ANNUAL DISTRICT REPORTS FOREST INSECT AND DISEASE SURVEY NEWFOUNDLAND - 1967

FOREST INSECTS AND TREE DISEASES

by
L. J. Clarke, E. C. Banfield,
W. J. Sutton, and D. M. Stone

FOREST RESEARCH LABORATORY
ST. JOHN'S NEWFOUNDLAND
INFORMATION REPORT N-X- 6

CANADA
DEPARTMENT OF FORESTRY
AND RURAL DEVELOPMENT

FORESTRY BRANCH
JANUARY, 1968

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*District Supervisor

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FOREWORD

The transfer of Survey personnel from the Corner Brook Laboratory to Regional Headquarters in St. John's was completed in October 1967. The field season was disrupted by the resignation of staff and the release of district technicians for three weeks to assist as "fire bosses" on forest fires in Labrador. L.J. Clarke assumed the duties of chief Ranger, replacing W.C. Parrott who resigned in July to accept a teaching assignment with the Newfoundland College of Trades and Technology. E.C. Banfield was designated as a technician supervisor in July and replaced E.M. Haines as district technician in Eastern Newfoundland. Mr. Haines transferred to the Fredericton Forestry Research Laboratory in April. W.J. Sutton was designated as a technician supervisor in Western Newfoundland and D.M. Stone was recruited in July and assumed the duties of district technician in Northern Newfoundland. Seven students were employed in the Survey. Three Trades and Technology students, D. O'Brien, C. Fudge and J. Price assisted in the eastern, central and western districts. Assistance in the laboratory was provided by two University students, J. Spencer and H. Gabriel, and two High School students, R. Verge and R. Vincent. Dr. P. Singh was recruited as a mycologist replacing Mr. M. Ostafichuk who resigned in September.

Forest Insect and Disease Survey Districts were revised in 1967. The new boundaries and appropriate nomenclature are shown in Fig. 1.

Aerial surveys were conducted throughout the Province in August and October. Forty-seven hours were flown in fixed-winged aircraft for detecting and mapping insect outbreaks. A helicopter was used for 41 hours to transport crews to inaccessible areas in an appraisal survey of hemlock looper infestations in western and central Newfoundland. Approximately 60,000 miles were travelled in department vehicles and 350 miles in boats along the coast on the Northern Peninsula and on special surveys along the shores of larger lakes.

Weather conditions were similar in all areas of the Province. Spring weather was cool and wet but moderated in mid-June and was

followed by a record breaking hot, dry summer and fall.

Survey technicians collected 1,530 insect and 43 disease samples during the season, approximately 300 more than in 1966. The hemlock looper provided the most serious insect problem, with severe outbreaks throughout the Province. The major outbreaks occurred in balsam fir stands in western Newfoundland. The boundaries of the balsam woolly aphid outbreaks were extended in eastern and central areas but remained virtually unchanged in western Newfoundland. In central Newfoundland the larch sawfly outbreaks increased from 100 square miles in 1966 to 250 square miles in 1967. European spruce sawfly increased in numbers and distribution in eastern and western Newfoundland. Balsam fir sawfly infestations were again reported in the Gallants and Grand Lake areas in western Newfoundland while outbreaks near Marystown on the Burin Peninsula terminated. The birch casebearer continued to be a serious pest in birch stands throughout western Newfoundland. It caused severe browning of mature birch in the Spruce Brook - Gallants areas.

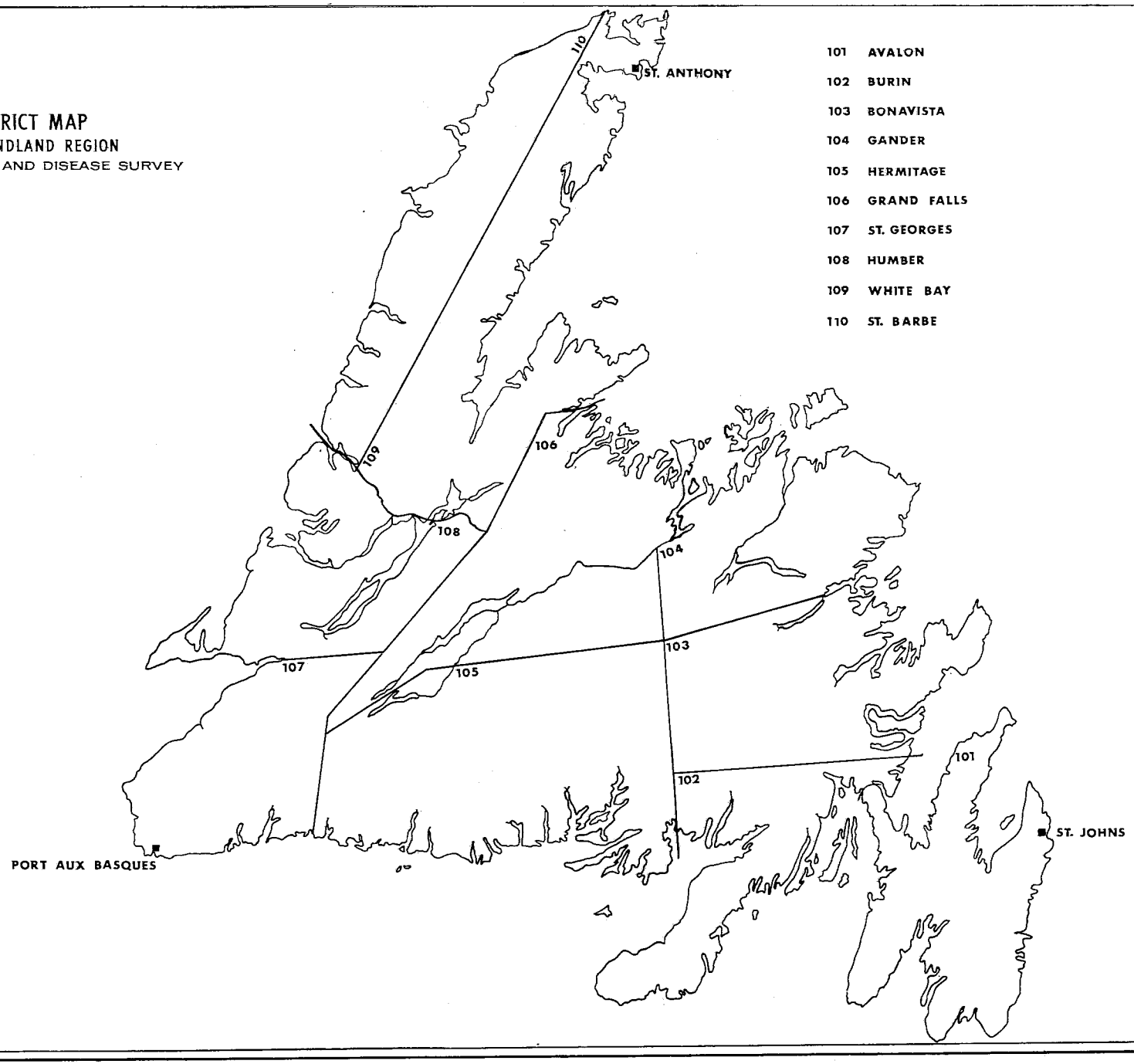
Tree mortality was observed in a stand of immature black spruce in the Sandy Lake area. Armellaria root rot has been prevalent in this stand since 1965. There were no major diseases recorded in the Province and foliage diseases remained low.

Details of forest insect and disease conditions are reviewed in the accompanying district reports.

DISTRICT MAP

NEWFOUNDLAND REGION

FOREST INSECT AND DISEASE SURVEY



SECTION I

DISTRICTS 101,102, 103 AND 104 - AVALON, BURIN, BONAVISTA AND GANDER

E.C. Banfield

INTRODUCTION

Weather conditions were cold and wet during the spring months but by mid-June hot sunny weather was experienced and persisted throughout the remainder of the summer and fall.

Field activities began in early May with the reassessment of the permanent balsam woolly aphid 100-tree study plots at North Branch, Crabbes River and Highlands. K.E. Pardy assisted in this phase of the field work. The writer then assisted in the construction of a summer field station at Wiley Brook, Red Indian Lake, to accommodate Dr. J.R. Bider's field crew involved with studies of the masked shrew. The writer was on loan to the Provincial Department of Mines, Agriculture and Resources for emergency fire fighting duties in Labrador (July 2-15). During this period the insect and disease collecting was conducted by casual and student employees. Field duties were concluded in December following the annual shrew dispersal study.

The insect and disease collecting and assessment program began July 4 and terminated on August 25. A total of 418 insect and 27 disease samples were collected during this period.

Boundaries of the balsam woolly aphid infestations in eastern Newfoundland expanded in the Burin Peninsula area and a new outbreak was discovered on the western end of the Bonavista Peninsula. An outbreak of the hemlock looper was reported at Deer Arm, Trinity Bay. Small numbers of the looper were recorded in all other districts except on the Avalon Peninsula. The European spruce sawfly, and the balsam fir sawfly were found throughout the Bonavista and Gander districts. The yellow-headed spruce sawfly caused medium defoliation in a red spruce plantation in the North Pond experimental area. The birch leaf miner and birch leaf-mining sawfly caused severe leaf browning in Bonavista and Gander districts.

There were no unusual foliage diseases recorded in eastern Newfoundland during 1967. Black knot of cherry continued to be severe and common wherever the host tree occurred. A high incidence of needle cast was recorded on balsam fir at Thornlea and also in a red pine plantation at Deer Park, Salmonier. Anthracnose of maple caused light to medium damage in Gander Bay North and light damage in Terra Nova National Park. Red flag of balsam fir was recorded as moderate to high on the Avalon Peninsula. Few disease injury symptoms were detected elsewhere throughout the districts.

INSECT CONDITIONS

Balsam Woolly Aphid, Adelges piceae (Ratz.)--A new infestation of this insect was discovered on the western end of the Bonavista Peninsula where light to medium gout was observed in the Bunyan's Cove, Lethbridge and Harcourt areas. The 1967 survey showed that balsam woolly aphid infestations on the Burin Peninsula now extend from Marystown north to the Trans-Canada Highway at Goobies. However, the boundaries of the infestation between Swift Current and Goobies (Figs. 2,3) are very irregular because fir stands are interrupted by black spruce and open bog. Results of the aphid survey in Terra Nova National Park are discussed in Section II.

Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.)--In 1966 the hemlock looper was reported on the Avalon District only but in 1967 it was recorded in all eastern districts except Avalon. Light to medium defoliation was recorded in 3,500 acres of balsam fir at Deer Arm in Trinity Bay. See Section VII for a detailed report on this insect.

Collections	No. larvae per tree sample
25	1

Larch Sawfly, Pristiphora erichsonii (Htg.)--Several small outbreaks of this sawfly occurred in eastern Newfoundland, mainly on Twillingate and New World Islands in Gander District. Defoliation in both instances was estimated at 25%. Defoliation was estimated at 10% on 12 trees at Badgers Quay and 25% in a 7 acre stand near

Grand Bank on the Burin Peninsula.

Collections	No. larvae per tree sample
5	21

European Spruce Sawfly, Diprion hercyniae (Htg.)--Population levels of this sawfly increased in eastern Newfoundland over the past two years. The most significant increases were recorded near Port Albert and Herring Neck in Gander District, and at Shoal Harbour River and Thorburn Lake in Bonavista District. Over 30 larvae per tree were collected in the Burin District and none in the Avalon District. Diseased larvae were common in most collections.

Collections	No. larvae per tree sample
52	4

Yellow-Headed Spruce Sawfly, Pikonema alaskensis (Roh.)--An isolated outbreak of the yellow-headed spruce sawfly was recorded on red spruce seedling in a departmental plantation at North Pond. Maximum defoliation was estimated at 40% and over 50% of the seedlings were infested. Defoliation was estimated at 25% on black spruce saplings growing along the periphery of the plantation. The plantation and trees in the immediate area were sprayed with Diazinon about a week prior to the investigation and a subsequent hand-picked sample produced only 34 sawfly larvae. This insect was also recorded in low numbers throughout Bonavista and Gander districts.

Collections	No. larvae per tree sample
24	3

Balsam Fir Sawfly, Neodiprion abietis complex--Infestations of the balsam fir sawfly have been reported from the Burin Peninsula since 1961. However, no larvae were collected in this district in 1967. Low numbers were collected in the Bonavista and Gander districts.

Collections	No. larvae per tree sample
8	0.6

Larch Casebearer, Coleophora laricella (Hbn.)--Larval numbers of the larch casebearer remained low throughout most of eastern

Newfoundland for the fifth consecutive year. The highest of casebearer larvae was recorded along the Topsail-St.Phillips road, but browning was light.

A summary of sampling data, based on the number of casebearers on 30 fascicles per tree at 20-tree sampling stations, follows:

Location	Stand vigor	Stand defoliation	Av. no. cases/sample
Witless Bay South	MV	L	3.12
Goulds	"	"	8.10
Tors Cove	"	"	3.10
Portugal Cove (Indian Meal Line)	"	"	0.40
" " (St. Phillips Rd.)	"	"	0.44
Pouch Cove (Bauline Line)	"	"	1.65
Shoe Cove (Torbay)	V	"	1.25
St. Phillips Rd.	MV	"	3.23
Topsail - St. Phillips Rd.	V	"	21.42
Salmonier Line (T.C.H.)	V	"	5.68
Cochrane Pond Park (T.C.H.)	MV	"	2.35
Middle Cove - Outer Cove Rd.	"	"	1.52
Brigus	"	"	7.75
Holyrood Access Rd.	"	"	1.22
Conception Harbour	"	"	0.97
Witless Bay Line	"	"	0.70
Old Bay Bulls Line	"	"	0.49
Cape Broyle	"	"	0.65
Upper Gullies	"	"	1.43
Cupids	"	"	1.26
Harbour Grace - Tilton	"	"	1.35
Carbonear - Heart's Content	"	"	0.62
Roaches Line	V	"	1.70
Salmonier	MV	L	0.30
Colinet - Salmonier (R6)	"	"	0.45
Markland - Whitbourne Rd. (R32)	"	"	0.25
Haricot - Mt. Carmel Rd.	"	"	0.40
Terra Nova National Park (central)	U	M	1.49

V = Vigorous; MV = Moderately vigorous; U = Unthrifty

Birch Leaf Miner, Fenusa pusilla (Lep.) and Birch Leaf-Mining Sawfly, Heterarthrus nemoratus (Fall.)--Leaf browning caused by these leaf miners increased from 1966 in the Bonavista and Gander districts and was most conspicuous in Gander District where browning ranged from light to heavy. Damage was most common on roadside white birch saplings. The most severe browning was recorded at Thorburn Lake where damage was estimated at 75%. The following summary shows the status of these pests in 1967:

Location	Degree of browning
Glenwood	Medium
Norris Arm	"
Square Pond	Light
Soulis Brook	Medium
Gander	"
Traytown	Light
Port Blandford	"
Thorburn Lake	Heavy
Clarenville	Medium
Bloomfield	"
Lethbridge	Light
Plate Cove	Heavy
Michaels Hr.	Medium
Windmill Bight Prov. Park	"
Georges Brook	Light

OTHER INSECTS RECORDED

Species	Host (s)	Locality	Average per tree sample	No. of collections
Acmaeops proteus Kby. A long-horned borer	bS	Sweet Bay	0.3	1
Acleris variana (Fern.) Black-headed budworm	bF, bS, wS	Throughout eastern Newfoundland	0.7	22
Adoxus obscurus Linn. Western grape rootworm	bF, bS	Georges Brook near Port Blandford	0.6	2
Anoplodera mutabilis Newn.	bS	Georges Brook	0.3	1
Anoplodera rubrica Say A long-horned borer	bF	Frederickton	0.3	1
Anoplonyx spp. A sawfly on larch	tL	Throughout eastern Newfoundland	1.5	10
Campaea perlata Guen. Fringed looper	Al, wB	Bonavista and Burin districts	0.6	5
Caripeta divisata Wlk. Grey spruce looper	bS	Georges Brook	0.3	1
Choristoneura fumiferana (Clem.) Spruce budworm	bF	Great Barasway, Plate Cove West	0.5	2
Chrysomela falsa Brown Willow leaf beetle	W, tA	Bonavista and Gander districts	5.0	11
Cimbex americana Leach Elm sawfly	Al	Goose Cove	1.0	1
Corythucha spp. Lacebugs	Al, W	Gander and Bonavista districts	26.0	7

(Insects Cont'd.)

Species	Host (s)	Locality	Average per tree sample	No. of collections
Ctenicera falsifica Lec. A click beetle	bS, bF, wB, tL	Gander and Bonavista districts	0.5	11
Ctenicera sp. A click beetle	bF	Mann Point, Sweet Bay	0.5	2
Ctenicera triundulata Rand. A click beetle	bS, bF	Terra Nova National Park, Point Verde, Elliots Cove, Southern Bay	0.3	4
Dendroides concolor Newn. Fire-colored beetle	bF	Lethbridge	0.3	1
Dimorphopteryx sp. A birch sawfly	Al, wB	Middle Brook Prov. Park, Shoal Harbour River	0.8	2
Dioryctria reniculella (Grt.) Spruce coneworm	wS	Forest Field	0.3	1
Eucordylea atrupictella Dietz. A spruce needle miner	bF, bS	Clarenville, Bonavista, Bunyans Cove	0.3	3
Eupithecia sp. A brown spruce looper	bS	Burin, Bonavista and Gander districts	0.6	42
Fenusa dohrnii (Tisch.) European alder leaf miner	Al	Gander District, Thorburn Lake area	22.4	6
Feralia jocosa (Guen.) Green striped caterpillar	bF, bS, wS, wB	Burin, Bonavista and Gander districts	0.6	10
Hemichroa crocea (Fource.) Striped alder sawfly	wB	Spanish Room	4.5	1

(Insects Cont'd.)

Species	Host (s)	Locality	Average per tree sample	No. of collections
Monochamus scutellatus (Say.) White spotted sawyer beetle	bS, tL tA	Glenwood, Noggin Cove, St. Jones Within	0.4	3
Nematus limbatus (Cress.) Willow sawfly	wS	Marystown	0.3	1
Nyctobia limitaria Wlk. Green balsam looper	bF, bS, wS	Avalon, Bonavista and Burin districts	0.5	8
Nymphalis antiopa (L.) Mourning-cloak butterfly	tA, W, pCh	Gander and Bonavista districts	16.1	7
Orgyia antiqua (L.) Rusty tussock moth	Al, pCh, tL, wB, As, wB, bF, bS, moM	Burin, Bonavista and Gander districts	1.3	45
Phenacaspis pinifoliae (Fitch.) Pine needle scale	wS, bS	Birchy Bay, Glovertown	50.0	2
Phlogophora iris Gn. A cutworm	rM	Bunyans Cove	1.0	1
Phratora purpurea purpurea Brown A leaf beetle	bS	Weybridge	0.7	1
Phyllocnistis populiella Cham Aspen leaf miner	tA	Aspen Cove Jct. (R40)	4.0	1
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bF, bS, wS	Gander and Bonavista districts, and Burin Bay Arm	0.8	22
Pissodes strobi Peck The white pine weevil	bS	Lethbridge	0.3	1

(Insects Cont'd.)

Species	Host (s)	Locality	Average per tree sample	No. of collections
Pristiphora lena Kincaid A spruce sawfly	bS, wS	Burin, Bonavista and Gander districts	2.1	12
Recurvaria piceaella Kft. Spruce leaf miner	bF	Bauline Line	0.3	1
Semiothisa sexmaculata (Pack.) Green larch looper	tL	St. Jones Within, Newstead, Port Albert	1.4	4
Semiothisa spp. A looper	bF, bS, wS, tL, wB	Burin, Bonavista and Gander districts	1.0	40
Solenobia walshella Clem. A bagworm	bS, wS, bF, tL	Gander and Bonavista districts, Frenchmans Cove Prov. Park	1.2	25
Stilnoptia salicis (L.) Satin moth	tA	Georges Brook	1.0	1
Syneta spp. A leaf beetle	bF, Al	Melrose, Trinity, Bonavista	0.4	3
Tetraphleps sp. A predator	bF, bS, wS, tL, Al	Burin, and Bonavista districts, Herring Neck, Middle Bk., Long Beach	0.9	10
Trichiocampus irregularis (Dyar.) A willow sawfly	W	Gander, Lewisporte	10.0	2
Typocerus spp. A long-horned beetle	bF, wB	Thorburn Lake, Winterland Jct.	0.5	2
Zeiraphera diniana Gn. Douglas fir cone moth	tL	Harcourt, South East Placentia	0.3	2
Zeiraphera ratzburgiana Ratz. Spruce budmoth	bS	Point Verde	1.0	1

(Insects Cont'd.)

Miscellaneous families	Host (s)	Locality	Average per tree sample	No. of collections
Acrididae Grasshoppers	bS, Al	Dildo Run Provincial Park Sweet Bay	0.5	2
Aphidae Aphids	pCh, wS, Al, bF, tL	Bonavista district and Birchy Bay	23.7	6
Cantharidae Soldier beetles	bS	Harcourt	0.3	1
Cicadellidae Leaf hoppers	bF, Al	Trouty, Goose Cove North Pond	1.4	3
Coccinellidae Lady beetles	bS	Terra Nova National Park	0.3	1
Curculionidae Weevils	bF, bS, jP	Logy Bay, Windsor Lake Glenwood, Gander Dildo Run Provincial Park	0.4	5
Elateridae Click beetles	bF, bS, tL, wB	Bonavista district	0.5	5
Geometridae		Throughout eastern Newfoundland		
Liparidae Tussock moths	wB, Al, W, tA, rM	Burin, Bonavista and Gander districts	0.6	14
Noctuidae Noctuid moths	Al, tL, W, wB, tA, bS, bF	Avalon, Bonavista, and Gander districts	0.8	25
Notodontidae Prominents	tA, Al, moM, W, bS, wS, wB, pCh	Gander and Bonavista districts, Rushoon	0.7	15

(Insects Cont'd.)

Miscellaneous families	Host (s)	Locality	Average per tree sample	No. of collections
Pamphiliidae A web-spinning sawfly	bF, wS	Gander and Bonavista districts	0.4	8
Papilionidae Swallowtails	Al, tA	Frederickton, Birchy Bay, Summerford	0.4	3
Pentatomidae Stink bugs	Al, bS, wS, wB, bF	Gander and Bonavista districts, Grand Bank	1.2	21
Sphingidae Sphinx moth	W	Soulis Brook	0.3	1
Syrphidae A predator	bF	South East River, South East Placentia, Salmonier Nursery	2.0	3
Tenthredinidae Sawflies	W, Al, pCh, As, wB, yB Currant	Burin, Bonavista and Gander districts	2.0	23
Tortricidae Leaf rollers	Al, W, tA, rM, As, wB, yB, pCh, bF, bS, wS, tL	Throughout eastern Newfoundland	0.9	40

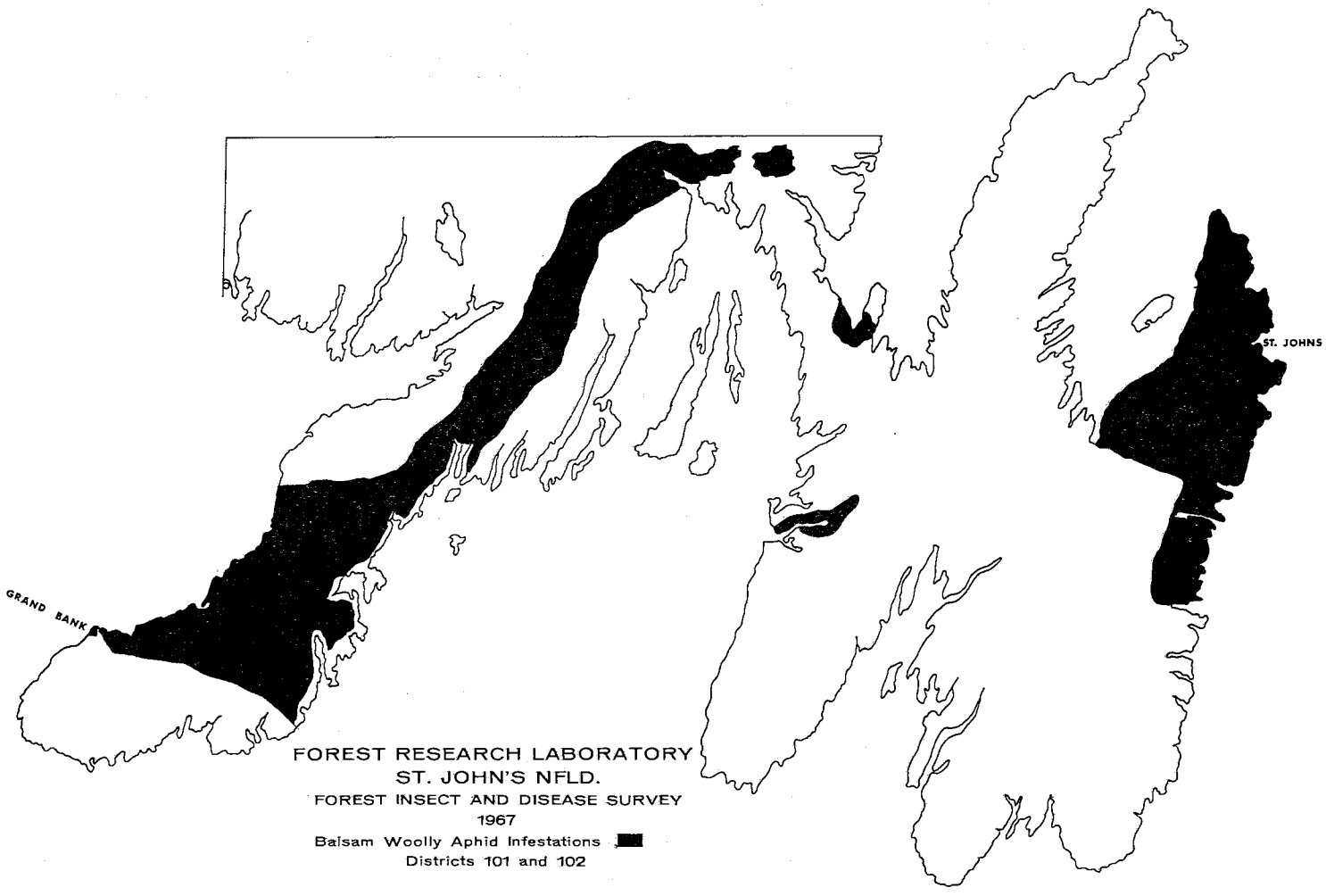
DISEASE CONDITIONS

Anthracnose of Maple, Gloesporium apocryptum Ell. and Ev.--This disease organism occurred mainly throughout the northern part of Gander District. Medium damage was recorded on the foliage of red and mountain maple at Michaels Harbour, Gander Bay and Frederickton, while a low incidence was recorded at Port Albert. Light damage of this disease also was found near Charlottetown in the Terra Nova National Park. This pathogen was inconspicuous elsewhere in eastern Newfoundland.

Red Flag of Balsam Fir, Fusicoccum abietinum (Hartig) Prill. & Delacr.--Red flag of balsam fir was conspicuous in two localized areas on the Avalon Peninsula. Medium damage was recorded in immature stands of balsam fir along the roadside between Colinet and Markland, and also 5 miles south of St. Josephs in a 2-acre stand of young fir. Damage throughout the rest of eastern Newfoundland was negligible.

OTHER DISEASES RECORDED

Organism	Host (s)	Locality	Remarks
Bifusella faullii Darker Needle cast of balsam fir	bF	Thornlea, Knights Cove, Jct. Charlottetown Rd. & T.C.H. (TNNP)	Heavy Light
Ciborinia whetzelii (Seav.) Seav. Ink spot of aspen	tA	Middle Brook Prov. Park	Light
Chrysomyxa ledicola Lagerh. Needle rust on spruce	bS	St. Jones Within	Light
Coccomyces hiemalis Higg. Shot hole of cherry	Pch	Hare Bay	Light
Cylindrosporium betulae Davis Leaf spot	wB	Burgoynes Cove	only regeneration infested
Dothyostroma pini Hubb. Needle cast	rP	Deer Park Plantation (Salmonier)	Heavy
Gymnosporangium sp. Leaf rust	Mo	Middle Brook	Light
Melampsorella caryophyllacearum Schroet. Yellow witches broom of balsam fir	bF	Nearys Pond (Portugal Cove),	Light
Taphrina robinsoniana Gies Catkin hypertrophy	sAl	2 miles South of Newstead, 4 miles South of Fortune	Light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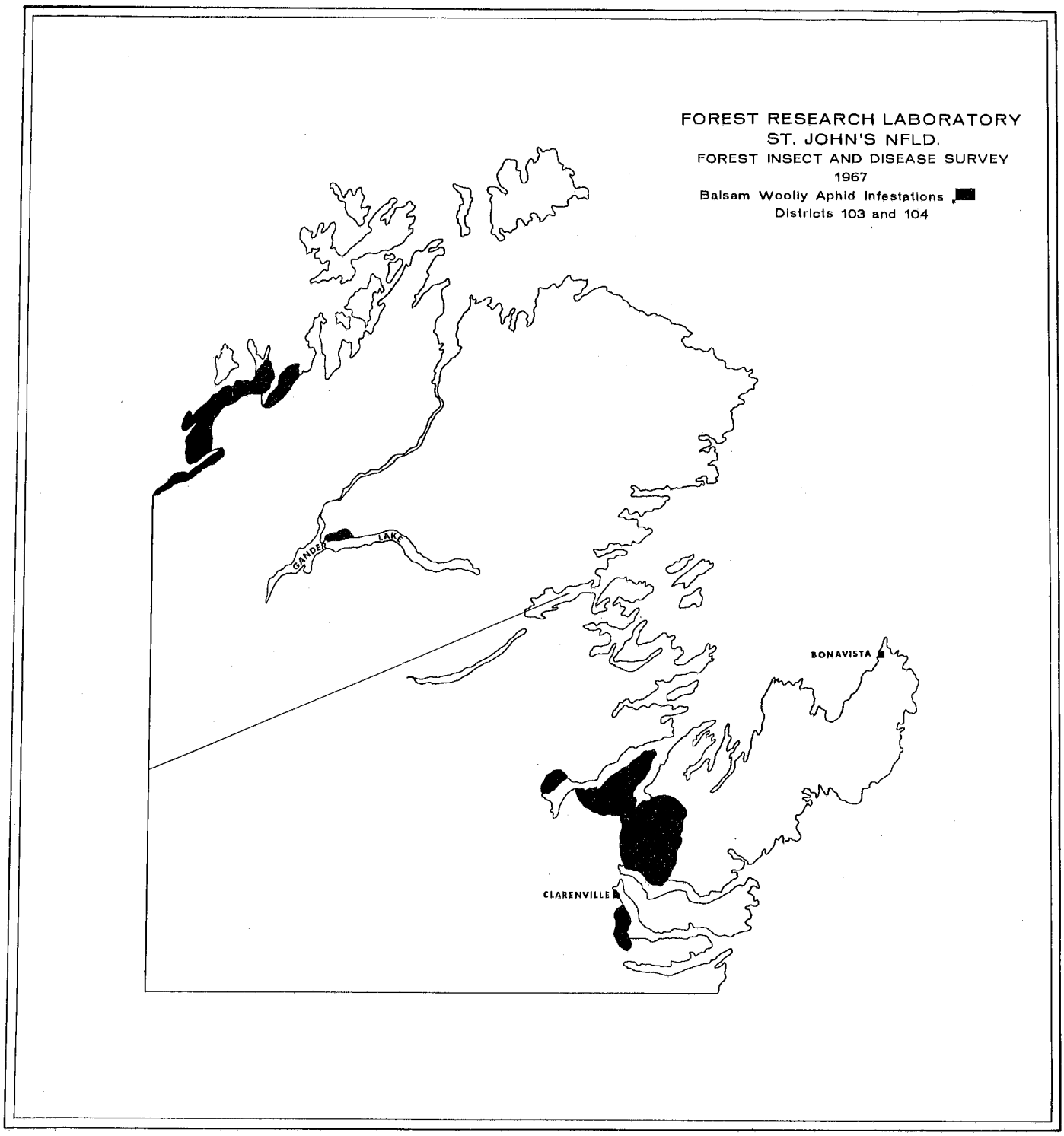
FOREST INSECT AND DISEASE SURVEY
1967
Balsam Woolly Aphid Infestations
Districts 101 and 102

Fig. 2.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FOREST INSECT AND DISEASE SURVEY
1967
Balsam Woolly Aphid Infestations
Districts 103 and 104
GANDER LAKE
BONAVISTA
CLARENVILLE

Fig. 3.

SECTION II
INSECT AND DISEASE CONDITIONS
IN
TERRA NOVA NATIONAL PARK

E.C. Banfield

The Survey has provided this section of the Annual District Report for the convenience of officials of Terra Nova National Park. It includes a summary of insect and disease conditions, a map of general sampling points and tabular lists of specimens collected.

An examination of balsam fir stands indicated that there was no appreciable change in the boundary of the balsam woolly aphid outbreak. The few infested trees which remained in the area cut in 1966 have now been removed. Aphid infested trees scattered along the highway from the eastern entrance of the park to Dunphy's Pond road are now being cut by the park authorities. This area contains numerous small bogs and forest composition is approximately 90 percent black spruce. Therefore, the removal of aphid infested fir will not seriously affect the aesthetic value in the park.

The hemlock looper was the most common defoliator. It was found at seven out of ten sampling points but few larvae were collected and no defoliation was observed. A total of 71 insect and 3 disease samples was collected, these are grouped by location in Table I and are shown in alphabetical order in Table II. Disease collections are shown in Table III. Sampling points are shown in Fig. 4.

TABLE I

INSECT COLLECTIONS IN TERRA NOVA NATIONAL PARK

Grid. No. 2228539 Location: 1.7 Miles South of Traytown Jct.

Species	Host	No. Insects	Date
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	bS	1	19/7/67
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS	2	19/7/67
Semiothisa sp. A looper	bS	1	19/7/67

Grid. No. 2228538 Location: 3.3 Miles South of Traytown Jct.

Diprion hercyniae (Htg.) European spruce sawfly	bS	1	21/7/67
Feralia jocosa (Guen.) Green striped caterpillar	wB	1	21/7/67
Lambdina fiscellaria fiscellaria (Guen.)	bF	3	"
Hemlock looper	bS	1	"
Semiothisa sp. A looper	bF	3	"
Solenobia walshella Clem. A bagworm	bS	1	"

(Insect collections cont'd.)

Grid. No. 2228538 Location: 8.3 Miles South of Traytown Jct.

Species	Host	No. Insects	Date
Acleris variana (Fern.) Black-headed budworm	bS	3	21/7/67
Ctenicera triundulata Rand. A click beetle	bS	1	"
Diprion hercyniae (Htg.) European spruce sawfly	bS	1	"
Eupithecia sp. A looper	bS	1	"

Grid. No.2227537 Location: 10.7 Miles South of Traytown Jct.

Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	4	21/7/67
Coleophora laricella (Hbn.) Larch casebearer	tL	9	22/7/67
Pristiphora erichsonii (Htg.) Larch sawfly	tL	1	"
	tL	21	"

Grid. No. 2171537 Location: 1 Mile from T.C.H. on Sandy Pond Rd.

Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	10	24/7/67
Feralia jocosa (Guen.) Green striped caterpillar	bF	1	"

(Insect collections cont'd.)

Grid. No. 2171537 Location: 1 Mile from T.C.H. on Sandy Pond Rd.

Species	Host	No. Insects	Date
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	bF	2	24/7/67
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS bF	1 1	" "

Grid. No. 2171536 Location: Junction of Charlottetown Rd. & T.C.H.

Diprion hercyniae (htg.) European spruce sawfly	bS	12	22/7/67
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	bF	2	"
Nyctobia limitaria Wlk. Green balsam looper	bF	2	"
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS	7	"
Solenobia walshella Clem. A bagworm	bF bS	5 9	" "

Grid. No. 2171536 Location: 4.4 Miles S.W. of Charlottetown Jct.

Diprion hercyniae (Htg.) European spruce sawfly	bS	5	24/7/67
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	bS tL rM	1 1 2	" " "

(Insect collections cont'd.)

Grid. No. 2171536 Location: 4.4 Miles S.W. of Charlottetown Jct.

Species	Host	No. Insects	Date
Orgyia antiqua (L.) Rusty tussock moth	bS tL	2 1	24/7/67 "

Grid. No. 2171536 Location: 7.1 Miles S.W. of Charlottetown Jct.

Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	bF	2	24/7/67
Nyctobia limitaria Wlk. Green balsam looper	bF	2	"

Grid. No. 2170536 Location: 10.8 Miles S.W. of Charlottetown Jct.

Diprion hercyniae (Htg.) European spruce sawfly	bS	3	24/7/67
Eupithecia spp. A looper	bS	1	"
Nyctobia limitaria Wlk. Green balsam looper	bF	1	"
Orgyia antiqua (L.) Rusty tussock moth	Al wB bF Al	5 2 1 1	" " " "
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	bS	2	"
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	bS	1	"

(Insect collections cont'd.)

Grid. No. 2170536 Location: 10.8 Miles S.W. of Charlottetown Jct.

Species	Host	No. Insects	Date
Semiothisa spp.	bS	1	24/7/67
A looper	bF	3	"
Solenobia walshella Clem.	bS	1	"
A bagworm	bF	3	"

TABLE II

INSECT COLLECTIONS IN TERRA NOVA NATIONAL PARK

Species	Grid No.	Location	Date	Host	No. Insects
Acleris variana (Fern.) Black-headed budworm	2228538	8.3 Mi. S. of Traytown Jct.	22/7/67	bS	3
Anoplonyx spp. A sawfly on larch	2171537	1 Mi. from T.C.H. on Sandy Pond Rd.	24/7/67	tL	10
	2227537	10.7 Mi. S. of Traytown Jct.	21/7/67	tL	4
Coleophora laricella (Hbn.) Larch casebearer	2227537	10.7 Mi. S. of Traytown Jct.	22/7/67	tL	9
Ctenicera triundulata Rand. A click beetle	2228538	8.3 Mi. S. of Traytown Jct.	21/7/67	bS	1
Diprion hercyniae (Htg.) European spruce sawfly	2228538	8.3 Mi. S. of Traytown Jct.	21/7/67	bS	1
	2228538	3.3 Mi. S. of Traytown Jct.	21/7/67	bS	1
	2171536	Jct. Charlottetown Rd. & T.C.H.	22/7/67	bS	12
	2171536	5.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	5
	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	3
Eupithecia spp. A brown spruce looper	2228538	8.3 Mi. S. of Traytown Jct.	21/7/67	bS	1
	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	1
Feralia jocosa (Guen.) Green striped caterpillar	2228538	3.3 Mi. S. of Traytown Jct.	21/7/67	wB	1
	2171536	4.4 Mi. S.W. of Charlottetown Jct.	24/7/67	bF	1
	2171537	1 Mi. from T.C.H. on Sandy Pond Rd.	24/7/67	bF	1
Lambdina fiscellaria fiscellaria (Guen.) Hemlock looper	2228539	1.7 Mi. S. of Traytown Jct.	19/7/67	bS	1
	"	3.3 " " " " "	21/7/67	bF	3
	"	" " " " " "	21/7/67	bS	1
	2171536	Jct. Charlottetown Rd. & T.C.H.	22/7/67	bF	2
	"	4.4 Mi. S.W. of Charlottetown Jct.	24/7/67	bF	26
	"	5.8 " " " " "	24/7/67	bS	1
	"	" " " " " "	24/7/67	tL	1
	"	" " " " " "	24/7/67	rM	2
	"	7.1 " " " " "	24/7/67	bF	2
	2171537	1 Mi. from T.C.H. on Sandy Pond Rd.	24/7/67	bF	2

(Insect collections cont'd.)

Species	Grid No.	Location	Date	Host	No. Insects
Neodiprion abietis (Harr.) Balsam fir sawfly	2171536	4.4 Mi. S.W. of Charlottetown Jct.	24/7/67	bF	2
Nyctobia limitaria Wlk. Green balsam looper	2171536	Jct. Charlottetown & T.C.H.	22/7/67	bF	2
	"	7.1 Mi. S.W. of Charlottetown Jct.	24/7/67	bF	2
	2170536	10.8 " " " " "	24/7/67	bF	1
Orgyia antiqua (L.) Rusty tussock moth	2171536	5.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	2
	"	" " " " " "	24/7/67	tL	1
	2170536	10.8 " " " " "	24/7/67	Al	5
	"	" " " " " "	24/7/67	wB	2
	"	" " " " " "	24/7/67	bF	1
	"	" " " " " "	24/7/67	Al	1
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	2228539	1.7 Mi. S. of Traytown Jct.	19/7/67	bS	2
	2171536	Jct. Charlottetown Rd. & T.C.H.	22/7/67	bS	7
	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	2
	2171537	1 Mi. from T.C.H. on Sandy Pond Rd.	24/7/67	bS	1
	"	1 " " " " " " "	24/7/67	bF	1
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	1
Pristiphora erichsonii (Htg.) Larch sawfly	2227537	10.7 Mi. S. of Traytown Jct.	21/7/67	tL	1
	"	" " " " " "	22/7/67	tL	21
Semiothisa sp. A looper	2228539	1.7 Mi. S. of Traytown Jct.	19/7/67	bS	1
	"	3.3 " " " " "	21/7/67	bF	3
	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	1
	"	" " " " "	24/7/67	bF	1
Solenobia walshella Clem. A bagworm	2228538	3.3 Mi. S. of Traytown Jct.	21/7/67	bS	1
	2171536	Jct. Charlottetown Rd. & T.C.H.	22/7/67	bF	5
	"	" " " " "	22/7/67	bS	9
	2170536	10.8 Mi. S.W. of Charlottetown Jct.	24/7/67	bS	1
	"	" " " " " "	24/7/67	bF	3

TABLE III

DISEASE COLLECTIONS IN TERRA NOVA NATIONAL PARK

Organism	Grid No.	Location	Date	Host	Incidence
Bifusella faullii Darker Needle cast of balsam fir	2171536	Jct. Charlottetown Rd. & T.C.H.	22/7/67	bF	Low
Cronartium ribicola J.C. Fischer White pine blister rust	2171537	Access Road to Terra Nova	24/7/67	wP	Medium
Gloesporium apocruptum Ell. and Ev. Anthracnose of maple	2171536	5.8 Mi. S.W. of Charlottetown Jct.	24/7/67	rM	Low

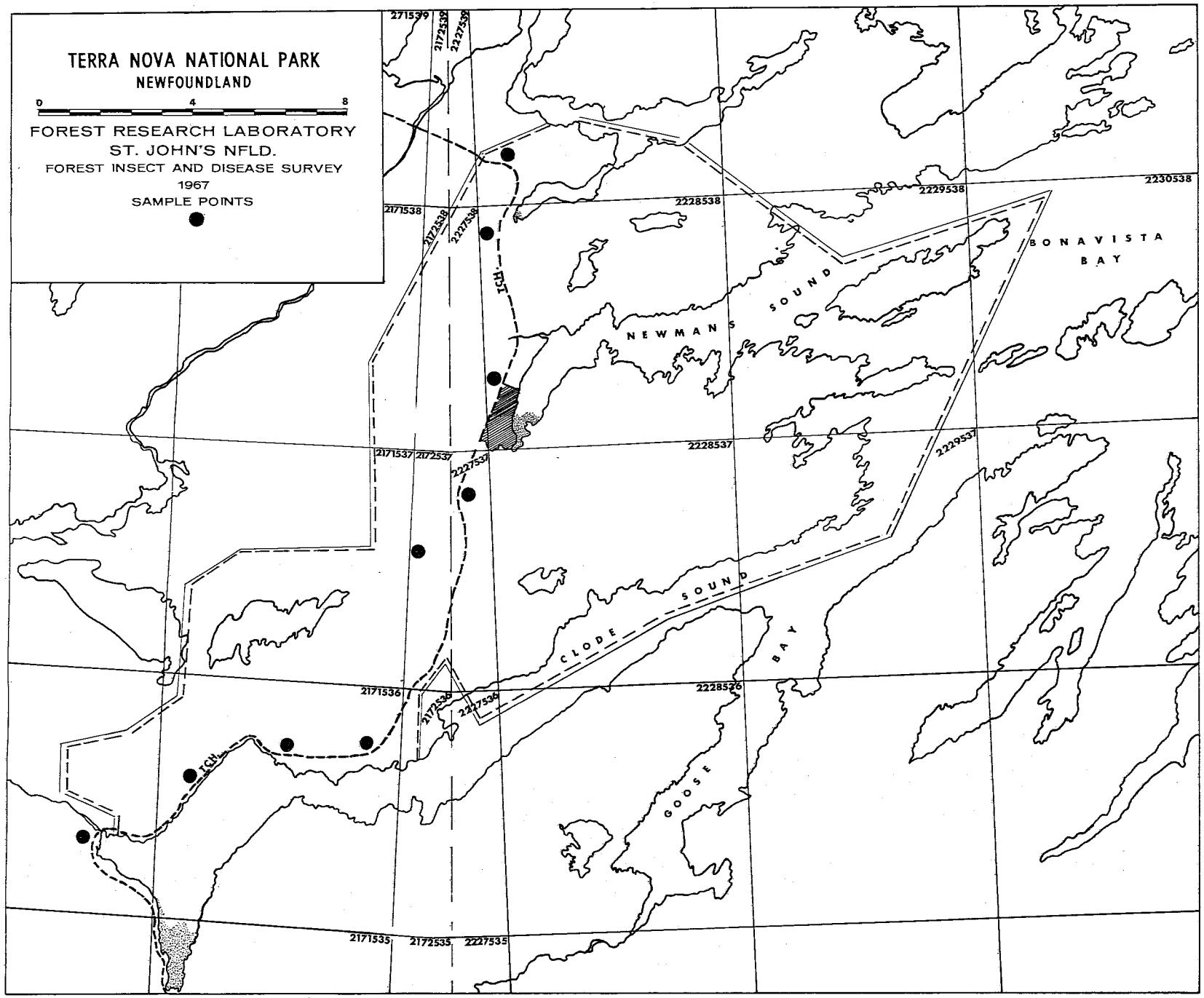
TERRA NOVA NATIONAL PARK
NEWFOUNDLAND
0 4 8
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1967
SAMPLE POINTS
TCH
NEWMANS SOUND
BONAVISTA BAY
CLODE SOUND
GOOSE BAY
2171539
2172539
2227539
2171538
2172538
2227538
2228538
2229538
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Fig. 4.

SECTION III
FOREST INSECT AND DISEASE SURVEY
DISTRICTS 105 AND 106-HERMITAGE AND GRAND FALLS

L.J. Clarke

INTRODUCTION

The cool, wet weather of early summer terminated around mid-June and was followed by a record-breaking warm, dry summer and fall. The general field program began in late May when technicians assisted Dr. J.R. Bider, MacDonald College in establishing a temporary field station and shrew study plots at Red Indian Lake. A 5-day fall shrew trapping period was carried out in November to check shrew populations in these study plots. Assistance also was given Mr. J. Follinsbee, Memorial University, who was conducting a study of the native field mouse Microtus pennsylvanicus terraenovae Bangs.

Surveys to determine forest insect and tree disease conditions commenced in these districts on July 10 and concluded with the annual aerial survey in October. A total of 325 insect and 30 disease samples were collected. The most noteworthy insect conditions on coniferous trees included the sudden occurrence of the hemlock looper outbreaks, advancement of balsam woolly aphid infestation boundaries and an increase in outbreaks of the larch sawfly. The most important pests of deciduous trees were the birch leaf miner, leaf-mining sawfly, alder leaf miner, satin moth and mourning-cloak butterfly.

There was a marked reduction in the incidence of tree foliage diseases from 1966 but Armillaria root rot continued to cause mortality to black spruce regeneration in the Sandy Lake, Badger area.

INSECT CONDITIONS

Balsam Woolly Aphid, Adelges piceae (Ratz.)--New spot outbreaks of this insect were discovered along the Trans Canada Highway immediately east of South Pond, Halls Bay; near Crooked Lake, 10 miles west of Badger; and at Red Cliff, 5 miles west of Grand Falls. The small infestation along the west side of Badger-Buchans road extended to the eastern side of the road. The infested stands on the west side of the road were cut by Price (Nfld.) Limited in 1966. The condition of aphid infested stands in the Lloyd's River and Red Indian Lake watersheds remained unchanged (Fig. 5).

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.)--Population levels of the hemlock looper reached outbreak proportion in 1967. A total of 7,290 acres were defoliated at four separate locations: Pamehac Brook, Badger; Greenwood Brook, Northwest Gander River; Caribou Pond, Southwest Gander River; and Conne River Pond, Baie D'Espoir. For additional information on hemlock looper infestations, see Section VII.

Collections	No. of larvae per tree sample
14	14

Larch Sawfly, Pristiphora erichsonii (Htg.)--Larch sawfly infestations continued to increase in central Newfoundland. In 1965 the outbreak around Red Indian Lake was estimated at 35 square miles, in 1966 the area increased to 100 square miles and in 1967 defoliation occurred over an area of some 250 square miles. This outbreak now occurs in stands along both sides of the lake and extends north throughout the South Brook watershed to Gull Pond. Larch sawfly infestations occurred along the Halls Bay road near Burnt Pond, and along the Trans Canada Highway from the junction of Baie Verte road to Indian Pond. Defoliation was also observed at Rocky Pond and Mark's Lake near North Twin Lake. Figure 6 shows the boundaries and intensity of the outbreak in central Newfoundland.

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

Location	Area infested	Maximum % defoliation
Harbour Round - Victoria River	65 sq. miles	90
Little Sandy Brook	5 sq. miles	75
Buchans Brook - Shanadithit Brook	60 sq. miles	70
Mary March Brook - Gull Pond	120 sq. miles	95
Burnt Pond (Halls Bay Rd.)	4 sq. miles	30
Long Pond - Rocky Pond	5 sq. miles	80
Baie Verte road - Indian Pond (Along T.C.H.)	4 sq. miles	30

Collections	No. larvae per tree sample
25	40

Larch Casebearer, Colephora laricella (Hbn.)--Larch casebearer population levels remained low in central Newfoundland. A summary of sampling data based on the number of casebearers on 30 fascicles per tree at 20-tree sampling stations follows:

Location	Stand vigor	Stand defoliation	Av. no. cases/sample	Av.dev.from 1966
6 miles from Badger (Buchans road)	V	Nil	1.7	+ 1.6
Buchans	"	"	0.6	+ 0.6
4 miles S.W. Buchans Jct.	"	"	0.5	---
6 miles S.W. Buchans Jct.	"	"	0.2	+ 0.1
Roberts Arm	MV	"	0.1	+ 0.1
Grand Falls	V	"	1.2	- 9.3

V = Vigorous; MV = Moderately vigorous

Collections	Av. no. cases per sample
5	0.5

Birch Leaf Miner, Fenusa pusilla (Lep.) and Birch Leaf-Mining Sawfly, Heterarthus nemoratus (Fall.)--These insects caused severe browning of roadside white birch along the Trans Canada Highway and secondary roads throughout central Newfoundland for the seventh consecutive year. The most severe injury occurred in small patches

along Roberts Arm road.

Collections	No. larvae per tree sample
14	156

European Alder Leaf Miner, Fenusa dohrnii (Tisch.)--This leaf miner was first recorded in central Newfoundland in 1959 and has been prevalent since that time. In 1967, the most noteworthy browning occurred along the Badger-Buchans road, and at Victoria Lake, Crescent Lake, Sandy Lake, Western Arm Brook, Charles Brook, Lake Douglas and St. Josephs Cove. Browning ranged from 40% to 90% in most of these areas.

Collections	No. larvae per tree sample
5	15

Satin Moth, Stilpnotia salicis (L.)--The satin moth caused complete defoliation to aspen, and balsam and Lombardy poplars in the town of Little Bay. This insect also caused 80% defoliation to Lombardy poplar and 100% defoliation to trembling aspen shade trees at Botwood. The parasite Apanteles solitarius Ratz., was common in all areas.

Collections	No. larvae per tree sample
5	15

Mountain Ash Sawfly, Pristiphora geniculata (Htg.)--Larvae of this sawfly caused severe defoliation to mountain ash shade trees at Botwood and Badger. Light to medium defoliation was also recorded along the Bay d'Espoir road near Rattling Brook.

Collections	No. larvae per tree sample
6	20

Aspen Leaf Miner, Phyllocnistis populiella (Chamb.)--An estimated 90% of the foliage of immature aspen trees were infested with this insect in the Halls Bay area. This outbreak was first recorded in 1965 and has increased annually. It presently extends from South Pond to Gull Pond along the Trans Canada Highway.

Collections	No. larvae per tree sample
20	24

Lacebugs, Corythucha sp.--Large collections of these insects were taken from speckled alder and willow along a 4-mile section of the old Rattling Brook road, from Rattling Brook Depot to the junction of the Baie D'Espoir road. Approximately 80% browning was recorded on both alder and willow.

Collections	No. larvae per tree sample
5	21

OTHER INSECTS RECORDED

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Adelges cooleyi (Gill) Spruce gall aphid	wS	Grand Falls	10.0	1
Adoxus obscuris Linn. Leaf beetle	fireweed	Crescent Lake, 4 mi. S. Kings Pt., 5 mi. S.W. Sandy Lake, Little Bay	11.9	4
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Victoria Lake Dam, Lemottes Brook, Sandy Brook, Sandy Lake Dam, Jct. Baie Verte Rd. & T.C.H., Halls Bay Rd.	0.50	6
Anoplodera rubrica (Say) A long-horned borer	bS	Badger Field Stn.	0.33	1
Clepsis persicana (Fitch.) White triangle leaf roller	bS	Jacksons Cove	0.33	1
Caripeta divisata Wlk. A spruce looper	bS, wS	2 mi. S.E. Lake Douglas, Kings Point; 10 mi. E. Baie Verte Rd., Stony Brook, 6 mi. W. Roberts Arm	0.33	5
Choristoneura fumiferana (Clem.) Spruce budworm	bF, bS	Cornfield Lake, Crescent Lake, Kings Point, Shanadithit Brook	0.33	4
Chrysomela falsa Brown Willow leaf beetle	W	South East Arm, Crescent Lake, Western Arm Brook, 10 mi. fr. Baie Verte Jct. T.C.H., Burnt Pond, Badger, Buchans Lake	36.00	12
Chrysomela mainensis (Bech.) Alder flea beetle	Al	8 mi. S. South Brk Halls Bay	1.0	1
Croesus latitarsus Nort. Dusky birch sawfly	wB	Badger Field Station	17.0	1

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Dimorphopteryx melanognathus (Rol.) A sawfly	yB	5 mi. N. Bay d'Espoir	2.3	1
Dioryctria reniculella Grote Spruce cone worm	bS	Wiley Brook, S.E. end of South Pond	0.33	2
Eucordylea atrupictella Dietz. A spruce needle miner	bS	24 mi. S. Badger, Buchans Hwy., Jct. Baie Verte Rd. & T.C.H., South Pond-Halls Bay, 6 mi. E. South Brk.-Halls Bay, South Pond-Halls Bay, 5 mi. N. South Brook-Roberts Arm Rd., 10 mi. E. Baie Verte Jct. on T.C.H., Red Indian Falls-Buchans Hwy.	1.2	8
Eupithecia sp. A brown spruce looper	bS, bF	Throughout district	0.58	26
Feralia jocosa (Guen.) Green striped caterpillar	bF, bS, wS	Tom Joe Brook, Lemottes Lake, Rushy Pond, Kings Point, 4 mi. S. of Pt. Leamington, 5 mi. N. of Bay d'Espoir, Western Arm Brook, Lake Ambrose	00.33	9
Galerucella sp. A leaf beetle	wB, Can. burnet	2 mi. N. of Victoria Dam	21.8	4
Griselda radicana (Wlshm.) Micro moth	bF, bS	Crescent Lake, Phillips Head	0.33	2
Hemichroa crocea Striped alder sawfly	Al	2 mi. S. Victoria Dam, Long Lake, Burnt Pond-Halls Bay Rd.	57.3	6
Herculia thymetuslis Wlk. Spruce coneworm	bS	4 mi. S. Bishops Falls on Bay d'Espoir Rd.	7.4	1

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Lucidota corrusca L. A firefly beetle	tL	Victoria Lake Dam	0.33	1
Melanophila fulvoguttata ((Harr.) Eastern hemlock borer	bS	Shanadithit Brook	0.33	1
Monochamus scutellatus Say. White-spotted sawyer	bS	Stony Brook	0.33	1
Nematus limbatus (Cress.) Willow sawfly	W	Long Lake Rd., 5 mi. N. Bay D'Espoir	55.6	3
Neodiprion abietis (Harr.) Balsam fir sawfly	bF	2 mi. fr. Kings Pt. on Jacksons Cov. Rd., Rattling Brk.-Kings Pt. Rd., 4 mi. S. Pt. Leamington	0.33	3
Nymphalis antiopa (L.) Mourning cloak butterfly	W	1 mi. E. Twin Lakes Rd., 10 mi. E. Baie Verte Jct. T.C.H., 6 mi. E. South Brk.-Old Halls Bay Rd., 2 mi. fr. Kings Pt.-Jacksons Cv. Rd.	19.6	9
Nyctobia limitaria Green balsam looper	wS, bF	Kings Pt., 6 mi. fr. Northern Arm on Pt. Leamington Rd., Cottrell's Cove, Tom Joe Brook, West Lake, Pamehac Brook, Rattling Brk.-Kings Pt. Rd.	0.33	8
Orgyia antiqua (Linn.) Rusty tussock moth	W, tA, bF, SAl	5 mi. N. Bay D'Espoir, 3 mi. E. South Brook-T.C.H., Western Arm, Cottrell's Cove, Aspen Pond, 24 mi. S. Badger on Buchans Hwy., Long Lake	1.1	10
Phratora purpurea Brown A leaf beetle	W	Crescent Lake	0.33	1

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Pristiphora lena Kincaid A spruce sawfly	bS, wS	4 mi. S.W. Lake Ambrose, 5 mi. E. South Brook, Pilleys Island, Cornfield Lake, 10 mi. S. Bisohops Falls-Bay D'Espoir Rd., 3 mi. E. South Brk., N.W. Gander River-Bay D'Espoir Rd.	0.83	10
Semiothisa sp. A looper	bS, L, bF	Throughout district	0.58	32
Semiothisa sexmaculata Green larch looper	L	Sandy Brook	0.67	1
Solenobia walshella Clem. A bagworm	bS, bF	5 mi. S.W. Sandy Lake, 2 mi. fr. Kings Pt. on-Jacksons Cove Rd., Crescent Lake	0.33	3

(Insects cont'd.)

Miscellaneous families	Host (s)	Locality	Av. per tree sample	No. of collections
Aphidae Aphids	W, bF	Leonards Lake, Sandy Lake Dam	35.3	2
Buprestidae Flat-headed wood borer	bS	Noel Pauls Brook	0.33	1
Cantharidae Leather-winged beetle	bS	6 mi. E. South Brook-Halls Bay	0.33	1
Cicadellidae Leaf hoppers	bF	15 mi. S. of Bishop's Falls-Bay D'Espoir Rd.	1.0	1
Coccinellidae Lady beetles	tL, bF	8 mi. S. of South Brook-Halls Bay, Pamehac Brook	0.33	2
Coleoptera A beetle	bS	Badger Field Station, 5 mi. E. of South Brook Roberts Arm Rd.	0.33	2
Geometridae A looper	tL, wS, bS, bF, wP, Al	Throughout district	2.4	20
Hymenoptera A sawfly	wB, Al, bF, bS	Throughout district	3.4	7
Ichneumonidae A parasite	wB	Badger Field Station	0.33	1
Liparidae Tussock moth	w. tA Lab. tea Al, wB	Throughout district	2.6	7
Noctcidae Noctuid moths	tA, W, tL, bS, Lab. tea	Throughout district	4.4	17

(Insects cont'd.)

Miscellaneous families	Host (s)	Locality	Av. per tree sample	No. of collections
Notodontidae A moth	W	Aspen Brook	0.33	1
Pamphiliidae A web-spinning sawfly	bF, wS	Twin Lakes Rd., Lake Ambrose	0.33	2
Papilionidae A swallowtail butterfly	bS, wS	Stony Brook, Cottrell's Cove	0.33	1
Syrphidae Flower flies	pCh	West Lake	1.33	1
Tenthredinidae A sawfly	wB, W	Throughout district	4.0	7

DISEASE CONDITIONS

Armillaria Root Rot, Armillaria mellea (Vahl. ex Fr.) Kummer--This root rot continued to cause mortality to immature black spruce along the Sandy Lake woods road 7 miles north of Sandy Lake. The affected trees occur in a 50 foot strip about five miles long. The area of the outbreak has not increased in size since 1965 but tree mortality is now estimated at 10%, about double that in 1964 when the damage was first discovered.

Needle Rust of Spruce, Chrysomyxa ledicola Lagerh. and C. ledi de Bary--A high incidence of needle rust on open grown immature black spruce occurred in a 4-square mile area, 10-miles north of Lake Ebbegunbaeg along the Lake Ambrose road. Yellowing of spruce foliage was estimated at 60%.

Needle Rust of Balsam Fir, Pucciniastrum pustulatum (Pers.) Diet and Milesia sp.--This disease infected about 40% of the new foliage of balsam fir seedlings in a 10-year-old cutover along the northeast end of Long Lake. The total area affected was estimated at one-half square mile.

OTHER DISEASES RECORDED

Organism	Host (s)	Locality	Remarks
Chrysomyxa arctostaphli Diet. Yellow witches' broom	bS	Badger	Medium
Cronartium ribicola J.C. Fischer White pine blister rust	wP	Throughout district	"
Dibotryon morbosum (Schw.) Theises and Syd. Black knot of cherry	pCh	Badger-Buchans Rd.	"
Gloeosporium apocruptum Ell. & Ev. Anthracnose of maple	moM	Aspen Brook	Low
Gymnosporangium sp. Rust	Se	Badger	Medium
Gymnosporangium cornutum Arth. ex Kern Leaf rust	Mo	Badger	Low
Hypodermella laricis Tub. Needle cast of tamarack	tL	Badger	"
Pollaccia radiosa (Lib.) Bald & Cif. and P. elegans Serv. Leaf & twig blight of poplar	tA	Charles Brook	Medium
Pollaccia saliciperda All. & Tub. Arx Willow blight	W	Indian River	Low

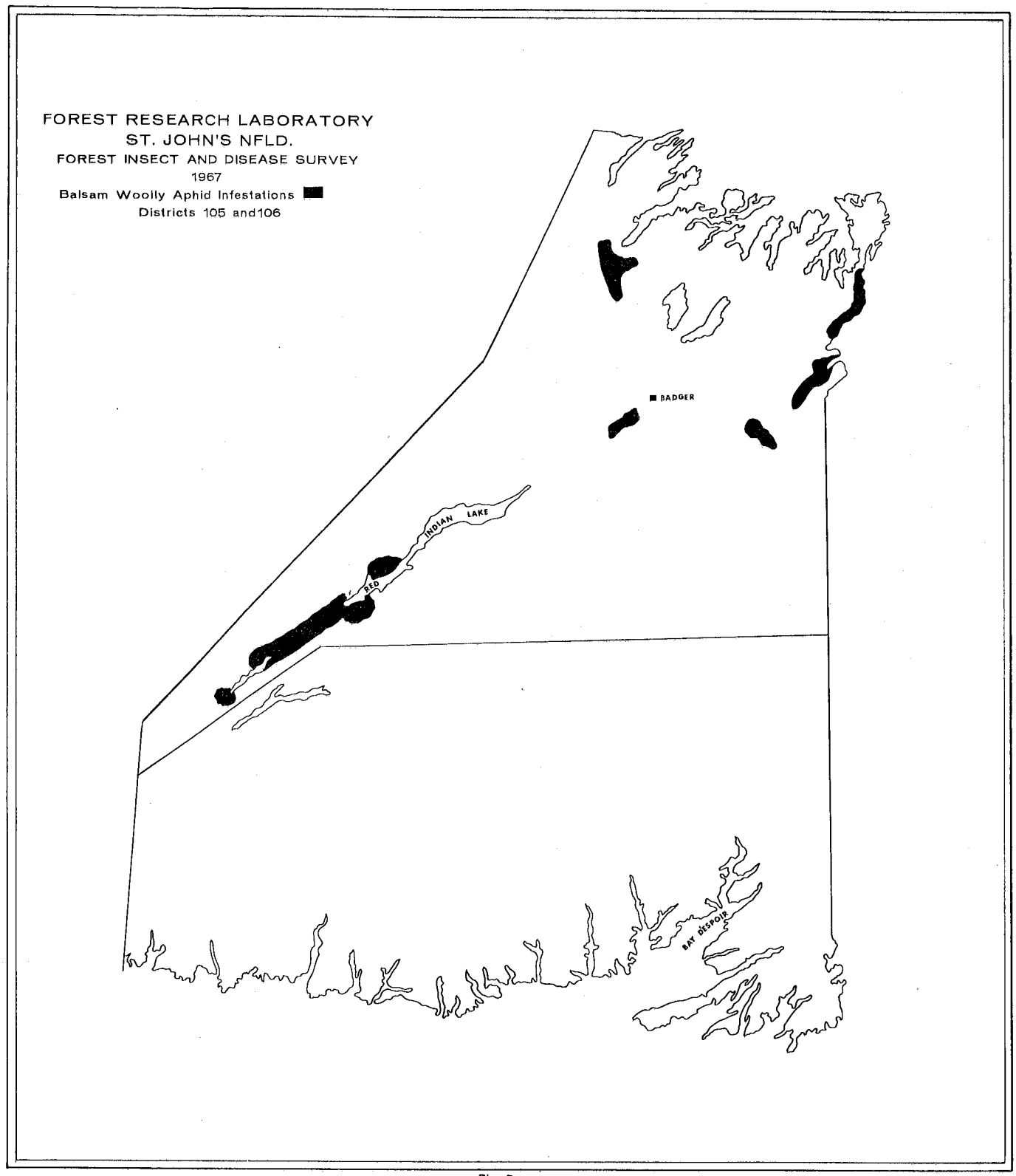
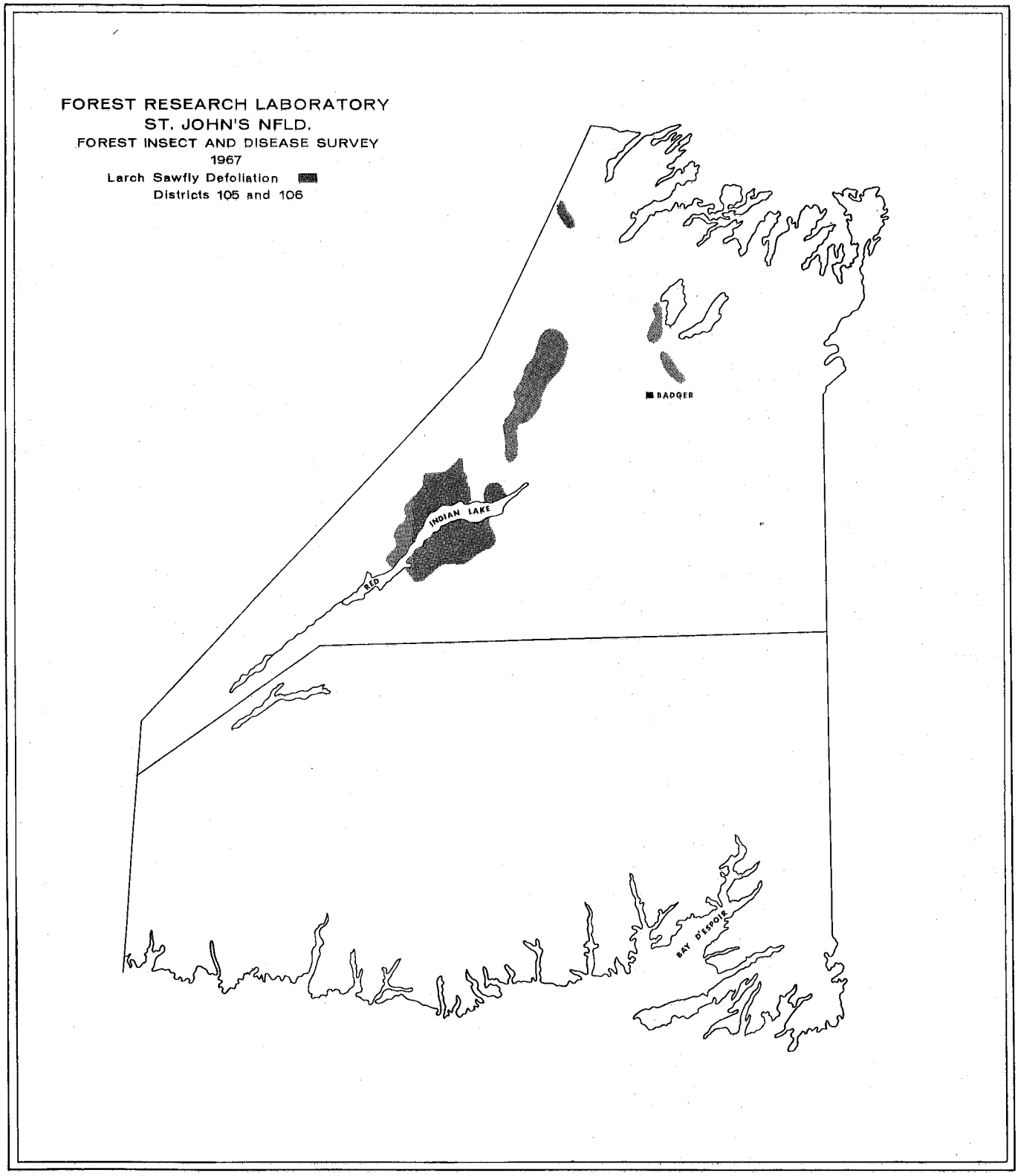

FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1967
Balsam Woolly Aphid Infestations
Districts 105 and106
BADGER
INDIAN LAKE
RED
BAY DESPOIR

Fig. 5.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FOREST INSECT AND DISEASE SURVEY
1967
Larch Sawfly Defoliation
Districts 105 and 106
BADGER
INDIAN LAKE
RED
BAY D'ESPOIR

Fig. 6.

SECTION IV

FOREST INSECT AND DISEASE SURVEY

DISTRICTS 107 AND 108 - ST. GEORGES AND HUMBER

W.J. Sutton

INTRODUCTION

Weather conditions on the west coast were abnormally cool and wet during the spring and early summer and tree and insect development were retarded during this period. Conditions changed in late June and July and August were the warmest and driest on record.

During the winter and spring, the writer supervised the construction of the departmental field station at Pasadena. Field activities began on May 15 when balsam woolly aphid estimates were recorded in the permanent sample plots at Steady Brook, Trout Brook, Lomond Road and Wild Cove. Two trips were made to Labrador during the summer. The first from June 19 to 22 to conduct a porcupine damage and general insect survey and the second from July 2 to July 19 to assist in fighting forest fires. During October and November the writer and J. Meades established plots at Serpentine Lake and collected preliminary data for a study of the effect of hemlock looper damage on stand deterioration.

The regular insect and disease collecting program began in western Newfoundland on June 19. A total of 418 insect and 18 disease collections were made in the Humber and St. Georges districts. The hemlock looper reached outbreak proportions in many watersheds in the St. Georges and Humber districts. There were no changes noted in the boundaries of the balsam woolly aphid infestations. Balsam fir sawfly population levels decreased in the Gallants - Spruce Brook area but increased in the Grand Lake and Long Lake areas. The European spruce sawfly was found in all areas of western Newfoundland but damage was light. The rusty tussock moth was widespread in both districts and was collected from many species of trees and shrubs but damage was negligible. Defoliation by the satin moth was severe on ornamental poplars in the city of Corner Brook. Birch casebearer population levels continuted to increase and caused severe damage to both mature and immature birch stands from Codroy Pond to Georges Lake.

No major disease symptoms were observed in western Newfoundland. However, a late frost in June caused some damage to mountain maple in the Codroy area. Black knot of cherry persisted but the incidence of new attacks was lower than in 1966. Needle Rust was severe on spruce trees at Bonne Bay.

INSECT CONDITIONS

Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.)--The hemlock looper reached outbreak proportions in 1967. Balsam fir was severely defoliated in many watersheds from Serpentine Lake to the Codroy Valley. (See Section VII for a detailed report on this insect).

Collections	No. larvae per tree sample
40	26.8

Balsam Woolly Aphid, Adelges piceae (Ratz.)--The boundaries of the balsam woolly aphid infestations in western Newfoundland remained the same as in 1966 (Fig. 7). Approximately 4,000 square miles of balsam fir forest in the Humber and St. Georges districts have now been infested. Although many of these stands have been harvested large areas containing damaged trees are still present in many watersheds between Cape Ray and Bonne Bay.

Balsam Fir Sawfly, Neodiprion abietis (Complex)--The balsam fir sawfly has been a persistent pest of balsam fir in the Gallants and Spruce Brook areas for the past 15 years. Population levels and percentage defoliation have varied considerably during this period. Defoliation was estimated as light in 1966 and was negligible in 1967. No samples of this insect were collected in stands at Long Lake during 1966 but 100 larvae per tree were collected in 1967 and defoliation was estimated at 65%. An increase was also recorded for the Flat Bay Brook area where only small numbers of larvae were collected in 1966 and 21.3 per tree were collected in 1967. A few larvae were also collected at Southwest Brook, Little Barachois Brook road, St. Georges, the Feeder Brook area and 3 miles east of Port aux Basques on the Trans Canada Highway.

Collections	No. larvae per tree sample
14	12.4

Larch Sawfly, Pristiphora erichsonii (Htg.)--One small outbreak of the larch sawfly was reported along Robinsons River in the St. Georges District. Defoliation was estimated at 75% over a 2-square mile area. No outbreaks were observed in the Humber District.

Collections	No. larvae per tree sample
9	7.4

Larch Casebearer, Coleophora laricella (Hbn.)--Population levels of this insect were estimated in only two areas in 1967. Branch samples collected in June produced an average of 2.8 cases per branch at South Branch and 3.0 at O'Regans. Casebearer larvae were also collected from a beating sample at Doyles. No browning was recorded anywhere in the St. Georges and Humber districts.

European Spruce Sawfly, Diprion hercyniae (Htg.)--The European spruce sawfly was found throughout the Humber and St. Georges districts (Fig. 8). Population levels were low and defoliation was negligible. The highest population levels were found at Irishtown where a total of 39 larvae were collected from three white spruce trees.

Collections	No. larvae per tree sample
36	2.4

Rusty Tussock Moth, Orgyia antiqua (Linn.)--The rusty tussock moth was found on many species of trees and shrubs throughout the St. Georges and Humber districts. The highest numbers of larvae occurred along Barachois Brook road where four larvae per tree were collected. During October large numbers of larvae were commonly seen migrating across Carters road, the highway between Stephenville Crossing and St. Georges, and on the Trans Canada Highway between Carters road and Flat Bay road.

Birch Casebearer, Coleophora fuscedinella (Zell.)--The birch casebearer was prevalent on white birch saplings and mature birch from Deer Lake to the Codroy Valley (Fig. 9). The most severe damage was recorded on roadside birch saplings from St. Georges to

the Codroy Valley where defoliation was recorded at 90% to 100% in mid-July. The most heavily defoliated mature birch occurred in the Spruce Brook area. However, varying degrees of browning was observed on all birch stands during the aerial survey of the forested areas between the Codroy Valley and the Humber Valley.

Satin Moth, Stilpnotia salicis (L.)--Satin moth larvae did not appear to be as numerous as they were in 1966 but severe damage was reported on ornamentals around Corner Brook with defoliation of 95% to 100% estimated on some Lombardy poplar trees.

Mountain Ash Sawfly, Pristiphora geniculata--The mountain ash sawfly was recorded in outbreak numbers in western Newfoundland for the first time since 1961. This insect was found wherever the host tree occurred and defoliation was severe. A high of 63 larvae was collected in one sample in the Lomond area.

Collections	No. larvae per tree sample
3	31.1

OTHER INSECTS RECORDED

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Acleris variana Black-headed budworm	bF	Cambells & Steel Mt. Rd.	0.5	2
Anomogyna perquiritata (Morr.) Grey spruce cutworm	bF	Crabbes River	1.0	1
Anoplonyx lutipes Marlatt's Larch sawfly	tL	Doyles to Corner Brook	0.4	3
Carythuca sp. Lace bugs	wB	Pynns Bk.	22.0	1
Caripeta divisata (Wek.) A spruce looper	bF, tL wS, Al	Whites Bk.Rd., Doyles, Point Au Mal, St. Andrews	0.4	5
Chrysomela falsa (Brown) Willow leaf beetle	Ch, tA	Summerside Rd., Grand Lake	85.5	2
Cimbex americana (Leach) Elm sawfly	wB	Gallants, Deer Lake	0.3	2
Compaea perlata (Guen.) Fringed looper	wB, yB, Al, Ch	Districts 107 & 108	1.1	10
Croesus latitarsus (Nort.) Dusky birch sawfly	wB	Spruce Brook, Pinch Gut, Grand Lake	1.1	3
Dimorphopteryx melanognathus (Roh.) A sawfly	yB, wB, wS, Al	Districts 107 & 108	1.8	14
Eupithecia sp. A brown spruce looper	bPo, wS, Al, bS, tL	Districts 107 & 108	0.8	53

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Fenusa dohrnii (Tisch.) European alder leaf miner	Al	Piccadilly, Point Au Mal	25.5	2
Feralia jocosa Guen. Green striped caterpillar	bF, bS, yB, aS, wS	Districts 107 & 108	0.3	27
Hemichroa crocea (Four.) Striped alder sawfly	wS, Ch, W, Al	McKays, Little Rapids, South Branch, Millville, St. Georges	0.8	7
Nematus limbatus (Cress.) Willow sawfly	w, Ch, M	Corner Brook, Jefferys, Pinch Gut, Flat Bay, Upper Ferry	12.7	6
Nymphalis antiopa (L.) Mounting-cloak butterfly	tA, w	Barachois Prov. Park, Robinsons	38.0	2
Orgyia antiqua (L.) Rusty tussock moth	yb, bPo, bF, AL, tL, D, RbE, RAS, wS, Pch, bS, Ch	Districts 107 & 108	0.9	50
Papilio glaucus canadensis (L.) Tiger swallowtail	tA, wb, AL, Ch	Grand Lake, Little Rapids, Lomond, Pynns Bk., Steady Bk.	0.6	6
Pikonema alaskensis (Roh.) Yellow-headed spruce sawfly	wS, bS	Port Au Port Pen., Robinsons, South Branch, Little Rapids	0.5	8
Pikonema dimmockii (Cress.) Green-headed spruce sawfly	wS, bS, As	Districts 107 & 108	0.5	18
Pristiphora lena (Kincaid) Spruce sawfly	bS, wS	Districts 107 & 108	0.3	10

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Semiothisa sexmaculata Pack Green larch looper	tL, wP, bF	St. Georges of Jefferys	1.5	8
Semiothisa sp. A looper	wS, wS, bF, tL, bS	Districts 107 & 108	1.1	38
Solenobia walshella (Clem.) A bagworm	bF, wS	Summerside, Steady Bk., St. Davids, Glenbourne, South Branch	0.4	5
Syneta sp. A leaf beetle	wB	Codroy	2.9	1
Tetraphleps sp. Predator of B.W.A.	AL	Robinsons	0.3	1
Tethida cordigera Beauv. Black-headed ash sawfly	As	Barachois Prov. Pk.	176.0	1
Trichiocampus irregularis (Dyar) A willow sawfly	W	Deer Lake	37.0	1

(Insects cont'd.)

Miscellaneous families	Host (s)	Locality	Av. of tree sample	No. of collections
Aphidae Aphids	wS, bPo	Cambells Creek, Whites Bk.	39.5	2
Cecidomyiidae Cone maggots	Ch, bS, bPo	Fishells, Millville, Summerside, Frenchmans Cove	5.3	4
Cimbicidae	wB, w	Doyles, South Branch	0.5	2
Curculionidae Weevils	wS, tL	Petries, Barachois Bk.	0.6	2
Elateridae Click beetles	wB	Codroy	1.0	1
Geometridae A looper	wB,sA,yB, bF,tA, M, Al,Ch,bS, MA,w, tL, wS	Districts 107 & 108	1.2	86
Liparidae Tussock moths	wB,bF,AL, D,yB,tL, Ch, As	Districts 107 & 108	1.2	37
Noctuidae Noctuid moths	tL,RbE,wB, w,yB,m,bPo, Ch,AL,AS, tA	Gallants to Upper Ferry	1.3	23
Pamphiliidae A web-spinning sawfly	bF,wB, wB,Al,wS, tA	Pynns Brook to Jefferys Bonne Bay to Jefferys	0.3 0.8	6 9
Sphingidae Sphinx moth	Cn, tA, w	Corner Brook,Doyles, Pinch Gut, Barachois Pk.	1.5	5

(Insects cont'd.)

Miscellaneous families	Host (s)	Locality	Av. per tree sample	No. of collections
Tenthredinidae Flower flies	tA, yB, wS, AL, As, w, Ch, bPo, D	Districts 107 & 108	2.9	41
Tortricidae Leaf rollers	wB, sA, bPo, AS, Ras, RM, tL, bF, Ch, E, W, M	Districts 107 & 108	1.7	37

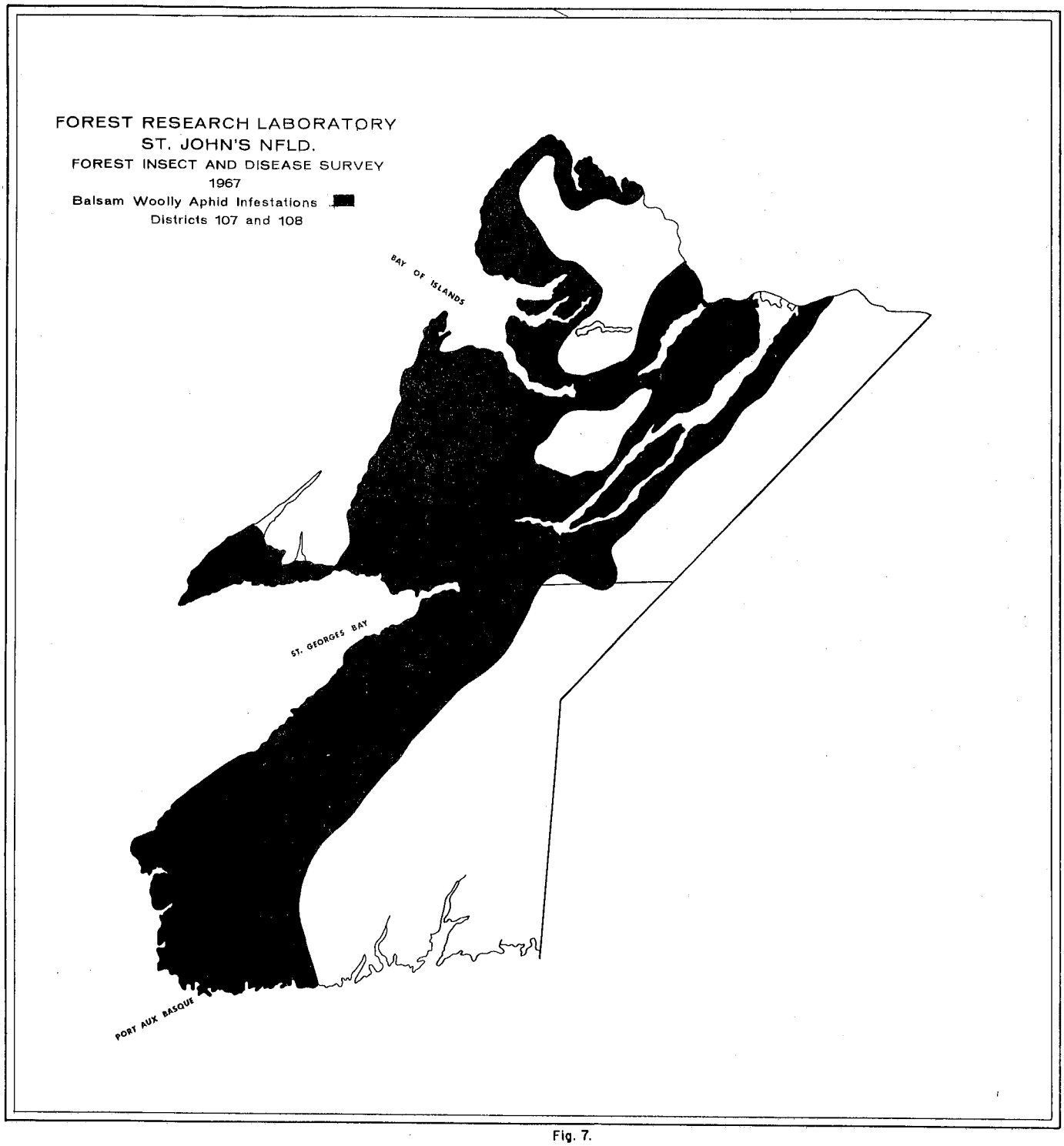
DISEASE CONDITIONS

Needle Cast of Balsam Fir, Bifusella faullii (Darker)--This disease was found in the Bonne Bay area and while it was severe on some trees was confined to small areas. The damage to the stand was estimated as light.

Frost Damage--A late frost in June caused moderate browning of foliage of mountain maple along the T.C.H. from Codroy Pond to Crabbes River. Foliage development and production were not seriously retarded.

OTHER DISEASE RECORDED

Organism	Host (s)	Locality	Remarks
Cronartium ribicola J.C. Fischer White pine blister rust	wP	Throughout districts	Medium
Dibotryon morbosum (Schw.) Theises and Syd. Black knot of cherry	pCh	Throughout districts	"
Gloeosporium apocruptum Ell. & Ev. Anthracnose of maple	moM	St. Davids Rd.	"
Phyllosticta minima (Berk & Curt.) Ell. & Ev. Leaf spot (Purple eye)	rM	Fishells River	Low
Pollaccia radiosa (Lib.) Bald. & Cif. and P. elegans Serv. Leaf & twig blight of poplar	Po	Fishells River	Medium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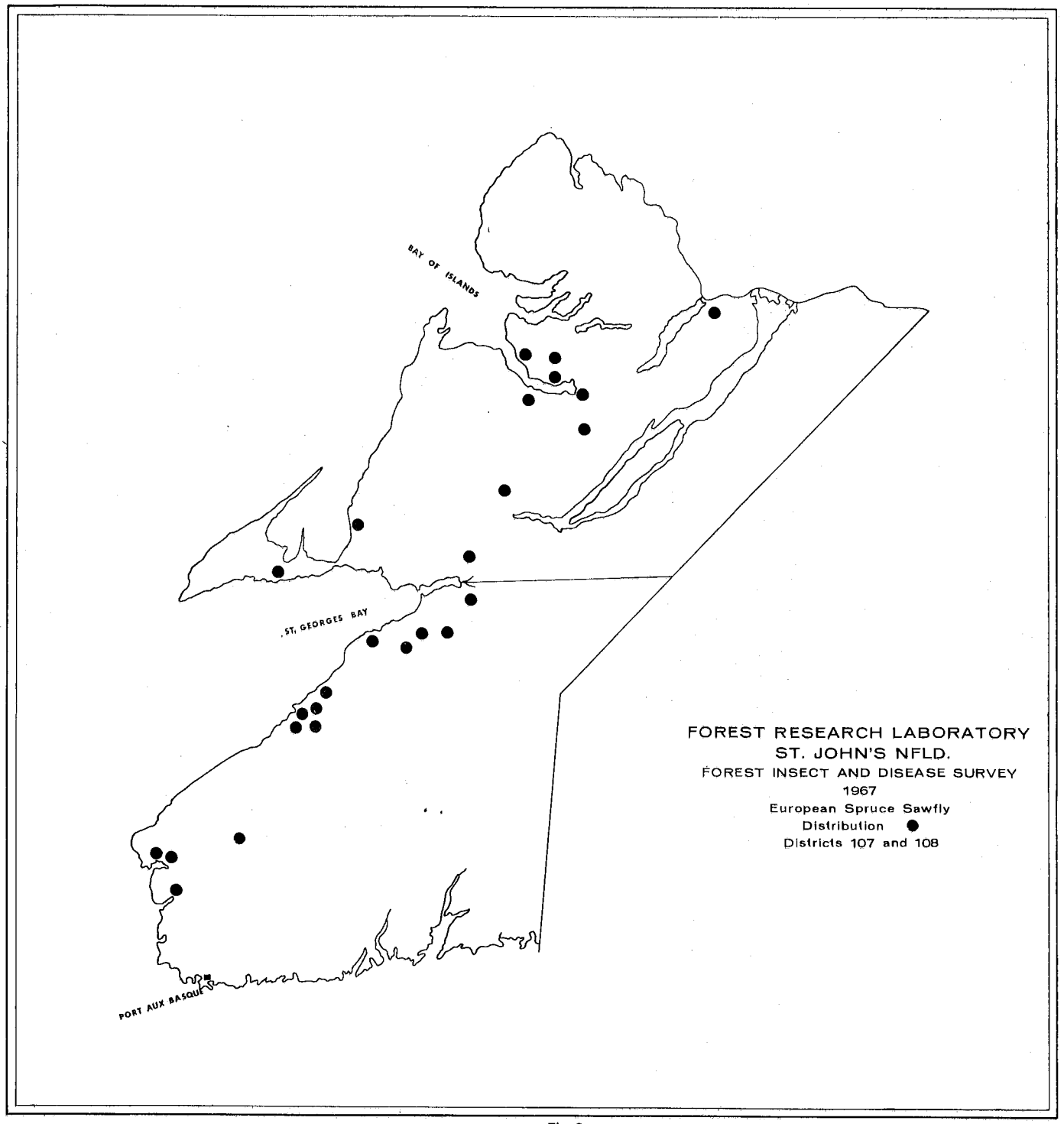
1967
Balsam Woolly Aphid Infestations
Districts 107 and 108
BAY OF ISLANDS
ST. GEORGES BAY
PORT AUX BASQUE

Fig. 7.


BAY OF ISLANDS
ST. GEORGES BAY
PORT AUX BASQUE
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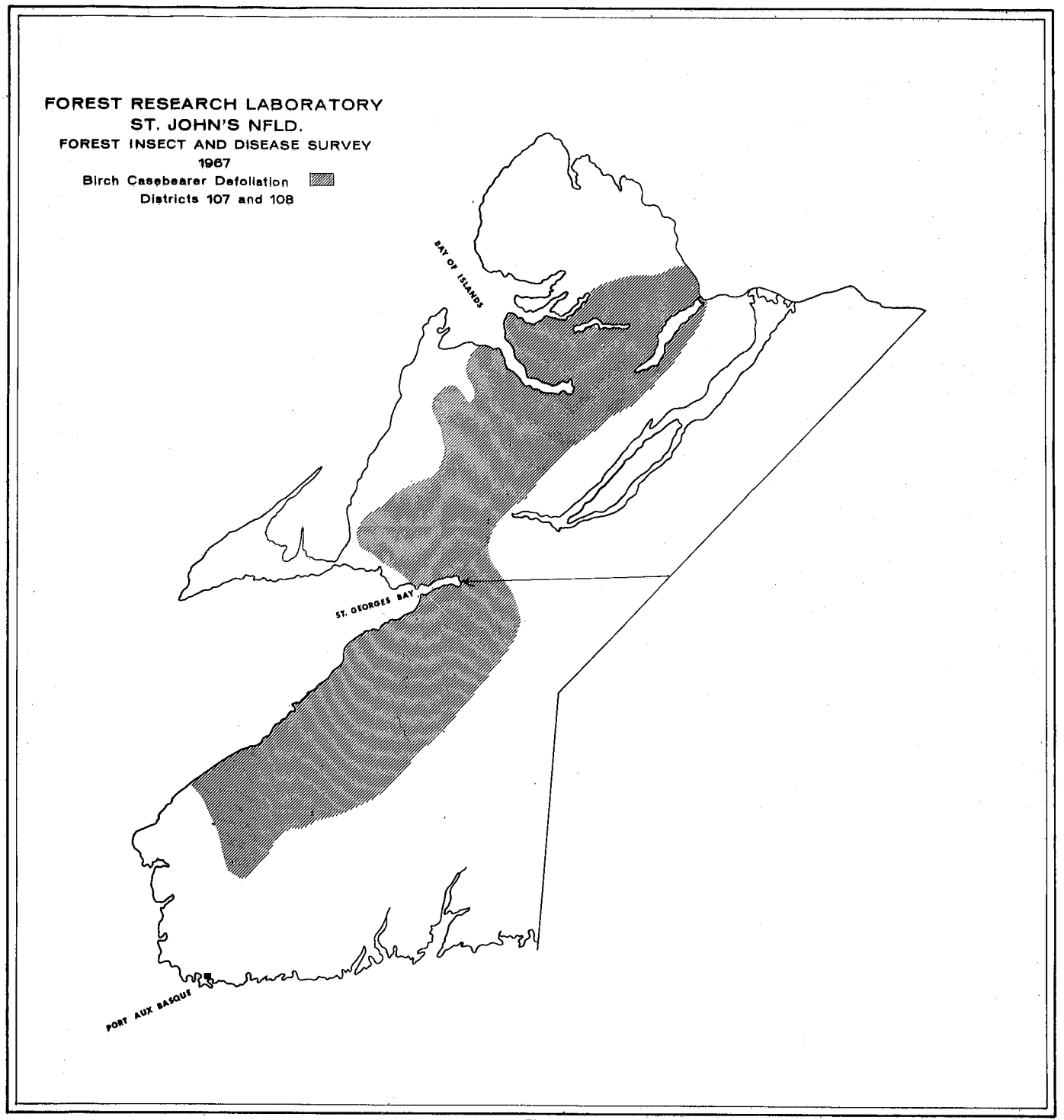
FOREST INSECT AND DISEASE SURVEY
1967
European Spruce Sawfly
Distribution
Districts 107 and 108

Fig. 8.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FOREST INSECT AND DISEASE SURVEY
1967
Birch Casebearer Defoliation
Districts 107 and 108
BAY OF ISLANDS
ST. GEORGES BAY
PORT AUX BASQUE

Fig. 9.

SECTION V

FOREST INSECT AND DISEASE SURVEY

DISTRICTS 109 AND 110 - WHITE BAY AND ST. BARBE

D.M. Stone

INTRODUCTION

Ideal weather conditions prevailed throughout the collecting season with temperatures above normal.

The annual insect and disease collecting and assessment program began on July 1 and terminated in August. A total of 316 insect and 10 disease collections were made. There were no major outbreaks in 1967. Surveys showed no evidence of balsam woolly aphid damage north of the principal infestation boundary at Norris Point, Bonne Bay. The European spruce sawfly was the most widely distributed insect but caused little damage. No hemlock looper infestations were present in these districts and only a few moths were observed in the Bonne Bay and Deer Lake areas. The larch sawfly caused medium to severe defoliation on tamarack on the Baie Verte and Northern Peninsulas. The birch leaf-miners and the willow leaf beetle were the principal defoliators of hardwoods.

INSECT CONDITIONS

Balsam Woolly Aphid, Adelges piceae (Ratz.)--There were no major changes in the boundaries of balsam woolly aphid infestations in these districts since 1965. Surveys showed no evidence of injury symptoms north of Deer Arm, Bonne Bay. A spot outbreak, recorded in 1965 at the narrows of Sandy and Birch lakes, has increased for a distance of 5 miles in an easterly direction along Birchy Lake (Fig. 10).

European Spruce Sawfly, Diprion hercyniae (Htg.)--This insect was the most widespread pest in these districts in 1967 (Fig. 11). Defoliation was estimated at 15 to 20 percent on white spruce at Eastern Arm in the Bonne Bay area and at Reidsville near Deer Lake. Low larval populations were observed on the Baie Verte Peninsula but defoliation was negligible. Diseased larvae was present in all collections.

Collections	No. larvae per tree sample
63	1

Larch Sawfly, Pristiphora erichsonii (Htg.)--Two separate small outbreaks of this sawfly were recorded in 1967. Collections averaged 12 larvae per tree and defoliation was estimated at 50% at Fournier Point, Hare Bay. Seventy-five percent defoliation occurred on mature tamarack for two miles along the Trans Canada Highway west from the junction of the Baie Verte road. Sawfly population levels also increased at Englee and River of Ponds on the Northern Peninsula and at Bear Cove and Nippers Harbour on the Baie Verte Peninsula. Less than 10% defoliation was estimated in all areas.

Collections	No. larvae per tree sample
7	16

Balsam Fir Sawfly, Neodiprion abietis complex--Larvae of this sawfly were common on immature balsam fir in the Sheffield Lake area but defoliation was light. A few larvae were collected throughout the Northern Peninsula but damage was negligible.

Collections	No. larvae per tree sample
11	.42

Spruce Budworm, Choristoneura fumiferana (Clem.)--Population levels of the spruce budworm remained low for the fourth consecutive year. Larvae were collected in low numbers at Reidsville, Birchy Lake, Hampden and along the northwest coast. No defoliation was recorded.

Collections	No. larvae per tree sample
10	.37

Birch Leaf Miner, Fenusa pusilla (Lep.) and Birch leafming sawfly, Heterarthrus nemoratus (Fall.)--These leaf miners were common along the Deer Lake and Main Dam roads and from Hampden Junction to Big Falls in the Upper Humber watershed. Browning of immature roadside white birch was severe in both areas. Browning was light along the coastal areas of Bonne Bay to St. Anthony.

Collections	No. larvae per tree sample
14	11

Willow Leaf Beetle, Chrysomela falsa Brown--Larvae were numerous on willow at Coles Pond and Rocky Pond in the White Bay District. Defoliation in these areas was recorded as 80% at Coles Pond and 40% at Rocky Pond. Elsewhere larvae were scarce and defoliation was negligible.

Collections	No. larvae per tree sample
7	15

OTHER INSECTS RECORDED

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Acleris variana (Fern.) Black-headed budworm	bF	Cow Head	1.00	1
Anoplodera nitens Forst. A long-horned beetle	bS, bF	Salmon Pond - Baie Verte Pen.	0.33	2
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Throughout district	0.90	4
Campaea perlata (Guen.) Fringed looper	wB	Cormack E.	0.33	1
Caripeta divisata Wlk. Grey spruce looper	bS, wB	White Bay District, Rocky Hr.	0.33	4
Chrysomela mainensis mainensis Bech. Alder leaf beetle	Al	S.E. Side of Deer Lake	10.0	2
Coleophora fuscedinella (Zell.) Birch casebearer	wB	Deer Lake, Barachois Pond	9.25	4
Coleophora laricella (Hbn.) Larch casebearer	tL	Deer Lake, River of Ponds	2.00	2
Dimorphopteryx melanognathus (Roh.) A sawfly	Al	Englee	2.33	1
Dioryctria reniculella (Grote.) Spruce coneworm	wS	Jct. of Reidsville & Bonne Bay Rds.	0.33	1
Eucordylea atrupictella (Dietz.) A spruce needle miner	bS, wS	Main Dam Rd., Reidsville	0.50	2
Eupithe ia sp. A brown spruce looper	bF, bS wS	Throughout district	0.44	31

(Insects cont'd.)

Species	Host (s)	Locality	Av. per tree sample	No. of collections
Fenusa dohrnii (Tisch.) European alder leaf miner	Al	Alexanders, Burlington, Baie Verte Jct.	12.8	3
Hemichroa crocea Four. Striped alder sawfly	Al	Adies Lake	16.9	1
Mindarus abietinus Koch. Balsam twig aphid	bF	White Bay district	27.6	4
Nematus limbatus (Cress.) Willow sawfly	W	Hampden, Deer Lake	9.75	2
Nyctobia limitaria (Wlk.) Green balsam looper	bF, wS	St. Barbe and White Bay districts	0.38	19
Orgyia antiqua (L.) Rusty tussock moth	bF, wB	Birchy Basin	0.26	4
Papilio ajax Linn. Black swallowtail	Wild parsnip	St. Barbe District	1.00	3
Pristiphora geniculata (Htg.) Mountain ash sawfly	Mo	3 mi. S.W. of Hawkes Bay	1.00	1
Solenobia walshella Clem. A bagworm	bS, bF	Throughout District	0.94	6
Tetraphleps sp. A predator	bS, bF	Throughout District	0.75	4
Zeiraphera diniana Gn. Douglas fir cone moth	tL	Big Falls	0.33	2

(Insects cont'd.)

Miscellaneous families	Host (s)	Locality	Av. per tree sample	No. of collections
Aphidae Aphids	bF, Al	Cormack E., Deer Lake	20.0	2
Cimbicidae Large sawflies	W, bF	Western Pond, Flatwater Pond	1.00	2
Hymenoptera A sawfly	bF	Sheffield Brk., T.C.H.	0.34	1
Liparidae A tussock moth	bF, bS	Deer Lake, Big Falls, Northern Penn.	0.54	5
Noctuidae A cutworm	wB, W, bF	White Bay District	0.33	12
Pamphiliidae A web-spinning sawfly	bF	Cow Head, White Bay District	0.38	7
Tenthredinidae A sawfly	bF, Al, W	Throughout district	0.85	9

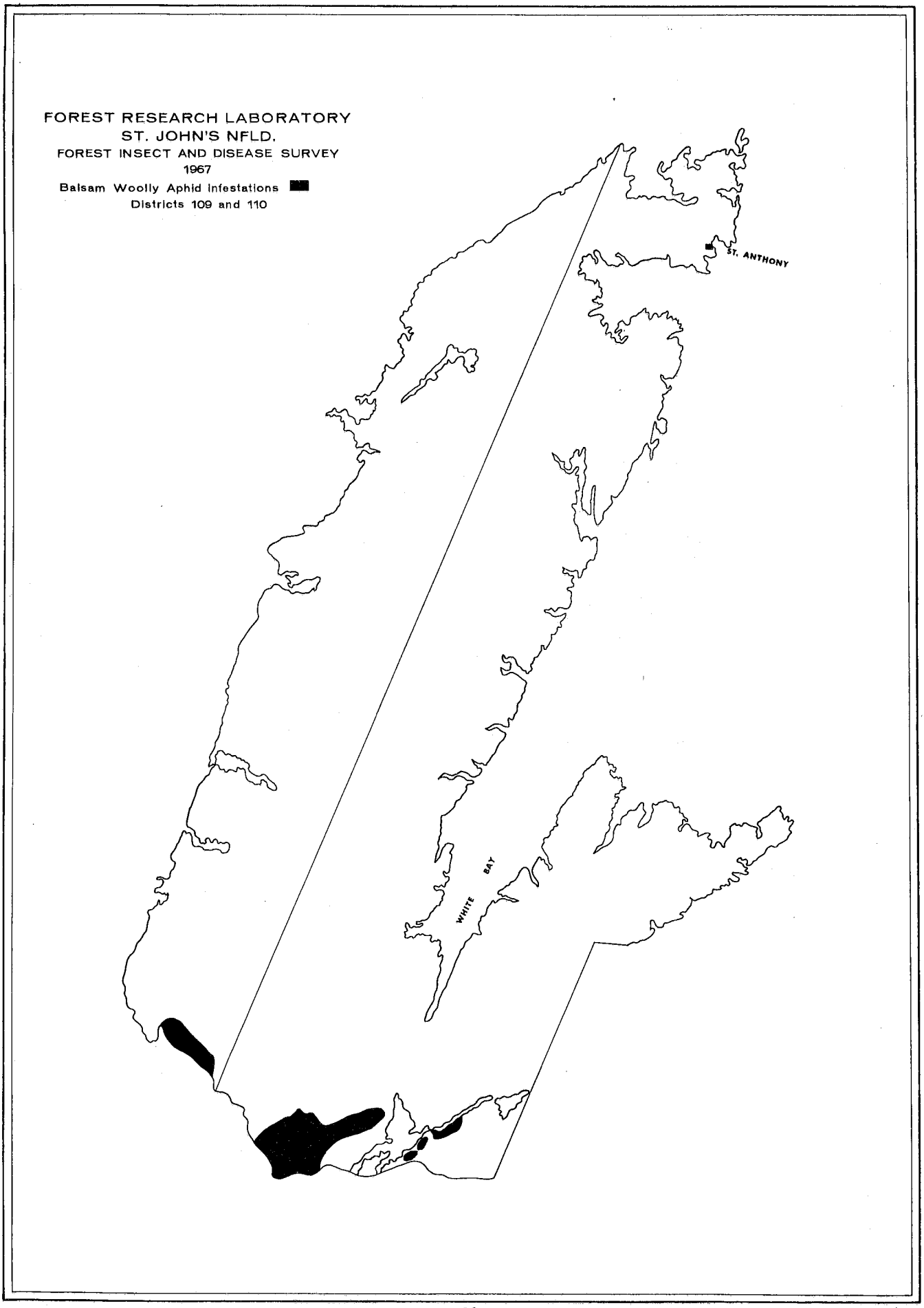
DISEASE CONDITIONS

Needle Rust of Spruce, Chrysomyxa ledicola Lagerh. and C. ledi de Bary--Two small outbreaks of these diseases were found at Hawkes Bay and Doctors Brook. Browning was recorded as 10% in a 1-acre area at Hawkes Bay and as 10% on several trees near Doctors Brook.

Ink Spot of Aspen, Ciborinia whetzelii (Seav.) Seav.--This disease was common along roads in the Upper Humber Watershed and on the Baie Verte Peninsula. Only light damage was observed on immature roadside trembling aspen.

OTHER DISEASES RECORDED

Organism	Host (s)	Locality	Remarks
Chrysomyxa ledicola (PK) Legerh. and C. ledi (A & S) de Bary Needle rusts of spruce	bS	Long Island	Low
Dibotryon morbosum (Schw.) Theises and Syd. Black knot of cherry	pCh	Throughout districts	"
Fomes ignarius (L.) Gill. White trunk rot	wB	Baie Verte Road	"
Gymnosporangium cornutum Arth. ex Kern Leaf rust	moM	Ten Mile Lake	Medium
Lenzites saepiaria (Wulf.) Brown pocket rot	bS	Sops Arm Prov. Park	Low
Phyllosticta mimima (Berk & Curt.) Ell. & Ev. Leaf spot (purple eye)	rM	Coachmans Cove	Medium
Polyporus tomentosus Fr. var. circinatus Red butt rot	wP	25 miles E. of Deer Lake on T.C.H.	Low
Pucciniastrum pustulatum (Pers.) Diet. and Milesia sp. Needle rusts of balsam fir	bF	8 miles S. of Ten Mile Lake	"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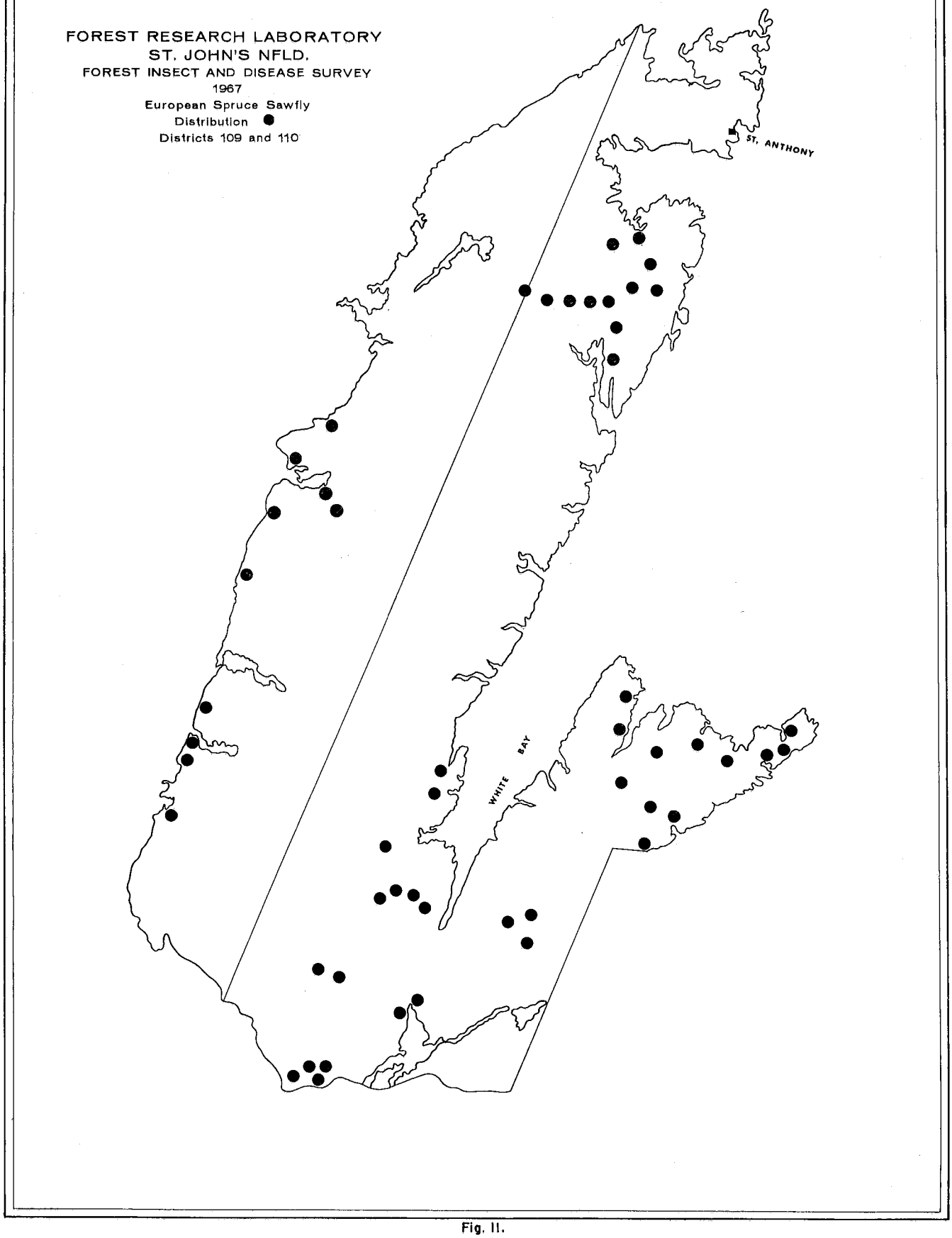
1967
Balsam Woolly Aphid Infestations
Districts 109 and 110
ST. ANTHONY
WHITE BAY

Fig. 10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FOREST INSECT AND DISEASE SURVEY
1967
European Spruce Sawfly
Distribution ●
Districts 109 and 110
ST. ANTHONY
WHITE BAY

Fig. 11.

SECTION VI
FOREST INSECT AND DISEASE SURVEY
LABRADOR

W.J. Sutton

INTRODUCTION

An aerial survey was conducted over about 1,000 square miles of the major forested areas of Labrador from June 22 to June 28. The purpose of the survey was to determine the extent of previously reported porcupine damage and to sample stands for insects and disease conditions. Ground checks were made where porcupine damage was evident and where landing conditions were favourable.

The survey was carried out in conjunction with one being conducted by Dr. Hustich, a plant ecologist from Finland, and Mr. W. Wilton, Liaison officer, of the Dept. of Forestry and Rural Development, Newfoundland Region.

INSECT AND DISEASE CONDITIONS

There was no evidence of defoliation on softwoods and the only insects collected included one undetermined sawfly from trembling aspen and a few leaf rollers on willow in the Salt Water Pond area.

No symptoms of disease, other than porcupine damage, were observed.

The Eastern Porcupine, Erethizon dorsatum picinum (Bangs)--The porcupine survey was primarily an aerial survey and included the major watersheds of the forested areas of eastern and central Labrador. One ground spot cruise was conducted at each four locations. Results of aerial and ground surveys are shown as follows:

Aerial Survey

Watersheds	Damage Assessment	Remarks
Kenamo	Light	Small area of watershed observed. Damage on scattered trees confined to river valley.
Eagle	Light to severe	Isolated pockets (not exceeding 2 acres) along southern end of river. Individual trees throughout river valley.
Paridise	Light	Scattered trees.
Alexis	Light	Scattered trees observed in Bobbys Pond area. Severe porcupine damage was previously reported in this area but the damaged stands have been cut.
Churchill	Light to severe	Scattered trees and isolated pockets throughout watershed east of Churchill Falls. Damaged areas did not exceed two acres and most were less than 1 acre. The damage occurred mainly on balsam fir.
Naskaupi	Light to severe	Scattered trees and a few isolated pockets. The most severe damage occurred in an area of approximately 2 acres at the junction of the Naskaupi and Red Wine Rivers. An estimated 60% mortality was recorded for this area.

Ground Spot Cruises

Location	Tree species	Av.dam. in ins.	Damage assessment % attacked	% dead	% dead Other causes	Remarks
Gull Pond	bF (9)	4.5	33	11	11	No fresh damage
	bs (18)	7.2	33	11	1	observed.
	wb (2)	5.0	0	0	0	
Churchill River (1)	bF (12)	4.3	50	17		No fresh damage
(25 mi. East	bs (12)	6.7	9	9		observed. Area
Churchill Falls)						approx. 1 acre.
Churchill River (2)	bF (26)	4.1	96	89		No fresh damage.
	bS (2)	3.5	0	0		
	wb (1)	5.0	0	0		
Eagle River	bF (18)	4.0	63	22	6	66% fresh
Near elevation	bs (4)	5.5	25	0	50	damage
1155						

Ground Observations

Location	Damage Assessment	Remarks
15 mi. West Goose Bay	Light to severe	One area of approximately 2 acres of severe fresh damage 15 miles on Churchill tote road. The stand consisted mainly of balsam fir and damage was most severe on smaller trees. Many of the damaged trees were completely gridled.
Salt Water Pond	Light	Stands were mainly black spruce and damage was very scattered and mostly light.

Observations indicate that porcupine damage occurs throughout the forested areas of Labrador. The severely damaged stands previously reported in the Alexis River area had been cut by Bowaters (Nfld.) Ltd. The most extensive and severe damage occurred along the Churchill River where 96% of the balsam fir had been attacked and 89% killed. However, the only evidence of fresh porcupine damage found during the ground survey was in the Eagle River and the Churchill tote road areas. It appears from the results of this survey that porcupine population levels are either sporadic or on the decline in the eastern and central Labrador.

SECTION VII
SPECIAL SURVEY
EASTERN HEMLOCK LOOPER
(Lambdina fiscellaria fiscellaria (Guen.)

L.J. Clarke

INTRODUCTION

Climatic conditions over the past two years have been exceptionally favourable for most forest insects including the hemlock looper. As a result there have been marked increases in population levels of the looper throughout the Province especially in Western Newfoundland. The highest percentage of balsam fir forests occur on the west coast where periodic looper outbreaks have been reported since 1912. Forest Insect and Disease Survey district technicians, assisted by two foresters from Bowaters (Nfld.) Limited, conducted an aerial and ground detection and appraisal surveys of the outbreaks for 1967. Data from these surveys were used to determine what stands should be salvaged immediately and to provide information on hazard potential forming the basis for a possible chemical control program.

SURVEY METHODS

In early September a preliminary aerial survey was made in a Cessna 185 aircraft over all forested areas throughout the Province. Boundaries of looper infestations were mapped from observed defoliation. Following the preliminary survey a survey was conducted to assess damage in all defoliated areas and for detection in susceptible stands (stands comprised primarily of mature, over-mature or balsam woolly aphid infested fir). Figures 12 and 13 show locations where samples were taken. This latter survey began in western Newfoundland on September 16 and concluded in central Newfoundland on October 13. A Hellier helicopter, a boat and three station wagons were used to transport crews to the survey areas. Flight lines were inscribed on topographic maps where cruise lines and check points were needed and work was programmed daily. Six field personnel were divided

into three two-man crews. One crew stayed with the helicopter and worked in readily accessible stands. The remaining crews were flown to less accessible areas and transferred twice daily. Where possible the survey was conducted by motor vehicle and occasionally by boat. Hemlock looper defoliation, balsam woolly aphid damage, stand composition and tree sizes were included in the tally. Four survey methods were devised and used as follows:

Detection Survey

Stands were examined at 2-5-10 or more miles beyond defoliated stands. If defoliation was observed tree height, d.b.h., balsam woolly aphid damage and percentage looper defoliation were recorded on 25 mature balsam fir trees. If no defoliation was observed tree height, d.b.h. and aphid damage was recorded on at least 10 mature fir trees. The ground, the bark of white birch trees, and old stumps were checked for moths. Relative abundance of moths was indicated as not present (-), a few (+) or numerous (+1). Detection surveys were conducted in the following watersheds:

Western Newfoundland

Lomond Road, Goose Arm Road and Snug Harbour
South Brook Valley and Grand Lake Road
Eastern Lake Road
Little Georges Lake Road
Little Georges Lake to Corner Brook Lake
Serpentine Lake to Stag Hill and the west end of Grand Lake
Crescent Pond Road
Island Pond Road
Gallants and Spruce Brook roads
Bottom Brook and Lower Grand Lake
Southwest Brook to Lloyds Lake
Flat Bay and Little Barachois brooks
Fishells and Robinsons rivers
Crabbs River and the North Branch of Codroy River
Anguille Mountains

Central Newfoundland

King George IV Lake and Upper Lloyds River

Central Newfoundland Cont'd.

Lloyds Lake and Star Lake
Lower Lloyds Lake to Sheffield and Red Indian Lakes
Star Lake and Pamehac Brook
Grand Falls and New Bay Lake
North Twin Lake and Burnt Berry Brook
Kittys Brook and Birchy Lake

Appraisal Survey

Tree species, height, d.b.h., looper defoliation and balsam woolly aphid damage were recorded in 8 feet by 10 chain cruise strips in mature balsam fir stands having varying degrees of looper defoliation. This survey was conducted in the following watersheds:

Western Newfoundland

Camp 33 Road Grand Lake
Bottom Brook
Southwest Brook
Little Barachois Brook
Flat Bay Brook
Fishells River
Robinsons River and Northern Feeder
Barachois Brook
Crabbes River
Highlands River
*North Branch of the Codroy River

DISTRIBUTION AND ASSESSMENT

Surveys showed that 161,790 acres of balsam fir were defoliated throughout the Province. A total of 151,000 acres were defoliated on the West Coast, approximately 7,290 acres at four separate locations in central Newfoundland, and 3,500 acres at one location in eastern Newfoundland (Fig. 14). A summary of the acreage defoliated in 1967 in various watersheds follows:

Western Newfoundland

Location	Estimated Defoliation Acres
Serpentine Lake	6,400
Bottom Brook	10,240

Location	Estimated Defoliation Acres
Western Newfoundland Cont'd.	
St. Georges River	2,560
Southwest Brook	20,480
Little Barachois Brook	20,500
Birchy Brook	640
Flat Bay Brook	3,200
Journois Brook	640
Fishells Brook	10,750
Northern Feeder and Robinsons River	29,000
Barachois Brook	15,360
Crabbes River	16,890
Highlands	640
Highlands River	5,000
North Branch	4,500
Anguille Mountain	1,200
Coal Brook to South Branch	1,800
Little Codroy Pond	1,200
Central Newfoundland	
Badger	3,000
Greenwood Brook (N.W. Gander River)	450
Caribou Pond (S.W. Gander River)	2,560
Conne Pond (Baie D'Espoir)	1,280
Eastern Newfoundland	
Deer Arm (Trinity Bay)	3,500

Defoliation estimates from aerial surveys indicated that the most severe damage occurred in the Little Barachois Brook, Robinsons and Crabbes river watersheds. Results of ground cruises (Table I) verify these previous estimates and illustrate the damage accrued in the other defoliated watersheds on the west coast. No assessment cruises were conducted in defoliated stands in central or eastern areas.

Summary of hemlock looper and balsam woolly aphid damage, conducted in looper defoliated stands in western Newfoundland, 1967.

Watershed	Av. Height	Av. D.B.H.	Balsam woolly aphid damage	Hemlock looper defoliation %
Bottom Brook	32	6	Light	15
" "	32	5	"	17
" "	37	6	Medium	38
" "	34	6	"	20
North Branch	39	6	Light	10
" "	42	6	---	3
" "	39	10	Medium	2
Crabbes River	34	6	Light	87
" "	41	6	"	87
" "	33	9	"	[illegible]
" "	34	6	"	20
Northern Feeder	31	4	"	1
" "	40	5	"	16
Fishells River	39	6	"	60
" "	33	6	"	20
" "	33	7	Medium	20
" "	36	6	Light	10
" "	34	7	"	20
Flat Bay Brook	30	5	Medium	10
" " "	32	5	"	70
Southwest Brook	38	8	Light	30
" "	32	5	Medium	20
" "	35	6	Light	50
" "	36	6	Light	20
" "	29	5	"	25
" "	40	7	"	10
Grand Lake (Camp 33)	40	6	"	5
Highlands River	44	6	Medium	2
Little Georges Lake	46	6	Light	15
Robinsons River	35	6	"	25
" "	49	11	"	45

Watershed	Av. Height	Av. D.B.H.	Balsam woolly aphid damage	Hemlock looper defoliation %
Barachois Brook	48	3	Light	55
" "	41	7	"	80
Little Barachois Brook	33	8	"	40
" " "	37	8	Medium	95

Table II shows the looper conditions in stands sampled (Fig. 11 and 12) outside the boundary of the defoliated areas. These data show that trace to light defoliation occurred at various locations and moths were numerous in other areas even though trees were not defoliated. In general, fewer moths were found as the distance from defoliated areas increased and no moths were found at most sample points north of Corner Brook in western Newfoundland and west of Red Indian Lake in central Newfoundland. The results of this survey indicate that the looper outbreak will continue through 1968 and the boundaries of defoliated areas will be greatly enlarged.

TABLE II

Summary of data from detection survey outside the boundaries of hemlock looper infestations in western and central Newfoundland.

Watershed	Av. trees sampled	Av. tree height	Av. tree D.B.H.	Av. Hemlock looper defoliation %	Remarks
Western Newfoundland					
Bottom Brook	13	45	8	Nil	Few moths
" "	25	45	8	2	Numerous moths
North Branch	17	36	6	Nil	" "
Crabbes River	13	50	9	"	" "
" "	25	40	7	1	Few moths
Fishells River	15	45	8	Nil	Numerous moths
Flat Bay Brook	25	36	6	3	" "
Southwest Brook	15	36	6	Nil	" "
Grand Lake	25	44	7	5	" "
Robinsons River	13	47	9	Nil	" "
" "	25	41	6	1	" "

Watershed	Av. trees sampled	Av. tree height	Av. tree D.B.H.	Av. Hemlock looper defoliation %	Remarks
Barachois Brook	13	39	7	Nil	Few moths
" "	25	48	9	4	Numerous moths
" "	25	49	8	1	" "
Little Barachois Brook	16	43	8	Nil	" "
Little Georges Lake	15	48	7	"	Few moths
Corner Brook Lake	8	38	7	"	" "
Upper Serpentine River	10	38	7	"	" "
" " "	17	51	9	"	" "
Lower Serpentine River	15	18	5	"	Numerous moths
Gallants	25	36	6	1	Few moths
Spruce Brook	25	42	7	1	Few moths
Island Pond	25	36	6	1	" "
Crescent Pond	25	45	8	1	" "
Eastern Lake	25	40	8	1	" "
Corner Brook Lake	25	38	8	Nil	Nil "
South Brook Valley	25	38	7	"	" "
North Pond - Goose Arm	25	40	6	"	" "
Raft Pond - Goose Arm	25	36	6	"	Few moths
Nicholsville - Deer Lake	25	36	6	"	Nil "
Lomond Road (5 miles N. Deer Lake)	25	33	6	"	" "
Lomond River	25	34	6	"	" "
4 miles S. of Lomond	25	38	7	"	" "
Lomond	25	41	7	"	" "
Little Bonne Bay Pond	25	39	6	"	" "
Big Bonne Bay Pond	25	38	7	"	Few "
<u>Central Newfoundland</u>					
Lloyds River	25	55	9	2	Numerous moths
Lloyds Lake	15	46	9	Nil	" "
Bottle Pond	13	40	6	"	Few moths
King George IV Lake	9	47	8	"	" "
Star Lake	15	40	7	"	" "
Star River	15	38	6	"	Nil "

Watershed	Av. trees sampled	Av. tree height	Av. tree D.B.H.	Av. Hemlock looper defoliation %	Remarks
Shandithit Brook	17	50	8	Nil	Few moths
Pamahae Brook	17	39	6	"	Numerous moths
Burnt Berry Brook	12	40	7	"	Nil moths
Kittys Brook	15	48	8	"	" "

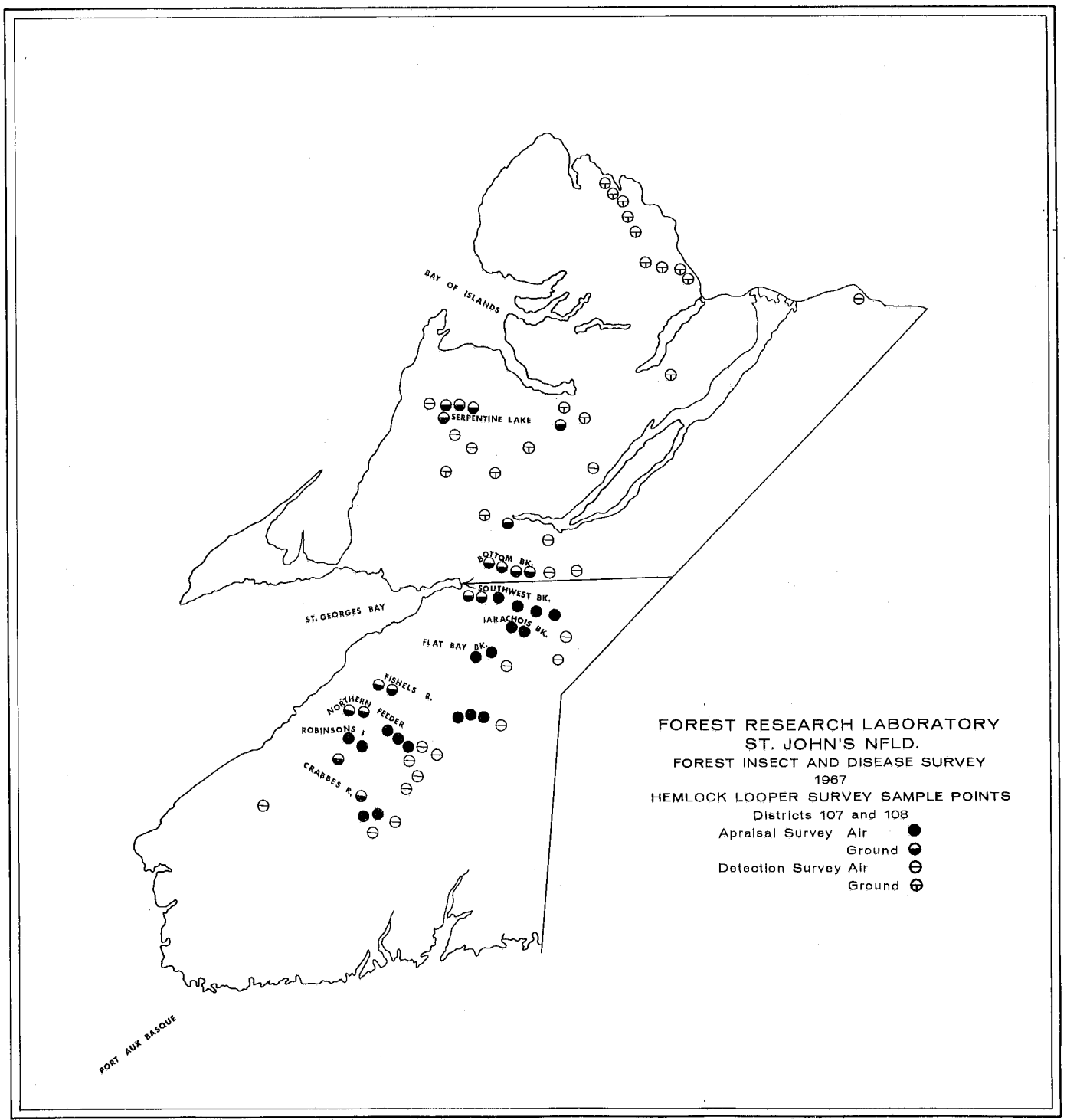
BAY OF ISLANDS
SERPENTINE LAKE
BOTTOM BK.
SOUTHWEST BK.
JARACHOIS BK.
ST. GEORGES BAY
FLAT BAY BK.
FISHELS R.
NORTHERN FEEDER
ROBINSONS R.
CRABBES R.
PORT AUX BASQUE
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1967
HEMLOCK LOOPER SURVEY SAMPLE POINTS
Districts 107 and 108
Apraisal Survey Air
Ground
Detection Survey Air
Ground

Fig. 12.

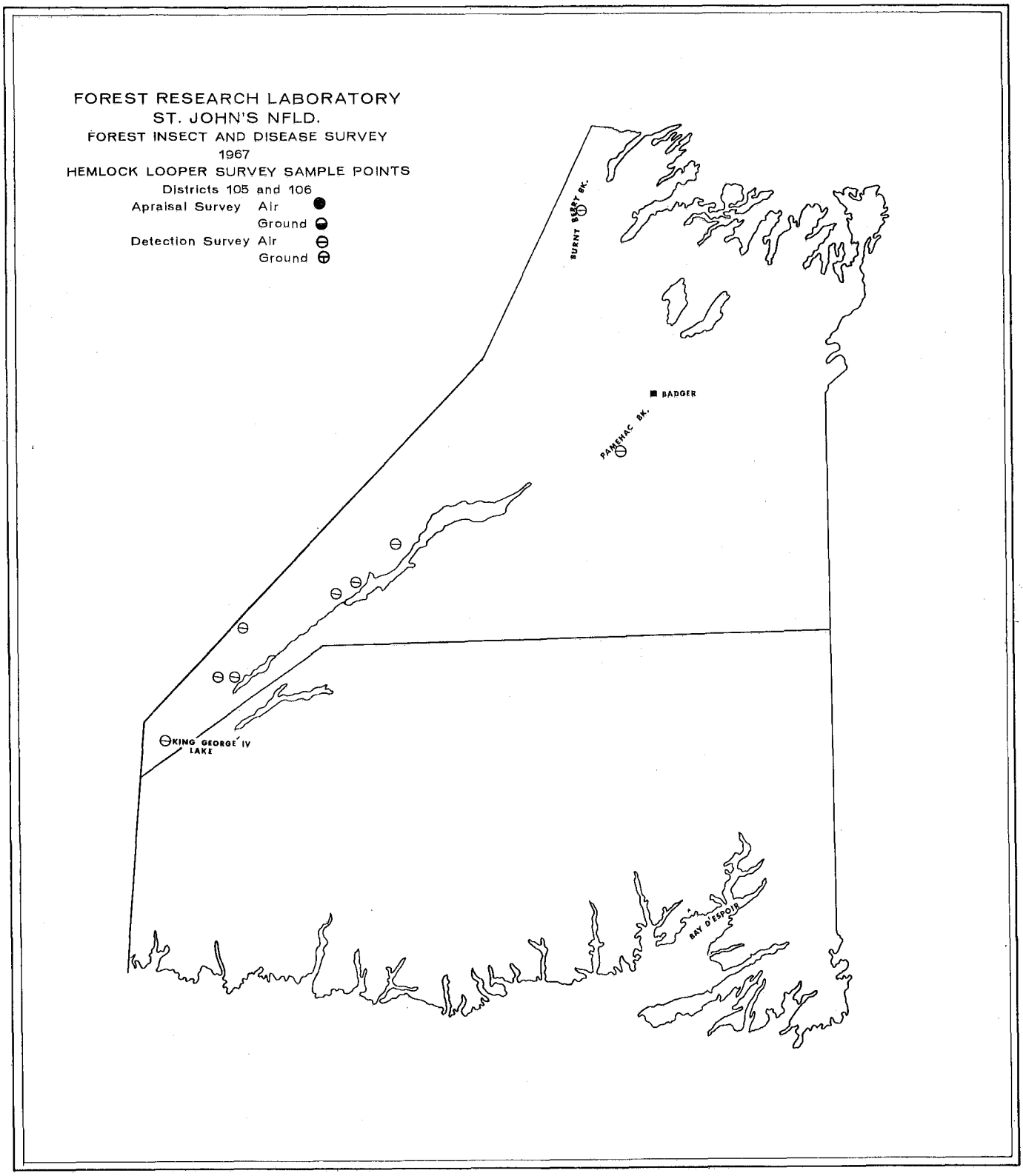
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1967
HEMLOCK LOOPER SURVEY SAMPLE POINTS
Districts 105 and 106
Apraisal Survey Air
Ground
Detection Survey Air
Ground
BURNT BEEF BK.
BADGER
PAMEHAC BK.
KING GEORGE IV LAKE
BAY D'ESPOIR

Fig. 13.

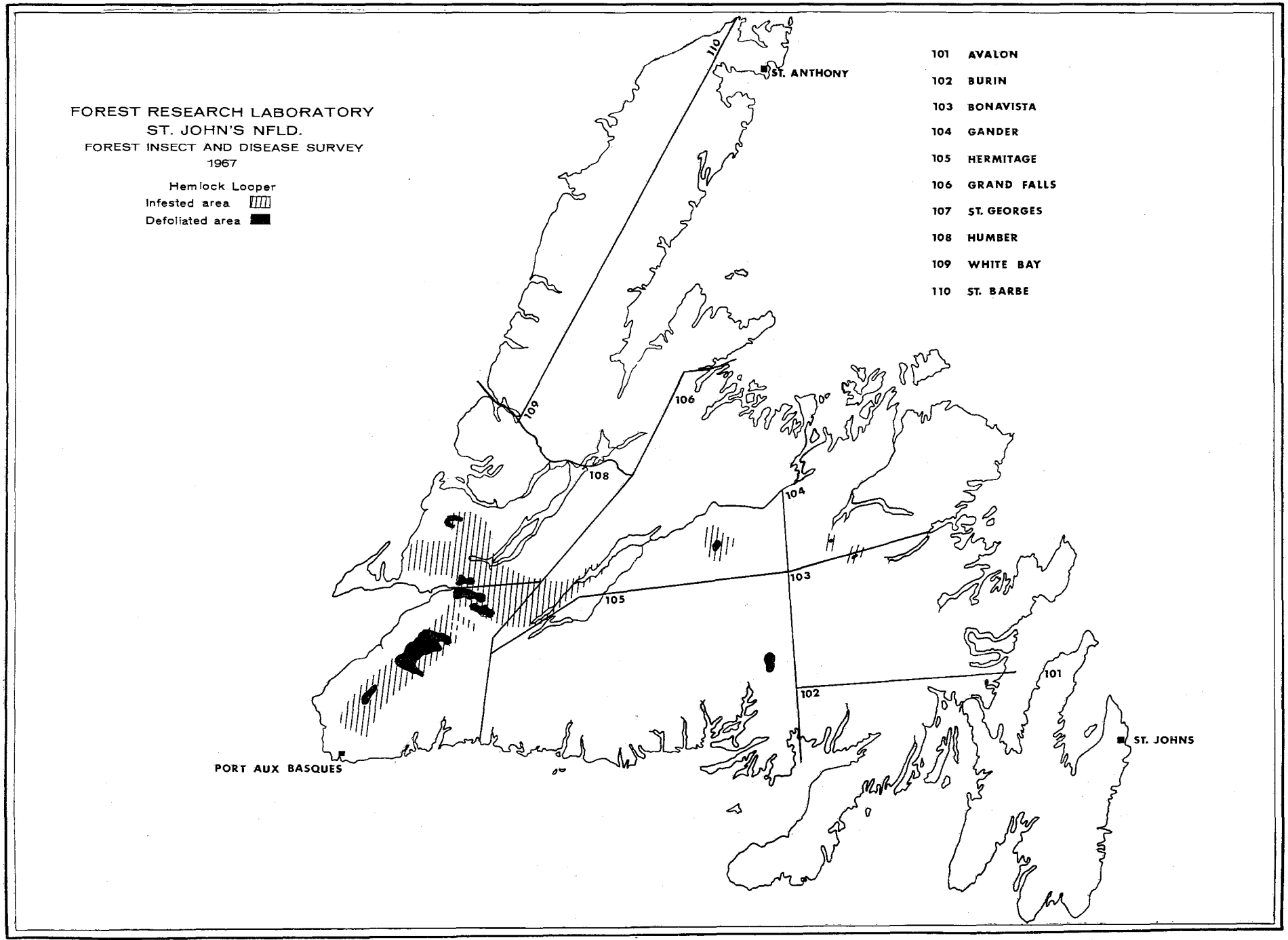
FOREST RESEARCH LABORATORY
ST. JOHN'S NFLD.
FOREST INSECT AND DISEASE SURVEY
1967
Hemlock Looper
Infested area
Defoliated area
101 AVALON
102 BURIN
103 BONAVISTA
104 GANDER
105 HERMITAGE
106 GRAND FALLS
107 ST. GEORGES
108 HUMBER
109 WHITE BAY
110 ST. BARBE
ST. ANTHONY
PORT AUX BASQUES
ST. JOHNS

Fig.14

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