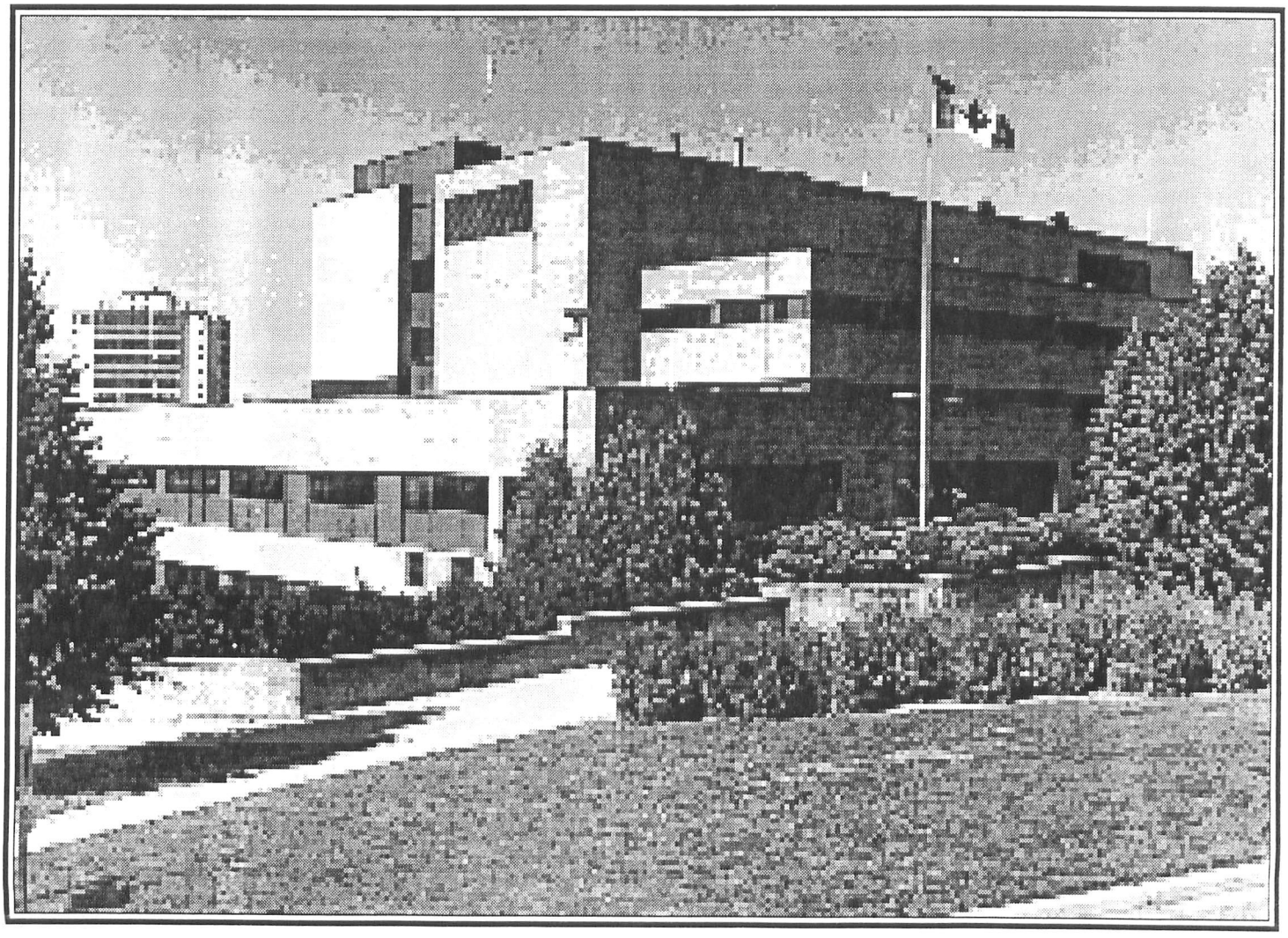
FILE REPORT

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



Natural Resources Canada | Ressources naturelles Canada
Canadian Forest Service | Service canadien des forêts

Canada

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

Compiled by

H.J. Weir and M.J. Thomson[1]

FORESTRY CANADA

ONTARIO REGION

GREAT LAKES FORESTRY CENTRE

1990

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

FOREWORD

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

Major Insects or Diseases

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

Minor Insects or Diseases

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

Abiotic Damage

Damage caused by non-living factors.

All measurements in this review are in metric form and conversions from Imperial measurements from the earliest reports are taken to the second decimal point [i.e., sq. mi. to km^2 = area (sq. mi.) x 2.59 = area km^2]. Infestation maps in this review were copied from the original maps in the FIDS technicians' reports. Abbreviations for the common names of the host tree species, along with the scientific names, are shown in Appendices A and B. To facilitate the location of hosts, deciduous and coniferous species have been separated and listed alphabetically under their common names.

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

ACKNOWLEDGMENTS

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

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

1950-1952	J.C. Charbonneau
1953-1957	L.S. MacLeod
1958-1966	W.J. Miller
1967-1969	M.J. Thomson
1970	R.L. Bowser, V. Jansons, H.J. Weir and M.J. Applejohn
1971	H.J. Weir and M.J. Applejohn
1972-1973	H.J. Weir and W.D. Biggs
1974-1975	H.J. Weir and H.D. Lawrence
1976-1979	H.J. Weir and V. Jansons
1980	H.J. Weir and H.J. Evans

TABLE OF CONTENTS

(cont'd)

TABLE OF CONTENTS (concl.)

INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Minden District between 1950 and 1980, with a brief summary of outbreaks prior to 1950. In the selection of pests for this report particular attention was paid to the major working groups of host species in the district, namely tolerant hardwoods (sugar maple, hemlock, yellow birch, red oak, beech) and the white pine-red pine group (white pine, red pine, jack pine, white spruce, balsam fir, poplar and white birch), as well some ornamental and shade trees. The insects included are capable of causing, or have caused, tree mortality or a reduction in growth. Also included are abiotic problems that cause tree damage, such as salt, winter drying, snow damage, etc.

SUMMARY

FOREST INSECTS

Pine False Webworm, *Acantholyda erythocephala* (L.) [Major]
page

This destructive pest of pine trees causes severe defoliation in red pine, Scots pine and white pine plantations. As a rule the insect does not feed on the current foliage until it has devoured the older foliage; consequently, damage is usually limited to a reduction in increment. High populations were recorded in red pine plantations from 1976 to 1980. No infestations were reported prior to 1976.

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

This serious pest of eastern white cedar can cause tree mortality after a number of years of severe defoliation. High populations were recorded in the southern part of the district between 1974 and 1979. Some mortality was observed in 1980. Populations were not reported prior to 1955.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham. [Major]
page

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 three to four years, then decline rapidly. This insect was not reported between 1964 and 1971, between 1973 and 1980, or prior to 1959.

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

This insect is considered the most destructive insect pest of several coniferous hosts in eastern Canada (mainly white spruce and balsam fir). Though not major hosts, black spruce, eastern hemlock, and tamarack are attacked, and considerable tree mortality can occur. The current infestation started with low populations in 1968, increased from 1969 to 1975, declined considerably between 1976 and 1978, then increased dramatically in 1979 and 1980. Top killing and whole-tree mortality were first recorded in 1974, and by 1980 wholesale mortality was evident. No infestations had been reported prior to the current infestation.

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

Defoliation by this miner, which can weaken trees and leave them susceptible to secondary insects and diseases, may also be a predisposing factor in birch decline. As a rule the insect attacks single trees, but when populations build up, stands of trees are severely defoliated. Severe browning of trees was recorded periodically between 1964 and 1969, and in 1971 and in 1973 and 1974. The insect was not reported prior to 1960.

Hemlock Looper, *Lambdina fiscellaria fiscellaria* Gn. [Major]
page

Because of the wasteful feeding habits of this insect, severe defoliation of mature trees (>50%) can result in tree mortality after as little as one season of attack. Low population levels were reported periodically from 1952 until 1968. Severe defoliation and some mortality occurred in 1978, but the infestation virtually collapsed the following year.

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

This caterpillar is distributed throughout North America. Infestations usually last an average of five years and high population levels denude large areas of susceptible stands. The principal host attacked is aspen; however, many other deciduous species also suffer severe defoliation. Repeated defoliation retards growth and affects vigor, leaving trees susceptible to attack by other pests. Moderate-to-severe defoliation occurred between 1949 and 1953; from 1963 until 1965 and from 1972 until 1978.

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

Severe defoliation can cause mortality of balsam fir and white spruce trees when an infestation persists over a period of years. Moderate-to-severe defoliation was reported in 1961 and 1962 and low population levels were recorded from 1963 to 1976.

Jack Pine Sawflies, *Neodiprion pratti banksianae* Roh.,
N. pratti paradoxicus Ross [Major]
page

These closely related sawflies were considered to be one species prior to 1969. In 1969 the species were separated and most of the insects collected in southern Ontario are now identified as *N. pratti paradoxicus*. Tree mortality can occur after prolonged, severe defoliation. High populations were recorded in 1963, 1964, 1969 and 1980. Scattered colonies have been reported periodically since 1959, although the insect was not reported before then. No mortality has been observed in the district.

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

This destructive pest of pine plantations can cause mortality after several years of severe defoliation. The preferred hosts are Scots pine, red pine and jack pine planted in pure stands. High populations were recorded between 1952 and 1959, from 1963 to 1968, from 1972 to 1976 and from 1978 to 1980. No infestations were reported before 1950. Some mortality was observed after periods of severe defoliation.

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

This destructive insect has been categorized as a serious pest of young spruce plantations and open-growing ornamentals. High mortality can occur after a few years of severe defoliation. Although severe defoliation has not been recorded in any large plantations, single-tree mortality has been observed since 1952. High populations on small numbers of trees were reported in 1956, from 1959 to 1965, from 1971 to 1973, and from 1975 to 1978. The insect was not reported before 1952.

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

This weevil is considered the most destructive pest of white pine in North America. Successive weeviling over a period of years results in multiplestemmed trees. High populations were recorded from 1952 to 1957, from 1960 to 1971, and in 1979 and 1980. In addition, low populations have been common at numerous locations since 1951.

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

The larch sawfly is the primary defoliating insect of native and most exotic species of larch. On good sites, larch trees can withstand six to nine years of severe defoliation before mortality occurs; on less favorable sites, mortality may follow three or more years of complete defoliation. Severe defoliation was recorded between 1959 and 1961, between 1963 and 1965, and in 1971, 1972, 1977 and 1978. Low population levels have been reported periodically since 1955. The insect was not reported before 1955.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.) [Major]
pages

Although mountain-ash trees are not considered merchantable, many are used as shade trees and ornamentals in rural and urban areas. This insect can weaken trees by prolonged, severe defoliation, and subsequent borer infestations can cause mortality. Populations of varying degrees of intensity were recorded during most years since 1952.

Other Noteworthy Insects [Major and Minor]
pages

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

FOREST DISEASES

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

This disease is particularly damaging to young pine trees in plantations. Over a number of years, intensive surveys have been carried out to determine its distribution. The first infection was recorded in 1967 on a small jack pine tree in Minden Township. Subsequently, the disease was found in a small plantation in Glamorgan Township in 1980.

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

This major disease organism, which affects all species of elm, was first recorded in Ontario in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. The disease was first reported in Haliburton County in 1958. The extent of its distribution has increased, and the mortality rate has been high throughout the district.

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

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

A high incidence of the disease was reported in different areas of the district from 1961 to 1966, but there were no reports before 1960.

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

White pine blister rust is the most serious disease of eastern white pine. It causes top killing and mortality in trees of all ages. Between 1953 and 1980 the incidence of this disease was high, and there was some mortality. The disease was not recorded prior to the inception of the Disease Survey in 1952.

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

Mortality caused by this disease is usually restricted to trees in the 7-cm to 13-cm class growing on poor sites, but branch and top mortality may occur in trees of greater diameter. The disease has been widespread in the district since 1953, but was not reported before that.

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

Reduced stocking of regeneration aspen occurs when the incidence of this disease is high. Trees more than 5 years old are seldom affected and, therefore, the disease is of little economic importance in natural stands. A high incidence was reported in 1965 and again in 1976, at separate locations. The disease was not recorded prior to 1959.

Other Noteworthy Diseases
pages

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

DIEBACKS AND DECLINES

Semi-mature-tissue Needle Blight [Major]
page

This condition causes a discoloration of white pine foliage in trees of all ages, but damage is mostly aesthetic. Severe discoloration was reported in 1955, 1964, 1970 and 1977. Light damage has occurred periodically since 1953.

ABIOTIC DAMAGE
pages

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

I N S E C T S

Pine False Webworm, *Acantholyda erythrocephala* (L.) [Major]

Host(s): rP, scP

Year	Remarks
1950-1975	not reported
1976	Severe damage was reported in red pine plantations in Harvey, Minden and Somerville twps. This was the first record of damage in the district.
1977	Severe defoliation recurred in Minden and Somerville twps, and a new heavy infestation was found in Galway Twp.
1978	High populations persisted in Somerville Twp, but populations decreased slightly in Galway Twp.
1979	High populations recurred for the fourth consecutive year in Somerville Twp; decreases were noted elsewhere.
1980	A heavy infestation persisted in Somerville Twp, and populations increased to a high level in Galway Twp. Up to 50% of the previous year's foliage was destroyed in infested areas in both townships.

Cedar Leafminers, *Argyresthia thuiella* (Pack.), *A. canadensis* Free., *Pulicalvaria thujaella* (Kft.) [Major]

Host(s): eC

Year	Remarks
1950-1954	not reported
1955-1958	Trace damage at scattered points
1959-1962	not reported
1963-1966	light infestations observed at numerous points
1967	A heavy infestation occurred in Harvey Twp. Light infestations persisted at numerous points elsewhere.
1968-1973	not reported
1974	A heavy infestation was recorded in Carden Twp; however, a sample from the area revealed an incidence of 30% parasitism in the population. Small numbers were found elsewhere.
1975	There was marked increase in distribution; high population levels were found in Carden, Harvey, Galway, Somerville, Laxton, Digby and Dalton twps.
1976	Moderate-to-severe foliar damage was recorded in Snowdon, Glamorgan, Anson and Minden twps.
1977	High population levels occurred in Harvey, Somerville, Galway, Lutterworth and Minden twps.
1978	Populations declined to a low level except in Somerville Twp, where light-to-moderate damage occurred.
1979	A sharp increase in population levels was recorded in Carden, Somerville, Galway and Harvey twps; light damage was recorded in Cavendish Twp.
1980	There was a sharp decline in population levels throughout the district; however, the first incidence of tree mortality caused by repeated mining of foliage was recorded in Harvey Twp.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch [Major]

Year	Remarks
1950-1958	not reported
1959	Severe skeletonizing and discoloration of foliage caused by large populations of this insect were observed in six townships in the northeastern part of the district
1960	The area of infestation increased markedly throughout the district
1961	A heavy infestation persisted throughout the district
1962	Populations decreased to a generally light level of infestation; however, small pockets of heavy infestation persisted at a few points.
1963	Population levels decreased for the second consecutive year. Only small residual pockets of infestation were left, at a few points in the northern part of the district
1964-1971	not reported
1972	New heavy infestations were reported in Snowdon, Glamorgan, Galway, and Cavendish twps, where severe foliar damage occurred
1973-1980	not reported

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): bF, spruce [Major]

Year	Remarks
1950-1967	not reported
1968	A pocket of light infestation caused light defoliation in Galway Twp
1969	A pocket of medium-to-heavy infestation caused approximately 30% defoliation in a mixed white spruce-balsam fir stand in Harvey Twp
1970	Populations increased markedly. Pockets of severe defoliation were recorded in Harvey, Somerville, Galway, Cavendish, Glamorgan and Monmouth twps
1971	The area of infestation increased for the third consecutive year. Severe damage occurred throughout much of the eastern half of the district
1972	The area of infestation increased for the fourth consecutive year

(cont'd)

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

Year	Remarks
1973	The area of infestation increased for the fifth consecutive year
1974	Infestations persisted; however, the area infested remained much the same as in the previous year The first incidence of balsam fir tree and top mortality was recorded in Somerville, Galway and Cavendish twps
1975	High populations continued to cause severe defoliation; however, little change occurred in the area infested No change in the amount of mortality could be determined
1976	As a result of spectacular decreases in populations, the infestation was confined to the southern quarter and the corner of the district Balsam fir tree and top mortality increased in the southern half of the district
1977	Populations continued to decrease. Infestations were confined to the southern half of the district . The area within which tree mortality occurred increased considerably in the southern part of the district
1978	Populations declined for the third consecutive year. Small pockets of infestation remained at nine places in the western half of the district . Little change in the incidence of tree mortality could be determined from aerial surveys
1979	Populations increased markedly, and caused severe defoliation through most of the southern half of the district. Small pockets of heavy infestation were found at several points elsewhere Aerial mapping revealed that the area within which tree mortality was occurring changed little from the previous year
1980	There was little change in population levels and in area affected Although the amount of tree mortality changed little in the southern half of the district, new pockets of mortality were mapped in Hindon Twp and on the western boundary of Carden Twp

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch [Major]

Year	Remarks
1950-1959	not reported
1960-1963	trace populations at scattered points
1964	New heavy infestations occurred in Hindon and Harburn twps.
1965	The heavy infestation persisted in Harburn Twp, and a new heavy infestation was recorded in Havelock Twp.
1966	Heavy infestations persisted in Harburn and Havelock twps.
1967	A new heavy infestation occurred in Minden Twp; only small numbers could be found elsewhere.
1968	A heavy infestation persisted in Minden Twp; moderate damage was observed in Glamorgan Twp.
1969	A heavy infestation recurred in Minden Twp.
1970	not reported
1971	Severe foliar damage was observed in Glamorgan Twp.
1972	Populations declined to light intensity in Glamorgan Twp, and there were small numbers elsewhere.
1973	Populations increased in Minden Twp, and moderate damage was observed.
1974	Moderate damage recurred in Minden Twp; there was light damage at scattered points elsewhere.
1975	light damage at widely separated points
1976	not reported
1977-1978	light browning at numerous locations
1979	not reported
1980	only trace populations observed

Hemlock Looper, *Lambdina fiscellaria fiscellaria* (Gn.)

Host(s): He, eC, bF [Major]

Year	Remarks
1950-1951	not reported
1952	Trace populations occurred in Havelock Twp.
1953-1957	not reported
1958	Trace populations were observed in Dudley Twp.
1959-1961	not reported
1962	Small numbers occurred in Havelock Twp.
1963	not reported
1964-1965	Trace populations were found in Somerville Twp.
1966	not reported
1967	Trace populations were reported in Somerville Twp.
1968	Trace populations occurred in Minden Twp.
1969-1977	not reported
1978	Pockets of heavy infestation caused severe defoliation and 1% tree mortality through 243 ha of forested land in Harvey and Cavendish twps.
1979	Populations decreased in Harvey and Cavendish twps. The examinations of larvae revealed an incidence of 79% in the area. Tree mortality increased from 1% in the previous year to 13%.
1980	trace populations only

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): deciduous [Major]

Year	Remarks
1950	Pockets of medium-to-heavy infestation were recorded in seven townships in the northern part of the district and in seven in the southern part. Light infestations occurred throughout the remainder of the district
1951	Populations increased, and there was severe defoliation throughout the district
1952	The area of medium-to-heavy infestation increased by approximately 50% from that of the previous year
1953	The area infested decreased by about 50% for the second consecutive year
1954	The infestation collapsed as a result of unfavorable weather conditions during the hatching period and large numbers of caterpillar parasites.
1955-1961	not reported
1962	Small numbers were observed at scattered points
1963	Populations increased; there were pockets of moderate-to-severe defoliation in three townships in the northern part of the district
1964	Populations decreased; one pocket of light infestation was found in Guilford Twp
1965	There was discernible change from the previous year
1966-1971	not reported
1972	small numbers of larvae observed in Minden Twp
1973	Populations increased slightly, and larvae were commonly observed in Minden Twp.
1974	Pockets of moderate-to-heavy infestation occurred in Minden and Cavendish twps, and light defoliation was observed in Snowdon and Glamorgan twps
1975	Populations increased markedly. Pockets of infestation reported in 1974 expanded and joined to form a large area of heavy infestation. In addition, numerous small pockets of new infestation were recorded
1976	A heavy infestation caused severe defoliation of host trees through approximately 80% of the district

(cont'd)

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

Year	Remarks
1977	Although the area of infestation decreased, heavy infestation persisted in approximately 60% of the district
1978	There was a marked decrease in the area infested; however small pockets of heavy infestation persisted in Minden and Sherborne twps . Extremely high numbers of a parasitic fly, *Sarcophaga aldrichii* Park., were present throughout the district.
1979-1980	not reported

Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF, spruce [Major]

Year	Remarks
1950-1951	not reported
1952	Light infestations occurred in Snowdon and Lutterworth twps.
1953	Populations were more widely distributed. Light infestations were observed in Lutterworth, Laxton, Somerville, Dysart and Monmouth twps.
1954	There was little change from the previous year. Light infestations were observed in Lutterworth, Laxton, Somerville, Dysart and Monmouth twps.
1955	Light infestations persisted.
1956	Populations declined to trace levels except in Monmouth Twp, where a light infestation persisted.
1957	Populations remained at much the same level as in 1956.
1958	Populations increased. Light infestations were recorded in Monmouth, Guilford, Stanhope, Digby and Somerville twps.
1959	Population levels decreased by about 50%.
1960	little change in population levels over the previous year
1961	A small pocket of heavy infestation occurred in Somerville Twp, and medium infestations were observed in Stanhope and Galway twps. Elsewhere, populations remained at a low level.
1962	Small pockets of heavy infestation were found in Monmouth and Somerville twps, and small numbers were observed at scattered points.
1963	Populations declined to a low level.
1964-1968	small numbers at a few points
1969	small numbers observed in Lutterworth, Monmouth and Dudley twps
1970-1974	not reported
1975	scattered colonies observed in Minden and Hindon twps
1976	Small numbers of colonies occurred at numerous points.
1977-1980	not reported

Jack Pine Sawflies, *Neodiprion pratti banksianae* Roh,
N. pratti paradoxicus Ross

Host(s): jack pine [Major]

Note: These closely related sawflies were considered to be one species prior to 1969. In 1969 the species were separated and most of the sawflies collected in the southern part of Ontario were identified as *N. pratti paradoxicus.*

Year	Remarks
1950-1958	not reported
1959	a few larval colonies observed in Carden and Longford twps
1960	scattered colonies observed in Carden Twp
1961	A pocket of infestation caused light damage in Dalton Twp.
1962	The population in Dalton Twp increased in intensity.
1963	A marked increase was observed in the population in Dalton Twp. As much as 75% defoliation occurred on some trees.
1964	The heavy infestation persisted in Dalton Twp. A few colonies were observed in Carden
1965	Populations decreased to a low level in Dalton Twp. Small numbers of colonies were observed in Minden Twp.
1966	Populations remained at a low level in Dalton and Minden twps.
1967-1968	Small numbers of colonies were observed at two points.
1969	A new heavy infestation was found in Galway Twp.
1970-1973	not reported
1974	Small numbers of colonies were observed at scattered points.
1975-1979	not reported
1980	A pocket of heavy infestation caused severe defoliation in a small group of jack pine in Minden Twp.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Host(s): pine [Major]

Year	Remarks
1950	low populations at widely distributed points
1951	no discernible change over the previous year
1952	Populations increased. Pockets of heavy and medium infestation were observed in Stanhope Twp, and moderate defoliation occurred in Somerville Twp. Surveys elsewhere revealed light damage in seven additional townships.
1953	A heavy infestation recurred in Stanhope Twp. New heavy infestations were recorded in Minden and Somerville twps. Pockets of light and moderate defoliation were observed at several other locations.
1954	Heavy infestations recurred in Minden Twp and a new heavy infestation was found in Monmouth Twp. Moderate or light defoliation was observed at three points elsewhere.
1955	A heavy infestation persisted in Minden Twp. Surveys revealed light damage in five additional townships.
1956	A heavy infestation recurred in Minden Twp and a new heavy infestation was reported in Somerville Twp. Light damage was observed in five additional townships.
1957	A heavy infestation occurred in Somerville Twp. One pocket of medium infestation and several pockets of light damage were observed in four other townships.
1958	Populations increased. Pockets of heavy infestation occurred in Harvey, Somerville, Havelock and Sherborne twps. Light defoliation was observed at several points in nine additional defoliation.
1959	Populations decreased. A single pocket of heavy infestation occurred in Havelock Twp.
1960	not reported
1961	light defoliation observed in Minden and Guilford twps
1962	not reported
1963	Populations increased. Severe defoliation occurred in Guilford Twp.
1964	Populations increased. Severe defoliation recurred in Guilford Twp. New heavy infestations were found in Snowdon and Glamorgan twps.
1965	The only heavy infestation reported occurred in Somerville Twp.

(cont'd)

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch) (cont"d)

Year	Remarks
1966	Populations increased. Heavy damage occurred in Stanhope, Minden and Glamorgan twps and in Somerville Twp for the second consecutive year.
1967	Populations increased for the third consecutive year. Medium or heavy infestations were observed in eight townships.
1968	Populations decreased, except in Galway and Somerville twps. Light damage was observed for four other townships.
1969	Populations decreased for the second consecutive year. Damage was confined to one pocket in Dysart Twp.
1970	not reported
1971	light defoliation observed in Hindon Twp
1972	Populations increased. Moderate damage occurred in Hindon and Stanhope twps.
1973	light-to-moderate defoliation observed in four townships in the southern half of the district
1974	Populations remained much the same as in the previous year.
1975	Populations were widely distributed. Light infestations occurred in Galway, Harvey, Lutterworth, Minden and Snowdon twps.
1976	Populations decreased. Light infestations occurred in Lutterworth, Minden and Somerville twps.
1977	no discernible change in population levels over the previous year
1978	Populations increased. Pockets of heavy infestation caused severe defoliation in Lutterworth and Minden twps.
1979	Severe defoliation recurred in Minden Twp. Light infestations were observed in Stanhope and Laxton twps.
1980	A general increase in populations of this destructive pest of plantation red pine trees developed over the last three years in the Algonquin Region. Concern on the part of the Ontario Ministry of Natural Resources about the damage caused by this insect in Crown-owned, Woodlands Improvement Act and private plantations prompted a request to the Forest Pest Management Institute in Sault Ste. Marie to carry out an experimental aerial and ground spray program in the region to combat defoliation by this sawfly. In 1980 a control program was conducted in 96 plantations in six districts There were eight aerial applications and 88 ground-spray treatments with nuclear polyhedrosis virus over 539.8 ha.

(cont'd)

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

Year	Remarks
	The spray treatment was applied when the majority of the larvae were in the second- and third-instar of the development, but when third- and fourth-instar larvae were encountered later in the summer, malathion was added to the treatment at some locations to speed up the destruction of the pest. Preliminary results of this spray project were considered excellent, but final results will have to be evaluated in 1981, when surveys are conducted to determine populations.

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

Host(s): spruce [Major]

Year	Remarks
1950-1951	not reported
1952	small numbers on small open-growing and roadside white spruce at scattered points
1953	little change in population levels over the previous year
1954	trace populations observed in Lutterworth, Laxton and Sherborne twps
1955	Low population levels were common.
1956	Populations increased. Small numbers of small open-growing white spruce were severely defoliated at several points small-diameter open-growing plantation trees at numerous points.
1958	Populations declined.
1959	Populations increased markedly and caused severe defoliation of white spruce shade trees, ornamentals and hedge-rows at several points in Laxton, Somerville, Dudley and Dalton twps
1960	A pocket of heavy infestation caused severe defoliation in Anson Twp. Elsewhere, low population levels were commonly observed.
1961	Heavy infestations on clumps of small white spruce in Stanhope Twp caused as much as 75% defoliation. Surveys elsewhere revealed only small numbers.
1962	Very small numbers of trees were severely defoliated at widely separated points.
1963	Small pockets of severe defoliation were observed in Minden, Guilford and Somerville twps. Trace defoliation occurred at several points elsewhere.
1964	Small numbers of trees were severely defoliated at scattered points.
1965	A small pocket of heavy infestation occurred in Minden Twp. Low population levels were observed at numerous points elsewhere.

(cont'd)

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

Year	Remarks
1966	A light infestation occurred in Snowdon Twp. Trace populations were found at a few points elsewhere.
1967-1968	Low population levels were common throughout the district.
1969	Populations increased. Light defoliation was observed on small-diameter open-growing white spruce at several points.
1970	not reported
1971	Small numbers of trees were severely defoliated at scattered points.
1972	High populations recurred on small numbers of trees at scattered points.
1973	Small pockets of light, moderate or severe defoliation occurred at several points.
1974	Population levels decreased. Only light defoliation was observed.
1975	Small numbers of open-growing small-diameter trees were severely defoliated at a few points.
1976	There was little change in population levels. Small numbers of trees were severely defoliated.
1977	Small pockets of heavy infestation were observed at a few points.
1978	There was little change from the previous year. Small, heavy infestations persisted.
1979	Populations decreased. Only small numbers of larvae could be found.
1980	The numbers of larvae increased on open-growing trees.

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce [Major]

Year	Remarks
1950	not reported
1951	populations widely distributed throughout the district
1952	high populations on young white pine at numerous points
1953	Extensive damage to white pine reproduction recurred at several points.
1954	Severe damage caused by high populations of this weevil occurred in Minden, Somerville, Snowdon, Glamorgan, Dysart and Anstruther twps. Damaged terminals averaged 43% in these areas.
1955	High populations recurred in Minden, Somerville, Snowdon, Glamorgan and Dysart twps. Terminal damage averaged 31% in the above townships. A new infestation was recorded in Stanhope Twp.
1956	High populations recurred; however, control measures were carried out by the Ontario Ministry of Natural Resources at numerous points.
1957	Populations decreased generally to a low level in most areas except in Somerville Twp, where 22% of the terminals were damaged at one point.
1958	Although populations remained at a low level, infested shoots were found in many white pine plantations.
1959	Populations remained at a low level throughout the district.
1960	Populations remained low except in Minden Twp, where a heavy infestation occurred.
1961	Populations increased, and heavy infestations occurred in Stanhope and Minden twps. Control measures were carried out at some locations.
1962	Pockets of heavy infestation recurred in Minden Twp; elsewhere, populations declined.
1963	Populations were high in Stanhope Twp; populations declined elsewhere.
1964	Heavy infestations were observed in Harvey and Dalton twps. Elsewhere, small numbers of weevils were widely distributed, except in Guilford Twp, where moderate damage occurred at one point.
1965	Little change in overall population levels could be detected. Heavy infestations recurred in Dalton Twp, and high populations occurred in Galway and Guilford twps. Moderate damage was noted in Harvey Twp; elsewhere, small numbers of weevils were widely distributed.

(cont'd)

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

Year	Remarks
1966	Heavy damage occurred in Galway, Harvey, Dalton and Guilford twps. Small numbers were common at numerous points elsewhere in the district.
1967	A heavy infestation persisted in Galway Twp. Populations increased in Glamorgan and Somerville twps; small numbers of weevils were found elsewhere.
1968	Heavy infestations recurred in Galway, Glamorgan and Somerville twps. An average of 33% leader damage was recorded in these townships, but there was no appreciable change in numbers in the remainder of the district.
1969	A heavy infestation persisted in white pine and Norway spruce plantations in Somerville Twp, where 78% of the white pine trees were damaged. Elsewhere, there was little change in population levels.
1970	A heavy infestation recurred in Somerville Twp, but there was little change in numbers elsewhere.
1971	A heavy infestation persisted in Somerville Twp, where 62% of the leaders were damaged at one sample point. High population levels also occurred in Glamorgan Twp.
1972	Population levels decreased in Somerville and Glamorgan twps.
1973	Little change was observed in population levels since the previous year except in Carden Twp, where numbers increased markedly.
1974	There was a slight increase in numbers at several points.
1975	Extensive leader damage occurred in Somerville Twp, but there was little change in numbers at various points examined elsewhere.
1976	There was a general decrease in numbers.
1977	There was little change over the previous year. An average of 9% leader damage was recorded in three townships.
1978	Population levels remained much the same as in the previous year.
1979	A high population occurred at one point in Minden Twp, but there was little change in numbers elsewhere.
1980	A high population persisted in Minden Twp, but there was little change elsewhere.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): larch [Major]

Year	Remarks
1950-1954	not reported
1955	trace populations observed in the district
1956	pockets of light infestation observed throughout most of the southeastern two-thirds of the district
1957	Populations declined; however, small numbers were observed at numerous points.
1958	There was little change over the previous year. Light infestations were observed at numerous points.
1959	Populations increased. Severe defoliation occurred in Dudley Twp, a pocket of moderate infestation was observed in Laxton Twp, and light infestations were found at numerous points elsewhere.
1960	A heavy infestation occurred in Glamorgan Twp. Moderate defoliation was observed in Hindon Twp and small pockets of light infestation were found in numerous townships in the remainder of the district.
1961	Populations increased and caused severe defoliation in Galway, Glamorgan and Dysart twps. Numerous pockets of light infestation occurred through the remainder of the district.
1962	Infestations decreased from the previous year's levels; however, numerous pockets of light infestation persisted.
1963	Although populations continued to decrease generally, a pocket of heavy infestation caused approximately 50% defoliation in Galway Twp.
1964	Small numbers of larch were heavily defoliated in Lutterworth Twp, and moderate damage was observed in Harvey Twp. Elsewhere, lightly defoliated trees were common.
1965	Light infestations occurred in small areas in Galway, Lutterworth and Somerville twps. Individual larval colones were observed at widely scattered locations elsewhere.
1966	A small pocket of medium infestation was observed in Somerville Twp. Only small numbers of colonies could be found at widely separated points elsewhere in the district.
1967	Lightly infested fringe trees were observed in Monmouth Twp, and trace populations at a few widely scattered points elsewhere.
1968	Populations declined to a very low level.
1969	Populations remained at a low level.
1970	not reported

(cont'd)

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

Year	Remark
1971	Populations increased and caused moderate defoliation in pockets of tamarack in Glamorgan and Cavendish twps. Small numbers were observed at scattered points elsewhere.
1972	Little change occurred in population levels from the previous year. A medium infestation was found in Galway Twp, and small numbers of larvae were observed elsewhere.
1973	A general decline in populations occurred.
1974-1975	trace population
1976	not reported
1977	A small pocket of heavy infestation was observed in Hindon Twp.
1978	Moderate-to-severe defoliation occurred in a small larch stand in Somerville Twp. Light defoliation was evident in Hindon Twp, where a medium-to-heavy infestation occurred the previous year.
1979	A heavy infestation reported in Somerville Twp in the previous year declined to light intensity.
1980	not reported

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)

Host(s): mountain-ash [Major]

Year	Remarks
1950-1951	not report
1952-1953	Heavy defoliation occurred on native and ornamental trees at a few points.
1954	moderate-to-heavy defoliation observed in Dysart, Harburn and Hindon twps
1955	Light-to-moderate defoliation occurred in Stanhope Twp.
1956	not reported
1957	small numbers observed at scattered points
1958	not reported
1959-1960	High populations caused severe defoliation at scattered points.
1961	moderate defoliation observed in Sherborne Twp
1962	not reported
1963	severe defoliation observed in Hindon Twp, and on individual trees at widely separated points elsewhere
1964-1968	not reported
1969-1971	small numbers of colonies observed at a few points
1972	light defoliation commonly observed in Minden Twp
1973	not reported
1974	High populations caused severe defoliation at a few widely separated points.
1975	Populations declined to a low level.
1976-1979	not reported
1980	small numbers of colonies at a few points

Other Noteworthy Insects

Pine Spittlebug, *Aphrophora cribrata* (Wlk.)

Host(s): conifers [Major]

Year	Remarks
1950-1971	not reported
1972	medium-to-heavy damage in a Scots pine plantation in Galway Twp
1973	not reported
1974	large numbers in a Scots pine plantation in Lutterworth Twp
1975	common at numerous points in the district
1976	not reported
1977-1978	large numbers in Minden Twp
1979	trace populations
1980	not reported

Saratoga Spittlebug, *Aphrohora saratogensis* (Fitch)

Host(s): coniferous [Major]

Year	Remarks
1950-1975	not reported
1976	light damage in Somerville Twp
1977	low numbers in Somerville Twp
1978-1980	not reported

Basswood Leafminer, *Baliosus nervosus* Panz.

Host(s): Ba [Major]

Year	Remarks
1950-1955	not reported
1956	moderate-to-severe defoliation in 494 ha in Harvey Twp
1957	Populations declined to light intensity in Harvey Twp.
1958	trace population in Harvey Twp
1959-1980	not reported

Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): larch [Major]

Year	Remarks
1950-1952	not reported
1953	High population levels caused considerable foliar damage in Galway Twp. Low population levels were observed at numerous points elsewhere.
1954	Populations decreased. Low population levels were recorded at six scattered points.
1955	not reported
1956	low population levels recorded in eight townships
1957-1961	low population levels widely distributed throughout the district
1962	Although populations remained at a low level, casebearers were more numerous in many stands.
1963-1966	Low population levels persisted at numerous points.
1967	A light infestation caused noticeable damage in Harvey Twp. Small numbers persisted at many points elsewhere.
1968	Populations increased in the southern half of the district, where as much as 10% defoliation was observed in stands of larch in seven townships.
1969	Populations decreased to a low level.
1970-1971	not reported
1972	Low population levels occurred in larch stands in Glamorgan Twp.
1973-1979	not reported
1980	A pocket of heavy infestation caused severe foliar damage in Minden Twp.

Red Cone Beetle, *Conophthorus resinosae* Hopk.

Host(s): [Minor]

Year	Remarks
1950-1958	not reported
1959	large numbers in stands in Havelock Twp, light damage in Harvey Twp
1960-1965	not reported
1966	high numbers in Havelock Twp
1967-1980	not reported

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

Host(s): rO [Major]

Year	Remarks
1950-1978	not reported
1979	pockets of moderate-to-severe defoliation in Harvey, Cavendish, Dalton and Carden twps
1980	small numbers at scattered locations

Eastern Larch Beetle, *Dendroctonus simplex* LeC.

Host(s): tL [Minor]

Year	Remarks
1950-1967	not reported
1968	Mortality was reported along the fringes of stands at many locations.
1969-1972	not reported
1973	a small amount of mortality in Galway Twp
1974-1980	not reported

Hickory Twig Pruner, *Elaphidion oides parallelus* (Newm.)

Host(s): rW, wO, Hi [Minor]

Year	Remarks
1950-1958	not reported
1959	large numbers in Lutterworth and Laxton twps; smaller numbers in Somerville and Harvey twps
1960	not reported
1961	pockets of heavy damage in Lutterworth and Laxton twps
1962-1964	not reported
1965	light damage at several points
1966	not reported
1967	light damage in Somerville Twp
1968	not reported
1969	trace populations at scattered locations
1970-1973	not reported
1974	light damage in Harvey Twp
1975-1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous [Major]

Year	Remarks
1950-1952	not reported
1953	trace population observed in Digby and Laxton twps
1954	Pockets of severe defoliation occurred in Harvey and Laxton twps.
1955-1956	Populations declined to a low level.
1957-1959	not reported
1960	Small numbers were found in Monmouth Twp.
1961	A small pocket of medium infestation was recorded in Lutterworth Twp.
1962	trace populations recorded at widely separated points
1963	small pockets of heavy infestation recorded in Glamorgan Twp
1964-1973	not reported
1974	small numbers at scattered points
1975-1976	trace populations commonly observed
1977-1980	not reported

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine [Major]

Year	Remarks
1950-1952	not reported
1953	small numbers at a few points
1954-1958	not reported
1959	small numbers at scattered points
1960-1962	low populations widely distributed
1963	not reported
1964	trace populations
1965	not reported
1966-1967	small numbers at scattered points
1968	Populations increased. Sampling revealed an incidence of 6% leader damage in Somerville
1969	Populations decreased. In Somerville Twp, 2% leader damage was recorded. There were trace populations elsewhere.
1970	low populations general
1971-1976	not reported
1977	Populations increased. Moderate damage was recorded in Minden Twp.
1978	Moderate damage recurred in Minden Twp, and small numbers were observed at numerous points elsewhere.
1979	Populations increased in Minden Twp, and 37% of trees were infested. There was no leader damage.
1980	not reported

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

Host(s): spruce [Minor]

Year	Remarks
1950-1951	not reported
1952-1955	Surveys revealed trace populations throughout the district.
1956	Sampling showed a slight increase in numbers.
1957-1980	small numbers distributed throughout the district

Pine Engraver, *Ips pini* Say

Host(s): pine, spruce [Major]

Year	Remarks
1950-1955	scattered mortality in a 20-ha red pine plantation in Somerville Twp
1956-1963	not reported
1964	light damage in log piles in Bruton and Glamorgan twps
1965	not reported
1966	trees heavily damaged in a plantation in Glamorgan Twp
1967-1980	not reported

Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl.

Host(s): rP, jP [Major]

Year	Remarks
1950-1961	not reported
1962	light damage in a red pine plantation in Snowdon Twp
1963-1980	not reported

White Pine Sawfly, *Neodiprion pinetum* (Nort.)

Host(s): wP [Minor]

Year	Remarks
1950-1963	not reported
1964	light defoliation in a 40-ha stand in Minden Twp
1965-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1977	not reported
1978	first record in the district; scattered colonies at one point in Somerville Twp
1979-1980	not reported

Bruce Spanworm, *Operophtera bruceata* (Hlst.)

Host(s): deciduous [Major]

Year	Remarks
1950-1974	not reported
1975	light infestation on the northern boundary of the district (see map, page 78)
1976-1980	not reported

Northern Pine Weevil, *Pissodes approximatus* Hopk.

Host(s): pine [Major]

Year	Remarks
1950-1978	not reported
1979	light mortality in a 3-year-old red pine plantation in Longford Twp
1980	not reported

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

Host(s): pines [Major]

Year	Remarks
1950-1954	not reported
1955-1956	small numbers on mugho pine at one point in Minden Twp
1957	not reported
1958-1960	small numbers in Minden Twp
1961-1980	not reported

Red Pine Needle Mite, *Setoptus jonesi* (Keifer)

Host(s): rP [Major]

Year	Remarks
1950-1964	not reported
1965	A medium-to-heavy infestation occurred in a 50-ha plantation in Stanhope Twp.
1966	medium-to-heavy infestations in several plantations in Minden and Stanhope twps; some dead trees
1967-1980	not reported

D I S E A S E S

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

Host(s): pine [Major]

Year	Remarks
1950-1966	not reported
1967	An intensive survey revealed a very light infection on small jack pine in Minden Twp.
1968-1969	surveyed but not reported
1980	An incidence of 16% was recorded in a young 4-ha red pine plantation in Glamorgan Twp (see map, page 84).

Map

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

Host(s): elm [Major]

Year	Remarks
1950-1957	not reported
1958	first recorded in Lot 12, Con IX, Minden Twp
1959	infected trees observed at several points
1960-1961	No change was detected in the distribution or incidence of this disease.
1962	No change in distribution could be detected; however, the number of infected trees increased.
1963	The distribution of the disease and incidence of infection remained much the same as in the previous year.
1964	The incidence of diseased trees increased and some tree mortality occurred in Minden and Stanhope twps.
1965	The incidence of the diseased trees and mortality increased. Sampling in Minden and and Stanhope twps showed an average incidence of 7% diseased trees and an average of 22% mortality in two sample plots examined.
1966	Numbers of diseased trees increased; however, little change in the incidence of tree morality could be determined.
1967	Symptoms of diseased trees and mortality were widespread throughout the district; however, the incidence of tree mortality was much the same as in the previous year.
1968	The disease continued to cause high tree mortality throughout the district.
1969	Serious damage and a high rate of infection continued.

(cont'd)

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

Year	Remarks
1970	Little change could be determined. The disease continued to ravage shade trees and stands throughout the district.
1971	The incidence of infection and mortality increased throughout the district. Particularly high levels of incidence were observed in Carden, Dalton and Minden twps.
1972	The number of infected and dead trees increased throughout the district. Extremely high levels of infection and tree mortality continued to occur in Carden, Dalton and Minden twps.
1973	An increase in the number of infected trees and in tree mortality occurred. Quantitative samples in Carden and Monmouth twps revealed that 50 and 55%, respectively, of the trees examined were diseased.
1974	The disease continued to ravage elm stands and open-growing trees throughout the district. A quantitative sample in Carden Twp showed that mortality was occurring at an annual rate of 12.5%.
1975	Stand deterioration continued at a high rate throughout the district. A quantitative sample in Carden Twp showed a marked increase in the percent mortality over the previous year, when 57.1% mortality was recorded.
1976	A high incidence of infection and heavy tree mortality continued throughout the district.
1977	The disease continued to decimate the remaining elms in the district. Sampling in Harvey and Dysart twps revealed that 69 and 60%, respectively, of the living trees were infected.
1978-1980	High levels of infection and heavy tree mortality continued to occur.

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

Host(s): tA [Major]

Year	Remarks
1950-1960	not reported
1961	Pockets of heavy infection caused serious foliar damage in Longford and Lutterworth twps.
1962	Heavy infection occurred in a small group of trees in Snowdon Twp.
1963	Pockets of heavy infection occurred in Cavendish and Dudley twps. Light damage was also noted in Dysart Twp.
1964	Pockets of extremely heavy infection occurred in Cavendish and Luttersworth twps, where over 90% of the foliage was damaged.
1965	A high incidence of infection was found in a 8-ha stand in Snowdon Twps; however, foliar damage was light in the area. Little damage could be found elsewhere.
1966	A small area was heavily infected in Harvey Twp, and light damage was observed in Lutterworth and Somerville twps.
1967	A decline in the infection level of this disease occurred. Only trace foliar damage could be found at a few points.
1968	Only trace levels of infection were observed.
1969	The disease was widely distributed throughout the district at a low level of infection.
1970	trace levels of infection observed in Glamorgan and Carden twps
1971	not reported
1972	light foliar damage observed in Glamorgan and Carden twps
1973-1974	not reported
1975	Moderate damage occurred in a 40-ha area in Snowdon Twp.
1976-1980	traces of infection at widely separated points

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

Host(s): wP [Major]

Year	Remarks
1950-1952	not reported
1953	diseased trees observed at a few locations
1954	small numbers of diseased trees at scattered locations
1955	A more detailed survey for this disease showed that infected trees were present in most white pine stands in the district. The highest incidence of infection was recorded in Stanhope and Harvey twps, where 18 and 19%, respectively, of host trees were diseased.
1956-1957	not reported
1958	common throughout the district, especially in Somerville and Lutterworth twps
1959	common in most white pine stands in the district
1960	no discernible change in incidence from the previous year
1961	light tree mortality observed in Minden Twp
1962	small pockets of heavy infection observed in Minden Twp
1963	The incidence of infection increased, and moderate damage occurred at several points.
1964	little change from the previous year
1965-1967	no discernible change in incidence
1968	The disease was found in most white pine stands in the district. The incidence of infection ranged from 8 to 26% at three points, and averaged 18%.
1969-1971	not reported
1972	light-to-moderate damage observed in underplanted areas in Glamorgan and Cavendish twps
1973	There was little change in incidence from the previous year; however, light tree mortality occurred in a semimature stand in Carden Twp.
1974	There was no discernible change in incidence; however, light tree mortality was again recorded in Carden Twp.
1975	Detailed surveys in plantations in Galway and Minden twps showed that 23 and 8%, respectively, of the trees were infected. Little change in the incidence of infection could be detected elsewhere in the district.

(cont'd)

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

Year	Remarks
1976	Light-to-moderate infection continued throughout the district.
1977	A sample of 2-m-high trees in a plantation in Minden Twp showed 11.3% incidence of infection in the area.
1978-1979	not reported
1980	4-ha plantation sampled in Minden Twp showed a 15% incidence of infection.

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

Host(s): tA, lA [Major]

Year	Remarks
1950-1952	not reported
1953	An intensive survey of poplar stands revealed that this disease was widely distributed throughout the district.
1954	There was no discernible change in incidence of the disease.
1955	Continuing surveys for this disease revealed its presence in practically all trembling aspen stands in the district. Cankers were also found in a stand of large-tooth aspen at one point.
1956	not reported
1957	widespread throughout the district
1958-1963	not reported
1964-1965	small numbers of recently infected trees observed at scattered points
1966-1967	There was little change in the incidence of infection; however, light infections persisted in most trembling aspen stands throughout the district.
1968	Surveys carried out to determine the incidence of infection by this disease in Glamorgan, Digby and Hindon twps showed that an average of 6% of trees were affected.
1969-1972	not reported
1973	A moderate-to-high infection level was observed in Snowdon Twp and light infection in Carden Twp. Some damage persists in most trembling aspen stands in the district.
1974-1980	infected trees common in trembling aspen stands throughout the entire district

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

Host(s): tA, lA [Major]

Year	Remarks
1950-1958	not reported
1959	This shoot blight was commonly found on small poplar trees throughout the district.
1960	Light-to-moderate damage was observed on regeneration aspen at a few widely separated points.
1961-1963	not reported
1964	Light shoot mortality was observed on small trembling aspen trees at scattered points.
1965	A small pocket of heavy infection was observed in an immature trembling aspen stand in Snowdon Twp. Approximately 50% current shoot mortality
1966-1968	trace levels of infection observed at widely scattered points
1969-1974	not reported
1975	trace levels of infection occurred at a few points
1976	35% mortality in a stand of aspen in Somerville Twp
1977-1980	not reported

Other Noteworthy Diseases

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

1950-1954	not reported
1955	found at scattered locations
1956-1962	not reported
1963	Occasional infected and dead trees were reported in Minden and Somerville twps.
1964	small patches of light infection at scattered points
1965	not reported
1966	light damage at a few locations
1967-1970	not reported
1971	light damage in Glamorgan Twp
1972-1976	not reported
1977	Mortality levels of 32% were reported in a 0.5-ha red pine plantation in Somerville Twp.
1978	not reported
1979	Light incidence of mortality was reported in pine plantations at a few locations.
1980	not reported

Pullularia, *Aureobasidium pullulans* (de Bary.) Arnaud

Host(s): rP, scP [Major]

Year	Remarks
1950-1958	not reported
1959	considerable foliar damage observed in plantations in Somerville Twp
1960-1965	not reported
1966	moderate-to-severe damage on red pine and light damage on red pine and light damage on Scots pine in Minden Twp
1967	not reported
1968	extensive damage on a high-elevation site in Somerville Twp
1969-1980	not reported

Twig Blight, *Cenangium ferruginosum* Fr. : Fr.

Host(s): rP [Major]

Year	Remarks
1950-1973	not reported
1974	Medium-to-high incidence was reported in a red pine plantation in Harvey Twp; light damage occurred in a Scots pine plantation in Lutterworth Twp and in a red pine plantation in Somerville Twp.
1975-1980	not reported

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

Host(s): hard pines [Major]

Year	Remarks
1950-1957	not reported
1958	light needle damage observed on red pine in Somerville and Snowdon twps
1959-1967	not reported
1968	trace levels of infection at a few points
1969-1970	not reported
1971-1973	trace levels of infection on red pine at scattered points
1974	low infection levels observed in red pine plantations in Cavendish Twp
1975-1979	not reported
1980	light foliar damage observed on red pine in Minden Twp

Eutypella Canker, *Eutypella parasitica* Davidson & Lorenz

Host(s): sM [Major]

Year	Remarks
1950-1961	not reported
1962	found commonly on trees in all diameter classes in Eyre, Havelock, Dysart, Harburn and Sherborne twps
1963	not reported
1964	low incidence observed at two locations in Dalton Twp
1965-1968	not reported
1969	medium-to-high incidence and infection level at one point in Lutterworth Twp; moderate incidence in Stanhope Twp
1970-1980	not reported

Needle Cast, *Lophodermium pinastri* (Shrader : Fr.)

Host(s): rP, jP [Major]

Year	Remarks
1950-1956	not reported
1957	several young trees affected in Somerville Twp
1958-1972	moderate-to-severe loss of foliage in Somerville and Minden twps
1973-1975	not reported
1976	low incidence of infection at several locations
1977-1980	not reported

White Trunk Rot of Hardwoods, *Phellinus igniarius* (L. : Fr.) Quélet

Host(s): [Major]

Year	Remarks
1950-1954	not reported
1955	common on mature aspen and ironwood at scattered points
1956-1965	not reported
1966	small numbers of infected trees at scattered points
1967-1970	not reported
1971	widely distributed through the district
1972-1980	not reported

Red Ring Rot, *Phellinus pini* (Brot. : Fr.) A. Ames

Host(s): coniferous [Major]

Year	Remarks
1950-1954	not reported
1955	diseased trees at several locations
1956-1980	not reported

Shoot Blight, *Pollaccia elegans* Servit

Host(s): bPo [Major]

Year	Remarks
1950-1964	not reported
1965	medium-to-heavy shoot infections at one point in Snowdon Twp
1966	light infections on regeneration at several points
1967-1980	not reported

DIEBACKS AND DECLINES

Balsam Fir Dieback

Host(s): bF [Major]

Year	Remarks
1950-1954	not reported
1955	common in pastured woodlots, on dry, rocky sites and along newly constructed roads
1956-1957	not reported
1958	small numbers of affected trees at scattered locations
1959	light mortality and deterioration in small numbers of trees
1960-1980	not reported

Maple Deterioration

Host(s): sM [Major]

Year	Remarks
1950-1958	not reported
1959	dead and deteriorating trees observed along roadsides at several points
1960	not reported
1961-1965	damaged trees observed commonly along roads and on some ornamental and shade trees
1966	light mortality at a few locations
1967	deterioration common along roadsides
1968-1977	not reported
1978	Some mortality occurred in a mixed stand in Hindon Twp.
1979-1980	moderate damage at one point in Lutterworth Twp

Semi-mature-tissue Needle Blight

Host(s): wP [Minor]

Year	Remarks
1950-1952	not reported
1953	Light damage occurred at several points in the district.
1954	not reported
1955	A marked increase in the incidence of this disease occurred in Stanhope, Minden, Somerville, Galway and Harvey twps. Sampling in plantations in each township revealed that the incidence of the infection ranged from 16 to 24%.
1956-1957	not reported
1958	Light damage was commonly observed in small pockets of white pine at a few points.
1959	trace infection observed at scattered points
1960-1963	not reported
1964	severe foliar damage observed at numerous points throughout the district
1965-1969	not reported
1970	conspicuous damage observed in a white pine plantation in Laxton Twp
1971-1976	not reported
1977	Several ornamental trees were severely infected in Somerville Twp.
1978-1980	not reported

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

Drought

Year	Remarks
1966	A drought condition that persisted from late June until early August caused serious deterioration of many tree species growing on rocky ridges and shallow-soil sites at several points through the district.

Foliar

Year	Remarks
1975	Browning: Considerable damage to old foliage of cedar, caused by a weather-related factor, occurred throughout the winter and resulted in foliar browning throughout the southern part of the district.

Frost

Year	Remarks
1950-1962	not reported
1963-1964	Late spring frosts caused serious damage to developing shoots and foliage throughout the district.
1972	Heavy frosts on 11 and 12 June caused extensive damage to the current foliage and shoots on white spruce, balsam fir and black ash at numerous points. Foliage on black ash was damaged particularly seriously.
1973-1976	not reported
1977	Heavy frost in early June caused severe damage to developing foliage and shoots in white spruce plantations in Somerville Twp.
1978-1979	not reported
1980	Late spring frosts between 4 and 17 June caused severe damage to new shoots on various hosts throughout the district.

Hail

Year	Remarks
1968	Hail storms caused twig damage and partial defoliation of hardwood stands in Monmouth and Harburn twps. Trembling aspen was affected most seriously affected.

Ice

Year	Remarks
1969	An ice storm in January caused serious damage to forest stands in a few areas. The heaviest damage occurred in immature jack pine plantation in Stanhope Twp, where many trees were bent over and occasionally broken off because of the weight of the ice. elsewhere, broken limbs were commonly observed in affected areas.

Wind

Year	Remarks
1965	A tornado-like windstorm in September caused heavy blowdown of most tree species within approximately 2.5 km- of forested land in Sherborne Twp.

Winter Drying

Year	Remarks
1970	Winter drying conditions caused reddening of foliage and extensive bud failure in red spruce stands in Sherborne, Havelock and Eyre twps. Some tree mortality occurred in Eyre Twp.

Scorch

Year	Remarks
1972	This foliage condition caused by excessively rapid transpiration, was widespread in the district. Red maple and silver maple were affected most seriously; however, light damage also occurred to beech and ironwood.

A P P E N D I C E S

APPENDIX A

DECIDUOUS HOST

Common Name	Scientific Name	Abbreviations
Alder	*Alnus* spp.	Al
Apple	*Malus* spp.	Ap
Ash, black	*Fraxinus nigra* Marsh.	As
Aspen, largetooth	*Populus grandidentata* Michx.	lA
trembling	*tremuloides* Michx.	tA
Basswood	*Tilia* spp.	Ba
Beech	*Fagus grandifolia* Ehrh.	Be
Birch, white	*Betula papyrifera* Marsh.	wB
yellow	*alleghaniensis* Britt.	yB
Butternut	*Juglans cinerea* L.	Bu
Cherry, eastern choke	*Prunus virginiana* L.	eaCh
pin	*pensylvanica* L.f.	pCh
Elm, white	*Ulmus americana* L.	wE
Horse-chestnut	*Aesculus hippocastanum* L.	hChe
Ironwood	*Ostrya* spp.	I
Maple, Manitoba	*Acer negundo* L.	mM
red	*rubrum* L.	rM
sugar	*saccharum* Marsh.	sM
Mountain-ash, American	*Sorbus americana* Marsh.	aMo

(cont'd)

APPENDIX A

DECIDUOUS HOST

Common Name	Scientific Name	Abbreviations
Oak, bur	*Quercus macrocarpa* Michx.	bO
red	*rubra* L.	rM
Poplar, balsam	*Populus balsamifera* L.	bPo
Carolina	X *canadensis* Moench	cPo
Lombardy	*nigra* var. *italica* Muenchh.	lPo
silver	*alba* L.	sPo
Willow	*Salix* spp.	W

APPENDIX B

CONIFEROUS HOST

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