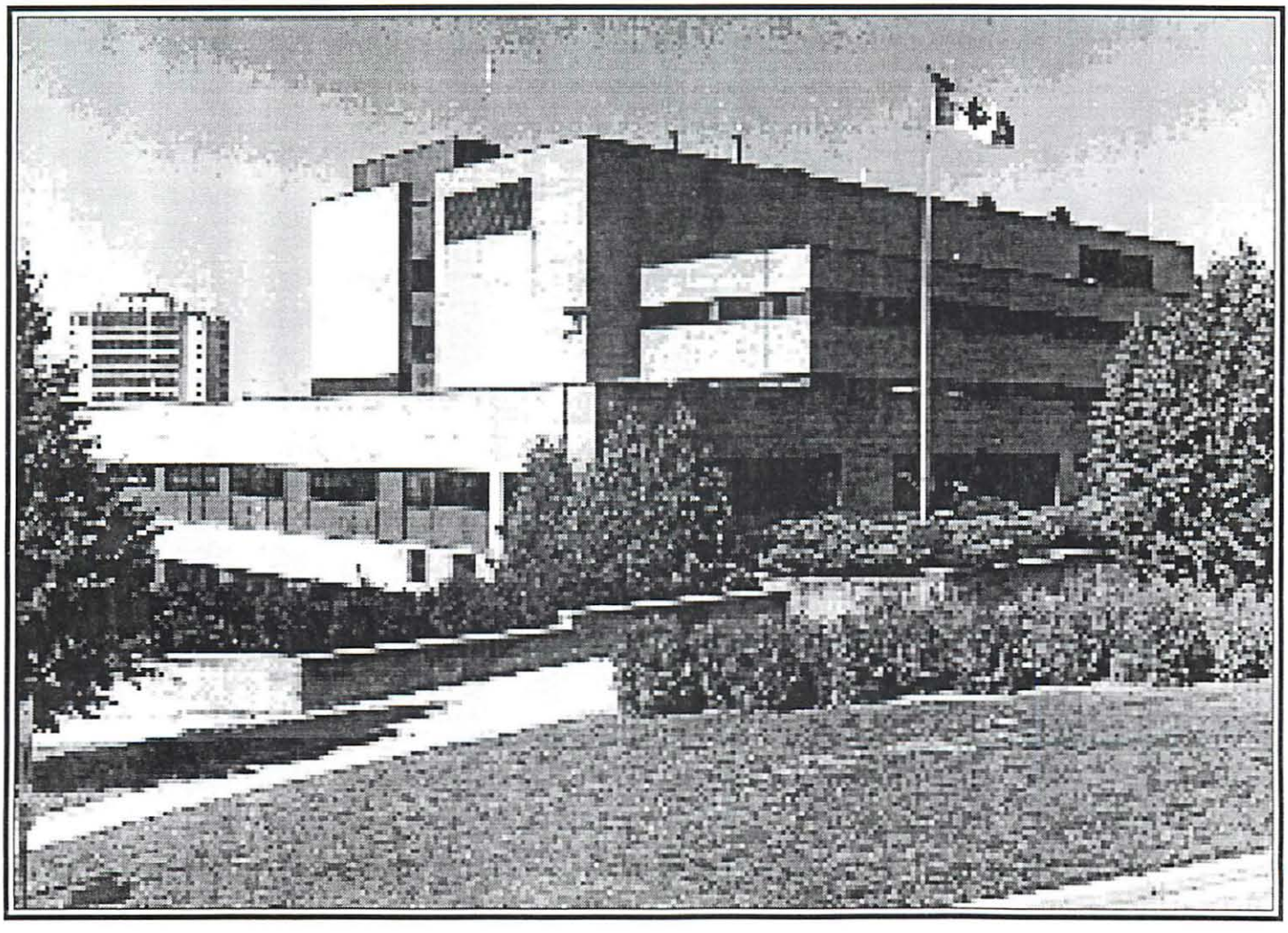
A Review of Important Forest Insect and Disease Problems in the Chatham District of Ontario, 1950 – 1980



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

Compiled by

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FORESTRY CANADA

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FOREWORD

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

Major Insects or Diseases

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

Minor Insects or Diseases

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

Abiotic Damage

Damage caused by non-living factors.

All measurements in this review are in metric form and conversions from Imperial measurements from the earliest reports are taken to the second decimal point, i.e., [sq. mi. to 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.

ACKNOWLEDGMENTS

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1950-1952	A.G. Donaldson
1953-1956	L. Jago
1957-1961	H. Foster
1962-1966	J. Trinnell
1967-1969	G. Atkinson
1970-1975	V. Jansons
1976-1979	D.C. Constable
1980	C.A. Barnes

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INTRODUCTION

This is a review of significant forest insects and diseases in the Chatham District from 1950 to 1980. The present Chatham District was formed in 1973 from parts of the former Lake Erie and Lake Huron districts. In the selection of pests for this report special attention was paid to major working groups of host species in the area, namely southern hardwoods and plantation conifers. Also included are pests that cause damage to shade and ornamental trees. The insects and diseases described are capable of causing or have caused, tree mortality or a reduction in growth. Also included are abiotic conditions that have caused tree damage, i.e., frost, drought and winter drying.

SUMMARY

FOREST INSECTS

Fall Cankerworm, *Alsophila pometaria* (Harr.) [Major]
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Although this insect rarely causes tree mortality, heavy defoliation retards growth and vigor making host trees susceptible to attach by other pests. Moderate-to-severe defoliation was recorded in 1952-1953, 1960 and 1963 at various points in the district.

Orangestriped Oakworm, *Anisota senatoria* (J.E. Smith) [Major]
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Defoliation by this insect seldom causes mortality of the host but weakened trees are subject to attack by secondary insects and diseases. Populations have fluctuated greatly during the 30-year period.

Uglynest Caterpillar, *Archips cerasivorana* (Fitch)
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Damage by this insect does not seriously affect the trees, but the nests detract from the aesthetics of the trees. This insect was commonly observed since 1953.

Arborvitae Leafminer, *Argyresthia thuiella* (Pack.) [Major]
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Repeated defoliation by this miner has caused some mortality in cedar stands in southern Ontario. Moderate-to-severe defoliation occurred in 1971, 1974 and in 1980 at numerous locations.

Jack Pine Budworm, *Choristoneura pinus pinus* Free. [Major]
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This is a destructive pest of pines that can cause mortality after two years of severe defoliation. Population levels of this insect have been light since 1957.

Larch Casebearer, *Coleophora laricella* (Hbn.) [Major]
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A serious pest of both native and European larch, this insect can reduce tree growth after two successive years of complete defoliation. Moderate-to-severe defoliation was most commonly observed in the Kettle Point area since 1957.

Walnut Caterpillar, *Datana integerrima* G. & R. [Major]
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The walnut caterpillar feeds mainly on the foliage of walnut, butternut, hickory and several other species. Severe defoliation after a number of years can cause branch and whole-tree mortality. Varying degrees of defoliation has been observed over the past 30 years in the district.

Walking Stick, *Diapheromera femorata* (Say) [Major]
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This defoliator of broad-leaved trees, consumes the leaf blade, leaving only parts of stout veins. Three to four years of severe defoliation may kill branches. High populations were reported in 1952 and in 1954 in Bosanquet Twp.

Greenstriped Mapleworm, *Dryocampa rubicunda* (F.) [Major]
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The greenstriped mapleworm defoliates hardwoods stands, particularly maple. Serious injury can follow several years of severe defoliation. Moderate-to-severe defoliation occurred in Harwich Twp in 1962 and again in 1965.

Basswood Looper, *Erannis tiliaria* (Harris) [Major]
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Because outbreaks are normally short-lived, it is rare that hardwoods die from defoliation by this looper. However, moderate-to- severe defoliation may weaken trees. Only light defoliation has occurred since 1958.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr. [Major]
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This insect usually infests lateral shoots and causes only aesthetic damage. When high populations develop, some leaders are infested and killed causing deformity of infected trees. Low populations have occurred in the district since 1954.

Birch Leafminer, *Fenusa pusilla* (Lep.) [Major]
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Defoliation by this miner can weaken trees and leave them susceptible to secondary insects and diseases and may be a predisposing factor in birch decline. As a rule, these insects attack single trees, but when populations build up, stands of trees are heavily defoliated. Varying degrees of foliar damage have occurred since 1961.

Fall Webworm, *Hyphantria cunea* (Drury) [Major]
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This insect attacks a wide variety of deciduous hosts, however, because defoliation comes late in the growing season, damage is usually considered serious where aesthetic values are important. Since 1950, population levels have varied greatly in the district.

Eastern Tent Caterpillar, *Malacosoma americanum* (F.) [Major]
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This caterpillar feeds primarily on pin cherry, choke cherry and apple and is more common on roadside trees and ornamentals than in forest stands. Moderate-to-severe defoliation occurred at several locations during the periods from 1956 to 1963.

European Pine Sawfly, *Neodiprion sertifer* (Geoff.) [Major]
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This sawfly feeds on many species of pine but is a particular pest in Scots pine plantations and, consequently, a threat to Christmas tree growers. Moderate-to-severe defoliation occurred at numerous locations since 1950.

Spruce Spider Mite, *Oligonychus ununguis* (Jac.) [Major]
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The spruce spider mite attacks various conifers. Serious economic damage to hemlock, spruce and cedar have been recorded in plantations, nurseries and ornamental plantings. High populations were reported in 1958 and 1959 at Point Pelee National Park.

White-marked Tussock Moth, *Orgyia leucostigma intermedia* Fitch [Major]
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This insect feeds on a wide variety of coniferous and deciduous hosts from Newfoundland to Alberta. In Ontario infestations have often occurred in urban areas primarily on Manitoba maple and elm as well as other deciduous hosts. Moderate-to-severe defoliation occurred on a wide variety of roadside trees in 1957, 1962-1966 and in 1976-1977.

White Pine Weevil, *Pissodes strobi* (Peck) [Major]
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This weevil is considered the most destructive pest of white pine in North America. Successive weeviling over a period of years results in multiple-stemmed trees. Damage has not exceeded 3% since 1950.

Larch Sawfly, *Pristiphora erichsonii* (Htg.) [Major]
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The larch sawfly is the primary defoliator of native and most species of larch. On good sites, larch trees can withstand six to nine years of severe defoliation before mortality occurs; on less favourable sites, mortality may follow three or more years of complete defoliation. Moderate-to-severe defoliation was reported in 1961 to 1963 and again in 1965 to 1969.

Mountain Ash Sawfly, *Pristiphora geniculata* (Htg.) [Major]
page

Although mountain-ash trees are not considered merchantable, a great many are utilized as shade and ornamental trees in urban and rural areas. This insect weakens trees when prolonged defoliation occurs, leaving them susceptible to attack by secondary insects and diseases. Varying degrees of defoliation have occurred since 1962 in the district.

European Pine Shoot Moth, *Rhyacionia buoliana* (D. & S.) [Major]
page

This important pest attacks all species of pine but red and Scots pine are preferred. Repeated attacks on red pine have been especially damaging because of resulting deformity. High degrees of damage occurred in 1954 to 1956, 1960 to 1963 and in 1977.

Other Noteworthy Insects [Major and Minor]
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These are insects that have the potential for causing damage to stands, regeneration and plantations.

FOREST DISEASES

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau [Major]
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This major disease organism, which affects all species of elm, was first recorded in Prescott County in 1946, and has gradually spread throughout most of the known range of elm in Ontario. Since 1950, this disease continued to attack and kill elm across the entire district.

Leaf Blotch, *Phyllosticta sphaeropsoidea* Ell. & Ev. [Major]
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The first indication of the disease is a slight discoloration at the point of infection which may occur anywhere on the leaf or petioles. When infections are severe, the affected leaves become brittle, brown and distorted resulting in premature leaf drop. Heavy infections were only reported in 1978 where 100% incidence occurred from Harrow to Leamington.

Other Noteworthy Diseases
pages

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

ABIOTIC DAMAGE
page

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

DIEBACKS AND DECLINES
page

Varying degrees of damage have been reported since 1960 in the district as a result of these conditions.

I N S E C T S

Fall Cankerworm, *Alsophila pometaria* (Harr.)

Host(s): deciduous [Major]

Year	Remarks
1950-1951	Several small pockets ranging from 1 ha to 8 ha occurred throughout Lambton County. Defoliation averaged 20% to 30%.
1952-1953	Moderate-to-severe defoliation occurred at numerous points, especially in Bosanquet Twp, Lambton County.
1954-1958	not reported
1959	Light defoliation occurred in South Colchester Twp.
1960	Moderate defoliation occurred in South Gosfield Twp.
1961-1962	not reported
1963	Moderate-to-severe defoliation occurred on 7-m Manitoba maple trees near Thamesville, Howard Twp.
1964-1967	not reported
1968	Low numbers were reported in Bosanquet Twp.
1969-1973	not reported
1974-1977	Light defoliation was recorded in the district at several locations.
1978-1980	not reported

Orangestriped Oakworm, *Anisota senatoria* (J.E. Smith)

Host(s) white, black and red oak [Major]

Year	Remarks
1950	not reported
1951-1952	Up to 100% defoliation was recorded in more than 100 ha of open-grown and woodlot trees in North and South Colchester twps, Essex County.
1953	Populations declined to light intensity in Essex County and a light infestation occurred in Bosanquet Twp.
1954	Populations collapsed in Essex County and remained light in Bosanquet Twp.
1955-1961	Light infestations were reported in Bosanquet Twp.
1962	Moderate defoliation occurred to a few trees at Ridgetown in Howard Twp and light infestations persisted in Pinery Provincial Park, Bosanquet Twp.
1963	Heavy damage occurred to a few trees in Howard Twp.

(cont'd)

Orangestriped Oakworm, *Anisota senatoria* (J.E. Smith) (concl.)

Year	Remarks
1964	Populations declined to cause moderate defoliation in Howard Twp.
1965-1966	Moderate-to-severe defoliation was recorded at several locations in Pinery Provincial Park, Bosanquet Twp, and in Dawn Twp.
1967	Populations declined to a light intensity in Pinery Provincial Park and in Dawn Twp.
1968-1976	not reported
1977	Severe defoliation was observed on white oak in Tilbury Twp.
1978-1979	Light defoliation occurred on single open-grown trees at Rondeau Provincial Park and in Tilbury Twp.
1980	20% defoliation was common in Tilbury, Bosanquet and Harwich twps; small, localized infestations were common in Rondeau Provincial Park and at Point Pelee National Park.

Uglynest Caterpillar, *Archips cerasivorana* (Fitch)

Host(s): cherry [Major]

Year	Remarks
1950-1952	not reported
1953	Light populations recorded on roadside trees and shrubs at Point Pelee National Park, Essex County.
1954-1957	not reported
1958	Moderate numbers caused unsightly damage in Point Pelee National Park.
1959-1960	not reported
1961	Medium infestations occurred in small areas in Point Pelee National Park.
1962	Populations collapsed at Point Pelee National Park, however, low numbers were observed at several locations across the district.
1963	not reported
1964-1966	Moderate defoliation was recorded along the St. Clair River, Sarnia Twp; Point Pelee National Park, Mersea Twp and in Dawn Twp.
1967	Very low populations occurred in the district
1968-1973	not reported
1974	Trace numbers were observed in Bosanquet Twp.

(cont'd)

Uglynest Caterpillar, *Archips cerasivorana* (Fitch) (concl.)

Year	Remarks
1975	not reported
1976	commonly observed throughout the district
1977-1978	not reported
1979	light-to-moderate populations in the district
1980	heavy defoliation on Pelee Island and in Point Pelee National Park

Arborvitae Leafminer, *Argyresthia thuiella* (Pack.)

Host(s): cedar, eastern white and red [Major]

Year	Remarks
1950	not reported
1951-1952	Light-to-medium infestations were recorded in Lambton County.
1953	not reported
1954-1957	Light infestations were common in the district, especially in Bosanquet and Plympton twps.
1958-1968	not reported
1969-1970	Light-to-moderate discoloration was reported in Lambton and Essex County.
1971	High populations occurred at scattered locations.
1972	not reported
1973	Light infestations were commonly observed in the district.
1974	Severe damage was common in parts of the district.
1975-1976	Infestations declined to trace levels.
1977-1978	not reported
1979	Damage was generally considered at light levels in the district.
1980	Small pockets of heavy infestations occurred south of Grand Bend in Bosanquet and Plympton twps.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Host(s): jack pine, Scots pine [Major]

Year	Remarks
1950-1956	not reported
1957	Light infestation occurred in a small Scots pine plantation in South Colchester Twp.
1958-1959	not reported
1960	light defoliation in Colchester Twp
1961	Light defoliation persisted in Colchester Twp and a new area of moderate damage was recorded in Zone Twp.
1962	Populations at both locations collapsed.
1963	Trace numbers remain in South Colchester Twp.
1964	low numbers recorded in Romney Twp
1965	Light damage occurred in Euphemia Twp.
1966-1979	not reported
1980	Light infestations were recorded on Pelee Island.

Larch Casebearer, *Coleophora laricella* Hbn.

Host(s): European, Japanese larch [Major]

Year	Remarks
1950-1953	not reported
1954-1956	Light infestations were observed through the district.
1957	Moderate-to-severe defoliation occurred at Kettle Point, Bosanquet Twp.
1958	Populations declined to a light intensity at Kettle Point.
1959	A slight resurgence in population occurred at Kettle Point to cause moderate defoliation.
1960	Infestations declined to light intensity at Kettle Point.
1961	Heavy defoliation occurred at Kettle Point.
1962	Infestations declined to moderate damage levels in Bosanquet Twp.
1963	Populations increased at Kettle Point to high levels.
1964	Light-to-moderate defoliation recorded at Kettle Point and other locations in Bosanquet Twp.

(cont'd)

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

Year	Remarks
1965	Low numbers recurred in Bosanquet Twp.
1966	Populations increased to high intensity at Kettle Point, Bosanquet Twp.
1967	slight decline in numbers were noted this year
1968	Light-to-moderate defoliation occurred at Kettle Point.
1969	Populations recurred at a moderate level at Kettle Point.
1970-1971	Low populations were recorded in the district.
1972-1975	not reported
1976	Light defoliation was recorded in the district.
1977-1979	not reported
1980	Small pockets of light-to-moderate defoliation were noted in the district.

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

Host(s): black walnut, butternut and hickories [Major]

Year	Remarks
1950	Defoliation of individual trees ranged from 2% to 95% throughout the district.
1951-1953	High populations caused severe defoliation on individual trees in Kent County and low numbers were recorded elsewhere in the district.
1954	10% to 50% defoliation occurred on roadside trees through Kent County and light damage was noted in Lambton County
1955	Moderate populations causing up to 70% defoliation was recorded in the southern part of the district.
1956	10% and 30% defoliation on roadside trees in Enniskillen and Raleigh twps, respectively
1957	Defoliation was recorded as high as 100% in Tilbury East Twp, however, light damage occurred through the northern portions of Lambton County.
1958-1960	10% to 45% defoliation was recorded on individual trees throughout the district
1961	An increase in population was recorded as defoliation ranged from 40% to 80% on some trees in the district.

(cont'd)

Walnut Caterpillar, *Datana integerrima* G. and R. (concl.)

Year	Remarks
1962-1964	Moderate-to-severe defoliation was recorded to clumps of trees in Essex and Kent counties. Light damage was experienced in Lambton County.
1965	Populations declined to medium intensity in Essex County. High populations recurred in Kent County, however, a marked increase occurred in Point Pelee National Park where only moderate defoliation was recorded on a few trees. Branch mortality was recorded commonly in Romney Twp. A slight increase in population was noted in Lambton County
1966-1967	Defoliation was recorded from 10% to 90% on isolated trees from Enniskillen in the north to Tilbury in the south, respectively.
1968-1969	Defoliation averaged 85% in the district.
1970-1971	population declined to low levels on scattered trees in the district
1972	not reported
1973-1976	Light-to-moderate defoliation was recorded on scattered trees or in small groups of trees in the southern portion of the district.
1977-1979	Many single and open growing trees were completely stripped from Point Pelee National Park to Windsor.
1980	Heavy defoliation persisted including Rondeau Provincial Park.

Walking Stick, *Diapheromera femorata* (Say)

Host(s): oak [Major]

Year	Remarks
1950-1951	not reported
1952	Complete defoliation occurred in a 400-ha area of Pinery Provincial Park, Bosanquet Twp.
1953	Populations declined to low levels.
1954	Moderate-to-severe defoliation occurred south of Grand Bend in Bosanquet Twp for approximately 3 km. Light damage was recorded for 0.6 km north of this infestation.
1955	not reported
1956	Infestations declined, only light defoliation was recorded in Bosanquet Twp.
1957	not reported
1958-1960	Low populations were recorded in the district.

(cont'd)

Walnut Caterpillar, *Datana integerrima* G. and R. (concl.)

Year	Remarks
1961-1964	not reported
1965	Light damage occurred at Point Pelee National Park.
1966	not reported
1967-1968	This insect was found commonly in the district.
1969-1980	not reported

Greenstriped Mapleworm, *Dryocampa rubicunda* (F.)

Host(s): maple [Major]

Year	Remarks
1950-1956	not reported
1957	Light-to-moderate defoliation occurred to scattered trees through Kent and Lambton counties.
1958	Light infestations only were recorded in Kent County and in West Tilbury Township.
1959-1961	not reported
1962	Moderate-to-severe defoliation of silver maple plantings occurred on roadside ornamentals in Harwich Twp.
1963	not reported
1964	Low numbers occurred in North Gosfield Twp.
1965	heavy defoliation to a single tree in Harwich Twp
1966-1980	not reported

Linden Looper, *Erannis tiliaria* (Harr.)

Host(s): deciduous [Major]

Year	Remarks
1950-1957	not reported
1958	Light infestations were recorded in Brooke Twp.
1959-1960	not reported
1961	Light damage occurred in a few woodlots in Lambton County.
1962-1965	not reported
1966-1967	Trace numbers were observed in the district.
1968-1973	not reported
1974-1976	Light populations were reported at numerous locations in the district.
1977-1980	not reported

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine [Major]

Year	Remarks
1950-1953	not reported
1954	Light infestations were recorded in Bosanquet Twp.
1955	not reported
1956	Low populations caused light damage to Scots and white pine trees in Kent County.
1957-1963	not reported
1964	Light-to-medium infestations occurred on Scots pine in Enniskillen and Plympton twps. Also, in Howard Twp 6% of the 1.5-m trees were infested and 3% of the leaders were destroyed.
1965-1980	not reported

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): white birch [Major]

Year	Remarks
1950-1960	not reported
1961	heavy population in the Windsor area
1962-1963	not reported
1964	Light-to-heavy damage occurred on fringe trees at Kettle Point, Bosanquet Twp.
1965	not reported
1966-1967	light damage reported at Kettle Point
1968-1973	not reported
1974-1975	severe leafmining to ornamentals in the southern part of the district
1976-1978	not reported
1979	Up to 100% defoliation was noted along Hwy 401 through the district.
1980	Varying degrees of defoliation were noted in the town of Blenheim and Kingsville.

Fall Webworm, *Hyphantria cunea* (Drury)

Host(s): deciduous [Major]

Year	Remarks
1950-1953	Webs of this insect were observed at low numbers throughout the district.
1954	Populations increased in Kent County and decreased in Essex County.
1955-1961	Light damage occurred to roadside trees throughout the district.
1962	moderate population level in the southern half of Essex County
1963	High population occurred at Kettle Point, Bosanquet Twp and in Point Pelee National Park, Mersea Twp. Light-to-moderate damage occurred at numerous points in Essex and Kent counties.
1964-1966	Moderate-to-heavy infestations occurred throughout Essex County and on Pelee Island.
1967-1968	Populations declined to a light level on Pelee Island, however, moderate-to-severe defoliation occurred in Lambton and Essex counties.
1969-1972	not reported
1973	Moderate populations occurred at Rondeau Provincial Park and at Point Pelee National Park.
1974	Populations declined to cause only light defoliation.
1975	High populations were recorded in Pinery Provincial Park in Bosanquet Twp. Low numbers recurred in Point Pelee National Park and Wheatley areas.
1976	Infestations were prevalent in the southern portion of the district.
1977-1980	Heavy infestations were observed throughout Essex County. Light damage was recorded in Harwich Twp and in Tilbury East Twp.

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

Host(s): deciduous [Major]

Year	Remarks
1950-1951	Trace populations were observed in the district.
1952-1953	not reported
1954-1957	Light infestations occurred on roadside trees and shrubs throughout the district.

(cont'd)

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

Year	Remarks
1958	Heavy damage occurred in Euphemia Twp and low populations were recorded elsewhere in the district.
1959-1963	Moderate damage persisted in Pinery Provincial Park, Bosanquet Twp and light defoliation was common throughout the remainder of Lambton County.
1964-1967	High populations were recorded in Pinery Provincial Park, Bosanquet Twp and light defoliation was observed at numerous other points in the district.
1968-1970	High numbers persisted in Bosanquet Twp and were recorded in Zone Twp.
1971	light-to-heavy infestation commonly observed in the district
1972-1976	not reported
1977-1978	low populations recorded in the district
1979-1980	not reported

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): deciduous [Major]

Year	Remarks
1950	not reported
1951	trace numbers found at one location in Warwick Twp
1952-1957	not reported
1958	Light infestations occurred in the northern portion of Lambton County.
1959	Trace numbers were observed in the district.
1960-1963	not reported
1964	Trace numbers were observed in the district.
1965-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1951	High populations occurred at numerous locations throughout the district.
1952-1953	Moderate-to-severe defoliation occurred in the Bothwell area, Zone Twp.
1954-1955	High numbers were reported at several areas across the district. The polyhedral virus was used in Plympton and Enniskillen twps in 1953 and 1954 in control operations.
1956	80% defoliation occurred on red pine trees 2 m in height in Romney Twp and 20% defoliation occurred on 3-m red and jack pine trees in Enniskillen Twp.
1957	60% defoliation occurred at one location in South Colchester Twp and 15% and 20% occurred in Enniskillen and Romney twps, respectively
1958-1959	Moderate-to-severe damage was reported in Romney Twp and light defoliation occurred at several locations in Zone Twp.
1960-1961	Moderate-to-severe defoliation occurred at one location in Romney Twp.
1962-1963	Moderate-to-severe defoliation occurred in a 40-ha Scots pine plantation in the Wheatley area of Mersea Twp.
1964-1966	Moderate-to-severe defoliation occurred in Romney Twp.
1967	Population levels declined to cause only light defoliation in Romney Twp.
1968-1976	not reported
1977-1979	low populations found throughout the district
1980	High populations were reported in the Essex-Windsor area.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

Host(s): coniferous [Major]

Year	Remarks
1950-1957	not reported
1958	severe browning of red cedar in Point Pelee National Park - control measures were implemented
1959	approximately 16% red cedar mortality recorded in southern portion of Point Pelee National Park
1960	population collapse; recovery of most weakened trees
1961	light infestation on red cedar in Point Pelee National Park
1962-1980	not reported

White-marked Tussock Moth, *Orgyia leucostigma intermedia* Fitch

Host(s): deciduous [Major]

Year	Remarks
1950-1956	not reported
1957	Moderate populations were recorded on roadside Chinese elm along Hwy 78 west of Dresden and on honey-locust east of Tilbury.
1958-1961	not reported
1962	Severe defoliation occurred on roadside elm in Maidstone Twp.
1963	Complete defoliation was recorded on sycamore beside Hwy 80 in Brooke Twp.
1964	Moderate damage occurred on single trees in North Gosfield and Maidstone twps.
1965	Severe defoliation of sycamore and other hardwoods occurred in North Gosfield and Mersea twps.
1966	Heavy infestations on scattered trees in Essex County; light defoliation occurred elsewhere in the district.
1967-1972	not reported
1973	light defoliation of roadside trees in Dover Twp
1976	severe defoliation was recorded in Raleigh Twp
1977	Moderate-to-severe defoliation occurred on ornamentals in North Tilbury Twp.
1978-1980	not reported

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): pine, spruce [Major]

Year	Remark
1950-1960	not reported
1961	Low populations were reported in the Bothwell area of Zone Twp.
1962-1978	not reported
1979	3% leader mortality occurred in Bosanquet Twp
1980	not reported

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): European larch, tamarack [Major]

Year	Remarks
1950-1951	not reported
1952	trace population recorded at Kettle Point, Bosanquet Twp
1953-1960	not reported
1961	medium infestation was recorded in Howard Twp
1962-1963	Populations increased to cause heavy defoliation in the Reynolds Tract, Howard Twp.
1964	Only light defoliation was recorded in Howard Twp as the population subsided.
1965-1969	A slight increase in population was noted in Howard Twp causing moderate defoliation.
1968-1969	Low numbers were also recorded at Kettle Point in Bosanquet Twp.
1970-1971	not reported
1972-1973	Light defoliation occurred at many locations in the district.
1974-1976	not reported
1977	Light defoliation occurred in the district.
1978	Small pockets of severe defoliation occurred in Howard Twp.
1979	In Howard Twp populations declined to light intensity.
1980	not reported

Mountain Ash Sawfly, *Pristiphora geniculata* (Htg.)

Host(s): mountain-ash [Major]

Year	Remarks
1950-1961	not reported
1962	Light infestations were observed in the town of Thedford and at Point Edwards, Sarnia Twp.
1963-1973	not reported
1974	Light defoliation was recorded on scattered trees in the district.
1975-1976	moderate-to-severe defoliation at numerous locations
1977	Low numbers were observed in the district.
1978-1979	Varying numbers were recorded on roadside and ornamental trees in the district.
1980	Severe defoliation occurred to occasional ornamentals in the district.

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

Host(s): pine [Major]

Year	Remarks
1950-1951	High populations occurred on red pine trees across the district.
1952	Light infestations were reported on hard pines in Essex County.
1953	Varying degrees of infestations occurred in the district.
1954-1956	high populations reported across the district
1957-1959	Infestations in the district declined to light levels.
1960	Moderate populations were reported near Bothwell in Zone Twp.
1961-1963	Moderate populations occurred on red and Scots pine trees throughout the district.
1964-1966	10.6% of the bud clusters were infested at one location in Romney Twp
1967-1971	not reported
1972	Light damage was reported in the district.
1973-1976	not reported
1977	Localized pockets of light-to-medium infestations were observed in Harwich Twp, south of Windsor.
1978	low populations reported throughout the district
1979	not reported
1980	Low populations were once again observed in the district.

Other Noteworthy Insects

Elm Flea Beetle, *Altica carinata* Germ.

Host(s): elm [Major]

Year	Remarks
1950-1951	not reported
1952-1959	Low numbers were found commonly in Essex and Kent counties.
1960-1980	not reported

Solitary Oak Leafminer, *Cameraria hamadryadella* (Clem.) formerly *Lithocolletis hamadryadella*

Host(s): red, white and black oak [Major]

Year	Remarks
1950-1956	not reported
1957	Infestations in Rondeau Provincial Park, Harwich Twp, varied from light in closed-canopy stands, to heavy intensity on open-grown trees.
1958	Heavy infestations occurred in Rondeau Provincial Park, Harwich Twp, and light damage was recorded from Port Franks to Grand Bend, Bosanquet Twp.
1959-1960	Populations declined causing light damage in Rondeau Provincial Park, Harwich Twp.
1961-1974	not reported
1975	Light infestations were recorded in the Sarnia area.
1976-1980	not reported

Spruce Budworm, *Choristoneura fumiferana* Clem.

Host(s): spruce, fir [Major]

Year	Remarks
1950-1970	not reported
1971-1974	low populations throughout the district
1975	13% defoliation recorded at one location, Sarnia Twp
1976-1978	Populations declined to trace levels in the district.
1979-1980	not reported

Elm Casebearer, *Coleophora ulmifoliella* McD.

Host(s): elm [Minor]

Year	Remarks
1950	not reported
1951	Low numbers were recorded throughout the district.
1952	not reported
1953	Small numbers of larvae occurred at several locations in Sandwich East Twp.
1954-1976	not reported
1977	Moderate-to-severe defoliation occurred on regeneration trees throughout the district.
1978	High population levels were recorded in the district.
1979-1980	not reported

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

Host(s): red and black oak [Major]

Year	Remarks
1950-1975	not reported
1976	Trace populations were recorded in the district.
1977	Light defoliation occurred at Pinery Provincial Park, Bosanquet Twp.
1978-1980	not reported

Yellownecked Caterpillar, *Datana ministra* (Drury)

Host(s): deciduous [Minor]

Year	Remarks
1950-1951	Light defoliation was recorded through Kent and Essex counties.
1952	not reported
1953	Trace populations were recorded at scattered locations throughout the district.
1954-1955	not reported
1956-1960	Light defoliation was recorded throughout Essex and Kent counties.

(cont'd)

Yellownecked Caterpillar, *Datana ministra* (Drury) (concl.)

Year	Remarks
1961	Light-to-heavy infestations occurred on roadside trees in Essex and Kent counties.
1962	Severe defoliation occurred on a few trees in Wheatley Provincial Park and light infestations occurred at scattered locations in the district.
1963	low numbers of colonies only noted in district
1964	Moderate infestations occurred near Belle River, Maidstone Twp and Thedford, Bosanquet Twp.
1965-1966	Moderate-to-severe defoliation occurred at many points in Lambton and Essex counties.
1967-1972	not reported
1973	Scattered colonies were commonly observed in the district.
1974-1980	not reported

Zimmerman Pine Moth, *Dioryctria zimmermani* (Grt.)

Host(s): Scots and mugho pine [Minor]

Year	Remarks
1950-1962	not reported
1963	This insect was recorded heavily infesting 34% of the Scots pine trees in Euphemia Twp.
1964	High population levels persisted in Euphemia Twp where surveys revealed less than 25% of the Scots pine Christmas trees remained merchantable owing to the heavy branch flagging.
1965	Infestations decreased to medium intensity in Euphemia Twp.
1966	Medium infestations occurred on mugho pine near Thamesville and light damage was recorded near Bothwell, Zone Twp.
1967-1980	not reported

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

Host(s): pine [Major]

Year	Remarks
1950-1957	not reported
1958	Light infestations occurred on Scots pine in South Gosfield and Howard twps.
1959-1964	not reported
1965	Light damage occurred in Romney Twp.
1966	not reported
1967	Low populations were observed in the district.
1968-1980	not reported

Elm Leafminer, *Fenusa ulmi* Sund.

Host(s): elm [Major]

Year	Remarks
1950-1953	not reported
1954	Light infestations were recorded at one location in Anderdon Twp.
1955-1966	not reported
1967	commonly found in the district at low levels
1968-1970	not reported
1971	Localized heavy infestations were noted in the district.
1972-1980	not reported

Nursery Pine Sawfly, *Gilpinia frutetorum* (F.)

Host(s): pine [Minor]

Year	Remarks
1950-1961	not reported
1962	Low numbers were recovered on Scots pine in Enniskillen Twp.
1963-1964	Populations increased to cause moderate defoliation in Enniskillen Twp.
1965	Medium infestations declined to light intensity.
1966-1967	Populations of this insect remained at low levels in Enniskillen and Plympton twps.
1968-1980	not reported

Mimosa Webworm, *Homadaula anisocentra* Meyr.

Host(s): locust [Major]

YearRemarks	
1950-1977	not reported
1978	First record for Canada at Harrow; numerous tents were recorded along with severe defoliation at Kingsville, Ruthven and west of Leamington, in South Colchester, South Gosfield and Mersea twps.
1979	Severe defoliation of ornamentals recurred in the town of Harrow.
1980	not reported

Pales Weevil, *Hylobius pales* (Hbst.)

Host(s): Scots pine [Major]

Year	Remarks
1950-1951	not reported
1952	first time recorded at damaging levels in Christmas tree plantings throughout the district
1953-1966	not reported
1967	Light branch flagging was observed at one location in Euphemia Twp.
1968-1980	not reported

Oystershell Scale, *Lepidosaphes ulmi* (L.)

Host(s): elm, ash and black walnut [Major]

Year	Remarks
1950	not reported
1951	Heavy infestation caused light mortality to 7 cm ash trees near Tilbury in the Kent County Reforestation Plot.
1952-1963	not reported
1964	heavy on occasional shade and ornamental trees
1965-1966	not reported
1967	found commonly in small numbers in the district
1968-1980	not reported

Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl.

Host(s): red and jack pine [Major]

Year	Remarks
1950-1972	not reported
1973-1974	Scattered colonies were collected in Pinery Provincial Park, Bosanquet Twp.
1975	not reported
1976	light defoliation of understory regeneration at Pinery Provincial Park, Bosanquet Twp
1977-1980	not reported

Question Mark, *Polygonia interrogationis* (F.)

Host(s): deciduous [Minor]

Year	Remarks
1950-1956	not reported
1957	Light damage was recorded on roadside white elm in Essex, Kent and Lambton counties.
1958-1962	Populations were very low in the southern portion of the district.
1963	not reported
1964	Moderate defoliation occurred to a single tree at Fish Point, Pelee Island. Light damage was reported at widely separated sites in the district.
1965	Moderate numbers were recorded on single trees at Holiday Beach Provincial Park and on Pelee Island.
1966	Low numbers were observed at several points.
1967-1980	not reported

Cottony Maple Scale, *Pulvinaria innumerabilis* (Rathv.)

Host(s): maple, willow and locust [Minor]

Year	Remarks
1950-1966	not reported
1967	Heavy infestations occurred in 3 km^2 area around Bellecraft Beach, South Colchester Twp. Light infestations occurred in Windsor.
1968-1969	Severe infestations persisted in South Colchester and Malden twps from Bellecraft Beach to Windsor. Light twig and branch mortality was recorded.
1970	Populations declined to trace levels.
1971-1979	not reported
1980	High populations caused light branch mortality at many locations in Essex and Kent counties.

Elm Leaf Beetle, *Pyrrhalta luteola* (Müll.)

Host(s): elm [Minor]

Year	Remarks
1950	not reported
1951-1952	Moderate-to-severe skeletonizing occurred to a row of host trees in the town of Tecumseh.
1953-1954	Infestations declined to light damage levels in Tecumseh.
1955-1956	Moderate damage was recorded on a few trees in the town of Essex. Light damage recurred in Tecumseh. Heavy defoliation occurred at Amherstburg.
1957-1958	Infestations in Amherstburg and occurred in Essex.
1959-1960	Moderate damage occurred in Tecumseh and light damage recurred at Amherstburg.
1961	Populations increased to heavy intensity from Windsor to Tecumseh. Light damage recurred at Amherstburg and occurred in Essex.
1962-1965	not reported
1966	Severe defoliation was recorded on several trees in Maidstone Twp and in the town of Amherstburg.
1967	commonly observed in the district
1968-1980	not reported

Smaller European Elm Bark Beetle, *Scolytus multistriatus* (Marsh.)

Host(s): elm [Major]

Year	Remarks
1950	A range extension was noted this year as far west and north as Petrolia and Waterford, Lambton County.
1951	Low numbers of this insect were collected.
1952	not reported
1953	Low numbers were collected east of Tilbury in Kent County.
1954	Low numbers were collected in Sandwich West and Tilbury twps.
1955	Low numbers were collected in Plympton, Raleigh and Romney twps.
1956-1964	not reported
1965	High populations wee noted in the district.
1966-1969	not reported
1970	slight northward extension in the range occurred in the district
1971-1972	No changes were observed in the distribution of these beetles.
1973	An extension of 30 km north occurred in the district.
1974-1980	not reported

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

Host(s): elm [Major]

Year	Remarks
1950	This disease was commonly observed in Windsor.
1951-1952	not reported
1953	Light damage was recorded in South Gosfield Twp and in the city of Chatham.
1954	Samples of this disease were obtained in the city of Chatham.
1955	new records of this disease from the city of Sarnia and in the Bothwell area, Zone Twp
1956	not reported
1957-1958	Mortality of elm ranged from 14% in Lambton County to 42% in Essex and Kent counties.
1959	Appreciable increase in mortality was noted in the district; approximately 75% mortality occurred on Pelee Island.
1960	High level of mortality of elm occurred around Windsor through Essex, Kent and south Lambton counties. Light mortality levels were recorded in north Lambton County.
1961-1962	The incidence in mortality declined in the district.
1963	not reported
1964-1965	10% to 86% of the trees examined were severely affected and mortality averaged 13% in the district
1966	60% was the average infection level in the district; few health elm trees were reported to exist in the district
1967	Of the remaining trees, infection levels reached 100% throughout the district.
1968	not reported
1969	46% mortality was recorded in Warwick Twp
1970-1980	not reported

Cedar-apple Rust, *Gymnosporangium juniperi-virginianae* Schwein.

Host(s): red cedar [Minor]

Year	Remarks
1950-1966	not reported
1967	Light twig and branch mortality occurred in Zone Twp.
1968-1974	not reported
1975	High incidence and severe damage caused by numerous galls occurred on open-grown trees in Rondeau and Wheatley Provincial Parks.
1976-1980	not reported

Other Noteworthy Diseases

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

Host(s): poplars, maples [Major]

Year	Remarks
1950-1953	not reported
1954	Light infection of poplars growing on poor sites occurred in the district.
1955	Varying degrees of infection were recorded in the district.
1956-1967	not reported
1968	Incidence of infection ranged from 5% to 15% in the district.
1969	Trace infections were recorded throughout the district.
1970-1980	not reported

Anthracnose, *Kabatiella apocrypta* (Ell. & Ev.) Arx

Host(s): sugar maple [Minor]

Year	Remarks
1950-1976	not reported
1977	Moderate-to-severe leaf damage occurred from Sarnia to Windsor.
1978	Varying levels were recorded in the district.
1979	35% foliar damage was recorded in Sarnia Twp, but varying defoliation levels occurred in the district.
1980	10% foliar damage was noted in Bosanquet Twp

Leafblotch, *Phyllosticta sphaeropsoidea* Ell. & Ev.

Host(s): horse chestnut, shagbark hickory [Major]

Year	Remarks
1950-1975	not reported
1976	Light defoliation occurred throughout the district.
1977	commonly observed on ornamentals in Sarnia and Windsor
1978	100% leaf infection occurred from Harrow to Leamington and heavy damage was recorded on shagbark hickory in Wheatley Provincial Park
1979	Incidence declined to cause light damage in the district.
1980	Light-to-moderate infection levels were noted in the district.

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

Frost Damage

Host(s): deciduous, coniferous [Major]

Year	Remarks
1950-1956	not reported
1957	Severe damage occurred to white oak in the district and all other deciduous and coniferous trees were affected at varying levels.
1958-1963	not reported
1964-1965	Late spring frosts caused severe damage to the current growth of all trees. Up to 90% of the new growth was damaged in frost pockets in many areas.
1966-1968	not reported
1969	Severe damage to various hardwoods was observed throughout Lambton County.
1970-1975	not reported
1976	Light damage occurred to sugar maple in the district.
1977-1979	not reported
1980	Low levels of foliar damage occurred in the district.

DIEBACKS AND DECLINES

Maple Deterioration

Host(s):

Year	Remarks
1950-1965	not reported
1966	7% and 19% of the trees were infected in Warwick and Plympton twps, respectively; 4% mortality was recorded at the Warwick Twp site
1967	The incidence of affected trees declined considerably in the district.
1968	60% incidence occurred in Sarnia Twp
1970-1974	not reported
1975	3.3% mortality of roadside trees was recorded at one location in Howard Twp; crown dieback averaged 45.7% in Bosanquet Twp
1976-1978	not reported
1979	Damage was evident on roadside trees in the district.
1980	not reported

Oak Decline

Host(s): oak [Major]

Year	Remarks
1950-1968	not reported
1969-1971	Severe wilting and curling of leaves occurred in Canatara Park in Sarnia; 3% current mortality was recorded in Rondeau Provincial Park, Harwich Twp.
1972-1976	not reported
1977	An oak health plot was established in Bosanquet Twp to monitor decline in oak trees at the request of OMNR.
1977-1980	No mortality was recorded; health of trees fairly stable with 65% of the trees with less than 20% crown dieback. Approximately 11% of the trees had 21-40% crown dieback and 24% of the trees sustained more than 40% crown deterioration.

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

(continued)

APPENDIX A (continued)

DECIDUOUS HOST

Common Name	Scientific Name	Abbreviations
Mountain-ash, American	*Sorbus americana* Marsh.	aMo
Oak, black	*Quercus velutina* Lam.	blO
bur	*macrocarpa* Michx.	bO
red	*rubra* L.	rO
white	*alba* L.	wO
Poplar, balsam	*Populus balsamifera* L.	bPo
Carolina	*eugenei* Simon-Louis	cPo
Lombardy	*nigra* L. var. *italica* Muench.	lPo
silver	*alba* L.	sPo
Sycamore	*Platanus occidentalis* L.	Sy
Walnut, black	*Juglans nigra* L.	Wa
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, European	*Larix decidua* Mill.	eL
Pine, Austrian	*Pinus nigra* Arn.	auP
eastern white	*strobus* L.	ewP
jack	*banksiana* Lamb.	jP
mugho	*mugho* Turra	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
Tamarack	*Larix laricina* (Du Roi) K. Koch	tL