FOREST PEST CONDITIONS IN THE MARITIMES IN 1974 WITH AN OUTLOOK FOR 1975

by

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FREDERICTON, NEW BRUNSWICK

INFORMATION REPORT M-X-53

CANADIAN FORESTRY SERVICE

DEPARTMENT OF THE ENVIRONMENT

April 1975

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ABSTRACT

This Report reviews the status of forest insects and tree diseases in the Maritimes Region in 1974 and gives, for some pests, a forecast of conditions for 1975.

Résumé

Ce rapport passe en revue les conditions relatives aux divers insectes et maladies des arbres dans la Région des Maritimes en 1974 et présente un aperçu des conditions prévues pour quelques uns des ces organismes nuisibles en 1975.

FOREWORD

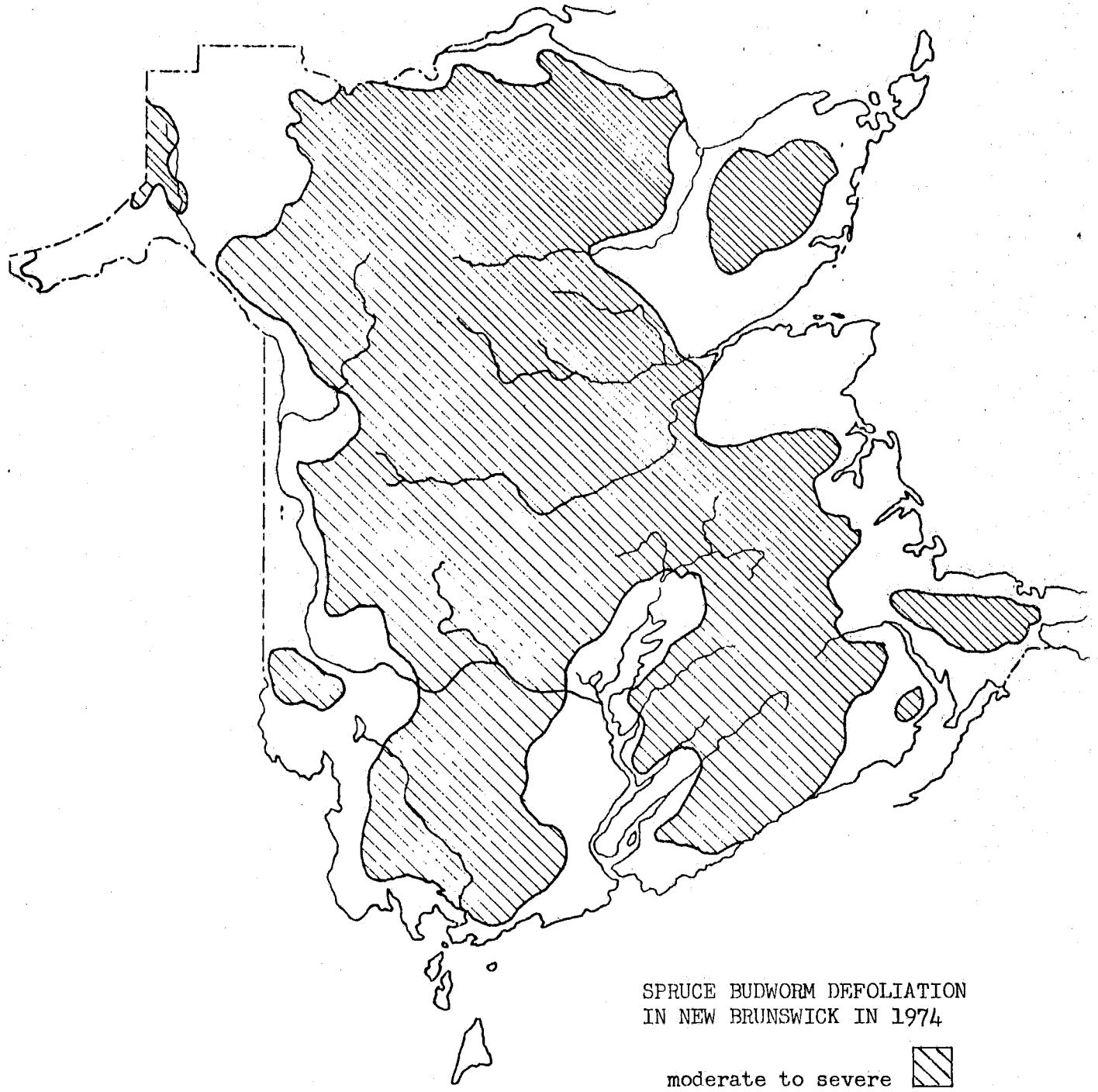
One of the objectives of the Forest Insect and Disease Survey is to report on the status of important forest insects and diseases. In the Maritimes, this information is included in seasonal summary reports and in an annual national report made up of regional contributions. The national report usually is not available in time to be of much use to forest managers in the current year. Therefore, the purpose of this report is to provide early information on the status of forest insects and diseases in the Maritimes Region, along with maps and some illustrations of the more important pests and their damage.

IMPORTANT FOREST INSECTS

Spruce Budworm, *Choristoneura fumiferana* (Clem.)--In New Brunswick, defoliation (loss of new needles and shoots of balsam fir and spruce) by the spruce budworm was moderate to severe over 3.4 million hectares (8.3 million acres), as compared to 3.1 million hectares (7.8 million acres) in 1973. Once again, the extent of moderate to severe defoliation decreased in the Fundy coastal area roughly between Saint John and Sussex in the west, and Moncton and the Petitcodiac River in the east, but such defoliation was prevalent in balsam fir and spruce stands in the rest of the Province. The largest area of continuous moderate to severe defoliation was within the Bathurst-Juniper-Edmundston "triangle". Such extensive defoliation was predicted from egg-mass surveys in 1973 and from surveys of overwintering larvae and third-instar larvae in the spring of 1974.

Forest Protection Limited, an agent of the Province of New Brunswick, sprayed about 1,582,000 hectares (3,906,000 acres) in May and June against larvae, and about 817,000 hectares (2,017,000 acres) in July against adults of the spruce budworm.

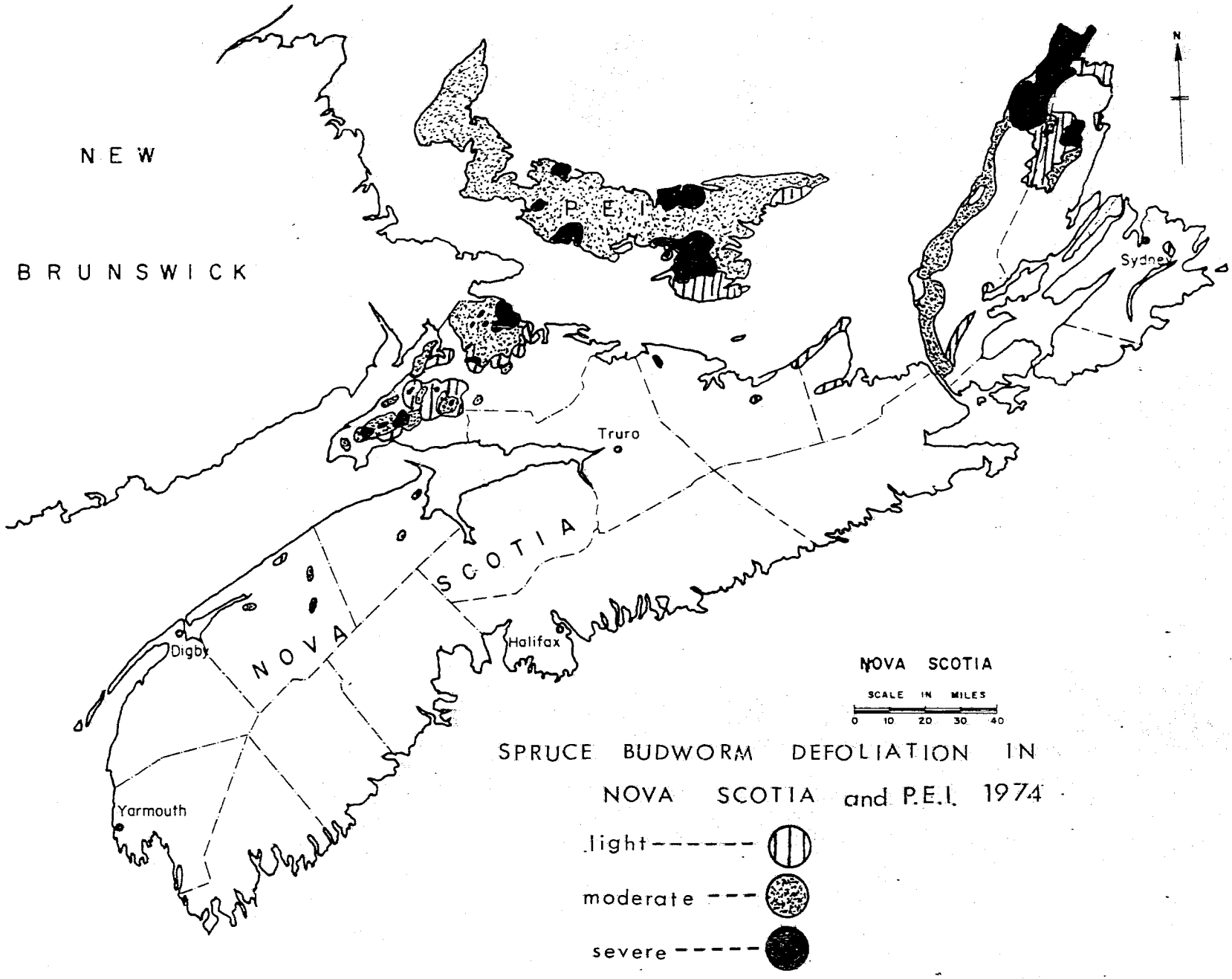
In August, 1,100 locations were sampled for spruce budworm egg masses. This survey showed that the extent and severity of budworm infestations increased everywhere in New Brunswick and that almost all the balsam fir and spruce forest harbours medium to high egg-mass populations. This is probably the largest area infested since the 1912-1920 outbreak. High to extreme hazard (risk of tree mortality or top killing


SPRUCE BUDWORM DEFOLIATION
IN NEW BRUNSWICK IN 1974
moderate to severe

with further attack) is estimated to occur over approximately 2.8 million hectares (7.0 million acres), compared to 1.6 million hectares, (3.9 million acres) in 1973.

In Nova Scotia, aerial surveys showed that defoliation was moderate to severe over 189,000 hectares (467,000 acres) in Cumberland County, but near the coast in this County defoliation was negligible, in sharp contrast to that in 1973 and 1972. The extent and intensity of defoliation again decreased greatly in the Annapolis Valley, but moderate to severe defoliation occurred over 164,600 hectares (406,500 acres) in Inverness and Victoria counties. In Victoria County, in an area of about 8,100 hectares (20,000 acres) just west of Gisborne Lake, the spruce budworm in association with the black-headed budworm and eastern hemlock looper destroyed all the new needles and many of the old needles on mature and overmature balsam fir trees, leaving stands in poor condition and subject to extensive mortality in 1975. Immediately south of this area, stands are younger and were less severely attacked. No defoliation was observed on Cape Breton Island in 1973 and there is little doubt that the 1974 defoliation stemmed in part from invasion of spruce budworm moths in 1973.

Surveys for spruce budworm egg masses in August 1974, at 129 locations in Nova Scotia showed that population levels increased from 1973 in the Counties of Cumberland, Colchester, Hants, Annapolis, Antigonish, Richmond, Victoria, and Inverness. Despite this, egg population levels were medium to high only in Cumberland, Richmond, Victoria, and Inverness counties.


NEW
BRUNSWICK
P.E.I.
N
Sydney
Truro
NOVA SCOTIA
Halifax
Digby
Yarmouth
NOVA SCOTIA
SCALE IN MILES
0 10 20 30 40
SPRUCE BUDWORM DEFOLIATION IN
NOVA SCOTIA and P.E.I. 1974
light
moderate
severe

Spruce budworm larva

Defoliation of stand caused by the spruce budworm

In Prince Edward Island, defoliation was severe over 17,000 hectares (42,000 acres), and generally light to moderate in patches over the entire Province. Egg sampling at 43 locations showed that the mean egg-mass density [egg-masses per 9.3 m^2 (100 ft^2) of foliage] was 237, as compared to 542 for 1973. Despite this, moderate to severe defoliation of balsam fir and spruce will be common in 1975 as this egg-mass density ordinarily results in such levels of defoliation.

Balsam Gall Midge, *Dasineura balsamicola* (Lint.)--The following table, based on examinations of balsam fir foliage collected annually to assess numbers of spruce budworm egg masses in New Brunswick, shows that population levels of the balsam gall midge are low.

	Branch samples		
Year	Number examined	With galled needles	With at least 30% of new needles attacked
1968	1,160	730	175
1969	1,200	590	130
1970	1,169	132	3
1971	889	17	0
1972	1,065	10	0
1973	1,105	0	0
1974	1,100	1	0

The occurrence of light attacks at four locations in New Brunswick and at eight in Nova Scotia, and of moderate to severe infestations in areas of northwest Victoria County, N. S., however, indicate that balsam gall midge numbers are increasing, possibly leading to an outbreak similar to that of the late 1960's.

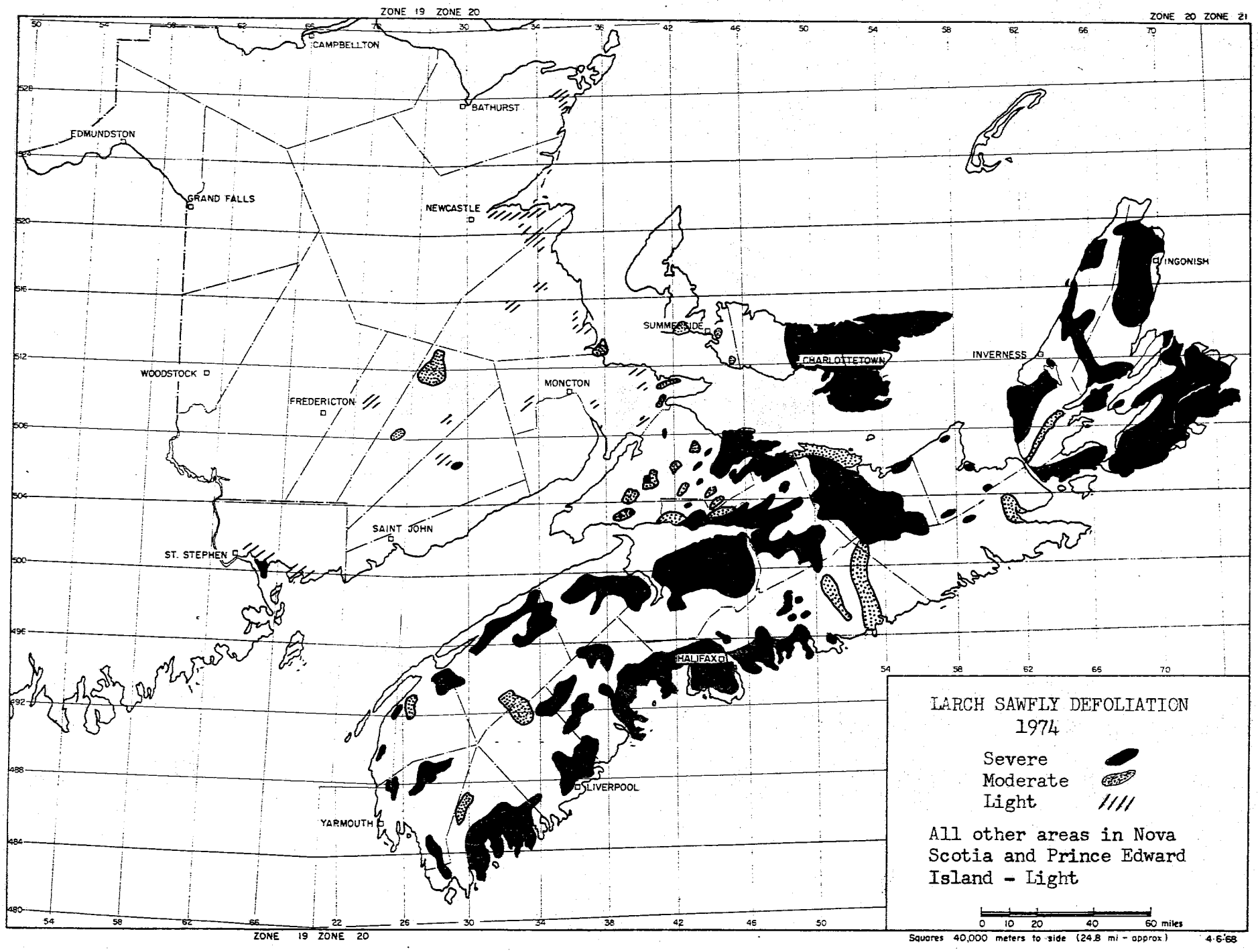
Spruce Beetle, *Dendroctonus rufipennis* (Kirby)--Moderate to severe attacks by this insect occurred in Victoria Park, Truro, N.S., mostly on mature red spruce but also on some white spruce trees over about 73 hectares (180 acres). Over 36 hectares (90 acres), about half of the trees were killed and 35% were attacked but are still living. In the rest of the affected area, the infestation was patchy with about 12% of the trees dead and 23% attacked. A sanitation program, including the removal of the infested trees and others of high susceptibility, is in operation.

Elsewhere in Nova Scotia, infestations occurred on white spruce trees at St. Andrews, where a few were killed over about 4 hectares (10 acres).

Larch Sawfly, *Pristiphora erichsonii* (Htg.)--Compared to 1973, the intensity and extent of infestations decreased in New Brunswick, increased in Nova Scotia, and remained about the same in Prince Edward Island.

In New Brunswick, infestations remained small and widely scattered and were mostly light, occurring largely in southern Charlotte County and in coastal areas of Gloucester, Northumberland, Kent, and Westmorland counties. Infestations were moderate over a sizeable area near Chipman and in pockets of Kent and Westmorland counties, and severe at and near St. Andrews and near Millstream.

In Nova Scotia, except for western Cumberland County where defoliation was negligible, attacks were extensive and often severe. Defoliation was especially severe throughout much of Cape Breton Island and in the Counties of Pictou, Colchester, Hants, and Halifax.


ZONE 19 ZONE 20
ZONE 20 ZONE 21
CAMPBELLTON
BATHURST
EDMUNDSTON
GRAND FALLS
NEWCASTLE
INGONISH
SUMMERSIDE
CHARLOTTETOWN
INVERNESS
WOODSTOCK
FREDERICTON
MONCTON
SAINT JOHN
ST. STEPHEN
HALIFAX
LIVERPOOL
YARMOUTH
LARCH SAWFLY DEFOLIATION
1974
Severe
Moderate
Light
All other areas in Nova Scotia and Prince Edward Island - Light
0 10 20 40 60 miles
Squares 40,000 meters to side (24.8 mi - approx)
4-6-68

In Prince Edward Island, as in 1973, infestations were mostly severe in the eastern half and very light with patches of moderate in the west.

Biological control studies, using the introduced parasite, *Olesicampe benefactor* Hinz, were continued. No recoveries of *O. benefactor* were made from larch sawfly larvae collected near College Lake, Halifax County, N.S. where the parasite was released in 1973. By contrast, host material reared from Mount Vernon, Queens County, P.E.I., where the parasite was released in 1971, produced several adults of *O. benefactor*, indicating establishment at the location.

Larch Casebearer, *Coleophora laricella* (Hbn.)--Population levels of the larch casebearer were expected to be low in 1974 on the basis of sampling overwintering larvae at 89 sampling stations throughout the Region (see accompanying table), and infestations were indeed generally light. Defoliation of tamarack was severe, however, in localized areas near Judique, Inverness County, N.S. and moderate at several places in eastern Prince County, P.E.I.

District	Number of -- Sampling stations	Cases per sample	Deviation from 1973	Infestation class
Western New Brunswick	18	2.0	+0.2	Light
Northeastern New Brunswick	14	4.6	+2.2	Light
Southeastern New Brunswick	11	0.7	+0.5	Light
Prince Edward Island	5	6.7	+4.0	Light
Eastern Nova Scotia	16	2.8	+0.7	Light
Western Nova Scotia	25	0.9	-0.7	Light

European Pine Shoot Moth, *Rhyacionia buoliana* (Schiff)--This introduced pest is becoming increasingly important in the Maritimes on young pine trees in nurseries and plantations and on ornamentals. The insect destroys the terminal and lateral buds and new shoots, which retards growth, promotes the development of adventitious buds, and gives rise to serious malformations.

In Nova Scotia, infestations were severe in red pine plantations at Island Point and Mira Road, Cape Breton County, at Crystal Cliffs, Antigonish County, and at Abercrombie, Pictou County, and on Scots pine at Coldbrook and in all pine plantations near Kentville, Kings County. Attacks were moderate in red pine, Scots pine, and jack pine plantations at South Milford, West Paradise, and Inglisville, Annapolis County. Elsewhere in the Region, infestations were light and scattered.

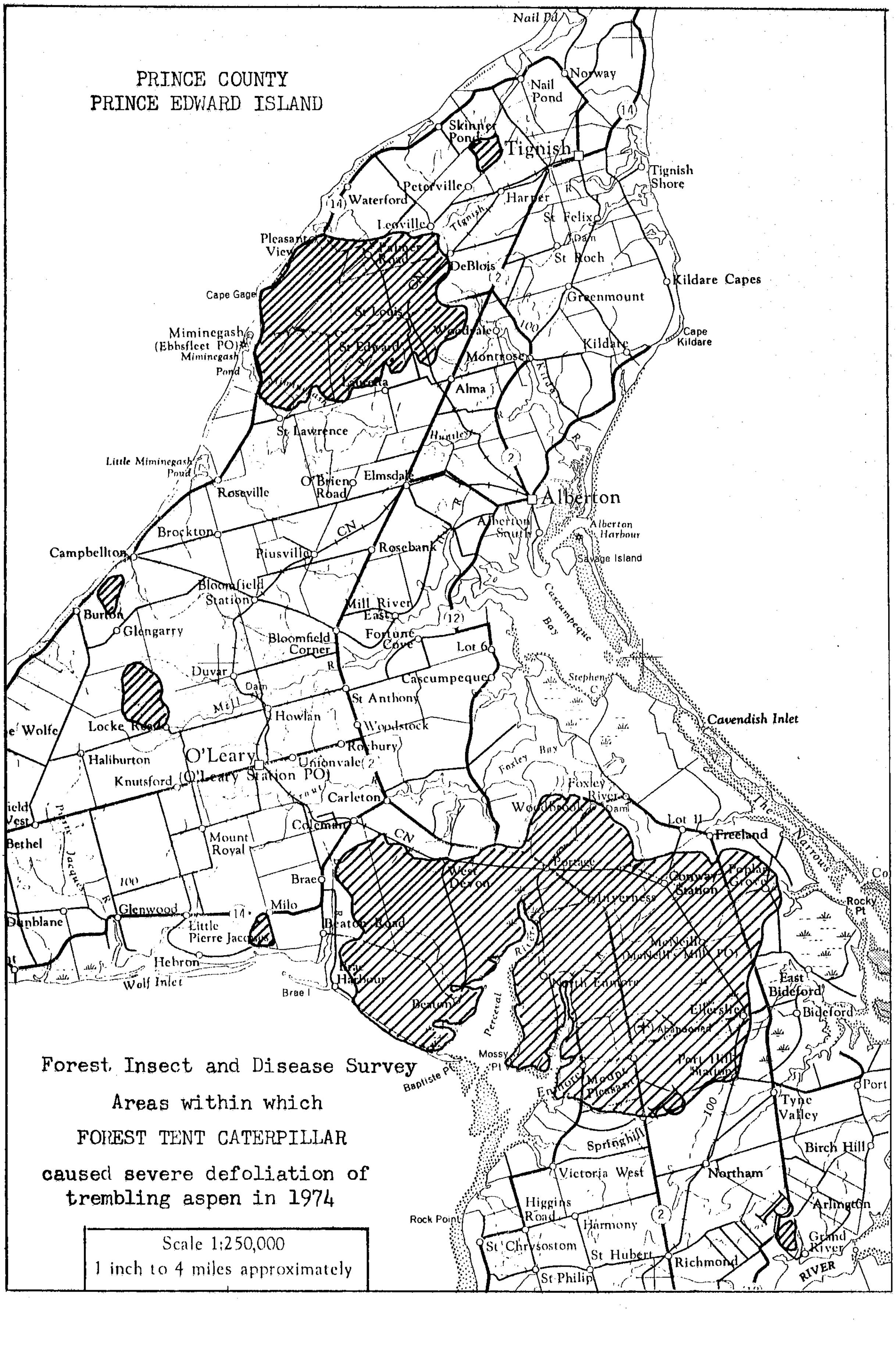
Red Pine Sawfly, *Neodiprion nanulus nanulus* Schedl--Severe loss of old needles of red pine by this sawfly, the first noticed in the Region since 1960, occurred in 1973 over about 3.6 hectares (9 acres) in a plantation at the Garden of Eden Barrens, Guysborough County, N.S. Egg sampling indicated that attacks would intensify and expand in 1974. Consideration was given to the biological control of the sawfly with a nuclear polyhedrosis virus. Masses of larvae were infected in the laboratory with the virus from a "disease bank" and an extract was prepared. This was sprayed experimentally on a portion of the infested trees in 1974, killing all larvae on trees sprayed and on trees within spray drift. Further studies will be conducted in 1975.

Fall Cankerworm, *Alsophila pometaria* (Harr.)--Common on hardwoods, especially white elm, red oak, red maple, and apple trees, the fall cankerworm caused moderate to severe defoliation at numerous locations in Madawaska, Northumberland, York, Sunbury, Kings, and Westmorland counties, N.B., in many areas of Halifax and Hants counties, N.S., and at several places in Kings County, P.E.I.

Birch Casebearer, *Coleophora fuscedinella* (Zell.)--As predicted from sampling overwintering larvae at 88 locations, moderate to severe defoliation of white birch and wire birch trees occurred in parts of Restigouche, Gloucester, Kings, and Westmorland counties, N.B., and in Prince County, P.E.I. Similar injury was predicted for parts of eastern, central, and western Nova Scotia but attacks in that Province were much lighter than expected.

Birch Leafminer, *Fenusa pusilla* (Lep.)--Birch leafminer numbers were low except in northeastern New Brunswick where leaf browning of white and wire birch trees was moderate to severe and in southeastern New Brunswick and eastern Prince Edward Island where foliar browning of wire birch was moderate in patches.

Forest Tent Caterpillar, *Malacosoma disstria* (Hbn.)--Population levels of the forest tent caterpillar were low except in Prince County, P.E.I. where the spotty but severe infestations reported in 1973 coalesced to cover about 28,000 hectares (70,000 acres) in two large and five small areas.

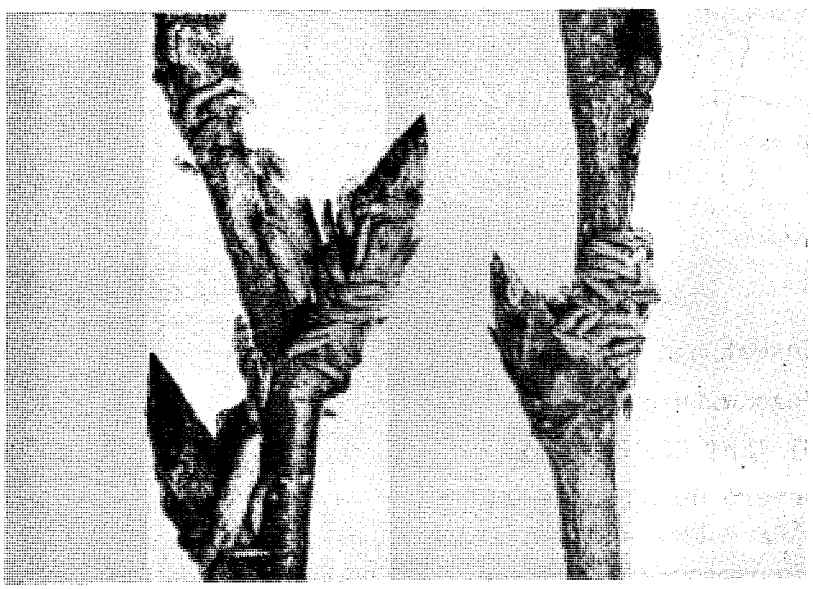


PRINCE COUNTY
PRINCE EDWARD ISLAND

Forest Insect and Disease Survey
Areas within which
FOREST TENT CATERPILLAR
caused severe defoliation of
trembling aspen in 1974

Scale 1:250,000
1 inch to 4 miles approximately

European pine shoot moth feeds in and kills new shoots on red pine



Birch casebearer larvae overwintering in cases on white birch

Satin Moth, *Stilpnotia salicis* (L.)--Carolina, silver, Lombardy, and balsam poplar shade trees were moderately to severely defoliated at numerous places in Restigouche, Gloucester, Northumberland, Sunbury, and Westmorland counties, N.B., in Pictou, Inverness, and Richmond counties, N.S., and in Prince and Queens counties, P.E.I.

Largetooth aspens and trembling aspens were moderately attacked in the woodlot of the University of New Brunswick, the first such attack observed on native poplars in a woodland area since 1970.

Adults caught in a light trap at Wellington, P.E.I. totalled 232, the largest catch of satin moths from traps operated in the Region.

Lesser Maple Spanworm, *Itame pustularia* (Gn.)--The following table, giving catches from light traps, indicates widespread dispersion and maintenance of high populations of the lesser maple spanworm. The insect was especially numerous in central New Brunswick, where, in association with the fall cankerworm and maple leaf roller, it caused moderate to severe defoliation of red maple.

Location	Number of adults		
	1972	1973	1974
New Brunswick			
Ashton Hill	12,450	63,827	60,650
Canterbury	17	1,335	129
Fredericton	272	1,058	4,305
Fundy Park	45	1,103	968
Oak Bay	3	952	11
Plaster Rock	256	6,320	1,907

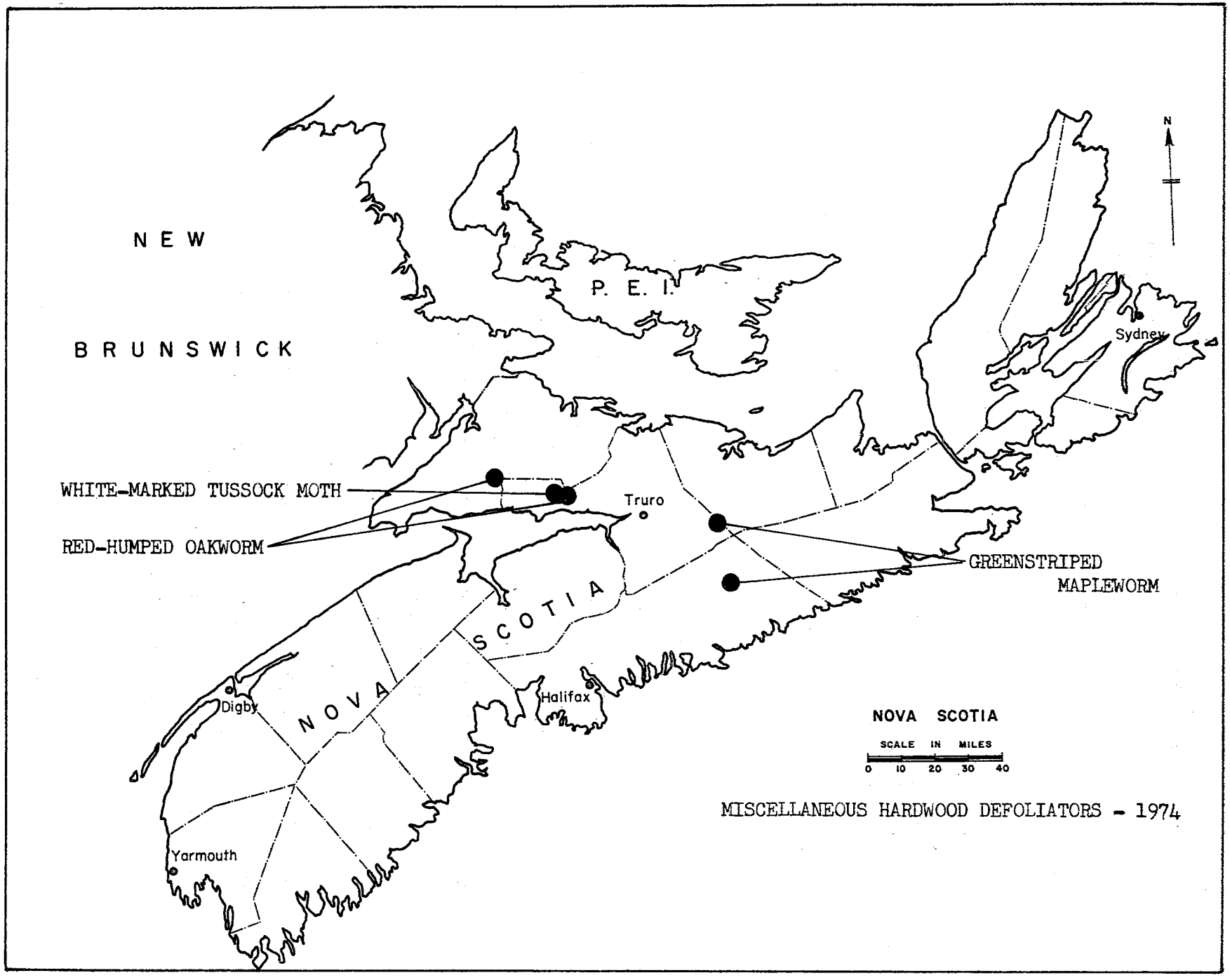
Location	Number of adults		
	1972	1973	1974
Nova Scotia			
Debert	0	7	-
Georgeville	0	0	0
Ingonish	-	64	94
Kejimkujik	53	364	338
Lawrencetown	4	3	5
Londonderry	-	-	23
Prince Edward Island			
Beech Grove Inn	3	38	6
St. Peters	0	3	5
Wellington	53	159	78

Maple Leaf Roller, *Cenopis pettitana* (Rob.)--Maple leaf roller attacks were common and often moderate to severe on red maple throughout much of central and southern New Brunswick in parts of Cumberland County, and over about 81 hectares (200 acres) near Lawrencetown, N.S., and in central Queens County, P.E.I. Population levels of moths since 1972 appear relatively constant, as indicated by the accompanying table of light trap catches.

Location	Number of adults		
	1972	1973	1974
New Brunswick			
Ashton Hill	2,587	1,383	718
Canterbury	21	35	69
Fredericton	759	189	1,779
Fundy Park	965	472	831
Oak Bay	15	66	35
Plaster Rock	644	604	691

Location	Number of adults		
	1972	1973	1974
Nova Scotia			
Debert	17	26	-
Cape Mabou	0	-	-
Ingonish	-	4	-
Georgeville	3	0	2
Kejimkujik	6	61	4
Lawrencetown	10	11	24
Londonderry	-	-	33
Margaree	3	-	-
Prince Edward Island			
Beech Grove Inn	87	11	29
St. Peters	19	10	5
Wellington	266	38	50

Greenstriped Mapleworm, *Anisota rubicunda* (Fr.)--The infestations of this insect on red maple in south-central Nova Scotia, first observed in 1971 at Kent Lake, Halifax County, and later in nearby areas, continued in most areas of known occurrence. The outbreak collapsed, however, at Kent Lake, after killing nearly 28,300 cubic meters (100,000 cu ft) of red maple, much of which is seriously stained and discolored, and perhaps unsalable. Defoliation of red maple was moderate to severe and dead branches were common over about 200 hectares (500 acres) along the Nelson River between Dickey Lake, Colchester County and Ellen Brown Lake, Pictou County and over about 12 hectares (30 acres) near Rocky Brook Lake, Halifax County.



MISCELLANEOUS HARDWOOD DEFOLIATORS - 1974

OTHER NOTEWORTHY INSECTS

Insect	Host(s)	Locality	Remarks
Acleris variana (Fern.) Blackheaded budworm	Fir, balsam Spruce, white and red Hemlock, eastern	Maritime Provinces	Numbers low, except in Victoria and Inverness counties, N.S., where it was associated with the spruce budworm and the eastern hemlock looper in causing moderate to severe defoliation of balsam fir.
Adelges piceae (Ratz.) Balsam woolly aphid	Fir, balsam	Nova Scotia; Lake George, N.B.	Stem attacks were light and scattered in Nova Scotia, and severe on a few mature trees at Lake George.
Archips cerasivoranus (Fitch) Uglynest caterpillar	Cherry, choke	Maritime Provinces	Nests common, but especially numerous at Eden Lake, Pictou Co., N.S., and at Tracadie, Gloucester Co., N.B.
Argyresthia aureoargentella Brower *A. freyella* Wlshm. *A. thuiella* Pack. *Pulicalvaria thujaella* Kft. Cedar Leafminers	Cedar, eastern white	Muddy Creek, Prince Co., P.E.I.	Patches of trees dead and dying over 3 Km^2 (5 sq. mi) following moderate to severe attacks each year since 1971.
Bucculatrix canadensisella (Cham.) Birch skeletonizer	Birch, white	Southeastern New Brunswick, Nova Scotia, and Prince Edward Island	Variable degrees of leaf skeletonizing on most white birch.

Insect	Host(s)	Locality	Remarks
Choristoneura conflictana (Wlk.) Large aspen tortrix	Miscellaneous deciduous hosts	New Brunswick and Prince Edward Island	Associated with fall cankerworm and Bruce spanworm in causing severe defoliation of trembling aspen in the "panhandle" of Madawaska Co., N.B. Numbers low elsewhere.
Choristoneura pinus pinus Free. Jack-pine budworm	Pine, jack Scots	Central and south-eastern New Brunswick; Woodburn, N.S.	Numbers low.
Choristoneura rosaceana Harr. Oblique-banded leaf roller	Miscellaneous deciduous hosts	Maritime Provinces	Common in New Brunswick, and occasional in Nova Scotia and Prince Edward Island.
Croesia semipurpurana (Kft.) Oak leaftier	Oak, red	New Brunswick and Prince Edward Island	Leaf rolling severe at 11 locations in New Brunswick and 1 in Prince Edward Island. Elsewhere, it was light to moderate.
Dioryctria reniculella (Grt.) Spruce coneworm	Spruce, red	Maritime Provinces	Larval numbers low, averaging about 3 per 10 trees at 100 locations. Moths common in light traps especially Ashton Hill, N.B. and Ingonish, N.B. where 1,849 and 1,023 were caught, compared to 429 and 214 in 1973.

Insect	Host(s)	Locality	Remarks
Diprion hercyniae (Htg.) European spruce sawfly	Spruce, white	Maritime Provinces	Population levels low.
Fenusa ulmi Sund. Elm leafminer	Elm, English	10 locations in southeastern New Brunswick and central Nova Scotia	Moderate to severe leaf browning at Truro, Pictou Amherst, N.S., and at Sackville, N.B.
Hylobius spp. Root collar weevils	Pine, red, Scots, and jack	Beaverdam Lake, Shelburne Co. and Canoe Lake, Cape Breton Co., N.S.; and Bathurst, N.B.	A few trees damaged.
Hyphantria cunea (Drury) Fall webworm	Miscellaneous deciduous hosts	Maritime Provinces	Except for Town of Digby where infestation subsided, population levels remained high in western Nova Scotia.
Lambdina fiscellaria fiscellaria (Guen.)	Fir, balsam	Maritime Provinces	Numbers low, except in Victoria and Inverness counties, N.S., where it was associated with the spruce budworm and blackheaded budworm in causing moderate to severe defoliation of balsam fir.
Malacosoma americana (F.) Eastern tent caterpillar	Apple Cherry, pin and choke.	Gloucester, Northumberland, Kent counties, N.B.; Antigonish and Lunenburg counties, N.S.	Nests few and scattered.

OTHER NOTEWORTHY INSECTS (continued)

Insect	Host(s)	Locality	Remarks
Megacyllene robiniae (Forst.) Locust borer	Locust, black Honey-locust	Moncton, Pointe du Chêne, N.B.; Halifax, N.S.	Moderate infestations on a few mature ornamentals.
Mindarus abietinus Koch Balsam twig aphid	Fir, balsam	Val d'Amour, Restigouche Co., N.B.	Light infestation.
Nematus odoratus (Marlatt) Willow sawfly	Willow	Mamozekel River, Victoria Co., N.B.	Defoliation complete along 225 meters (300 yards) of roadside.
Neodiprion abietis complex Balsam fir sawfly	Fir, balsam Spruce, white and red	Nova Scotia and New Brunswick	Numbers low.
Nymphalis antiopa (L.) Spiny elm caterpillar	Elm, white Aspen, trembling Willow Maple, silver Poplar, balsam	New Brunswick	Moderate to severe infestations in scattered areas.
Operophtera bruceata (Hulst) Bruce spanworm	Miscellaneous deciduous hosts	New Brunswick and Nova Scotia	Numbers generally low. Common in York and Sunbury counties, and in the "panhandle" of Madawaska Co. where it caused severe defoliation of trembling aspen in association with the fall cankerworm and the large aspen tortrix.

Insect	Host(s)	Locality	Remarks
Operophtera brumata (L.) Winter moth	Apple Elm, white	Durham, Pictou Co. Clarence, Annapolis Co., Collingwood, Nappan and River Phillip, Cumberland Co., N.S.	Moderate defoliation of apple trees at Durham, and of white elm at other locations.
Orgyia leucostigma (J.E.Smith) Whitemarked tussock moth	Miscellaneous deciduous and coniferous	Portapique, Colchester Co., N.S. Mount Whatley, Westmorland Co., N.B.	Moderate to severe infestation over about 8 hectares (20 acres) at Portapique, and on a few tamarack trees at Mount Whatley.
Paleacrita vernata (Peck) Spring cankerworm	Maple, sugar Birch, white Cherry, pin Willow Apple Hazelnut	Madawaska, Restigouche, and York counties, N.B.; Cumberland Co., N.S.	Numbers low. Larvae often associated with other insect defoliators.
Physokermes piceae (Schrank) Spruce bud scale	Pine, red	Annapolis, Lunenburg, and Hants counties, N.S.; Kings Co., N.B.	Severe infestation on scatter trees in several plantations.
Pikonema alaskensis (Roh.) Yellowheaded spruce sawfly	Spruce, red	Annandale, Cumberland Co., Miller and Upper Stewiacke, Colchester Co., Mushaboom, Halifax Co., and Aspen, Guysborough Co., N.S.	Severe defoliation of plantation at Annandale and of young trees growing singly and in small groups at other locations.

OTHER NOTEWORTHY INSECTS (concluded)

Insect	Host(s)	Locality	Remarks
Pineus coloradensis Gill. Hard pine adelgid	Pine, Scots	Pinehurst, Lunenburg Co., N.S.	Severe in part of a plantation.
Pissodes strobi (Peck) White pine weevil	Pine, eastern white and Scots	Madawaska, Northumberland, and Kings counties, N.B.; Guysborough, Lunenburg and Annapolis counties, N.S.	Leaders damaged on scattered plantation and ornamental trees.
Porthetria dispar (L.) Gypsy moth	Miscellaneous deciduous and coniferous hosts	Maritime Provinces	From 200 traps set out, one male moth was caught at Annapolis Royal, N.S., and one on Grand Manan Island, N.B.
Pristiphora geniculata (Htg.) Mountain-ash sawfly	Mountain ash	Maritime Provinces	Severe defoliation at Campbellton, N.B. Elsewhere, numbers were low to moderate.
Rhynchaenus rufipes Lec. A willow beetle	Willow	Moncton and Riverview, N.B.	Severe defoliation on ornamentals.
Symmerista albifrons J.E.Smith Red-humped oakworm	Maple, sugar	Colchester and Cumberland counties, N.S.	The severe infestation between South and Mapleton brooks continued. At junction of Gamble and Portapique rivers, defoliation was severe over 24 hectares (60 acres), and light over 14 hectares (35 acres).
Zeiraphera canadensis Mut. & Free. and *Zeiraphera fortunana* Kft. Spruce budmoths	Spruce, white and red	Maritime Provinces	Common but numbers low.

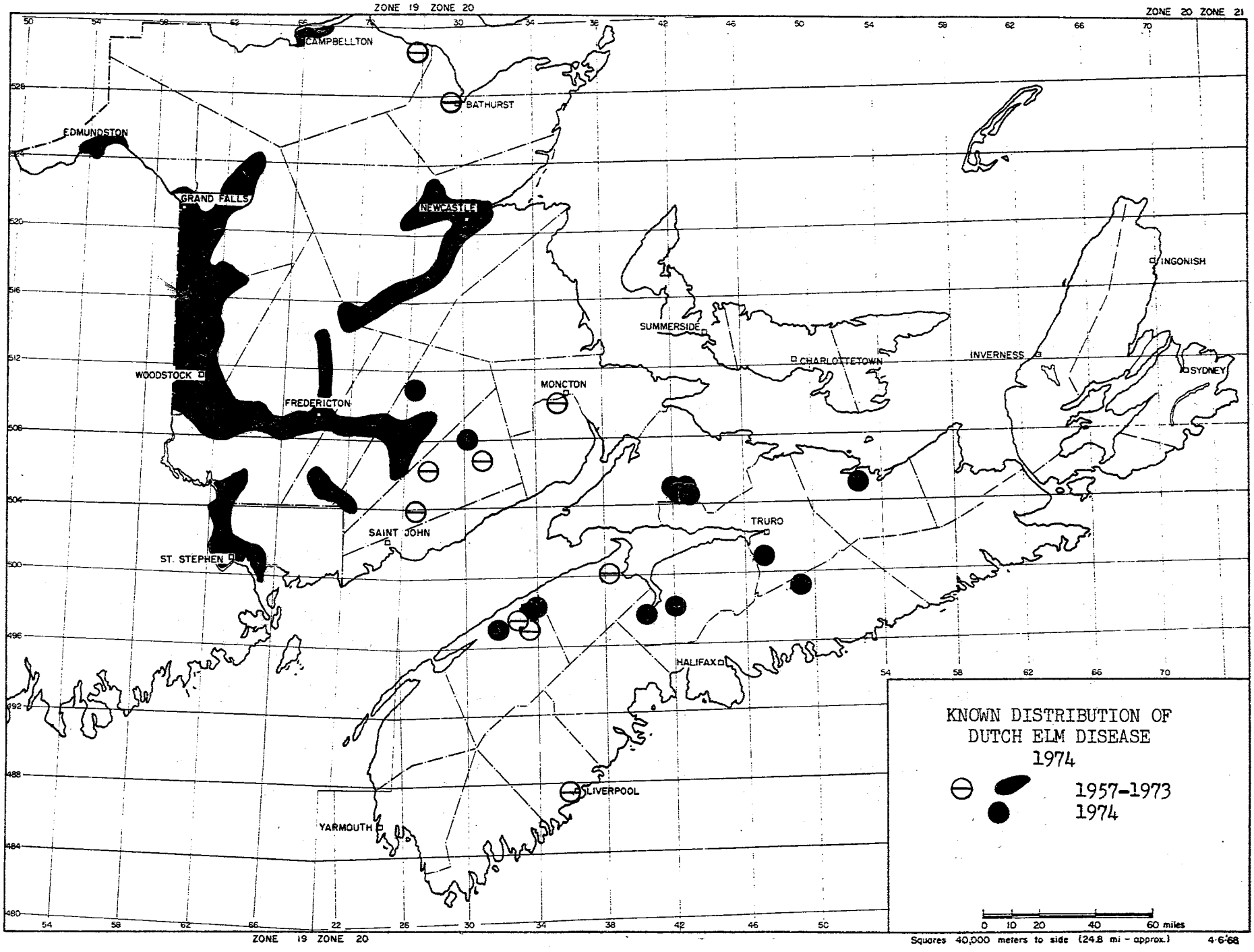
IMPORTANT FOREST DISEASES

Dutch Elm Disease, *Ceratocystis ulmi* (Buism.) C. Moreau--This disease continued to intensify with respect to new infections and mortality. In Nova Scotia, where the disease was first found in 1969, and where it has been active only at Kentville and Brickton, there was a significant extension of its known distribution. The locations where the disease was found and the numbers of trees affected are given below:

Stellarton	4	Woodville	1
Middle Musquodoboit	1	Windsor	2
Alton	1	Wilmot Station	1
River Philip	1	Middleton	2
Collingwood Corner	1	Brickton	7
Williamsdale	66	Paradise	1
Jackson	2		

In Kentville, where an extensive tree removal program was conducted during the winter of 1973-74, 14 diseased trees were discovered, compared with 137 found there since 1970.

In New Brunswick, infected trees were observed in most towns or cities, their numbers depending on the number of elms, time since the disease was established, and sanitation efforts exerted. Individual infected trees were found for the first time at Millstream and Newcastle Bridge, N.B. In Fredericton (preamalgamation limits), 131 diseased elm trees, compared with 89 in 1973, were removed, totalling 508 since 1961.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CAMPBELLTON
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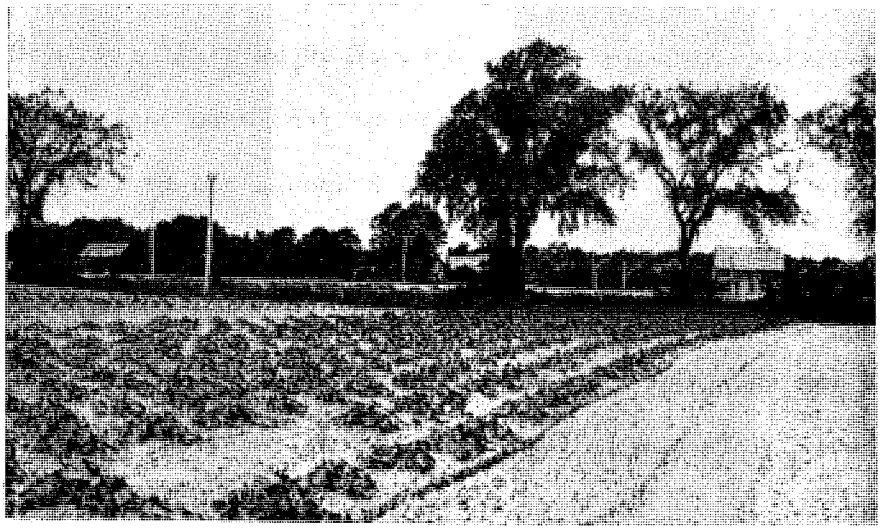
CHARLOTTETOWN
INVERNESS
SYDNEY
WOODSTOCK
FREDERICTON
MONCTON
SAINT JOHN
TRURO
ST. STEPHEN
HALIFAX
LIVERPOOL
YARMOUTH
KNOWN DISTRIBUTION OF
DUTCH ELM DISEASE
1974
1957-1973
1974
0 10 20 40 60 miles
Squares 40,000 meters to side (24.8 mi - approx.)
4-6-68



The tree in the center is showing early symptoms of Dutch elm disease

Two years later all three trees are dead as a result of Dutch elm disease

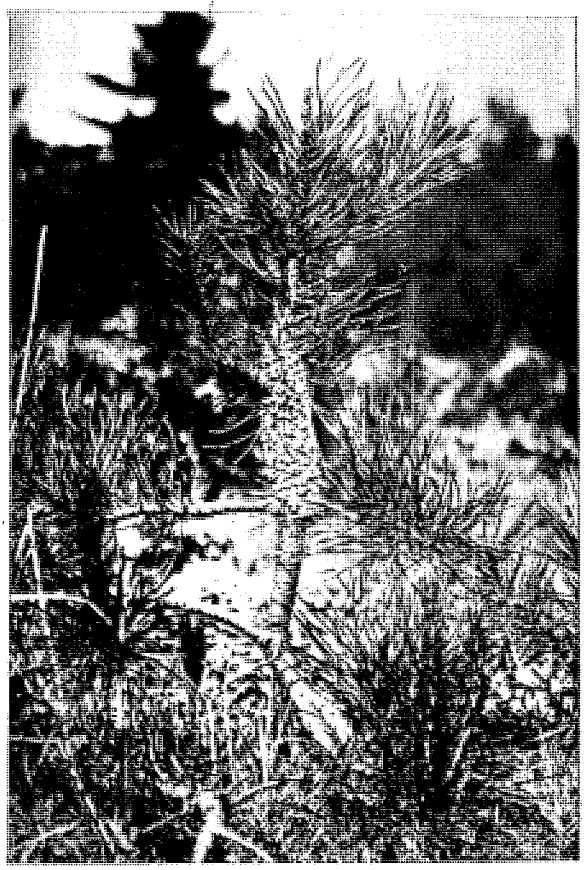
Of the 33 apparently healthy trees selected in 1967 in areas of high tree mortality in New Brunswick as part of a study of resistance to Dutch elm disease, 8 remain unaffected, 6 are living but diseased, 16 have been killed by the disease, and 3 have died from other causes. Of the living, infected trees, one, of 48 cm diam. (19 in dbh), first infected in 1971, and which had 60% of its crown yellow or brown and 40% wilted in 1973, had only a few dead branches and no foliage discoloration. A tree, 28 cm in diameter (11 in dbh), infected in 1969, which had 20% of the crown dead in 1972 and 1973, had only one yellow flag in 1974, but it was too high to resample. The additional trees at Derby Junction and Scovil, infected in 1968 and 1970, respectively, again appeared healthy.

Fume Injury--A problem with sulphur dioxide (SO_2) emissions was first detected at a mine in north-central New Brunswick late in 1970, and damage to the adjacent forests became apparent early in 1971 (see 1971 and 1972 Annual Reports). Extensive salvage cuttings were initiated and are continuing. As a confinement program progresses within the mine (concrete bulkheads, and sand and water backfills to exclude oxygen), the amount of SO_2 exhausted is gradually decreasing. Eastern white pine seedlings outplanted at intervals up to 9.6 km (6 miles) from the mine had no marked injury typical of SO_2 after 3 month's exposure, and alfalfa (a very sensitive indicator plant) exhibited only tip and marginal necrosis of the leaves in the three nearest locations southeast of the mine.

At Belledune Point, N.B., small scattered patches of trembling aspen, white birch, alder, fireweed, and raspberry, growing 0.4 to 1.6 km (0.25 to 1 mile) from a smelter-fertilizer plant, exhibited moderate and severe leaf spotting and interveinal necrosis typical of SO_2 injury. On tamarack, up to 3.2 km (2 miles) north of the complex, the distal half to three quarters of most needles was brown. This injury may have resulted from a single release of SO_2 during a process changeover late in July. Since the complex began operation in 1966, only minor foliar browning very near the plant (see 1967 to 1970 Annual Reports) has been observed.

Animal Damage--Winter feeding by mice killed more than 10,000 red pine trees in a young plantation near New Glasgow, N.S. Porcupines have killed or severely deformed more than 90% of the trees in one plantation on the Chignecto Game Sanctuary, 30% at Lake Paul, 20% near Stanley, and about 10% at Debert. In New Brunswick, girdling by porcupines occurred on 25% of the red pine trees over 1 hectare (2 acres) near Hurley Corner.

Scleroderris Canker of Pine, *Gremmeniella abietina* (Lagerb.) Morlet (*Scleroderris lagerbergii* Gremmen)--This disease, now found widely distributed in the natural range of jack pine in New Brunswick, was observed on natural jack pine regeneration on the "Tomogonops Burn" near Bathurst, and in jack pine plantations near Tabu Airstrip and at Minneval, where about 50% of the trees, had from one to ten affected branches. All locations are within a few miles of stands previously



Sweetfern blister rust, a disease of hard pines, can cause mortality in young trees

Globose gall rust disfigures and can also kill branches of jack and Scots pine trees

known to be infected. In Nova Scotia, infections were noted in young red pine plantations at Oban and near New Glasgow, and in two Scots pine plantations near West Leicester, making six locations in the Province where the disease has been found.

Shoot Blight of Conifers, *Sirococcus strobilinus* Preuss.--This disease, found on red pine for the first time in each of the three Provinces, attacks current-year shoots, commonly causing browning of new needles and shoot dieback. In Nova Scotia, affected branches varied from only a few on individual trees to more than half the branches on up to 80% of the trees in single plantations near Tantallon, Glenmore, Chester, and Auburndale, in 17 plantations near Stanley, in 10 in the Chignecto Game Sanctuary, and in 3 at Debert. Only light and scattered shoot blight was observed at Kemptville, north of Lake Rossignol, near Moose Lake, near Hodson and at Mira Road. Infected red pines were noted in a windbreak at Fundy National Park and in a young natural stand near Cherryvale, N.B., and near Murray River, P.E.I.

The fungus was responsible for up to 20% mortality in 2-0 white and black spruce seedbeds at the Provincial Nursery at Charlottetown, P.E.I., and in 1-0 white spruce at the Acadia Forest Experiment Station, N.B.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.--Little change has been observed in the distribution and incidence of this disease since it was last reported (see 1968 Annual Report). Malformed stems of hard pines, and some mortality in younger age classes, are

usually found wherever pine and sweetfern, the alternate host, grow in close proximity. Near Marcelville, N.B., in a provenance study involving 8-year-old jack pine, 18% of the trees were infected (12 to 24% range in nine blocks) with one or more stem cankers. In addition, 30% of the trees were missing or dead and many of these may have also been infected. Some provenances appeared to be more susceptible to infection than others. Furthermore, the incidence of infections in plantations in which sweetfern was common, was much greater than the average of 3% reported in natural stands.

Foliar Diseases of Hardwoods--Ink spot of trembling aspen, *Ciborinia whetzelii* (Seaver) Seaver, was again widespread but less severe than in 1973. At Maccan, N.S., leaf browning was severe but localized. From 10 to 40% of the leaves on sapling growth were again infected over about 8 hectares (20 acres) near St. Jacques, N.B. Elsewhere, browning was generally light and patchy.

Leaf and twig blight of aspen, caused by *Venturia macularis* (Fr.) E. Muell. & Arx, was less common than in 1973 and intensities were generally light except in localized stands near Cambridge and at Edgett Landing, N.B., where about 30% of the shoots were affected.

Willow blight, caused by *Venturia saliciperda* Nuesch., was very light, the lowest level in the past 5 years.

Cherry blight was slightly more common than in 1973, affecting about 25% of the shoots on many pin cherry bushes at St. Peter's, near Wood Island, and in the National Parks, P.E.I.; and from Hopewell Cape

to Fundy National Park and near Bathurst, N.B. Shoot dieback was common, but severe only on scattered trees, from Sevogle Airstrip to Little Bald Mountain.

Leaf spots on sugar maple, caused by *Phyllosticta minima* (Berk. & Curt.) Ell. & Ev., and leaf blister on red maple, caused by *Taphrina dearnessii* Jenkins were noted at only a few scattered locations in central New Brunswick. Leaf scorch of maple leaves was moderate on roadside trees between Lower Coverdale and Alma, N.B., and occurred at scattered locations elsewhere. A leaf blister of yellow birch, caused by *Taphrina carnea* Johans., was reported from three widely separated locations in New Brunswick, and was moderate on a few trees near North River, N.S. Ash rust, *Puccinia sparganioides* Ell. & Barth., occurred on 10% of the leaves on several white ash trees near Effies Brook, and was light from Round Hill to Digby, N.S. Anthracnose of beech, caused by *Discula quercina* (West.) Arx., was light on about 30% of the trees at Cheticamp River, Cape Breton Highlands National Park. Leaf blotch of horse-chestnut, caused by *Guignardia aesculi* (Pk.) V.B. Stew., which was widespread and severe for the past 2 years, and shothole of cherry, caused by *Coccomyces hiemalis* Higgins, were rare.

Needle Rusts--Needle rusts were again widespread, and were severe in some locations for the second consecutive year, thereby delaying the harvest of some Christmas trees. The balsam fir-blueberry rust, *Pucciniastrum goeppertianum* (Kuehn) Kleb., and the balsam fir-fireweed rust, *P. epilobii* Otth., affected an average of 20% of the new needles and up to 40% on some shoots in Christmas tree stands near Tracadie, and Hacheyville, N.B., respectively.

A needle rust on jack pine, (*Coleosporium viburni* Arth.), which alternates to witherod viburnum, was collected for the first time in the Region and was found on both hosts at four locations in New Brunswick and two in Nova Scotia. Infections were generally light on the 1972 and 1973 needles in jack pine plantations at the Acadia Forest Experiment Station, the Tabu Airstrip, and near Rogersville, N.B., and in the Chignecto Game Sanctuary, the Eden Lake Barrens, and near Neil Harbour, N.S.; in most cases, infections were severe on about 10% of the trees, probably because of the abundance and close proximity of the alternate host and favorable weather during the infection period in early fall.

Coleosporium asterum (Diet.) Syd. was generally light on scattered red pine except at Merland, N.S. and at Tyrone, P.E.I., where up to 80% of the old needles on most trees in two small plantations were infected.

The spruce-Labrador tea rusts, *Chrysomyxa ledi* (Alb. & Schw.) D By. and *C. ledicola* Lagh., were very light on black spruce in several swamps in the Region, and in nursery transplant lines at Juniper, N.B.

Chrysomyxa weirii Jacks., which requires no alternate host, infected about 15% of the needles on ornamental Engelmann spruce at Acadia Forest Experiment Station but was very light in a nearby plantation.

The larch-willow rust, *Melampsora* sp., was consipicuous near Little Bald Mountain, N.B., where about 20% of the needles on tamarack were infected.

Needle Casts--Browning of old foliage, caused by a variety of fungi, was again observed only occasionally. *Hendersonia pinicola* Wehm. caused severe browning of the 1973 foliage on ornamental mugho pine trees at Acadia Forest Experiment Station. Infections of *Davisomycella ampla* (Davis) Darker caused moderate browning on jack pine at five scattered locations in New Brunswick and one in Nova Scotia. Light infections of *Lophodermium pinastri* (Schrad, ex Fr.) Chev., were observed in several red pine plantations. Foliar browning, caused by *Lirula macrospora* (Hartig) Darker, on red and white spruce, and by *L. nervata* (Darker) Darker on balsam fir, was rare and light.

Abiotic Injuries--Winter drying injury was scattered and was less severe than in recent years. The distal half of all needles on red pine trees was again affected at the Middle Island Provincial Park near Chatham, and browning of red pine needles was moderate in patches near Bathurst, N.B. and at Mira Road and West Caledonia, N.S. Elsewhere, injury was generally scattered and very light.

Frost injury was light on white spruce over 1.2 hectare (3 acres) near Waterford, N.B., and was very light and scattered elsewhere.

Storm damage was severe and widespread. In New Brunswick, high winds in late June uprooted or broke many roadside trees between St. Leonard and St. Quentin and at scattered points between Edmundston and Grand Falls. In Prince Edward Island, hail and high winds in June and early July broke many shoots, wounded bark, and defoliated hardwoods in a 1.6-km (1-mile) swath from Hunter River to Winsloe. In Nova Scotia,

on Cape Breton Island, winds and heavy wet snow in late October flattened patches of forest up to 8 hectares (20 acres) in a 10- to 13-km (6- to 8-mile) wide swath along the coast from St. Peters to Louisburg; on the mainland, where damage occurred in patches from Debert west to Bass River and Five Islands, and broken tops were common west of this area to Apple River, losses to date in private woodlots are estimated to be near 60,000 m^3 (25 million board feet).

Snow accumulation was less than normal and except for several broken red pine trees in one plantation on the Chignecto Game Sanctuary, N.S., there was little breakage of stems and branches.

OTHER NOTEWORTHY DISEASES

Organism and Disease	Host(s)	Locality	Remarks
Armillaria mellea (Vahl ex Fr.) Kummer Root rot	Fir, balsam Pine, red, eastern white Spruce, red	5 locations in New Brunswick, 3 in Nova Scotia	Killed single trees or those in small groups.
Cronartium commandrae Pk. Blister rust	Northern commandra	Pabineau Lake, N.B.	First record on this host in Region.
Cronartium ribicola J.C.Fischer White pine blister rust	Pine, eastern white	Maritime Provinces	Infection levels unchanged from previous years (see 1967 Report).
Endocronartium harknessii (J.P.Moore) Y, Hiratsuka Globose gall rust	Pine, jack, mugho	Blackville and Acadia Forest Experiment Station, N.B.	At Blackville, 15% of young tubelings were infected, many at base where plastic wounded the stem; inoculum came from mature, heavily infected trees not cut in recent harvest. At Acadia, girdling caused severe shoot dieback on ornamentals.
Fusicoccum abietinum (Hartig) Prill. & Del.	Fir, balsam	Barachois River, N.S.; northern New Brunswick	At Barachois River, 5-20 flags occurred on 60% of trees along roadside. In New Brunswick, flags occurred on about 10% of trees at scattered locations.

OTHER NOTEWORTHY DISEASES (concluded)

Organism and Disease	Host(s)	Locality	Remarks
Hypoxylon mammatum (Wahl.) Miller Hypoxylon canker	Poplar, balsam	Bathurst, N.B.	Continues to kill trees and predispose others to wind breakage, constituting a hazard in many camping and picnic sites, (see 1968 Report).
Nectria cinnabarina (Tode ex Fr.) Fr. Nectria canker	Locust, black	Taymouth, N.B.	Associated with dieback on 30% of cuttings planted in 1973.
Semi-mature tissue needle blight	Pine, eastern white	Carrolls Crossing, N.B.	Caused browning of distal 1/2 to 3/4 of all new needles on most trees.
Steganosporium ovatum (Pers. ex Merat) Hughes Branch canker	Maple, sugar	Murray, N.S.	Caused 200+ red flags on some ornamentals.

SUMMARY

The spruce budworm remained paramount in importance. In New Brunswick, the loss of new foliage of balsam fir and spruce was moderate to severe over about 3.4 million hectares (8.3 million acres), compared to 3.1 million hectares (7.8 million acres) in 1973. In Nova Scotia, areas of moderate to severe infestation totalled 189,100 hectares (467,000 acres) in Cumberland County, were greatly reduced from 1973 in the Annapolis Valley, and covered about 164,600 hectares (406,500 acres) in Inverness and Victoria counties. In Prince Edward Island, attacks were severe over about 17,000 hectares (42,000 acres), and light to moderate in patches throughout the Province. In 1975, moderate to severe infestations are expected in almost all balsam fir and spruce stands in New Brunswick where high hazard (risk of tree mortality or top killing) now occurs over about 2.8 million hectares (7.0 million acres), in parts of Cumberland, Richmond, Inverness, and Victoria counties in Nova Scotia, and in many areas of Prince Edward Island. Balsam gall midge numbers were generally low, but light attacks observed in widely separated areas suggest that population levels of the midge are increasing. Infestations of the spruce beetle killed many mature red spruce trees and weakened others in Victoria Park, Truro, N.S. The European pine shoot moth was common, especially in plantations in Nova Scotia where attacks were often moderate or severe. Experimental spraying with a virus killed all red pine sawfly larvae treated in a localized infestation at Garden of Eden Barrens, N.S. Larch casebearer infestations were generally light, as predicted. Larch sawfly infestations decreased in

intensity and extent in New Brunswick from 1973, increased in Nova Scotia, and remained about the same in Prince Edward Island. Moderate to severe birch casebearer infestations occurred in parts of New Brunswick and Prince Edward Island as predicted, but attacks in Nova Scotia were lighter than expected. Population levels of the forest tent caterpillar were high in two large and four small areas of western Prince Edward Island, and low elsewhere. Red maple in central and southern New Brunswick sustained moderate to severe defoliation by the lesser maple spanworm, often in association with the maple leaf roller and the fall cankerworm.

The known distribution of Dutch elm disease in Nova Scotia was greatly extended as is indicated by its discovery at locations in Cumberland, Colchester, Hants, Halifax, and Pictou counties. In Kentville, where it has been known since 1970, 14 more diseased trees were found. In Fredericton, N.B., 131 diseased trees were removed, making a total of 508 since 1961. Scleroderris canker of pines, widespread in New Brunswick was discovered in three new areas in Nova Scotia, making six locations where it is now known in that Province. Shoot blight of conifers, caused by *Sirococcus strobilinus* Preuss. was found for the first time in each of the three Provinces, with intensity of infections varying widely. A needle rust on jack pine, *Coleosporium viburni* Arth. was collected for the first time in the Region, at four locations in New Brunswick and at two in Nova Scotia. Storm damage was widespread and severe, especially in Nova Scotia where wind and rain flattened sizeable patches of forest on Cape Breton Island and on the north-central mainland.

Insect and disease collections totalled 3,512, of which 2,450 were insect and 1,062 disease. Their respective distribution by provinces 1,557 and 612 in New Brunswick; 830 and 425 in Nova Scotia; and 63 and 25 in Prince Edward Island.

Appreciation is extended to all agencies and individuals who contributed to the Survey's operations in 1974.