Fisheries & Environment

Forestry Service

1978 ANNUAL DISTRICT REPORT FOREST INSECT AND DISEASE SURVEY NEWFOUNDLAND

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

NEWFOUNDLAND FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
INFORMATION REPORT N-X-168

MARCH 1979

ABSTRACT

This report gives a detailed account of the major forest insects and diseases of Newfoundland and Labrador in 1978 and tabulates the other noteworthy pests of the region.

RÉSUMÉ

Ce rapport donne un exposé détaillé des principaux insectes et maladies des forêts de Terre-Neuve et du Labrador en 1978. Il liste les autres agents nuisibles qui sont importants pour la région.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1978 ANNUAL DISTRICT REPORT FOREST INSECT AND DISEASE SURVEY NEWFOUNDLAND

by

L.J. Clarke, E.C. Banfield, W.J. Sutton, D.M. Stone, D.S. O'Brien, K.E. Pardy and G.C. Carew

INTRODUCTION

This report provides the results of the 1978 detecting, monitoring, assessment and prediction surveys of forest insect and disease conditions in the twelve ranger districts on the Island and Labrador (Figure 1). It also reports on the pest conditions in the urban centres of the Island. Survey personnel collected 858 insect and 68 disease samples by random sampling. A total of 869 branch samples were collected on the Island and Labrador during the egg-mass survey and 214 samples for overwintering larvae to forecast the spruce budworm outbreak in 1979. The tree pest extension service made 112 calls to private properties in the major urban centres of the Province and responded to 28 queries by telephone and letters for advice on pest problems. Approximately 180 contacts were made with personnel of Provincial and National Parks and industrial woods operations to discuss forest pest problems. Phenology plots were established in western and central Newfoundland in early May to check tree and spruce budworm development (Table 1).

Permanent sample plots were remeasured for volume and vigour five years after being established. Shrew plots were established at Halls Bay in central Newfoundland and St. Georges in western Newfoundland as part of the annual shrew census conducted in October. Survey technicians also made special spruce budworm collections for Dr. Otvos as part of a study on parasite populations. Three methods of spruce budworm sampling were conducted during the season to determine the most efficient method of monitoring budworm populations (Table 2). Technicians also lectured forestry students from the College of Trades and Technology on insect problems in Newfoundland. Approximately 360 hours were flown in fixed-wing aircraft and helicopters to conduct surveys on spruce budworm overwintering larval populations, egg-mass numbers and damage assessments. In their field work forest insect and disease survey technicians were assisted by personnel from the Forest Protection Division of the Provincial Department of Forestry and Agriculture. This agency provided most of the aircraft time and also personnel assistance for counting overwintering larvae and egg-masses. The National and Historic Parks Branch personnel of the Department of Indian Affairs and Northern Development conducted egg-mass surveys in the National Parks and the samples were analysed at the Newfoundland Forest Research Centre.

Weather conditions this spring and early summer varied considerably across the Island. A warm dry period in early May followed in late May and June by heavy rains, cool temperatures with snow flurries and frost

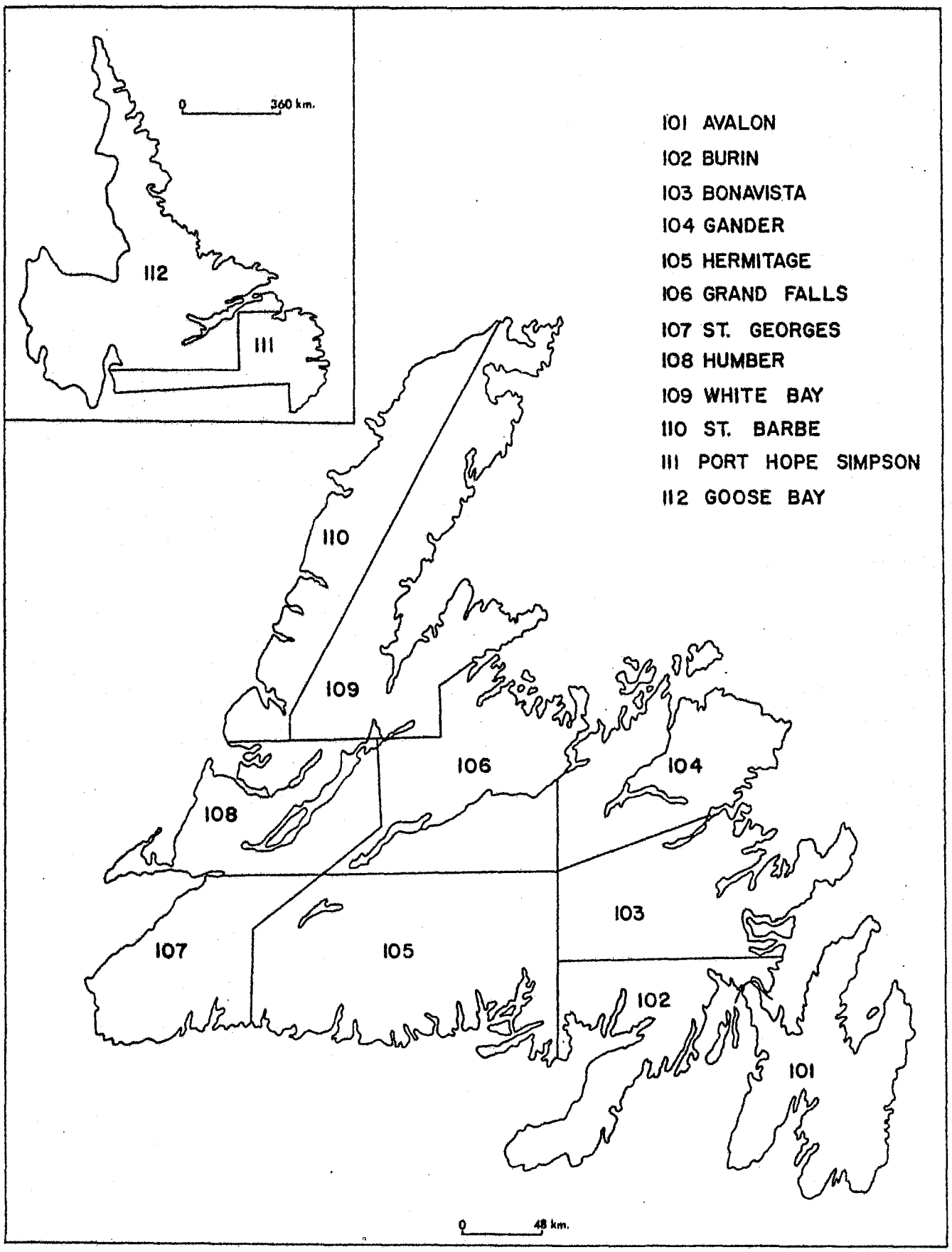

Fig. 1. Forest Insect and Disease Survey Districts.

Table 1. Development of Spruce Budworm and Balsam Fir in 1978 in Newfoundland.

Location	Dates of Average Growth								Larval Development (instar)					
	Terminal				North Lateral									
	Bud-burst	25%	50%	Total	Bud-burst	25%	50%	Total	L_2 larvae in buds	L_3	L_4	L_5	L_6	Pupation
Bottom Brook road	June 11	June 24	July 5	Aug. 4	June 11	June 20	June 27	July 30	June 12	June 14	June 24	July 2	July 10	20% July 1
Stag Lake road	June 13	June 24	July 6	Aug. 2	June 13	June 21	June 29	July 21	-	June 17	June 24	July 3	July 10	-
South Brook Valley	June 6	June 14	June 21	July 19	June 5	June 11	June 16	July 11	June 10	June 12	June 19	June 29	July 4	100% July 12
Jct. Cormack & Bonne Bay roads	June 11	June 22	July 3	July 28	June 11	June 16	June 23	July 17	-	June 21	-	June 29	July 4	-
Sheffield Lake	June 6	June 21	July 1	July 24	June 7	June 13	June 21	July 14	-	-	June 26	July 4	-	July 11
Average	June 10	June 21	July 1	July 28	June 5	June 16	June 23	July 19	June 11	June 16	June 24	July 1	July 7	July 12

Table 2. Average number of spruce budworm larvae collected in ranger districts in 1978 by the beating method and branch sampling.*

District	No. trees sampled	No. larvae collected	No. larvae per tree sample	No. branches sampled	No. larvae collected	No. larvae per branch
Eastern 101-102-103-104	259	6,394	24.7	179	1,447	8.1
Central 105-106	172	4,540	26.4	69	971	14.1
Western 107-108	299	3,760	12.6	237	1,018	4.3
Northern 109-110	142	2,064	14.5	223	764	3.4
Labrador 111-112	4	25	6.2	1	40	40.0
Total	876	16,783	19.1	709	4,240	6.0

*A 45 cm branch tip taken from the mid-crown of each of three trees.

in western and part of central Newfoundland. These conditions suppressed insect development and feeding and defoliation did not occur until late June and early July. In eastern Newfoundland and Labrador, however, temperatures averaged 15-16°C by day but dropped to 5°C by night. This weather condition was caused by persistent northeast winds in eastern Newfoundland and heavy ice along the Labrador coast. In July, August and September, temperatures were near normal with very little precipitation, especially in central Newfoundland where major watersheds were at the lowest level recorded. Weather conditions in Labrador during 1978 were practically normal, except for June when temperatures were slightly below normal and precipitation was nearly double the normal rate. Temperatures and precipitation for the past eight years are shown in Table 3.

Table 3. Temperatures and Total Precipitation for Newfoundland 1971-1978

		Temperature (°C)								Precipitation (cm)			
		May		June		July		August					
Year	Location	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	May	June	July	August
1971	St. John's	-3	23	2	27	4	27	7	28	4.24	9.37	14.68	15.04
1972	St. John's	-7	26	1	26	4	28	6	25	10.44	9.75	1.93	11.81
1973	St. John's	-2	19	-1	24	9	28	6	26	12.24	15.88	6.60	19.15
1974	St. John's	-2	14	-1	28	1	26	5	24	10.87	6.12	9.12	14.40
1975	St. John's	-2	22	0	26	2	29	5	27	22.02	11.18	1.93	14.53
1976	St. John's	-2	22	0	28	-1	27	1	28	4.09	10.65	7.76	5.48
1977	St. John's	-4	18	2	28	7	27	7	28	7.60	9.53	8.30	5.44
1978	St. John's	-6	19	-1	26	7	26	4	29	4.77	5.72	8.31	4.96
1971	Gander	-2	26	2	28	4	28	4	28	2.49	5.77	7.95	7.95
1972	Gander	-9	28	2	28	5	31	5	26	13.34	9.80	4.52	6.25
1973	Gander	-2	22	-1	28	8	29	5	24	9.83	14.63	5.92	16.21
1974	Gander	-3	14	-2	28	1	26	4	27	7.11	10.64	5.05	5.26
1975	Gander	-4	21	-2	25	5	34	5	29	17.93	2.44	6.20	6.03
1976	Gander	-3	25	-1	30	3	29	4	33	3.91	8.52	7.07	1.94
1977	Gander	-2	21	2	28	6	28	6	29	9.96	4.71	10.00	8.25
1978	Gander	-5	24	-2	27	7	29	4	29	3.94	5.84	7.00	5.59
1971	Deer Lake	-5	26	-1	29	3	30	1	31	4.19	6.07	6.30	13.61
1972	Deer Lake	-8	24	-1	28	-1	31	-1	28	9.45	10.21	4.04	9.32
1973	Deer Lake	-3	23	-3	27	3	31	3	28	6.65	15.29	8.69	13.28
1974	Deer Lake	-4	14	-4	31	0	29	-1	31	3.56	2.21	8.99	6.27
1975	Deer Lake	-6	22	-3	27	1	33	0	31	6.60	4.72	3.71	8.10
1976	Deer Lake	-5	28	0	29	4	32	-2	33	7.18	5.60	3.02	4.88
1977	Deer Lake	-7	24	-2	29	4	29	-3	29	7.54	4.64	2.05	8.49
1978	Deer Lake	-5	21	-3	28	3	31	0	28	3.86	7.52	10.24	6.09
1971	Goose Bay	-6	26	1	26	2	30	1	31	7.84	10.49	9.90	14.09
1972	Goose Bay	-15	16	-2	32	4	33	1	29	3.71	11.25	5.64	13.64
1973	Goose Bay	-7	23	-1	31	6	33	2	28	3.33	11.30	12.06	6.53
1974	Goose Bay	-5	14	-1	33	1	31	1	30	3.83	5.94	6.20	8.38
1975	Goose Bay	-8	16	-1	27	4	37	2	27	1.93	7.62	6.83	6.17
1976	Goose Bay	-4	21	-1	27	4	29	0	33	2.96	2.00	9.40	14.25
1977	Goose Bay	-6	18	-1	31	5	32	6	30	11.61	5.80	9.63	10.69
1978	Goose Bay	-7	26	-4	29	3	30	4	27	5.68	15.85	9.07	9.54

The spruce budworm and spruce coneworm were the most serious pests of fir and spruce stands throughout the Island. Hemlock looper populations continued to increase as predicted in 1977. The spruce coneworm larvae increased this year and caused severe damage to both foliage and cones of white and black spruce. Larvae of the spruce budmoth caused light damage to current foliage of white spruce throughout the Island. Balsam woolly aphid population levels have remained low since 1967, except for isolated infestations in eastern Newfoundland. The larch sawfly continued to increase in western Newfoundland and remained high in Labrador. Larch casebearer continued to cause severe defoliation in the St. John's Metropolitan area and in the Terra Nova National Park. The larch beetle reached outbreak levels in weakened larch stands along the Trans Canada Highway and secondary roads in central Newfoundland. This weakening was caused by spruce budworm defoliation, flooding and road construction. Blackheaded budworm infestations terminated in 1978 on the Island and in Labrador. The European pine sawfly continued to increase and cause severe defoliation of pine around Windsor Lake and throughout the city of St. John's.

Balsam twig aphid population levels were high in most areas of western Newfoundland. Birch casebearer populations caused severe damage of white birch throughout the Island. The mountain ash sawfly infestation continued in the St. John's area and new infestations occurred in the Badger and Baie Verte areas. A severe infestation of the satin moth occurred in the St. John's area. The large aspen tortrix and the poplar leaf roller caused moderate to severe defoliation in the Upper Humber Watershed, the Baie Verte Peninsula and between Halls Bay and Port Blandford. A small infestation of the uglynest caterpillar continued along Flat Bay Brook in western Newfoundland.

Major diseases found in the Province in 1978 were Armillaria root rot which caused mortality of Scots pine in the North Pond area; witches' broom of black spruce was conspicuous in several areas of western Newfoundland; broom rusts of balsam fir and black spruce common throughout central Newfoundland and in the Terra Nova National Park and the Avalon Peninsula; stem and branch cankers common on several ornamental and shade hardwood species throughout the city of St. John's; canker of lombardy poplar that caused branch and tree mortality of this species throughout the major urban centres on the Island; needle rusts of conifers more common in 1978 than in past years; shoot and leaf blight of trembling aspen prominent in stands of regeneration in western and central Newfoundland; leaf spots of hardwoods recorded in many parts of western and central Newfoundland and in Labrador and needle casts of conifers that occurred in western Newfoundland and in Labrador. Frost damage was extensive and common in low lying areas in the Georges Lake and Goose Bay areas and winter drying caused light damage on balsam fir in western Newfoundland and Labrador.

IMPORTANT FOREST INSECTS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Larval Development and Damage - Sampling of larval stages of this insect began in late May and continued to mid-July. Larval development was a week later than in 1977 and about three weeks later than usual. Tree defoliation was not evident until late June and early July. Population levels were generally lower than forecast from results of the egg-mass and overwintering larval surveys because survival was low in the early larval stages throughout the Province. This low survival was generally caused by the unfavourable weather concitions in June and by starvation due to a depleted food supply caused by severe defoliation during the past few years. Moderate to severe defoliation occurred from Doyles to Flat Bay Brook, near Glide Lake between Deer Lake and Grand Lake, from Roddickton to Main Brook on the Northern Peninsula and from Freshwater Pond to Burlington on the Baie Verte Peninsula. Sampling at other locations in western Newfoundland showed low larval numbers and only light or a trace of defoliation.

In central and eastern Newfoundland, moderate to severe defoliation occurred from Halls Bay to Red Indian Lake, from Badger east to Random Island, including the Bonavista Peninsula, Bay d'Espoir, along the Trans Canada Highway near the Fairhaven Road, Manuels River and on the Bellevue Peninsula. Defoliation near Paddys Pond, Donovans, Newtown, Bay Bulls Pond and between Pouch Cove and Bauline was light to moderate.

In Labrador only light to moderate defoliation was recorded throughout most of the outbreak, except for a few locations in the Kenamu River Valley where defoliation was severe.

An aerial tree damage assessment augmented with ground checks was conducted in August to determine the area and volume of dead and damaged stands. The survey classified the merchantable stands according to the following categories:

A - Dead: 50% or more of the total volume of the stand dead.

B - Moribund, unlikely to recover: 20-49% of the total volume dead or more than 50% of the total volume dying (dying = 75 or more total defoliation).

C - Very severe damage, likely to recover: 5-19% of the total volume dead or less than 50% of the total volume dying.

D - Severe damage, likely to recover: severe damage but less than 5% mortality or dying trees.

The survey showed that the areas of dead and dying stands were increasing rapidly, especially in western Newfoundland. The total area of merchantable stands with dead and dying trees for the Island increased from 174 532 ha in 1977 to 300 400 ha in 1978 (Table 4) (Figures 2, 3, 4, 5, 6). These stands contained about 6 547 000 m^3 of dead trees, an increase of 1 398 000 m^3 since 1977. However, the volume of dying trees in stands classified as "A", "B", and "C" decreased from about 8 500 000 m^3 in 1977 to about 4 841 000 m^3 in 1978. This decrease is attributed partly to the increase in tree mortality and partly to recovery of trees in areas where the outbreak collapsed either from natural causes, such as unfavourable weather conditions and starvation of larvae or from the application of chemical control. It is important to note that the total volume of stands classified as "A", "B" and "C" increased from an estimated 15 354 000 m^3 in 1977 to 22 399 000 m^3 in 1978. The area of stands classified as "D" was about 639 000 ha.

In Labrador the total area of light, moderate and severe defoliation decreased from 52 678 ha in 1977 to 5 660 ha in 1978 (Figure 7). The volume of dead and dying trees scattered throughout this area was 770 000 m^3.

Damage assessments were also conducted in sub-merchantable young stands of fir on the Island. The area of stands in the moderate to severely damaged category decreased from 692 000 ha in 1977 to about 356 000 ha. However, the area of very severely damaged stands with mortality increased from 20 000 ha to 32 000 ha in 1978. The areas of high tree mortality occurred in the Harry's River, Gallants, Furriers and Trout Brook areas after four years of severe defoliation. It should, also, be noted that most of these stands were initially under stress from damage by other insects before the budworm outbreak. There was little or no mortality in stands with less than three years of severe defoliation, however, top-killing continued to occur. In stands with low populations and less than three years of severe defoliation good tree recovery was evident in 1978.

Aerial defoliation surveys usually conducted in early August were cancelled this year but a map showing the severity of defoliation was prepared from ground observations during the egg-mass survey (Figure 8). The areas of light, moderate and severe defoliation in productive forests of the Island totalled about 1 300 000 ha (Table 5).

Larval and pupal parasitism in 1978 was about 35%, the same as in 1977. Larval parasitism decreased slightly while pupal parasitism increased, compared to that of 1977. The parasite Glypta fumiferanae (Vier.) was considerably more numerous than Apanteles fumiferanae (Vier.) among the larval parasites. Among the pupal parasites Phaeogenes hariolus (Cress.) and Apechthis ontario (Cress.) continued to be the two

Table 4. 1978 spruce budworm damage assessment survey in merchantable stands. Volume based on 2.41 m^3/cord.

Management unit no.	Ownership	Area and Volume Affected											
		A (Dead)*				B (Moribund)*				C (Very severe damage)*			
		Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)
1	Crown	-	-	-	-	1 947	67 367	1 518	52 374	710	40 389	-	13 429
2	Crown	-	-	-	-	74	7 531	-	4 519	926	40 061	-	5 408
4	Price	552	36 516	29 214	-	4 387	262 892	46 205	128 945	2 061	189 359	-	46 730
5	Crown	-	-	-	-	-	-	-	-	832	83 675	-	30 593
	Bowaters	-	-	-	-	226	22 902	-	13 739	338	34 251	1 012	6 326
	Price	422	42 691	25 613	-	156	14 807	-	8 883	2 072	143 084	13 879	21 463
6	Crown	143	8 165	5 717	-	-	-	-	-	-	-	-	-
	Bowaters	-	-	-	-	8 009	791 212	202 734	3 817	2 012	191 462	24 524	31 790
	Price	-	-	-	-	-	-	-	-	296	29 896	-	11 958
7	Crown	1 368	63 525	58 690	-	6 912	353 436	75 189	180 092	9 331	572 673	53 200	147 800
8	Crown	-	-	-	-	442	48 200	-	28 920	2 027	126 802	3 977	10 151
	Bowaters	-	-	-	-	-	-	-	-	816	25 273	-	6 982
9	Crown	3 485	242 916	175 499	36 360	2 000	213 280	47 190	97 552	2 753	182 063	583	48 287
	Bowaters	3 629	296 256	216 924	48 116	10 109	905 244	256 930	312 970	6 618	572 879	2 463	153 146
10	Crown	-	-	-	-	-	-	-	-	1 027	31 316	5 825	8 830
	Price	3 950	133 861	98 248	9 315	3 296	186 539	67 121	56 628	6 988	263 611	24 078	61 761
11	Price	-	-	-	-	2 240	86 955	-	52 174	159	12 725	-	2 545
12	Crown	68	5 900	5 131	-	-	-	-	-	-	-	-	-
	Price	6 770	461 927	363 308	27 358	1 658	122 517	11 327	53 825	1 149	76 840	831	12 971
13	Price	150	15 694	10 985	-	1 571	125 161	46 323	4 593	1 777	135 828	12 026	6 227
14	Crown	16 571	955 495	617 606	161 058	12 297	1 069 457	342 316	229 687	14 501	1 213 888	213 215	264 681
	Bowaters	5 759	461 363	290 875	43 802	21 433	1 792 707	703 734	205 727	12 791	1 066 420	153 825	249 999
15	Crown	-	-	-	-	4 696	400 940	104 242	68 639	1 505	107 582	-	18 863
	Bowaters	10 290	796 693	537 963	98 198	13 487	1 184 067	362 772	259 145	15 187	1 207 983	123 619	119 513
16	Crown	-	-	-	-	9 965	899 123	95 788	440 926	6 329	484 364	44 180	148 066
	Bowaters	4 128	318 448	209 945	41 744	7 089	529 506	138 864	175 046	4 687	336 146	44 510	103 999

Cont'd...

Table 4 - Concluded.

Management unit no.	Ownership	Area and Volume Affected											
		A (Dead)*				B (Moribund)*				C (Very severe damage)*			
		Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)
17	Crown	3 076	85 555	49 600	16 593	1 659	147 492	5 350	95 588	506	50 610	-	8 315
	Bowaters	5 832	382 036	232 659	84 430	275	18 027	6 309	2 704	3 628	282 170	14 607	57 057
	GMNP	193	12 356	11 120	-	12 736	828 763	271 518	133 167	4 130	319 785	51 967	30 744
14	Private	-	-	-	-	-	-	-	-	2 181	181 858	34 188	36 372
All	Crown	24 659	1 359 520	910 206	214 010	39 594	3 164 535	671 778	1 166 975	33 725	2 519 759	276 528	612 759
	Bowaters	29 638	2 254 796	1 488 365	316 288	60 189	5 218 756	1 665 551	969 331	45 804	3 699 179	363 693	725 943
	Price	11 844	690 689	527 368	36 673	13 307	798 872	170 975	305 048	14 501	851 342	50 815	163 656
	GMNP	193	12 356	11 120	-	12 736	828 763	271 518	133 167	4 130	319 785	51 967	30 744
	Private	-	-	-	-	-	-	-	-	2 181	181 859	34 188	36 372
Total Island		66 386	4 319 397	2 939 096	566 972	126 664	10 078 126	2 785 432	2 609 661	107 386	8 000 998	822 499	1 664 035
Total Island (Area in acres, vol. in cords)		164 045	1 792 281	1 219 542	235 258	312 994	4 181 795	1 155 781	1 082 847	265 234	3 319 916	341 286	690 471

*A (Dead): 50% or more of total volume of stand dead.
B (Moribund, unlikely to recover): 20% to 49% of total volume of stand dead or more than 49% of total volume dying.
C (Very severe damage, likely to recover): 5 to 19% of total volume dead or 5 to 49% of total volume dying.

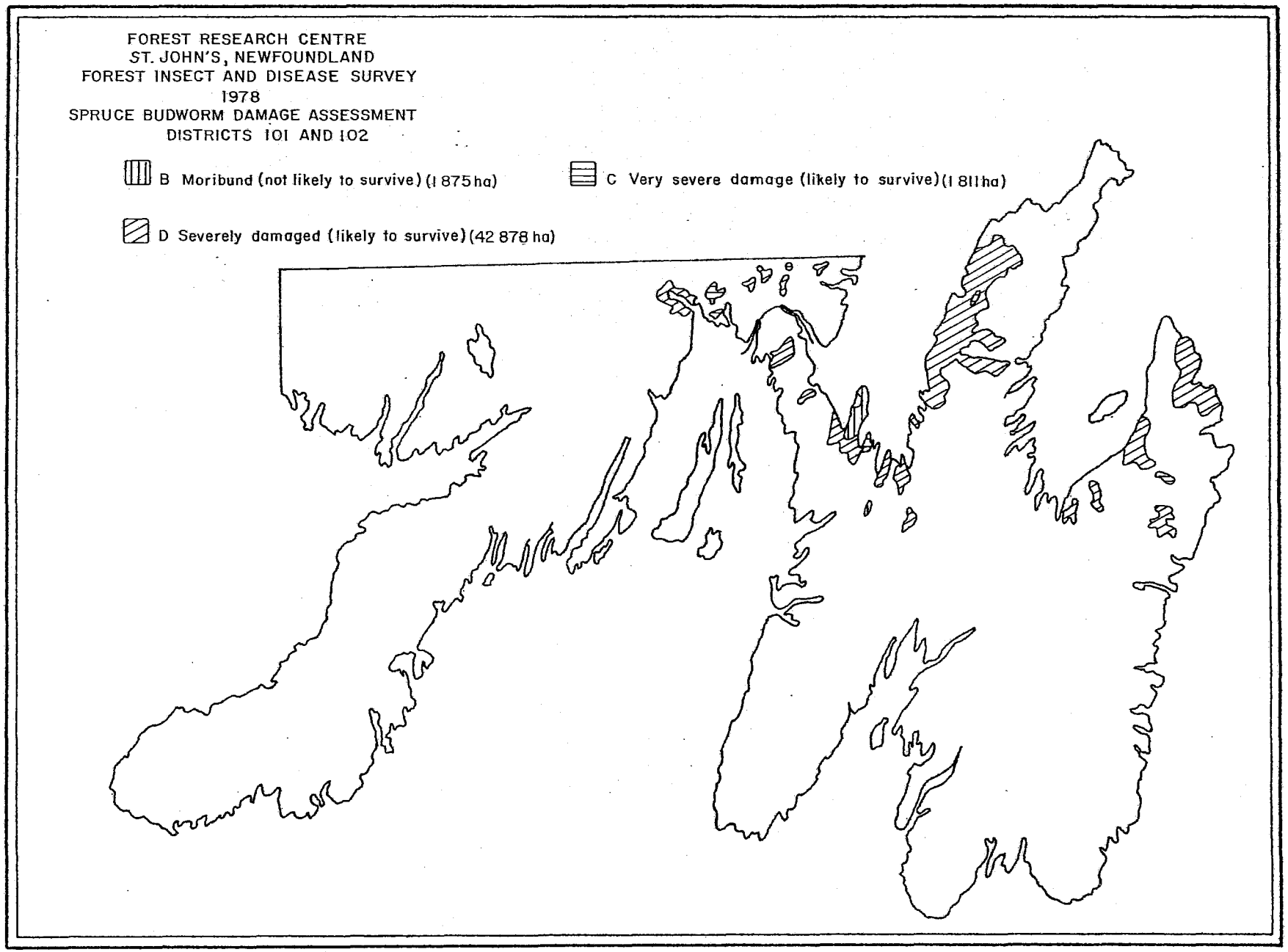
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 101 AND 102
B Moribund (not likely to survive) (1 875 ha)
C Very severe damage (likely to survive) (1 811 ha)
D Severely damaged (likely to survive) (42 878 ha)

FIG. 2

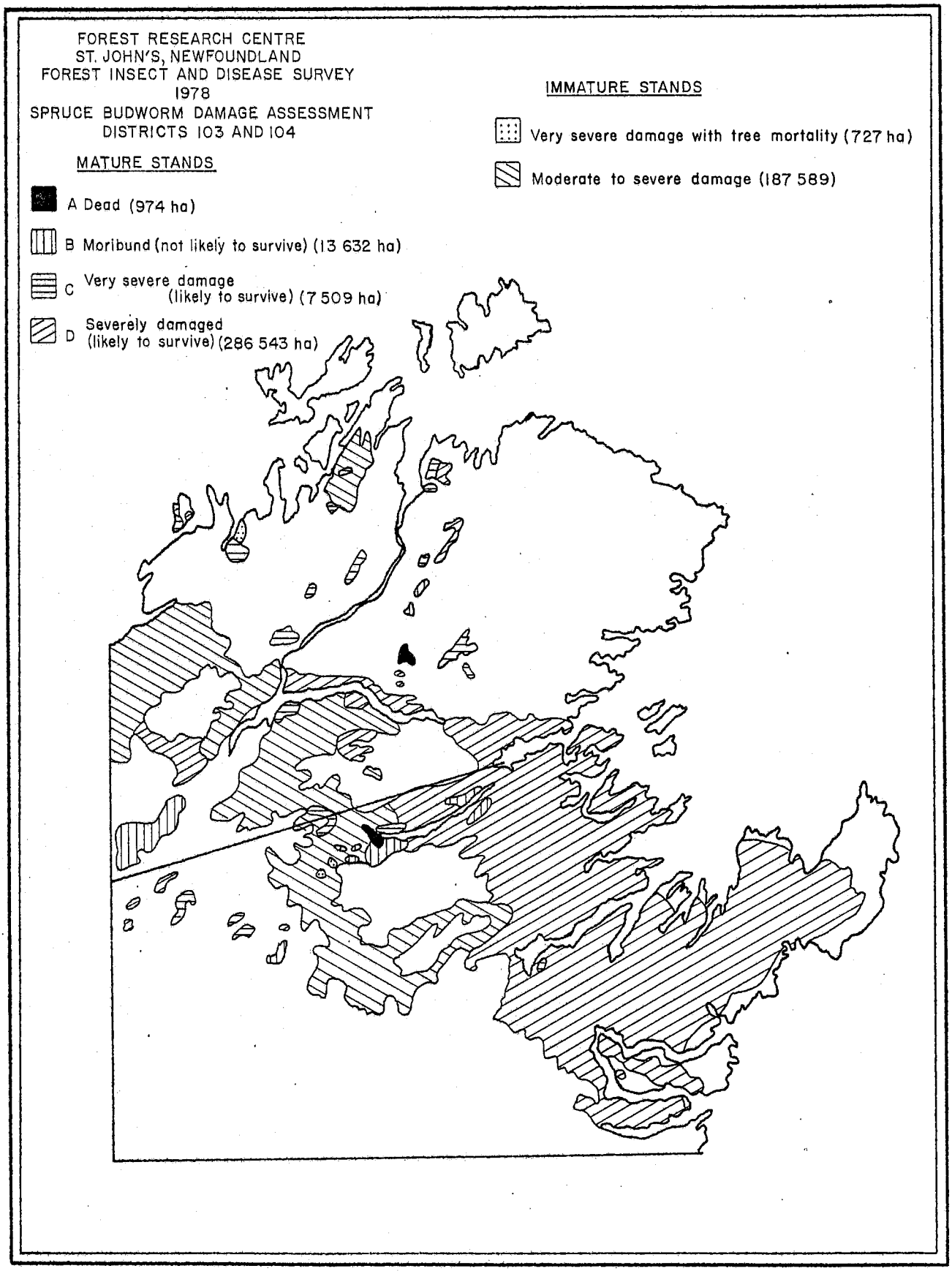
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 103 AND 104
MATURE STANDS
A Dead (974 ha)
B Moribund (not likely to survive) (13 632 ha)
C Very severe damage (likely to survive) (7 509 ha)
D Severely damaged (likely to survive) (286 543 ha)
IMMATURE STANDS
Very severe damage with tree mortality (727 ha)
Moderate to severe damage (187 589)

FIG. 3

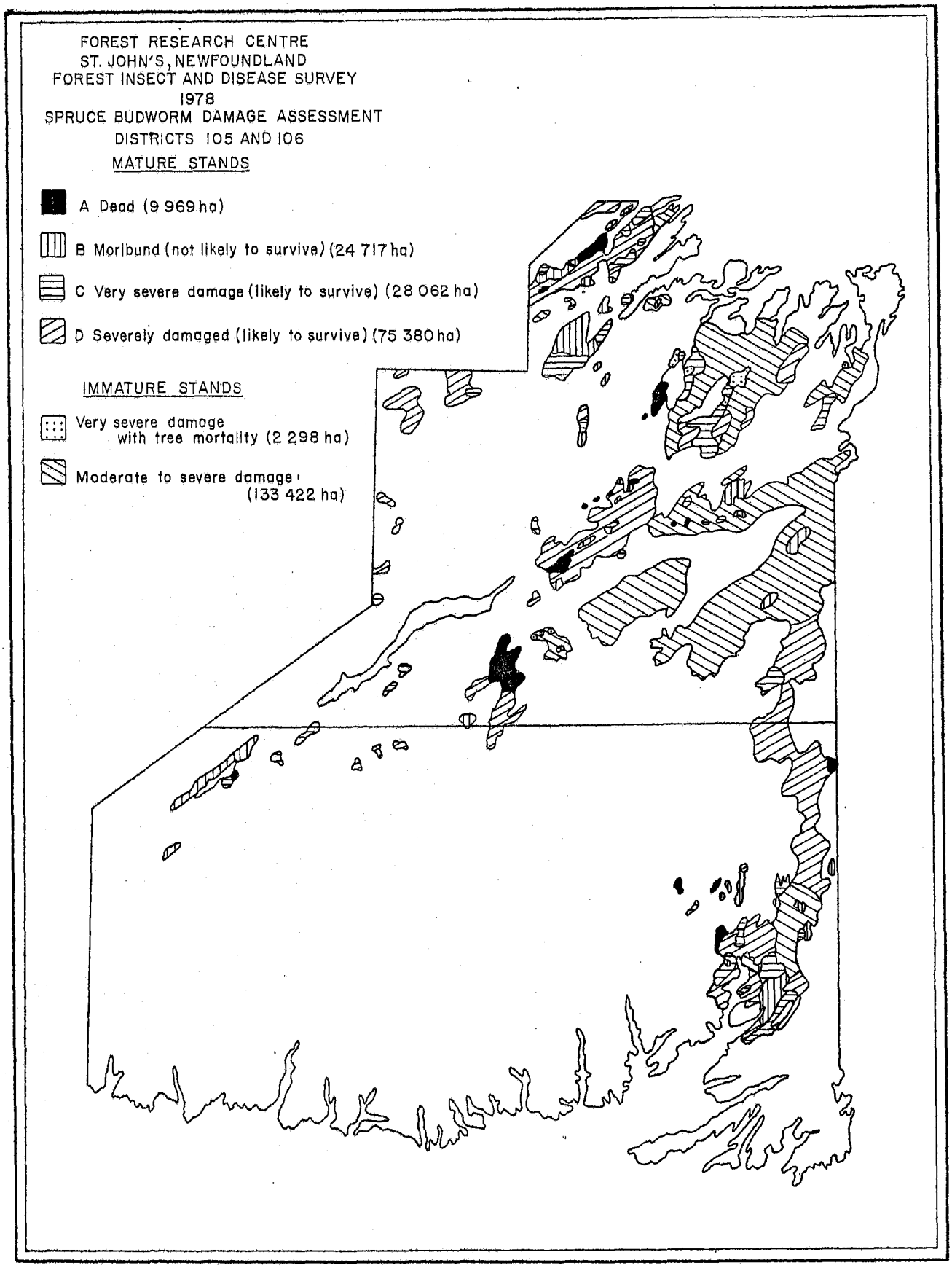
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 105 AND 106
MATURE STANDS
A Dead (9 969 ha)
B Moribund (not likely to survive) (24 717 ha)
C Very severe damage (likely to survive) (28 062 ha)
D Severely damaged (likely to survive) (75 380 ha)
IMMATURE STANDS
Very severe damage with tree mortality (2 298 ha)
Moderate to severe damage (133 422 ha)

FIG. 4

FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 107 AND 108

MATURE STANDS

A Dead (34 635 ha)

B Moribund (not likely to survive) (52 743 ha)

C Very severe damage (likely to survive) (41 702 ha)

D Severely damaged (likely to survive) (63 273 ha)

IMMATURE STANDS

Very severe damage with tree mortality (27 970 ha)

Moderate to severe damage (2 207 ha)

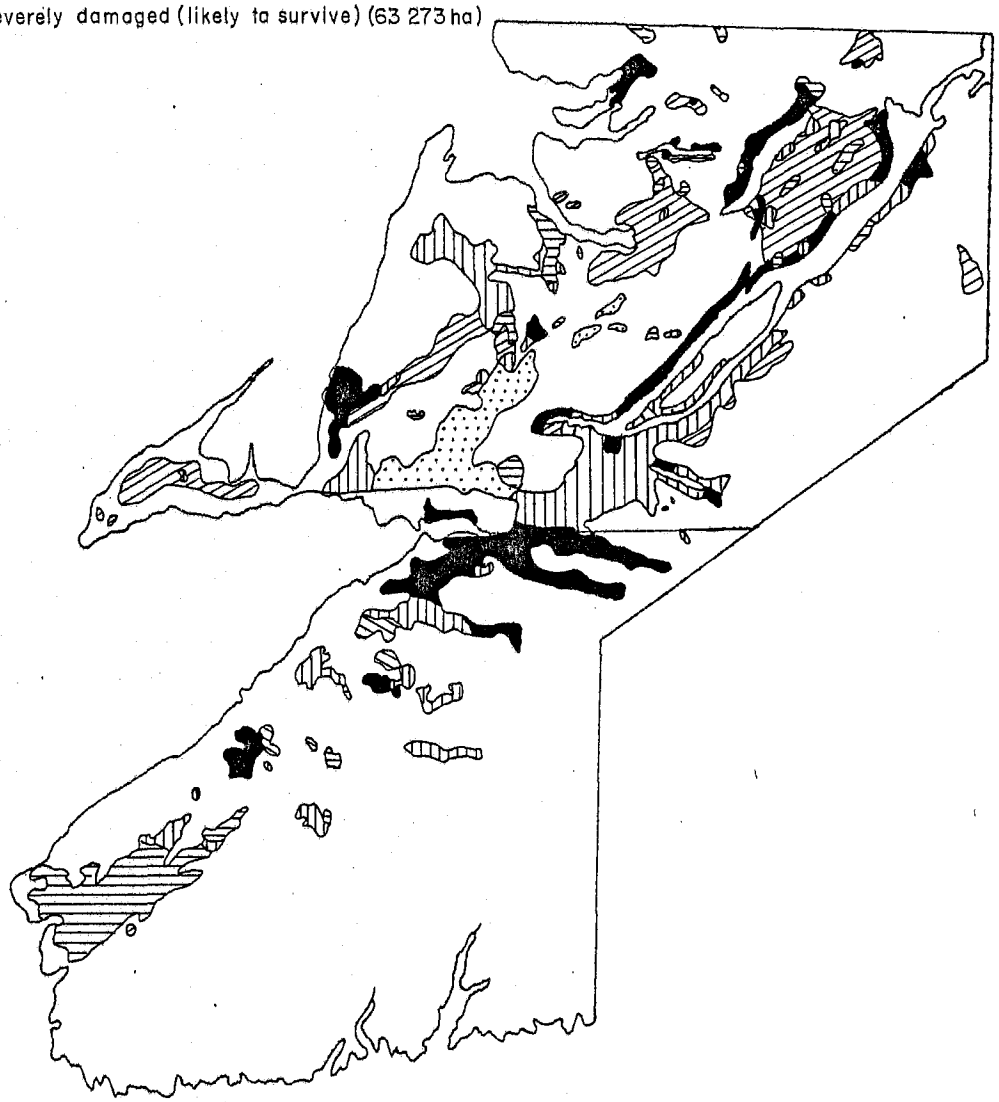

FIG. 5

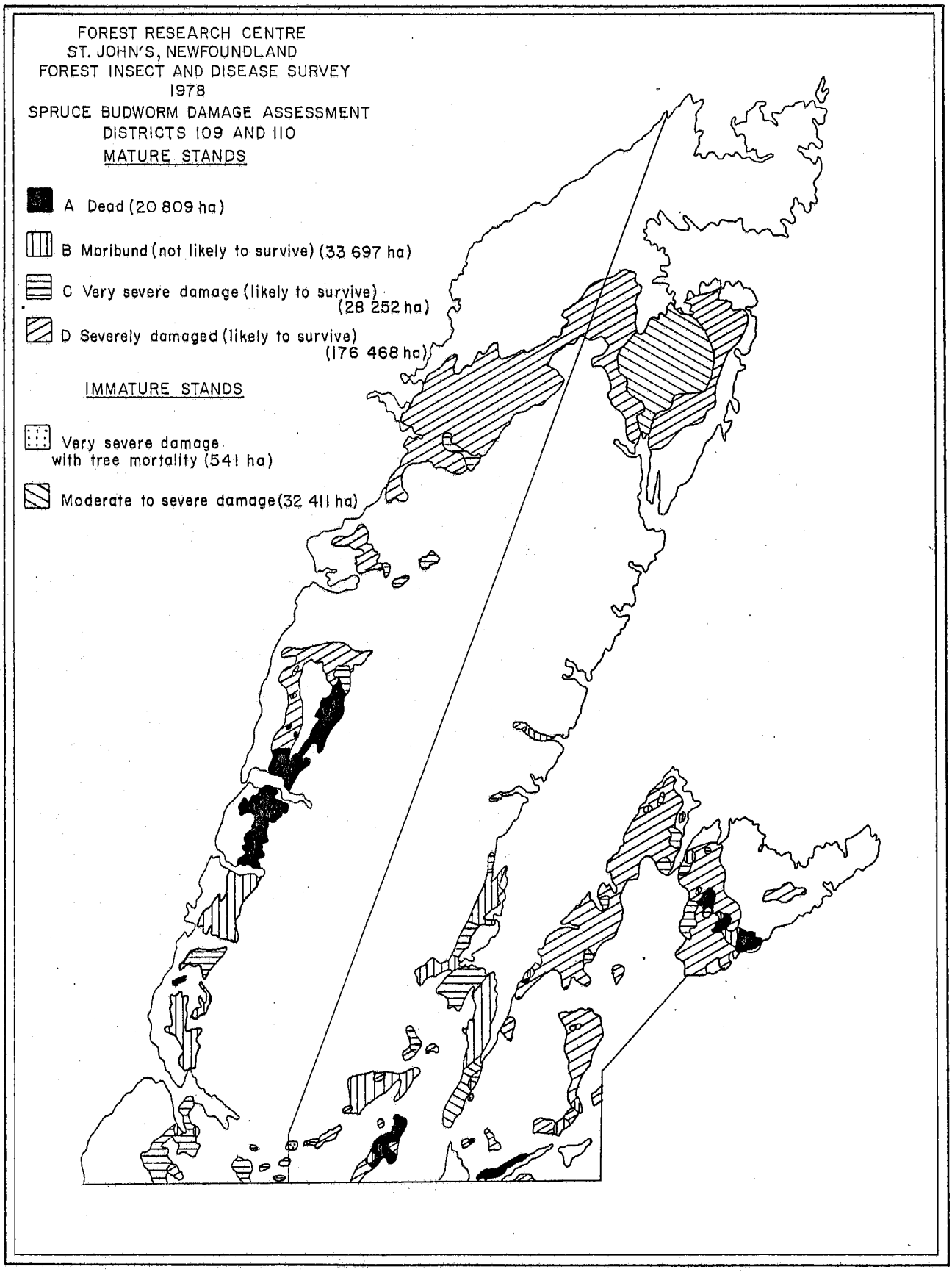
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 109 AND 110
MATURE STANDS
A Dead (20 809 ha)
B Moribund (not likely to survive) (33 697 ha)
C Very severe damage (likely to survive) (28 252 ha)
D Severely damaged (likely to survive) (176 468 ha)
IMMATURE STANDS
Very severe damage with tree mortality (541 ha)
Moderate to severe damage (32 411 ha)

FIG. 6

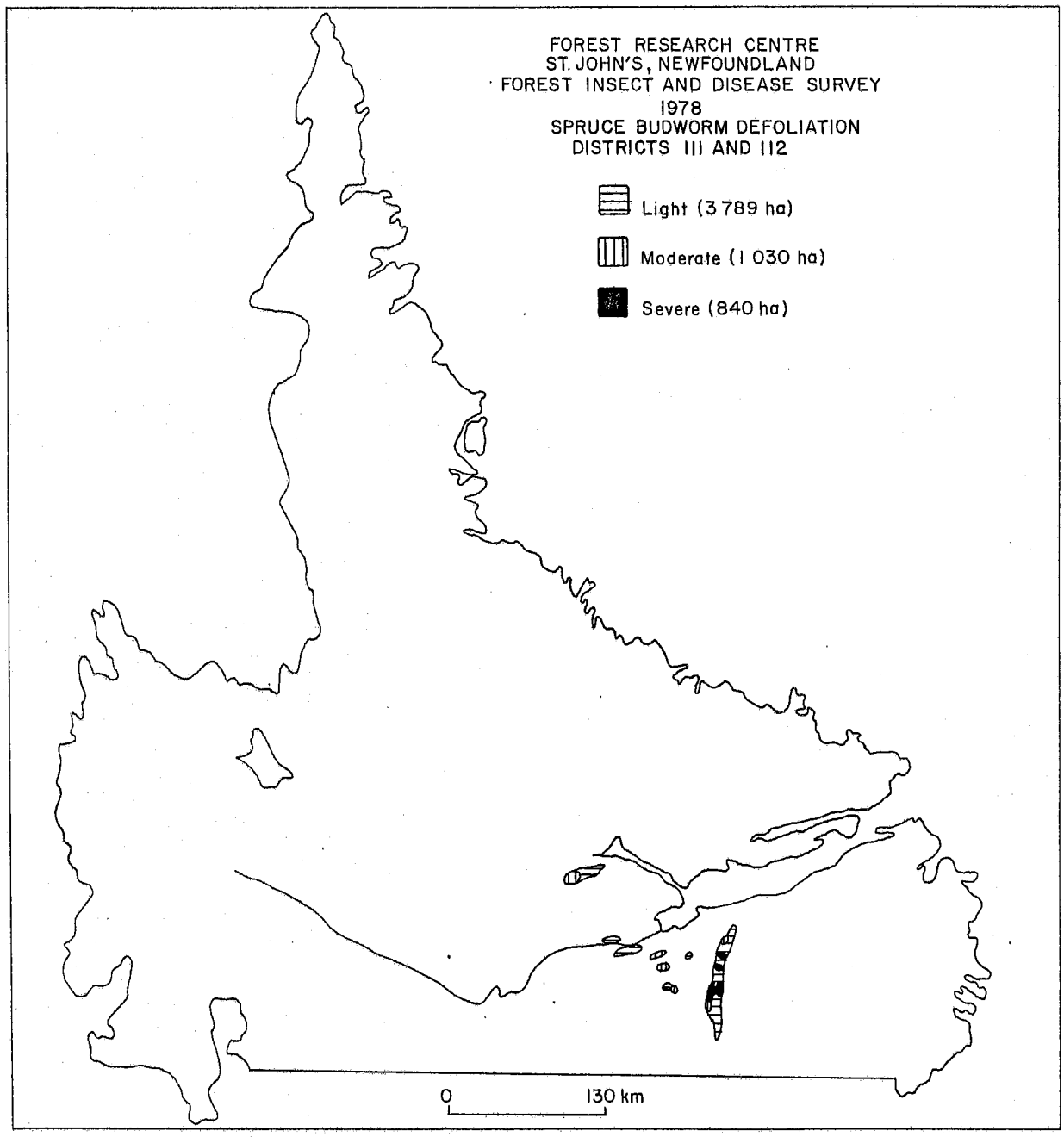
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DEFOLIATION
DISTRICTS 111 AND 112
Light (3 789 ha)
Moderate (1 030 ha)
Severe (840 ha)
0
130 km

Fig. 7

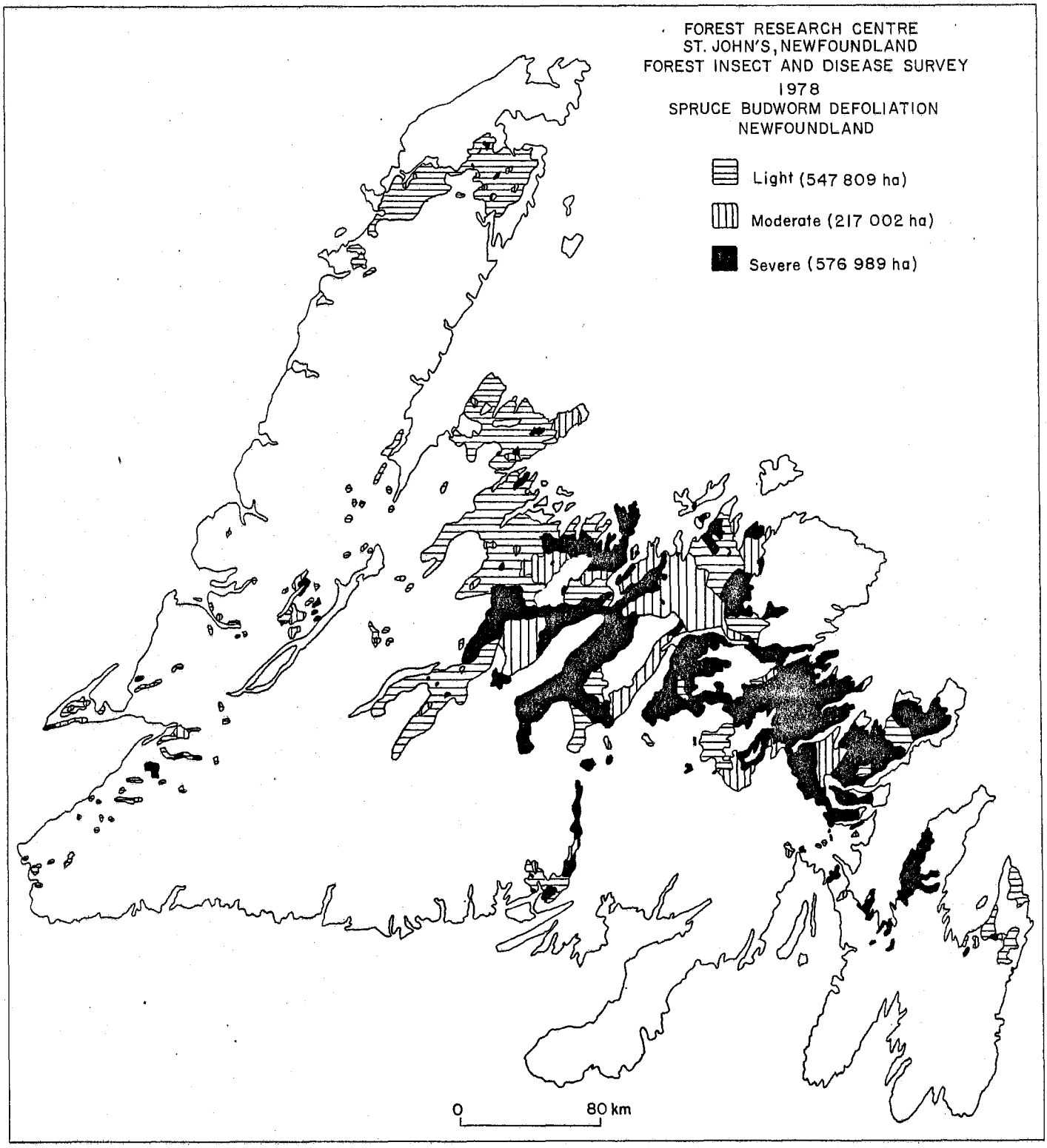
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1978
SPRUCE BUDWORM DEFOLIATION
NEWFOUNDLAND
Light (547 809 ha)
Moderate (217 002 ha)
Severe (576 989 ha)
0
80 km

FIG. 8

Table 5. Spruce Budworm Defoliation in Productive Forests of Newfoundland in 1978 in Hectares.

Management unit no.	Light	Moderate	Severe	Total
1		495	29 114	29 609
1A	14 551	1 072	1 030	16 653
2	15 205	19 025	113 000	147 230
3	83	662	-	745
4	16 671	11 649	39 658	67 978
5	19 841	25 660	115 255	160 756
6	18 303	18 753	72 823	109 879
7	16 779	2 630	7 194	26 603
8	36 536	55 560	56 037	148 133
9	172 317	14 888	14 100	201 305
10	28 600	36 200	33 078	97 878
11	15 895	18 679	87 649	122 223
12	54 122	969	3 565	58 656
14	10 888	3 163	1 953	16 004
15	2 318	5 315	823	8 456
16	7 990	961	532	9 483
17	34 344	329	-	34 673
18	83 366	992	1 178	85 536
Total	547 809	217 002	576 989	1 341 800
Total in acres	1,353,670	536,223	1,425,771	3,315,664

most important species. Fungal infection, caused by Entomophthora spp., was lower in 1978 and not as widespread as in 1977. This was apparently due to the warm and dry weather during mid and late summer in 1978, which is unfavourable for fungal growth and spread of the disease.

The Forestry Branch, Department of Forestry and Agriculture, conducted a chemical control program in high larval population areas. Approximately 376 600 ha (941,500 acres) were treated with two applications of 70 gm active ingredient of Matacil at 1.461 per ha (1.0 oz. a.i. per 20 U.S. fl. oz. per acre).

Egg-Mass Survey - The egg-mass survey was conducted in September at 854 locations on the Island and 15 locations in Labrador (Appendix I). The results of this survey showed that the area of moderate and severe defoliation is forecast to be about 740 000 ha (Table 6) distributed predominantly in central and eastern Newfoundland from Red Indian Lake and Twin Lakes to Bay d'Espoir and east to Random Island, including the Bonavista Peninsula and a few isolated locations on the Avalon Peninsula (Figure 9). In western Newfoundland only a few areas are forecast to remain in the severe defoliation category in 1979, including the Codroy Valley, Fishell's River and Barry Brook areas. In Labrador the outbreak is expected to virtually collapse. Moderate to severe defoliation is forecast only in a few small isolated areas in the Beaver River and Kenamu River Valleys.

Overwintering Larval Survey - The overwintering larval survey was conducted in November, instead of early spring as in previous years. The data from this survey was used to check and refine the results of the earlier egg-mass survey. A total of 197 locations were sampled on the Island and 17 locations in Labrador (Appendix II). The results indicated that the budworm infestation area would be larger than was forecast by the egg-mass survey. The area of moderate to severe defoliation was forecast to increase by 192 000 ha, for an overall total of 932 000 ha (Table 6, Figure 9). Increases in central and eastern regions are attributed to budworm dispersal from areas with high populations. The western and most of the additional areas were borderline previously and increased sampling and larval dispersal were sufficient to cause a change to the moderate and severe defoliation category.

Hazard - The results of the egg-mass and overwintering larval surveys, data on the level of current and previous years defoliation and on tree vigor for each sample point were combined to provide a hazard rating for budworm infested areas. Moderate to high ratings indicates considerably reduced tree vigor and top killing can be expected in 1979. Very high rating means that tree mortality is likely to occur. In 1979, based on the egg-mass survey, moderate to high hazard with high population levels exists on 356 000 ha (Figure 10).

The overwintering larval survey increased the forecast area of moderate to high hazard by 6 000 ha, for a total of 362 000 ha. There are 300 000 ha of stands already in the dead, dying and very severely damaged classes.

Spruce Coneworm, Dioryctria reniculelloides M. & M. - High larval numbers occurred between Sops Arm and Port Blandford and caused severe damage to foliage and cones of white and black spruce. The coneworm was intermixed with spruce budworm in most areas and it reached as high as 60% of the total population at some locations. Defoliation estimates and

Table 6. Areas of moderate and severe defoliation and areas of moderate and high hazards forecast for 1979 based on egg-mass and overwintering larval surveys.

Management unit no.	Ownership	Areas of moderate and severe defoliation (hectares)			Areas of moderate to high hazard (hectares)		
		Based on egg-mass survey	Change based on overwintering larval survey	Total area	Based on egg-mass survey	Change based on overwintering larval survey	Total area
1	Crown	16 922		16 922	5 574		5 574
1A	Crown	2 257		2 257	2 491		2 491
2	Crown	152 499	288	152 787	41 484		41 484
	TNNP	25 083		25 083	13 289		13 289
4	Crown	-	9 434	9 434	-		-
	Price	39 456	33 532	72 988	8 023		8 023
5	Crown	69 225	12 818	82 043	7 030		7 030
	Bowaters	41 930		41 930	9 678		9 678
	Price	38 967		38 967	1 844		1 844
6	Bowaters	54 045	30 072	84 117	33 340		33 340
	Price	20 386		20 386	5 840		5 840
7	Crown	25 263		25 263	20 450		20 450
	Bowaters	16 723		16 723			
8	Crown	43 358	8 255	51 613	24 629		24 629
	Bowaters	12 023		12 023	881		881
	Price		3 192	3 192			
9	Crown	32 236	2 752	34 988	13 956		13 956
	Bowaters		9 830	9 830	10 685		10 685
	Price				253		253
10	Bowaters	942		942	980		980
	Price	31 522	2 205	33 727	31 120		31 120
11	Price	69 462	33 934	103 396	82 371		82 371
12	Price	28 005	10 042	38 047	13 493		13 493
13	Price	1 369		1 369			
14	Crown	5 193	7 472	12 665	5 915		5 915
	Bowaters	12 006	4 541	16 547	12 029	2 449	14 478

Cont'd...

Table 6 - Concluded.

Management unit no.	Ownership	Areas of moderate and severe defoliation (hectares)			Areas of moderate to high hazard (hectares)		
		Based on egg-mass survey	Change based on overwintering larval survey	Total area	Based on egg-mass survey	Change based on overwintering larval survey	Total area
15	Crown		1 095	1 095	4 315		4 315
	Bowaters		18 554	18 554	2 603	3 935	6 538
16	Crown				881		881
	Bowaters	1 102	1 353	2 455	2 091		2 091
18	Crown		431	431			
	Bowaters		2 010	2 010			
	GMNP				275		275
All	Crown	346 953	42 545	389 498	126 725		126 725
	Bowaters	138 771	66 360	205 131	72 287	6 384	78 671
	Price	229 167	82 905	312 072	142 944		142 944
	GMNP				275		275
	TNNP	25 083		25 083	13 289		13 289
	Private						
Total Island		739 974	191 810	931 784	355 520	6 384	361 904
Total Island (areas in acres)		1,828,513	473,974	2,302,485	878,507	15,776	894,283

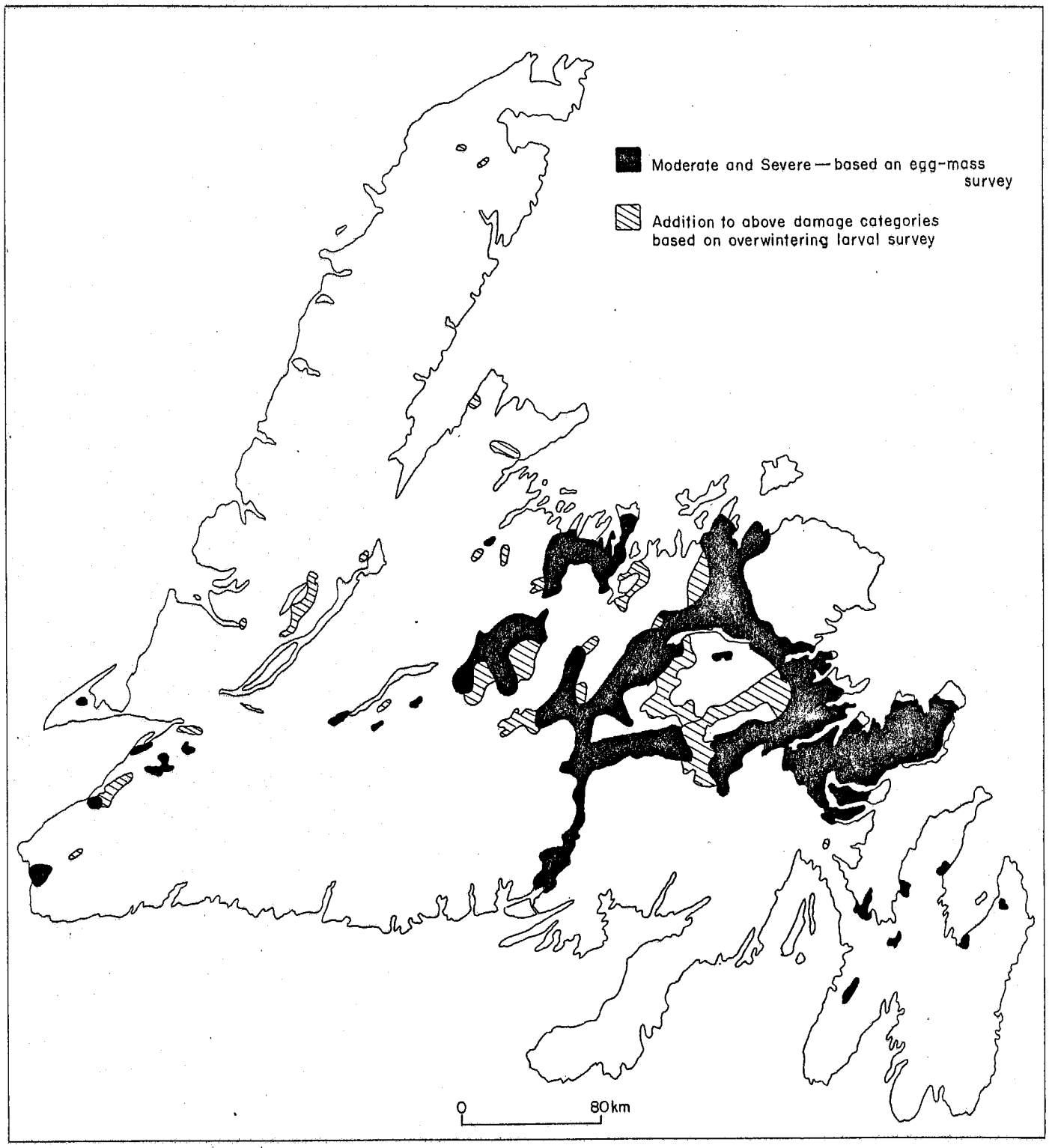

Fig. 9. Areas of moderate and severe defoliation forecast for 1979 based on egg-mass and overwintering larval surveys.

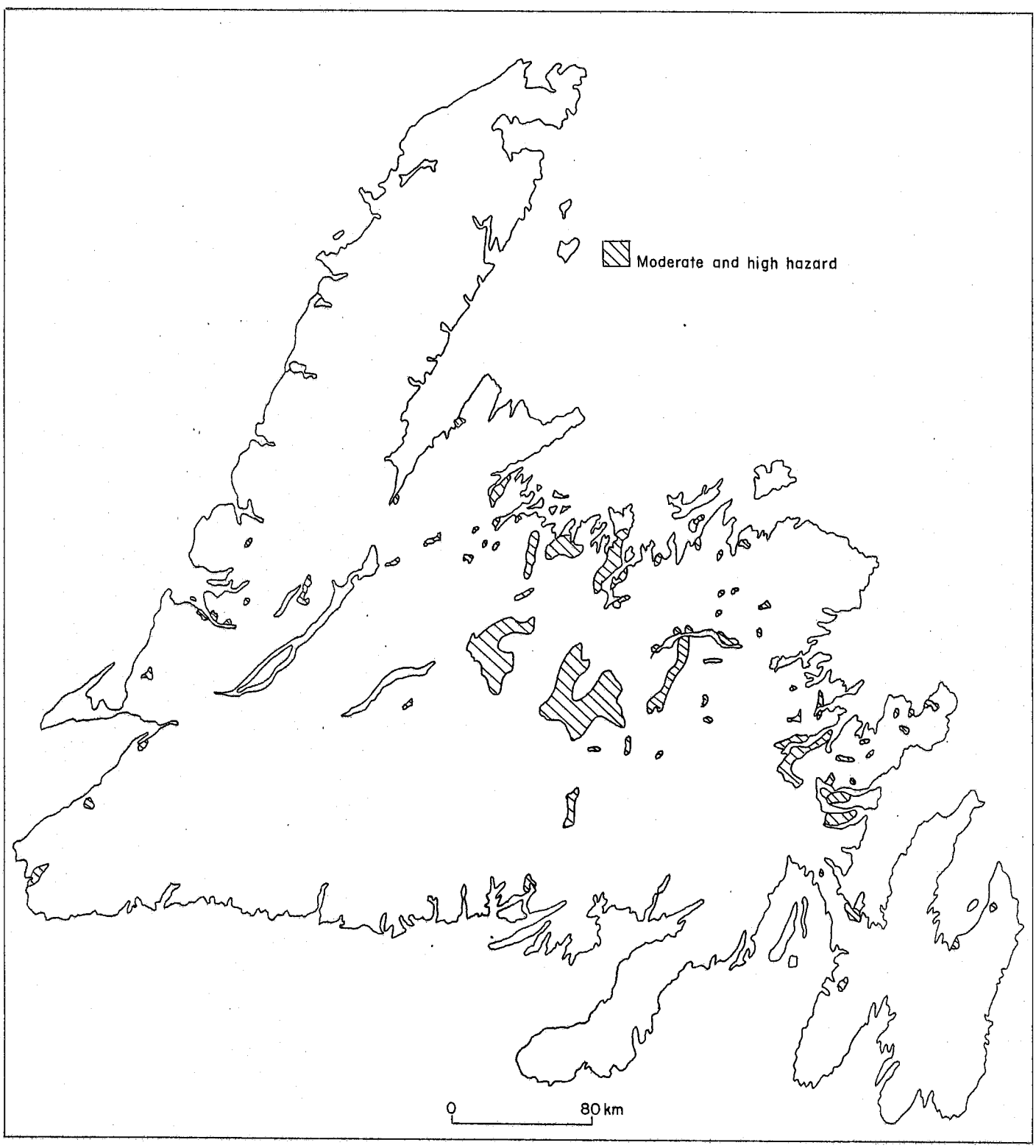

Figure 10. Areas of moderate and high hazard with high populations for 1979.

area size were impossible to determine because of the concurrent damage caused by the spruce budworm.

In Labrador relatively low populations were present in 1977 but no coneworms were found in 1978.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	Beating 57	0.2	8.6	88.7
1978	Branch 47	0.2	4.7	28.0

The last recorded spruce coneworm infestation on the Island was in 1956 in the Stephenville area and along the Northern Peninsula.

Spruce Budmoth, Zeiraphera canadensis Mut. & Free. - Low larval numbers were found throughout the Island and light defoliation of current foliage of white spruce was recorded from Whitbourne to Hearts Delight, North Pond, Badger, Deadwater Brook and Pasadena.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	4	0.3	0.5	1.0

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen) - Population levels continued to increase, mainly in western and central Newfoundland where spruce budworm numbers have decreased. In western Newfoundland the highest larval counts were recorded at Lomond, Hinds Lake Road, Frenchman's Pond and Hughes Brook. In central and eastern Newfoundland highest numbers were found at Millertown and Lake St. John, respectively. Moth sightings were reported from West Pond, South Pond and Little Red Indian Pond during the spruce budworm egg-mass survey in September. The hemlock looper is a major pest of balsam fir in Newfoundland and there is a concern that population levels may be increasing where spruce budworm numbers are declining.

Year	No. of Collections	No. of Larvae per Tree Sample Min.	Avg.	Max.
1978	83	0.1	1.0	7.0

Blackheaded Budworm, Acleris variana (Fern.) - Infestations on the Northern and Avalon peninsulas collapsed in 1978. The infestations between Round Lake and Eddies Cove, near St. Catherines, in the Salmonier Valley, between Logy Bay and Pouch Cove, from the Foxtrap Access Road to Newtown and near Bay Bulls Big Pond virtually collapsed in 1978. The highest larval counts were found 10.6 km south of St. Joseph's, Salmonier, where 16 larvae per tree sample were collected.

Year	No. of Collections	No. of Larvae per Tree Sample Min.	Avg.	Max.
1978	26	0.1	1.0	16.7
1977	75	0.0	8.9	85.0

Balsam Woolly Aphid, Adelges piceae (Ratz.) - Population levels have remained low since 1967 with the exception of isolated pockets of infestations throughout the Island. The most recent of these infestations occurred along the Notre Dame Bay and Trinity Bay areas between Lewisporte and Random Island. In 1978 new infestations were recorded at Summerford on New World Island and on Random Island.

Larch Sawfly, Pristiphora erichsonii (Htg.) - Population levels of this sawfly continued to increase in western Newfoundland and remained at high levels in Labrador. Moderate to severe defoliation of stands occurred along the Trans Canada Highway 8.8 km west of Howley Junction and along the Humber Canal between Deer Lake and Grand Lake. Light defoliation occurred at Deer Lake, Goose Arm, North Lake, Lomond River and Trout River. In Labrador the sawfly outbreak continued for the fourth consecutive year. Larval numbers remained high in the Goose River to Goose Bay area, along the Churchill Road and between Sandwich Bay and Winokapau Lake. Tree mortality occurred in two stands of approximately 250 ha in the Mud Lake area.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978 - Island	20	0.3	43.9	136.7
1978 - Labrador	5	26.7	30.0	50.0

A five day trapping period was conducted in October in five plots located throughout the Island to determine the population levels of the masked shrew. Results of this survey showed that population levels in central and eastern Newfoundland were double the numbers in western Newfoundland and the Avalon Peninsula (Table 7). This difference in shrew numbers was probably due to the drier weather conditions experienced in east-central Newfoundland in 1978.

Larch Casebearer, Coleophora laricella (Hbn.) - High numbers of this casebearer were recorded in eastern Newfoundland for the third consecutive year. New infestations occurred near the junction of the Trans Canada Highway and the Hampden Road and along the Kings Point Road. On the Avalon Peninsula the infestation extended from Donovans to Paddy's Pond and along the Arterial Road near the Newtown overpass for a total area of 50 ha. Defoliation was about 25% in both areas. Four separate infestations in the Terra Nova National Park were located at Sandy Pond Road, east of Charlottetown Junction on the Trans Canada Highway and in two areas west of the Park Headquarters. Defoliation in these areas ranged from 5-95%. Parasites play an important role in controlling the casebearer and usually terminates infestations in two or three years. Table 8 shows stand defoliation and number of casebearer per branch sample.

Larch Beetle, Dentroctonus simplex Leconte - This is the first recorded outbreak of this species in Newfoundland. Outbreak levels occurred in spruce budworm-weakened tamarack stands and trees weakened by flooding and road construction along the Trans Canada Highway and secondary roads in central Newfoundland. Dead trees in widely scattered groups of three to 40 trees characteristic of bark beetle outbreaks were recorded. Cumulative damage over the years may cause a significant proportion of tree mortality.

European Pine Sawfly, Neodiprion sertifer (Geoff.) - Accidentally introduced to the St. John's area in 1974, this pest continues to increase and cause severe defoliation to stands of pine around Windsor Lake and

Table 7. Estimated number of shrews per hectare in Newfoundland 1968-1978.

Location	Sept. 1968	Oct. 1969	Sept. 1970	Sept. 1971	Sept.* 1972	Sept.* 1973	Oct.* 1974	Oct. 1975	Oct. 1976	Oct. 1977	Oct. 1978
St. Georges	-	-	-	-	-	-	-	-	-	-	6.45
Hall's Bay	8.28	7.09	7.04	6.08	5.39	8.60	9.69	-	-	-	13.99
Wiley Brook	-	-	12.26	8.82	6.45	9.69	6.45	Discontinued			-
Terra Nova	1.66	7.09	8.40	7.07	7.54	9.69	10.77	3.24	9.98	8.13	10.77
Paddy's Pond	-	-	0.00	1.51	3.24	9.69	4.30	2.15	9.98	7.34	5.39

*Ten day trapping period.

Table 8. 1978 Larch Casebearer Population Levels

	Stand vigor	Stand defoliation	Avg. no. of cases per branch sample
Newtown	M	M	9.9
3.0 km N.E. Mount Pearl	V	L	7.8
St. John's	M	L	5.3
St. John's	U	M	8.1
6.4 km S. Tors Cove	U	M	6.4
Saltons Brook	V	S	12.4
Sandy Pond Junction	M	M	4.7
Cobblers Brook	V	L	1.1
Junction of Hampden Road	V	L	0.1
2.6 km E. of Crooked Feeder	V	L	1.0
Junction Brook	U	L	2.9
2.5 km E. Whites Road (TCH)	M	L	1.4
6 km W. of Junction Brook (TCH)	V	L	2.5
2.5 km E. of Crooked Feeder (TCH)	V	L	1.5

Stand Vigor: U = unthrifty
M = moderately vigorous
V = vigorous

Stand Defoliation: L = light
M = moderate
S = severe

ornamental pines throughout the city. In 1978 a larval parasite, Lophyroplectus luteator (Thunb.) and a pupal parasite, Pleolophus basizonus Grav., have been introduced in an attempt to control the infestation and reduce tree damage.

Birch Casebearer, Coleophora fuscedinella (Zell.) - High numbers of casebearer were recorded throughout the Island from Port aux Basques to Clarenville with isolated pockets of larvae on the Avalon Peninsula. Moderate to severe defoliation occurred from River Brook to Fischells River, St. Georges to Southwest Brook, Pinchgut Lake to Steady Brook, from Pasadena to Deer Lake, Reidsville, Cormack, Lomond to Rocky Harbour and from Deer Lake to Baie Verte in western Newfoundland. Moderate to severe damage also occurred throughout central and eastern Newfoundland as far as Clarenville. Although the main infestation hasn't reached the Avalon Peninsula, isolated infested trees have been located in St. John's and Mt. Pearl. There were no recoveries of the introduced parasites Campoplex and Apanteles species released in 1974 and 1975 in the Mint Brook, Badger and White River Road areas.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	68	0.3	9.9	26.0
1977	84	0.3	17.4	130.0

Large Aspen Tortrix, Choristoneura conflictana (Wlk.) and Poplar Leaf Roller, Compsolechia niveopulvelia (Cham.) - Population levels of the tortrix continued to decline while the poplar leaf roller remained about the same as 1977 from Hall's Bay to Badger and throughout the Exploits Valley. Severe damage of trembling aspen occurred in the Cresent Lake, Roberts Arm area and larvae of the tortrix were common. The most severe poplar leaf roller damage was reported from Hall's Bay to Grand Falls. Light damage was recorded along North Pond Road.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	15	0.3	6.0	16.7

Uglynest Caterpillar, Archips cerasivoranus (Fitch) - A small infestation near the Trans Canada Highway at Flat Bay Brook continued for the third consecutive year and increased 10 km along Flat Bay Brook. Population levels averaged 48 per tree sample and caused 20-30% defoliation of Choke cherry and speckled alder. A separate infestation was reported at Piccadilly Head Provincial Park where 50 larvae per tree sample caused 10% defoliation to Choke cherry.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	6	17.0	49.0	140.0
1977	4	33.3	50.0	100.0

Satin Moth, Leucoma salicis (Linn.) - A severe infestation occurred on ornamental trees in and around St. John's and Mount Pearl. Complete defoliation of poplars and willows were common throughout the city. In Corner Brook a three year old infestation terminated. Control of the outbreak was achieved by the introduced parasite Apanteles solitarius (Ratz.).

Fall Webworm, Hyphantria cunea (Dru.) - Population levels averaged 100 per tree sample from Whites Road, Stephenville Crossing. This infestation began in 1973 and the only other recorded infestation was in the period 1952 to 1955. In 1978 only light defoliation was recorded on roadside speckled alder.

Year	No. of Collections	No. of Larvae per Tree Sample		
		Min.	Avg.	Max.
1978	2	67.0	100.0	133.3

OTHER NOTEWORTHY INSECTS

Species	Host(s)	Locality	Average per tree	No. of collections
Anomogyna perquiritata (Morr.) Gray spruce cutworm	bF	Burnt Berry Brook	0.3	1
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	Goose Arm Rd., North Lake Rd., Howley Jct.	0.3	3
Archippus packardianus (Fern.) Spring spruce needle moth	bF	Whelans Pond Rd.	0.3	1
Archips myricanus McD. A leafroller	Black Ash	Pasadena Nursery	15	1
Archips rosanus (Linn.) European leafroller	wB	Pasadena Field Station	0.2	1
Campaea perlata (Guen.) Light emerald	wB	Barachois Pond Provincial Park	0.3	1
Caripeta divisata Wlk. Gray spruce looper	bF, bS wS	Botwood Highway, Templemans Lake, Aspen Brook Rd., Lewisporte Rd., Bottle Pond Rd., Nicholsville, Barachois Pond Provincial Park	0.5	7
Choristoneura rosaceana (Harr.) Obliquebanded leafroller	wB, rM	Pasadena Nursery, Barachois Pond Provincial Park, Flat Bay Brook	2.7	4
Chrysomela falsa Brown Willow leaf beetle	W	South Brook Valley, Churchill Rd. Mud Lake, Kenamu River	3.0	4

Cont'd...

Continued.

Species	Host(s)	Locality	Average per tree	No. of collections
Chrysomela mainensis mainensis Bech. Alder leaf beetle	Sal	Bottom Brook, Junction Brook,	8.8	3
Cimbex americana Leach Elm sawfly	W	Pasadena Nursery	1.0	1
Coccinella transversoguttata richardsoni Brown Transverse lady beetle	bS	2.1 km E. of TNNP boundary	0.3	1
Croesus latitarsus Nort. Dusky birch sawfly	wB	St. John's	60.0	1
Ctenicera triundulata (Rand) Three-spotted click beetle	bF, rS wS	Pouch Cove, Dildo Pond, North Pond Plantation, Bay Bulls Big Pond, Careless Cove, Crooked Lake, Hungary Hill, Red Indian Lake, Frenchmans Pond, Roddickton Road	0.4	11
Diprion hercyniae (Htg.) European spruce sawfly	wS, bS	22.4 km on Churchill Rd., Otter Creek, District 108	0.8	7
Epinotia solandriana Linn. A leaf roller	wB	Islington	0.2	1
Eucordylea atrupictella Dietz. Spruce micromoth	bF	3.2 km N.W. of Beaver Pond	0.2	1
Eupithecia sp. Brown spruce looper	bF, wS Sal	District 101, Lake Douglas, Lake Ambrose, Michaels Hr., South Brook Valley, Barry Brook, Island Pond Rd., Neddys Harbour	0.3	12

Cont'd...

Continued.

Species	Host(s)	Locality	Average per tree	No. of collections
Fenusa dohrnii Tischb. European alder leafminer	Sal	Cobblers Brook, Random Island, TNNP, Georges Lake, Gallants Rd., Island Pond Rd., Otter Creek, Goose Bay, 8.8 km on Churchill Rd.	10.4	10
Fenusa pusilla (Lep.) Birch leafminer	Sal	Marine Lab Rd., District 103, 107 and 108, Gros Morne National Park, Birchy Lake, North Lake Rd., North West River, Otter Creek, Goose Bay, Churchill Rd.	9.8	32
Feralia jocosa (Guen.) Red-marked caterpillar	bF	Pouch Cove, Bay d'Espoir, 11.2 km S.W. of Glenwood, Baie Verte Peninsula, Districts 107 and 108.	0.5	13
Griselda radicana Wlshm. Red-striped spruce shoot moth	wS, bF	Dildo South, Buchans Rd., Jct. TCH and Bottle Pond Rd.	0.7	3
Hedia variegana (Hbn.) Green budworm	Pch, rM	Pasadena Nursery	5.7	2
Hemichroa crocea (Four.) Striped alder sawfly	Sal	Gayside Rd.	15.0	1
Heterarthus nemoratus (Fall.) Birch leafmining sawfly	wB	Dildo South	10.0	1
Hylobius sp. Root collar weevil	sP, bF	North Pond Pine Plantation, Frenchmans Pond, Spruce Brook, 29 km from TCH (S.W. Brook Rd.)	1.1	4

Cont'd...

Continued.

Species	Host(s)	Locality	Average per tree	No. of collections
Mindarus abietinus Koch Balsam twig aphid	bF	Pouch Cove, Outer Cove, District 108, Coachman's Cove, North Lake, Sops Arm Provincial Park, 8 km W. of Quirpon Jct., 6 km S.W. of N.W. River	13.4	13
Monochamus scutellatus (Say) Whitespotted sawyer	bF	Rogerson Lake Rd.	0.3	1
Nadata gibbosa (J.E. Smith) Green oak caterpillar	wB	Barachois Pond Provincial Park	0.3	1
Nematus sp. A willow sawfly	W	Military Reserve Rd. (North West River), Pynns Brook, Snug Harbour, Gallants Rd., Bottle Pond Rd.	2.4	5
Neodiprion abietis complex Balsam fir sawfly	bF	Bay Bulls Big Pond, Pouch Cove, Whelans Pond Rd., Goose Arm Brook, Logging School Rd., Roddickton Rd., Fleur de Lys, Jackson's Arm	0.5	9
Nepytia canosaria (Wlk.) False hemlock looper	bF	Hearts Content, Whelans Pond Rd., Buchans Jct., Red Indian Lake, Victoria Lake, Harbour Round, Goose Arm, Robinsons River Rd., Barachois Pond, Prov. Park., Lomond, Coachmans Cove, Bide Arm	0.4	13
Neurotoma inconspicua (Nort.) Plum webspinning sawfly	Pch	24 km from TCH (Bay d'Espoir), Notre Dame Provincial Park, 13.4 km W. of Norris Arm, 22.4 km on Churchill Rd., 8.8 km on Churchill Rd.	26.4	5

Cont'd...

Continued.

Species	Host(s)	Locality	Average per tree	No. of collections
Nycteola cinereana N. & D. Poplar leaftier	W	Wild Cove Jct.	0.3	1
Nyctobia limitaria (Wlk.) Green balsam looper	bF, wS bS	Avalon Peninsula, 19 km S.W. of Victoria River, Pynn's Brook, Bottom Brook Rd.	0.4	12
Orgyia antigua (L.) Rusty tussock moth	bF, wB Sal, W	Noel Paul Brook, Birchy Bay North, Junction Brook, Gros Morne National Park, Baie Verte Peninsula	0.4	8
Otiorhynchus singularis (Linn.) Clay-colored root weevil	bF, wS W	Avalon Peninsula, Pasadena Nursery	0.6	13
Papaipema pterisii Bird. A stalk borer	Wild Parsnip	Georges Lake, Pinchgut Lake Rd.	1.0	2
Papilio glaucus canadensis R. & J. Canadian tiger swallowtail	wB	12.3 km S.W. of Badger	0.1	1
Parorgyia plagiata (Wlk.) Pine tussock moth	bF	Mings Bight	0.3	1
Phyllocnistis populiella Chamb. Aspen leafminer	tA	Churchill Rd., Goose Bay	5.7	3
Pikonema alaskensis (Roh.) Yellowheaded spruce sawfly	wS	Blue Gulch Pond Rd., Old Goose Arm Rd.	0.3	2
Pikonema dimmockii (Cress.) Greenheaded spruce sawfly	wS, bS	Marine Lab Rd., Pouch Cove, Nicholsville, Gallants Rd., Spruce Brook Rd., S.W. Brook Rd.	0.4	6

Cont'd...

Concluded.

Species	Host(s)	Locality	Average per tree	No. of collections
Pissodes sp. A weevil	bF	Outer Cove, Whelans Pond Rd.	0.2	2
Pristiphora geniculata (Htg.) Mountain ash sawfly	Mt-Ash	Random Island Causeway, District 106, 108, Mummichop Provincial Park, Birchy Narrows	39.5	15
Protoboarmia p. indicataria (Wlk.) Dotted line looper	bF	Burnt Berry Brook Rd.	0.3	1
Rhyacionia buoliana (Schiff.) European pine shoot moth	sP	Pasadena Field Station	0.5	2
Sciaphila duplex Wlshm. Poplar leafroller	tA	Flatwater Pond Provincial Park	1	1
Semiothisa sp. A looper	bF, bS tL, wS	Thorburn Lake, Roddickton Rd., Districts 101 and 108	0.3	12
Sicya macularia Harr. Lumpy looper	Sal	12.8 km from TCH (Bottom Brook Rd.)	0.3	1
Syneta sp. A leaf beetle	bF, bS wS	Carters Rd., North Pond Plantation, Lake St. John, Hawkes Bay, District 101	0.3	11
Syngrapha alias (Ottol.) Spruce climbing cutworm	bF, bS	St. Catherines, North Pond Plantation, Pinchgut Lake	0.2	3
Trichiosoma sp. A sawfly	W	Pasadena Nursery, South Brook Valley	0.5	2
Zeiraphera fortunana Kft. Spruce budworm	wS	North Pond Plantation, Dildo South, Hearts Delight, Mummichog Provincial Park	0.7	5
Zeiraphera improbana (Wlk.) Larch needleworm	tL	New Harbour	0.3	1

IMPORTANT FOREST DISEASES

Broom Rusts of Conifers - Broom rust of balsam fir caused by Melampsorella caryophyllacearum Schroet., and of black spruce caused by Chrysomxa arctostaphyli Diet., continued to be the most conspicuous diseases in 1978. As in the past four years, their incidence varied from low to severe. A few new infections and brooms were observed in balsam fir regeneration at Stag Lake near Roddickton in western Newfoundland along the Badger Buchans Road near Badger and in the Terra Nova National Park. In some areas up to 12% of the trees were affected.

Witches' Broom of Black Spruce - Witches' broom of black spruce caused by dwarf mistletoe, Arceuthobium pusillum Peck, continued to be a serious disease problem for the past few years in wet and low-lying areas from Trout Brook to Crabbles River in western Newfoundland. The incidence and intensity of the damage increased in some areas as compared to previous years. New and additional brooms were observed on several trees. Dwarf mistletoe was also observed on a few trees at North Pond near Gambo.

Needle Rust of Balsam Fir, Pucciniastrum epilobii Otth. - A low incidence of this disease was recorded at several locations on the Island and in Labrador. An estimated 5% damage occurred on balsam fir in North Pond plantation NF88 at Shoal Cove Brook in the Gros Morne National Park and 20% damage of balsam fir regeneration on the Pinchgut Lake Road. A stand of young balsam fir was also affected in the South Brook Valley 2 km from the Trans Canada Highway. In Labrador, light damage occurred near North West River and along the Churchill Road.

Armillaria Root Rot, Armillaria mellea (Vahl Ex Fr.) Kummer - This organism was found in a Scots pine plantation at North Pond. Up to 5% tree mortality was recorded and approximately 10% currently infected.

Ink Spot of Aspen, Ciborinia whetzelii (Seav.) Seav. - A high incidence of this disease was recorded in trembling aspen stands on the Baie Verte Peninsula, Red Indian Lake, and in the Goose Bay area of Labrador. In the Baie Verte area 20-60% of the foliage and 90% of the trees were affected in the Flatwater Pond, Wild Cove and Burlington roads and at Wild Cove Brook. In Labrador this disease continued to cause moderate to severe damage for the fourth consecutive year. Browning of foliage along the Churchill Road near Goose Bay was estimated at 30-100%. A low incidence of the disease also occurred along a 12 km stretch of the road near Glovers Harbour and 37 km on the Churchill Road from Goose Bay and at Happy Valley. Only 10% infection was recorded from both areas.

Leaf and Twig Blight of Trembling Aspen, Pollacia radiosa (Lib.) Bald and Cif. - Severe wilting occurred on 50% of trembling aspen regeneration along the Trans Canada Highway in the Birchy Lake area. Low incidences occurred on the Baie Verte Peninsula and in the North Pond plantation NF-76 and near Bishops Falls.

Winter Drying - A low incidence of winter drying was observed in balsam fir stands near East Arm in the Gros Morne National Park and on immature balsam fir near North West River in Labrador.

Frost Damage - Low to moderate damage by frost, affecting up to 40% of the new shoots of balsam fir regeneration was observed near Barry Brook and along the Pinchgut Lake woods road in western Newfoundland.

OTHER NOTEWORTHY DISEASES 1978

Organism and Disease	Host(s)	Locality	Remarks
Apiosporina morbosa (Schw.) Arx Black knot	Cherry, pin	Bonne Bay Rd , 0.8 km S. of Cormack Rd.	High incidence
Cronartium ribicola J.G. Fischer White pine blister rust	Currant, skunk	Pinchgut Lake Rd.	High incidence
Cytospora salicis (Cola.) Rabh. Stem canker	Willow	Piccadilly Head Provincial Park, Goose Bay	Low incidence
Gloeosporium apocryptum Ell. & Ev. Large leaf spot	Maple, red and mountain	South Brook Valley, Pasadena, Gillams, Blue Pond Provincial Park, Blow-Me-Down Provincial Park, Lomond, 2.6 km S. of River of Ponds, Dicks Brook	Low to high infection
Gymnosporangium cornutum Arth. ex Kern Leaf rust	Ash mountain	Roddickton Rd.	Low incidence
Hypodermella laricis V. Tub. Needle cast of larch	Larch	2 km W. Logging School Rd., Lake St. John	Low incidence
Lirula macrospora (Hartig) Darker Needle cast	Spruce, black	1.6 km N. Otter Creek	Moderate infection
Melampsora abietis-carpraerum Tub. Leaf rust of willow	Willow	Goose Bay	Light incidence
Mycosphaerella sp. Leaf spot	Fireweed	Pinchgut Lake Rd.	Moderate incidence

Cont'd...

Concluded.

Organism and Disease	Host(s)	Locality	Remarks
Phyllosticta minima (Berk. & Curt.) Underw. and Earle Purple eye spot	Maple, mountain and red	Roddickton Rd., River of Ponds Provincial Park, Dicks Brook, Logging School Rd., Barachois Pond Provincial Park	Trace to light infection.
Taphrina sp. Leaf blister	Birch, white	McIvers	Moderate infection.

TREE PEST EXTENSION SERVICE REPORT 1978

The Tree Pest Extension Officer, E.C. Salter, resigned early in 1978. As a result, the Forest Insect and Disease Survey assumed responsibility for replying to the many requests received by the Newfoundland Forest Research Centre.

Field technicians stationed at Badger and Pasadena answered requests in their areas while in St. John's a telephone answer service was established, whereby calls were answered each day.

A total of 140 calls were received during 1978. From this number, 63 pamphlets and 28 letters were sent by mail explaining control measures to be taken. Personnel at the Research Centre also made 47 visits to property owners.

Cooperation was received from the Newfoundland Forest Service and Agriculture Canada through the research station at Mt. Pearl. Each year the research station provides updated pamphlets on garden and household pests to complement the forestry notes which are published by the Forest Research Centre.

The major insect pests recorded during 1978 were:

Spruce Budworm - Although population levels decreased in 1978 in western Newfoundland, severe defoliation to ornamental spruce and fir occurred in St. John's and surrounding areas. High numbers of budworm were reported from Goulds, Manuels, Outer Cove and Torbay.

Satin Moth - Again as in 1977, a severe infestation occurred on ornamental poplars and willows in St. John's. Defoliation of the current foliage was 100% in many instances. Population levels were extremely high in the Holyrood and Mt. Pearl areas.

European Pine Sawfly - This introduced pest continued to increase and defoliate stands of pine at Windsor Lake and ornamental pines in the city of St. John's. A small stand of pine near the Confederation Building was severely infested. In this area and at Windsor Lake, the larval parasite Lophyroplectus luteator (Thunb.) and the pupal parasite Pleolophus basizonus (Grav.) were released in an attempt to control the pine sawfly infestation.

OTHER NOTEWORTHY INSECTS

Species	Host(s)	Locality
Archips spp. Leaf rollers	rM	Newtown, St. John's
Blissus leucopterus (Say.) Chinch bug	Grasses	St. John's
Cerarteryx graminis (Linn.) Antler moth	Grasses	St. John's
Choristoneura conflictana (Wlk.) Large aspen tortrix	tA	Stephenville
Coleophora fuscedinella (Zell.) Birch casebearer	wB	Corner Brook, St. John's
Cryptorhynchus lapathi (L.) Poplar and willow borer	W	Pasadena, St. Phillips
Desmocerus palliatus (Forst.) Elder borer	Golden Elder	St. John's
Fenusa ulmi Sund. Elm leafminer	Elm	St. John's
Gracillaria syringella (F.) Lilac leafminer	Lilac	Grand Falls
Harpipteryx xylostella (Linn.) European honeysuckle leafroller	Hawthorne	Grand Falls, St. John's
Monochamus scutellatus (Say) Whitespotted sawyer	bS, wP	Gambo, Gander
Pikonema alaskensis (Roh.) Yellowheaded spruce sawfly	bS	Mt. Pearl
Pristiphora geniculata (Htg.) Mountain ash sawfly	Ash	Point au Mal, St. John's
Tipula paludosa Meigen European crane fly	Grasses	St. John's
Vasates quadripedes (Shimer) Maple bladdergall mite	rM	St. John's

DISEASES

Nectria Canker was the most common disease in 1978. It was found on six different host species in the St. John's area. The hosts were elm, elder, horse chestnut, red maple, silver maple and American basswood. The incidence varied from moderate to high and some of the trees had up to six cankers. Percentage infection ranged from 20% to 100%.

OTHER NOTEWORTHY DISEASES

Species	Host(s)		
Infectious diseases			
Apiosporina morbosa (Schw.) Arx Black knot	Pin cherry	St. John's Gander	A high incidence was noticed in St. John's and all the two trees were infected.
Cytospora species Dieback and canker	Balsam poplar	Mt. Pearl	High incidence was recorded and 100% of the trees
	Weeping willow	Corner Brook	Moderate infection on one tree. Some branches dead.
Dothichiza populea Sacc. and Briard Dothichiza canker	Lombardy poplar	St. John's	Moderate to high infection.
Melampsorella caryophyllacearum Schroet. Broom rust	Balsam fir	Flat Rock	Moderate to high infection in a large area. Most trees had one to two brooms.
Pleurotus species Decay fungus	Horse chestnut	St. John's	Low incidence. Found on one tree which also had Nectria canker
Pollacia elegans Serv. Leaf and shoot blight	Balsam poplar	Mt. Pearl	100% infection. A very high incidence of young trees.
Taphrina populina Fr. Leaf blister	Griffin poplar	Mt. Pearl area	Trace. Approximately 2% of leaves on the two trees had blister.
Frost cracks	Horse chestnut	St. John's	Widespread. Incidence low.

APPENDIX I.

Appendix I. Results of spruce budworm egg-mass and overwintering larval surveys.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoliation	Egg-mass category*	Overwintering larvae category
	EASTERN NEWFOUNDLAND					
1	Bay Bulls	3	0	Nil	Nil	-
2	Country Pond	3	0	Nil	Nil	-
3	Bay Bulls Big Pond	3	179	Nil	L	
4	Goulds	3	0	L	Nil	-
5	Cochrane Pond	3	51	M	L	-
6	Blackhead	3	52	Nil	L	-
7	Logy Bay	3	0	M	Nil	-
8	Torbay	3	117	L	Nil	-
9	Pouch Cove	3	0	L	Nil	-
10	Bauline	3	0	Nil	Nil	-
11	Bauline	3	0	L	Nil	-
12	Bauline Line	3	0	L	Nil	-
13	St. Phillips	3	0	L	Nil	-
14	St. Thomas	3	35	Nil	L	-
15	Paradise	3	902	S	S	-
16	Paddy's Pond	3	1571	S	S	-
17	32 km W. Paddy's Pond	3	0	Nil	Nil	-
18	6.4 km W. Paddy's Pond	2	58	Nil	L	-
19	Butterpot Prov. Park	3	0	Nil	Nil	-
20	6.4 km N. Holyrood	3	904	S	S	-
21	Hr. Main Pond	3	0	L	Nil	-
22	Southwest Pond	3	0	L	Nil	-
23	Jct. Prison Camp Rd.	3	0	L	Nil	L
24	6.4 km N.E. St. Catherines	3	19	L	L	-
25	St. Catherines	3	0	Nil	Nil	-
26	New Bridge	3	0	Nil	Nil	-
27	St. Catherines	3	11	Nil	L	M
28	Markland River	2	0	Nil	Nil	H
29	Argentia Access Rd.	2	88	Nil	L	-
30	Argentia Access Rd.	1	556	M	S	M
31	Placentia	1	375	M	S	-
32	Dildo Pond	2	0	M	Nil	-
33	Dildo Arm	3	120	Nil	L	-
34	Hopeall	2	0	Nil	Nil	-
35	6.4 km S.W. Bay Roberts	2	66	Nil	L	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
36	Riverhead	1	340	Nil	S	-
37	3.2 km S. Carbonear	3	102	L	L	-
38	3.2 km N. Whiteway	2	29	Nil	L	E
39	Heart's Delight	2	0	Nil	Nil	E
40	Chapel Arm	2	0	Nil	Nil	M
41	Chapel Arm	2	0	Nil	Nil	-
42	Kite Hill	1	1082	S	S	-
43	Thornlea	3	330	L	M	-
44	Bellevue	1	619	S	S	-
45	Bellevue	3	746	S	S	E
46	Thornlea	1	1036	S	S	-
47	Bellevue Beach	1	543	S	S	-
48	Jack's Pond Prov. Park	3	224	S	L	E
49	Goobies	2	0	S	L	H
50	Hatchet Cove	3	339	M	M	H
51	St. Jones Within	2	565	S	S	-
52	Adeytown	2	47	S	L	M
53	Random Island	2	0	S	Nil	-
54	Elliots Cove	1	1120	S	S	-
55	Aspen Brook	3	678	S	S	M
56	Weybridge	3	229	S	M	-
57	Lady Cove	3	360	M	M	-
58	Hickman's Hr. Jct.	1	349	M	S	H
59	Brittania	3	300	S	L	-
60	1.6 km E. Barton	2	664	S	S	-
61	5.6 km E. Monroe	1	492	S	S	-
62	6.4 km N. Georges Bk.	2	33	M	Nil	-
63	3.2 km S. Lethbridge	2	0	M	Nil	-
64	6.4 km S.E. Bonavista Rd.	1	815	S	S	-
65	12.8 km S.E. Bonavista Rd.	3	691	S	S	-
66	Northern Pond	1	446	M	S	-
67	Portland Rd.	3	210	M	L	-
68	Bonavista Hwy.	1	455	L	S	H
69	Sweet Bay	1	362	S	S	-
70	64 km E. Southern Bay	2	124	L	L	M
71	Summerville	1	645	L	S	-
72	Plate Cove	2	503	M	M	E
73	King's Cove Rd.	1	401	S	S	-
74	King's Cove	2	628	S	S	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
75	Port Rexton Rd.	3	681	S	S	-
76	Lockston Prov. Park	1	520	S	S	E
77	3.2 km N. Port Rexton	1	378	M	S	-
78	Knight's Cove	3	699	S	S	H
79	4.8 km S. Cove Upper Amherst Cove	3	432	M	M	-
80	Catalina Rd.	1	712	S	S	-
81	Newman's Cove	1	586	S	S	H
82	Bread Cove Brook (TNNP)	2	0	L	Nil	-
84	Bread Cove	1	360	Nil	S	-
85	3.2 km E. Bread Cove (TNNP)	1	431	Nil	S	-
87	Fire Lookout (TNNP)	3	639	L	M	-
88	3.2 km N.W. Fire Lookout (TNNP)	3	224	L	L	-
89	3.2 km N. Fire Lookout (TNNP)	2	939	L	S	-
91	Clode Sound (TNNP)	3	551	Nil	M	-
92	Park Harbour Hill (TNNP)	3	182	Nil	L	-
93	Clode Sound (TNNP)	3	582	M	M	-
94	South Broad Cove (TNNP)	2	96	M	S	-
95	Mt. Stamford (TNNP)	3	687	S	S	-
96	Mt. Stamford (TNNP)	2	48	S	L	-
97	Jct. T.C.H. Park Headquarters	1	429	M	S	-
98	Saltons Brook (TNNP)	1	340	M	S	-
99	Southwest Arm (TNNP)	2	200	L	L	-
100	Bluehill Pond (TNNP)	1	438	Nil	S	-
101	Long Pond North (TNNP)	2	125	S	L	-
102	Swale Island (TNNP)	2	0	M	Nil	-
103	Matchim's Cove (TNNP)	3	479	M	M	-
104	Green Hill Ponds (TNNP)	2	0	L	Nil	-
105	Broad Cove	1	369	L	S	-
108	Jct. Garden Cove Rd.	3	382	L	M	-
109	Piper's Hole River	2	0	S	Nil	-
126	11.2 km E. George's Pond	3	487	S	S	-
127	8.0 km George's Pond	3	178	S	L	E
128	Thorburn Lake	3	490	S	M	-
129	Port Blandford	3	605	S	M	E
130	8.0 km W. Bunyan's Cove	1	421	S	S	-
131	Bunyan's Cove	3	553	S	M	E
132	Northwest Arm (TNNP)	3	232	L	L	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
133	South Boundary (TNNP)	2	98	M	L	-
134	Jct. Sandy Pond Rd. (TNNP)	3	222	M	L	-
135	Tidewater	1	519	M	S	-
137	Charlottetown Jct. (TNNP)	1	615	M	S	-
138	3.2 km S. Dunphy's Pond Rd. (TNNP)	3	459	Nil	M	-
139	Dunphy's Pond	2	0	M	Nil	-
140	Terra Nova Bk.	2	28	M	L	-
141	Pine Hill Pond	3	524	S	M	-
142	Terra Nova Rd.	3	553	S	M	-
143	Chain Pond	2	137	L	L	-
144	Terra Nova Lake	1	1095	S	S	-
145	Northwest Pond	2	41	M	L	-
146	Terra Nova Rd.	1	557	M	S	-
147	Terra Nova Rd.	3	675	S	S	E
148	Terra Nova Rd.	2	0	S	Nil	-
149	Lake St. John	1	580	M	S	-
150	4.8 km S. New Pond	2	129	M	L	H
151	Mollyguajeck Lake	3	1376	M	S	-
152	Larry's Pond	2	65	Nil	L	H
153	Larry's Pond	3	456	M	M	-
154	Lake St. John	2	0	Nil	Nil	-
155	Deer Pond	2	0	L	Nil	H
156	Deer Pond	2	122	L	L	-
157	Deer Pond	3	252	L	L	H
158	Newton Lake	2	189	S	L	E
159	Deer Pond area	3	454	L	M	E
160	4.8 km S. Southwest Pond	3	663	S	M	L
161	Triton Brook	2	0	Nil	Nil	-
162	Triton Brook	1	369	L	S	-
163	Triton Brook	2	95	Nil	L	-
164	Deer Pond	3	517	M	M	-
165	Triton Brook	2	0	Nil	Nil	H
166	Triton Brook	2	0	M	Nil	H
167	Riverhead Brook	2	39	Nil	L	-
168	Deadwolf Pond	2	37	Nil	L	H

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoliation	Egg-mass category*	Over-wintering larvae category
169	Gambo Pond	3	454	M	M	-
170	Gambo Pond	3	158	S	L	H
171	Gambo Pond	2	32	M	L	-
172	North Pond	3	547	L	M	E
173	Mason's Pond	3	370	M	L	-
174	Gambo	1	481	M	S	-
175	Glovertown	1	917	M	S	E
850	Victoria	2	0	Nil	Nil	-
851	9.6 km W. Carbonear	3	261	Nil	L	-
852	Southern Cove Pond	2	0	Nil	Nil	-
853	Cavendish	2	31	L	L	-
854	Green's Harbour	2	748	Nil	S	-
855	Random Island	2	287	S	M	H
856	Ocean Pond	2	747	S	S	-
857	8.0 km W. Trinity	3	26	L	L	-
858	6.4 km N.E. Champney's	2	0	M	O	-
Average			192			
119	Conne River	2	80	L	L	E
120	6.4 km N. Head Bay d' Espoir	1	666	Nil	S	E
121	Milltown	1	465	Nil	S	-
122	Head Bay d'Espoir	3	315	L	L	-
123	4.8 km N. St. Veronicas	1	448	S	S	-
124	St. Joseph's Cove	3	204	L	L	M
125	Swanger Cove	2	46	S	L	-
176	Dark Cove	1	532	S	S	-
177	Lower Dark Cove	3	973	M	S	-
178	Square Pond	1	397	M	S	E
179	6.4 km E. of Benton Jct.	2	668	S	S	-
180	Benton Jct.	3	1321	S	S	E
181	Soulis Pond	2	0	L	Nil	E
182	Soulis Pond	2	0	Nil	Nil	-
183	Soulis Pond	2	511	S	S	E
184	Home Pond	2	48	L	L	-
185	4.0 km S. Deadman's Pond	1	531	M	S	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
186	Rodney Pond	3	357	L	M	E
187	Rodney Pond	2	134	O	L	M
188	Joe Batt's Pond	3	267	M	L	E
189	Glenwood	3	1129	M	S	-
190	Gander Lake	2	137	S	L	-
191	Gander Lake	2	54	M	L	-
192	N.W. Gander River	1	452	M	S	-
193	N.W. Gander River	2	0	Nil	Nil	-
194	N.W. Gander River	3	55	M	S	-
195	Winter Brook	1	500	Nil	S	-
196	S.W. Gander River	2	112	M	L	H
197	S.W. Gander River	3	229	L	L	-
198	Little Dead Wolf Pond	2	89	M	L	-
199	Hunt's Pond	2	48	L	L	E
200	Hunt's Brook	2	67	M	L	-
201	S.W. Gander River	2	0	L	Nil	-
202	Dead Wolf Brook	2	34	L	L	-
203	Watcher's Brook	2	34	S	L	-
204	Caribou Lake	2	42	L	L	H
205	S.W. Gander River	3	179	S	L	-
206	S.W. Gander River	1	400	S	S	-
208	N.W. Gander River	2	1611	M	S	-
209	N.W. Gander River	2	82	S	L	-
210	S.W. Gander River	3	479	L	M	M
211	Great Gull River	2	0	M	O	-
212	Third Berry Hill Pond	3	556	S	M	E
213	N.W. Gander River	2	0	Nil	Nil	-
214	N.W. Gander River	2	39	L	L	M
215	5.0 km N. Rattling Pond	2	31	S	L	-
216	Webber Pond	2	0	L	Nil	H
217	6.4 km E. Crowe Lake	2	42	L	L	-
218	Crowe Lake	2	111	L	L	H
219	8.0 km N. Crowe Lake	3	282	L	L	-
220	Burnt Lake	2	729	S	S	-
221	Burnt Lake	3	492	S	M	E
222	Frozen Ocean Lake	2	0	Nil	Nil	H
223	Tote Hill	1	459	S	S	H
224	Bay d'Espoir Rd.	1	729	S	S	-
225	Miquel's Lake	3	738	S	S	H
226	Bay d'Espoir Rd.	1	673	L	S	-
227	Bay d'Espoir Rd.	2	566	L	S	-
228	Bay d'Espoir Rd.	2	635	L	S	H

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
229	Little Gull Lake	3	468	L	M	-
230	Bay d'Espoir Rd.	3	904	S	S	-
231	Bay d'Espoir Rd.	3	337	S	M	E
232	Bay d'Espoir Rd.	1	741	S	S	-
233	Twillick Brook	2	130	L	L	E
234	Great Rattling Brook	3	411	S	M	E
235	North Great Rattling Brook	2	0	Nil	Nil	H
236	North Great Rattling Brook	1	593	S	S	-
237	Great Rattling Brook	1	457	S	S	-
238	Miquels Lake	3	204	S	L	-
239	Great Rattling Brook	3	599	S	M	H
240	Diversion Lake	2	117	S	L	-
241	Sandy Brook	2	0	L	Nil	E
242	Diversion Lake	2	114	M	L	-
244	Lemott's Lake	3	415	S	M	-
245	West Lake	2	112	M	L	H
246	Tom Joe Brook	3	698	M	S	E
247	10.0 km W. Grand Falls	3	655	S	M	H
248	Aspen Brook	3	487	S	M	E
249	Jonathan's Pond Prov. Park	3	336	S	M	H
250	Island Pond Brook	3	799	S	S	-
251	Weirs Brook	3	574	L	M	M
252	Gander River	1	400	S	S	-
253	Gander Bay Rd.	3	46	S	L	-
254	Weirs Pond	2	0	M	Nil	-
255	Gander Bay	2	61	M	L	H
256	Beaver Hill	1	495	S	S	E
257	Carmanville	3	559	S	M	H
258	Ragged Hr. River	2	0	Nil	Nil	-
259	Dog Bay	2	1078	Nil	S	-
260	Boyd's Cove	2	0	L	Nil	-
261	Chapel Island	2	1618	S	S	-
262	Summerford	3	222	S	L	-
263	Chanceport	2	43	Nil	L	-
264	8.0 km N. Birchy Bay	2	469	S	M	-
265	Birchy Bay	2	519	S	S	-
266	Duder Lake	2	0	L	Nil	-
267	Burnt Lake	1	1477	S	S	-
268	Burnt Lake	2	40	L	L	E
269	Bellman's Pond	1	400	M	S	-
270	Ten Mile Lake	2	0	L	Nil	-
271	Long Pond	2	0	M	Nil	-
272	South Pond	3	138	M	L	H

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
273	4 km S. Brinks Pond	2	91	M	L	E
274	Dans Pond	2	0	M	Nil	-
275	Salmon Pond	3	729	M	S	-
276	Salmon Pond	1	417	L	S	H
277	Indian Pond	2	67	S	L	L
278	4.8 km N. Southside	1	422	S	S	-
279	Campbellton	3	83	M	L	M
280	Newstead Rd.	2	126	S	L	-
281	Burnt Lake	3	215	M	L	-
282	Bear Lake	2	84	M	L	-
283	Jumpers Brook	2	139	M	L	-
284	Norris Arm	2	0	S	Nil	E
285	Norris Arm N. Jct.	2	19	S	L	-
286	12.8 km S. Lewisporte	3	467	M	M	E
287	8.0 km S. Lewisporte	2	74	M	L	-
288	Norris Arm North	3	202	M	L	-
289	Brown's Arm	2	467	S	L	E
290	Laurenceton	3	294	S	L	H
291	Point of Bay	1	467	S	S	-
292	Indian Cove	3	599	L	M	-
293	9.6 km S. Cottrell's Cove	1	491	S	S	-
294	Northern Arm	1	679	M	S	E
295	4.8 km N. Northern Arm	1	486	S	S	-
296	Mill Pond	3	252	S	M	E
297	West Arm Brook	1	579	S	S	H
298	Mill Cove	2	35	L	L	-
299	4.8 km S.E. Lewis Pond	2	0	Nil	Nil	-
300	New Bay Pond	3	931	S	S	-
301	4.8 km E. New Bay Pond	2	150	M	L	-
302	New Bay Pond	2	84	Nil	L	-
303	New Bay Pond	2	0	Nil	Nil	-
304	New Bay Pond	2	0	L	Nil	-
305	2.4 km N. Peter's River	3	389	L	M	-
306	9.6 km S. New Bay Pond	2	67	Nil	L	-
307	Hodges Hill	2	0	L	Nil	-
308	Mary Ann Lake	2	108	M	L	E
309	Moose Pond	3	219	M	L	-
310	Rocky Pond	2	0	M	L	-
311	Mary Ann Lake	2	76	M	L	-
312	Mary Ann Lake	1	524	M	S	-
313	South Twin Lake	2	254	L	L	-
314	Frozen Ocean Lake	3	467	M	M	E
315	South Twin Lake	2	0	L	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
316	Frozen Ocean Lake	2	97	M	L	-
317	South Twin Lake	3	788	S	S	-
318	South Twin Lake	3	378	M	M	-
319	Seal Bay Brook	3	582	M	M	-
320	4.8 km S. Wild Bight	2	0	M	Nil	-
321	South Twin Lake	3	372	M	M	M
322	4.8 km S.W. Wild Bight	2	0	S	Nil	-
323	Mark's Lake	2	27	Nil	L	-
325	North Twin Lake	2	206	M	L	H
326	North Twin Lake	2	0	M	Nil	-
327	North Twin Lake	2	0	L	Nil	-
328	North Twin Lake	2	130	L	L	-
329	North Twin Lake	2	81	Nil	L	M
330	Sop's Lake	2	19	S	L	-
331	Kippen's Pond	2	0	Nil	Nil	-
332	Roberts Arm Rd.	2	0	L	Nil	-
333	Crescent Lake	2	94	L	L	-
334	Pilley's Island	2	131	Nil	L	-
340	6.4 km S. Badger	1	2255	S	S	-
341	Buchans Rd.	1	1466	S	S	-
342	Millertown Jct. Rd.	1	545	Nil	S	-
343	Millertown Jct. Rd.	2	0	Nil	Nil	-
345	Little Red Indian Pond	2	75	L	L	-
346	Buchans Rd.	3	576	S	M	H
347	Buchans Rd.	3	763	S	S	-
348	Badger Lookout	2	797	S	S	-
349	Pamehac Brook	2	517	L	S	-
350	64 km W. West Lake	3	304	S	L	-
352	West Brook	2	0	Nil	Nil	-
353	Sandy Lake	2	57	M	L	-
354	Sandy Lake	2	1111	S	S	-
355	Sandy Lake	2	1271	S	S	-
356	Caledonia Bk. Area	1	649	S	S	H
357	Tom Joe's Bk.	3	269	L	L	-
358	Noel Paul's Bk.	2	0	M	Nil	-
359	Noel Paul's Bk.	2	0	L	Nil	-
360	Noel Paul's Bk.	2	43	L	L	E
361	Noel Paul's Bk.	2	0	Nil	Nil	-
362	Noel Paul's Bk.	2	0	L	Nil	-
363	Noel Paul's Bk.	2	142	Nil	L	-
364	Noel Paul's Bk. Area	2	143	L	L	-
365	Noel Paul's Bk. Area	2	0	Nil	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
366	Noel Paul's Bk.	2	0	Nil	Nil	E
367	Noel Paul's Bk.	2	0	Nil	Nil	-
368	Tally Pond	3	61	M	L	-
369	Tally Pond	2	0	Nil	Nil	-
370	9.6 km N.E. Tally Pond	2	75	S	L	E
371	9.6 km N.E. Tally Pond	1	439	L	S	-
372	11.2 km N.E. Tally Pond	3	159	L	L	-
373	11.2 km N. Tally Pond	1	467	Nil	S	-
374	Harpoon Bk.	2	0	Nil	Nil	-
375	Buchans Jct.	2	0	Nil	Nil	-
376	Millertown	3	467	L	M	-
377	Exploits Dam	3	127	S	L	-
378	Hungry Hill	2	0	Nil	Nil	-
379	Harpoon Bk. Area	2	0	L	Nil	-
380	Harpoon Bk.	2	0	M	Nil	-
381	Harpoon Hill	2	68	L	L	-
382	Lake Ambrose	2	36	L	L	-
383	Lake Douglas	2	0	L	Nil	M
384	Lake Douglas	2	0	L	Nil	-
385	Lake Douglas	2	139	L	L	-
386	Wilding Lake	2	0	L	Nil	-
387	Quinn Lake	2	45	Nil	L	-
388	Victoria River	2	0	Nil	Nil	-
389	Victoria River Area	2	519	Nil	S	-
390	Quinn Lake	2	0	Nil	Nil	-
391	Rogerson Lake	2	30	Nil	L	-
392	Beaver Lake	3	406	Nil	M	H
393	Victoria River	2	0	Nil	Nil	-
394	Bobby's Pond	2	0	Nil	Nil	-
395	Red Indian Lake	2	0	L	Nil	-
396	Red Indian Lake	2	45	L	L	-
397	Red Indian Lake	2	0	Nil	Nil	-
398	Red Indian Lake	2	0	Nil	Nil	-
399	Red Indian Lake	2	0	L	Nil	H
400	Red Indian Lake	2	0	L	Nil	-
401	Red Indian Lake	2	0	Nil	Nil	-
402	Victoria River	2	0	Nil	Nil	-
403	Costigan Lake	3	34	Nil	L	M
404	Tulks Bk.	2	0	Nil	Nil	-
405	Lloyd's Lake	2	0	Nil	Nil	-
406	Red Indian Lake	2	67	Nil	L	-
407	Shanadithit Bk.	2	0	Nil	Nil	-
409	Victoria River	2	0	Nil	Nil	-
410	Victoria Lake	2	0	Nil	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
411	Lloyd's River Area	2	0	Nil	Nil	-
412	Lloyd's River	2	0	Nil	Nil	M
413	Lloyd's Lake Area	2	0	Nil	Nil	-
414	Victoria Lake	2	0	Nil	Nil	-
415	Lloyd's Lake	2	0	Nil	Nil	-
416	Lloyd's Lake Area	2	0	Nil	Nil	-
417	Portage Lake	2	0	Nil	Nil	-
419	Battle Pond	2	0	Nil	Nil	-
452	Buchan's Rd.	1	530	L	S	H
453	Buchan's Rd.	2	0	Nil	Nil	-
454	Badger Bk.	2	0	Nil	Nil	-
455	Joe's Lake	2	27	Nil	L	-
456	Crooked Lake	2	134	M	L	-
457	Crooked Bog	2	82	L	L	-
458	Dawes Pond	2	0	L	Nil	-
459	Dawes Pond	2	0	L	Nil	-
460	South Bk. (Halls Bay)	2	0	M	Nil	-
461	Little Glodes Pond	2	69	L	L	M
462	Three Corner Pond	2	0	Nil	Nil	M
463	Great Gull Lake	3	376	L	M	H
464	Great Gull Lake	2	88	L	L	-
465	Burnt Pond	2	0	L	Nil	-
466	Great Gull Lake	2	87	L	L	-
467	South Bk. (Halls Bay)	2	0	L	Nil	-
468	Rocky Pond	2	0	L	Nil	-
469	South Pond	2	50	L	L	E
470	Barney's Bk.	2	0	M	Nil	-
471	Barney's Bk.	2	0	Nil	Nil	-
472	West Bk.	2	0	Nil	Nil	-
473	West Bk.	3	582	Nil	M	H
474	Burnt Berry Bk.	2	32	Nil	L	-
475	Burnt Berry Bk.	2	73	Nil	L	-
476	West Pond	2	1100	L	S	-
477	Burnt Berry Bk.	2	0	L	Nil	-
478	Burnt Berry Bk.	2	0	L	Nil	-
479	Burnt Berry Pond	2	0	L	Nil	-
480	Burnt Berry Pond	2	22	M	L	-
481	Springdale	2	129	L	L	-
482	Jct. King's Point Rd.	3	521	M	M	M

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoliation	Egg-mass category*	Overwintering larvae category
483	Davis Pond	3	196	L	L	-
484	King's Point Rd.	2	59	L	L	-
485	11.2 km E. Baie Verte Jct.	3	306	M	L	-
486	Indian River Area	2	0	Nil	Nil	-
487	Gull Pond	2	25	Nil	L	-
488	King's Point	2	0	L	Nil	-
489	Jackson's Cove Rd.	3	483	M	M	-
490	Jackson's Cove Rd.	2	0	L	L	-
491	Middle Arm Ridge	2	0	Nil	Nil	-
859	6.4 km S.W. Glenwood	2	0	Nil	Nil	H
860	Rodney Pond	3	516	S	M	-
861	Southwest Gander River	3	445	S	M	H
862	North Great Rattling Bk.	2	0	Nil	Nil	-
863	Great Rattling Bk.	2	100	L	L	H
864	4.8 km E. Migrel's Hill	2	0	Nil	Nil	-
865	Leech Bk.	1	637	M	S	-
866	Indian Bay Pond	3	275	S	L	-
867	Jonathan's Pond	3	524	S	M	-
868	Barry's Pond	2	0	M	Nil	-
869	Hodges Hill	2	0	Nil	Nil	-
870	Middleton Lake	2	0	M	Nil	-
871	Sop's Arm Bk.	2	0	M	Nil	-
874	Little Red Indian Pond	3	422	S	M	H
875	Lake Ambrose	2	0	Nil	Nil	-
877	Lloyds Lake	2	0	Nil	Nil	-
878	Lake Bond	2	0	L	O	-
879	4.8 km E. Crooked Lake	2	148	Nil	L	-
880	Nutmeg Hill	2	0	Nil	Nil	-
881	Rocky Pond	2	92	M	L	-
882	Burnt Berry Bk.	2	74	Nil	L	-
883	West Brook	2	82	Nil	L	-
Average			138			
	WESTERN NEWFOUNDLAND					
335	Jct. Woodstock Rd.	2	0	L	Nil	-
336	La Scie Rd.	2	0	Nil	Nil	-
337	Jct. Nipper's Hr. Rd.	2	0	L	Nil	-
338	Jct. Hr. Round Rd.	3	365	M	M	-
339	Jct. Tilt Cove Rd.	2	34	M	L	-
408	Hinds Lake	2	32	M	L	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
418	Puddle Pond	2	0	Nil	Nil	-
420	Battle Pond	2	0	Nil	Nil	-
421	3.2 km W. Silver Pond	2	0	Nil	Nil	-
422	Little Barachois Bk.	2	0	Nil	Nil	-
423	Little Barachois Bk. Area	2	0	Nil	Nil	-
424	Southwest Bk.	2	0	Nil	Nil	-
425	Southwest Bk.	2	0	Nil	Nil	-
426	Little Grand Lake	2	0	Nil	Nil	-
427	Little Grand Lake Area	2	0	Nil	Nil	-
428	Little Grand Lake	2	0	Nil	Nil	-
429	W. side of Grand Lake	2	0	Nil	Nil	-
430	Glover Island	2	20	Nil	L	-
431	Glover Island	2	0	Nil	Nil	-
432	W. side of Grand Lake	2	22	Nil	L	-
433	Corner Brook Lake	2	0	Nil	Nil	-
434	Corner Brook Lake	2	0	Nil	Nil	M
435	Corner Brook Lake	2	0	Nil	Nil	-
436	8.0 km S. Pinchgut Lake	2	0	Nil	Nil	-
437	Pinchgut Lake	2	0	Nil	Nil	-
438	Pinchgut Lake	2	0	Nil	Nil	-
439	Stag Lake	2	0	Nil	Nil	-
440	Pinchgut Lake	2	0	Nil	Nil	-
441	Lady Slipper Rd.	2	0	Nil	Nil	-
442	Lady Slipper Rd.	2	0	Nil	Nil	M
443	Corner Brook Lake Rd.	2	29	L	L	L
444	Steady Brook Lake	2	0	Nil	Nil	-
445	Northern Hr. Rd.	2	0	Nil	Nil	-
446	South Bk. Valley Rd.	2	0	Nil	Nil	-
447	Island Pond	2	0	Nil	Nil	M
448	Grand Lake	2	0	Nil	Nil	-
449	South Bk. Valley Rd.	2	0	Nil	Nil	-
450	Irishtown	2	0	M	Nil	-
451	Summerside	2	28	Nil	L	E
492	8.0 km N.E. Gull Pond	2	0	Nil	Nil	M
493	Cross Country Pond	3	515	L	M	M
494	Burlington Rd.	2	0	M	Nil	E
495	8.0 km N.W. Burlington	2	0	L	Nil	-
496	Burlington Rd.	2	0	L	Nil	E
497	South Bk. (Baie Verte Pen.)	2	0	Nil	Nil	-
498	South West Bk. (Baie Verte	2	0	L	Nil	-
499	South Bk. (Baie Verte Pen.)	2	0	C	Nil	-
500	La Scie Rd.	2	0	Nil	Nil	-
501	Jct. Ming's Bight	3	0	Nil	Nil	M
502	Ming's Bight Rd.	2	0	Nil	Nil	-
503	4.8 km E. Baie Verte	3	244	L	L	M

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
504	La Scie Rd.	2	0	Nil	Nil	-
505	Baie Verte Rd.	2	0	Nil	Nil	-
506	Jct. Seal Cove Rd.	2	0	L	Nil	-
507	6.4 km N. Baie Verte	2	0	L	Nil	-
508	6.4 km N.W. Baie Verte	2	0	Nil	Nil	-
509	Wild Cove Rd.	3	173	L	L	E
510	Jct. Wild Cove Rd.	2	0	Nil	Nil	-
511	Seal Cove	3	177	L	L	E
512	Southern Pond	2	0	Nil	Nil	-
513	Baie Verte Rd.	2	0	L	Nil	M
514	Gull Pond	2	116	L	L	M
515	East Pond	2	0	L	Nil	-
516	Westport	2	0	Nil	Nil	-
517	Pumbly Cove	2	0	Nil	Nil	-
518	Wild Cove Pond	2	0	Nil	Nil	L
519	4.8 km S.W. Gull Pond	2	0	Nil	Nil	-
520	Baie Verte Rd.	2	0	L	Nil	-
521	Flatwater Pond	2	0	L	Nil	-
522	Wild Cove Pond	2	0	Nil	Nil	-
523	Wild Cove Pond	2	0	Nil	Nil	-
524	Micmac Lake	2	0	L	Nil	L
525	Black Lake	2	0	Nil	Nil	-
526	Indian Pond	2	0	L	Nil	-
527	Baie Verte Prov. Park	2	0	L	Nil	-
528	4.8 km W. Baie Verte Jct.	3	423	M	M	M
529	Sheffield Lake	2	38	L	L	-
530	Sheffield Lake	2	48	L	L	-
531	Sheffield Lake	2	0	L	Nil	-
532	Birchy Lake	2	60	Nil	Light	-
533	Birchy Lake	2	0	Nil	Nil	-
534	Birchy Lake	2	0	L	Nil	L
535	Chain Lakes	3	372	Nil	M	M
536	Chain Lakes	2	0	L	Nil	-
537	Chain Lakes	2	0	Nil	Nil	-
538	Goose Brook	2	0	Nil	Nil	-
539	Hind's Bk.	2	0	Nil	Nil	-
540	Howley	2	0	L	Nil	-
541	Jct. Howley Rd. & T.C.H.	2	0	L	Nil	H
542	6.4 km E. of Howley	2	0	L	Nil	-
543	Sandy Lake	2	0	Nil	Nil	-
544	6.4 km E. Big Falls	2	0	Nil	Nil	-
545	Big Falls	2	89	M	L	M
546	Birchy Ridge	2	0	Nil	Nil	-
547	Mary Ann Bk.	2	0	Nil	Nil	-

Cont'd...

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
548	Crooked Feeder	2	0	Nil	Nil	-
549	Crooked Feeder	2	0	L	Nil	-
550	Junction Bk.	2	0	L	NIl	-
551	Upper Humber River	2	0	L	Nil	-
552	Cormack	2	22	L	L	-
553	1.6 km E. White River Rd.	2	0	L	Nil	-
554	Little Falls	2	53	L	L	-
555	6.4 km E. Adies Lake	3	237	0	L	-
556	Hampden Rd.	2	0	Nil	Nil	-
557	Hampden Rd.	2	0	Nil	Nil	-
558	Hampden Rd.	2	0	Nil	Nil	-
559	Hampden Rd.	2	0	L	Nil	-
560	Hampden Rd.	2	0	Nil	Nil	M
561	Sop's Arm Rd.	2	0	L	Nil	-
562	Sop's Arm Rd.	2	0	L	Nil	-
563	4.8 km W. Hampden	2	0	Nil	Nil	-
564	Sop's Arm Rd.	2	0	Nil	Nil	-
565	Birchy Basin	2	0	L	Nil	-
566	Birchy Basin	2	0	L	Nil	-
567	Taylors Bk.	2	0	Nil	Nil	-
568	Sop's Arm Rd.	2	0	Nil	Nil	-
569	Sop's Arm Rd.	2	0	Nil	Nil	-
570	9.6 km N. Hampden	2	99	L	L	L
571	8.0 km S. Sop's Arm	2	0	Nil	Nil	L
572	Sop's Arm Rd.	2	0	L	Nil	-
573	Sop's Arm Rd.	2	0	L	Nil	-
574	Main River Area	2	0	Nil	Nil	-
575	Main River	2	0	Nil	Nil	-
576	Sop's Arm	2	20	L	L	-
577	4.8 km N. Sop's Arm	2	0	Nil	Nil	-
578	Jackson's Arm	2	0	Nil	L	-
579	Great Coney Arm	2	0	Nil	Nil	-
580	9.6 km N.W. Sop's Arm	2	0	Nil	Nil	-
582	Main River	2	0	Nil	Nil	-
583	St. Paul's Big Pond	2	0	Nil	Nil	-
584	Upper Humber	2	0	Nil	Nil	-
585	Upper Humber Area	2	0	Nil	Nil	-
586	Upper Humber	2	0	Nil	Nil	-
587	Upper Humber	2	0	L	Nil	-
588	Upper Humber	2	0	Nil	Nil	-
589	Adies River	2	0	Nil	Nil	-
590	Adies Lake	2	0	Nil	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
591	Whites River	2	0	Nil	Nil	-
592	6.4 km W. Adies Lake	0	0	Nil	Nil	-
593	Bonne Bay Big Pond	2	0	Nil	Nil	-
594	Rocky Bk.	2	0	L	Nil	-
595	9.6 km N.W. Deer Lake	2	0	L	Nil	-
596	Goose Arm Rd.	2	0	L	Nil	-
597	Goose Arm Rd.	2	19	M	L	L
598	Goose Arm Rd.	2	20	M	L	-
599	Deer Lake	3	545	S	M	E
600	Little Harbour	3	0	L	Nil	-
601	Humber Canal	2	0	L	Nil	-
602	4.8 km N.W. Glide Lake	2	0	L	Nil	-
603	Grand Lake	2	0	L	Nil	L
604	Glide Lake	2	0	L	Nil	H
605	Pynn's Bk. (9.6 km west)	2	0	M	Nil	-
606	Pynn's Bk.	2	0	Nil	M	-
607	Pynn's Bk.	2	0	Nil	Nil	H
608	Pasadena	2	0	L	Nil	-
609	Blue Gulch Pond	2	0	Nil	Nil	H
610	15.4 km S. Frenchman's Pond	2	0	Nil	Nil	-
611	Frenchman's Pond	2	0	Nil	Nil	-
612	Old Man's Pond	2	0	Nil	Nil	-
613	Hughes Lake	2	0	Nil	Nil	-
614	Old Man's Pond	2	0	Nil	Nil	-
615	Deer Lake	2	0	L	Nil	-
616	Otter Bk.	2	0	Nil	Nil	-
617	Old Man's Pond	2	0	L	Nil	-
618	Goose Arm	2	0	L	Nil	-
619	8.0 km N. Old Man's Pond	2	0	Nil	Nil	-
620	6.4 km S. North Lake	2	0	Nil	Nil	-
621	Goose Arm Rd.	2	0	Nil	Nil	-
622	Goose Arm Rd.	2	42	Nil	L	L
623	Goose Arm Rd.	2	0	Nil	Nil	-
624	Goose Arm Rd.	2	0	Nil	Nil	-
625	North Arm	2	0	Nil	Nil	-
626	Trout River	2	0	Nil	Nil	-
627	Trout River Pond	2	0	M	Nil	-
628	Governor's Pond	2	0	Nil	Nil	-
629	Bonne Bay Big Pond	2	0	Nil	Nil	-
630	Bonne Bay Little Pond	2	40	L	L	M
631	East Lomond River (GMNP)	2	0	L	Nil	-
632	Bonne Bay Little Pond	2	0	Nil	Nil	-
633	Southeast Hill (GMNP)	2	0	L	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
634	6.4 km E. Glenburnie (GMNP)	2	0	L	Nil	-
635	Glenburnie	2	0	L	Nil	-
636	East Arm (GMNP)	2	0	L	Nil	-
637	East Arm (GMNP)	2	0	L	Nil	-
638	Deer Arm (GMNP)	2	0	L	Nil	-
639	Deer Arm (GMNP)	2	0	L	Nil	-
640	Deer Pond (GMNP)	2	0	L	Nil	-
641	Lobster Cove (GMNP)	2	0	L	Nil	-
642	Bakers Bk. Pond (GMNP)	2	0	M	Nil	-
643	6.4 km E. Green Pt. (GMNP)	2	0	L	Nil	-
645	St. Paul's Inlet	2	0	L	Nil	-
646	St. Paul's Inlet	2	0	M	Nil	-
647	Cow Head	2	0	Nil	Nil	-
648	Shallow Bay (GMNP)	2	0	L	Nil	-
649	6.4 km E. Cow Head	2	0	L	Nil	-
650	9.6 km E. Belldown's Point	2	0	L	Nil	-
651	9.6 km N. Baie Verte	2	0	L	Nil	-
652	12.8 km N. Baie Verte	2	0	L	Nil	-
653	4.0 km S. Fleur de Lys	2	0	L	Nil	-
654	N. of Baie Verte	2	0	L	Nil	-
655	3.2 km S.W. Little Lobster Hr.	2	0	Light	Nil	-
656	Cat Arm River	2	0	Nil	Nil	-
657	Cat Arm River	2	0	Nil	Nil	-
658	Cat Arm River	2	0	Nil	Nil	-
662	Little Harbour Deep River	2	0	Nil	Nil	-
663	Little Harbour Deep River	2	70	Nil	L	-
665	8.0 km S.W. Great Harbour Deep	2	0	Nil	Nil	-
667	Great Harbour Deep River	2	0	Nil	Nil	-
668	Soufflet's River	2	0	Nil	Nil	-
669	Cloud River	2	0	Nil	Nil	-
670	Bide Arm	2	0	Nil	Nil	-
671	6.4 km E. Roddickton	3	235	Nil	L	-
672	6.4 km W. Conche	2	0	Nil	Nil	-
673	8.0 km N.E. Roddickton	2	0	Nil	Nil	L
674	Coles Pond	3	291	M	L	-
675	6.4 km N. Roddickton	2	0	Nil	Nil	-
676	Roddickton Rd.	2	0	M	Nil	-
677	Beaver Brook	2	0	Nil	Nil	-
678	Northwest Arm	2	0	Nil	Nil	-
679	Boony Lake	2	0	Nil	Nil	-
680	Roddickton Rd.	2	56	Nil	L	L

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
681	8.0 km W. Boony Lake	2	0	Nil	Nil	-
682	Middle Gulch Bk.	2	0	Nil	Nil	-
683	Leg Pond	2	0	Nil	Nil	-
684	Leg Pond	2	0	Nil	Nil	-
685	6.4 km N. Castor's River	3	214	L	L	L
686	Squid Cove	2	0	Nil	Nil	-
687	9.6 km E. Port aux Choix	2	0	Nil	Nil	-
688	East River	2	0	Nil	Nil	-
689	Western Brook Pond	2	0	Nil	Nil	-
690	8.0 km S. Western Brook Pond	2	24	Nil	L	-
691	Hawkes Bay Rd.	2	0	Nil	Nil	-
692	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
693	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
694	Eastern Blue Pond	2	0	Nil	Nil	-
695	Little Brook Pond	2	0	Nil	Nil	-
696	River of Ponds	2	87	L	L	M
697	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
698	Western Blue Pond	2	0	Nil	Nil	-
699	Hawkes Bay Logging Rd.	2	0	Nil	Nil	L
700	8.0 km S. River of Ponds Lake	2	0	Nil	Nil	-
701	9.6 km N. Bellburns	2	0	Nil	Nil	-
702	8.0 km N.E. Bellburns	2	0	Nil	Nil	-
703	Bellburns	2	0	Nil	Nil	-
704	4.8 km E. Bellburns	2	0	Nil	Nil	-
705	8.0 km N. Daniel's Harbour	2	0	Nil	Nil	-
706	Brian's Pond	2	0	Nil	Nil	-
707	Portland Creek	2	127	L	L	M
708	8.0 km N. Parsons Pond	2	63	Nil	L	-
709	Ten Mile Lake	2	0	Nil	Nil	-
710	Ten Mile Lake	2	0	M	Nil	-
711	Ten Mile Lake	2	61	Nil	L	M
712	Roddickton Rd.	2	0	Nil	Nil	-
713	Salmon River	2	28	Nil	L	M
714	Southwest Brook	2	260	S	M	M
715	Southwest Brook	2	0	L	Nil	-
716	20.0 km W. Main Bk.	2	0	Nil	Nil	H
717	16.0 km W. Main Bk.	2	0	Nil	Nil	-
718	10.0 km N.E. Round Lake	2	0	Nil	Nil	-
719	16.0 km N.E. Round Pond	2	0	Nil	Nil	H
720	Benoit's Cove	3	428	L	M	-

Cont'd....

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
721	Frenchman's Cove	3	347	L	M	-
722	Gillams	3	444	M	M	-
723	Gillams Bk.	2	0	Nil	Nil	-
724	McIvers	2	30	L	L	-
725	Frenchman's Pd.	2	0	Nil	Nil	-
726	3.2 km S. Cox's Cove	2	0	Nil	Nil	-
727	Old Woman Hd.	2	0	Nil	Nil	-
729	Halfway Point	2	50	L	L	L
730	Serpentine Lake Rd.	2	0	Nil	Nil	-
732	Serpentine Lake Rd.	2	52	Nil	L	-
733	Serpentine Lake	2	59	Nil	L	L
738	Pinchgut Lake	2	44	0	L	L
743	George's Lake	2	0	Nil	Nil	-
744	George's Lake	2	42	Nil	L	-
747	4.8 km S. Serpentine Lake	3	264	Nil	L	-
748	Serpentine Lake	3	306	Nil	L	-
749	Middle Blue Hill Bk.	2	0	Nil	Nil	-
750	Middle Blue Hill Bk.	2	61	Nil	L	L
754	Spruce Bk.	2	0	Nil	Nil	-
755	George's Lake	2	133	Nil	L	-
756	Island Pond	2	0	Nil	Nil	L
757	Grand Lake Bk.	2	0	Nil	Nil	-
758	Moose Pond	2	0	Nil	Nil	-
759	Gallants	2	0	Nil	Nil	-
760	Gallants	2	0	Nil	Nil	-
764	N. of Stephenville	3	41	Nil	L	L
770	Cache Valley	2	140	Nil	L	-
771	Fox Island River	2	0	L	Nil	-
772	Fox Island River	3	659	L	M	M
773	Romaines Bk.	2	0	Nil	Nil	-
776	Jack Burke Pond	2	0	Nil	Nil	M
777	Mistaken Pond	2	0	Nil	Nil	-
778	Trout Bk.	2	0	Nil	Nil	-
779	Trout Bk.	2	0	Nil	Nil	-
780	Hare Hill	2	0	Nil	Nil	-
781	Caribou Bk.	3	44	L	L	M
782	Bottom Bk.	2	36	Nil	L	-
783	Bottom Bk.	2	0	Nil	Nil	-
784	Bottom Bk.	2	100	Nil	L	-
785	Southwest Bk.	2	0	Nil	Nil	-
786	Southwest Bk.	2	0	Nil	Nil	-
787	Little Barachois Bk.	2	47	Nil	L	L
788	Little Barachois Bk.	2	0	Nil	Nil	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoli-ation	Egg-mass category*	Over-wintering larvae category
789	Southwest Bk.	2	0	Nil	Nil	-
790	Southwest Bk.	2	0	Nil	Nil	-
791	Bottom Bk.	2	0	Nil	Nil	-
792	Southwest Bk.	2	73	Nil	L	-
793	Barachois Prov. Park	2	0	L	Nil	-
794	Barachois Prov. Park	3	486	M	M	E
795	Mattis Pt. Pond	3	339	Nil	M	-
796	St. George's River	2	0	Nil	Nil	-
797	Long Gull Pond	2	0	Nil	Nil	-
798	Blanche Bk.	2	0	Nil	Nil	-
799	Cold Bk.	2	0	Nil	Nil	-
800	4.8 km S. Point au Maul	2	76	Nil	Light	-
801	Man of War Cove	2	0	Nil	Nil	-
802	Piccadilly	2	0	Nil	Nil	-
803	4.8 km N. Ship Cove	2	0	Nil	Nil	-
804	Harry's Bk. (Port au Port)	2	0	L	Nil	-
805	Victor's Bk.	1	340	L	S	-
806	6.4 km E. Mainland	2	0	M	Nil	-
807	Barachois Bk.	3	381	L	M	M
808	Shallop Cove	1	417	M	S	-
809	Flat Bay Rd.	2	0	Nil	Nil	-
810	Steel Mtn. Rd.	2	80	M	L	-
811	Steel Mtn. Rd.	2	622	L	S	-
812	Steel Mtn. Rd.	3	280	L	L	-
813	Flat Bay Bk.	2	0	Nil	Nil	-
814	Flat Bay Bk.	3	630	L	M	-
815	Middle Bk.	2	640	M	S	E
816	St. Teresa	2	367	L	S	-
817	Fischell's River	3	463	L	M	-
818	Fischell's River	1	444	M	S	-
819	Mount Howley	2	0	Nil	Nil	-
820	Fischell's River	2	98	L	L	-
821	6.4 km S.E. Fischell's (TCH)	2	0	Nil	Nil	-
822	Robinson's River	3	386	L	M	H
823	Robinson's River	2	0	L	Nil	-
825	Robinson's River	2	0	Nil	Nil	-
826	Robinson's River	2	0	Nil	Nil	-
827	Barachois Bk.	2	0	Nil	Nil	-
828	Barachois Bk.	2	0	Nil	Nil	-
829	Camp 180 Rd. (Crabbes River)	2	0	Nil	Nil	-
830	Jeffery's	3	132	Nil	L	-
831	Jct. St. Fintan's Rd. & TCH	3	239	Nil	L	H
832	Crabbes River Rd.	2	52	L	L	-

Cont'd...

Continued.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoliation	Egg-mass category*	Overwintering larvae category
833	Camp 180 Rd.	2	0	Nil	Nil	-
834	Crabbes River	2	0	Nil	Nil	-
835	Crabbes River	2	0	Nil	Nil	-
836	Crabbes River	2	0	Nil	Nil	-
837	6.4 km E. Codroy Pond	2	0	Nil	Nil	-
838	Highland River	2	0	Nil	Nil	-
839	Butter Bk.	3	1354	M	S	-
840	1.6 km N.E. Codroy Pond (TCH)	2	88	Nil	L	-
841	North Branch	2	0	Nil	Nil	-
842	Codroy Pond	2	53	O	L	M
843	4.8 km S.W. Codroy Pond	2	0	Nil	Nil	-
844	6.4 km N. Coal Bk.	2	41	Nil	L	L
845	South Branch	3	343	M	M	E
846	4.8 km N.E. O'Regan's	2	77	L	L	-
847	4.0 km S. Upper Ferry	1	575	L	S	-
848	Mummichog Prov. Park	3	1535	M	S	-
849	4.0 km N. St. Andrews	1	444	M	S	-
873	Nipper's Hr. Rd.	2	0	L	O	-
876	Hind's Lake	2	0	Nil	Nil	-
884	East Brook (Baie Verte Pen.)	2	45	S	L	-
885	8.0 km N. Cross Country Pond	2	41	Nil	L	-
886	Middle Arm	2	0	Nil	Nil	-
887	Bear Cove	2	147	L	L	-
888	6.4 km S. Pumbley Cove	2	0	Nil	Nil	-
889	Big Chouse Bk.	2	0	Nil	Nil	-
890	George's Cove	2	89	Nil	L	-
891	Birchy Lake	2	0	L	Nil	-
892	Conical Hill	2	0	Nil	Nil	-
893	4.8 km S.W. Glide Lake	2	0	L	Nil	L
894	12.8 km S. Sop's Arm	2	0	Nil	Nil	-
895	3.2 km N. Sop's Arm	2	0	Nil	Nil	-
896	Hughes Brook	2	0	Nil	Nil	-
897	North Lake	2	0	Nil	Nil	-
898	3.2 km N. Govenor's Pond	2	32	Nil	L	-
899	East Lomond River (GMNP)	2	0	L	Nil	-
900	Western Brook Hill (GMNP)	2	0	L	Nil	-
901	4.8 km N. St. Paul's Inlet (GMNP)	2	0	L	Nil	-
902	Parson's Pond	2	0	Nil	Nil	-
903	Western Brook Pond	2	0	Nil	Nil	-
904	8.0 km S.W. Western Brook Pond	2	0	Nil	Nil	-

Cont'd...

Concluded.

Plot No.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1978 Defoliation	Egg-mass category*	Overwintering larvae category
905	4.8 km W. Brian's Pond	2	0	Nil	Nil	-
906	8.0 km N. Parson's Pond	2	0	Nil	Nil	-
907	11.2 km N.E. Parson's Pond	2	47	0	L	M
908	North Brook (Gallants Area)	2	0	Nil	Nil	-
909	South Branch River	2	0	Nil	Nil	-
910	6.4 km S.W. South Branch	2	100	L	L	-
Average			29			
	LABRADOR					
1	Beaver River	3	344	M	M	L
2	Beaver River	2	0	Nil	Nil	-
3	Goose Bay	2	0	L	Nil	L
4	Churchill River	2	0	Nil	Nil	L
5	Churchill River	2	0	L	Nil	L
6	Mud Lake	2	0	Nil	Nil	L
7	Mud Lake	2	0	L	Nil	L
8	Mud Lake	2	0	Nil	Nil	L
9	Mud Lake	2	0	L	Nil	L
10	Mud Lake	2	0	M	Nil	M
11	Kenamu River	2	71	M	L	L
12	Kenamu River	2	0	L	Nil	L
13	Kenamu River	3	301	L	L	L
14	Kenamu River	2	113	L	L	L
15	Kenamu River	2	0	L	Nil	L
Average			26			

Defoliation

L = Light = 0-25
M = Moderate = 26-75
S = Severe = 76-100

Egg-mass Category

L = Light
M = Moderate
S = Severe

Overwintering Larval Category

L = Low = 1-108
M = Medium = 109-323
H = High = 324-700
E = Extreme = 700+