ANNUAL DISTRICT REPORT

FOREST INSECT AND DISEASE SURVEY

BRITISH COLUMBIA, 1974

PART II, PRINCE RUPERT FOREST DISTRICT

by

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CANADIAN FORESTRY SERVICE

VICTORIA, BRITISH COLUMBIA

- FILE REPORT -

DEPARTMENT OF THE ENVIRONMENT

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INTRODUCTION

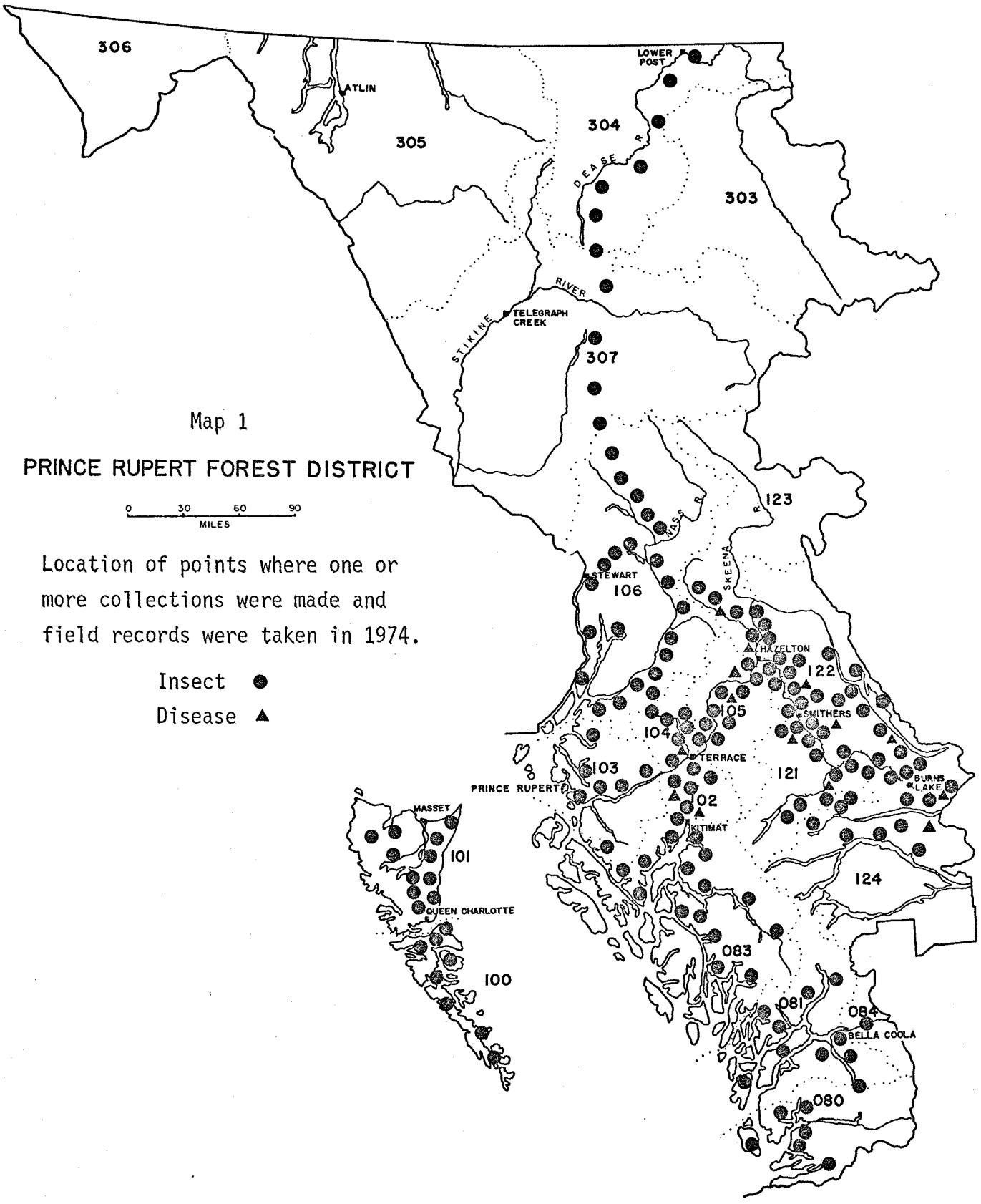
This report outlines the status of forest insect and disease conditions in the Prince Rupert Forest District for 1974, and attempts to forecast trends of pests capable of sudden, damaging outbreaks.

Regular field work in the District extended from the end of May to the end of October. Special surveys were carried out for the black army cutworm, the mountain pine beetle and blackheaded budworm. Aerial surveys were carried out over the coastal forests of the District.

A total of 387 insect and 49 disease collections were submitted to the Pacific Forest Research Centre in 1974. Map 1 shows the collection localities and drainage divisions. Numbers of defoliators found in field collections increased from 1973. In 1974, 96% and 90% of the beating collections in the western and eastern parts of the District, respectively, contained larvae.

Mountain pine beetle continued to expand in new areas. Blackheaded budworm caused light to heavy defoliation over a greater area than in 1973. Green spruce aphid caused moderate to heavy defoliation of Sitka spruce on the northern portion of Moresby Island and on Graham Island along the coast from Queen Charlotte City to Juskatla. A birch and willow leaf miner caused extensive browning of these hosts from Kitwanga Lake to Skeena River and along the river from Skeena Crossing to Oliver Creek. Hemlock sawfly was collected in large numbers on the Queen Charlotte Islands. Spruce budworm pheromone traps were set out at three locations in the District. Black army cutworm caused little damage to plantations in 1974. *Adelges* sp. caused moderate to heavy damage on white spruce in areas close to plantations of Douglas-fir and stands of native Douglas-fir.

A shoot blight of western hemlock caused considerable damage to advanced regeneration near the Nass and Skeena rivers and was also found infecting shoots of western hemlock and Sitka spruce on the Queen Charlotte Islands. Heavy infection by a spruce needle rust occurred on Sitka spruce on 20 acres near Port Clements. A needle cast of Sitka spruce continued defoliating trees in the Interior and Coastal areas of the District. Frost damage occurred over widespread locations in the interior white spruce forests. Nearly 50% of the stems of lodgepole pine were infected by globose gall rust near Burns Lake. A leaf and twig blight of poplar caused extensive browning of trembling aspen along Cranberry River and on island stands of black cottonwood along the Skeena River.



Map 1

PRINCE RUPERT FOREST DISTRICT

0 30 60 90
MILES

Location of points where one or more collections were made and field records were taken in 1974.

Insect ●

Disease ▲

FOREST INSECT CONDITIONS

Currently Important Insects

Mountain pine beetle, *Dendroctonus ponderosae*

Mountain pine beetle has been a serious pest of lodgepole pine in the interior portion of the District for the past 4 years. Starting at Date Creek in 1969 and Weegett Creek in 1970, infestations developed along the Kitwanga and Skeena rivers, expanded in areas along the Kispiox and Suskwa rivers, and by 1973 occurred in small patches near Smithers and Houston. In 1974, pockets of red trees were observed farther east to Burns Lake and farther west along the Skeena River to Ritchie. Table 1 shows locations, number of trees, and the estimated acreage of lodgepole pine killed by mountain pine beetle in 1973, and visible as red-topped trees in 1974.

Table 1. Mountain pine beetle infestations, Prince Rupert Forest District, 1974

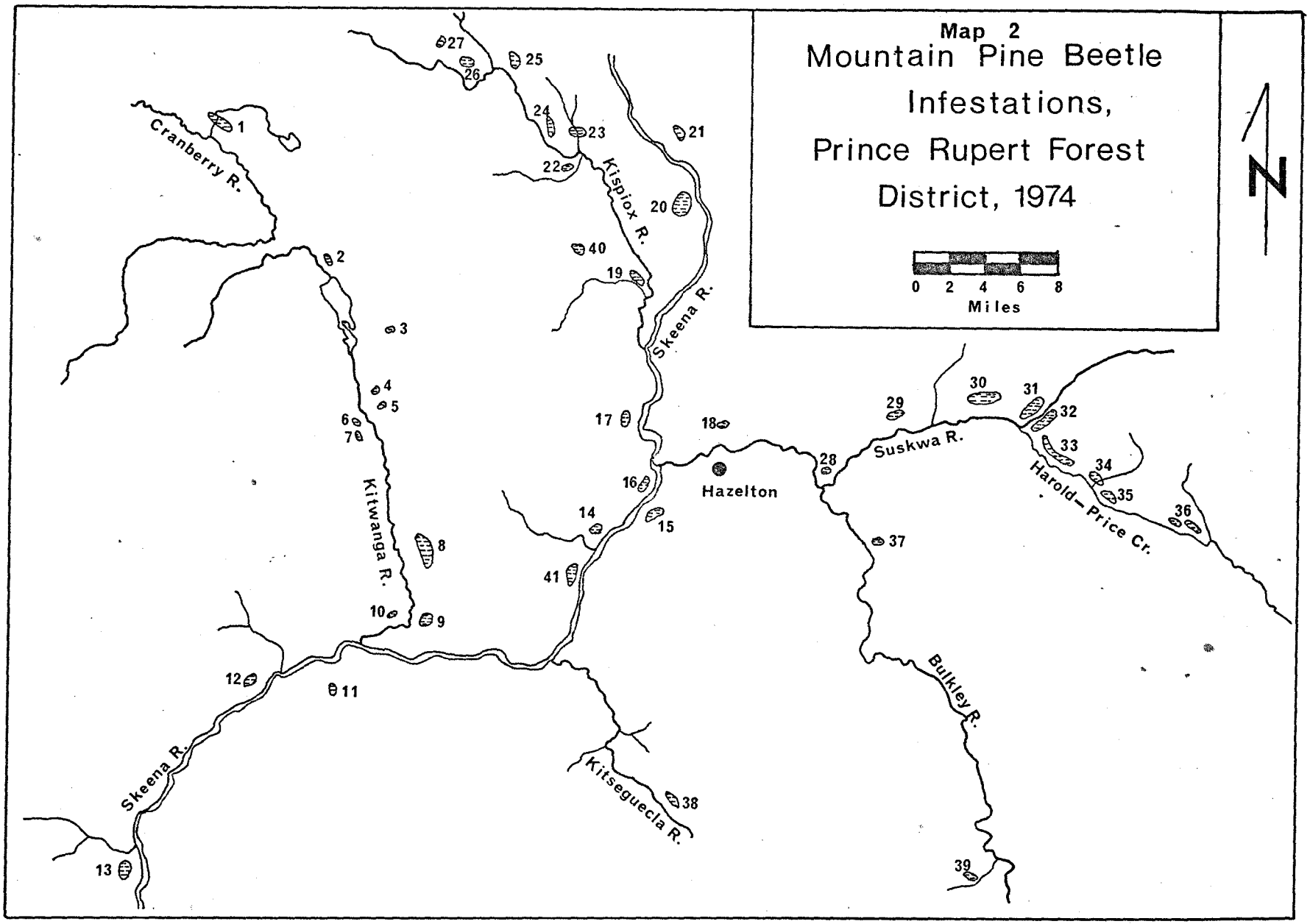
Map no.	Infestation no.	Locality	Estimated acreage involved	No. of red trees
Kitwanga area				
2	1	Weegett Cr	500 (202.4 ha)	2,000
2	2	Kitwanga L	10 (4.0)	95
2	3	Moonlit Cr	5 (2.0)	30
2	4,5,6,7	Kitwancool	100 (40.5)	420
2	8	Radio Tower Hill	1,000 (404.9)	3,500
2	9,10	Kitwanga	25 (10.1)	300
2	11,12	Cedarvale	20 (8.1)	165
2	13	Ritchie	50 (20.2)	300
2	14	Burdick Cr	10 (4.0)	180
2	15	Seeley L	50 (20.2)	540
2	38	Kitseguecla R	30 (12.1)	300
2	41	Skeena R	70 (28.3	560
Hazelton area				
2	16	Hazelton	25 (10.1)	110
2	17	Glen Vowell	20 (8.1)	100
2	18	Four Mile Mtn	2 (0.8)	20
2	19	Date Cr	30 (12.1)	290
2	20	Tenas Hill	50 (20.2)	250

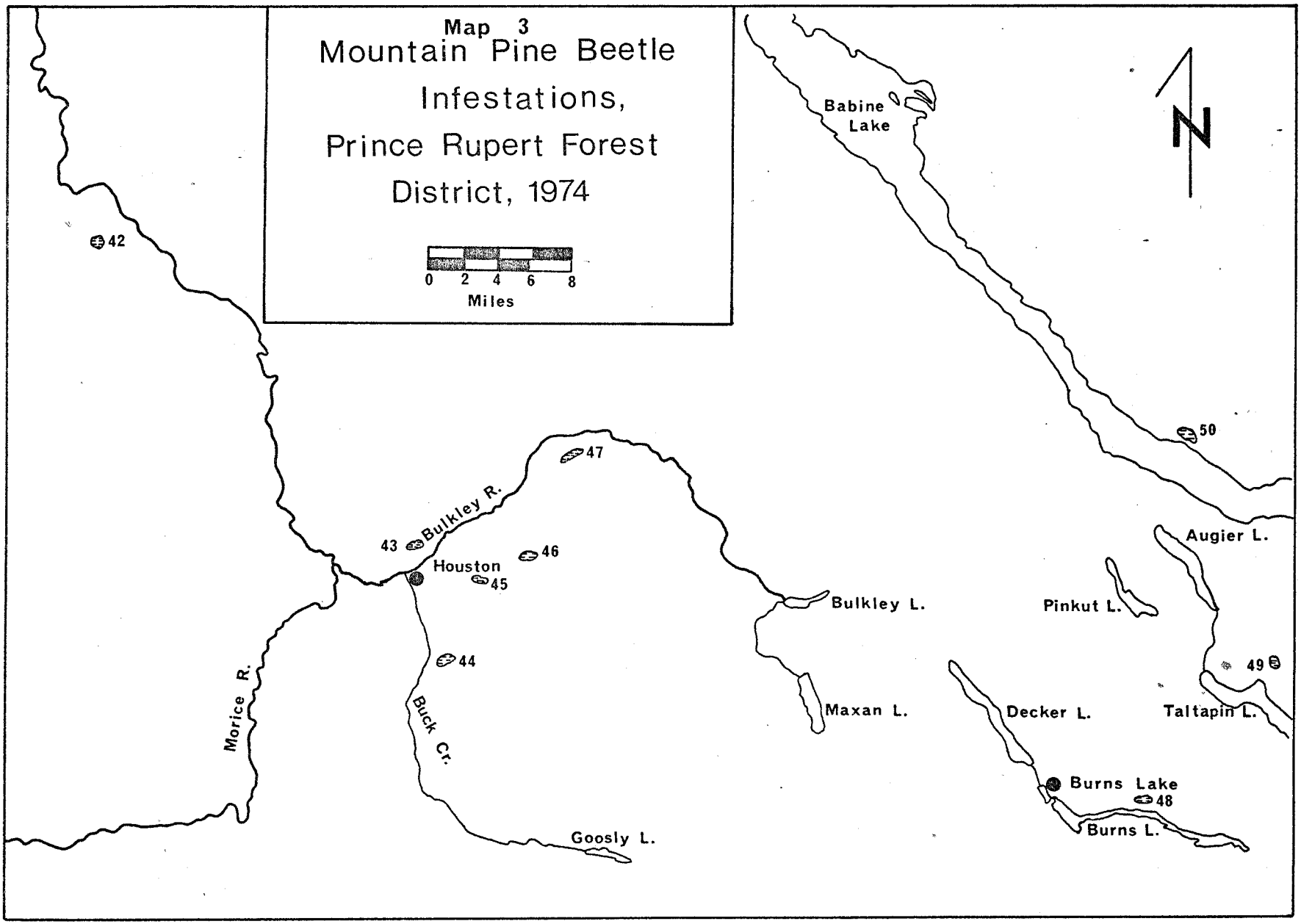
Table 1 - cont'd.

Map no.	Infestation no.	Locality	Estimated acreage involved	No. of red trees
2	21	Sterritt Cr	5 (2.0)	20
2	22	McCully Cr	5 (2.0)	90
2	23	Murder Cr	25 (10.1)	110
2	24	Sammon L	20 (8.1)	170
2	25	First Cabin	15 (6.7)	190
2	26	Kline L	40 (16.2)	500
2	27	Elizabeth L	10 (4.0)	90
2	28	Jct. Suskwa R & Bulkley R	10 (4.0)	20
2	29	Eighteen Mile Cr	4 (1.6)	40
2	30	Natlan Cr	80 (32.3)	1,000
2	31-36	Harold-Price Cr	400 (161.9)	1,980
2	37	Sharpe Cr	10 (4.0)	30
2	40	Sunday L	30 (12.1)	130
Smithers area				
2	39	Dahlie Cr	20 (8.1)	100
3	42	Goathorn Cr	40 (16.2)	800
Houston area				
3	43	Mt. Harry Davis	10 (4.0)	60
3	44	Bob Cr	30 (12.1)	500
3	45	Dungate-Aitken Cr	150 (60.7)	500
3	46	McKilligan Cr	100 (40.)	400
3	47	Gilmore L	40 (16.2)	200
Burns Lake area				
3	48	Tintagel	50 (20.2)	250
3	49	Taltapin L	1 (.4)	10
3	50	Boling Pt.	200 (81.0)	750
		Totals	3,292 acres 1,316 ha)	17,100

In 1973, logging was initiated as a means of partially containing infestations in the Prince Rupert District. Limited success was gained in 1973 and 1974 and there are plans to log newly infested areas in 1975.

Logging of infested stands in the eastern portion of the District could very well contain or limit the beetle outbreaks, however, logging in the Kitwanga area will be limited to T.F.L. and Crown held lands and not include infested Indian lands, thereby sustaining the large populations in an area of susceptible host material.


Map 2
Mountain Pine Beetle
Infestations,
Prince Rupert Forest
District, 1974
0 2 4 6 8
Miles
N
Cranberry R.
Kispiox R.
Skeena R.
Kitwanga R.
Skeena R.
Kitseguecla R.
Suskwa R.
Harold-Price Cr.
Bulkley R.
Hazelton


Map 3
Mountain Pine Beetle
Infestations,
Prince Rupert Forest
District, 1974
0 2 4 6 8
Miles
N
Babine
Lake
42
47
50
43
Bulkley R.
Houston
46
45
Bulkley L.
Augier L.
Pinkut L.
44
49
Morice R.
Buck Cr.
Maxan L.
Decker L.
Taltapin L.
Burns Lake
48
Burns L.
Goosly L.

Western blackheaded budworm, *Acleris gloverana*

There was a general increase in budworm populations throughout the District in 1972 with light to moderate populations in localized stands of western hemlock from Calvert Island north to Douglas Channel, Lyell and Burnaby islands of the Queen Charlotte Islands, and on alpine fir and white spruce in parts of the interior portion of the District. In 1973, populations increased to epidemic levels with defoliation on over 280,000 acres of western hemlock and alpine fir in the District. In 1974, infestations increased to 316,000 acres and expanded into isolated areas on Graham Island, from Kitimat north to Skeena River and along the Portland Canal.

In most drainage divisions (Map 1) within the coastal forest there was an increase in the percentage of collections containing blackheaded budworm larvae and in the number of larvae per collection (Table 2).

Table 2. 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		
		1972	1973	1974	1972	1973	1974	1972	1973	1974
W. hemlock	080	7	5	6	85	100	100	17	133	33
	081	5	9	9	100	100	100	18	138	190
	083	13	13	11	84	92	100	86	154	214
	100	14	20	13	50	50	69	86	100	39
	101	17	22	17	18	27	76	4	4	43
	102	8	26	17	12	65	76	<1	8	100
	103	3	4	3	33	50	100	8	2	132
	104	7	40	25	40	53	64	7	10	19
	105	14	18	14	7	67	57	<1	5	70
	106	13	0	18	15	0	72	1	0	15
White spruce	121	29	16	22	62	75	64	10	145	33
	122	36	26	32	47	69	75	5	65	40
Alpine fir	121	21	15	15	86	80	53	20	106	33
	122	13	25	30	93	72	70	10	72	42

[1/] See Map 1.

A total of 6,000 larvae were sent to various agencies for determination of disease and parasites or to use in sex attractant experiments. Difficulty in rearing budworm larvae was evident by high mortality during the early feeding stages. Moderate parasitism was encountered but no identifications have been received. In one collection sent to the Insect Pathology Research Institute there were traces of *Isaria* fungus.

Traps, baited with the sex attractant Trans-11-tetradecenal (CSC74), were placed in stands at Terrace, in the Copper River Drainage and near the Bell-Irving River to aid in measuring adult male populations. The traps were placed in the stands on July 6 prior to moth flight in August, and collected in October. An average of 4 and 14 moths indicated a lighter population at Terrace and Copper River than was anticipated, however an average of 67 and 68 moths indicated a large moth flight along the Bell-Irving River.

Within T.F.L. 41, populations increased in numbers and extended to higher elevations than in 1973. Moderate to heavy defoliation was encountered along Gardner Canal to Kitlope River and throughout most drainages to 3,000 feet elevation. North of Kitimat, light defoliation continued near Hirsch and Dahl creeks and became apparent at Little Wedeene and Kitimat rivers and Chist and Nalbeelah creeks.

West of T.F.L. 41, along the Mainland coast, populations increased on western hemlock in the northern portion of the 1973 infested area and were sporadic south of Ocean Falls. Increased populations caused light defoliation northward along Grenville Channel to Bachelor Lake, along each side of Skeena River between Terrace and Legate Creek, including drainages emptying into the river between these locations, along the west side of Portland Canal from Maple Bay to Stewart, and on alpine fir along the Bell-Irving River between the first and second crossing bridges.

On the Queen Charlotte Islands, populations persisted on Lyell and Burnaby islands, although in reduced numbers, and expanded in extent and intensity at Tasu Sound, Crescent and Sewell inlets and Deena Creek. Small, new infestations were recorded along the ridge behind Queen Charlotte City, near Port Clements, Kwaikans Island in Masset Inlet and near Eden Lake.

In the interior of the Prince Rupert District, populations persisted at Fort Babine and Nadina Lake, resulting in light to moderate defoliation of the current year's growth of alpine fir and white spruce. At Ganowka Creek, Hudson Bay Mountain and Byman Creek, the populations increased from 1973, and there was moderate to heavy defoliation of the tips of alpine fir and white spruce.

In the fall of 1974, an egg survey was made at 24 locations from Skeena River south to Gamsby River and on the Queen Charlotte Islands. Based on the number of overwintering eggs and amount of defoliation by the budworm in 1974, the defoliation hazard for 1975 has been predicted (Table 3). Predictions for 1975 defoliation are based on the premise that the majority of the eggs will hatch successfully and that inclement weather will not prevent the larvae from feeding.

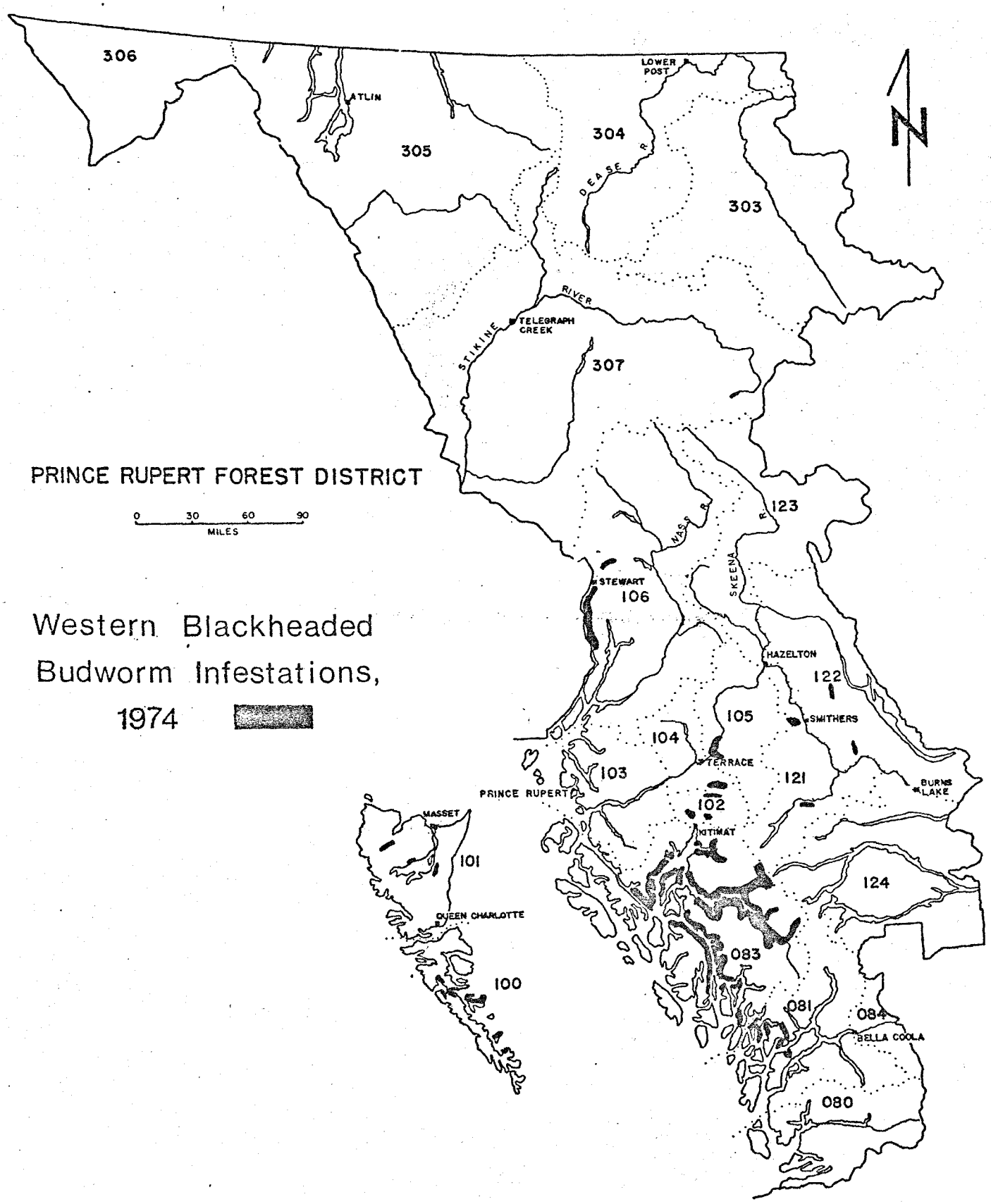

306
ATLIN
305
LOWER POST
304
DEASE R.
303
STIKINE RIVER
TELEGRAPH CREEK
307
PRINCE RUPERT FOREST DISTRICT
0 30 60 90
MILES
Western Blackheaded
Budworm Infestations,
1974
WASE R.
123
SKEENA R.
STEWART
106
HAZELTON
122
105
SMITHERS
104
TERRACE
103
121
PRINCE RUPERT
BURNS LAKE
102
KITIMAT
MASSET
101
124
QUEEN CHARLOTTE
083
100
081
084
BELLA COOLA
080

Table 3. Blackheaded budworm infestations, Prince Rupert Forest District, 1974

Location	Avg no. eggs per 18" branch		% total defoliation		Defoliation hazard for 1975
	1973	1974	1973	1974	
Dahl Cr	42	4	18	30	light
Emsley Cove	7	18	23	10	light
Foch Lagoon	22	2	7	23	light
Kildala Arm	54	2	12	30	light
Kiltuish Inlet	15	2	49	28	light
Kemano R	140	2	43	43	light
Chief Mathews Bay	30	2	67	45	light
Gamsby R	56	0	36	42	light
Kitlope L	9	0	29	25	light
Deena Cr (heavy area)	24	4	59	79	light
*Deena Cr (light area)	-	21	light	52	light
*Takelley Cove	-	1	moderate	32	light
*Sedgwick Bay	-	1	light	40	light
*Burnaby Narrows	-	1	moderate	25	light
*Crescent Inlet	-	10	light	21	light
*Masset Inlet	-	59	nil	20	moderate
*Kwaikans I	-	29	nil	95	moderate
*Kumdis Cr (south)	-	79	nil	40	heavy
*Kumdis Cr (north)	-	102	nil	25	heavy
*Chindemash Cr	-	3	nil	23	light
*Kleanza Cr	-	13	nil	25	light
*Copper R	-	27	nil	30	moderate

*No egg samples in 1973. Defoliation estimates from aerial surveys.

DISCUSSION

The history of blackheaded budworm in the Prince Rupert District has been of periodic infestations lasting from one to four years, starting in the south and extending northward. This has been the trend, beginning in 1972 south of Ocean Falls, extending to Douglas Channel and Moresby Island in 1973, and to Graham Island, Portland Canal and Bell-Irving River in 1974.

Defoliation in 1975 is expected to be confined to stands north of Kitimat on the Mainland coast, Graham Island on the Queen Charlotte Islands, Bell-Irving River, Hudson Bay Mountain, Byman and Ganowka creeks in the interior subalpine forests.

Spruce beetle, *Dendroctonus rufipennis*

Along the Cranberry River, bottom land Sitka spruce was predisposed to beetle attack by flooding. Approximately 200-300 trees were attacked during the past two years and some of the beetles had dispersed outward from the flooded area to smaller diameter trees (8-12" dbh). Examination of these 1973-attacked trees disclosed near total mortality of the progeny.

Black army cutworm, *Actebia fennica*

Heavy defoliation of newly planted conifer seedlings and natural growing ground-cover plants and shrubs was widespread in the Interior portion of the District in 1973. In 1974, light feeding on herbaceous plants was found at Chapman Lake, Luno Creek, Knockholt, Andrew Bay and Burdick Creek in the Interior, and near Onion Lake in the coastal forest. Damage to planted seedlings was negligible.

A willow and birch leaf miner, *Lyonetia saliciella*

Heavy browning of willow, birch and in some areas, poplar sp., was prevalent from Kitwanga Lake to Kitwanga and from Skeena Crossing southwest along the Skeena to Oliver Creek.

Sitka spruce aphid, *Elatobium abietinum*

Moderate to heavy defoliation of shoreline Sitka spruce was evident from Sandspit to Alliford Bay on Moresby Island, along Skidegate Inlet between Charlotte City and Skidegate Mission, Tlell to Port Clements and near Juskatla. Defoliation occurred on single and scattered groups of trees. Range of defoliation was from 50 to 80%.

Table 4. Other insects of current minor significance

Insect	Host	Locality	Remarks
Adelges cooleyi(Gill.) Cooley spruce gall aphid	White spruce	Tintagel L, Ootsa L, Francois L	Moderate infestation in localized areas.
Choristoneura biennis (Free.) Two-year-cycle spruce budworm	Alpine fir	Bell-Irving R	Light population.
Ectropis crepuscularia (Schiff.) Saddle-back looper	Western hemlock	Terrace, Kitimat	Light population.
Epirrita autumnata (Gn.) Green velvet looper	Western hemlock, amabilis fir, alpine fir	Terrace, Kitimat, Nass R, Hazelton	Common in most collections.
Lambdina f. lugubrosa (Hulst) Hemlock looper	Western hemlock	General	Low populations.
Malacosoma pluviale Dyar Western tent caterpillar	Willow, alder	Kitimat	Common near Kitimat.
Neodiprion sp. Hemlock sawfly	Western hemlock	Queen Charlotte Islands, Mainland coast	Up to 300 larvae per collection. In conjunction with blackheaded budworm.
Nyctobia limitaria (Wlk.) Green balsam looper	Western hemlock	General	Decrease in numbers from 1973.
Pineus coloradensis (Gill.) A woolly aphid	Lodgepole pine	Houston	Common around townsite. Some control measures taken on ornamentals.
Trypodendron lineatum Oliver Ambrosia beetle	Western hemlock, Sitka spruce, amabilis fir	Nass R	Moderate population in decked logs.

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 outbreaks, 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

Late spring frosts damaged white spruce stands in the eastern portion of the District. At Hudson Bay Mountain, 30% of new growth was damaged on 70% of the trees; Nadina River, 15-60% of new shoots on 90% of trees; Chapman Lake, 90% of new shoots on 60% of the seedlings; Taltzen Lake, 50% of new shoots on 40% of the seedlings; Perow, 40% of new shoots on 60% of the trees, and McKendrick Creek, 30% of the new shoots on 30% of the trees.

Foliage Diseases

Shoot blight of conifers, *Sirococcus strobilinus*

Since 1972, tip wilting caused by this disease has been common on regeneration and pole-sized western hemlock from the Nass River to Kitimat. In 1974, blighted western hemlock and Sitka spruce, suspected to be infected by this fungus, were collected for the first time on the Queen Charlotte Islands from Sandspit to Juskatla.

Spruce needle cast, *Lirula macrospora*

Pole-sized Sitka spruce were infected in the Prince Rupert District from Cedarvale to Terrace, and in Carlson and Cooper Inlets. On the Queen Charlotte Islands, infection occurred on Sitka spruce from Cumshewa Inlet to Sandspit and along the south coast of Graham Island.

Globose gall rust, *Endocronartium harknessii*

From 30 to 50% of the lodgepole pine trees were infected near Co-op Lake, east of Burns Lake. The dense 10-15-year-old stand had regenerated after a fire.

Leaf and twig blight of poplar, *Venturia macularis*

Browning and moderate to heavy defoliation caused by this disease occurred on mature aspen from Weegett Creek to Kitwanga Lake and in mature island stands of black cottonwood in the Skeena River from Terrace west to Kwinitsa.

Large-spored rust, *Chrysomyxa ledicola*

This boreal forest rust was heavy on 20 acres of bog-site Sitka spruce near Tlell. Ninety percent of the foliage on the regeneration was infected.

Spruce needle rust, *Chrysomyxa weirii*

Spruce needle rust was found in the Interior portion of the District at Kisgegas and Robinson Lake. There was light infection at Fisheries Fence on Babine River and moderate infection along the Stikine River.