ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY NEWFOUNDLAND - 1968

FOREST INSECT AND TREE DISEASES

by
L. J. Clarke, E. C. Banfield, W. J. Sutton,
D. M. Stone and D. S. O'Brien

FOREST RESEARCH LABORATORY
ST. JOHN'S, NEWFOUNDLAND
INFORMATION REPORT N-X-26

FORESTRY BRANCH
DEPARTMENT OF FISHERIES AND FORESTRY
JANUARY, 1969

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*District Supervisor

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FOREWORD

Changes in the Insect and Disease Survey staff in 1968 included the addition of a laboratory technician and two field technicians. Miss M. Taylor was appointed as an assistant laboratory technician in June, D.S. O'Brien was assigned as field technician in central Newfoundland and G.C. Carew assumed the duties as technician to the mycologist, Dr. P. Singh. Five Trades and Technology College students were employed to assist in the hemlock looper survey and general survey functions.

The field season began early in May when technicians classified aphid injury symptoms in three, 1-mile by 8-foot, plots in the Humber District. Data from these plots will be used to aid in developing a more comprehensive and refined method for interpreting aphid damage from aerial photographs. Technicians applied fertilizer to balsam woolly aphid plots at Crabbs River and South Branch to study the effect of fertilizers on aphid population levels. Agricultural limestone was applied to these 1/10 acre plots in the fall of 1967 and the fertilizer in May 1968. Field staff also established a temporary field station at Wiley Brook, Red Indian Lake, for the shrew-larch sawfly studies being conducted by Dr. J.R. Bider of Macdonald College. Hemlock looper larvae were collected and shipped to the Insect Pathology Research Institute, Sault Ste. Marie and the Chemical Control Institute at Ottawa for disease studies and chemical toxicity studies.

The normal insect and disease collecting program was restricted by demands from the hemlock looper chemical control operation. A total of 1675 insect and disease samples was collected of which 695 were from balsam fir as part of the looper sampling plan.

Aerial surveys were conducted throughout the Province in September; fifty-eight hours were flown in fixed-winged aircraft, detecting and mapping insect outbreaks. Ninety-six hours were flown in helicopters for pre-spray and post-spray sampling of hemlock looper infestations. Approximately 75,000 miles were travelled in departmental vehicles and 50 miles in boats.

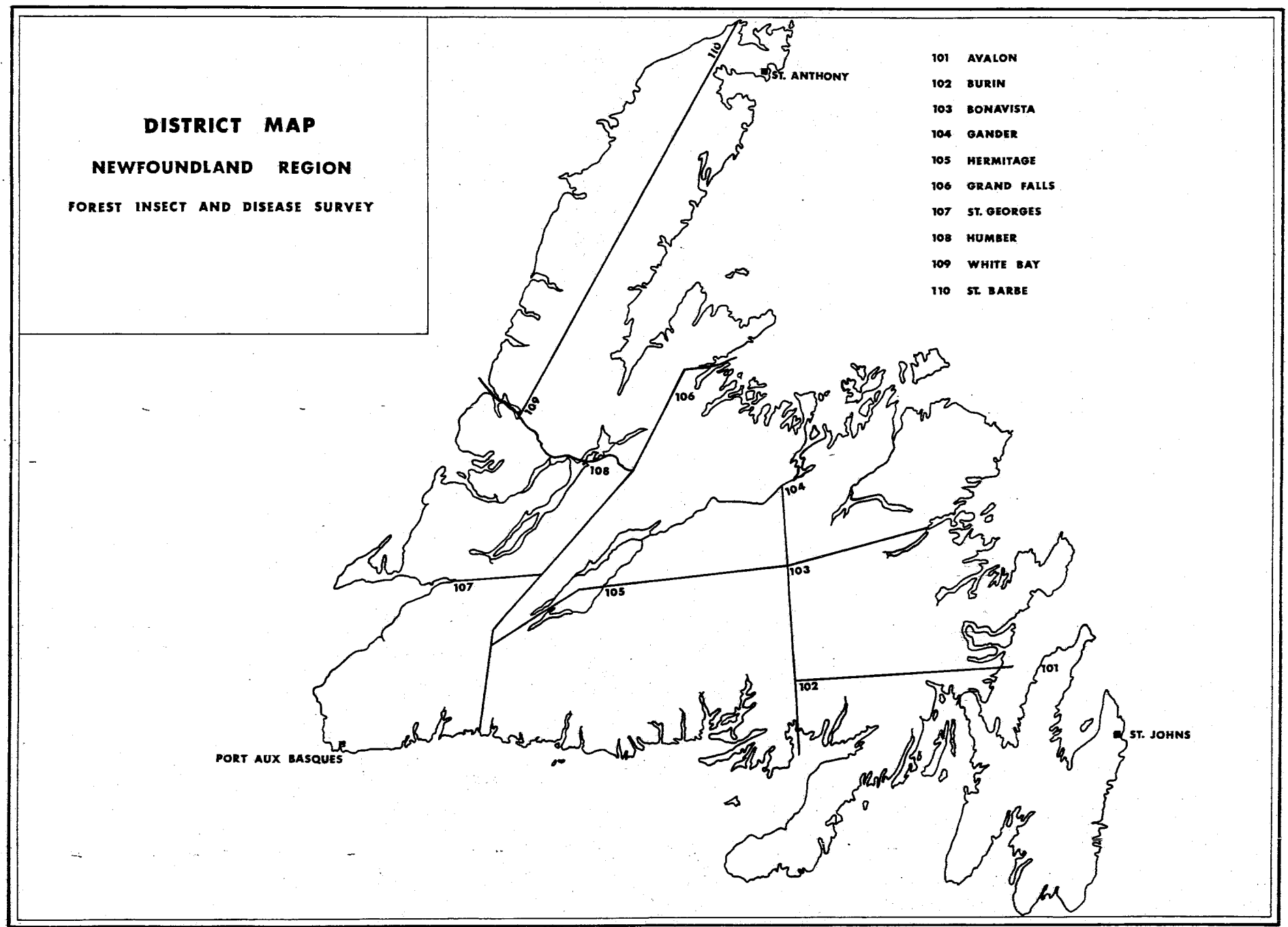
The hemlock looper outbreak was the most significant insect problem. Population levels remained high throughout most of the watersheds in western Newfoundland and new outbreaks were detected in northern, central and eastern Newfoundland. The boundaries of the balsam woolly aphid outbreaks remained unchanged in western areas but increased in the central and eastern areas. Larch sawfly outbreaks, which had persisted in tamarack stands in central Newfoundland for the past eight years, collapsed in 1968. The outbreak of balsam-fir sawfly in St. George's District expanded and caused severe damage to immature balsam fir.

Spruce budworm larval numbers were the highest since 1962 and caused light defoliation of coastal balsam fir and white spruce in the St. George's District. Severe birch casebearer damage was observed in many birch stands on the west coast. New records of this insect were also found on the Northern Peninsula and in central Newfoundland.

Armillaria root rot was the most important tree disease recorded in 1968. Severe damage was recorded on exotic species of spruce and larch in plantations throughout the Province and some crown mortality was observed in natural stands of black spruce in the Sandy Lake, Badger area and in balsam fir in the Lake Ambrose, Millertown area. Needle casts of balsam fir, black and white spruce, and larch were common throughout the Island.

Cull surveys were continued in conjunction with the Inventory and Land Capability Group of the Department of Mines, Agriculture and Resources of the Province of Newfoundland (Internal Report N-12, Warren, Hudak and Meades). A study of the rate of deterioration of balsam fir, killed by the hemlock looper, was continued in stands at Serpentine Lake and Crabbs River (Internal Report N-15, Meades and Sutton).

Data collected by field technicians is summarized in this report according to the Forest Insect and Disease Survey District, as revised in 1967. (Fig. 1).


DISTRICT MAP
NEWFOUNDLAND REGION
FOREST INSECT AND DISEASE SURVEY
101 AVALON
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PORT AUX BASQUES

Fig. 1

SECTION I

DISTRICTS 101 AND 102

AVALON AND BURIN

L.J. Clarke

INTRODUCTION

Record low temperatures and high rainfall were recorded by the weather office at Torbay during June and August and below normal temperatures during the remainder of the collecting season.

A total of 103 insect and 11 disease samples was collected throughout the districts.

Hemlock looper defoliation was recorded in the Avalon District for the first time in 48 years. The boundaries of balsam woolly aphid infestations remained unchanged on the Avalon Peninsula but damaged trees were more common on the Burin Peninsula. An increase of balsam-fir sawfly was noted between Marystown and Creston North. Larch casebearer was found in moderate numbers along the Topsail-St. Phillips Road. The rusty tussock moth was prevalent on many species of trees throughout the Burin and Avalon districts.

The most common tree diseases were needle casts of balsam fir, black and white spruce and larch.

INSECT CONDITIONS

Balsam Woolly Aphid, Adelges piceae (Ratz.) -- There was little change in boundaries or intensity of damage of balsam woolly aphid outbreaks on the Avalon Peninsula. The outbreak that was discovered in St. John's in 1949 now extends from Cape St. Francis, south to Cape Broyle and west to Seal Cove. The boundaries of the outbreak at Bellevue increased for 1-mile, south along the Trans Canada Highway, and damage increased in the outbreak at Dunville, Placentia Bay. Most of the balsam fir stands on the Burin Peninsula have now been damaged by the aphid and the numbers of damaged trees have increased in the more recently infested stands between Swift Current and Goobies.

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.)

The hemlock looper defoliated approximately 12,000 acres of mature balsam fir on the Avalon Peninsula in 1968. This outbreak occurred between Cochrane Pond and Mobile Big Pond. Although defoliation ranged from 20% to

60% on fir, stands were not seriously damaged because they were composed primarily of undefoliated black spruce. This is the first outbreak of this insect reported on the Avalon Peninsula since 1920. (See Section VII for a detailed report on the looper).

Collections	No. of larvae per tree sample
3	0.7

Balsam-fir Sawfly, Neodiprion abietis complex -- No larvae were collected in 1967 but this insect was common on immature balsam fir between Marystown and Creston North in 1968. Outbreaks of this sawfly have been recorded in the Burin District since 1961.

Collections	No. of larvae per tree sample
2	4.3

Larch Casebearer, Coleophora laricella (Hbn.) -- High numbers of this casebearer were recorded for the second consecutive year in the Topsail-St. Phillips road. Population levels remained low in all other areas of the districts.

Location	Stand vigor	Stand defoliation	Av. no. cases per 20 branch sample
Portugal Cove (Indian Meal Line)	MV	Nil	0.27
" " (St. Phillips Rd.)	"	"	0.40
Pouch Cove (Bauline Line)	"	"	1.26
Shoe Cove (Torbay)	"	"	1.10
St. Phillips Rd.	"	L	3.40
Topsail-St. Phillips Rd.	V	M	13.31

V = Vigorous; MV = Moderately vigorous

European Spruce Sawfly, Diprion hercyniae (Htg.) -- Larvae collections indicated that population levels of this sawfly increased from 1967. Large numbers were collected from white spruce at Marystown, Burin Bay Arm, Terrenceville and Grand Beach on the Burin Peninsula (Fig. 2). This insect caused little damage and many larvae collected were infected by a virus disease.

Year	Collections	No. larvae per tree sample
1968	12	5.8
1967	52	4.0

Rusty Tussock Moth, Orgyia antiqua (L.) -- Rusty tussock moth larvae were collected throughout the Avalon and Burin peninsulas (Fig. 3). They were numerous on balsam fir and white birch at Cochrane Pond and Terrenceville but no defoliation was recorded.

Collections	No. larvae per tree sample
16	2.0

OTHER INSECTS RECORDED

Species	Host(s)	Locality	Av. per tree sample	No. of collections
Acleris variana (Fern.) Black-headed budworm	wS,bF	St. Thomas, 2 mi. W. of Torbay near Holyrood, Marystown, Frenchman's Cove Prov. Park	0.7	6
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Bay Bulls Big Pond, Baine Hr., Jean de Baie	0.5	3
Brachyrhinus singularis Linn. A weevil	wS,bF	Conception Bay	0.4	4
Chrysomela falsa Brown Willow leaf beetle	W	Cochrane Pond Prov. Park	58.0	1
Chrysomela mainensis mainensis Alder leaf beetle Bech.	Al	2 mi. N. of Flatrock	5.0	1
Ctenicera triundulata Rand. A click beetle	wS,bF	St. Thomas, Flatrock	2.3	3
Dimorphopteryx sp. A birch sawfly	yB,wB	1.2 mi. N.E. of Grand Beach, Jct. Garden Cove and Burin Peninsula roads	1.0	2
Eupithecia sp. A brown spruce looper	bS,bF	3.6 mi. S. of Boat Hr. Jct., 1 mi. S. of Epworth Jct.	0.6	6
Feralia jocosa (Guen.) Green-striped caterpillar	bF	Creston North, North Hr. Rd., 1.1 mi. S. of Epworth	0.4	3
Herculia thymetusalis Wlk. Spruce needleworm	wS,bS	2 mi. W. of Torbay, Country Pond, Witless Bay Line	3.1	2
Mindarus abietinus Koch. Balsam twig aphid	bF	Frenchman's Cove Prov. Park	50.0	1
Nematus sp. A sawfly	W	Jct. Garden Cove and Burin Pen. Road	1.0	1

(Insects cont'd.)

Species	Host(s)	Locality	Av. per tree sample	No. of collections
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	wS,bS	1 mi. N. of Holyrood, Jct. Garden Cove & Burin roads, Creston North, Boat Hr.	1.2	4
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bS	LaManche Valley Prov. Park, Boat Hr., Jct. Garden Cove and Burin roads	1.0	3
Pristiphora erichsonii (Htg.) Larch sawfly	tL	Bauline - Portugal Cove Rd.	35.0	1
Pristiphora geniculata (Htg.) Mountain-ash sawfly	Mo	1 mi. N. of Holyrood, North Hr. Road, 3.3. mi. W. of Long Beach	27.7	3
Pristiphora lena Kinc. A spruce sawfly	wS,bF	Burin District	0.5	7
Semiothisa sp. A looper	wS,bF	Holyrood, 2 mi. W. of Torbay	0.6	3
Sicya macularia (Harr.) A looper	Al	10.9 mi. from T.C.H. on Burin Road	0.7	1
Solenobia walshella Clem. A bagworm	wS,bS,bF	Flatrock, Goulds, Holyrood, Boat Hr., Jct. Garden Cove and Burin roads, Country Pond, Witless Bay Line	0.8	7
Strophosoma melanogrammum Forst. A weevil		Conception Bay	1.7	4
Syneta sp. A leaf beetle	bF	1 mi. S. of Carbonear	0.3	1
Tetraphleps sp. A predator	bF	1.2 mi. N.E. of Grand Beach, 1.1 mi. S. of Epworth	0.3	2
Trichiosoma triangulum Kby. A sawfly	wB	5.9 mi. S. of Baine Hr. Jct., Winterland	0.2	2

(Insects cont'd.)

Miscellaneous families	Host(s)	Locality	Average per tree sample	No. of collections
Chrysomelidae Leaf beetles	wS	St. Thomas	3.3	1
Coccinellidae Lady beetles	wS	St. Thomas	1.0	1
Elateridae Click beetles	wS,bF, tL	Goulds, Torbay	1.3	6
Geometridae Geometrid moths	bF,Pch	4 mi. S. of Pouch Cove on Bauline Line, Tors Cove, Boat Hr., Jean de Baie, 1.7 mi. N.E. of Terrenceville	0.5	5
Noctuidae Owlet moths and underwings	wB,tL	LaManche Valley Prov. Park, 2.8 mi. S. of Bay L'Argent, Country Pond, Witless Bay Line	0.4	3
Notodontidae Notodonid moths	yB	Winterland	0.3	1
Pamphiliidae Web-spinning sawflies	bF	Jean de Baie, 5.9 mi. S. of Baine Hr. Jct.	0.2	2
Pentatomidae Stink bugs	Al,Pch, wB	Tors Cove, 1 mi. N. of Cape Broyle, Goulds, Conception Bay	4.1	2
Tenthredinidae Sawflies	bF,wB, moM,Mo	Creston North, Winterland, 1 mi. W. of Holyrood, 3.6 mi. S. of Boat Hr. Jct.	1.3	3
Tortricidae Leaf roller moths	yB	Winterland	0.3	1

DISEASE CONDITIONS

Needle Cast of Balsam Fir, Isthmiella faullii Darker -- Needle cast caused by Isthmiella faulii Darker and Lophodermium sp. is one of the most common foliage diseases of balsam fir. A high incidence of this needle cast was observed in the Come-by-Chance River Valley near Goobies and at Northern Bay Sands Provincial Park, Conception Bay.

Needle Cast of Spruce, caused by Lophodermium filiforme Darker and Isthmiella crepidiformis Darker, was common near Windsor Lake on the Avalon Peninsula. Browning of foliage was estimated at 90% in an area of $\frac{1}{2}$-square mile.

OTHER DISEASES RECORDED

Organism	Host(s)	Locality	Remarks
Gymnosporangium cornutum Arth. Leaf rust & Kern.	moM	3.6 mi. S. of Boat Hr. Jct., 1.0 mi. N. of Garden Cove	Medium
Hypodermella larieis v. Tub Needle cast of tamarack	tL	Country Pond-Witless Bay Rd.	Medium
Lophodermium filiforme Darker Needle cast	wS	Goulds	Light
Mycosphaerella sp. Leaf spot	Mo	1 mi. N. of Garden Cove	Medium
Pucciniastrum epilobii Otth Needle rust of balsam fir	bF	1 mi. N. of Holyrood	Trace
Puccinia sparganiodes Ell. Leaf rust and Barth.	Service-berry	Goulds	Medium

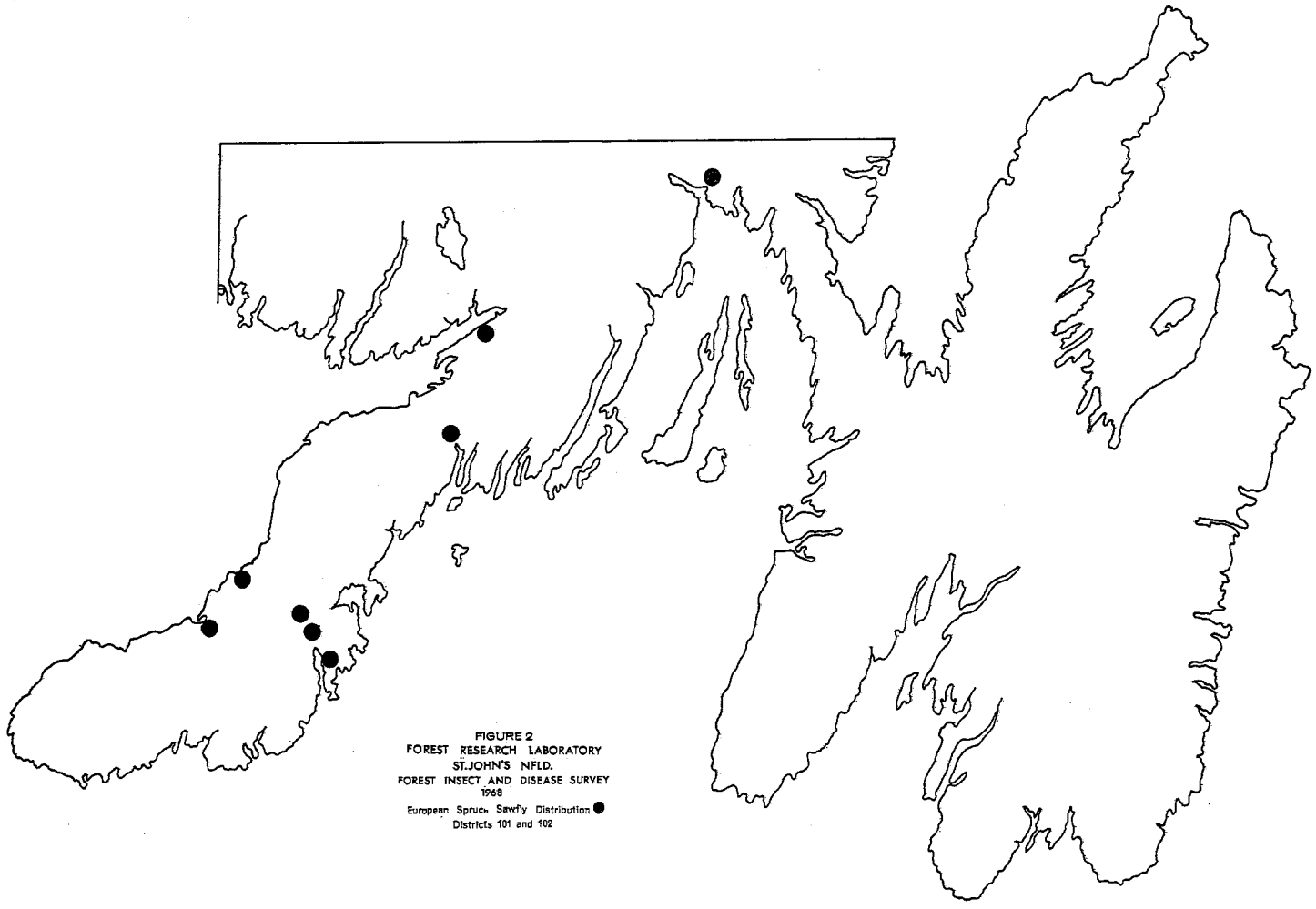


FIGURE 2
FOREST RESEARCH LABORATORY
ST.JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
European Spruce Sawfly Distribution ●
Districts 101 and 102

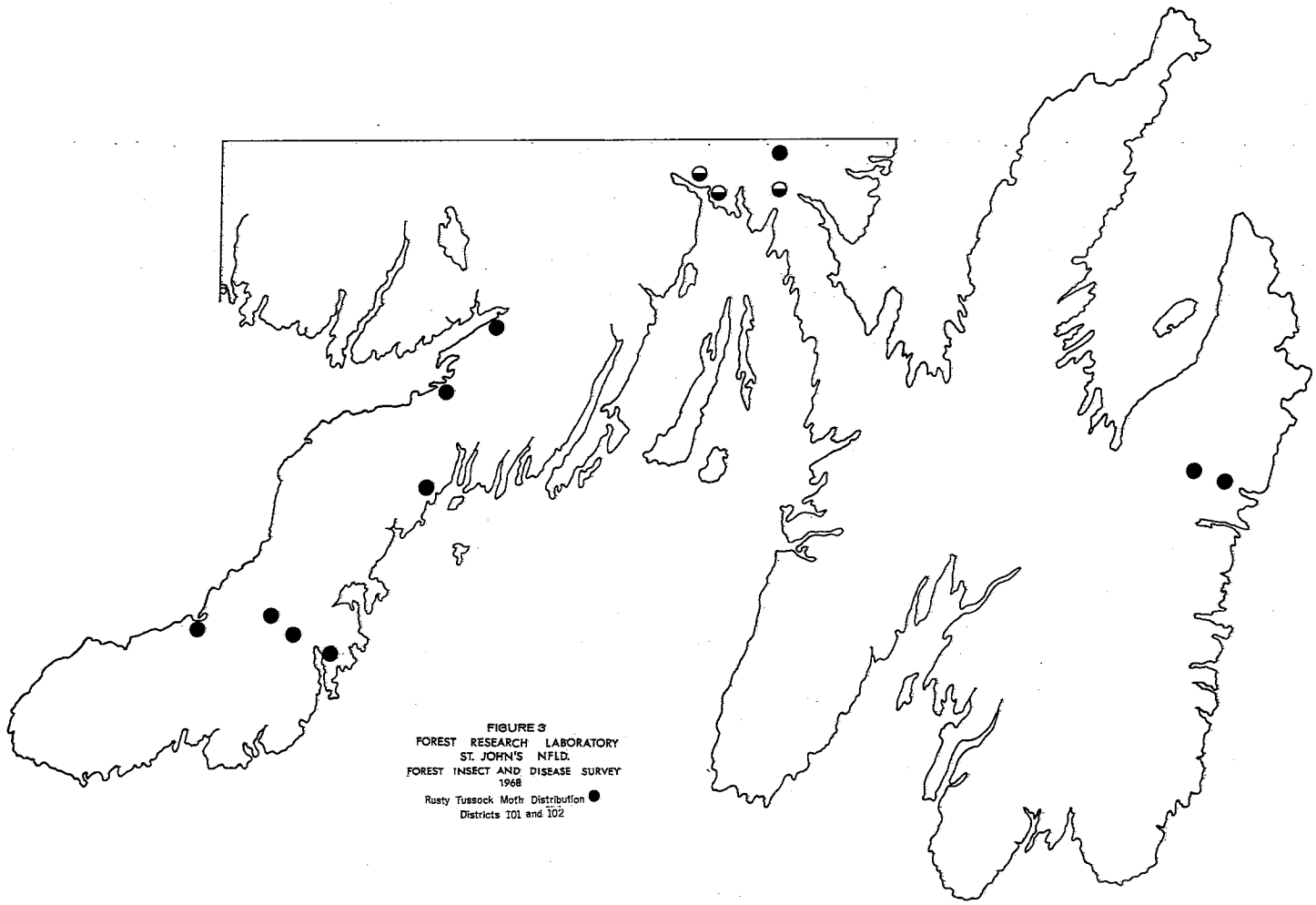


FIGURE 3
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Rusty Tussock Moth Distribution ●
Districts 101 and 102

SECTION II

DISTRICTS 103 AND 104

BONAVISTA AND GANDER

E.C. Banfield

INTRODUCTION

The weather office at Gander reported abnormally cold wet weather throughout the spring and summer months. June and August were the coldest on record, but weather conditions moderated in September to near normal temperatures and precipitation.

Field activities began on April 29, and terminated on November 22. The normal insect and disease collecting program was limited to the month of August due to the priority given to the hemlock looper survey. A total of 173 insect and 18 disease samples was collected. Mr. R. French, a forestry student at the College of Trades and Technology assisted in the survey. Insect and disease conditions in the Terra Nova National Park are shown in Section III.

Balsam woolly aphid infestations expanded and several spot outbreaks were observed from Shoal Harbour River to Gander. Hemlock looper damage ranged from light to severe in the Gander District. Population levels of this insect remained low in all areas of Bonavista District except for two small outbreaks on the Bonavista Peninsula. A larch sawfly outbreak and high population levels of mountain-ash sawfly were recorded on the Bonavista Peninsula. Tussock moth larvae were plentiful throughout both districts but defoliation was negligible.

Several tree diseases were recorded in both districts and damage ranged from light to severe. Needle rusts on balsam fir and black spruce were common on new foliage, but damage was light. Needle casts of balsam fir and larch were prevalent, and caused light to severe injury. Also the needle casts of black and white spruce were widespread, but little damage resulted. Leaf and twig blight of aspen was common and caused severe injury to trembling aspen regeneration. Medium damage resulted to mountain-ash from leaf rust and leaf spot diseases on the Bonavista Peninsula.

INSECT CONDITIONS

Balsam Woolly Aphid, *Adelges piceae* (Ratz.) -- The boundaries of the Bay of Exploits infestation of the aphid remained unchanged. However, damage was more pronounced at Eel Brook and stem attack was recorded there

for the first time, resulting in an estimated 20% tree mortality. The Gander Lake - King's Point outbreak extended 14 miles north along the Gander Bay Road. Damage was light in the more recently infested stands but increased from moderate to severe in the King's Point stands. Spot outbreaks were discovered along the Trans-Canada Highway near Gander, Gambo, Glovertown, Charlottetown, Thorburn Lake and Shoal Harbour River. The outbreak at Gambo extends west for approximately 2 miles and damage was recorded as light to medium. Light damage occurred in all other spot outbreaks. Balsam woolly aphid infestations are shown in (Fig. 4).

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) -- Population levels of the looper reached outbreak proportions in many balsam fir stands throughout both districts (Fig. 5.). Varying degrees of defoliation were recorded in approximately 300,000 acres in the Gander District but only about 1,200 acres were defoliated in the Bonavista District. Section VII of this report contains a summary of hemlock looper survey activities in the province for 1968.

District	Collections	No. larvae per tree sample
Gander	76	92.5
Bonavista	28	2.0

Larch Sawfly Pristiphora erichsonii (Htg.) -- Low numbers of larch sawfly were collected in the Bonavista District except along the Trans-Canada Highway, 2 miles north of Shoal Harbour River, where larvae were numerous. Approximately 5 acres were infested and defoliation was estimated at 10%.

Collections	No. larvae per tree sample
5	12.1

European Spruce Sawfly, Diprion hercyniae (Htg.) -- No noteworthy changes occurred in the status of this sawfly. Population levels remained about the same as in 1967. The largest larval count was recorded at Milton, where a three-tree beating sample produced 52 larvae (Fig. 6). Defoliation was negligible.

Collections	No. larvae per tree sample
19	3.4

Yellow-Headed Spruce Sawfly, Pikonema alaskensis (Roh.) -- No new outbreaks of this sawfly were recorded in 1968. Low numbers of larvae were collected throughout the Bonavista District but damage occurred only at the Forestry Branch plantations at North Pond where an outbreak was recorded in 1967. Defoliation in this outbreak was light in 1968, however, some red spruce seedlings were killed presumably from the damage inflicted during the 2 years of attack.

Collections	No. larvae per tree sample
15	1.4

Rusty Tussock Moth, Orgyia antiqua (L.) -- Rusty tussock moth larval population levels showed a marked increase over 1967 (Fig. 7). Larvae were found on most forest trees and shrubs, but little damage was observed.

Year	Collections	No. larvae per tree sample
1968	52	13.7
1967	45	1.3

Mountain-Ash Sawfly, Pristiphora geniculata (Htg.) -- Moderate to high larval counts of the mountain-ash sawfly were recorded on the Bonavista Peninsula. Damage was confined to individual trees and defoliation ranged from 5% to 15%.

Collections	No. larvae per tree sample
5	35.2

OTHER INSECTS RECORDED

Species	Host(s)	Locality	Average per tree sample	No. of Collections
Acleris variana (Fern.) Black-headed budworm	bS,bF	Bonavista Peninsula	0.4	5
Anoplodera cordifera Oliv. A wood borer	bS	King's Cove	0.5	1
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Bonavista Peninsula	1.2	5
Chrysomela falsa Brown Willow leaf beetle	W	Shoal Harbour River, Princeton	10.2	3
Coleophora laricella (Hbn.) Larch casebearer	tL	North Pond Road	0.7	1
Ctenicera falsifica Lec. A click beetle	bF	North Pond Road	0.3	1
Ctenicera triundulata Rand. A click beetle	bS	7 mi. N. of George's Brook	0.5	1
Eucordylea atrupictella Dietz. A spruce needle miner	bF	King's Cove	0.7	1
Eupithecia sp. A brown spruce looper	bS,bF	Bonavista Peninsula, near Goobies	0.5	4
Feralia jocosa (Guen.) Green-striped caterpillar	bF,bS,wS	Bonavista District	0.4	10
Herculia thymetusalis Wlk. Spruce needleworm	wS	Fosters Point, Hillview	0.8	2
Hylobius piceus Deg. A root weevil	bF	Shoal Harbour River	0.3	1

(Insects cont'd.)

Species	Host(s)	Locality	Average per tree sample	No. of Collections
Neodiprion abietis complex Balsam-fir sawfly	bF	Bonavista District	0.9	11
Nycteola cinerana N. and D.	wB	Southern Bay	0.5	1
Papilio sp. A swallowtail butterfly	Mo,Al	9 mi. E. of Southern Bay Jct., Port Rexton	0.6	2
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bS,wS	Bonavista District and Jonathan's Prov. Park	0.9	18
Pristiphora lena Kinc. A spruce sawfly	bS	Norris Arm	0.3	1
Scoliopteryx libatrix Linn. Scalloped owlet	W	Shoal Harbour River	0.3	1
Semiothisa sp. A looper	bF,tL	Charleston, Norris Arm	1.8	2
Solenobia walshella Clem. A bagworm	bF,bS, wS	Bonavista District	0.8	7

Miscellaneous families	Host(s)	Locality	Average per tree sample	No. of Collections
Aphididae Aphids	bS	Jonathan's Prov. Park, Clarenville	10.5	2
Cerambycidae Round-headed wood borers	bF	St. Jones Within	0.3	1
Curculionidae Weevils	wB	George's Brook	0.5	1
Geometridae Geometrid moths	bF,wS,wB, Al,Pch,tL	Bonavista and Gander Districts	0.8	22
Notodontidae Notodonid moths	tA	Lethbridge	0.3	1
Pamphiliidae Web-spinning sawflies	bF	Hodges Cove	0.3	2
Pentatomidae Stink bugs	Al,wB	Gambo, Fosters Point, Hodges Cove	0.3	3
Tenthredinidae Sawflies	Al,Pch	Fosters Point	0.7	2
Tortricidae Leaf roller moths	bF,bS,Al,wB,W	Bonavista Districts and Jonathan's Prov. Park	0.7	8

DISEASE CONDITIONS

Leaf and Twig Blight of Poplar, Pollacia radiosa (Lib.) Bald and Cif. and Pollacia elegans Serv. -- Leaf and twig blight of poplar was very common in the Gander District. Trembling aspen regeneration was severely injured in the Gambo Lake area and along North Pond and Gander Bay roads. Damage at other locations was recorded as light to medium.

Needle Cast of Balsam Fir, Isthmiella faullii Darker and Lophodermium sp. -- The incidence of this needle cast was quite common on balsam fir and occurred throughout both districts. The most severe damage was recorded in balsam fir stands on the Bonavista Peninsula.

Needle Cast of Larch, Hypodermella laricis v. Tub. -- Needle cast of larch was prevalent in most tamarack stands in Gander District, however, it was not recorded in the Bonavista District. The most severe yellowing of tamarack foliage was found in Gander Bay South areas.

OTHER DISEASES RECORDED

Organism	Host	Locality	Remarks
Isthmiella crepidiformis Darker Needle Cast of Spruce	bS	Bonavista Peninsula	Low
Lophodermium filiforme Darker Needle cast of spruce	wS	Bonavista Peninsula	Low
Chrysomyxa ledicola Lagerh. Needle rust of black spruce	bS	North Pond	Low
Dibotryon morbosum (Schw.) Theiss. & Syd. Black knot of cherry	Pch	North Pond, Gambo Lake, Glenwood	Heavy
Gymnosporangium cornutum Arth. & Kern. Leaf rust	Mo	Charleston	Medium
Mycosphaerella sp. Leaf spot	Mo	Bonavista Peninsula	Medium
Pucciniastrum epilobii otth Needle rust of balsam fir	bF	Princeton	Heavy

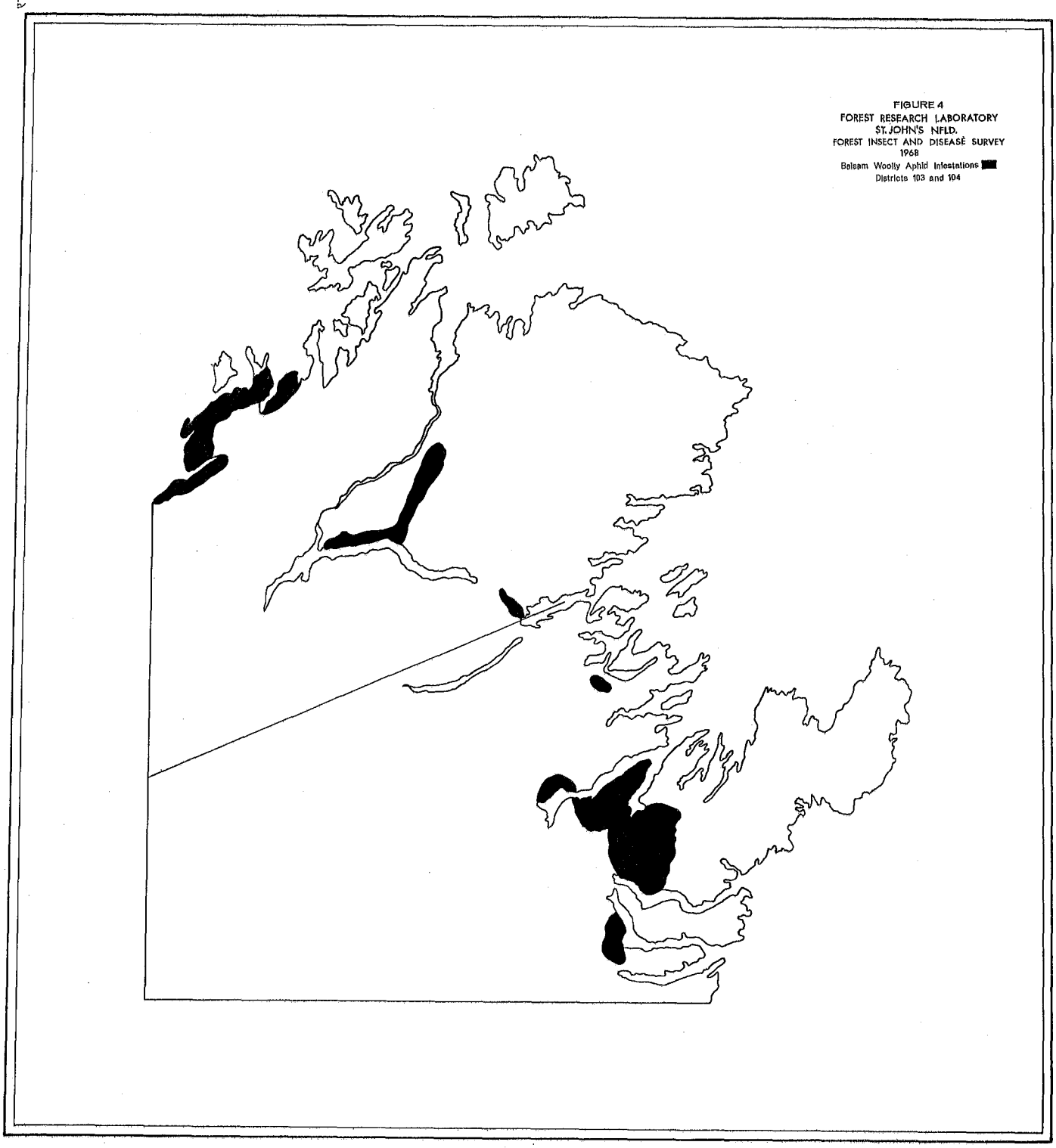


FIGURE 4
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Balsam Woolly Aphid Infestations
Districts 103 and 104

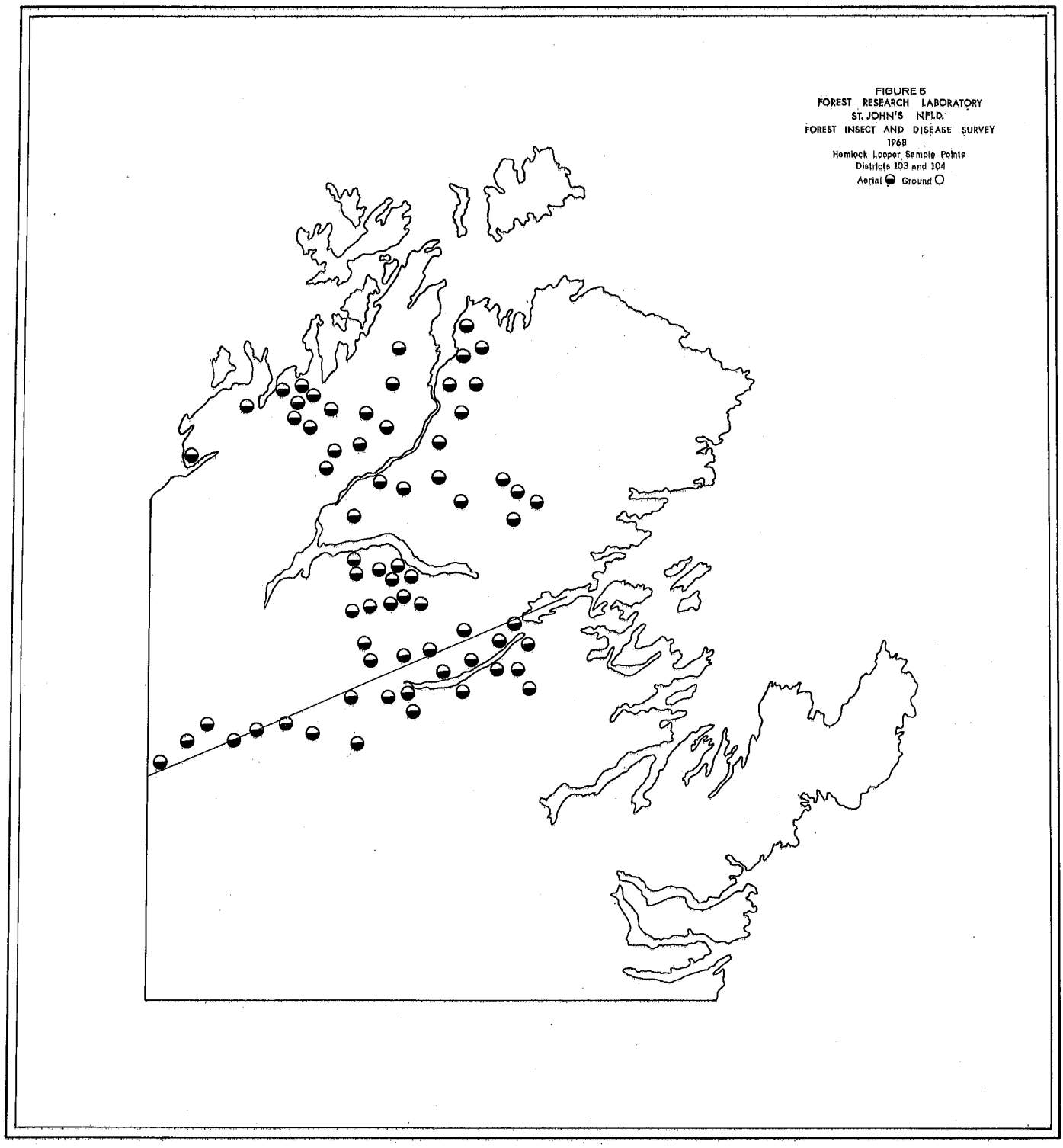


FIGURE 5
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Hemlock Looper Sample Points
Districts 103 and 104
Aerial Ground

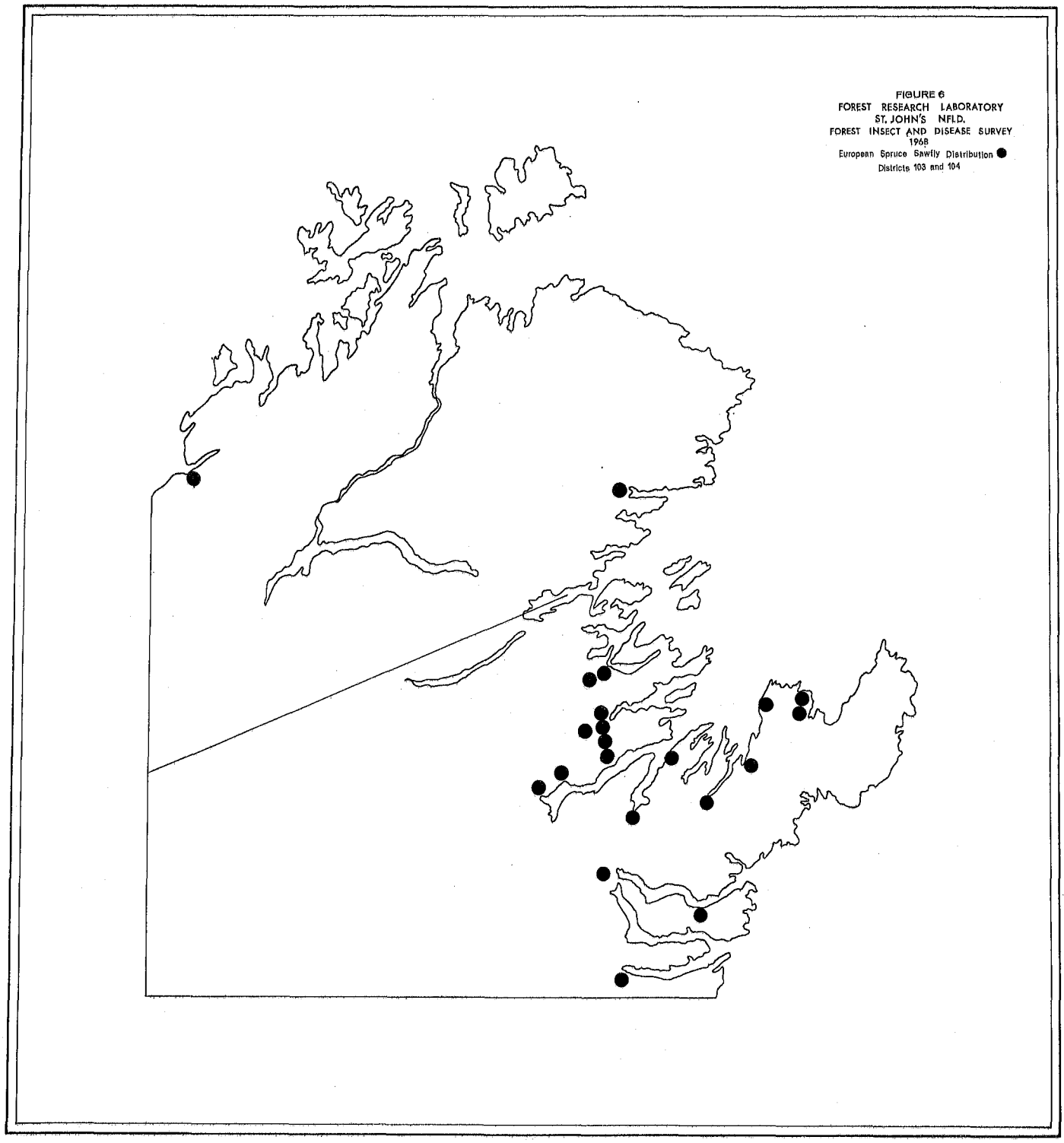


FIGURE 6
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
European Spruce Sawfly Distribution
Districts 103 and 104

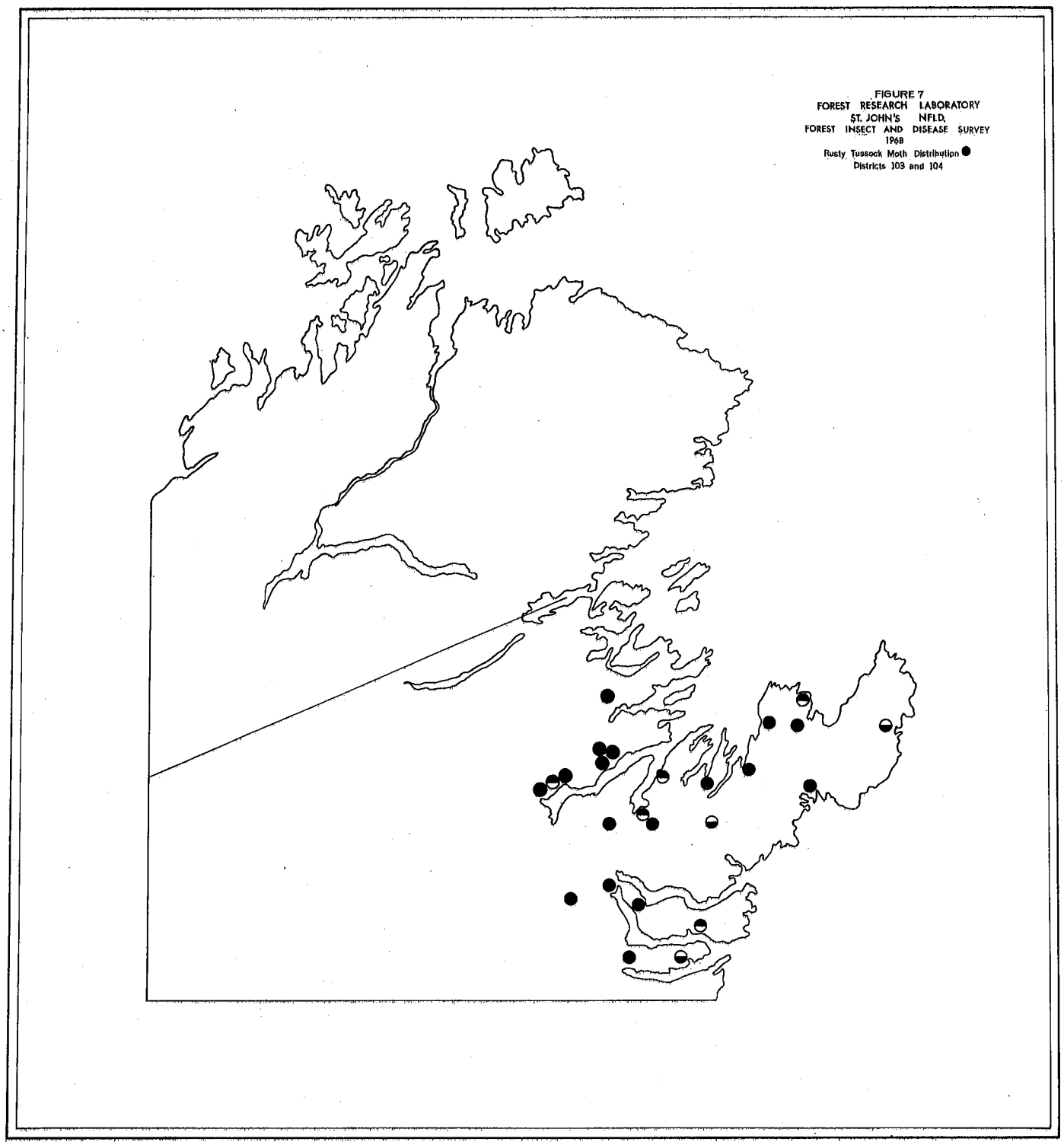


FIGURE 7
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Rusty Tussock Moth Distribution
Districts 103 and 104

SECTION III

INSECT AND DISEASE CONDITIONS

TERRA NOVA NATIONAL PARK

E.C. Banfield

This section of the Annual District Report is provided for the convenience of Terra Nova National Park officials. It includes a summary of the more important forest insects, a map shows the 1968 sampling points, and tabular lists of all insect and disease specimens,

The author accompanied by Mr. Ben Roper, chief warden of the Park, conducted an aerial survey on August 2. No insect or disease damage was detected within the park boundaries during this survey.

Road surveys and sampling indicated that boundaries of the balsam woolly aphid infestation have extended from Dunphy's Pond Road to Charlottetown Junction. Light to moderate gout was observed at several locations along this section of the Trans-Canada Highway. Population levels of the hemlock looper increased to outbreak proportions in five out of 10 sampling stations throughout the Park. Samples were taken along the T.C.H. from 3 miles North of Saltons Brook to 5½ miles south west of Charlottetown Junction. High moth counts were recorded during a survey conducted in October, and based on this information, an increase in population levels is predicted for 1969. European spruce sawfly and rusty tussock moth larvae were very common but damage was negligible.

White pine blister rust occurred on young and mature eastern white pine along the Terra Nova Road. Black knot of cherry was common wherever hosts occurred. A total of 33 insect samples and one disease sample was collected. Insects are grouped in alphabetical order in Table I and sample points are shown in Fig. 8.

INSECT COLLECTIONS IN TERRA NOVA NATIONAL PARK

Species	Grid No.	Location	Date	Host	No. Insects
Acleris variana (Fern.) Black-headed budworm	2170536	Eastern Boundary	3/8/68	bS	1
	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	bS	1
Anoplonyx luteipes Cress. Marlatt's larch sawfly	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	tL	2
	2171536	6.6 mi. S.W. of Charlottetown Jct.	3/8/68	tL	3
	2171537	1 mi. W. T.C.H. on Sandy Pond Road	3/8/68	tL	7
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	3
Coleophora laricella (Hbn.) Larch casebearer	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	1
Corythucha sp. Lacebugs	2228538	1.2 mi. N. of Saltons Brook	6/8/68	Al	1
Dimorphopteryx sp. A birch sawfly	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	Al	1
Diprion hercyniae (Htg.) European spruce sawfly	2170536	Eastern Boundary	3/6/68	bS	43
	2170536	" "	"	bS	4
	2171536	Jct. Charlottetown Rd. & T.C.H.	3/8/68	bS	23
	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	bS	30
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bS	3
	2171537	1 mi. W. T.C.H. on Sandy Pond Road	3/8/68	bS	2
	2227537	1.4 mi. N. of Jct. Ochre Hill Rd.	6/8/68	bS	6
	2227538	4.5 " " " " " " "	6/8/68	bS	2
	2228538	1.2 mi. N. of Saltons Brook	6/8/68	bS	6
	2228539	3.0 " " " " "	6/8/68	bS	10
Elateridae Click beetles	2171537	1 mi. W. T.C.H. on Sandy Pond Rd.	3/8/68	bF	7
	2227537	1.4 mi. N. of Jct. Ochre Hill Rd.	6/8/68	tL	2
Eupithecia sp. A brown spruce looper	2171537	1 mi. W. of T.C.H. on Sandy Pond Rd.	3/8/68	tL	1
Feralia jocosa (Guen.) Green-striped caterpillar	2171537	1 mi. W. of T.C.H. on Sandy Pond Rd.	3/8/68	tL	1
	2227538	4.5 mi. N. of Jct. Ochre Hill Rd.	6/8/68	bS	1
	2228538	1.2 mi. N. of Saltons Brook	6/8/68	bS	1

(Insect Collections cont'd.)

Species	Grid No.	Location	Date	Host	No. Insects
Geometridae	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	tL	2
Geometrid moths	2171536	Jct. Charlottetown Rd. & T.C.H.	3/8/68	bF	1
	2171536	1.4 mi. N.E. Cobblers Brook	6/8/68	bF	4
	2171536	5.5 mi. S.W. of Charlottetown Jct.	3/8/68	wB	1
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	3
	2127538	Near Park Headquarters	3/8/68	wB	3
	2227537	1.4 mi. N. of Jct. Ochre Hill Rd.	6/8/68	Al	5
	2227537	" " " " " " "	6/8/68	tL	5
	2227538	4.5 " " " " " " "	6/8/68	bF	1
	2227538	" " " " " " "	6/8/68	bS	1
	2228538	1.2 mi. N. of Saltons Rd.	6/8/68	bS	1
Hemichroa crocea (Fourc.) Striped alder sawfly	2127538	Near Park Headquarters	3/8/68	wB	30
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	2171536	4.4 mi. S. of Jct. Charlottetown Rd.	3/8/68	bF	45
	2171536	1.4 mi. N.E. of Cobblers Pk.	6/8/68	bF	6
	2171536	" " " " " "	6/8/68	wB	1
	2171536	Jct. Charlottetown Rd. & T.C.H.	3/8/68	bF	19
	2171536	" " " "	3/8/68	bS	2
	2171536	5.5 mi. S.W. of Jct. Charlottetown Rd.	3/8/68	tL	3
	2171536	" " " " " " "	3/8/68	wB	17
	2171536	" " " " " " "	3/8/68	bF	18
	2171537	1.0 mi. W. T.C.H. on Sandy Pond Rd.	3/8/68	tL	3
	2171537	" " " " " " "	3/8/68	bS	2
	2171537	" " " " " " "	3/8/68	bF	2
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bF	1
	2171537	" " " " "	5/8/68	tL	1
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	2227537	1.4 mi. N. of Jct. Ochre Hill Rd.	6/8/68	bS	1
	2227537	" " " " " " "	6/8/68	tL	2
	2227538	4.5 " " " " " " "	6/8/68	bF	17
	2227538	4.5 " " " " " " "	6/8/68	bS	8
	2228538	1.2 mi. N. of Saltons Bk.	6/8/68	bF	20
	2228538	" " " " " "	6/8/68	bS	4
	2228539	3.0 " " " " "	6/8/68	bS	1
	2228539	" " " " " "	6/8/68	bF	6

(Insect Collections cont'd.)

Species	Grid No.	Location	Date	Host	No. Insects
Neodiprion abietis complex.	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bF	1
Balsam-fir sawfly	2228539	3.0 mi. N. of Saltons Bk.	6/8/68	bS	1
Notodontidae	2171536	Jct. Charlottetown Rd. & T.C.H.	3/8/68	W	1
Notodonid moths					
Nyctobia limitaria (Wlk.)	2171536	5.5 mi. S.W. of Jct. Charlottetown Rd.	3/8/68	tL	2
Green balsam looper	2171537	1 mi. W. of T.C.H. on Sandy Pond Rd.	3/8/68	tL	1
Orgyia antiqua (L.)	2171536	5.5 mi. S.W. of Jct. Charlottetown Rd.	3/8/68	tL	7
Rusty tussock moth	2171536	" " " " " " "	3/8/68	wB	16
	2171536	1.4 mi. N.E. of Cobblers Bk.	6/8/68	wB	1
	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	Al	1
	2171536	" " " " "	6/8/68	tL	9
	2171537	1.0 mi. W. of T.C.H. on Sandy Pond Rd.	3/8/68	bF	1
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	1
	2227537	1.4 mi. N. of Jct. Ochre Hill Rd.	6/8/68	tL	5
	2227537	" " " " " " " "	6/8/68	Al	2
	2228538	1.2 mi. N. of Saltons Brook	6/8/68	bS	1
	2228538	" " " " " "	6/8/68	Al	5
Pamphiliidae	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bF	1
Web-spinning sawflies					
Papilionidae	2171536	1.4 mi. N.E. of Cobblers Brook	6/8/68	Al	2
Swallowtail butterflies					
Pikonema alaskensis (Roh.)	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	bS	2
Yellow-headed spruce sawfly	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bS	2
	2228538	1.2 mi. N. of Saltons Bk.	6/8/68	bS	6
	2228539	3.0 " " " " "	6/8/68	bS	18
Pikonema dimmockii (Cress.)	2170536	Eastern Boundary	3/8/68	bS	1
Green-headed spruce sawfly	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	bS	5
	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	bS	2
	2227537	1.4 mi. N. Jct. Ochre Hill Rd.	6/8/68	bS	1
	2227538	4.5 " " " " " "	6/8/68	bS	2

(Insect Collections cont'd.)

Species	Grid No.	Location	Date	Host	No. Insects
Pristiphora erichsonii (Htg.)	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	3
Larch sawfly	2171537	1.0 mi. W. T.C.H. on Sandy Pond Rd.	3/8/68	tL	2
Semiothisa sp.	2171536	5.5 mi. S.W. of Jct. Charlottetown Rd.	3/8/68	tL	3
A looper	2171536	Dunphy's Pond Rd. (shrew plot)	6/8/68	tL	3
Solenobia walshella Clem.	2228538	1.2 mi. N. of Saltons Bk.	6/8/68	bS	4
A bagworm					
Syneta sp.	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	1
A leaf beetle					
Tortricidae	2171536	Jct. Charlottetown Rd. & T.C.H.	3/8/68	W	2
Leaf roller moths					
Zeiraphera diniana Gn.	2171537	Jct. Ochre Hill Rd. & T.C.H.	5/8/68	tL	1
Douglas-fir cone moth					

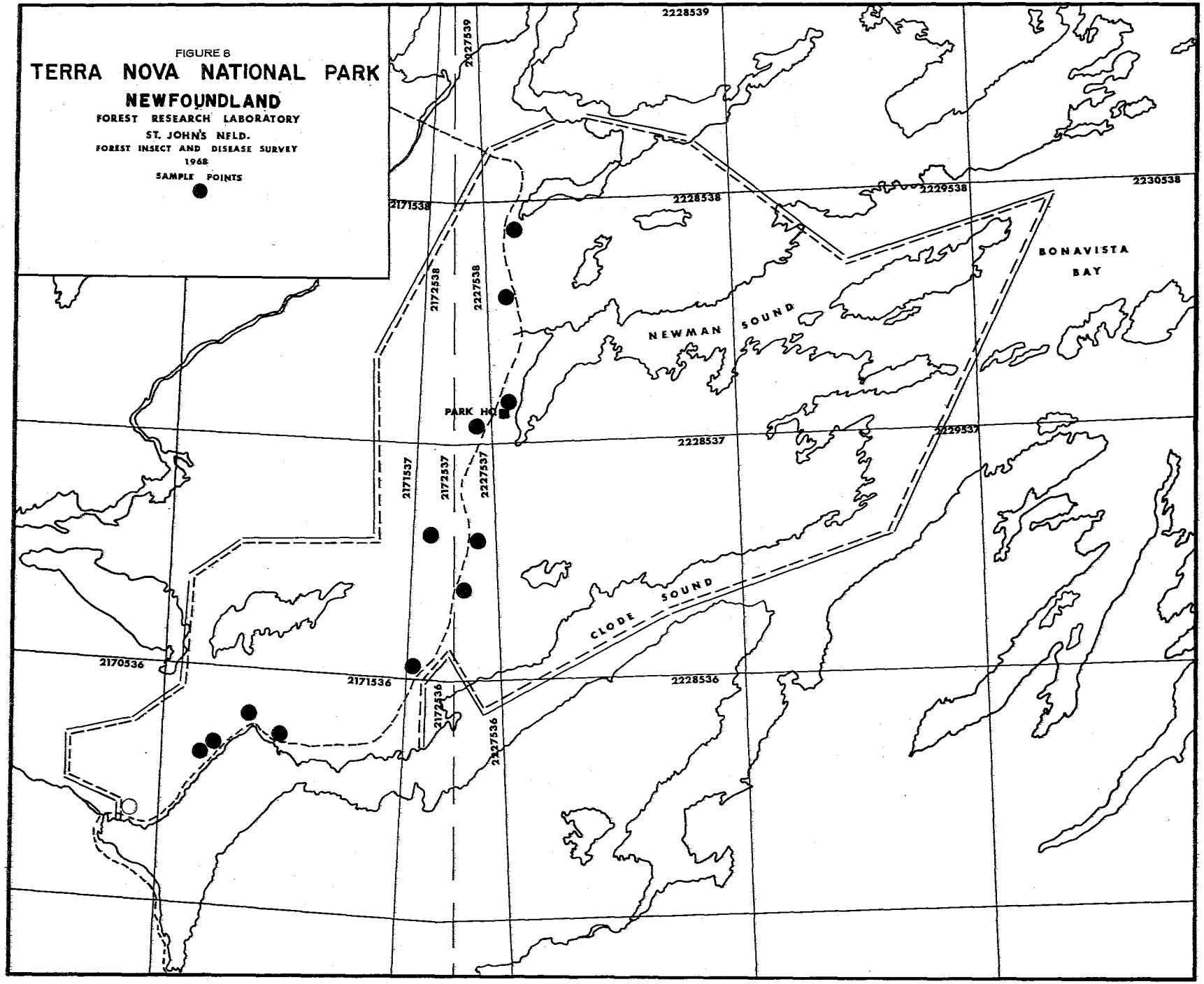


FIGURE 8
TERRA NOVA NATIONAL PARK
NEWFOUNDLAND
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
SAMPLE POINTS
2228539
2227539
2171538
2228538
2229538
2230538
2172538
2227538
BONAVISTA
BAY
NEWMAN SOUND
PARK HQ
2228537
2229537
2171537
2172537
2227537
CLODE SOUND
2170536
2171536
2228536
2172536
2227536

SECTION IV

DISTRICTS 105 AND 106

HERMITAGE AND GRAND FALLS

W.J. Sutton - D.S. O'Brien

INTRODUCTION

The collecting program in the Hermitage and Grand Falls districts began on August 1 and terminated on August 31. A total of 313 insect and 35 disease collections was made during this period. The results of the collecting program showed the hemlock looper to be the major problem with a number of outbreaks recorded. There was little change in the status of the balsam woolly aphid conditions. Larch sawfly population levels in the Red Indian Lake and Halls Bay areas virtually collapsed in 1968 and very little damage was attributed to the insect. An outbreak of the pine-needle scale was recorded in the Rattling Brook area. The most common pests of deciduous trees were the alder sawfly, the mourning-cloak butterfly and the birch leaf miner.

Needle cast diseases of softwoods and leaf spot diseases of hardwoods were common throughout the districts. Armillaria root rot continued to be a problem in the Sandy Lake and Lake Ambrose areas.

INSECT CONDITIONS

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) -- The hemlock looper was the most important pest in central Newfoundland. High population levels occurred in many balsam fir stands and more than 500,000 acres were defoliated. Survey sample points are shown in Fig. 9. Details of the hemlock looper conditions are discussed in section VII of this report.

Collections	No. larvae per tree sample
108	8.4

Balsam Woolly Aphid, Adelges piceae (Ratz.) -- The only significant change in the status of the balsam woolly aphid in these districts occurred at Bishops Falls where the outbreak extended an additional 8 miles south along the Bay d'Espoir Road (Fig. 10).

European Spruce Sawfly, Diprion hercyniae (Htg.) -- This insect was collected throughout central Newfoundland but larval counts remained low and defoliation was negligible (Fig. 11).

Collections	No. larvae per tree sample
63	1.4

Pine-Needle Scale, Phenacaspis pinifoliae (Fitch) -- This insect was recorded for the first time in the Grand Falls district. It was collected in a stand of stunted black spruce on the Rattling Brook road 2.2 miles west of the Bay d'Espoir road. Browning of the foliage was severe on 90% of the trees.

Larch Sawfly, Pristiphora erichsonii (Htg.) -- The larch sawfly outbreaks around Red Indian Lake and in the South Brook, Halls Bay, virtually collapsed in 1968 and only low counts and light defoliation were recorded in the area. One small outbreak was recorded at the intersection of Buchans Road and Wiley Brook Road, but larvae did not survive beyond the second instar, probably because of the very cold wet season.

Collections	No. larvae per tree sample
8	2.3

The following summary shows the status of this past in various areas:

Location	% Defoliation	No. larvae per tree
Fortune Harbour	5%	5
Badger	Nil	4
South Brook	Nil	5
Lake Ambrose	Nil	1
Ebbegunbaeg Canal	Nil	1
Wiley Brook	Nil	12
Red Indian Lake	Nil	1

Striped Alder Sawfly, Hemichroa crocea (Fourc.) -- Population levels of this sawfly more than doubled from 1967 and reached outbreak proportions in the Victoria Lake area. Defoliation ranged from 50% to 100% on roadside stands of alder and along Victoria River.

Year	Collections	No. larvae per tree sample
1968	8	129.7
1967	6	57.3

Mourning-Cloak Butterfly, Nymphalis antiopa (L.) -- Severe defoliation ranging from 75 to 100% and numerous larvae were recorded wherever the host tree occurred along roads in the Victoria Lake area.

Collections	No. larvae per tree sample
4	16.0

Rusty Tussock Moth, Orgyia antiqua (L.) -- Population levels of the rusty tussock moth increased and larvae were collected throughout both districts in 1968 (Fig. 12). Defoliation was generally light in most areas but was severe on a variety of young deciduous trees near Long Pond, Hermitage district.

Light to moderate defoliation was observed on patches of white birch regeneration in the Victoria Lake area.

Year	Collections	No. larvae per tree sample
1968	80	4.0
1967	10	1.1

Birch Leaf Miner, Fenusa pusilla (Lep.) -- Very few samples of this leaf miner were collected in central Newfoundland. However, light to moderate browning of roadside white birch was attributed to this insect in many areas.

Mountain-Ash Sawfly, Pristiphora geniculata (Htg.) -- Light to moderate damage was caused by this sawfly at South Brook and New Bay Lake. The Badger, Botwood and Bay d'Espoir outbreaks collapsed in 1968.

Collections	No. larvae per tree sample
4	28.2

Birch Casebearer, Coleophora fuscedinella (Zell.) -- The birch casebearer was discovered in central Newfoundland in 1968 (Fig. 13). Larvae were collected at Gull Pond-Halls Bay and 1 mile from the southwest end of Lloyds Lake. Defoliation was negligible in both areas.

OTHER INSECTS RECORDED

Species	Host(s)	Locality	Average per tree sample	No. of Collections
Acleris variana (Fern.) Black-headed budworm	bS	Buchans Jct.	0.3	1
Anomogyna perquiritata (Morr.) Gray spruce cutworm	bS	Ebbegunbaeg Canal	3.6	1
Anoplodera cordifera (Oliv.) A wood borer	tA	Rattling Brook Rd.	1.0	1
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Grand Falls, Badger, Millertown, Indian River, Rattling Brook Rd.	0.9	10
Campaea perlata (Guen.) Fringed looper	bF,wB	Little Gull Pond, Morrisville, St. Veronicas, Sandy Lake	0.8	5
Choristoneura fumiferana (Clem.) Spruce budworm	bF	Leading Tickles	0.3	1
Chrysomela falsa Brown Willow leaf beetle	W	South Twin Lake, Indian River	31.4	2
Chrysomela mainensis mainensis Bech. Alder leaf beetle	sAl	Millertown Jct.	20.0	1
Croesus latitarsus Nort. Dusky birch sawfly	wB	Victoria Lake	0.3	1
Ctenicera falsifica Lec. A click beetle	tL	New Bay Lake	1.0	1
Dimorphopteryx sp. A birch sawfly	wB	Hungry Hill	2.0	1
Eupithecia sp. A brown spruce looper	bF,bS,tL	Bay d'Espoir, Sandy Lake, Red Indian Lake	0.4	6

Species	Host(s)	Locality	Av. per tree sample	No. of Collections
Feralia jocosa (Guen.) Green-striped caterpillar	bF,bS	Badger to Fortune Harbour, Bay d'Espoir, Victoria Lake, Lake Ambrose, Grand Falls	0.4	11
Herculia thymetusalis Wlk. Spruce needleworm	bS	Pt. Leamington Rd. Lake Ambrose, Pudops Dam	0.3	3
Heterarthrus nemoratus (Fall.) Birch leaf-mining sawfly	wB,W	Victoria River, Badger	14.8	3
Hylobius piceus (Deg.) A bark weevil	tL,bF	New Bay Lake Rd. South Brook, St. Veronicas	0.4	5
Neodiprion abietis complex Balsam-fir sawfly	bF	Bay d'Espoir, Shanadithit River, Buchans Jct.	0.5	5
Nyctobia limitaria (Wlk.) Green balsam looper	bF	Grand Falls, Aspen Brook Road, Lloyds Lake, Howley Lake	0.4	4
Papilio glaucus L. Tiger swallowtail	wB,pCh,sAl	Bay d'Espoir Rd. Kings Point, Harrys River, Roberts Arm	1.0	4
Parorgyia sp. A tussock moth	wB,bF	Badger, Victoria Lake	0.5	2
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS	Botwood to Pt. Leamington, Badger, Grand Falls, Bay d'Espoir, Buchans, Lake Ambrose	0.5	18
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bS,bF,wS	Botwood to Cottrels Cove, Grand Falls, Badger, Bay d'Espoir Road, Millertown, Victoria Lake, Buchans	0.9	43
Pissodes strobi (Peck) White-pine weevil	tL,bF	Bay d'Espoir Road, St. Veronicas	0.5	2

Species	Host(s)	Locality	Av. per tree sample	No. of Collections
Pristiphora lena Kinc, A spruce sawfly	bS,sAl	Buchans to Lake Ambrose, New Bay Lake, Rattling Brook, Bay d'Espoir	0.8	7
Scoliopteryx libatrix Linn. Scalloped owlet	tA	Millertown	1.0	1
Semiothisa sp. A looper	bF,bS,tL	Badger to Lake Ambrose, Badger to Bay d'Espoir, Millertown, Indian River	0.8	31
Sicya macularia (Harr.) A looper	sAl	Badger	1.0	1
Solenobia walshella Clem. A bagworm	bF,tL	Rattling Brook Road, St. Patricks	0.3	2
Syngrapha alias (Ottol.) Spruce climbing cutworm	bS,bF	Red Indian Lake, Lloyds Lake	0.5	2
Zeiraphera diniana Gn. Douglas-fir cone moth	tL	Fortune Harbour, Lake Ambrose, Buchans	0.6	4
Zeiraphera canadensis Mut. and Free. Spruce bud moth	bF	Bully's Cove, Glover's Harbour Road	0.3	2

Miscellaneous Families	Host(s)	Locality	Av. per tree sample	No. of Collections
Aphididae Aphids	pCh	South Brook, Wiley Brook	200.0	2
Braconidae Braconids	tA	Mill Cove Pond	2.7	1
Cecidomyiidae Gall midges	W	Bay d'Espoir Rd.	100.0	1
Curculionidae Weevils	tA	Mill Cove Road	2.0	1
Elateridae Click beetles	bS,tL	Bay d'Espoir Rd.	0.5	2
Geometridae Geometrid moths	bS,wB, sAl,tL, tA,yB	Badger to Cottrels Cove, Bay d'Espoir, Victoria Lake, Sandy Lake, Millertown, Lake Ambrose	0.9	61
Noctuidae Owlet moths and underwings	bF	South Brook	1.0	1
Notodontidae Notodontid moths	wB	Bay d'Espoir	1.0	1
Pamphiliidae, Web-spinning sawflys	bS,wS, bF	Botwood, Grand Falls, Rogerson Lake	0.3	3
Papilionidae Swallowtail butterflies	tA,bF,wB	Rattling Bk. Road, Jumpers Brook, St. Veronicas	0.6	3
Pentatomidae Stinkbugs	bF,sAl	Badger, South Brook, Bay d'Espoir Road	0.6	3
Syrphidae Flower flies	pCh,tL	Glovers Hr. Road, Leach Bk., Wiley Bk.	1.8	3
Tenthredinidae Sawflies	bS,W,wB, sAl	Bay d'Espoir, Buchans, Rushy Pond, Lake Ambrose	1.5	9

DISEASE CONDITIONS

Needle Cast of Balsam Fir, Isthmiella faullii Darker, -- This disease caused severe browning of old and new foliage on fir in a 2-acre area on the New Bay road. Light browning was also recorded at Morrisville, St. Veronicas, Rogerson Lake and along Rattling Brook Road. Lophodermium sp. caused 50% yellowing of needles in a small stand of balsam fir on the Sandy Lake woods road.

Needle Casts of Black Spruce, Lophodermium filiforme Darker and Isthmiella crepidiformis Darker, caused moderate damage on scattered trees at Millertown and Snowshoe Pond.

Needle Cast of Tamarack, Hypodermella laricis v. Tub. -- Symptoms of this disease were observed throughout both districts. Yellowing of foliage reached 90% in a mature stand of tamarack on the south side of the Exploits River 5 miles west of Grand Falls. Light damage, 10% to 20%, was also recorded at Sandy Lake and Lake Ambrose.

Armillaria Root Rot, Armillaria mellea (Vahl ex Fr.) Kummer -- The outbreak of armillaria root rot at Sandy Lake remained the same as in 1967 and tree mortality did not increase. Light damage was recorded in 12 acres of semi-mature balsam fir along a Power Commission road on the east side of Lake Ambrose, 70% of the trees were infested. This infestation is in the vicinity of a previous outbreak where infected trees were cut during a road building operation.

OTHER DISEASES RECORDED

Organism	Host(s)	Locality	Remarks
Cercospora salicina Ell. & Ev. Leaf spot	W	Cottrells Cove Rd.	Light
Chrysomyxa ledicola Lagerh. Needle rust	bS	Snowshoe Lake	Medium
Cylindrosporium betulae Davis. Leaf spot	wB	Victoria Lake	Light
Gymnosporangium cornutum Arth. & Kern. Leaf rust	Mo	Millertown	Trace
Melampsora epitae Thiim. Leaf spot	W,tA	Cottrells Cove Rd., Grand Falls, Rushy Pond	Light
Mycosphaerella sp. Leaf spot	tA,As	Badger, Bay d'Espoir	Light
Phyllostiate minima (Burk. & Curt.) Underw. & Earl Leaf spot	rM	Bay d'Espoir Rd.	Light
Pollacia radiosa (Lib.) Bald. & Cif. Leaf and twig blight	tA	Exploits Dam	Light
Puccinia sparaganioides Ell. & Barth. Rust	Serviceberry	Wiley Brook	Light
Septora betulae (Lib.) West. Leaf spot	wB	Morrisville	Medium
Venturia acerina Plakidas, nom. & nud. Leaf spot	rM	Bay d'Espoir Rd.	Light

FIGURE 9
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Hemlock Looper Sample Points
Districts 105 and 106
Aerial ◒ Ground ○

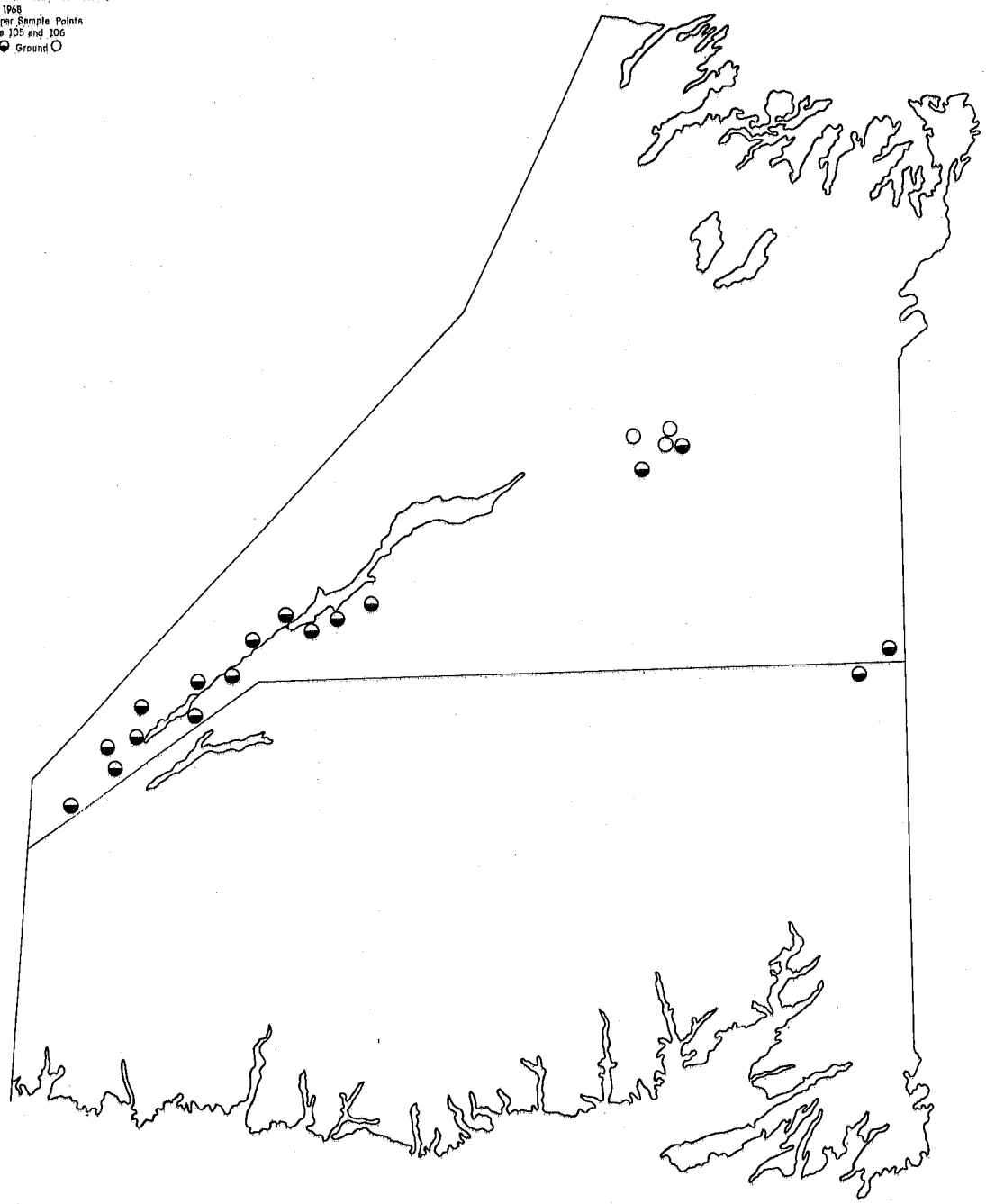


FIGURE 10
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD,
FOREST INSECT AND DISEASE SURVEY
1968
Balsam Woolly Aphid Infestations
Districts 105 and 106

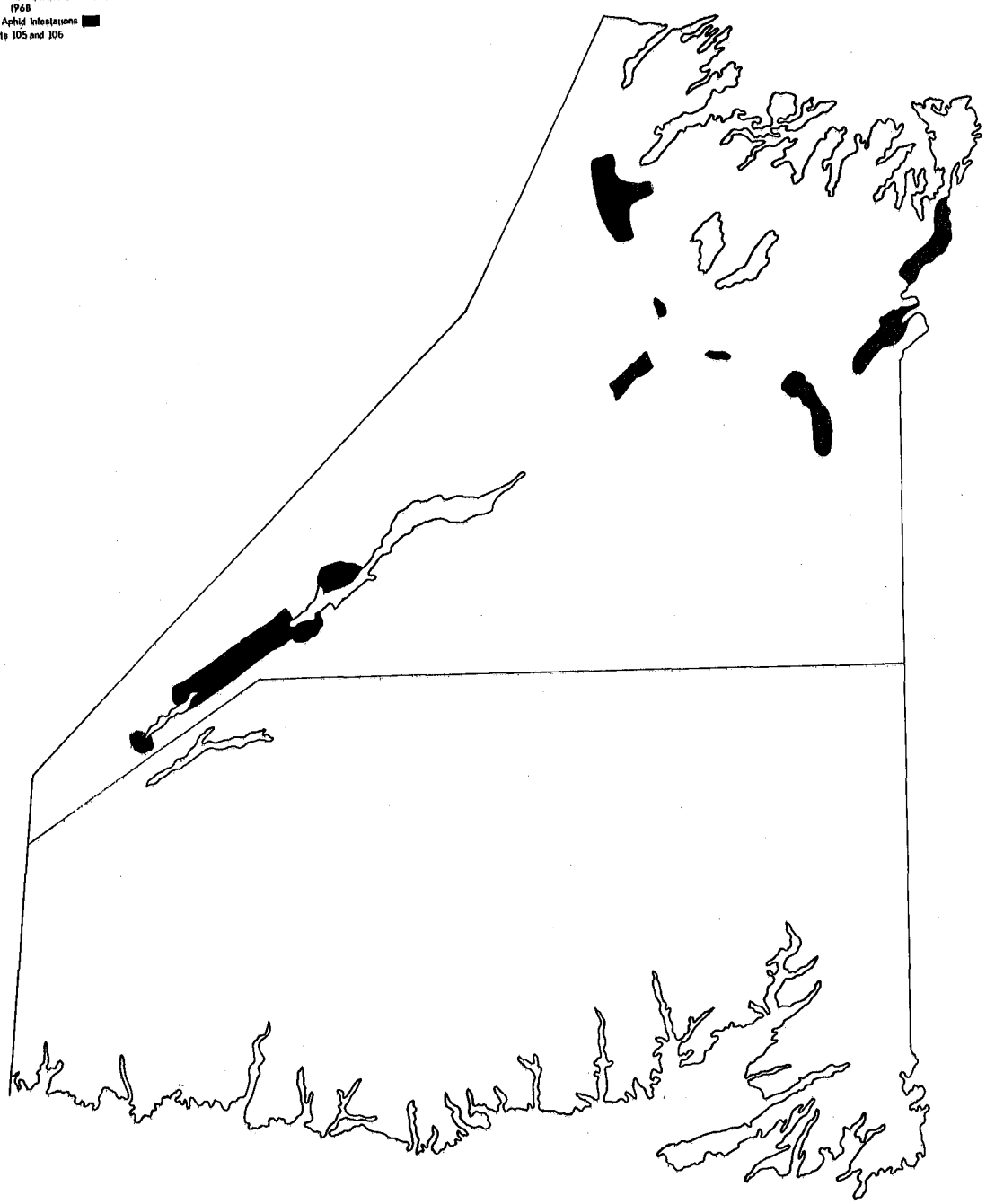


FIGURE 11
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
European Spruce Sawfly Distribution ●
Districts 105 and 106

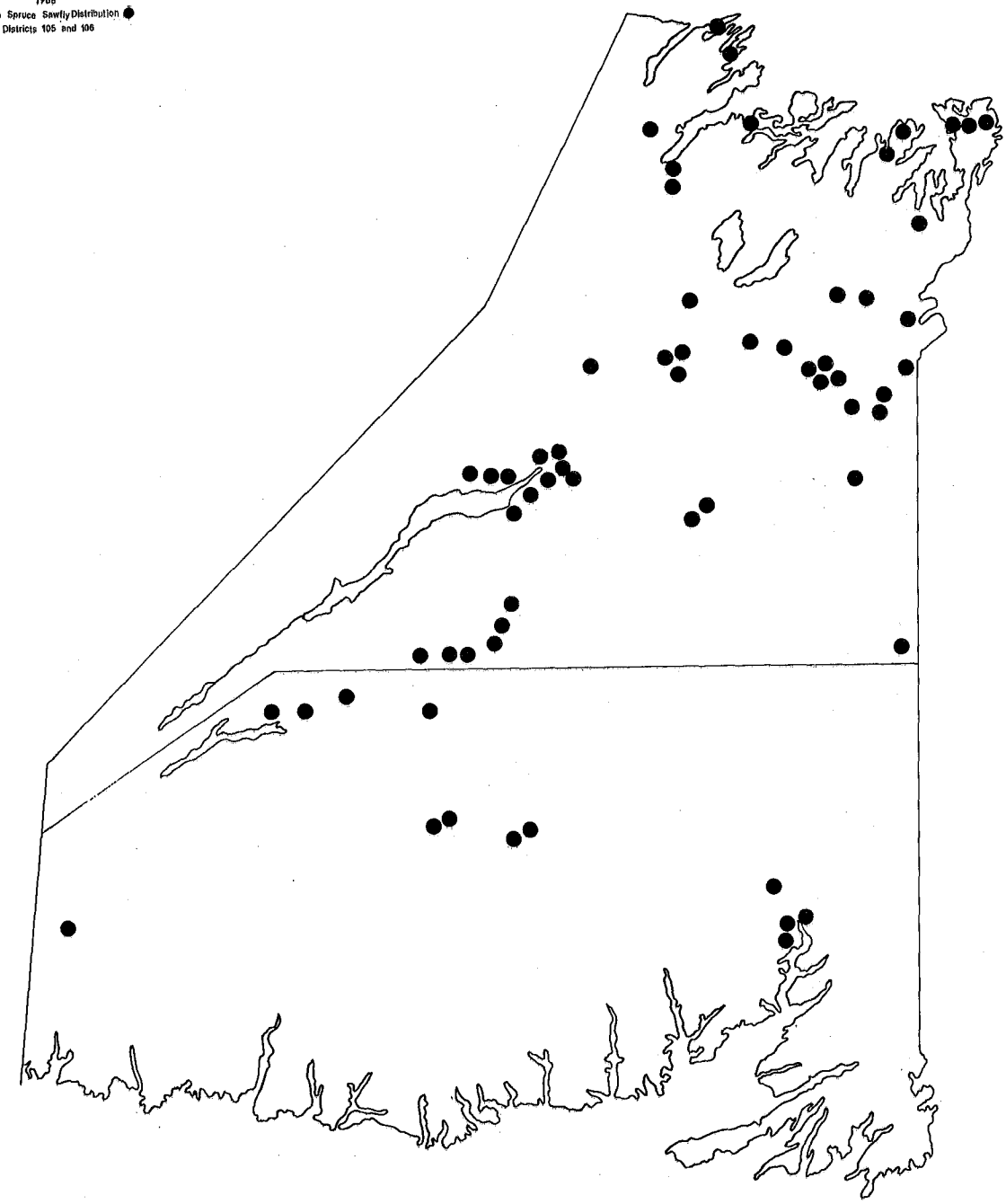


FIGURE 12
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1988
Rusty Tussock Moth Distribution ●
Districts 105 and 1

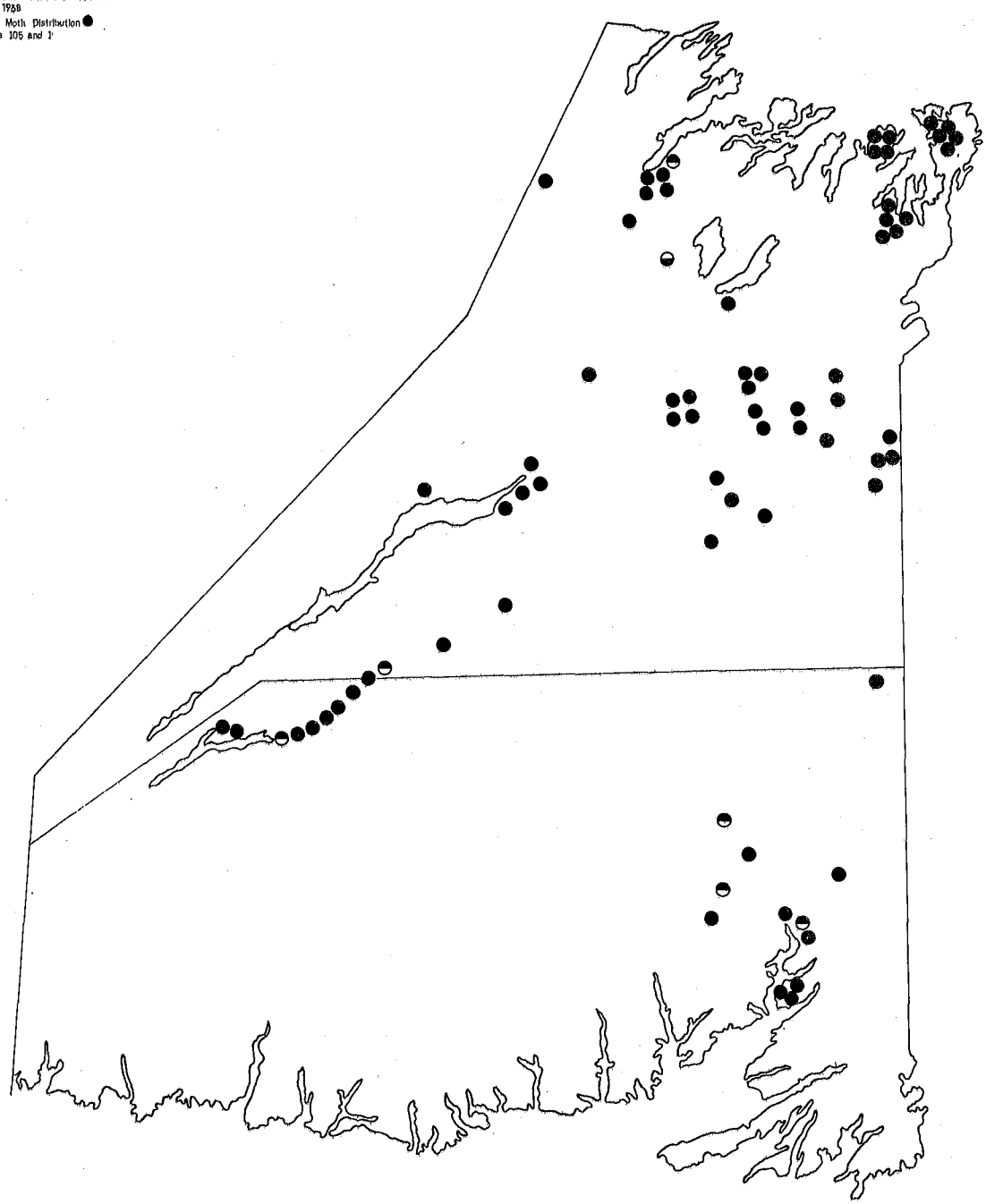
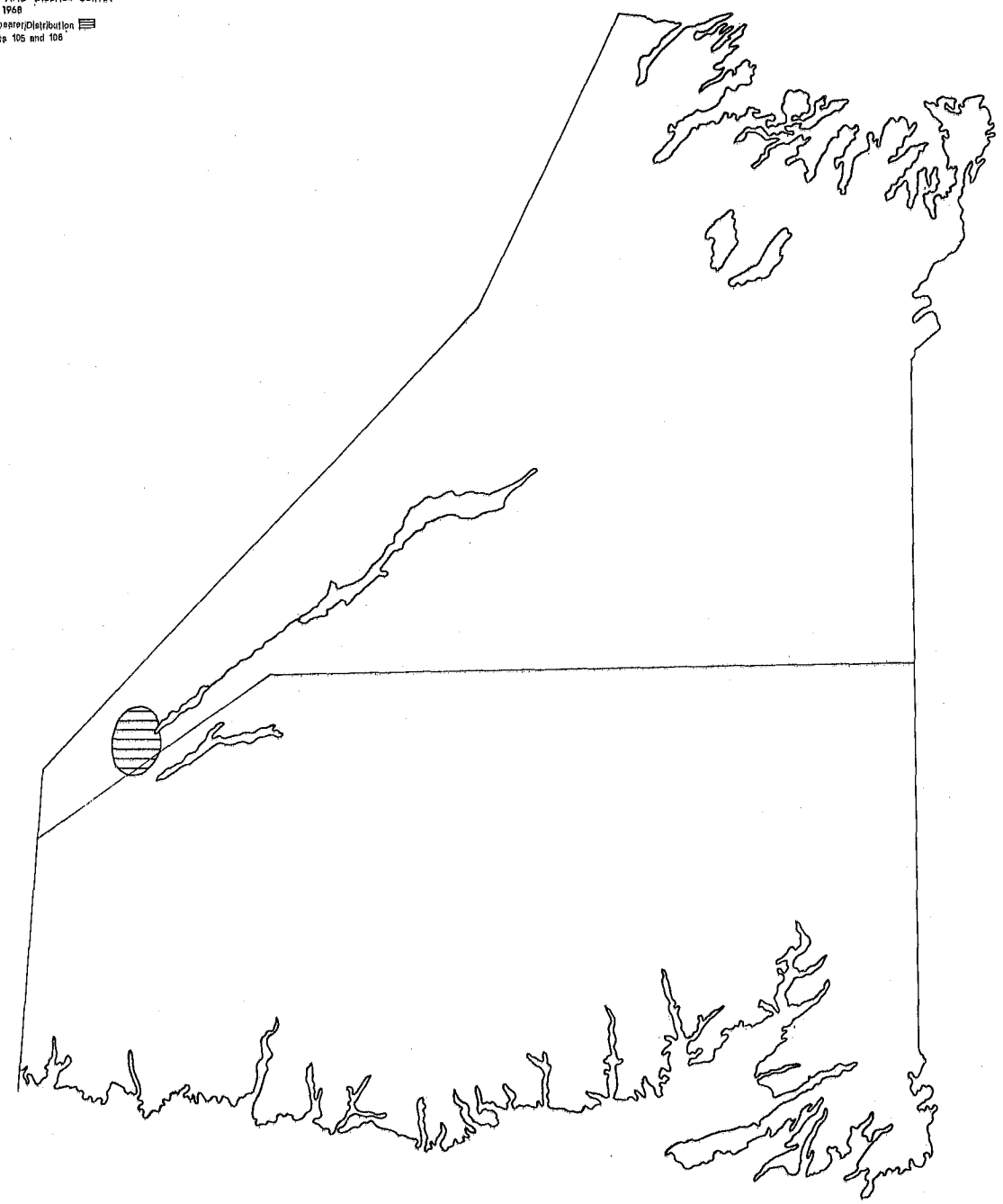


FIGURE 13
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Birch Casebearer Distribution
Districts 105 and 106



SECTION V

DISTRICTS 107 AND 108

ST. GEORGES AND HUMBER

W.J. SUTTON

INTRODUCTION

The field season began in early May and terminated in November. All Survey technicians were engaged in a chemical control operation against the hemlock looper and the normal insect and disease collecting and appraisal program was restricted to the month of August.

A total of 531 insect and 18 disease collections was made in the Humber and St. George's districts. The hemlock looper remained the most important problem with severe outbreaks recorded in both districts. European spruce sawfly counts were low in all areas. Two spot outbreaks of larch sawfly were recorded and defoliation was severe. A balsam-fir sawfly outbreak continued in the Pinchgut Lake area, and rusty tussock moth population levels increased slightly. Satin moth population levels in the Corner Brook area decreased considerably, and defoliation was light. The birch casebearer continued to spread and severe defoliation was recorded in many stands.

There were no major disease outbreaks in western Newfoundland. The most common diseases observed were needle cast of tamarack, needle casts of balsam fir and black spruce, and black knot of cherry.

INSECT CONDITIONS

Eastern Hemlock Looper, Lambdina fiscellaria, fiscellaria (Guen.) -- The hemlock looper population levels remained high in western Newfoundland in 1968, and severe defoliation was recorded over large areas of the Humber and St. Georges districts. Survey sample points are shown in Fig. 14. For details of the hemlock looper situation see Section VII of this report.

Collections	No. larvae per tree sample
174	6.5

Balsam Woolly Aphid, Adelges piceae (Ratz.) -- Although no change was observed in the boundaries of the balsam woolly aphid infestations in these districts, the intensity of damage increased from light to moderate in stands between Stephenville Crossing and Black Duck and from moderate to severe in outbreaks from Little Grand Lake to Howley. Large areas of balsam woolly aphid damaged trees have been completely defoliated by the hemlock looper, and salvage operations have begun on a large scale in some of these areas, particularly along the east shore of Grand Lake and the Crabbs River watershed.

Balsam-Fir Sawfly, Neodiprion abietis complex -- The outbreak of balsam-fir sawfly, near Pinchgut Lake, increased from 1-square mile to 10-square miles in 1968 and up to 80% defoliation was observed on the old foliage of young fir in stands between Pinchgut Brook and Island Pond Road. High population levels and light to severe defoliation was also recorded near Barachois Park (Fig. 15). Few larvae were collected in the Spruce Brook, Gallants, Flat Bay Brook, St. George's and Port-aux-Basques areas and defoliation was less than 5%. Low numbers of larvae were also collected at Nicholsville, Goose Arm, North Branch and St. Fintans, but no defoliation was observed.

Collections	No. larvae per tree sample
16	14.6

Spruce Budworm, Choristoneura fumiferana (Clem.) -- Population levels of the spruce budworm increased considerably in the St. George's District in 1968. Defoliation was estimated at 5% to 10% in several stands of balsam fir and white spruce in a 175-square-mile area from Heatherton to St. Andrews.

Collections	No. larvae per tree sample
56	1.1

Larch Casebearer, Coleophora laricella (Hbn.) -- An outbreak of this casebearer occurred in a 2-acre larch stand at Fishels River and browning of foliage was estimated at 75% (Fig. 16). Browning was severe on a few ornamental larch trees in the Margaret Bowater Park, near Corner Brook. Population levels of this casebearer increased at Doyles, South Branch, Flat Bay Brook, Loch Leven, Stephenville Crossing and Upper Ferry.

Collections	No. larvae per tree sample
9	17.4

Larch Sawfly, Pristiphora erichsonii (Htg.) -- Only six larch sawfly larvae were collected in western Newfoundland in 1968. These were collected along Carters Road but no defoliation was observed. However, light to moderate defoliation was observed in small outbreaks at Dribble Brook and along Lower Flat Bay Brook (Fig. 16).

European Spruce Sawfly, Diprion hercyniae (Htg.) -- Only four collections of this sawfly were made in western Newfoundland in 1968. This represents a continued reduction in population levels of this insect since 1966 when the last outbreak was recorded in western Newfoundland.

Year	Collections	No. larvae per tree sample
1968	4	0.3
1967	36	2.4
1966	58	5.6

Satin Moth, Stilpnotia salicis (L.) -- The outbreaks of the satin moth in the Corner Brook area decreased considerably and only light defoliation was recorded. Low numbers of larvae were also collected near Crabbs River.

Mountain-Ash Sawfly, Pristiphora geniculata (Htg.) -- No samples of this insect were collected in 1968 and the 1967 outbreaks appear to have collapsed.

Rusty Tussock Moth, Orgyia antiqua (Linn.) -- Rusty tussock moth larval counts remained high in 1968 and larvae were collected in all areas of the Humber and St. George's districts. The highest count recorded was 50 per tree in the Bottom Brook area (Fig. 17). Defoliation remained light in all areas.

Year	Collections	No. larvae per tree sample
1968	63	2.2
1967	50	0.9

Birch Casebearer, Coleophora fuscedinella (Zell.) -- Birch casebearer population levels continued to expand in the St. George's and Humber districts in 1968. The main outbreak now includes all stands west of the Long Range mountains from Port-aux-Basques to Cormack except for an area around the Lewis Hills and an area along the coast, from Goose Arm to Trout River (Fig. 18). Leaf browning was severe in many mature and immature stands from Steady Brook to the Codroy Valley.

Collections	No. larvae per tree sample
46	12.1

OTHER INSECTS COLLECTED

Species	Host(s)	Locality	Av. Per Tree Sample	No. of Collections
Acleris variana (Fern.) Black-headed budworm	wS,bF	Muddy Hole, Heatherton	0.3	4
Anomogyna sp. A cutworm	bF	Grand Lake, Crabbs River, Is. Pond Rd. South Branch	0.3	6
Anomogyna perquiritata (Morr.) Gray spruce cutworm	bF	Serpentine Lake, Robinsons Pond	0.2	2
Brachyrhinus singularis (Linn.) A weevil	bF	Spruce Brook	1.0	1
Campaea perlata (Guen.) Fringed looper	wB,yB	Gallants, Bowaters Park	0.8	2
Caripeta divisata (Wlk.) Gray spruce looper	bF	Carters Rd.	8.0	1
Croesus latitarsus Nort. Dusky birch sawfly	wB	Goose Arm Rd.	0.3	1
Ctenicera falsifica Lec. A click beetle	sA,wS	Bowaters Park	0.5	2
Dioryctria reniculella (Grt.) Spruce coneworm	wS	Flat Bay Rd., Carters Rd., Jeffreys	0.7	5
Epinotia solandriana (L.) A leaf roller	wB	Petries	1.3	1
Eucordylea atrupictella Dietz. A spruce needle miner	bF,bS	Grand Lake, St. Davids	0.4	2
Feralia jocosa (Guen.) Green-striped caterpillar	bF	Muddy Hole, Robinsons, Flat Bay Brook, Logging School Rd., Carters Rd.	0.6	5
Eupithecia sp. A brown spruce looper	wS,bF, Mo	Georges Lake, Lomond, Port-au-Port Peninsula, St. Georges to South Branch	0.4	14

Species	Host	Locality	Av. Per Tree Sample	No. of Collections
Hylobius piceus Deg. A bark weevil	bF	Bottom Brook Rd., North Branch	0.3	2
Hylobius warreni (Wood.) Warren's collar weevil	bF	North Branch	0.3	1
Hematus sp. A sawfly	W	Spruce Brook	1.0	1
Nyctobia limitaria (Wlk.) Green balsam looper	bS,wS	Goose Arm Rd. to Crabbs R., Port-au-Port Peninsula	0.5	20
Mindarus abietinus Koch Balsam twig aphid	bF	McKays	200.0	1
Monochamus scutellatus (Say) White-spotted sawyer	bF,W	Gallants, North Branch, Robinsons	0.4	3
Parorgyia sp. A tussock moth	bF	Crabbs River	0.3	1
Phyllocnistis populiella (Chamb.) Aspen leaf miner	bPo	Lomond	1.3	1
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	wS	Lomond, Muddy Hole, Middle Bk., North Lake	0.8	5
Pissodes strobi (Peck.) White-pine weevil	bF	Crabbs River	0.3	1
Pristiphora lena Kinc. Spruce sawfly	wS	McKays, North Lake	0.4	2
Pulicalvaria piceaella Kft. Spruce leaf miner	bF,bS, wS	Southwest Bk., Crabbs River, Port-au-Port Peninsula	0.5	12
Rhyacionia buoliana (Schiff.) European pine shoot moth	bS	Bowater Park	0.3	1

Species	Host	Locality	Av. per tree sample	No. of Collections
Semiothisa sp. A looper	bF,wS, tL	Goose Arm Rd., Stag Lake, Cape Ray	0.6	13
Solenobia walshella Clem. A bagworm	bF	Lomond	0.7	1
Syneta sp. A leaf beetle	Al,bF	St. Fintan's, Pasadena	0.4	3
Syngrapha alias (Ottol.) Spruce climbing cutworm	bF,tL	North Branch, South Branch, Flat Bay Rd., Grand Lake, George's Lake, Stag Lake	0.4	6
Syngrapha sp. A cutworm	bF	Robinsons	0.3	1
Zeiraphera fortunana (Kft.) Yellow spruce budworm	bF	North Branch	0.3	1
Zeiraphera canadensis Myt. and Free. Spruce bud moth	bF,wS	Pasadena, St. George's to Codroy	1.9	12

Miscellaneous Families	Host	Locality	Av. per tree sample	No. of Collections
Aphididae Aphids	bF,D,pCh, sAl	Grand Lake to Crabbs River		
Bibionidae March flies	bF,M,wS	Serpentine Lake, South Branch, Highlands, Flat Bay Bk.	0.8	5
Cerambycidae Round-headed wood borers	bF	Robinsons Pond, Fishels River	0.3	2
Chrysomelidae Leaf beetles	M	St. Fintans	50.0	3
Cicadellidae Leafhoppers	bF,sAl	Crabbs River, Rose Blanche	1.2	2
Cimbicidae Cimbicid sawflies	bF	Bottom Bk.	0.6	1
Elateridae Click beetles	tL,M	Flat Bay Rd., South Brook	0.5	2
Geometridae Geometrid moths	bF,yB,wB, sAl,tL, wS,M,bS	Serpentine Lake to South Branch	0.6	43
Gryllidae Crickets	wB	Serpentine Lake	1.0	1
Lymantriidae Tussock moths	bF,yB,tA	Spruce Bk., South Branch, Barachois Park, Southwest Bk.	0.9	4
Noctuidae Owlet moths and underwings	bF,tL	North Branch, Doyles, South Branch	0.3	3
Papilionidae Swallowtail butterflies	Ch	St. Georges	1.0	1
Pentatomidae Stink bugs	yB	South Brook	1.0	1

DISEASE CONDITIONS

Needle Cast of Tamarack, Hypodermella laricis v. Tub. -- Symptoms of this disease were observed wherever the host tree occurred in western Newfoundland but no serious damage was recorded.

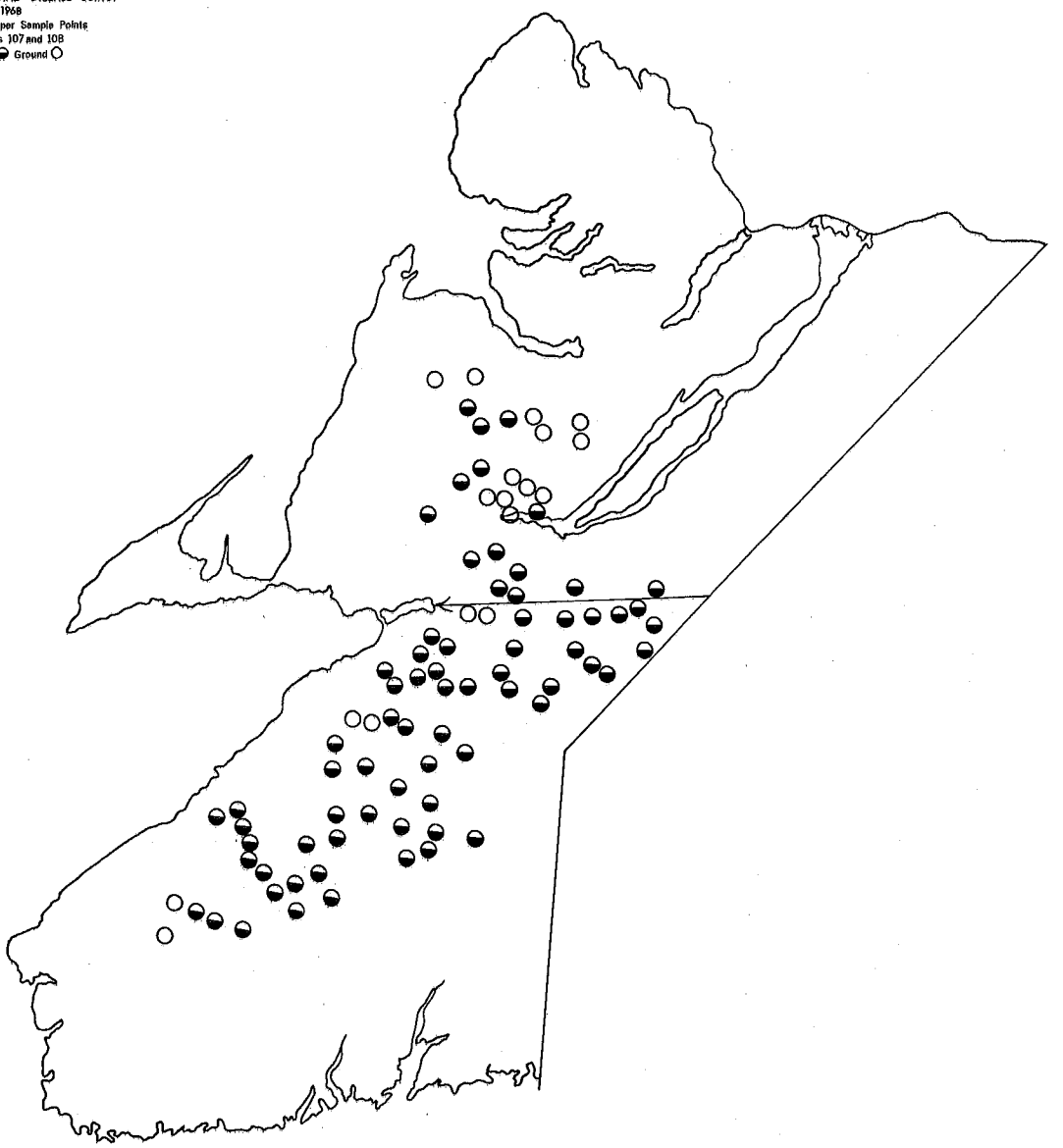
Needle Rust of Balsam Fir, Pucciniastrum epilobii Otth -- Light browning, caused by this fungus, was observed in the Lost Pond-Bottom Brook area and 6 miles from the Trans-Canada Highway on the Flat Bay Road.

Needle Cast of Black Spruce, Lophodermium filiforme Darker and Isthmiella crepidiformis Darker -- Severe browning was recorded in a small area 6 miles from the Trans-Canada Highway on the Flat Bay Road. Moderate damage was also observed 8 miles north of Cape Ray.

OTHER DISEASES RECORDED

Organism	Host(s)	Locality	Remarks
Isthmiella crepidiformis Darker Needle cast	bS	St. Andrews, Flat Bay	Medium
Isthmiella faullii Darker Needle cast	bF	Bottom Brook	Trace
Dibotryon morbosum (Schw.) Theiss & Syd. Black knot of cherry	Pch	St. Fintans	Light
Elsinoe corni Jenkins & Bitanc Leaf spot	Do	Steel Mountain Rd.	Light
Gloeosporium apocryptum Ell. & Ev. Leaf spot	rM	Steel Mountain Rd.	Light
Lenzites saepira (Wulf, ex Fr.) Fr. Stem decay	bF	Bottom Brook	Light
Lophodermium filiforme Darker Needle cast	bS	St. Andrews, Flat Bay	Medium to Heavy
Polyporous versicolor L. ex Fr. Decay	wB	Bottom Brook	Light
Taphrina carnea Johans. Leaf blisters	yB	South Brook River, Lomond	Medium
Taphrina sp. Leaf blisters	yB	Whites Brook Rd.	Light
Trametes sp. Stem decay	bF	Bottom Brook	Light

FIGURE 14
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Hemlock Looper Sample Points
Districts 107 and 108
Aerial ◒ Ground ○



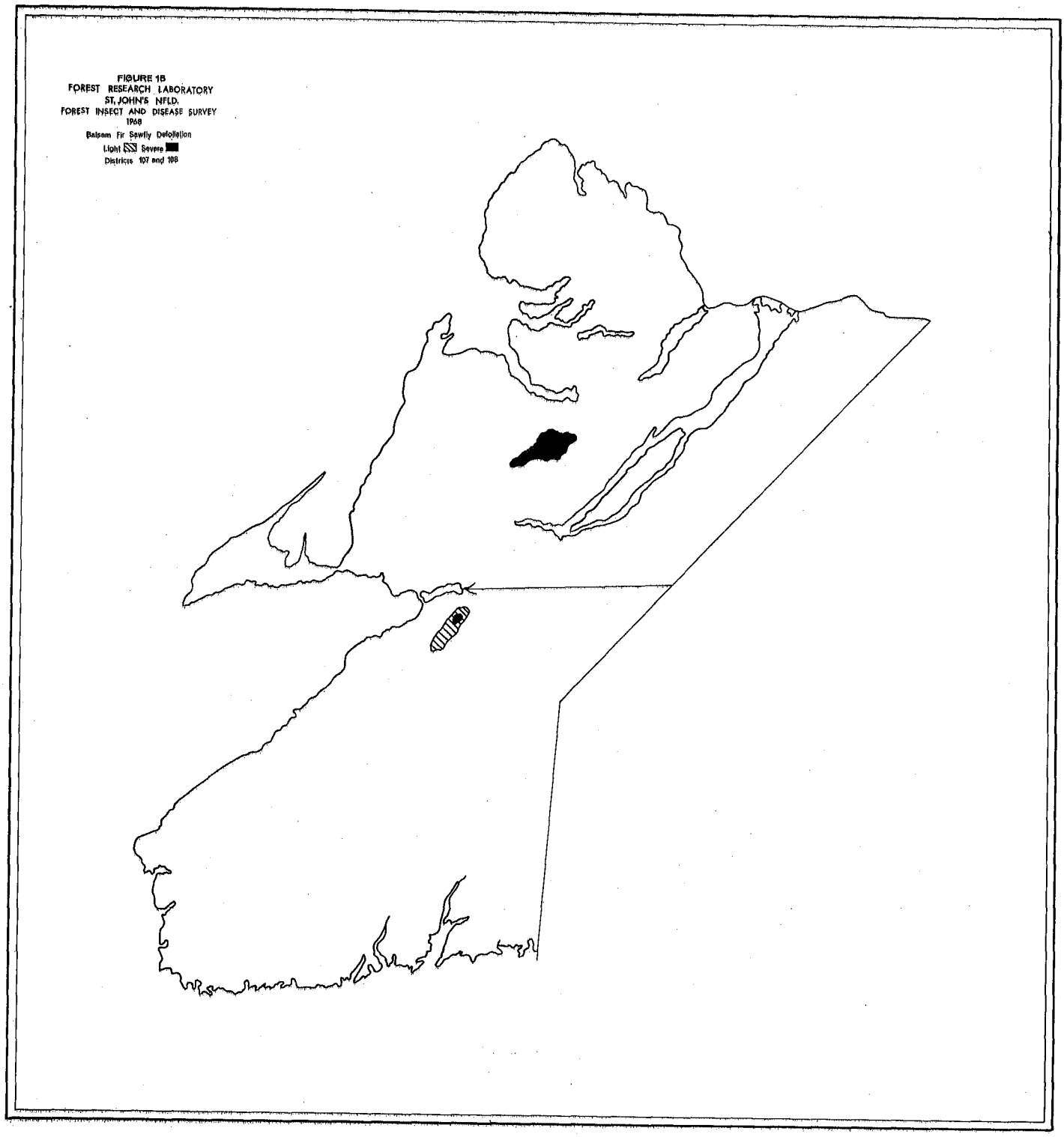


FIGURE 15
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Balsam Fir Sawfly Defoliation
Light
Severe
Districts 107 and 108

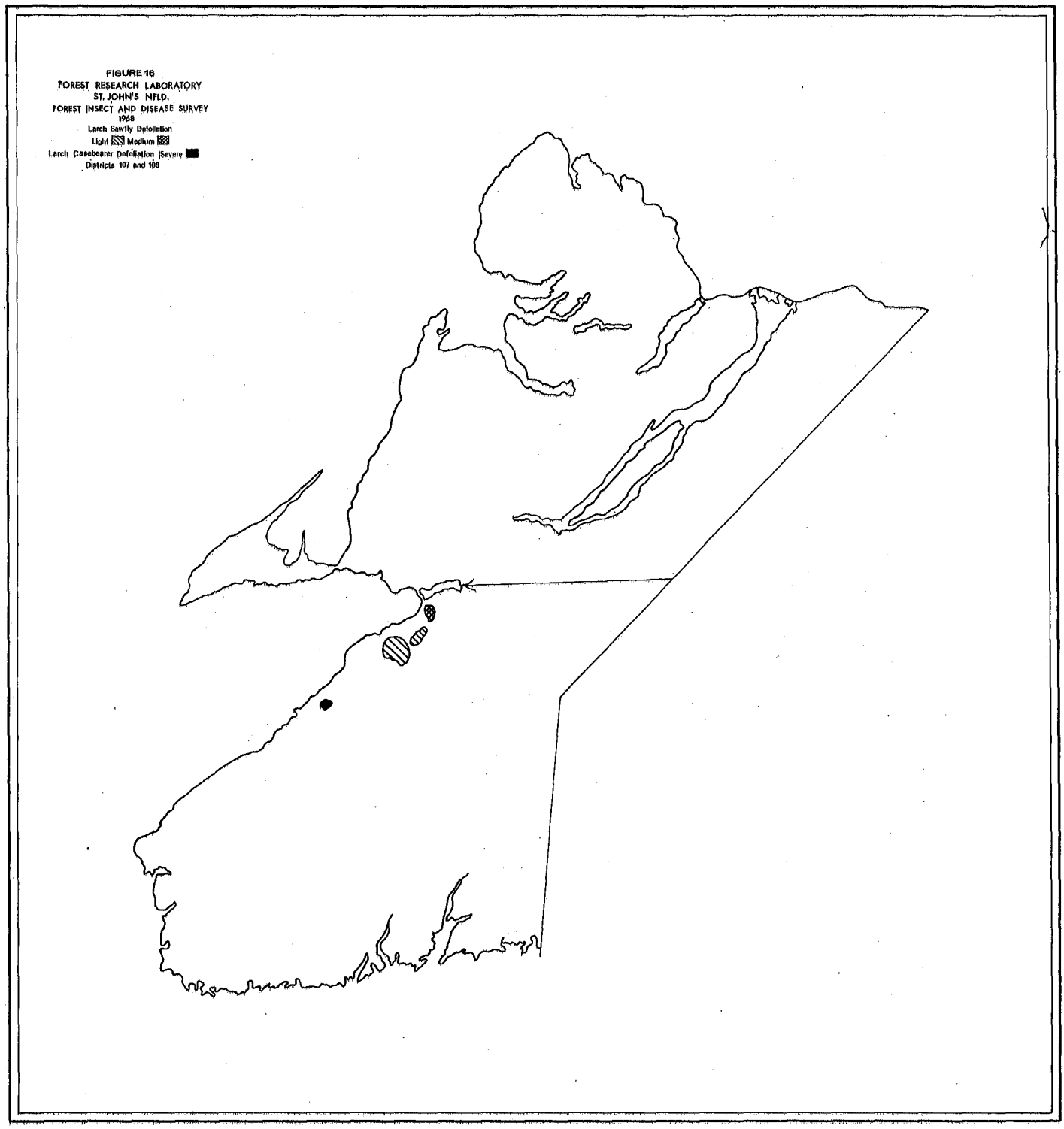


FIGURE 16
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Larch Sawfly Defoliation
Light Medium
Larch Casebearer Defoliation Severe
Districts 107 and 108

FIGURE 17
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Rusty Tussock Moth Distribution ●
Districts 107 and 108

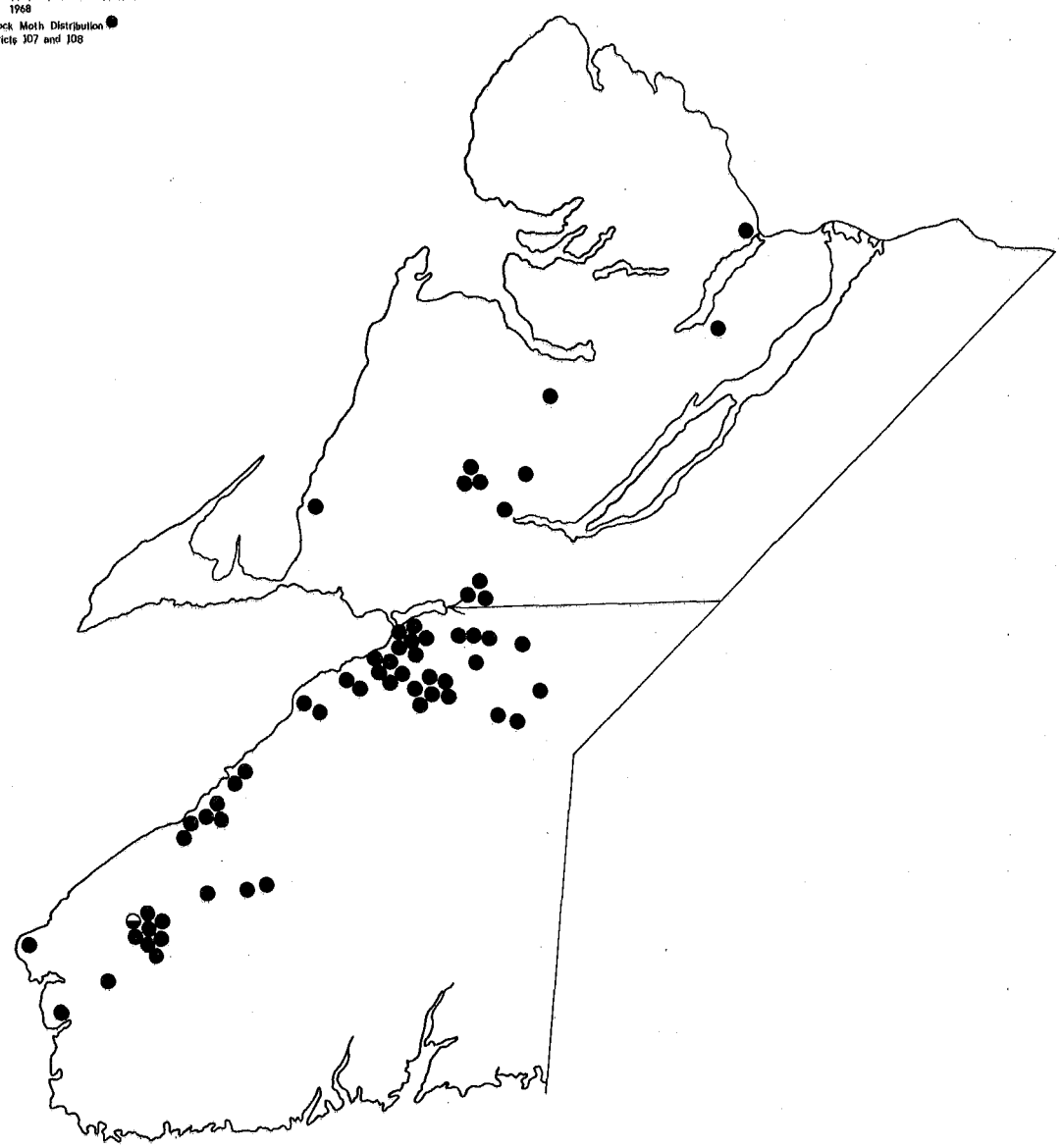


FIGURE 18
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Birch Casebearer Defoliation
Districts 107 and 108

SECTION VI

DISTRICTS 109 AND 110

WHITE BAY AND ST. BARBE

D.M. Stone

INTRODUCTION

The insect sampling program was restricted by the hemlock looper chemical control operations, until late July. Sampling procedures terminated on August 30. Two forestry students from the College of Trades and Technology, C. Wentzell and J. Price assisted in collecting 451 insect samples and 13 disease samples.

No balsam woolly aphid damage was observed north of its present boundary at Deer Arm, however, new infestations were located at the northeast end of Birchy Lake, along the old Trans-Canada Highway. A hemlock looper outbreak was discovered at Parsons Pond and light defoliation by the larch sawfly was recorded at Pistolet Bay in the St. Barbe district. Rusty tussock moth population levels increased slightly from last year. The major birch casebearer outbreak extended 5 miles north from the Cormack road and east to the Baie Verte road. Larvae were also collected at scattered points throughout the districts.

Black knot of cherry was prevalent in the LaScie area and needle cast of balsam fir caused light damage to individual mature trees at Big Bonne Bay Pond and in the Birchy Lake areas. Armillaria root rot caused severe damage to young sitka spruce in a plantation at Cormack.

INSECT CONDITIONS

Balsam Woolly Aphid, Adelges piceae (Ratz.) -- The boundaries of the balsam woolly aphid infestations at Deer Arm, Bonne Bay, and east along the southeast side of Birchy Lake have remained the same since 1965. A new infestation was discovered at the northeast end of Birchy Lake in 1968. This infestation extends for 2 miles along the old Trans-Canada Highway.

Larch Sawfly, Pristiphora erichsonii (Htg.) -- Population levels of the larch sawfly decreased noticeably this year. Only one outbreak was recorded. It caused 15% to 20% defoliation in a ½ square mile stand of mature tamarack near St. Anthony. Larvae of this sawfly were also collected at Birchy Narrows but no defoliation was observed.

Collections	No. larvae per tree sample
2	8.0

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) -- Low numbers of the hemlock looper were found throughout the White Bay District and at Deer Arm in Bonne Bay. Outbreak numbers were recorded at Parsons Pond where 20 square miles were infested and defoliation varied from light to moderate with patches of severely infested trees.

Further information on the hemlock looper is recorded in Section VII of this report.

Collections	No. larvae per tree sample
25	1.0

European Spruce Sawfly, Diprion hercyniae (Htg.) -- This insect was common on black and white spruce, and balsam fir throughout St. Barbe and White Bay districts, however, numbers were low and damage was negligible (Fig. 19). High population levels occurred at East Adies Stream near Silver Mountain, where 20 larvae per tree were found on mature white spruce. Defoliation was light.

Collections	No. larvae per tree sample
39	1.0

Rusty Tussock Moth, Orgyia antiqua (L.) -- Population levels of the rusty tussock moth increased slightly during 1968. Larvae were found throughout the White Bay District and at Ten Mile Lake on the Northern Peninsula. No defoliation was observed (Fig. 20). The most common hosts were white birch and willow. Some collections were also taken from balsam fir, white and black spruce, and speckled alder.

Year	Collections	No. larvae per tree sample
1968	24	1.0
1967	4	0.3

Mourning-Cloak Butterfly, Nymphalis antiopa (L.) -- The mourning-cloak butterfly was recorded for the first time since 1966 in the White Bay District. Defoliation ranged from 20% to 25% on willow at Hampden Junction, LaScie, and in the Burlington area. Clumps of willow were completely defoliated in a 1-acre area on the White River road.

Collections	No. larvae per tree sample
9	51.0

Birch Leaf Miner, Fenusa pusilla (Lep.) and Birch Leaf-mining Sawfly, Heterarthrus nemoratus (Fall.) -- Damage caused by these insects was common in the White Bay District but light compared with previous years.

Heaviest browning occurred on white birch regeneration in the Baie Verte and Sandy Lake areas. Damage was negligible on the Northern Peninsula.

Collections	No. larvae per tree sample
7	5.0

Birch Casebearer, Coleophora fuscedinella (Zell.) -- The boundries of the major birch casebearer outbreak on the west coast expanded to 5 miles northwest of the junction of the Cormack and Bonne Bay roads. Birch casebearer larvae were also collected for the first time at several locations north of this boundary. These locations include Roddickton, Englee, and Jacksons Arm on the Northern Peninsula and Indian Pond, Adies Lake and LaScie on the Baie Verte Peninsula (Fig. 21).

Collections	No. larvae per tree sample
6	30

OTHER INSECTS RECORDED

Species	Host(s)	Locality	Av. per tree sample	No. of Collections
Acleris variana (Fern.) Black-headed budworm	bF,wS	Northern Peninsula	0.4	9
Anomogyna perquiritata (Morr.) Gray spruce coneworm	bF	Humber River, 10 mi. N.W. Birchy Dam	0.3	1
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Sandy Lake area and Birchy Dam	2.0	4
Campaea perlata (Guen.) Fringed looper	wB	Reidville	0.3	1
Choristoneura fumiferana (Clem.) Spruce budworm	bF,wS,bS	Northern Peninsula and Baie Verte Peninsula	0.6	19
Chrysomela falsa Brown Willow leaf beetle	W	White Bay district	17.0	5
Coleophora laricella (Hbn.) Larch casebearer	tL	River of Ponds, Hampden Jct., Baie Verte Jct.	4.0	3
Croesus latitarsus Nort. Dusky birch sawfly	wB	Big Bonne Bay Pond	1.0	1
Dioryctria reniculella (Grt.) Spruce coneworm	wS,bS,bF	White Bay district, Eastern Arm, Norris Point	2.2	7
Eucordylea atrupictella Dietz. A spruce needle miner	bS	Sheffield Brk., Birchy Lake	0.3	2
Eupithecia sp. A brown spruce looper	bF,bS,wS, tL	White Bay district, Roddickton, Ten Mile Lake	0.5	31
Fenusa dohrnii (Tischb.) European alder leaf miner	sAl	N. end of Sandy Lake	2.0	1
Feralia jocosa (Guen.) Green-striped caterpillar	bF,bS	Snooks Hr., Big Bonne Bay Pond, Ten Mile Lake	0.4	3

Cont'd

Species	Host(s)	Locality	Av. per tree sample	No. of collections
Griselda radicana (Wlshm.) A micro-moth	wS	1 mi. N. of Bellburns	0.7	1
Nematus limbatus (Cress.) Willow sawfly	W	N.W. corner of Ten Mile Lake	22.0	1
Neodiprion abietis complex Balsam-fir sawfly	bF,wS	St. Barbe, White Bay	0.4	24
Nyctobia limitaria (Wlk.) Green balsam looper	bF,bS	White Bay, St. Barbe	0.3	14
Parorgyia sp. A tussock moth	bF,bS	Birchy Ridge, 11 mi. S. of Pollards Pt.	0.2	2
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS,wS,bF	White Bay, St. Barbe	0.7	9
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bS,wS,bF	St. Margarets Mtn., White Bay	0.5	21
Pristiphora geniculata (Htg.) Mountain-ash sawfly	Mo	Ten Mile Lake, Jct. of Brent Cove and LaScie roads	33.0	2
Pristiphora lena Kinc. A spruce sawfly	wS	2 mi. N. Sally's Cove	0.7	1
Pulicalvaria piceaella Kft. Spruce leaf miner	bF	Portland Creek	0.3	1
Semiothisa sp. A looper	wS,bS,bF, tL	White Bay, River of Ponds, Cowhead	0.6	12
Scoliopteryx libatrix Linn. Scalloped owlet	bF,W	Ten Mile Lake, Sops Arm, Burlington, Hawkes Bay	0.5	4
Selenobia walshella Clem. A bagworm	bF,bS	Brig Bay, Dicks Brk., Eddie's Cove, Burlington	1.0	4

Cont'd

Species	Host(s)	Locality	Av. per tree sample	No. of collections
Stilpnotia salicis (L.) Satin moth	W	Sops Arm Rd., Baie Verte Jct.	2.0	3
Trichiosoma triangulum Kby. A sawfly	wB	Big Falls	0.3	1
Zeiraphera diniana Gn. Douglas-fir cone moth	tL	2 mi. S.W. Birchy Dam	2.0	1
Zeiraphera canadensis Mut. Spruce and Free. budmoth	wS	1 mi. N. Bellburns	0.7	1

OTHER INSECTS RECORDED

Miscellaneous families	Host(s)	Locality	Av. per tree sample	No. of Collections
Aphididae Aphids	sAl,bS,bF,W	White Bay and St. Barbe	3.0	5
Braconidae Braconids	bF,bS	Roddickton, River of Ponds, Burlington	0.3	3
Chrysomelidae Leaf beetles	tL	TCH, 5 mi. E. Deer Lake	1.0	1
Coccinellidae Lady beetles	bF	LaScie	0.3	1
Geometridae A looper	W,moM,bF,bS, tL,sAl,wB	White Bay and St. Barbe	0.9	22
Ichneumonidae Ichneumons	wB	Jct. Mings Bight and LaScie Rds.	0.3	1
Lymantriidae Tussock moths	tL	Hampden Rd., 10 mi. from TCH	0.3	1
Tortricidae Leaf roller moths	W,wB,bF,tA, sAl,wS,bS	White Bay and St. Barbe	0.8	16

DISEASE CONDITIONS

Black Knot of Cherry, Dibotryon morbosum (Schw.) Theiss. and Syd. -- This disease was prevalent on young pin cherry in the LaScie area, but no serious damage was recorded. Traces of the same disease were found throughout the White Bay District.

Armillaria Root Rot, Armillaria mellea (Vahl ex Fr.) Kummer -- Symptoms of this disease were common on black and sitka spruce in the Birchy Lake and Birchy Ridge areas and throughout the old Cormack burn. A special Armillaria root rot survey was initiated this year to determine the presence and status of this disease in plantations in Newfoundland (Singh and Carew, Internal Rpt. N-13).

White Pine Blister Rust, Cronartium ribicola J.C. Fisher-- Low incidence of this disease was found on mature white pine in the Sheffield Lake-Birchy Lake area. Light browning was observed on individual mature trees.

OTHER DISEASES RECORDED

Organism	Host(s)	Location	Remarks
Isthmiella faullii (Darker) Needle cast of balsam fir	bF	Big Bonne Bay Pond	Light
Cylindrosporium betulae Davis Blight and spotting	wB	6 mi. N. of Roddickton	Light
Gloeosporium apocryptum Ell. & Ev. Anthracnose of maple	Mom	McIsaacs Brook, TCH.	Light
Melampsora epitea Thiim. Leaf spot	W	5 mi. N. of Englee	Trace
Rhytisma salicinum (Pers.) Fr. Tar spots on willow	W	TCH at Hampden Rd.	Trace
Septoria betulae (Lib.) West Leaf rust	wB	Wigwam Brook, 9 mi. N.E. of Big Falls	Trace

FIGURE 19
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
European Spruce Sawfly Distribution ●
Districts 109 and 110

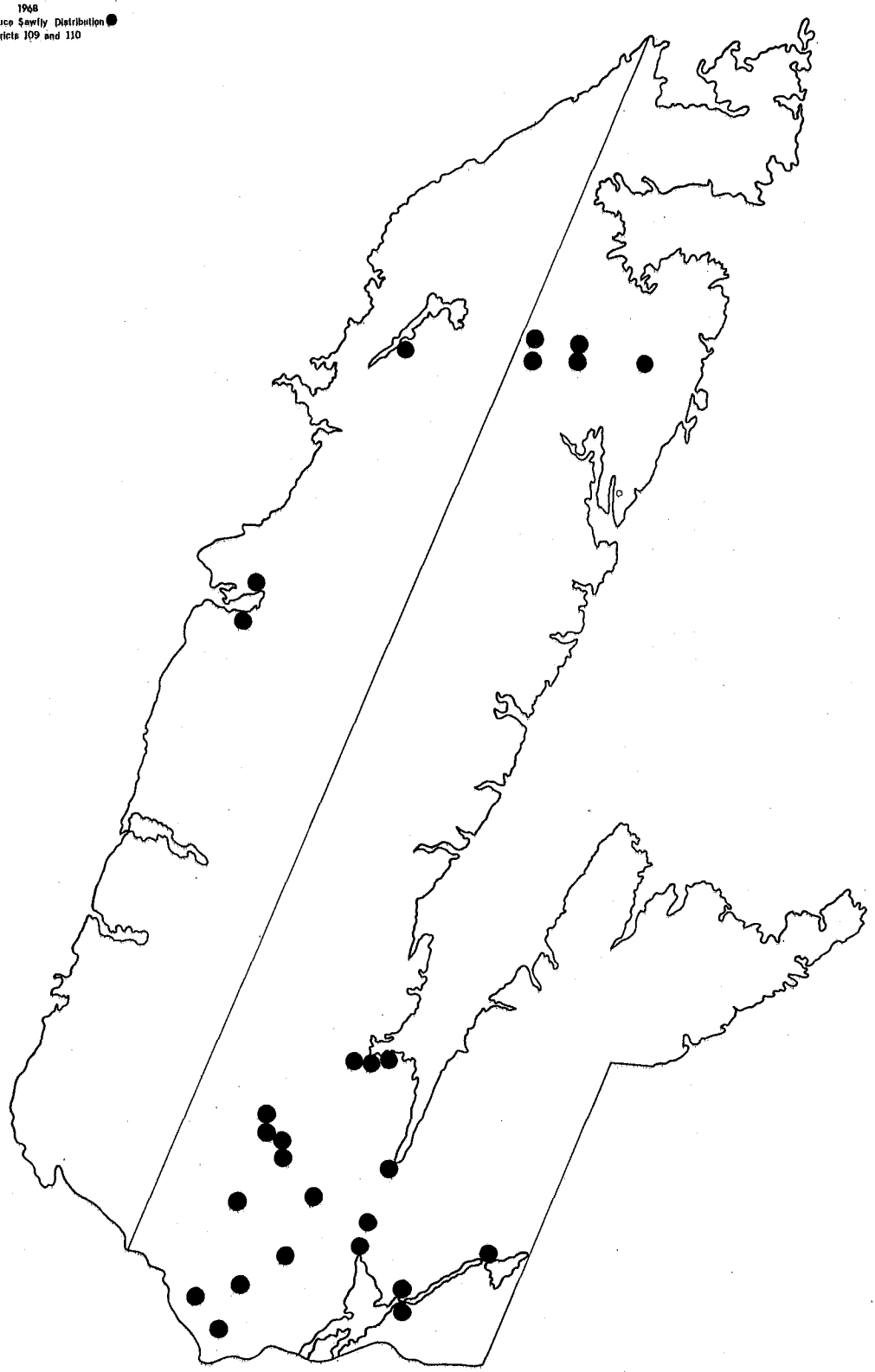


FIGURE 20
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Rusty Tussock Moth Distribution ●
Districts 109 and 110

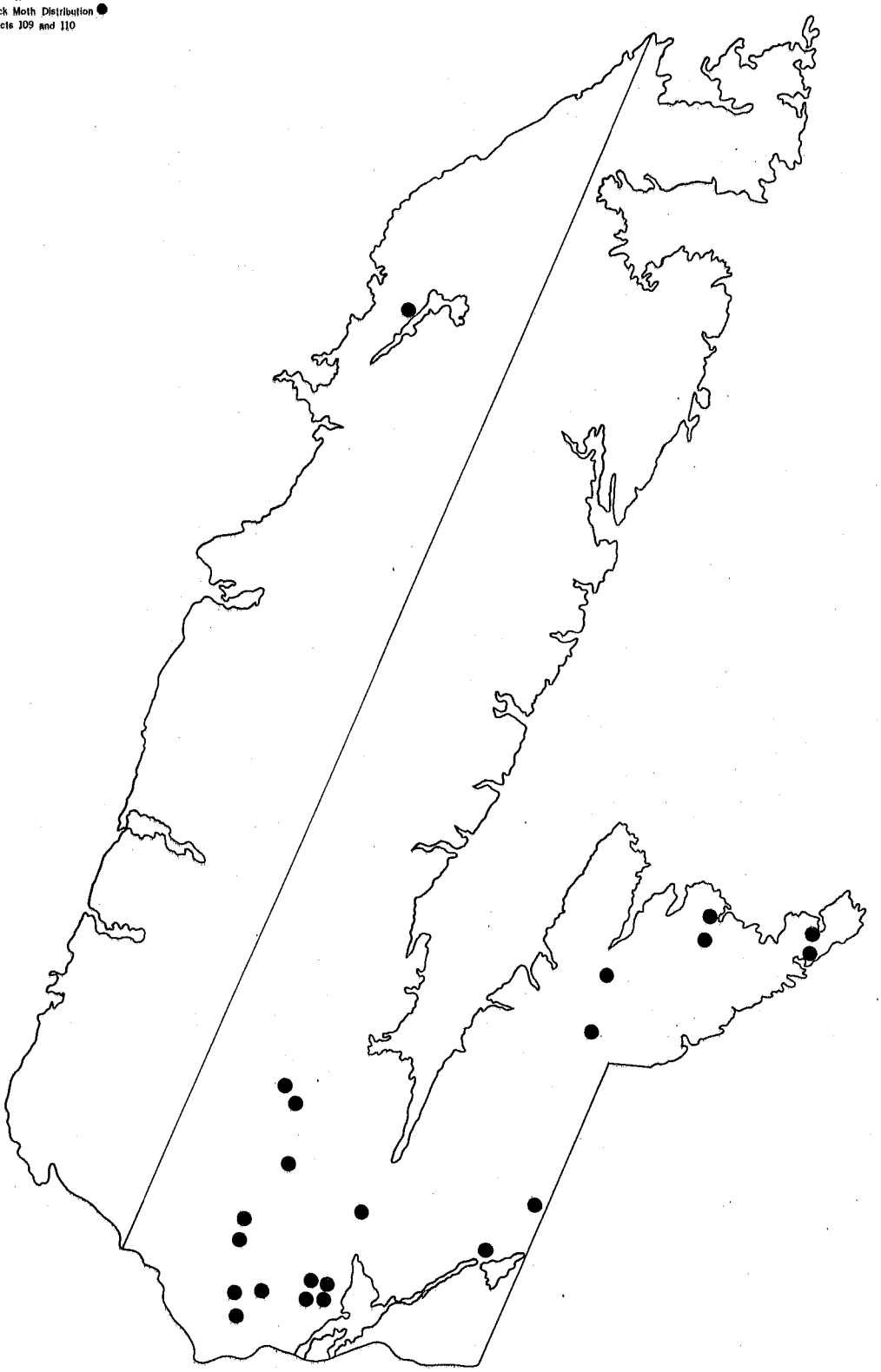
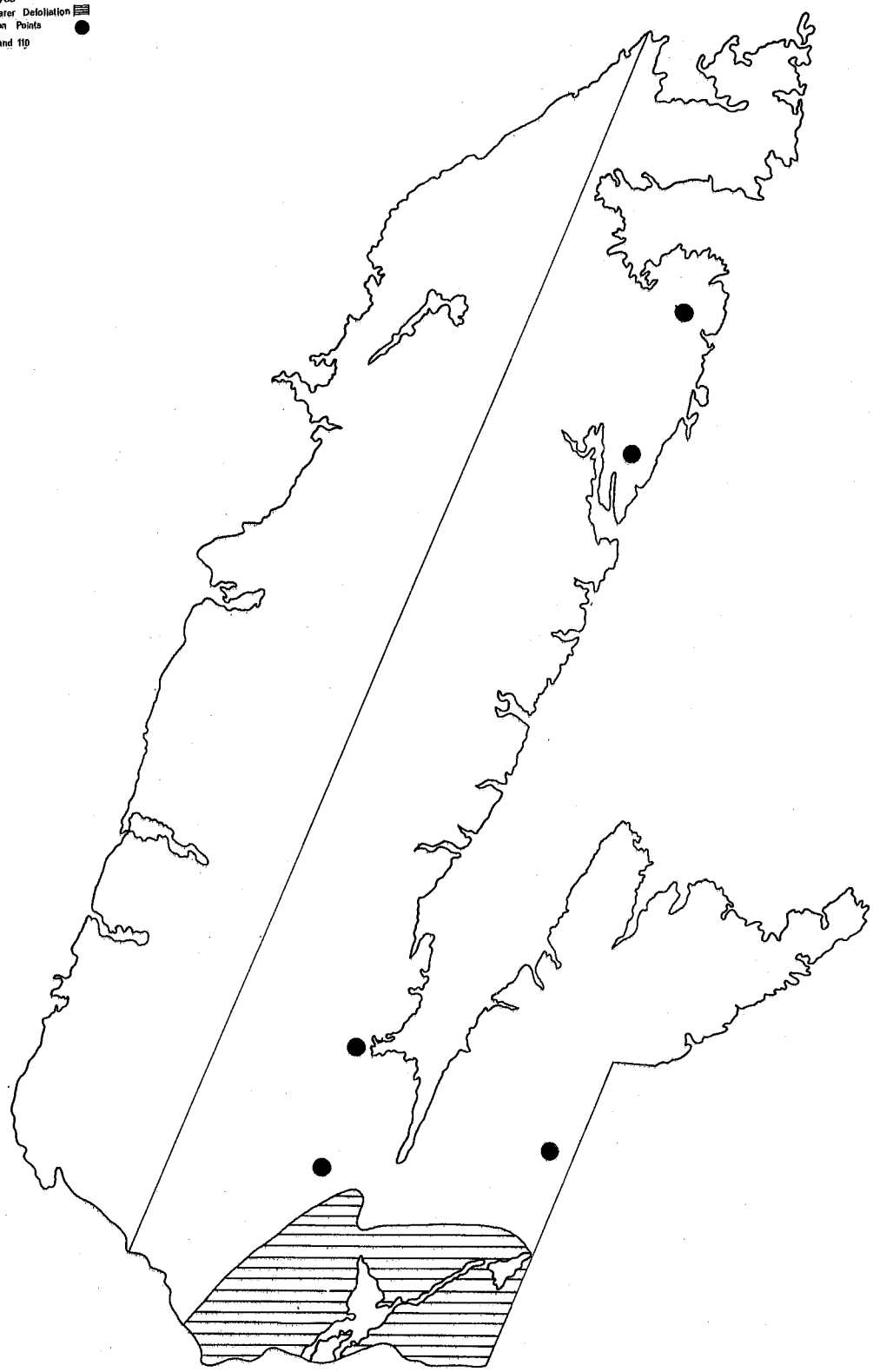


FIGURE 21
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1968
Birch Casebearer Defoliation
New Collection Points
Districts 109 and 110



SECTION VII

SPECIAL SURVEY

EASTERN HEMLOCK LOOPER

Lambdina fiscellaria fiscellaria (Guen.)

L.J. Clarke

INTRODUCTION

Recent outbreaks of hemlock looper began in Western Newfoundland in 1966. By 1967 the outbreak was estimated to cover 151,000 acres in west coast stands and additional outbreaks were recorded in central (7,290 acres) and eastern (3,500 acres) areas. Intensive ground checks in 1967 indicated that population levels were high in many undefoliated stands creating a highly destructive potential in over 750,000 acres of merchantable balsam fir. Crabbs River-Barachois Brook were considered as salvage areas and the Provincial Government decided to spray about 500,000 acres of susceptible forest during the summer of 1968.

Forest Insect and Disease Survey technicians conducted an intensive pre-and post-spray survey at predetermined sample points beginning on June 27. Data from these surveys was used to provide information for a chemical control program.

SURVEY METHODS

PRE-SPRAY SURVEY

The pre-spray survey was designed to determine the hemlock looper potential (10 or more larvae per tree sample) in balsam fir stands. Sampling points were located in stands considered to have the highest hazard rating established as follows:

Class A. Defoliated areas other than those relegated to salvage.

B. No defoliation but stands consisted primarily of mature or overmature fir with aphid damage and a record of looper moths.

C. No defoliation but stands consisted primarily of immature or mixed stand with little or no looper moth population.

Sampling was conducted by two methods depending on mode of transport as follows:

Road Transport -- Three 3-tree sample sub-plots were spaced at 9 chain intervals along a 20-chain (1320 feet) line. The first sub-plot was

located at least 2 chains from the roadside, the second sub-plot at 11 chains and the third at the end. The location of these plots and the trees sampled were marked with paint for post-spray sampling and for distributing and recovering spray deposit cards. Each tree was sampled by sweeping one side of the tree and collecting larvae on a 7 x 9 beating sheet subdivided into 9 equal squares. The opposite side of the tree was reserved for post-spray sampling. The number of larvae found in each square of the sheet was recorded on the tally card. However, when 10 or more larvae were collected, sampling was discontinued and another sub-plot sampled. If less than 10 larvae were collected, sampling continued until 10 or more larvae were collected or a unit (3 trees) was completed. The number of larvae collected was recorded for each tree. When population levels were high (more than 100 per sheet), the number of larvae on the center square was counted and the total number for the collection estimated by multiplying the results of the single square count by 9. Colored ribbon was marked A, B and C to indicate sample trees. Sample location (Figs.5, 9, 14) and sub-plot numbers were recorded on tally cards and maps. The standard survey enclosure slip was completed showing the location and plot numbers.

Two balsam woolly aphid branch samples were taken from the mid-crown of the three marked trees in the first sub-plot at each location. Each branch sample was placed in a paper bag marked with appropriate plot and tree numbers, and the age and compass direction of the branch. The degree of "gout" was recorded on the tally card, using the aphid damage classification adopted by the Survey. A Survey enclosure slip was submitted with each sample. For results of the aphid survey see (Bryant, Bio Monthly Res. Notes 24(b)).

Helicopter Transport -- Survey crews were moved by helicopter to areas inaccessible by vehicle. At each location six trees constituted a sample unit. Sampling and recording procedures were conducted as outlined in the previous section. All six trees were sampled only when larvae numbers were less than 10 per tree.

POST-SPRAY SURVEY

The post-spray survey was conducted to check the effectiveness of the spray in terms of larval mortality. It was conducted 6 to 10 days after spraying. All road plots in sprayed areas were sampled using opposite sides of the same trees sampled in the pre-spray survey. However, only 15 of the helicopter plots were sampled. The selection of these plots was at the discretion of the crew chief and only plots with high pre-spray numbers were sampled. Survey enclosure slips were completed from the West Coast plots but time did not allow for this procedure in the central areas. Hemlock looper counts were made following the same procedure as outlined in the preceding sampling instructions. The counts recorded the numbers of dead and living larvae. Road sampling crews were required to collect another aphid branch sample following the procedure outlined above but from the opposite compass direction. Attempts to use spray deposit cards proved unsuccessful because spray supervisors could not allocate spray locations until ½ hour before spray time.

RECONNAISSANCE SURVEY

Susceptible unsprayed areas were examined from fixed-wing aircraft prior to the completion of the chemical control operation. This survey was conducted following reports of defoliation in unsampled stands, particularly in central Newfoundland. Following the spray operation all forested areas of the Island were examined from fixed-wing aircraft (September 4 - 11). This survey was essential to map hemlock looper outbreak boundaries and to estimate degree of defoliation (Fig. 22, 23, 24, 25).

MOTH SURVEY

A hemlock looper moth survey was conducted in undefoliated and sprayed stands in October using both helicopter and road crews. This survey was undertaken to assist in predicting possible outbreak areas requiring control in 1969. Results of the survey were mapped (Fig. 26) according to the following classification:

Value	Description	Identification
0	No moths	Black Triangle
20	Few moths	Black Square
Too numerous to count	Numerous	Black Circle

Results of ocular estimates of abundance of moths at sample locations follow:

Hemlock Looper Moth Assessment Survey

Location	Stand Description %fir	Age	Moth Abundance
Western			
Highlands River	90	60	Few
Crabbs River	90	55	Few
Barachois Brook W.	40	70	0
Barachois Brook E.	90	50	0
Robinsons River	100	70	0
Northern Feeder	100	65	Few
Fishels Brook	70	75	"
Flat Bay Brook	80	50	"
Southwest Brook	80	85	0
Camp 33 Grand Lake	50	M	Numerous
" " " "	80	Sapling	Few
Pinchgut	90	"	0
Crescent Pond	60	M	Few
Spruce Brook	95	60	0
Cookes Pond	95	70	Few
Middle Brook	50	70	Numerous
Knights Brook	95	65	"

Location	Stand Description % fir	Age	Moth Abundance
Knights Brook E.	95	25	Numerous
Sheffield Lake	25	75	Few
" "	25	75	"
Birchy Lake	90	75	0
Chain Lakes	75	70	0
Logging School Rd. 4 W	90	75	0
" " " 14 W	95	86	Numerous
" " " 18 W	95	50	"
Goose Arm Rd.	85	30	0
Goose Arm Rd. 5 W	95	65	Numerous
North Lake Rd. 6 N	95	70	Few
Bottom Brook 5 E	90	75	0
" " 10 E	95	85	0
South Brook Valley 3 S	95	65	Numerous
" " " 7 S	90	65	Few
Crescent Pond 4 E	90	60	0
Serpentine Lake Outlet	90	85	Numerous
" " Gate	90	42	Few
Middle Arm, Baie Verte	10	42	0
5 mi. W. of Jct. Baie Verte Rd. Western Arm Rd.	35	35	0
Jct. Westport and Bear Cove Rd.	70	50	0
Westport Rd. 2 mi. from Jct. Bear Cove Rd.	55	79	0
N.E. end Birchy Lake (N. side)	80	62	Few
N. side Birchy Lake (4 mi. from N.E. end	20	43	0
Hampden Rd. (4 mi. from T.C.H.)	65	34	0
Sops Arm Rd. (5 mi. from Hampden Rd.)	20	44	0
Jct. Sops Arm & Birchy Dam Rds.	20	21	0
Sops Arm Rd. 5 mi. N. Birchy Dam Rd.	60	51	0
Doucers Brook (Sops Arm Rd.)	70	43	0
Sops Arm	30	38	0
5 mi. N. Sops Arm	80	100	0
Jct. Brook Rd. ½ W. T.C.H.	25	30	0
T.C.H. 17 mi. E. Deer Lake	100	68	Numerous
McIsaacs Brook T.C.H.	80	49	Few
N. end Sandy Lake	80	27	"
Hampden	100	38	0
Jct. Hampden & Jacksons Arm Rd.	100	71	0
Squires Mem. Park	25	48	0
Cormack East	80	20	0
Deer Lake School Woodlot	90	32	Few
Rocky Brook (Reidville Rd.)	40	42	"

Location	Stand Description % fir	Age	Moth Abundance
Birchy Narrows	40	80	Few
T.C.H. 3 mi. E. Birchy Narrows	80	40	"
N.E. Corner Sheffield Lake	80	71	Numerous
E. end Baie Verte Pond	20	55	0
4 mi. S. Flatwater Pond	30	150	0
Jct. Bear Cove & Baie Verte Rd.	100	62	0
6 mi. S. of Baie Verte	80	80	0
Seal Cove	60	44	0
Jct. Seal Cove & Wild Cove Rd.	75	86	0
Wild Cove	75	59	Few
Coachman's Cove	60	37	0
3 mi. S. Fleur de Lys	50	36	0
2 mi. N. Baie Verte	90	147	0
LaScie Rd. 4 mi. E. Baie Verte Rd.	90	150	0
Ming's Bight	60	44	0
Jct. Ming's Bight & LaScie Rds.	90	66	0
Woodstock	90	42	0
Jct. Woodstock & LaScie Rds.	70	70	Few
3 mi. E. Nippers Hr. Rd. (LaScie Rd.)	75	61	0
Tilt Cove	35	46	0
Jct. Snooks Hr. & Round Hr. Rds.	40	65	0
Burlington Rd. 5 mi. from LaScie Rd.	80	150	0
Burlington Rd. 10 mi. from LaScie Rd.	80	80	0
Jacksons Arm	80	49	0
Pollards Point	70	60	0
Wigwam Brook	70	45	Few
W. Side Birchy Ridge 4 mi. from Cormack Rd.	70	49	Numerous
Upper Humber River 3 mi. N.E. Big Falls	85	55	0
Central			
Burnt Berry Brook	80	90	Numerous
Springdale	90	80	"
Powderhorn Lake	30	50	"
West Lake	98	30	"
Tally Pond	100	65	Few
Noel Paul Brook	90	45	0
Millertown Jct. Rd.	50	M	Numerous
Great Gull River	80	70	"
Northwest Gander	90	75	"
Rodney Pond S.	90	75	"
" " N.	60	107	"
North Twin Lake	80	60	"
South " "	100	25	"
New Bay River	80	M	Numerous
New Bay Lake E.	20	50	"
Indian Arm Brook	100	65	"
Weirs Pond	90	M	"
Jonathons Pond	20	75	"

Location	Stand Description % fir	Age	Moth Abundance
Gander Lake 2 W	40	M	0
" " 5 W	40	M	0
" " 5 N	90	M	Numerous
" " 9 N	90	M	Few
" " 15 N	60	65	Numerous
Barneys Lake	90	53	"
Gander 5 E	35	35	Few
" 10 E	50	45	"
Gambo 2 W	90	45	"
Eastern			
TNP Dunphys Pond Rd.	80	50	Numerous
Thorburn Lake	35	60	Few
Blue Hills Rd.	80	70	"
Shoal Hr. Brook	50	55	"
Clarenville 1 W	20	35	0

SUMMARY OF OPERATION AND STATUS OF LOOPER

Looper development surveys were initiated on June 1. The first hemlock looper larvae (1) were found at Crabbs River on June 5. The first significant number (13) was found at North Branch on June 19 and pre-spray sampling was initiated on this date. Sampling in inaccessible stands began on June 26, when helicopters became available. No larvae were collected from several locations during the early sampling period. These locations were sampled at later dates and samples were taken three times from 20 locations in a 200,000 acre area in the Bottom and Southwest Brook watersheds. No significant numbers of larvae were found. This area was not sprayed and no defoliation was observed. Spraying began on July 9. Organo-phosphate insecticides were applied twice at 2 oz./acre at 7 day intervals. Approximately 295,000 acres were sprayed in western Newfoundland by July 24. Spray activities were then transferred to Gander to control new outbreaks in central areas. Spraying in the later stands began on July 26 and all available insecticide was applied by August 3 when an estimated 136,000 acres had been treated once with Sumithion at 4 ounces per acre (Figs. 27, 28, 29). The effects of the chemical treatments, as indicated by pre-and post-spray larval counts, follows:

Region	Treatment	Estimated larval Mortality in %	No. Samples
Western	Not sprayed	180*	11
Western	Sprayed July 9-24	95.7	36
Central	Sprayed July 26-August 3	61.8	7

* % increase in numbers of larvae.

Although sampling was too limited to provide conclusive results the above summary indicates high larval mortality in the areas sprayed earlier (Western region) but questionable effect where insecticide was applied later in larval development (central region). Estimates of damage derived from aerial surveys substantiate these results. In general, spraying appeared to be least effective where defoliation was noted prior to spraying, presumably because much of the foliage had been damaged by the looper prior to treatment and a large proportion of the larvae had developed to late stages.

Areas defoliated and number of acres estimated as severely defoliated or killed are listed in the following table:

Western Newfoundland	Acres	Acres severely damaged
Parsons Pond N.	2,770	790
Parsons Pond S.	7,485	2,235
Parsons Pond E.	990	--
Old Man's Pond	8,915	2,235
Goose Arm	2,575	515
North Arm	2,065	685
Deer Lake	3,145	--
Serpentine Lake	15,940	7,565

Western Newfoundland	Acres	Acres severely damaged
Grand L. South	4,345	4,345
Bottom Brook	1,765	1,765
Southwest Brook	12,990	Patches of dead and severely damaged trees 80% trees dead west of power dam. 40% trees dead in sprayed area east of power dam.
Little Barachois Brook	9,025	
Flat Bay Brook	13,210	
Journois Brook	4,410	1,720
Fishels Brook	21,795	6,190
Robinsons & Northern Feeder	30,825	18,575
Barachois Brook	22,015	20,640
Crabbs River	31,615	18,920
Highlands River	12,350	12,040
Codroy Pond	9,510	6,880
North Branch	11,840	10,320
South Branch	14,440	13,760
St. Georges	330	--
Long Gull Pond	660	--
Grand Lake E.	14,045	10,320
South Brook Valley	5,395	2,755
Sub Total	264,450	142,255

Central Newfoundland		
Red Indian Lake	5,350	--
Exploits River	14,265	--
Pamehac Brook	37,280	--
Lemottes Lake	2,465	100
Burnt Berry Brook	29,525	690
Halls Bay	4,535	--
Gull Pond	3,015	--
Badger Lakes	13,650	--
North Twin Lake	9,840	3,100
South Twin Lake	20,145	--
Middleton Lake	2,865	1,375
New Bay Pond	73,535	13,760
Jumpers Brook	3,810	--
Amy's Lake	9,600	9,600
Norris Arm & Thwart Island	19,570	6,880
Rattling Brook	22,560	17,000
Gander River North (including Islands)	52,365	5,000
Gander River East	59,805	10,000

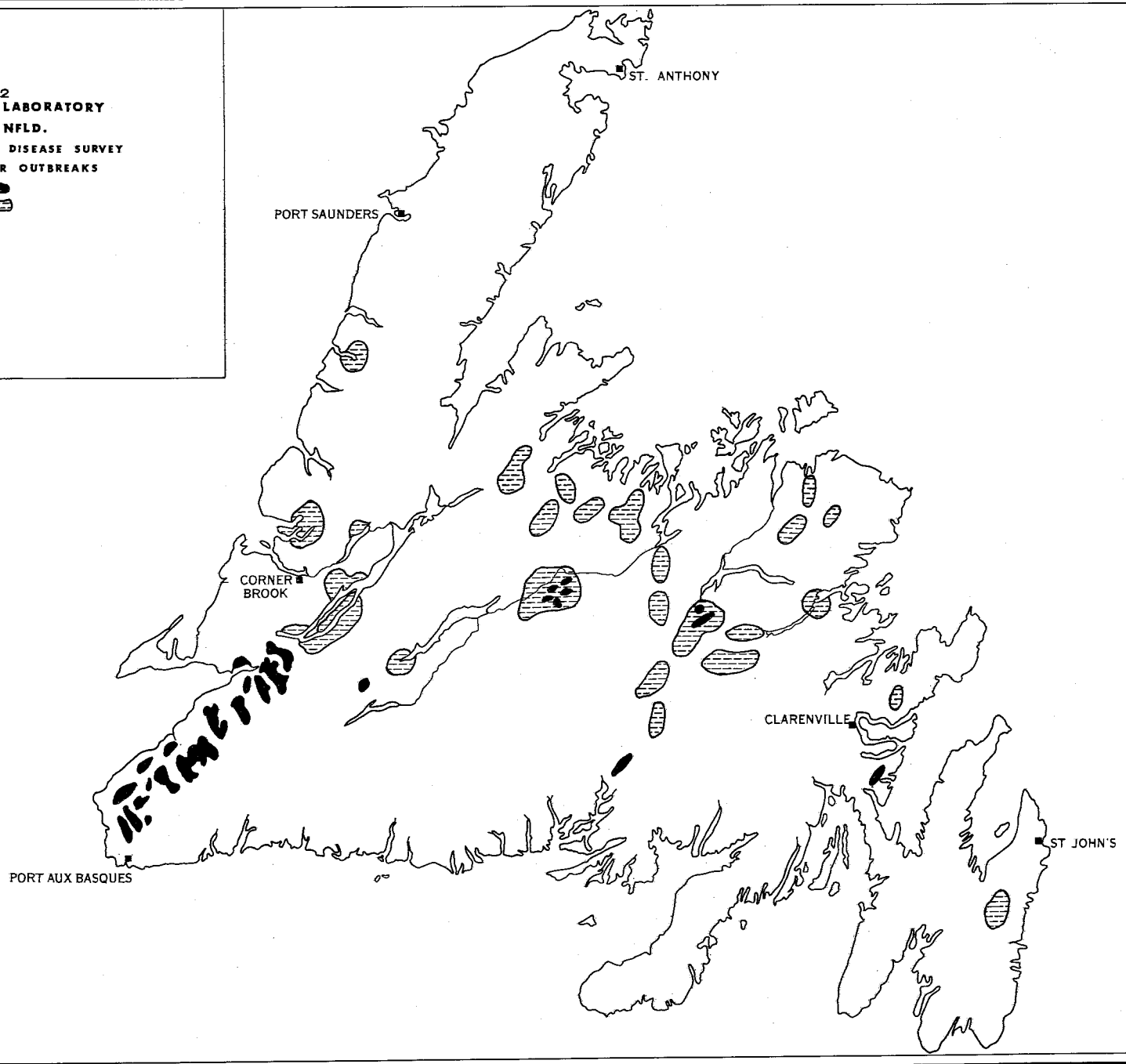
Cont'd

Central Newfoundland	Acres	Acres severely damaged
Northwest Gander River West	26,315	12,000
Northwest Gander River East including Dead Wolf Southwest Pond groups	61,955	14,000
Berry Hill Pond	10,855	5,000
Triton Brook - Gambo Pond	32,325	10,000
Rodney Pond	28,775	7,000
Sub Total	564,405	120,505
Eastern Newfoundland		
Lady Pond	2,970	—
Cochrane Pond	9,010	—
Sub Total	11,980	0
Grand Total	840,835	262,760
Estimates for 1967	162,000	87,000
Increase 1968	678,835	175,760
% Increase in 1969	319%	102%

As indicated in the above table the area of stands defoliated increased by more than 300% in 1968 and areas classed as severely defoliated or killed increased by approximately 105%.

These results, defoliation maps, and inventory data have been provided to a Task Force composed of representatives of the Provincial Forest Service, industry and the Forestry Branch to assist in forecasting looper conditions in 1969. Practically all activities of the survey during the Winter of 1968-69 have been concentrated on planning a very extensive chemical control operation in the summer of 1969. The survey will be responsible for monitoring looper conditions and appraising damage.

FIGURE 22
FOREST RESEARCH LABORATORY
ST. JOHN'S , NFLD.
FOREST INSECT AND DISEASE SURVEY
HEMLOCK LOOPER OUTBREAKS
1967
1968



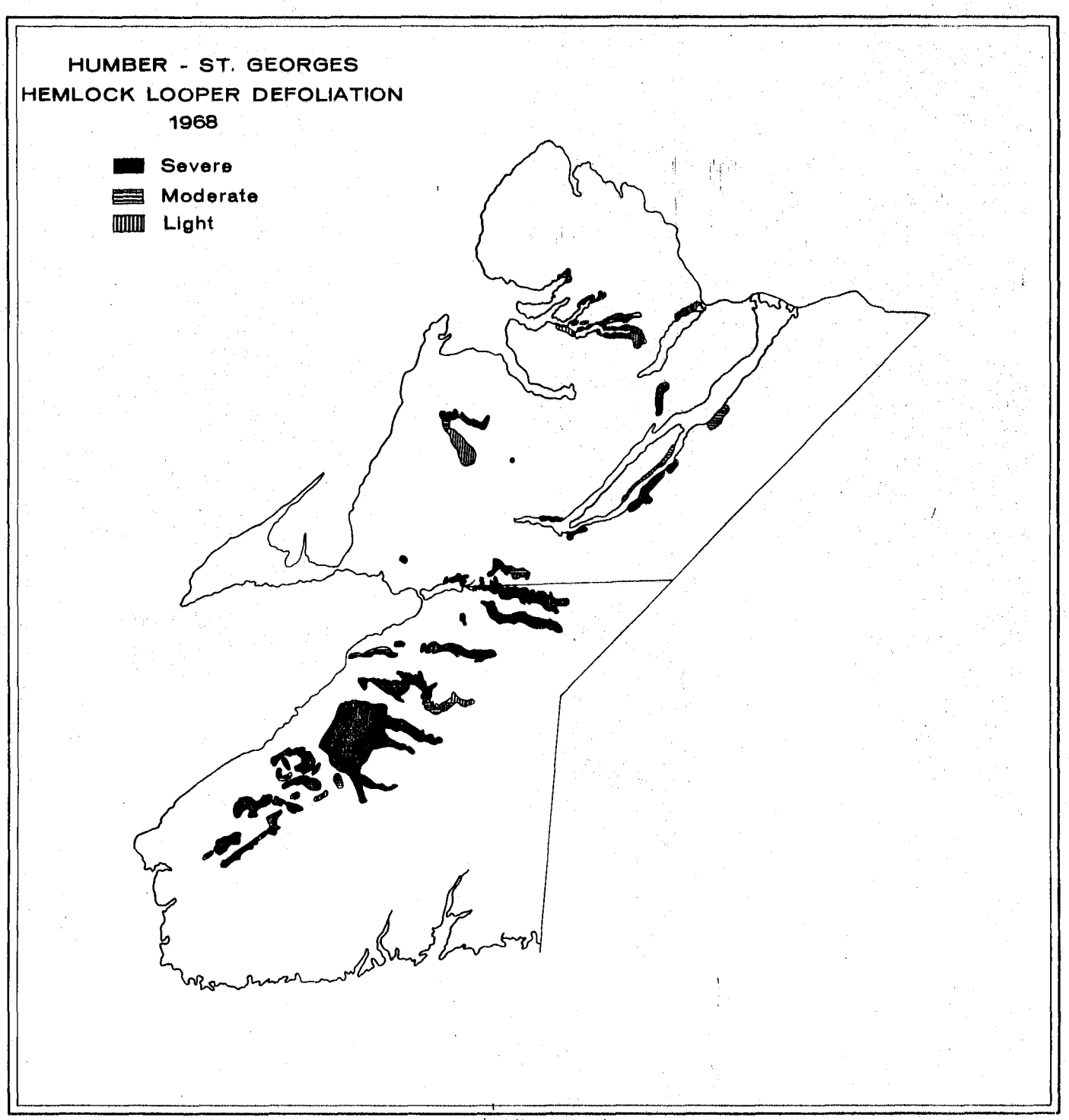

HUMBER - ST. GEORGES
HEMLOCK LOOPER DEFOLIATION
1968
Severe
Moderate
Light

Fig. 23

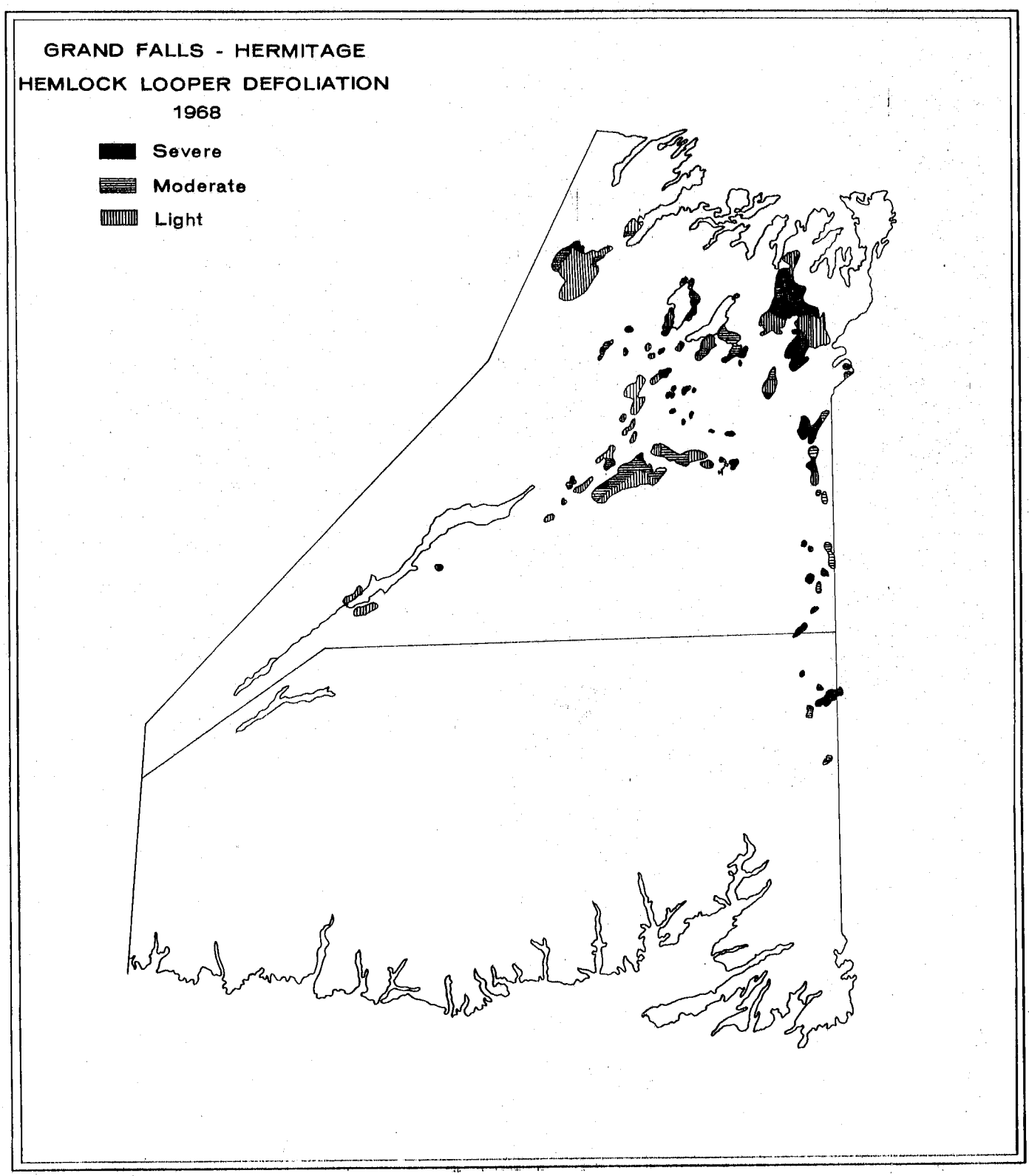

GRAND FALLS - HERMITAGE
HEMLOCK LOOPER DEFOLIATION
1968
Severe
Moderate
Light

Fig. 24

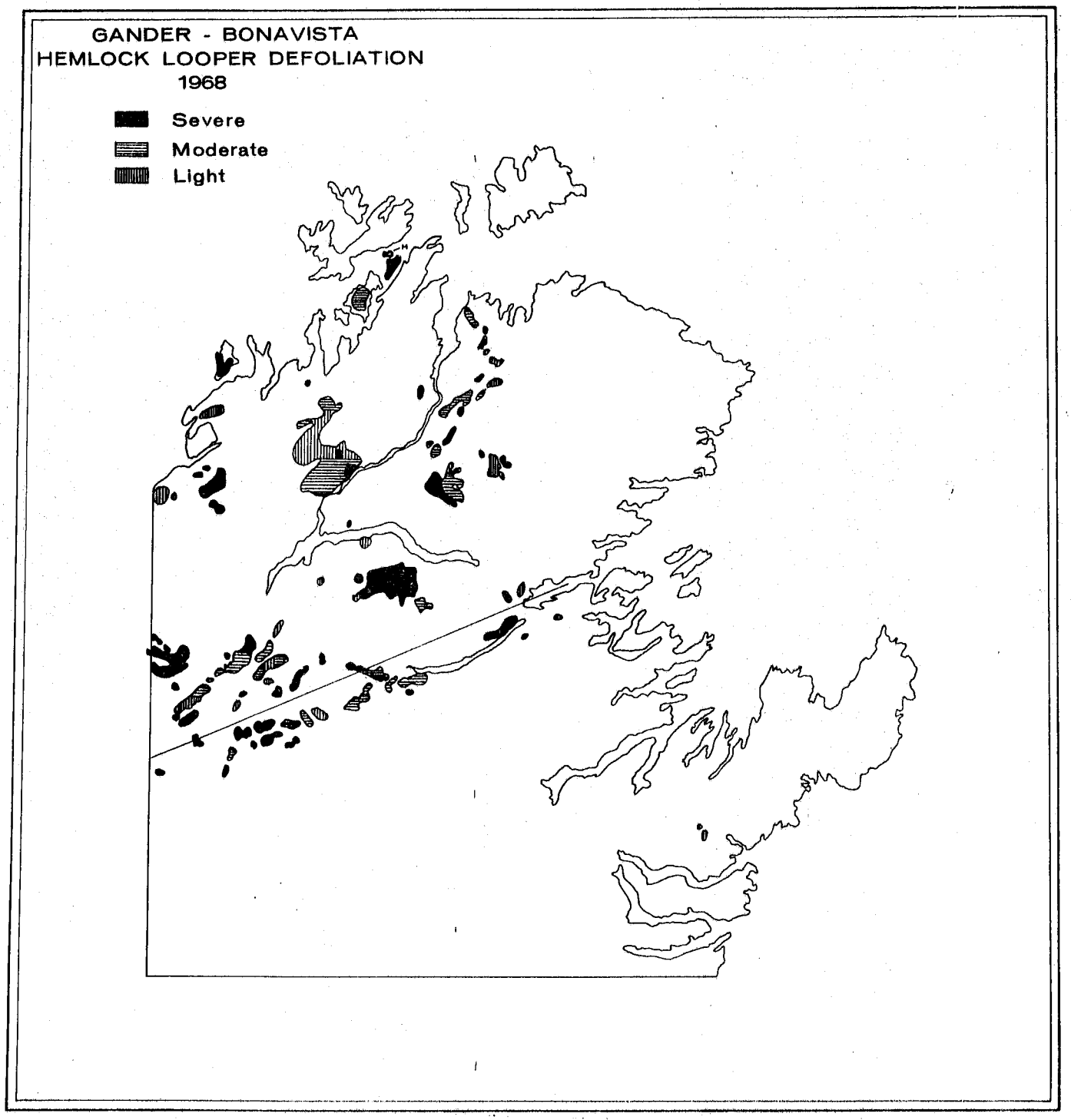

GANDER - BONAVISTA
HEMLOCK LOOPER DEFOLIATION
1968
Severe
Moderate
Light

Fig. 25

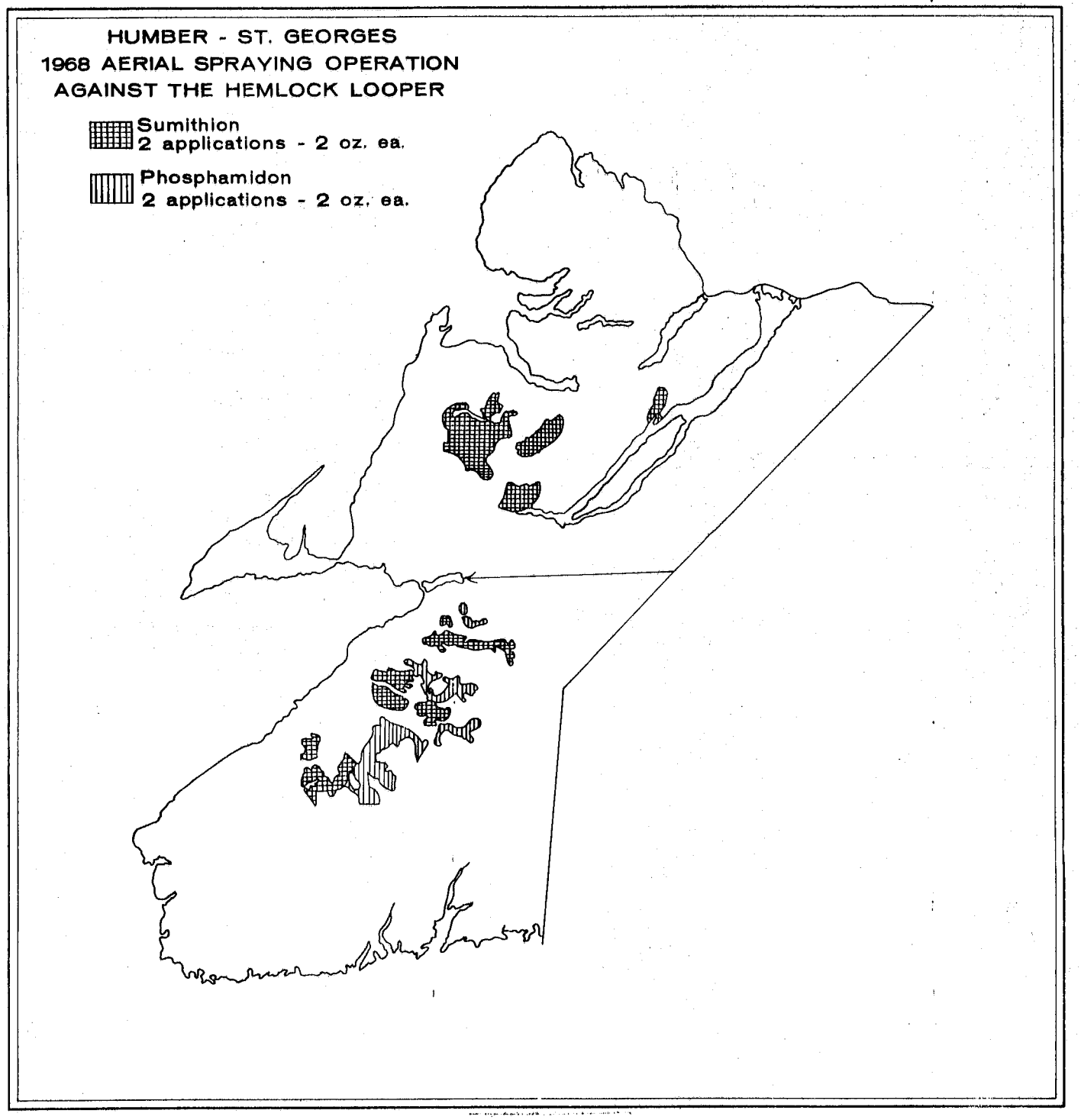

HUMBER - ST. GEORGES
1968 AERIAL SPRAYING OPERATION
AGAINST THE HEMLOCK LOOPER
Sumithion
2 applications - 2 oz. ea.
Phosphamidon
2 applications - 2 oz. ea.

Fig. 27

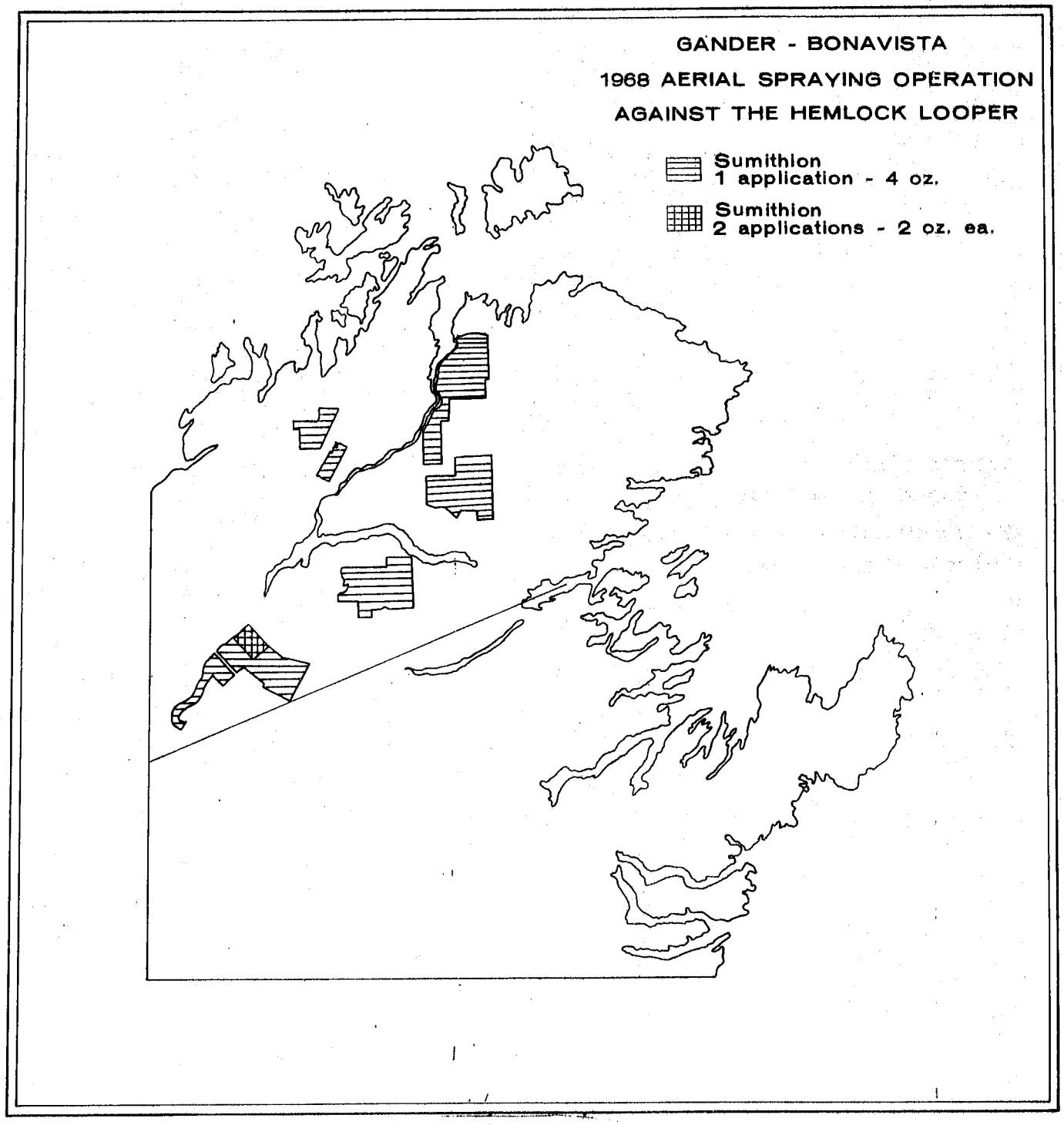

GANDER - BONAVISTA
1968 AERIAL SPRAYING OPERATION
AGAINST THE HEMLOCK LOOPER
Sumithion
1 application - 4 oz.
Sumithion
2 applications - 2 oz. ea.

Fig. 29

A

B

C

D

E

F

G

N

O

P

R

S

T