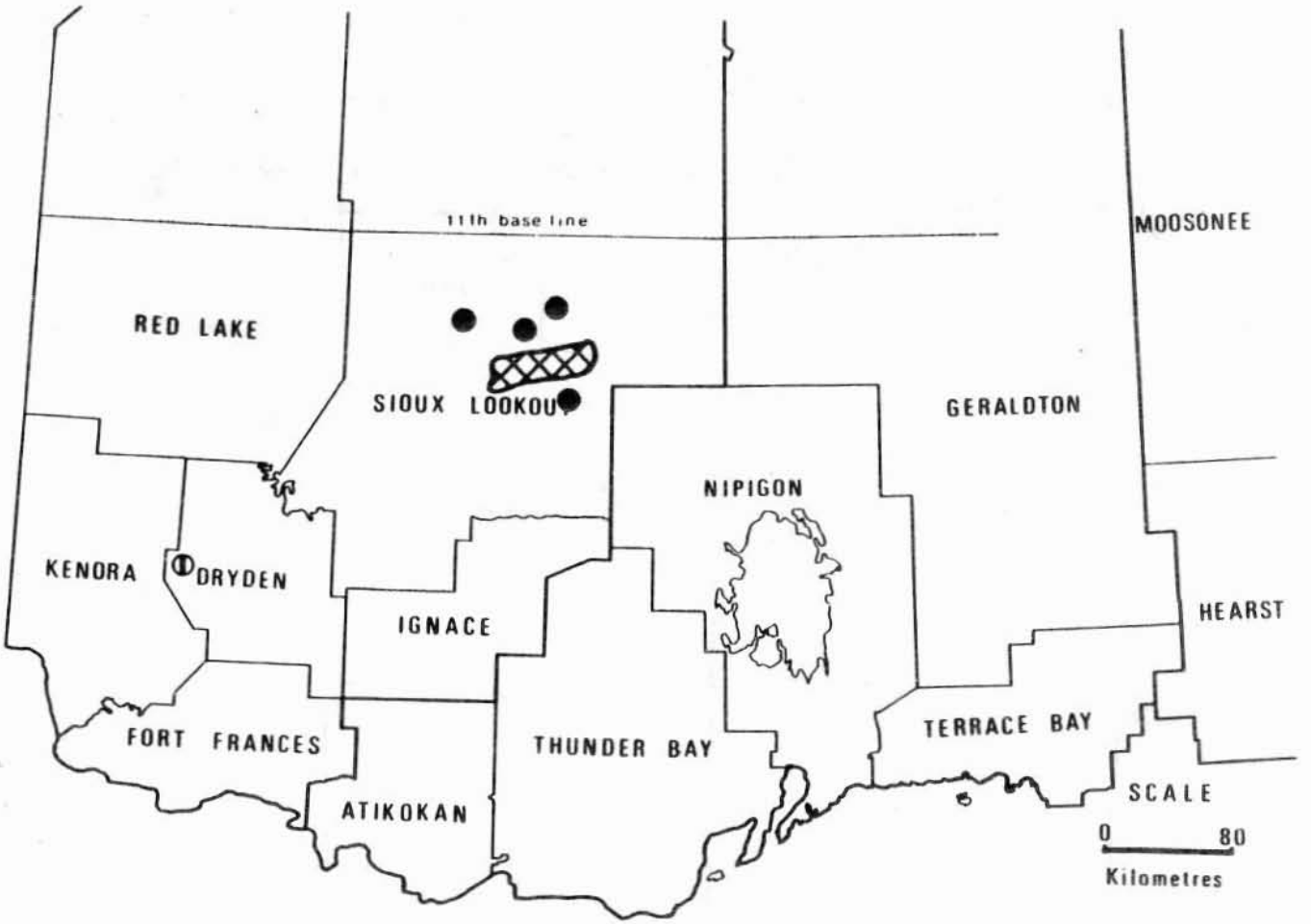
Forest Tent Caterpillar

Areas within which defoliation occurred in 1956

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1957

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO

Forest Tent Caterpillar

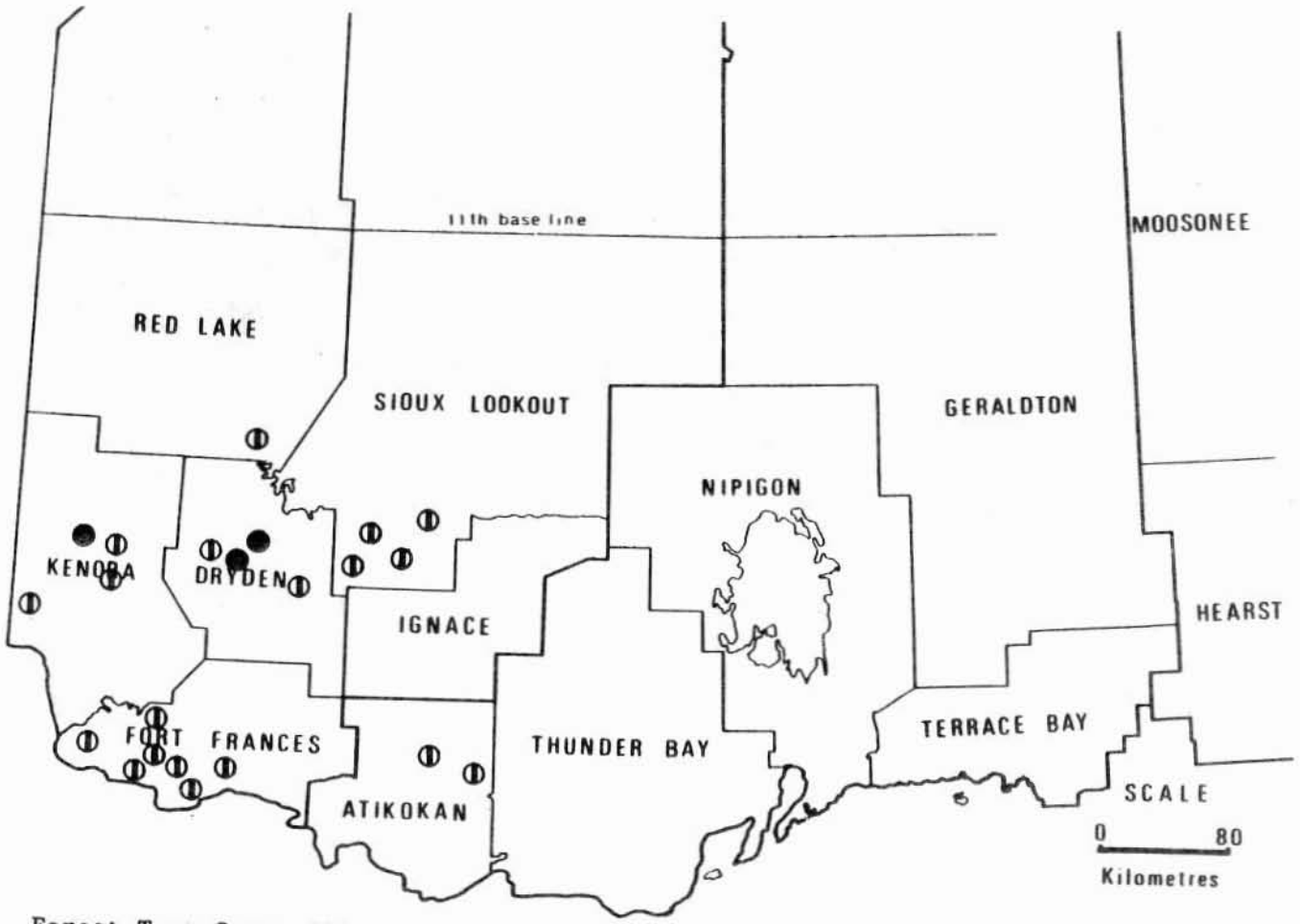
Areas within which defoliation occurred in 1959

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

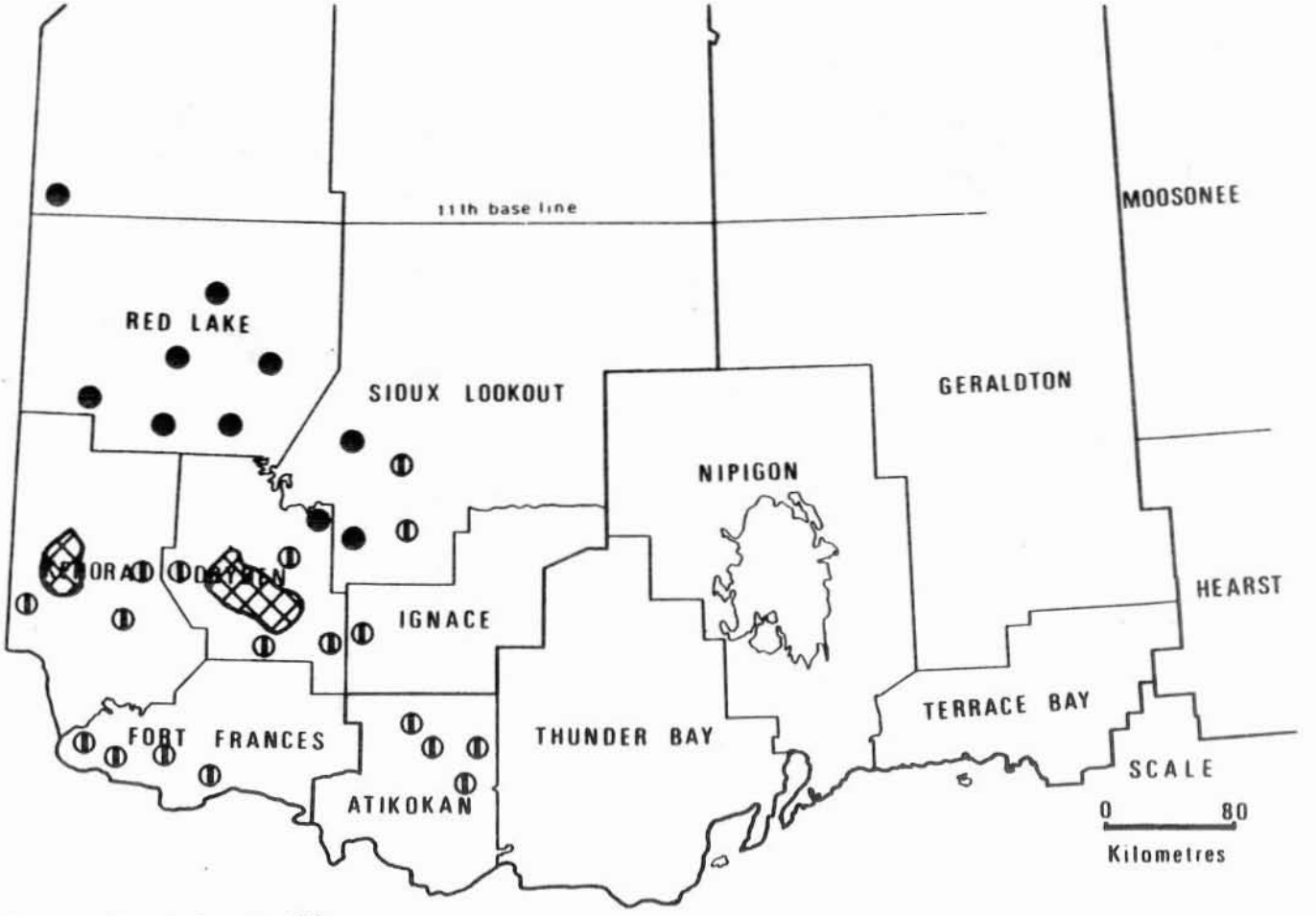
Areas within which defoliation occurred in 1960

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

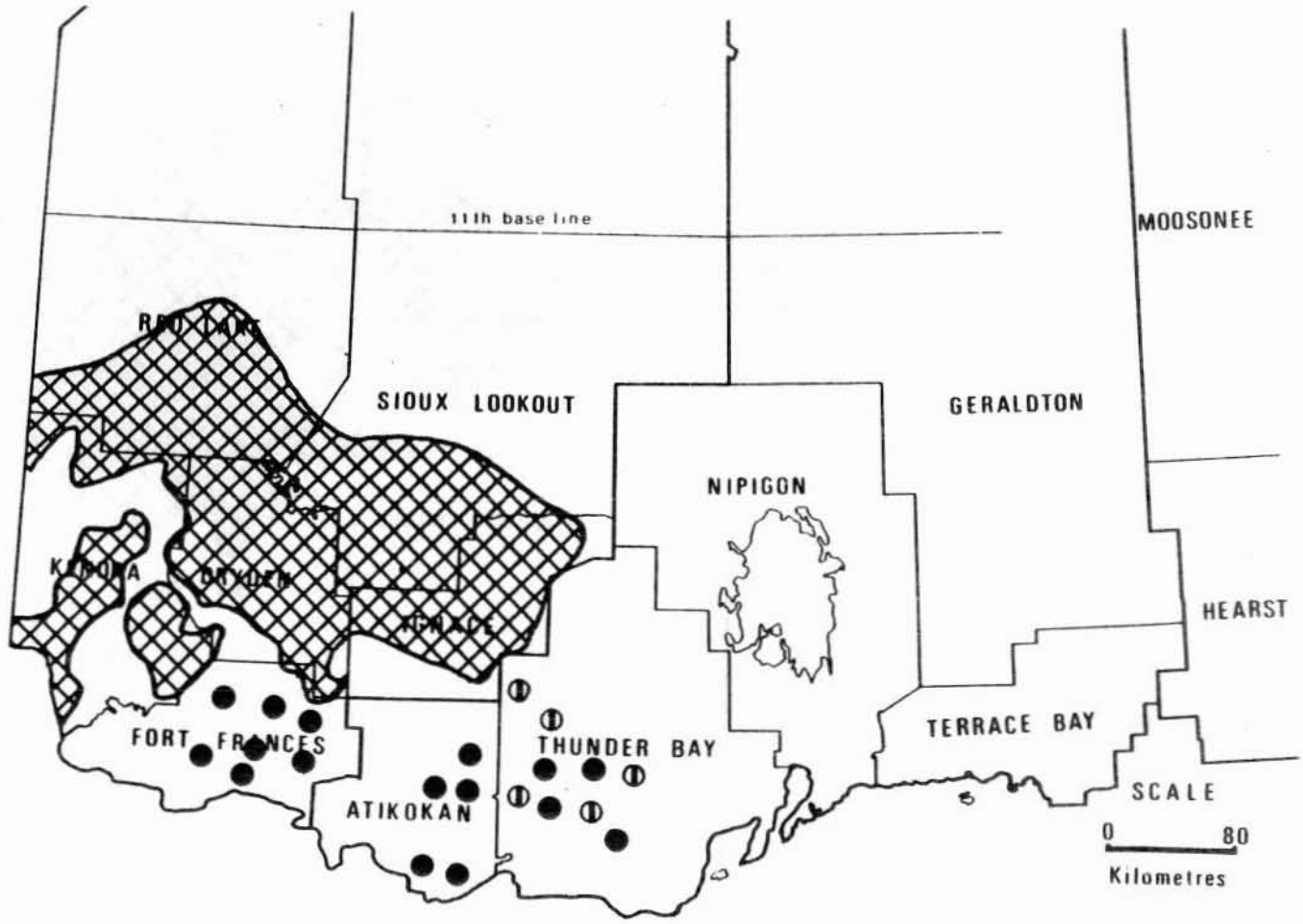
Areas within which defoliation occurred in 1961

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

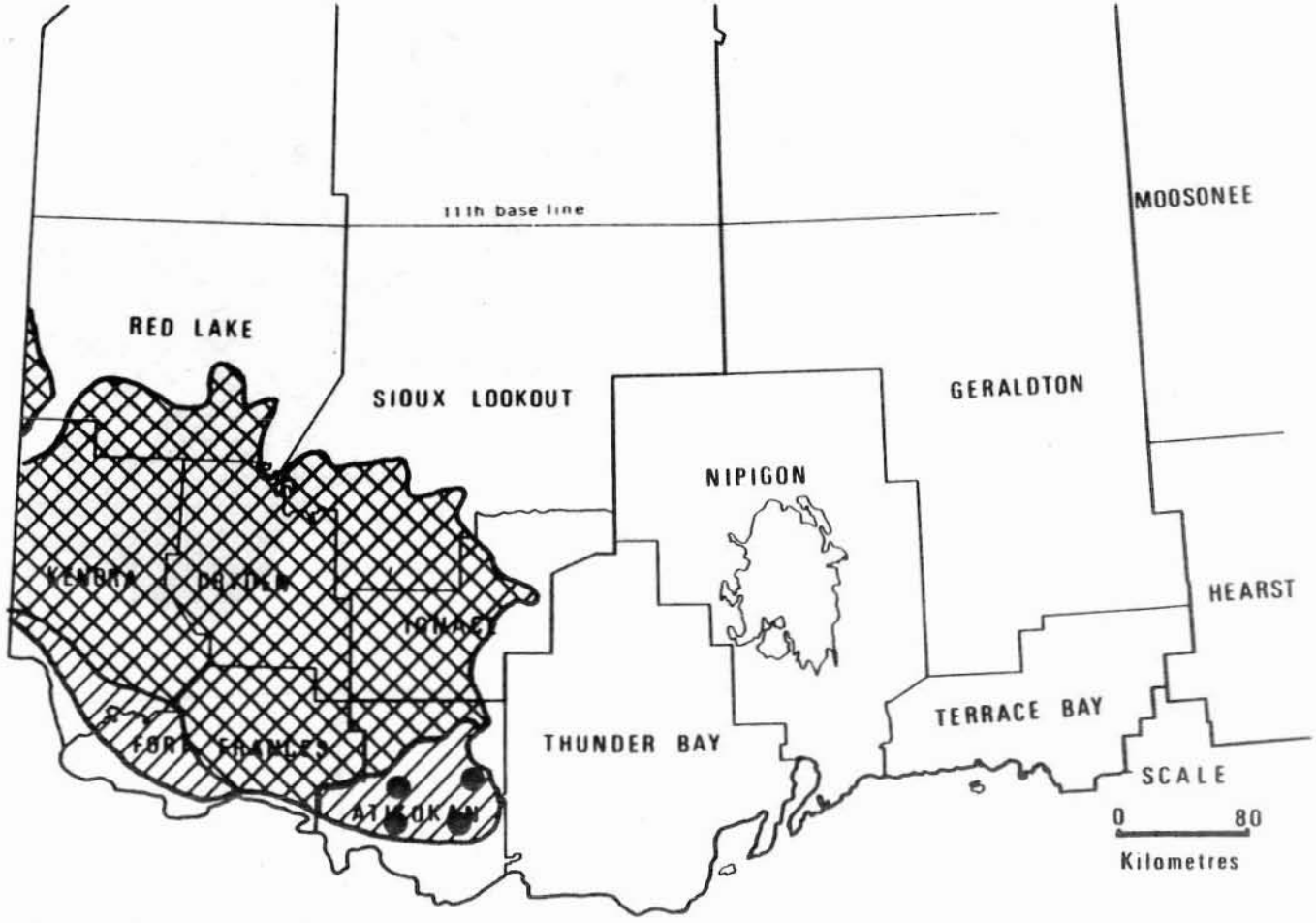
Areas within which defoliation occurred in 1962

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ● or ▨

NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1963

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or