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FOREST INSECTS AND TREE DISEASES IN
NATIONAL PARKS IN THE MARITIME PROVINCES, 1974

by

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ABSTRACT

This report reviews the status of important forest pests in 1974 in the five national parks in the Maritime Provinces giving particular attention to current infestations of the spruce budworm and its expected status in 1975.

RÉSUMÉ

Le but de ce rapport est de faire le bilan des activités relatives aux dommages causés en 1974 dans les cinq parcs nationaux des provinces Maritimes par les maladies et les insectes nuisibles importants. Il traite surtout de la portée des infestations actuelles de la tordeuse des bourgeons de l'épinette et donne en plus un aperçu des dégâts prévus en 1975.

INTRODUCTION

Most of the information in this report is based on routine ground and aerial surveys by field technicians of the Forest Insect and Disease Survey, Canadian Forestry Service (C.F.S.), with emphasis on specific pests causing major problems. In Fundy and Kouchibouguac National parks, the spruce budworm infestation received increased attention and in Cape Breton Highlands National Park, surveys were intensified because of increased populations of spruce budworm and hemlock looper.

The staff of Fundy, Cape Breton Highlands, and Kejimikujik parks again operated moth traps as part of a program of light trap operation at 8 locations throughout the Maritime Provinces. The Prince Edward Island, Cape Breton Highlands, and Fundy parks were again included in the areas where sex attractant traps were set out to determine whether or not male adults of the gypsy moth were present. All traps in the national parks gave negative results.

In 1974, general surveys throughout the Maritimes showed a significant increase in damage by the spruce budworm. Egg-mass surveys indicated that the infestation increased in both size and intensity from 1973; as a result, moderate to severe defoliation is forecast in 1975 for most of New Brunswick and Prince Edward Island, and for parts of Cumberland County and Cape Breton Island in Nova Scotia. The National Parks have not escaped this increase in budworm activity. Of the five Parks, all but Kejimikujik, harbour moderate to high infestations of budworms.

CAPE BRETON HIGHLANDS NATIONAL PARK

Birch Casebearer, *Coleophora fuscedinella*. Defoliation of white birch was severe (+70%) through the Grand Anse Valley, Inverness County, and light (up to 30%) between Cape North and Ingonish, Victoria County.

Fall Webworm, *Hyphantria cunea*. The light brown webs formed by colonies of this insect were numerous on roadside hardwoods between Pleasant Bay and the top of MacKenzie Mountain, and between Cap Rouge and Corney Brook, Inverness County.

Balsam Gall Midge, *Dasineura balsamicola*. Infestations were light but swollen needles, symptomatic of feeding by larvae of this midge, were found on the new shoots of balsam fir at more locations than in 1973.

Larch Sawfly, *Pristiphora erichsonii*. Population levels of this sawfly increased from 1973 throughout northern Cape Breton Island and severe defoliation of tamarack was evident wherever this tree species occurred.

Spruce Budworm, *Choristoneura fumiferana*, Blackheaded Budworm, *Acleris variana*, and Hemlock Looper, *Lambdina fiscellaria fiscellaria*. Population levels of all these insects increased significantly from 1973 in the Cape Breton Highlands both inside and outside the Park. Infestations of the spruce budworm increased most dramatically. Defoliation (loss of new foliage) in 1974 was caused largely by the spruce budworm but

about 25% was caused by the blackheaded budworm and the hemlock looper. One patch of forest outside the immediate southeast section of the Park was very severely attacked and some tree mortality will occur in 1975.

This striking increase in populations of the spruce budworm is shown in Table 1 where the results of sampling at permanent sample stations are summarized. Table 2 shows the increase in the size of catches in light traps.

Table 1. Numbers of spruce budworm larvae per tree at four sampling locations in Cape Breton Highlands National Park 1970-1974

Location	Tree species	Larvae per tree				
		1970	1971	1972	1973	1974
Ingonish	w. spruce	0.0	1.4	0.8	0.8	12.5
North Aspy	w. spruce	0.0	0.5	0.5	0.4	43.3
McGregor Brook	b. fir	0.1	0.1	0.0	0.0	44.3
French Mountain	b. fir	2.0	0.7	0.0	0.0	67.3

This increase in infestation levels which resulted in some 129,000 acres of defoliation in 1974 (Fig. 1, Table 3) was predicted from counts of overwintering budworm larvae in the winter of 1973-74. No defoliation was recorded in 1973. Counts of egg masses along the west and north boundaries of the Park indicate that a high to very high infestation will occur in 1975 (Table 4). Surveys for overwintering larvae confirmed the results of the egg-mass survey but showed that the infestation was low to medium in the southern and eastern sections of the Park.

Table 2. Results of light trapping for moths of Fundy, Kejimikujik and Cape Breton Highlands National Parks, 1971 - 1974

Species	Fundy				Kejimikujik				Cape Breton Highlands			
	1971	1972	1973	1974	1971	1972	1973	1974	1971	1972	1973	1974
<i>Actias luna</i> luna moth	0	0	0	0	0	46	63	69		0	0	0
<i>Anisota rubicunda</i> greenstriped mapleworm	0	2	1	2	0	54	87	157		0	1	0
<i>Cenopsis pettitana</i> leaf roller on maple	631	959	472	808	52	6	61	4		0	4	2
<i>Choristoneura fumiferana</i> spruce budworm	24,092	2,147	4,989	20,896	1,543	76	467	240	Not operated	468	7,637	11,813
<i>Choristoneura rosaceana</i> oblique-banded leaf roller	0	1,044	927	3,214	0	1	16	13		2	18	6
<i>Datana ministra</i> yellownecked caterpillar	0	3	0	0	0	205	147	377		0	0	0
<i>Dioryctria reniculella</i> spruce coneworm	0	14	41	102	0	2	74	15		0	324	1,023
<i>Hyphantria cunea</i> fall webworm	0	32	228	65	412	1,024	392	323		0	1	0
<i>Itame pustularia</i> lesser maple spanworm	4	109	1,103	912	90	53	348	181		4	79	94
<i>Malacosoma disstria</i> forest tent caterpillar	15	35	233	281	269	191	97	29		0	30	18
<i>Stilpnotia salicis</i> satin moth	15	16	2	9	0	3	0	0		1	0	0

Nevertheless, widespread defoliation will be evident in 1975, but the hazard is generally low to moderate because the infestation is new. This infestation should have close surveillance in 1975.

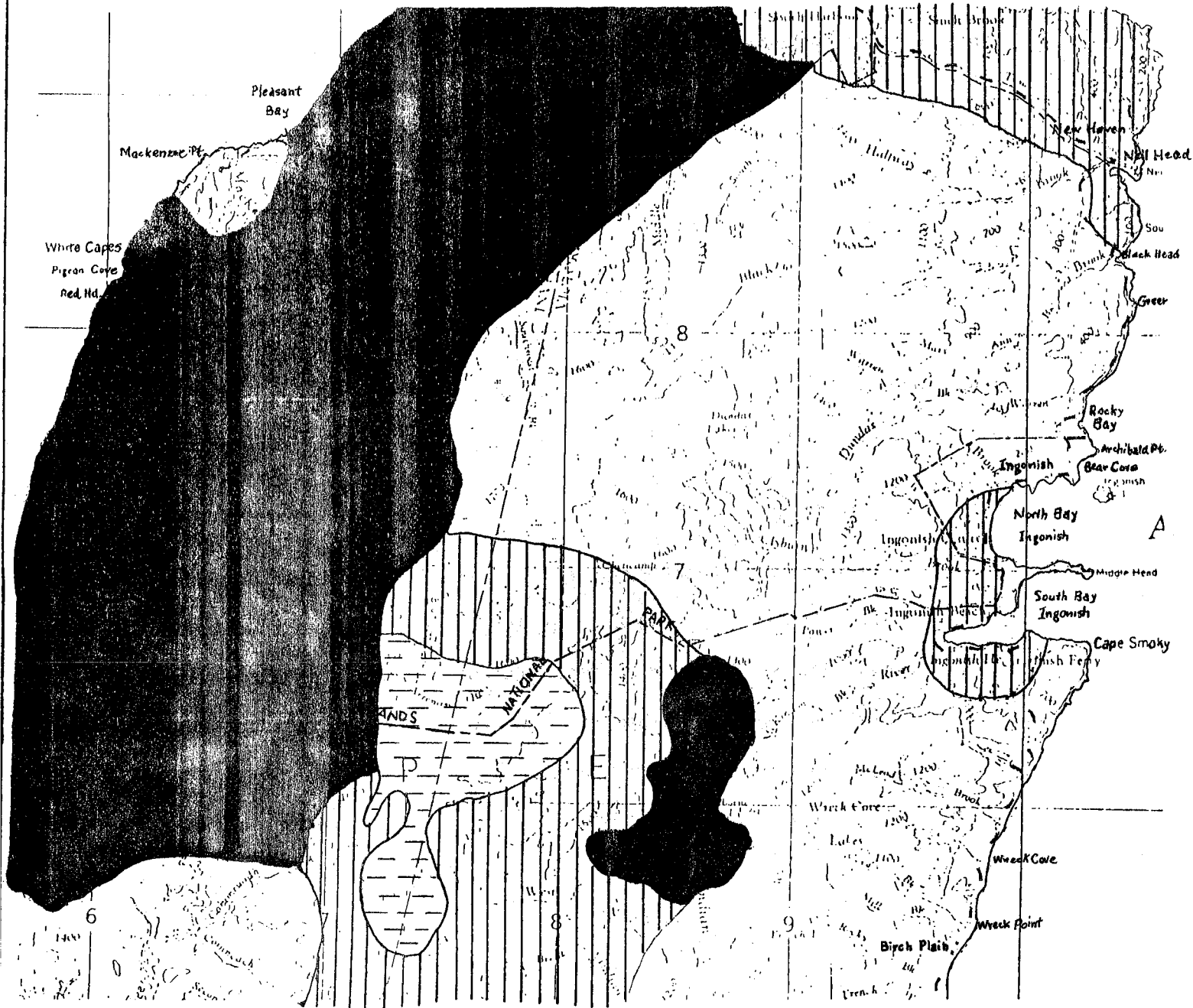
Table 3. Spruce budworm defoliation in National Parks in the Maritimes Region, 1974

Park	Defoliation (acres)			Total
	Light	Moderate	Severe	
Cape Breton Highlands	18,400	5,000	105,600	129,000
Fundy	3,200	2,200	600	6,000
Kouchibouquac	0	2,500	1,500	4,000
Prince Edward Island	small patches of light to severe defoliation			
Kejimikujik	0	0	0	0

Surveys in September-October 1974 showed that infestations of the blackheaded budworm and the hemlock looper, contributed to defoliation at French Mountain and North Mountain. Because of sampling difficulties with these insects, we are unable to accurately forecast infestations for 1975. However, we expect that both the blackheaded budworm and hemlock looper will cause some damage on balsam fir trees within the Park.

CAPE BRETON HIGHLANDS

NATIONAL PARK



DEFOLIATION SURVEY — 1974

LEGEND

Light

Moderate

Severe

Figure 1.

KEJIMKUJIK NATIONAL PARK

Balsam Woolly Aphid, *Adelges piceae*. Damage resulting from attacks by this sucking insect on the twigs of balsam fir becomes more evident yearly, except where severe winter conditions reduce populations. In 1974, as in previous years, this type of damage was most noticeable near the Park entrance. The balsam woolly aphid also attacks the stems of living trees but this type of infestation has not been severe recently. Only a few aphids (identifiable as dots of "wool" on the tree trunks) were noticed in 1974.

Beech Bark Disease, *Cryptococcus fagi* and *Nectria coccinea* var *faginata*. Damage caused by this combination of scale insect and associated fungus is characterised by patches of dead bark and severely cankered stems. This type of damage is evident throughout the Park wherever beech occurs.

Birch Leaf Miner, *Fenusa pusilla*. Browning of the foliage of wire birch was sporadic and ranged from trace to severe.

Fall Webworm, *Hyphantria cunea*. Population levels of this tentmaker were high again in parts of western Nova Scotia including the Park area where webs were very common on miscellaneous hardwoods. Numbers of adult moths taken in the black-light trap were slightly lower than in 1973 (Table 2).

Eastern Hemlock Looper, *Lambdina fiscellaria fiscellaria*. Larvae were present in softwood stands in endemic numbers and no defoliation was observed.

Larch Sawfly, *Pristiphora erichsonii*. Most tamarack stands in western Nova Scotia were moderately or severely infested in 1974 including those that occurred within the Park boundary.

Orchard Tent Caterpillar, *Malacosoma disstria*. Webs formed by colonies of this insect were observed on roadside hardwoods at scattered locations.

Spruce Budworm, *Choristoneura fumiferana*. Population levels were low and only traces of feeding were recorded on the new foliage of host trees. Fewer budworm adults were taken in the light trap in 1974 than in 1973 (Table 2). Surveys for budworm egg-masses and overwintering larvae at three plots in and near the Park showed that infestation levels are very low; therefore no significant damage is expected in 1975 (Table 4).

White Pine Blister Rust, *Cronartium ribicola*. This disease which is common in the Maritimes Region and has been reported near the Park entrance and elsewhere, in previous years, continued to infect white pines at scattered locations within the Park.

Table 4. Summary of spruce budworm infestations (1974) and overwintering larval infestations (1974-75) in and near National Parks in the Maritimes Region

National Park	Average ^a egg masses per 100/ft ²	No. plots	Overwintering ^b larvae per branch	Range	No. plots
Cape Breton Highlands	1,108	5	20	(5-51)	12
Fundy	455	7	24	(16-28)	4
Kouchibouguac	481 ^c	19	20	(6-43)	5
Prince Edward Island	179 ^c	6	22	(13-32)	2
Kejimikujik	0 ^c	3	1	(0-1)	3

^aEgg-masses per 100 ft² of fir foliage -
 0 - 99 - low
 100 - 239 - medium
 240 - 399 - high
 400+ - very high

^bOverwintering larvae per branch -
 1 - 8 - low
 9 - 21 - medium
 22 - 49 - high
 50+ - very high

^cMost of the samples were taken outside but near the perimeter of the Park and would be representative of infestations in the Park.

FUNDY NATIONAL PARK

Balsam Shoot-boring Sawfly, *Pleroneura borealis*. The larva of this insect borrows into and usually kills the new shoot of balsam fir, with the damage appearing as a reddish brown rosetta at the end of the branch. This type of damage was observed on a few scattered young balsam fir trees at Bennett Lake and near the riding stables.

Balsam Woolly Aphid, *Adelges piceae*. No changes were observed from conditions reported in 1973. Swollen shoots, branch dieback, and height growth loss are common and tree mortality is evident.

Birch Skeletonizer, *Bucculatrix canadensisella*. Leaf browning of yellow birch and white birch was trace to light wherever these tree species occurred. Larvae feed on the lower surface of leaves between the veins giving the leaves a skeletonized appearance in late August.

European Pine Shoot Moth, *Rhyacionia buolania*. A few infested shoots were found on Mugho pine near the Work Compound.

Fall Webworm, *Hyphantria cunea*. Scattered colonies (webs) occurred on miscellaneous hardwoods along roadsides, and fewer adults were taken in the light trap in 1974 than in 1973 (Table 2).

Gypsy Moth, *Porthetria dispar*. A program of trapping for male adults of the Gypsy moth was continued in 1974 using 18 traps, all of which produced negative results.

Sirococcus strobilinus. This fungus, identified for the first time in the Maritimes Region in 1974, caused blighted shoots on red pines in a small mixed stand of conifers near Park headquarters. Shoot browning was severe on 3, moderate on 10, and light on 9 of 22 red pine trees examined.

Miscellaneous. As in most other parts of New Brunswick, maple trees supported a variety of defoliators in 1974, including the leaf rollers, *Cenopsis pettitana* and *Choristoneura rosaceana*, and the spanworm *Itame pustularia*. Numbers of adults of *Itame* increased about tenfold in the light trap in 1974 (Table 2). Infestations of the balsam twig aphid, *Mindarus abietinus*, were light on the new shoots of balsam fir trees in the trailer park at Park headquarters, at Bennett Lake, and near the riding stables.

Spruce budworm, *Choristoneura fumiferana*. In 1973, surveys for spruce budworm egg masses and tree hazard delineated a patch of forest on the eastern boundary of the Park as high hazard. Subsequently, the National Parks Branch arranged to have the area within the Park sprayed by Forest Protection Limited. The block was sprayed in the evening on 3 June 1974, with an emulsion formulation of the insecticide fenitrothion (Fig. 2). Prior to spraying, 10 locations within the spray block were sampled for spruce budworm larvae. There was an average of 21 budworm per 18-in branch tip from fir trees and 23 per branch from spruce trees. The plots were not sampled for post-spray surviving budworms but the spray block was visited in mid-July and showed only light defoliation

within the spray block. It was estimated that between 60 and 70% of the foliage crop was saved by spraying.

Over the past 4 years, budworm activity within the Park has been decreasing and in 1974 defoliation surveys mapped only 3,200 acres of light, 2,200 acres of moderate, and 600 acres of severe defoliation, the lowest level of damage recorded in recent years (Fig. 3, Tables 3,5).

However, counts of budworm egg-masses in August 1974, at 8 sample plots showed that there was a dramatic increase in the level of the infestation. The average egg-mass count for 1974 (Table 4) was 455 as compared to 153 in 1973. This was further substantiated by counts of overwintering larvae. These counts of egg-masses and larvae indicate that moderate to severe defoliation will be prevalent in the Park in 1975. Because of the forecast of high infestations for 1975 and the history of budworm damage within the Park, 14,000 acres are deemed to be in a high hazard category (Fig. 4).

Table 5. Acreages of spruce budworm defoliation in Fundy National Park, 1971-1974

Year	Defoliation category			Total
	Light	Moderate	Severe	
1971	7,644	3,686	228	11,558
1972	3,413	455	6,675	10,543
1973	-	-(8,050*)	-	8,050
1974	3,200	2,200	600	6,000

* in 1973 - only moderate to severe defoliation

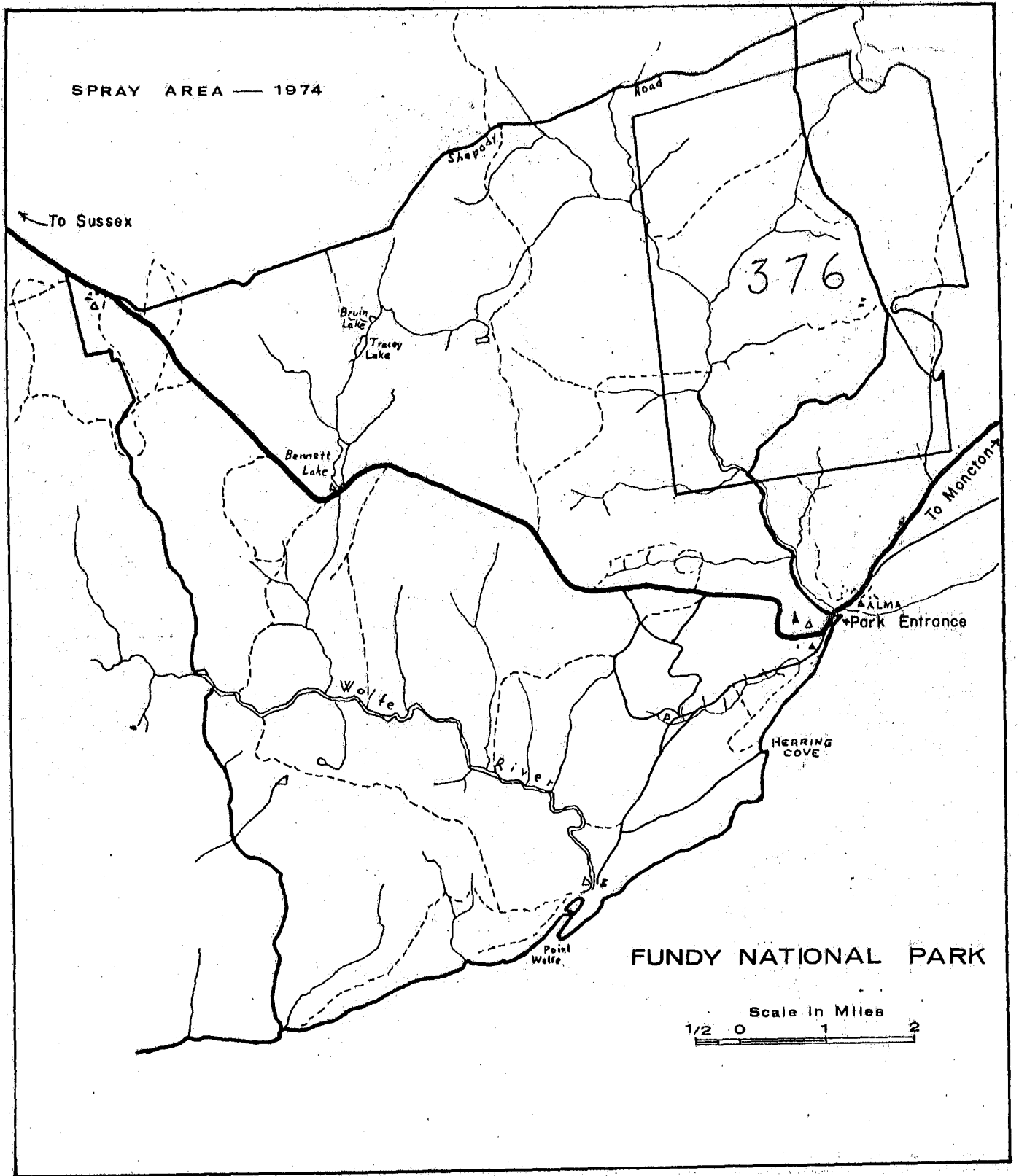


Fig. 2. Area sprayed for spruce budworm, 1974.

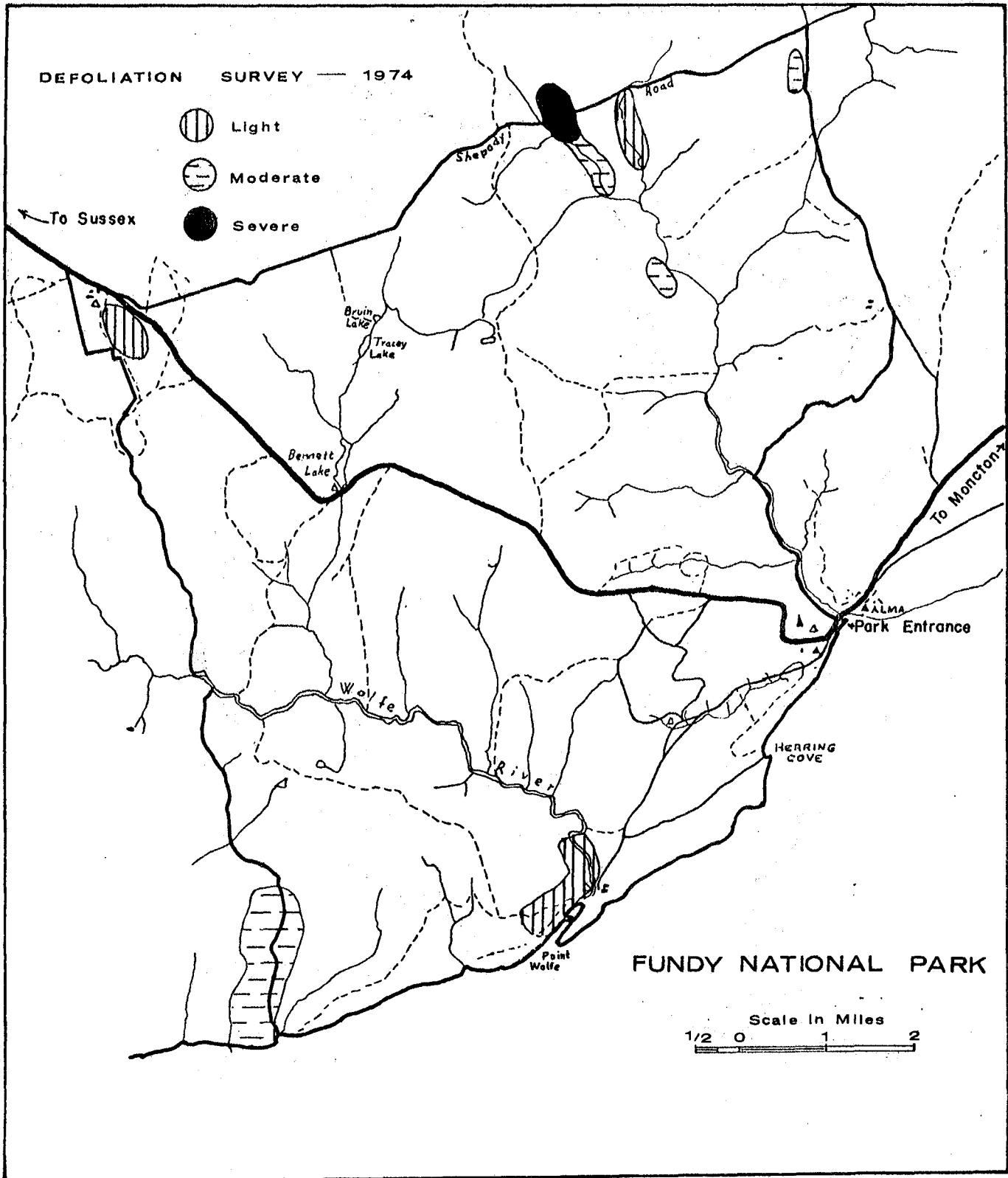


Fig. 3. Areas of defoliation caused by spruce budworm, 1974.

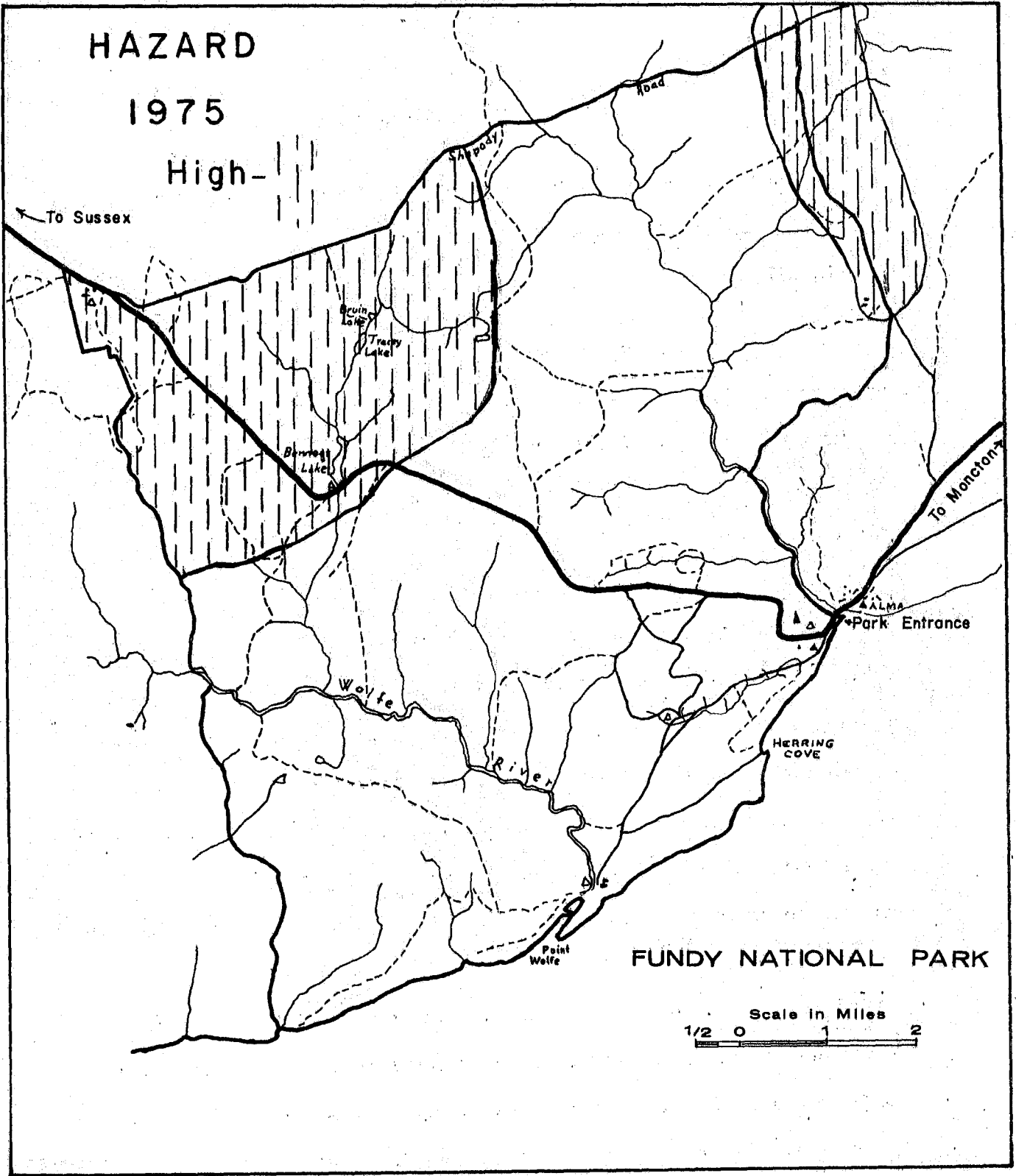


Fig. 4. Areas of high hazard from spruce budworm attacks, 1975.

KOUCHIBOUGUAC NATIONAL PARK

Except for spruce budworm surveys, no general surveys for forest insects and diseases were conducted in Kouchibouguac National Park in 1974.

Spruce budworm, *Choristoneura fumiferana*. Aerial surveys for spruce budworm defoliation in July 1974 delineated about 4,000 acres of moderate and severe defoliation (Fig. 5 Table 3). This was confirmed by ground surveys in April 1975 when five areas were examined and severe defoliation was observed.

Surveys for spruce budworm egg-masses in August 1974 near the Park indicated that there was a high infestation within and around the Park. Delineation of hazard to trees showed that about 13,000 acres are in a high hazard condition (Fig. 6). At the request of the Park Superintendent, a survey for overwintering larvae and damage, in April 1975, confirmed reports of the 1974 surveys. Five semi-permanent plots were established which will be sampled henceforth in C.F.S. surveys. Counts of overwintering larvae were low at 1 location, moderate to high at 3 locations and high at 1 location (Table 6).

Estimates of damage caused by the budworm indicate that there are patches of balsam fir trees in poor condition. Four of the five stands examined had either some trees killed by the budworm or trees with dead tops as the result of budworm feeding. With a forecast of moderate to high infestations for 1975, further deterioration of stands of balsam fir can be expected.

Table 6. Results of survey of overwintering larvae and tree conditions in Kouchibougauc National Park, April 1975

Plot	Defoliation% 1974	Tree Condition	Overwintering* Larvae/branch
1	100	Poor (dead trees)	43
2	100	Good (just one year's defoliation)	16
3	100	Fair (dead tops)	6
4	100	Poor (dead trees)	16
5	70	Fair (dead tops)	18

*Overwintering larvae per branch: 1 - 8 = low
 9 - 21 = moderate to high
 22+ = high

DEFOLIATION SURVEY — 1974

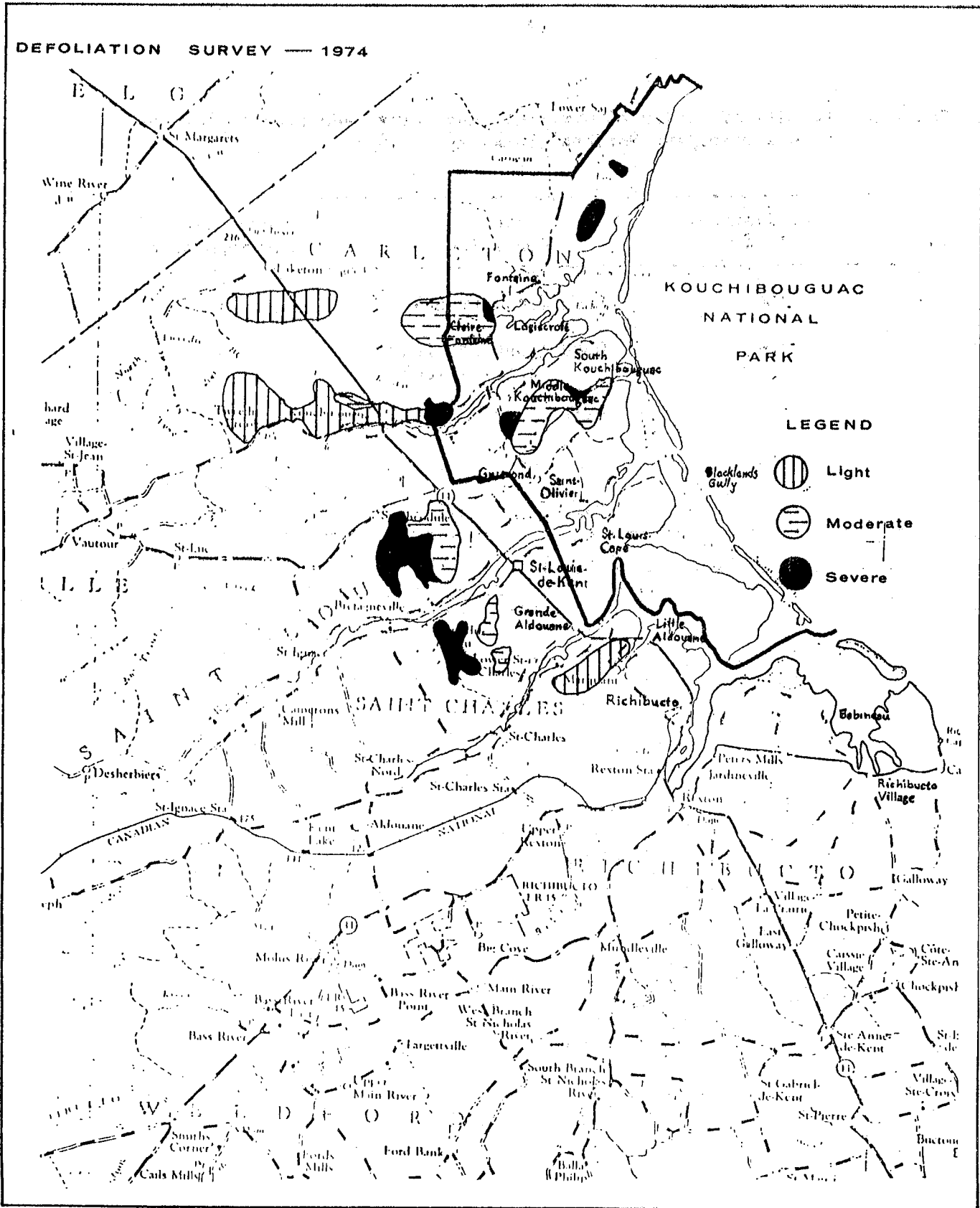


Fig. 5. Areas of defoliation caused by spruce budworm, 1974.

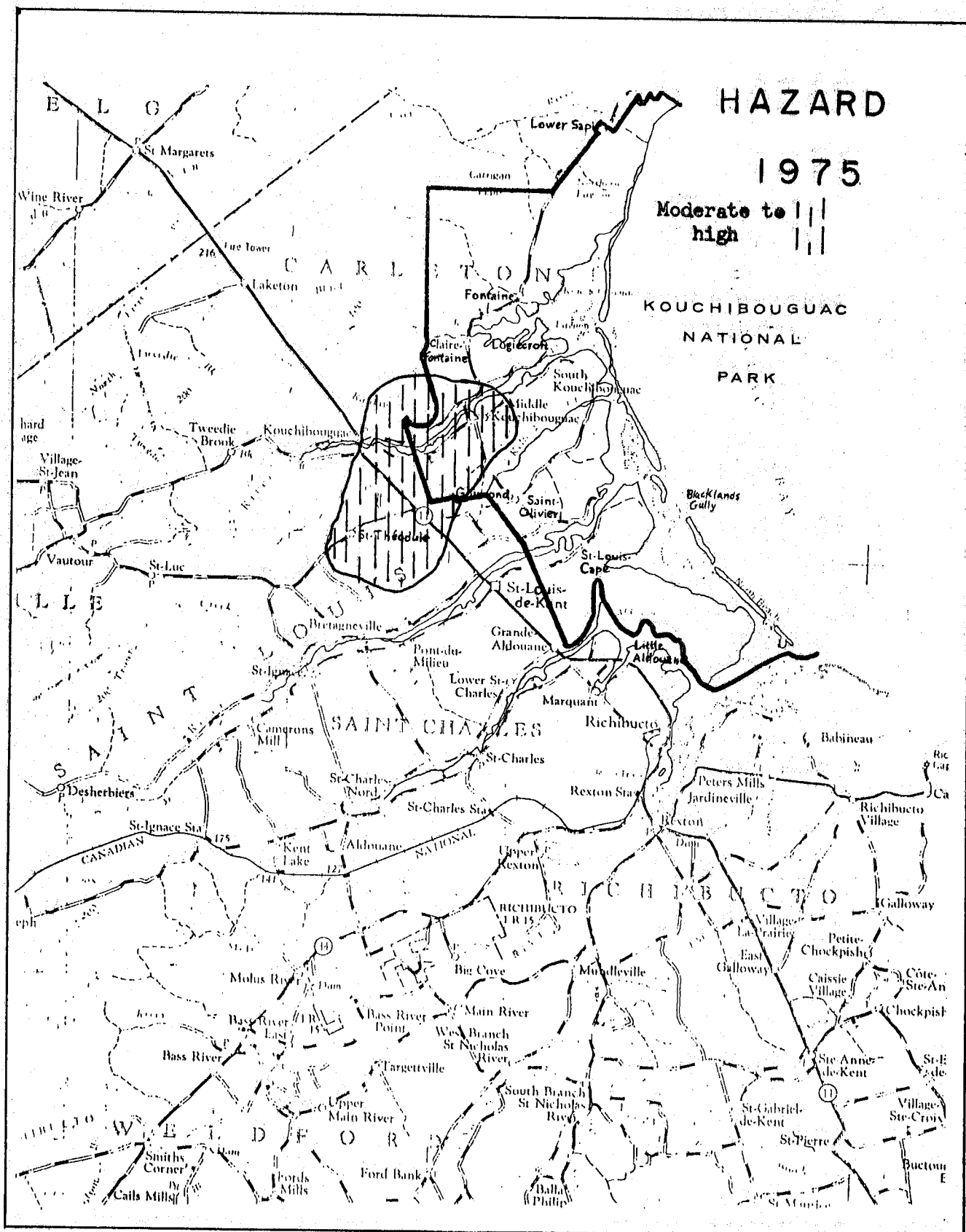


Fig. 6. Areas of moderate to high hazard from spruce budworm attacks, 1975.

PRINCE EDWARD ISLAND NATIONAL PARK

Birch Casebearer, *Coleophora fuscedinella*. Population levels remained unchanged from 1973. Leaf browning of wire birch ranged up to moderate at scattered locations.

Birch Leaf Miner, *Femusa pusilla*. As with the casebearer, there was little change from 1973. Leaf browning of wire birch ranged up to moderate at scattered locations.

Birch Skeletonizer, *Bucculatrix canadensisella*. Numbers of this insect increased noticeably in parts of the Maritimes in 1974 including the P.E.I. National Park where defoliation of white and wire birches was generally light, with patches of moderate.

Larch Sawfly, *Pristiphora erichsonii*. Most tamarack trees within the Park were severely infested by the larch sawfly in 1974, but some groups of trees were only moderately defoliated.

Spruce Budworm, *Choristoneura fumiferana*. In 1974, the spruce budworm caused light to severe defoliation in patches over the entire Island including the National Park. Counts of egg-masses and overwintering larvae indicate that there is generally a moderate to high infestation within and near the Park (Table 4); the hazard rating is generally low to moderate.

Miscellaneous. The eastern spruce gall aphid, *Adelges abietis*, caused light damage on scattered white spruce trees on Rustico Island. The maple leaf roller, *Cenopsis pettitana* and the maple spanworm, *Itame pustularia*, were common on maple. Little change from previous years was evident in the status of the balsam woolly aphid, *Adelges piceae*.

LIGHT TRAPS

Throughout the summer of 1974, light traps were operated by Parks' staff at Fundy, Kejimikujik and Cape Breton Highlands National Parks. The catches were analyzed by staff of the Canadian Forestry Service. Table 3 gives a summary of the more important insects caught from 1971 to 1974. The spruce budworm predominates in catches from all three places in all years of trapping. Further, there is apparently a richer insect fauna representation in Kejimikujik than in either Fundy or Cape Breton Highlands National Parks, probably due to the greater variety and mix of trees in Kejimikujik Park.