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

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FOREWORD

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

Major Insects or Diseases

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

Minor Insects or Diseases

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

Abiotic Damage

Damage caused by non-living factors.

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

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

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

1950	A.L. Rose
1951-1953	F.A. Bricault
1954-1958	D.G. Grisdale
1959-1968	C.A. Barnes
1969	D.H. Lawrence
1970-1973	L.S. MacLeod and D.H. Lawrence
1974-1975	H.J. Weir and D.H. Lawrence
1976-1979	H.J. Weir and V. Jansons
1980	H.J. Weir and H.J. Evans

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INTRODUCTION

This report is a review of significant forest insects and diseases in the Bracebridge District of Ontario from 1950 to 1980, together 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, mainly tolerant hardwoods (sugar maple, hemlock, yellow birch, red oak and beech) and the white pine-red pine group (white pine, red pine, jack pine, white spruce, balsam fir, poplar and white birch). The insects and diseases included are capable of causing, or have caused, tree mortality or a reduction in growth. Also included are abiotic problems that cause damage, i.e., salt, frost, winter drying and snow.

SUMMARY

FOREST INSECTS

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

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. Severe browning was recorded from to 1964 and then from 1970 to 1972. This may have been a predisposing factor in the birch decline that was evident in 1966 and 1967. A previous infestation occurred between 1941 and 1944.

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

This insect is considered the most destructive insect pest of several coniferous hosts in eastern Canada, particularly white spruce and balsam fir. Though not major hosts, black spruce, eastern hemlock and tamarack are attacked and considerable tree mortality can occur. Population levels were low between 1954 and 1974, but they increased in 1975. Widespread defoliation occurred, and there was some mortality of balsam fir in 1979 and 1980. Prior to 1950, infestations were recorded between 1940 and 1943.

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

Defoliation by this miner, which can weaken trees and leave them susceptible to secondary insects and diseases, 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. High population levels occurred periodically between 1955 and 1980. No infestations were reported prior to 1955.

Saddled Prominent, *Heterocampa guttivitta* (Wlk.) [Major]
pages

Larvae of this species are serious defoliators of hardwoods, particularly maple, birch and beech. Severe defoliation for 2 to 3 years can cause branch and tree mortality. Severe defoliation occurred between 1968 and 1970 and some mortality was recorded (see Maple Decline, page 94). No infestations were reported prior to 1968.

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

Severe defoliation of hemlock and eastern white cedar occurred in the Muskoka Lakes area in 1937 and 1938 and caused some mortality. Between 1950 and 1954 high population levels were observed in the Lake of Bays and Lake Joseph areas, and up to 70% mortality was recorded. Since 1955, very low population levels have been observed.

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

This caterpillar is widely distributed through North America. Infestations usually last an average of 5 years and large 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 growth and vigor of trees, leaving them susceptible to attack by other pests.

The earliest recorded outbreak in the district occurred in the Muskokas and between Huntsville and Burks Falls, and subsided in 1938. Severe defoliation was again observed between 1949 and 1953, between 1963 and 1966 and between 1975 and 1977. Mortality of sugar maple and red oak occurred in 1952 and again in 1978 (see Maple Decline, page 94).

Pine Sawflies: Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl.;
Jack Pine Sawfly, *N. pratti banksianae* Roh.;
Redheaded Jack Pine Sawfly, *N. virginianus* complex
[Major]
pages

The sawflies listed are capable of causing mortality of semimature and plantation pine trees when population levels are high. Populations of these sawflies were reported causing various degrees of infestation from 1952 until 1969.

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

This destructive pest of pine plantations can cause mortality after several years of severe defoliation. Preferred hosts are red, Scots and jack pine planted in pure stands. High population levels have been recorded periodically in the district since the inception of the Insect Survey in 1936. Yearly population trends are difficult to determine because of control measures undertaken by the government and private plantation owners, i.e., clipping and applications of insecticides and viruses.

European Pine Sawfly, *Neodiprion sertifer* (Geoff.) [Major]
page

This introduced sawfly was first recorded in North America in 1925. In the Bracebridge District it was first observed on mugho pine near Bracebridge in 1972. Tree mortality seldom occurs because the larvae do not feed on current foliage and trees are never fully defoliated.

Bruce Spanworm, *Operophtera bruceata* (Hlst.) [Major]
pages

Serious damage to deciduous forests occurs when large populations develop. Severe infestations were recorded in 1974 and 1975. This insect was not recorded prior to 1964.

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

This destructive insect has been categorized as a serious pest of young spruce plantations and open-growing ornamentals. High mortality can occur after successive years of severe defoliation.

Although there have been no large areas of mortality in the district, severe defoliation and single-tree mortality have occurred since 1938.

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

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. Large populations have occurred periodically since 1951 and leader kill has varied from a reported low of 8% to as high as 80%.

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.

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.) [Major]
page

Heavy feeding by this scale may result in considerable branch mortality or the death of entire trees. High population levels occurred in 1961, 1962, 1964 and 1969. No infestations were reported prior to 1961.

Aspen Defoliators: *Choristoneura conflictana* (Wlk.), *Egira dolosa* Grt., *Enargia decolor* (Wlk.), *Pseudexentera oregonana* (Wlsm.)
[Major]
page

No tree mortality has been associated with defoliation caused by this complex of aspen and poplar defoliators. Pockets of severe defoliation were recorded in 1964, 1979 and 1980.

Other Noteworthy Insects [Major and Minor]
pages

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

FOREST DISEASES

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

This root-rot disease often kills trees previously stressed by drought, insects, other pathogens or unfavorable environment. However, the fungus, or certain strains of the fungus, can kill vigorous trees under some circumstances. Both deciduous and coniferous trees are attacked. The organism was reported periodically at low levels in the district from 1955 to 1980.

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

This destructive pathogen of young planted pine was first confirmed in the district in 1971. The disease was subsequently confirmed throughout most of the district. Controls have been carried out in several high-value plantations.

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

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

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. Pockets of moderate-to-severe defoliation occurred throughout the district in 1959, 1962, 1963, 1969 and 1978.

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. Incidence in the district ranged from low in 1953 to high in 1978.

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

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. The disease was found commonly in the district from 1952 to 1980.

Leaf and Shoot Blight of Aspen, *Venturia macularis* (Fr.) Müller & v. Arx. [Major]
page

Reduced stocking of regeneration aspen occurs when the incidence of this disease is high. Trees more than 5 years old are seldom affected and, therefore, the disease is of little economic importance in natural stands.

Other Noteworthy Diseases
pages

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

ABIOTIC DAMAGE
pages

Abiotic damage has a variety of causes, e.g., frost, winter drying, salt, etc. Trees by abiotic factors are susceptible to any of a number of insects and diseases.

I N S E C T S

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): wB [Major]

Year	Remarks
1950-1959	not reported
1960	severe defoliation through 800 ha of forested land in Finlayson and Livingstone twps (see map, page 10)
1961	There was a marked increase in the area infested. Medium-to-heavy infestation occurred throughout the district (see map, page 11).
1962	There was a major decline in population levels, but the insect was still common throughout the district.
1963	medium-to-heavy infestations observed in Machar, Laurier and Ballantyne twps; light infectations at many points elsewhere in the district (see map, page 12)
1964	A pocket of moderate infestation recurred in Machar Twp. Elsewhere, populations declined sharply.
1965-1969	not reported
1970	Heavy infestations occurred in the northeastern part of the district (see map, page 13).
1971	heavy infestations through the northern part of the district (see map, page 14)
1972	Heavy infestations recurred in the northern part of the district (see map, page 15).
1973	Populations declined sharply (see map, page 16).
1974-1980	not reported

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): wS, bF, tL [Major]

Year	Remarks
1950-1953	not reported
1954	trace populations in Franklin Twp
1955	not reported
1956	trace populations at scattered points in the district
1957-1965	not reported
1966	trace populations at scattered points in the district
1967	Small numbers of budworm were reported in Machar, McClintock and Stephenson twps (see map, page 19).
1968	light defoliation observed in Sherborne Twp (see map, page 20)
1969	noticeable increase in population levels throughout the district
1970	little change in population levels from the previous year
1971	little change from the previous year; low population levels
1972	no disernible change; low population levels
1973	no discernible change; low population levels
1974	Small populations persisted.
1975	A small pocket of moderate-to-severe defoliation occurred in Armour Twp (see map, page 21).
1976	Populations increased. Small pockets of moderate-to-severe infestation occurred in Armour, Strong and Proudfoot twps (see map, page 22).
1977	Populations increased for the third consecutive year. Pockets of moderate-to-severe infestation were found in Armour, Strong, Joly, Proudfoot and Stisted twps (see map, page 23).

(cont'd)

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

Year	Remarks
1978	Infestations continued to increase in the northern half of the district and small pockets of new infestation occurred at scattered points elsewhere (see map, page 24).
1979	Major population increases occurred in the northern half of the district and numerous small pockets of infestation occurred in the southern section (see map, page 25). A small pocket of balsam fir tree and top mortality was observed in Armour Twp (see map, page 26).
1980	Major increases in the area of infestation occurred (see map, page 27). An increase in mortality was recorded when a very small pocket was observed in Laurier Twp; however, there was little change in mortality from the previous year in Armour Twp (see map, page 28).

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): wB [Major]

Year	Remarks
1950-1954	not reported
1955	high populations in Lake of Bays area; low populations at scattered points elsewhere
1956	not reported
1957	Moderate damage occurred in Brunel Twp.
1958	low populations widely distributed throughout the district
1959	low populations at scattered points
1960	low populations at scattered points
1961-1962	not reported
1963	pockets of heavy infestation observed in Machar Twp
1964	Heavy infestations recurred in Machar Twp.
1965	Heavy infestations persisted in Machar Twp.
1966	Heavy infestations persisted in Machar Twp and new heavy infestations were recorded in Chaffey, Stephenson, Macaulay, and McLean twps. Moderate damage was observed at scattered points elsewhere.
1967	Populations declined. Moderate damage was observed in Machar and Strong twps.
1968	Medium infestations recurred in Strong Twp. Moderate damage was also recorded at one point in Chaffey Twp.
1969	not reported
1970	light-to-moderate damage observed at scattered points in the southern half of the district
1971	severe leaf mining in Strong and Machar twps.
1972	Heavy infestations recurred in Strong and Machar twps.

(cont'd)

Birch Leafminer, *Fenusa pusilla* (Lep.) (concl.)

Year	Remarks
1973	A heavy infestation recurred in Strong Twp, and a new heavy infestation was found in Armour Twp.
1974	Populations increased. Severe leaf mining was observed in Strong, Armour, Perry, Brunel and Macaulay twps.
1975	heavy infestations in townships between Bracebridge and South River
1976	Severe leaf mining was again apparent in the central part of the district.
1977	Large populations recurred through the central part of the district.
1978	Populations declined in the central part of the district.
1979	heavy infestations at scattered points in townships between Bracebridge and Sundridge
1980	severe foliar damage at scattered points between Sundridge and Gravenhurst

Saddled Prominent, *Heterocampa guttivitta* (Wlk.)

Host(s): sM, Be [Major]

Year	Remarks
1950-1967	not reported
1968	Defoliation of hardwoods occurred in the eastern part of the district, from Ballantyne Twp in the northern part, southward to Finlayson Twp (see map, page 31).
1969	Populations increased between Huntsville and Trout Creek and decreased in Ridout, Franklin and McLean twps (see map, page 32).
197	Populations declined sharply; however, some light defoliation did occur in Machar and Proudfoot twps.
1970-1980	not reported

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

Host(s): eH, bF [Major]

Year	Remarks
1950	small populations in Lount, Proudfoot, Butt, Brunel, Sherborne and Draper twps and on shorelines or islands of Rousseau and Joseph lakes
1951	high population levels on islands and along shorelines of Lake Joseph and on Crown Island in Lake of Bays; light infestations on islands in Lake Rousseau; heavy mortality of hemlock and balsam fir on Laurie Island in Lake Joseph
1952	Populations declined in the Lake Joseph infestations; however, heavy infestations caused severe defoliation of hemlock and cedar in Lake of Bays. A chemical spray operation was conducted in the area.
1953	A heavy infestation persisted on Crown Island in Lake of Bays. As much as 70% mortality of conifers was recorded.
1954	Populations were low in the Lake Joseph area and on Crown Island, Lake of Bays. Mortality increased in the latter area.
1955	small populations on Crown Island, Lake of Bays
1956	small numbers on islands in Lake of Bays
1957	low population levels in the Lake Joseph area
1958	light infestation levels in the Lake Joseph area
1959	low populations in the Lake Joseph area
1960	trace populations in the Lake Joseph area
1961	trace populations
1962	small numbers in the Lake Joseph area
1963	small numbers in the Lake Joseph area
1964	not reported
1965	small numbers at scattered points

(cont'd)

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

Year	Remarks
1966-1967	not reported
1968	small numbers at scattered points
1969-1980	not reported

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): tA, sM, rO [Major]

Year	Remarks
1950	major increases in infestations since 1949 (see map, page 37)
1951	medium-to-heavy infestations through 90% of the district (see map, page 38)
1952	heavy infestations through the northern half of the district (see map, page 39); some mortality in Monck and Watt twps
1953	pockets of heavy infestation in Ballantyne, Laurier, Perry, Bethune and Chaffey twps; moderate defoliation in Machar, Joly, Strong, Armour, Proudfoot, Franklin, McClintock, Sherborne, Ridout, McLean, Morrison and Ryde twps (see map, page 40)
1954	low population levels at scattered points
1955-1960	not reported
1961	low population levels
1962	Populations increased.
1963	severe defoliation in the southwestern part of the district (see map, page 41)
1964	Heavy infestations persisted in the southern part of the district. Sugar maple and red oak were severely defoliated in Medora and Wood twps (see map, page 42).

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

Year	Remarks
1965	The infestation increased in size in the southern part of the district (see map, page 43).
1966	Populations declined (see map, page 44).
1967	The infestation collapsed. Population levels were low in Wood and Ridout twps (see map, page 45).
1968	A further decline in populations occurred.
1969-1971	not reported
1972	small numbers of larvae observed
1973-1974	not reported
1975	There were two pockets of heavy infestation in the southwestern part of the district and one in the northern part (see map, page 46).
1976	There was moderate-to-severe defoliation through the southwestern part of the district and along the western boundary of the northern half (see map, page 47). Aerial spraying was planned for Arrowhead and Mikisew Provincial Parks but was cancelled because of a population collapse that followed cold spring weather.
1977	Heavy infestations occurred throughout the western two-thirds of the district (see map, page 48); spray operations were conducted in Mikisew and Arrowhead Provincial Parks, and at the Bracebridge Resource Management Centre.
1978	Heavy infestations collapsed. Scattered colonies were found in Machar and Lount twps (see map, page 49). Mikisew Provincial Park was aerially sprayed with *Bacillus thuringiensis*.
1979-1980	not reported

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

Host(s): jP, rP [Major]

Year	Remarks	
1950-1951	not reported	
1952	*N. pratti banksianae* -	severe defoliation of a small number of jack pine trees in Macaulay Twp
1953	*N. pratti banksianae* -	heavy defoliation at one point in Medora Twp; small numbers at scattered points elsewhere
1954	N. pratti banksianae -	severe defoliation in Medora Twp; new light infestations in Franklin and Macaulay twps
1955	not reported	
1956	*N. pratti banksianae* -	light infestations in Franklin and Strong twps
1957	N. pratti banksianae -	moderate defoliation in Watt Twp; small numbers at scattered points elsewhere
	N. virginianus complex -	small numbers on jack pine at one point in Strong Twp
1958	not reported	
1959	*N. pratti banksianae* -	small numbers of colonies at scattered points
1960	*N. pratti banksianae* -	high population levels in Macaulay and Draper twps
1961	*N. pratti banksianae* -	A new light infestation was found in McLean Twp.
	N. virginianus complex -	very small numbers at widely scattered points
	N. nanulus nanulus -	small numbers recorded on red pine at one point in Franklin Twp

(cont'd)

Jack Pine Sawflies: *Neodiprion pratti banksianae* Roh.,
N. nanulus nanulus Schedl.,
N. virginianus complex (concl.)

Year	Remarks	
1962	*N. pratti banksianae* -	small numbers of colonies observed at widely separated points
1963	*N. pratti banksianae* -	severe defoliation observed at one point in Monck Twp
1964	N. pratti banksianae -	The infestation declined in Monck Twp to small numbers of colonies. Scattered colonies were observed in Medora, McLean and Draper twps.
	N. virginianus complex -	trace populations at widely scattered points
	N. nanulus nanulus -	low population levels observed in Franklin and Perry twps
1965	*N. pratti banksianae* -	small numbers at scattered points in the district
1966	*N. pratti banksianae* -	low population levels in Medora, McLean, Monck and Draper twps
	N. nanulus nanulus -	small numbers in Perry and Franklin twps
1967	N. pratti banksianae -	Populations increased in McLean Twp. Elsewhere, numbers remained at much the same level as in the previous year.
1968	*N. pratti banksianae* -	very low population levels at scattered points
1969-1980	not reported	

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Host(s): rP, jP, scP [Major]

Year	Remarks
	Note: Yearly fluctuations in population trends were undoubtedly related to chemical control operations in many instances.
1950	large populations in red pine plantations in Machar and McLean twps; small populations at scattered points elsewhere
1951	heavy infestations in red pine plantations in Machar, McLean and Medora twps; medium infestations at one point in McLean and Strong twps; pockets of light infestation recorded in Armour, Stisted, Chaffey, Cardwell, Franklin, McClintock, Brunel, Sherborne, Ridout, Monck and Morrison twps; serious damage observed in Medora Twp
1952	Heavy infestations recurred in Machar Twp, and new heavy infestations were recorded in Strong and Chaffey twps. Medium infestations were found in Brunel and Muskoka twps. Light infestations and scattered colonies were found elsewhere.
1953	Heavy infestations recurred in Machar Twp and a new heavy infestation was recorded in Macaulay Twp. A medium infestation occurred in McLean Twp. Elsewhere, pockets of light infestation and scattered colonies were observed. Significant tree mortality (%) was recorded at one point in Machar Twp.
1954	heavy infestations in Medora and Morrison twps; light defoliation at numerous points elsewhere
1955	heavy infestations in Muskoka Twp; moderate damage recorded in Morrison Twp
1956	There was a general increase in populations in the southern half of the district. Heavy infestations persisted in Muskoka Twp, and heavy infestations were recorded in Mccaulay Twp. Some tree mortality occurred in these areas. Light infestations were observed in Morrison, Ryde, Monck, Medora, Watt, McLean and Franklin twps.

(cont'd)

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

Year	Remarks
1957	Heavy infestations persisted in Muskoka and Macaulay twps. Light infestations were observed at numerous points elsewhere.
1958	Low population levels occurred in Medora, Morrison, McLean and Ryde twps.
1959	Moderate defoliation was recorded in Ryde Twp. Low population levels were found at many points elsewhere in the district.
1960	small populations at numerous points
1961	not reported
1962	colonies observed in Livingstone, McClintock and Franklin twps
1963	heavy infestations in Livingstone and Medora twps; chemical controls applied in the former
1964	Heavy infestations were recorded in McClintock, Sherborne, Macaulay, Machar and Medora twps, and moderate defoliation was observed in Ballantyne and Ridout twps. Defoliation in heavily infested areas was approximately 60%.
1965	severe defoliation in townships in the Muskoka Lakes and Lake of Bays area
1966	heavy infestations in Ridout, Stephenson and Macaula twps; moderate defoliation recorded in Ballantyne, Machar and McLean twps
1967	Heavy infestations persisted in Ridout, Stephenson and Macaulay twps. Moderate-to-severe damage was recorded at scattered points in the Muskoka Lakes area and in Sinclair Twp. Light infestations and scattered colonies were recorded at numerous points elsewhere. Heavy tree mortality was observed in small, previously damaged red pine in Ridout Twp.
1968	Heavy infestations and severe defoliation occurred in Ridout, McLean and Perry twps.

(cont'd)

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

Year	Remarks
1969	Heavy infestations recurred in Ridout and Perry twps. New heavy infestations were recorded in Franklin Twp.
1970	decline in populations
1971	decline in populations
1972-1974	not reported
1975	An increase in population levels was noted when colonies were observed at numerous points.
1976	not reported
1977	Severe defoliation was recorded in a 10-ha red pine plantation in Ridout Twp; light-to-moderate damage was observed at scattered points elsewhere.
1978	light-to-moderate infestations observed in Watt Twp
1979	heavy infestation in Joly Twp; light-to-moderate damage in Watt, Machar, Perry, Bethune and Proudfoot twps
1980	There was a general increase in population levels of this destructive pest of plantation red pine trees over the past three years in 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 (see map, page 55). Eight aerial applications and 88 ground-spray treatments were conducted with nuclear polyhedrosis virus over a total of 539.8 ha. The spray treatment was applied when the majority of the larvae were in the second and third instar, 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 destruction of the pest.

Map

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

Host(s): scP, rP, mP [Major]

Year	Remarks
1950-1971	not reported
1972	Small numbers of colonies were found in Muskoka an Sherborne twps. This report represented the first known occurrence of the insect in the district.
1973	A heavy infestation was found in Monck Twp, but a control program in 1972 in Monck and Sherborne twps eliminated the populations in the area.
1974	small numbers of colonies in Monck Twp
1975-1976	not reported
1977	A light infestation was discovered in a red pine plantation in Watt Twp.
1978	A light infestation persisted in Watt Twp. Low population levels occurred in Macaulay Twp.
1979	not reported
1980	small numbers found at one point in Muskoka Twp

Bruce Spanworm, *Operophtera bruceata* (Hlst.)

Host(s): sM [Major]

Year	Remarks
1950-1964	not reported
1965	Light infestations occurred in Finlayson, Sinclair, and Livingstone twps (see map, page 57).
1966-1973	not reported
1974	Severe defoliation occurred in Ridout, McClintock and Livingstone twps. New heavy infestations were found in Draper and McLean twps (see map, page 58).
1976	Infestations decreased sharply, to low levels.
1977-1980	not reported

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

Host(s): wS, bS [Major]

Year	Remarks
	Note: In some instances, the heavy infestations reported may have been confined to small numbers of trees, ornamentals, etc. This sawfly can cause severe damage and tree mortality.
1950	severe defoliation observed on small white spruce at scattered points in McLean, Ridout, Perry, Chaffey and Franklin twps
1951	low population levels at numerous points; trace defoliation
1952	severe defoliation in Perry and Ryde twps; light infestations in McLean and Findlayson twps
1953	The sawfly was widely distributed but population levels were lower than in the previous year.
1954	heavy infestations and severe damage in Franklin, Strong, Oakley and McLean twps; moderate damage observed in Stephenson and Stisted twps; pockets of light infestation recorded in Livingstone and Machar twps
1955	severe defoliation in McClintock and Perry twps; some tree mortality recorded in Ridout Twp
1956	medium infestations observed on black spruce in Stephenson and Franklin twps
1957	Moderate infestations recurred in Stephenson Twp, and new moderate infestations were recorded in Ryde Twp. Low populations were observed at many points elsewhere.
1958	low population levels at numerous points
1959	A marked increase in population levels occurred. Moderate-to-severe defoliation was recorded at points in Ridout, Franklin, Muskoka, Monck, Stephenson and Morrison twps.
1960	Moderate-to-severe defoliation recurred in Franklin and Stephenson twps. A heavy infestation was recorded in Chaffey Twp.

(cont'd)

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.) (cont'd)

Year	Remarks
1961	severe defoliation of small roadside trees at one point in Chaffey Twp; light defoliation observed at numerous points elsewhere in the district
1962	Severe defoliation recurred in Chaffey Twp.
1963	only light defoliation at widely scattered points
1964	Light infestations occurred on small white spruce in Chaffey and Sinclair twps.
1965	very low population levels at widely scattered points
1966	very low population levels
1967	light infestations recorded in Machar, Perry and Sherborne twps
1968	Moderate defoliation occurred in Chaffey, Brunel and Sherborne twps.
1969	heavy defoliation observed on scattered open-growing trees in Strong, Laurier and Franklin twps
1970-1971	not reported
1972	low population levels at scattered points
1973	low population levels at scattered points
1974	low population levels at scattered points
1975	not reported
1976	moderate defoliation in a white spruce plantation in Machar Twp
1977	moderate-to-severe defoliation of planted white spruce in Mikisew and Arrowhead Provincial Parks
1978	Moderate-to-severe defoliation recurred in Mikisew and Arrowhead provincial parks and on ornamentals in the town of Bracebridge.

(cont'd)

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

Year	Remarks
1979	low population levels in Mikisew and Arrowhead provincial parks; small numbers at widely scattered points elsewhere
1980	moderate damage at one point in Macaulay Twp

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): wP, scP, rP, jP, wS, bS [Major]

Year	Remarks
1950	not reported
1951	Severe damage occurred in a white pine plantation in Perry Twp, where 80% of the trees were attacked. The insect was widely distributed on white pine, Scots pine, jack pine and white spruce through the remainder of the district.
1952	A heavy infestation recurred in Perry Twp. There was little change elsewhere.
1953	light infestations widely distributed throughout the district
1954	Populations increased to a high level in Stephenson Twp and to a moderate level in Macaulay and McLean twps.
1955	Populations increased for the second consecutive year. High population levels occurred in McLean, Macaulay, Franklin and Oakley twps. A moderate infestation was observed in Perry Twp.
1956	Populations decreased to moderate intensity in McLean Twp. Elsewhere, small numbers of weevils were found at many points.
1957	Little change in population levels occurred. Moderate damage recurred in McLean Twp. A moderate infestation was recorded in Macaulay Twp. Elsewhere, small numbers of weevils were common.

(cont'd)

White Pine Weevil, *Pissodes strobi* (Peck) (cont'd)

Year	Remarks
1958	Moderate damage recurred in McLean Twp; however, infestations decreased to light intensity in Macaulay Twp and remained much the same as in the previous year elsewhere in the district.
1959	moderate damage recorded in McLean and Macaulay twps; little change elsewhere
1960	moderate-to-severe damage in McLean and Macaulay twps; little change elsewhere
1961	A new moderate infestation was found in Armour Twp, and light infestations were observed in Chaffey Twp. There was little change elsewhere.
1962	widely distributed throughout the district
1963	A general decrease in populations occurred.
1964	Populations increased. A moderate infestation occurred in Armour Twp, where 8% damage was recorded. Light damage was observed in Stisted and Chaffey twps.
1965	Populations increased and caused heavy damage in Chaffey Twp. Low population levels were recorded in Macaulay and McLean twps.
1966	Low population levels were observed in Macaulay, McLean, Armour and Chaffey twps.
1967	Populations increased and caused moderate damage in Ridout and Chaffey twps. Damage records show that 18% and 16%, respectively, of tree leaders were killed in these areas. Small numbers were observed at numerous points elsewhere.
1968	Populations increased for the second consecutive year in Ridout and Chaffey twps. An increase in numbers also occurred in Livingstone Twp.
1969	Moderate-to-severe damage was recorded in Livingstone, Ridout, Armour and Proudfoot twps.

(cont'd)

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

Year	Remarks
1970	Heavy infestations occurred in Armour and Proudfoot twps. Damage records show an incidence of 30% and 71% leader damage, respectively, in the above areas. Heavy damage recurred in Ridout Twp as well.
1971	Moderate-to-severe damage recurred in Armour and Proudfoot twps, and a new heavy infestation was observed in Joly Twp.
1972	moderate-to-severe damage at numerous points
1973	Populations declined. Moderate damage was reported in Joly Twp.
1974	not reported
1975	small numbers in Stisted Twp
1976	Populations remained at low levels.
1977	Populations increased; a moderate infestation was found in Spence Twp and a light infestation was recorded in Stisted Twp.
1978	A large infestation damaged 26% of trees examined at one point in Macaulay Twp. There was little change in population levels elsewhere.
1979	Populations increased and 73% of tree leaders at one point in Macaulay Twp were damaged. There was little change in population levels elsewhere.
1980	low population levels general through district

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): tL [Major]

Year	Remarks
1950	small numbers in Sherborne, McLean and Macaulay twps
1951-1954	not reported
1955	small numbers of colonies at widely distributed points
1956-1959	not reported
1960	A pocket of moderate damage occurred in Machar Twp.
1961	A pocket of heavy infestation was recorded in Machar Twp; moderate infestations were observed in Joly, Oakley and Ridout twps; scattered colonies were found at numerous points elsewhere.
1962	Populations declined to low levels throughout the district.
1963	not reported
1964	Infestations were generally at low levels, except in Ballantyne Twp, where a light infestation occurred.
1965	not reported
1966	low population levels at widely scattered points
1967	A general increase in populations occurred.
1968	Populations increased for the second consecutive year.
1969	severe damage at numerous points along Highway 11 and in Perry and Chaffey twps
1970	small stands severely defoliated in Perry, Chaffey and Strong twps
1971	a small pocket of heavy infestation in Joly Twp
1972	The infestation in Joly Twp declined to moderate intensity.
1973	moderate-to-severe defoliation recorded in Morrison Twp
1974-1975	not reported
1976	light defoliation of individual trees at scattered points
1977	pockets of moderate defoliation observed in Watt and Stisted twps

(cont'd)

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

Year	Remarks
1978	light defoliation of scattered trees at widely separated points
1979	small pockets of severe defoliation observed in Machar and Chaffey twps
1980	not reported

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

Host(s): jP, scP [Major]

Year	Remarks
1950-1960	not reported
1961	A heavy infestation occurred in Chaffey Twp; approximately 500 trees were seriously damaged.
1962	A heavy infestation recurred in Chaffey Twp.
1963	not reported
1964	A heavy infestation occurred in two Scots pine plantations in Stisted Twp.
1965-1966	not reported
1967	trace populations on fringe Scots pine in Stisted and Armour twps
1968	not reported
1969	large populations observed in Chaffey and Muskoka twps
1970-1971	not reported
1972	small populations at scattered points
1973-1980	not reported

Aspen Defoliators: *Choristoneura conflictana* (Wlk.), *Egira dolosa* Grt., *Enargia decolor* (Wlk.), *Pseudexentera oregonana* (Wlsm.)

Host(s): tA [Major]

Year	Remarks
1950-1957	*C. conflictana* - not reported
1958	*C. conflictana* - small numbers at scattered points
1959-1978	*C. conflictana* - not reported
1979	*C. conflictana* - small pockets of severe defoliation observed in Strong, Armour, Proudfoot, Stisted and Oakley twps
1980	*C. conflictana* - Populations decreased. There was one small pocket of heavy infestation in Strong Twp.
1950-1963	*P. oregonana* - not reported
1964	*P. oregonana* - pockets of heavy infestation at scattered points
1965-1966	*P. oregonana* - not reported
1967	*P. oregonana* - light infestations at scattered points
1950-1973	*E. decolor* - not reported
1974	*E. decolor* - low populations at scattered points
1950-1978	*E. dolosa* - not reported
1979	*E. dolosa* - high population levels in conjunction with *C. conflictana* infestations

OTHER NOTEWORTHY INSECTS

Pine False Webworm, *Acantholyda erythrocephala* (L.)

Host(s): rP [Major]

Year	Remarks
1950-1976	not reported
1977	heavily infested trees in Watt Twp
1978	moderate-to-severe defoliation in Watt Twp
1979	not reported
1980	Moderate-to-severe defoliation was reported in Watt and Bethune twps.

Birch Sawfly, *Arge pectoralis* (Leach)

Host(s): wB, yB, Al [Minor]

Year	Remarks
1950	small numbers of colonies in Ballantyne, Strong and Sherborne twps
1951-1954	small numbers at widely separated locations
1955-1969	scattered colonies in McLintock, Perry and Machar twps
1970-1972	not reported
1973	small numbers in Sinclair and Perry twps
1974-1980	not reported

Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): tL [Major]

Year	Remarks
1950	not reported
1951	Moderate-to-heavy infestations caused severe browning of foliage in light traps (see map, page 71). New light infestations were also recorded in Machar, Ballantyne, Paxton and Perry twps. Some twig mortality occurred in Chaffey and Perry twps.
1952	Severe defoliation recurred in Stephenson and Machar twps. Moderate damage was recorded in Armour Twp and light infestations were common in Perry and McLean twps.
1953	Although populations declined, small numbers of casebearers were common at many points in the district.
1954	Very light infestations were observed in Perry, Stephenson, McLean and Joly twps.
1955	very low population levels at scattered points
1956	A significant increase in population levels was noted in Ridout and Stephenson twps.
1957	Increases recurred for the second consecutive year in Ridout and Stephenson twps. Populations also increased in Perry, Ridout and McLean twps.
1958	Populations declined to low levels in Ridout and Stephenson twps. Small populations were also observed in Perry, Muskoka and Sinclair twps.
1959	low population levels at scattered points
1960	very low populations
1961	A light infestation was observed in Ridout Twp. Approximately 15% defoliation occurred.
1962	A new light infestation occurred in McLean Twp, and there were small populations at many points elsewhere in the district.

(cont'd)

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

Year	Remarks
1963	low population levels general throughout district
1964	Populations increased; many larch stands were lightly defoliated.
1965	Population increases were noted in Ridout Twp. Elsewhere, little change from the previous year could be determined.
1966	Only low population levels were observed.
1967	low populations throughout the district
1968	A very heavy infestation was observed in Stisted Twp; low population levels occurred throughout the remainder of the district.
1969	A heavy infestation recurred in Stisted Twp. Very light infestations were observed in Perry, Stephenson and McLean twps.
1970	not reported
1971	low population levels at widely scattered points
1972	not reported
1973	Light-to-moderate infestations were observed in Monck and Muskoka twps.
1974-1977	not reported
1978	low population levels at widely scattered points
1979	heavy infestations observed in Stisted Twp
1980	severe defoliation in seven townships in the central part of the district

map

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

Host(s): maple [Major]

Year	Remarks
1950-1961	not reported
1962	lightly infested trees in Ridout and Muskoka twps
1963-1980	not reported

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

Host(s): Oaks [Major]

Year	Remarks
1950-1974	not reported
1975	severe defoliation in the Bracebridge area; light damage in McClintock Twp
1976	Infestations in the Bracebridge area declined to a low level.
1977	Light-to-moderate defoliation was observed in Sinclair, Finlayson, Bethune and Watt twps.
1978	Light-to-moderate defoliation occurred on red oak in Ryde and Morrison twps.
1979	Populations increased and caused moderate-to-severe defoliation in Wood, Muskoka and Morrison twps.
1980	not reported; infestations collapsed

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

Host(s): pines [Minor]

Year	Remarks
1950-1971	not reported
1972	first records of the sawfly in the district; a few larvae found in Wood, Morrison and Muskoka twps
1973	not reported
1974	trace populations at a few locations
1975-1980	not reported

Oak Twig Pruner, *Elaphidionoides parallelus* (Newm.)

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

Year	Remarks
1950-1958	not reported
1959-1960	light damage at several locations
1961	a few heavily damaged trees in Chaffey Twp
1962-1968	not reported
1969	common in the southern part of the district
1970-1980	not reported

Basswood Looper, *Erranis tiliaria* (Harr.)

Host(s): deciduous [Major]

Year	Remarks
1950-1951	not reported
1952	light damage at numerous points
1953	A heavy infestation was recorded in Watt Twp; moderate damage occurred in Macaulay Twp and pockets of light infestation were found in Monck, Chaffey, Medora, Wood and Cardwell twps.
1954	Moderate defoliation occurred at one point in Frankli Twp. Elsewhere, sharp declines in population levels were recorded.
1955	very small numbers in the Lake of Bays area
1956	small numbers observed at widely scattered points
1957-1961	not reported
1962	Pockets of severe defoliation were observed in McClintock, Sherborne, Ridout, Wood, Chaffey, Medora, Morrison, McLean and Macaulay twps.
1963	Severe defoliation recurred in Sherborne, McClintock, McLean and Chaffey twps; new heavy infestations were found in Livingstone, McDougall and Monck twps, and small pockets of defoliation were recorded in Muskoka, Medora and Wood twps.
1964	Populations declined sharply except in Ridout and Medora twps, where medium and light infestations were recorded, respectively.
1965-1972	not reported
1973	low population levels recorded at scattered points
1974-1975	not reported
1976	low population levels common throughout the district
1977-1980	not reported

Eastern Pine Shoot Borer, *Eucosoma gloriola* Heinr.

Host(s): Pines [Major]

Year	Remarks
1950-1955	not reported
1956	Small numbers of terminal shoots were killed in Macaulay, McLean and Stisted twps.
1957	light infestations in Macaulay, McLean and Stisted twps
1958	Light infestations recurred in Macaulay, McLean and Stisted twps.
1959	low populations at scattered points
1960	Populations increased. There was moderate-to-heavy damage to terminal shoots in McLean Twp.
1961	heavy infestations in Armour and Chaffey twps
1962	medium infestations recorded in Armour and McLean twps
1963	Medium infestations recurred in Armour and McLean twps.
1964	Populations declined to light intensity in Armour and McLean twps.
1965	very low population levels at scattered points
1966	Populations increased. Moderate-to-heavy damage was observed in Armour and Stisted twps.
1967	Moderate-to-heavy infestation persisted in Stisted Twp but damage was light in Armour Twp. Small numbers of borers were observed at scattered points elsewhere.
1968-1970	not reported
1971	moderate damage recorded in Franklin, Joly and Strong twps
1972	A general decline in populations occurred except in Strong Twp, where moderate damage recurred.
1973-1977	not reported

(cont'd)

Eastern Pine Shoot Borer, *Eucosoma gloriola* Heinr. concl.)

Year	Remarks
1978	Population increases were noted, especially in Stisted, Strong and Watt twps.
1979	light infestations observed in Stisted and Strong twps
1980	high population levels in Stisted Twp; small numbers of borers elsewhere

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

Host(s): wS, bS [Minor]

Year	Remarks
1950-1952	not reported
1953	low population levels at a few locations
1954-1955	not reported
1956	widely distributed through the district but in very small numbers
1957-1960	not reported
1961	small numbers at a few locations
1962-1966	not reported
1967	small numbers in Machar, Joly, Perry and McLean twps
1968-1976	not reported
1977	small numbers at numerous points
1978-1980	not reported

Pales Weevil, *Hylobius pales* (Hbst.)

Host(s): pines [Major]

Year	Remarks
1950-1963	not reported
1964	moderate-to-heavy infestations in Christmas tree plantations in Armour and Morrison twps
1965-1980	not reported

Pine Root Collar Weevil, *Hylobius radicis* Buch.

Host(s): pines [Major]

Year	Remarks
1950-1958	not reported
1959	first record in the district
1960	small numbers at one location in Muskoka Twp
1961	a few infested trees in Monck Twp
1962-1980	not reported

Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF, wS [Major]

Year	Remarks
1950	not reported
1951	small numbers at widely scattered points
1952	not reported
1953	low population levels at scattered locations

(cont'd)

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

Year	Remarks
1954	not reported
1955	small numbers in Machar, Laurier and Perry twps
1956	severely defoliated trees in Brunel and Machar twps
1957	not reported
1958	small numbers at several locations
1959-1980	not reported

Northern Pitch Twig Moth, *Petrova albicapitana* (Bsk.)

Host(s): jP [Minor]

Year	Remarks
1950-1954	not reported
1955	large numbers at one location in Macaulay Twp
1956	not reported
1957	common in McLean and Macaulay twps
1958-1980	not reported

Northern Pitch Weevil, *Pissodes approximatus* Hopk.

Host(s): pines [Major]

Year	Remarks
1950-1959	not reported
1960	Winter drying affected trees that had been heavily infested at one location near Burk's Falls and the trees subsequently died.
1961	some light mortality in the Gravenhurst area
1962-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1952	not reported
1953	first record in the district in Medora Twp
1954-1955	not reported
1956	trace populations 3 km south of Gravenhurst
1957-1980	not reported

D I S E A S E S

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

Host(s): coniferous, deciduous [Major]

Year	Remarks
1950-1954	not reported
1955	common in deteriorating hemlock between Huntsville and Dorset
1956	not reported
1957	infected balsam fir observed at numerous points
1958-1962	not reported
1963	moderate damage at one point in Strong Twp
1964	light damage observed at numerous points
1965-1966	not reported
1967	moderate damage observed in a red pine plantation in Strong Twp; common at numerous points elsewhere
1968	not reported
1969	light mortality observed in a white spruce stand in Ridout Twp
1970-1973	not reported
1974	light damage to young conifers at scattered points
1975	low levels of damage at many points throughout the district
1976	not reported
1977	Infection caused light mortality of maple at one point in Joly Twp. Damaged trees were observed at scattered points elsewhere.
1978	not reported
1979	Mortality reached 2.7% in a 6-ha red pine plantation in Strong Twp.
1980	not reported

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

Host(s): Pines [Major]

Year	Remarks
1950-1970	not reported
1971	The canker was found in Strong Twp, the first record of this disease in the district.
1972	heavy damage observed in a red pine plantation in Proudfoot and Stisted twps
1973	recorded for the first time in Joly Twp
1974	Extensive surveys conducted in 34 red pine, Scots pine or jack pine plantations in Stisted, Bethune, Joly, Machar, Proudfoot and Strong twps revealed that trees in 30 plantations were infected, with incidence levels ranging from 2 to 100%.
1975	High levels of infection persisted at numerous points.
1976	Little change in incidence or level of infection from the previous year could be determined.
1977	The disease continued to spread in Stisted and Bethune twps. An 87% incidence of infection was recorded at two points in the former township and at one point in the latter.
1978	continued high incidence of infection, and a 25-km extension southward into Macaulay Twp
1979	continued high incidence of infection throughout known range
1980	Continued high incidences of infection and a southward extension were recorded when an area of light infection was found in Oakley Twp (see map, page 85).

Map

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

Host(s): wE [Major]

Year	Remarks
1950-1957	not reported
1958	The first report of the disease in the district was recorded in the towns of Bracebridge and Gravenhurst.
1959	There was a further spread of the disease, which was found in the Huntsville area.
1960	increase in distribution; found in the South River area
1961	further increases in the distribution; observed at numerous points
1962	infection throughout the range of elms in the district
1963	Mortality occurred at numerous points.
1964	Mortality increased to as much as 17% in the Rousseau Lake area.
1965	Mortality increased from the previous year in Armour and Strong twps.
1966	The incidence of infected trees averaged 26.5% at six sample locations.
1967	Little change could be determined in distribution or incidence of infection over the previous year.
1968	The incidence of infected trees averaged 45.6% at five sample points.
1969	not reported
1970	Tree mortality was evident throughout the district.
1971	heavy mortality observed at many points
1972	heavy mortality general throughout the district
1973	Mortality averaged 78.5% at four sample points.

(cont'd)

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

Year	Remarks
1974	heavy current mortality widespread in the district
1975	Heavy current mortality continued and averaged 48.3% in Machar, Morrison and Watt twps.
1976	Mortality continued to occur at approximately the same rate as in the previous year in Machar, Morrison and Watt twps.
1977	The incidence of infection averaged 60% at two sample points.
1978	not reported
1979	high levels of infection and heavy mortality observed at numerous points
1980	High levels of mortality were general throughout the district.

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

Host(s): tA [Major]

Year	Remarks
1950-1958	not reported
1959	pockets of heavy infection observed in Franklin Twp
1960-1961	not reported
1962	Pockets of heavy infection caused premature browning of foliage in Chaffey Twp.
1963	pockets of heavy infection observed at numerous points
1964	Damage declined to pockets of light infection at scattered points.

(cont'd)

Ink Spot of Aspen, *Ciborinia whetzellii* (Seaver) Seaver (concl.)

Year	Remarks
1965	not reported
1966	trace or light damage observed at widely scattered points
1967	Infection levels increased, and moderate-to-severe damage occurred on regeneration at numerous points.
1968	Infection levels decreased to a low level.
1969	pockets of moderate foliar damage observed in Perry Twp
1970	only trace infection observed
1971	little change from the previous year
1972-1973	Low infection levels occurred at numerous points.
1974-1975	not reported
1976	trace levels of infection at scattered points
1977	little change over the previous year; trace levels of infection only
1978	moderate infection levels observed in Stisted Twp
1979-1980	not reported

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

Host(s): wP [Major]

Year	Remarks
1950-1952	not reported
1953	light infection observed in white pine stands in Perry and Franklin twps
1954	not reported

(cont'd)

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

Year	Remarks
1955	The disease was common at numerous points. The incidence of infection reached 21% in Sherborne Twp.
1956-1958	not reported
1959	widely distributed throughout the district
1960	no discernible change from the previous year
1961	not reported
1962	numerous recently infected trees observed in Franklin Twp
1963	common in white pine stands throughout the district
1964	current branch mortality and light stem mortality observed at numerous points in the district
1965	infected trees common at many points in the district
1966	not reported
1967	continued to cause branch and light stem mortality throughout the district
1968	moderate levels of infection observed at numerous points in the district
1969-1970	not reported
1971	widespread throughout the district; light tree mortality
1972	newly infected trees observed at a few points
1973	not reported
1974	Damage occurred in virtually every white pine stand in the district.
1975	not reported
1976	small numbers of recently infected trees observed at numerous points
1977	little change from the previous year
1978-1980	not reported

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

Host(s): tA, lA [Major]

Year	Remarks
1950-1952	not reported
1953	common in aspen stands throughout the district
1954	no discernible change from the previous year
1955	There was little change in a sample plot in Chaffey Twp; 38% of the trees were infected.
1956-1961	not reported
1962	widely distributed throughout the district
1963	moderate damage observed in Franklin Twp
1964	The disease continued to cause appreciable damage throughout the district. An infection incidence of 26% was recorded in two stands in Franklin Twp.
1965	no change from the previous year
1966	no change in incidence
1967	easily found in most poplar stands
1968	Moderate damage occurred in Franklin Twp.
1969	common in the district; 2.5% current mortality recorded in Franklin Twp
1970	not reported
1971	common in most poplar stands
1972	not reported
1973	high incidence in Franklin Twp; 32% current mortality recorded in one stand
1974	not reported

(cont'd)

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

Year	Remarks
1975	little change over the past several years; common throughout the district
1976	The disease was common throughout the district. No change in incidence could be observed.
1977	not reported
1978	light mortality at scattered points
1979-1980	not reported

Leaf and Shoot Blight of Aspen, *Venturia macularis* (Fr.) E. Müller & v. Arx

Host(s): tA [Major]

Year	Remarks
1950-1962	not reported
1963	trace damage observed at scattered points in the district
1964	light damage observed on regeneration at numerous points
1965	light damage common on regeneration throughout the district
1966	no discernible change over the previous year
1967	Infection levels increased, and there was severe shoot damage at numerous points.
1968	not reported
1969	Damage levels decreased to a low level, but the disease remained common in the district.
1970-1971	not reported
1972	Trace levels of infection observed at numerous points.

(cont'd)

Leaf and Shoot Blight of Aspen, *Venturia macularis* (Fr.) E. Müller & v. Arx (concl.)

Year	Remarks
1973	no change from previous year
1974	not reported
1975	a trace of infection observed in Armour Twp
1976-1977	not reported
1978	trace levels of infection observed at numerous points
1979-1980	not reported

OTHER NOTEWORTHY DISEASES

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

Host(s): rP [Major]

Year	Remarks
1950-1957	not reported
1958	moderate infection levels observed near Burk's Falls
1959	pockets of light infection common in the district
1960-1961	not reported
1962	Pockets of heavy infection caused severe browning of foliage in McLean Twp.
1963	Incidence of infection declined to low levels.
1964	not reported
1965	pockets of heavy infection recorded in McClintock Twp
1966	Heavy infection caused severe browning of foliage in Sherborne and Muskoka twps.
1967-1970	not reported

(cont'd)

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

Year	Remarks
1971	pockets of light infection observed at numerous points in the district
1972	not reported
1973	Pockets of heavy infection occurred in Joly Twp.
1974-1979	not reported
1980	light damage observed in Draper, Joly, Macaulay, Machar and Oakley twps

Eutypella Canker, *Eutypella parasitica* Davidson & Lorenz

Host(s): sM [Major]

Year	Remarks
1950-1959	not reported
1960	common in maple stands in Muskoka Twp
1961-1962	not reported
1963	common in maple stands at numerous points in the district
1964	no discernible change from the previous year; most common in the southern part of the district
1965-1968	not reported
1969	light mortality observed in Brunel, Ridout, McClintock and McLean twps
1970	widely distributed throughout the district
1971-1980	not reported

Pine Needle Cast, *Lophodermium pinastri* (Schrader: Fr.) Chev.

Host(s): rP, wP [Major]

Year	Remarks
1950-1956	not reported
1957	light infection in white pine stands at numerous points in the district
1958	Light infection recurred at numerous points.
1959	no discernible change from the previous year
1960-1964	not reported
1961	heavy infection at scattered points in the district
1962-1964	not reported
1965	pockets of heavy infection observed at widely separated points in the district
1966-1972	not reported
1973	heavy infection observed at widely scattered locations
1974-1978	not reported
1979	Pockets of light infection occurred in red pine plantations in Stisted and Strong twps.
1980	not reported

Hemlock-poplar Rust, *Melampsora abietis-canadensis* C.A. Ludwig ex Arthur

Host(s): eH

Year	Remarks
1950-1962	not reported
1963	first Ontario record; infected cones found in Medora, Monck and Draper twps
1964-1980	not reported

Larch-poplar Rust, *Melampsora medusae* Thüm.

Host(s): tamarack [Minor]

Year	Remarks
1950-1967	not reported
1968	light infections in larch stands in Perry and Armour twps
1969	heavy infections in Perry Twp
1970	not reported
1971	light infections at several locations
1972-1980	not reported

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

Host(s): deciduous [Major]

Year	Remarks
1950-1952	not reported
1953-1955	widespread through the district
1956-1980	not reported

Red Ring Rot of Conifers, *Phellinius pini* (Brot.: Fr.) A. Ames

Host(s): bF, pine, spruce [Major]

Year	Remarks
1950-1954	not reported
1955	observed on small, open-growing trees at several points
1956-1980	not reported

ABIOTIC DAMAGE

Balsam Fir Dieback

Host(s): bF [Major]

Year	Remarks
1950-1956	not reported
1957	Mortality ranged from 10% to 25% on small fringe trees at several points.
1958	light mortality at several points
1959-1980	not reported

Birch Decline

Host(s): wB, yB

Year	Remarks
1950-1965	not reported
1966	Light damage was widespread through the district.
1967	little change in the condition of birch stands
1968-1980	not reported

Frost

Year	Remarks
1950-1956	not reported
1957	widespread severe damage to red oak
1958-1958	not reported
1960	severe damage to white spruce and Scots pine between Huntsville and South River
1961-1963	not reported
1964	severe damage to white spruce, red oak, ash and aspen in Armour and Strong Twp

(cont'd)

Frost (concl.)

Year	Remarks
1965	severe damage in Ryerson Twp
1966-1968	not reported
1969	light damage on red oak in the Muskoka Lakes area
1970-1976	not reported
1977	severe damage in white spruce plantations in Stisted and Bethune twps
1978-1979	not reported
1980	severe damage in white spruce plantations in Machar and Stisted twps

Maple Decline

Host(s): sM

Year	Remarks
1950-1977	not reported
1978	Numerous pockets of dead trees were found in the southern part of the district, and tree mortality reached 90% in a small woodlot in Medora Twp.
1979	There was little change from the previous year; however, an improvement in vigor was noted in trees not severely damaged in the previous year. Fungi present in samples from damaged trees were *Armillaria mellea* (Vahl: Fr.) Kummer, *Eutypella parasitica* Davidson & Lorenz, *Fomes connatus* (Weinm. ex Fr.) Gill., *Fomes fomentarius* (Fr.) Kickx., *Fomes igniarius* (L. ex Fr.) Kickx., *Polyporus tomentosus* Fr. and *Hericium* sp. (see map, page 98).
1980	Further improvements in tree vigor occurred in stands not severely damaged in 1978. Severe defoliation by the forest tent caterpillar from 1974 to 1977 is considered to be the major cause of the decline.

Oak Decline

Host(s): rO

Year	Remarks
1950-1976	not reported
1977	A general decline in red oak vigor was recorded in Macaulay Twp. Branch mortality ranged from -5% on 90% of trees sampled to + 60% on the remainder.
1978	There was little change from the previous year; however, 2% mortality was recorded.
1979	Little change was recorded. Current mortality was 2% for the second consecutive year.
1980	There was little change in the overall condition of affected trees. Current mortality reached 4%.

Map

Winter Drying

Year	Remarks
1950-1958	not reported
1959	light damage to red pine on exposed sites generally severe damage
1961-1963	not reported
1964	light damage to red pine and Scots pine on exposed sites
1965-1966	not reported
1967	extensive damage to Scots pine and white pine
1968-1969	not reported
1970	moderate damage in red oak plantations
1971	trace damage general
1972	severe damage on exposed sites
1973-1974	not reported
1975	trace damage general
1976	severe damage in Machar and Chaffey twps
1977-1980	not reported

A P P E N D I C E S

APPENDIX A

DECIDUOUS HOSTS

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	*P. tremuloides* Michx.	tA
Basswood	*Tilia* spp.	Ba
Beech	*Fagus grandifolia* Ehrh.	Be
Birch, white	*Betula papyrifera* Marsh.	wB
yellow	*B. alleghaniensis* Britt.	yB
Butternut	*Juglans cinerea* L.	Bu
Cherry, eastern choke	*Prunus virginiana* L.	eaCh
pin	*P. 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	*A. rubrum* L.	rM
sugar	*A. saccharum* Marsh.	sM
Mountain-ash, American	*Sorbus americana* Marsh.	aMo
Oak, bur	*Quercus macrocarpa* Michx.	bO
red	*Q. rubra* L.	rO
Poplar, balsam	*Populus balsamifera* L.	bPo
Carolina	X *P. canadensis* Moench	cPo
Lombardy	*P. nigra* var. *italica* Muenchh.	lPo
silver	*P. alba* L.	sPo
Willow	*Salix* spp.	W

APPENDIX B

CONIFEROUS HOSTS

Common Name	Scientific Name	Abbreviations
Cedar, eastern white	*Thuja occidentalis* L.	eC
Fir, balsam	*Abies balsamea* (L.) Mill.	bF
Larch	*Larix laricina* (Du Roi) K. Koch	tL
Pine, Austrian	*Pinus nigra* Arn.	aP
eastern white	*strobus* L.	wP
jack	*banksiana* Lamb.	jP
mugho	*mugho* Turra var. *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