

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

Compiled by

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CANADIAN FORESTRY SERVICE  
GOVERNMENT OF CANADA

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## FOREWORD

The first forest surveys in Ontario were carried out in 1936 from the Dominion Entomological Laboratory in Ottawa and continued from this location until 1944, when the province of Ontario was divided, for the purpose of these surveys, into northern and southern Ontario. In 1945, personnel from Ottawa continued to conduct and report on surveys in the area south of 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 given in the earliest reports are taken to the second decimal point [i.e. sq. mi. to  $\text{km}^2$  = area (sq. mi.)  $\times$  2.59 = area  $\text{km}^2$ ]. 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 Ontario grouped alphabetically by insect species or disease pathogen and showing the location of infestations within a region or infestation boundaries that extend beyond regions.

## ACKNOWLEDGMENTS

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

1950-1953	H.R. Foster
1954-1968	K.C. Hall
1969	H.J. Weir
1970-1971	C.N. Davis, M.J. Thomson, C.A. Barnes
1972-1973	M.J. Thomson, C.A. Barnes, M.J. Applejohn
1974-1975	H.R. Foster, M.J. Applejohn
1976-1977	H.R. Foster, H.D. Lawrence
1978-1980	H.D. Lawrence, W.D. Biggs



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## INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Thunder Bay District between 1950 and 1980. The present Thunder Bay District was formed in 1973 from parts of the former Sioux Lookout and Thunder Bay 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, white spruce, black spruce, balsam fir, and the tolerant hardwoods (white birch and poplar) as well as some ornamental 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, e.g., salt, frost, wind and snow damage, etc.

## SUMMARY

### FOREST INSECTS

Eastern Blackheaded Budworm, *Acleris variana* (Fern.) [Major]  
pages 11-12

There is no record of tree mortality as a result of attacks by this defoliator, which is found primarily on spruce, balsam fir and eastern hemlock. Trace or light populations were recorded from 1950 to 1980.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham. [Major]  
pages 13-17

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. Infestations occurred from 1962 to 1965 and from 1970 to 1973.

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.) [Major]  
pages 18-23

There is no record of tree mortality as a result of attacks by this defoliator, which is found primarily on aspen and poplar. Major outbreaks of moderate-to-severe defoliation occurred in the years from 1957 to 1959 and from 1969 to 1973.

Spruce Budworm, *Choristoneura fumiferana* (Clem.) [Major]  
pages 24-47

This insect is considered the most destructive 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. Infestations were confined primarily to the Sibley Peninsula from 1950 to 1956. From 1957 to 1963 infestations occurred mainly in the southwestern part of the district. Following three years of low populations, medium-to-heavy infestations occurred over relatively small areas in the southern and western parts of the district up to 1975. Areas of moderate-to-severe defoliation increased annually from 1976 to 1980.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.  
page 48

[Major]

This is a destructive pest of pines that can cause mortality after two years of severe defoliation. No major infestations of jack pine budworm occurred from 1950 to 1980.

Larch Casebearer, *Coleophora laricella* (Hbn.)  
page 49

[Major]

A serious pest of both native and European larch, this insect can cause reduced tree growth and tree mortality after two successive years of complete defoliation. In most years only trace populations or low numbers were evident in the district.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.  
page 50

[Major]

This insect usually infests lateral shoots and causes only aesthetic damage. When high populations develop, some leaders are infested and killed, and infested trees become deformed. Various population levels were recorded from 1961 to 1980.

Birch Leafminer, *Parus pusilla* (Lep.)  
page 51

[Major]

Defoliation by this miner can weaken trees and leave them susceptible to secondary insects and diseases, and may be a predisposing factor in birch decline. As a rule these insects attack single trees, but when populations build up, stands of trees are severely defoliated. First recorded in the district in 1962, the miner has since caused varying degrees of damage.



Forest Tent Caterpillar, *Malacosoma disstria* Hbn.  
pages 52-64

[Major]

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 retards tree growth and vigor, leaving the trees susceptible to attack by other pests. Medium-to-heavy infestations occurred in a number of years, but were most pronounced from 1951 to 1953 and in 1964 and 1965.

Balsam Fir Sawfly, *Neodiprion abietis* complex  
page 65

[Major]

Severe defoliation can cause mortality of balsam fir and white spruce trees when an infestation persists over a period of years. No major outbreaks of this insect were recorded from 1950 to 1980. Low numbers occurred in several years.

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

[Major]

pages 66-70

The sawflies listed are capable of causing mortality of semimature and plantation pine trees when populations are high. All three of these sawflies have caused serious damage periodically in the district.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)  
pages 71-72

[Major]

Although this insect has not been known to cause tree mortality, severe damage to foliage over a period of years can cause a reduction in growth. Moderate-to-severe mining of foliage occurred in a number of years. Particularly high numbers were recorded from 1974 to 1979.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)  
pages 73-74

[Major]

This destructive insect has been categorized as a serious pest of young spruce plantations and open-growing ornamentals. High mortality can occur after successive years of severe defoliation. Medium-to-heavy infestations of this insect were recorded in most years of the 30-year period. Damage was most common in the southeastern part of the district.

White Pine Weevil, *Pissodes strobi* (Peck)  
pages 75-76

[Major]

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. Damage in the district was recorded on jack and Scots pine as well as on white and Norway spruce. Heavy damage was recorded in a number of years.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)  
pages 77-79

[Major]

The larch sawfly is the primary defoliating insect of native larch and most exotic species. 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. Medium-to-heavy infestations occurred in a number of years at various locations.

Aspen Leafroller, *Pseudexentera oregonana* Wlsh. ~~Wlsh.~~  
pages 79-83

[Major]

No tree mortality has been recorded as caused by this defoliator, which feeds almost exclusively on trembling aspen. From 1975 to 1978 the insect caused moderate-to-severe defoliation over a large area in the southern part of the district.

Spearmarked Black Moth, *Rheumaptera hastata* (L.)  
pages 84-85

Infestations of this insect have been infrequent and tend to be of short duration, usually one to two years. Feeding causes browning of foliage and premature leaf drop. Outbreaks occurred in 1953 and again in 1962.

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.)  
pages 86-87

Heavy feeding by this insect may result in considerable branch mortality or the death of entire trees. A large percentage of trees may die following one or two seasons of attack. An outbreak of the scale resulted in considerable mortality from 1956 to 1958.



Other Noteworthy Insects  
pages 88-102

[Major and Minor]

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

## FOREST DISEASES

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer  
page 105

[Major]

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. Varying degrees of damage were reported from 1950 to 1980.

Scleroderris Canker, *Ascochyta abietina* (Lagerb.) Schläpfer-Bernhard  
page 106

Although surveys for this destructive pest of young pine were carried out in the district, the pathogen was not confirmed by culturing until 1966. Since then, it has been collected from a number of areas. The most notable damage has occurred in the English River and Graham Road areas.

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau  
page 107

[Major]

This major disease organism, which affects all species of elm, was first recorded in Ontario in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. The organism was first recorded in the district in 1976 in Blake Twp.

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary  
and *C. ledicola* (Peck) Lagerh.  
pages 107-108

[Major]

These, the most widely spread rusts in the Canadian boreal forest, are of concern on mature trees, but the potential for damage in nurseries can be high. Medium-to-heavy infections have occurred in about half the years between 1950 and 1980.

Ink Spot of Aspen, *Gibberinia whetzelii* (Seaver) Seaver  
pages 109

[Major]

This ink spot disease is widespread throughout the range of aspen. Many poplar species and hybrids are susceptible, but trembling aspen is most commonly affected. Heavily infected trees may be defoliated prematurely and repeated attacks can reduce increment and even kill regeneration. Infections at the moderate-to-severe levels were recorded in five years of the 30-year review period.

Rusts of Pine: Pine Needle Rust, *Coelosporium asterum*  
(Dietel) Sydow, Sweet Fern Blister Rust,  
*Cronartium comptoniae* Arthur, Eastern Gall  
Rust, *C. quercuum* (Berk.) Miyabe ex Shirai  
f. sp. *banksianae*, and Western Gall Rust,  
*Endocronartium harknessii* (J.P. Moore) Y. Hirats.  
pages 110-112

[Major]

These rusts may kill trees outright or make them more susceptible to insects, decay, and wind breakage depending on the degree of infection. Infections of all three of these rusts have been recorded at various levels in the district.

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer  
page 113

[Major]

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. Damage has occurred throughout the range of white pine in the district.

Tar Spot Needle Cast, *Davisonmycelia ampla* (J. Davis) Darker  
page 114

[Minor]

This pathogen causes severe defoliation when incidence is high. In years of severe defoliation, trees are weakened and growth is reduced. Infection can be so severe that all but the current year's foliage may be cast off. Significant levels of foliar damage occurred in 1976 and 1979.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller  
pages 114-115

[Major]

Mortality caused by this disease is usually restricted to trees in the 7- to 13-cm class growing on poor sites, but branch and top mortality may occur in trees of greater diameter. In 1968, 40% of the trees (a record high) were affected and there was a current mortality rate of 2.5% in Conmee Twp.



Shoot Blight, *Siroccus conigenus* (DC.) P. Cannon & Minter [Major]  
pages 115-116

This pathogen is capable of killing trees outright in many age classes, especially young understory regeneration. The principal host is red pine, although other pines are susceptible to attack. Extensive surveys were conducted in 1973 to determine the distribution of this organism in the district.

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx. [Major]  
page 117

Reduced stocking of regeneration aspen occurs when the incidence of this disease is high. Trees more than 5 years old are seldom affected, and therefore the disease is of little economic importance in older stands. There have been several years of medium-to-heavy infections recorded in the district.

Other Noteworthy Diseases  
pages 118-121

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

#### ABIOTIC DAMAGE

pages 125-129

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

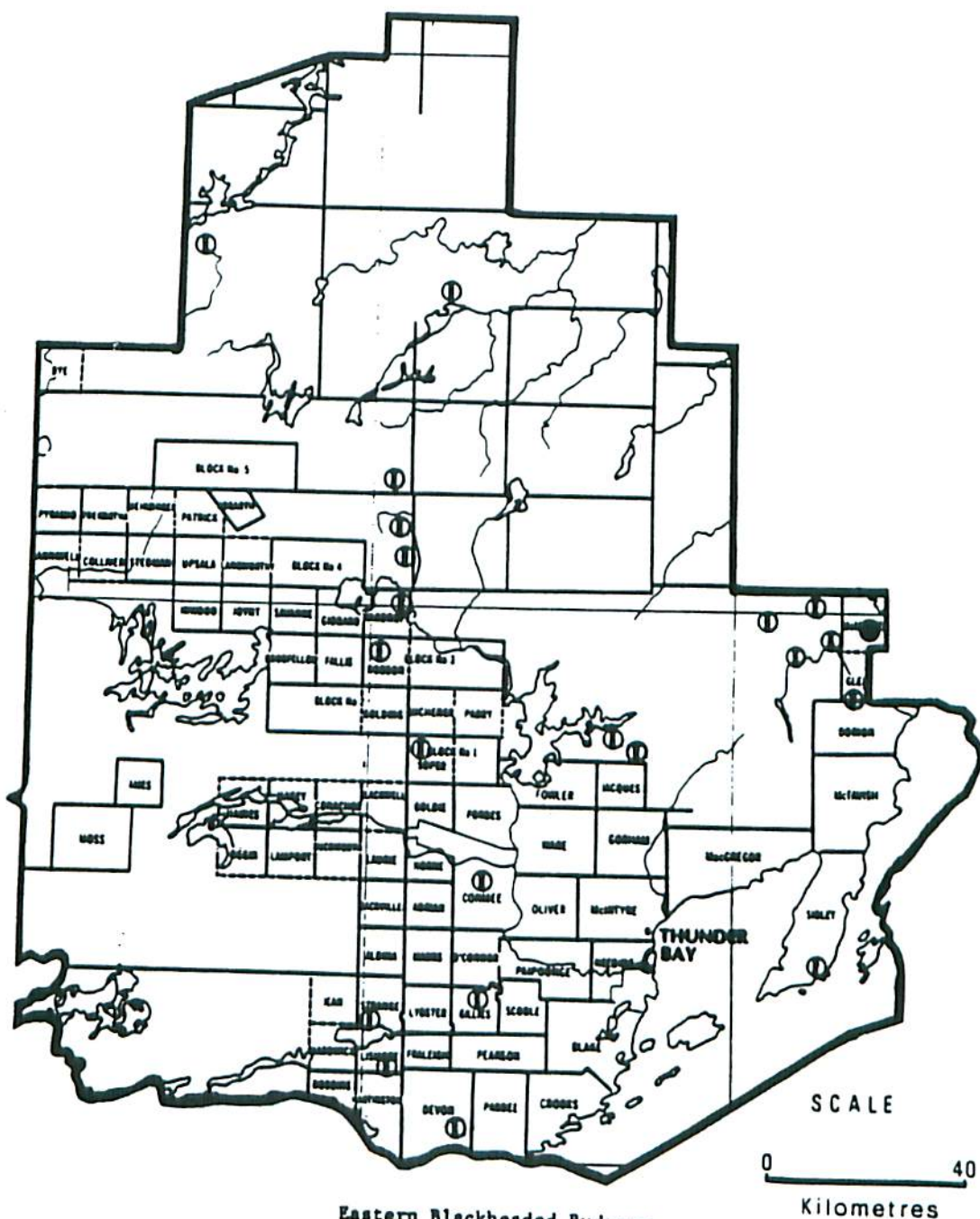
# INSECTS

Eastern Blackheaded Budworm, *Acleris variana* (Fern.)  
Host(s): spruce, bF

[Major]

<u>Year</u>	<u>Remarks</u>
1950	Trace populations occurred on the Sibley Peninsula and in McIntyre and Gorham twps.
1951	trace populations at widely scattered points
1952	Balsam fir were 24% defoliated at Kearns Lake and 19% at Armistice Lake. Light defoliation also occurred on black spruce at Mack Lake on the western boundary of the district.
1953	Light populations were recorded at numerous locations, and at one point in McMaster Twp there was moderate-to-severe defoliation (see map, page 12).
1954	Population levels changed little from those of 1953.
1955	major decline in population levels
1956-1957	not reported
1958-1961	trace populations
1962	light populations on open-grown white spruce, O'Connor Twp
1963-1965	low numbers common at numerous points
1966	light populations along the Burchell Lake road and in O'Connor Twp
1967	not reported
1968	low numbers, Inwood Twp
1969-1970	not reported
1971-1972	trace populations
1973	not reported (within the current boundaries of Thunder Bay District)
1974-1976	Low numbers were commonly encountered.
1977	populations reduced to trace levels
1978-1980	not reported

# THUNDER BAY DISTRICT



Eastern Blackheaded Budworm  
Areas within which defoliation  
occurred in 1953

## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ●



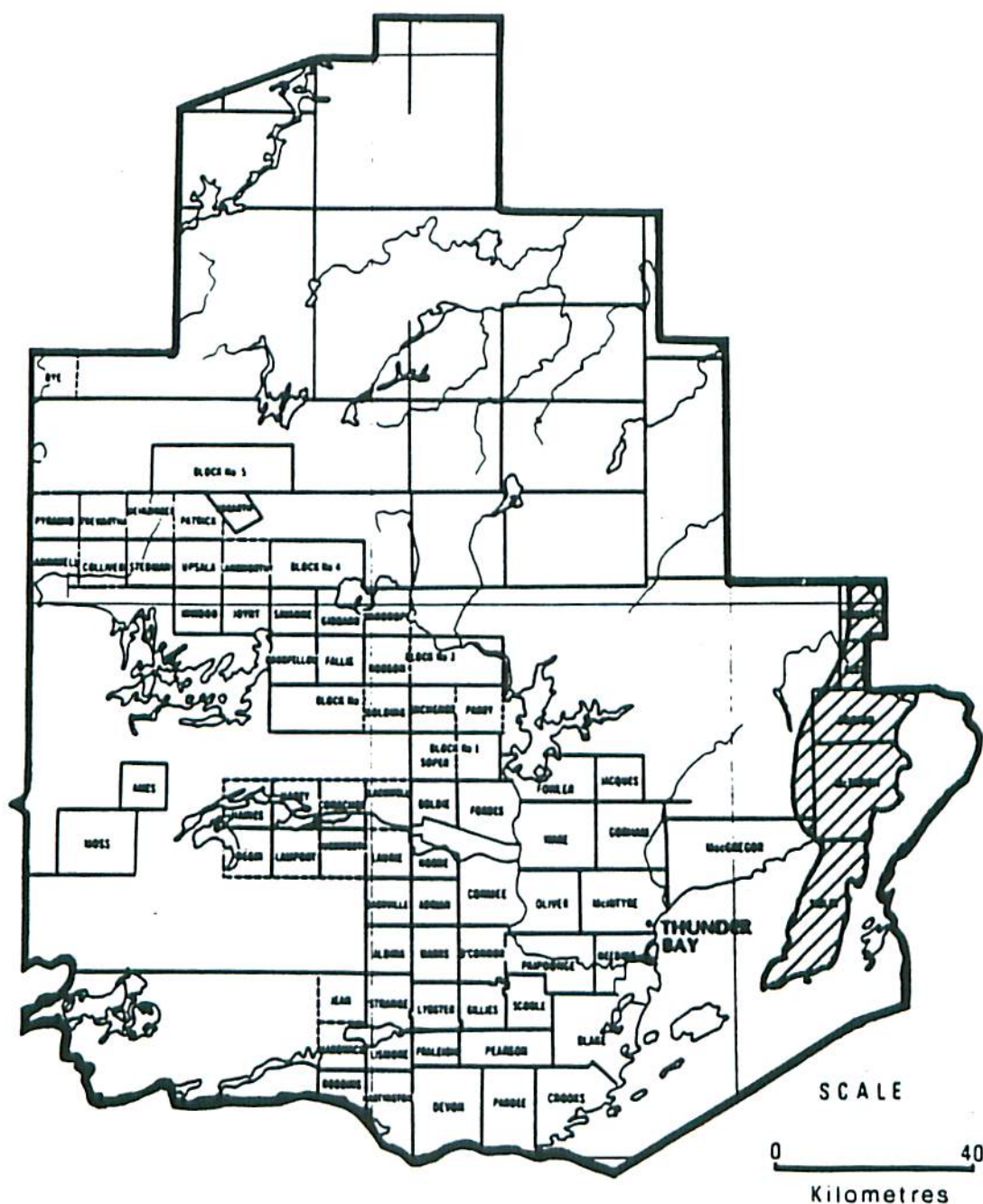
Birch Skeletonizer, *Bucculatrix canadensisella* Chem.

Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	light infestation on white birch in the Perching Gull Lake area
1955-1961	not reported
1962	A light infestation occurred along the eastern boundary of the district from McMaster Twp to Silver Islet (see map, page 14).
1963	The area of light infestation extended westward (see map, page 15)
1964	Moderate-to-severe defoliation occurred in the area of Cheeseman and Kabitotiquia lakes (see map, page 16).
1965	Populations declined to trace levels in the previously infested area.
1966-1969	not reported
1970	A large area of moderate-to-severe defoliation in the Northwestern Region extended into the district at Tilly Lake. Similar damage was recorded in five other areas in the western part of the district (see map, page 17).
1971-1973	Moderate-to-severe defoliation occurred through most birch stands in the district.
1974	substantial decline in population levels
1975	complete collapse of infestation
1976-1980	not reported

# THUNDER BAY DISTRICT



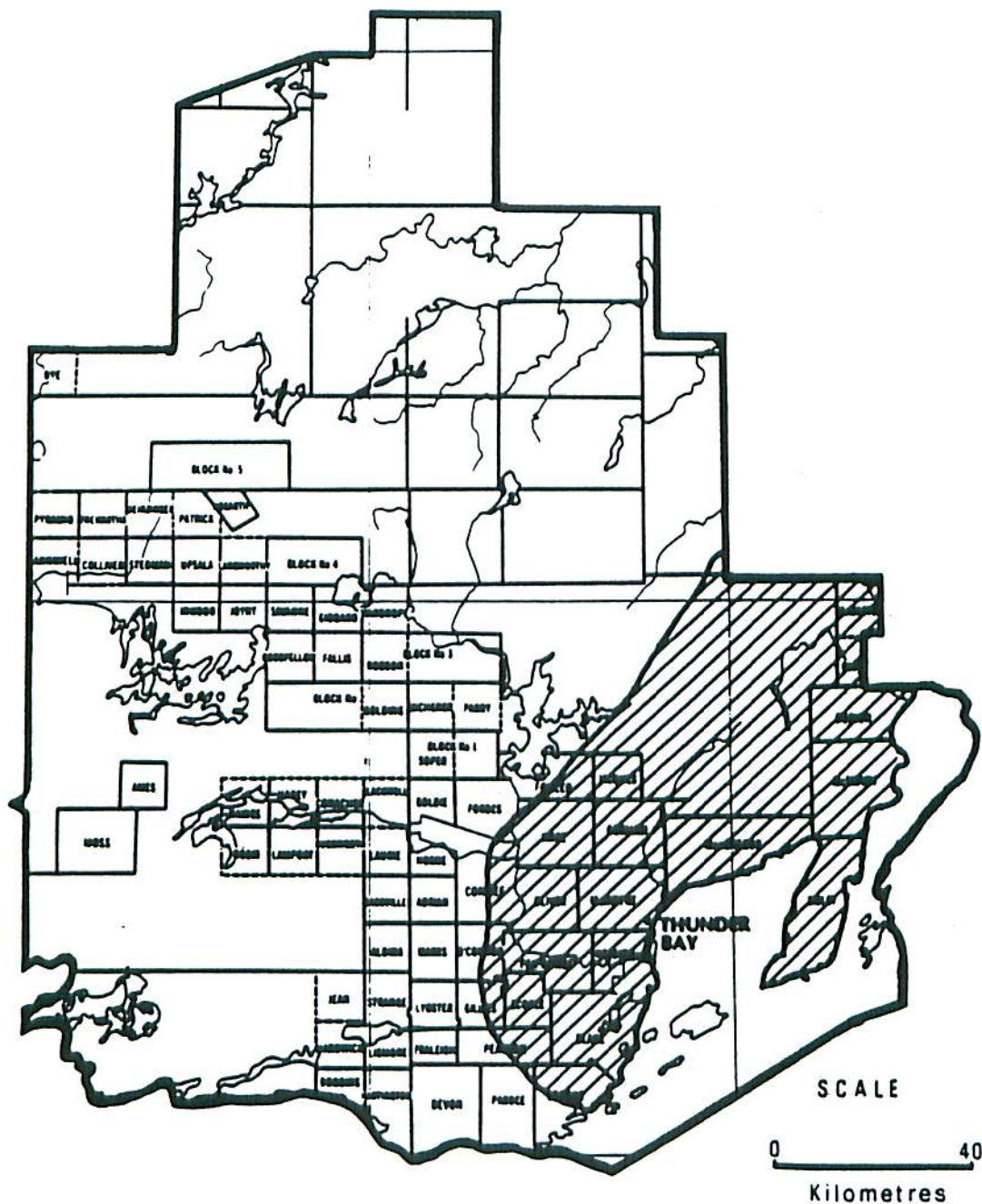
Birch Skeletonizer

Areas within which defoliation  
occurred in 1962

LEGEND

Light defoliation 

# THUNDER BAY DISTRICT



Birch Skeletonizer

Areas within which defoliation  
occurred in 1963

LEGEND

Light defoliation

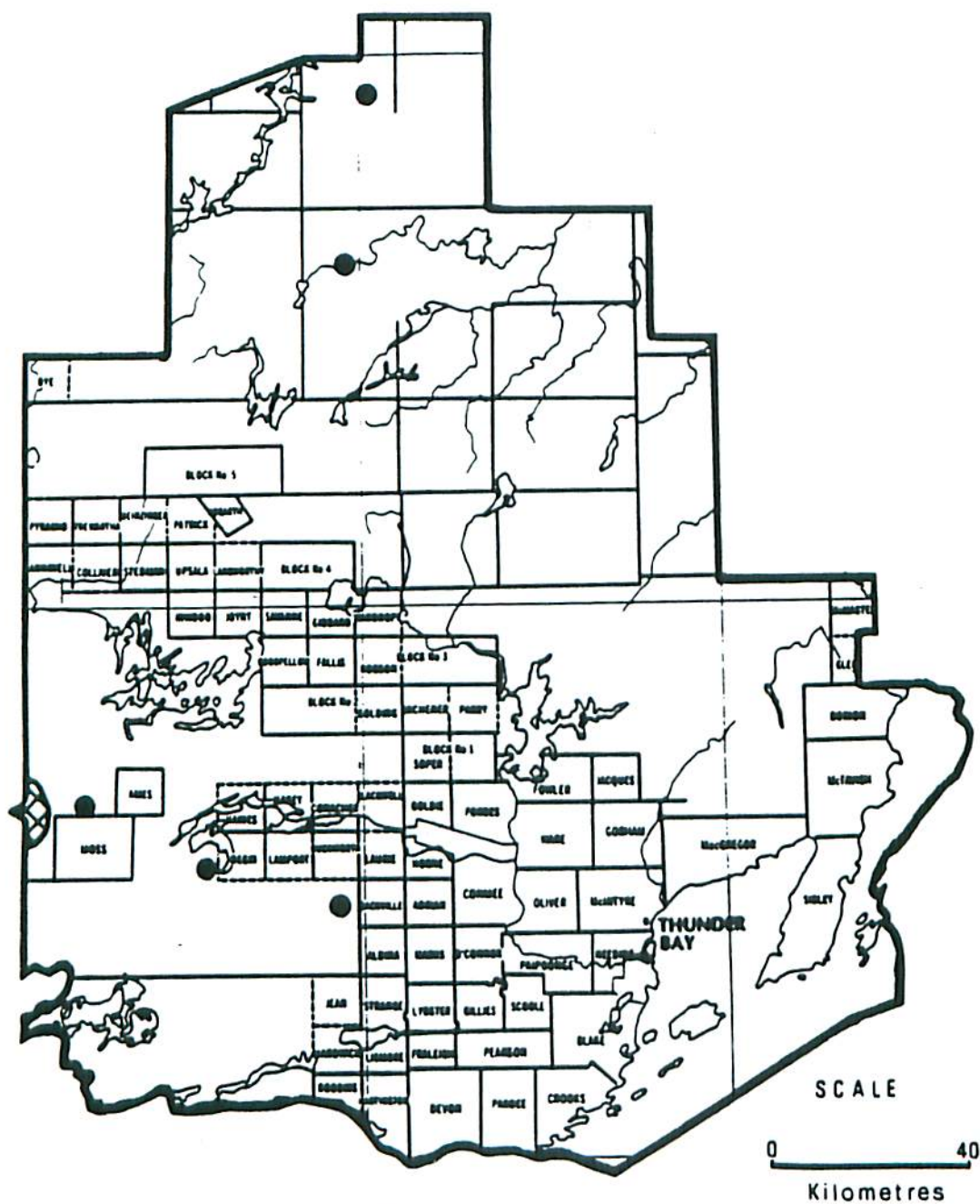








# THUNDER BAY DISTRICT



Birch Skeletonizer

Areas within which defoliation  
occurred in 1970

## LEGEND

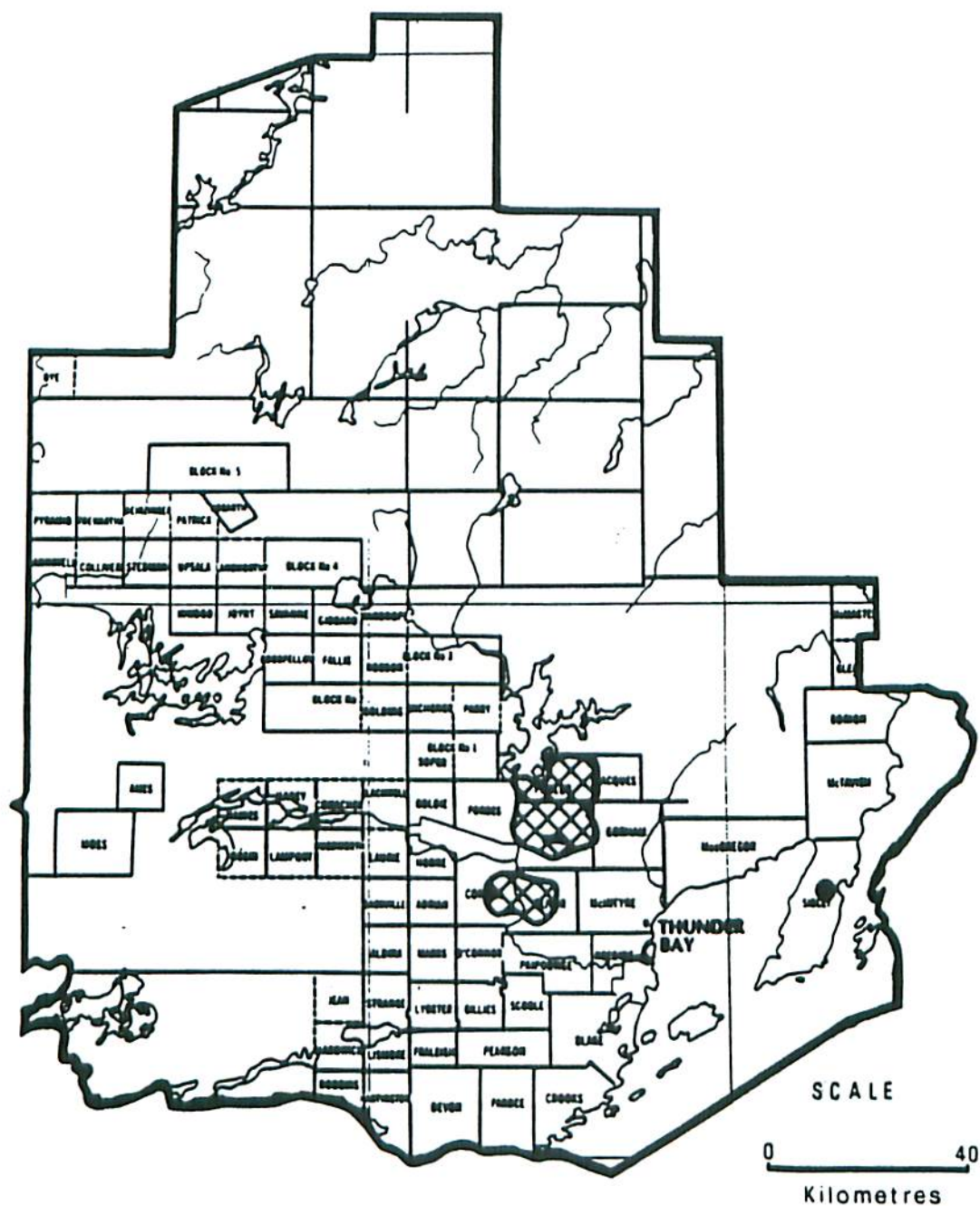
Moderate-to-severe defoliation ● or 

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.)  
Host(s): poplar

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957	Moderate-to-severe defoliation occurred over about 62 km <sup>2</sup> in the Pigeon River area in Devon and Pardee twps.
1958	An area of medium-to-heavy infestation along the Pigeon River expanded to about 145 km <sup>2</sup> . An adjacent 65-km <sup>2</sup> area of light infestation extended as far as Cloud Lake and eastward to Cloud Bay.
1959	The infestation collapsed; pockets of moderate numbers remained in Pardee Twp.
1960-1961	trace populations in the Pigeon River area
1962-1967	not reported
1968	small area of moderate populations in Conmee Twp
1969	A medium-to-heavy infestation totalling about 508 km <sup>2</sup> was recorded in three areas (see map, page 19).
1970	Moderate-to-severe defoliation occurred over a total of 1,813 km <sup>2</sup> (see map, page 20).
1971	The area of medium-to-heavy infestation again increased in size (see map, page 21)
1972	Moderate-to-severe defoliation occurred over much of the district (see map, page 22).
1973	The area of moderate-to-severe defoliation increased in the northern part of the district but declined in the southern part (see map, page 23)
1974	The infestation declined; there were two areas of light defoliation.
1975-1980	not reported

# THUNDER BAY DISTRICT



Large Aspen Tortrix

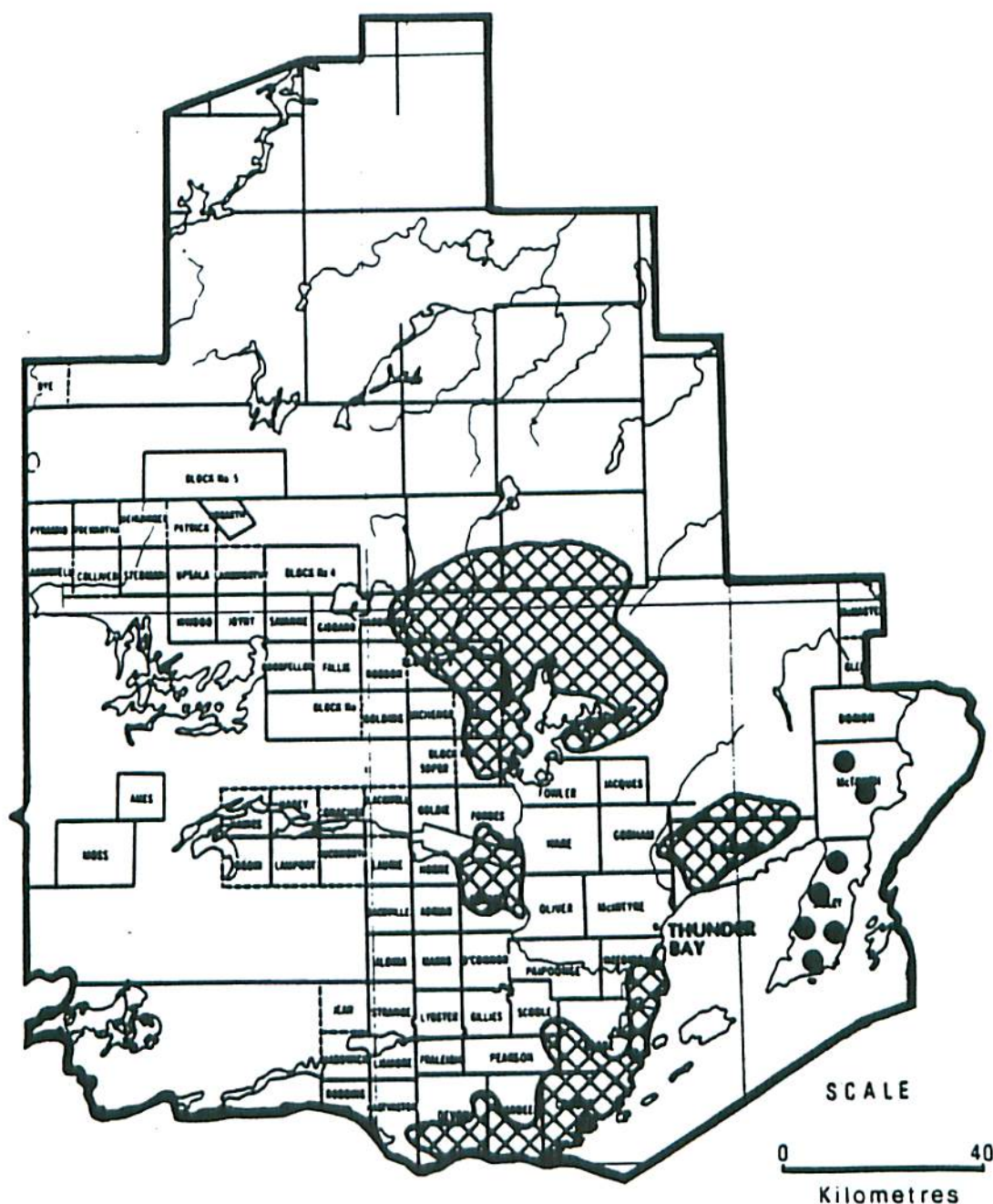
Areas within which defoliation  
occurred in 1969

## LEGEND

Moderate-to-severe defoliation ● or 



# THUNDER BAY DISTRICT



Large Aspen Tortrix

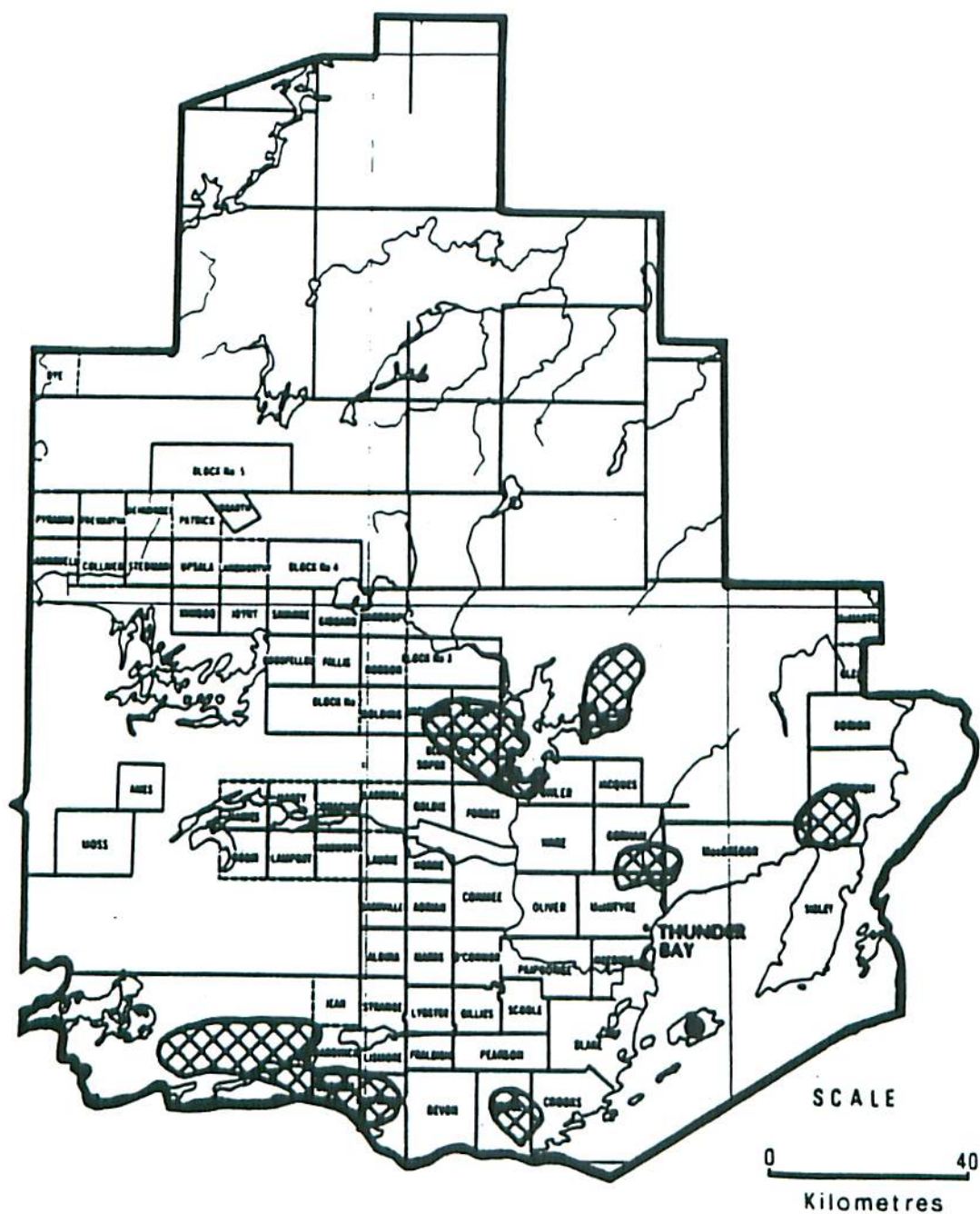
Areas with which defoliation  
occurred in 1970

LEGEND

Moderate-to-severe defoliation ● or 



# THUNDER BAY DISTRICT



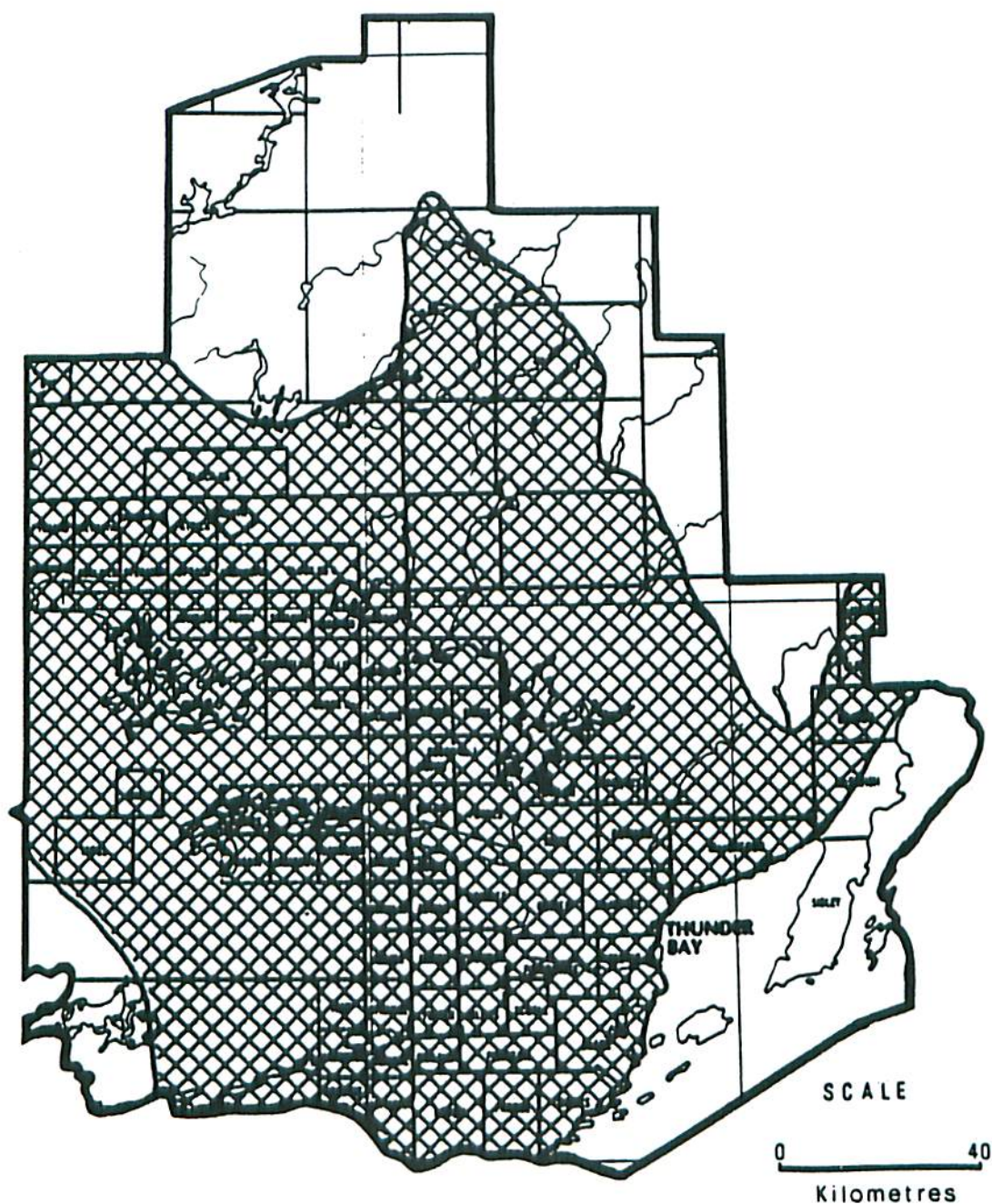
Large Aspen Tortrix

Areas within which defoliation  
occurred in 1971

## LEGEND

Moderate-to-severe defoliation ● or 

# THUNDER BAY DISTRICT



Large Aspen Tortrix

Areas within which defoliation  
occurred in 1972

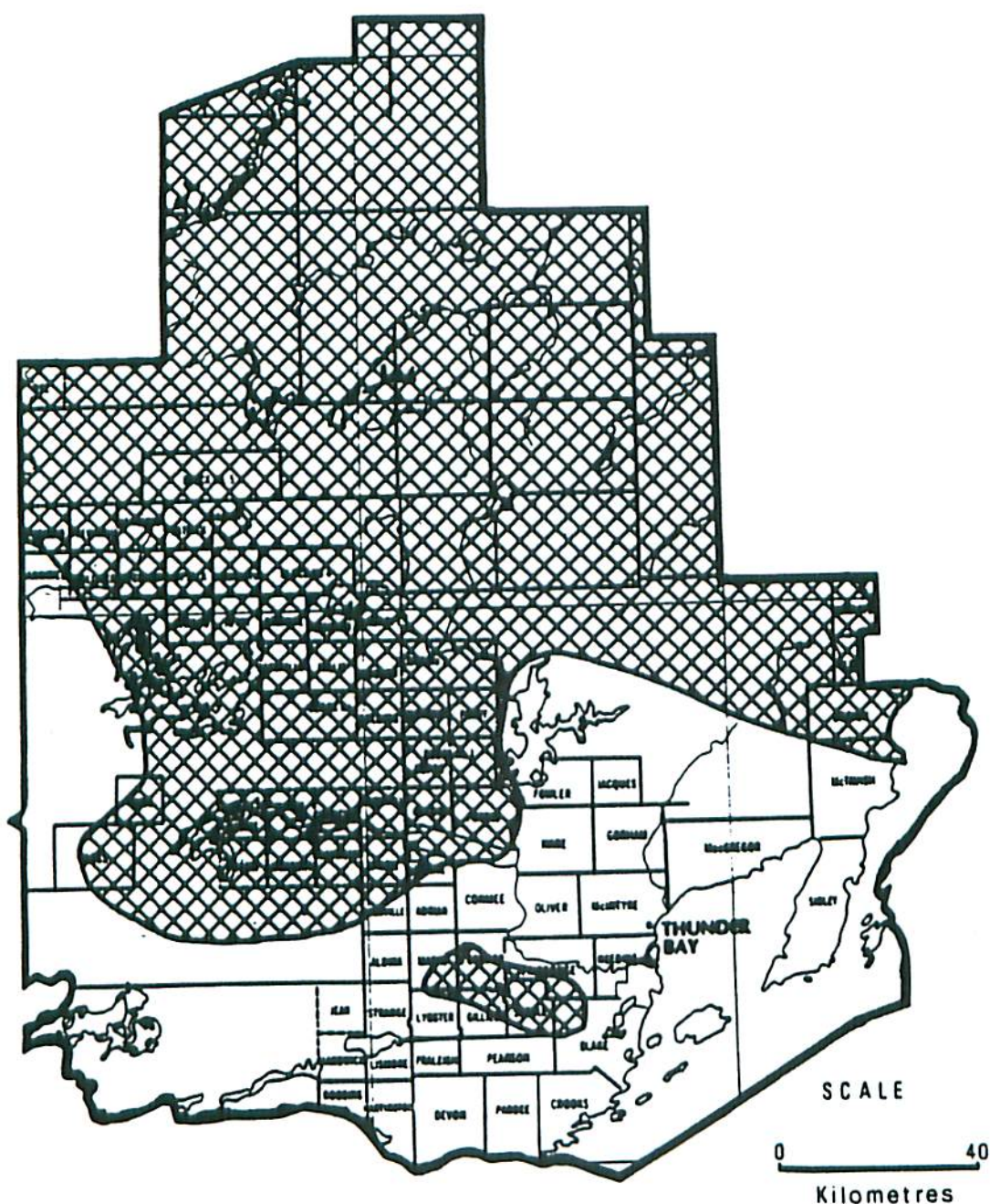
## LEGEND

Moderate-to-severe defoliation





# THUNDER BAY DISTRICT



## Large Aspen Tortrix

Areas within which defoliation  
occurred in 1973

### LEGEND

Moderate-to-severe defoliation



Spruce Budworm, *Choristoneura fumiferana* (Clem.)  
Host(s): spruce, bF

[Major]

<u>Year</u>	<u>Remarks</u>
1950	Moderate-to-severe defoliation occurred in the central portion of the Sibley Peninsula for the third consecutive year, and there was light damage in the surrounding area (see map, page 28). The area of balsam fir tree mortality in the Lake Nipigon infestation extended into the northeastern part of the district.
1951	Moderate-to-severe defoliation recurred in the same area as in 1950. In the northeastern part of the district, a large area of mortality resulted from previous infestations (see map, page 29).
1952	The area of moderate-to-severe defoliation on the Sibley Peninsula continued (see map, page 30). Traces of balsam fir mortality were evident. New areas of mortality also became evident in the Poshkokagan Lake area which was previously infested.
1953	Moderate-to-severe defoliation continued in the central portion of the Sibley Peninsula. Light defoliation occurred north of this infestation (see map, page 31).
1954	Infestation boundaries on the Sibley Peninsula remained unchanged. An area of moderate-to-severe defoliation extended into the district south of Leckie Lake (see map, page 32).
1955	The Sibley Peninsula infestation continued at moderate-to-severe levels (see map, page 33). In other areas the infestations declined to trace levels.
1956	Moderate-to-severe damage recurred on much of the Sibley Peninsula (see map, page 34). A pocket of moderate-to-severe defoliation occurred at Pyramid Lake on the district boundary.
1957	A substantial spread of medium-to-heavy infestation occurred along the southern part of the Atikokan-Thunder Bay district border, the Sibley Peninsula infestation continued and the Pyramid Lake infestation remained at moderate-to-severe levels (see map, page 35).

(cont'd)



Spruce Budworm, *Choristoneura fumiferana* (Clem.) (cont'd)  
Host(s): spruce, bF

[Major]

<u>Year</u>	<u>Remarks</u>
1958	The area of moderate-to-severe defoliation expanded in the southwestern part of the district (see map, page 36). No appreciable change occurred in the infestation on Sibley Peninsula.
1959	The infested area in the southwestern part of the district intensified (see map, page 37), whereas the infestation on Sibley Peninsula subsided. Severe mortality of balsam fir occurred throughout the peninsula.
1960	The eastern boundary of the medium-to-heavy infestation in the southwestern part of the district extended slightly to the east (see map, page 38). No infestations were present on Sibley Peninsula.
1961	The area of moderate-to-severe damage again expanded slightly eastward (see map, page 39). Infestations in the Upper Shebandowan Lake area and at Open Bay on Lac des Mille Lacs declined to very low levels.
1962	The total area of moderate-to-severe defoliation was reduced and the area of light infestation in 1961 declined to endemic levels.
1963	The total area infested was reduced from 1,554 km <sup>2</sup> in 1962 to 829 km <sup>2</sup> and the intensity declined to light (see map, page 40).
1964	Populations declined further. Only small residual populations persisted at Plummes, Saganaga and Northern Light lakes. Defoliation of balsam fir did not exceed 10%.
1965	There were small residual populations at Plummes Lake; mortality of balsam fir as a result of several years of moderate-to-severe defoliation was evident from Ross and Plummes lakes to the United States border.
1966	small, light infestation recorded in the Burchell Lake area
1967	Moderate-to-severe defoliation occurred over approximately 180 km <sup>2</sup> in the Burchell Lake area; light defoliation was detected in several places (see map, page 41).

(cont'd)

Spruce Budworm, *Choristoneura fumiferana* (Clem.) (cont'd)  
Host(s): spruce, bF

[Major]

<u>Year</u>	<u>Remarks</u>
1968	Aerial spraying operations effectively suppressed populations. Within the sprayed area only 526 ha of moderate-to-severe defoliation and 546 ha of light defoliation occurred. Outside the spray area two pockets of light infestation were detected, one on the west side of Kasha-bowie Lake and the other near Open Bay, Lac des Mille Lacs.
1969	Two areas of medium-to-heavy infestation totalling 1,619 ha occurred near Granite and Northern Light lakes in the southwestern portion of the district.
1970	Despite aerial spraying operations, 567 ha were moderately to severely defoliated in the Northern Light and Granite lakes areas.
1971	Approximately 800 ha of moderate-to-severe defoliation were recorded, mostly in a new infestation found near Mountain Lake. Small pockets occurred in sprayed areas at Northern Light, Granite and Gunflint lakes and in adjacent unsprayed areas near Gunflint Lake. A small area of light defoliation occurred in Inwood Twp near Upsala.
1972	Several small pockets of moderate-to-severe defoliation were recorded in the area of Northern Light, Granite and Gunflint lakes.
1973	Persistent infestations in the southwestern part of the district were finally eliminated by aerial spraying carried out from 1970 to 1973.
1974	not reported
1975	A new moderate-to-heavy infestation of 6,600 ha was found just north of the Pigeon River (see map, page 42) and moderate-to-severe defoliation occurred in a small area near Swallow Lake.
1976	Several areas of moderate-to-severe defoliation were detected (see map, page 43) in the southwestern portion of the district. In addition, moderate numbers of budworm were found in the Sandstone-Prelate lakes area and at Mountain Lake. Low numbers were found in the city of Thunder Bay, in Gorham Twp, on the Sibley Peninsula and south of Athelstane Lake.

(cont'd)

Spruce Budworm, *Choristoneura fumiferana* (Clem.) (concl.)  
Host(s): spruce, bF

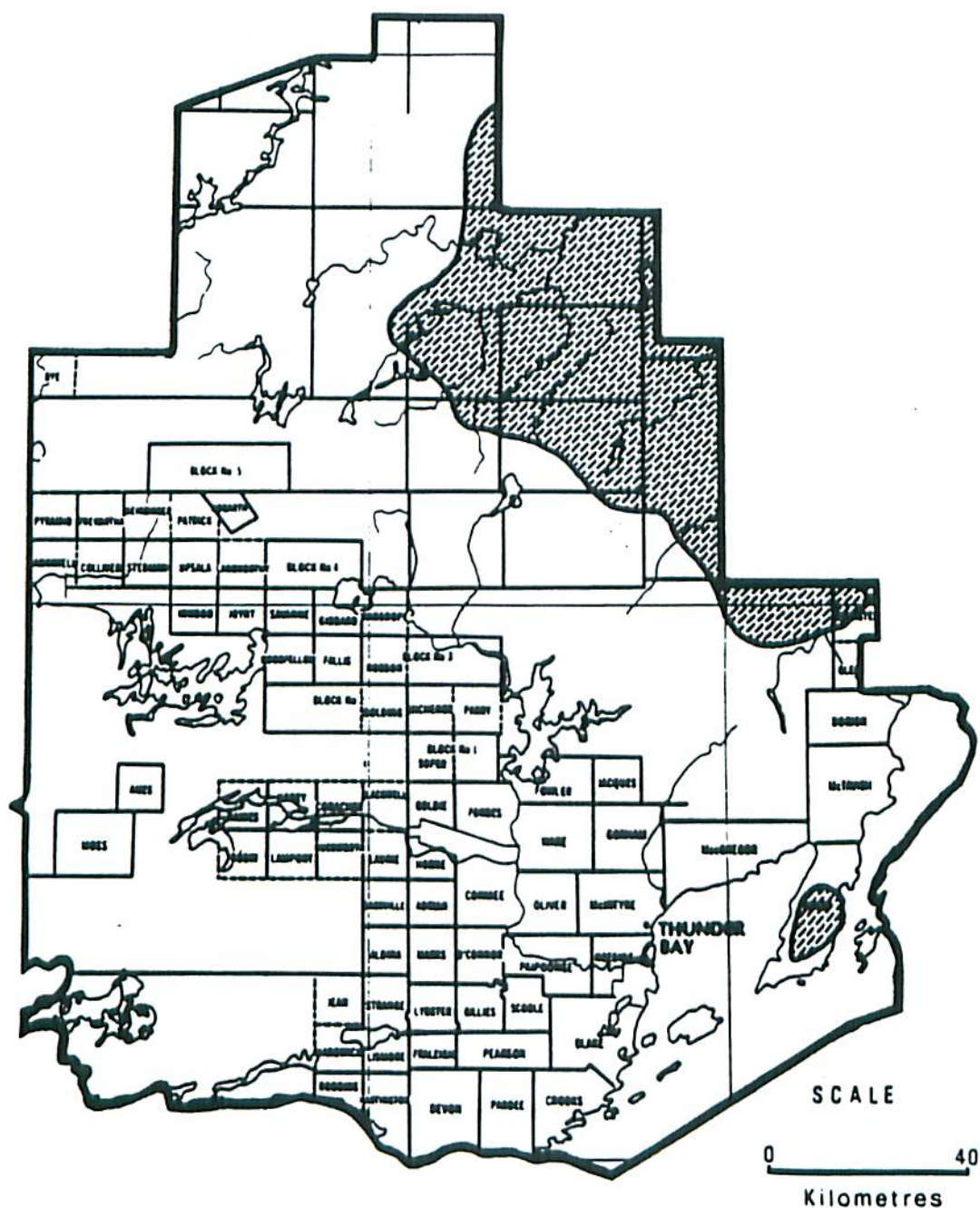
[Major]

<u>Year</u>	<u>Remarks</u>
1977	There was moderate-to-severe defoliation in 1977 (see map, page 44) in the area in which the 1976 infestation occurred. A population buildup was noted in the area between Boulevard Lake in the city of Thunder Bay northward to Stepstone in Gorham Twp.
1978	The area of moderate-to-severe defoliation recurred in the southwestern part of the district (see map, page 45).
1979	The area of moderate-to-severe defoliation was approximately double that of 1978 in the southwestern part of the district (see map, page 46).
1980	The medium-to-heavy infestation increased again, spreading to Lac des Mille Lacs in the north and Horne Twp in the east. A new area of moderate-to-severe defoliation totalling 60,700 ha was mapped west of Black Sturgeon Lake and the infestation at Arrow Lake expanded in 1980 (see map, page 47). Light populations were common south of a line extending from Raith to Black Bay on Lake Superior.






# THUNDER BAY DISTRICT



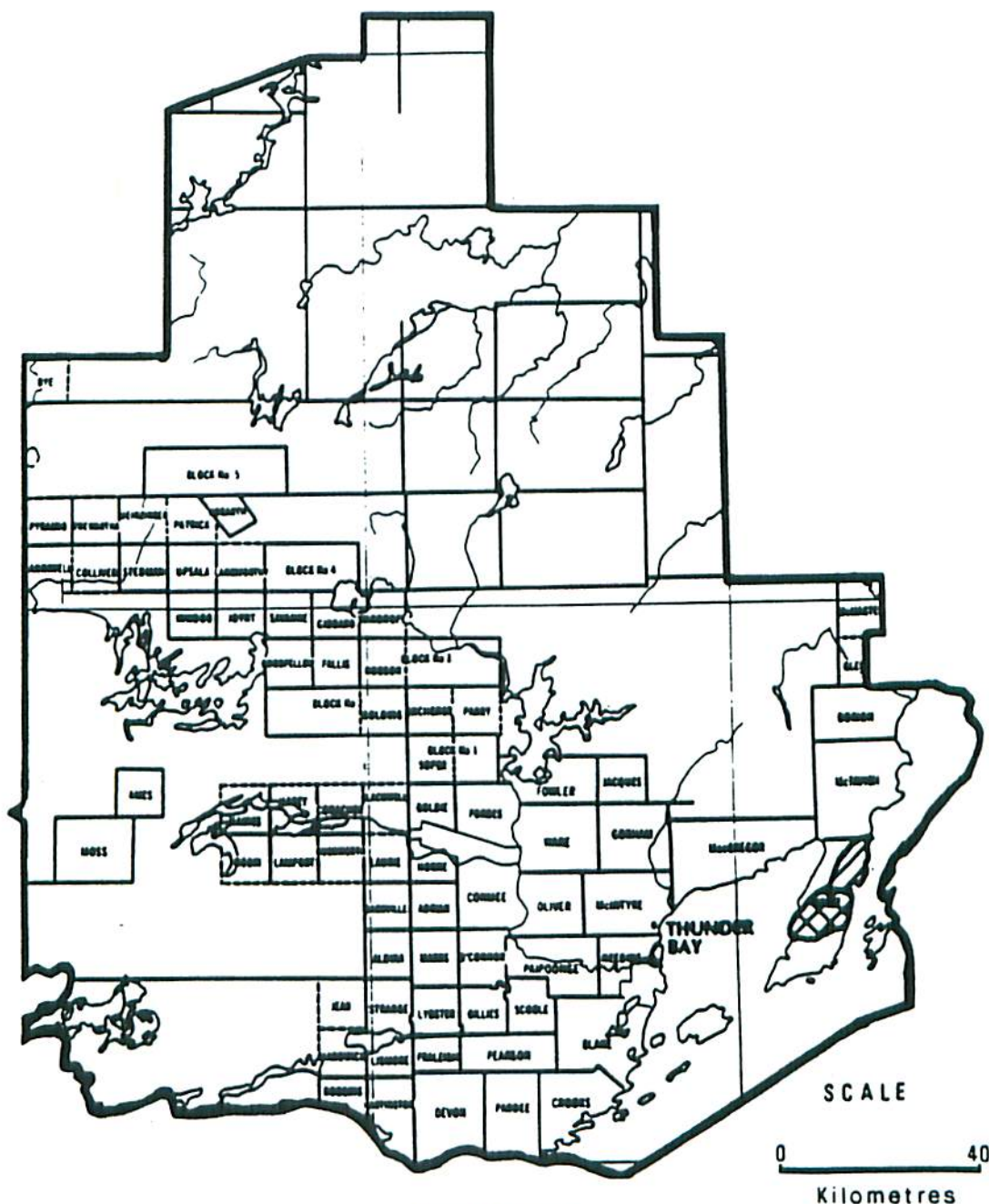
Spruce Budworm

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

## LEGEND

Mortality 

# THUNDER BAY DISTRICT



Spruce Budworm

Areas within which defoliation  
occurred in 1952

## LEGEND

Light defoliation

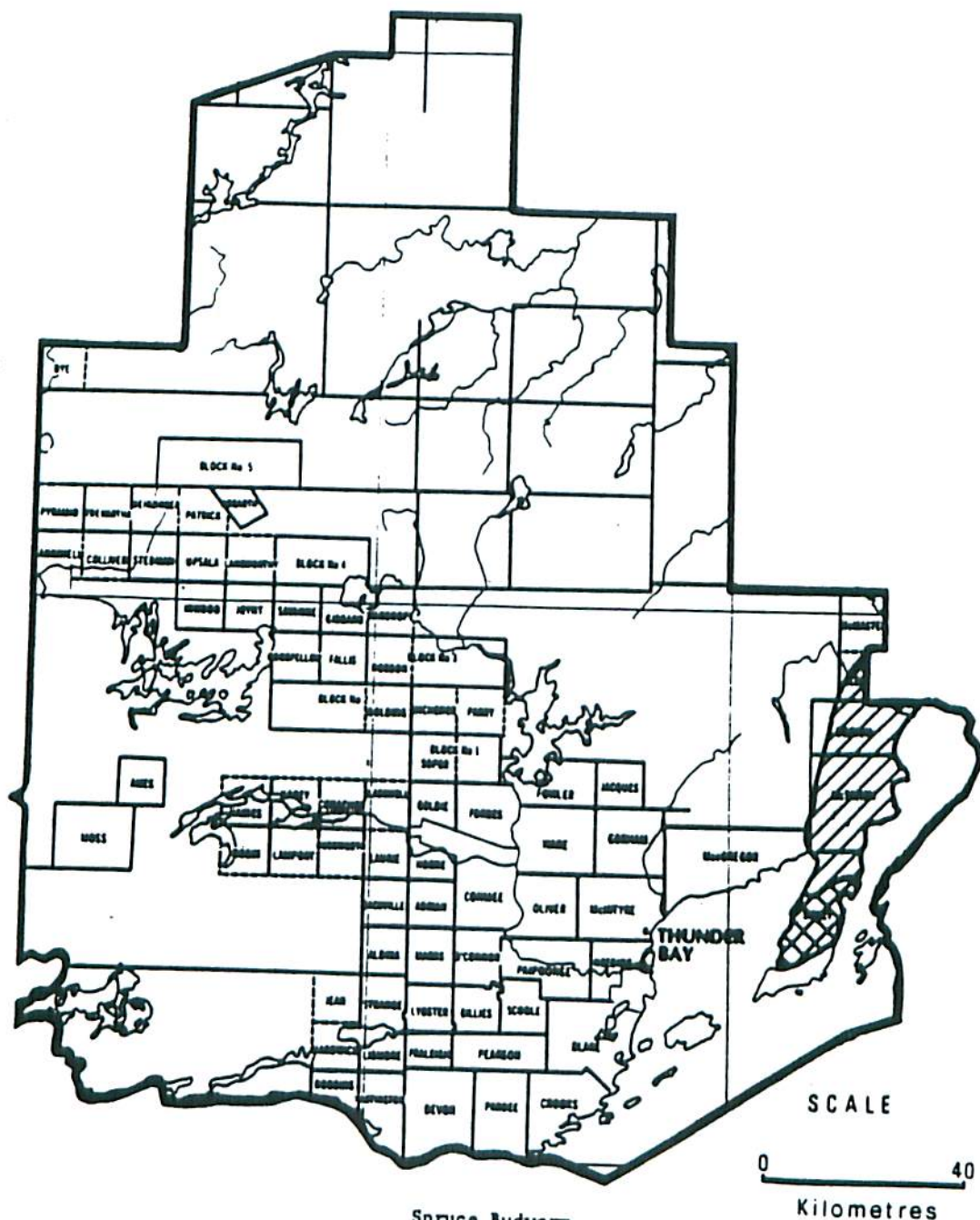


Moderate-to-severe defoliation





# THUNDER BAY DISTRICT



Spruce Budworm

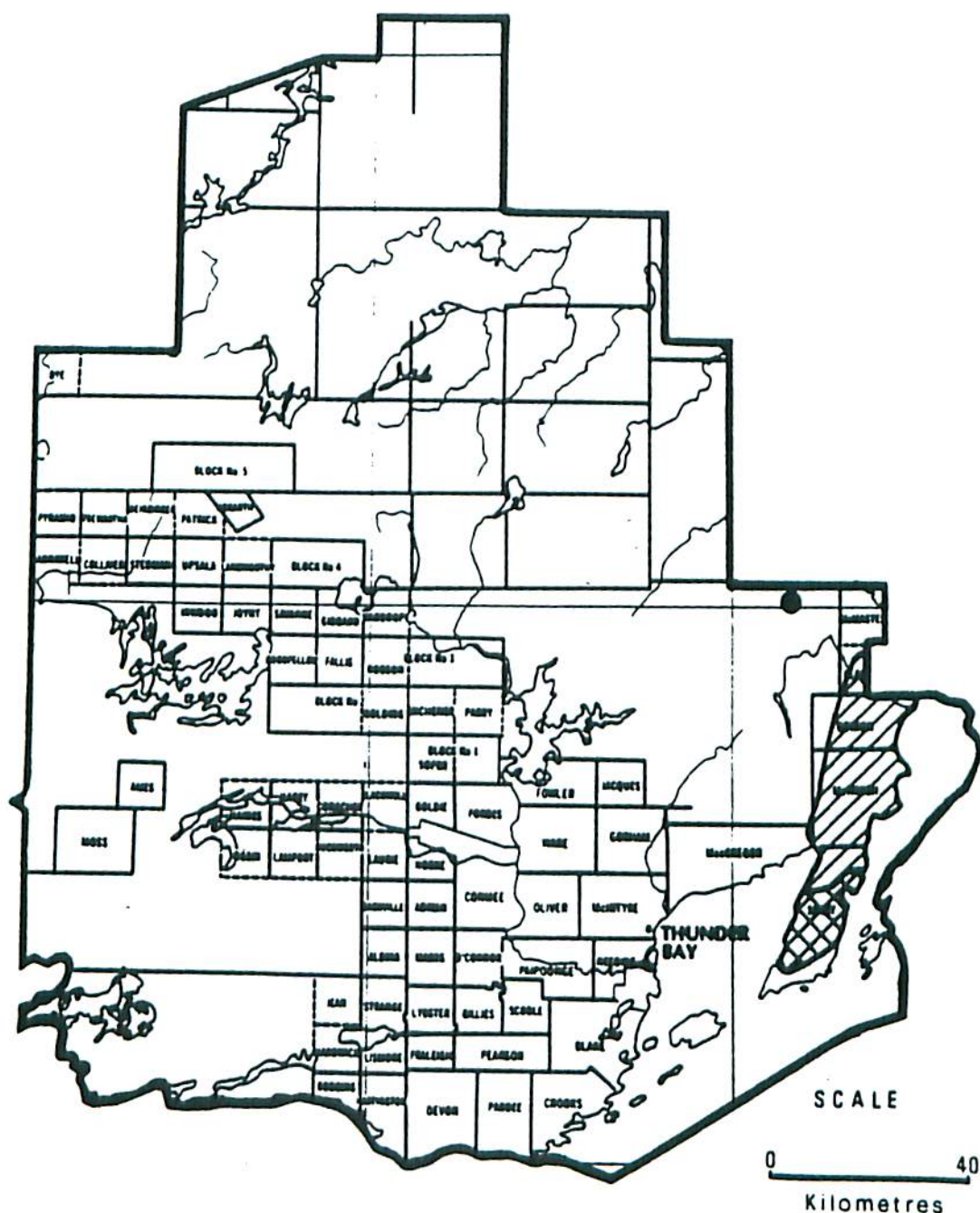
Area within which defoliation  
occurred in 1953

## LEGEND

Light defoliation 

Moderate-to-severe defoliation 

# THUNDER BAY DISTRICT



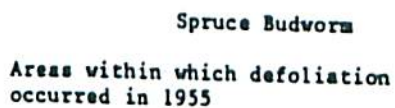
Spruce Budworm

Areas within which defoliation occurred in 1954

## LEGEND

Light defoliation 

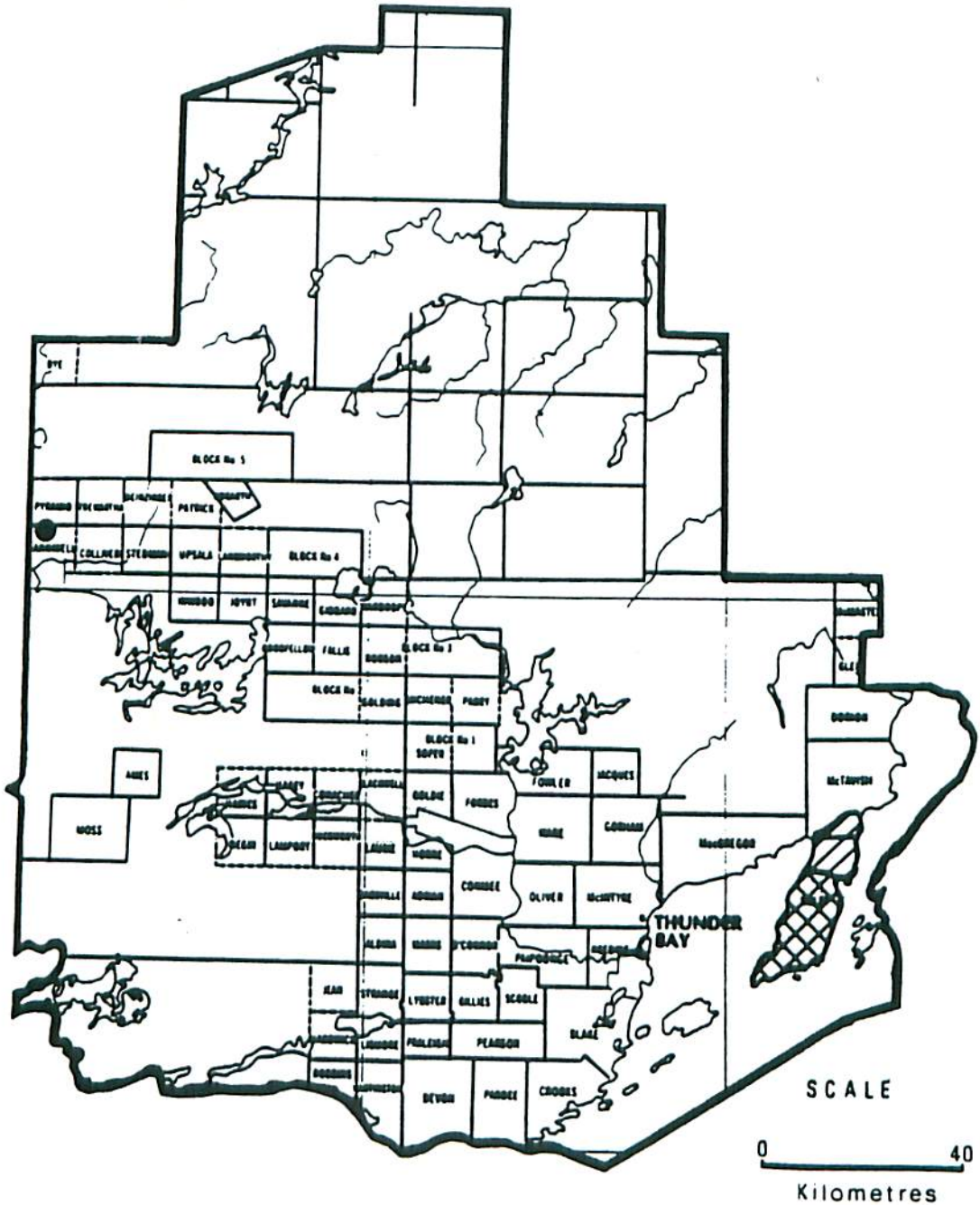
Moderate-to-severe defoliation 



Moderate-to-severe defoliation



# THUNDER BAY DISTRICT



Spruce Budworm

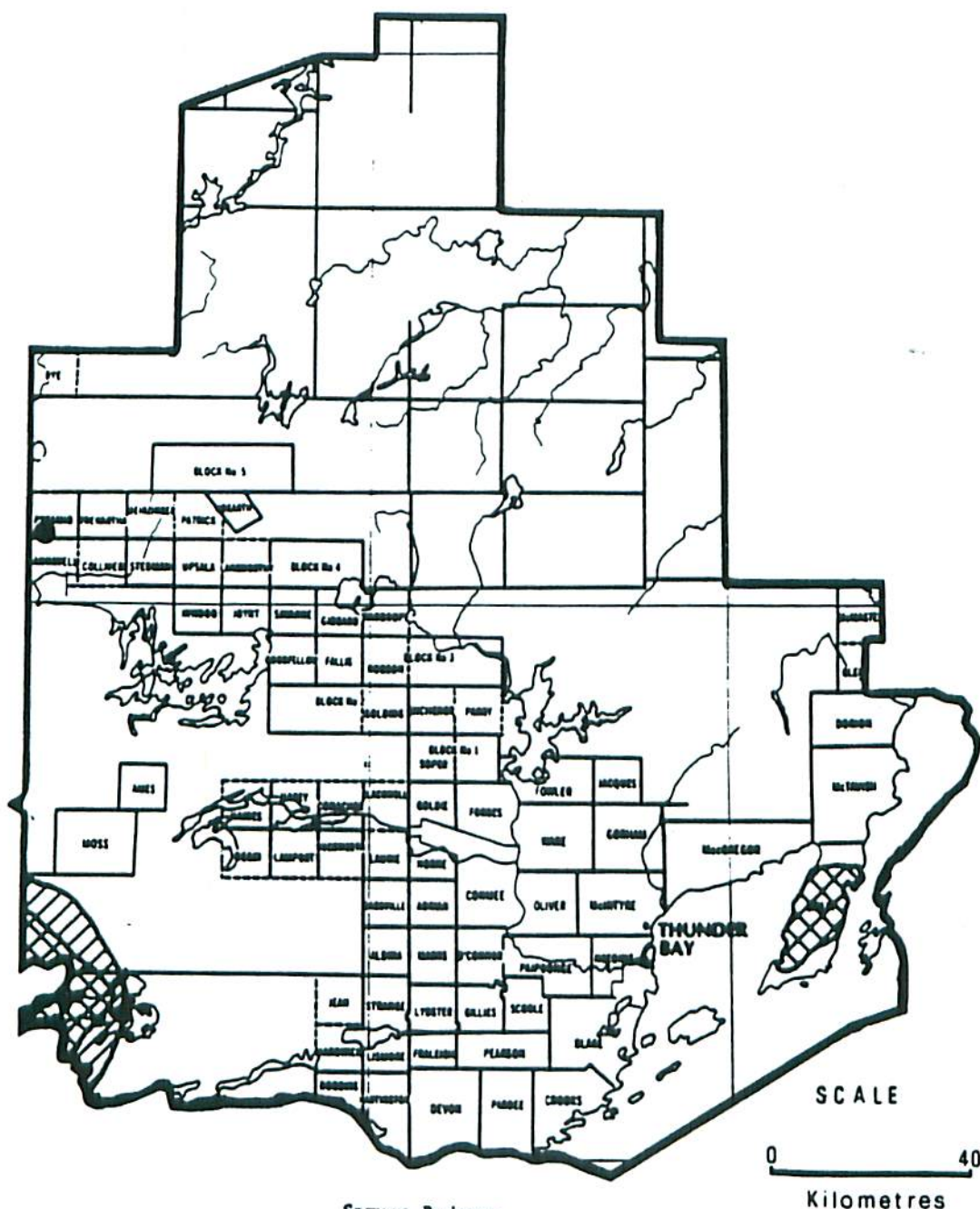
Areas within which defoliation  
occurred in 1956

## LEGEND

Light defoliation 

Moderate-to-severe defoliation ● or 

# THUNDER BAY DISTRICT



Spruce Budworm

Areas within which defoliation occurred in 1957

## LEGEND

Light defoliation (diagonal hatching)

Moderate-to-severe defoliation (solid black circle or cross-hatch pattern)

Areas within which defoliation  
occurred in 1958

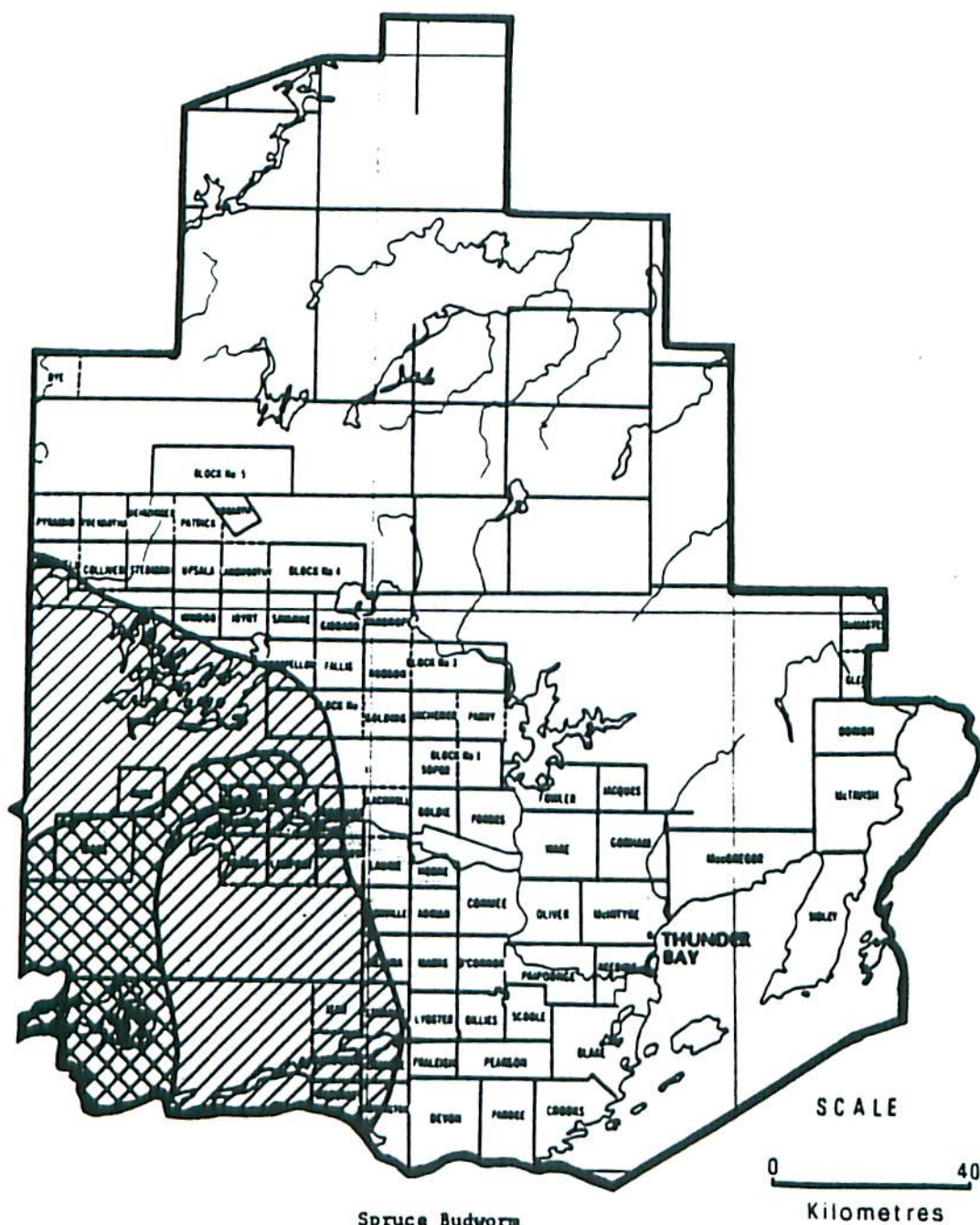
### LEGEND

### Light defoliation

Moderate-to-severe defoliation



# THUNDER BAY DISTRICT



Spruce Budworm

Areas within which defoliation  
occurred in 1959

## LEGEND

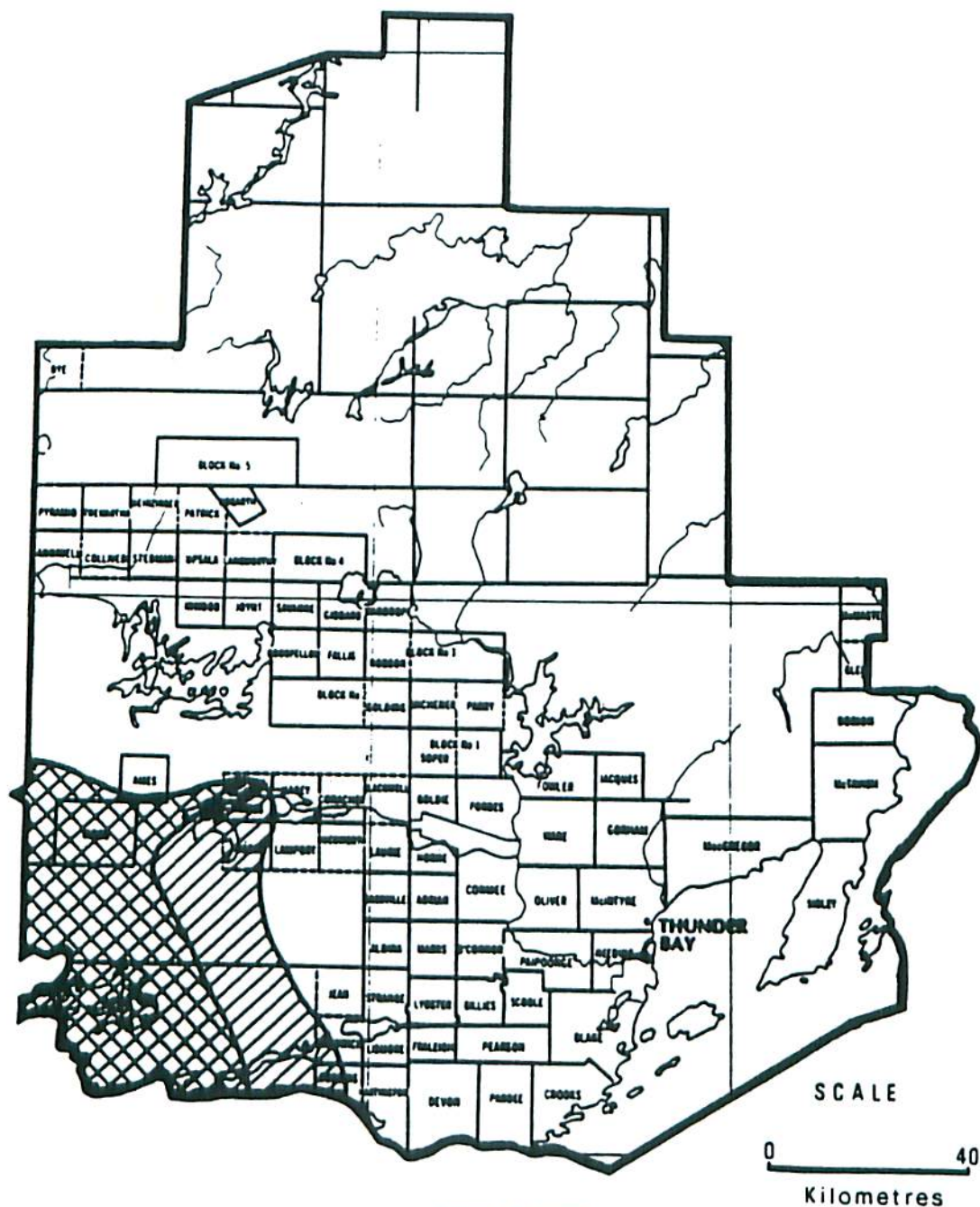
Light defoliation



Moderate-to-severe defoliation



# THUNDER BAY DISTRICT




Spruce Budworm

Areas within which defoliation occurred in 1960

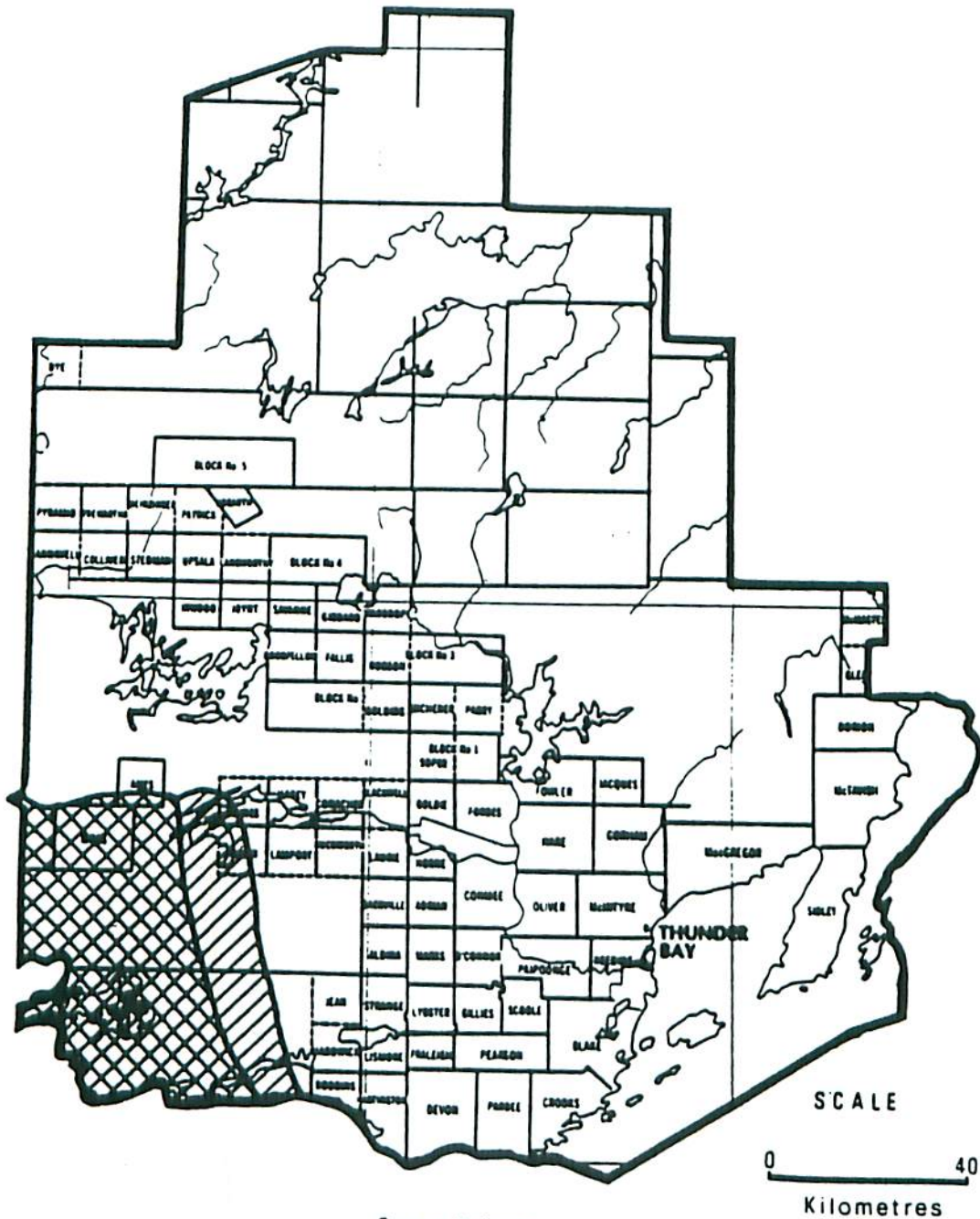
## LEGEND

Light defoliation 

Moderate-to-severe defoliation 



# THUNDER BAY DISTRICT




Spruce Budworm

Areas within which defoliation  
occurred in 1961

## LEGEND

Light defoliation 

Moderate-to-severe defoliation 





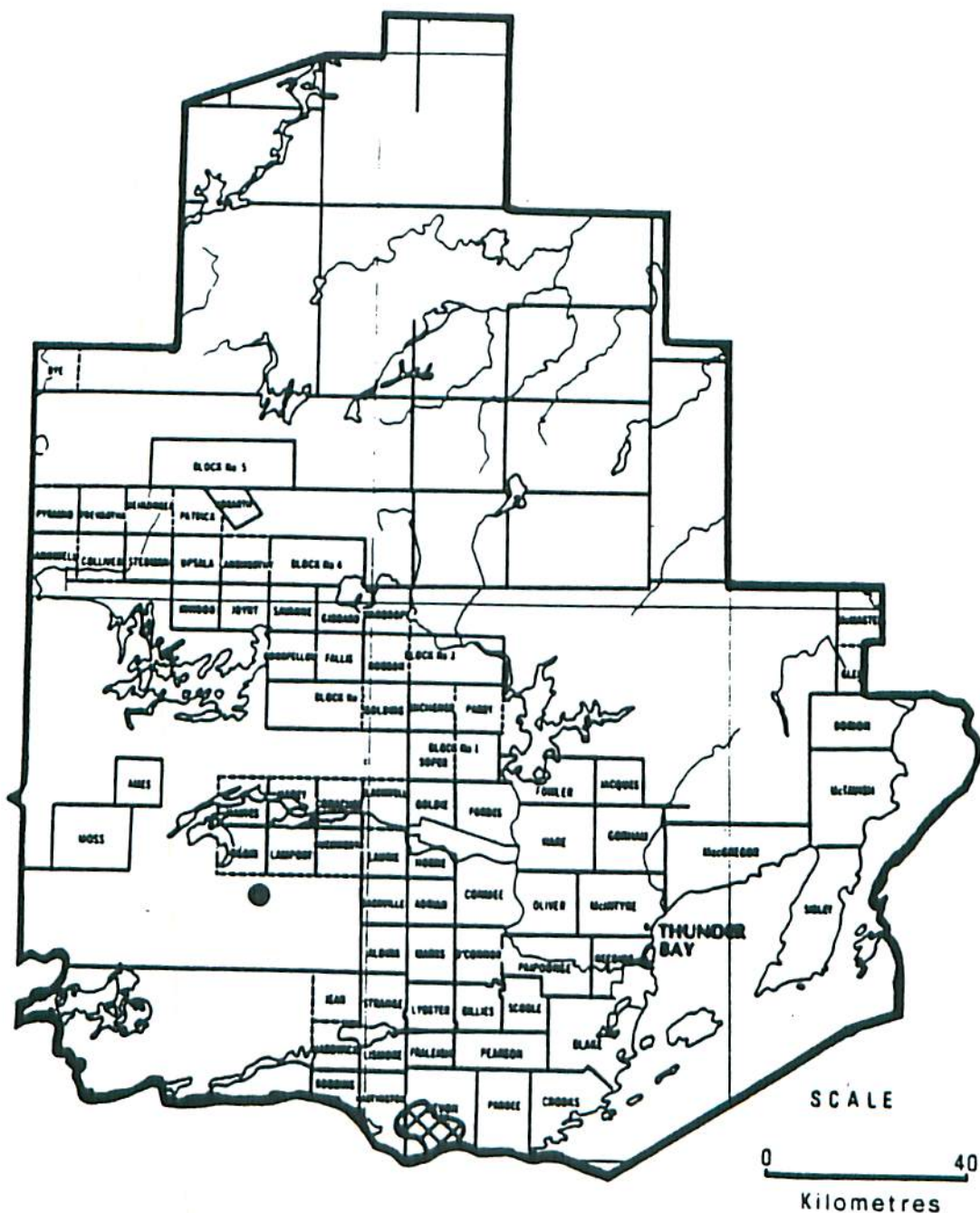


### LEGEND

Light defoliation ①

Moderate-to-severe defoliation 

# THUNDER BAY DISTRICT



Spruce Budworm

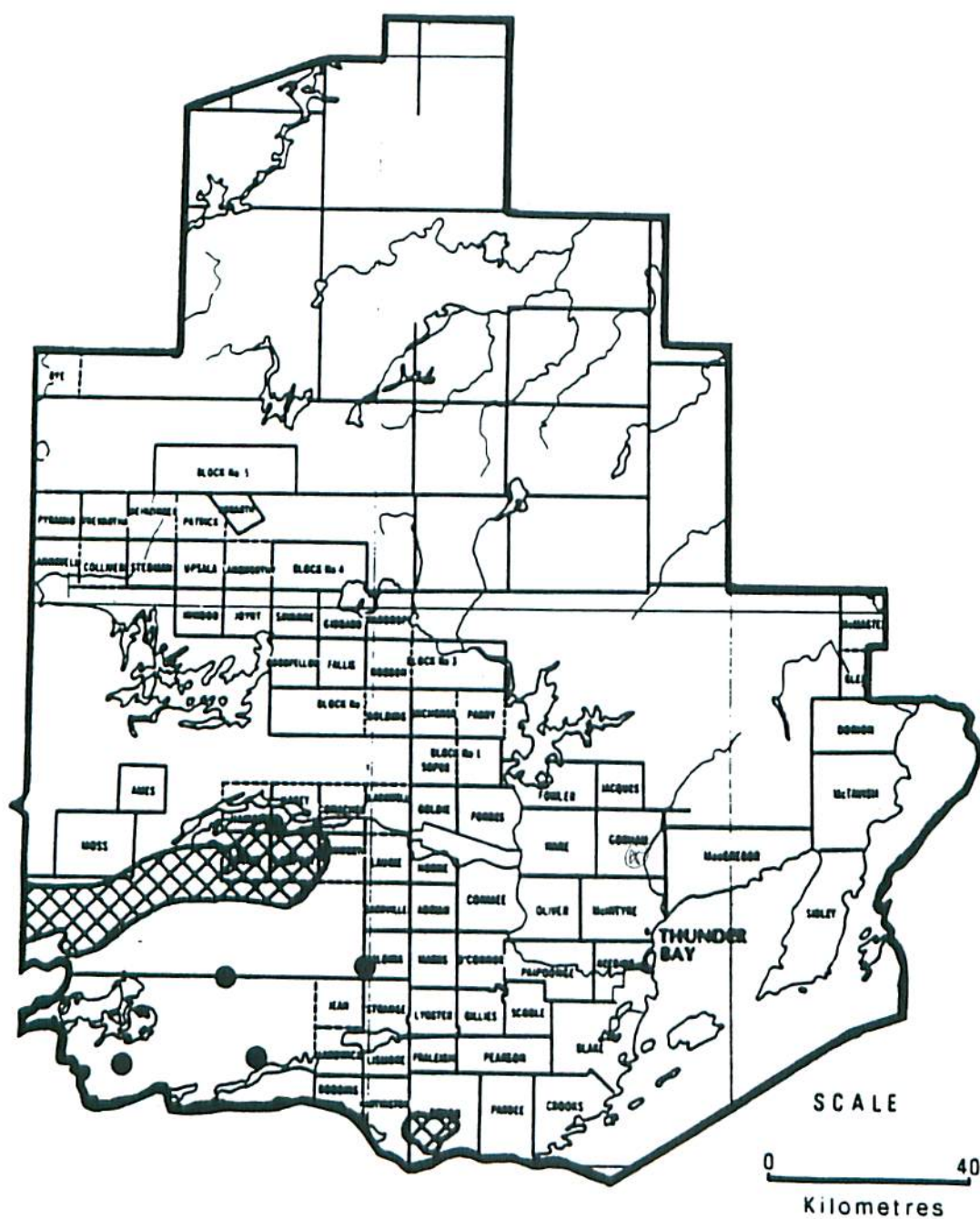
Areas within which defoliation  
occurred in 1975

## LEGEND

Moderate-to-severe defoliation ● or 



# THUNDER BAY DISTRICT



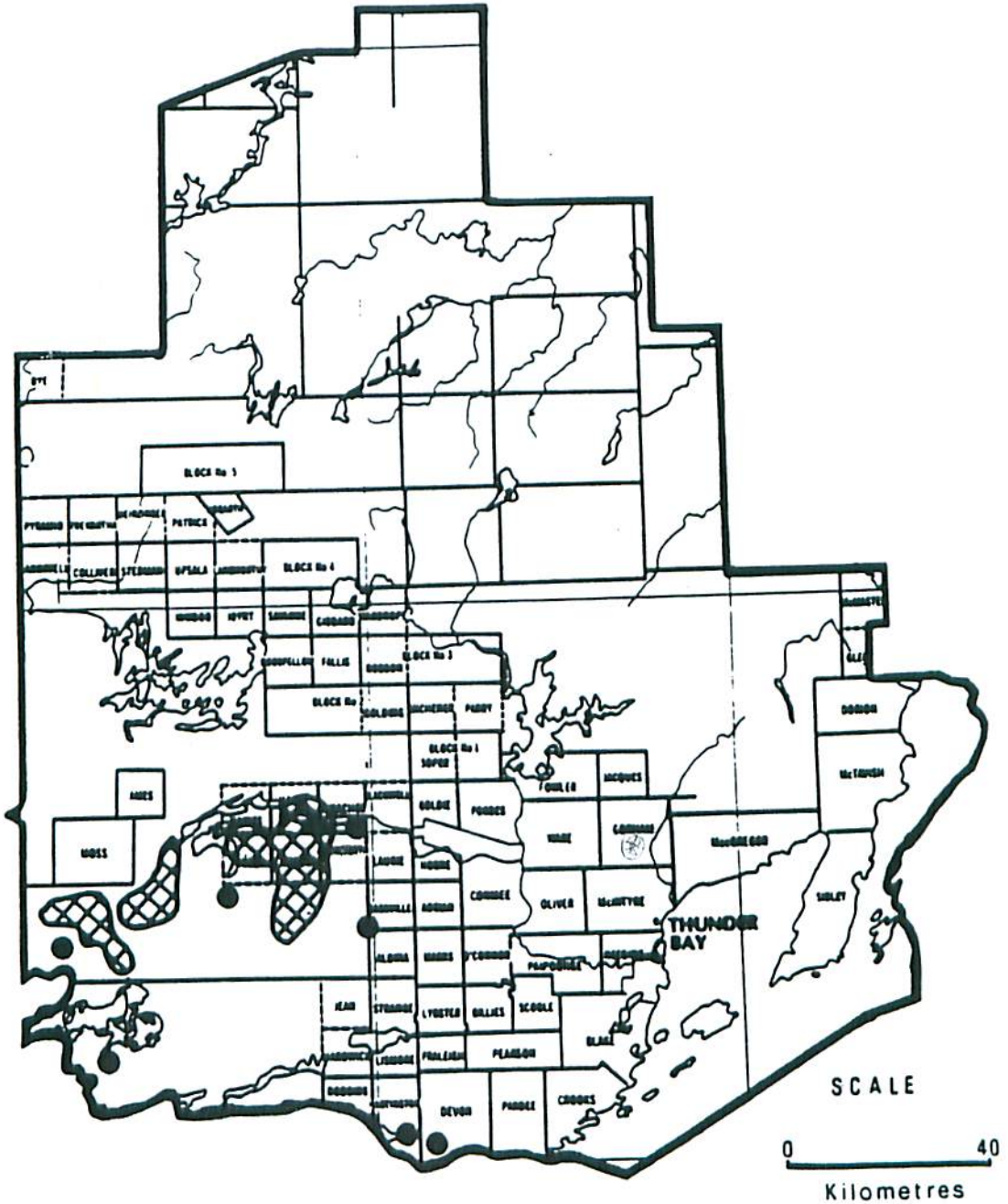
Spruce Budworm

Areas within which defoliation  
occurred in 1976

## LEGEND

Moderate-to-severe defoliation ● or 

# THUNDER BAY DISTRICT



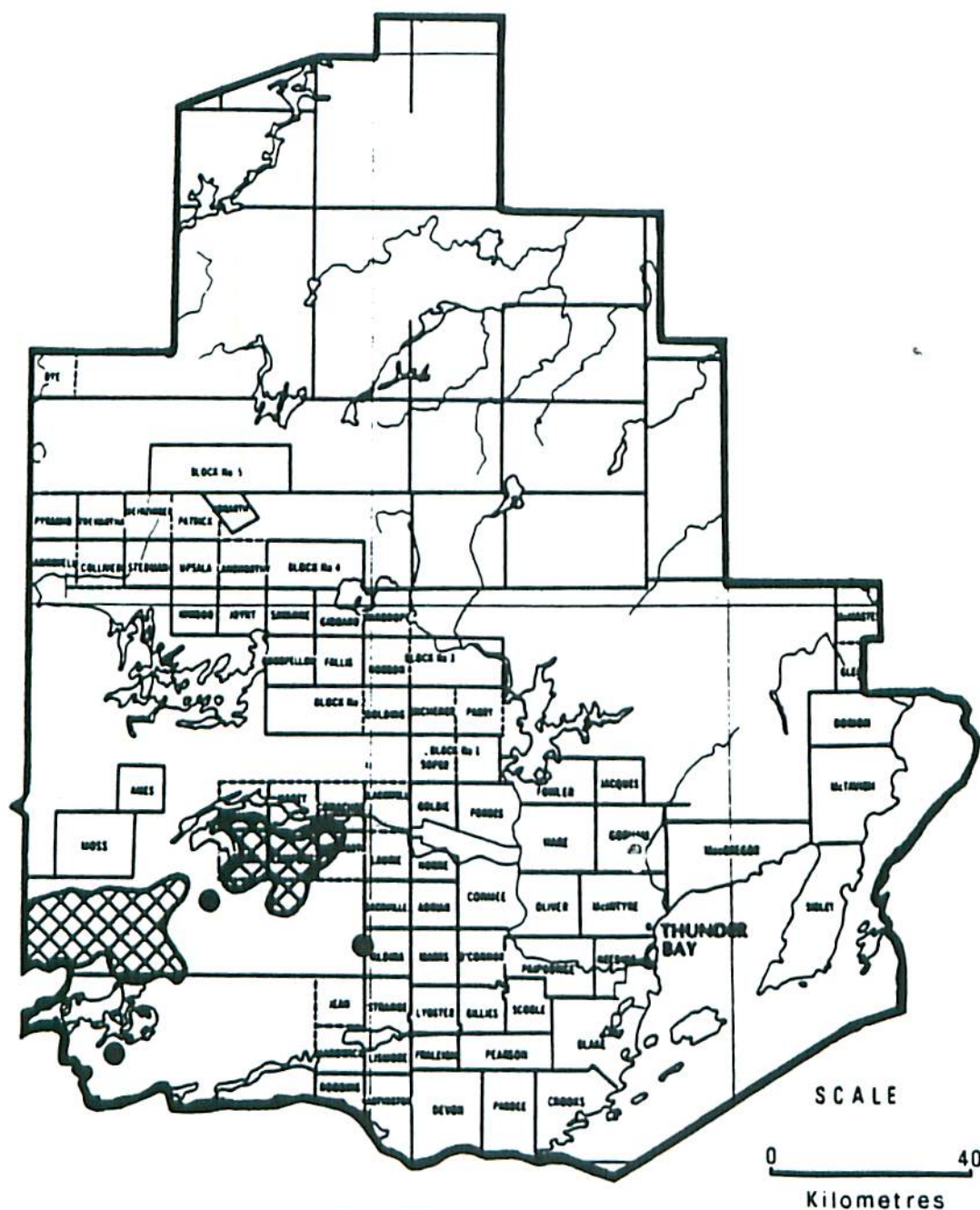
## Spruce Budworm

Areas within which defoliation  
occurred in 1977

### LEGEND

Moderate-to-severe defoliation ● or 

# THUNDER BAY DISTRICT



Spruce Budworm

Areas within which defoliation  
occurred in 1978

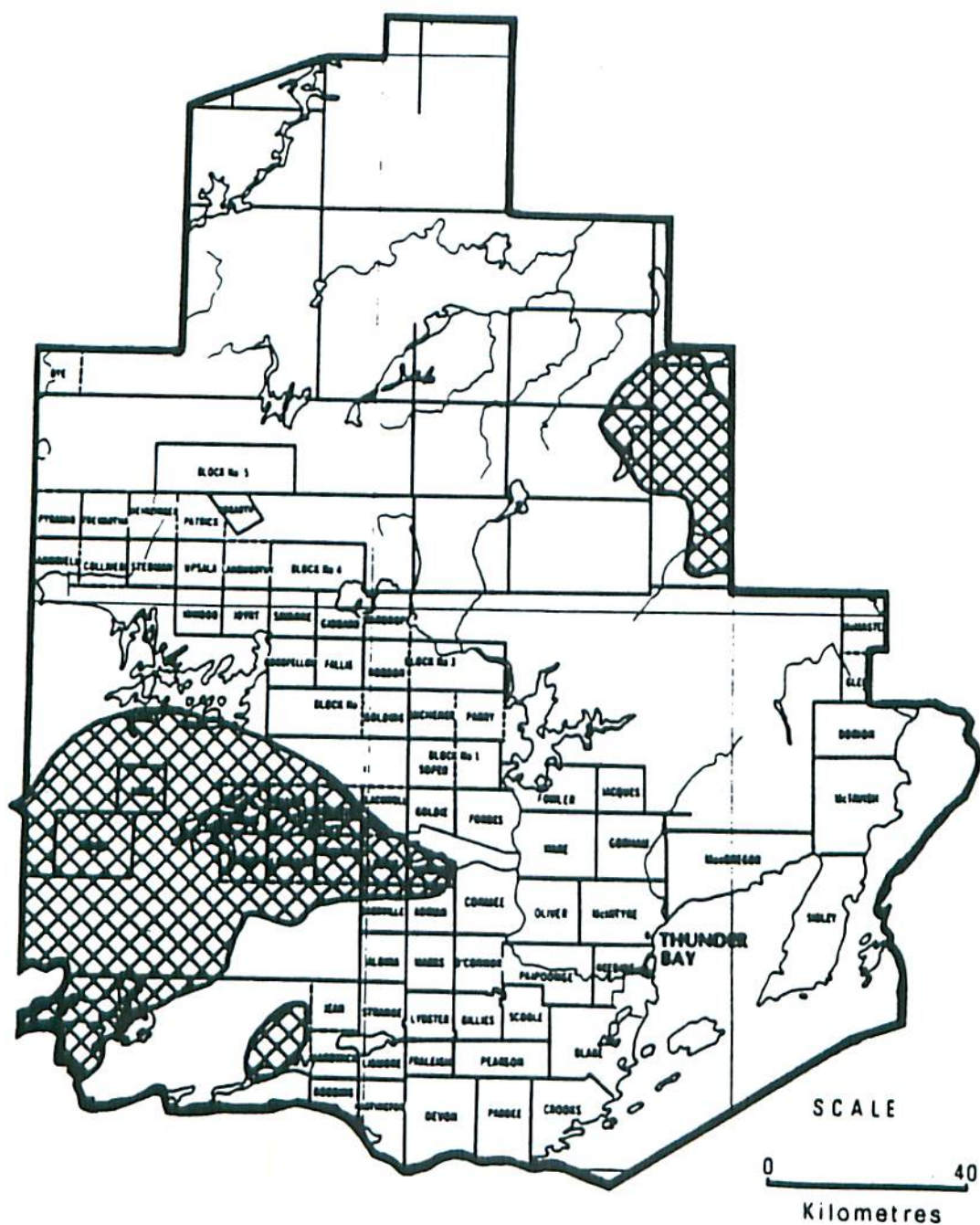
## LEGEND

Moderate-to-severe defoliation ● or 





# THUNDER BAY DISTRICT



Spruce Budworm

Areas within which defoliation  
occurred in 1980

LEGEND

Moderate-to-severe defoliation



Jack Pine Budworm, *Choristoneura pinus pinus* Free.  
Host(s): jP, scP

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	trace populations, Paipoonge Twp
1956	trace populations
1957	not reported
1958	trace populations
1959-1960	not reported
1961	low populations along Hwy 11 for 16 km east of the Atikokan District boundary
1962	trace populations
1963-1967	not reported
1968	low numbers collected at scattered locations along the Graham road and north of Lake Shebandowan
1969	light defoliation, Paipoonge Twp
1970	trace populations
1971-1976	not reported
1977-1978	trace populations
1979-1980	not reported



Larch Casebearer, *Coleophora laricella* (Hbn.)  
Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1950	trace populations near the city of Thunder Bay
1951-1955	not reported
1956	trace populations
1957	Low numbers were recorded at Wild Goose in MacGregor Twp.
1958	Light infestations were found in MacGregor, Paipoonge and O'Connor twps. Trace populations occurred at most other sampled locations.
1959	Light infestations persisted in MacGregor, Paipoonge and O'Connor twps.
1960	trace populations
1961-1962	Low populations occurred in MacGregor, Paipoonge, Crookes and O'Connor twps.
1963-1965	trace populations
1966-1967	Low numbers occurred in MacGregor Twp.
1968-1973	trace populations
1974	not reported
1975	trace populations
1976-1979	not reported
1980	low population at Savanne River in Robson Twp

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.  
Host(s): pine

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	A light infestation was recorded on jack and Scots pine plantation trees at the Thunder Bay Forest Station and at one location in Conmee Twp; this was the first record in the district.
1962	low populations
1963-1973	not reported
1974	high numbers on ornamental mugho pine and light damage at the Thunder Bay Forest Station
1975-1976	light damage, Thunder Bay Forest Station
1977-1978	not reported
1979	Increased populations occurred in the western half of the district; there was leader damage of up to 12% in jack pine plantations along the Matawin River road.
1980	Light damage was recorded in five areas of plantation jack pine in the western half of the district. Leader damage averaged 6%.

Birch Leafminer, *Fenusa pusilla* (Lep.)  
Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962	high population at one point in the city of Thunder Bay; first record in the district
1963	Medium-to-heavy infestations were recorded throughout the city of Thunder Bay
1964	The infestation of 1963 declined to light intensity; there were new distribution records in MacGregor and McIntyre twps
1965	light populations
1966	new distribution records in Conmee Twp and on Sibley Peninsula; increased populations in the city of Thunder Bay
1967-1968	light populations
1969	moderate numbers, Scoble Twp
1970	Moderate numbers recurred in Scoble Twp and also infested ornamentals in the city of Thunder Bay.
1971-1972	Distribution increased to include all of the southern part of the district. There was a pocket of high numbers of insects along Hwy 527.
1973-1974	Medium-to-heavy infestations occurred along the Boreal Road, south of Thunder Bay and in the areas adjacent to Northern Light Lake and Shebandowan village.
1975-1976	high populations at several locations
1977-1980	generally low numbers except in and around the city of Thunder Bay, where high populations persisted



Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

[Major]

Host(s): aspen, deciduous

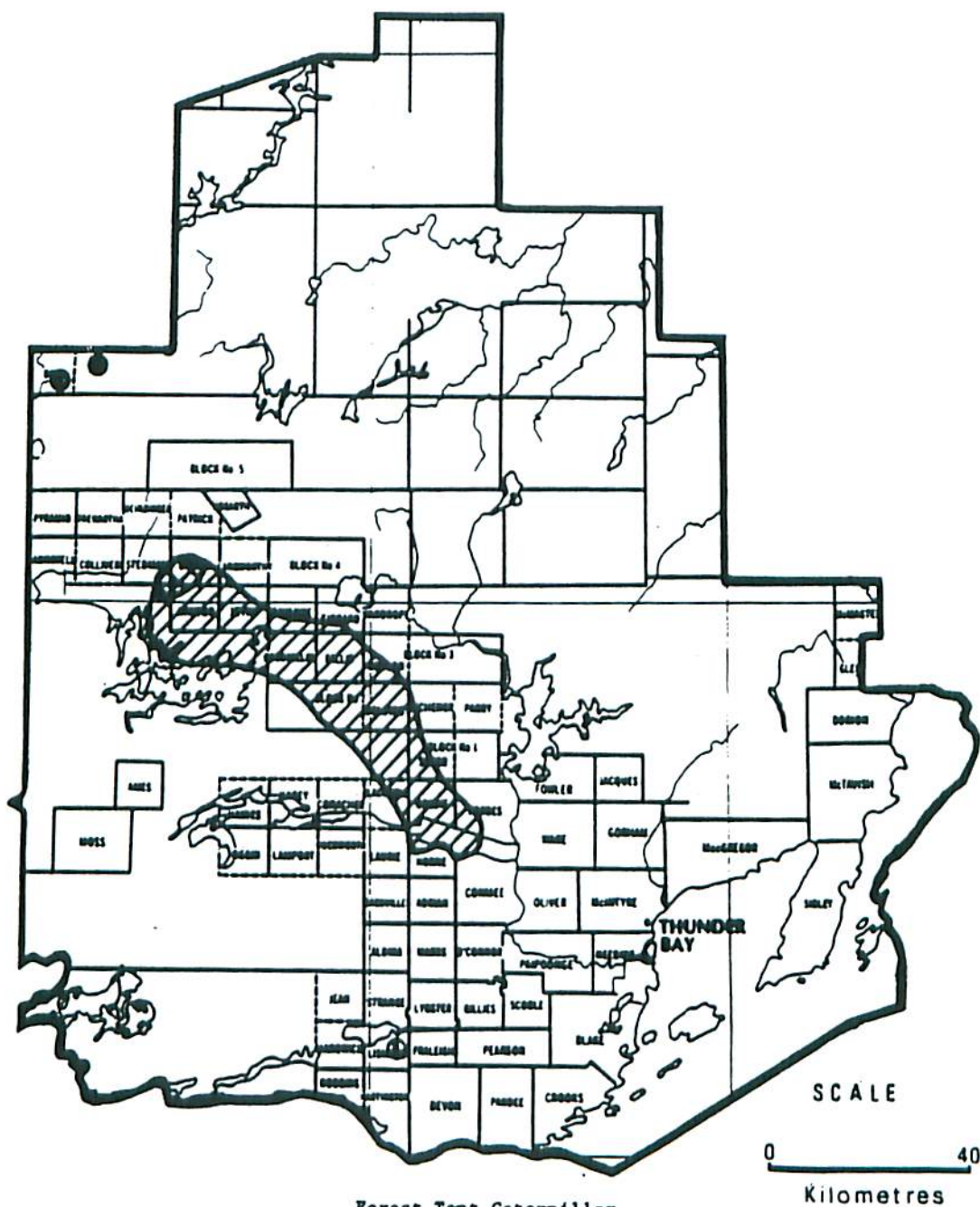
<u>Year</u>	<u>Remarks</u>
1950	Moderate-to-severe defoliation occurred over about 16 km <sup>2</sup> in Upsala Twp, and numerous areas of light infestation were observed (see map, page 54).
1951	Moderate-to-severe defoliation occurred over most of the northwestern part of the district (see map, page 55).
1952	Moderate-to-severe defoliation occurred over most of the western and central parts of the district, with light defoliation in the remainder of the district (see map, page 56).
1953	The area of moderate-to-severe defoliation was reduced but remained in the southeastern part of the district (see map, page 57).
1954	No infestations were reported.
1955-1959	not reported
1960	trace populations in Pardee Twp
1961	not reported
1962	Four areas of moderate-to-severe defoliation and several areas of light infestation occurred in the western part of the district (see map, page 58).
1963	Populations declined. Four small areas of medium-to-heavy infestation were reported in the Lac des Mille Lacs area.
1964	Moderate-to-severe defoliation occurred in the northwestern corner of the district, and there was a bordering area of light defoliation (see map, page 59).
1965	The infested area increased to include approximately half of the district (see map, page 60).
1966	The area of medium-to-heavy infestation was reduced to about 310 km <sup>2</sup> (see map, page 61).

(cont'd)

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. (concl.) [Major]  
Host(s): aspen, deciduous

<u>Year</u>	<u>Remarks</u>
1967	Populations continued to decline. A 40-ha area of light infestation remained in the Clay Lake area near the Atikokan District boundary.
1968-1974	not reported
1975	trace populations
1976	low populations around the city of Thunder Bay and in parts of Neebing, Paipoonge and O'Connor twps
1977	The 1976 infestations increased in intensity to the moderate-to-severe level.
1978	The area of medium-to-heavy infestation increased (see map, page 68).
1979	There was a slight increase in the medium-to-heavy infestation (see map, page 63).
1980	The area of medium-to-heavy defoliation again increased somewhat (see map, page 64).

# THUNDER BAY DISTRICT



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1950

## LEGEND

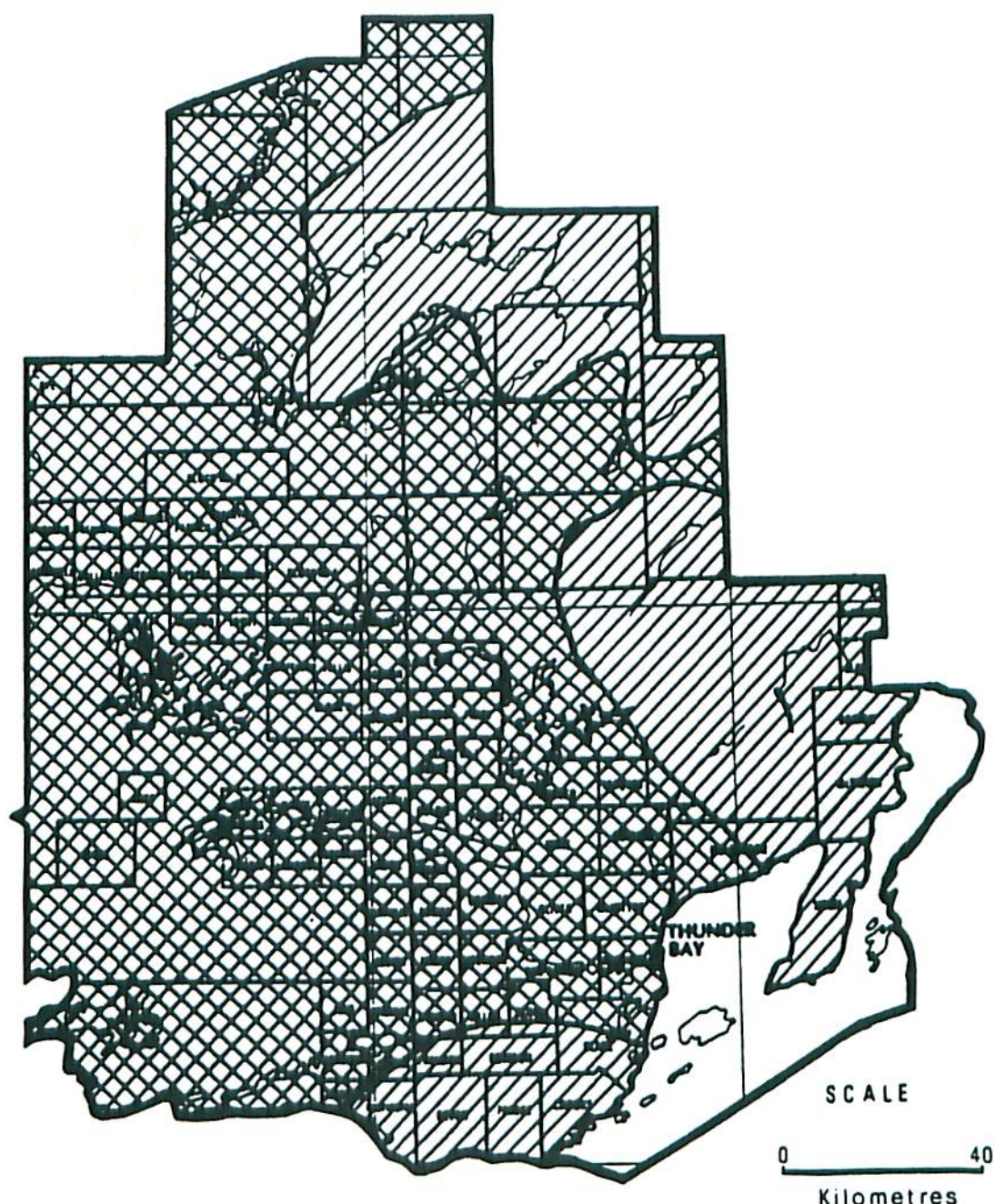
Light defoliation ① or

Moderate-to-severe defoliation ● or



Moderate-to-severe defoliation ☒ or ☐

# THUNDER BAY DISTRICT



## Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1952

### LEGEND

Light defoliation

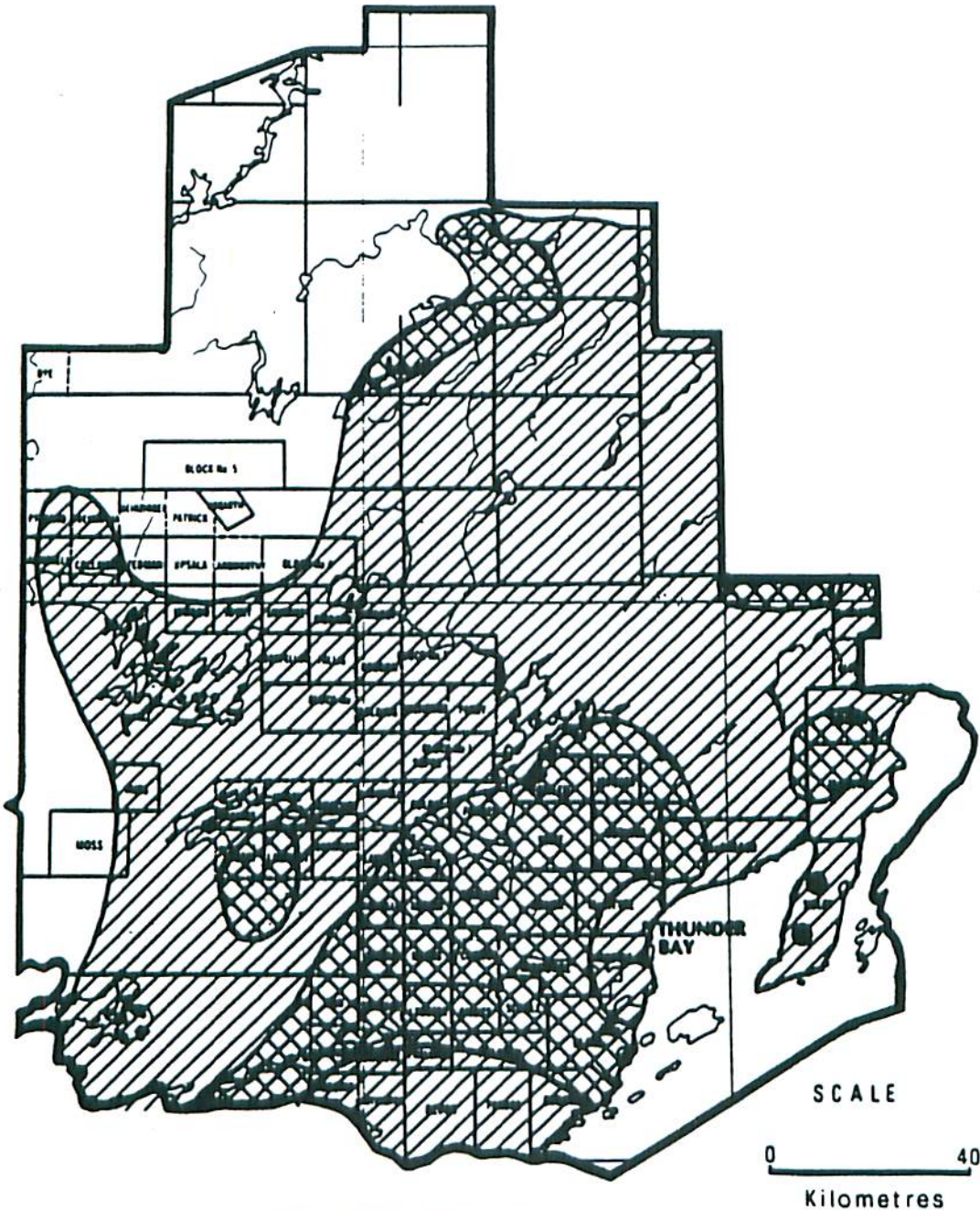


Moderate-to-severe defoliation





# THUNDER BAY DISTRICT



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1953

## LEGEND

Light defoliation



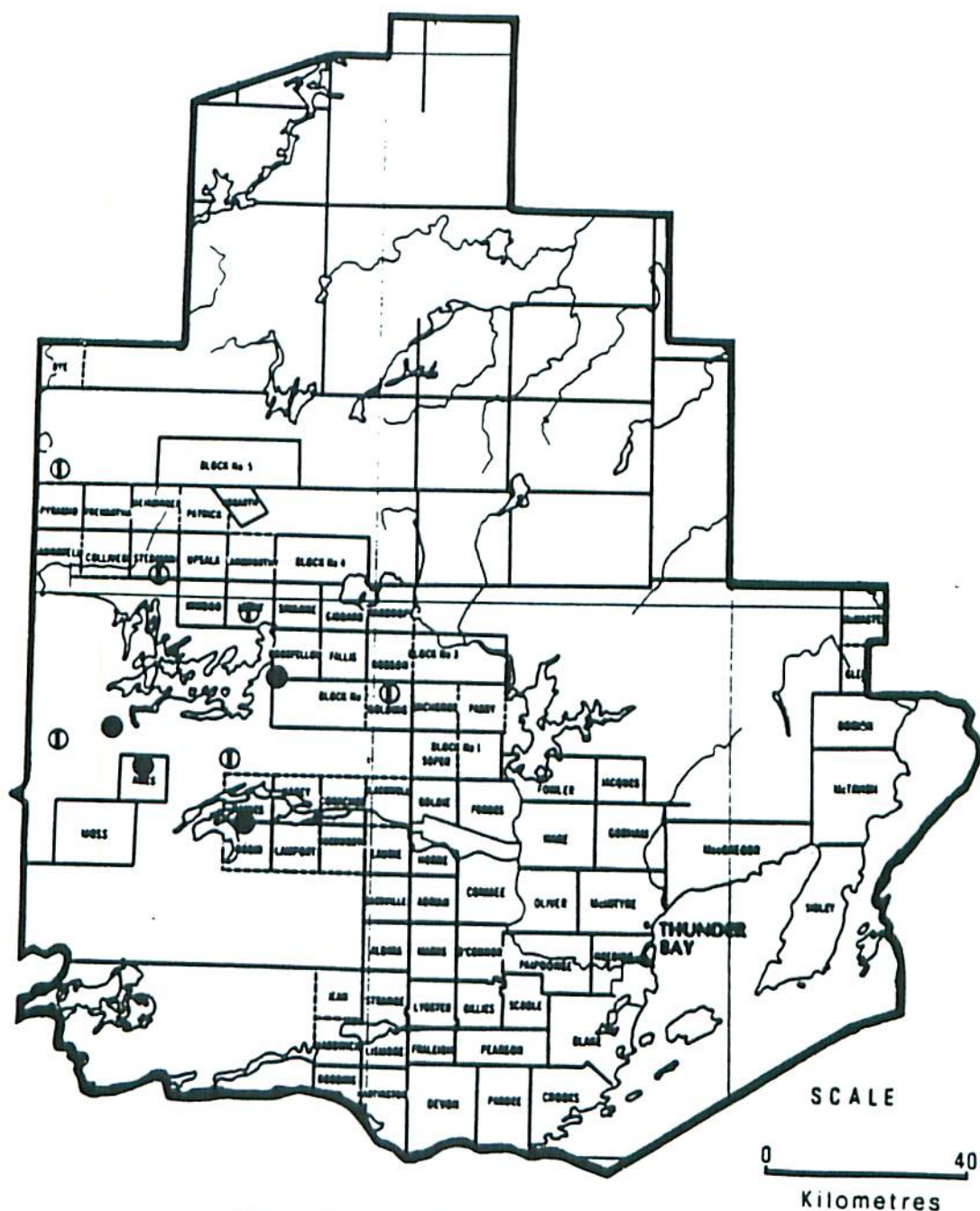
Moderate-to-severe defoliation

● or





# THUNDER BAY DISTRICT



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1962

## LEGEND

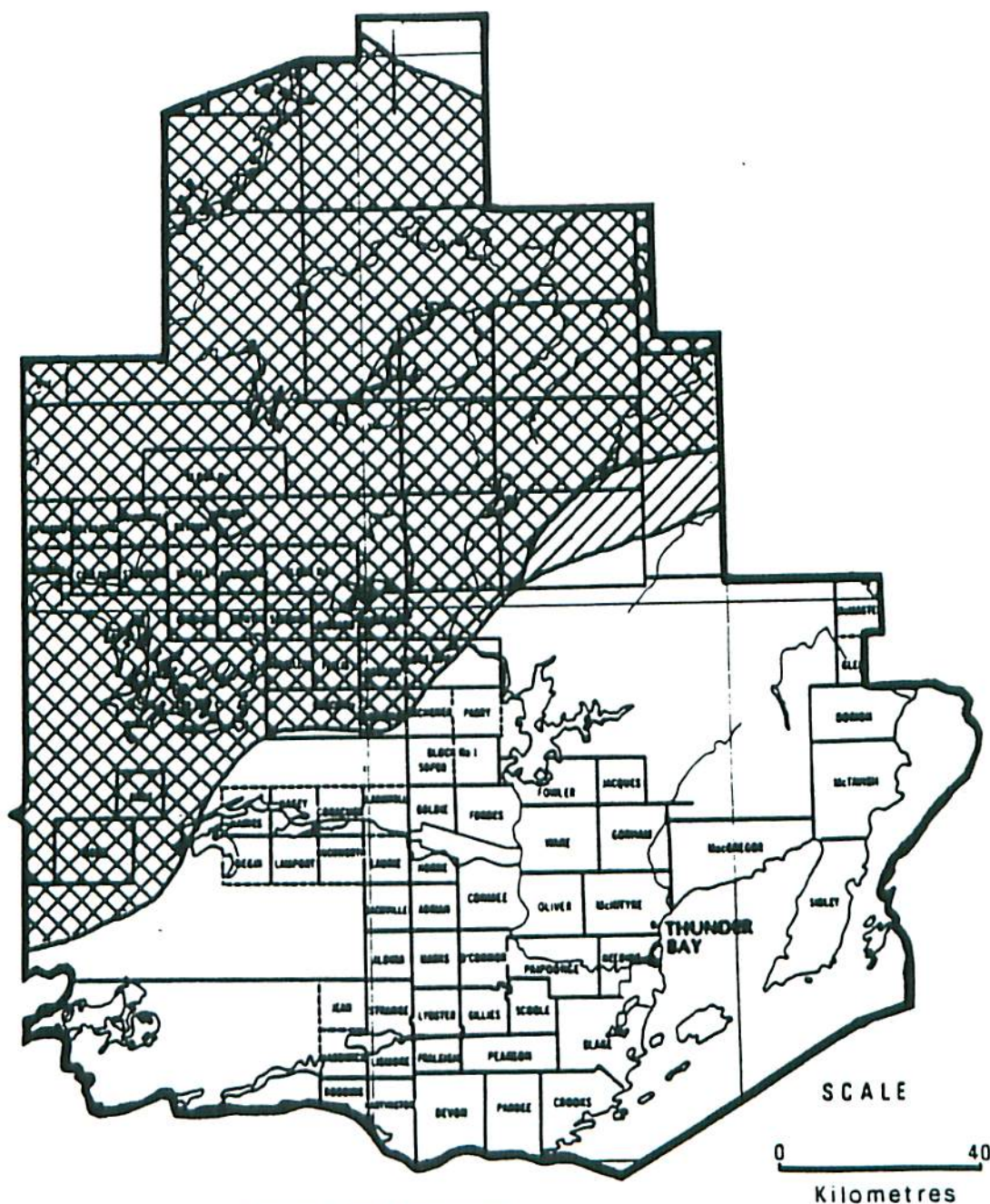
Light defoliation ①

Moderate-to-severe defoliation ●





# THUNDER BAY DISTRICT



Forest Tent Caterpillar

Areas within which defoliation occurred in 1965

## LEGEND

Light defoliation

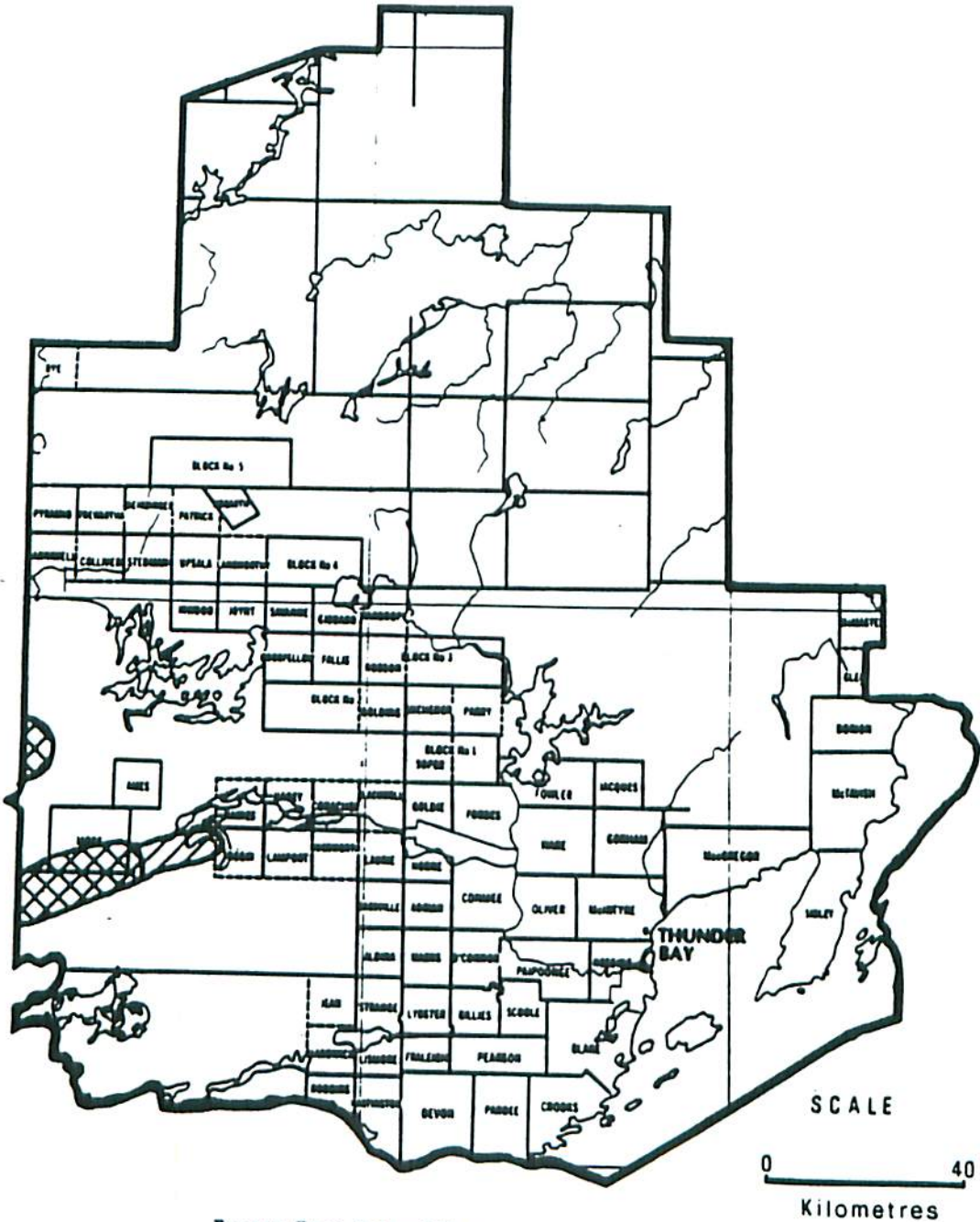


Moderate-to-severe defoliation

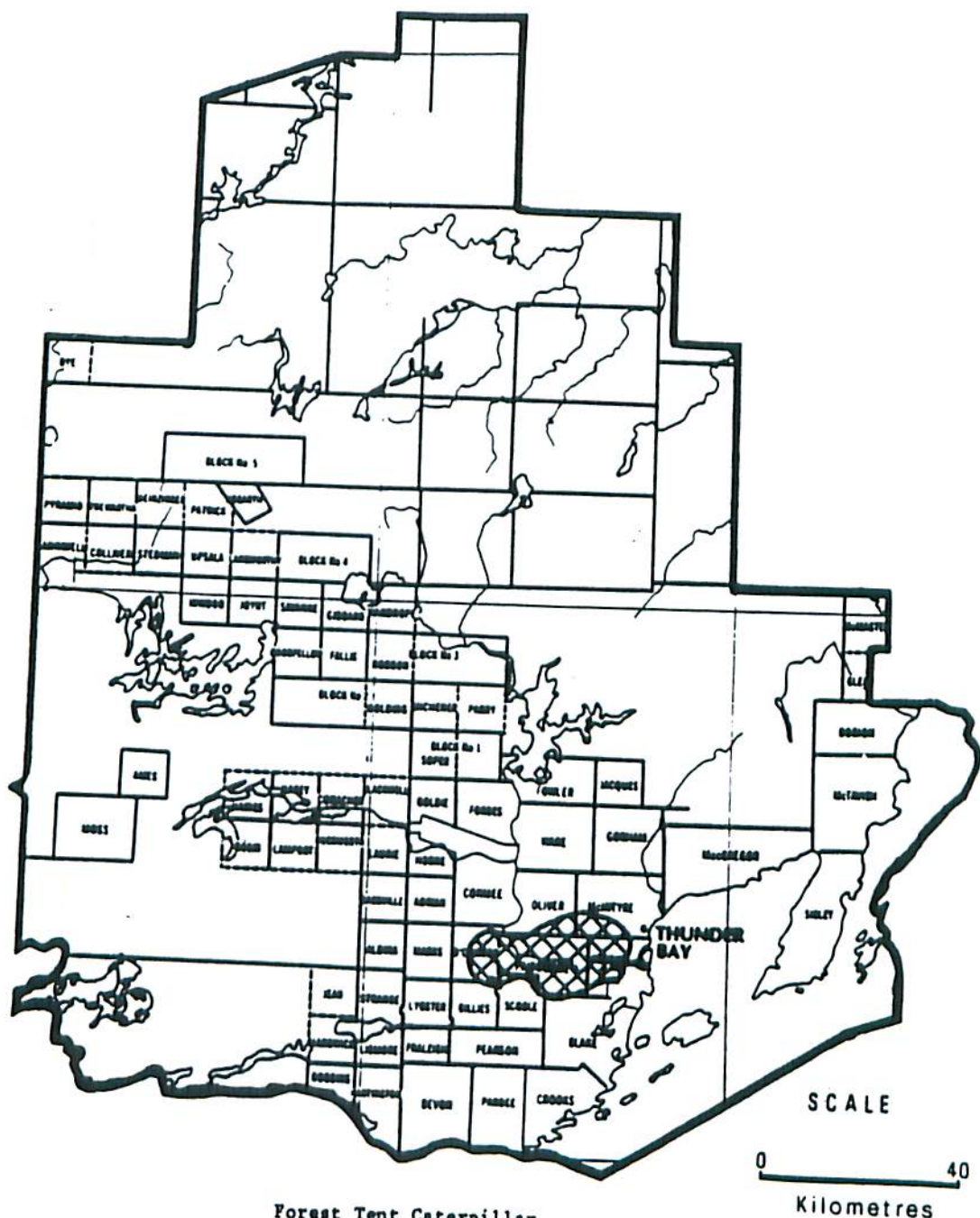




# THUNDER BAY DISTRICT



# THUNDER BAY DISTRICT



Forest Tent Caterpillar

Areas within which defoliation  
occurred in 1978

## LEGEND

Moderate-to-severe defoliation







Areas within which defoliation  
occurred in 1980

### LEGEND

Moderate-to-severe defoliation ● or

Balsam Fir Sawfly, *Neodiprion abietis* complex  
Host(s): bF, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	trace populations on white spruce in Upsala and Strange twps
1955	Light populations were recorded on balsam fir in Inwood and Strange twps; there were trace numbers at 10 other locations.
1956	Trace populations persisted in Inwood and Strange twps.
1957-1958	not reported
1959	trace populations
1960	not reported
1961-1962	trace populations at Inwood Provincial Park
1963	not reported
1964	trace populations in O'Connor Twp and on the Sibley Peninsula
1965-1966	low populations in Blackwell, Inwood, O'Connor, Marks and Gillies twps
1967-1968	low populations
1969-1970	not reported
1971	trace populations
1972-1973	not reported
1974	light infestation at Holinshead Lake
1975	trace populations
1976	Light defoliation occurred in the southwestern half of the district.
1977	trace populations
1978-1980	not reported

Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl.

[Major]

Host(s): rP, jP

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	low populations from Roundtable Lake to Iron Range and in Scoble and Trewartha twps
1954	Moderate numbers occurred in Stedman and Blake twps, and low populations were recorded at several other locations.
1955	Moderate numbers caused 40% defoliation in Robson Twp. Elsewhere, light defoliation was common.
1956	Light infestations occurred along Hwy 17 from the city of Thunder Bay to English River and at Harmon and Bishop lakes.
1957	Low numbers recurred at English River. Populations declined to trace levels elsewhere.
1958-1960	trace populations
1961	60% defoliation on several open-grown jack pine trees at Shelter Bay; trace populations elsewhere
1962-1963	not reported
1964	light population in Upsala Twp
1965-1967	trace populations
1968	Moderate populations occurred in Paipoonge and Neebing twps.
1969-1971	not reported
1972	moderate numbers on ornamentals in the city of Thunder Bay
1973-1974	not reported
1975-1977	trace populations in the Thunder Bay Forest Nursery area
1978-1979	not reported
1980	trace populations reported near Kingstone Lake



Jack Pine Sawfly, *Neodiprion pratti banksianae* Roh.  
Host(s): JP

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	light infestation near Niblock
1953	moderate populations in Stedman and Sibley twps; light defoliation at several other locations
1954-1955	Moderate numbers occurred in Paipoonge Twp and at Greenwich Lake; populations were low at several other locations.
1956	not reported
1957	trace populations
1958-1960	not reported
1961-1962	trace populations
1963-1964	not reported
1965	trace populations
1966	not reported
1967	trace populations
1968	light population, Paipoonge twp
1969	light infestations in Paipoonge, Neebing, Oliver and Hagey twps
1970-1971	not reported
1972	moderate numbers on ornamentals in the city of Thunder Bay
1973-1974	trace populations
1975-1976	not reported
1977	trace populations
1978-1980	not reported

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex [Major]  
Host(s): jP

<u>Year</u>	<u>Remarks</u>
1950	heavy defoliation on a few trees in Soper Twp
1951	Heavy damage recurred in Soper Twp and light defoliation was reported on regeneration at Kashisibog Lake.
1952	light defoliation in MacGregor Twp and west of the city of Thunder Bay
1953	Low numbers were recorded in MacGregor and McIntyre twps, west of Upsala to English River and at Pakashkan and Bishop lakes.
1954	Populations increased. Moderate-to-severe defoliation was recorded at three locations and light defoliation at several others (see map, page 70).
1955-1956	Moderate-to-severe damage recurred in MacGregor and Paipoonge twps. Areas of light defoliation were recorded at several locations.
1957	High populations recurred at Wild Goose in MacGregor Twp, but populations declined to trace levels elsewhere.
1958	trace populations
1959	low numbers in Inwood and Neebing twps
1960	Moderate-to-severe defoliation occurred on small trees in Savanne Twp. Low populations were common elsewhere.
1961	Medium-to-heavy infestations were reported in Inwood and Savanne twps.
1962	populations reduced to light in Inwood and Savanne twps
1963	not reported
1964-1965	high numbers at one point along Hwy 11 near Shabaqua
1966	Pockets of medium-to-heavy infestation occurred near Shabaqua and in Savanne, Oliver, McIntyre, Neebing and Sibley twps.

(cont'd)

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex (concl.)

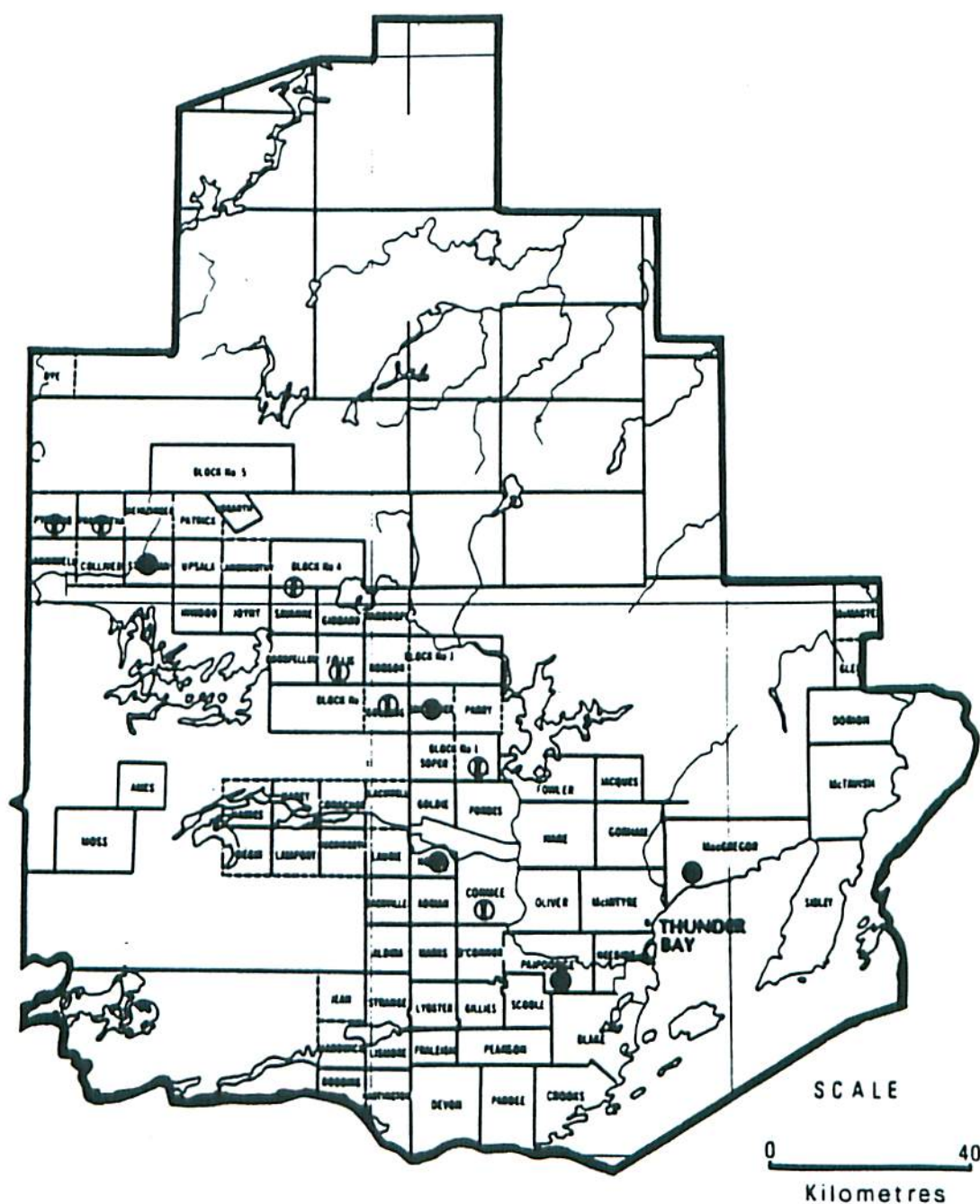
Host(s): jP

[Major]

<u>Year</u>	<u>Remarks</u>
1967-1968	trace populations
1969-1970	not reported
1971	colonies common in Sibley Twp
1972	high numbers in the Pigeon River area
1973-1975	not reported
1976	Moderate-to-severe defoliation occurred east of Raith, west of Poshkokagan Lake, near Kashabowie, west of Upsala and in Blake Twp.
1977	High numbers recurred west of Upsala.
1978	high numbers again west of Upsala and light infestation in the Matawin River area
1979	moderate numbers west of Upsala
1980	not reported



# THUNDER BAY DISTRICT



### Redheaded Jack Pine Sawfly

Areas within which defoliation  
occurred in 1954

### LEGEND

Light defoliation ①

Moderate-to-severe defoliation ●

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)  
Host(s): aspen

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	High populations were recorded on young trembling aspen throughout the district.
1952-1954	not reported
1955	trace populations in Soper Twp
1956	High populations occurred in Joynt and Savanne twps.
1957	Low numbers were observed throughout the district.
1958	low populations recorded at a few locations
1959	Moderate numbers were collected from small aspen trees and trace populations occurred on larger host trees.
1960	moderate number of leaves affected in Ames and Pyramid twps
1961	High populations occurred along Hwy 11 east of the Atikokan District boundary and in Pyramid, Trewartha and Colliver twps.
1962-1963	An area of medium-to-heavy infestation extended eastward to Hagey Twp in the south and from Joynt Twp to Raith in the north.
1964	Populations declined to trace levels in the infested area except along the Lac des Mille Lacs road, where moderate numbers recurred.
1965	Light infestations occurred along Hwy 11 in the Shelter Bay area and in the Lac des Mille Lacs area.
1966	Light infestations reported in 1965 increased to the moderate-to-severe level.
1967	High numbers occurred along Hwy 11 and Hwy 17 west of Raith.
1968	not reported

(cont'd)

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.) (concl.) [Major]  
Host(s): aspen

<u>Year</u>	<u>Remarks</u>
1969	Moderate populations occurred in O'Connor, Goldie and Blackwell twps.
1970	heavy infestations near Kakabeka Falls and in the city of Thunder Bay
1971	Populations increased near Northern Light Lake, Lac des Mille Lacs and Shebandowan.
1972	small pockets of heavy infestation
1973	High numbers occurred at Northern Light and Shebandowan lakes.
1974	High numbers occurred in many areas, most notably in Paipoonge and Stedman twps.
1975	Medium-to-heavy infestations were reported in Paipoonge Twp, along the Hogarth Lake Road and near Hay Lake.
1976	Moderate-to-severe mining occurred between Whitefish and Prelate lakes, at Middle Falls Park on the Pigeon River and in Paipoonge Twp.
1977	Moderate-to-severe mining was reported south of a line from English River to Poshkokagan Lake.
1978	Medium-to-heavy infestations occurred from the city of Thunder Bay southwest to Northern Light Lake.
1979	Moderate-to-severe damage occurred throughout the district, most notably in the Rosslyn Village area.
1980	Populations declined to trace levels in most areas. Light damage occurred in the southwestern portion of the district.



Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)  
Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	trace populations
1951	low populations in the Graham area, in the city of Thunder Bay and at Middle Falls on the Pigeon River
1952	Light defoliation occurred east of Thunder Bay to Ouimet in Dorion Twp, in the Kabitotikwia Lake area and near Graham.
1953	Light defoliation recurred east of Thunder Bay to Ouimet.
1954	Moderate populations caused up to 75% defoliation of white spruce at Dorion. Elsewhere, low numbers were common.
1955	Moderate-to-severe defoliation occurred at several locations along Hwy 17 east of Thunder Bay to Dorion and south of Thunder Bay on Hwy 61 to Pigeon River.
1956	Moderate-to-severe defoliation recurred at Ouimet and Dorion along Hwy 17 and in Neebing and Paipoonge twps along Hwy 61.
1957	Open-grown white spruce trees in Paipoonge and Neebing twps and in the city of Thunder Bay sustained moderate-to-severe defoliation ranging from 60 to 80%. Elsewhere, light defoliation was common.
1958-1960	Moderate-to-severe defoliation was common on open-grown white and black spruce in the southeastern part of the district.
1961	Low numbers prevailed in the southeastern part of the district.
1962-1963	trace populations
1964	Moderate numbers occurred in Neebing, Blake and Paipoonge twps.

(cont'd)

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.) (concl.) [Major]  
Host(s): spruce

<u>Year</u>	<u>Remarks</u>
1965	Moderate defoliation, up to 60%, occurred in Dorion and Blake twps. Low numbers were common elsewhere in the southeastern part of the district.
1966-1967	Moderate-to-severe defoliation was reported in a white spruce plantation in McTavish Twp. Low numbers prevailed elsewhere.
1968	The medium-to-heavy infestation in McTavish Twp persisted, causing light mortality.
1969	not reported
1970-1974	Varying degrees of infestation were found through the district.
1975	Moderate-to-severe defoliation occurred on ornamentals in the city of Thunder Bay.
1976	not reported
1977	Moderate defoliation occurred in the Northern Light Lake area and within the city of Thunder Bay.
1978	Moderate-to-severe defoliation was reported on ornamentals in the city of Thunder Bay.
1979	low numbers at Northern Light Lake
1980	Moderate-to-severe defoliation occurred on ornamentals in the city of Thunder Bay.

White Pine Weevil, *Pissodes strobi* (Peck)  
Host(s): pine, spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	trace populations on jack pine along Hwy 17 west of the Shebandowan road junction
1951	Light infestations occurred on jack pine in Pyramid and Goldie twps and in the Graham area. Trace populations were found on black spruce in the same areas.
1952-1953	Light infestations recurred in Goldie Twp and in the Graham area.
1954	25% of leaders affected in a Scots pine plantation in O'Connor Twp
1955	Infested leaders increased to 42% in O'Connor Twp.
1956-1957	The percentage of leaders affected in O'Connor Twp was reduced to 29% in 1956 and declined further to 5% in 1957
1958	30% of jack pine windbreak trees affected in Upsala Twp: light infestations in Savanne, Inwood, Paipoonge and Conmee twps
1959	Light infestations occurred in Upsala, Paipoonge and Conmee twps.
1960	6% of Scots pine infested near Kakabeka Falls
1961	approximately 10% of leaders attacked in plantations at the Thunder Bay Forest Nursery
1962-1964	Weeviling was light (up to 14%) on trees at the Thunder Bay Forest Nursery. Damage of 13% was recorded on Scots pine near Kakabeka Falls in 1964.
1965-1966	Light damage prevailed in Paipoonge Twp.
1967	22% of leaders affected on Scots pine in Paipoonge Twp
1968	In Marks Twp a Norway spruce windbreak had 25% of the leaders attacked. In forested areas populations remained low.

(cont'd)



Larch Sawfly, *Pristiphora erichsonii* (Htg.) (cont'd)  
Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1964	Light infestations were reported in Inwood Twp and in the areas of Poshkokagan River and Lac des Mille Lacs.
1965	Pockets of moderate-to-severe defoliation occurred in the Lac des Mille Lacs area. Low levels were recorded in many other areas.
1966	Populations increased again. Numerous pockets of medium-to-heavy infestations were recorded.
1967	Moderate-to-severe defoliation was recorded in Neebing, Soper and McIntyre twps; in most stands along Hwy 17 west of Raith; at points along Hwy 11 west of Shebandowan; and at Brightsand Lake.
1968	Moderate-to-severe defoliation occurred in most larch stands in Soper, McIntyre, Inwood and Upsala twps. Light infestations were recorded at several other locations.
1969-1971	Areas of moderate-to-severe defoliation occurred along Hwy 17 between Raith and English River and along the Armstrong road as well as in the area of the city of Thunder Bay.
1972	Medium-to-heavy infestation persisted in McIntyre Twp, whereas populations declined in other previously infested areas.
1973	trace populations
1974	Populations increased, with areas of moderate-to-severe defoliation occurring along Hwy 17 between Raith and English River, in the city of Thunder Bay and in the Metionga-Harmon lakes area.
1975	Medium-to-heavy infestations occurred at numerous locations.
1976	Medium-to-heavy infestations recurred mostly in the central part of the district.

(cont'd)

Larch Sawfly, *Pristiphora erichsoni* (Htg.) (concl.)  
Host(s): larch

[Major]

<u>Year</u>	<u>Remarks</u>
1977	light infestations in the Poshkokagan Lake area
1978	trace populations
1979	low numbers common in many areas
1980	moderate-to-severe defoliation of young roadside trees at several locations

Aspen Leafroller, *Pseudezertera oregonana* Wlsh. <sup>1</sup>  
Host(s): poplar

[Major]

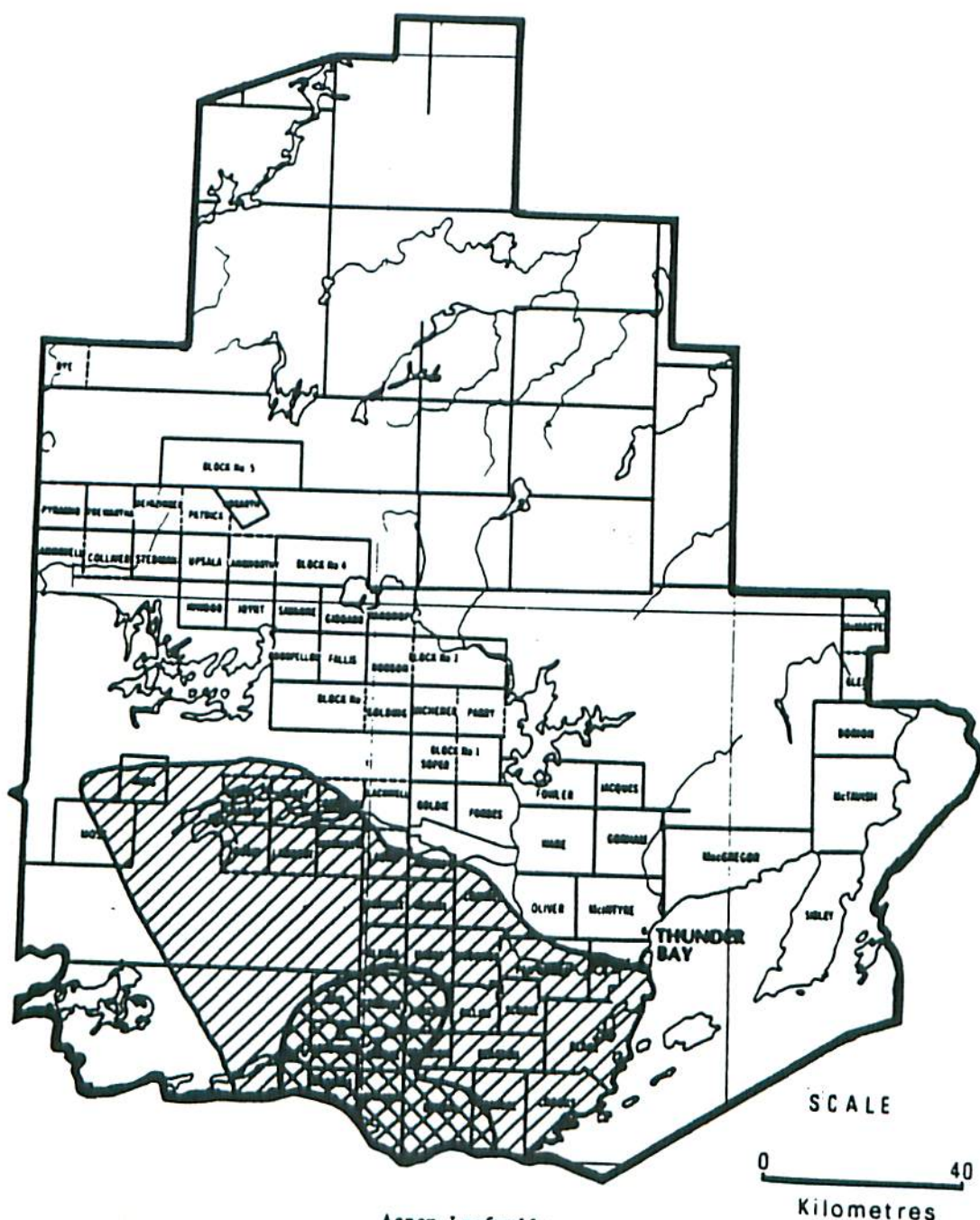
<u>Year</u>	<u>Remarks</u>
1950-1974	not reported
1975	Moderate-to-severe defoliation occurred over an area of approximately 2,700 km <sup>2</sup> (see map, page 80). Defoliation ranged from 40 to 100%.
1976	Moderate-to-severe defoliation was mapped over an area of 2,070 km <sup>2</sup> (see map, page 81); it was associated with other insects in some areas.
1977	Moderate-to-severe defoliation occurred over a total of 460 km <sup>2</sup> , and the surrounding area sustained light damage (see map, page 82).
1978	The area of moderate-to-severe defoliation declined to light intensity (see map, page 83).
1979	Only low numbers were found north of Mountain Lake and near Graham and a small area of medium-sized populations persisted in the Upsala area.
1980	not reported







# THUNDER BAY DISTRICT




Aspen Leafroller

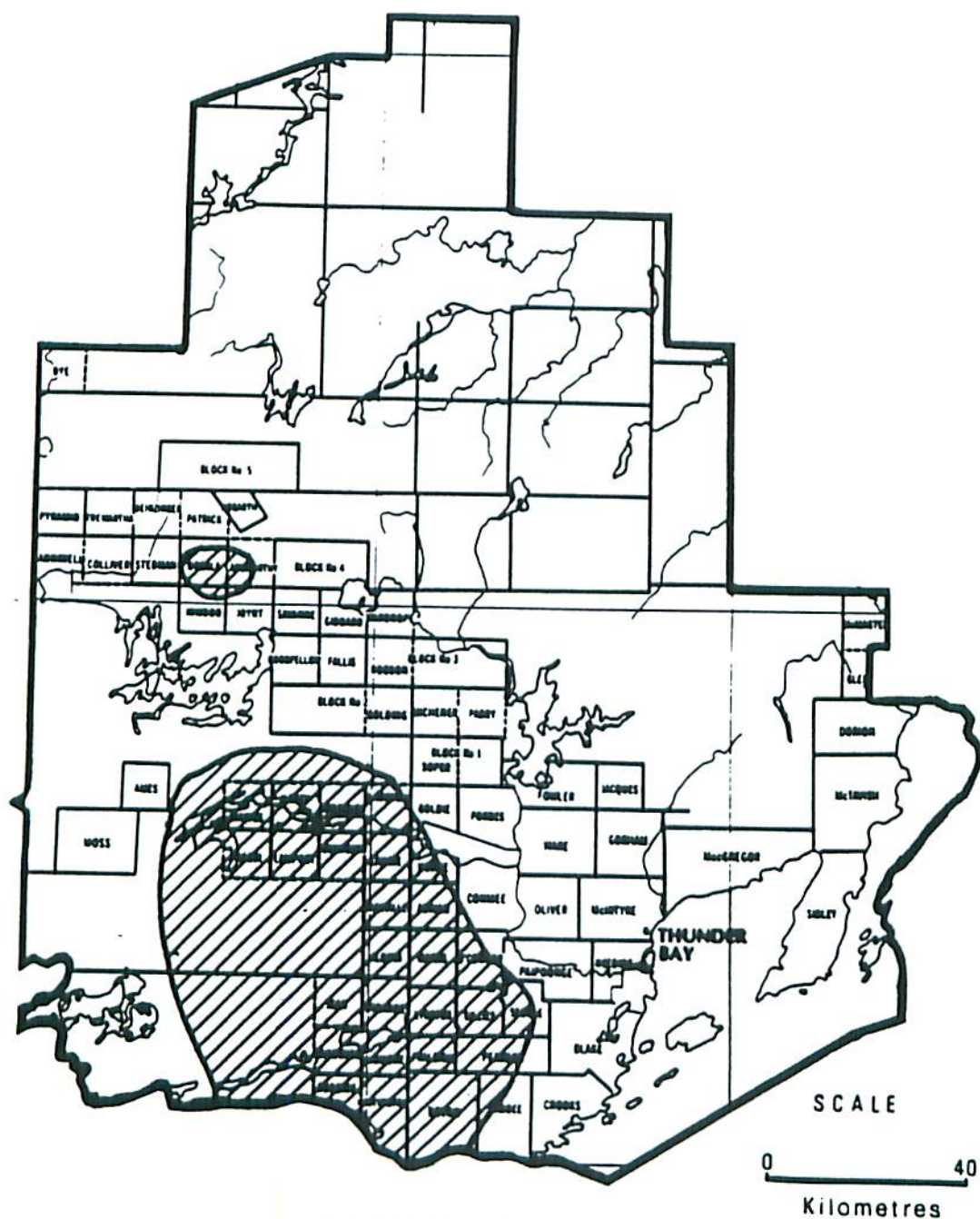
Areas within which defoliation  
occurred in 1977

## LEGEND

Light defoliation 

Moderate-to-severe defoliation 

# THUNDER BAY DISTRICT



Aspen Leafroller

Areas within which defoliation  
occurred in 1978

LEGEND

Light defoliation





Spearmarked Black Moth, *Rheumaptera hastata* (L.)  
Host(s): birch, alder

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	Medium-sized populations occurred at Marie Louise Creek and Joeboy Lake, Sibley Peninsula. Low numbers were reported in the Graham-Pakashkan Lake area and from Whitefish Lake to the city of Thunder Bay.
1954-1961	not reported
1962	Approximately 570 km <sup>2</sup> of white birch sustained moderate-to-severe defoliation in the northeastern part of the district and on Sibley Peninsula (see map, page 85).
1963	Populations declined to trace levels.
1964-1977	not reported
1978-1980	low numbers



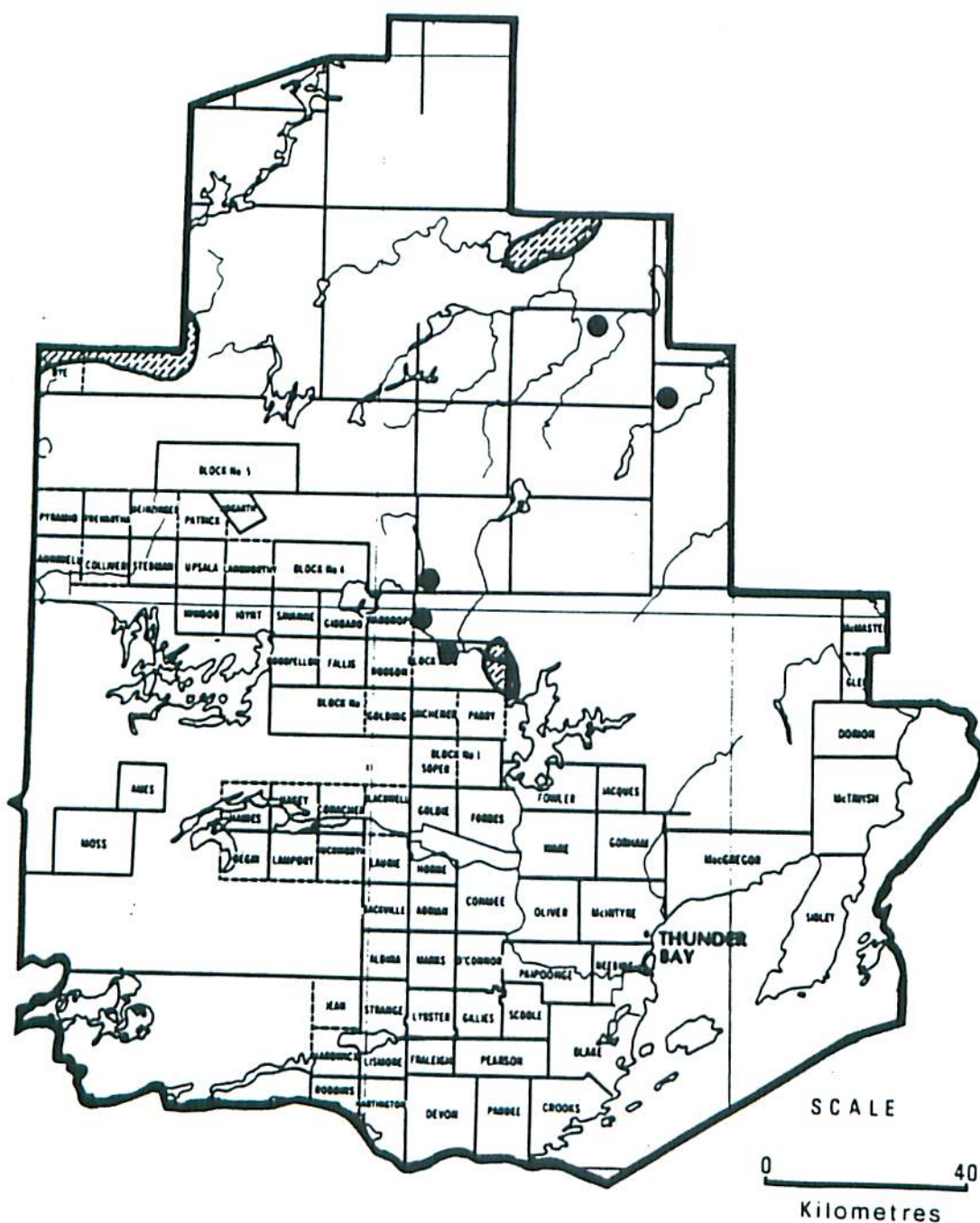
Pine Tortoise Scale, *Toumeyella parvicornis* (Ck11.)  
Host(s): jP, scP

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	trace population, Robson Twp
1956	Several areas of severe damage and jack pine mortality occurred in areas northwest of Dog Lake, west of Lake Nipigon and south of Block No. 6 (see map, page 87).
1957	Populations of the scale insect collapsed, largely as a result of predation and unfavorable weather. Jack pine mortality, however, increased. One plot near Dog River had 59% mortality in the fall of 1957.
1958	Mortality in previously infested areas increased slightly. Trace populations occurred in Savanne Twp.
1959-1960	not reported
1961	trace populations
1962	increased numbers in Paipoonge Twp
1963-1971	not reported
1973-1980	not reported



# THUNDER BAY DISTRICT



Pine Tortoise Scale

Areas within which tree mortality occurred in 1956

## LEGEND

Mortality ● or [hatched box]

Other Noteworthy Insects

Uglynest Caterpillar, *Archips cerasivorana* (Fitch)  
Host(s): cherry

[Major]

<u>Year</u>	<u>Remarks</u>
1950	trace populations west of the city of Thunder Bay
1951-1954	not reported
1955	low numbers, Paipoonge Twp
1956	light infestation along Hwy 17 east of Kakabeka Falls
1957	Populations increased east of Kakabeka Falls and high numbers also occurred at Whitefish Lake in Strange Twp.
1958	High numbers occurred in McIntyre and Paipoonge twps.
1959-1960	trace populations
1961	low populations, Paipoonge Twp
1962	Low populations occurred in Paipoonge and McIntyre twps.
1963-1964	light damage at one location in Paipoonge Twp
1965	high numbers in Paipoonge Twp
1966	High populations recurred in Paipoonge Twp and also occurred at Whitefish Lake.
1967	Medium-to-heavy infestations were reported in Neebing, Paipoonge and McIntyre twps.
1968-1970	not reported
1971	trace populations
1972-1975	not reported
1976-1977	high populations in Slate River Valley
1978-1979	moderate-to-severe defoliation southwest of the city of Thunder Bay
1980	moderate-to-severe defoliation west of Thunder Bay to Kaministiquia

Jack Pine Tip Beetle, *Conophthorus banksianae* McPherson  
Host(s): pine

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	Light populations occurred in Oliver and Paipoonge twps.
1956	Light damage continued in Oliver and Paipoonge twps and a new area was detected in Neebing Twp.
1957	Light twig mortality was observed along Hwy 61 in Neebing Twp and along Hwy 17 throughout the district.
1958-1959	low populations throughout the district
1960	not reported
1961	Light damage occurred in several areas. The heaviest damage occurred in Inwood Twp where the average number of damaged shoots per 5-cm (DBH) tree was 12.2.
1962	Light infestations persisted in Inwood and Upsala twps.
1963	trace populations
1964	not reported
1965-1966	moderate numbers in Upsala Twp
1967	Light populations persisted in Upsala Twp.
1968-1971	not reported
1972-1973	low populations along the Graham Road and in Trewartha Twp
1974-1978	not reported
1979	Moderate damage occurred in Crooks Twp and low numbers were observed near Arrowroot Lake.
1980	Light damage was evident along Hwy 11 west of Burchell Lake to Windigoostigwan Lake.



Linden Looper, *Erannia tiliaria* (Harr.)  
Host(s): deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1956	not reported
1957-1960	trace populations
1961-1975	not reported
1976	High numbers in association with the aspen leafroller, <i>Pseudexentera oregonana</i> Wlsh., caused moderate-to-severe defoliation of white birch and trembling aspen in Blake, Crooks and Pardee twps.
1977	Populations declined to low levels in the area infested in 1976.
1978-1980	not reported

Spiny Ash Sawfly, *Eupareophora parca* (Cress.)  
Host(s):

[Minor]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951	Light defoliation occurred in small stands of black ash in Gorham and McTavish twps and in the Kabitotikwia River area.
1952-1954	not reported
1955-1957	defoliation of up to 10% at Middle Falls, Pardee Twp
1958	not reported
1959-1960	low population in Pardee Twp
1961	not reported
1962	defoliation of 60% on small trees at Kashabowie River
1963	not reported
1964	low numbers in the southern part of the district
1965-1980	not reported

European Spruce Sawfly, *Gilpinia hercyniae* (Htg.)  
Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961-1966	Low populations were collected at numerous locations in the district.
1967-1971	not reported
1972-1973	trace populations
1974	not reported
1975-1977	trace populations
1978-1980	not reported

American Aspen Beetle, *Gonioctena americana* (Schaeef.)  
Host(s): poplar

[Major]

<u>Year</u>	<u>Remarks</u>
1950	Light defoliation was common throughout the district. Moderate numbers occurred near Pearl and Raith and in Jacques Twp.
1951	Moderate numbers were reported in MacGregor, McTavish, Gorham and Conacher twps.
1952	Light defoliation was observed in Trewartha, MacGregor and Gorham twps and near Mountain Lake.
1953	Moderate populations occurred near Pass Lake on Sibley Peninsula and in a stand west of Savanne; there were low numbers at several other locations.
1954-1955	trace populations
1956	not reported
1957	Moderate numbers caused up to 40% defoliation along the Dog River road.

(cont'd)

American Aspen Beetle, *Gonioctena americana* (Schaefer.) (concl.) [Major]  
Host(s): poplar

<u>Year</u>	<u>Remarks</u>
1958	declined to low levels in the area infested in 1957
1959-1960	trace populations
1961	Light infestations occurred along the Dog Lake road and Hwy 527.
1962-1964	Low numbers at numerous locations, and up to 20% defoliation.
1965	Small pockets of infestation occurred in the Dog Lake area, with defoliation ranging upwards to 90%.
1966	light defoliation in several areas
1967	trace populations
1968	10% defoliation common on Sibley Peninsula
1969	not reported
1970-1971	trace populations
1972	medium-to-heavy infestations near Weikwabinonaw River (2.8 ha) and along Early Lakes road
1973	high populations in Wardrobe Twp
1974	Moderate-to-severe defoliation occurred in pockets north of Dorion and near the Upper Dog River.
1975	not reported
1976	trace populations
1977	not reported
1978	light defoliation north of Dorion
1979	moderate populations south of the Whitefish-Arrow lakes area
1980	Moderate-to-severe defoliation occurred between Kaministiquia and Shabaqua Corners on large trembling aspen and on young trees in Goldie, Oliver and Blake twps.



Fall Webworm, *Hyphantria cunea* (Dru.)

[Major]

Host(s): deciduous

<u>Year</u>	<u>Remarks</u>
1950-1955	not reported
1956	A light infestation occurred along Hwy 61 from Thunder Bay to Pigeon River. Trace populations were reported east of Thunder Bay.
1957-1958	low populations along Hwy 61
1959	trace populations
1960	not reported
1961	low numbers at five locations
1962	not reported
1963-1965	trace populations
1966	not reported
1967	moderate numbers of colonies along Mapleward road, McIntyre Twp
1968-1969	not reported
1970	low numbers at three locations
1971	trace populations
1972-1973	not reported
1974	increased numbers reported in the Thunder Bay and Nolalu areas
1975	high numbers on elm in the Slate River Valley; common elsewhere
1976-1977	light infestations in the Thunder Bay - Kakabeka Falls area
1978	not reported
1979	low numbers west of the city of Thunder Bay
1980	not reported

Hemlock Looper, *Lambdina fiscellaria fiscellaria* (Gn.)  
Host(s): coniferous, deciduous

[Major]

<u>Year</u>	<u>Remarks</u>
1950	trace populations
1951-1953	not reported
1954	trace populations
1955-1963	not reported
1964-1965	trace populations
1966-1976	not reported
1977	collected at Tanner Lake Dam
1978-1980	not reported

Northern Tent Caterpillar, *Malacosoma californicum pluviale* Dyar  
Host(s): cherry

[Minor]

<u>Year</u>	<u>Remarks</u>
1950	collections made in the Whitefish Lake area and north of Thunder Bay to Dog Lake
1951	trace populations
1952-1953	not reported
1954	Low numbers were recorded at 13 locations; the insect was most numerous in Paipoonge Twp.
1955	Light infestation recurred in Paipoonge Twp.
1956-1957	trace populations
1958	common along the Roslyn road
1959-1960	trace populations
1961	Low populations occurred in MacGregor and Neebing twps.
1962	Low numbers were reported in Paipoonge Twp and again in MacGregor and Neebing twps.

(cont')

Northern Tent Caterpillar, *Malacosoma californicum pluviale* Dyar(concl.)  
Host(s): cherry [Minor]

<u>Year</u>	<u>Remarks</u>
1963	Low numbers recurred in MacGregor Twp but elsewhere populations declined.
1964	area of light infestation near Kakabeka Falls
1965-1966	Low populations occurred in McGregor Twp.
1967-1970	not reported
1971-1972	trace populations
1973	not reported
1974	trace populations
1975-1976	not reported
1977	trace populations
1978-1980	not reported

Sawyer Beetles, *Monochamus* spp.  
Host(s): coniferous

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	Numerous larvae were recovered in trap logs at Marks Lake.
1967-1975	not reported
1976-1978	increasing numbers of adults observed in the district
1979	Light damage from adult feeding was observed at Pakashkan Lake.
1980	A total of 26.5 ha sustained tree mortality or heavy branch mortality in places adjacent to cut areas near Windigoostigwan, Picklepuss, Kerfoot and McWhinney lakes as a result of adult feeding from 1978 to 1980.



Northern Pitch Twig Moth, *Petrova albicapitana* (Busck)  
Host(s): jP, scP

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	trace populations at three locations
1955	not reported
1956	low populations at 20 locations
1957	not reported
1958	Light infestations occurred on jack pine windbreak trees in Upsala, Gorham and Stedman twps.
1959	trace populations
1960	not reported
1961	low populations
1962	not reported
1963-1964	trace populations
1965-1972	not reported
1973	light infestation near Kakabeka Falls
1974-1975	not reported
1976	low numbers on Scots pine in Gillies Twp
1977-1978	not reported
1979	increased populations and widespread incidence; most noteworthy in Meinzinger and Wardrope twps and east of Windigoostigwan Lake
1980	not reported

Balsam Poplar Leafblotch Miner, *Phyllonorycter nipigon* (Free.) [Major]  
Host(s): bPo

<u>Year</u>	<u>Remarks</u>
1950-1961	not reported
1962-1963	Medium-to-heavy infestations occurred in Marks, O'Connor, Neebing, Scoble, Conmee, Paipoonge, Oliver and McIntyre twps.
1964-1965	Medium-to-heavy infestations persisted in all areas infested in 1963 except Neebing Twp, where populations were reduced to low levels.
1966-1969	High populations persisted in most of the previously infested areas in the district.
1970-1971	not reported
1972	Small areas of high populations occurred in Blake and Paipoonge twps.
1973-1975	High numbers were recorded near Kakabeka Falls, in Blake Twp and near Pigeon River.
1976-1977	common in the southern half of the district
1978	high numbers from Whitefish Lake to Pigeon River
1979-1980	high numbers through the southwestern portion of the district

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)  
Host(s): mountain-ash

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1969	not reported
1970	This introduced insect was first recorded in the district in and near the city of Thunder Bay.
1971	The distribution of the insect increased to a narrow band along Lake Superior from the Pigeon River to Nipigon, and extending as far west as Rosslyn.
1972	High numbers occurred in the city of Thunder Bay and south to the Pigeon River.
1973	The distribution of the insect continued both westward and northward.
1974-1975	Medium-to-heavy infestations occurred around the city of Thunder Bay, south of Kakabeka Falls and in the Pigeon River area.
1976	The range of the insect extended to south and east of a line from Whitefish Lake through Raith; high numbers occurred west of Thunder Bay to Kakabeka Falls and south along Hwy 61 to Pigeon River.
1977	High populations were reported from Thunder Bay west to Whitefish Lake; the insect's range extended westward to Burchell Lake.
1978	Light defoliation was common throughout the southeastern portion of the district.
1979	Moderate-to-severe defoliation was common from the Nipigon District boundary through the city of Thunder Bay and south to Pigeon River, as well as north along Hwy 527 to Mott Lake.
1980	The infestation continued to expand through a large area south of a line running from Windigoostigwan Lake, north-east through Savanne Twp to Gull Bay on Lake Nipigon; moderate-to-severe defoliation occurred throughout the southeastern part of the district.



Ambermarked Birch Leafminer, *Profenusa thomsoni* (Konow)  
Host(s): birch

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1960	not reported
1961	first record of this insect in the district; collected on Mt. McKay
1962	not reported
1963-1964	Low populations were found along Hwys 61 and 11-17 from Pigeon River to the Nipigon District boundary.
1965-1966	Low numbers prevailed; new collection points show that the insect is widely distributed throughout the district.
1967-1975	not reported
1976-1977	low populations at scattered locations
1978-1980	not reported

Spruce Bud Midge, *Rhabdophaga swainei* Felt  
Host(s): spruce

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	trace populations on white spruce
1960-1966	low numbers on both white and black spruce at several locations
1967	generally low numbers; 10% of terminal buds affected in MacGregor Twp
1968-1973	not reported
1974-1976	trace populations
1977-1978	not reported
1979	common on white spruce in the Matawin Road OMNR Tree Seed Orchard
1980	not reported

Redhumped Caterpillar, *Schizura concinna* (J.E. Smith)  
Host(s): deciduous

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1955	not reported
1956	low populations along Hwy 61 in Neebing Twp
1957-1958	not reported
1959	not reported
1960	low populations
1961	A small, light infestation occurred near Joe Lake on Sibley Peninsula.
1962-1963	trace populations
1964	low numbers in Crooks, Scoble and Paipoonge twps
1965	trace populations
1966	not reported
1967	trace populations
1968-1969	not reported
1970	trace populations
1971-1979	not reported
1980	scattered colonies along Hwy 593

Spruce Bud Moths, *Zeiraphera canadensis* Mut. & Free., *Z. destitutana*  
(Wlk.) and *Z. fortunana* Kft.

Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	trace populations, Dorion Twp
1956	Moderate-to-severe defoliation occurred in Paipoonge, O'Connor, Inwood and Oliver twps, where defoliation ranged from 40 to 75%.
1957	Moderate numbers were recorded in O'Connor and Paipoonge twps and light populations occurred at several other locations.
1958	Populations declined to light intensity.
1959-1960	Low numbers recurred in O'Connor, MacGregor, Gillies and Inwood twps.
1961-1962	A small pocket of medium-to-heavy infestation occurred in O'Connor Twp. Low populations recurred at other locations.
1963-1965	low populations
1966	not reported
1967-1968	trace populations
1969	not reported
1970	moderate-to-severe defoliation of windbreak and ornamental spruce in the city of Thunder Bay and surrounding area
1971	not reported
1972	moderate-to-severe defoliation at Burchell Lake and along Dog River road
1973	several small areas of medium-to-heavy infestation

(cont'd)



Spruce Bud Moths, *Zeiraphera canadensis* Mut. & Free., *Z. destitutana* (Wlk.) and *Z. fortunana* Kft. (concl.) [Major]

Host(s): spruce

<u>Year</u>	<u>Remarks</u>
1974	Medium-to-heavy infestations were reported on windbreaks at the Thunder Bay Forest Station, on ornamentals in the city of Thunder Bay, at several locations on Sibley Peninsula, in the Burchell Lake area and along the North Heaven Lake road.
1975	Moderate-to-severe defoliation recurred in areas infested in 1974. New areas of medium-to-heavy infestation occurred along Hwy 593 near Pigeon River and east of Kakabeka Falls.
1976	High populations again were evident in and around Thunder Bay and on Sibley Peninsula.
1977	Moderate numbers occurred in the Thunder Bay area, on Sibley Peninsula and in the Cheeseman Lake area.
1978	Moderate populations were found on mature white spruce in Boulevard Lake Park in Thunder Bay. Light damage occurred through the eastern half of the district.
1979	Populations declined to trace levels.
1980	Moderate-to-severe defoliation (up to 90% of current shoots attacked) occurred throughout most of the district. Notable areas were north of Graham, the Upsala area, south of Bedivere Lake, in and around the city of Thunder Bay and on Sibley Peninsula.

# **DISEASES**

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer  
Host(s): all species

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	very common in jack pine stands along the Dog River
1959-1963	not reported
1964	collected on the roots of dead trees at several locations
1965-1966	not reported
1967	light damage common
1968	not reported
1969	infection center located in jack pine in Goldie Twp
1970	current mortality rate of 7.5% of jack pine regeneration in both Stedman and Aldina twps
1971	5% of the jack pine affected at one location in Goldie Twp
1972	current mortality rate of 12.5% in jack pine, Graham Road
1973	not reported
1974	This fungus was isolated from 89% of the roots submitted in a survey of mortality in regeneration stands throughout the district.
1975	occasional tree mortality in young stands
1976	not reported
1977	current mortality rate of 5% in black spruce in the Matawin River area
1978	current mortality rate of 7% in jack pine regeneration in Sackville Twp
1979	3% mortality of jack pine near Little Greenwater Lake
1980	Mortality was 3% or less in numerous stands in the district.



Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer  
Host(s): all species

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1957	not reported
1958	very common in jack pine stands along the Dog River
1959-1963	not reported
1964	collected on the roots of dead trees at several locations
1965-1966	not reported
1967	light damage common
1968	not reported
1969	infection center located in jack pine in Goldie Twp
1970	current mortality rate of 7.5% of jack pine regeneration in both Stedman and Aldina twps
1971	5% of the jack pine affected at one location in Goldie Twp
1972	current mortality rate of 12.5% in jack pine, Graham Road
1973	not reported
1974	This fungus was isolated from 89% of the roots submitted in a survey of mortality in regeneration stands throughout the district.
1975	occasional tree mortality in young stands
1976	not reported
1977	current mortality rate of 5% in black spruce in the Matawin River area
1978	current mortality rate of 7% in jack pine regeneration in Sackville Twp
1979	3% mortality of jack pine near Little Greenwater Lake
1980	Mortality was 3% or less in numerous stands in the district.

Scleroderris Canker, *Ascocalyx abietina* (Lagerb.) Schlöpfer-Bernhard  
Host(s): pines [Major]

<u>Year</u>	<u>Remarks</u>
1950-1965	not reported
1966	In McTavish Twp, 5.8% of 400 red pine were affected; the mortality rate was 3.5%.
1967	Mortality increased to 4% in McTavish Twp.
1968-1969	not reported
1970	Light infections occurred on red pine seedlings and adjacent windbreaks at the Thunder Bay Forest Nursery.
1971	Several new centers of infection were detected in the English River and Graham Road areas. Mortality amounted to 15% in 400 ha of jack pine on the Graham Road.
1972	40% of trees affected in jack pine regeneration near the Graham airport
1973	Damage continued along the Graham Road and at the Graham Airport.
1974	Sporadic trace infections occurred for 25 km along the Graham Road.
1975	trace infections
1976	New infections were detected on red pine in Marks Twp, where 17% of the trees were severely affected, and in Gorham and Sibley twps light infections occurred on both jack and red pine.
1977	not reported
1978	light damage near English River
1979-1980	not reported

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau  
Host(s): elm

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1975	not reported
1976	This was the first record of the disease in the district. It was collected from trees growing along the Slate River south of Moose Hill in Blake Twp.
1977	increased damage around the initial infection area in Blake Twp
1978	A positive identification was made from trees along the Kaministiquia River at Hwy 61 in the south end of the city of Thunder Bay.
1979	recorded for the first time on Old Fort William property in the city of Thunder Bay
1980	not reported

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

Host(s): spruce

[Major]

<u>Year</u>	<u>Remarks</u>
1950	not reported
1951-1952	Moderate-to-severe defoliation was evident on black spruce in low-lying areas west of Upsala.
1953	Damage declined to light intensity in the area west of Upsala.
1954-1957	not reported
1958	Medium-to-heavy infections occurred in Trewartha and Neebing twps.
1959	Moderate-to-severe defoliation was observed along Hwy 17 from Raith to English River and in the area of Dog and Onion lakes.
1960	Light infection occurred in Trewartha, Gorham and Robson twps.

(cont'd)



Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary  
and *C. ledicola* (Peck) Lagerh. (concl.) [Major]  
Host(s): spruce

<u>Year</u>	<u>Remarks</u>
1961-1962	very low levels
1963	small area of white spruce in Goldie Twp moderately affected
1964	Pockets of heavy infection occurred in Upsala and Inwood twps; low levels were common at several locations.
1965	Several stands of small-diameter black spruce west of Huronia sustained heavy damage and light infections occurred from Raith to English River.
1966	Light infection recurred from Raith to English River.
1967	Moderate-to-severe defoliation occurred commonly along the Graham road.
1968	A moderate infection level was recorded on plantation white spruce in Conacher Twp.
1969	moderate infection level between Upsala and English River
1970	Moderate-to-severe damage occurred in Gorham Twp and at the south end of the Dog River road.
1971-1973	very low levels
1974	foliar damage of 30% on black spruce near Brennan Lake
1975	medium-to-heavy infections north of Upsala and north of Shebandowan
1976	foliar damage of 35% recorded on black spruce in Tre-wartha Twp
1977	very low levels
1978	moderate defoliation of 30% north of Drift Lake and east of English River
1979	A medium-to-heavy infection was reported on plantation white spruce northwest of Drift Lake and 10% defoliation occurred in a stand of black spruce in Inwood Twp.
1980	very low levels

Ink Spot of Aspen, *Ciborinia whetszelii* (Seaver) Seaver  
Host(s): tA

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	collected in Gillies Twp
1955-1957	not reported
1958	Defoliation ranged from 29% to 49% at locations in Conmee, Blake, Crookes, Pardee and Paipoonge twps.
1959	Moderate-to-severe defoliation occurred along the Pigeon, Kaministiquia and Shebandowan rivers and in the Dog lake area.
1960-1961	very light infections
1962	Moderate-to-severe defoliation occurred along Hwy 17 west from Kakabeka Falls to English River and in the Onion Lake area.
1963-1964	light infections common
1965	Medium-to-heavy incidence of the disease was reported along Hwys 61 and 527 and the Dog Lake road.
1966	low levels
1967	not reported
1968	light infections along the southern portion of Hwy 527
1969	not reported
1970-1971	very low levels
1972-1973	not reported
1974-1976	very low levels
1977	defoliation of 60% east of Shebandowan in Conacher Twp
1978-1979	light damage at several locations
1980	very low levels

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

[Major]

Host(s): jP

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	light infections in Golding and Joynt twps
1960-1961	not reported
1962	light infection on jack pine in O'Connor Twp
1963	common on small trees in Aldina Twp
1964	moderate-to-severe browning of foliage of plantation trees in O'Connor Twp where 70% of the trees were affected
1965	low levels of infection in O'Connor Twp and along the Atikokan Road
1966	light infection on several trees, Upsala Twp
1967	light infection in Paipoonge and Hagey twps
1968	not reported
1969-1973	very low levels
1974-1976	not reported
1977	defoliation of 12% west of Swallow Lake
1978	not reported
1979-1980	defoliation of about 30% in Golding Twp and south of Windigoostigwan Lake; generally lighter levels elsewhere



Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur  
Host(s): pines

[Major]

Year	Remarks
1950-1958	not reported
1959	single jack pine affected in O'Connor and Stedman twps and at English and Dog rivers
1960	trace infection levels, Inwood Twp
1961-1963	not reported
1964	single collection of infected jack pine seedlings, Thunder Bay Forest Nursery
1965-1969	not reported
1970	From 5 to 11% of trees were affected at four jack pine sites evaluated in the district.
1971	5% of trees affected at one location on Hwy 11 at the Atikokan District boundary
1972-1973	no new distribution points found or changes in infection levels
1974	not reported
1975	severely cankered stems on 6% of trees, Burchell Lake Road, and on 3% of trees in Hogarth Twp
1976-1980	not reported

Eastern Gall Rust, *Cronartium quercuum* (Berk.) Miyabe ex Shirai f.  
sp. *banksianae*,  
Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats.  
Host(s): pines [Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	light damage in small, open-grown jack pine stands in Robbins twp
1953	not reported
1954	trace infections, Stedman Twp
1955-1960	not reported
1961	light infections at Whitefish Lake and in Inwood Twp
1962	Light infections were found in Gorham Twp and along Hwy 11 near the Atikokan District boundary.
1963	High numbers of galls were observed in the Trout Lake area, Gorham Twp.
1964-1965	Medium-to-heavy infections occurred in Stirling and Ames twps and near English River.
1966	not reported
1967	Medium-to-heavy infections occurred along the Dog River and Armstrong roads, at English River and in Inwood Twp.
1968	A 243-ha stand along the Dog River road and a 20-ha stand at Huronian Lake sustained moderate-to-heavy damage.
1969	not reported
1970	17.5% of trees affected in Stedman Twp
1971	A mortality rate of 37.5% was recorded at Mile 15.5 on the Graham Road.
1972	75% of trees affected at Innes Lake and 37.5% at the Graham Airport
1973	a high number of trees affected at Herbert Lake and at Ouimet Caynon
1974-1980	not reported

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer  
Host(s): wP

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1954	not reported
1955	numerous infections at Pigeon River
1956-1958	not reported
1959	damage common in the Pigeon River area
1960-1961	not reported
1962	common throughout the range of white pine in the district
1963	high incidence along the Pigeon River
1964	6% and 3% of trees affected in plantations in Paipoonge Twp
1965-1968	not reported
1969-1970	Trace infections occurred on 61% of trees near Pickerel Lake on Sibley Peninsula.
1971-1972	not reported
1973	High infection levels were recorded in Pardee and Blake twps and on Sibley Peninsula.
1974	a high number of affected trees found in McTavish Twp
1975-1976	heavy damage at several locations, particularly in natural stands in Pardee and Blake twps and on Sibley Peninsula
1977	reduced active infections
1978-1980	not reported



Tar Spot Needle Cast, *Davisomycella ampla* (J. Davis) Darker [Major]  
Host(s): jP

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	trace infection at Huronian Lake
1960-1968	not reported
1969	Trace infection levels were recorded east of English River and in Paipoonge Twp.
1970-1971	not reported
1972-1973	common throughout the district at trace infection levels
1974-1975	not reported
1976	30% foliar damage on pole-sized jack pine in O'Connor Twp; several areas of light damage recorded elsewhere
1977-1978	trace levels of infection
1979	Numerous areas of damage occurred throughout the district. Notable areas of 30% foliar damage were recorded in Pearson and Inwood twps and on Hwy 527 at Current River.
1980	trace levels of infection

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller [Major]  
Host(s): poplar

<u>Year</u>	<u>Remarks</u>
1950-1952	not reported
1953	commonly found
1954	moderate numbers of affected trees in Goldie and Scoble twps
1955	recorded in numerous stands in the district, particularly in the area southeast of the city of Thunder Bay

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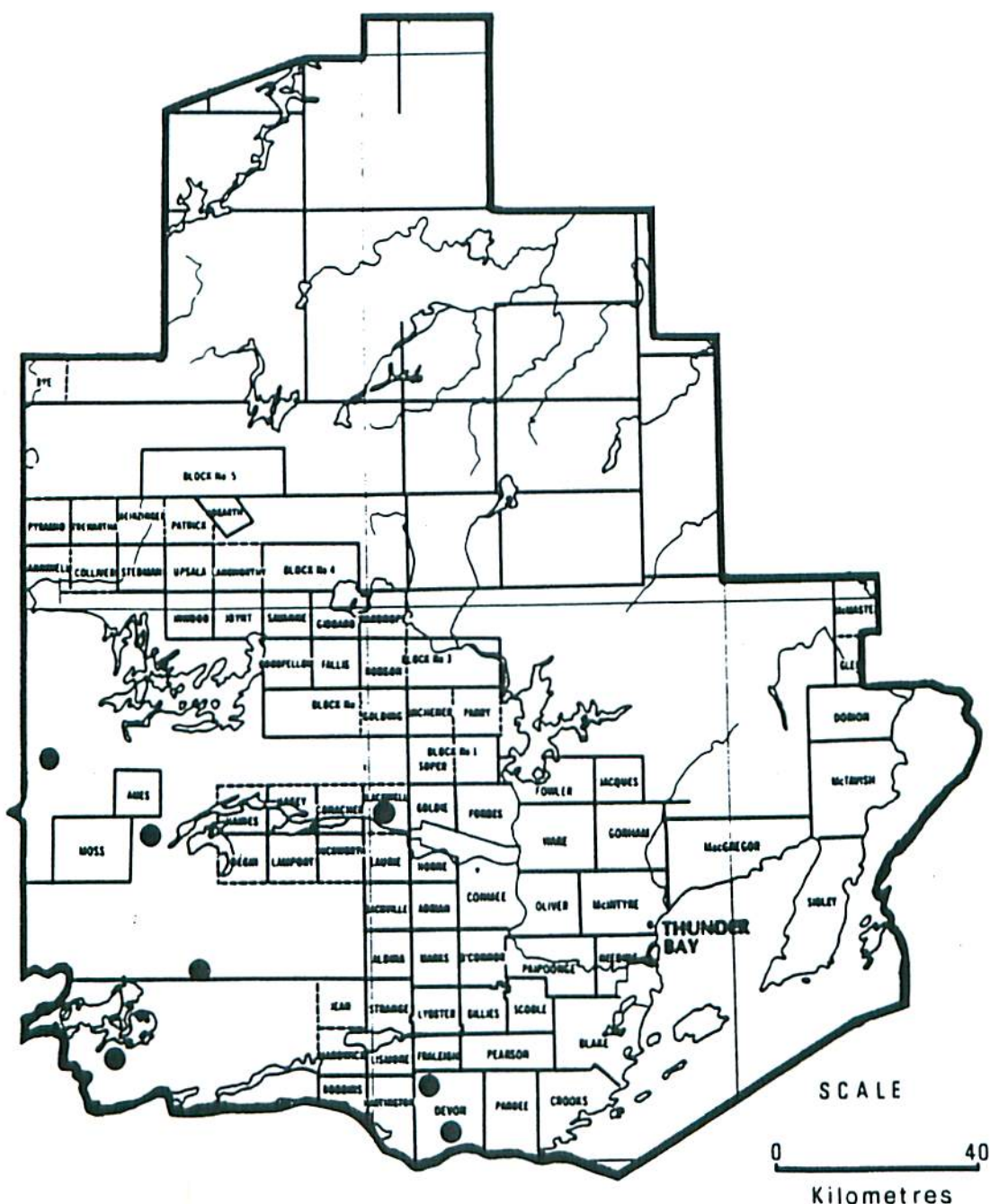
Hypoxyton Canker, *Hypoxyton mammatum* (Wahlenb.) J. Miller (concl.)  
Host(s): poplar [Major]

<u>Year</u>	<u>Remarks</u>
1956-1963	not reported
1964	Light infections were recorded in Horne, Trewartha, Pyramid and Golding twps.
1965-1967	not reported
1968	one area in Conmee Twp with 40% of the trees affected and a current mortality rate of 2.5%
1969-1973	not reported
1974-1975	trace levels observed
1976	not reported
1977	trace levels observed
1978-1980	not reported

Shoot Blight, *Sirococcus conigenus* (DC.) P. Cannon & Minter [Major]  
Host(s): pines, blue spruce

<u>Year</u>	<u>Remarks</u>
1950-1972	not reported
1973	Extensive surveys were carried out to determine distribution of this disease (see map, page 116). Medium-to-heavy infection centers were found on red pine near Titmarsh, Burchell and Windigoostigwan lakes.
1974	The disease was found at Allely Lake and on jack pine seedlings at the Thunder Bay Forest Nursery.
1975	no change in distribution
1976	The annual mortality rate decreased from 10% in 1975 to 3% in 1976 at Mountain Lake and from 13% to 2% at another plot at Northern Light Lake.
1977-1980	not reported

# THUNDER BAY DISTRICT



Shoot Blight

Locations of infection centers  
recorded in 1973

## LEGEND

Infection centers ●



Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx [Major]  
Host(s): tA

<u>Year</u>	<u>Remarks</u>
1950-1953	not reported
1954	generally light; all diameter classes of trees affected in Scoble and Gillies twps
1955	moderate incidence of infection in Goldie and Gillies twps
1956-1957	not reported
1958-1960	light infections common, particularly on small-diameter trees
1961	moderate incidence along Hwy 61
1962	medium-to-heavy incidence in several areas in the southern part of the district
1963	Moderate-to-severe shoot mortality occurred along Hwy 527 and in McMaster, Haines and Hagey twps.
1964-1968	light infection common
1969	high level of infection on regeneration in the Pace Lake area
1970	very low levels
1971	not reported
1972	low levels common
1973-1974	not reported
1975-1977	very low levels
1978	An average of 75% of the trees were affected with an average of 22% foliar damage at eight locations evaluated across the district.
1979	60% of the trees affected, about half with leaders killed
1980	very low levels

Other Noteworthy Diseases

Eastern Dwarf Mistletoe, *Arceuthobium pusillum* Peck  
Host(s): spruce, jP

[Major]

<u>Year</u>	<u>Remarks</u>
1950-1951	not reported
1952	Collections were made on black spruce at Saganaga and Uneven lakes.
1953-1954	not reported
1955	found at numerous points in Joynt and Savanne twps
1956-1967	not reported
1968	Moderate levels of infection were recorded in a 240-ha stand in Joynt Twp.
1969	not reported
1970	medium-to-heavy infections on jack pine and black spruce in a 4-ha stand at Northern Light Lake
1971-1972	not reported
1973	22% and 87% of trees affected in low-lying black spruce stands in Joynt and Conacher twps, respectively; wide-spread elsewhere
1974-1975	medium-to-heavy infection west of Raith and south of Sparkling Lake
1976-1980	not reported

Spruce Cone Rust, *Chrysomyxa pirolata* (Körn.) Winter  
Host(s): spruces

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1963	not reported
1964	Moderate infections were recorded in Fowler and MacGregor twps.
1965-1966	not reported
1967	light infections at several locations
1968-1973	not reported
1974	Medium-to-heavy infections occurred in Laurie and MacGregor twps and along the Heaven Lake Road.
1975	Medium-to-heavy infections recurred in Laurie Twp and along Heaven Lake Road.
1976-1980	not reported

Gall Rust, *Gymnosporangium cornutum* Arthur ex Kern  
Host(s): mountain-ash

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	Moderate infections occurred in MacGregor Twp.
1964	A small pocket of moderate infection occurred at the southern tip of Sibley Peninsula.
1965	not reported
1966-1968	light infection levels
1969-1970	not reported
1971	medium-to-heavy infections at Windigoostigwan Lake
1972-1980	not reported



Fireweed Rust, *Pucciniastrum epilobii* Otth  
Host(s): bF

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1962	not reported
1963	Light infections were common at numerous widely separated locations; infection levels were moderate in Robson Twp.
1964	not reported
1965	light infection level on Sibley Peninsula
1966-1967	not reported
1968	A moderate infection level was recorded on 4 ha on the east side of Lac des Mille Lacs.
1969	not reported
1970-1973	trace infection levels at many locations
1974-1977	not reported
1978	Moderate-to-severe defoliation occurred through the area north of Black Bay to McMaster Twp.
1979	damage reduced to light in the area that was affected in 1978
1980	not reported

Shoot Blight, *Venturia populina* (Vuill.) Fabric.  
Host(s): bPo

[Minor]

<u>Year</u>	<u>Remarks</u>
1950-1958	not reported
1959	light infection levels on small trees at Wolf River and in Gillies Twp
1960-1961	not reported
1962	light infections on the Sibley Peninsula and in Marks Twp
1963	light infection levels in Ware Twp
1964	Moderate infection levels were recorded in MacGregor and Marks twps.
1965	light infections
1966-1967	not reported
1968	trace level of infection throughout the district
1969-1973	not reported
1974	light infections
1975-1980	not reported

**ABIOTIC DAMAGE**



## Drought

<u>Year</u>	<u>Remarks</u>
1950-1969	not reported
1970-1971	Hot dry weather during July and August resulted in premature yellowing and leaf drop over large areas of the district. All species of deciduous trees were affected in both years.
1972-1973	not reported
1974	Dry weather in July and early August caused widespread foliar damage to white birch growing on dry sites in the southwestern part of the district.
1975	not reported
1976	Early browning of aspen and white birch foliage was conspicuous, particularly in the Shebandowan-Burchell Lake area.
1977-1978	Following the severe drought of 1976, a large area around Whitefish Lake extending east to Lake Superior showed considerable balsam fir mortality.
1979-1980	not reported

## Frost

<u>Year</u>	<u>Remarks</u>
1950-1963	not reported
1964	varying degrees of damage to the current year's growth of balsam fir and white spruce throughout the district
1965-1967	not reported
1968	light damage to balsam fir along the south portion of the Armstrong Road area
1969-1971	not reported

(cont'd)

Frost (concl.)

<u>Year</u>	<u>Remarks</u>
1972	Severe frosts in late May and early June caused extensive damage in the district. There was heavy shoot and foliage mortality of white spruce, black spruce, balsam fir and various deciduous species along the Spruce River Road and in Marks Twp. Newly planted white spruce suffered heavy mortality in the Dog River area and much of the foliage of black ash was destroyed in the Pigeon River area.
1973-1976	not reported
1977	40% damage to 78% of white spruce trees near Mawn Lake.
1978	Foliar damage averaged 32% in eight balsam fir stands and 31% in four white spruce stands examined.
1979	Moderate-to-severe defoliation of black spruce, white spruce and balsam fir occurred above a line 64 km north of Thunder Bay and between the Spruce River Road and Hwy 17.
1980	Small pockets of damage occurred in frost-prone areas between the Spruce and Dog rivers.

Hail

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	Heavy damage occurred over an area of 130 km <sup>2</sup> between the Atikokan District border and Bolton Bay on Lac des Mille Lacs.
1970-1978	not reported
1979	Extensive top, branch and whole-tree mortality occurred over 320 ha of semimature jack pine at the southwestern corner of Pakashkan Lake. The exact date of the storm that caused the damage was undetermined.
1980	not reported

Wind

<u>Year</u>	<u>Remarks</u>
1950-1968	not reported
1969	Large white pine and white spruce were uprooted in two areas totalling 39 km <sup>2</sup> near West Bedivere Lake and near Bolton Bay on Lac des Mille Lacs.
1970	small pockets of damage at scattered points
1971-1972	not reported
1973	small areas of damage near English River
1974-1980	not reported

Winter Drying

<u>Year</u>	<u>Remarks</u>
1950-1966	not reported
1967	common on small white, red and jack pine trees in the eastern half of the district; 90% of the trees affected in one white pine plantation in McTavish Twp
1968	not reported
1969	severe browning of red pine and Norway spruce east of Pearl on Hwy 17
1970	moderate-to-severe defoliation of red pine in Fowler Twp
1971	not reported
1972	Moderate-to-severe browning occurred across the south-eastern portion of the district, with up to 95% of trees affected. Species affected included Scots pine, red pine and spruce.
1973	Jack pine suffered moderate-to-severe browning of needles over a large area in the southwestern portion of the district (see map, page 129).

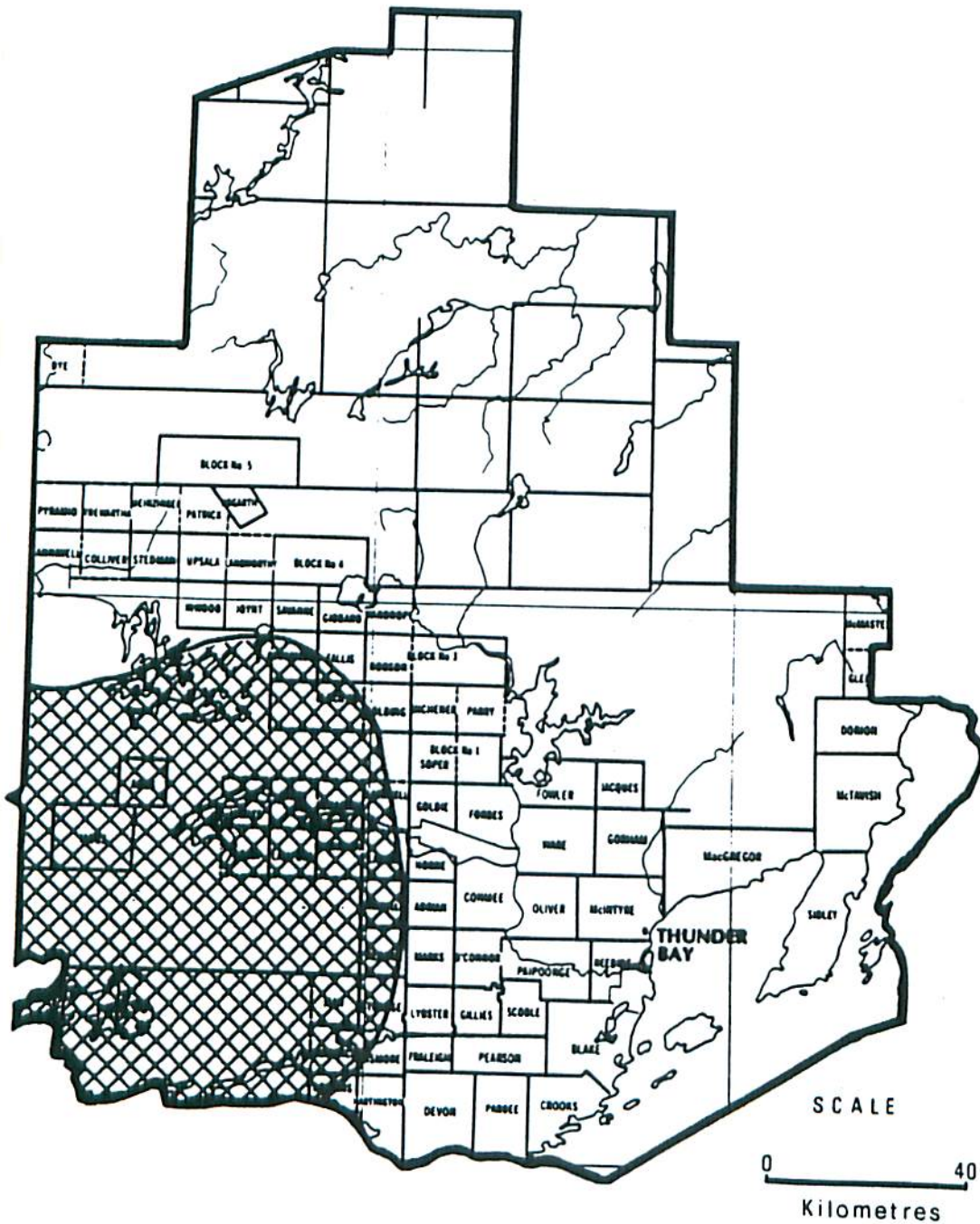
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Winter Drying (concl.)

<u>Year</u>	<u>Remarks</u>
1974	caused considerable twig and branch mortality in Scots pine plantations near Mokoman and Dorion
1975	Moderate-to-severe damage recurred on Scots pine at the locations mentioned in 1974 and on red pine in Paipoonge Twp.
1976	light browning on white spruce in and around the city of Thunder Bay
1977-1978	not reported
1979	Moderate-to-severe browning occurred on white pine, white spruce and Scots pine in and around the city of Thunder Bay. Numerous Scots pine windbreaks in Paipoonge and Blake twps were 100% affected.
1980	not reported

# THUNDER BAY DISTRICT



Winter Drying of Pines

Areas within which damage  
occurred in 1973

## LEGEND

Moderate-to-severe damage ● or 

# **APPENDICES**



# APPENDIX A

## DECIDUOUS HOST

<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Alder	<i>Alnus</i> spp.	Al
Apple	<i>Malus</i> spp.	Ap
Ash, black	<i>Fraxinus nigra</i> Marsh.	As
Aspen, largetooth	<i>Populus grandidentata</i> Michx.	lA
trembling	<i>tremuloides</i> Michx.	tA
Basswood	<i>Tilia</i> spp.	Ba
Beech	<i>Fagus grandifolia</i> Ehrh.	Be
Birch, white	<i>Betula papyrifera</i> Marsh.	wB
yellow	<i>alleghaniensis</i> Britt.	yB
Butternut	<i>Juglans cinerea</i> L.	Bu
Cherry, eastern choke	<i>Prunus virginiana</i> L.	eaCh
pin	<i>pensylvanica</i> L.f.	pCh
Elm, white	<i>Ulmus americana</i> L.	wE
Horse-chestnut	<i>Aesculus hippocastanum</i> L.	hChe
Ironwood	<i>Ostrya</i> spp.	I
Maple, Manitoba	<i>Acer negundo</i> L.	mM
red	<i>rubrum</i> L.	rM
sugar	<i>saccharum</i> Marsh.	sM
Mountain-ash, American	<i>Sorbus americana</i> Marsh.	aMo
Oak, bur	<i>Quercus macrocarpa</i> Michx.	bO
red	<i>rubra</i> L.	rM
Poplar, balsam	<i>Populus balsamifera</i> L.	bPo
Carolina	<i>eugenei</i> Simon-Louis	cPo
Lombardy	<i>nigra</i> L.	lPo
silver	<i>alba</i> L.	sPo
Willow	<i>Salix</i> spp.	W

APPENDIX B  
CONIFEROUS HOST

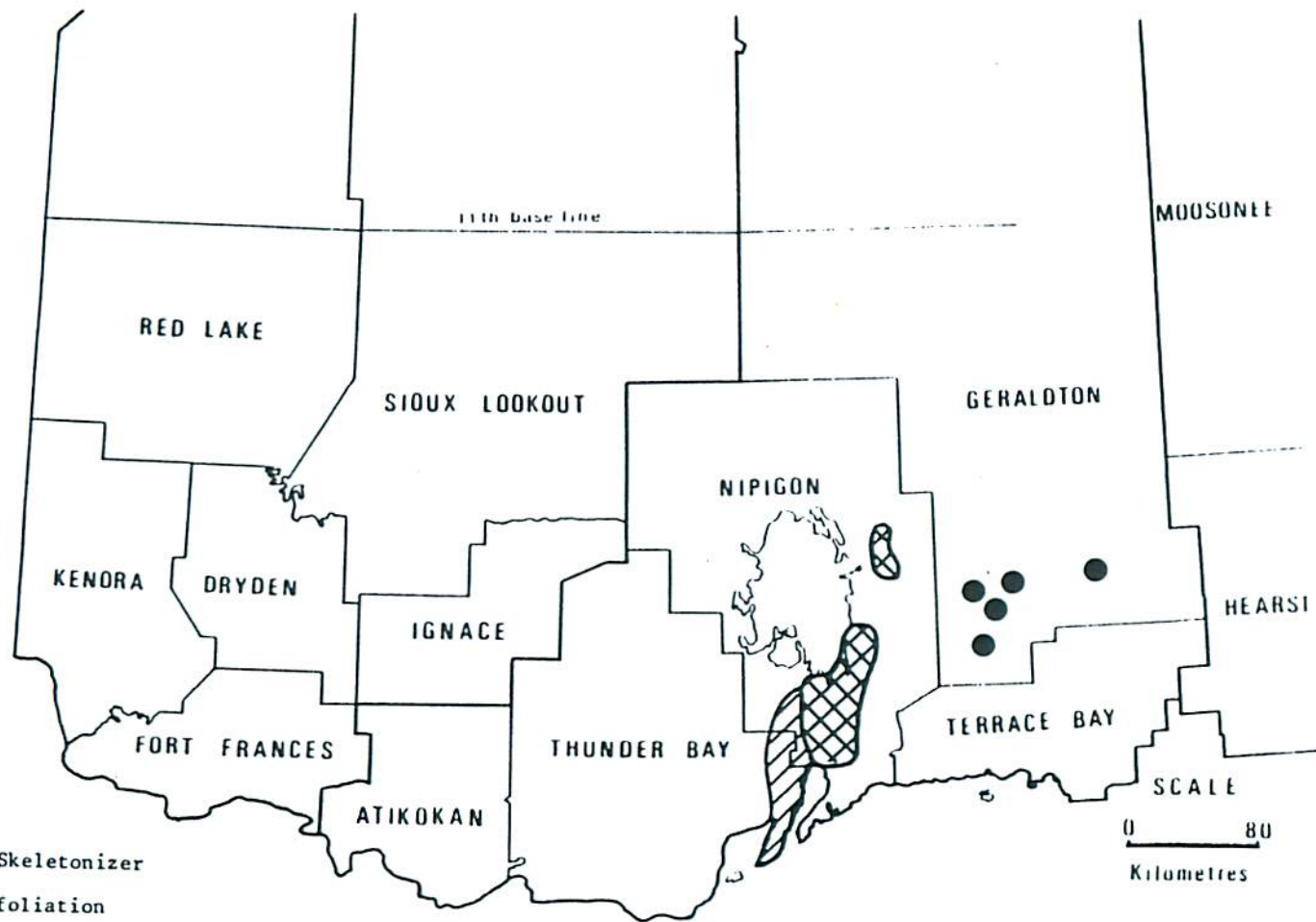
<u>Common Name</u>	<u>Scientific Name</u>	<u>Abbreviations</u>
Cedar, eastern white	<i>Thuja occidentalis</i> L.	eC
Fir, balsam	<i>Abies balsamea</i> (L.) Mill.	bF
Larch	<i>Larix laricina</i> (Du Roi) K. Koch	tL
Pine, Austrian	<i>Pinus nigra</i> Arn.	aP
eastern white	<i>strobis</i> L.	wP
jack	<i>banksiana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

A P P E N D I X   C

M A P S - N O R T H W E S T E R N   O N T A R I O




# NORTHWESTERN ONTARIO

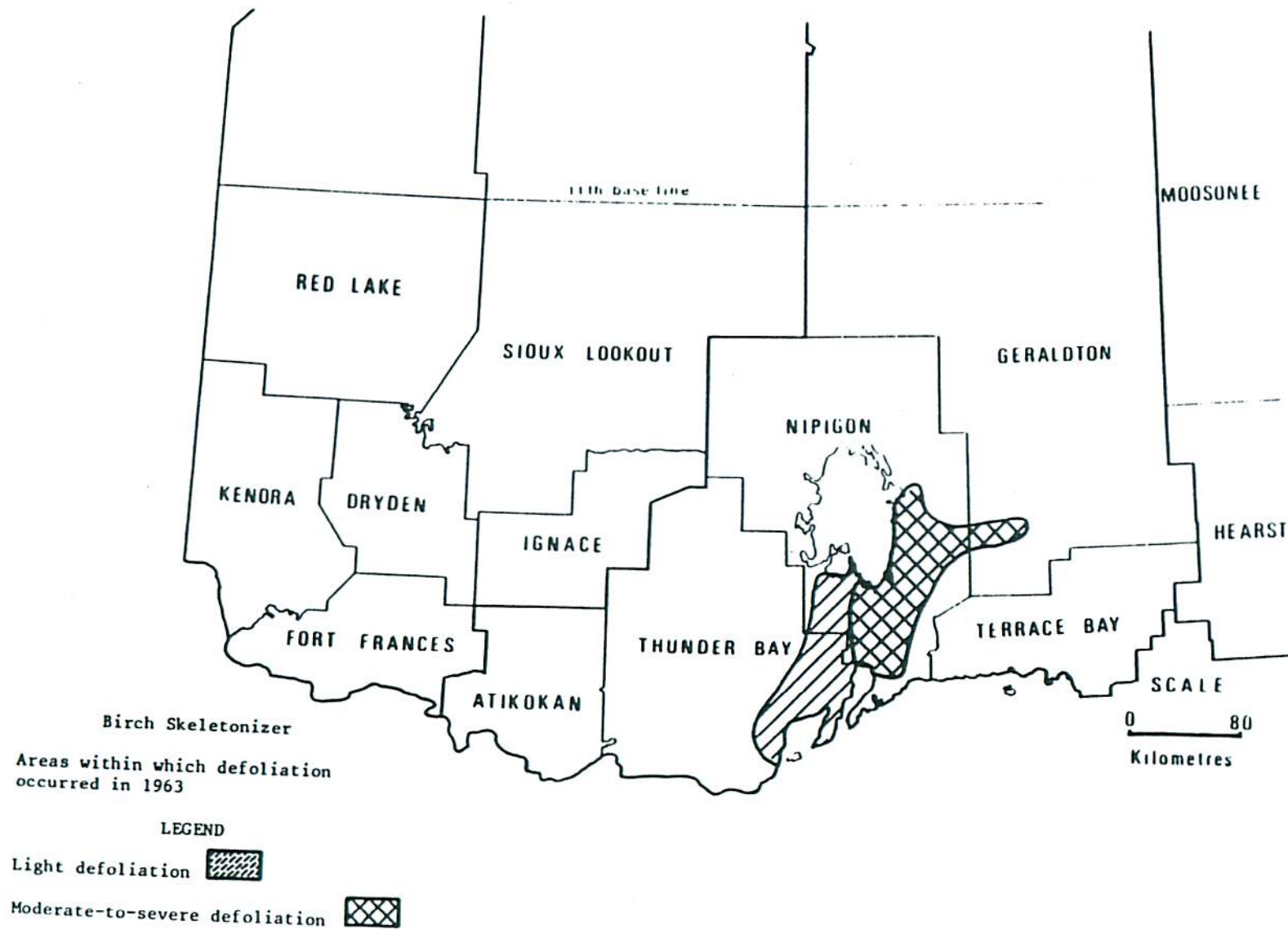


## LEGEND

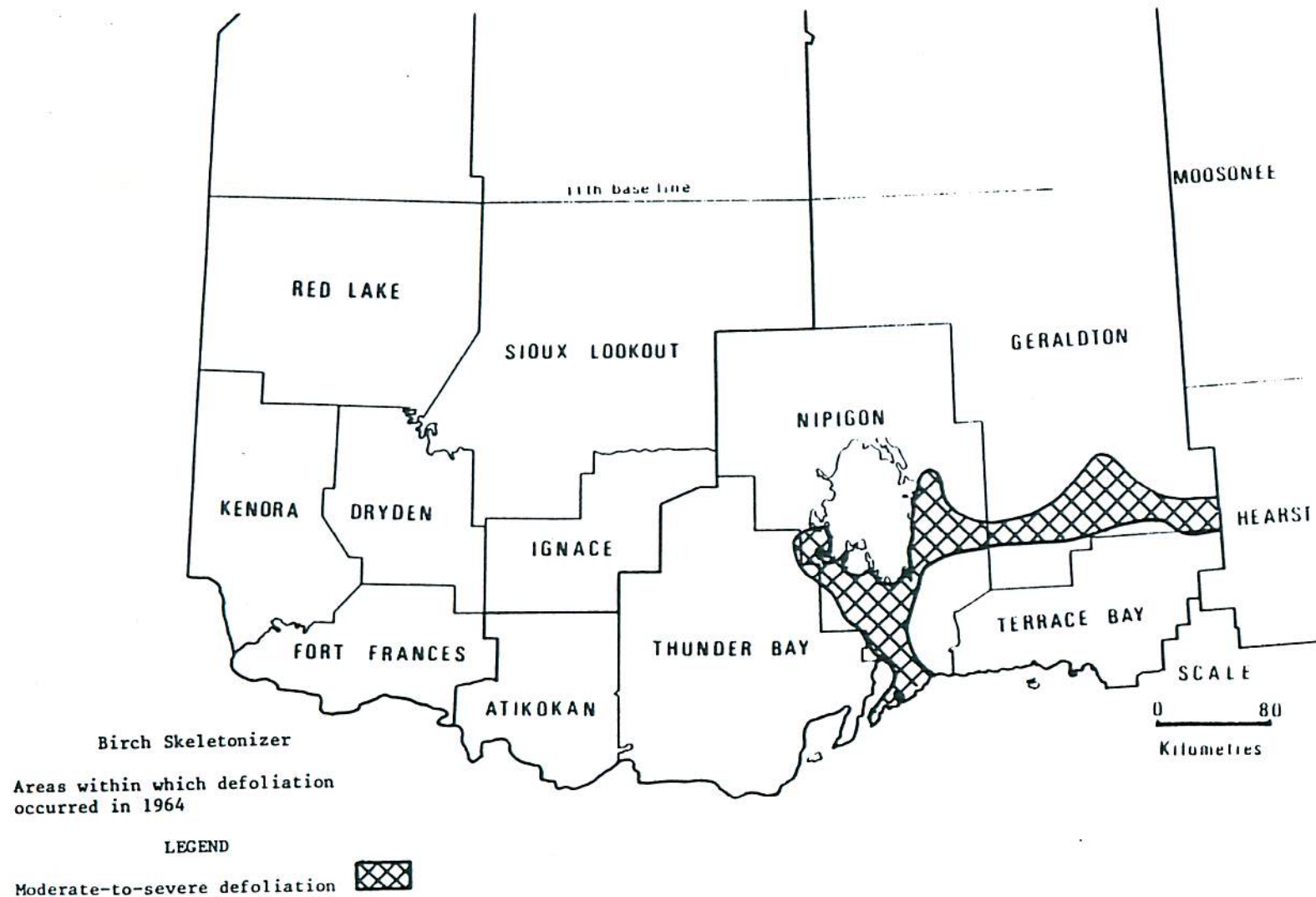
Light defoliation 

Moderate-to-severe defoliation ● or 

# NORTHWESTERN ONTARIO

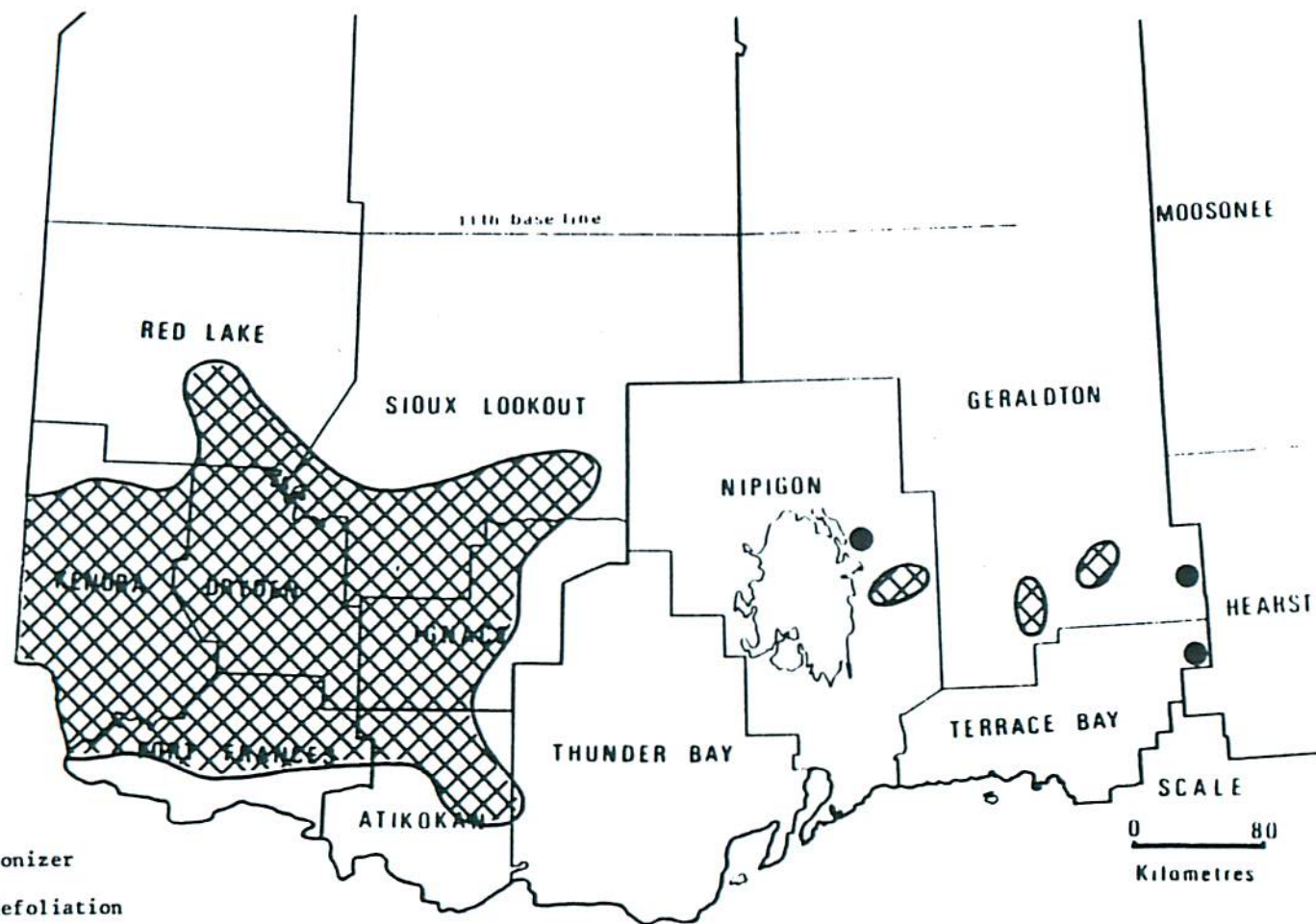


# NORTHWESTERN ONTARIO





# NORTHWESTERN ONTARIO



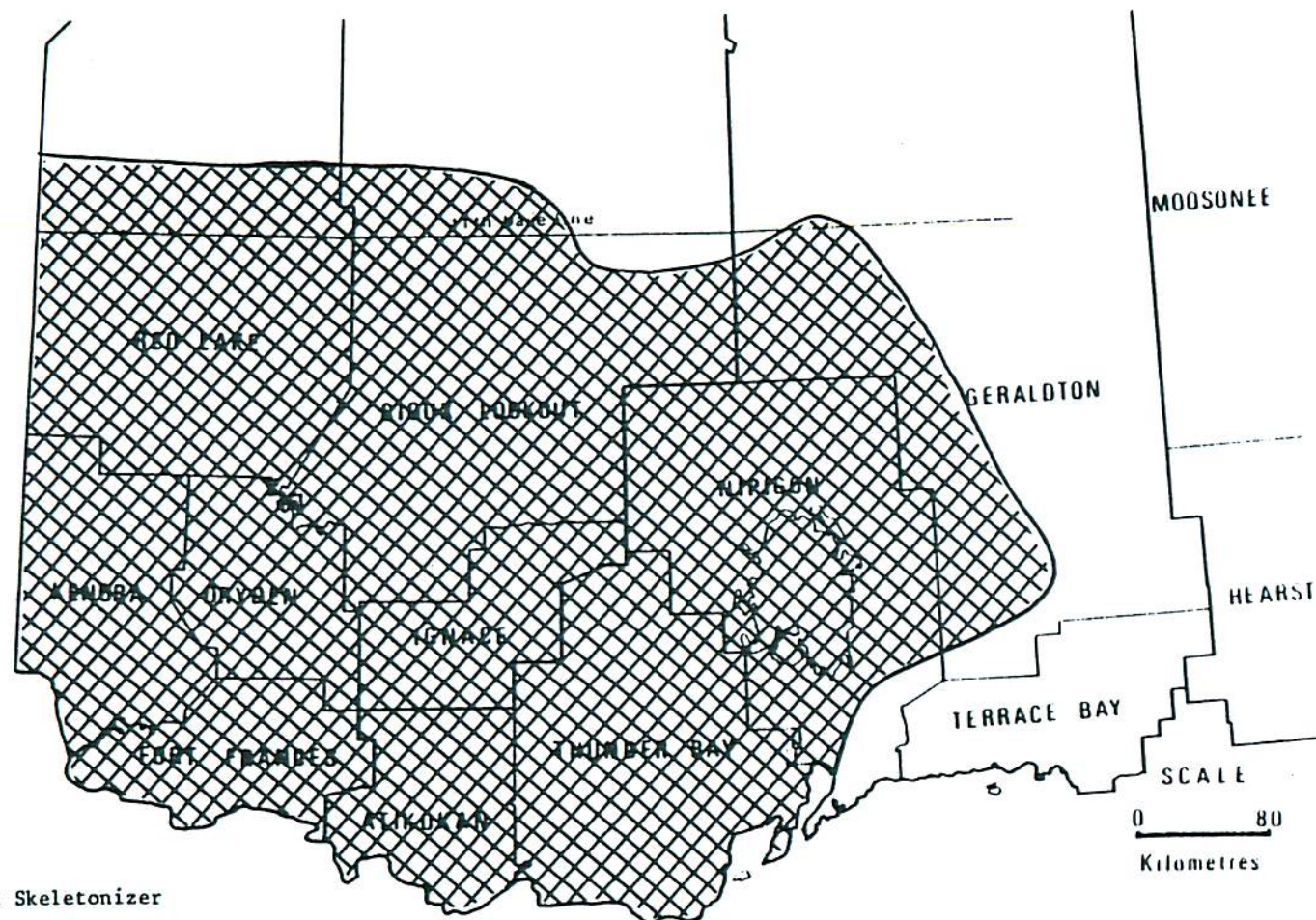
Birch Skeletonizer

Areas within which defoliation  
occurred in 1970

LEGEND

Moderate-to-severe defoliation ● or 

# NORTHWESTERN ONTARIO



Birch Skeletonizer

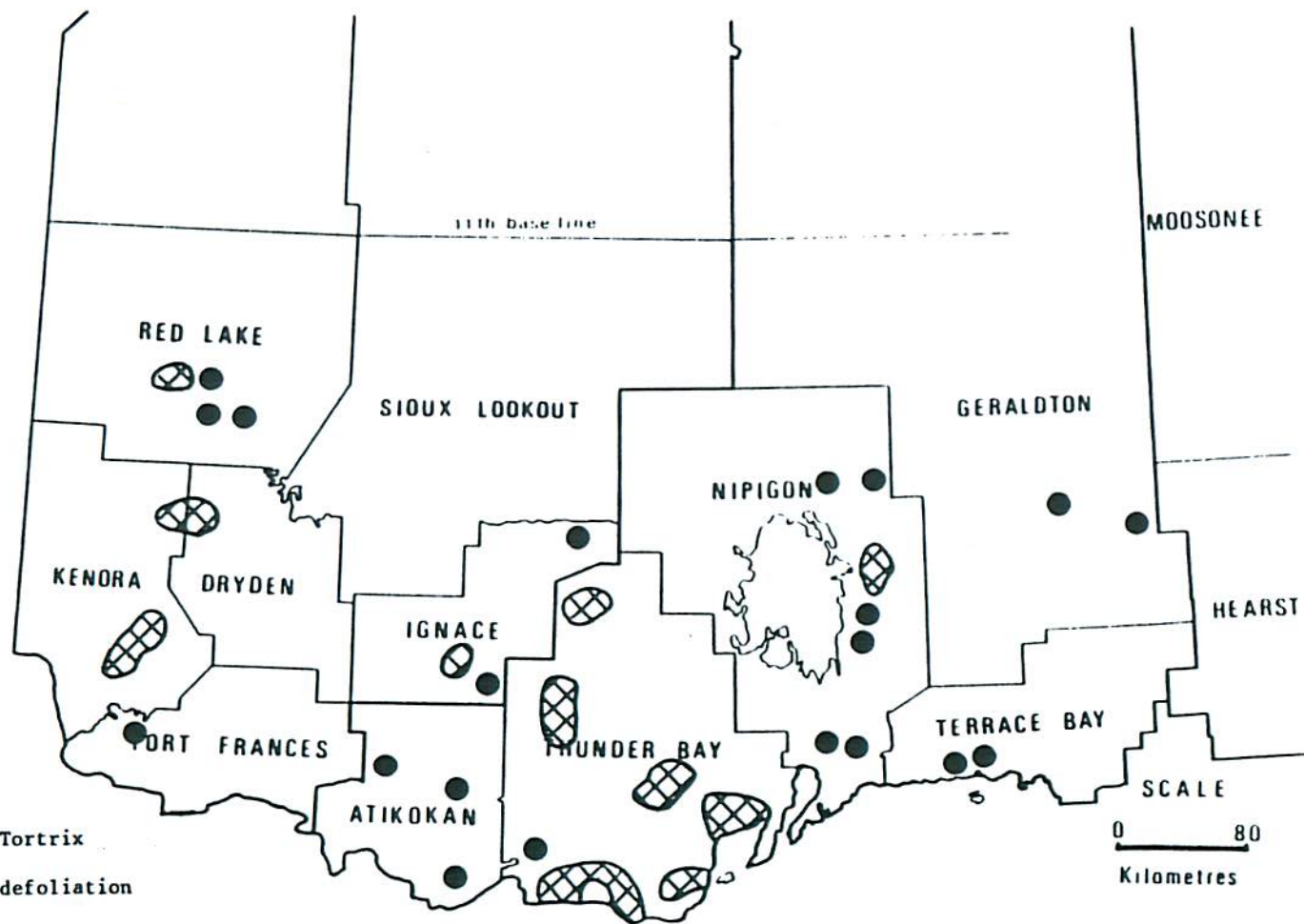
Areas within which defoliation  
occurred in 1972

LEGEND

Moderate-to-severe defoliation



# NORTHWESTERN ONTARIO



Large Aspen Tortrix

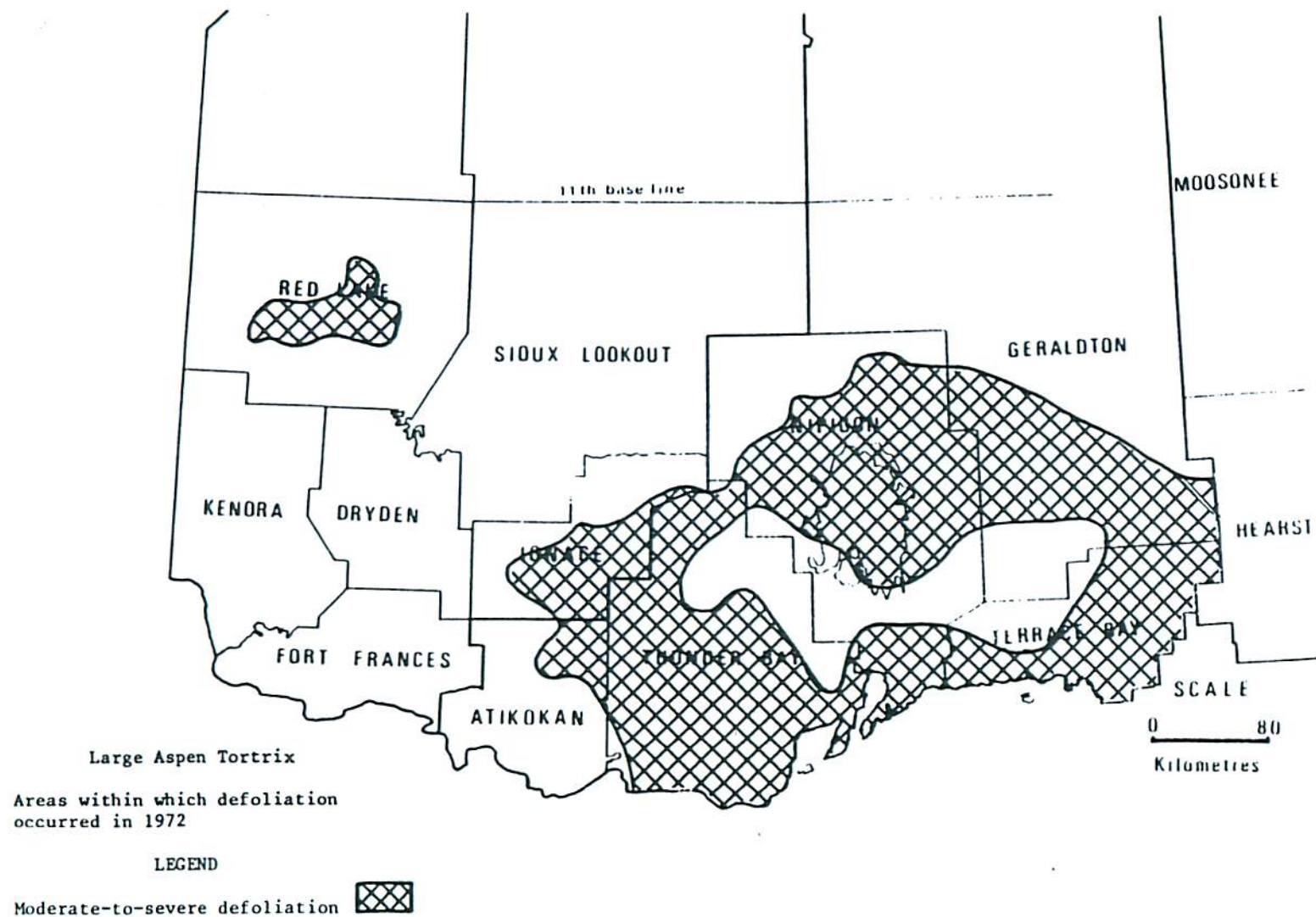
Areas within which defoliation  
occurred in 1971

## LEGEND

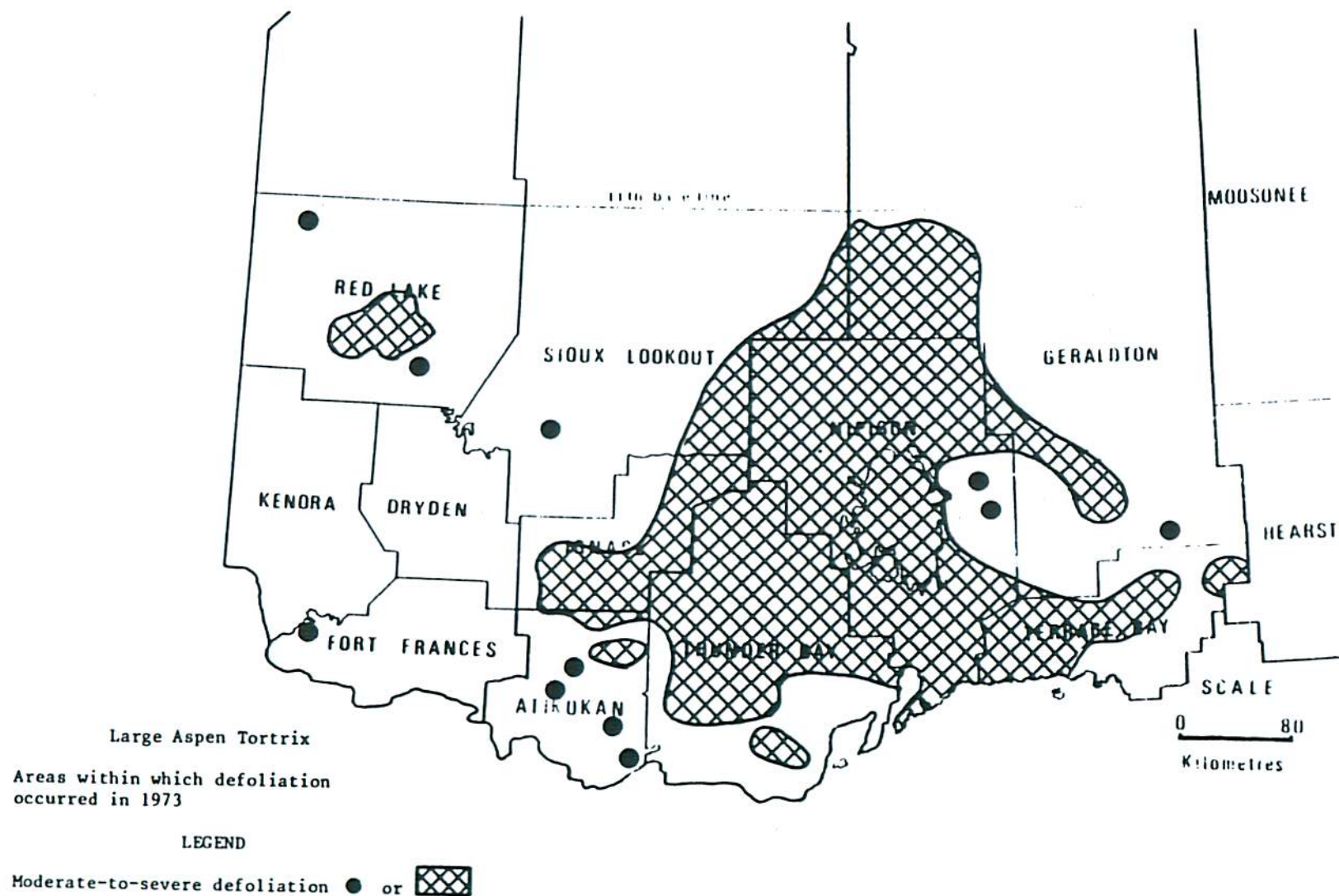
Moderate-to-severe defoliation ● or 



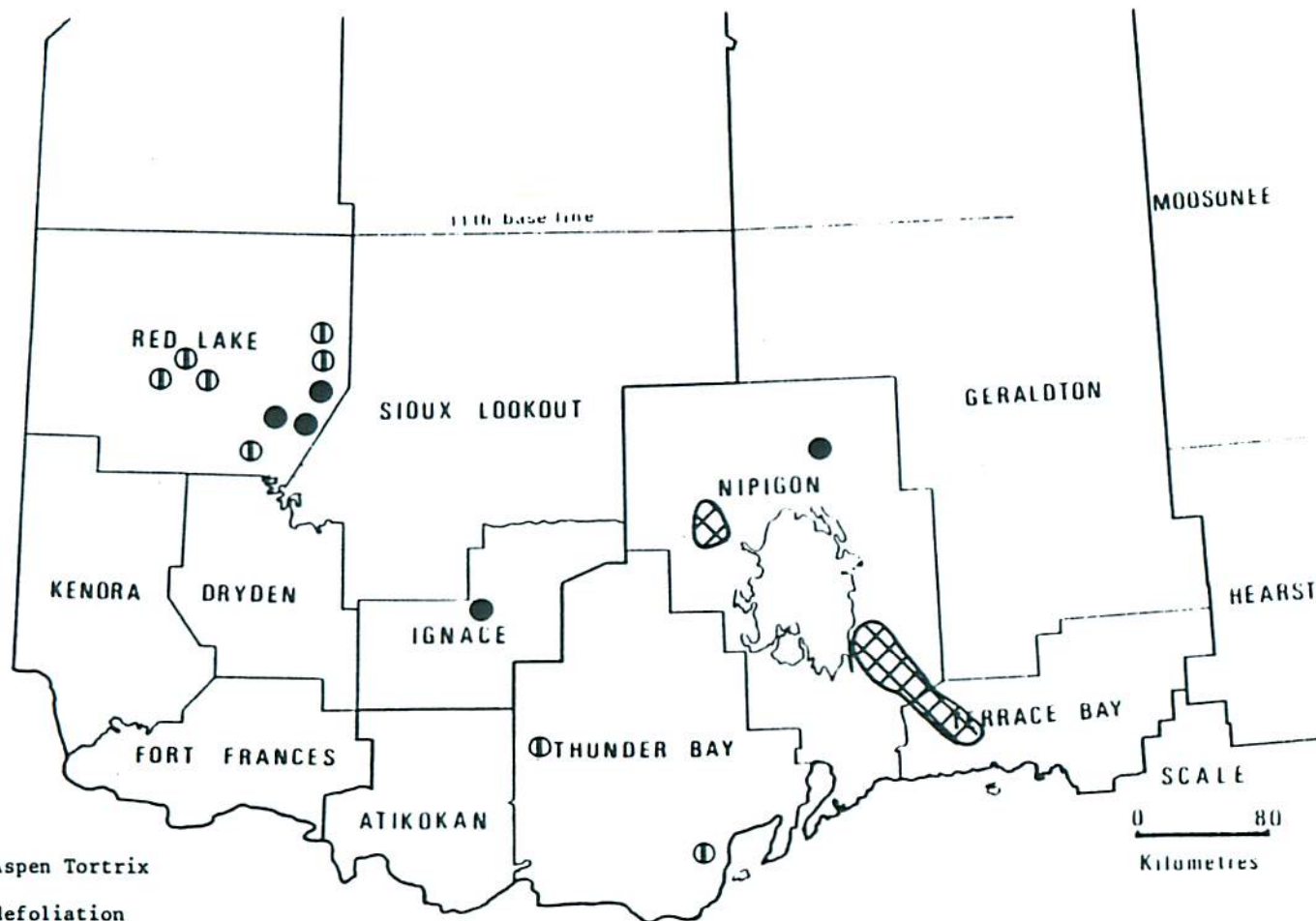
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO




Large Aspen Tortrix

Areas within which defoliation  
occurred in 1974

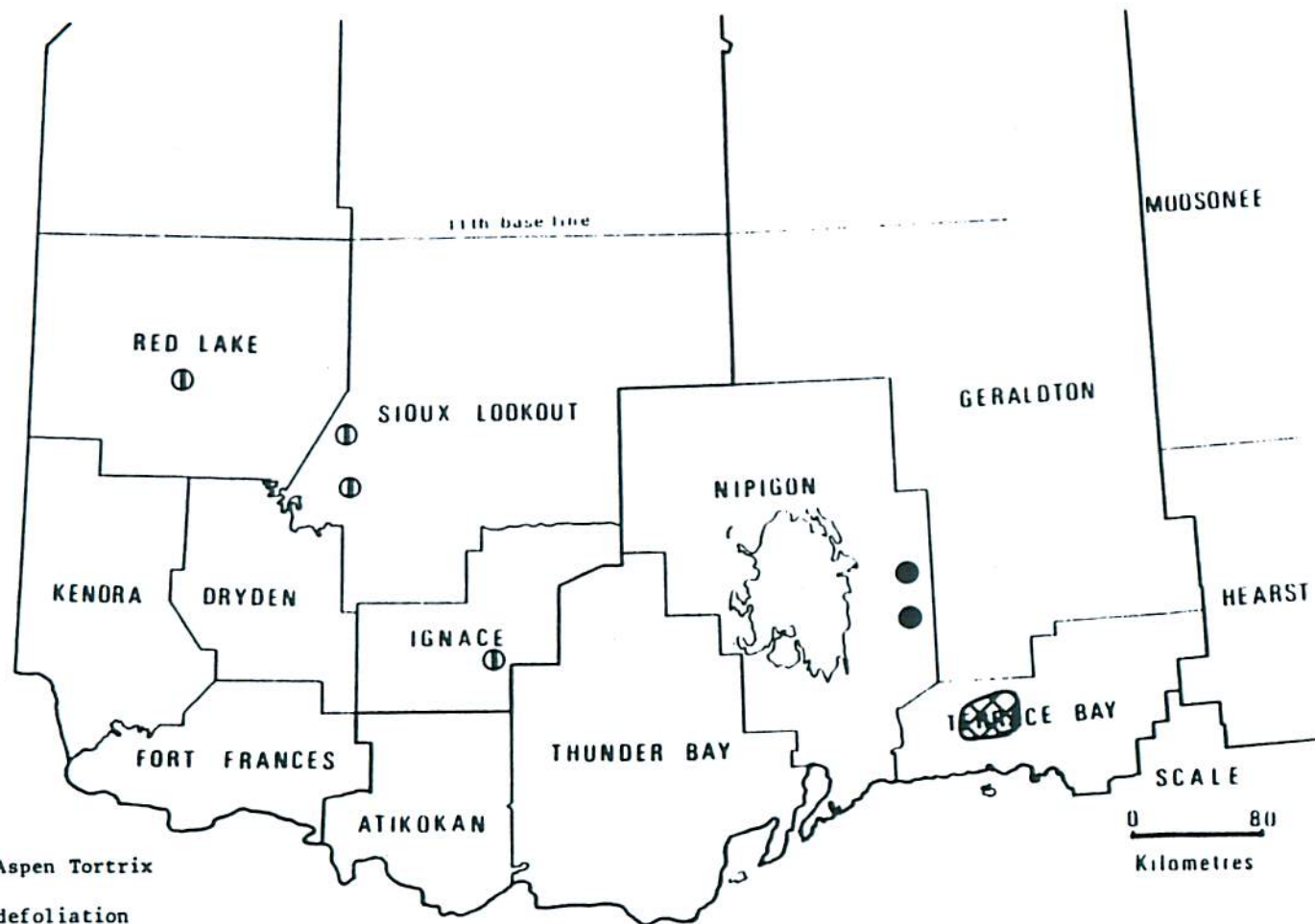
## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or 



# NORTHWESTERN ONTARIO



Large Aspen Tortrix

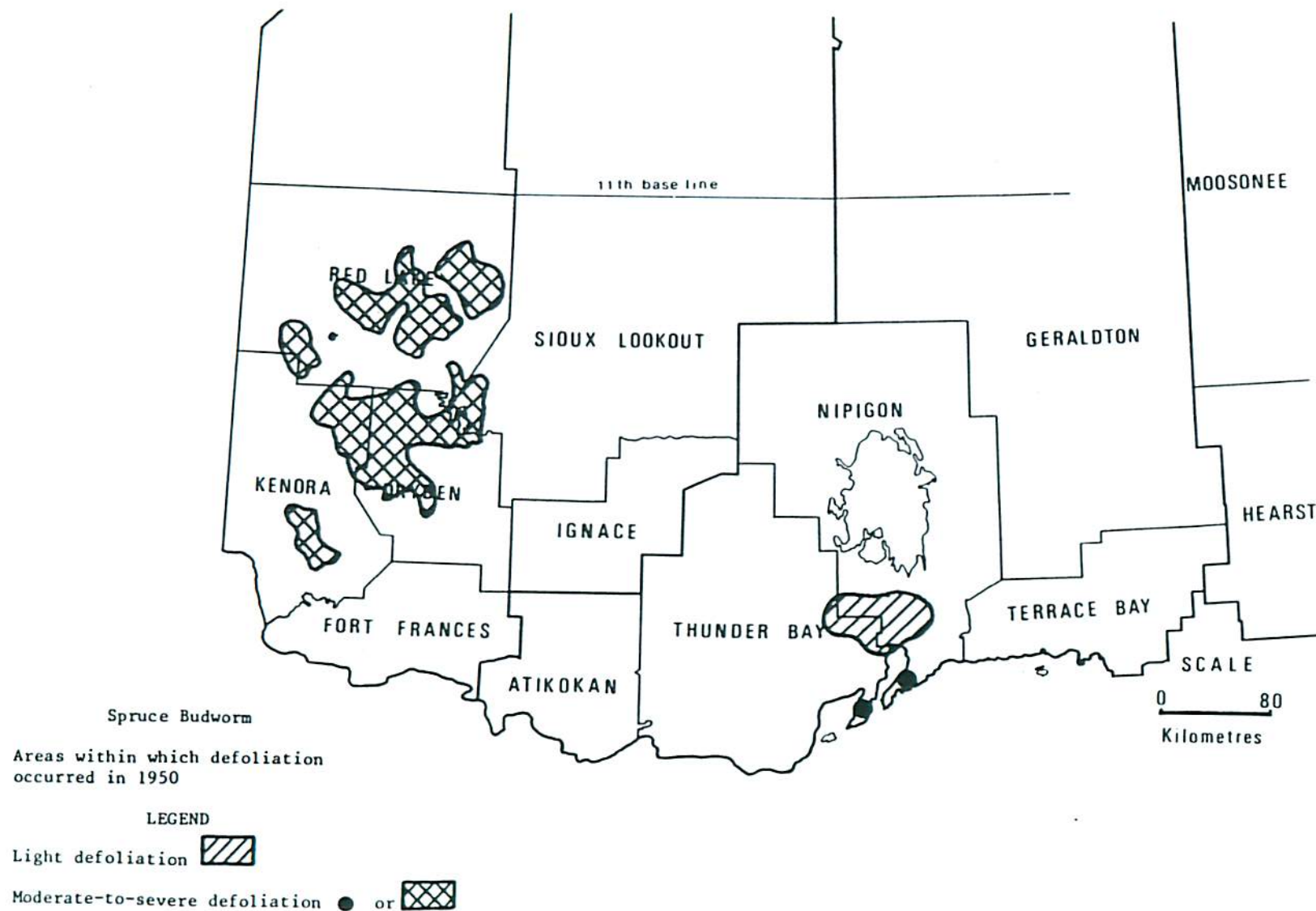
Areas within which defoliation  
occurred in 1975

## LEGEND

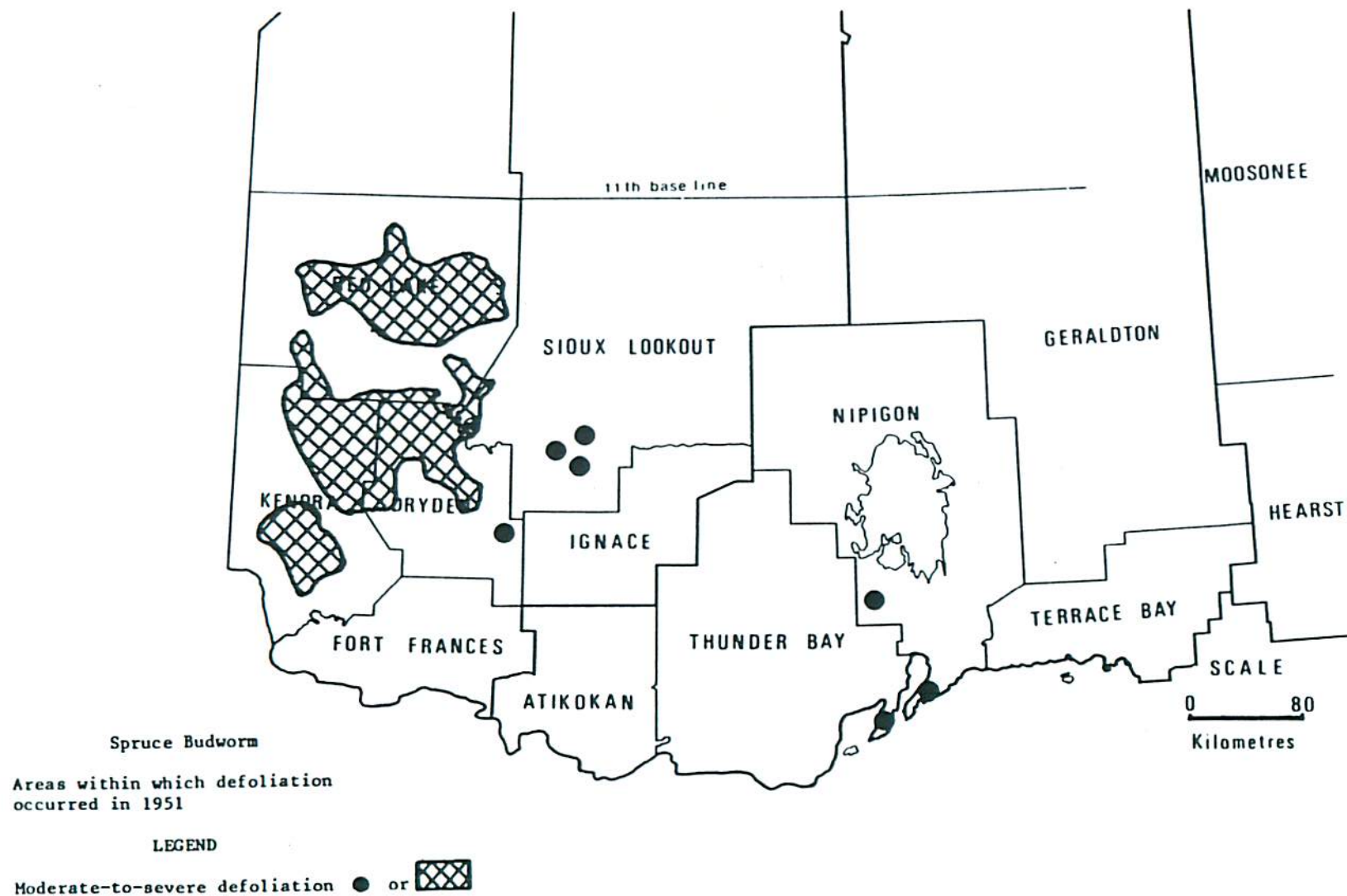
Light defoliation ①

Moderate-to-severe defoliation ● or 

# NORTHWESTERN ONTARIO

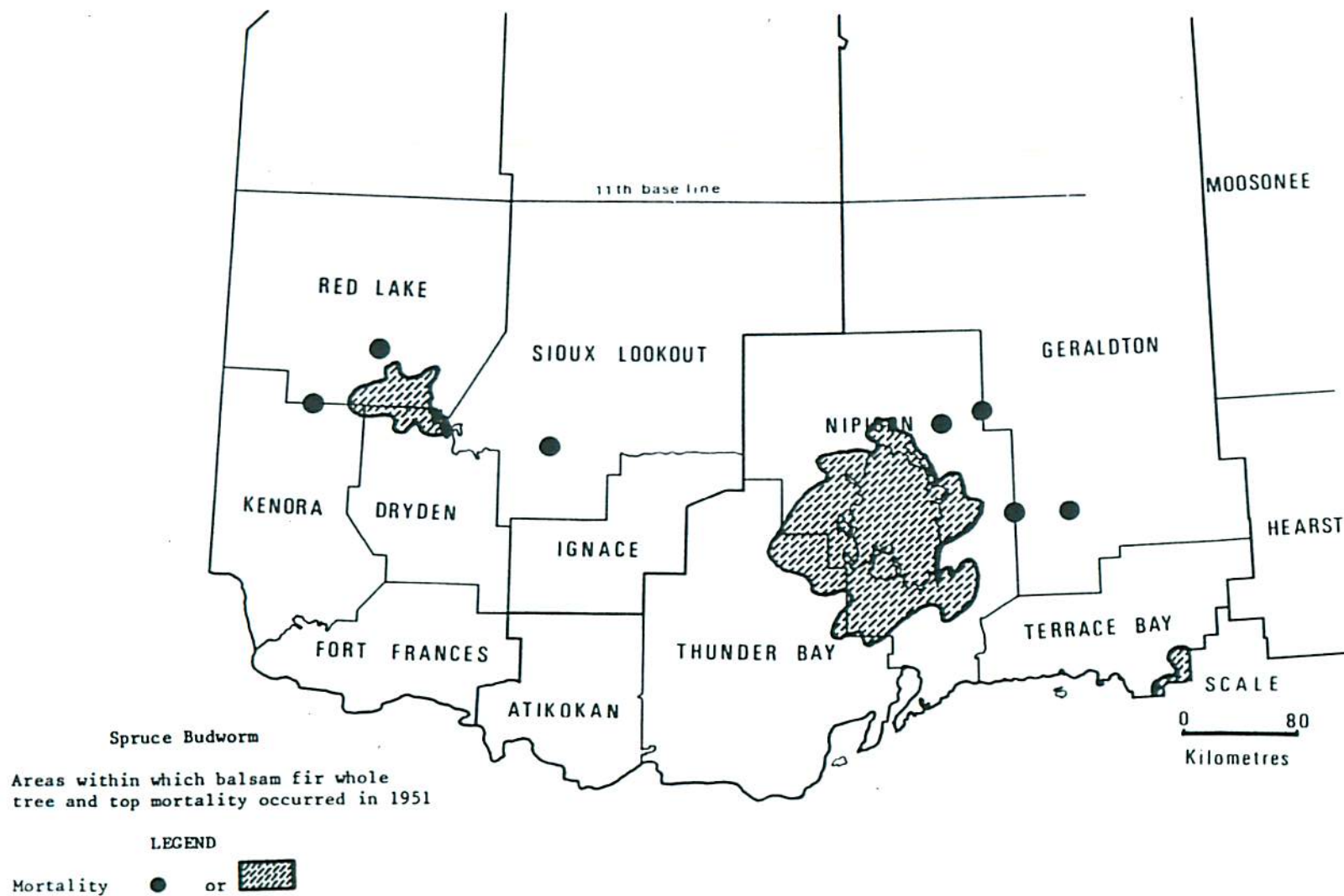


# NORTHWESTERN ONTARIO

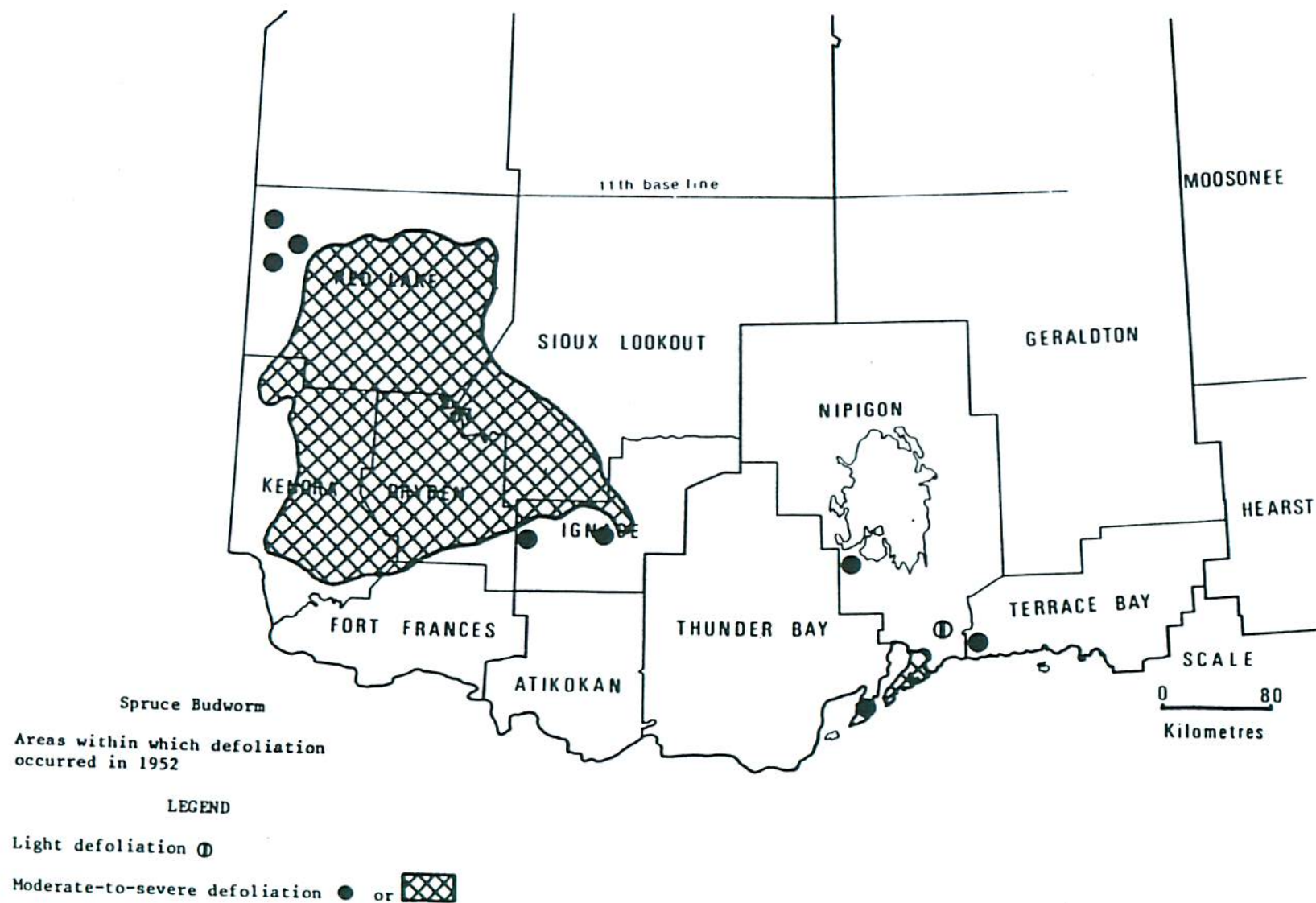




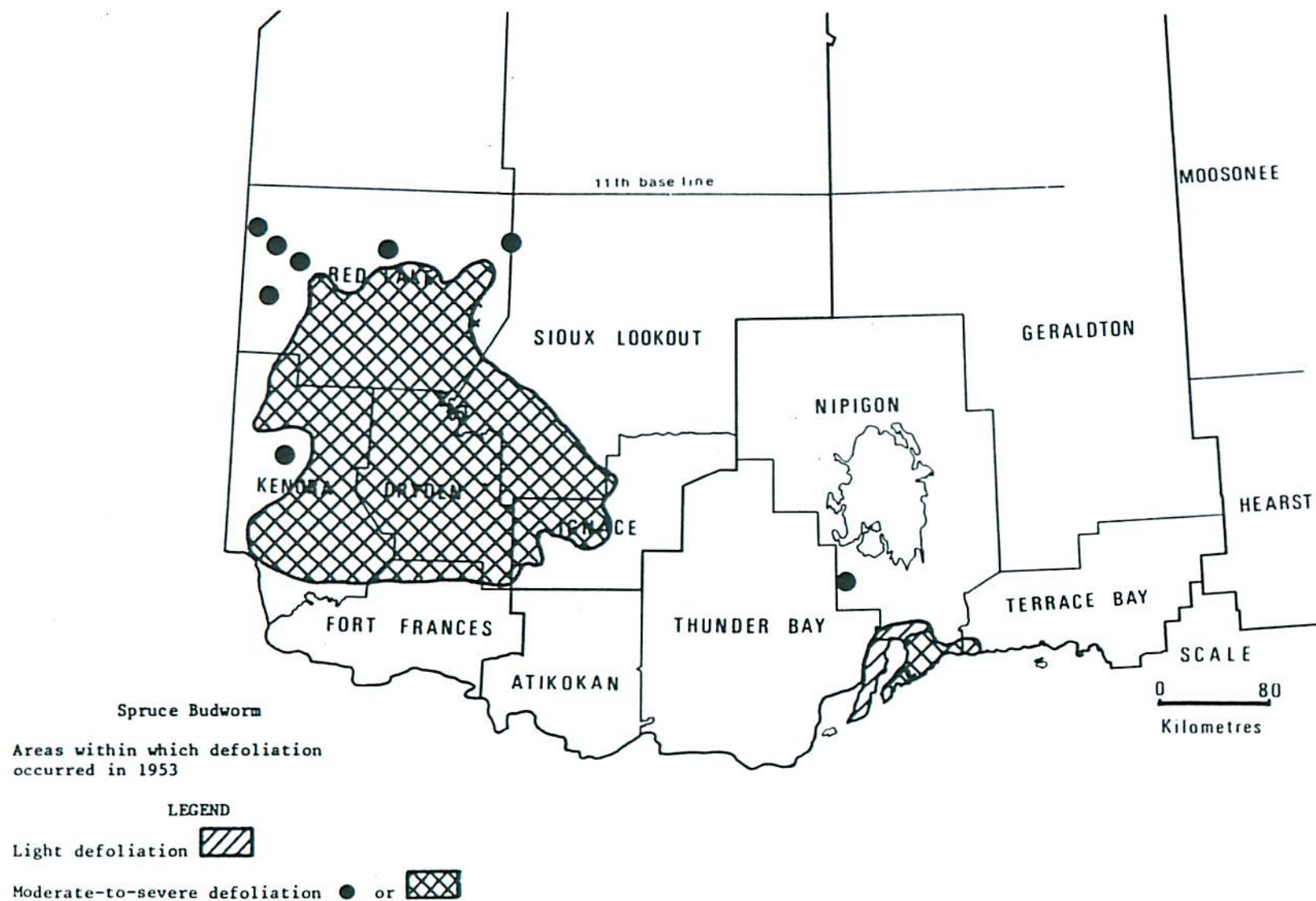
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

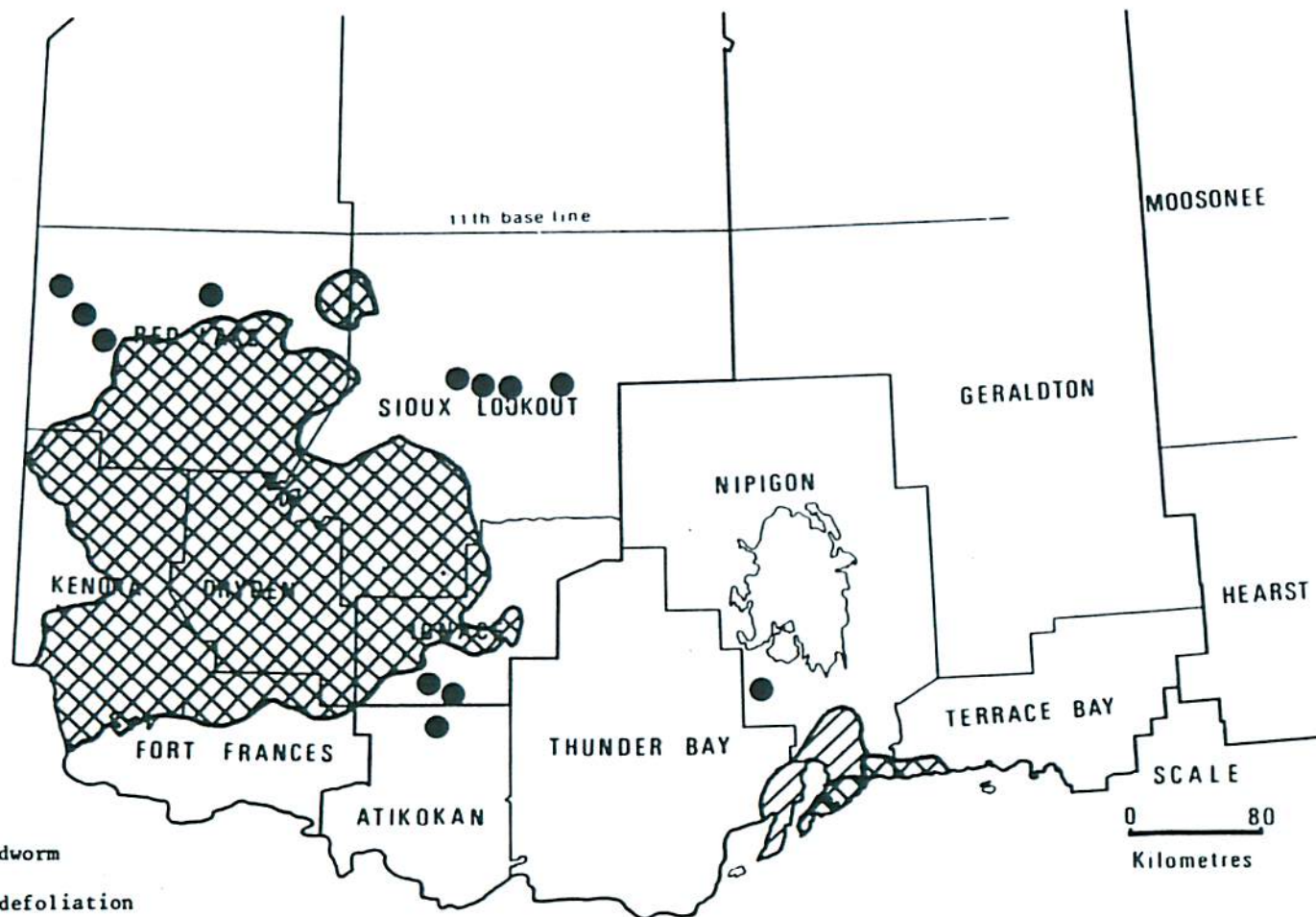


# NORTHWESTERN ONTARIO





# NORTHWESTERN ONTARIO



Spruce Budworm

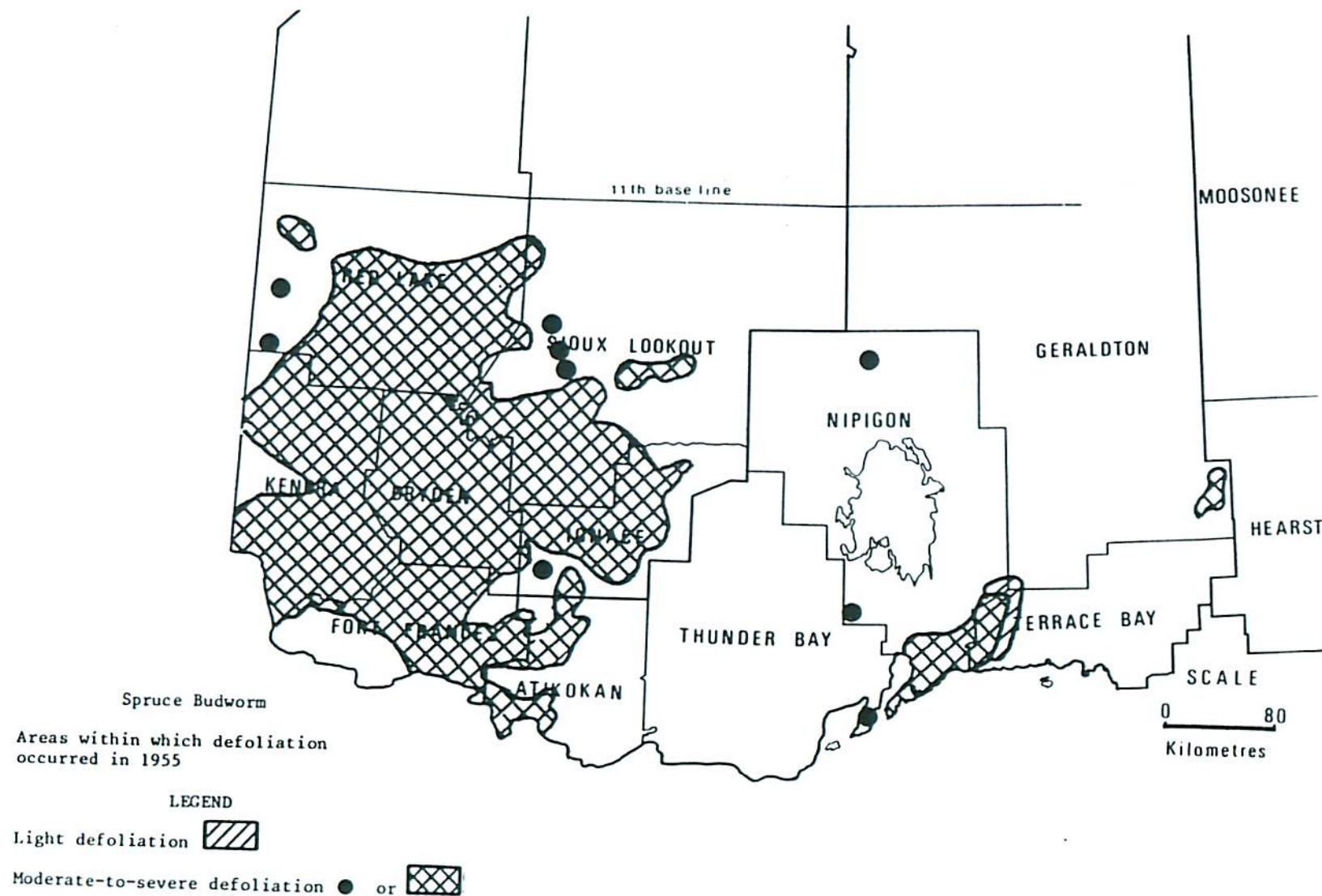
Areas within which defoliation  
occurred in 1954

## LEGEND

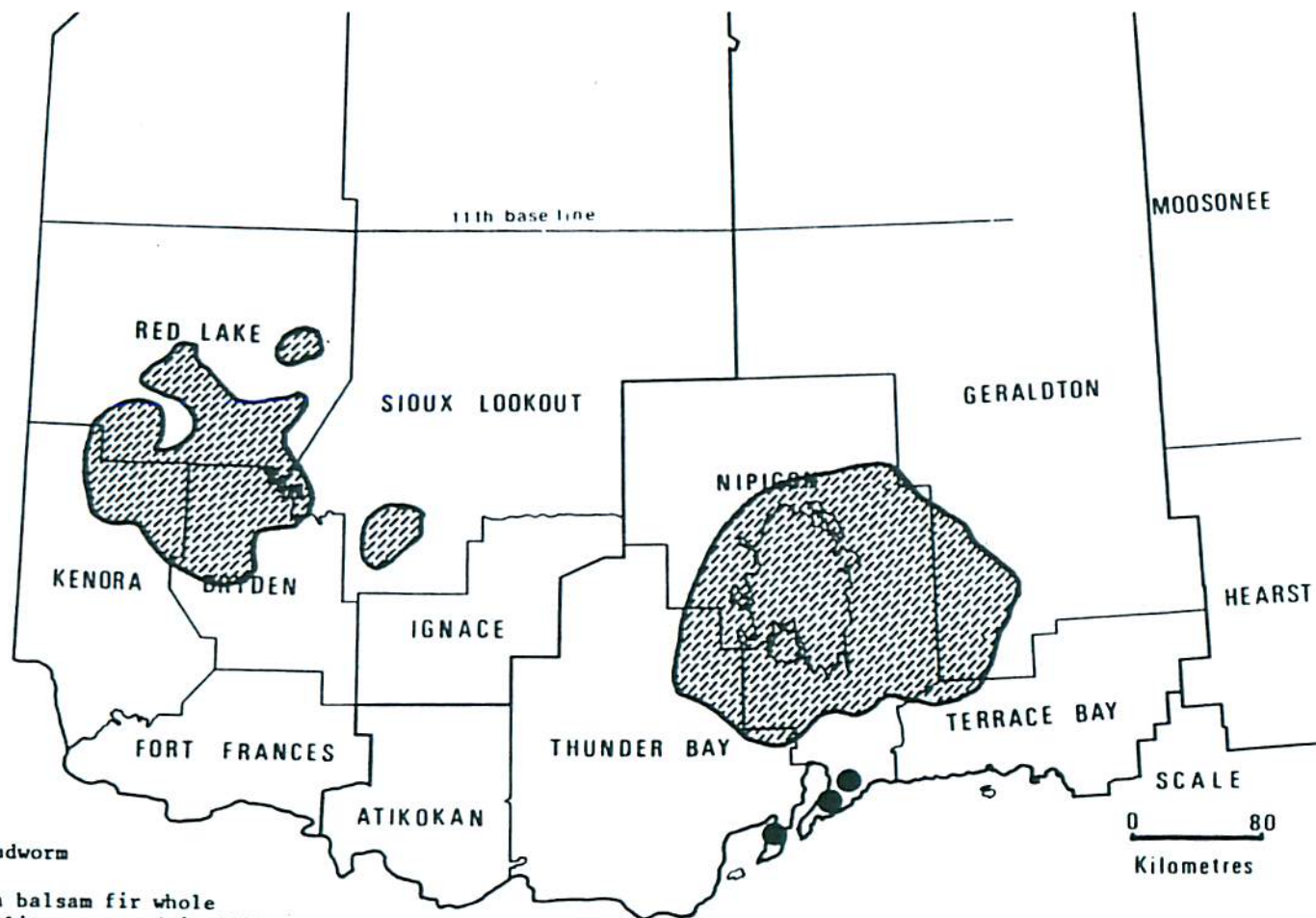
Light defoliation 

Moderate-to-severe defoliation ● or 

# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



Spruce Budworm

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

## LEGEND

Mortality

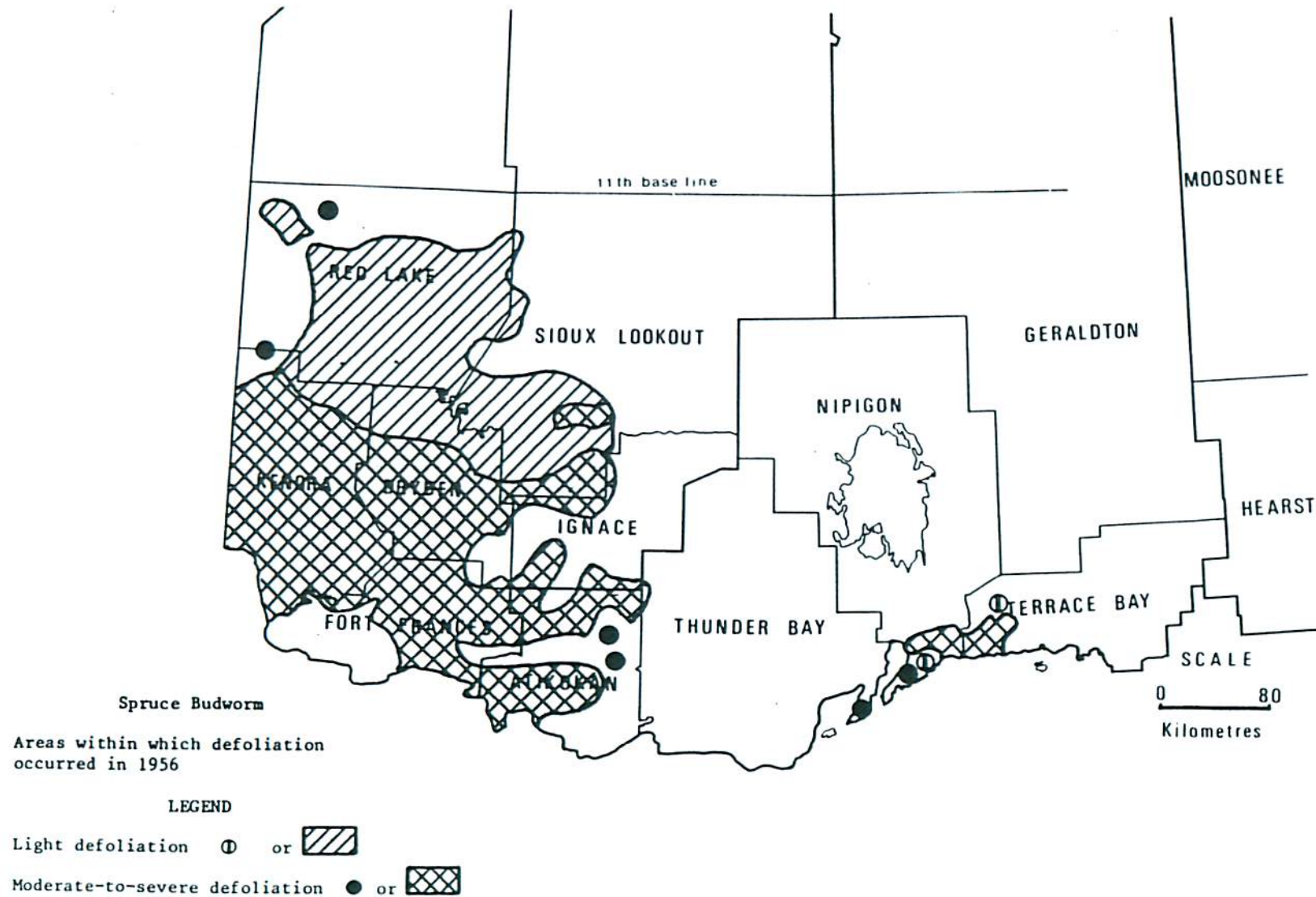


or

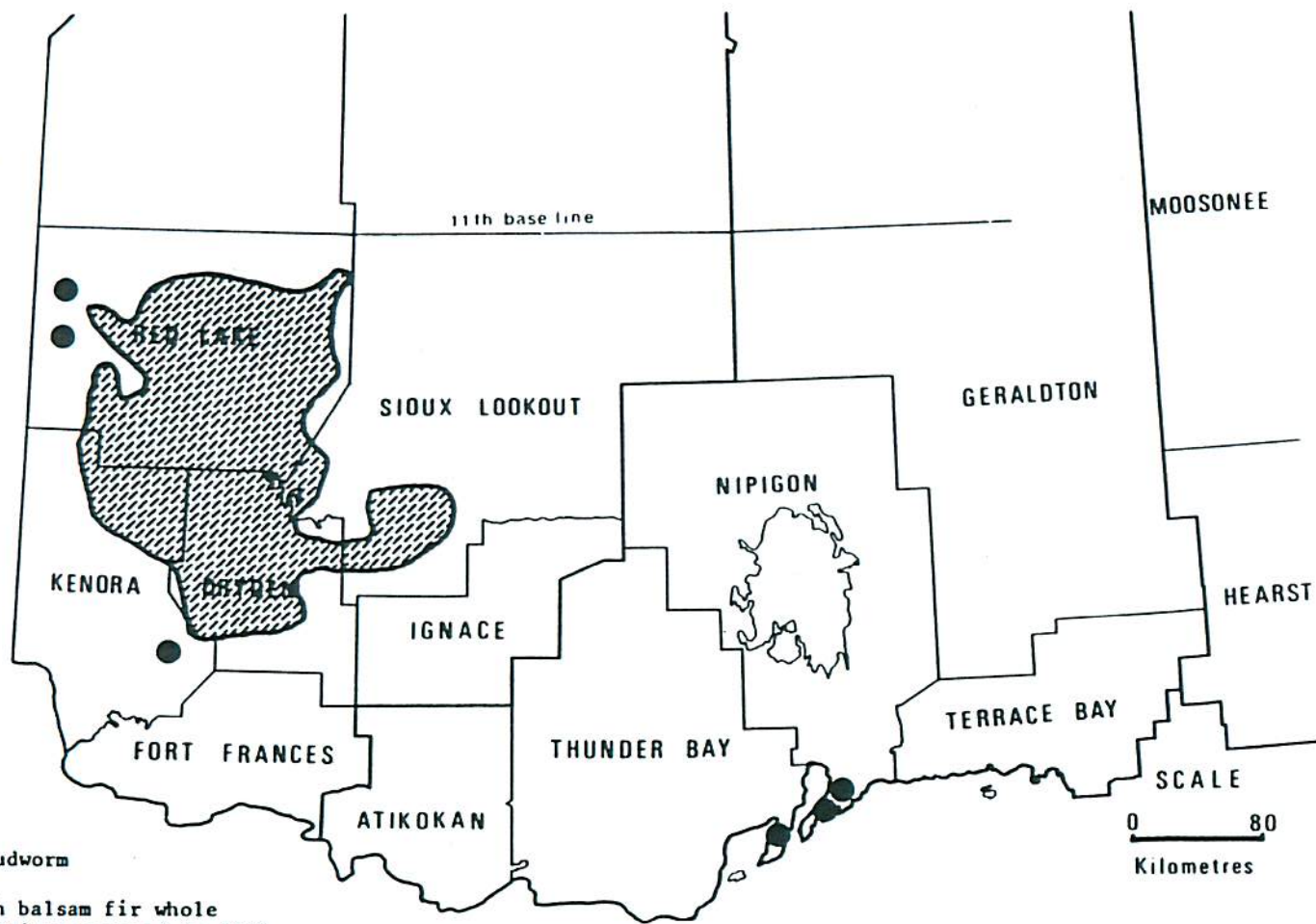




# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



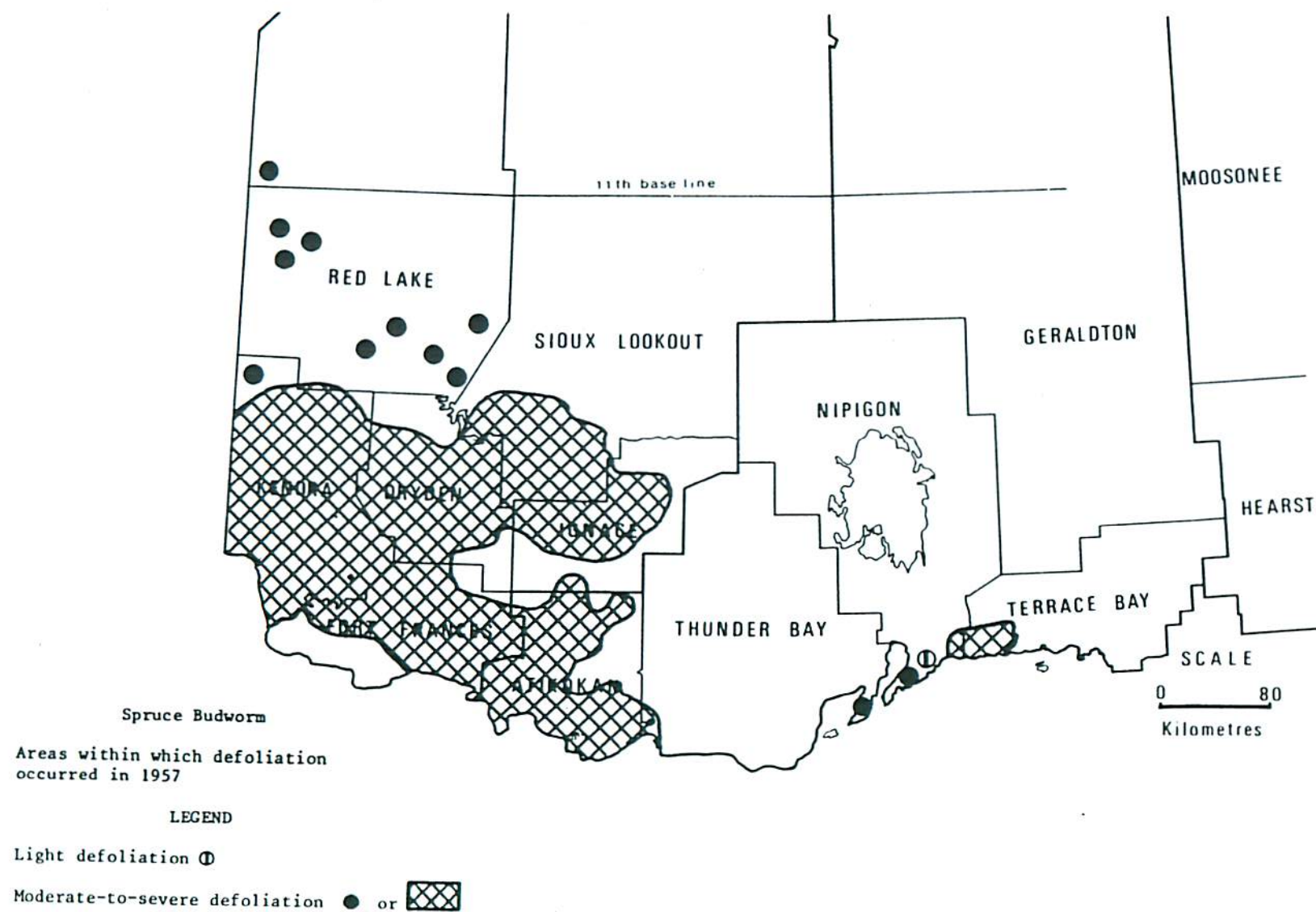
Spruce Budworm

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

LEGEND

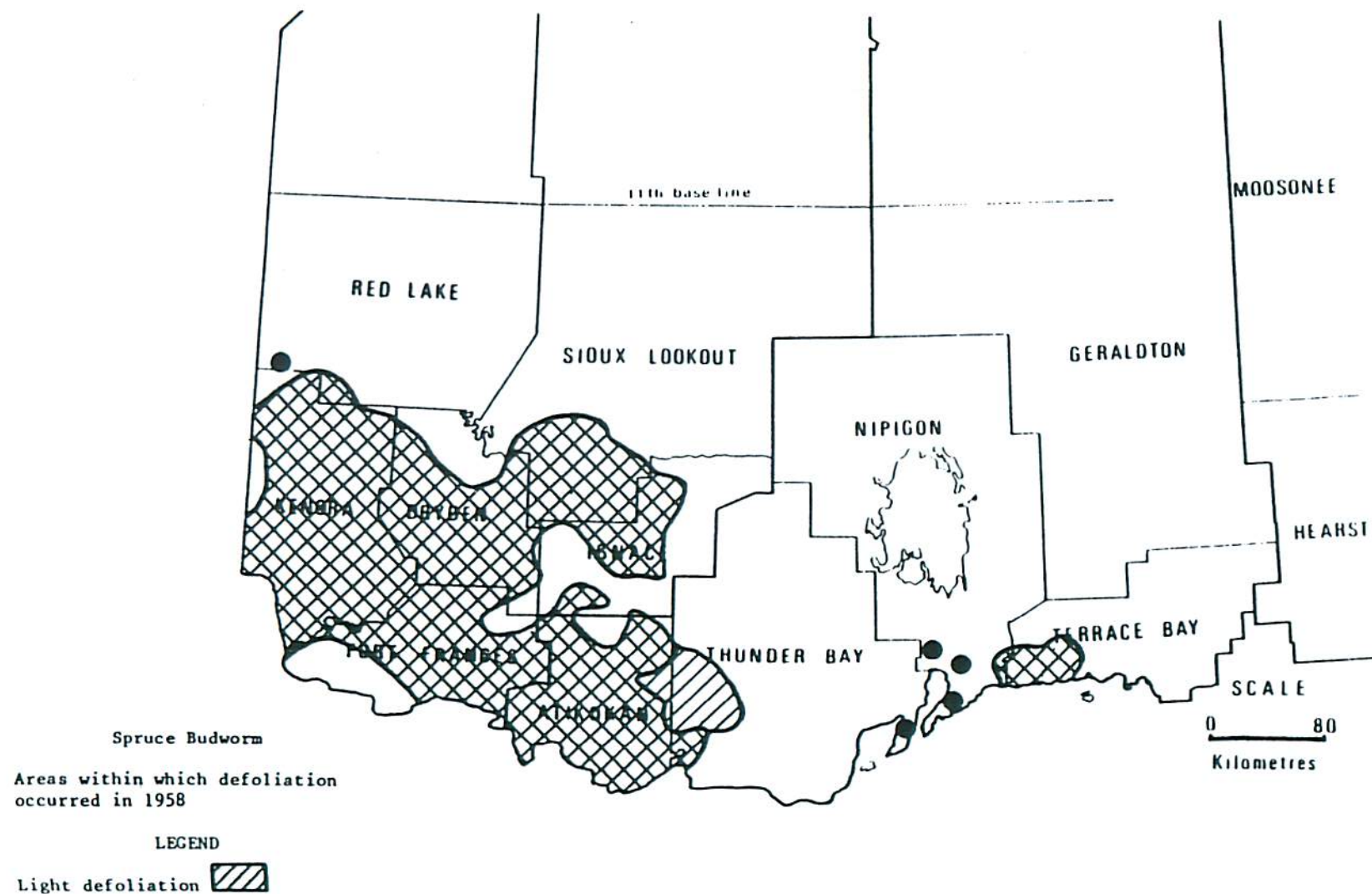
Mortality    ●    or    

# NORTHWESTERN ONTARIO

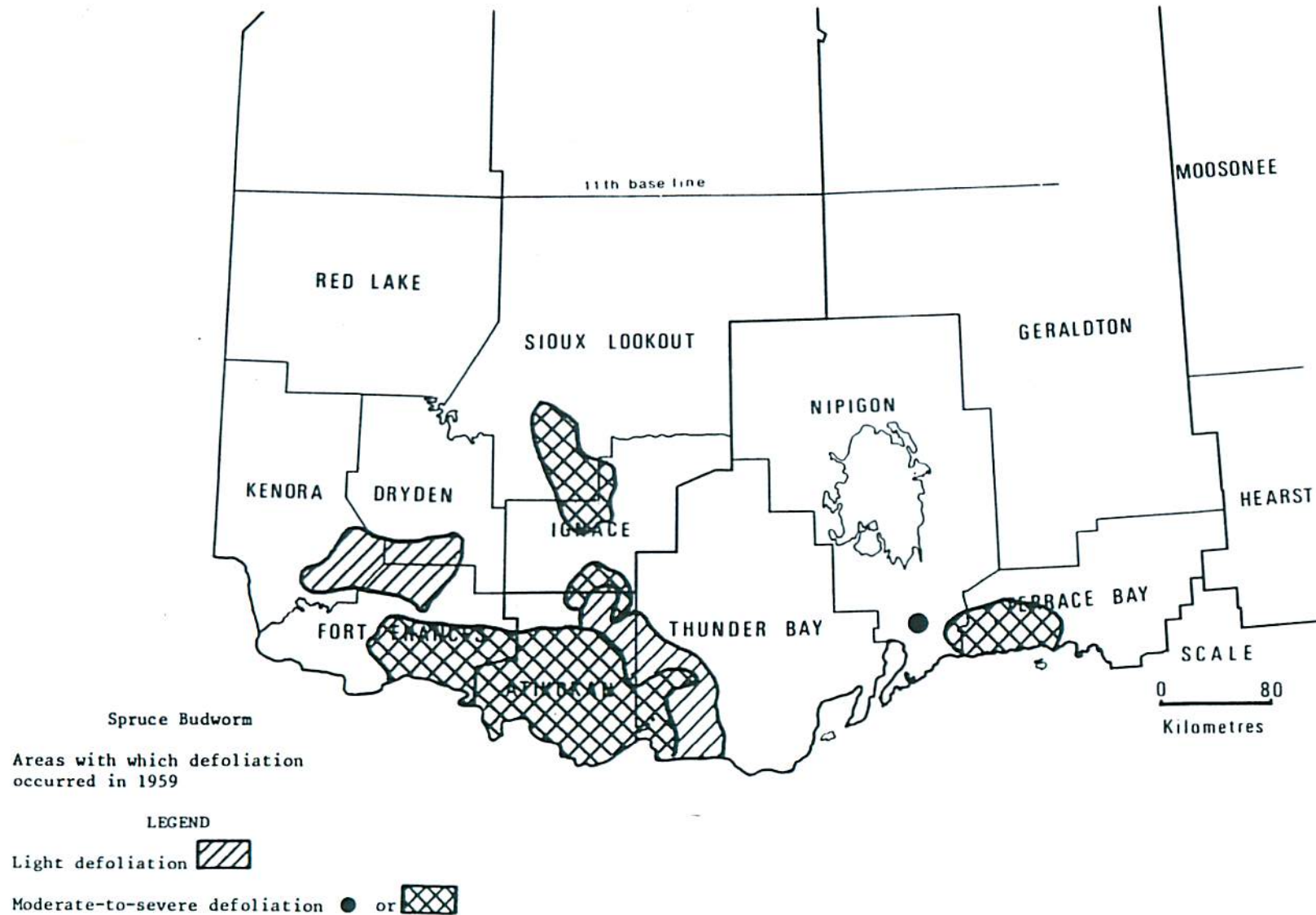




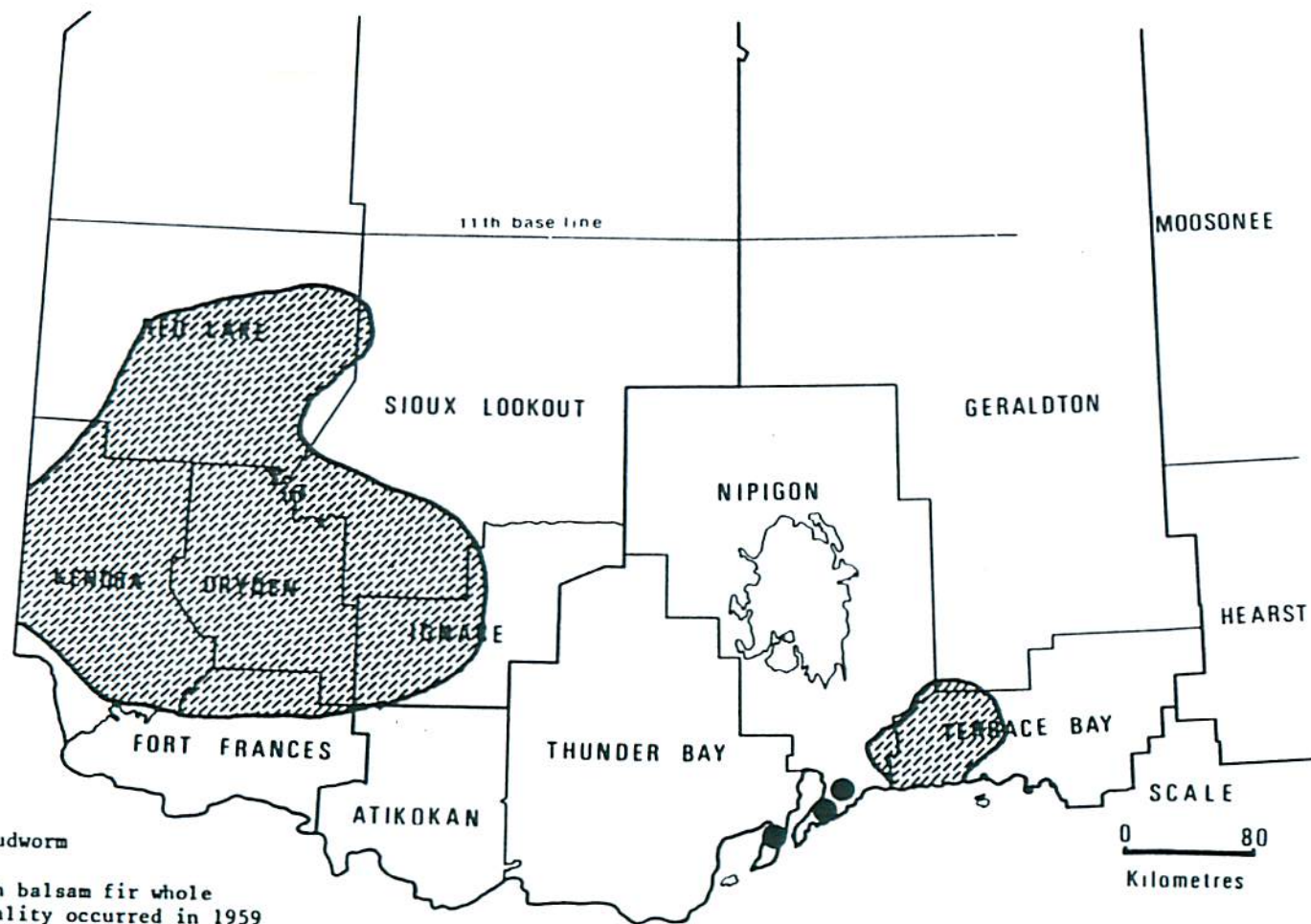
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



Spruce Budworm

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

LEGEND

Mortality

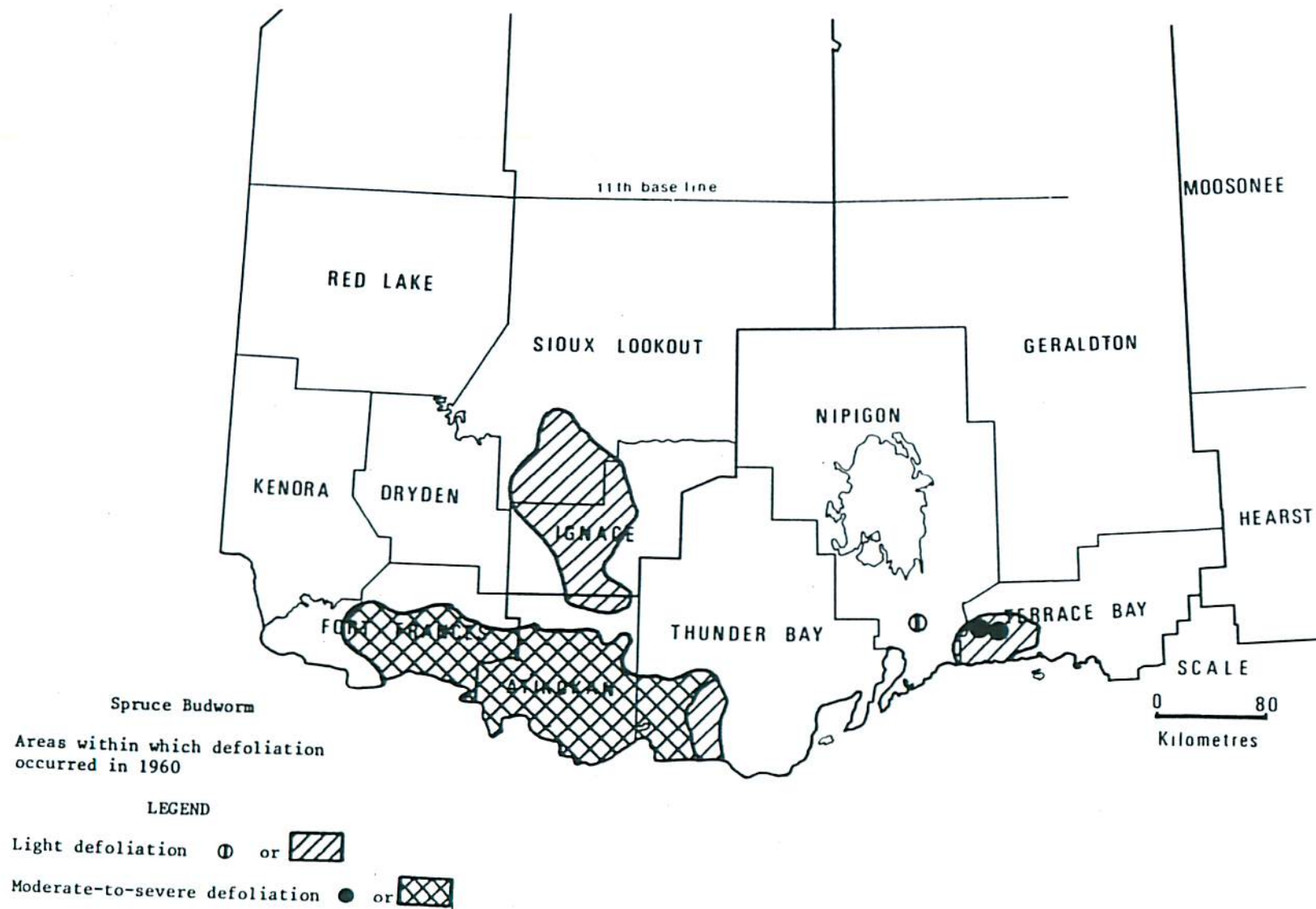


or

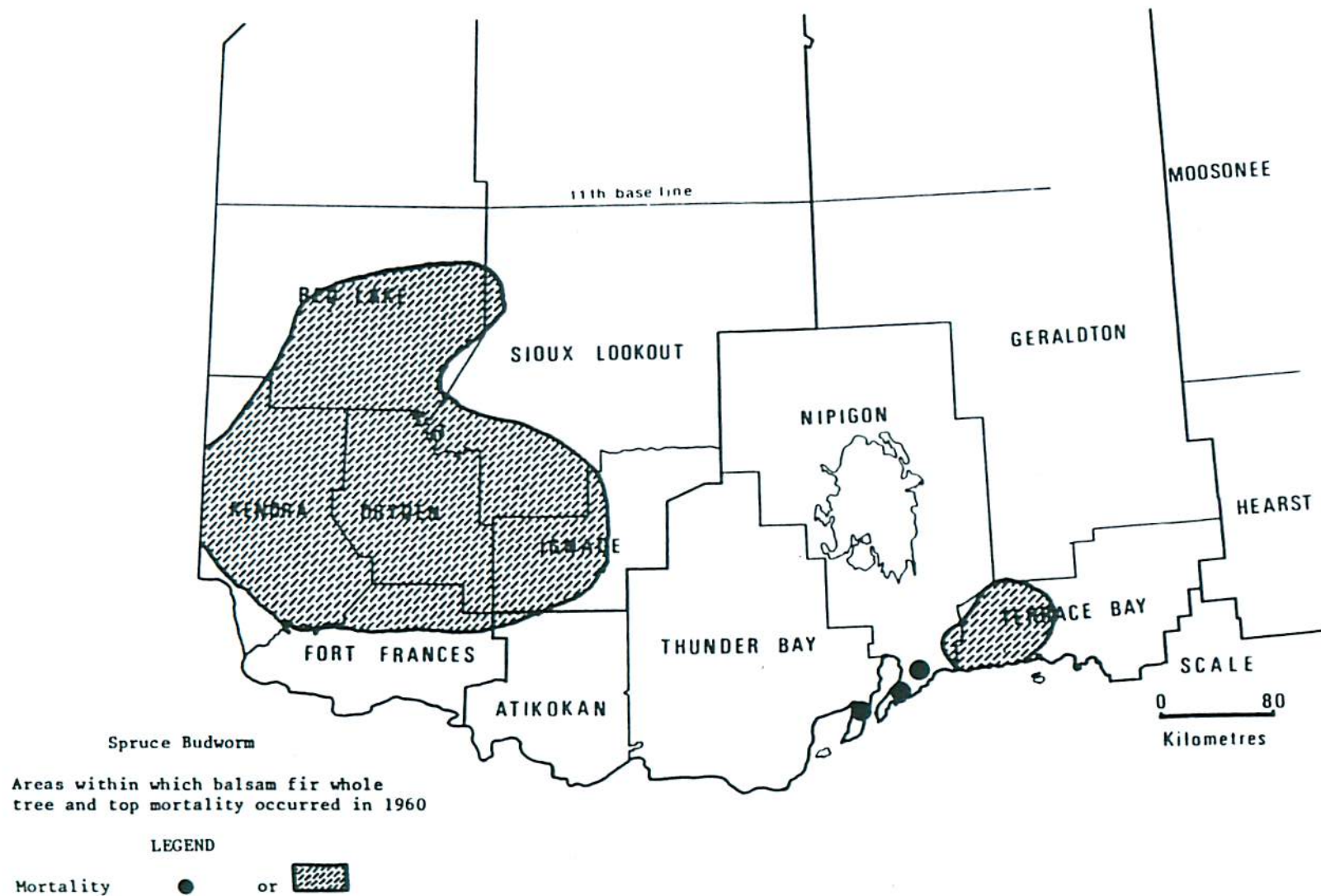




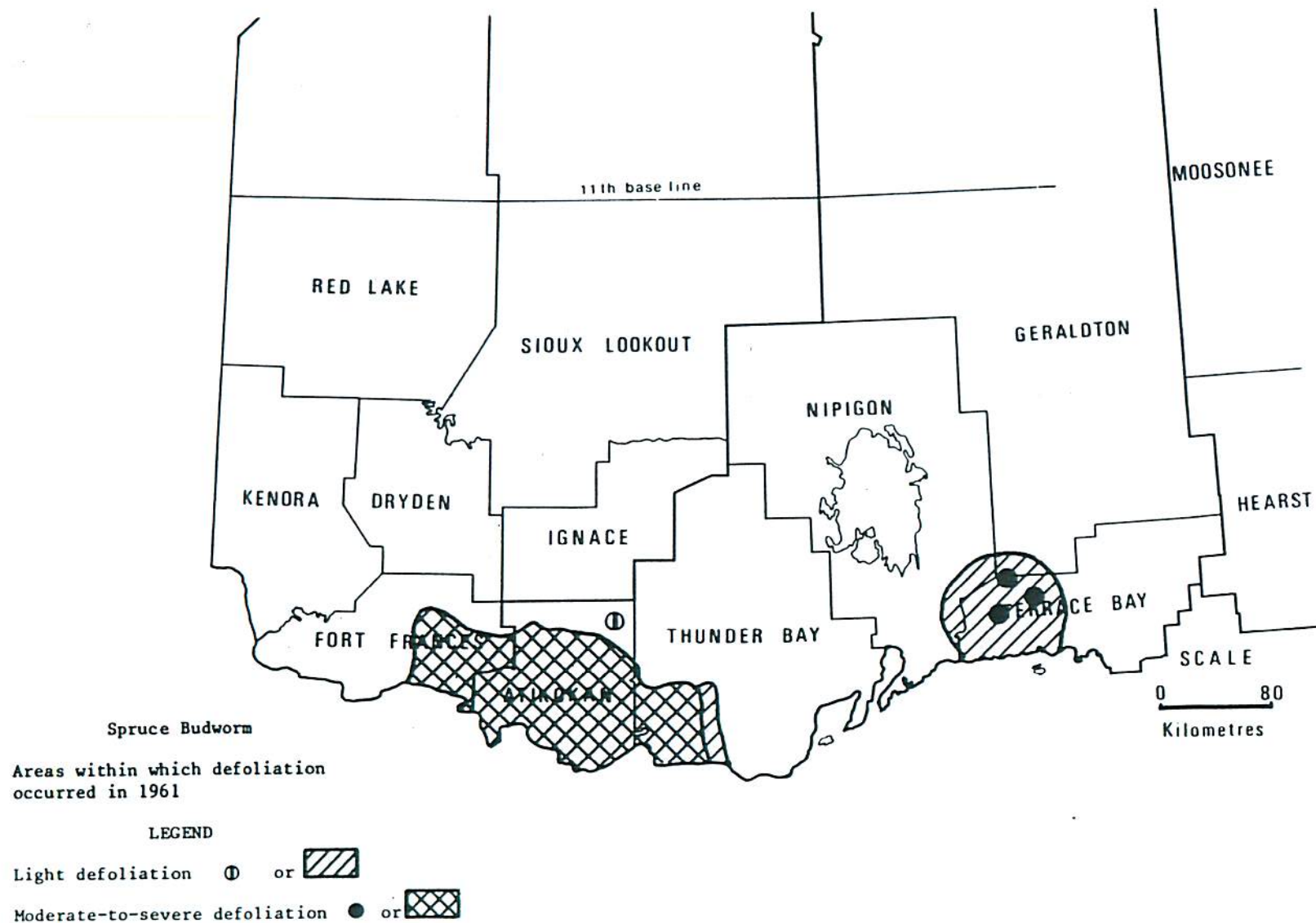
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

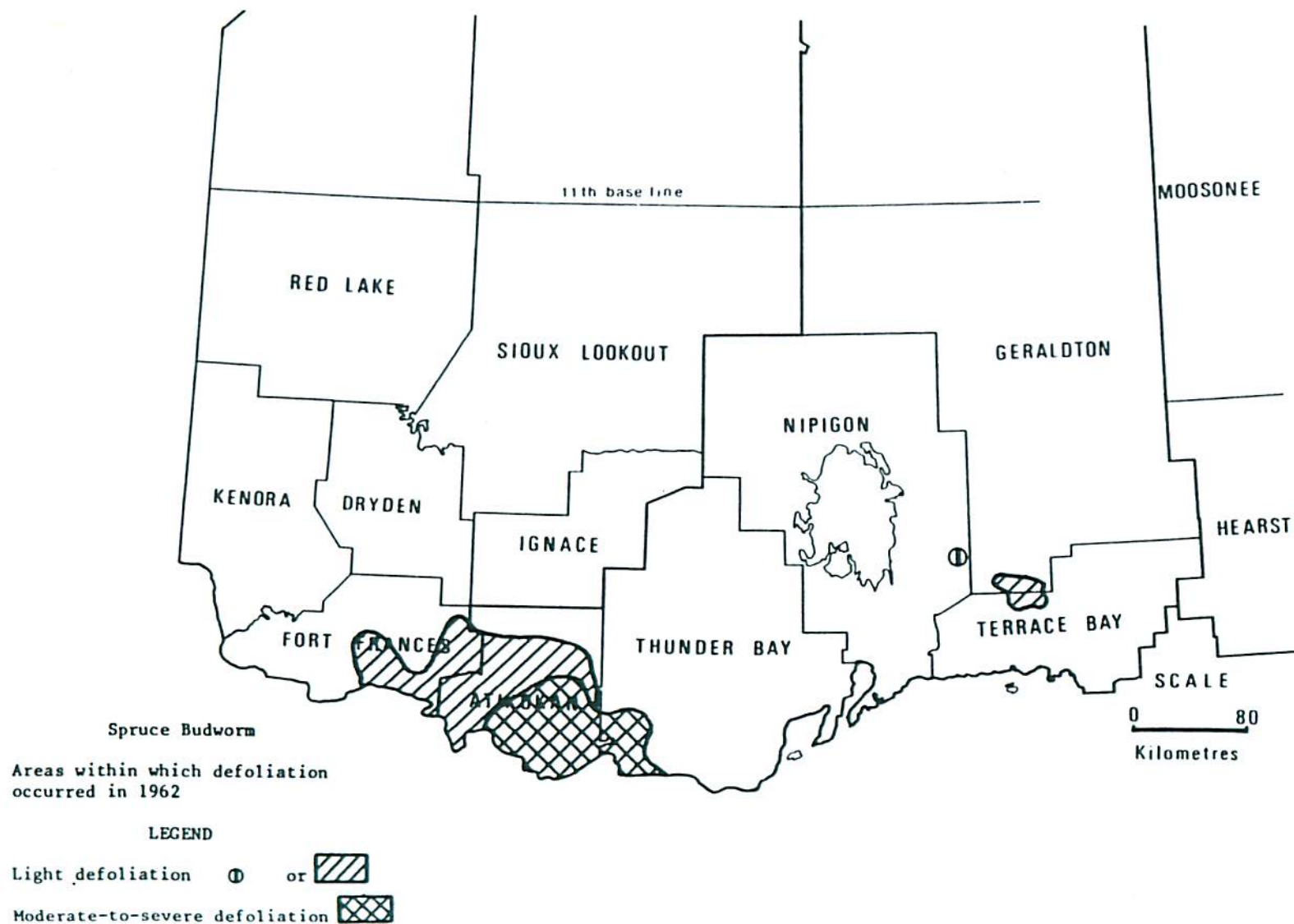


# NORTHWESTERN ONTARIO

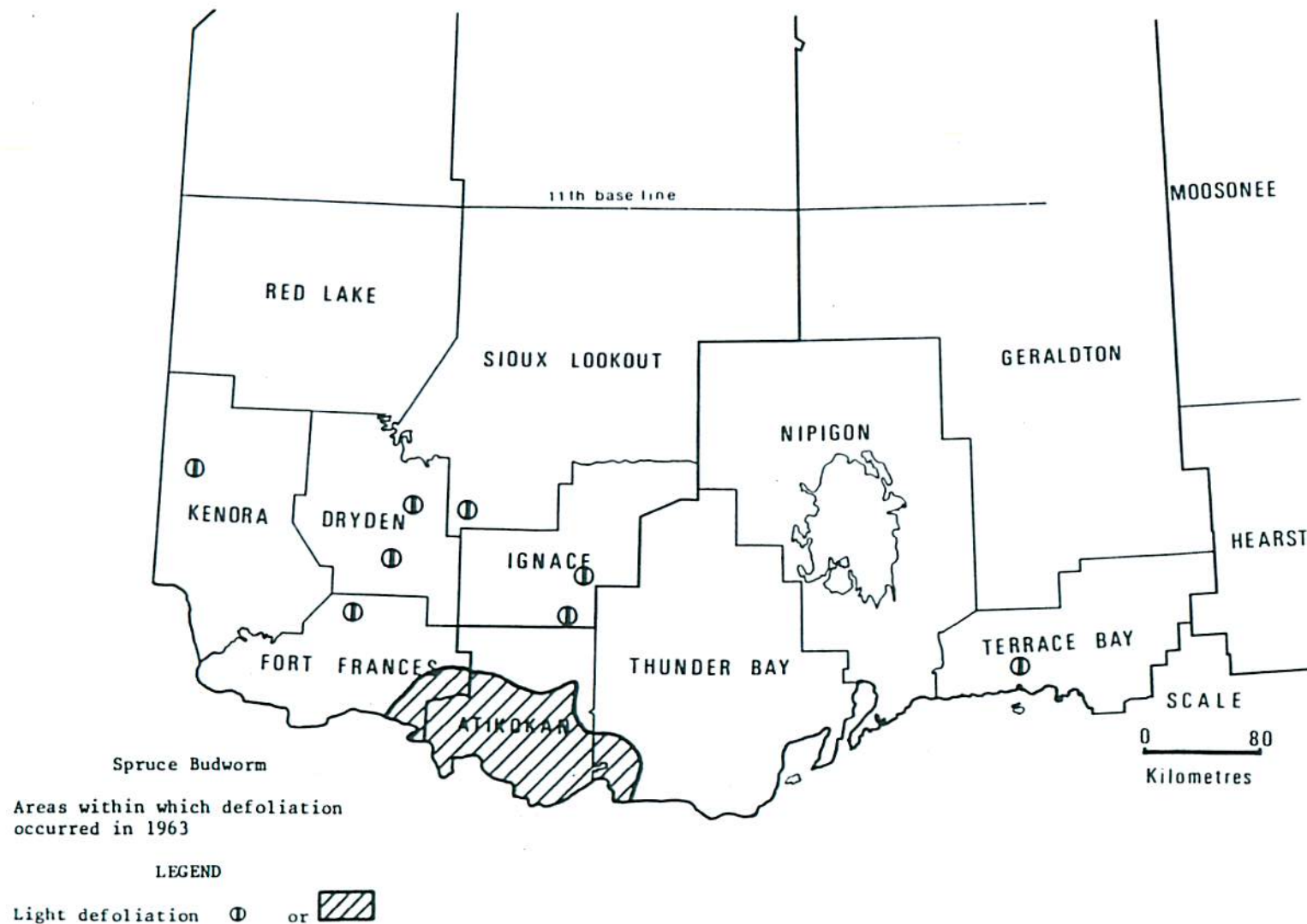




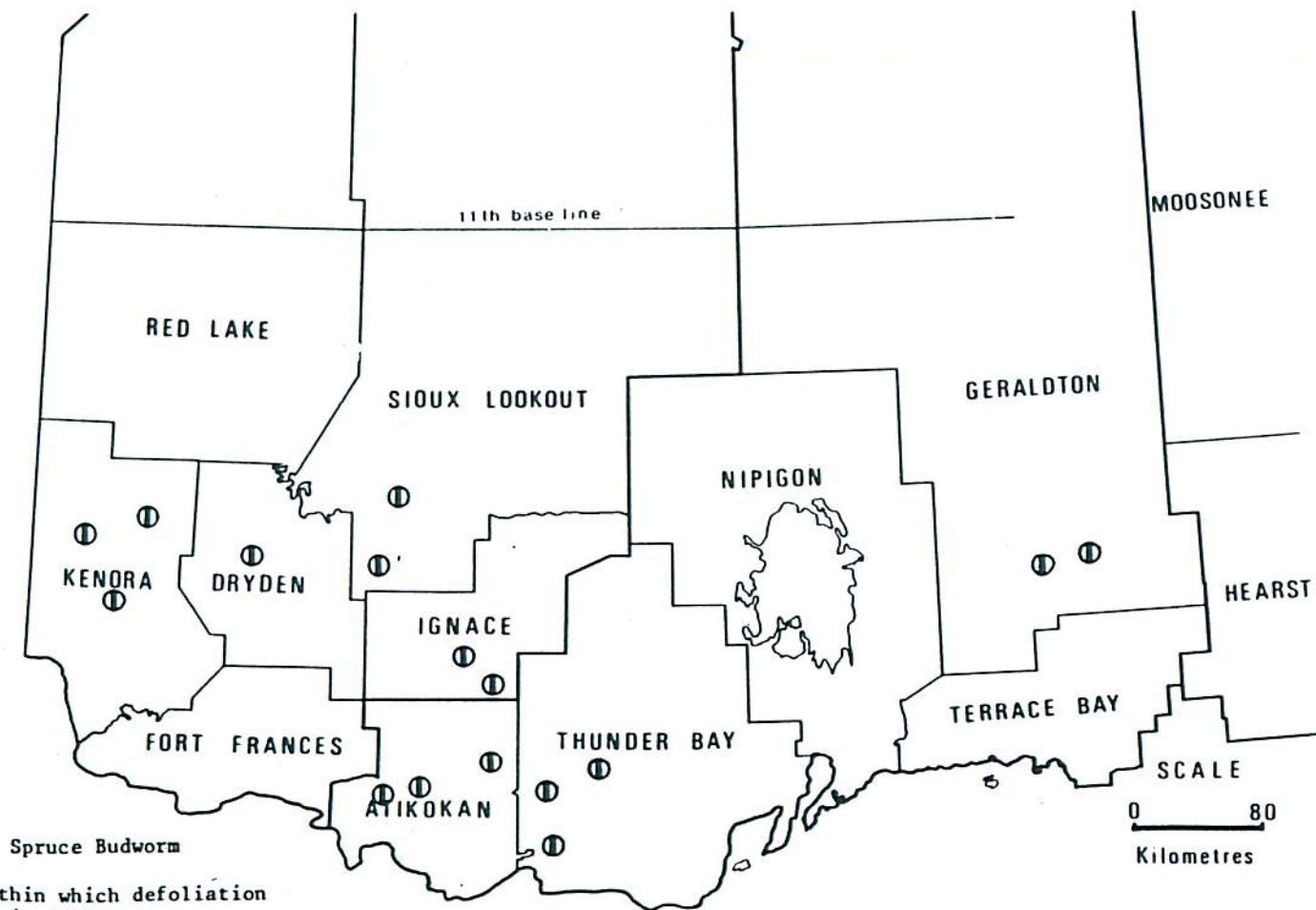
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



Areas within which defoliation  
occurred in 1964

## LEGEND

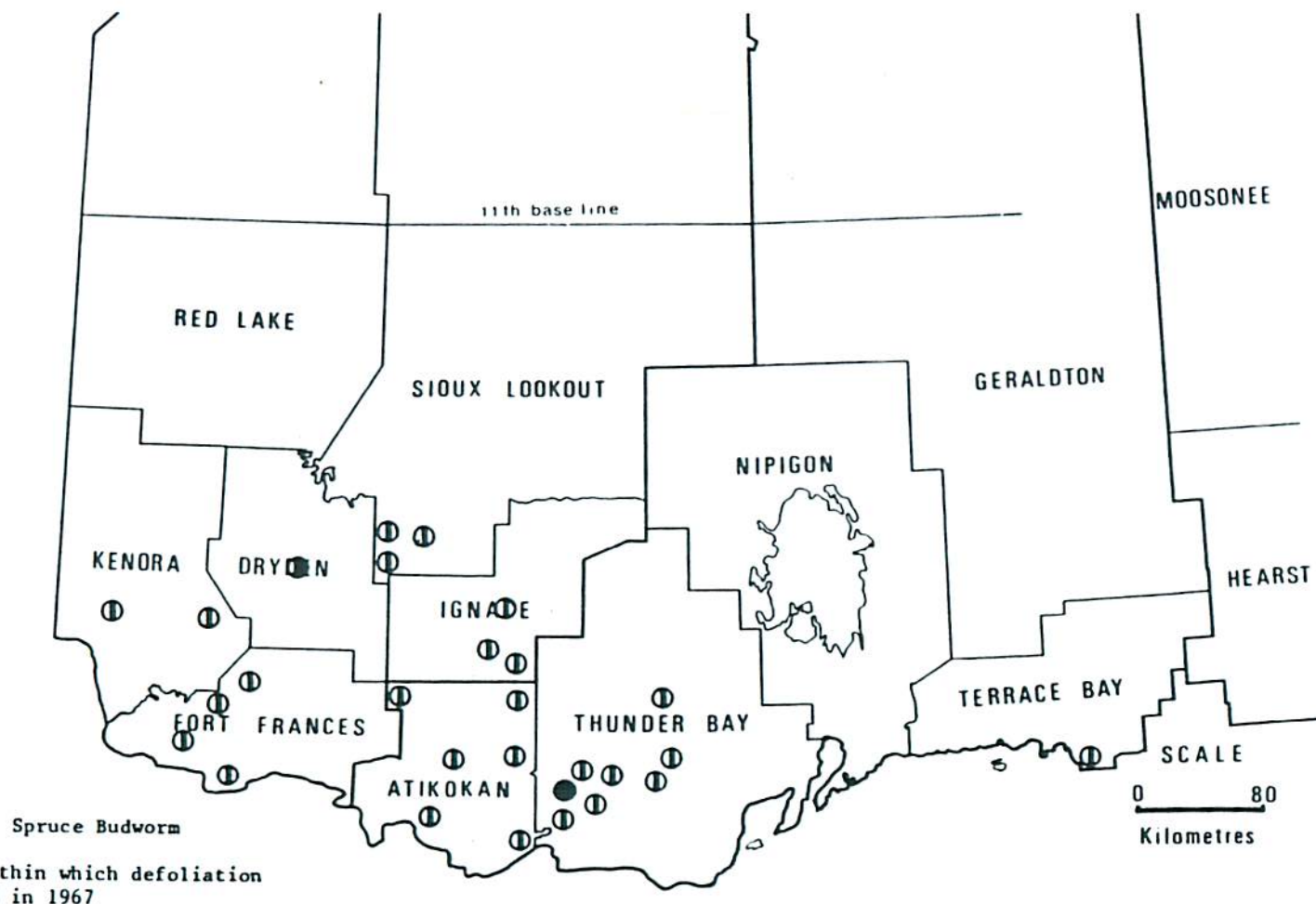
Light defoliation D



# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

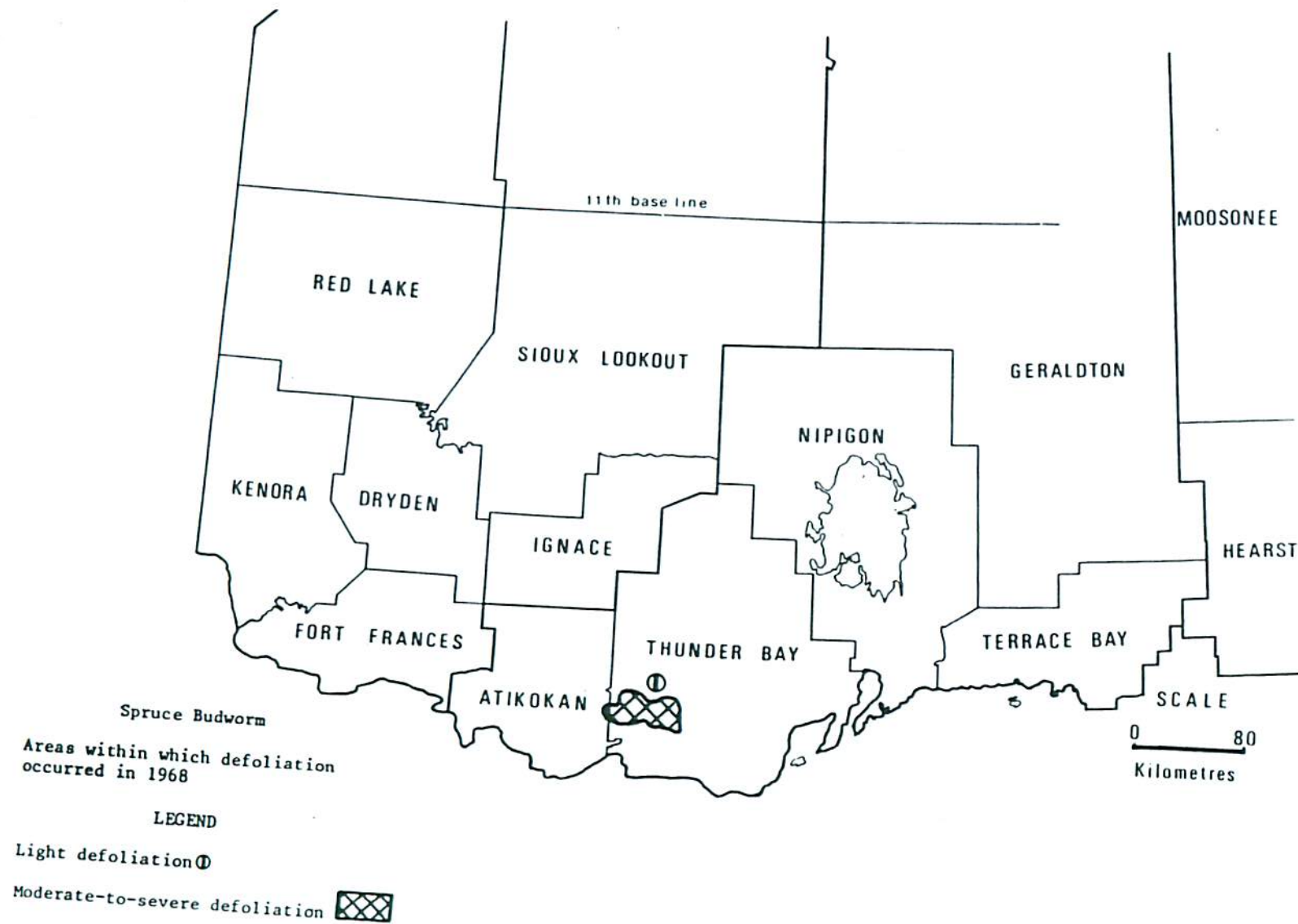


## LEGEND

Light defoliation ○

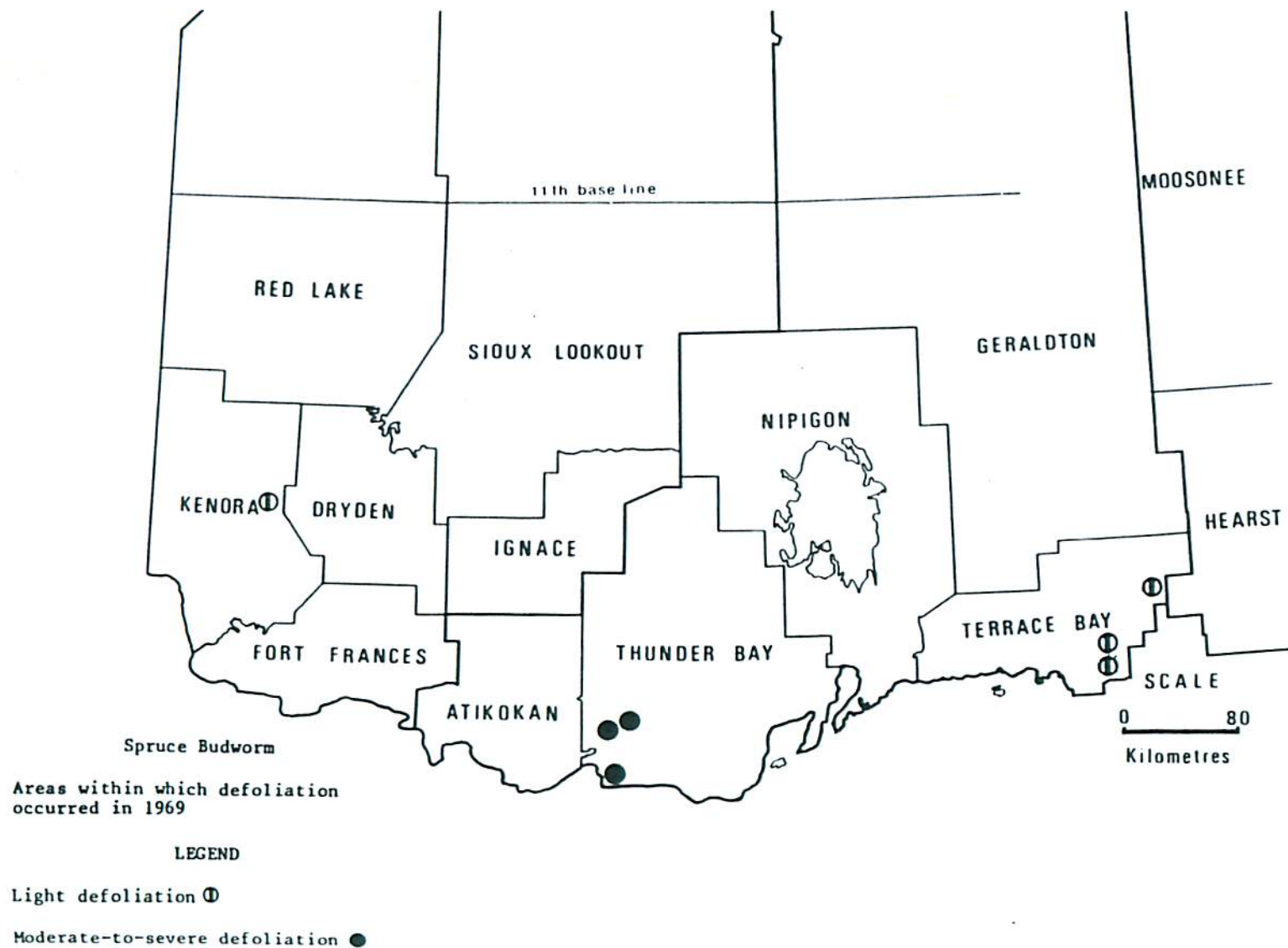
Moderate-to-severe defoliation ●

# NORTHWESTERN ONTARIO

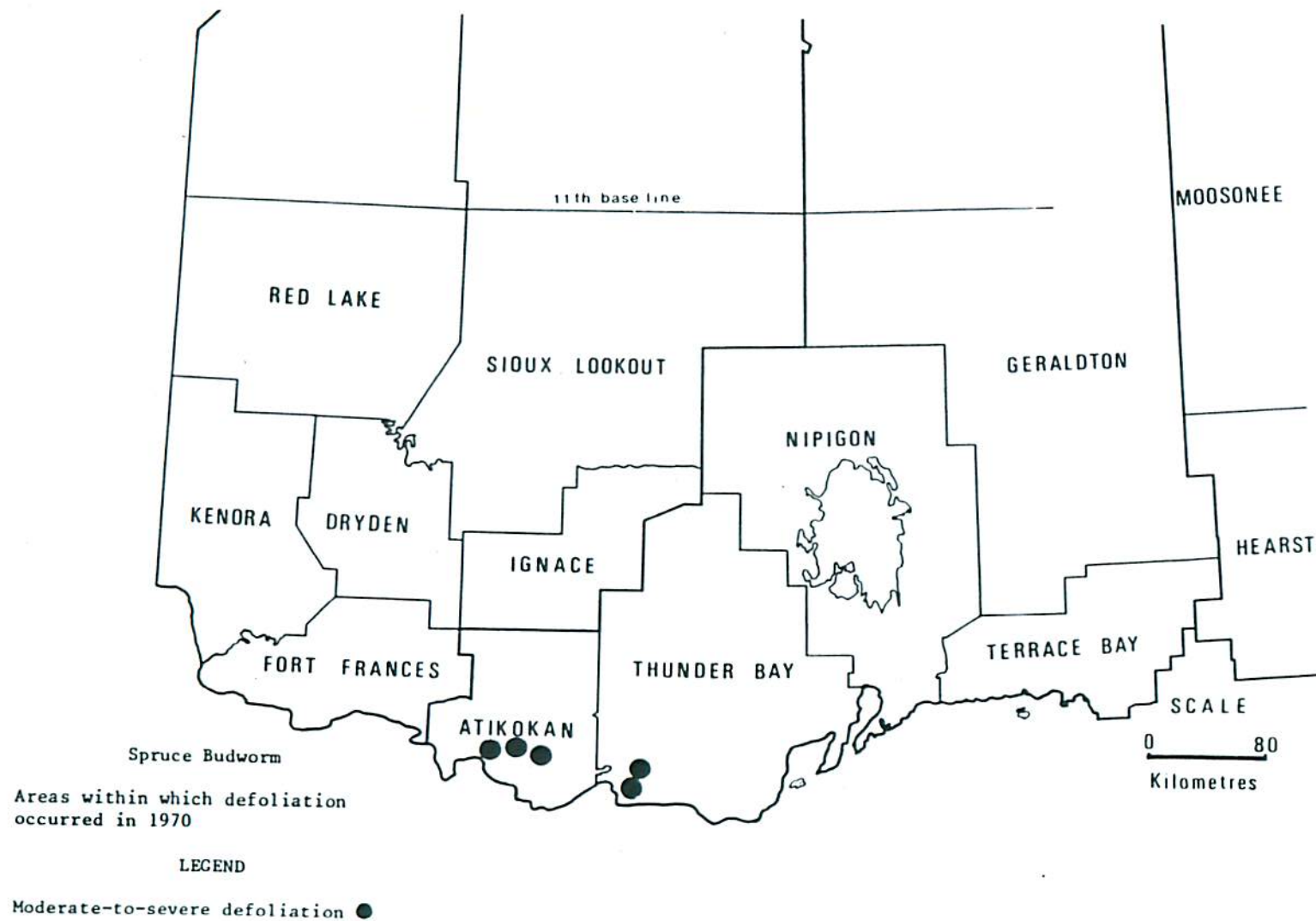




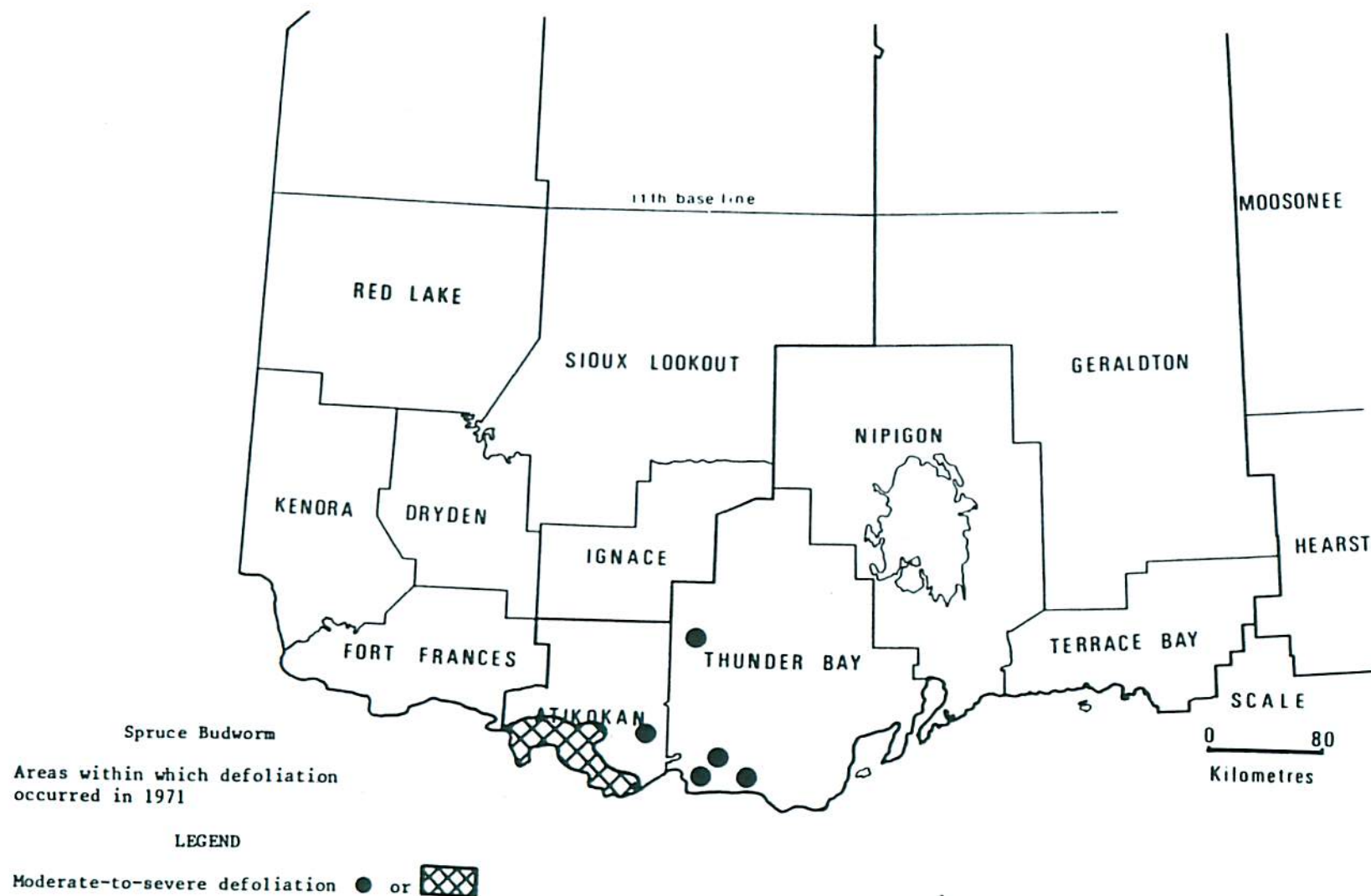
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

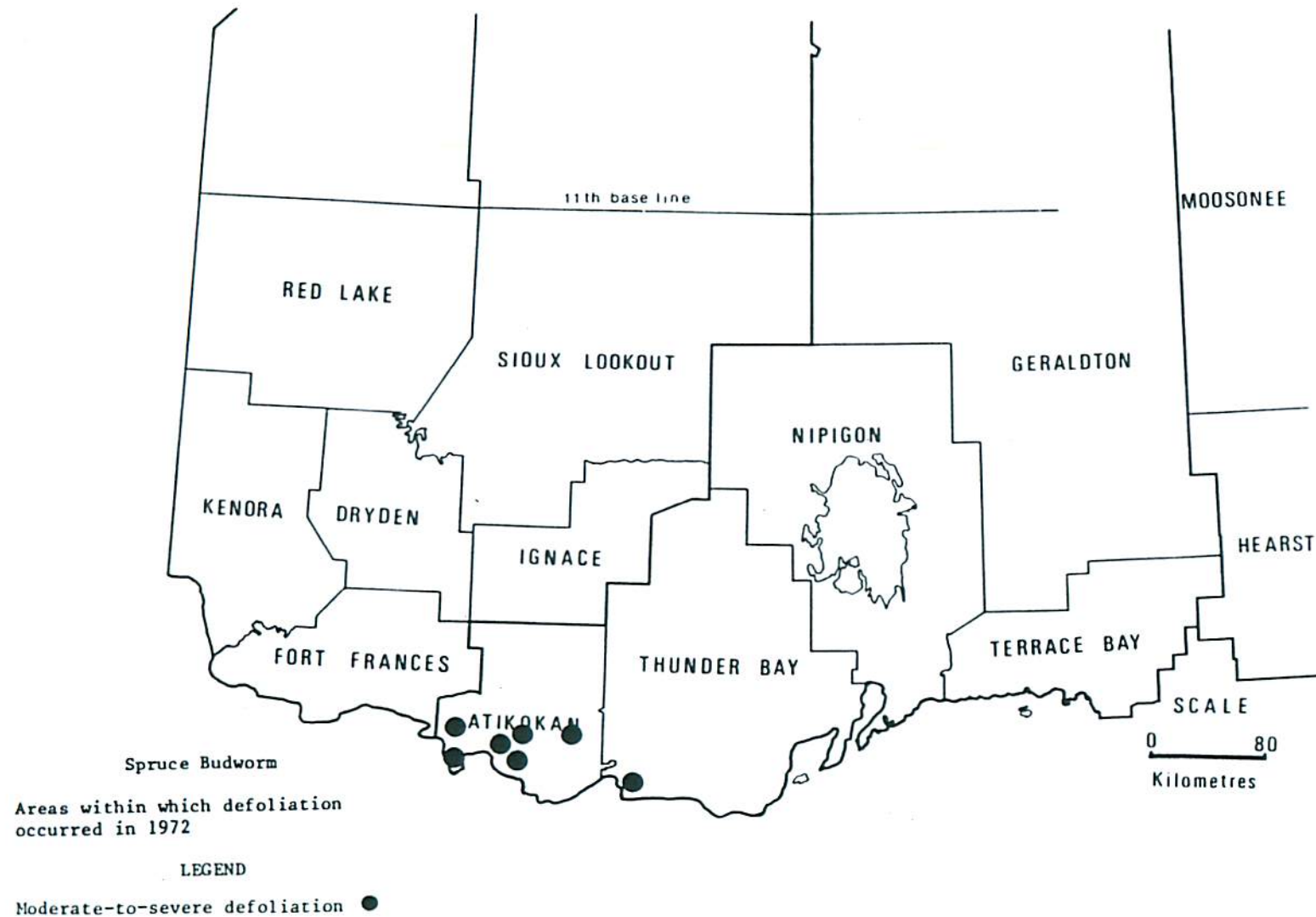


# NORTHWESTERN ONTARIO

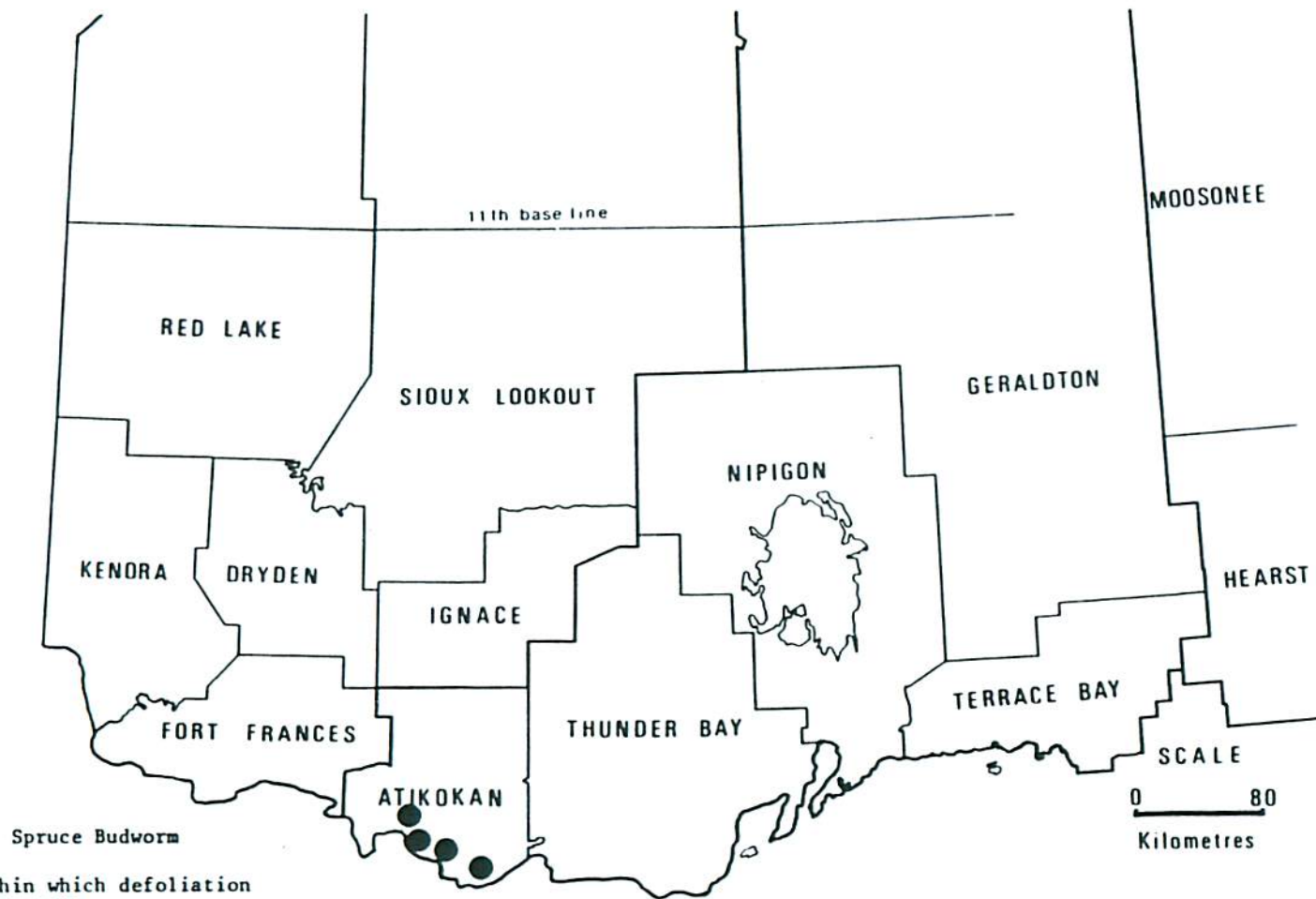




# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



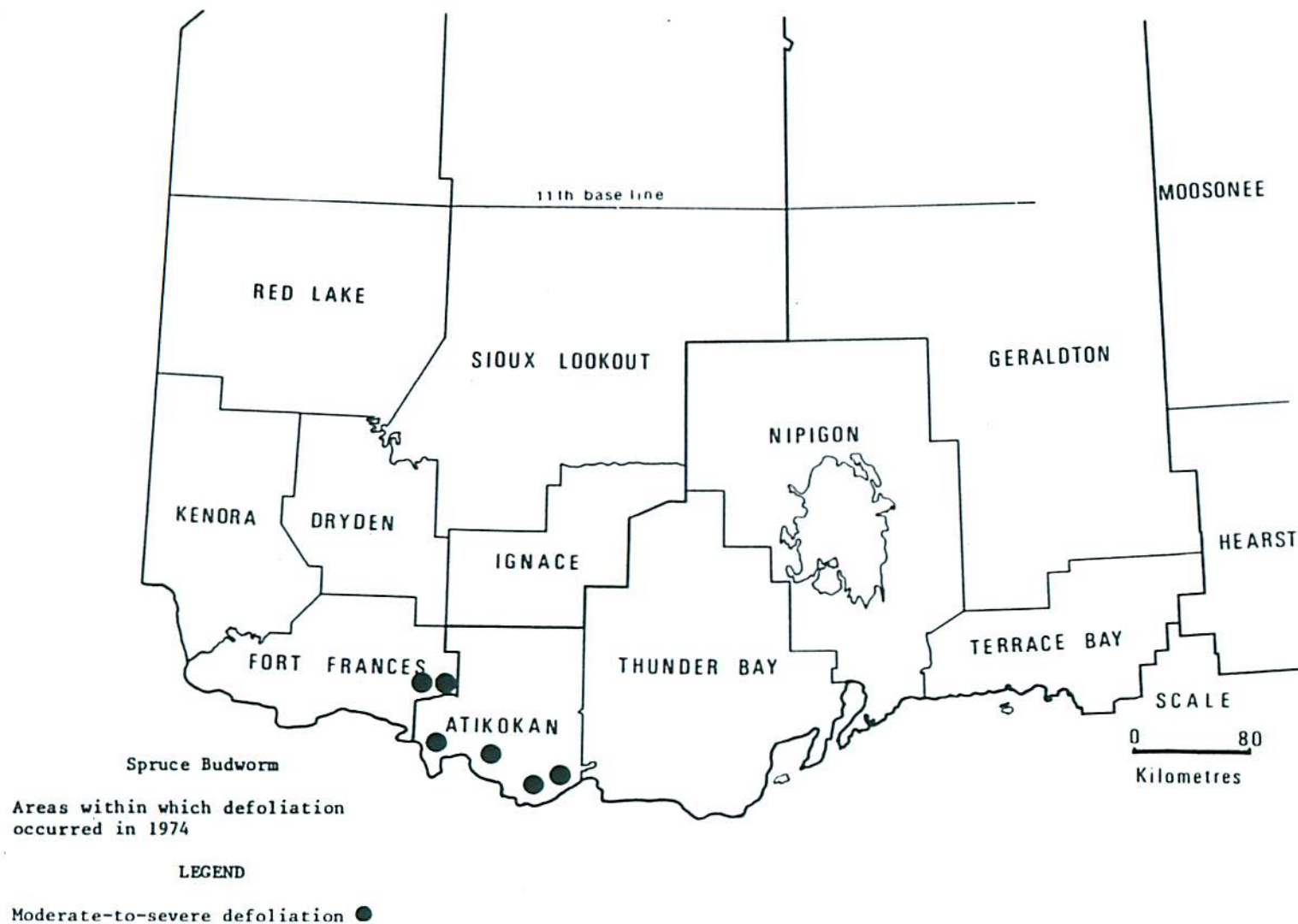
Spruce Budworm

Areas within which defoliation  
occurred in 1973

## LEGEND

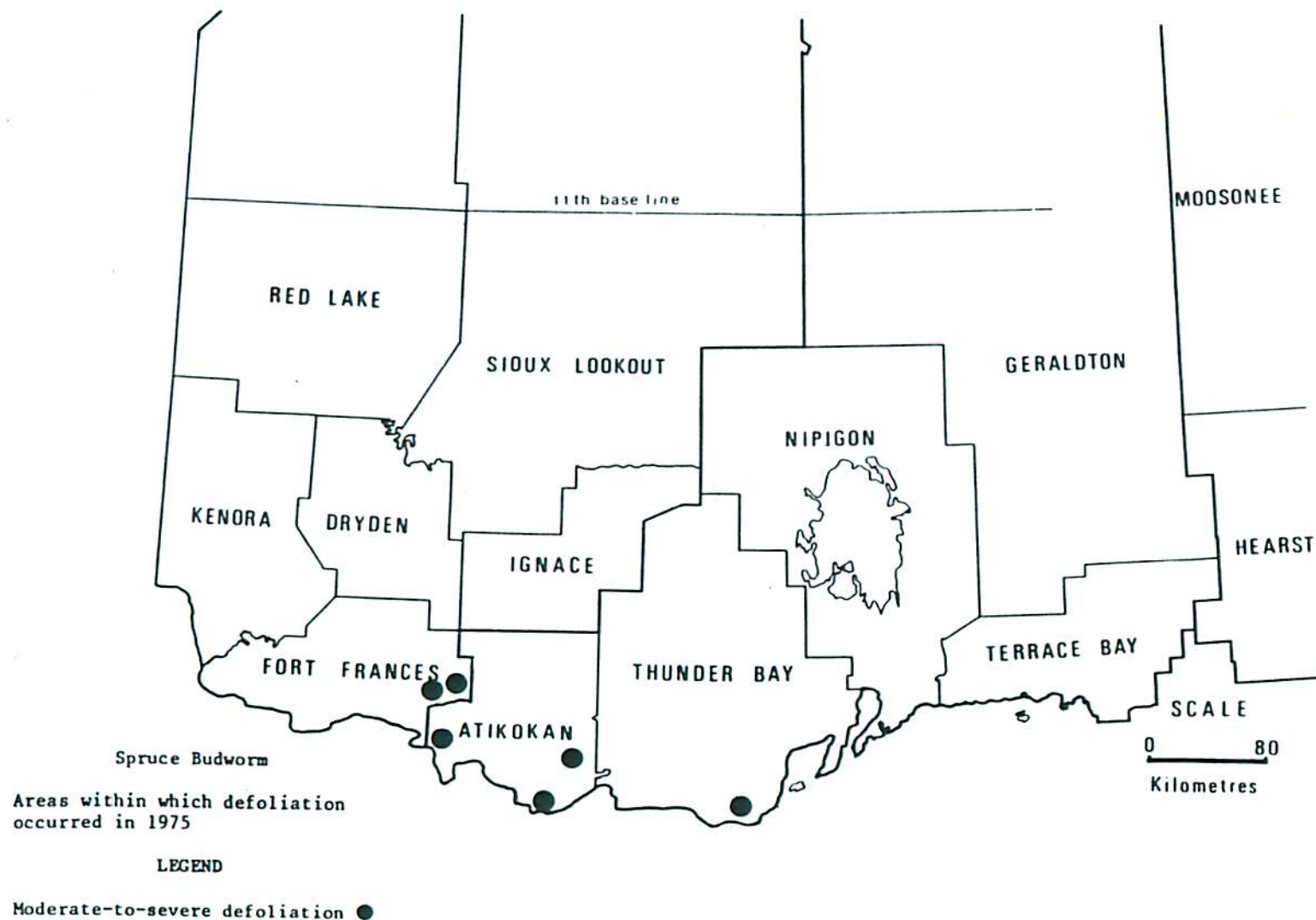
Moderate-to-severe defoliation ●

# NORTHWESTERN ONTARIO





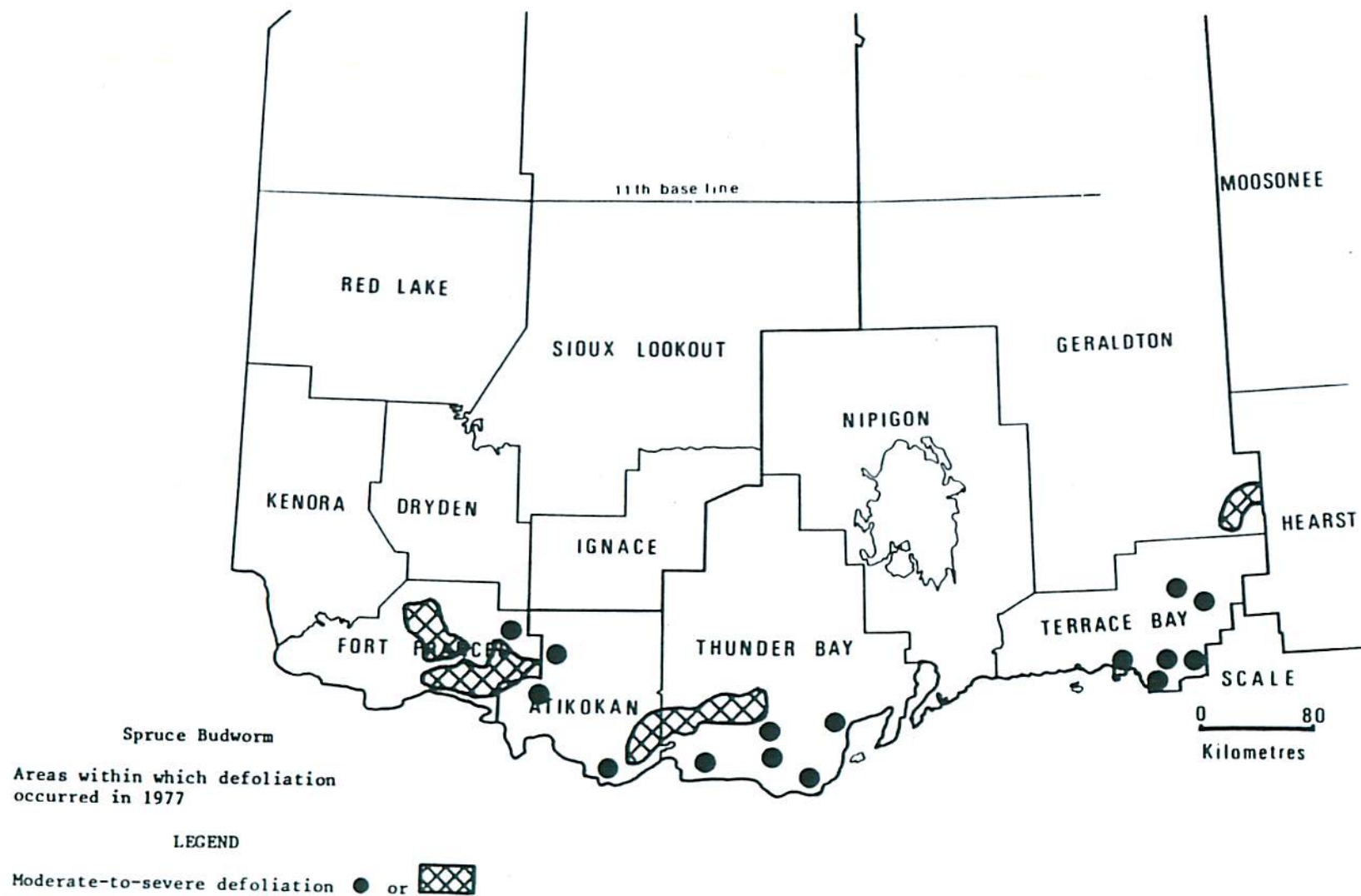
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

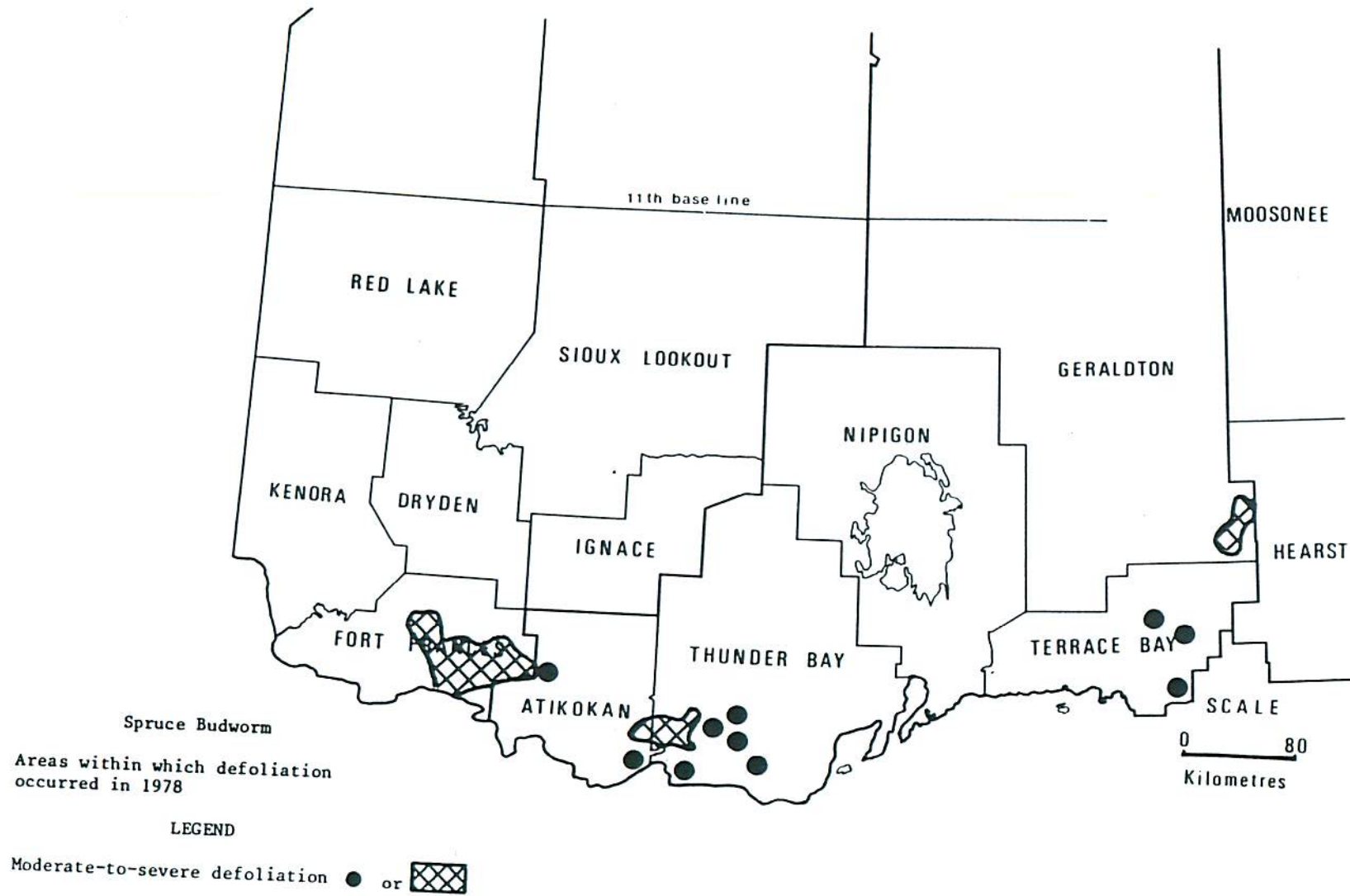


# NORTHWESTERN ONTARIO

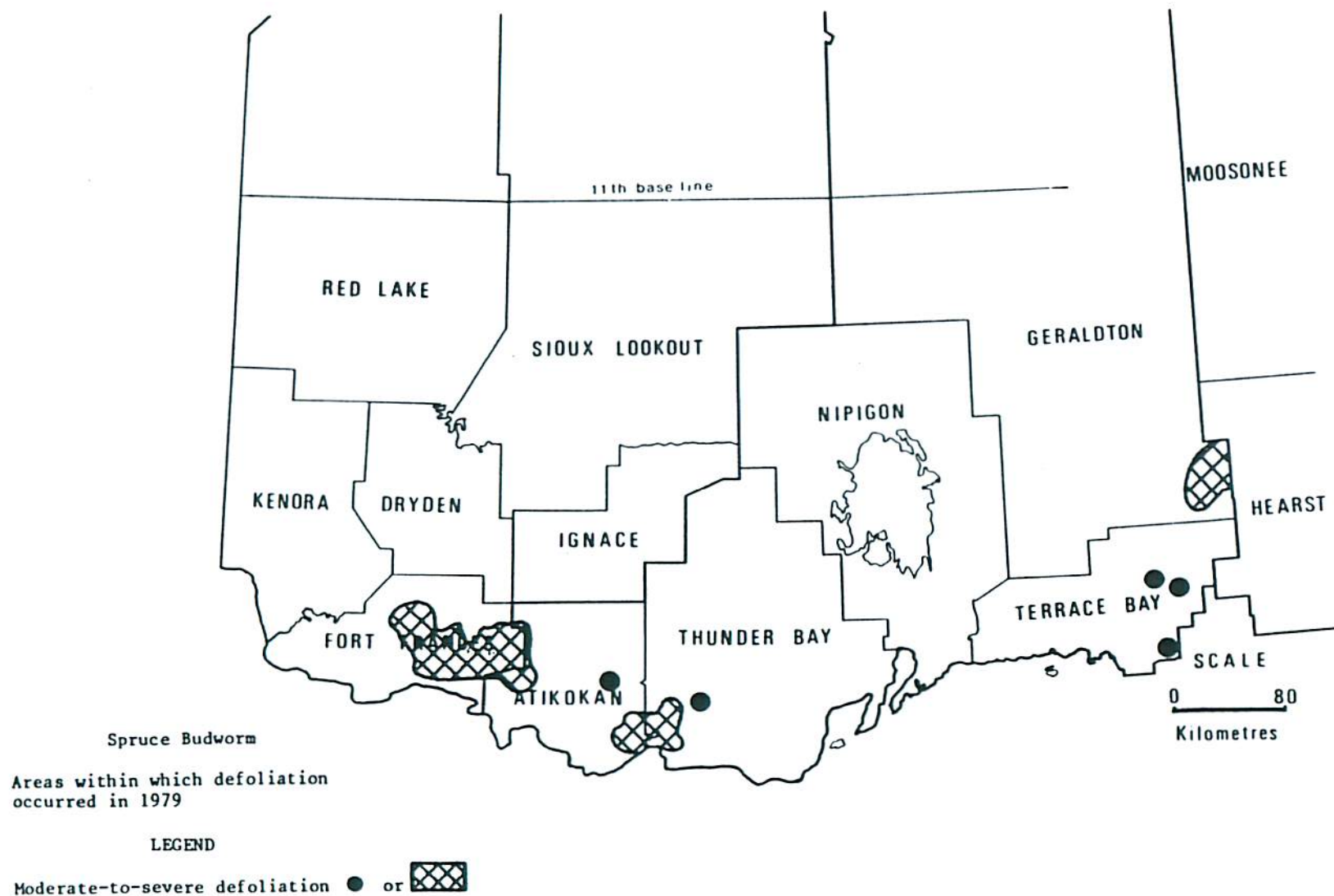




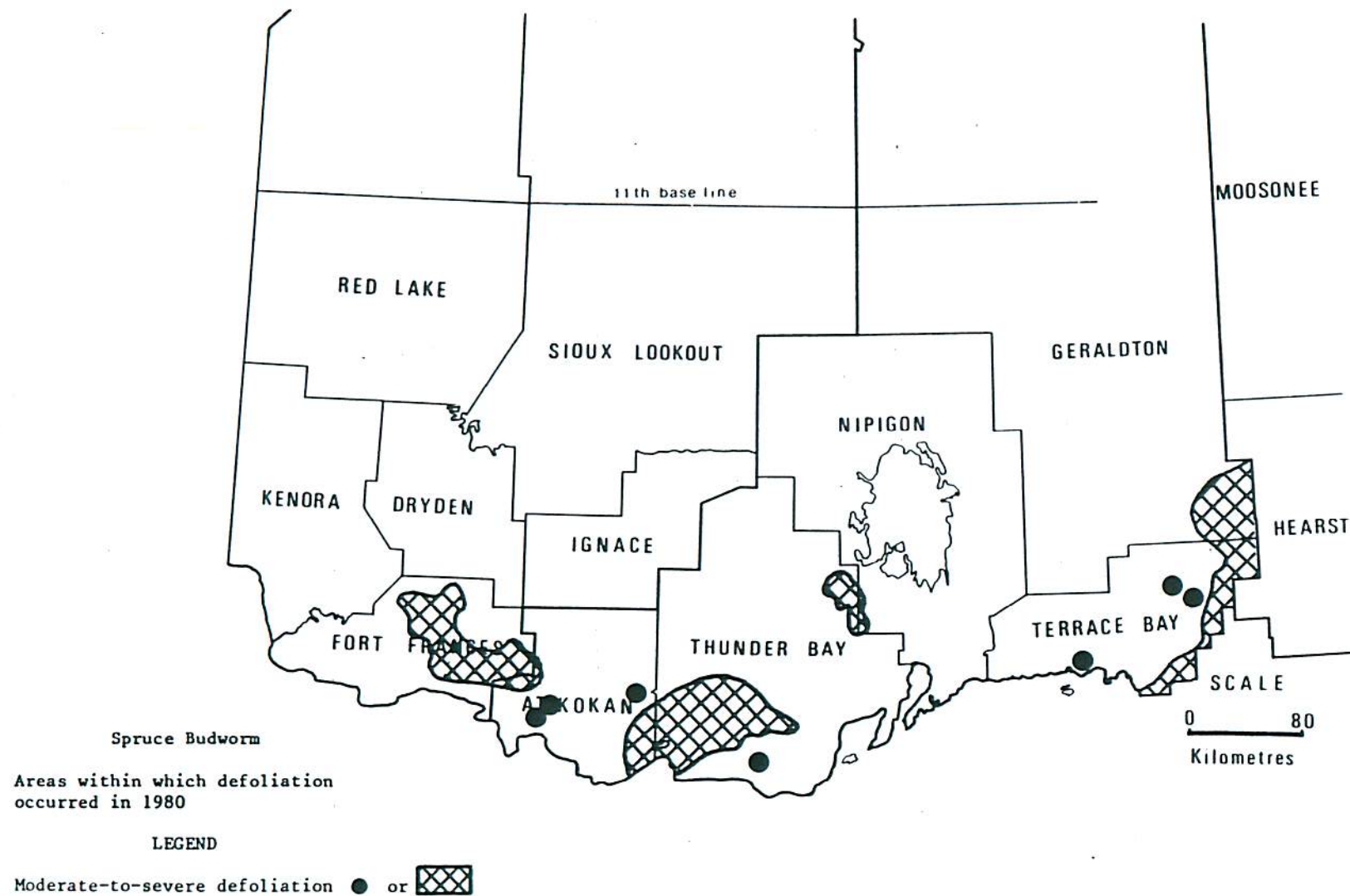
# NORTHWESTERN ONTARIO



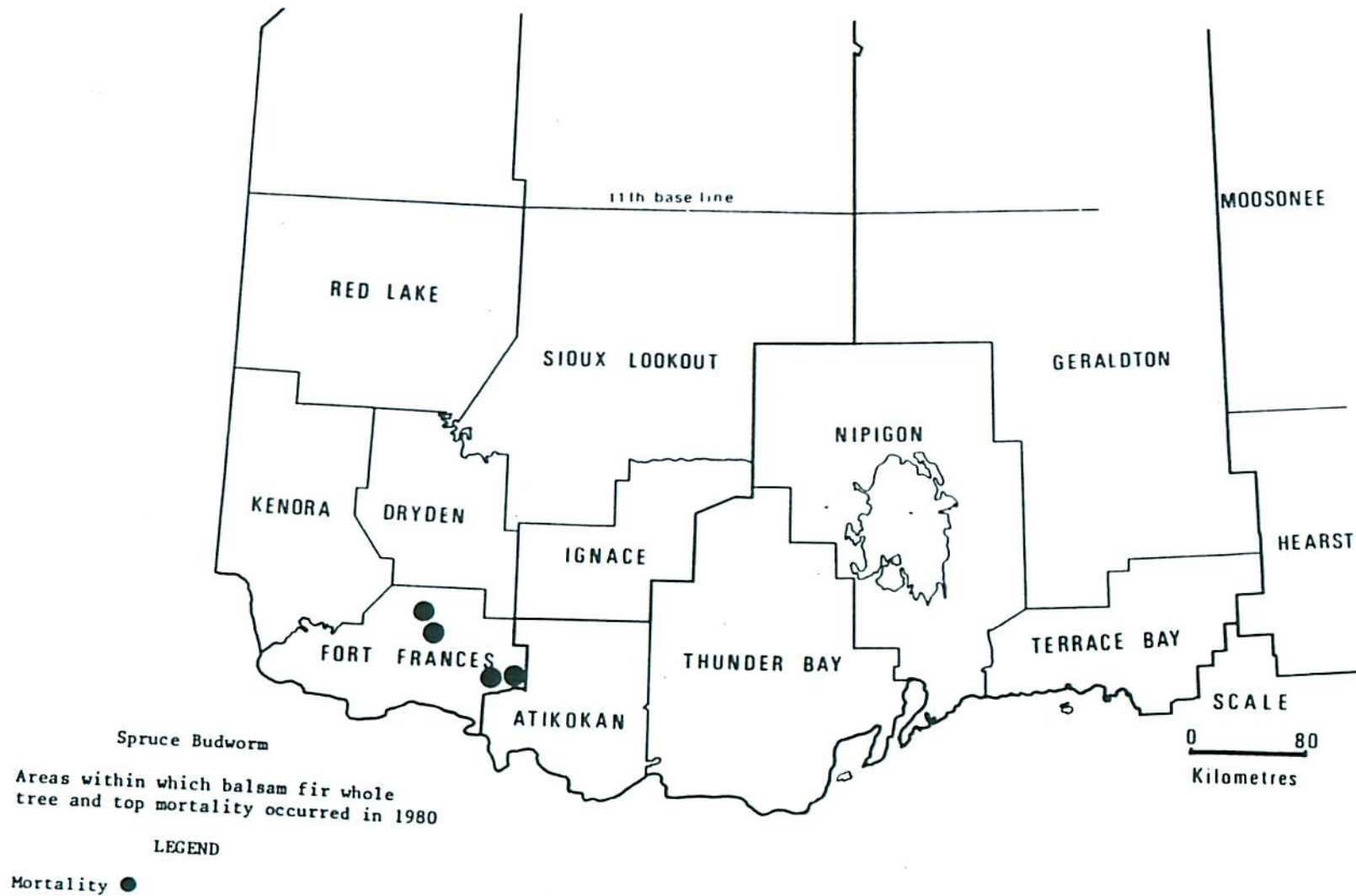
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO

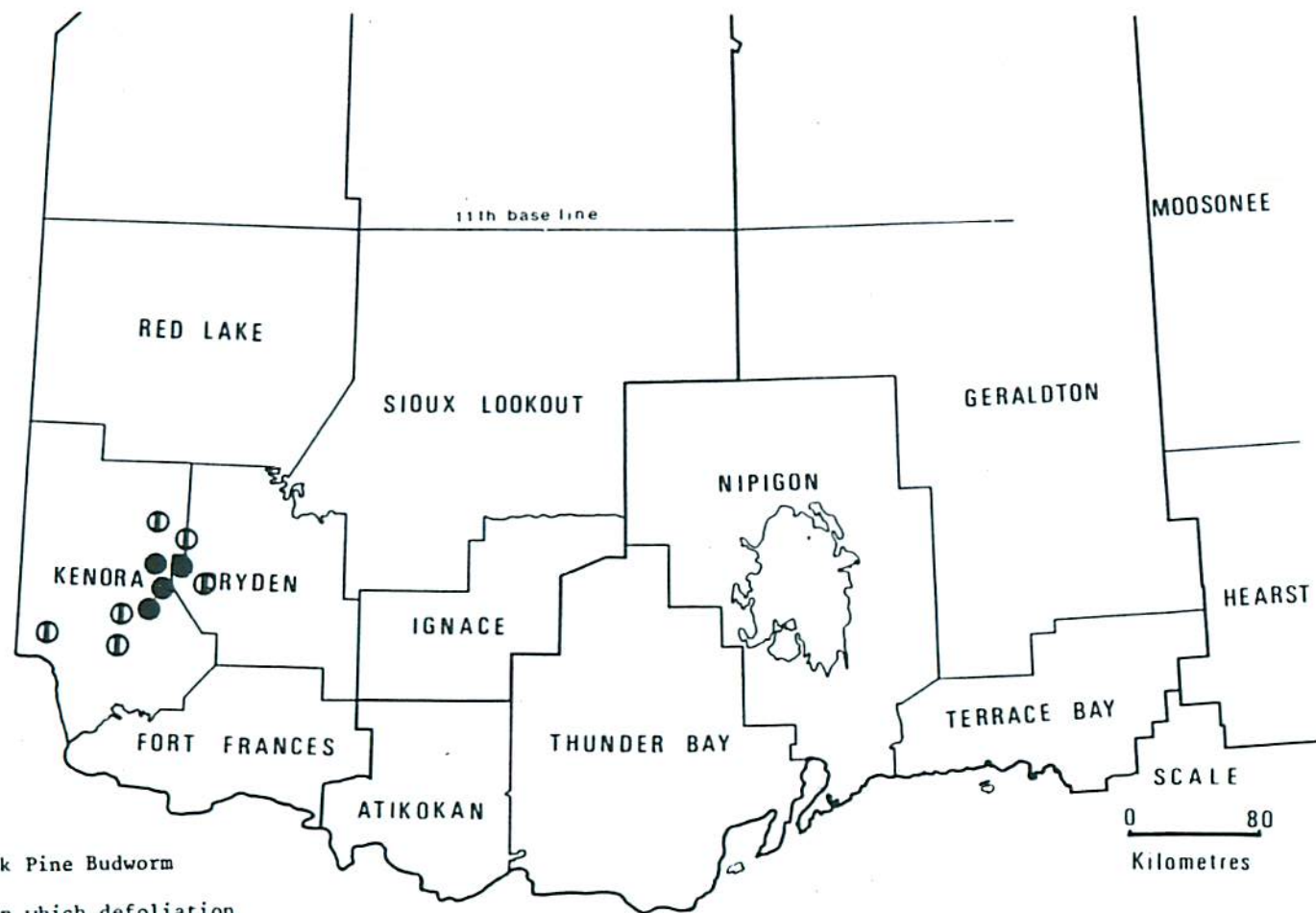


# NORTHWESTERN ONTARIO





# NORTHWESTERN ONTARIO



Jack Pine Budworm

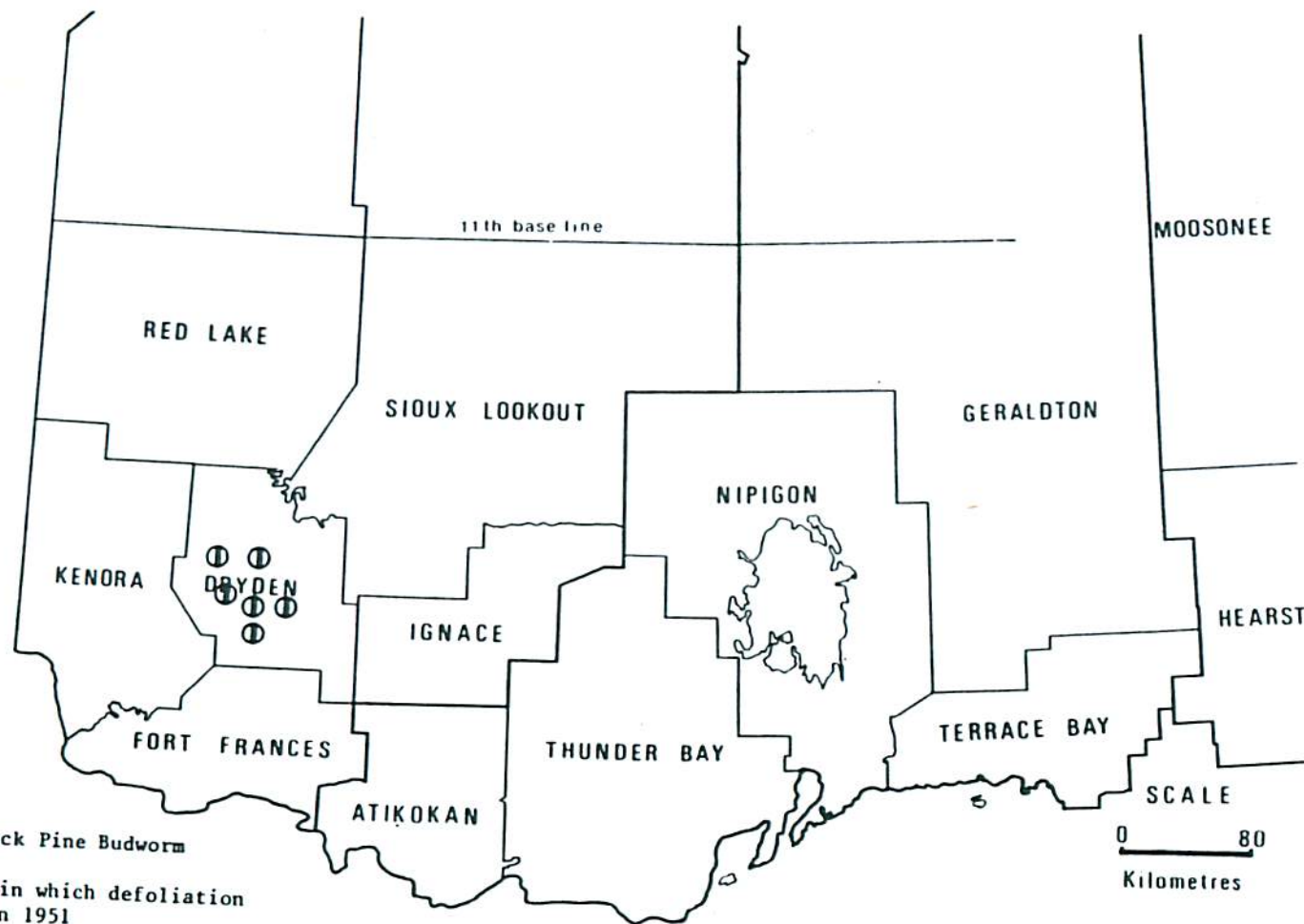
Areas within which defoliation  
occurred in 1950

## LEGEND

Light defoliation ⓪

Moderate-to-severe defoliation ●

# NORTHWESTERN ONTARIO

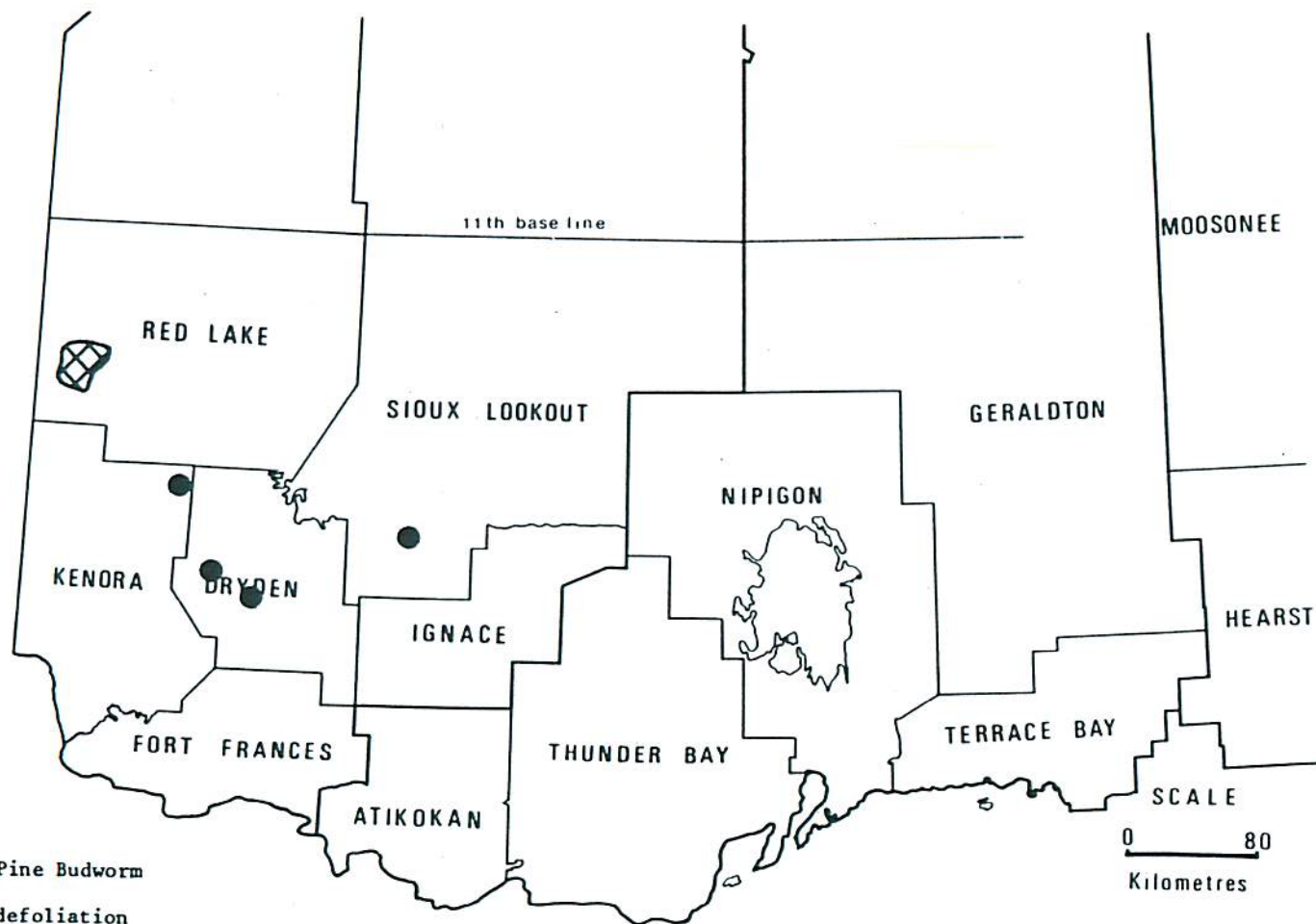


Areas within which defoliation  
occurred in 1951

## LEGEND

Light defoliation ○

# NORTHWESTERN ONTARIO



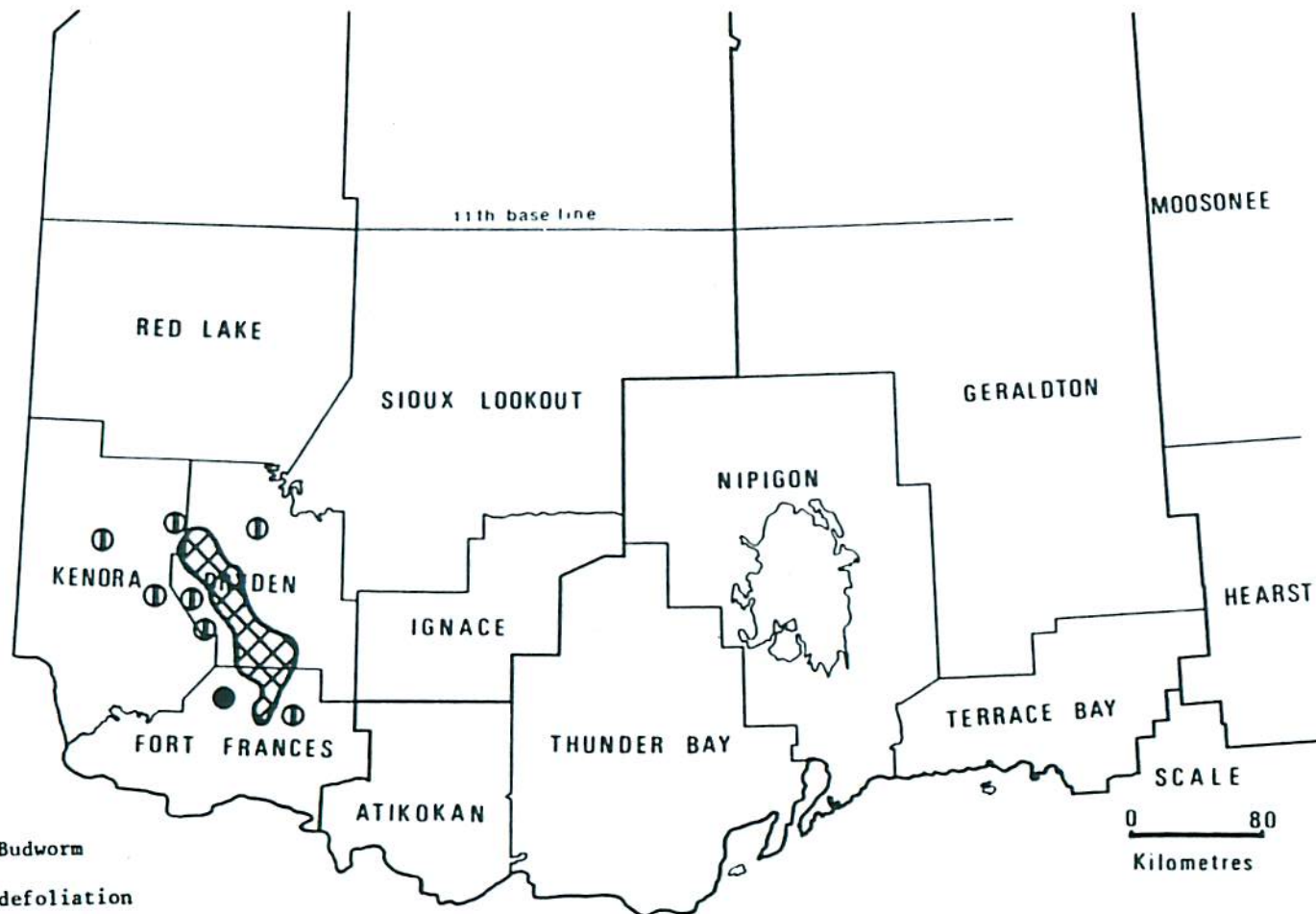
Jack Pine Budworm

Areas within which defoliation  
occurred in 1954

## LEGEND

Moderate-to-severe defoliation ● or 

# NORTHWESTERN ONTARIO



Jack Pine Budworm

Areas within which defoliation  
occurred in 1961

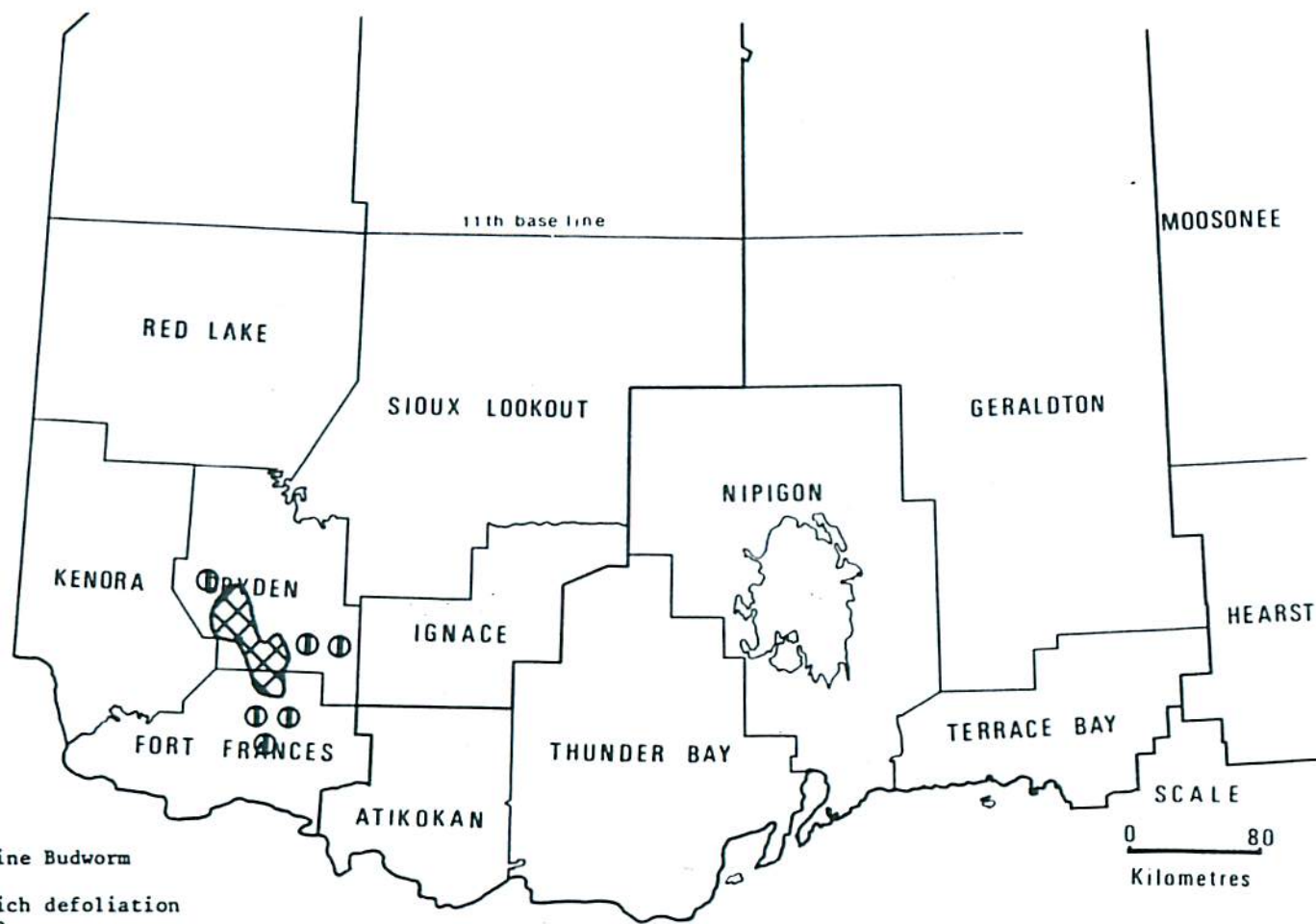
## LEGEND

Light defoliation ① or

Moderate-to-severe defoliation ● or 



# NORTHWESTERN ONTARIO



Jack Pine Budworm

Areas within which defoliation  
occurred in 1962

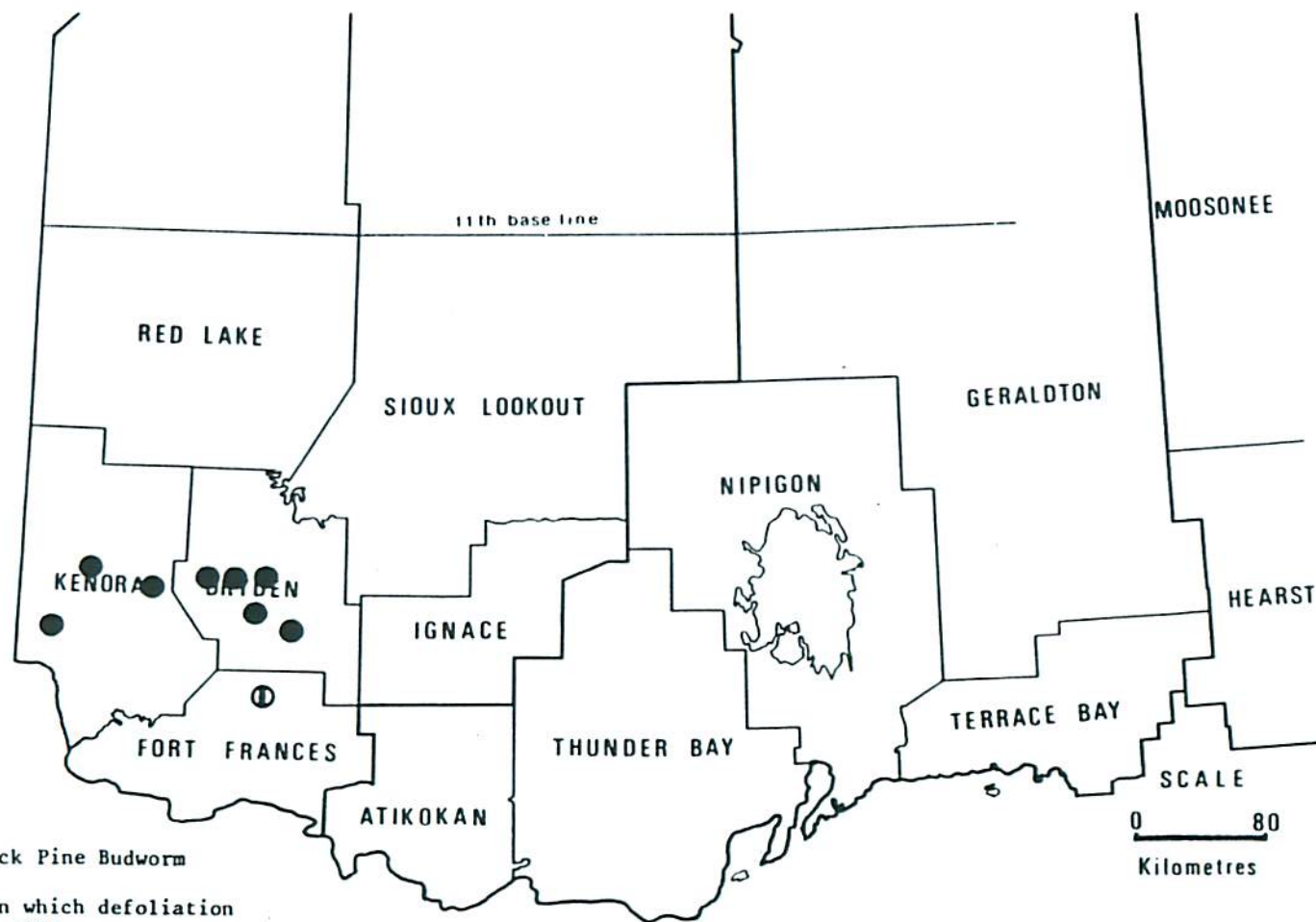
## LEGEND

Light defoliation ○

Moderate-to-severe defoliation



# NORTHWESTERN ONTARIO



Jack Pine Budworm

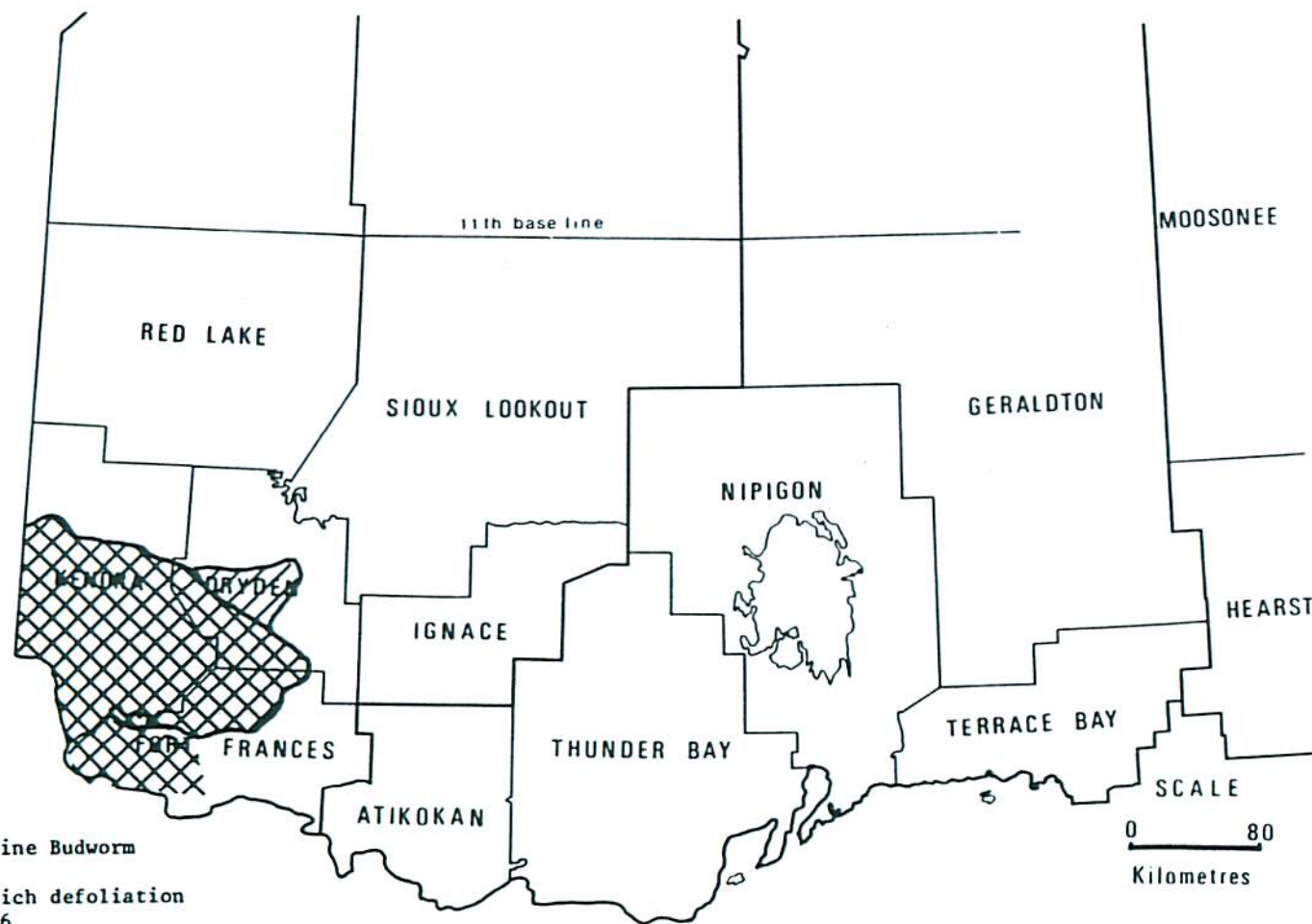
Areas within which defoliation  
occurred in 1965

## LEGEND


Light defoliation ○

Moderate-to-severe defoliation ●

# NORTHWESTERN ONTARIO

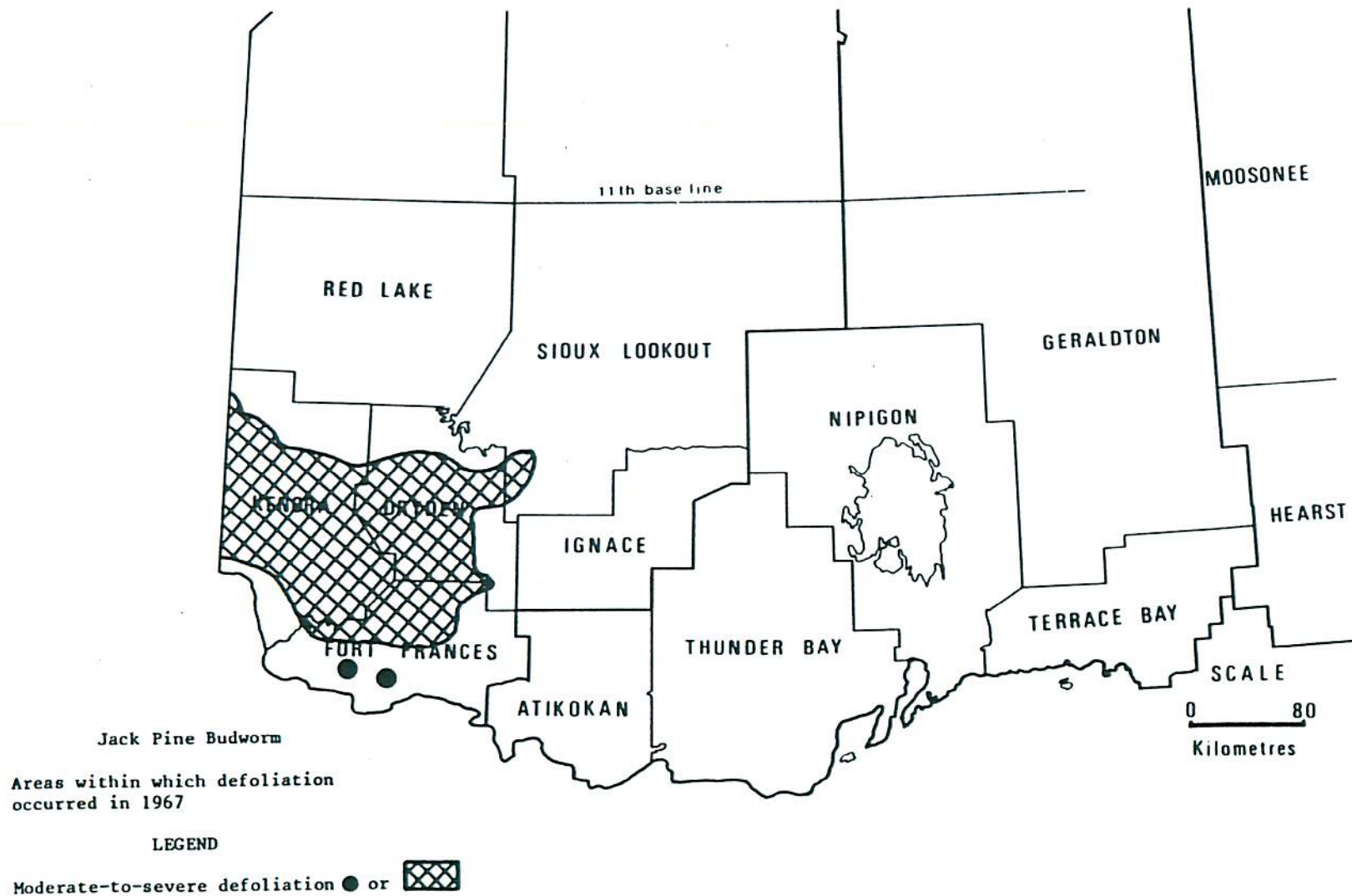


## LEGEND

Light defoliation 

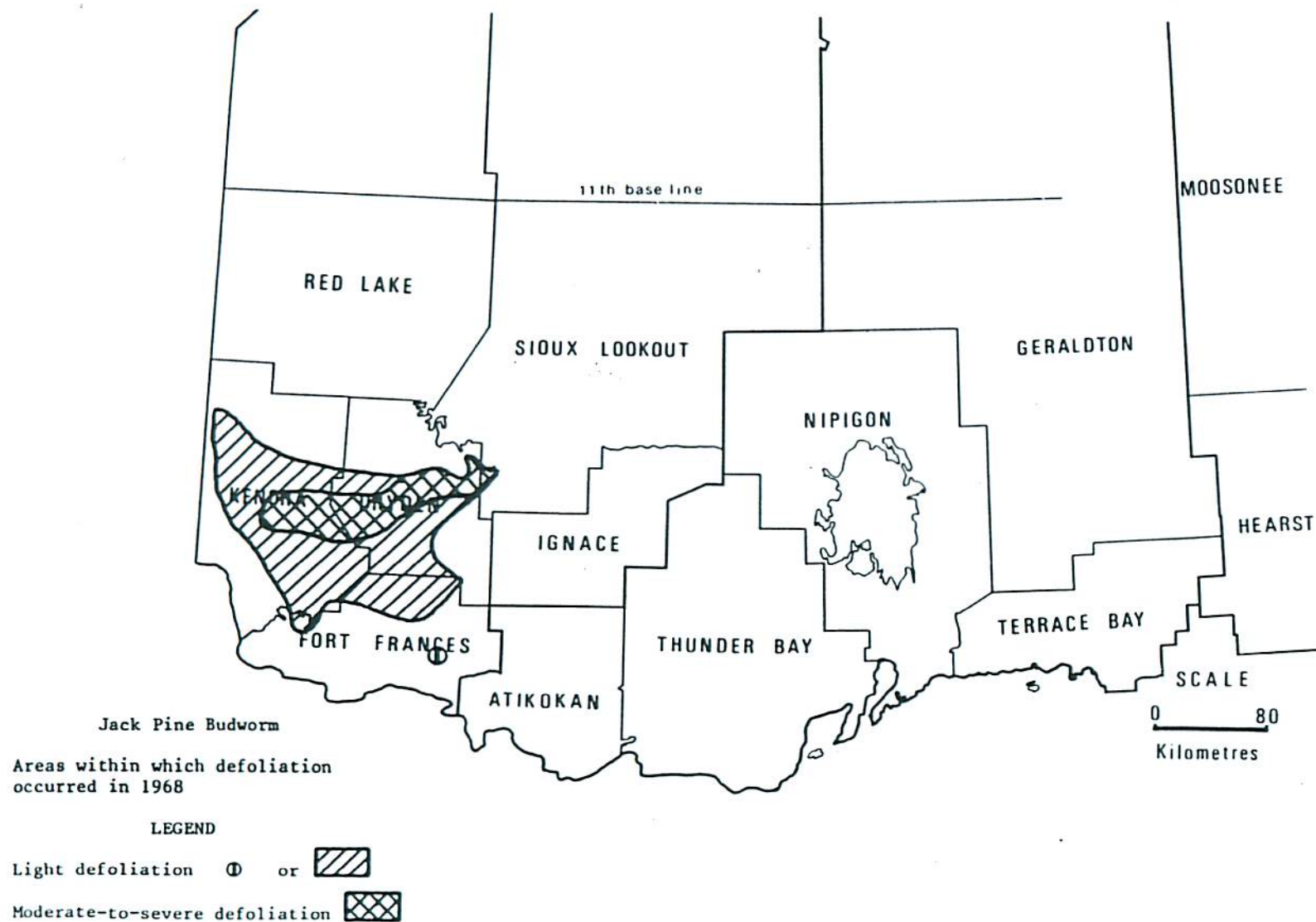
Moderate-to-severe defoliation 

# NORTHWESTERN ONTARIO

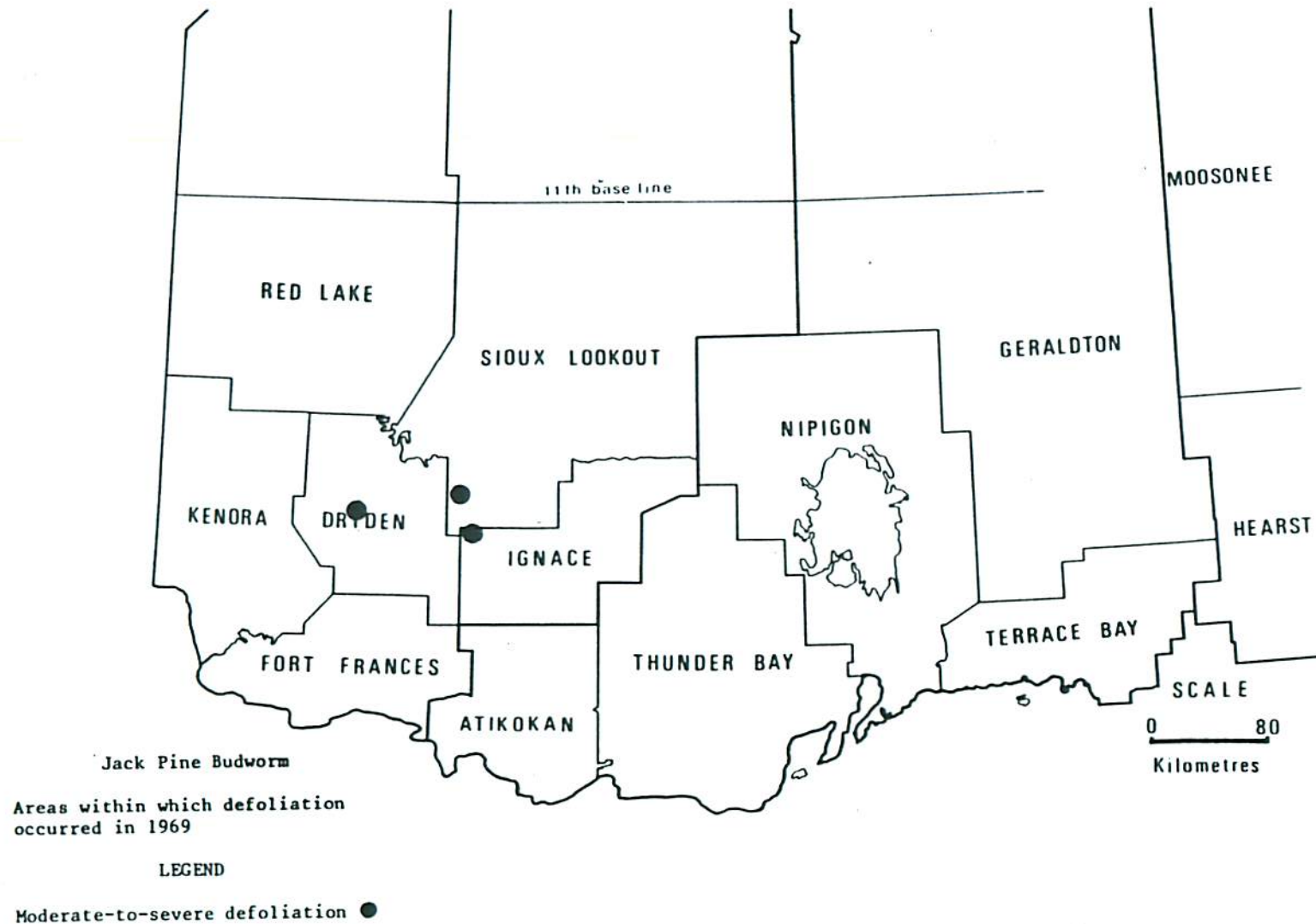




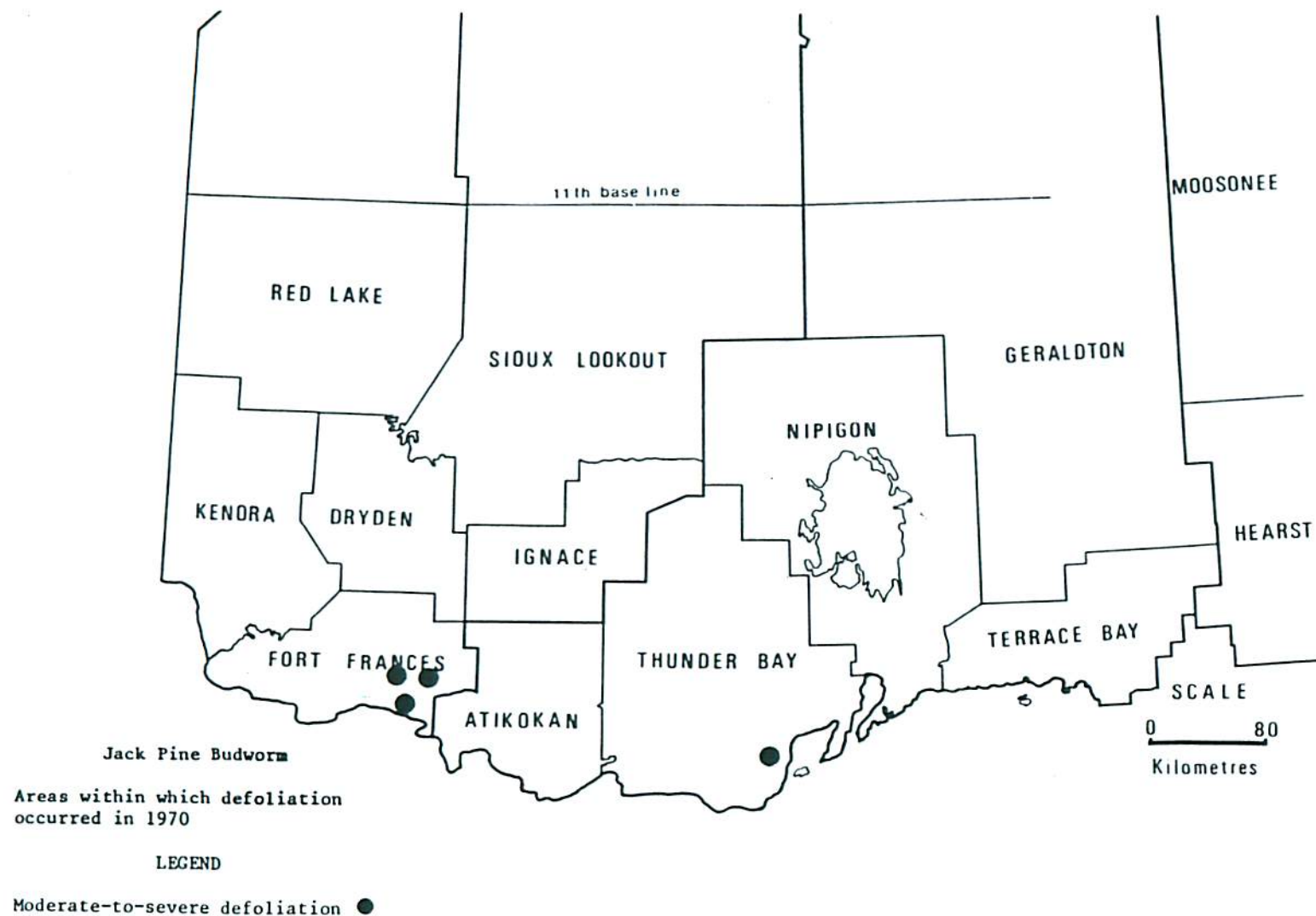
# NORTHWESTERN ONTARIO



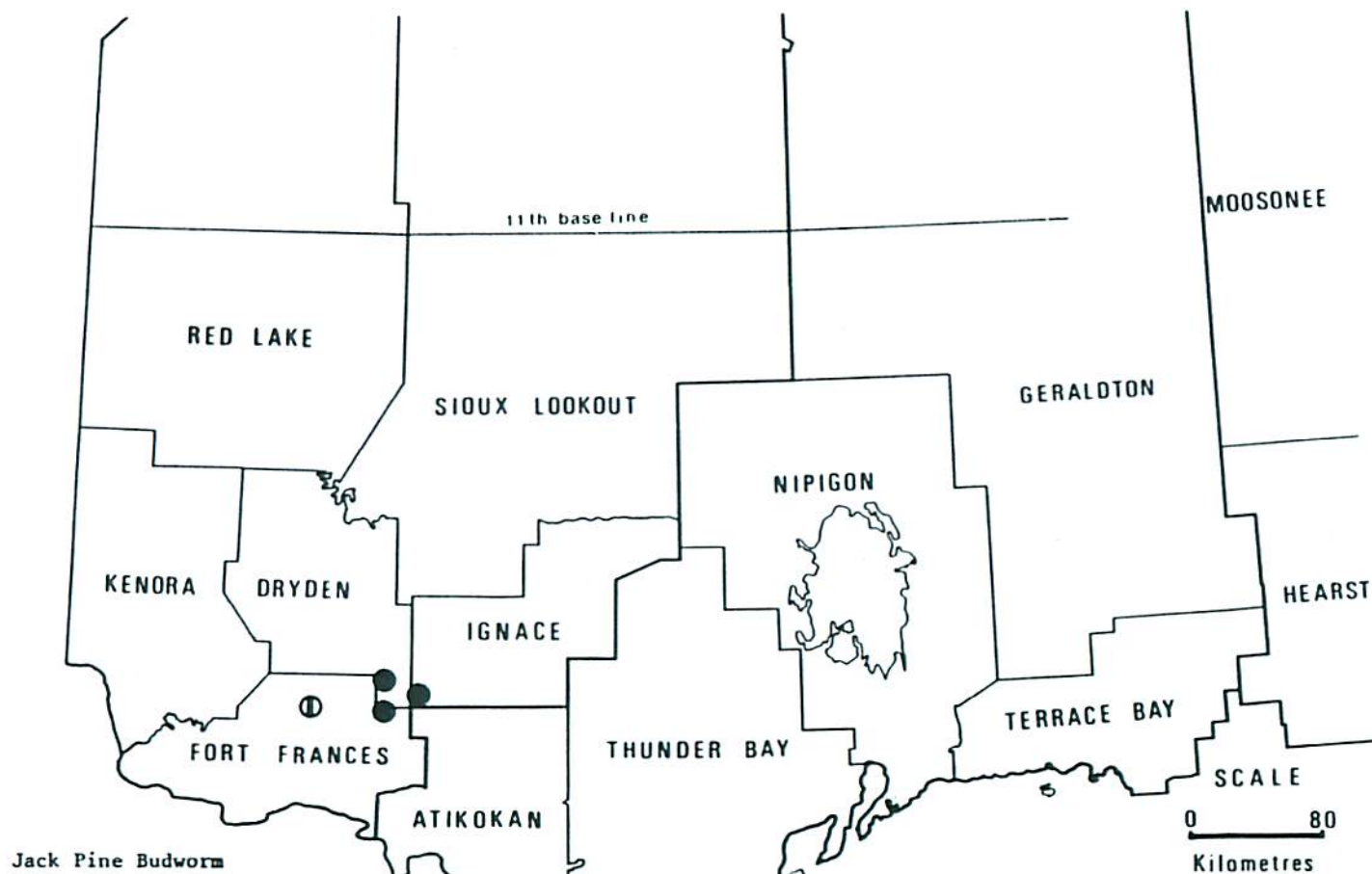
# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



# NORTHWESTERN ONTARIO



Jack Pine Budworm

Areas within which defoliation  
occurred in 1971

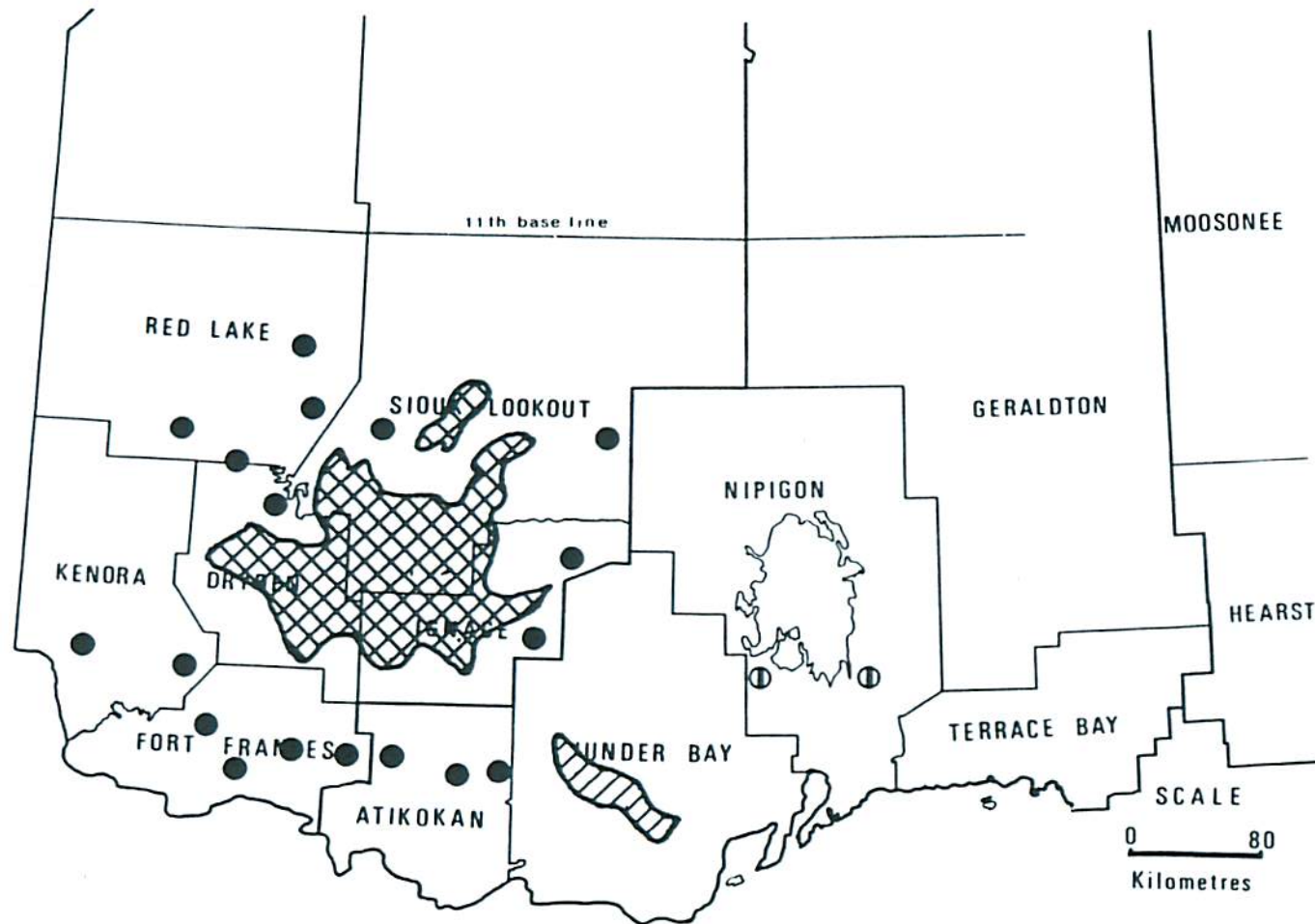
## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ●



# NORTHWESTERN ONTARIO



## Forest Tent Caterpillar

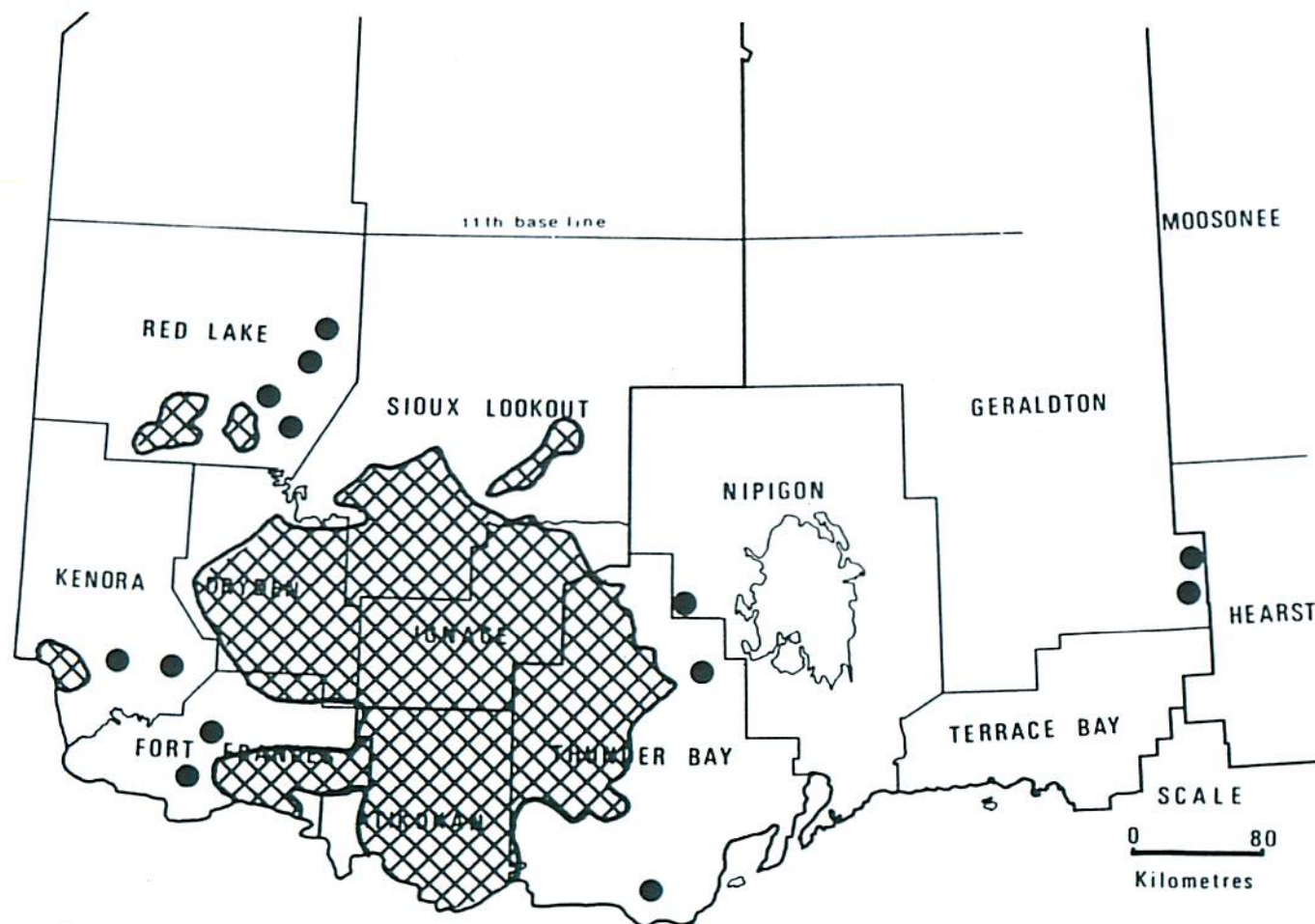
Areas within which defoliation occurred in 1950

### LEGEND

Light defoliation    ①    or    

Moderate-to-severe defoliation    ●    or    

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1951

## LEGEND

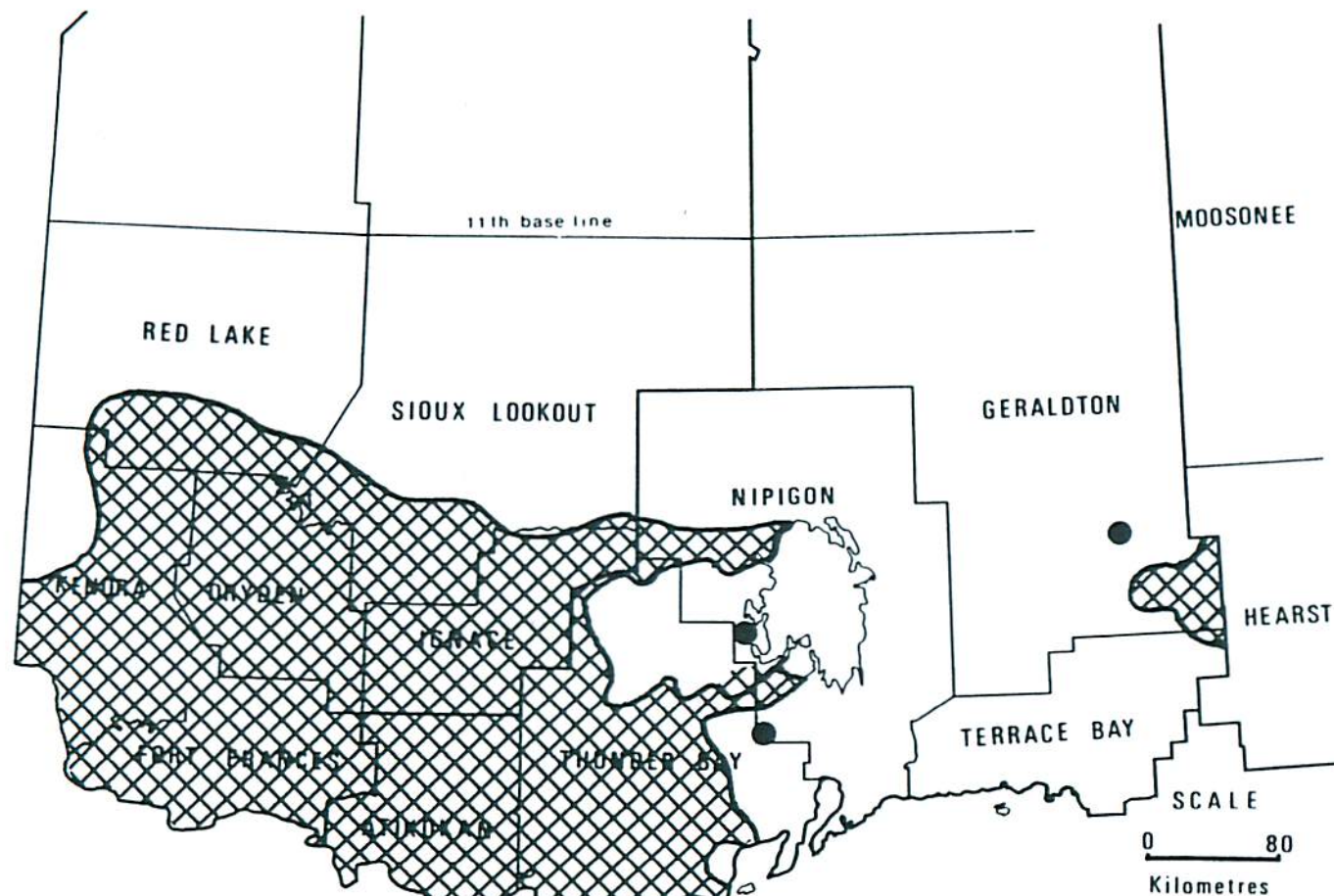
Moderate-to-severe defoliation



or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

## LEGEND

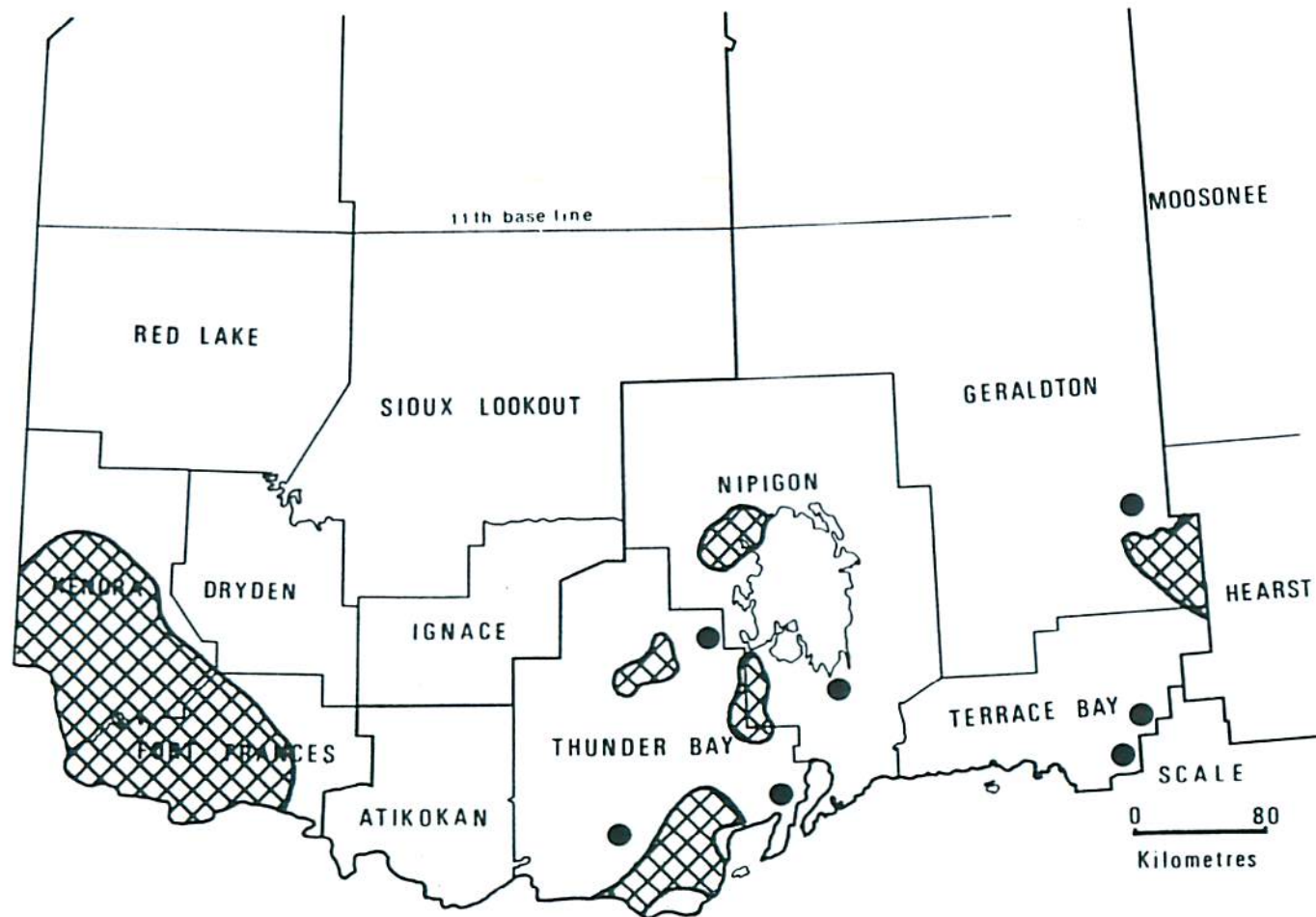
Moderate-to-severe defoliation



or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

LEGEND

Moderate-to-severe defoliation

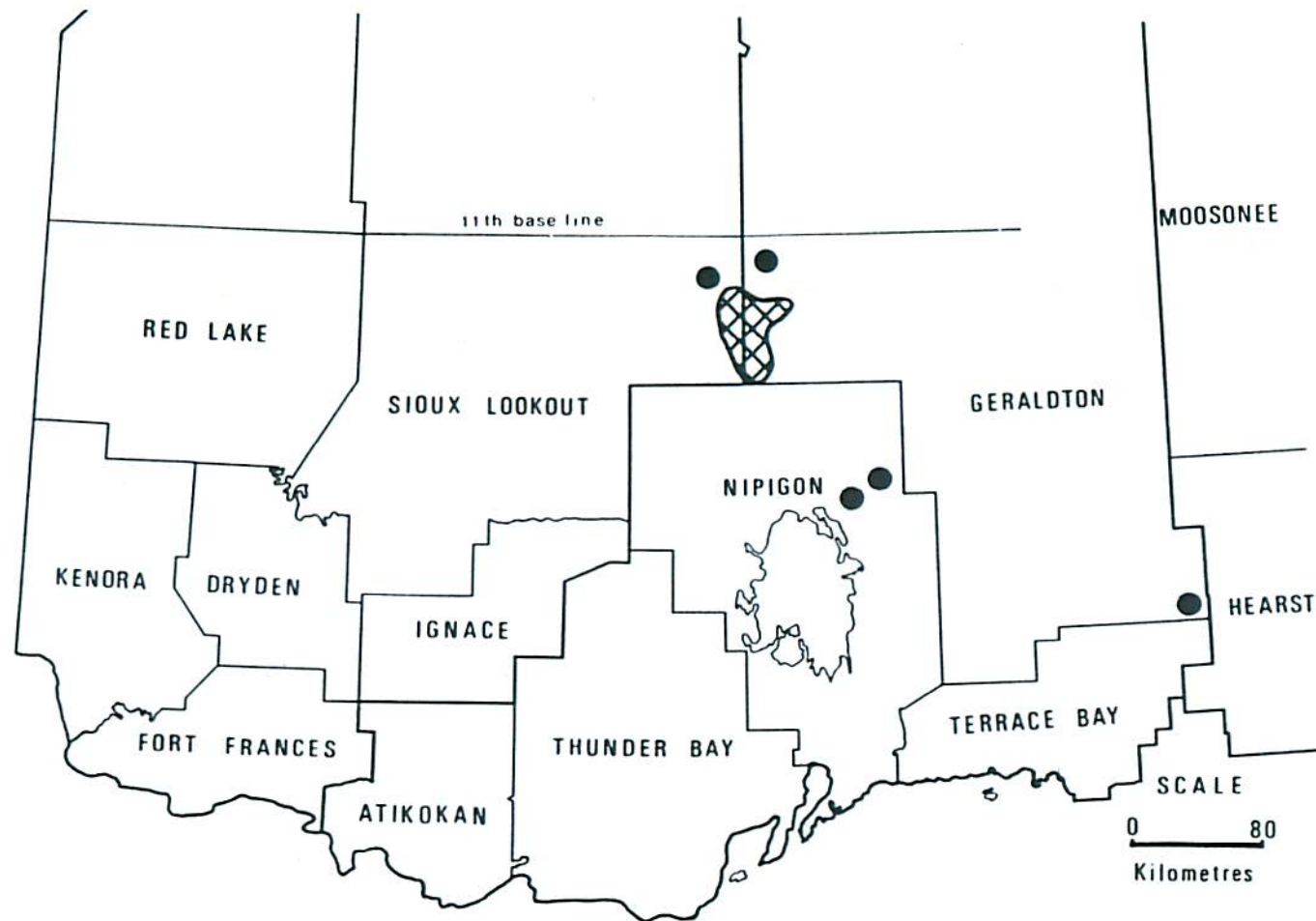


or





# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1954

## LEGEND

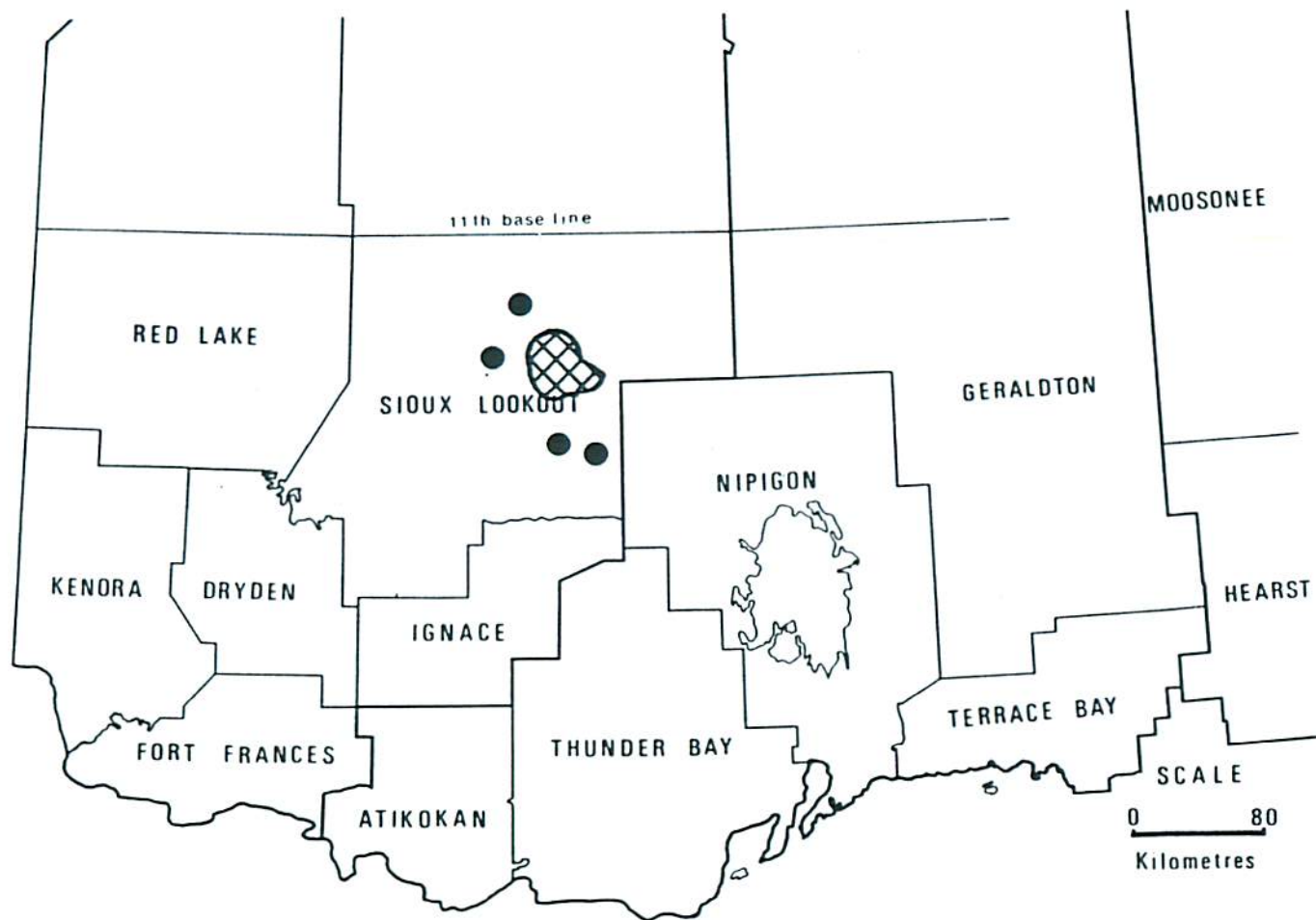
Moderate-to-severe defoliation



or



# NORTHWESTERN ONTARIO

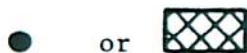


## Forest Tent Caterpillar

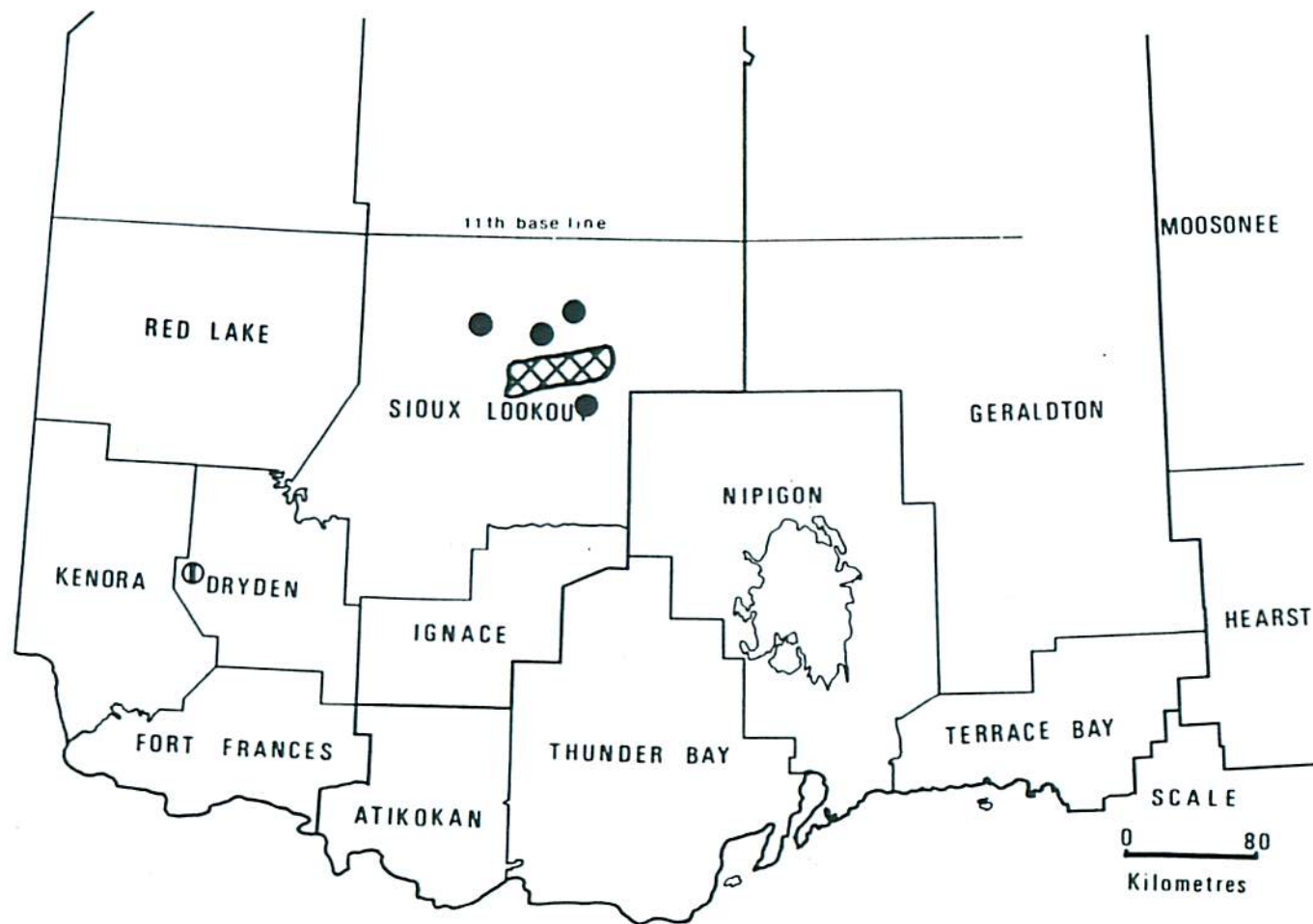
Areas within which defoliation occurred in 1956

### LEGEND

Moderate-to-severe defoliation



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

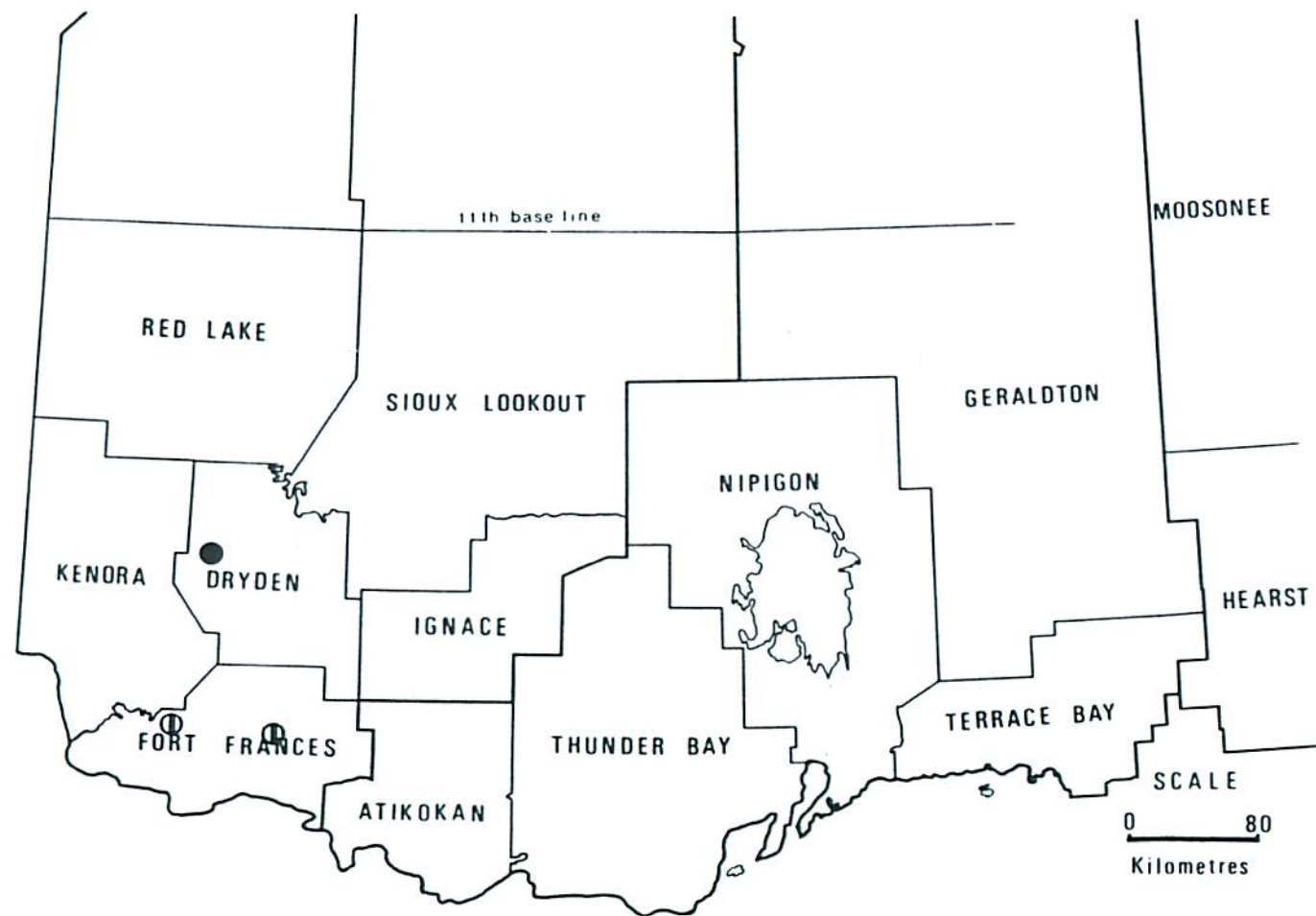
Areas within which defoliation occurred in 1957

## LEGEND

Light defoliation    ①

Moderate-to-severe defoliation    ● or [cross-hatched box]

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

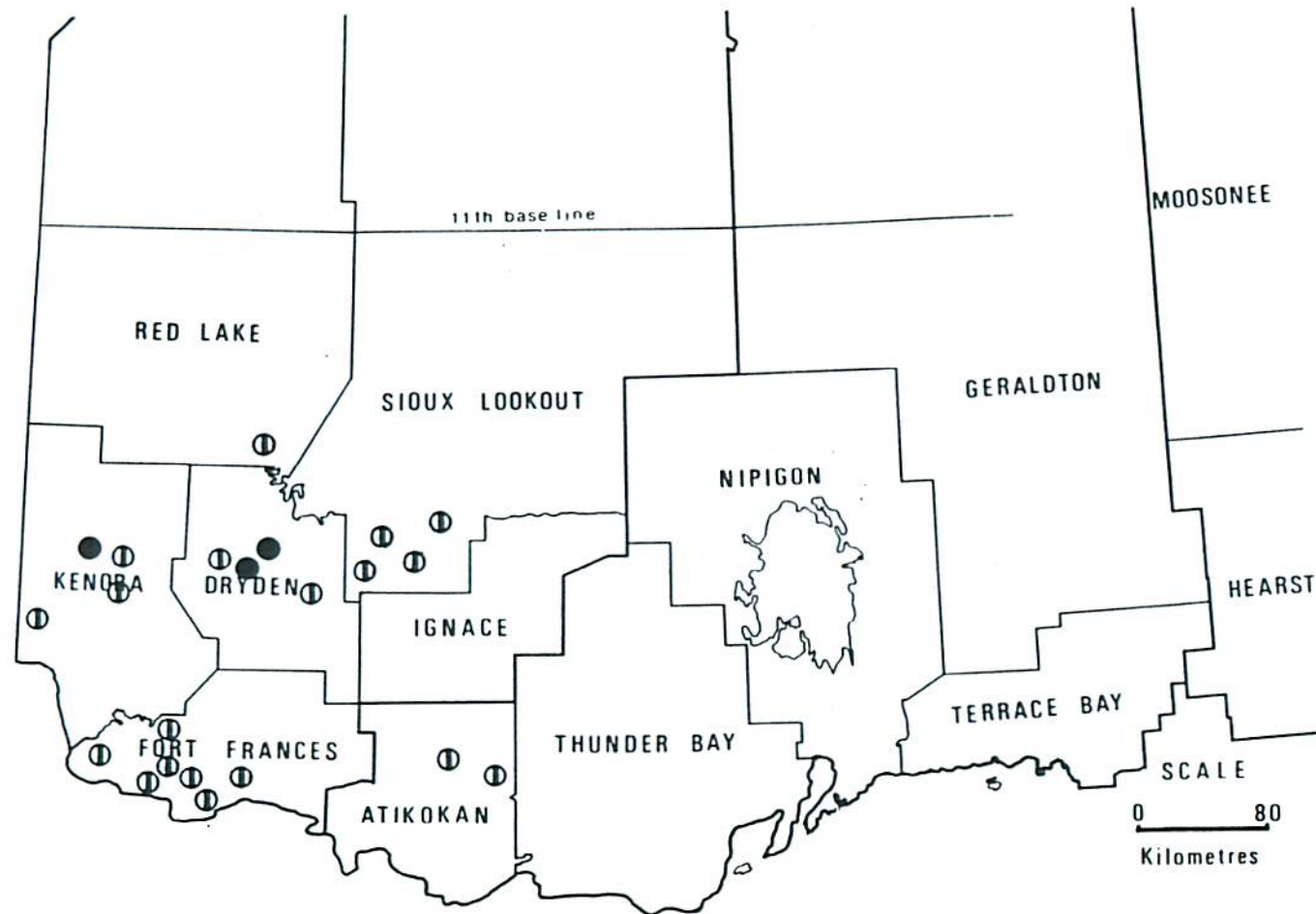
Areas within which defoliation occurred in 1959

## LEGEND

Light defoliation ①



# NORTHWESTERN ONTARIO



## Forest Tent Caterpillar

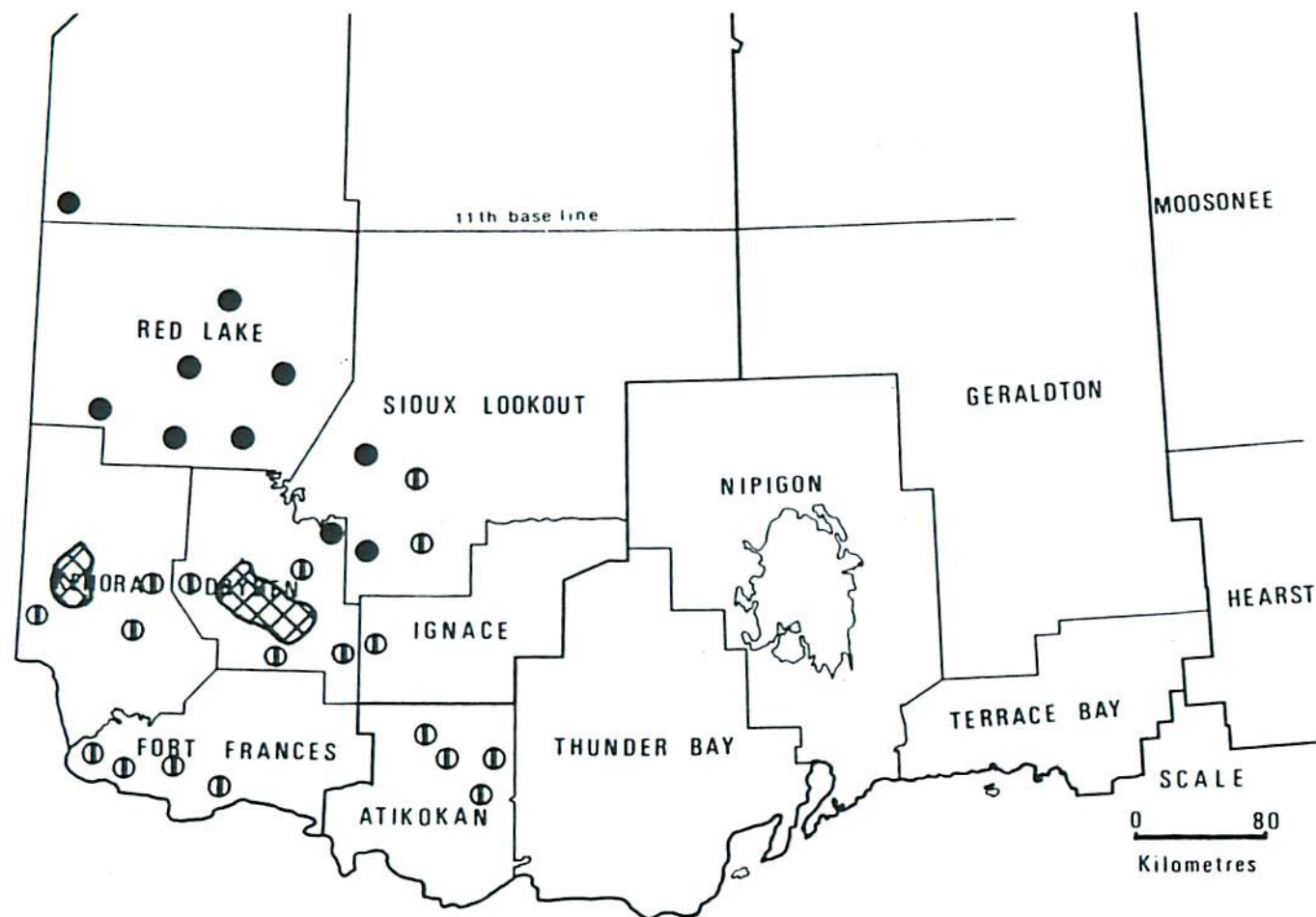
Areas within which defoliation occurred in 1960

### LEGEND

Light defoliation ○

Moderate-to-severe defoliation ●

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1961

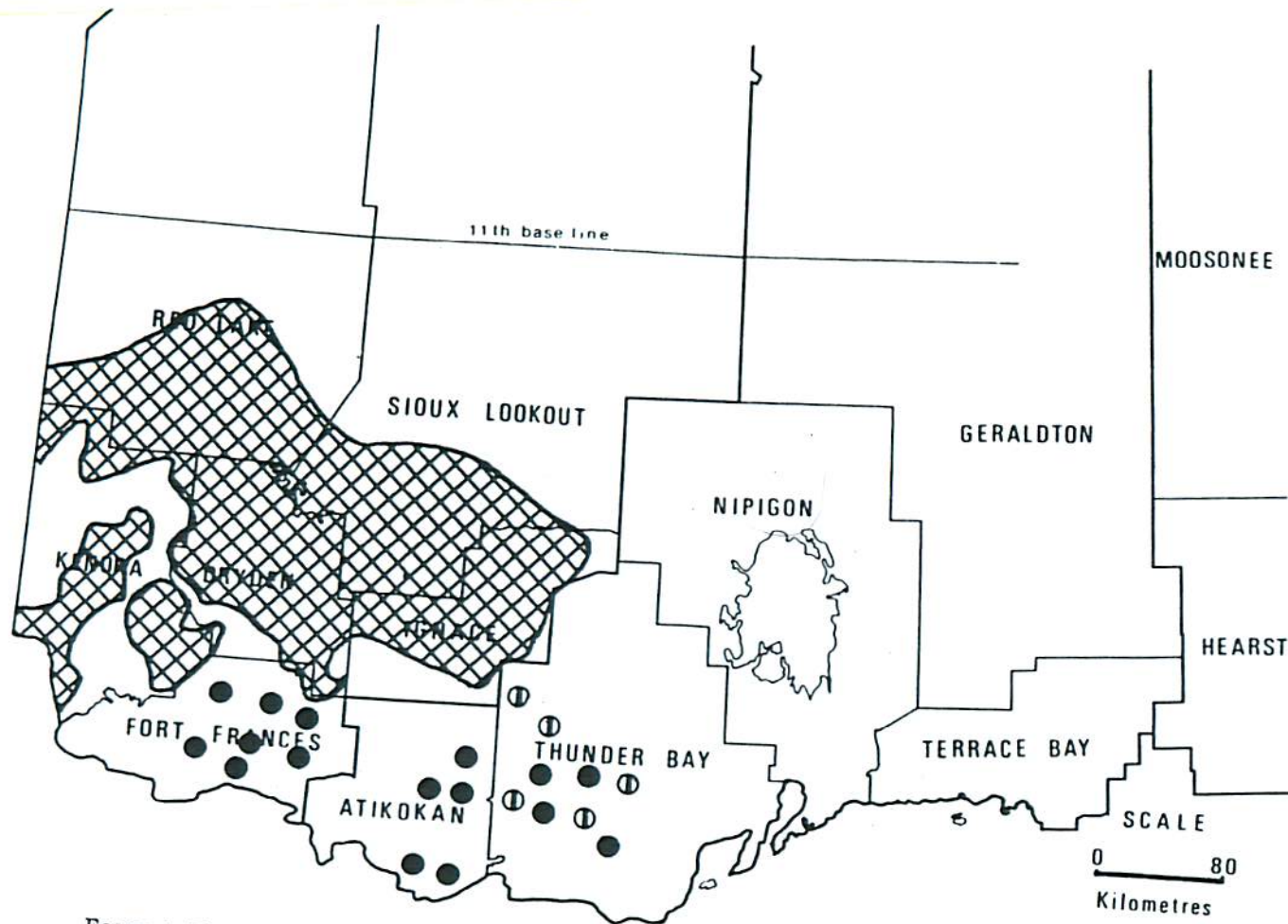
## LEGEND

Light defoliation      ⊗

Moderate-to-severe defoliation      ● or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

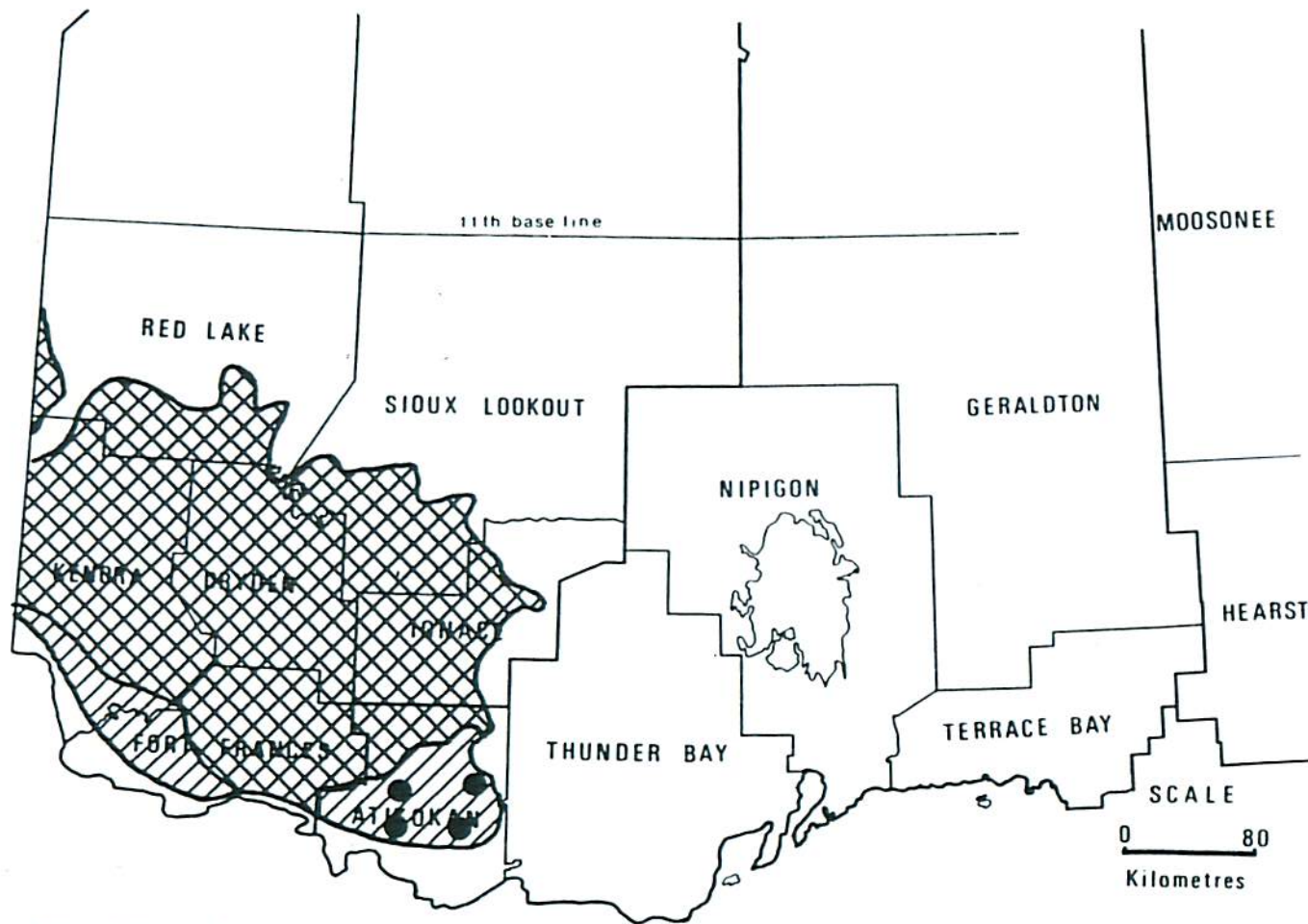
Areas within which defoliation occurred in 1962

## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or [cross-hatched box]

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1963

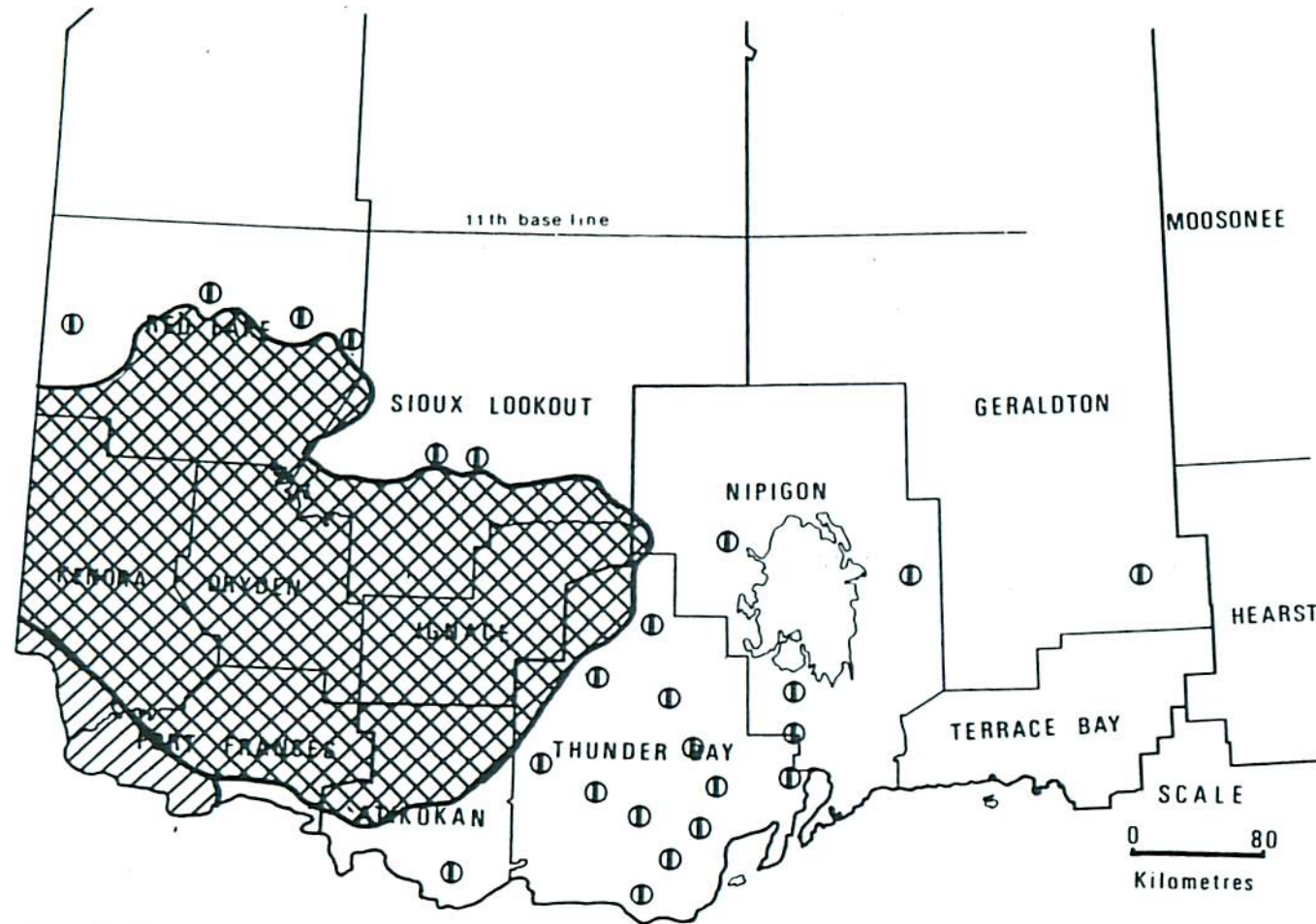
LEGEND

Light defoliation






# NORTHWESTERN ONTARIO




## Forest Tent Caterpillar

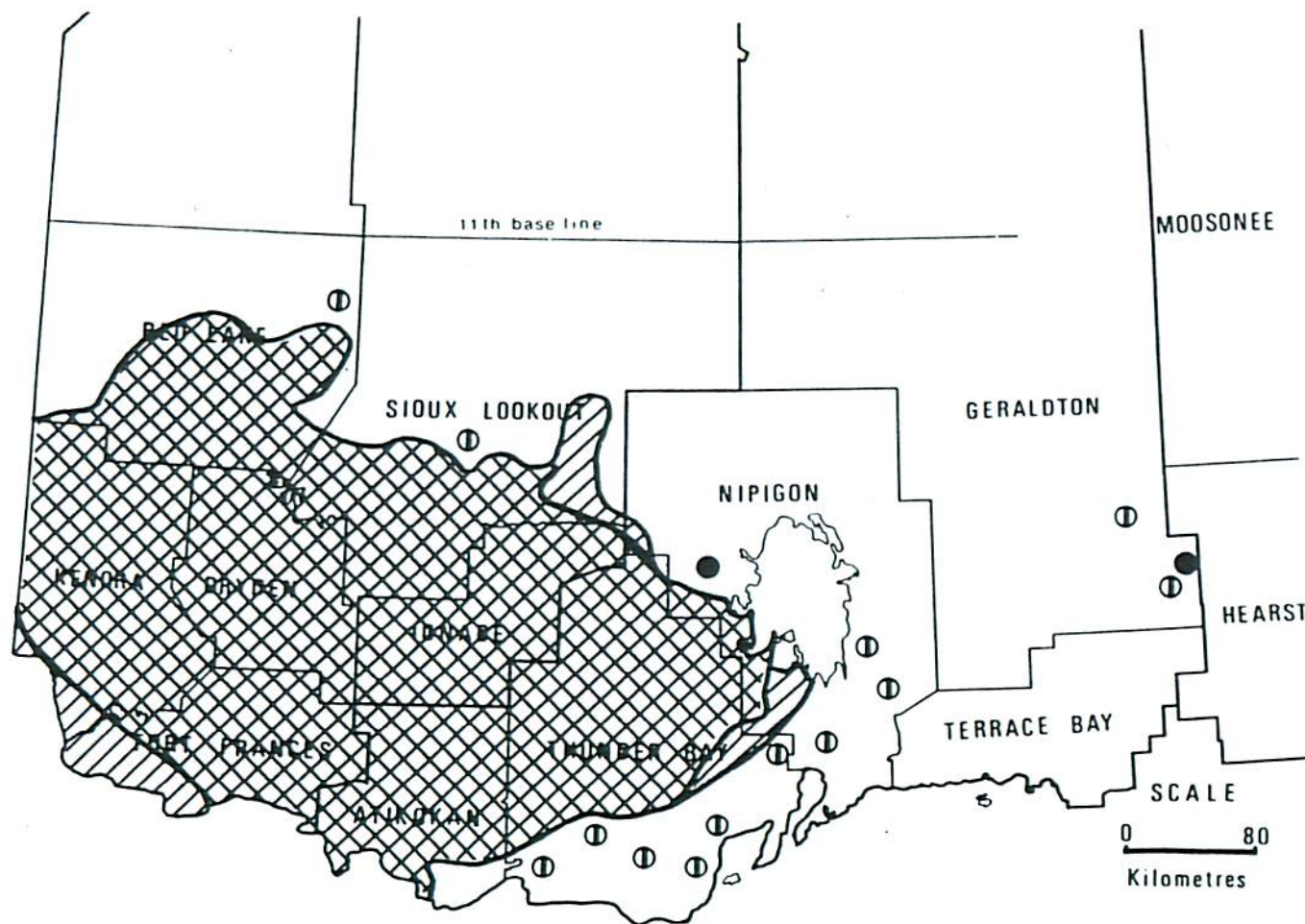
Areas within which defoliation occurred in 1964

### LEGEND

Light defoliation    ①    or    

Moderate-to-severe defoliation    

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

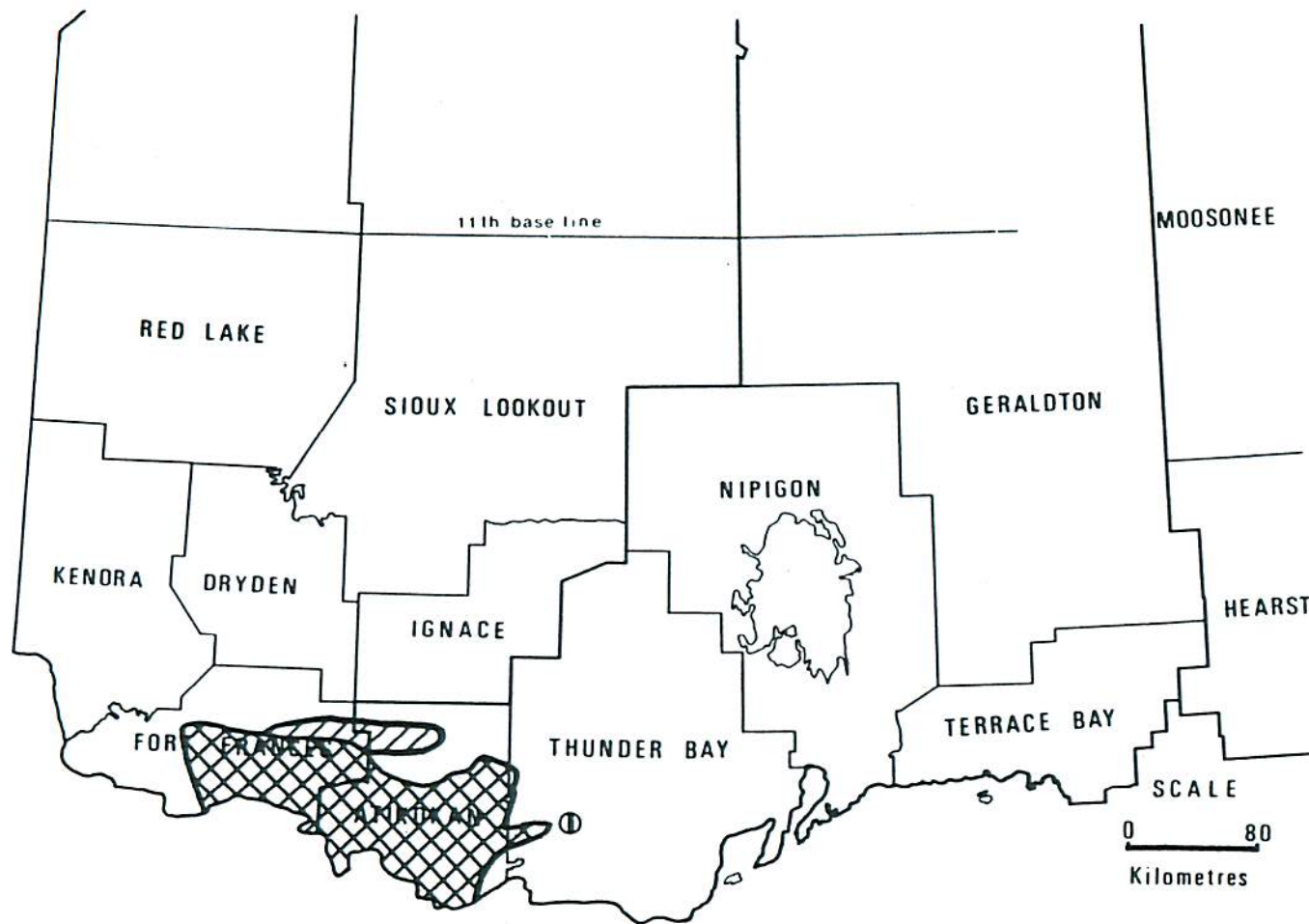
Areas within which defoliation occurred in 1965

## LEGEND

Light defoliation ① or 

Moderate-to-severe defoliation ● or 



# NORTHWESTERN ONTARIO



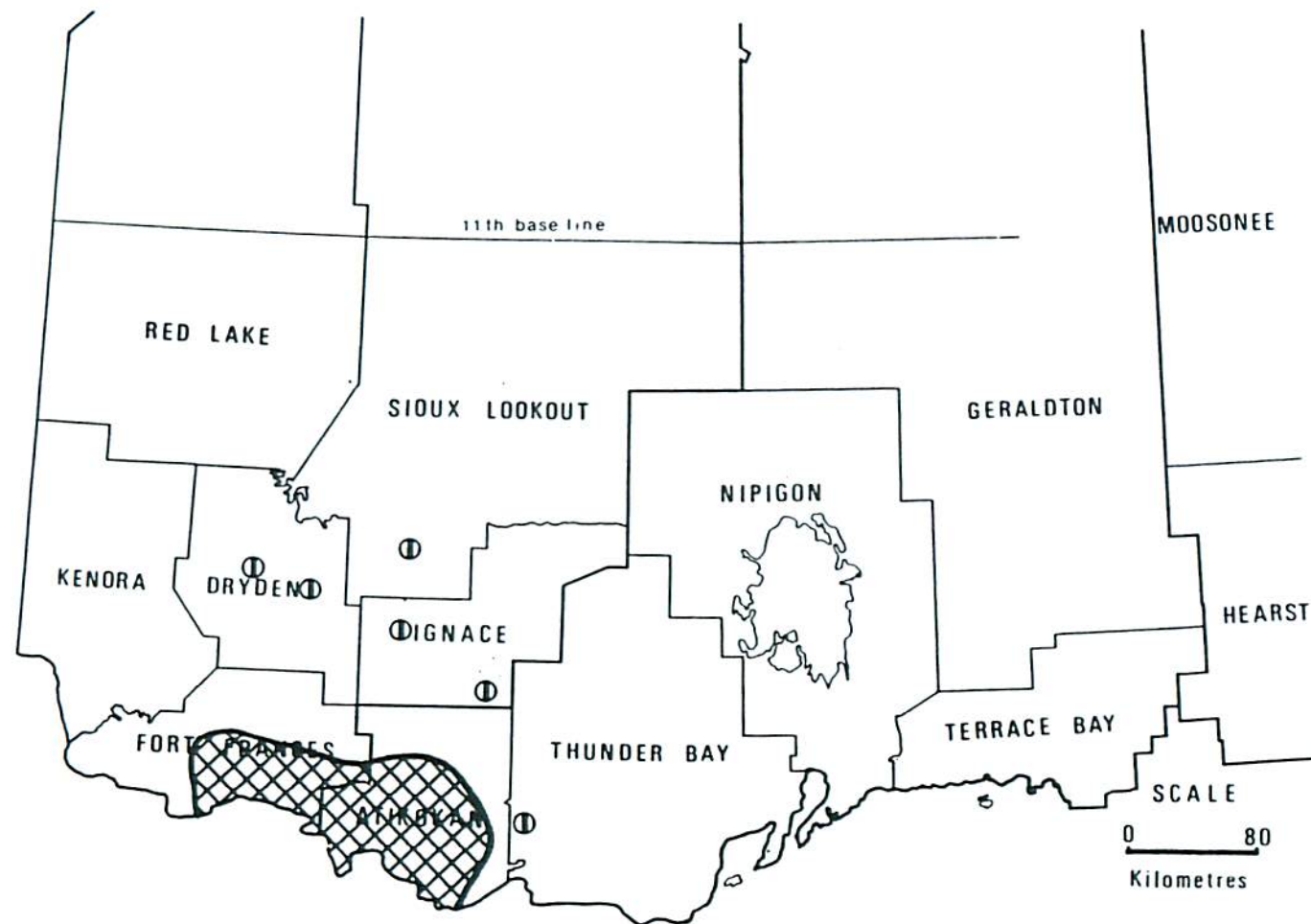
## Forest Tent Caterpillar

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

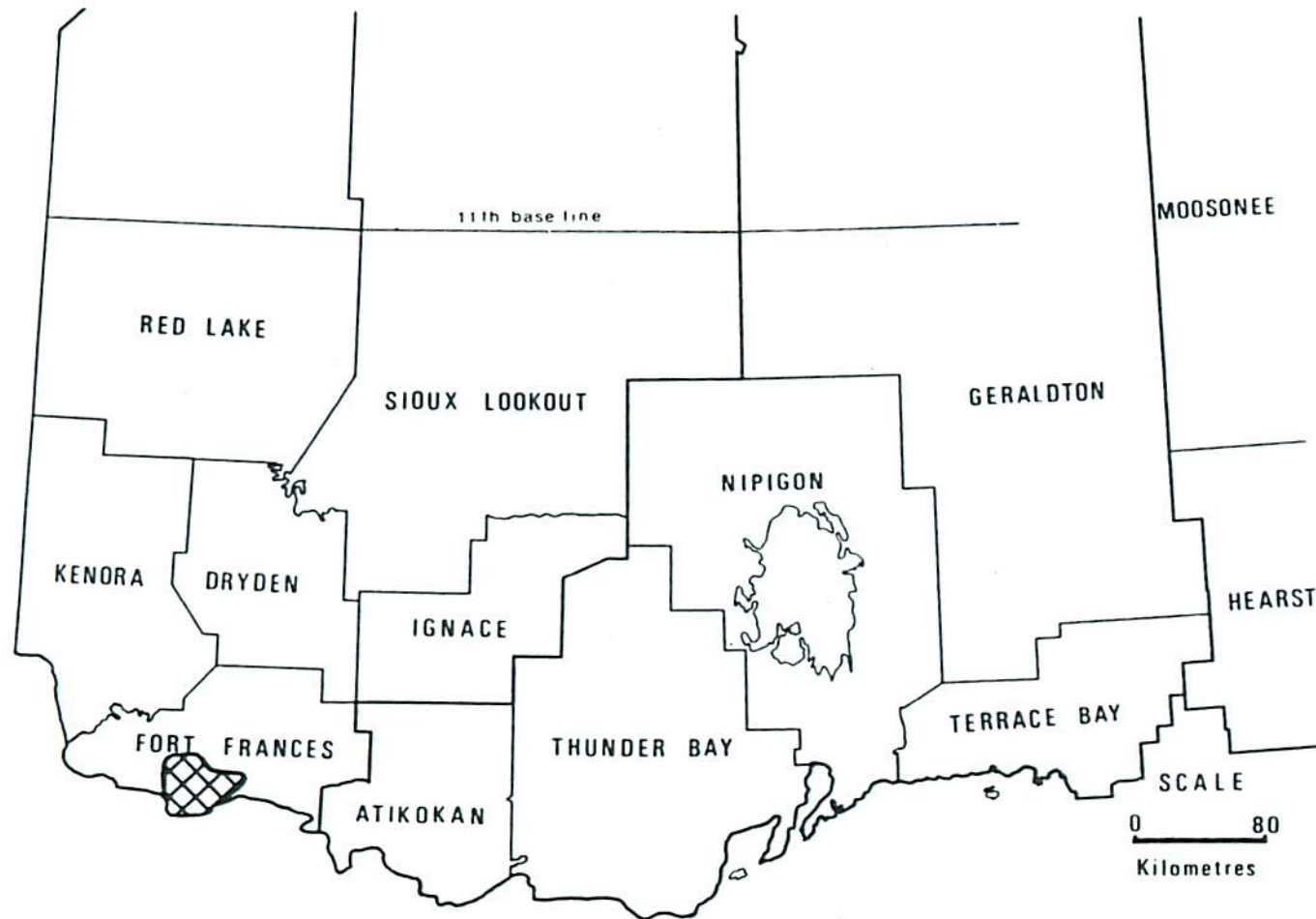
Light defoliation ①

Moderate-to-severe defoliation





# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

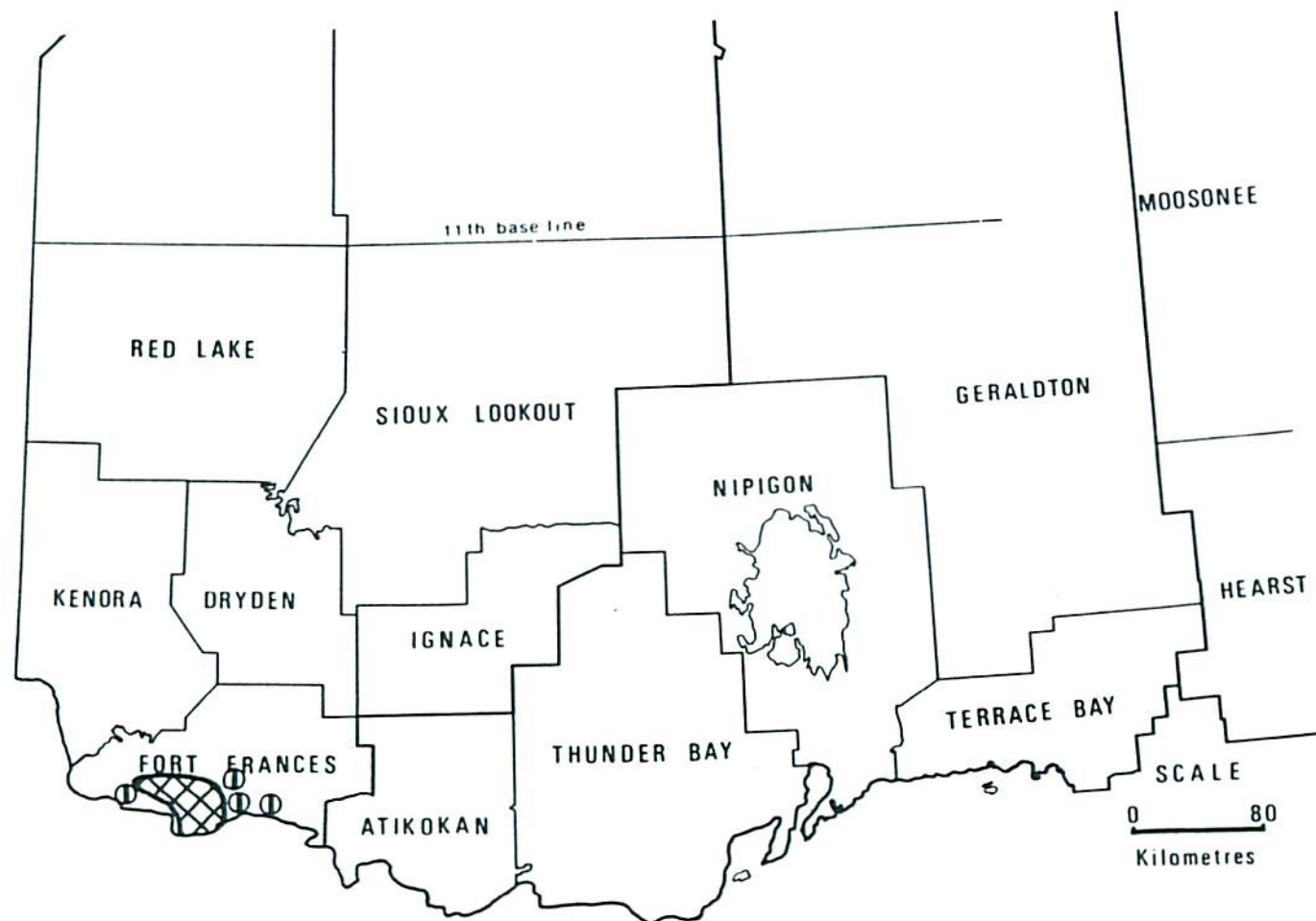
Areas within which defoliation occurred in 1968

LEGEND

Moderate-to-severe defoliation



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

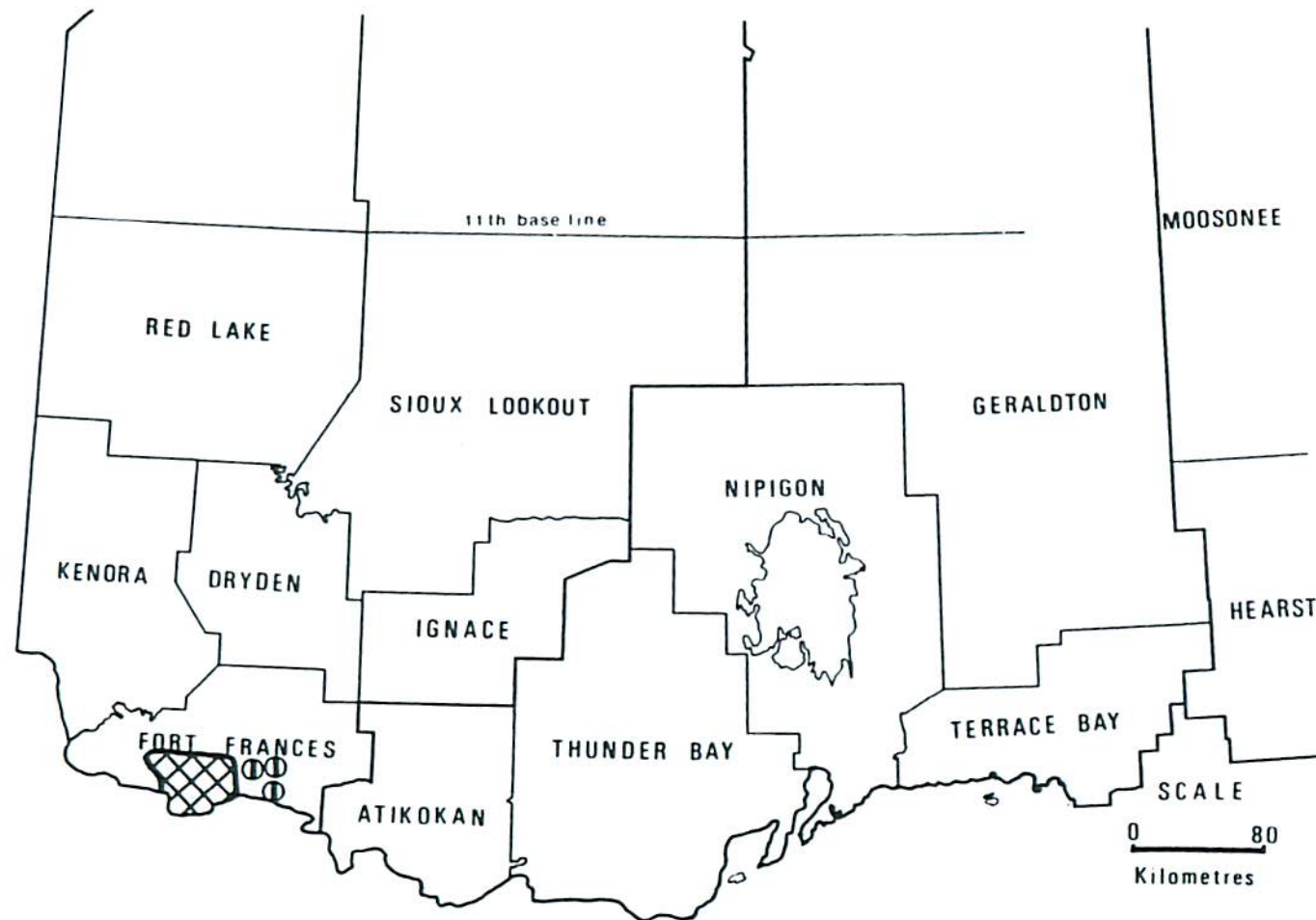
Areas within which defoliation occurred in 1969

## LEGEND

Light defoliation ①



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1970

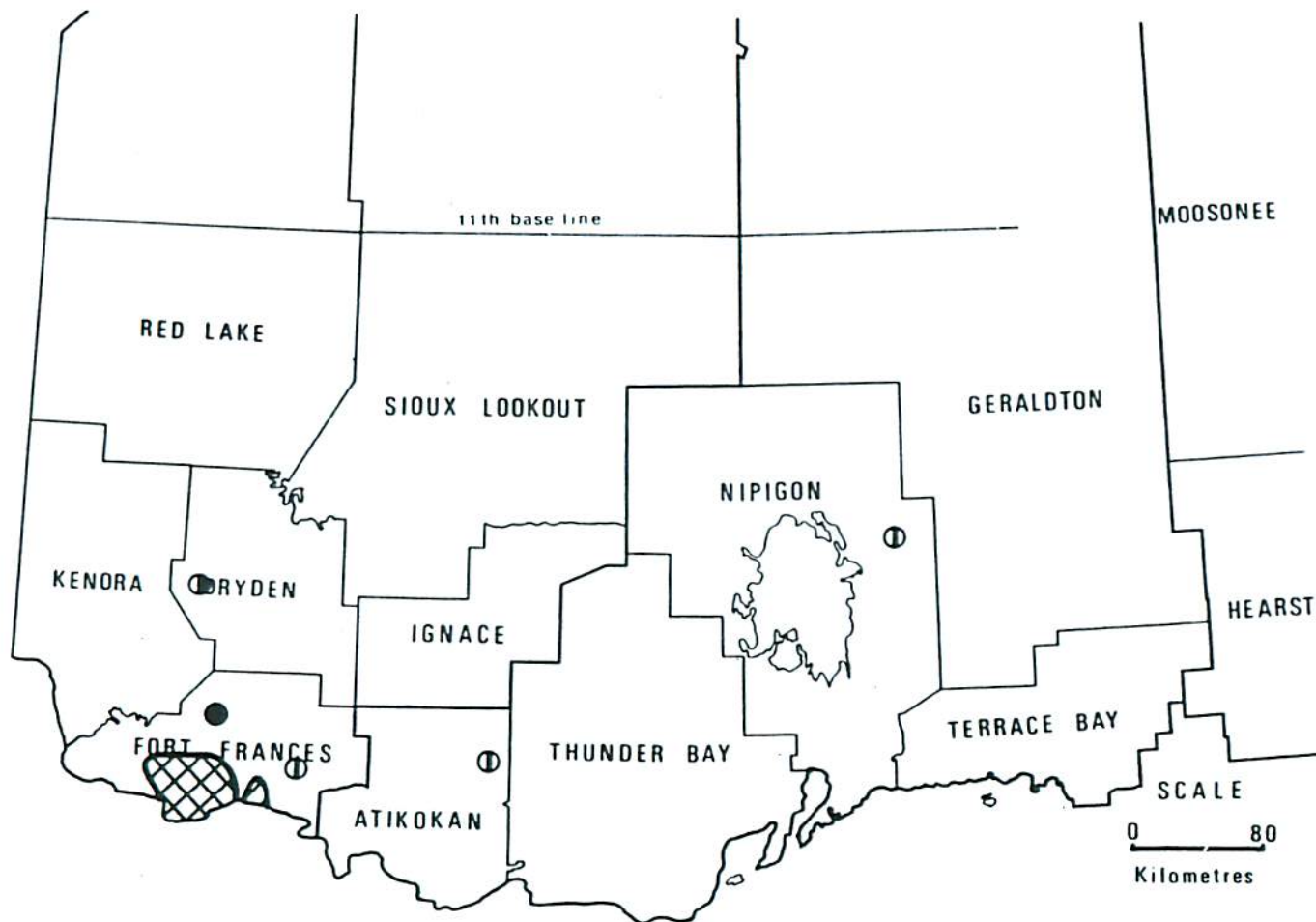
## LEGEND

Light defoliation ①

Moderate-to-severe defoliation




# NORTHWESTERN ONTARIO




Forest Tent Caterpillar

Areas within which defoliation occurred in 1971

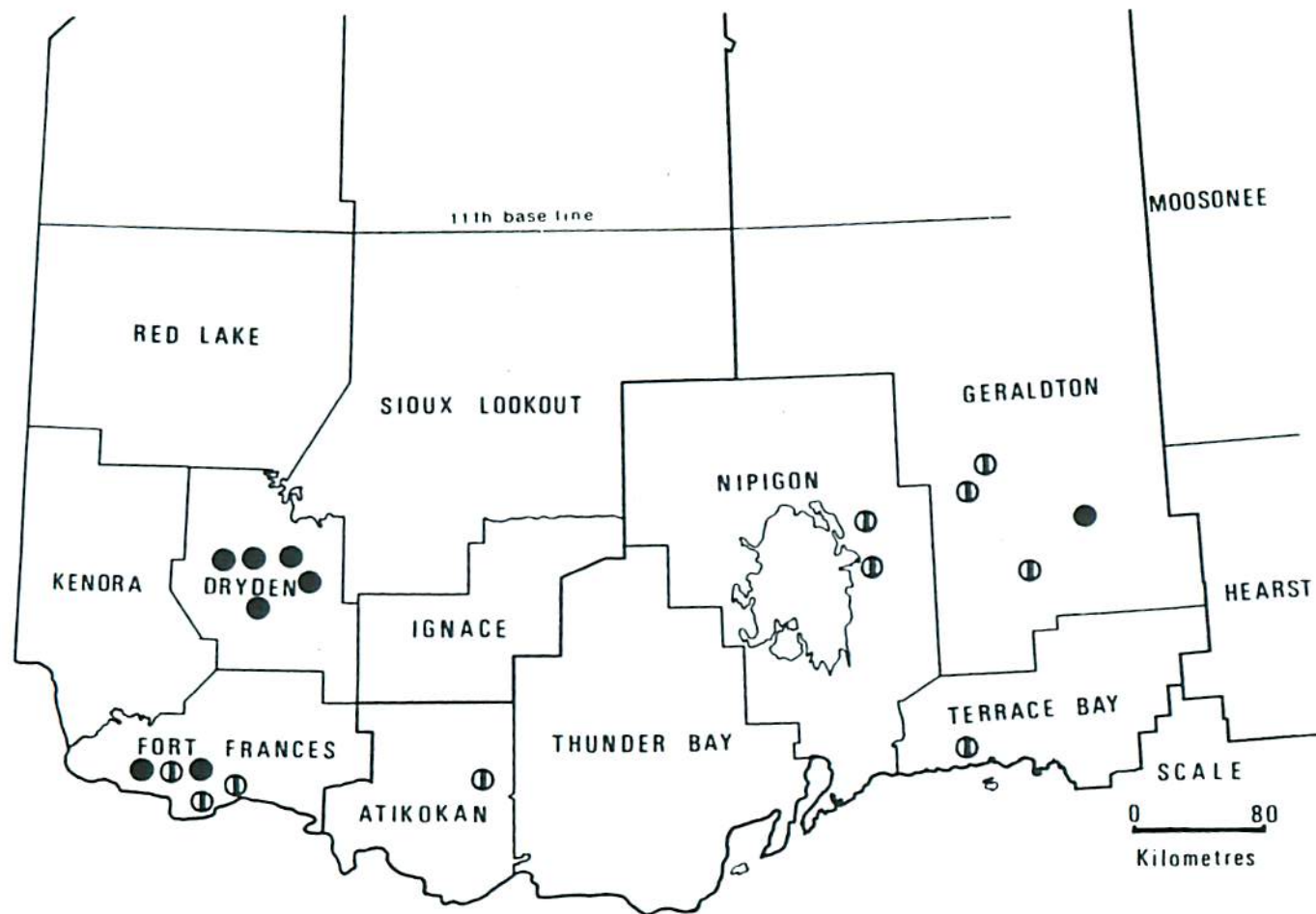
## LEGEND

Light defoliation    ①    or    

Moderate-to-severe defoliation    ●    or    



# NORTHWESTERN ONTARIO



## Forest Tent Caterpillar

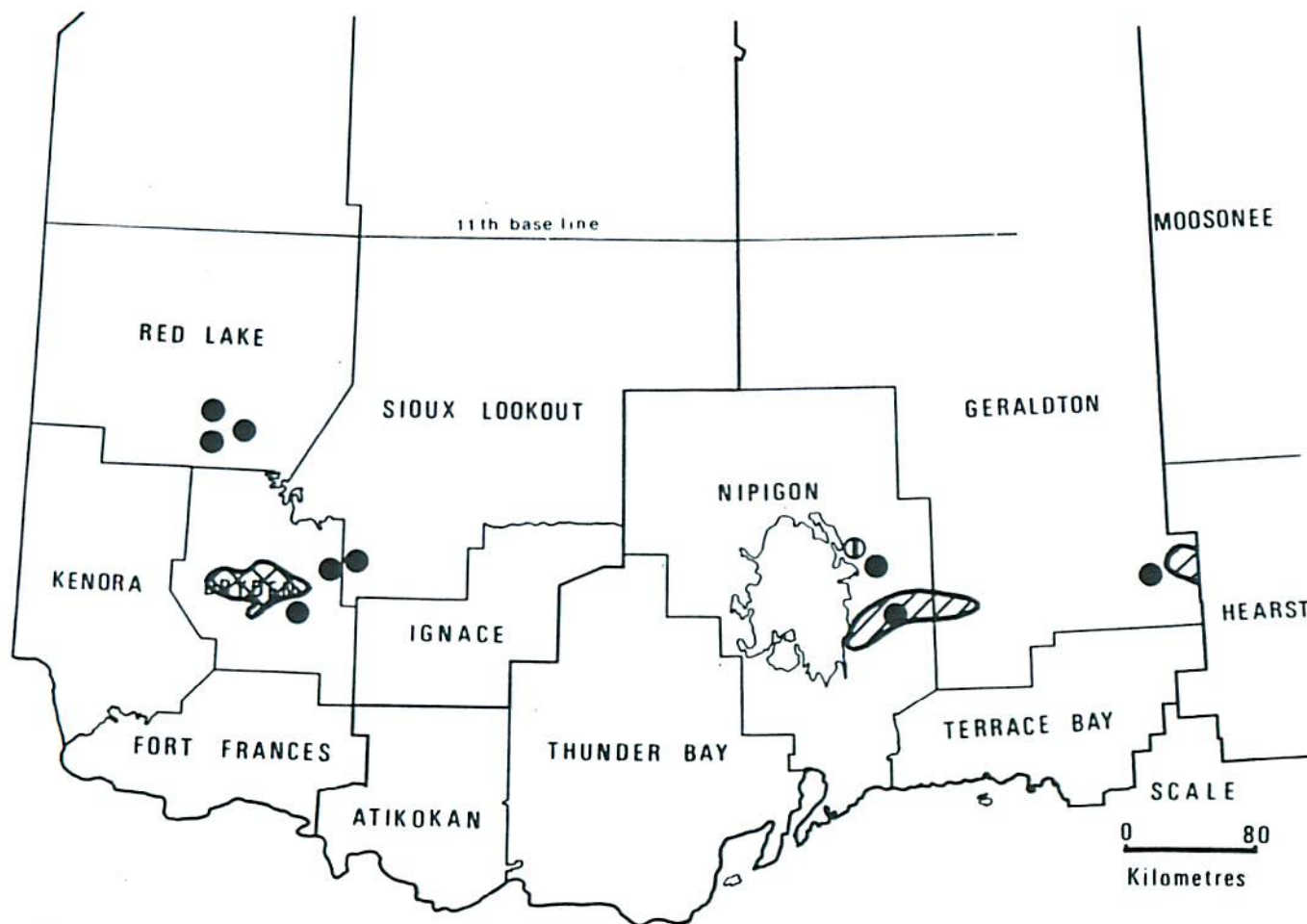
Areas within which defoliation occurred in 1972

### LEGEND

Light defoliation ○

Moderate-to-severe defoliation ●


# NORTHWESTERN ONTARIO




## Forest Tent Caterpillar

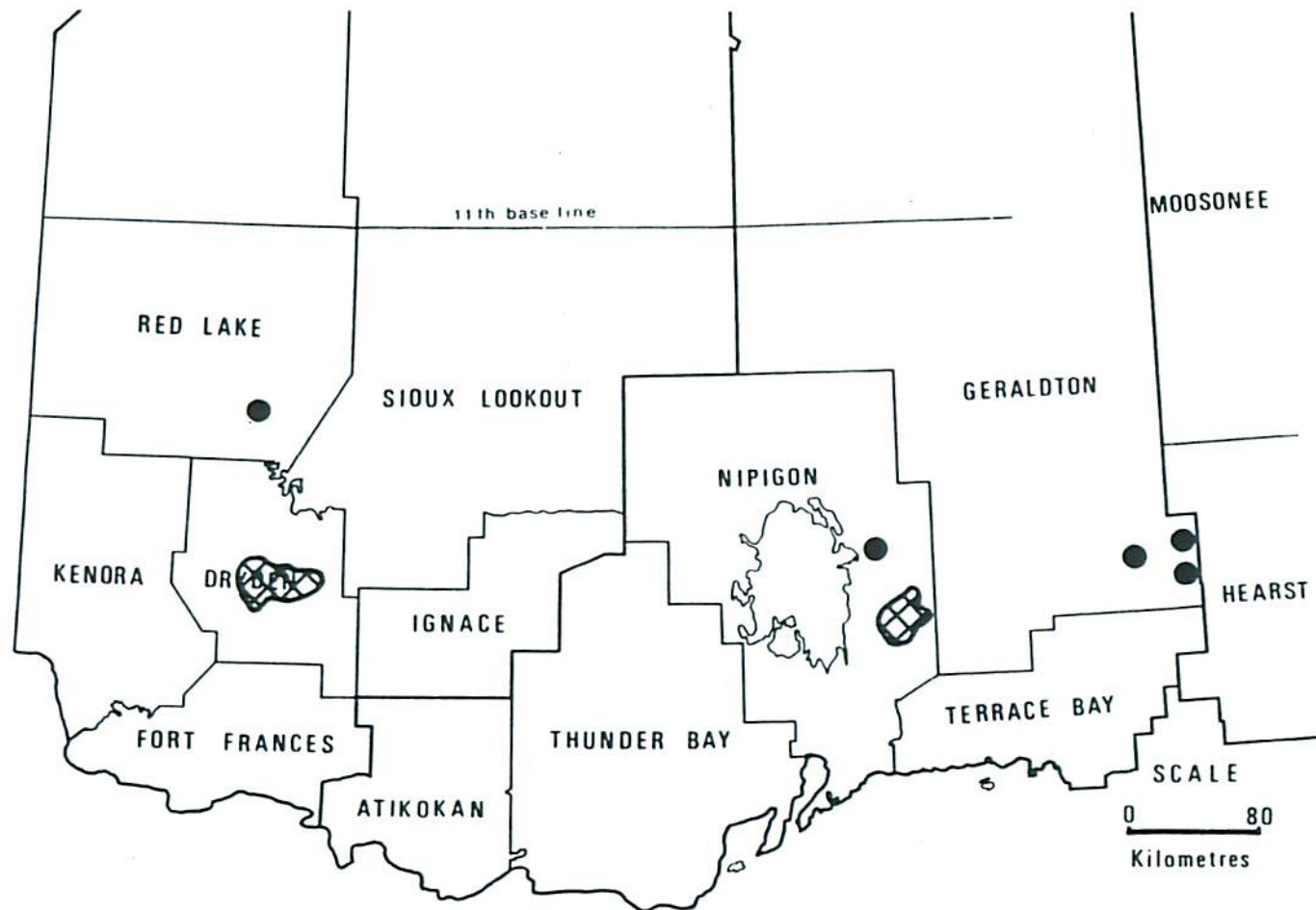
Areas within which defoliation occurred in 1973

### LEGEND

Light defoliation    ○    or    

Moderate-to-severe defoliation    ●    or    

# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

## LEGEND

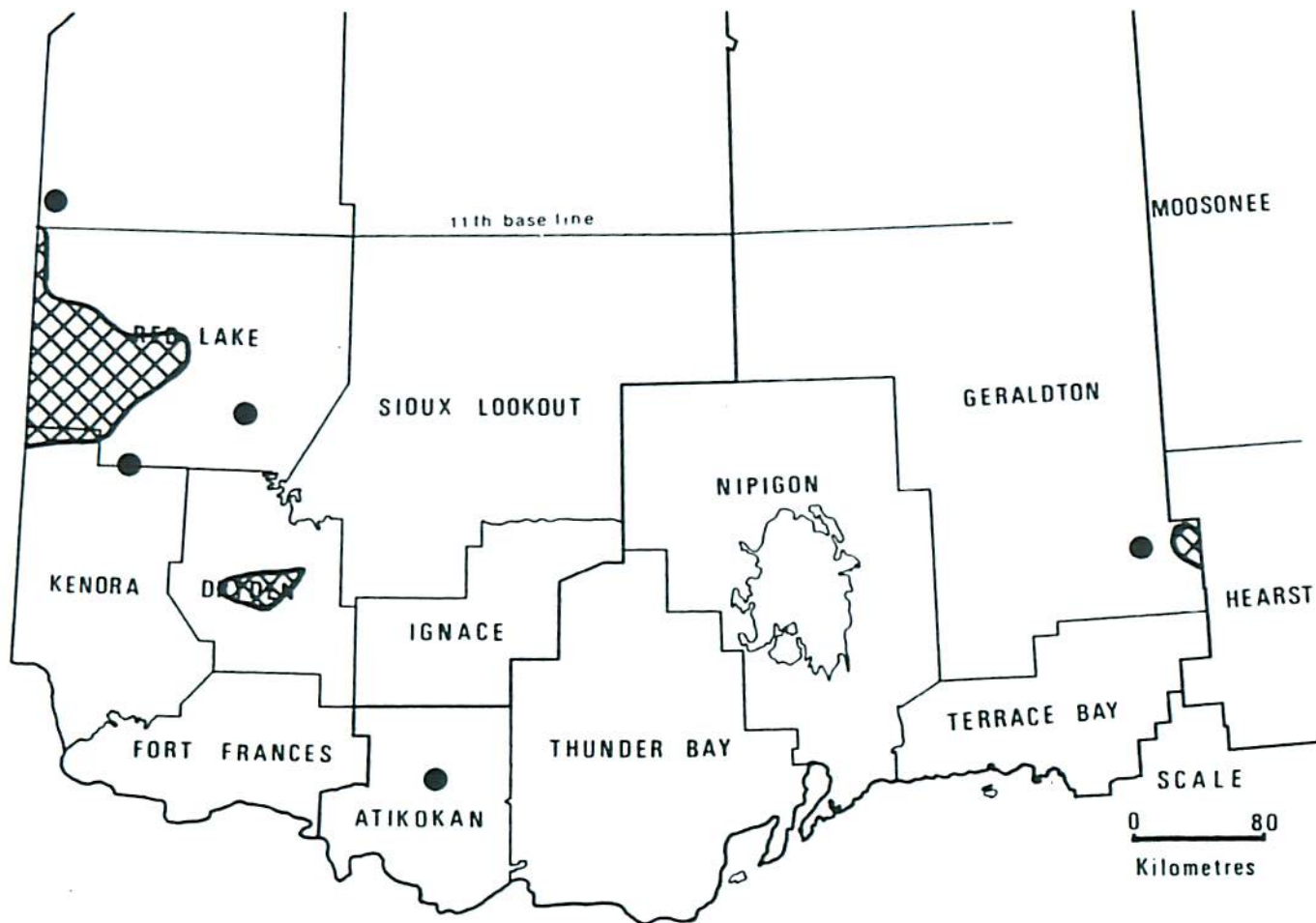
Moderate-to-severe defoliation



or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1975

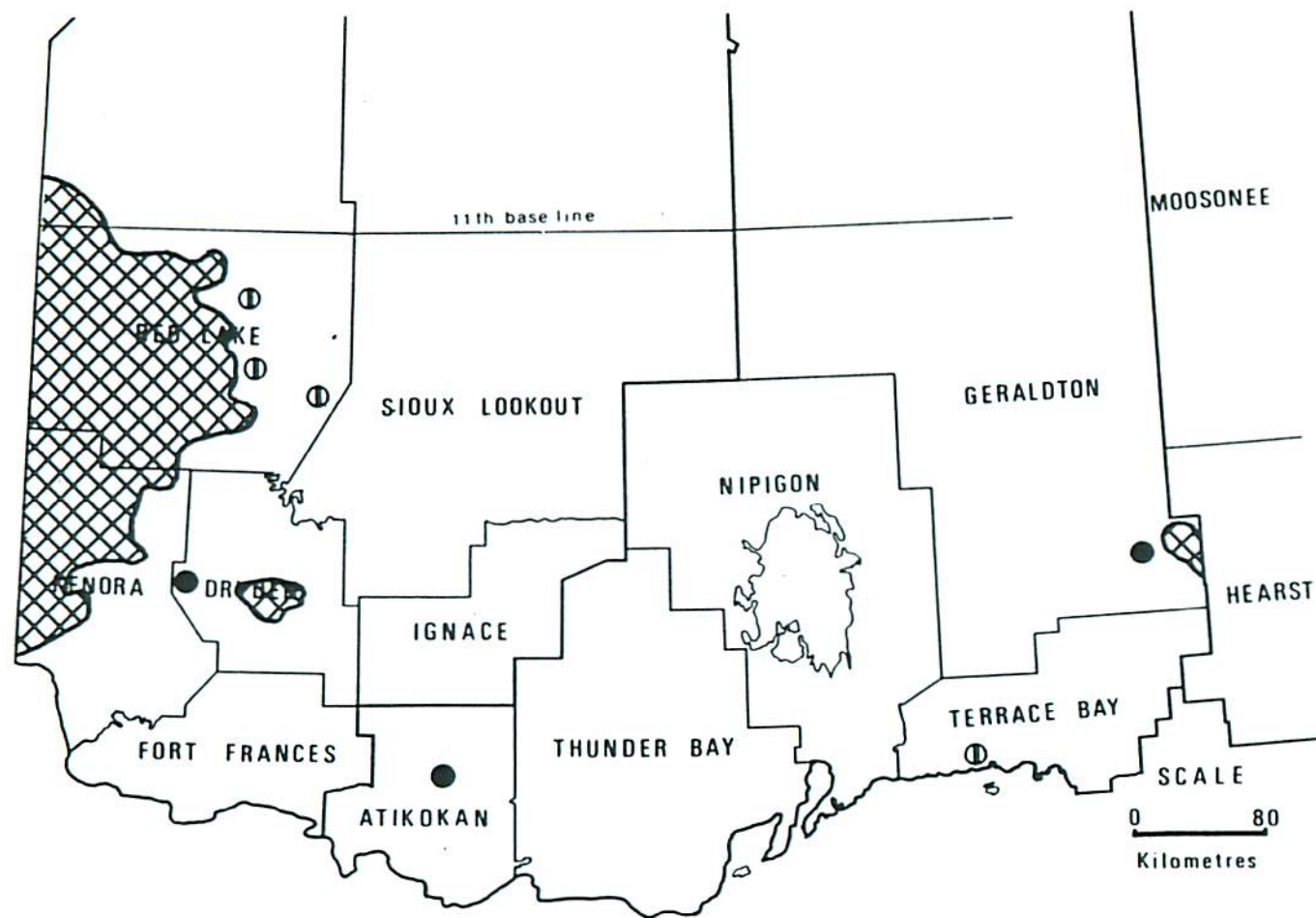
## LEGEND

Moderate-to-severe defoliation ● or





# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1976

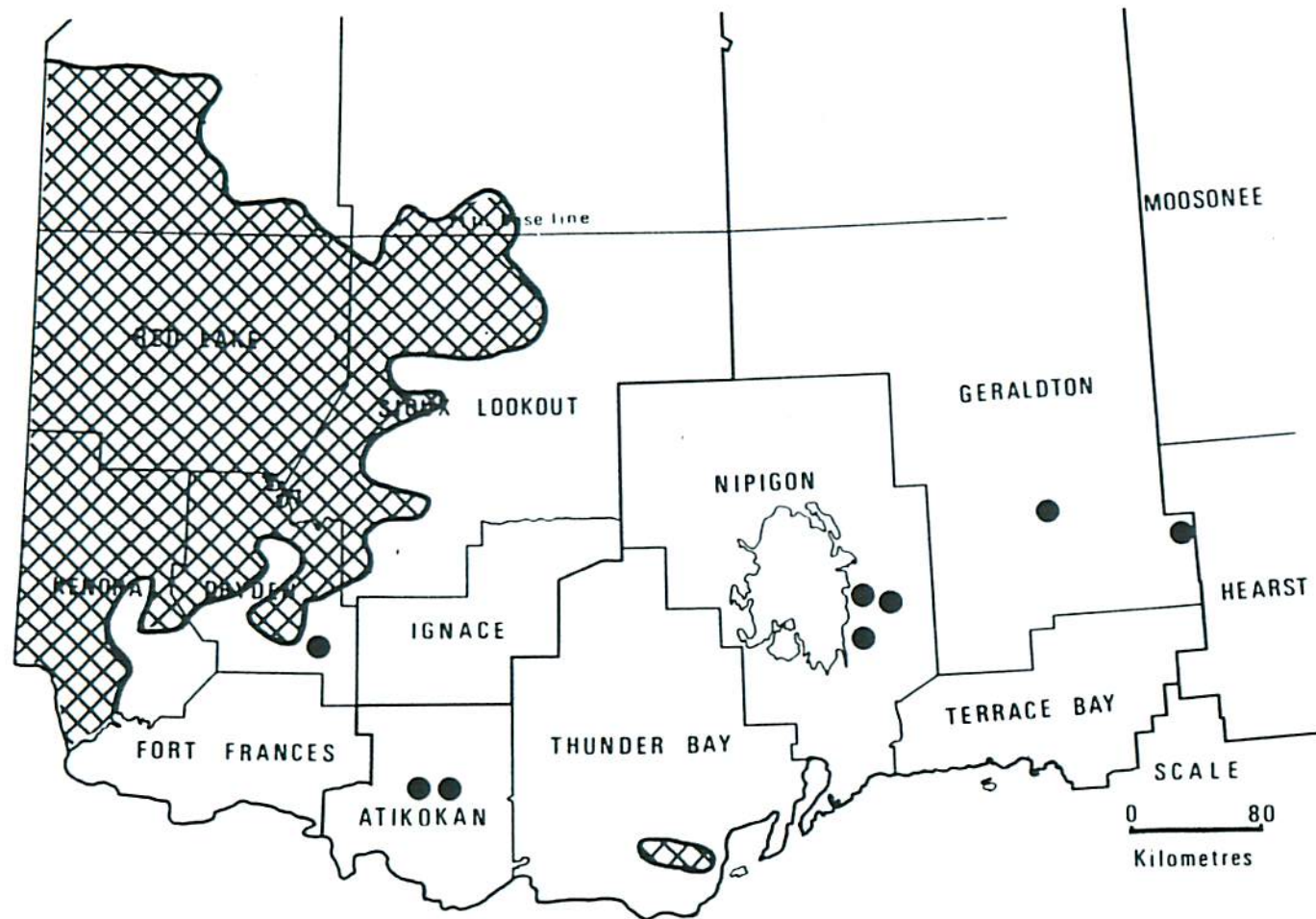
## LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

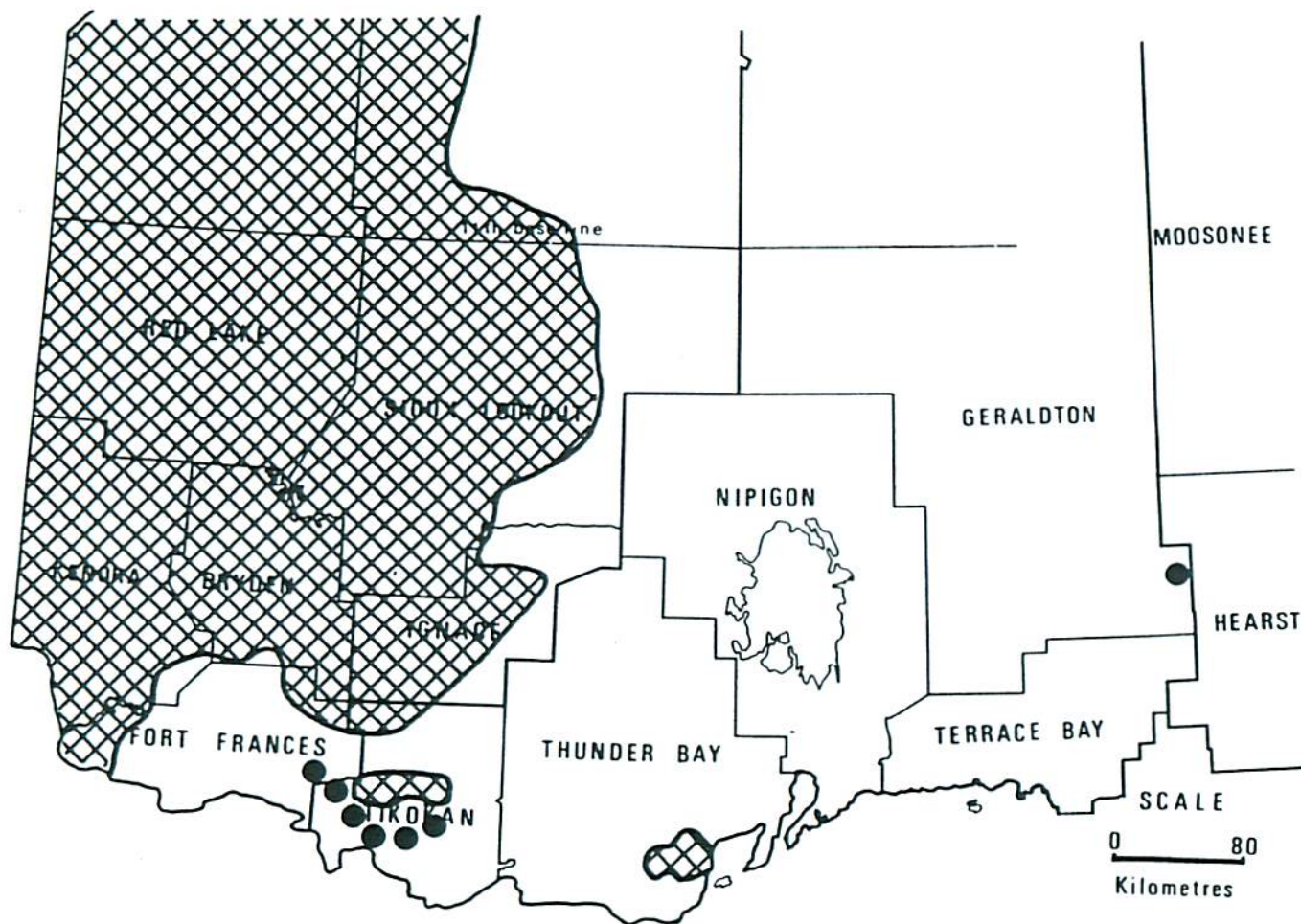
Areas within which defoliation occurred in 1977

## LEGEND

Moderate-to-severe defoliation ● or



# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1978

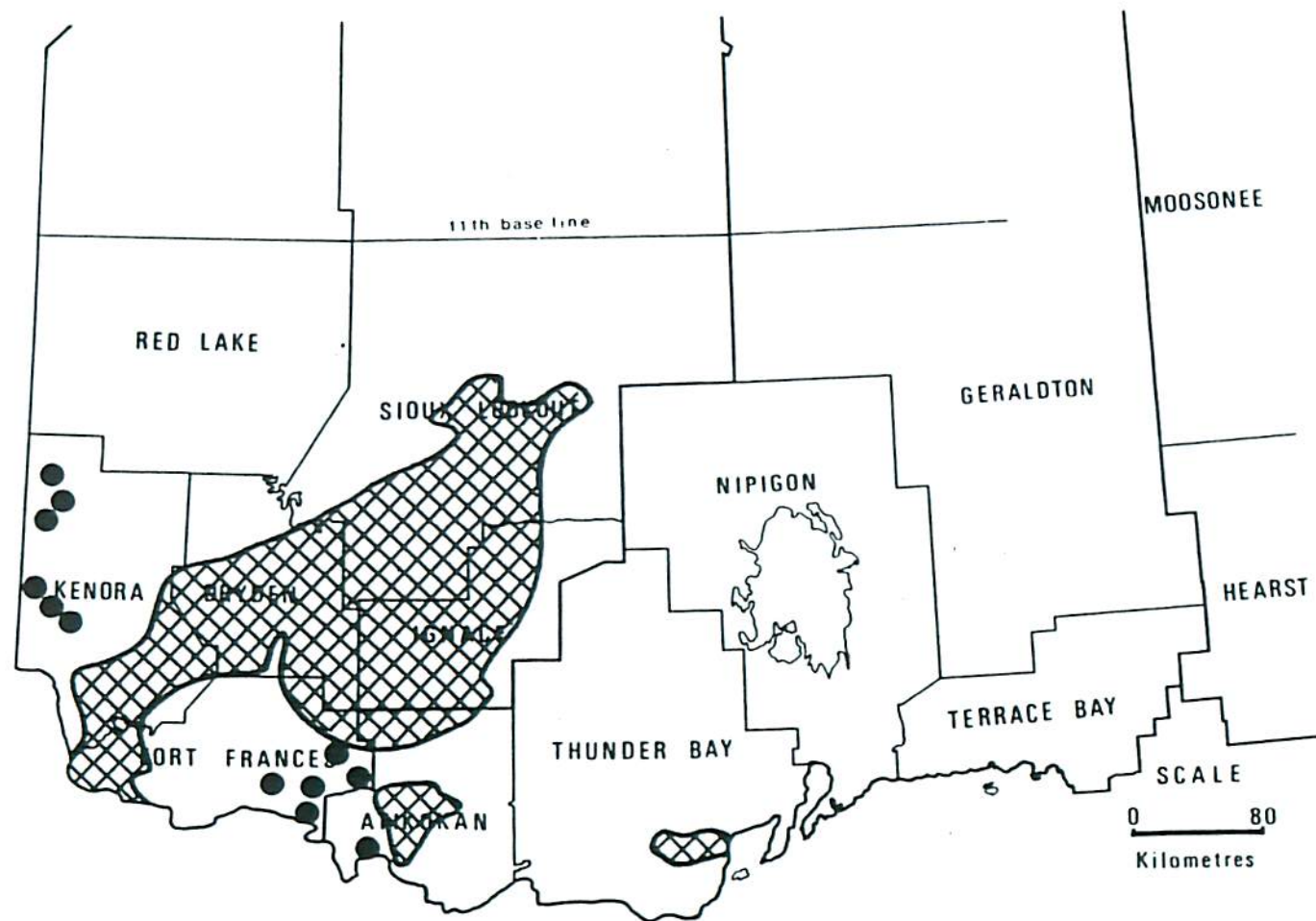
LEGEND

Moderate-to-severe defoliation





# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation

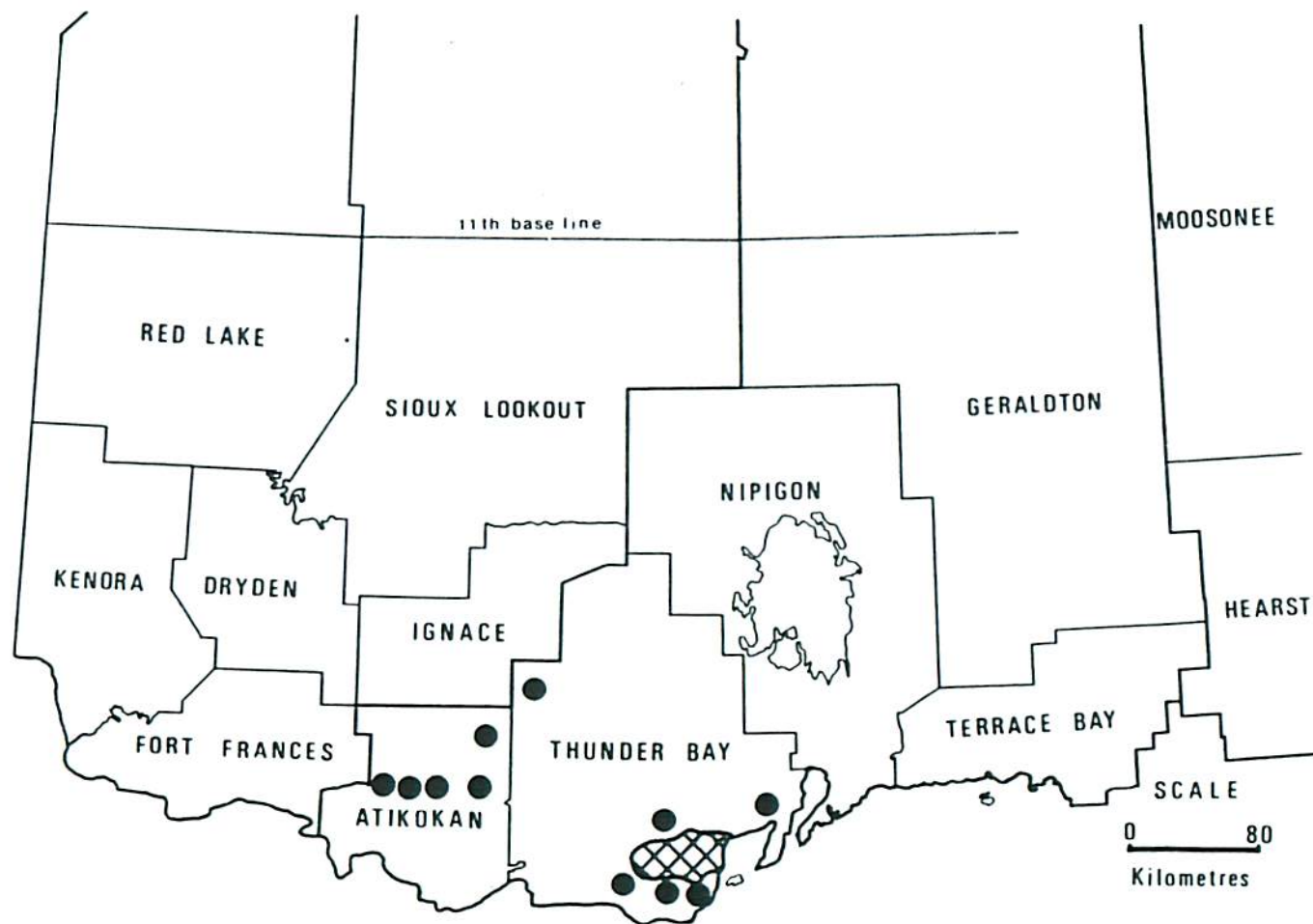


or





# NORTHWESTERN ONTARIO



Forest Tent Caterpillar

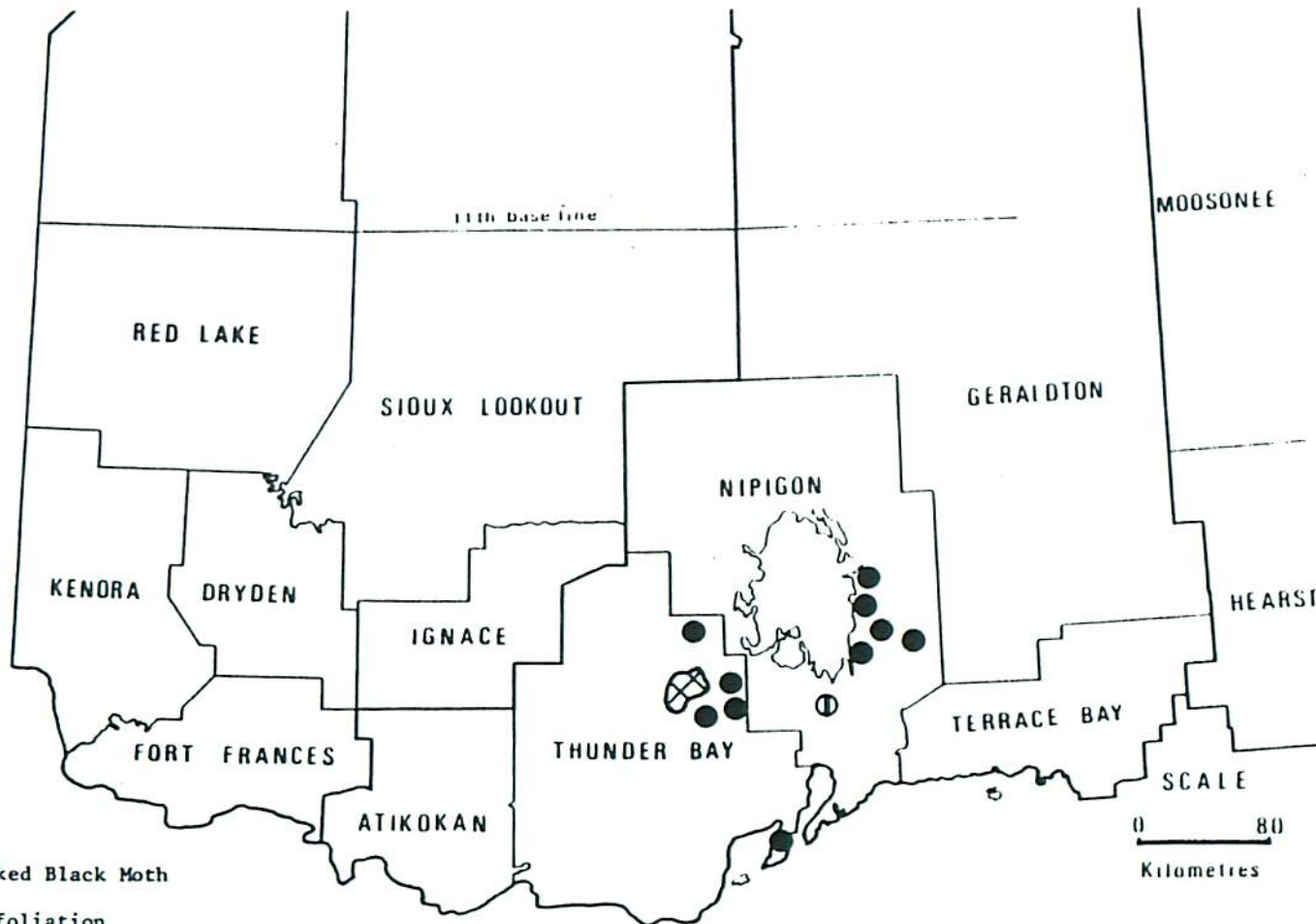
Areas within which defoliation occurred in 1980

## LEGEND

Moderate-to-severe defoliation    ●    or



# NORTHWESTERN ONTARIO



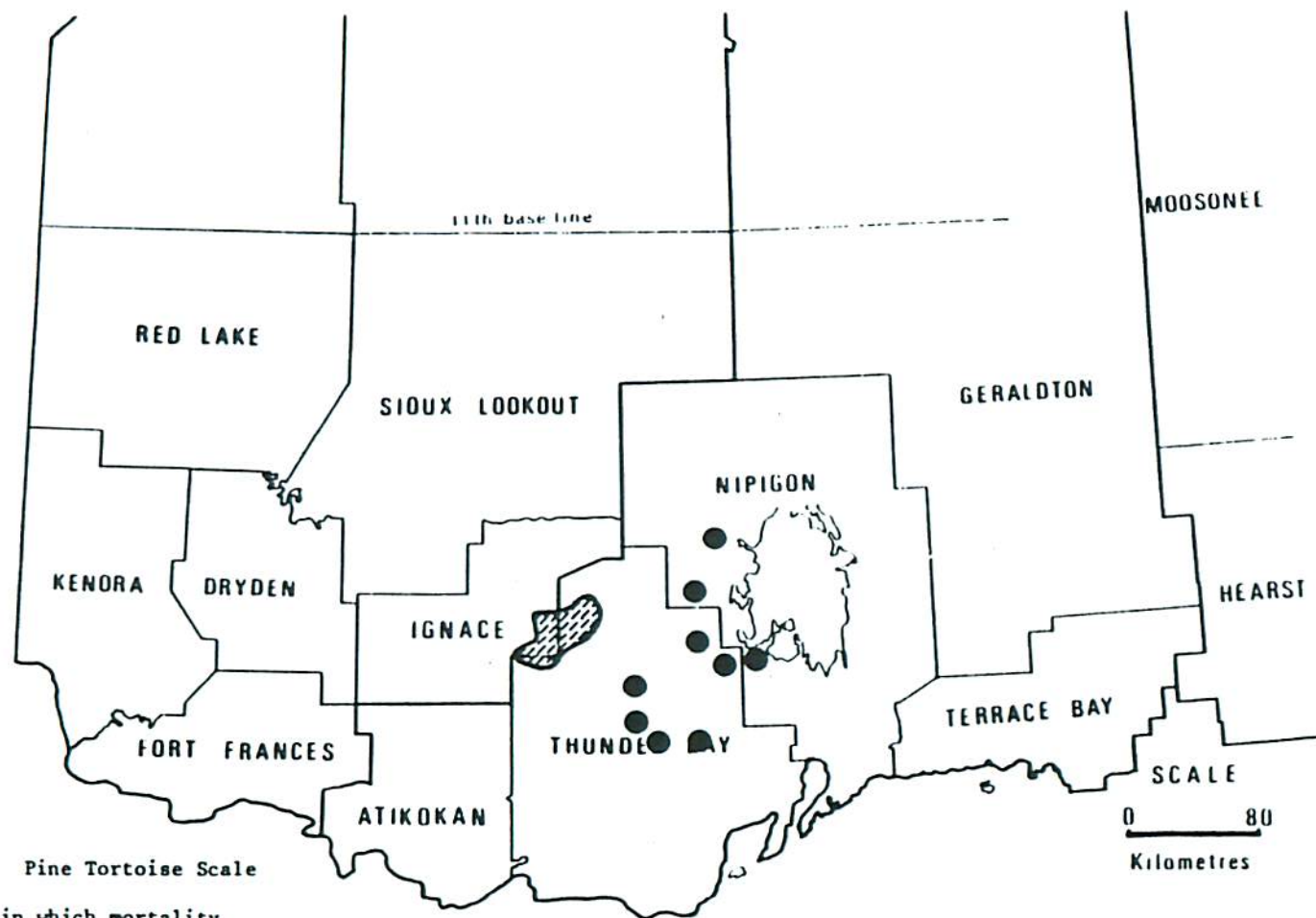
Spearmarked Black Moth

Areas within which defoliation  
occurred in 1962

## LEGEND

Light defoliation ⊕

# NORTHWESTERN ONTARIO



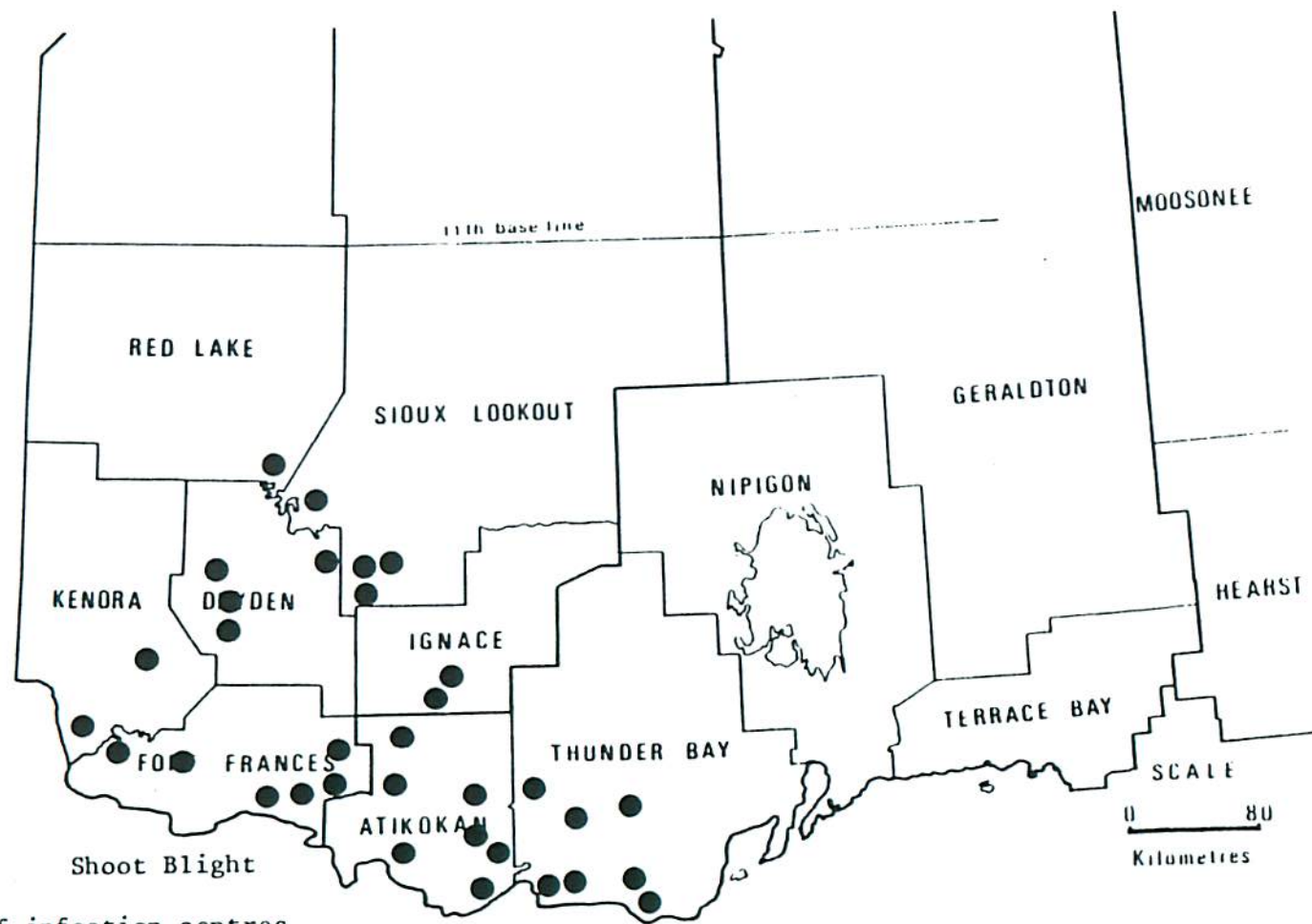
Pine Tortoise Scale

Areas within which mortality  
occurred in 1957

## LEGEND

Mortality ● or 

# NORTHWESTERN ONTARIO



Locations of infection centres  
in 1973

LEGEND



# NORTHWESTERN ONTARIO

