

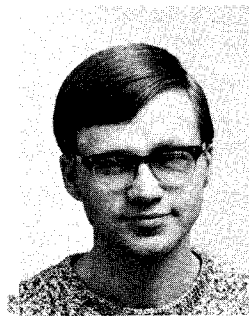
# FOREST INSECT AND DISEASE CONDITIONS 1973

## PRINCE RUPERT DISTRICT

by



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## HIGHLIGHTS

Forest pest problems increased in the Prince Rupert Forest District in 1973. Most notable were mountain pine beetle, blackheaded budworm and black army cutworm. The mountain pine beetle continued to kill lodgepole pine trees near Houston and Kitwanga. The blackheaded budworm reached epidemic proportions on 281,000 acres and defoliation was mapped along the Mainland coast from Bella Coola to Kitimat, in scattered patches of timber from Rose Harbour to Deena River in the Queen Charlotte Islands and on alpine fir and white spruce in four locations in the Interior. The black army cutworm, rarely reported as a forest pest, caused extensive damage to seedlings on reforested areas in the interior portion of the District.

Annual tree diseases were less noticeable in 1973 than in 1972. A shoot blight causing damage to advanced western hemlock regeneration was found again in areas near Kitimat, Skeena and Nass rivers. A needle cast of second year needles of Sitka spruce was widespread on the northern portion of Moresby Island and near Cedarvale. A needle rust found over much of the range of alpine fir in 1972 decreased considerably.

Over 70 hours of fixed wing and helicopter reconnaissance was used to help assess mountain pine beetle and blackheaded budworm outbreaks. Additional flying time was donated by the B. C. Forest Service, Eurocan Pulp and Paper Company and Rayonier of Canada Ltd., and is hereby gratefully acknowledged.

## MOUNTAIN PINE BEETLE

### PROMPTS SALVAGE OF

### LOGEPOLE PINE

The current outbreak of mountain pine beetle began at Date Creek in 1969 and was followed in 1970 by an outbreak at Weegett Creek in the

Cranberry drainage. In

1971, the Weegett Creek infestation expanded and scattered infestations occurred near Kitwanga, east along the Skeena River to Hazelton and north along the Kispiox River to Kline Lake. In 1972 infestations expanded and salvage cutting of infested stands began. These operations greatly reduced beetle populations but some areas could not be completely logged by beetle flight time and logging of numerous small infested patches was not feasible. Beetles successfully overwintered in those locations during 1972-73 and large beetle flights occurred during the summer.

In 1973 aerial surveys by the British Columbia Forest Service in cooperation with the Forest Insect and Disease Survey, disclosed a number of small infestations east of Houston and expansion of all existing infestations. Table 1 and Maps 1 and 2 show locations of known infestations, acreage involved, number of trees infested in 1972, and logging plans for the areas.

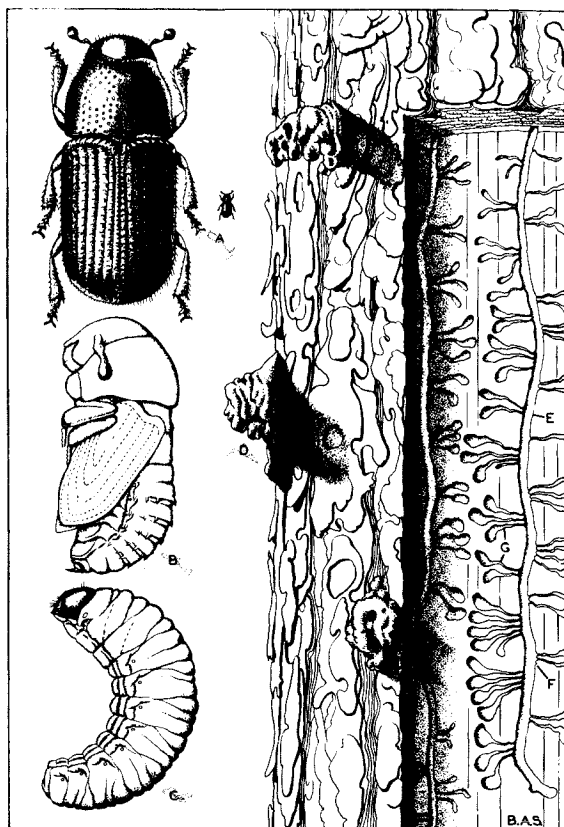


Table 1. Mountain pine beetle infestations,  
Prince Rupert Forest District, 1973

Map No.	Infestation No.	Locality	Estimated acreage involved	No. of red trees
<u>Being logged</u>				
1	1	Cranberry R	1,500	900-1,200
1	25	Date Cr		
1	32	Weegett Cr	1,700	
<u>Areas soon to be logged</u>				
1	7,8	Radio Tower Hill	640	1,070
1	9	5 Mi.	50	200
1	22	Seeley L	60	400
1	30	Kline L	40	150
1	39	Sharpe Cr	10	30
<u>Indian Reserve</u>				
1	3-6	Kitwancool	460	370
1	12,13	Andimaul	50	170
<u>No immediate logging planned</u>				
1	2	Kitwanga	20	30
1	10	Kitwanga Dump	30	75
1	11,11a	W. side Kitwanga R	20	20
1	14	Andi Cr	20	65
1	15	Hazelton-Kitwanga	150	175
1	16,17	Skeena R	160	350
1	18	Carnaby Sta.	60	70
1	19	Burdick Cr	40	200
1	20	Keynton L	30	30
1	21	Williams Farm	60	250
1	23	Hazelton	10	40
1	24	Glen Vowell	30	95
1	26	Sunday L	60	90
1	27	Murder Cr	20	40
1	28,29	First Cabin	18	60
1	31	Kline L	40	150
1	33	Suska R Jct.	10	20
1	34	Eighteen Mi. Cr	5	20
1	35	Natlan Cr	80	150
1	36,37,38	Harold Price Cr	540	1,100
1	40	Gramophone Cr <sup>S-H</sup>	5	30
1	41	Dahlie Cr <sup>S-H</sup>	5	30
2	42	Gilmore L <sup>H</sup>	30	40
2	43	Aitken Cr <sup>H</sup>	60	150
2	44,45	McKilligan Cr <sup>H</sup>	120	285
2	46	Boling Pt. <sup>Bahne</sup>	10	50
1	47	Kitseguecla R	10	30

6153

7235

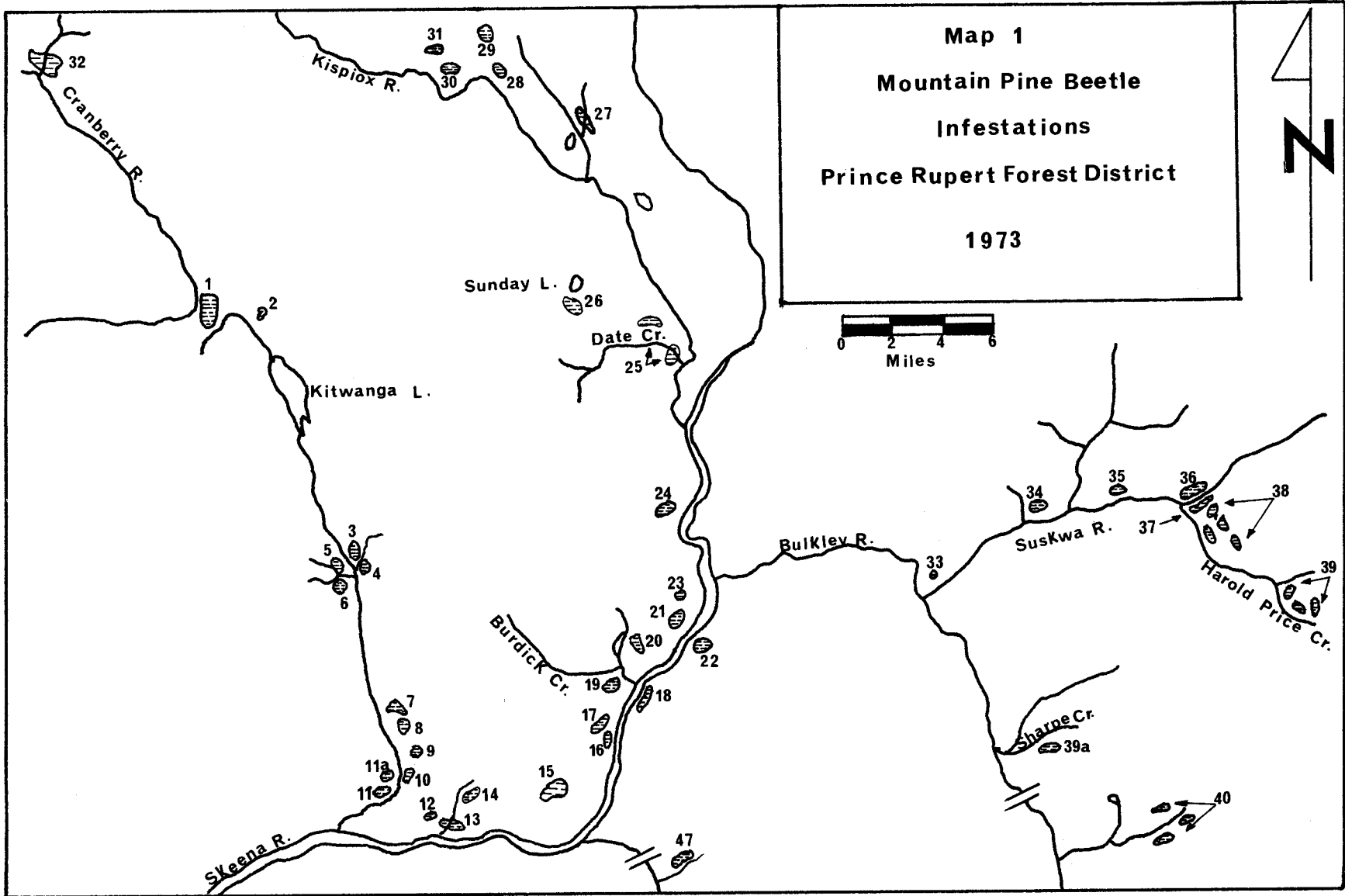
Two areas were cruised to determine the status of current attack; they were near Seeley Lake and near Radio Hill north of Kitwanga. The following table shows by percent the status of attack.

Location	Year attacked			Unattacked
	Prior to 1972	1972	1973	
Seeley Lake	13	14	35	38
Radio Tower Hill	4	12	23	61

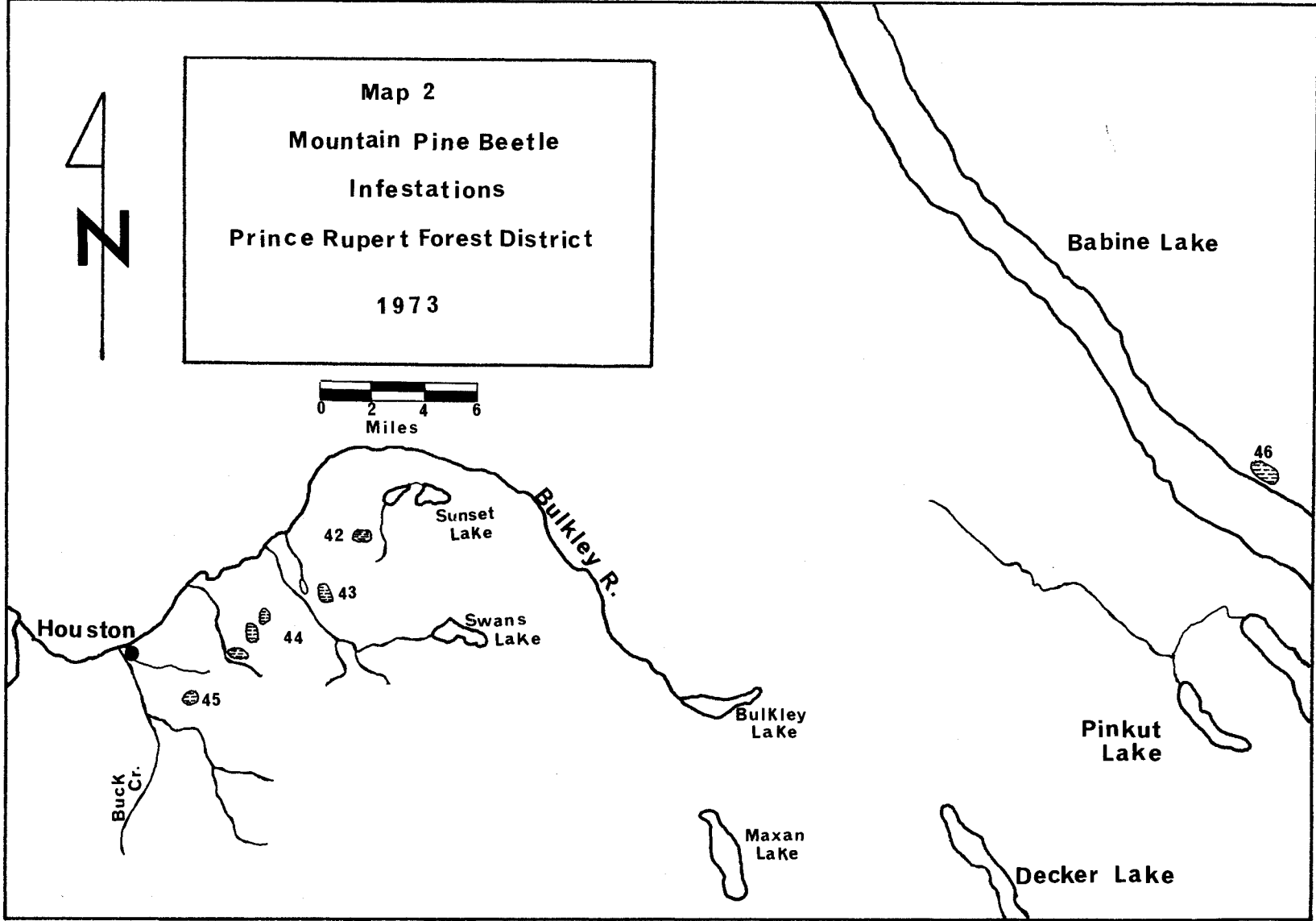
In conclusion, removal of bark from trees attacked in 1973 revealed large overwintering beetle broods, and density of 1973-attacked stems paralleled the 1972 attack, thereby indicating a continuing expansion of infestation in 1974.

1890  
1520  
2000

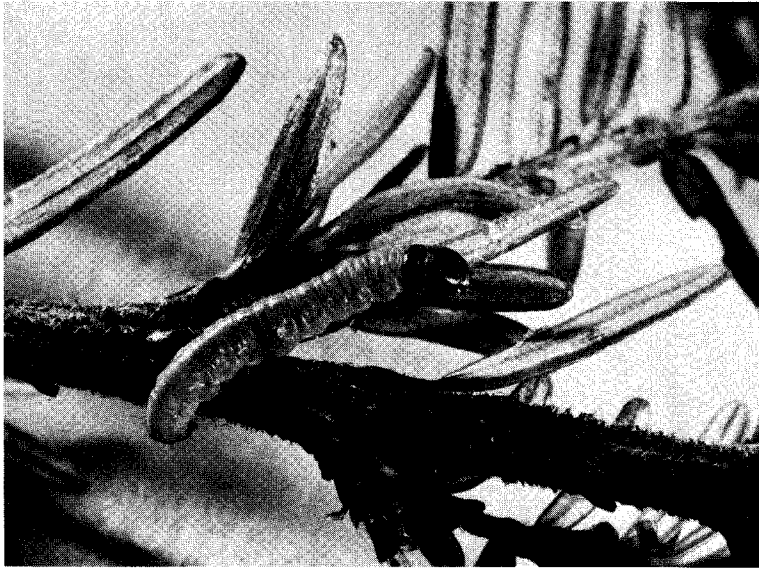
10 9/5  
5 4/0  
16 30 5



**Map 2**  
**Mountain Pine Beetle**  
**Infestations**  
**Prince Rupert Forest District**  
**1973**



WESTERN  
BLACKHEADED  
BUDWORM  
STILL  
INCREASING



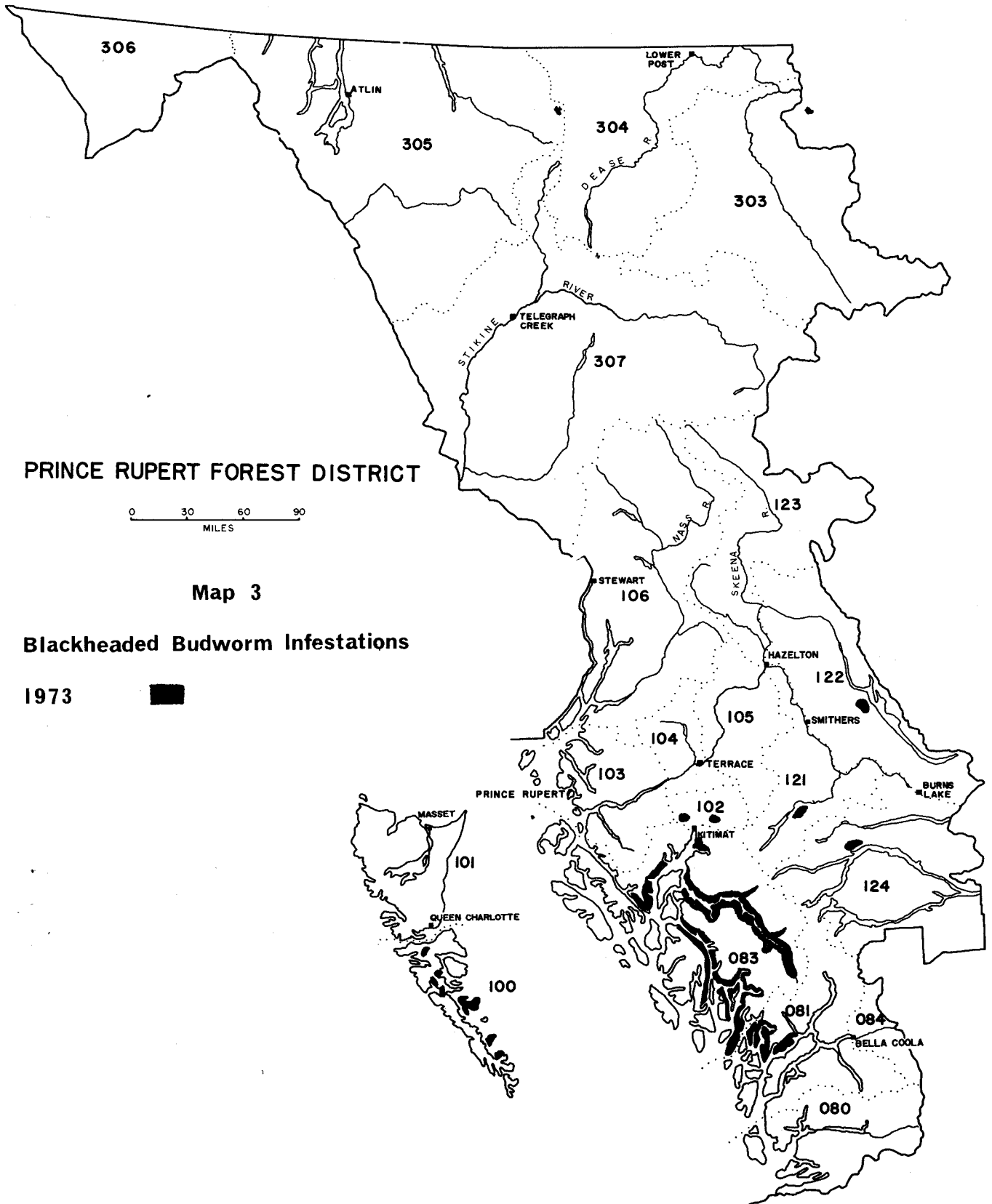
There was a general increase in budworm populations throughout the District in 1972 with light to moderate populations in scattered stands of western hemlock from Calvert Island north to Douglas Channel, Lyell and Burnaby islands on the Queen Charlotte Islands and on alpine fir west of Babine Lake. In 1973 populations increased to epidemic levels and defoliation caused by budworm feeding was mapped on more than 280,000 acres of western hemlock and alpine fir in the District (Map 3).

Larval development was normal for the Mainland but slower on the Queen Charlotte Islands. By mid-July collections of second instar larvae were made at most locations on the Queen Charlotte Islands, while on the Mainland, fifth instar were common and defoliation from blackheaded budworm feeding was noticeable.

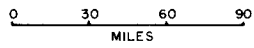
The numbers of larvae per collection as well as the number of collections containing budworm larvae increased substantially in all western hemlock stands from Terrace south to Bella Coola.

Maximum numbers of larvae in samples increased along Moresby Island from 400 in 1972 to 600 in 1973; from 250 to 500 from Bella Coola to Kitimat and from 10 to 70 from Terrace to Kitimat.





PRINCE RUPERT FOREST DISTRICT



Map 3

Blackheaded Budworm Infestations

1973



During August, Eurocan Pulp and Paper Company and Rayonier of Canada forestry personnel conducted aerial surveys to map defoliation in their respective holdings. In October, Forest Insect and Disease Survey personnel in cooperation with B. C. Forest Service and Eurocan Pulp and Paper Company personnel, conducted egg surveys along the Mainland coast, in the Interior and in the Deena River drainage on the Queen Charlotte Islands.

Overwintering egg populations were assessed by counting the eggs on two 18" branches from the mid-crown of each of three trees at 10 locations within the Eurocan T.F.L., 8 locations along the Mainland coast from Ocean Falls north to Douglas Channel, at 1 location in the Deena River drainage and at 4 locations in the Interior. Table 3 gives a summary of blackheaded



budworm infestations in the Prince Rupert District, the average defoliation of 10 trees, the average number of eggs per 18" branch and the predicted defoliation hazard for 1974. The criterion is as follows: 1 to 26 eggs - light defoliation; 27 to 59 - moderate; 60 or more - heavy.

Moderate defoliation was recorded at 4 egg sample locations; they were: Chief Mathews Bay, Salmon Bay, Green Inlet and Deena River. About half of the 10 trees (mostly intermediate trees) examined at each of these locations suffered about 6 feet of top stripping. The populations at Salmon Bay and Green Bay are expected to decrease and no further damage is expected but moderate defoliation is expected to occur again at Chief Mathews Bay and Deena River, and if so, top killing of intermediate trees could occur.

It is predicted that defoliation will decrease from Ocean Falls

along Matheson, Tolmie and Princess Royal channels, and increase along Douglas and Grenville channels and from Kemano north to Terrace. Populations in the Queen Charlotte Islands are expected to remain about the same, causing scattered light to moderate defoliation from Rose Harbour to Queen Charlotte City. Defoliation of new growth on white spruce and alpine fir at Fort Babine Rd., Smithers Landing, Morice Lake and Andrew Bay probably will occur again.

Table 3. Blackheaded budworm infestations, Prince Rupert Forest District, 1973

Location	Avg no. eggs per 18" branch	% total defoliation 1973	Defoliation hazard for 1974
<u>Terrace and T.F.L. 41</u>			
Terrace	78	17	heavy
Hirsch Cr	44	21	moderate
Dahl Cr	42	18	moderate
Emsley Cove	7	23	light
Foch Lagoon	22	7	light
Kildala Arm	54	12	moderate
Kiltuish Inlet	15	49	light
Kemano River	140	43	heavy
Chief Mathews Bay	30	67	moderate
Gamsby R	56	36	moderate
Kitlope R	9	29	light
<u>Douglas Channel-Ocean Falls</u>			
Kishkosh Inlet	8	11	light
Hartley Bay	40	31	moderate
Klekane Inlet	40	35	moderate
Green Inlet	15	66	light
Lizette L	12	19	light
Watson Bay	8	29	light
Salmon Bay	21	52	light
Link L	21	40	light
<u>Queen Charlotte Island</u>			
Deena River	24	59	light
<u>Interior</u>			
Fort Babine Rd.	60	25	moderate
Ootsa L	?	25	moderate
Morice L	12	25	light

## BLACK ARMY CUTWORM THREATENS PLANTATIONS

The black army cutworm had, until 1973, been known mainly as an agricultural pest. In June of 1973 British Columbia Forest Service reported severe damage to widely scattered 200-400-acre blocks of newly planted conifer seedlings. The sparse ground cover plants and shrubs were almost completely defoliated in these areas by June 12. In most instances, burning of the areas had preceded planting by six months to a year. Table 4 shows the areas infested, the year when burning and planting took place, the acreage infested and expected seedling mortality.

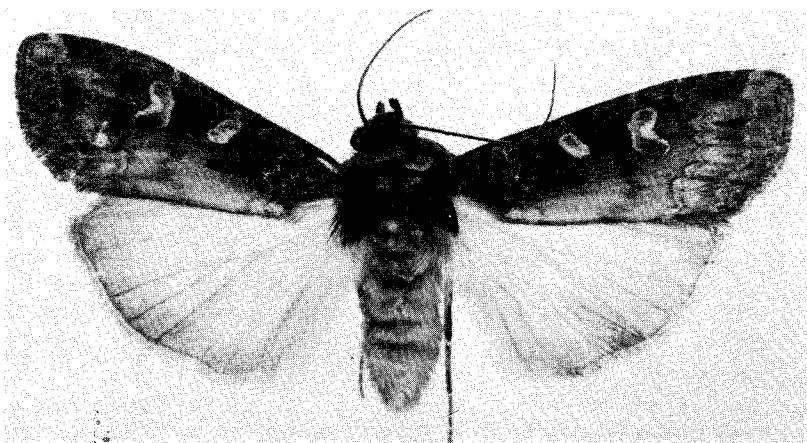
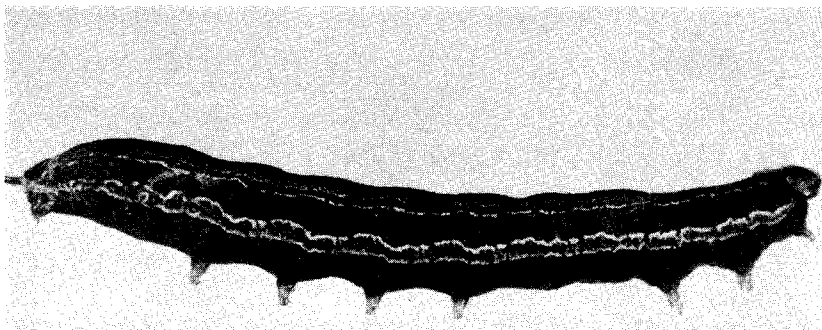


Table 4. Infestations of black army cutworm and estimated seedling mortality in Prince Rupert Forest District, 1973

Location	Burned	Planted	Acreage Infested	Estimated % Mortality*
Quick	1971	1973	80	60
Goosly L	"	"	70	30
Tagetochlain L	"	1972	400	75
Andrew Bay				
C.P. 067 B1k. 12	1971	1972	270	75
C.P. 067 B1k. 13	"	"	210	75
C.P. 012 B1k. 7	"	"	220	100
C.P. 012 B1k. 11	1970	1971	140	50
C.P. 056 B1k. 2	1971	1972	180	90
C.P. 002 B1k. 9	"	1973	180	90
C.P. 002 B1k. 11	"	"	180	100

\* B.C.F.S. estimates.

The black army cutworm is a dark brown to black caterpillar with a double white line extending lengthwise on each side of the body. Larvae range in size from 1/4" when newly hatched to nearly 2" when fully grown. In the spring they feed nocturnally in and on buds until flushed. At this time all weeds, shrubs and plants may be fed upon and damage becomes apparent. Larvae tend to congregate and may develop a feeding line, hence the name "armyworm". In the last instar, larvae stop feeding and pupate in the soil. Moths emerge in July and August and are apparently attracted to recently burned areas where they lay eggs.

Square foot soil samples to determine pupal populations were taken near Quick, Goosly Lake and three locations near Andrew Bay (Table 5).

Table 5. Number of black army cutworm pupae in soil samples taken in infested areas

Location	Total no. samples	Avg no. pupae per ft <sup>2</sup>	Max no. pupae per ft <sup>2</sup>
Quick	20	6	30
Goosly L	7	29	110
Andrew Bay			
C.P.002 Blk. 9	5	14	23
C.P.002 Blk. 11	12	25	100
C.P.012 Blk. 11	5	3	10

There was no evidence of disease in pupae sent to the Insect Pathology Research Institute from the infestation areas.

Past epidemics affecting agricultural crops have been severe for only two years. Survey technicians of the Canadian Forestry Service will be carefully checking to ascertain if the same will be true for forest plantations.

Survival plots within the 1973 infested areas will be established in the spring of 1974, after new growth becomes apparent, to determine seedling damage or mortality.

**SPRUCE BEETLES** were present in low numbers in white spruce near the Stewart-Cassiar Highway where recent right-of-way felling had taken place. Moderate to heavy populations have been encountered in nearby Alaska for the past two years.

**WESTERN BALSAM BARK BEETLES** are a continuous problem in the Interior sub-alpine forests of the District. Areas of chronic attack are the Upper Skeena and Nass rivers, McKendrick Creek and Telkwa River. Aerial surveys of the latter two areas revealed that a total of 2,000 trees have been attacked over the past four years.

SPRUCE BUDWORM were at low population levels in the District. A few *Choristoneura orae* were found on amabilis fir along the coast and *C. biennis* in the Interior on alpine fir.

GREEN SPRUCE APHID caused light to moderate damage to open-grown Sitka spruce from Skidegate Village to Tlell according to British Columbia Forest Service personnel.

PINE MIDGE damage on branch tips decreased in lodgepole pine in the Terrace - Kitimat areas and along Kitwanga River. However, up to 60% of tips were damaged in lodgepole pine stands along the Kispiox River.

SADDLEBACK LOOPERS were found in 20% of beating collections taken on the Queen Charlotte Islands. There was an average of 2.5 larvae per collection. No larvae were found in 1972.

A SHOOT BLIGHT caused light to moderate browning of foliage and light defoliation of regeneration and pole-sized western hemlock on one to two-acre patches from Kitimat north to Williams Creek and along tributaries of the Kitimat River.

A NEEDLE DISEASE caused moderate to heavy discoloration of second-year needles on groups of regeneration and pole-sized Sitka spruce on Moresby Island from Sandspit to Cumshewa Inlet and in the Cedarvale area where up to 90% of two-year needles were infected.

FIR-FIREWEED NEEDLE RUST infection was generally lighter on alpine fir in the western portion of the Interior. However, moderate to heavy infection was recorded in localized areas near Topley Landing, Lamprey Creek and Taltapin Lake.

CURRENT STATUS OF MAJOR PESTS IN B. C.

PEST	D I S T R I C T S					
	PRINCE GEORGE	PRINCE RUPERT	VANCOUVER	CARIBOO	KAMLOOPS	NELSON
Mountain Pine Beetle	light on Pw Canoe R	epidemic Hazelton area	patchy on Pw Fraser Canyon	light on P1 Cariboo L	outbreaks expanding	epidemics E and W Kootenays
Spruce Beetle	trace Monkman area	trace Stewart area	not found	trace Quesnel L	localized epidemics	light
Douglas-fir Beetle	light Canoe R	not found	trace Pemberton area	expanding Fraser R	light	light
Western Blackheaded Budworm	sporadic increase	new outbreaks	declined	moderate Wingdam	localized outbreaks	trace
Spruce Budworm	epidemic Liard R	light	epidemic Pemberton Fraser Cn	light Hendrix L	epidemic Lillooet area	trace
Douglas-fir Tussock Moth	absent	absent	declined	not found	localized epidemics	not found
Western Hemlock Looper	light	trace	light	not found	localized outbreaks	outbreaks Columbia R
False Hemlock Looper	absent	absent	light	not found	localized epidemics	trace
Black Army Cutworm	localized outbreaks	localized outbreaks	not found	not found	outbreak Blue R	outbreak Golden
Forest Tent Caterpillar	epidemic S & E of Pr. George	light	light	epidemic Quesnel - Horsefly	epidemic Raft R	epidemic Golden - Trail
Larch Casebearer	absent	absent	no host	no host	trace	declined
White Pine Blister Rust	light Canoe R	light	scattered light	light	frequent	common
Dwarf Mistletoe	southern areas on P1	widespread on Hw, P1	widespread on Hw	Cariboo - Chilcotin on P1	Okanagan on F	widespread on P1, Lw
Drought	not apparent	not apparent	localized	moderate	widespread severe	widespread moderate



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