ANNUAL REPORT OF FOREST BIOLOGY RANGERS

BRITISH COLUMBIA

1959

PRINCE RUPERT FOREST DISTRICT

FOREST BIOLOGY SURVEY

PRINCE RUPERT FOREST DISTRICT

1959

D. G. Collis

INTRODUCTION

The Prince Rupert Forest District, south from the Nass and Skeena River drainages is divided into three biology ranger districts, the east south and west Rupert districts. The northern portion, being accessible from the Alaska Highway, is surveyed by rangers from the Vernon laboratory as a portion of the North Prince George district. Rangers responsible for the survey of these areas in 1959 were:

Northern area	- T. Woods - Vernon
East Prince Rupert	- D. G. Collis
South Prince Rupert	- R. Murfitt
West Prince Rupert	- N. Alexander

The major insect problem in 1959 occurred on the Queen Charlotte Islands where the black-headed budworm population increased to major infestation proportions. Egg counts indicate similar conditions for 1960. Budworm larvae were also numerous along the mainland coast from Bella Bella north to Stewart.

The 2-year-cycle spruce budworm infestation around Babine Lake continued. The larval population was higher than in 1957, but defoliation was lighter.

Spruce bark beetles caused considerable scattered tree mortality in the East and West Prince Rupert districts.

The aspen leaf miner was again present throughout the range of the host tree.

ANNUAL REPORT OF FOREST BIOLOGY RANGER

for

SOUTH PRINCE RUPERT DISTRICT

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FOREST BIOLOGY SURVEY

SOUTH PRINCE RUPERT DISTRICT

1959

R. H. Murfitt

INTRODUCTION

The survey of this district commenced on July 7th. A total of 75 insect samples and seven tree disease samples were submitted to the Victoria laboratory. Insect collections by hosts are shown in Table 1 and localities where collections were made are shown in Map 1.

Table 1

Collections by Hosts

South Prince Rupert District - 1959

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Fir, amabilis	1	1	Alder, red		1
Cedar, red	8		Birch	1	
Cedar, yellow	2		Cottonwood	1	
Douglas fir	11	3			
Hemlock, mountain	1				
Hemlock, western	42	2			
Pine, lodgepole	2				
Spruce, Sitka	6				
			Total	2	1
Total	73	6	Grand Total	75	7

STATUS OF INSECTS

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hlst.)

A special survey was made to study an anticipated population increase of this insect in the Bella Coola valley and the river valleys of the South Bentinck Arm. Sample points were revisited and a decrease in population was evident. Eleven collections averaged 2.0 larvae each compared with an average of 3.2 larvae for 28 collections in 1958. Distribution of collections containing hemlock looper is shown in Map 2 and Table 2 shows the average number of larvae found by drainage divisions.

Table 2

Summary of Hemlock Looper found by Drainage Divisions,

South Prince Rupert District, 1958 - 1959.

Drainage Division	Total no. of samples taken during larval period		No. of samples containing hemlock looper		Average no. of larvae per sample	
	1958	1959	1958	1959	1958	1959
080	5	7	1	2	1.0	2.0
081	39	11	25	8	5.0	2.0
082	43	18	14	5	1.6	1.6
Total	87	36	40	15	3.7	1.9

Spruce Budworm, Choristoneura fumiferana (Clem.)

Seven larvae were found in six collections throughout the area surveyed. One of the larvae died of parasites.

Black-headed Budworm, Acleris variana (Fern.)

Larvae of this important insect were found consistently in the coastal drainages of this district. A total of 225 larvae were collected in 27 samples (Map 2). The five above average samples were confined to the northerly part of the district Table 3. Only three larvae were collected in drainage division 082.

Table 3

Location of Above Average Collections of Black-headed Budworm

Larvae in the South Prince Rupert District 1959.

Drainage Division	Location	No. of larvae
083	Klemtu, Swindle Island	23
083	Princess Royal Island, Cougar Bay	35
083	Butedale, Klekane Inlet	46
083	Butedale, Klekane Inlet, Scow Bay	35
083	Gardener Canal, Bishop Bay	16

The Green Striped Forest Looper, Melanolophia imitata Wlk.

This insect, unlike the hemlock looper in the Bella Coola area, increased slightly in numbers this year. There was a local infestation in drainage division 080 where the five collections averaged 14 larvae per sample (Map 3). Table 4 shows the average number of larvae found by drainage division.

Table 4

Summary of Green Striped Forest Looper found by Drainage Division

South Prince Rupert District 1958 - 1959

Drainage Division	Total no. of samples taken during larval period		No. of samples containing green striped forest looper		Average no. of larvae per sample	
	1958	1959	1958	1959	1958	1959
080	4	7	2	5	14.0	14.0
081	40	26	9	9	2.9	3.0
082	41	18	8	4	2.4	4.0
083 *	-	19	-	8	-	3.0

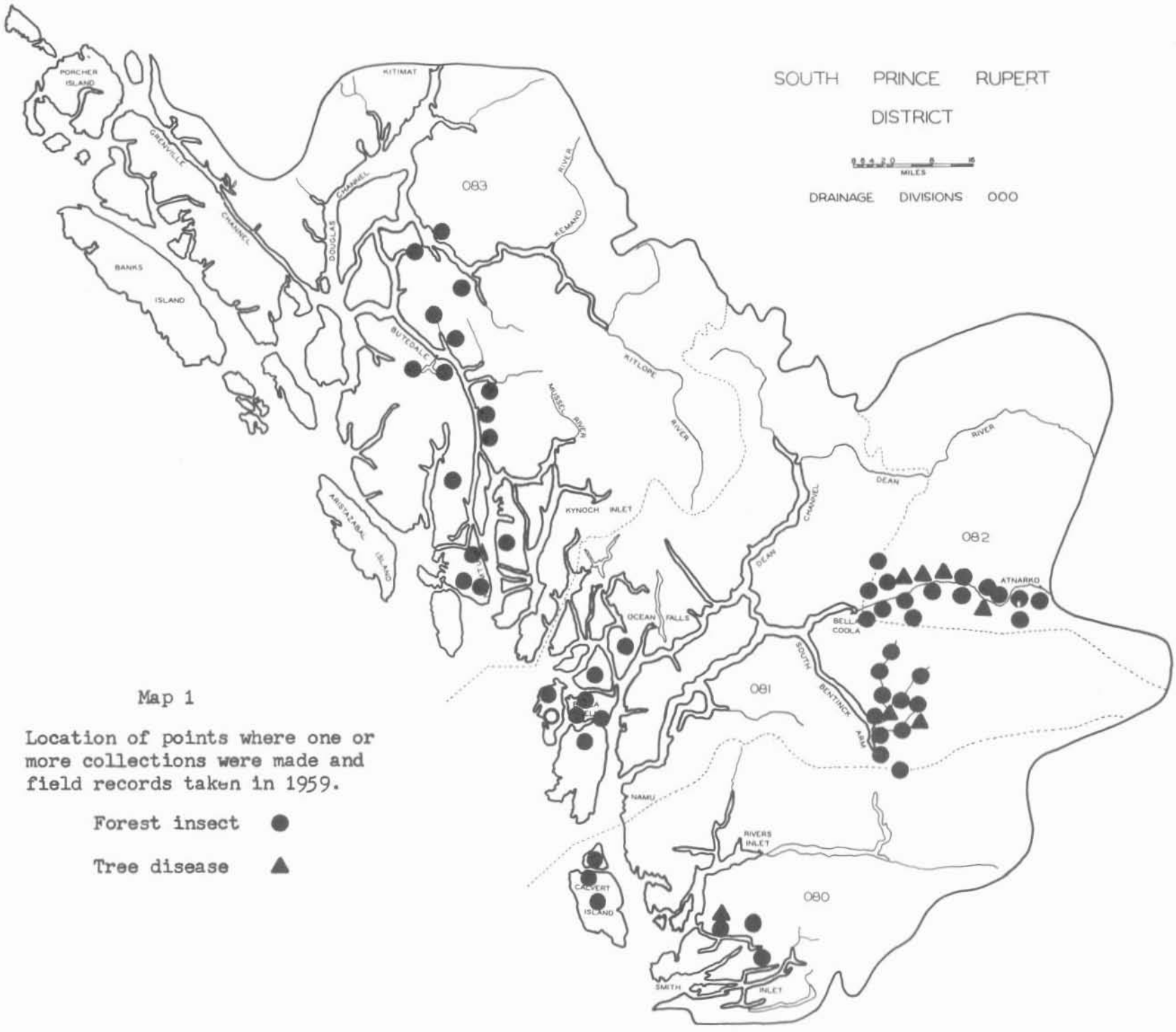
* Drainage division 083 was not sampled in 1958.

Saddle-backed Looper, Ectropis crepuscularia, Schiff.

Very few larvae were found in the district except for a localized population in an inlet in drainage division 080. Here samples averaged 22.8 larvae each. The largest collection contained 34 larvae.

Sawflies, Neodiprion spp.

Sawfly larvae were found in 30 collections. The majority were well under 20 larvae per sample. Significant collections of 78 and 84 larvae occurred at Klekane Inlet and Draney Inlet.

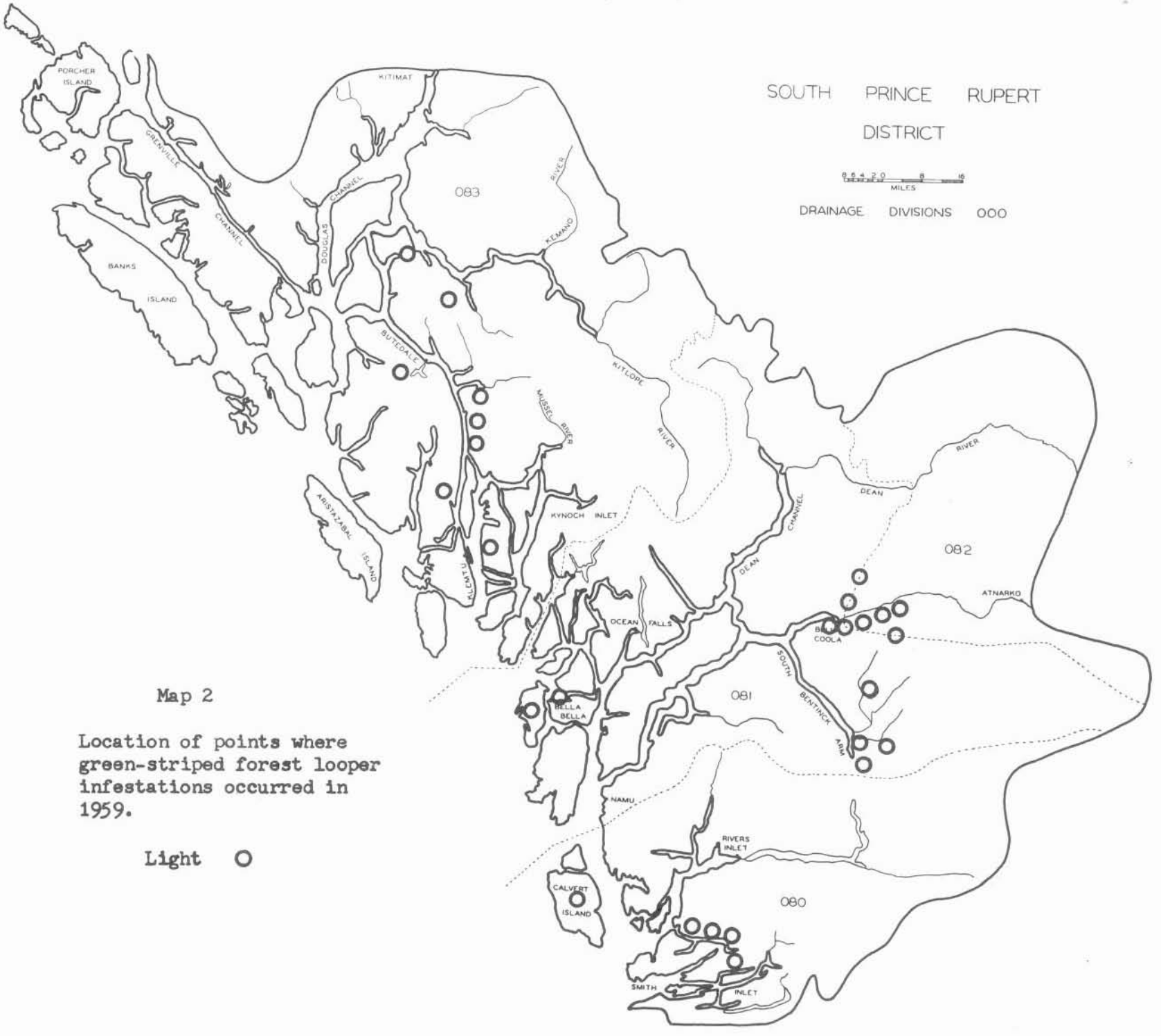


Map 1

Location of points where one or more collections were made and field records taken in 1959.

Forest insect ●

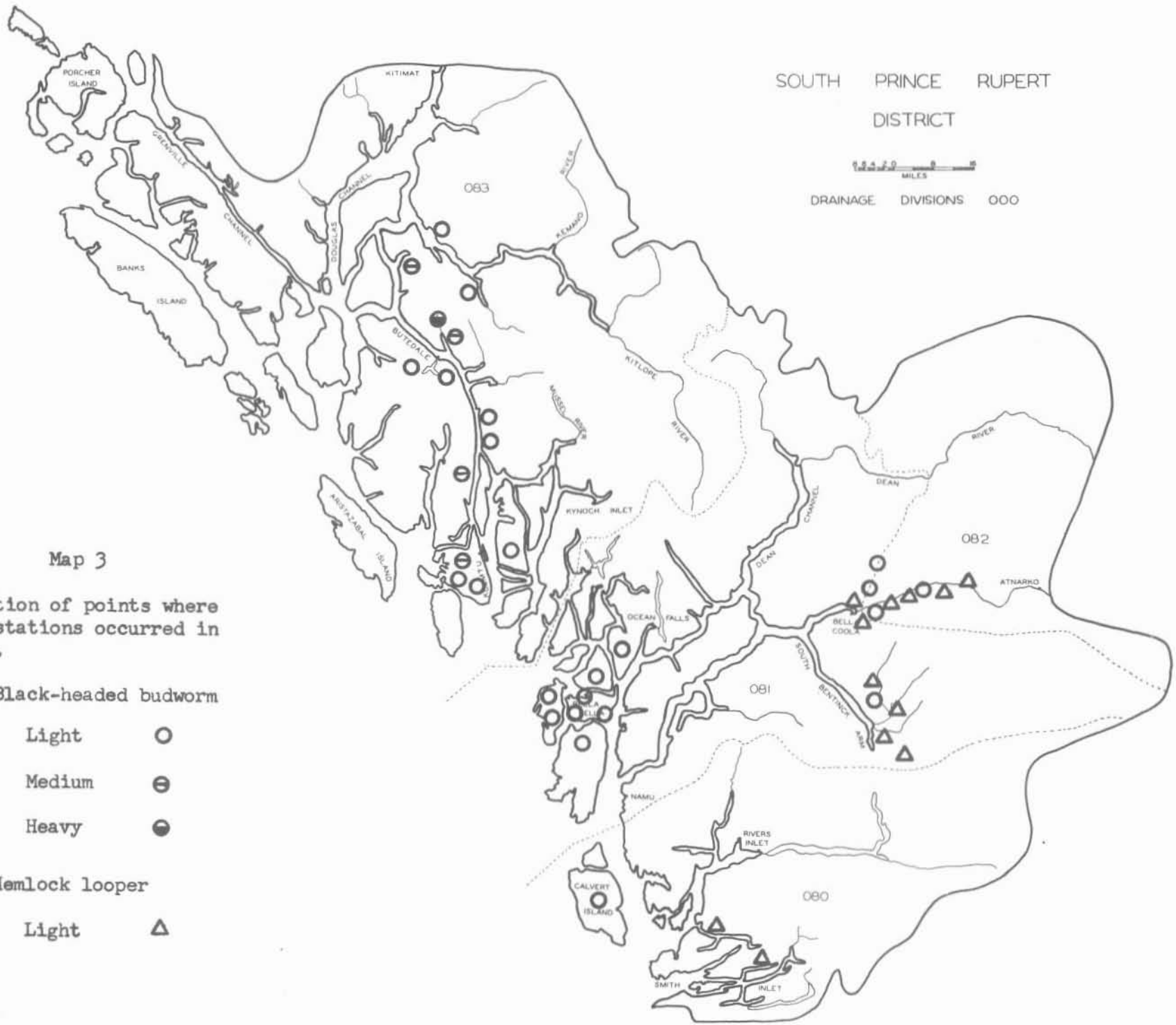
Tree disease ▲



Map 2

Location of points where green-striped forest looper infestations occurred in 1959.

Light O



Map 3

Location of points where infestations occurred in 1959.

Black-headed budworm

Light ○

Medium ⊖

Heavy ●

Hemlock looper

Light △

ANNUAL REPORT OF FOREST BIOLOGY RANGER

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WEST PRINCE RUPERT DISTRICT

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FOREST BIOLOGY SURVEY

WEST PRINCE RUPERT DISTRICT

1959

N. E. Alexander

INTRODUCTION

In 1959 a total of 370 insect samples and 52 forest disease samples were collected. Collections, listed by hosts, are shown in Table 1. Points at which collections were made and records taken are shown in Maps 1 and 2.

There were no unusal disease conditions encountered in 1959.

As in previous years, the British Columbia Forest Service personnel within the district lent every assistance and the writer would like to express sincere thanks for their help and observations.

Table 1

Collections by Hosts

West Prince Rupert District - 1959

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Cedar, red	10		Alder, red	20	8
Fir, alpine	15		Alder, Sitka	2	
Fir, amabilis	9	4	Aspen, trembling	9	4
Fir, balsam	1		Birch	4	
Hemlock, mountain	4		Cottonwood, black	11	2
Hemlock, western	205	13	Dogwood, red osier	1	
Pine, lodgepole	7	5	Maple, Douglas	1	
Spruce Engelmann	3		Willow	17	3
Spruce, Sitka	43	9	No host	3	
Spruce, white	1	1	Miscellaneous	4	3
			Total	72	20
Total	298	32	Grand total	370	52

STATUS OF INSECTS

Black-headed Budworm, Acleris variana (Fern.)

The black-headed budworm increased to heavy infestation levels in the West Prince Rupert District in 1959. As there was considerable variation between the mainland area and the Queen Charlotte Islands, they will be discussed separately.

Queen Charlotte Islands

General Survey:

The survey of the Queen Charlotte Islands was conducted during the month of July. Thirty-one collections containing black-headed budworm averaged 298.9 larvae per three-tree beating sample. They ranged from one to more than 1,500 larvae per collection. The larvae were in very early instars at the beginning of the month but had matured by the end of July. Pupation commenced early in August and was complete by August 26th.

Sampling commenced on Graham Island and progressed south. With a few exceptions larval counts were light to medium on Graham Island and were very heavy from Skidegate Inlet south (Map 4). Egg sampling in October substantiated this general trend. The larval population was uniformly high throughout the south islands (D. D. 100).

Population trends since 1952 are shown in Table 2. In all years the figures shown are for the entire district with the averages for the Charlottes shown separately for 1959.

Defoliation was not as heavy as the larval figures would indicate. A flight made from Sandspit to Jedway on July 16, in company with Mr. D. McLeod of Rayonier Canada Inc., was too early to spot defoliation but subsequent ground surveys over the same area failed to reveal as much heavy defoliation as was expected from such a high population.

Parasitism was very low. Of the 824 larvae reared from Graham Island only 0.4 per cent died of parasitism. On Moresby Island, of 2,626 larvae reared, 5.0 per cent were parasitized. The four highest areas of parasite mortality were Lagoon Inlet - 13.2 per cent, Talunkwan Island - 12 per cent, Burnaby Island - 24.2 per cent, and Trotter Bay - 12 per cent. Parasitism was considered too low to have any significant effect on the population.

Table 2

Black-headed Budworm Population Trend in the West Prince Rupert District. 1952 to 1959.

Year		Number of collections containing black-headed budworm	Average number of larvae, pupae, and adults per collection
1952		111	17.5
1953		217	38.0
1954		169	34.9
1955		54	36.0
1956		2	1.5
1957		19	3.1
1958		22	6.8
1959	Entire district	61	106.5
	Q. C. Is. only	31	298.9

Aerial Damage Appraisal

On August 27 and 28 a damage appraisal flight was made over the Charlottes. A Beaver aircraft was supplied by the British Columbia Forest Service. Two Forest Biology Rangers, accompanied by the Forest Service Ranger and Deputy Ranger, made the flight which extended from Naden Harbour south to Jedway. Visibility was excellent but gale force winds necessitated flying at an altitude too high for really good appraisal.

The only discoloration observed was on Lyell, Kungo, and Talunkwan islands, at Rockfish Harbour on Louise Island, and at Porter Head (base of the peninsula). Ground checks indicated that defoliation was much heavier than observed from the air.

Egg Survey

An egg survey was conducted in the islands from October 4th to October 13th. The British Columbia Loggers' Association was represented by Mr. H. A. Richmond, two Forest Biology Rangers were assigned to the job, and Mr. R. L. Fiddick, Ranger Supervisor, was in charge of the field party.

The major objectives of the survey were: (1) to assess the amount of defoliation and damage to date, (2) to obtain egg counts which would enable the expected defoliation in 1960 to be predicted, and (3) to obtain a satisfactory basis for calculating the population trend and predicting probable further damage if another survey is required in 1960.

Five branches from each of three trees were examined at each sample location. The average number of eggs per 10-inch branch was determined for each 15-branch sample. The egg counts were classified as shown in Table 3. Defoliation was also recorded.

Table 3

Classification for Black-headed Budworm Egg Counts

Average number of eggs per 10-inch sample	Expected defoliation 1960
0	nil to trace
1 - 7	light
8 - 15	medium
16 +	heavy

For the purposes of this report, classes "nil to trace" and "light" were grouped as light in Map 5.

Defoliation caused by the 1959 feeding was also classified as follows:

Light - total defoliation nil to very light or loss of current year's foliage up to 25 per cent.

Medium - defoliation of current year's foliage from 25 per cent to 90 per cent or total defoliation up to 40 per cent.

Heavy - defoliation of current year's foliage 90 per cent or over, or total defoliation exceeding 40 per cent, or top third of tree crowns heavily defoliated or stripped.

Analysis of the present outbreak on the Queen Charlotte Islands must also take into consideration damage inflicted upon the stands during the previous outbreak which subsided in 1955. Close examination of the foliage taken in the egg sampling this year indicates that in some areas previous defoliation was quite severe. Trees suffering from this damage for up to four years are in poor condition to survive further insect feeding. In making a hazard rating for 1960 this old damage was classified as follows:

Light - Previous year's (1958) foliage heavily defoliated or total defoliation up to 25 per cent.

Medium - Total defoliation previous to current year from 25 per cent to 40 per cent or tips damaged and bud kill common.

Heavy - Total defoliation, not counting present year's feeding, over 50 per cent, or bud kill common. Some trees with no new foliage as a result of bud kill.

This old damage was taken into consideration when classifying stand condition and, in conjunction with actual egg count figures taken last fall, gave a hazard rating for 1960.

A total of 82 localities were sampled, 33 on Graham Island and 49 on Moresby and adjoining islands. Approximate locations are shown in Map 5. Since the above dates, an additional 14 egg samples were collected in the Cumshewa Inlet - Skidegate Inlet area by company foresters and forwarded to Victoria.

On the northern portion of Graham Island medium numbers of eggs were found only at Tow Hill and Awun Lake; all other points were light or very light. The heaviest egg counts were between Skidegate Inlet and Cumshewa Inlet. This was also the area of heaviest budworm damage in the previous outbreak. The area from South Bay to Alliford Bay had the heaviest egg counts on the south island. Heavy counts were also found at Takelly Cove on Lyell Island, one of the few areas where damage was observed from the air in August. Light to medium egg counts ranged from Cumshewa Inlet along the eastern side of Moresby Island to Jedway.

A summary of egg counts by classes is shown below:

	Very light	Light	Medium	Heavy
Graham Island	14	15	4	0
Moresby Island	3	32	8	6
Total	17	47	12	6

Condition of stands

Defoliation on Graham Island was, for the most part, light. Heavy damage was recorded at only two localities. Trees at Griffith Pt. on Masset Sound had very little new foliage as a result of heavy bud kill during the previous outbreak. Stands on the north-east end of Yakoun Lake were in similar condition. Four areas of medium defoliation along Skidegate Channel and on Maude Island were the result of 1959 feeding.

The heaviest damage was on Moresby Island with medium to heavy damage common from Skidegate Inlet south to Jedway. Areas still not recovered from the previous outbreak are Copper River, the vicinity of Aero Camp, Lagoon Inlet, Newcombe Inlet, and Barrier Bay in Tasu Sound.

Hazard rating in all points sampled in the area between Skidegate Inlet and Cumshewa Inlet were classified as medium or heavy. Heavy damage was recorded on Moresby Island from Peel Inlet south to Crescent Inlet and in Botany Inlet on the west coast. Medium defoliation was prevalent on Talunkwan Island and the western portion of Lyell Island, at Section Cove, Burnaby Island, and at Jedway.

Ocular defoliation estimates made on standing trees were compared with estimates made after the trees were cut and examined closely. Of 32 samples compared, the estimates were similar in 19, over-estimated in two, and under-estimated in 11 cases. As the defoliation estimates are, if anything, on the conservative side, there is little danger of the damage being over-estimated and raising the hazard ratings unduly (Table 4).

The number of eggs was 154 per cent greater in 1959 compared to the previous year. Eight locations are compared in Table 5.

Table 4

Status of Black-headed Budworm Infestation on the Queen Charlotte Islands, 1959.

Sample pt. number	Location of sample	Egg Counts		Damage rating			Hazard rating for 1960
		Av. Number	Class	Current defoliation	Old damage	Combined rating	
1.	Tow Hill	7.87	M	M	-	M	H
2.	Tow Hill-Masset Road Block 838A	1.33	L	T	O	L	L
3.	Bl.749 South of Massett	7.00	L-M	L	O	L	L
4.	Griffith Pt. south of Massett	2.07	L	L	H	H	M
5.	Bl. 2039 West side of Massett Sound	0.53	VL	O	O	O	L
6.	Collison Pt. Massett Sd.	2.33	L	L	O	L	L
7.	Sewell-opp. Ship Island	0.07	VL	O	O	L	L
8.	Kumdis No. 2 Creek Port Clements	0.93	VL	L	O	L	L

Table 4 - continued

Sample pt. number	Location	Egg Counts		Damage rating			Hazard rating for 1960
		Av. Number	Class	Current defoliation	Old damage	Combined rating	
9.	Craft Bay, Naden Hbr.	0.47	VL	L	0	L	L
10.	Naden River mouth Naden Hbr.	0.80	VL	0	0	0	L
11.	N.E. corner Eden Lake	0.20	VL	L	0	L	L
12.	South end Eden Lake	0.67	VL	0	0	0	L
13.	Ian Lake at Skundale Lk.	0.13	VL	0	0	0	L
14.	North shore W end Ian Lk.	9.27	VL	L	0	L	L
15.	Parker Pt. Massett Inlet	0.40	VL	L	0	L	L
16.	T.L. 8255-Shannon Bay	2.47	L	L	0	L	L
17.	Juskatla Inlet-T.L. 10749	2.33	L	L	0	L	L
18.	Juskatla Inlet-Bl.1504	0.53	VL	L	0	L	L
19.	Juskatla Inlet-Cowhoe Bay	0.73	VL	L	0	L	L
20.	Awun Lake-T.L. 412	7.53	M	M	0	M	M
21.	Juskatla Inlet T.L. 7549	2.10	L	L	0	L	L
22.	Mamin R.-T.L. 12348	0.13	VL	0	0	0	L
23.	E. of Yakoun R. bridge	4.67	L	L	0	L	L
24.	Juskatla-Br. 41Ax41B	1.20	L	L	0	L	L
25.	Juskatla-Marie Lake	0.47	VL	L	0	L	L
26.	Juskatla-Br. 40-far end	3.93	L	L	0	L	L
27.	Yakoun Lk.-N.E. end	0.66	VL	L	H	H	L
28.	Yakoun Lk. South end	1.40	L	L	0	L	L
29.	Kagan Bay - Skidegate Inlet	1.93	L	L	0	L	L

Sample pt. number	Location of sample	Egg Counts Av. Number	Class	Damage rating Current defoliation	Old damage	Combined rating	Hazard rating for 1960
30.	Leonide Pt. Skidegate In.	7.53	M	M	O	M	M
31.	Maude I. mortality plot	8.07	M	M	O	M	M
32.	W. side Trounce Inlet	4.67	L	M	O	M	M
33.	Skidegate Inlet opp. Buck Channel	3.47	L	M	O	M	M
34.	Alliford Bay Rd.-3 mi. W of Sandspit	1.40	L	M	O	M	L
35.	Alliford Bay-5 mi. W of Sandspit	12.60	M	M	O	M	M
36.	Alliford Bay end of rd.	17.83	H	M	O	M	H
37.	Directly behind Alliford Bay	6.27	L	M	O	M	M
38.	South Bay P. L 140	76.67	VH	M	O	M	H
39.	South Bay	20.27	H	H	O	H	H
40.	South Bay Deena River	15.93	H	M	O	M	H
41.	P.L.149-between South Bay and Skidegate Lk	2.40	L	M	O	M	L
42.	P.L.53-N.E. Skidegate Lk.	7.13	L	H	O	H	M
43.	Copper River-P.L. 170	8.93	M	L	H	H	H
44.	P.L.-890-891-E of Skidegate Lake	1.67	L	L	M	M	L
45.	Heather Lake	4.53	L	M	O	M	L
46.	T.L. 1218-Aero-Moresby Rd.	31.67	H	M	O	M	H
47.	Mosquito Lk. Bl. 1326	5.27	L	M	O	M	L
48.	Aero Camp Rd. T.L. 1718	1.73	L	L	H	H	M
49.	Peel Inlet Road	0.60	L	H	O	H	L
50.	Lagoon Inlet	3.40	L	M	M	H	M
51.	Renner Pt. Louise I.	3.53	L	L	O	L	L

Table 4 continued

Sample pt. number	Location of samples	Egg counts		Damage rating			Hazard rating for 1960
		Av. Number	Class	Current defoliation	Old damage	Combined rating	
52.	Traynor Pt. Louise I.	13.07	M	L	O	L	M
53.	Mathers Lk " "	1.40	L	O	O	O	L
54.	Vertical Pt. " "	2.00	L	O	O	O	L
55.	Rockfish Hbr. " "	2.00	L	L	O	L	L
56.	Tasu Cr. Newcombe Inlet	1.67	L	L	H	H	M
57.	Trotter Bay	1.40	L	H	O	H	M
58.	Thurston Hbr. Bl.2444 Talunkwan I.	1.27	L	M	O	M	L
59.	Thurston Hbr. south side of peninsula	2.53	L	M	O	M	L
60.	Selwyn Inlet-Talunkwan I.	11.80	M	M	O	M	M
61.	South side Talunkwan I. opp. T. L. 1209	5.33	L	M	O	M	M
62.	Barrier Bay-Tasu Sd.	2.80	L	L	H	H	M
63.	Dana Inlet	2.80	L	H	O	H	M
64.	Triumph Point	6.93	L	H	O	H	M
65.	Crescent Pt. south side	3.93	L	M	O	M	M
66.	Botany Bay	0.47	L	H	O	H	M
67.	Crescent Inlet-head	1.33	L	M	O	M	M
68.	N. side Tanu Island	5.53	L	M	O	M	M
69.	SW corner Kunga I.	1.67	L	L	O	L	L
70.	Lyell I. opp. Richardson I.	15.07	M+	M	O	M	H
71.	Lyell I.-Takelley Cove	1.20	L	M	O	M	L
72.	Lyell I.-Beljay Bay	7.60	M	M	O	M	M
73.	Lyell I.-T.L. 1292	0.33	VL	L	O	L	L
74.	Lyell I.-Powrivco Bay	1.33	L	M	O	M	L

Table 4 - continued

Sample pt. number	Location of sample	Egg Counts Av. Number	Class	Damage rating Current defoliation	Old damage	Combined rating	Hazard rating for 1960
75.	Bay on E. shore Lyell I.	7.47	M	L	0	L	M
76.	S.E. corner Lyell I.	4.33	L	0	0	0	L
77.	Lyell I.-Beresford Inlet	7.73	M	M	0	M	M
78.	Ramsay Island	6.00	L	L	0	L	L
79.	Burnaby Island - south of Alder Island	2.07	L	L	0	L	L
80.	Burnaby I.-Section Cove	4.00	L	M	0	L	L
81.	" Poole Inlet	3.07	L	L	0	L	L
82.	Harriet Hbr. Jedway	12.87	M	M	0	M	M
83.	P.L. 159, Moresby Island	0.06	VL	-	-	-	-
84.	P.L. 172, Moresby Island	7.06	L	-	-	-	-
85.	P.L. 173, Moresby Island	7.20	L	-	-	-	-
86.	P.L.'s 153 and 154, Moresby Island	1.33	L	-	-	-	-
87.	P.L. 172, Moresby Island	14.00	M	-	-	-	-
88.	P.L. 187-188, Copper Bay	5.50	L	-	-	-	-
89.	P.L. 120-123, Skidegate Narrows	0.04	VL	-	-	-	-
90.	P.L. 64, Alliford Bay	32.70	VH	-	-	-	-
91.	P.L. 121, Skidegate Narrows	2.06	L	-	-	-	-
92.	P.L. 120, Moresby Island	4.63	L	-	-	-	-
93.	T.L. 2587, Moresby Island	5.33	L	-	-	-	-
94.	P.L. 121, Skidegate Narrows	9.40	M	-	-	-	-
95.	T.L. 2587, Moresby Island	0.66	V.L.	-	-	-	-

Table 5

Comparative Egg Counts with Associated Larval Collections and Resulting Defoliation at Eight Localities. Queen Charlotte Islands.

Sample No.	Av. no. eggs 1958 10-inch branch	No. larvae 1959 3-tree beating sample	1959 defoliation	Av. no. eggs 1959 10-inch branch
46	1.0	-	medium	31.7
50	1.3	142	medium	3.4
31	2.8	400	light	8.1
38	4.8	-	medium	76.7
45	7.4	600	trace	4.5
49	12.9	210	heavy	0.6
63	16.3) *	369	heavy	2.8
	)			
	10.6)			
Average	7.2			18.3

* two samples from same area

High hazard areas for 1960

From the previous information it has been concluded that some areas are in danger of serious damage by the budworm.

Chemical control has been recommended to reduce this hazard in the following areas: South Bay - Alliford Bay, Copper Creek, and Gillatt Arm (Moresby Camp). The total area involved is shown below:

South Bay - Alliford Bay	19,890 acres
Copper Creek	6,100 "
Gillatt Arm	4,860 "
	30,850 "

It is proposed to spray these areas with D. D. T. in reduced dosage from that used to control a budworm outbreak on Vancouver Island in 1957. Spray will be applied from Avenger aircraft at the rate of 1/4 lb. D. D. T. to the acre.

In addition to the above areas, one or two 50 acre plots will be sprayed with a bacterial insecticide, Bacillus thuringiensis Berliner. This insecticide has very little toxicity to fish or humans and is currently being carefully studied as a replacement for D. D. T. in projects of this type.

The foregoing research work and assessment of results will be supervised by Mr. J. M. Kinghorn of the Division of Forest Biology. It is expected that the necessary ground work before and after the actual spraying will involve from one to three months' work.

Mainland area

The black-headed budworm population on the immediate coast of the mainland increased considerably in 1959. As it was not possible to cover this area during the optimum sampling period, the larval collections were not large when compared to the islands. Thirty collections averaged 7.5 budworm with a maximum of 62 larvae and pupae in one collection.

Defoliation, although light, indicated there had been a considerable larval population and as the numbers of pupae found were almost equal in numbers to pupal collections made in the fall of 1958 on the Queen Charlotte Islands, an increase in the black-headed budworm population can be expected in 1960.

Summary

In 1959 the black-headed budworm population in the West Prince Rupert District increased to infestation levels. In the Queen Charlotte Islands the population has reached a level where serious damage can occur in some areas in 1960. Egg counts on the islands indicate that the high population will continue into 1960 and chemical control has been recommended for areas of high hazard rating.

The mainland area had a high budworm population in 1959 which is expected to increase again in 1960.

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hlst.)

The hemlock looper remained at a low level in 1959 (Table 6). Collections containing this insect were more widespread and for the first time the survey recorded two occurrences of the hemlock looper on the Queen Charlotte Islands (Table 7). One collection at Crescent Point, Logan Inlet, contained two larvae and another collection on the Peel Inlet road contained one larvae. Both collections were made from hemlock in mid July.

Table 6

Population Fluctuation of the Hemlock Looper in the West Prince Rupert District, 1954 to 1959.

Year	Number of collections containing larvae	Average number of larvae per collection
1954	84	7.9
1955	65	4.9
1956	6	1.0
1957	2	1.0
1958	7	1.7
1959	9	1.2

Table 7

Location of Points where Hemlock Looper were found, West Prince Rupert District, 1959.

Location	Drainage division	Host	Number of larvae found
Skeena River (opposite Exstew River)	103	H	2
Dragon Lake	106	Ba	1
Dragon Lake	106	H	1
Khutzeymateen Inlet	106	D	1
Dragon Lake	106	Ba	1
Kwinhak Creek	106	H	1
Terrace	104	B	1
Crescent Point, Logan Inlet*	100	H	2
Peel Inlet Road*	100	H	1

* Queen Charlotte Islands (Moresby Island)

Striped Alder Sawfly, Hemichroa crocea (Fourc.)

The alder sawfly was present in large numbers over all the southern islands in the Queen Charlotte Group this season. While no figures on population or feeding are available, flights made over this area in the course of the budworm egg survey revealed that this insect was defoliating large areas of alder in the logged over area. Estimates place defoliation at approximately 90 per cent in many localities.

This sawfly continued to infest large areas on the lower Nass River in Drainage Division 106.

The alder sawfly is not considered to be of major concern at this time as it appears to be very host specific and the host tree, Alnus rubra Bong. recovers from attack by the insect with little apparent harm.

Hemlock Sawfly, Neodiprion spp.

The hemlock sawfly population appeared to remain static during 1959 (Table 8). Collections were widely scattered throughout the district. No defoliation was observed in any localities where collections were made.

Table 8

Hemlock Sawfly in the West Prince Rupert District, 1954 to 1959.

Year	Number of collections	Average number of larvae per collection	Range of larvae per collection
1954	60	1.1	1 - 24
1955	64	6.8	1 - 200
1956	60	10.6	1 - 66
1957	74	11.7	1 - 176
1958	20 *	13.6	1 - 111
1959	51	11.5	1 - 118

* Queen Charlotte Islands not surveyed during larval season in 1958.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Forest tent caterpillars heavily infested the trembling aspen stands from Kitwanga east in the district this year. The areas of heaviest

feeding were on the Kitwanga Lake road and on the Kitwanga - Kispiox road. Patches there were 100 per cent defoliated. The trees leafed out again in most cases. Later in the season the trees were covered with empty pupal cases and eggs were found on all twigs examined.

It is expected that this population will show a marked increase in 1960.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

The western tent caterpillar continued to infest red alder, aspen, birch, cottonwood, willow, and various shrubs at Terrace during 1959. Defoliation was lighter than in 1958, but the number of webs increased considerably in occasional areas (Table 9).

In spite of the exceptionally high colony count on the Lakelse Lake road, it is possible that the infestation level is subsiding. There was a reduction in the number of pupae compared with 1958.

Table 9

Number of Western Tent Caterpillar Tents per Mile on one Side of Road

West Prince Rupert District, 1958 - 1959.

Area	Hosts in all areas	Number of webs	
		1958	1959
West Kalum Road	Red alder, birch	65	6
Remo Road	Cottonwood, willow	527	500
Lakelse Lake Road	and shrubs.	1,209	2,300

Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm larvae were found in occasional collections in 1959. Eleven collections contained 20 larvae, an average of 1.8 per sample. Distribution and hosts are shown in Table 10.

In 1958 only two insects in two collections were found. An interesting point in 1959 was that the budworm found in D. D. 105 were "out of phase" with the two year cycle spruce budworm which is at infestation levels in the adjoining East Prince Rupert district. These larvae were in their last instars while those in the infestation areas around Babine were in their fourth instar.

Table 10

Location	Drainage		Host	Number of larvae
Woodcock	105		Ba	1
Wilson Creek	105		Ba	2
Cedarvale	105		Ba	2
Kitwanga Lake Road	105		H	2
Kitimat	102		H	2
Kitimat Highway	102		S	2
Hadenschild Creek	104		H	1
Dragon Lake	106	Ba-2	H-1	5
McClinton Bay Lagoon	101		S	3

Green-striped Forest Looper, Melanolophia imitata Wlk.

The green-striped forest looper occurred much more frequently in 1959 than in the years previous (Table 11).

Collections were made in drainage divisions 100, 101, 103, 104, 105, and 106. The largest single collection was in Skidegate Inlet and the same collection contained more than 1,500 Acleris variana (Fern.), 70 Zeiraphera diniana Gn., three Nyctobia limitaria Wlk., 14 Neodiprion spp. and six Ectropus crepuscularia Sch. The host in this case was hemlock. Collections were also recorded from Sitka spruce, white spruce, red cedar, and amabilis fir.

Table 11

Population Variation of Melanolophia imitata Wlk. in the West Prince Rupert District, 1956 - 1959.

Year	Number of collections containing green-striped forest loopers	Average no. of larvae per collection
1956	7	1.1
1957	3	1.0
1958	7	2.0
1959	33	2.8

Yellow-lined Forest Looper, Nyctobia limitaria Wlk.

The yellow-lined forest looper increased in numbers in 1959. Twenty-two collections, on hemlock, alpine fir, and Sitka spruce, averaged 3.0 larvae per three-tree beating sample. In 1958 the average was 1.8 larvae and in the years 1957 to 1954 the averages were 1.6, 1.5, 1.6, and 2.5 respectively.

Spruce Sawflies, Pikonema spp.

The spruce sawflies, Pikonema alaskensis Roh., and Pikonema dimmockii Dresson, increased in occurrence and numbers during 1959. Thirty-four collections averaged 5.0 larvae each compared to approximately two per collection in 1958, one in 1957, and four single larvae in 1956.

Antique Tussock Moth, Orgyia antiqua badia (Hy. Ed.)

In 1959 the antique tussock moth occurred in eight collections which averaged 3.9 larvae each. In 1958 ten collections averaged 1.2 and in 1957 five collections averaged 1.0 larvae each. This insect was not recorded in 1956.

Green Spruce Looper, Semiothisa granitata (Guen.)

The green spruce looper continued to increase in numbers in 1959. Twenty-seven collections averaged 11.1 larvae each. A total of 300 larvae were collected in beating samples, the maximum number of 40 coming from hemlock. Samples were also made on black cottonwood, Sitka spruce, amabilis fir, alpine fir, and red cedar.

In 1958 twenty-seven samples averaged 3.3 larvae, and in 1957 three collections contained four larvae.

Grey Forest Looper, Caripeta divisata Wlk.

In common with most of the other forest insects, the grey forest looper increased in numbers this year. In 1958, 30 collections averaged 5.6 larvae each; in 1959, 24 collections averaged 12.2 larvae per collection. Collections contained from one to 50 larvae per three-tree beating sample and were widespread throughout the district.

Aspen Leaf-miner, Phyllocnistis populiella Chamb.

The aspen leaf-miner infestation was more sporadic this year than in 1958. In very few areas did trees appear to be uniformly infested. In the vicinity of Terrace there were places where casual observations indicated the infestation had collapsed. Counts were made in five areas this year and the percentage of leaves infested is shown in Table 12.

Table 12

Percentage of Leaves Mined by the Aspen Leaf-miner, West Prince Rupert District, 1958 - 1959.

Location	Drainage	Percentage of leaves infested 1958	1959
Kitwanga	105	88	86
Skeena Crossing	105	87	80
Lakelse Road	104	64	40
Kitwanga Lake	105	94	40
Flint Creek	105	84	98

Aphid spp.

Aphids of many species were abundant in the district during 1960. Particularly large numbers of aphids were observed on the cones and new foliage of alpine fir. In many areas, from Cedarvale east, 100 per cent of the cones crop was affected.

STATUS OF FOREST DISEASES

There were no important or significantly different forest diseases recorded in the West Prince Rupert District during 1959. Several samples have been forwarded to Ottawa for identification and of the remaining material, only the following warrant mention.

Important Diseases.

Spruce Needle Rust

Needle rust caused by Chrysomyxa ledicola Lagerh. continued to infect immature Sitka spruce on the Queen Charlotte Islands in 1959. The disease was noted throughout drainages 100 and 101 wherever the alternate host, Labrador tea, Ledum groenlandicum Oeder, occurred. There is still no evidence of tree mortality although this disease has occurred in this location for several years.

A heavy infection of this disease was also recorded near Prince Rupert this year (W.P.R. 200). Small spruce in the swampy regions bordering McNeil(Green) River at Tyee were affected.

Willow Leaf Rust

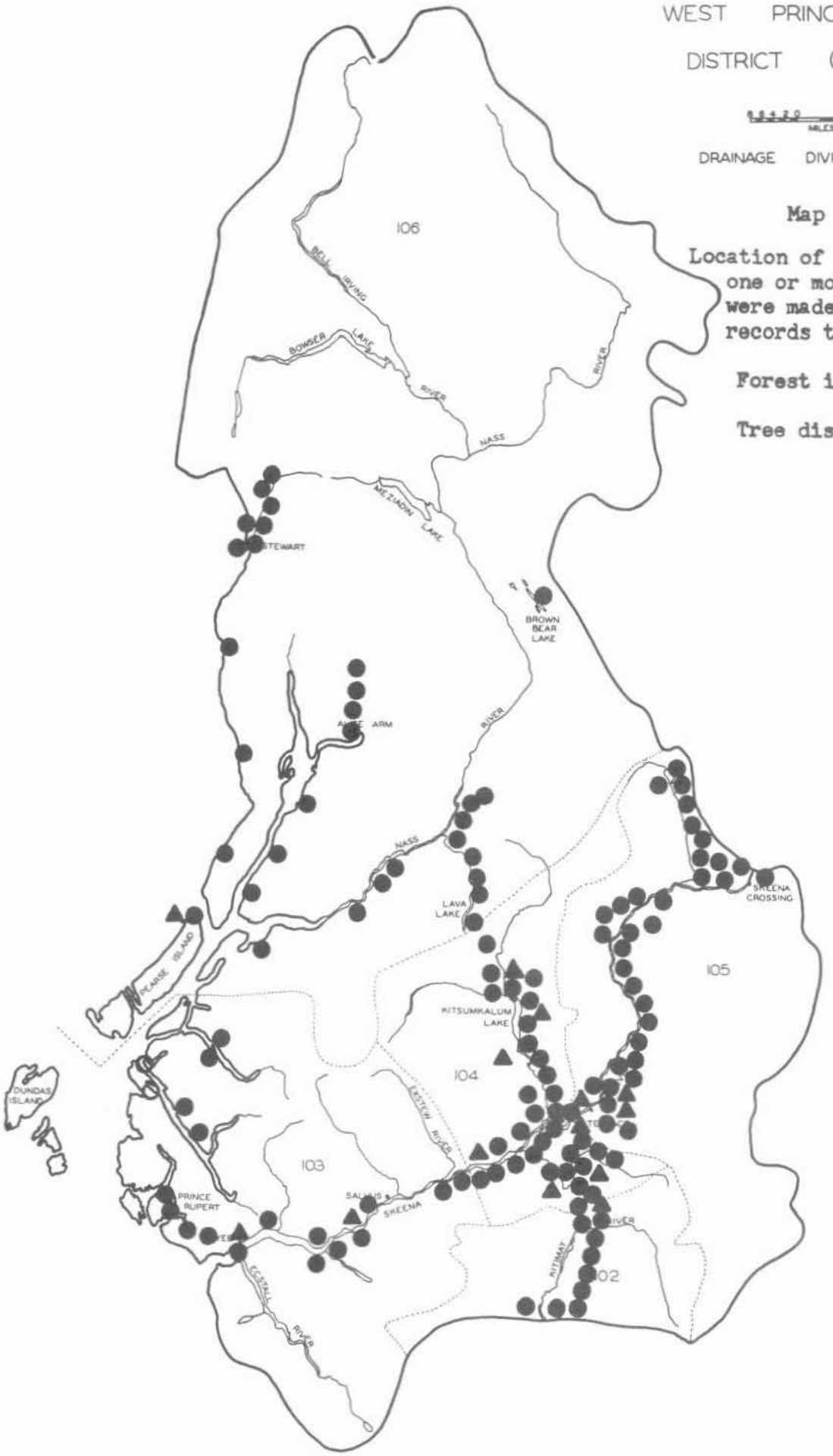
Willow leaf rust caused by Melampsora epitea Thum. was very common in the vicinity of Terrace this year. While this disease is capable of causing serious damage to Salix spp., the host is of little commercial value.

Exotic Plantations

Exotic plantations have been recently established in the district but no systematic observations have been made to date.

OTHER NOTEWORTHY DISEASES

Host	Organism	Locality	Remarks
Alder, red	Didymosphaeria oregonensis Goodding	All drainages (100-106)	Superficial branch and stem canker.
Aspen, trembling	Hypoxylen pruinatum (Klotzsch) Cooke	Woodcock	Dieback, capable of serious damage.
Cottonwood, black	Marssonina populi (Lib.) P. Magn.	Queen Charlotte City	Leaf blotch.
Hemlock, western	Arceuthobium campylopodum Engelmann	Usk	Dwarf mistletoe.
	Caliciopsis sp.	Terrace	Branch canker.
	Fomes annosus (Fr.) Cooke	Terrace	Root rot.
	Dimerosporium tsugae Dearn.	Usk	Sooty mould of foliage
Maple, Douglas	Phleosporo aceris (Lib.) Sacc.	Terrace	Foliage disease.
Pine, lodgepole	Atropellis piniphila (Weir) Lohm. and Cash	Usk	Stem canker
	Peridermium harknessii J. P. Moore	Terrace	Blister rust causing galls.
	Peridermium stalactiforme Arth. & Kern.	Terrace	Blister rust causing long hip-cankers.
Spruce, Sitka	Retinocyclus abieties (Crouan) Groves & Wells	Terrace	Branch canker
Wintergreen	Chrysomyxa pirolata Wint.	Cedarvale	Serious spruce cone rust from alternate host.
	Pucciniastrum pyrolae Diet. ex Arth.	Cedarvale	Rust, other hosts unknown; possibly tree rust.

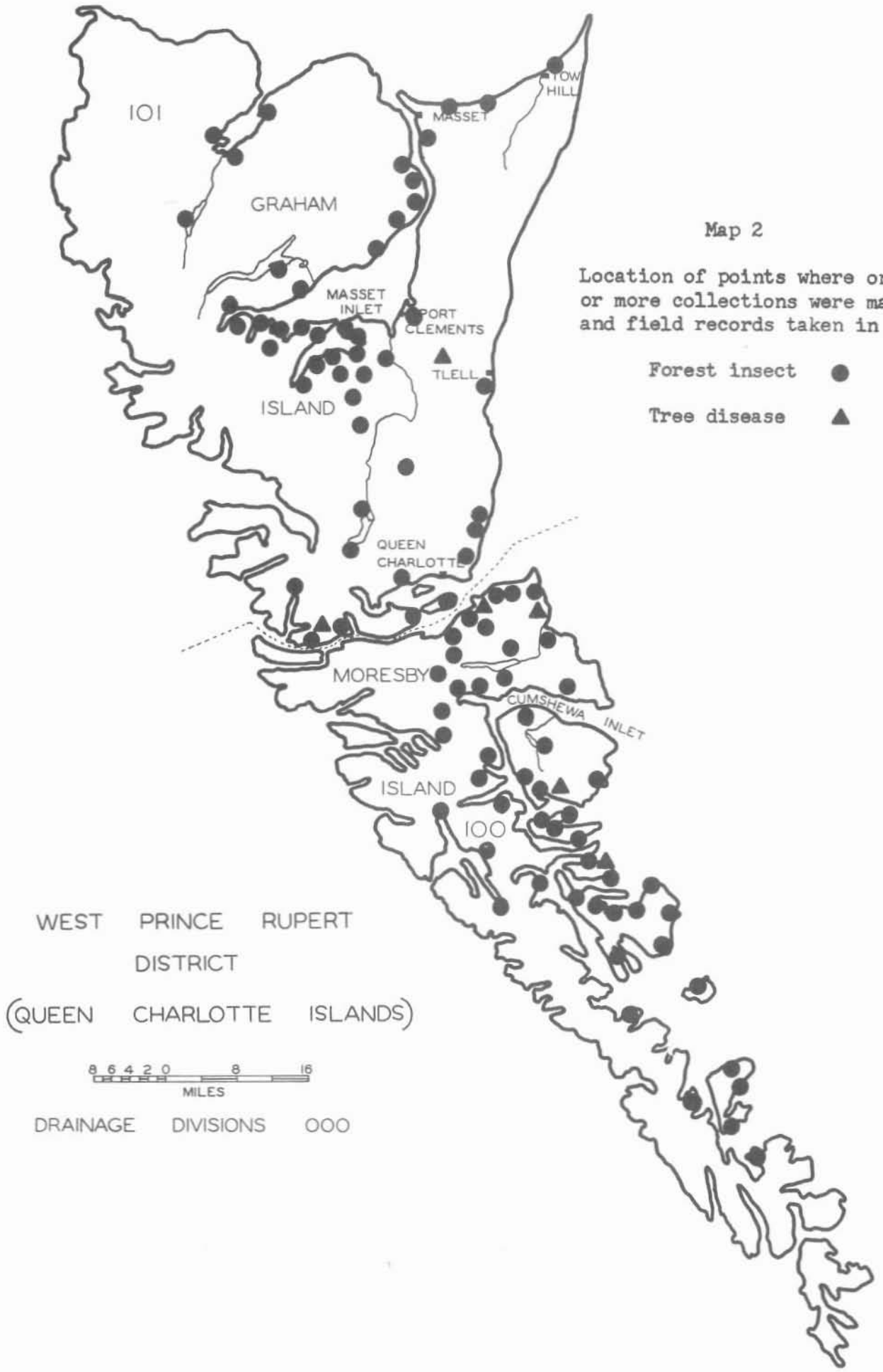


Map 1

Location of points where one or more collections were made and field records taken in 1959.

Forest insect ●

Tree disease ▲



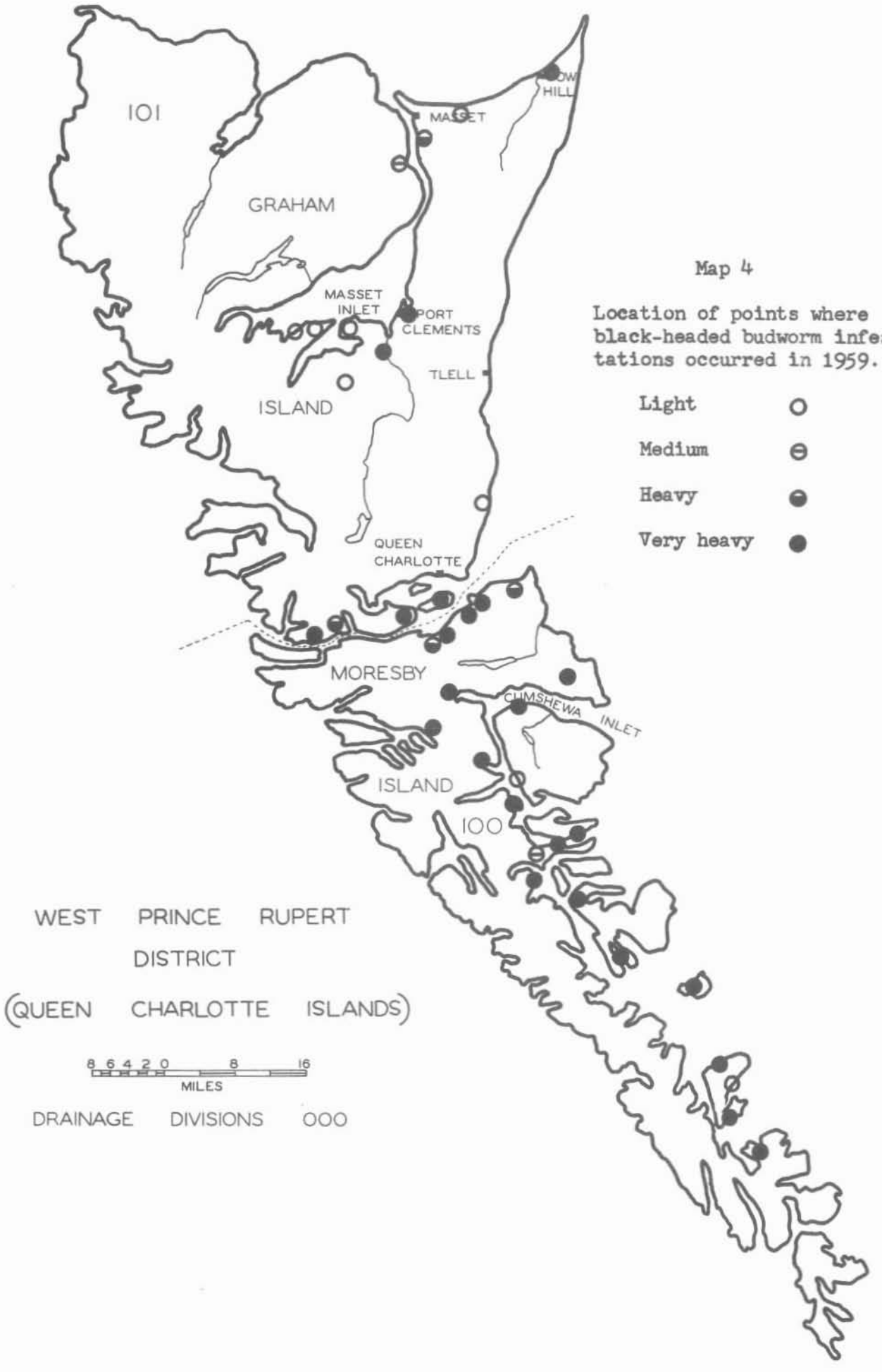
Map 2

Location of points where one or more collections were made and field records taken in 1959.

Forest insect ●

Tree disease ▲


WEST PRINCE RUPERT
DISTRICT (MAINLAND)
MILES
DRAINAGE DIVISIONS OOO
Map 3
Location of points where black-headed budworm infestations occurred in 1959.
Light
Medium
Heavy
106
BELL-IRVING
BOWSER LAKE
RIVER
NASS
RIVER
MEZIADIN LAKE
STEWART
BROWN BEAR LAKE
ALICE ARM
RIVER
NASS
LAVA LAKE
SKEENA CROSSING
105
PEARSE ISLAND
KITSUMKALUM LAKE
104
RIVER
TERRACE
DUNDAS ISLAND
EXSTEW RIVER
103
PRINCE RUPERT
SALVUS
SKEENA
RIVER
KITIMAT
102
ECSTALL
RIVER



Map 4

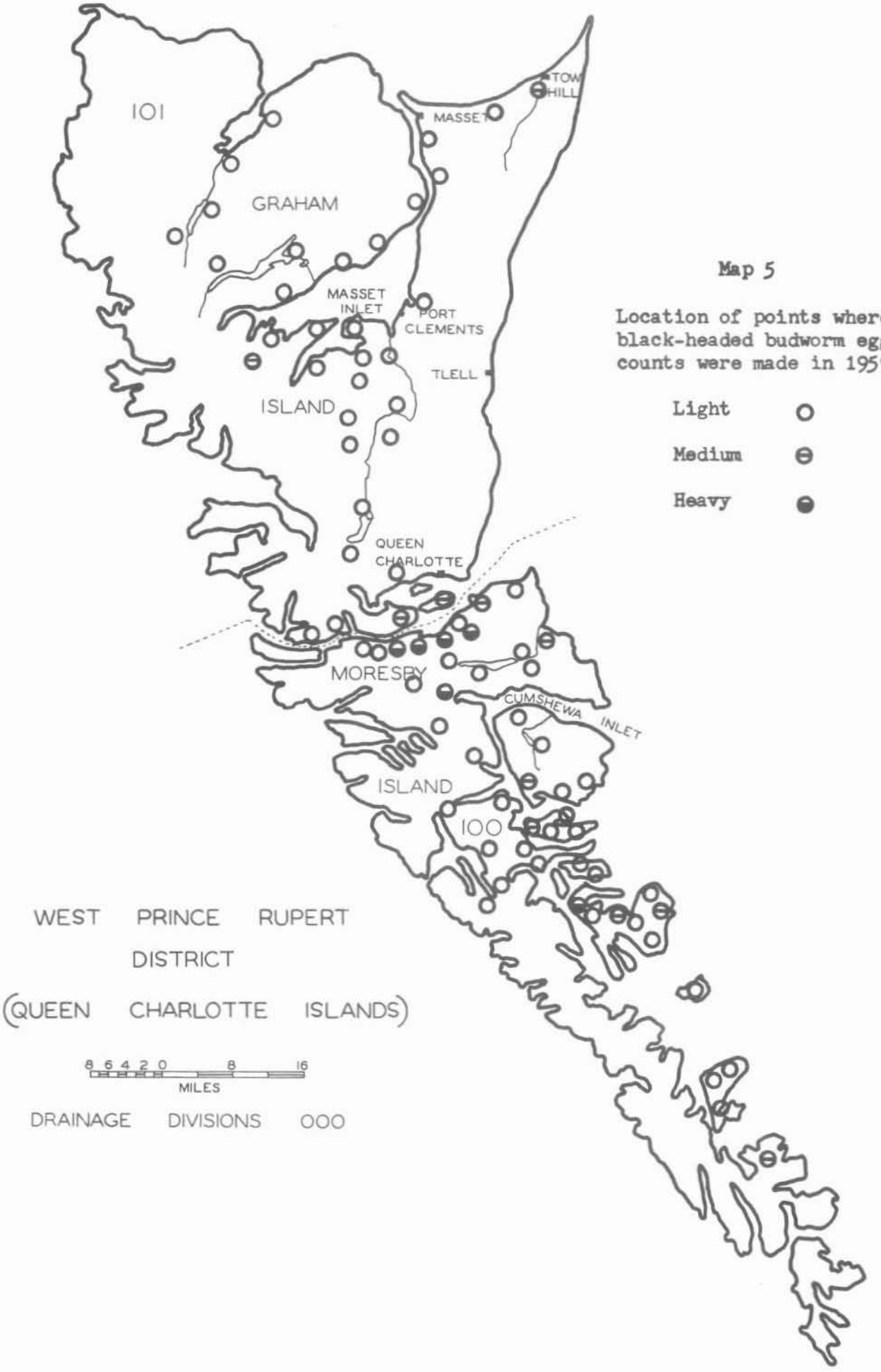
Location of points where black-headed budworm infestations occurred in 1959.

Light ○

Medium ⊖

Heavy ◒

Very heavy ●



Map 5

Location of points where black-headed budworm egg counts were made in 1959.

Light ○

Medium ⊖

Heavy ●

ANNUAL REPORT OF FOREST BIOLOGY RANGER

for

EAST PRINCE RUPERT DISTRICT

1959

FOREST BIOLOGY SURVEY

EAST PRINCE RUPERT DISTRICT

1959

D. G. Collis

INTRODUCTION

The annual survey of this district commenced on May 19 and ceased because of cabin construction work at the end of September. Forest insect and disease collections by hosts are shown in Table 1. The approximate locations of sample points are indicated on Map 1.

The tree species referred to in this report include:

alpine fir, Abies lasiocarpa (Hook) Nutt.

white spruce, Picea glauca (Moench) Voss.

lodgepole pine, Pinus contorta var latifolia Engelm.

trembling aspen, Populus tremuloides Michx.

western hemlock, Tsuga heterophylla (Raf.) Sarg.

western red cedar, Thuja plicata Donn.

Table 1

Collections by Hosts

East Prince Rupert District - 1959

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Cedar, red	4	-	Alder, sitka	-	4
Douglas fir	3	2	Aspen, trembling	16	-
Fir, alpine	73	21	Birch, white	10	-
Fir, amabilis	7	-	Cottonwood, black	4	4
Hemlock, western	18	1	Maple, Douglas	1	-
Hemlock, mountain	3	-	No host	4	-
Pine, lodgepole	26	9	Miscellaneous	1	-
Spruce, black	1	-			
Spruce, white	98	8			
			Total	44	8
Total	233	41	Grand Total *	277	49

* Of the 277 collections, 252 were made by the writer and the remaining 25 by British Columbia Forest Service personnel.

The majority of the forest disease samples are as yet unidentified.

STATUS OF INSECTS

Two-year-cycle Spruce Budworm, Choristoneura fumiferana (Clem.)

Infestations

Babine Lake

The insect was in the first year of its 2-year-cycle in 1959.

Aerial mapping was not attempted in 1959 because of an exceedingly heavy cone crop on alpine fir and white spruce trees, and a lighter degree of defoliation. There has been no indication of a population collapse in any locality visited, consequently it is assumed that there has been no reduction in the extent of the infestation. Ground checks have shown that a light population extends south-east along the westerly shore of Babine Lake to join up with the earlier infestation between Burns and Babine lakes. Consequently, what was previously considered two separate budworm problems is now one. A light population has also developed as far south as Wrights Bay on the east side of Babine Lake, a spread of 15 miles over previous records.

No extension of insect feeding was uncovered along the Babine River near its junction with the Skeena. Here the timber type changes to hemlock-cedar, and although the larvae did feed on the fringe hemlock there was very little penetration into the stand.

Larval Development

The weather for May and June was mainly wet and cold in the Bulkley Valley region. Budworm larvae were first observed on May 26, at Doris Lake, on a small sheltered alpine fir tree in a sunny location. White spruce buds had not begun to open at this time. Larval development had not advanced sufficiently for sampling to begin until June 8, and even then many of the white spruce buds were not open. For some reason, possibly the cool damp weather, a portion of the larval population did not hibernate, but continued to develop and complete their life cycle in one year. A few late instar larvae and one egg mass were found along the Cronin Mine road on July 30. Later in the year, egg masses were also observed at Doris and Pinkut lakes. It will not be known whether this constitutes a deviation from the 2-year-cycle until 1960.

Damage and Defoliation to Infested Timber.

Defoliation this season was the lightest recorded in the past four years. The persistent cool wet weather in May and June retarded the development of the budworm in relation to tree growth. The new buds outgrew the budworm feeding and it appeared by late June that defoliation would be fairly light, but at the end of July, when the area was re-visited, the timber had taken on the reddish colour of dead needles. The weather improved in July and the larvae destroyed a large percentage of the 1959 needles. As is typical of the budworm many needles which were not consumed were cut off and remained caught in webbing, to dry out and turn colour.

Records taken at 11 locations in the infestation in 1959 indicate that 72 per cent of the needles were destroyed, compared to 84 per cent in 1957. Seventy-five per cent of the current buds were destroyed in 1957, while in 1959 only 33.5 per cent were killed.

Tree Mortality

Tree mortality has been mainly confined to understory trees. One of the hardest hit areas is along the Bear Lake trail, where, in just over four chains, 120 of 179 trees examined were dead and the remaining 59 were killed back, usually to the bottom branches.

Mature trees are withstanding the annual defoliation with amazing tenacity. There are however, large mature white spruce and alpine fir trees which have suffered from 70 to 95 per cent total defoliation and some of these trees will probably succumb in time. There has been no mortality of overstory trees in any of the 12 budworm plots established to keep records of tree condition. At one location, about nine miles north of Fort Babine mature trees are dead and budworm feeding is a very probable cause of the mortality, but there is no annual record of insect populations and resultant damage.

Larval Populations

Egg surveys conducted in 1958 indicated a very large larval population for 1959. Counts in June of this year showed that larval numbers were double those of 1957. This larval increase was somewhat balances as the number of buds also doubled due to adventitious growth. In this way the percentage of current foliage lost by the trees through feeding may not have increased, but it does constitute a heavier loss of resources to a tree already suffering from past defoliation. Table 2 shows the rise in the number of buds and larvae per square foot of foliage on alpine fir trees.

A very heavy egg population was discovered on lodgepole pine in 1958, but apparently a relatively small proportion of the resultant larvae survived in 1959. Early instar larvae apparently have to mine pine blossoms for suitable food, but there was very little flowering on the pine in 1959, and larvae could only be found where pine blossoms existed.

Although the results of the egg survey of 1958 indicated a general increase in budworm numbers, and this proved correct, large egg counts do not necessarily indicate a large larval population in the same area the following year. * Table 3 shows a comparison of egg masses and larvae found at the same locations.

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* For example at Doris Lake egg masses averaged 14.0 per square foot and larval counts averaged 51, whereas at Bear Lake Trail where only 1.7 egg masses per square foot were found larvae averaged 60 per square foot.

Table 2

Number of Larvae and Buds per Square Foot of Foliage Surface.

Babine Lake

Location	No. larvae per sq. foot				No. buds per sq. foot		
	1956	1957	1958	1959	1957	1958	1959
Cronin Mine Road		54	25.8	112	55	104	96
Chapman Lake		44	14.3	82	45	124	174
Smithers Landing	16	37.7	18.6	70	31	95	118
Doris Lake		75.3	6.3	111	51	49	108
Junction Mine & Smithers Ldg. road	2.1	18.5	6.2	112	36	62	44
Babine Lk. opp. Old Fort			10.2	131	13	76	68
Babine Lk. opp. McKendrick Is.	7.8	17.9	5.5	133	27	48	84
Babine Lk. at Sunnyside			7.1	42	54	94	145
5 mi. on Bear Lk. trail	7.2		13.5	62	116	62	118
1/4 mi. on Bear Lk. trail	3.1		0.9	59	38	62	52
Babine Lk. opp. Fort Babine			3.0	39	60	42	49
Averages	7	41	10	87	48	74	96

Table 3

Egg Masses and Corresponding Number of Larvae per Square Foot of Foliage from the same Locations in 1958 and 1959.

Location	Host	Eggs per sq. ft. 1958	Larvae per sq. foot 1959
Junction Mine and Smithers Landing Road	Ba	3.8	122
1/4 mi. Bear Lake trail	Sw	1.7	60
	Ba	3.9	59
Opp. McKendrick Is.	Ba	4.3	133
Cronin Mine Road	Ba	3.3	112
North of Halifax	Sw	1.1	33
	Ba	4.4	-
West of Sunnyside	Ba	2.3	42
Opposite Old Fort	Ba	2.6	39
Hazelton trail	Sw	1.0	42
	Ba	0.9	33
5 mi. Bear Lk. trail	Sw	11.9	55
	Ba	14.6	62
N. end Chapman Lk.	Sw	5.5	88
	Ba	5.7	82
Doris Lake	Sw	14.0	51
	Ba	7.9	111
Smithers Ldg.	Sw	1.3	87
	Ba	3.3	70
Fulton Lk.	Sw	7.5	99
Average		4.4	73

Budworm activity has increased markedly in the area between Burns Lake and Babine Lake, where this insect has been found at various population levels since 1950. Light feeding took place over a wide area in 1959 and sufficient defoliation will probably occur in 1960 to cause some reddening of foliage. Table 4 shows the number of larvae found at two locations within this territory.

Table 4

Larvae per Square Foot of Foliage Found in the Area Between Burns and Babine lakes.

Location	Larvae per sq. ft.				
	1955	1956	1957	1958	1959
Pinkut Lake	9.0	9.1	4.9	6.1	38.0
Taltapin Lake			6.8	3.0	40.2

Summary

Judging by the information available at this time, almost complete loss of the 1960 growth can be expected from budworm feeding. Spruce and alpine fir trees generally have more new foliage and more buds than in the past three years. However, a shortage of new growth has been one of the main controlling factors over this population to date. Thus, this relatively large volume of potential new growth may only serve to make it possible for a higher percentage of larvae to reach the stage in development, where, they are able to feed on the older needles and bring the trees closer to 100 per cent defoliation.

Spruce Budworm Infestation on the West Side of the Bulkley Valley

This infestation, discovered in 1958, has the same characteristics as the Babine Lake outbreak. Forty-four larvae per square foot were found on white spruce foliage and 77 on alpine fir.

The extent of this infestation is not known; the moth flight in 1958 could have extended it considerably. There appears to be little in the way of natural barriers to prevent a spread of this infestation into the over mature balsam-spruce stands in the Morice Forest.

Mountain Pine Beetle, Dendroctonus monticolae Hopk.

Up to the fall of 1959 this beetle had been responsible for the death of approximately 54.212,246 cubic feet of lodgepole pine in the area between Hagan Arm of Babine Lake and Takla Lake. Since 1956, the number of red tops

has been steadily declining each year. Of the total kill; 42,617,249 cubic feet lies in the Prince George Forest District and 11,594,997 in the Prince Rupert District. The area is more accessible from Babine Lake in the Rupert District, and the cruising upon which this estimate is based was done adjacent to Babine Lake, so the estimates of kill for the whole area appear in this report.

Black-headed Budworm, Acleris variana (Fern.)

Larvae were found at 18 locations as shown on Map 3 but averaged only 1.9 insects per collection. The maximum number of larvae in one sample was 10.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

These larvae were observed feeding on aspen in spot infestations from Hazelton along the Skeena River to the Shegunia River and along the north-east side of the Bulkley River as far south as Gramophone Creek, about four miles south of Moricetown. Adults were observed over a wider area and were flying around the aspen trees in hugh numbers. Fifty cocoons were examined near Moricetown from which 46 adults had emerged, two pupae were parasitized and two dead.

Very large populations can be expected in 1960.

Spruce Bark Beetles, Dendroctonus sp.

Bark beetles are responsible for the mortality of a considerable volume of white spruce in the district. The kill is very scattered, but often more frequent around old logging operations. Mortality appears heaviest along the Smithers Landing Road as far as the Chapman Lake burn. Here, on one acre, seven newly attacked trees and three old dead trees were counted. Some of these trees are overmature and suffer from root and butt rots. In the Southbank Ranger District near Uncha Lake, immature white spruce are being killed by bark beetles. The roots of some of these trees were dead before beetle attack; large galleries made by a boring insect wind through the cambium and sapwood of the roots and disease is also present. This condition has not been examined critically enough to determine if this is the reason for the beetle attacks on these young trees.

The Green Velvet Looper, Epirrita autumnata Harr.

Samples containing this geometrid came from 23 locations in the district. Of these, 14 were from the cicle lakes in Tweedsmuir Park and seven from Morice Lake. Thirty larvae constituted the largest collection and the 21 samples from the Circle and Morice lakes averaged six larvae each.

Aspen Leaf-miner, Phyllocnistis populiella Chamb.

This insect was active over the whole district again in 1959. Feeding was spotty in the Bulkley Valley as far south as Smithers, but heavy in all side valleys leading into this area and over the remainder of the district.

STATUS OF FOREST DISEASES

Important Diseases

Douglas Fir Needle Rust

Common on Douglas fir needles, this rust Melampsora albertensis Arth. (Caeoma occidentale) was found on the under side of Douglas fir cone scales, and is believed to be a new record of infection on this portion of the tree. The samples were collected along the north side of Francois Lake from open growing fir.

Spruce Needle Rust

White spruce reproduction around the west end of Francois Lake was often so heavily infected with Chrysomyxa ledicola Lagerh. that entire trees turned yellow. Lighter infection occurred in other areas of the district. The spring and early summer of 1959 was extremely wet.

Leaf Spot Disease

Large patches of aspen along the shores of Babine Lake and other areas were infected in 1957 with a leaf spot disease and suffered premature leaf fall. The causal agent of this disease has now been identified as Marssonina brunnea (Ellis & Everh.) Sacc.

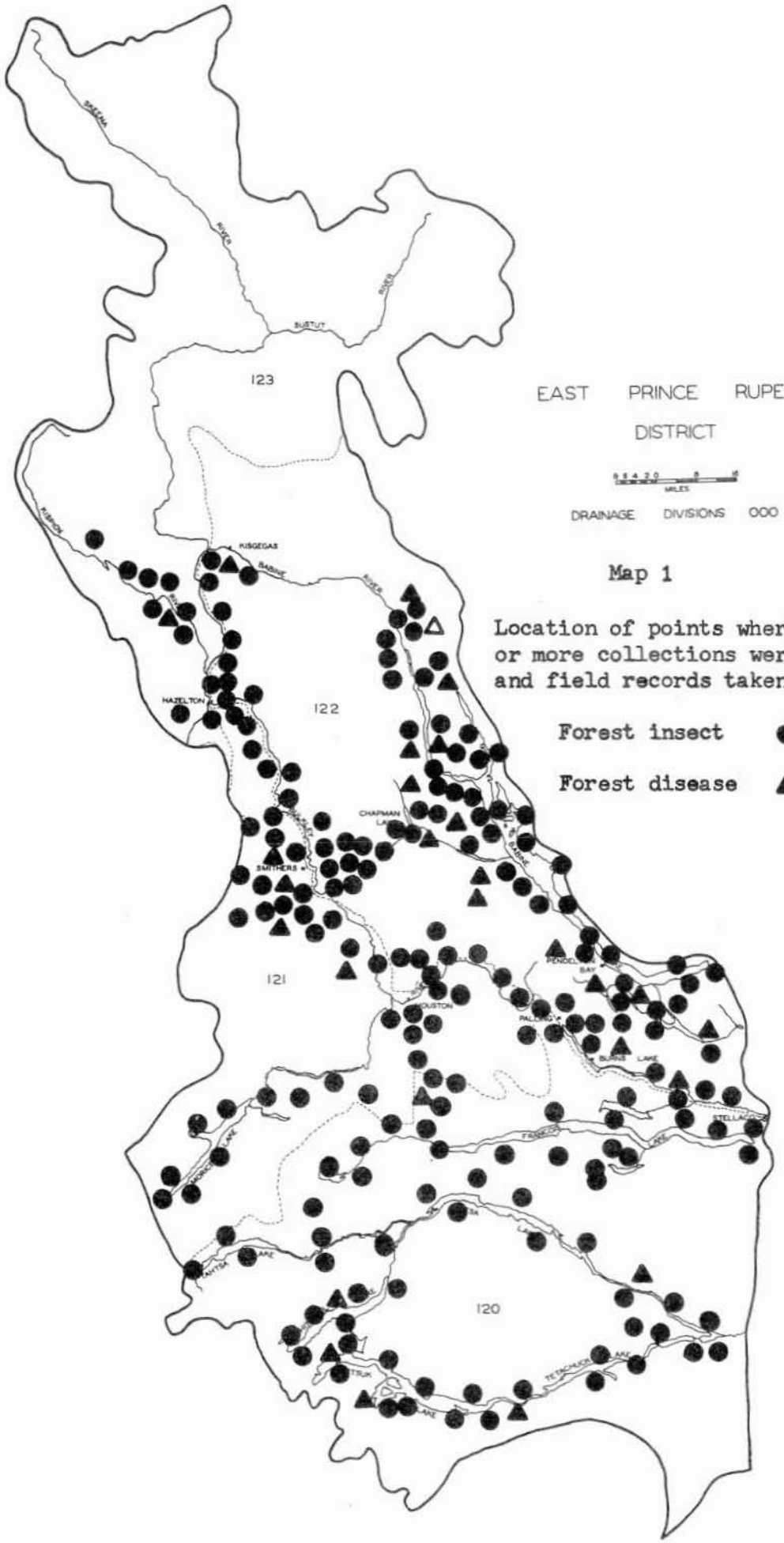
Disease Progress Plots

Stalactiforme canker on lodgepole pine

A plot comprising 75 small lodgepole pine trees was established in 1957 to record the effects of Peridermium stalactiforme Arth. & Kern on these close growing stands. At this time, 46 of the trees suffered from stem and branch infection and in two years the total now stands at 58. Ten of the plot trees have died as a result of the stem cankers and rodent gnawing.

OTHER NOTEWORTHY DISEASES

Host	Organism	Locality	Remarks
Alder, Sitka	Didymosphaeria oregonensis Goodding	Babine Lake	Superficial branch and stem canker
Fir, alpine	Melampsora abieti-capraearum Tub.	Telkwa	Common foliage rust in this area.
Fir, alpine	Pucciniastrum epilobii Otth	Telkwa	Foliage rust
Fir, alpine	Dasyscyphus agassizii (Berk. & Curt.) Sacc.	Babine Lake	New host record. Not considered pathogenic
Fir, alpine	Cytospora sp.	Morice Lake	Probably causes canker and dieback.
Pine, lodgepole	Cronartium commondrae Peck.	Burns Lake	Blister rust causing fusiform canker.
Pine, lodgepole	Peridermium harknessii J. P. Moore	Burns Lake	Blister rust causing galls
Spruce, white	Fomes pinicola (Swartz ex Fr.) Cook	Smithers	Trunk rot; seems to be predisposing trees to beetle attack.
Willow	Uncinula salicis (D. C) Wint.	Francois Lake	Powdery mildew.

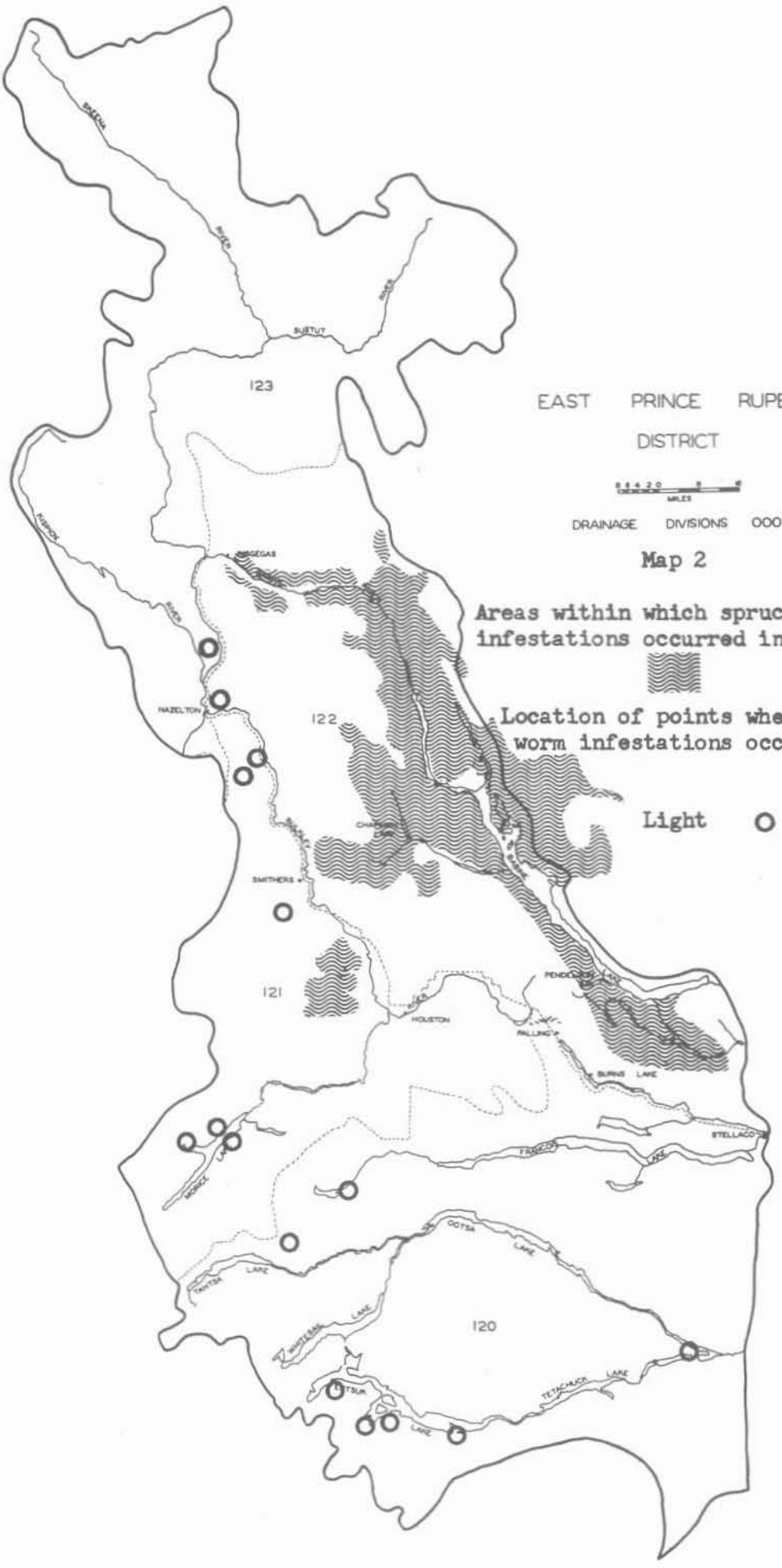


Map 1

Location of points where one or more collections were made and field records taken in 1959.

Forest insect ●

Forest disease ▲



EAST PRINCE RUPERT
DISTRICT

8 4 0 2 0 8 16
MILES

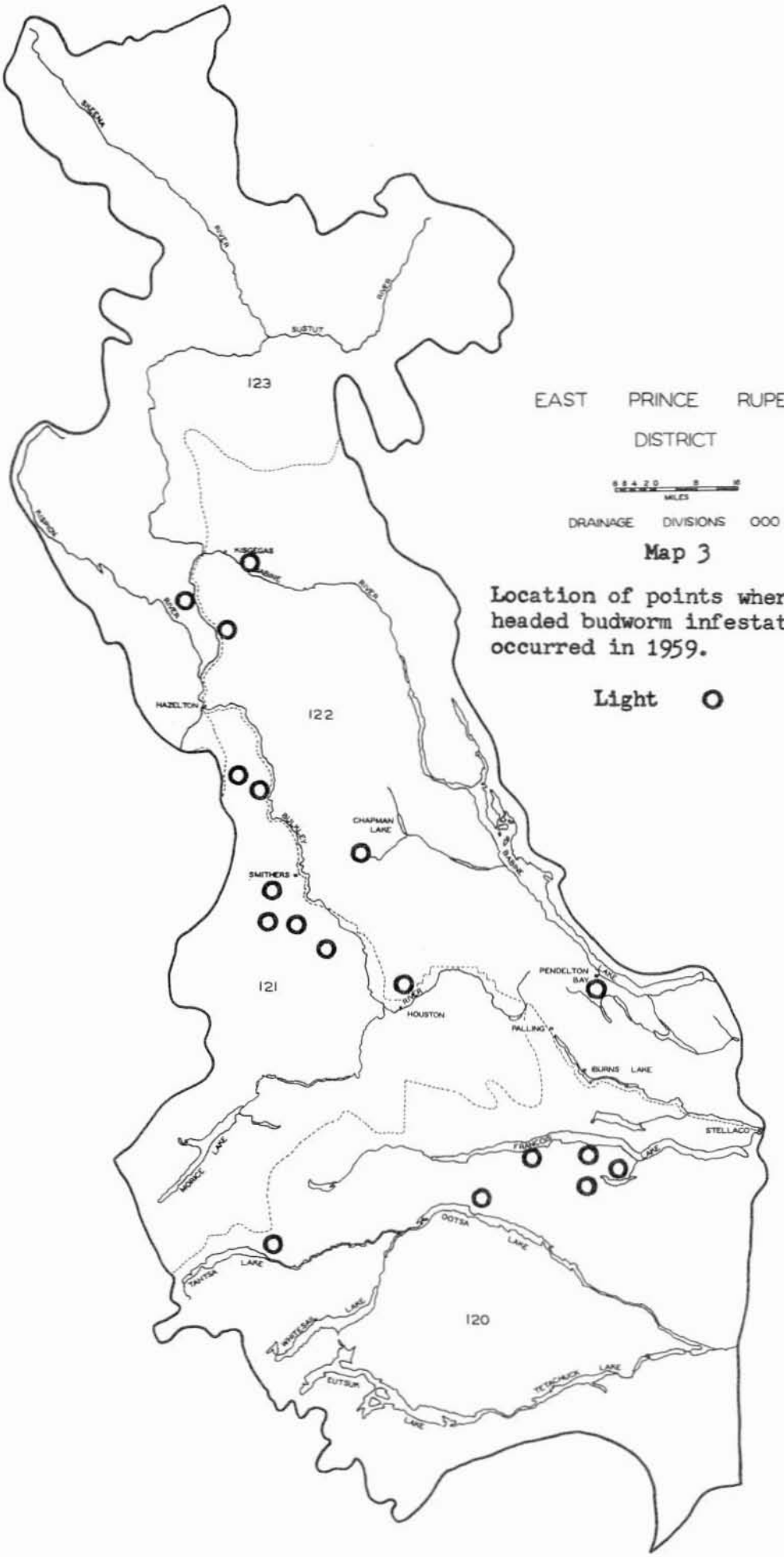
DRAINAGE DIVISIONS 000

Map 2

Areas within which spruce budworm infestations occurred in 1959.

Location of points where spruce budworm infestations occurred in 1959.

Light O



EAST PRINCE RUPERT

DISTRICT

MILES

DRAINAGE DIVISIONS 000

Map 3

Location of points where black-headed budworm infestations occurred in 1959.

Light O