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ANNUAL DISTRICT REPORT
FOREST INSECT AND DISEASE SURVEY
BRITISH COLUMBIA, 1975
PART II, PRINCE RUPERT FOREST DISTRICT

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by

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PACIFIC FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
VICTORIA, BRITISH COLUMBIA

- FILE REPORT -

DEPARTMENT OF THE ENVIRONMENT

December, 1975

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B. C.

INTRODUCTION

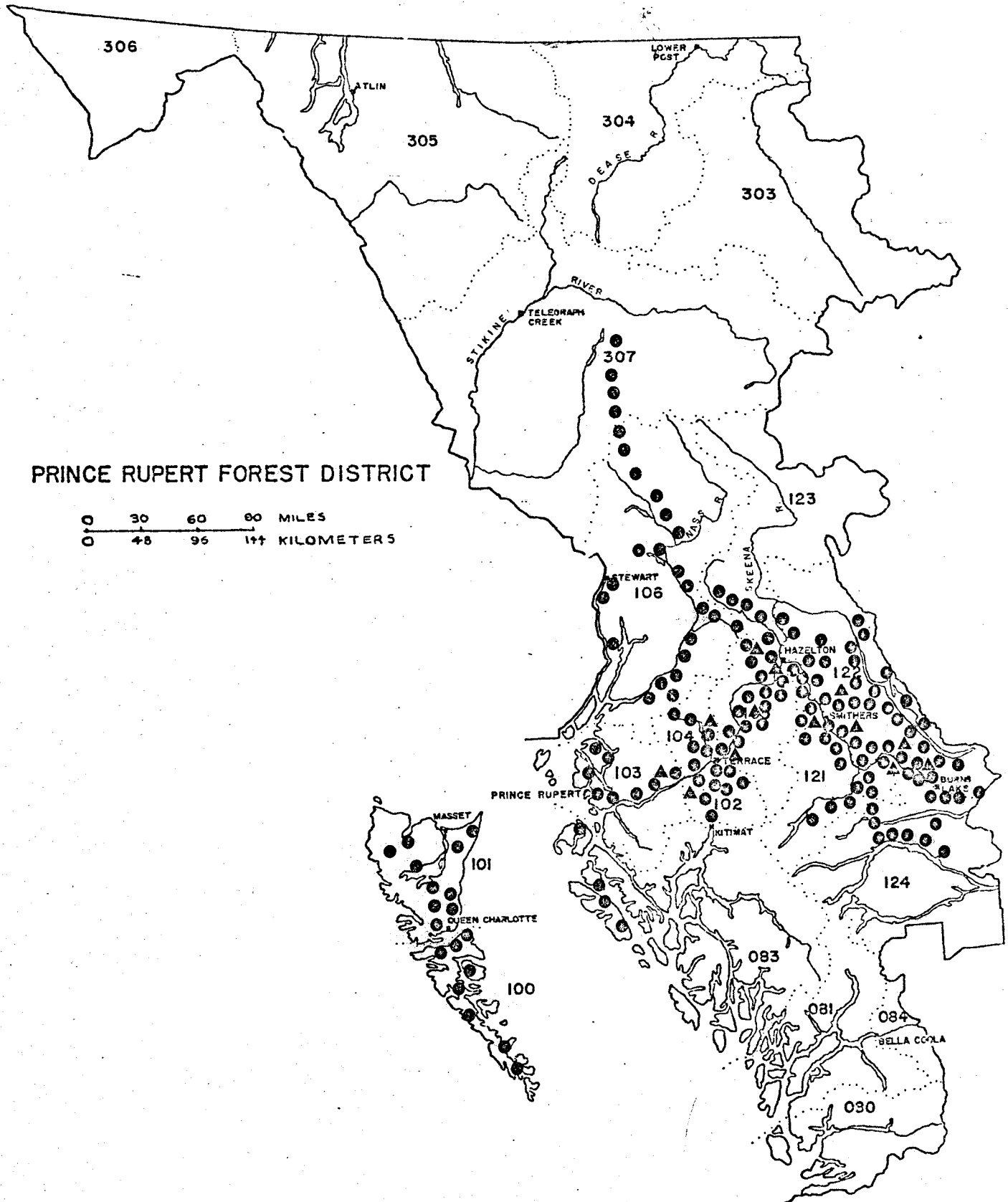
This report outlines the status of forest insect and disease conditions in the Prince Rupert Forest District for 1975, and attempts to forecast trends of pests capable of sudden, damaging outbreaks.

Regular field work in the District extended from June 1 to August 22. Special surveys were carried out for the mountain pine beetle. Aerial surveys were conducted over the Queen Charlotte Islands, the coastal area north of Prince Rupert and over portions of the Interior forests.

A total of 287 insect and 21 disease collections were submitted to the Pacific Forest Research Centre in 1975. Map 1 shows the collection localities and drainage divisions. Numbers of defoliators found in field collections decreased slightly from 1974. In 1975, 90% and 86% of the beating collections in the western and eastern parts of the District, respectively, contained larvae.

Mountain pine beetle continued to expand. Blackheaded budworm populations decreased greatly in the coastal forests and remained high in the Interior. A pine sawfly caused extensive defoliation of shore pine along the outer islands south of Prince Rupert. A pine needle miner caused considerable damage to pines in the Parrott Lakes area. Spruce budworm, in conjunction with blackheaded budworm, caused current year's growth defoliation near the Bell-Irving River. *Pinneus* sp. caused moderate to heavy damage to plantation seedlings in three areas of the Interior. A birch and willow blotch miner continued to cause browning of foliage in an expanded area along the Skeena River. A leaf beetle caused moderate browning of trembling aspen near Ootsa Lake.

A shoot blight of western hemlock caused considerably less damage in 1975 than in the past two years. Heavy infection by a spruce needle rust occurred again in 1975 on 20 acres of Sitka spruce near Port Clements. Porcupine damage was prevalent at scattered locations throughout the pine stands of the District. Foliage diseases of trembling aspen were noted between Babine Lake and Smithers, and near Skunsnat Creek. Light to moderate damage to lodgepole pine was caused by a gall rust at 13 locations tallied in the Interior stands.



FOREST INSECT CONDITIONS

Currently Important Insects

Mountain pine beetle, *Dendroctonus ponderosae*

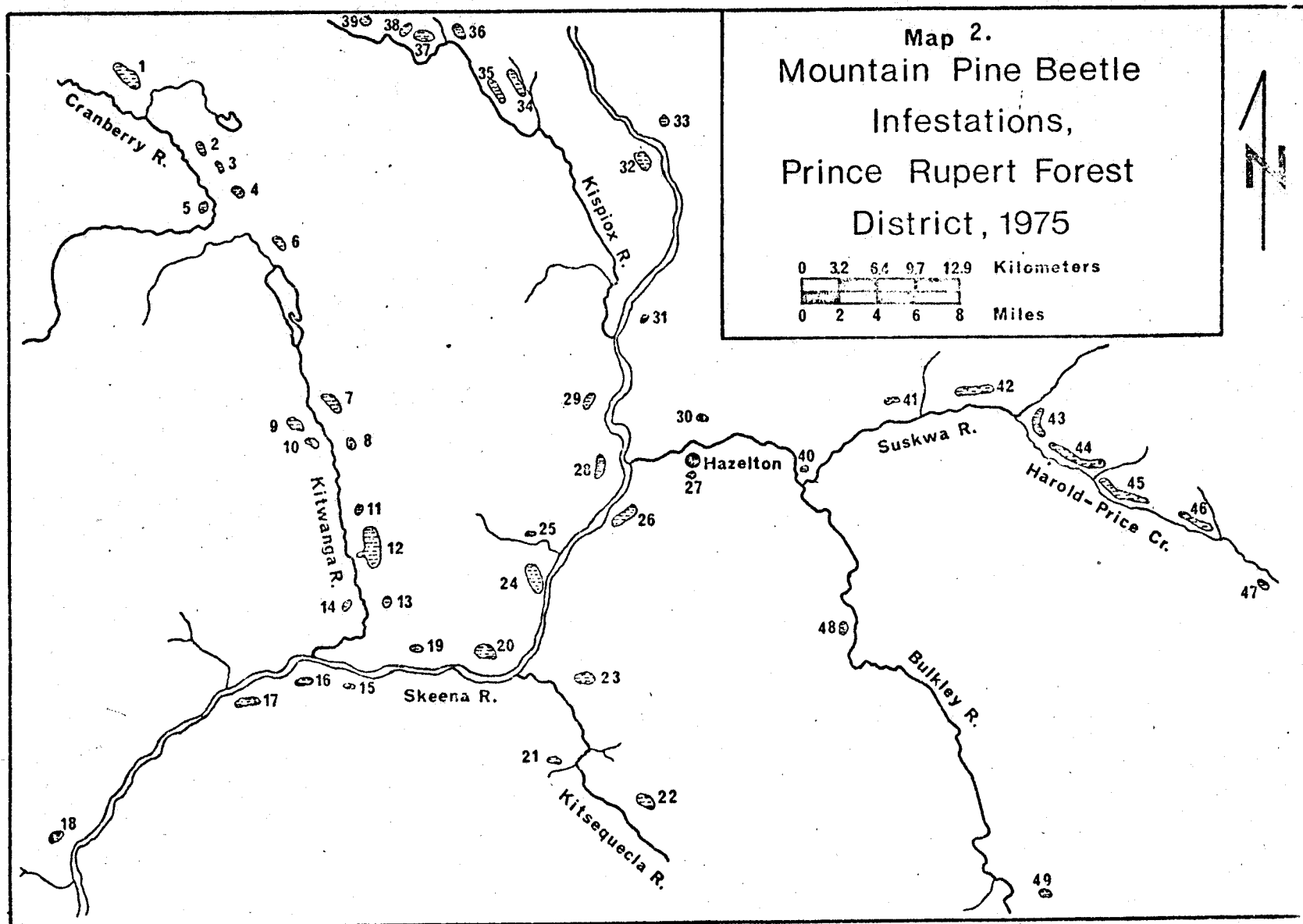
The first of the continuing mountain pine beetle infestations began in 1969, when 1,000 lodgepole pine were killed near Weegett Creek. In 1971, this figure increased to 1,930 red-topped pine on 245 acres at two locations. In 1975 there were more than 17,000 lodgepole pine killed on 5,100 acres at 48 locations extending from Ritchie to Babine Lake (Table 1, Maps 2 and 3).

Table 1. Estimated acreages infested in 1975, and lodgepole pine killed by mountain pine beetle in the Prince Rupert Forest District, as determined by aerial surveys (1974 figures in brackets)

Infestation no.	Location	Estimated acreage	No. of red-tops
<u>Kitwanga</u>			
1	Weegett Cr	505	3,035
2,3,4	N. of Kitwanga L	15	60
5	Cranberry R	10	30
6	Kitwanga L	30	95
7,8,9,10	Kitwancool	152	460
11	S. of Kitwanga L	5	40
12	Radio Tower Hill	2,000	5,000
13	5 mi. Kitwanga	15	200
14	Kitwanga	2	20
15	Shandilla L	25	70
16	opposite Kitwanga	15	25
17	opposite Woodcock	35	160
18	Cedarvale	20	50
Subtotals		2,829 (1,870)	9,245 (8,390)
<u>Hazelton</u>			
19	Andimaul	10	45
20	Nash	10	75
21	Kitsuns Cr	2	4
22	Kitseguecla R	50	325
23	Juniper Cr	10	60
24	opposite Carnaby	200	600
25	Burdick Cr	5	10
26	Seeley L	250	850
27	Hazelton	5	35
29	Glen Vowel	20	90
30	Four Mile Mtn	10	30
31	Kispiox Village	10	60

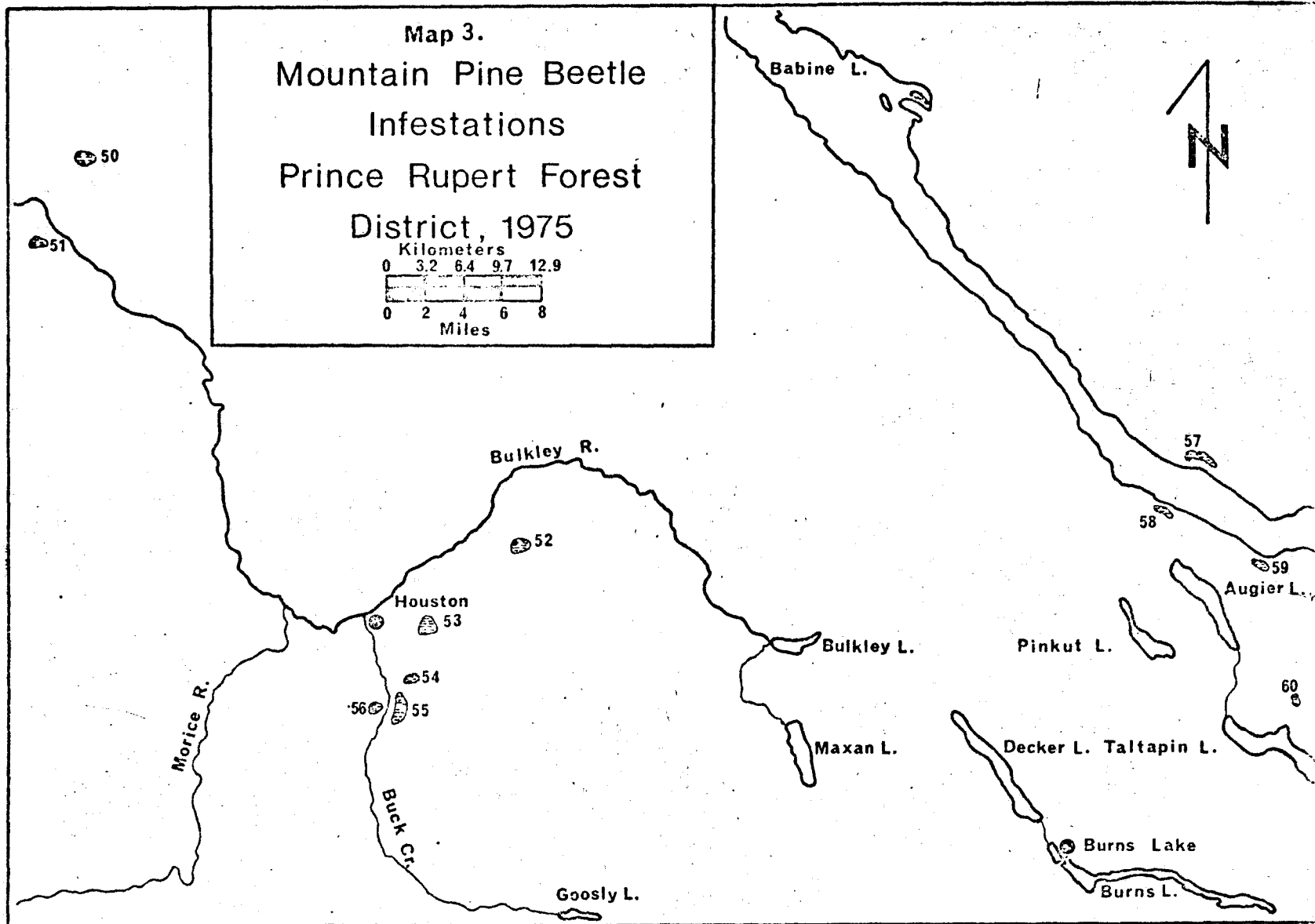
Table 1 - Cont'd.

Infestation no.	Location	Estimated acreage	No. of red-tops
32	Tenas Hill	25	140
33	Sterritt Cr	2	10
34,35	Sammon L	400	230
36	First Cabin	100	200
37,38	Kline L	200	1,070
39	Elizabeth L	15	20
40	Jct. Suskwa & Bulkley	5	20
41	18 Mile Cr	10	35
42	Natlan Cr	250	2,000
43,47	Harold Price Cr	500	1,990
48	Moricetown	2	12
Subtotals		2,111 (781)	7,881 (5,140)
<u>Smithers</u>			
49	Gramophone Cr	5	35
50	Canyon Cr	5	20
51	Telkwa (Hubert)	5	18
Subtotals		15 (60)	73 (900)
<u>Houston</u>			
52	Aitken Cr - Gilmore L	5	15
53	McKilligan Cr	30	65
54	Dungate Cr	2	10
55,56	Buck Cr	50	153
Subtotals		87 (330)	243 (1,660)
<u>Burns Lake</u>			
57	Boling Pt.	20	140
58	Donald Ldg.	5	65
59	Pinkut Cr	5	50
60	Taltapin L	2	4
Subtotals		32 (251)	259 (1,010)
Grand Totals		5,074 (2,992)	17,701 (17,100)



Map 3.
Mountain Pine Beetle
Infestations
Prince Rupert Forest
District, 1975

Kilometers
0 3.2 6.4 9.7 12.9
Miles
0 2 4 6 8



In June, beetle broods were assessed on one-half square foot bark samples at breast height on 25 trees at Kitwanga, Seeley Lake, Kline Lake, Dungate Creek and Goathorn Creek. The ratio of living progeny to successful total attacks indicated increasing populations at all locations.

During September, 13 cruise lines with prism plots at two-chain intervals were run at six localities to determine attack trends (Table 2). Stand type in most areas was lodgepole pine mixed with western hemlock, white spruce, balsam and/or trembling aspen and white birch.

In forecasting population and damage trends, consideration was given to changes of timber type, density of pine and proximity of logging to the strip.

Three strip cruises were run north and east of Elizabeth Lake to determine a possible northern extension of beetle infestations. Strip 6 indicates a preference of the beetle to attack susceptible pines in stands where previous attacks had occurred. An increasing number of red-tops will be evident in 1976 for a radius of some 15 chains around the groups of red-tops counted in 1975. South of these infestations, stands have a larger pine component and will be more susceptible to beetle attack than those to the north, where a gradual timber type change excludes pine.

Table 2. Status of lodgepole pine on cruise strips,
Prince Rupert Forest District, 1975

Strip no.	Location	Pine stems /acre	Per cent			
			Healthy	Green attack	Red	Gray
1	Kline L	41	100	0	0	0
2	" "	151	84	9	7	0
3	" "	55	37	44	19	0
4	Elizabeth L	20	100	0	0	0
5	" "	139	87	3	0	10
6	" "	71	78	10	3	9
7	First Cabin	133	80	11	2	6
8	" "	34	73	18	5	3
9	Weegett Cr	116	100	0	0	0
10	" "	127	94	6	0	0
11	Mi. 25 Kitwanga	132	91	2	1	6
12	McKilligan Cr	222	86	7	4	3
13	" "	64	88	0	6	6

The infestations south of Elizabeth Lake in the Kispiox River drainage are expected to increase in size, as are the outbreaks at Natlan and Harold Price creeks, along the Skeena River west of Hazelton and the infested areas in the Kitwanga drainage. Increased numbers of red trees are expected near the spot infestations north of Kitwanga Lake and north of Weegett Creek logged area. However, climatic change north of the main infested area at Weegett Creek and a forest type change to the east, will prevent further expansion of the infestation in these directions.

Most beetle infestations east of Hazelton and particularly those near Smithers, Houston and Burns Lake, that were infested in 1974, have been reduced by timely cut-and-burn and logging practices. This has been reflected by a reduction in the number of red trees counted in 1975 at Smithers, Houston and Burns Lake (Table 1). However, the abundance of suitable host material and favorable climatic conditions will continue to encourage increases in beetle populations.

Summary of Mountain Pine Beetle Sales in the
Prince Rupert Forest District up to and including
September, 1975

submitted by J. Grigel, September, 1975

Ranger District	No. of sales	Area (acres)	Avg size per sale (acres)
R.D. 1 Burns Lake	1	78	78
R.D. 5 Kitwanga	14	3,201	229
R.D. 6 Hazelton	32	7,315	229
R.D. 7 Smithers	3	607	202
R.D. 9 Houston	<u>28</u>	<u>3,540</u>	<u>126</u>
Total	78	14,741	189

Specific Sales by Ranger District

Ranger District 1

<u>Burns Lake</u>		
<u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-06628	78	Tintagel
Total	78	1 sale
Average size (acres) 78		

Specific Sales by Ranger District - Cont'd.

Ranger District 7

<u>Smithers</u> <u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-04939	128	Canyon Creek
A-04944	160	Canyon Creek
A-07386	319	Dahlie Creek
Total	607	3 sales
Average size (acres) - 202		

Ranger District 5

<u>Kitwanga</u> <u>Sale No.</u>	<u>Size (acres)</u>	
A-03642	247	
A-04914	140	
A-04915	225	
A-04937	95	
A-04940	138	
A-04947	80	
A-04952	165	
A-04955	60	
A-04959	122	
A-04962	126	
A-06608	45	
A-07389	87	
CP100, TFL #1	1,041	
A-01471, CP35	620	
Total	3,201	14 sales
Average size (acres) - 229		
(excluding CP100 and CP35 sales = 128)		

Ranger District 6

<u>Hazelton</u> <u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-04906	220	Kispiox
A-04907	140	"
A-04909	272	"
A-04924	252	"
A-04925	487	Suskwa R
A-04927	233	" "
A-04928	277	" "
A-04930	155	" "
A-04931	148	" "

R.D. 6, Hazelton - Cont'd.

<u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-04932	140	Suskwa R
A-04933	140	" "
A-04934	546	Burdick Cr
A-04935	134	" "
A-04941	126	Kitsequecla
A-04956	140	"
A-04957	120	"
A-04960	129	Seeley L
A-06572	12	" "
A-07363	400	" "
A-04961	162	Kline L
A-04973	943	Suskwa/Harold Price
A-06601	141	Kispiox
A-06603	132	"
A-06593	53 adj to A-04907	"
A-06618	120	"
A-07388	94 adj to A-06603	"
A-07393	49 Adj to A-06601	"
A-07394	590	"
A-07413	166	Elizabeth L
A-07422	80	McCulley Cr
A-07470	132	" "
A-07471	582	Suskwa
Total	7,315	32 sales

Ranger District 9

<u>Houston</u>		
<u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-04967	142	Dungate Cr
A-04892	17	McKilligan Cr
A-05031	80	Gilmore L
A-06520	55	McKilligan Cr
A-06632	353	Dungate Cr
A-06589	125	Aitken Cr
A-06640	185	McKilligan L
A-07355	48	Dungate Cr
A-07365	63	McKilligan Cr
A-07366	40	" "
A-07367	35	" "
A-07368	47	" "
A-07369	72	" "
A-07370	84	" "
A-07371	57	" "
A-07380	71	Gilmore L
A-07378	52	Dungate Cr
A-07383	86	Aitken Cr
A-07384	66	" "
A-07385	55	" "

R.D. 9, Houston - Cont'd.

<u>Sale No.</u>	<u>Size (acres)</u>	<u>General location</u>
A-07387	69	Mt. Harry Davis
A-07391	72	McKilligan L
A-07415	18 adj to A-04967(1)	
A-07460	52 " " A-07355	
A-07478	560	Mud Lake
A-07427	507	" "
CP051-A01476	264	Gilmore L
CP006-A01474	265	Dungate Cr
Total	3,540	28 sales
Average size (acres) - 126		
(excluding CP051-A01476, CP006-A01474,		
A-07478 & A-07427, average size is		
81 acres)		

Spruce beetle, *Dendroctonus rufipennis*

A light population of spruce bark beetle was found infesting damaged roadside white spruce near Snowbank Creek. A total of 41 trees were infested along a nine-mile stretch of road. During mid-July and August re-examination of the stand for possible new attack disclosed a portion of the beetles were still in the old attacked trees; no new attacked trees were observed.

Blackheaded budworm, *Acleris gloverana*

Epidemic numbers of blackheaded budworms were encountered in 1972 south of Ocean Falls. During 1973 and 1974, infestations spread northward in the coastal stands to Stewart and north on the Queen Charlotte Island to Masset Inlet. In the Interior it infested spruce and alpine fir in several areas from Babine Lake west to Hudson Bay Mountain, and south to Morice River. In 1974, over 316,000 acres of defoliation caused by the budworm on western hemlock, alpine fir and white spruce were mapped. During 1975, substantial decreases in populations were noted throughout the coastal zone. The exception to this was near Port Clements, where samples yielded up to 400 larvae per collection and light defoliation was evident. In the interior of the District, populations remained moderate to heavy, with heavy defoliation of current year's growth on alpine fir and spruce near the Bell Irving River, Telkwa River area and along the Fort Babine road.

Table 3 shows a summary of collection results from 1972 to 1975.

Table 3. Summary of blackheaded budworm collections from western hemlock, white spruce and alpine fir, by drainage division, Prince Rupert Forest District

Host	Drainage division ^{1/}	No. of samples during larval period				% samples containing larvae				Avg no. larvae per positive sample			
		72	73	74	75	72	73	74	75	72	73	74	75
W. hemlock	080	7	5	6	0 ^{2/}	85	100	100	0 ^{2/}	17	133	33	0 ^{2/}
	081	5	9	9	0 ^{2/}	100	100	100	0 ^{2/}	18	138	190	0 ^{2/}
	083	13	13	11	0 ^{2/}	84	92	100	0 ^{2/}	86	154	214	0 ^{2/}
	100	14	20	13	7	50	50	69	14	86	100	39	2
	101	17	22	17	10	18	27	76	60	4	4	43	120
	102	8	26	17	17	12	65	76	47	<1	8	100	8
	103	3	4	3	2	33	50	100	50	8	2	132	1
	104	7	40	25	33	40	53	64	57	7	10	19	3
	105	14	18	14	14	7	67	57	57	<1	5	70	1
	106	13	0	18	2	15	0	72	0	1	0	15	0
White spruce	121	29	16	22	17	62	75	64	76	10	145	33	66
	122	36	26	32	32	47	69	75	81	5	65	40	54
Alpine fir	121	21	15	15	15	86	80	53	67	20	106	33	95
	122	13	25	30	24	93	72	70	87	10	72	42	69

^{1/}See Map 1. ^{2/}D.D. 080, 081, 083 not sampled in 1975.

There was no egg sampling in the areas to facilitate predictions of budworm populations for 1976, however light to moderate populations may be expected in the interior portion of the District.

A pine sawfly, *Neodiprion* sp.

Shore pine was extensively defoliated on 230,000 acres on Banks, Pitt, McCauley and Porcher islands south of Prince Rupert. Only the current year's growth remained on most pine trees. On August 12, examination of the stands showed clusters of 10-50 cocoons on the current year's growth. A collection of 130 cocoons was sent to the Insectary for rearing. Seventy-nine per cent of the adults emerged successfully, indicating a probable recurrence of defoliation in 1976.

A pine needle miner, *Recurvaria* sp.

Browning of lodgepole pine foliage caused by this needle miner was evident from Buck Creek to Parrott Lakes, and south to Ootsa and Takysie lakes. About 60% of the trees from 3 feet to 70 feet were affected.

Spruce budworm, *Choristoneura* spp.

Spruce budworm has a complex life cycle in the Prince Rupert District. In the past there have been three species identified from this area: *C. orae*, a one-year-life-cycle along the coast radiating from the Kitimat area on amabilis fir and western hemlock; *C. biennis*, a two-year-life-cycle in the interior portion of the District on alpine fir and white spruce; *C. fumiferana*, a one-year-life-cycle on alpine fir and spruce in the Liard River area in northern British Columbia. During the past five years identification of larvae was determined on a geographical basis, that is, if larvae were collected in the coastal zone they were identified as *C. orae*, if collected in the Interior they were called *C. biennis*, and if larvae were collected from the Liard River area they were called *C. fumiferana*. With *C. biennis* identifications, larvae were believed to complete their life-cycle in the even numbered years, spending the odd numbered years as immature larvae.

In 1974, Soolure traps baited with pheromone sex attractants were used on an experimental basis to help determine populations of male moths and from these to possibly predict infestation buildups. Only small numbers of moths were collected during 1974 in the traps in the coastal zone and moderate numbers (18-31 moths per trap) in the Interior. In 1975, increased numbers of traps were set up in the interior spruce balsam stands at seven additional locations. The average number of moths per trap collected in 1975 were as follows: Oweege Creek, 102; Glacier Creek, 65; Bell Irving River, 118; Skunsnat Creek, 75; Smithers Landing, 74; Telkwa River, <1; Cedric Creek, 1; Morice River, 3 and near Kitimat, <1.

Larvae from collections near the Bell-Irving River were determined as one-year-cycle and therefore identified as *C. fumiferana*, extending the known range of this eastern species. Only small numbers of large larvae were collected near the other six locations, raising doubts as to identification of an

existing one-year-cycle or an overlapping of generations in a heretofore two-year-cycle area.

A recent study of budworm population levels from near the Liard River area indicates that while there is a complete metamorphosis of budworm each year there was in fact a peak larval population every two years. It is therefore presumed that all budworm may have the adaptability of being two-year-cycle but at lower elevations, and with favorable weather conditions and temperatures, budworm complete their metamorphosis in one year.

A woolly aphid, *Pineus* sp.

Infestations of a woolly aphid were evident near Chapman and Taltzen lakes and near Cullon Creek on regeneration white spruce. An examination of white spruce plantations near Cullon Creek followed submission by the British Columbia Forest Service of a sample of damage. Two adjoining plantations of 44 and 185 acres were affected. Heavy browning and gall formation was evident on many trees. Attack was severe on 15% of the seedlings with up to 95% of the tips of individual seedlings affected.

A leaf beetle, *Chrysomela* sp.

Several 1-5 acre patches of trembling aspen were heavily skeletonized near Wistaria. Damaged patches of trees extended eastward to the Henson Hills.

A willow and birch blotch miner, *Lyonetia saliciella*

Heavy browning of birch and willow was more extensive in 1975 than in 1974. Damage to these hosts extended from Hazelton southwest along the Skeena River to Legate Creek and from Kitwanga north to Kitwanga Lake.

FOREST DISEASE CONDITIONS

The organisms currently causing much of the tree mortality, growth loss and wood quality reduction attributed to diseases are mistletoes and stem and root rot fungi. These organisms, once established in a stand, persist for many years. They usually intensify at a slow rate, making annual summaries of their status repetitious; for this reason the following report may omit mention of some of the more important diseases. Emphasis is placed on new outbreak, the status of the annually varying foliage diseases and abnormal weather conditions, i.e., frost, drought, snow damage, etc., which immediately affect tree appearance and often cause dieback and mortality. Other aspects of the Disease Survey dealing with mortality, growth loss, and factors influencing the occurrence of the more important diseases are summarized elsewhere.

Winter Damage

Areas of winter damage were found in mixed stands at Maroon and Douglas creeks in the Kalum Blocks north of Terrace. Each area extended for approximately four to five miles on south and southwest facing slopes at 1,800 feet elevation. Some porcupine feeding was observed on the lodgepole pines within the damaged area.

Porcupine Damage

Damage caused by porcupines was widespread in the pine stands of the District. Numbers of damaged trees ranged from 2-50 in scattered groups from Terrace to Babine Lake. The most concentrated area of damage was between Babine Lake and Smithers, where approximately 30 acres of pines in scattered groups was noted.

Aspen foliage disease, *Venturia macularis*

Browning of foliage caused by this disease was evident in patches of trembling aspen from Hazelton to Bulkley Station and near Skunsnat Creek. By August, clones of damaged trees appeared thinned and scorched.

A shoot blight, *Sirococcus strobilinus*

Areas of infection with resulting wilting of western hemlock was greatly reduced in 1975. Traces of infection have been noted near Williams Creek and Humphrey Creek in the Kitimat Ranger District, and near Port Clements and Masset Inlet in an area of light defoliation caused by blackheaded budworm.

Large spored spruce rust, *Chrysomyxa ledicola*

Heavy infection by this rust occurred again in 1975 south of Port Clements although on a reduced area. Ninety per cent of the foliage on 5-6 foot trees were infected on an estimated 10 acres of bog site Sitka spruce.

Gall rust, *Endocronartium harknessii*

A special study to determine the extent and density of gall rust in lodgepole pine was carried out in the District in 1975. Table 4 shows the results obtained.

Table 4. Sampling locations and percentage of pine infested with pine gall rust, Prince Rupert District, 1975

Location	Percentage of trees infected
Kitwancool	11
Nash	21
Carnaby	29
Little Oliver Cr	4
N. end of Kalum L	0
Thornhill	5
Terrace Airport	23
Nadina R	8
Cesford Hill	40
McKendrick Cr	36
Buck Cr	43
Smithers Landing	10
Hudson Bay Mtn	10
Topley	4

ECOLOGICAL RESERVES
IN PRINCE RUPERT FOREST DISTRICT

Reserve No.	Name	Location	Features	Tree sp.	Elev.	Area (ha)
9	Tow Hill Graham Is	S.W. of Tow Hill - 23 km E. of Masset	<u>FOREST</u> -ecosys- tems dunes	sS,WH	0	514
10	Rose Spit	Most E. point of Graham Is.	<u>FOREST</u> -plant association	sS	0	170
23	Moore, Whitmore, McKenney Is	Hecate Str.- 11 km S.W. of Switzer Cove	<u>FOREST</u> -flora seabirds	sS,wrC, 1P,WH,Y	0	73
25	Dewdney Is. Glide Is.	Estevan Group- S.E. of Banks Is	<u>FOREST</u> -flora- birds- ecosystem	sS,WH, 1P	0	3,846
44	Jeffrey, E. Copper, Rankine Is	Skincuttle Inlet- E. coast Moresby Is	Marine-flora- plant associa- tion	sS,wrC, Al	0	121
45	Port Chanal	Graham Is, Q.C.I.	<u>FOREST</u> -flora- plant associa- tion	sS,wrC, WH	0	9,834
52	Drizzle L	S.S.E. of Masset- Graham Is	<u>FOREST</u> -marine- ecosystems	(CWH)	51	837