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RANGERS ANNUAL REPORT

1950

RANGER'S ANNUAL REPORT.

Victoria Laboratory

R. L. Fiddick

1950

INTRODUCTION

During the 1950 field season a total of 2,884 insect collections was made in the coastal forest, of this total 352 collections were made by co-operators. The number of collections is somewhat lower than last year because of the lateness of the season which reduced the collecting period by several weeks. Another factor contributing to the reduction in the number of collections was a major mechanical breakdown suffered by the M/V J. M. Swaine after completing the survey of the Gulf Islands in May. This delayed the northern coastal survey until late June.

For the most part the rangers operated singly in their district and consequently were unable to survey the isolated sections of the districts except when outside help was available.

An extensive outbreak of spruce budworm was discovered in the Prince Rupert Forest District near Burns Lake. The outbreak was somewhat patchy and caused heavy defoliation on understory balsam, otherwise damage was confined to crown defoliation.

Other insect populations were, for the most part, at endemic level. Black-headed budworm larvae appeared singly or in small numbers at widely scattered areas of the coast. At Nesto Inlet on the west side of Graham Island in the Queen Charlotte Islands a local infestation occurred but damage was scarcely noticeable.

Hemlock looper larvae were found in only a few collections from areas where it appeared to be increasing in 1949. In the Fraser Valley there was a slight increase in population over that of last year.

The oak looper which has caused severe defoliation in certain areas around Victoria declined substantially during 1950. The distribution of larval collections was wider but the population was not nearly as dense as that of previous years. The only tree mortality caused by the oak looper has been a few Douglas fir interspersed in the oak stands.

The alder sawfly populations rises and subsides very rapidly in certain areas on the coast and so far has caused no mortality.

General information on district and insect conditions is contained in the main body of the report and is written by the rangers in charge of survey work in the districts.

I THE STATUS OF THE MORE IMPORTANT
INSECTS WHICH ARE KNOWN TO BE
CAPABLE OF DOING DAMAGE

A Spruce Budworm, Choristoneura fumiferana (Glem.)

1. Coast Area Surveyed by the "J. M. Swaine".

There were approximately 50 larvae of this species found during 1950 in the whole of the northern British Columbia coast area. These were consistently found from Bella Coola to Kwina-mass Bay, in small numbers. All were collected between June 30 and August 1. An average of 58 per cent of the larvae were found on Sitka spruce, 29 per cent on amabilis fir, and 13 per cent on western hemlock.

2. Lower Mainland and Fraser Valley.

During the survey season for 1950, 30 larvae of this species were collected from widely scattered points in the lower mainland area. Preferred hosts were Douglas fir and lodgepole pine.

3. South Vancouver Island.

Five larvae of this insect were collected in widely separated areas in the lower Vancouver Island district; one from Douglas fir at Sooke, one from hemlock at Nanaimo Lakes, one from grand fir at Cedar, one from pine at Youbou and one from Douglas fir at Genoa Bay. These larvae were recorded in collections made between June 12 and June 30.

4. North Vancouver Island

Small numbers of spruce budworm larvae were found along the east coast of Vancouver Island between Qualicum Bay and Campbell River. On the mainland, in the Powell River area, larval populations were sparse throughout the region.

Total number of larvae collected amounted to 19, averaging 1.46 larvae per collection. Host trees were Douglas fir, grand fir, Sitka spruce, hemlock, and lodgepole pine. Douglas fir was the most predominant host in this district. All collections of this insect were made between June 10 and June 25.

5. Prince Rupert Forest District.

Data and information concerning the present spruce budworm infestation in the Burns Lake - Babine area is set forth in a special report contained in section IV of this report. The occurrence of this budworm in other areas of the Prince Rupert forest district are tabulated below with 1949 collection figures.

PLACE	HOST		NUMBERS	
	1949	1950	1949	1950
Burns Lake, P. S. S. No. BL-6	Sw	Sw	7	3
Babine Lake, P. S. S. No. BL-8	-	Sw	-	3
Pinkut Lake, west slope, No. BL-5	Sw	Sw	7	21
Morrison Lake	-	Sw	-	6
Burns Lake, Mile 4, Babine Road.	-	Sw	-	7
Falling, B. C., T. S. X.-38951	Fa	Fa	0	1
Falling, B. C., T. S. X.-38951	Sw	Sw	0	9
Topley, B. C., L-1214	Sw	Sw	0	1
Forestdale, B. C., P. S. S.-No. H-3	Sw	Sw	0	1
Babine Lake, L-1873, BL-3	-	Fa	-	3
Babine Lake, T. S. X.-35950, BL-4	Sw	Sw	3	3
Babine Lake, Pierre Co. T. S. X.-40002	-	Fa	-	1

B. Hemlock Looper, Lambdina fiscellaris lugubrosa (Hlst.)

1. Coast Area Surveyed by the "J. M. Swaine".

(a) Burke Channel.

The Bella Coola valley was given particular attention because of past records of the presence of the hemlock looper there. Samples were taken at intervals from the beach near the wharf to a point 42 miles up the valley. Elevations ranged from sea level to about 600 feet. Larvae of this insect were found at every point sampled and on all species of trees, both coniferous and deciduous. They were in small numbers, averaging no more than one per tree sampled. This was a decided decrease from the numbers found in the past two years. Unfortunately very few of these specimens survived the journey by mail to the insectory.

One larva was found on the west side of King Island, due west of Bella Coola.

(b) Douglas Channel.

Seven hemlock looper larvae were found in inlets at the north end of Douglas Channel.

2. Lower Mainland and Fraser Valley

A total of 71 specimens of this serious defoliator were collected. Although this number was considerably larger than that found in other districts of the coastal survey, no particular locality had a population of dangerous proportions. The collections were evenly distributed along both sides of the

Fraser Valley, over an area of approximately 3,000 square miles. This distribution indicated an expansion of the population over a much larger area than that occupied in 1949.

The collections for 1949 were taken in an area reaching from Capilano River, east along the mountain slopes to Stave Lake. While in 1950 this insect was also found near the Chilliwack River and Cultus Lake drainages. Larvae were not found further inland than Hope, where the climate and forest cover begin to change.

3. South Vancouver Island

Negative collections resulted, with the exception of one pupa in the Wilson Creek Valley, from sampling the hemlock looper.

4. North Vancouver Island.

Two hemlock looper larvae were found at the south-west end of Drew Harbour on Quadra Island.

5. Prince Rupert Forest District.

The presence of this dangerous defoliator in the lower Skeena River valley area between Scotia River and Hazelton was again recorded in 1950. There was, however, a marked decline in the numbers found and no larval collections exceeded a normal endemic level.

The following table shows host trees, location of larval

collections, and larval number in 1949 and 1950.

PLACE	1949	1950	No. of larvae	
	Host	Host	1949	1950
Scotia River	Ss	Hw	1	1
Salvus, L-532	Ss	Ss	11	3
" "	Hw	Hw	9	1
" "	D	D	1	0
Exchamsiks River	Ss	Ss	6	0
" "	Hw	Hw	5	1
" "	D	D	2	0
Cedar River	H	H	11	0
" "	Ss	Ss	11	1
Gold Creek	Hw	Hw	1	1
Copper Creek	Hw	C	1	1
Luncheon Creek	-	Fa	-	1
Exstew River	Hw	Hw	8	0
" "	Ss	Ss	8	1
Kitimat River L-26945	-	Hw	-	1
Fiddler Creek	-	Hw	-	1
Kitsequecla River	-	Ss	-	1
Shequnia River	Hw	Hw	1	1
Kitsumgallum Lake	Hw	Hw	9	0
" "	Ss	Ss	5	0
" "	Fa	Fa	9	0
" "	Bi	Bi	4	0
" "	D	D	3	0
Lakelse Lake	Hw	Hw	4	0
" "	Fa	Fa	5	0
" "	C	C	10	0
" "	Ss	Ss	6	0
Onion Lake	Hw	Hw	1	0
Shame River	Hw	Hw	7	0
" "	Fa	Fa	4	0
Khata River	Hw	-	3	0
" "	Ss	-	1	-
St. Croix Creek	Hw	Hw	1	-
Lower Kitsumgallum River	C	C	10	0
" " "	Hw	Hw	6	0
" " "	Ss	Ss	2	0
TOTALS	32	34	166	16

Average number of larvae per 3 beating collection.

Year	Number of collections	Number of larvae	
		Total	Average
1949	32	166	5.2
1950	34	16	.4

C. Oak Looper - Lambdina somnaria Hlst.

During April oak looper egg collections were made in and around the area of defoliation in the vicinity of Victoria. The egg collections indicated the heaviest population would be in the locality of the Uplands golf course, north Quadra Street, north Douglas street, and Cook Street north of Hillside Avenue. Thirteen collections made in 1950 showed a maximum of 319 new eggs per 1/2 square foot of moss and a minimum of 21. The average number of new eggs per collection was 132.

A technical study conducted in Victoria and vicinity by members of this laboratory produced a report dealing with larval collections and areas of infestation.

All other areas of the coast were free from this pest. A few host trees occur on the mainland near Vancouver but no record of oak looper is known for this area.

D. Black-headed Budworm - Acleris variana Fern.

1. Coast Area Surveyed by the "J. M. Swaine".

(a) Portland Canal.

Six larvae of this insect were found on hemlock in a collection made between the wharf and the village of Stewart.

(b) Graham Island.

In Nesto Inlet, on the west coast of Graham Island, the hemlock trees displayed between 25 and 50 per cent defoliation due partly to the appetite of this insect. Three collections here produced 70 larvae. The same collections contained numerous sawfly, looper and microlepidoptera larvae.

2. Lower Mainland and Fraser Valley.

In 1950, no budworm larvae were found in this district. A careful survey of the area bordering McConnell Creek yielded negative results. This locality was reported to possess dead and dying timber as a result of defoliation by the black-headed budworm during 1942-44 (Dr. M. Prebble and Dr. K. Graham).

3. South Vancouver Island

Budworm larvae were not found in this district even though sampling was done in most areas where the insect had been in infestation proportions several years previously.

4. North Vancouver Island.

Sampling black-headed budworm in this district proved negative again in 1950.

The accompanying photographs show the condition of the timber killed during the budworm outbreaks in the Sayward district between 1942 and 1945.



Budworm killed timber in Sayward District.



Dense regeneration under budworm killed timber. Sayward District June 16, 1950.

5. Prince Rupert Forest District.

Larval numbers, trees and location of areas where this tortricid was found during 1949 and 1950 are shown in the following table.

P L A C E	HOST		NUMBER	
	1949	1950	1949	1950
Green River	-	Hw	-	1
" "	-	B	-	1
Rainbow Lake	Hw	Hw	10	3
" "	Ss	Ss	0	8
" "	Fa	Fa	0	3
Prudhomme Lake	Hw	Hw	1	4
" "	Hw	Hw	4	5
" "	Pl	Pl	2	1
Salvus, B. C. L-532	Hw	Hw	0	1
Echamsiks River	Hw	Hw	0	1
Kitsumgallum River L-1402	Ss	Ss	3	1
Kitimat River	Hw	Hw	1	1
Onion Lake	Hw	Hw	3	0
" "	Fa	Fa	4	0
TOTALS	12	14	28	30

E. Hemlock Sawflies, Neodiprion spp.

1. Coast Area Surveyed by the "J. M. Swaine".

Larvae of this genus were more common and plentiful than of any other insect found on the northern coast of British Columbia. They were consistently collected on western hemlock, Sitka spruce and amabilis fir wherever sampled from Rivers Inlet to Stewart on the mainland, and on the Queen Charlotte Islands. There were 1,563 larvae taken in 127 collections; an average of nearly 13 larvae per collection.

Specimens of this genus were also gathered from lodgepole pine, mountain hemlock, Douglas fir and alder.

The following table shows the dates and locations of the largest individual collections, the host tree and number of larvae found.

DATE	LOCATION	H O S T T R E E S				
		H	S	B	Pl	Em
June 27	Moses Inlet	78				
" 30	S. Bentinck Arm	35				
July 4	Roscoe Inlet	27	18			
" 5	Briggs Inlet				160	
" 6	Korich Lake				120	67
" 7	Poison Cove	32	40			
" 7	" "		120			
" 7	Mussel Inlet		43			
" 7	" "		25			
" 8	Swanson Bay	44	54			
" 8	Khutze Bay		30			
" 10	Goat Harbour	29				
" 10	" "	45				
" 13	Hawksbury Is.	40				
" 15	Miskatla Inlet		30			
" 15	Giltoyees Inlet	36				
" 16	Kitkiatka Inlet	26	19	65		
" 17	Kiskoch Inlet	50	37	16		
" 18	Klewnuggit Inlet		39			
" 25	Big Bay	34				
" 26	Port Simpson	23				
Aug. 23	Nesto Inlet	35				

2. Lower Mainland and Fraser Valley.

Eleven hundred and sixty-nine larvae of this sawfly were collected over an area of 5,000 square miles. Though distribution was general, the greatest numbers were found between Howe Sound and Stave Lake on the north or mountainous side of the Fraser River. Since the hemlock sawfly is an economical feeder it may be supposed that the high larval count was no indication of a dangerous infestation. These numbers have occurred for several seasons past without causing serious damage but a further increase in population may become hazardous.

Of the total number of larvae collected, 183 were tentatively identified as N. abietis and the remainder as N. tsugae. The former were from Douglas fir and amabilis fir hosts while the latter were predominantly from hemlock.

3. South Vancouver Island.

Larvae of this defoliator were found in small numbers throughout the southern island district. One hundred and forty-six larvae were found at Sarita Bay on the Alberni Inlet. At Christie Bay in the same general area 11 larvae were recorded in one collection. Hemlock was the host in both cases.

A total of 25 collections contained sawfly larvae and except for the two mentioned above only 1 to 6 larvae were found in each.

4. North Vancouver Island

During the 1950 season, 68 collections containing larvae of this insect were received at the Langford insectary.

The following collections contained 10 or more larvae.

DATE	LOCATION	Host	Number of larvae collected
June 12	Blk. 182 Quadra Island	Douglas fir	26
" 17	150' north of Oyster River Bridge	spruce	13
" 20	2 miles north of Parksville on highway	hemlock	10
" 24	Lund	lodgepole pine	25
" 25	South-east end of Haslam Lake	white pine	11
July 6	North fork of Cruikshank River	amabilis fir	10
" 8	Blk. 17 Denman Island	hemlock	40
" 28	South side T. L. 3576 - NE Oshinow Lake	amabilis fir	40
" 28	South side T. L. 3576 - NE Oshinow Lake	hemlock	70
" 28	1/4 mile west June Lake - T. L. 3576P	amabilis fir	65
" 29	West side Blk 75 Sproat Lake	hemlock	10
Aug. 1	West side Bacon Lake	hemlock	10
" 2	West side, north end Blk 146 Sayward Forest	hemlock	14
" 10	Thiemer Lake Creek at R. R. grade	hemlock	230

Excluding the listed samples the collections were small, averaging 2.85 larvae each.

At T. L. 3576 near Oshinow Lake the larvae had consumed only the upper surface of the needle, the remaining portions turning noticeably yellowish-red in colour. Practically no defoliation was found at the Thiemer Lake creek crossing where a sample was taken in a stand of hemlock regeneration. In the same vicinity, the south-west corner of T. L. 699, a collection was taken in a second-growth hemlock and amabilis fir stand. Here only one larvae was found although the trees showed signs of slight defoliation.

5. Prince Rupert Forest District.

Forty-three larvae of all species were collected throughout the district, the majority being obtained from June 26th to August 29th at the following locations. Tabulations are separated for species and shows comparison of numbers between 1949 and 1950 surveys.

Neodiprion tsugae Midd.

P L A C E	H O S T		N U M B E R S	
	1949	1950	1949	1950
Rainbow Lake	Hw	Hw	3	5
" "	Pl	Pl	1	0
" "	Ss	Ss	0	5
Prudhomme Lake	Hemlock	Hw	10	2
Scotia River	Hemlock	Hw	1	2
Salvus L-532	Hemlock	Hw	26	7
" "	Spruce	Spruce	0	1
Exchamsiks River	Hemlock	Hemlock	41	3
Exstew River	Hemlock	Hemlock	2	3
Khyex River	Hemlock	Hemlock	0	1
TOTALS	10	10	84	29

Neodiprion abietis ?

P L A C E	H O S T		N U M B E R	
	1949	1950	1949	1950
Green River	Balsam	Balsam	0	2
Rainbow Lake	Balsam	Balsam	0	3
Exchamsiks River	Balsam	Balsam	5	3
Kwinitsa River	Balsam	Balsam	8	2
TOTALS	4	4	13	12

Neodiprion sp.

P L A C E	H O S T		N U M B E R	
	1949	1950	1949	1950
Burns Lake	Spruce	Spruce	0	1
Taltapin Lake	Spruce	Spruce	0	1
Babine Lake, T. S. X-33677	Spruce	Spruce	0	1
Onion Lake	Pine	Pine	2	1
TOTALS	4	4	2	4

F. Striped Alder Sawfly - Hemichroa crocea Fourc.

1. Coast Area Surveyed by the "J. M. Swaine".

(a) North coast of mainland.

From Rivers Inlet to Stewart the coast area is practically free of these insects, only 8 larvae having been found in five collections.

(b) Queen Charlotte Islands.

The alder sawfly infestation in these islands appears to be declining. The largest number of larvae were found on Graham Island, where the defoliation is very light. The most active part of the infestation during 1950 was on the lower part of Moresby Island, from Cumshewa south to Lyell Island. At the time of visiting this area most of the larvae had pupated and many adults had emerged. They could be seen both on the trees and floating in the inlets. There was no mortality of alder noted except for some lower limbs and twigs, although large areas had been defoliated 50 to 100 per cent.

2. Lower Mainland and Fraser Valley.

The larval collections of this defoliator were negative in the lower mainland during 1950. This bears out the trend of past years in which specimens were rare. The reports of other coastal districts indicated that this sawfly had progressed south and east from the Queen Charlotte Islands and Sayward to the Powell River forest area. A careful check must be maintained in the future to detect continued spread to the lower mainland region.

3. South Vancouver Island.

The alder sawfly was present, no doubt, in more areas than the three mentioned below but full information was not available due to the lack of personnel to carry out the survey at the proper time.

The three areas where larvae were collected were Beaver Point on Salt Spring Island, north end of Tuck Lake and one half mile south of Port Alberni. A report also indicates that very heavy defoliation occurred in the Alberni region over a radius of about 5 miles.

4. North Vancouver Island.

This insect increased its area of defoliation around Campbell River, Duncan Bay, and Powell River. The largest districts of defoliation occurred in the vicinity of Powell River, mainly around the golf course and at the south end of Powell Lake.

At Port Alberni this insect was found in small populations behind the plywood mill during 1949. It is now active

on the Beaver Creek road north east of Alberni and on the China Creek road.

* 5. Prince Rupert Forest District - see Page 14A.

G. Spruce Sawflies, Pikonema spp.

1. Coast Area Surveyed by the "J. M. Swaine".

Pikonema larvae were found in practically every area surveyed by the boat in 1950, but were usually in small numbers.

In 99 collections the average number of larvae was just over 4.

The largest individual sawflies were as follows:

DATE	PLACE	NO. OF LARVAE
June 27	Rivers Inlet	16
July 4	Roscoe Inlet	12
July 7	Poison Cove	12
July 7	Mussel Inlet	10
July 15	Miskatla Inlet	10
July 31	Khutzymateen River	19
July 31	Khutzymateen Inlet	19
August 18	Lawn Point, Graham Island	10
August 23	Nesto Inlet, Graham Island	26

2. Lower Mainland and Fraser Valley.

Fourteen specimens were collected during the survey season.

Two of these were Pikonema dimmockii and the remainder Pikonema alaskensis. It was notable that all except one larva were found above 3,500 foot elevation.

3. South Vancouver Island.

One larva of Pikonema dimmockii was found at Wilson Creek and three at Port Renfrew on the north side of the river. Spruce was the host in both cases.

F. Striped Alder Sawfly - Hemichroa crocea Fourc. (continued)

5. Prince Rupert Forest District.

This defoliation occurs only in the coastal region of the district and was recorded at five locations from August 9 to September 12. The host in all cases was alder.

The light infestation recorded in 1949, in regeneration growth at Seal Cove, was continuing in 1950 with defoliation reaching 75 per cent by September 1. Noticeable leaf damage as a result of this sawfly's feeding was more common in the Lakelse Lake area in 1950.

Other areas where larvae were found were Salvus (L-532), Kyhex River and Clear Creek. Larval numbers were low in these areas and were first records.

4. North Vancouver Island.

Pikonema sp. larvae were recorded in five collections averaging three specimens each. All were from the Campbell River - Courtenay districts.

5. Prince Rupert Forest District.

Fifty-three larvae of these sawflies were collected from June 26 to September 8 throughout Prince Rupert Forest District. With the exception of one larvae, taken from a hemlock host at Salvus, B. C., all larvae were collected from spruce hosts.

Location, host, and larval numbers are tabulated below for the 1949 and 1950 surveys.

P L A C E	H O S T N U M B E R S			
	1949	1950	1949	1950
Morrison Lake	-	Sw	-	1
Rose Lake	-	Sw	-	1
Burns Lake	Sw	Sw	2	1
Babine Lake T. S. X-33677	Sw	Sw	0	2
Palling, B. C., T. S. X-38951	Sw	Sw	0	2
Boer Mt., Burns Lake	-	Sw	-	5
Pierre Creek, Babine Lake	-	Sw	-	2
Rainbow Lake	Ss	Ss	0	1
Scotia River	Ss	Ss	0	5
Salvus, L-532	Ss	Ss	16	7
Salvus, L-532	Hw	Hw	0	1
Kyhex River	Ss	Ss	8	3
Kwinitsa River	Ss	Ss	5	3
Kitsumgallum River, lower	Ss	Ss	2	7
Clear Creek	-	Ss	-	1
Cedar River	Ss	Ss	0	2
Exchamsiks River	Ss	Ss	2	2
Exstew River	Ss	Ss	0	1
Lakelse Lake	Ss	Ss	0	1
Fiddler Creek	Ss	Ss	0	1
Cedarvale	Ss	Ss	0	1
Endako River	Sw	Sw	1	0
Pinkut Lake	Sw	Sw	1	0
Forestdale	Sw	Sw	5	0
Morice River	Sw	Sw	12	0

continued -

P L A C E	H O S T N U M B E R S			
	1949	1950	1949	1950
Natalkuz Lake	Sw	-	1	-
Tetachuck River	Sw	-	1	-
Intata Lake	Sw	-	4	-
Eutsuk Lake	Sw	-	1	-
Shegunia River	Sw	Sw	5	0
Kitsumgallum Lake	Ss	Ss	1	0
Prudhomme Lake	Ss	Ss	1	0
Green River	Ss	Ss	2	0

H. Tent Caterpillars, Malacosoma sp.

1. Coast Area Surveyed by the "J. M. Swaine".

All areas surveyed produced negative results for tent caterpillars during 1950.

2. Lower Mainland and Fraser Valley.

An accurate estimate of the tent caterpillar population for 1950 was difficult to obtain due to the shortened survey season. No increase in population was indicated and only 28 larvae were forwarded to Langford laboratory for identification. One specimen was identified as M. disstria and the remainder as M. pluvialis.

3. South Vancouver Island.

Approximately 70 tent caterpillar larvae were found on alder 2 miles north of the Harris Creek Camp in the Port Renfrew area. This was the only collection containing this insect during 1950.

4. North Vancouver Island.

No tent caterpillars were found in this district during the 1950 survey.

5. Prince Rupert Forest District.

The widespread infestation of this forest tent caterpillar, extending from the junction of the Bulkley and Morice rivers to Skeena Crossing on the Skeena River in 1949, has subsided to small localized areas of defoliation.

This rapid decline of this infestation was not anticipated for 1950 due to the heavy moth flight in 1949, the numerous egg masses on aspen growth, as well as relatively low parasitic percentages in larval collections made in 1949.

Examinations of aspen stands in the Morice and Bulkley rivers on June 11, 1950 showed that no feeding had occurred and that the majority of egg masses were unhatched and black in colour. The extremely late spring and night frosts experienced throughout this northern central area of British Columbia in 1950 could quite possibly have been the principle factor causing definitely delayed leafing of aspen growth in this northern area (Photograph No.).

J. Dendroctonus Bark Beetles, Dendroctonus spp.

1. Coast Area Surveyed by the "J. M. Swaine".

No activity by any species of Dendroctonus was discovered in this district during 1950.

2. Lower Mainland and Fraser Valley.

No report of Dendroctonus bark beetles was made for this district during 1950.

3. South Vancouver Island.

The Douglas-fir beetle, Dendroctonus pseudotsugae Hopk.,

attack in the looper damaged timber in Wilson Creek has declined. Some mortality of Douglas fir has occurred but no new attacks have been found.

4. North Vancouver Island.

The Douglas-fir beetle was active in recently felled Douglas fir at the Van West Logging Company, Royston, B. C.

In a stand of second-growth Douglas fir behind Lund, several trees were found dead and two were dying. In the latter trees adults and larvae were active and in the dead trees old galleries were numerous. No attack on any vigorous trees could be found.

5. Prince Rupert Forest District.

The general insect hazard as a result of numerous Dendroctonus broods in logging slash areas throughout the Burns Lake, Southbank, Houston and Smithers ranger districts showed a marked decline in 1950.

Special reports on the original examination, April 2nd and 3rd, 1950, of slash and timbered areas of T. S. X-47826 and T. S. X-49447 east of the Palling land division and the subsequent re-examinations on June 8th, July 4th, July 27th and September 12th 1950 are contained in Section IV of this report. A report on present beetle activity within the area controlled for Alaska spruce bark beetle in 1947 and 1949 to the east of L-6613 Palling, B. C. based on examinations June 8th, July 4th, July 28th, September 12th 1950 is also contained in Section IV as is spruce bark beetle damage occurring on L-4268 Smithers.

The presence of Dendroctonus monticolae Hopk. in wind-thrown or damaged lodgepole pine trees to the south of T. S. X-35950 on

Babine Lake was recorded on July 20. Developing larval broods were few due to the heavy flow of resin in attacked trees. This resin flow resulted in the drowning out of numerous adults and flooding of brood galleries.

II THE STATUS OF INSECTS WHICH ARE
COMMON BUT RARELY IN
SERIOUS OUTBREAK

A. Green Striped Forest Looper, Melanolophia imitata (Wlk)

1. Coast Area Surveyed by the "J. M. Swaine".

Larvae of this species were found in only 20 collections, averaging less than two larvae per collection. They had a fairly wide distribution, being found from Bella Coola to Stewart, and on the Queen Charlotte Islands. They occurred from sea level to an elevation of 3,500 feet, on a wide variety of host trees.

2. Lower Mainland and Fraser Valley.

A total of 839 larvae of this geometrid were collected and forwarded for identification. The largest sample for 1950 was 36 and an average of 5 larvae per collection for approximately 160 samples. Distribution was wide spread, however, no serious defoliation has been directly credited to this species.

3. South Vancouver Island.

Larvae of this looper were commonly found on Douglas fir and hemlock throughout the lower island region between June 21 and August 4. Fifty-one collections contained this species; 32 from hemlock, 8 from Douglas fir, 2 from grand fir and 9 from

various other forest trees. They numbered from 1 to 7 larvae per collection.

(4) North Vancouver Island

These larvae appeared frequently in this district during 1950. However the collections were small, averaging 2.2 larvae each, and were found between June 20 and August 24.

Hemlock was the host in 51 samples of the 70 collections.

(5) Prince Rupert Forest District

Eight larvae were obtained from cedar and hemlock host at Rainbow and Prudhomme lakes, Exchamsiks River and at Maroon Creek from August 6 to 16th.

B. Grey Forest Looper, Caripeta divisata Wlk.

1. Coast Area Surveyed by the "J. M. Swaine".

Larvae of this species appeared after August 3 to 7 collections made north of the Nass River on the mainland, and on Princess Royal and Queen Charlotte Islands.

2. Lower Mainland and Fraser Valley.

Sixty-eight larvae of this fairly common geometrid were taken from 18 collections. Larvae of this species usually appear late in the season and more specimens would have been collected if the survey had continued later in 1950. Distribution was general for all sample points in the Fraser Valley and collections continued as far as Boston Bar and Lytton on both sides of the Fraser Canyon. The hosts were mainly Douglas fir, western hemlock and amabilis fir.

3. South Vancouver Island

Prior to August 30, larvae of this insect were not recorded in the southern island district. From then until September 7, when the survey work ended, they occurred in 19 collections with increased numbers in the southern portion of the district. Hemlock appeared to be the preferred host with a total of 25 larvae found in one hemlock collection at Sooke Lake in the Victoria watershed.

4. North Vancouver Island.

Between July 28 and August 25, thirty collections contained these larvae. In the following collections over 10 larvae were obtained.

DATE	LOCATION	HOST	NO. COLLECTED
August 18	Vernon Lake Blk 122	hemlock	11
August 19	North west corner TL 7228	Douglas fir	12
August 19	North west corner TL 7228	hemlock	24
August 20	South east corner TL 7228	hemlock	13
August 20	South east corner TL 7228	amabilis fir	20

The remaining collections averaged 2.5 larvae each and were mainly from hemlock.

5. Prince Rupert Forest District.

Four hundred and fifteen larvae of this geometrid were obtained in 64 collections throughout the district from August 6 to September 18. Host trees were spruce, hemlock, cedar, balsam and pine, with an average of 6.5 larvae per three beating collections.

Areas where larval collections exceeded ten for three beatings are tabulated below with numbers, date and host.

DATE	PLACE	HOST	NUMBER
August 16	Deep Creek	hemlock	58
August 16	Maroon Creek	hemlock	13
August 19	Gold Creek	hemlock	24
August 21	Pine Lake	hemlock	23
August 22	Kitsungallum River L-1408	hemlock	17
August 22	Luncheon Creek, L-1412	balsam	11
August 23	Lean-to Creek L-1402	spruce	19
September 6	Chindemish Creek	hemlock	21
September 8	Cedarvale	pine	17
September 8	St. Croix Creek	balsam	11
September 9	Kitsequecla River	hemlock	14

C. Green Velvet Looper, Oporinia autumnata (Gn.)

1. Coast Area Surveyed by the "J. M. Swaine".

In 16 collections, made between June 27 and July 10, 21 larvae of this species were recorded. These were collected from Owikeno Lake to Goat Harbour, on the northern mainland coast.

2. Lower Mainland and Fraser Valley.

In the period from June 9, 1950 to August 10, 109 larvae of this looper were collected. The average per collection was slightly more than 3 and distribution was wide spread. In no case were more than 12 larvae found in one sample, but the total was a definite increase over past years. Only one larva was recorded as parasitized, this being taken from the most populated area near Mount Cheam.

3. South Vancouver Island.

Collections of this insect were recorded between May 12 and July 4. They were found at varying elevations from sea level to

3,000 feet and appeared in 34 collections in the south east portion of the district. Hosts were hemlock, grand fir and cedar.

4. North Vancouver Island

Collections showed that this geometrid increased in numbers and distribution over recent years. Collections were generally small, averaging 2.6 larvae each for all collections less than 10 larvae.

All larvae were found between May 30 and July 29.

Collections of more than 10 larvae are listed as follows:

<u>DATE</u>	<u>LOCATION</u>	<u>HOST</u>	<u>Elevation in feet</u>	<u>Number Collected</u>
June 30	West of Paterson Lake	hemlock	1,500	26
June 30	" " " " TL4691	amabilis fir	1,500	16
June 30	" " " " "	amabilis fir	2,000	16
June 30	" " " " "	hemlock	2,000	57

D. Green Hemlock Looper, Nepytia phantasmaria Stkr.

1. Coast Area Surveyed by the "J. M. Swaine".

Larvae of this species were found only in the Bella Coola valley. They occurred in very small numbers having a maximum of two per collection extending from sea level to a point 42 miles up the valley.

2. Lower Mainland and Fraser Valley.

Eighty-three larvae were obtained from 42 collections. Distribution ranged from the Capilano watershed east through the Seymour, Coquitlam, and Alouette watersheds. Further collections were taken from a point south east of Alouette on the opposite slope

of the Fraser Valley, near the Lihumitson Valley. A review of past records showed no marked increase over previous years.

3. North Vancouver Island.

Collections of this looper amounted to 8 larvae found mainly in the Alberni district. Average larval collections were 1.14 each.

E. Green Spruce Looper, Semiothisa granitata Guen.

1. Coast Area Surveyed by the "J. M. Swaine".

This insect was not found in samples until July 31. Only 16 larvae were collected in 13 samples from the mainland coast, north of Khutzymateen Inlet, Princess Royal and the Queen Charlotte Islands.

2. Lower Mainland and Fraser Valley.

This geometrid provided 126 specimens, averaging 3 per collection. Distribution was more localized, being centered in the Greater Vancouver Watershed and along the mountain slopes of the Fraser Canyon. The larvae collected in the former area were primarily from western hemlock while in the latter, the host was Douglas fir. The larvae appeared to show preference for the host tree most prevalent in each area.

3. South Vancouver Island.

This insect appeared during the latter part of the season because most sampling at this time was carried on only in the south east of the district, it is not known whether the insect occurred throughout the area. The looper was common in other coastal regions and it was assumed that an endemic population was present in the whole lower island district.

4. North Vancouver Island.

This geometrid was found in 32 collections during 1950 from August 3 to August 28. The number of larvae averaged 2.73 in 30 collections. In 2 collections larvae averaged more than 10 as shown below:-

<u>DATE</u>	<u>LOCATION</u>	<u>HOST</u>	<u>Number Collected</u>
August 19	Blk 122 one mile east Vernon Lake	hemlock	16
August 20	south-west corner T.L.7228 Nimkish Valley	hemlock	11

5. Prince Rupert Forest District.

Six hundred and seventy-six larvae of this geometrid were collected from hemlock, spruce, balsam, cedar and pine hosts in the coastal region of the district. The fifty collections containing these larvae were made from August 10th to September 9th. Average number of larvae per three beating collection was 13.5 however there were a number of collections which greatly exceeded this average but no noticeable defoliation was recorded.

Areas where larval collections exceeded ten three beatings are tabulated below with numbers, date and host.

<u>DATE</u>	<u>PLACE</u>	<u>HOST</u>	<u>Number</u>
August 15	Kitsungallum River	hemlock	19
August 16	Kitsungallum River	hemlock	127
August 16	Kitsungallum River	cedar	13
August 16	Kitsungallum River	spruce	14
August 19	Gold Creek	hemlock	19
August 21	Pine Lake	balsam	35
August 21	Pine Lake	hemlock	46
August 21	Pine Lake	spruce	20
August 21	Pine Lake	cedar	10
August 22	Kitsungallum River	hemlock	79
August 22	Kitsungallum River	hemlock	14
August 22	Pine Lake	hemlock	47
August 22	Luncheon Creek	hemlock	21
August 22	Luncheon Creek	balsam	24
August 23	Lean To Creek	hemlock	68
August 23	Lean To Creek	spruce	47

F. Brown Banded Looper, Gabriola dyari Tayl.

1. Coast Area Surveyed by the J. M. Swaine.

Thirteen collections containing 17 larvae of this species were taken between Rivers Inlet and Swanson Bay on the northern mainland coast. Host trees included all conifers growing in the area.

2. South Vancouver Island.

Twelve collections of this geometrid larvae were recorded May 22 to June 20. The host in most cases was Douglas fir although 16 loopers were collected from willow at Jordon River, June 20.

3. North Vancouver Island.

During June 6 to July 11, 5 larvae were recorded at an equal number of points throughout the district.

G. Eupithecia sp.

1. Coast Area Surveyed by the J. M. Swaine.

This genus occurred quite commonly in northern coastal areas, 75 larvae having been found in 44 collections. These included several species occurring on both coniferous and deciduous host trees.

2. North Vancouver Island.

Eight collections containing larvae were sent to Victoria between May 18 and July 8. Ten larvae were found in one collection $\frac{1}{2}$ miles south of Deep Bay on the Island Highway. The remaining collections averaged 1.11 larvae. In all cases cedar was the host.

Larvae identified only as Eupithecia sp. were found throughout the district between July 8 and August 25. The average number of larvae per collection was 1.70.

3. Prince Rupert Forest District.

A total of twenty-seven larvae of this genus of geometrid was collected in small numbers from June 26th to September 14th. Distribution was general throughout the district. Date, location and host of collections are tabulated below.

<u>DATE</u>	<u>LOCATION</u>	<u>HOST</u>
June 26	Morrison Lake	balsam
July 6	Burns Lake	spruce
July 15	Angier Lake	balsam
July 20	Babine Lake T.S.X-33677	spruce
July 31	Pine Creek T.S. X-40002	balsam
August 10	Exstew River	balsam
August 15	Kitsungallum River	hemlock
August 17	Kitsungallum Lake	balsam
August 20	Copper River	hemlock
August 21	Shame River	balsam
August 21	Pine Lake	balsam
August 22	Zymagotitz River	hemlock
August 26	Exstew River	balsam
August 28	Lakelse Lake	hemlock
August 28	Lakelse Lake	spruce
August 29	Kitimat River	balsam
September 6	St. Croix Creek	hemlock
September 7	Fiddler Creek	hemlock
September 7	Fiddler Creek	spruce
September 7	Fiddler Creek	balsam
September 8	Kitwancool River	balsam
September 14	Fort Babine	balsam
September 14	Fort Babine	spruce

H. Transverse-banded looper, Hydriomena sp.

1. Coast Area Surveyed by the J. M. Swaine.

Loopers of this genus were quite common after the middle of July. Sixty collections averaged about three larvae each. The largest individual samples were taken on Graham Island, as follows:

DATE	PLACE	NO. OF LARVAE
August 16	McClinton Bay	16
August 23	Nesto Inlet	19
August 24	Dawson Harbour	15

2. Prince Rupert Forest District.

Thirty-seven larvae of this geometrid were collected from June 12th to September 10th throughout the district.

Date, location and host are tabulated below.

DATE	LOCATION	HOST
June 12	Burns Lake	willow
June 16	Pendleton Bay	willow
August 13	Kwinitsa River	alder
August 14	Kasiks River	alder
August 15	Kitsumgallum River	spruce
August 19	Gold Creek	spruce
August 21	Shames River	spruce
August 21	Pine Lake	cedar
August 23	Lean To Creek	spruce
August 28	Lakelse Lake	alder, spruce
August 29	Kitmat River	balsam
September 8	Cedarvale	spruce
September 10	Shequinia River	spruce

J. Saddled Larch Looper, Ectropis crepuscularia Schiff.

1. Coast Area Surveyed by the J. M. Swaine.

Larvae of this species appeared in only 18 collections. There were 33 larvae found, scattered nearly evenly throughout the west coast area, with no more than 4 to any one collection.

2. Lower Mainland and Fraser Valley.

The larch saddled looper showed a definite increase in the 1950 survey both in quantity and distribution. A total of 107 larvae was collected from a variety of hosts, both coniferous and deciduous. This number was approximately double that of 1949

although the distribution of population was general in the district.

K. Spotless Fall Webworm, Hyphantria textor Harv.

1. South Vancouver Island.

No webworm larvae were submitted to the insectary but they were recorded as being present on deciduous trees bordering highways, logging roads and disused railway grades. No instance of appreciable damage was recorded.

2. North Vancouver Island.

The webs of this insect were seen throughout the eastern coastal section of the district. One collection was made on alder at Sproat Lake, July 29.

L. Silver Spotted Tiger Moth, Halisidota argentata Pack.

1. South Vancouver Island.

Three tiger-moth larvae were recorded in two collections from islands in the Gulf of Georgia.

M. Green Striped Spruce Caterpillar, Feralia jocosu (Guen.)

1. Coast Area Surveyed by the J. M. Swaine.

Twenty-two larvae were found in 15 collections taken on the northern mainland coast between Bella Coola and Stewart. The host trees were Douglas fir, western hemlock, Sitka spruce and emabilis fir.

2. Prince Rupert Forest District.

One larva of Halisidota m. angulifera was found on willow or alder hosts at Kitsumgallum River, Kitsumgallum Lake, Lakelse Lake and LeGate Creek from August 15th to September 6th.

2. South Vancouver Island.

Five larvae of this cutworm appeared in 4 collections in the district.

3. Prince Rupert Forest District.

Twenty-four larvae of this cutworm were collected throughout the district from June 24th to September 9th.

It was noted that larvae collected in late June and July in the interior section of the district were well developed and commencing pupation.

Date, location and host of collections are tabulated below.

<u>DATE</u>	<u>LOCATION</u>	<u>HOST</u>
June 24	Taltapin Lake	spruce
June 28	Rose Lake	spruce
July 19	Babine Lake L-1873	balsam
July 31	Pierre Creek T.S. X-40002	balsam
August 7	Prudhomme Lake	hemlock
August 8	Scotia River	hemlock
August 16	Kitsungallum River	hemlock
August 16	Maroon Creek	spruce
August 17	Kitsungallum Lake	hemlock
August 19	Gold Creek	spruce
August 21	Pine Lake	spruce
August 26	Exstew River	spruce
August 28	Lakelse Lake	cedar
September 6	Chindemish Creek	hemlock
September 6	St. Croix Creek	hemlock
September 7	Fiddler Creek	hemlock
September 8	Cedarvale	hemlock
September 8	Cedarvale	balsam
September 8	Cedarvale	spruce
September 9	Kispoix River	spruce

N. Nyctobia sp.

1. Coast Area Surveyed by the J. M. Swaine.

Small numbers of Nyctobia larvae were found in 41 collections between Rivers Inlet and Stewart, on the northern mainland coast. No collection contained more than 5 larvae.

O. Microlepidoptera.

1. Coast Area Surveyed by the J. M. Swaine.

Throughout the northern coast area Sitka spruce had suffered from tip feeding by Microlepidoptera larvae, although specimens were not always present at the time of collecting. Most of the larvae found were of the genera Griselda and Zeiraphera sp. Wild currant shrubs at Kiltuish Inlet and Dola River were skeletonized by these larvae. The largest individual collections were as follows:

DATE	PLACE	HOST	
		spruce	hemlock
July 4	King Island	18	
July 7	Poison Cave	50	
July 7	Mussel Inlet	13	
July 28	McShane Creek		14
July 29	Union Bay		40
August 1	Kwinamass River		14
August 10	Belle Bay		12
August 23	Nesto Inlet		11

2. North Vancouver Island.

Noticeable efforts were displayed on young spruce by feeding of Zeitaphera ratzeburgiana (Ratz.) which extended from Parksville north to Seymour Narrows. One collection of spruce buds from Church Road in the Parksville area contained 30 larvae.

P. Pyralidae.

1. Coast Area Surveyed by the J. M. Swaine.

The cones on yellow cedar in the vicinity of Marie Lake, on Graham Island, were heavily infested with Pyralid larvae.

Q. Polychrosis piceana (Free.)

1. Coast Area Surveyed by the J. M. Swaine.

Many of the Sitka spruce cones examined in the Massett Inlet area of Graham Island were infested with larvae of this species.

R. Syneta sp.

1. Coast Area Surveyed by the J. M. Swaine.

A few beetles of this genus, not more than 7 to a collection, were found in 39 samples taken between Rivers Inlet and Stewart on the north mainland coast.

2. North Vancouver Island.

Adults of this Chrysomelid were found in 8 widely separated areas of the district. The hosts were mainly coniferous trees and the collections usually yielded one specimen.

3. Prince Rupert Forest District.

Ten adults were collected from June 12th to August 12th at the following locations:

<u>DATE</u>	<u>PLACE</u>	<u>HOST</u>	<u>SPECIES</u>
June 12	Burns Lake	spruce	albida
June 16	Babine Lake (S.E.)	birch	albida
June 17	Augier Mt.	spruce	carinata
June 19	Tintegal B. C.	balsam	carinata
July 18	Babine Lake L-1873	spruce	pillosa
July 18	Henrietta Creek	spruce	carinata
July 28	Palling, B. C.	balsam	pillosa
August 6	Rainbow Lake	hemlock	pillosa
August 12	Kyhex River	hemlock	pillosa

S. Alder Leaf Beetles, Altica sp.

1. Coast Area Surveyed by the J. M. Swaine.

Very few of these beetles were found in the northern coast area. The only localities where large numbers appeared in collections were the Bella Coola Valley, Kwatna Bay, and Ocean Falls. These collections did not exceed 30 larvae each.

T. Willow Leaf Beetle, Galerucella carbo (Lec.)

1. South Vancouver Island.

Many instances were recorded, during the survey season, of adult willow leaf beetles being found on coniferous trees however they probably had flown there from nearby willow clumps. Defoliation of willow in the area was not nearly as heavy as that recorded in previous years.

In Saanich, 120 adults were collected from one tree.

2. North Vancouver Island.

This beetle was present throughout the lower elevations of the district, skeletonizing the willow between Menzies and Union Bay.

3. Prince Rupert Forest District.

A few adults of this leaf beetle were collected from June 11th to September 6th at following locations. Galerucella punctipennis Mann. is also included in this list.

DATE	LOCATION	HOST	SPECIES
June 11	Morice River	Aspen	carbo
July 28	Palling L-6613	Willow	carbo
June 28	Topley L-2636	Willow	carbo
June 29	Rose Lake	Willow	carbo
August 16	Maroon Creek	Birch	carbo
August 18	Kitsungallum Lake	Willow	carbo
August 26	Exstew River	Willow	puntipennis
September 6	LeGate Creek	Willow	puntipennis

The willow leaf beetle, (Galerucella carbo Lec.), attack on willow in the Topley and Rose Lake areas show a decline in intensity with defoliation well below 50 per cent on the average.

U. Chrysomela sp.

1. Coast Area Surveyed by the J. M. Swaine.

Alder, willow and cottonwood were hosts of these beetles in 28 collections taken on the northern mainland coast, between King Island and Bear River, north of Stewart. The largest individual collections are summarized as follows:

DATE	PLACE	HOST TREES		
		Alder	Willow	Cottonwood
July 4	King Island	18		
July 11	Kiltmish Inlet	44		
July 13	Kildala River	36	55	
July 15	Miskatla Inlet	12		
July 16	Kitkiatka Inlet	32		
July 17	Kiskoch Inlet	52		
July 18	Klewnugget Inlet	24		
July 28	N. Arm Work Channel	33	50	
July 29	Union Bay	11		
August 1	Kwinamass Bay	46		
August 3	Kshwan River			23
August 5	Kitsault River	12	20	29
August 3	Hastings Arm			10
August 9	Bear River	18		16
August 9	Stewart	16		
August 10	Belle Bay	40		

2. Prince Rupert Forest District.

Adults of these three Chrysomela spp. were collected from August 9 to 28th in the coastal region of the district.

Chrysomela scripta adults were obtained from cottonwood host at Salvus, L-532 August 9th.

Chrysomela aeneicollis appear in collections from alder and cottonwood host at Kwinitza and Kaniks River area on August 13th and 14th.

River bottom cottonwood and alder growth in the lower Exchamsiks and Exstew River valleys showed heavy defoliation by Chrysomela interrupta. Defoliation generally ranged from 25 per cent to 50 per cent and occurred on regeneration and mature growth alike. This beetle was also present in limited numbers at Shames River and Lakelse Lake.

V. Green Rose Chafer, Dichelonyx backii Kby.

1. Coast Area Surveyed by the J. M. Swaine.

The only locality on the northern mainland coast where beetles of this species were taken was in the Bella Coola valley. Two collections taken at Mile 42 from western hemlock and Douglas fir produced 28 and 10 beetles respectively, while one collection from Douglas fir at Mile 32 produced 4 beetles.

2. South Vancouver Island.

Very few samples contained larvae or adults of this beetle. It was recorded in 12 samples from widely scattered areas throughout the district, never amounting to more than 2 larvae per collection.

3. Prince Rupert Forest District.

Adults of this species again caused damage to aspen foliage in the Topley and Rose Lake areas. Defoliation, however, was not as severe as previously in 1949.

Scrub willow cottonwood and aspen on the south slope of Burns Lake also suffered light leaf damage as a result of localized feeding by this beetle. Date of collections was June 28th and July 6th respectively.

W. Western Rusty Tussock Moth,
Notolophus antiquus badius Hy. Edw.

The only larva of this defoliator found in the Prince Rupert district in 1950 was collected from a cedar host at Lakelse Lake.

X. Miscellaneous Insects from the Prince Rupert District.

1. Cooley Spruce Gall Aphid, Adelges cooleyii (Gill).

Severe localized damage by this aphid caused numerous gall formations on the terminals of spruce host was recorded at Savory, B. C., Old Fort and L-1873 Babine Lake. Damage was most extensive in the last mentioned area. On all sites over mature, wolf Douglas fir tree were present.

2. Dotted Line Looper, Protoboarmia indicatana.

Small numbers of larvae of this geometrid were found at listed areas from September 2nd to September 17th.

DATE	PLACE	HOST
September 2	Lakelse Lake	cedar
September 7	Fiddler Creek	pine
September 8	Cedarvale	hemlock
September 8	Cedarvale	balsam
September 8	Cedarvale	cedar
September 8	Cedarvale	spruce
September 8	Kitwancool River	hemlock
September 9	Kitsequecla River	spruce
September 9	Kitsequecla River	cedar
September 9	Kispiox River	spruce
September 9	Kispiox River	balsam
September 10	Shequinia River	hemlock
September 14	Fort Babine	balsam
September 15	Babine Lake T.S.X-33677	spruce
September 15	Babine Lake T.S.X-33677	balsam
September 17	Babine Lake T.S.X-46444	spruce

3. Large Aspen Tortrid, Archips conflictana (Wlk.)

Larvae of this tortricid were collected in small numbers from aspen and alder hosts at Telkwa, Kitimat and Shequinia River areas on July 11th, August 30th and September 10th respectively.

4. Native web spinning sawfly, Cephalcia spp.

Five larvae were obtained from hemlock, balsam, spruce and pine host at Exstew River, Kwinitza River, Maroon Creek, Copper River and Summit Lake from August 10th to September 18th.

5. Arge sp.

Larvae of this sawfly were present in small number from August 16th to September 14th at following locations:

<u>DATE</u>	<u>PLACE</u>	<u>HOST</u>
August 16	Maroon Creek	birch
August 18	Kitsumgallum Lake	birch
August 19	Gold Creek	willow
August 20	Copper River	alder
September 7	Fiddler Creek	willow
September 8	Cedarvale	birch
September 8	Cedarvale	willow
September 14	Fort Babine	birch

6. The American Sawfly, Cimbex americana Leach.

Larvae of this sawfly were collected from willow host at Maroon Creek and Exchamsiks River on August 16th and 26th respectively.

7. Willow sawfly, Trichiosoma spp.

Larvae of this sawfly were collected from August 12th to September 6th at following listed places and hosts.

<u>DATE</u>	<u>PLACE</u>	<u>HOST</u>
August 12	Kyhex River	alder
August 13	Kwinitsa River	alder
August 14	Kasiks River	cottonwood
August 14	Kasiks River	alder
August 14	Kasiks River	dogwood
August 16	Maroon Creek	willow
August 18	Kitsumgallum Lake	birch
August 19	Gold Creek	maple
August 28	Lakelse Lake	willow
August 28	Lakelse Lake	alder
September 2	Lakelse Lake	alder
September 6	Chindemash Creek	alder

8. Acronicta grisea.

Twenty-two larvae were collected from August 16th to September 16th from the following list, place and hosts.

<u>DATE</u>	<u>PLACE</u>	<u>HOST</u>
August 16	Maroon Creek	willow
August 16	Maroon Creek	birch
August 17	Clear Creek	willow
August 17	Clear Creek	alder
August 18	Kitsungellum Lake	birch
August 19	Gold Creek	alder
August 21	Shames River	alder
August 23	Leen To Creek	hemlock
August 28	Lakelse Lake	birch
September 8	Kitwancool	alder
September 16	Babine Lake	alder

9. Plectura spinicauda Mann.

Seven adults were collected from August 9th to 17th from alder, willow, hemlock and balsam hosts at Salvus, Kyhex River, Kasiks River and Clear Creek.

10. Pissodes spp.

Leader damage to open growing Sitka spruce regeneration was again recorded at Remo and Terrace as a result of Pissodes sitchensis Hopk. attack.

Pissodes engelmanni Hopk. leader damage to open spruce regeneration was again prevalent in the shelter belt areas at Topley. Damage by this weevil was also recorded at Burns Lake Morice River, Cedarvale and Kitsequecla River.

11. Poplar Leaf Miner, Phyllocnistis populiella (Cham.)

A light infestation of this leaf miner was recorded in aspen groves of the lower Skeena River Valley east from Dorreen to Hazelton. Heaviest leaf damage was recorded in Fiddler Creek Valley, at Cedarvale, Kitwanga, Kitwancool, Skeena Crossing and in the Kitsequecla, Kixpiox and Saegonia River

valleys. Leaf damage at Fiddler Creek and Cedarvale ranged from 50 per cent to 75 per cent but generally damage did not exceed 25 per cent or 50 per cent of aspen foliage.

12. Willow rose gall, Rhaldaphaga strobiloidus.

Leaf damage and gall formations caused by this insect were numerous on scrub willow growth at Fiddler Creek and Fort Babine.

Z.

A total 53 negative samplings were made during the 1950 Forest Insect Survey from a total of 159 trees of varying species. Listed below are date, location and host of the negative samplings.

PLACE	DATE	S	H	B	P	C	A	D	W	Cot
Francoise Lake	June 6	1		1	1		1	1	1	
Ootsa Lake	June 7	1		1	1		1	1	1	
Burns Lake	June 9	1		1	1		1	1	1	
Endako, B. C.	June 10	1		1	1		1	1	1	
Burns Lake	June 12									1
Pinkut Lake	June 17				1					
Summit Lake	June 17				1					
Tintegal, T.S. X46775	June 19				1					
Pinkut Creek	June 21				1					
Topley, B. C.	June 28				1					
Old Fort, B. C.	July 7	1							1	
Babine Lake, Hagan Arm	July 8			1						
Green River	August 5					1				
Prudhomme Lake	August 7					2				
Scotia River	August 8			1		1				
Kyhex River	August 12					1				
Kwinitsa River	August 13					1				
Kitsungallum River	August 15									1
Mason Creek	August 16							1		
Lakelse Lake	August 28							1		
Onion Lake	August 30		1	1		1				
Chimdemash Creek	September 6					1				
Le Gate Creek	September 6					1				
Fiddler Creek	September 7					1				
Kitwancool River	September 8					1				
Kispiox River	September 9					1				
Shegunia River	September 10					1	1			
TOTALS		5	1	7	10	13	4	6	5	2

III. AREAS SURVEYED

A. Coast Area Surveyed by the J. M. Swaine.

In 1950, between June 20th and September 3rd the northern coast area of British Columbia, from Rivers Inlet to Stewart, including the adjacent islands, was covered by the J. M. Swaine. A total of 654 insect collections was made in this area during the season. The survey party consisted of:-

Forest Insect Ranger	E. G. Harvey (in charge)
Forest Insect Ranger	S. J. Allen
University Student	G. A. Jones
University Student	G. Jones

The ship's crew consisted of:-

Skipper	G. J. McHugh
Engineer	R. MacDonald
Cook	H. E. Burnett

Several factors affected the coverage attained and the effectiveness of the work done.

The weather was very bad for insect collecting during the summer. There were only eleven days without any rainfall, and some of these were on days when no collecting was done. This meant that most of the collections were made either in the rain or under wet conditions between showers and rain has been found to greatly reduce the number of insects found. Weather conditions also greatly reduced the number and clarity of pictures taken in the surveyed areas.

The extensiveness of the area to be covered in a limited season reduced to a minimum the amount of time which could be spent at each stop. In many cases considerably more survey work should have been done than time permitted.

The lack of charts for many of the inlets has been a factor in slowing the work. This meant that the boat had to slowly feel its way through miles of uncharted channels. By use of the depth recorder on the "J. M. Swaine" preliminary charts of these inlets were drawn for future reference.

The dinghies and outboard motors supplied for the work were both found to be inadequate. The outboard motors, sport-models of $3\frac{1}{2}$ and 5 H. P. did not have enough power to carry the dinghies against tidal currents through narrows, or against river currents into large lakes. This prevented working big areas which could have been reached with a work-model motor of slightly greater horsepower. The small, light dinghies are excellent for short trips to shore, but are not sufficiently sea-worthy for long trips. More than once the rangers were caught with a stalled motor, miles from the ship, when a storm blew up. This meant rowing for several hours against strong winds. Such risks should be unnecessary.

The limited amount of fresh meat, vegetables, and water which the ship could carry meant following an itinerary which would allow the vessel to reach another source of supplies before running out. Charts and maps are old and very misleading to anyone without a local knowledge of the coast. Many of the towns shown are no longer in existence and some small settlements have appeared since the charts were made. The following table may be useful in the future, because it

lists the places where supplies were found to be available:

<u>PLACE</u>	<u>water supplies</u>		<u>fresh meat</u>	<u>fuel</u>
Rivers Inlet	yes	yes	limited	yes
Namu	yes	yes	yes	yes
Bella Coola	yes	yes	yes	yes
Ocean Falls	yes	yes	yes	yes
Butedale	yes	yes	limited	yes
Prince Rupert	yes	yes	yes	yes
Port Simpson	no	yes	no	yes
Arrandale	yes	limited	no	no
Alice Arm	yes	limited	limited	yes
Stewart	no	yes	yes	limited
Wales Island	yes	limited	no	no
Masset, Graham Island	yes	yes	yes	yes
Port Clements "	no	limited	no	no
Shannon Bay "	yes	no	no	no
Queen Charlotte City	yes	no	yes	yes

1. Rivers Inlet.

(Surveyed June 26 - 28.)

This was the southern extremity of the area surveyed by the "J. M. Swaine" in 1950. There is a good wharf and float at the cannery at the head of Rivers Inlet. The agent there, Mr. Charles Lord, was exceptionally helpful and hospitable. He and his wife billeted two members of the survey party, without charge, for two days, when they became stranded at Rivers Inlet after an unsuccessful attempt to reach Owikeno Lake by dinghy. Areas worked from here are described below.

(a) Owikeno Lake.

This is a large lake, 35 miles long, draining into the head of Rivers Inlet. A small area at the west end of the lake has been logged but there are still large stands of hemlock, Sitka spruce, amabilis fir, and cedar around the lake and in the valleys of the glacier-fed streams running into it.

There is a trail from the cannery, up the north side of the river, to the Indian village. From there to the lake there is an old logging road. The only other approach to the lake is via the river. This can be run with a dinghy and outboard of at least 10 H. P., but it is a very dangerous trip. Indians will take boats and passengers through to the lake for Ten Dollars each. It takes most of a day to make the four mile trip. The Dominion Government has a fish hatchery on the lake by the head of the river, so any further information required could be obtained from the head office of the Department of Fisheries.

(b) Moses Inlet.

Samples were taken in Hardy Inlet (west arm) and in North Arm. These areas were worked by dinghy from the "J. M. Swaine". Anchorage for the night was found at the head of North Arm on June 26th.

(c) Kilbella Bay.

This bay lies between Moses Inlet and the head of Rivers Inlet, on the north side. The bay provided good anchorage for the night.

2. Burke Channel.

(Surveyed June 29 - July 4.)

Burke Channel includes the area from Namu to Dean Channel. The areas sampled are described below.

(a) Kwatna Inlet.

This inlet leads southward from Burke Channel, opposite

the centre of King Island, for a distance of several miles between well-timbered mountains. Collections were made in a small inlet which branches to the east, and along the Kwatna River which flows into it.

(b) South Bentick Arm.

Parts of this 30 mile long inlet have been logged off but the remainder is still heavily timbered. A logging camp is located at the head of the inlet near Noch River. Roads lead back to the timbered areas.

(c) Bella Coola.

The village is located at the mouth of the Bella Coola River which flows into the head of North Bentick Arm. The valley, which has public roads extending inland for nearly 50 miles, has been described in detail in previous reports. Mr. W. Benwell, the assistant forest ranger stationed here, was very helpful, supplying transportation up the valley. This is the northern extremity of the Douglas fir stands on the coast of British Columbia.

(d) King Island.

This large island has fairly low mountains, covered with trees to the top. Collections were made on the west side of the island, near a waterfall which empties into Fisher Channel.

3. Ocean Falls.

(Surveyed July 3 - 5.)

Between Dean Channel and Mathieson Channel, this area consists of numerous narrow, twisting inlets separated by peninsulas of low elevations. They are well timbered with

stands of hemlock, Sitka spruce and cedar. Descriptions of the collection points follow.

(a) Cousins Inlet.

Ocean Falls, the large paper-mill town, is located at the head of this inlet. Collections were made at various levels on Claire Marion Mountain, which rises abruptly from the town-site, and along Marmot River which flows into the inlet two miles west of Ocean Falls.

(b) Roscoe Inlet.

This is a very long, twisting inlet with high, rugged mountains surrounding its head.

Timbered hills
between the
inlet and the
higher mountains.



(c) Briggs Inlet

There is a narrows in this inlet which prevents anything larger than a dinghy from entering. Several miles of inlet lie beyond this narrows.

(d) Tom Bay

This is a small bay on the west side of the Don Peninsula near the entrance to Mathieson Channel.

4. Mathieson Channel.

(Surveyed July 6 - 7).

There is considerable timber in this area, especially along the main channel. The inlets are bordered by very rugged mountains with timber only in the valleys leading into them. A float logging camp was located near the entrance to Kynock Inlet. The main points surveyed are described below.

(a) Kynock Inlet.

This inlet is surrounded with very high, rugged mountains, with little timber except near its entrance from Mathieson Channel and at the head of the north arm.



Timbered valley on north side of entrance
to Kynock Inlet.



Valley at head of north arm of
Kynock Inlet.

(b) Korich Lake.

Korich Lake is on the east side of Mathieson Channel just south of the entrance to Mussel Inlet. There is a blazed trail leading to it on the south side of the river. The lake lies on top of a well-timbered bench, several hundred feet above sea level. This offers an excellent opportunity to get away from the sea front for sampling. Incidentally, the lake provides very good fly fishing.

(c) Mussel Inlet.

There is considerable timber at the north end of the inlet, and along the slopes and valleys on the western side.



Timbered slopes at the north end of
Mussel Inlet.



Valley entrance at NW
corner of inlet.

(d) Poison Cove.

This is a very rugged part of the country with no timber except in two small valleys, one at each end of the cove.



Valley at north end of Poison Cove,
showing small timbered area.



Valley at south end of Poison Cove,
showing rugged nature of the area.

5. Graham Reach.

(Surveyed July 8 - 10, September 3).

This is the main shipping lane between Princess Royal Island and the mainland, with many narrow inlets running inland. The lower levels of the surrounding mountains are all covered with good stands of hemlock, cedar, and Sitka spruce. The areas surveyed are described below.

(a) Princess Royal Island.

This island is quite mountainous, but is well covered with trees. At Butedale there is a stairway up to the lake, offering a good opportunity to get to a higher elevation easily. Collections were also made in a sheltered bay near the southern end of the island.

(b) Green Inlet.

This is an uncharted inlet with a narrows a few miles in from its mouth. At slack water this narrows can be passed with a dinghy. There are several miles of inlet beyond, bordered by low hills which are covered with good stands of hemlock and cedar.

(c) Swanson Bay.

The charts show Swanson Bay as a town with a very large wharf. Neither the town nor wharf now exist. Good regeneration now covers the area.

(d) Khutze Inlet.

There is a good stand of timber along the river which flows into this inlet.

(e) Klekene Inlet.

This inlet is located directly across Graham Reach from Butedale. The surrounding mountains are not high and have a fair amount of timber on them.

(f) Goat Harbour.

Goat Harbour is a very small inlet to the north of Graham Reach, in Ursula Channel.

6. Gardner Canal.

(Surveyed July 11 - 13.)

Gardner Canal is the rockiest, most precipitous area on the coast of British Columbia. The mountains rise abruptly from the sea, and have glaciers showing on the tops in several places. The only timber to be found is in the first few miles near the mouth of the canal, except for small stands in the river valleys and at the heads of the inlets. A logging camp is in operation at Collins Bay. A description of the areas sampled follows.

(a) Triumph Bay.

This inlet offers good sheltered anchorage for the night. There is only a small amount of timber here.

(b) Kiltuish Inlet.

The "J. M. Swaine" could not enter much beyond the mouth of this inlet because of rocks and shallows. There is a long narrow inlet beyond this which can be reached by dinghy.

(c) Kemano Bay.

There is a large stand of mature spruce extending for several miles up the Kemano River valley, according to Fisheries men who are working there. They also report a good trail for ten miles, in to the proposed site of the power plant to be built for the Aluminum Company of Canada. Time did not permit a trip over this trail.

(d) Kitlope River

This river is very glacial, with about two miles of delta at the mouth, making it difficult to reach the trees.

7. Douglas Channel.

(Surveyed July 13 - 17).

Douglas Channel is bordered with fairly low mountains, with a very wide, low valley at the head. There is a lot of timber here, mainly hemlock, Sitka spruce and amabilis fir. There are several small logging camps operating in the area. The areas sampled are described below.

(a) Eagle Bay.

This bay is not on the charts, but it shows on the maps. Part of the area has been logged but considerable timber remains.

(b) Kildala Arm.

This is a heavily timbered area, part of which has been logged off. There is a logging camp in operation on the south side of the arm at present. Collections were made back of an abandoned Indian village near the mouth of the Dala River, and

along the Kildala River, which is navigable by dinghy for several miles.

(c) Kitimat.

This is the site which was chosen by the Aluminum Company of Canada for their large new aluminum plant. There are large stands of timber in the wide, low valleys behind here. It is necessary to tie the ship at the wharf at Kitimat Mission and visit the Kitimat River and Minette Bay areas by dinghy. This can be a very dangerous trip in a light dinghy as the wind blows strongly up Douglas Channel and the tidal currents are strong in the narrows entering Minette Bay.

(d) Miskatla Inlet.

This is a narrow inlet with fairly good stands of timber around it.

(e) Giltoyees Inlet

This inlet is very long and precipitous, with very little timber except at the head. An island near the mouth can be passed on either side. There is good anchorage here for the night.

(f) Drumlummon Bay.

Collections were made in an inlet, and along a fairly large river which enters it, due west of Dorothy Island on the east side of Hawksbury Island. This inlet does not show on any of the maps or charts. Good stands of Sitka spruce and hemlock are to found here.

(h) Kitkiata Inlet.

The river at the head of this inlet is navigable by dinghy for at least eight miles, through a wide, low valley. The area has been selectively logged and is now covered with good regeneration. A Fisheries' man is stationed here, in a cabin on the north side of the inlet.

(i) Kiskoch Inlet.

The entrance to this inlet is very shallow and should not be attempted at low tide without the depth recorder. A narrows just inside the entrance can be navigated by dinghy only at slack water. Several miles of inlet, bordered by well-timbered hills, lie beyond.

8. Grenville Channel.

(Surveyed July 18 - 19).

This is the main shipping route to Prince Rupert, between Pitt Island and the mainland. The bordering mountains have well-timbered slopes, and the inlets open into low valleys, some of which have had logging done in them. Sample areas are described below.

(a) Lowe Inlet.

A trail leads from the Indian village at the head of this inlet up past the waterfalls to the lake.

(b) Klewnuggit Inlet.

There are several arms in this inlet, in one of which there is a logging camp in operation. A lake flowing into the inlet can be reached by a very short portage.

(c) Baker Inlet.

This inlet must be entered and left during the slack of the tide. Beyond the very narrow entrance lies several miles of inlet surrounded by low, well-timbered mountains. A trail on the north side of the river leads to Alvin Lake.



The entrance to Baker Inlet
by Grenville Channel



The narrow channel from Baker Inlet
looking towards Grenville Channel.

(d) Kumealon Inlet.

Kumealon Inlet is very broken, with a waterfall barring entrance to the inner part. Possibly this could be passed by dinghy at high tide. Part of this area has been logged and is now covered with young regeneration.



Waterfall which divides Kumealon Inlet covers parts of the inlet with foam.

9. Portland Inlet.

(Surveyed July 25 - August 8).

This takes in a large area, cut by deep inlets and channels, between Prince Rupert and the Nass River. Some logging has been done here leaving areas of young regeneration, but most of this section is still covered with good stands of timber. Description of the areas surveyed follows.

(a) Chatham Sound.

Collections were made around Big Bay and Port Simpson. These parts have been logged and are now covered with young regeneration, of a scrubby nature.

(b) Work Channel.

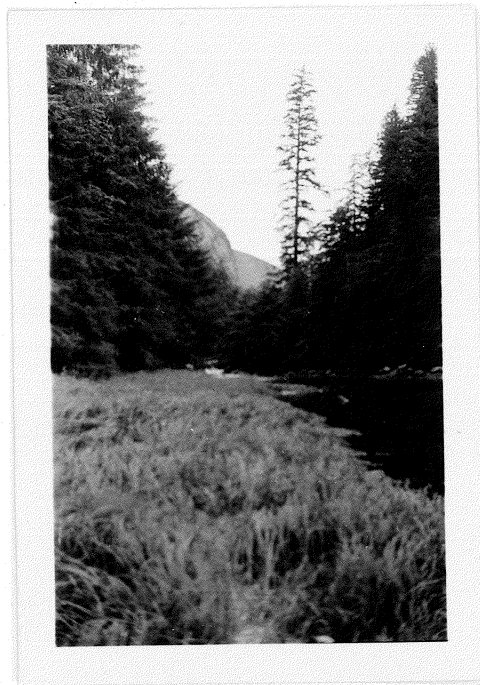
This is a very long channel with good stands of timber, mainly in the northern parts. The southern half, and the North Arm are very rugged and precipitous with little timber of value except in the river valleys. Collections were made in the North Arm by the Toon and the McShane rivers. In the main channel the Split Mountain lakes and the Lachmach River areas were sampled. Parts of the latter have been logged and are covered with young second growth.



North Arm of Work Channel
showing water falls and rugged nature
of the mountains.



North arm of Work Channel
showing the narrows and topography.



Work Channel: Salt Lake
looking toward Split mountain and Split Mountain Lake.



Head of Work Channel
showing cut-over spruce and hemlock.

(c) Khutzeymateen Inlet.

The Khutzeymateen Inlet area contains very large stands of hemlock, cedar and Sitka spruce. The head of the inlet, which is not charted, presents a danger to ships as there is an exceptionally large delta at the mouth of the river. At low tide a mud flat extends about a mile out from shore. The Columbia Cellulose Company, which has large timber holdings here, is opening up a new camp at Mouse Creek, about the north center of the inlet. It is possible, in an emergency, to get supplies here.

(d) Union Bay.

There is a good stand of mature hemlock around this inlet. Samples were taken as far as the lake which drains into it. This was a difficult climb as there was no trail.

(e) Kwinamass Bay.

It is necessary to anchor at the entrance of this bay, go ashore by dinghy and then walk. Most of the bay becomes a mud flat at low tide.

(f) Ness Bay.

Ness Harbour has become silted from the Ness River and can only be approached by dinghy. Iceberg Bay offers good anchorage, and the river flowing into it is navigable by dinghy for a considerable distance.

10. Observatory Inlet.

Surveyed August 3 - 7.

This inlet extends northward from the mouth of the Ness River for nearly 50 miles, and is divided for a third of its length into two arms. Timber conditions vary greatly in these arms due to the effects of the smelter fumes from Anyox, which was located just west of the branch of the inlet. Nothing remains of this town now except the wharf, the building having been burned. Anyox and the surrounding mountains, for several miles at least, are completely bare. A description of the arms in this inlet follows.

(a) Alice Arm.

A considerable amount of logging has been done around Alice Arm and the area is now covered with good regeneration. A good stand of mature hemlock extends up the Kitsault River. Transportation can be arranged with the trucking firm which

contracts the hauling for the Torbrit Silver mine. This mine is located 17 miles up the valley at an elevation of 1,700 feet.

(b) Hastings Arm.

Most of the mountains bordering Hastings Arm are bare, the trees having been killed by fumes from Anyox and subsequently burned. Patches of young regeneration are beginning to show. There is a small stand of timber at Bear Creek, on the east side, and a good stand extending up the Kshwan River at the head of the inlet. The delta at the mouth of this river makes it difficult to reach the timber.

11. Portland Canal

(Surveyed August 9 - 11)

This includes all that portion of British Columbia facing Alaska, from Wales Island to Stewart. The mountains of the peninsula and islands bordering the canal are low and well covered with timber in the southern end. The northern end is more rugged with precipitous mountains, crowned with glaciers, in the vicinity of Stewart. Here the timber is limited to the valleys and lower levels. Samples were taken at intervals from Wales Island, up the canal to Stewart, and up the Bear River Valley from Stewart for 15 miles. Transportation up this valley can be arranged in Stewart.

12. Graham Island

(Surveyed August 15 - 25).

The northern and eastern parts of Graham Island are low and sandy with some areas of muskeg. The southern and western parts

are more mountainous, with some elevations exceeding 2,000 feet. Large stands of Sitka spruce, hemlock and cedar cover most of the island, but the western slopes of the mountains facing the Pacific are covered with scrub timber only. One large logging operation is carried on from Juskatla Inlet, in the central part of the island.

The Forest Ranger, H. Hammer, was very helpful in the survey of Graham Island. He supplied transportation by road where it was possible. By water, his boat, powered by a 16 h.p. outboard motor, took our survey party into areas that could not have been reached with our own dinghy. Descriptions of the areas sampled follow.

(a) Masset.

From Masset, in the entrance to Masset Inlet, the North Beach area to Tow Hill was surveyed. The Forest Ranger borrowed the car belonging to the Indian Agent, Mr. Findley, for this trip. The area is very low, with sand dunes facing to the north, covered with stand of Sitka spruce.

(b) Masset Inlet.

This inlet is right in the centre of Graham Island, and about a third of the island can be covered from here. The inlet is surrounded by heavily timbered low mountains and hills. A few large Sitka spruce have been cut from the shore line. Kumdis Island, the Ain River and the inlets on the west end of Masset Inlet can all be reached by dinghy from the J. M. Swaine. Other areas are:

(i) Juskatla Inlet.

It was necessary to use the Forest Service boat to enter this inlet through the narrows. A large logging company, The Kelly Logging Company, has a camp at the mouth of the Mamin River. The superintendent, Mr. C. Germyn, supplied transportation over their roads which go in as far as the headwaters of the Yokoun River.

(ii) Tlell.

The Forest Ranger supplied us with use of his car for survey work from Port Clements east to Tlell, and south as far as Lawn Point. Much of this area is low and sandy, with areas of muskeg between Port Clements and Tlell.

(c) Naden Harbour.

There is no longer a settlement in Naden Harbour. This harbour gives access to a very large timbered area in the northern part of Graham Island. Naden River is navigable by dinghy for a distance of about two miles at high tide.

(d) West Coast.

The west coast of Graham Island is very rugged with a dangerous, rocky coastline and many inlets. There is a good fisherman's float at Langara Island, and sheltered anchorage may be obtained in most of the inlets. The mountains facing the sea are covered with scrub, but the inlets and sheltered side of the mountains and islands contain good stands of hemlock and spruce. Samples were taken at Langara Island, Port Louis, Nesto Inlet and Dawson Harbour.

13. Moresby Island.

Surveyed August 24 - August 29.

Moresby Island is quite mountainous, with many inlets and smaller adjacent islands. As with Graham Island, the slopes facing the Pacific are covered with scrub timber. All the remainder of the island is very heavily timbered with stands of Sitka spruce, hemlock and cedar, except those parts which have been logged. Several large companies have logging operations here. Many of the logged areas now have an overstory of alder. Areas surveyed are described below.

(a) Skidegate Inlet.

This is a very narrow and very shallow channel separating Moresby Island from Graham Island. A ship the size of the "J. M. Swaine" cannot make this passage on a tide of less than 17 feet, and should not attempt it then unless accompanied by a guide with local knowledge. At the west end of this inlet lies Chestl Island which is covered with scrub timber except on the sheltered side (Armentiers Channel) where some logging has been done. The Forest Ranger supplied transportation from Alliford Bay to Sandspit on the eastern end of the inlet. Much of this area has been logged by the Northern Pulpwood Co. at Sandspit.

(b) Cumshewa Inlet.

There are several large logging companies operating in this area, both on Louise Island and on the north side of the inlet. Louise narrows can be surveyed by dinghy only, as it is dry in the narrowest part at low tide.

(c) Selwyn Inlet.

Pacofi is now a deserted settlement. Much of this area has been logged and now has an overstory of alder. Collections were also made at Thurston Harbour and Lyell Island.

B. Lower Mainland and Fraser Valley.

A thorough description of the lower mainland area was made in the 1947 and 1948 survey reports. Since these reports were written, two new areas have been added to the district. These will be designated the Fraser Canyon and Hope-Manning Park. Descriptive photographs of permanent sample points and adjacent areas in the district are included at the end of this section.

1. Fraser Canyon.

A complete description of this area is not possible because only a preliminary survey was carried out in 1950. With this fact in mind the 1951 survey will be conducted so as to complete the information in greater detail. This region covers approximately 1,000 square miles, through which truck travel is limited to the main highways and a few logging roads. These logging roads occur between Yale and Hope in the southern portion and between Boston Bar and Lytton in the northern section. Between Yale and Boston Bar the terrain is exceedingly rugged and steep. The primary timber species is Douglas fir but growth is not exceptional in size or quality. Drainage is restricted to four creeks, the largest of which is Spuzzum Creek, a rushing mountain stream which does little to irrigate the timbered areas.

Between Hope and Yale there are two logging operations. One is the Texas Lake Logging Company, the other is the Emory Creek Logging Company. These two operations provide the only access into the mountain areas west of the Fraser Canyon, between Hope and Yale. The east side, along which the C. N. R. tracks run has no logging operations, villages, or stopping points and cannot be reached except by pre-arranged stops with the railway. A crossing of the Fraser Canyon is out of the question.

The northern part of the Fraser Canyon area, between Boston Bar and Lytton, is much more accessible due to the more gradual incline of the timbered slopes. On the west side, which is reached by aerial cable ferry from Boston Bar, a secondary road runs north for 13 miles into the Nahatlatch Valley. The dominant stand is hemlock, cedar and Douglas fir. Small logging operations have been carried out in the past along this side of the Fraser River but no large scale land clearing has been done. The only fire of any size in recent years was in regeneration along the north side of the Nahathatch Valley and although the exact size of the burned area is not known, it was limited to a few hundred acres.

At present no contacts are known with the exception of the British Columbia Forest Service assistant ranger just south of Lytton and Patrolman William Sacho of the British Columbia Forest Service at Chilliwack. (H. Stevenson - Ranger).

2. Nicolium - Sumallo River Valley.

This valley reaches south and east from Hope to Allison Pass. It is steep-sided and timbered for about 10 miles with a typical coast stand of Douglas fir, hemlock, lodgepole pine, and spruce. Ground cover is mainly braken, huckleberry, salmonberry and devils club. East of this point the valley widens slightly and the nearby mountains become more rolling in nature. The timber gradually changes to a Douglas fir, spruce, lodgepole pine open growing stand of lower volume per acre. One large open area in the valley, approximately 20 miles east of Hope is rather flat and sandy, stocked almost solely with lodgepole pine. It is close growing, branchy and of low merchantability. Further east the valley again narrows and becomes a deep well-stocked gorge with Douglas fir, spruce and white pine predominating. The whole valley is travelled by one road, the Hope-Princeton Highway. This road is of high standard throughout and passes through varying timber stands and burned areas which have appeared in recent years. The most serious fire took place near the park border in 1948 and laid waste 5,700 acres of moderate sized Douglas fir, pine and spruce. The valley reaches 4,400 feet at Allison Pass where it terminates and this point is used as the eastern boundary of the Lower Mainland district.

Drainage for this area, approximately 70 square miles, is brought about by the Skaist, Sumallo and Snass creeks flowing

into the Skagit River and a number of small nameless creeks draining into the Nicolum River farther west. The annual snowfall in the valley is heavy but drainage is rapid and tree growth good at the lower elevations.



Permanent Sample Point - Chilliwack Area - 17A.

Permanent Sample
Point - Stove
Lake - 5.





Permanent Sample Point - Fraser south - F. S.-6.



Permanent Sample Point - Pitt River - 3-A



Lodgepole pine regeneration - Chilliwack River
Valley 1948.

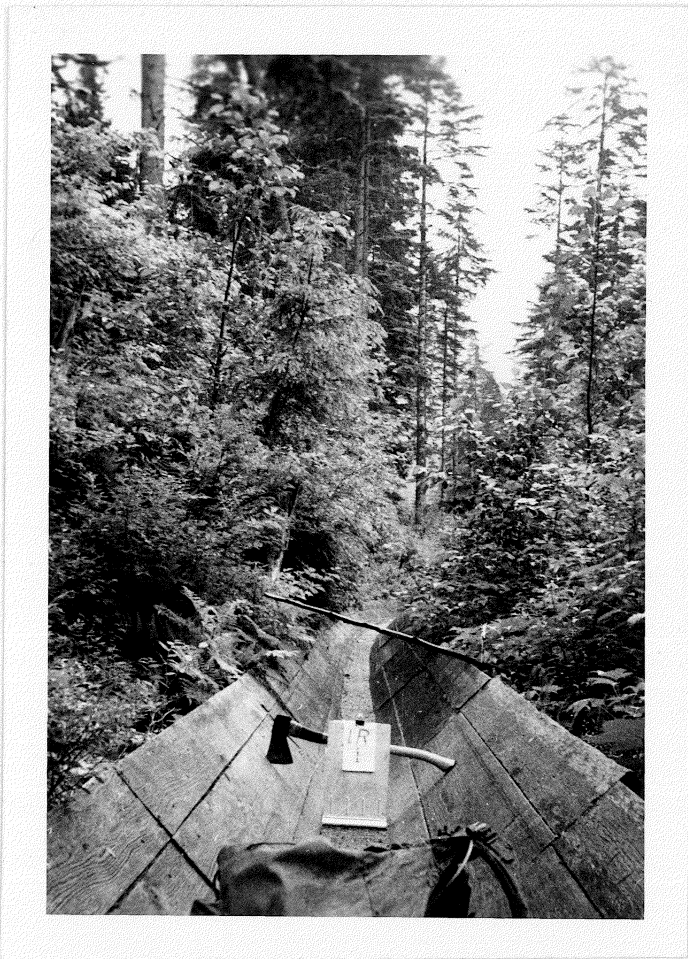
Permanent Sample
Point - Chilliwack
Area - 9A



Permanent Sample Point - Chilliwack Area - 13A

Permanent Sample
Point - Chilliwack
Area - 17A



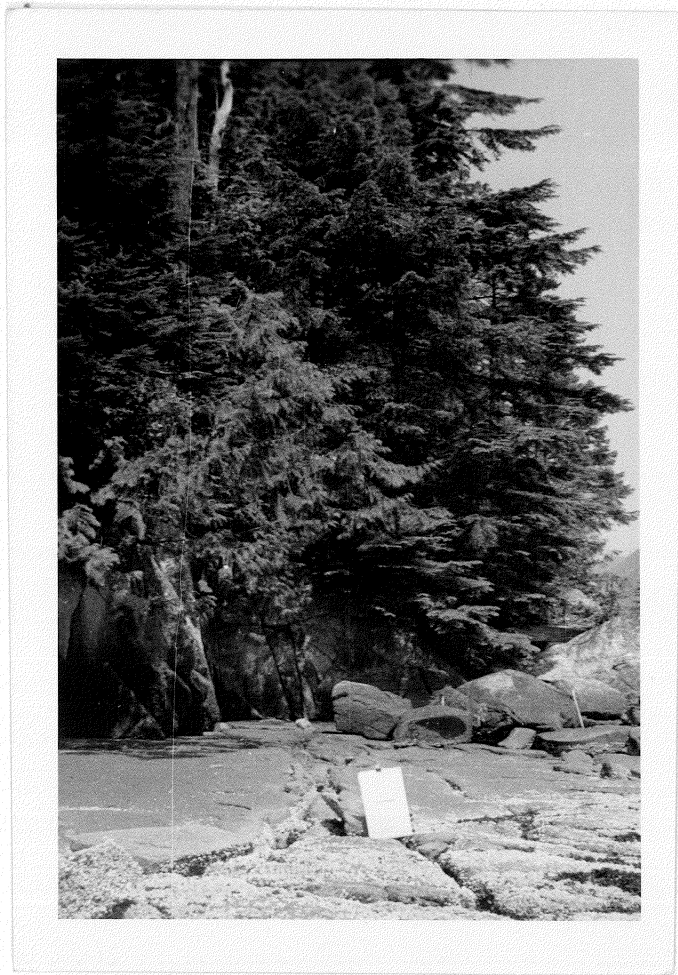


Permanent Sample Point - Indian River - 1.



INDIAN RIVER.

LOOPER KILL 1929-30.



Permanent Sample Point - Indian River - 2.

C. South Vancouver Island.

The southern Vancouver Island district has been discussed as to timber types, topography and accessibility in previous reports. The ranger who carried out the survey work in 1950 has resigned and very little can be added to the information already recorded. A few areas have more extended road systems, built since 1949.

1. Sarita Bay - Alberni Inlet.

Bloedel, Stewart and Welch have advanced operations from Sarita Bay to the Klanawa Valley. Their road has been constructed to within one mile of the main river fork. Salvage of looper killed timber is still being carried out but at the present time only one good log is available in each tree.

2. Nanaimo Lakes.

A road has been constructed from the Island Highway near the Nanaimo River along the north side of the river to the Nanaimo Lakes. This gives much easier access to a large area in which there are several large logging operations and stands of valuable mature timber.

D. North Vancouver Island.

This district was described in detail in the reports of 1948 and 1949. A few parts of the district have since been surveyed for the first time and in a few places the conditions have changed during the 1950 season. The following description covers this additional information.

1. The Nimkish and Gold River Valleys.

These two drainage systems form a trough through Vancouver Island from the mouth of the Nimkish River on Johnstone Strait to Muchalet Inlet on Nootka Sound. A low divide of 1,100 feet separates the valleys of the Nimkish and the Oktwanch rivers. The latter joins the Muchalet, the Muchalet joins the Gold and the Gold River joins the Heber River which flows south-west into Muchalet Inlet.

The region from Engelwood to Nimkish Lake has been logged and is now covered with a stand, mainly of hemlock and amabilis fir regeneration. The timber bounding Nimkish Lake is scrubby because of the rocky nature of the terrain. The valley from here south to Woss Lake contains a mixed-age stand. Most of the timber in the valley bottom has been logged in recent years. The north side supports a stand, predominantly Douglas fir, that is 100 to 120 years old.

The timber from Woss Lake south to the divide and Vernon Lake comprises some of the best stands of Douglas fir, hemlock, and cedar remaining in British Columbia. South from the divide to the Oktwanch River the trees are generally smaller, the stand comprising a mixture of hemlock, Douglas fir, amabilis fir, and western red cedar. From Muchalet Lake south to the junction of the Heber River, hemlock, amabilis fir, and cedar are the main species encountered, with occasional areas of Douglas fir intermixed. Stands in the Heber Valley are patchy because of its rocky nature. Pockets of Douglas fir fringe the river but larger stands of hemlock and amabilis fir cover the valley. Lodgepole pine occurs on the rock outcrops.

From Davie River a trail leads to the north end of Vernon Lake, thence through block 122 across a low pass to the upper Ninkish River. The Vernon Lake end of this trail was in good condition during 1950, although it became increasingly indistinct after crossing Surprise Creek. The trail wanders through the divide over beaver dams and swamps. After crossing the main Oktivanch River, the trail stays on the west side and is adequately blazed except around camp sites and creek crossings, or where windfalls have made it almost impassible. After leaving Muchalet Lake on the north side of the river a fairly well marked trail is found leading to the Gold River, crossing just above the forks. This trail appears to be heading too far north in some places. On crossing by a fallen tree to the east side of the Gold River, the trail blazes are found about 100 yards to the south. Within about 5 miles the trail reaches a small lake. From here the best trail south is in very poor condition and impossible to follow in some parts. An over-head cable at the junction of the Gold and Heber rivers is usable although difficult to handle. If the river is low enough, wading is the better method of crossing. The Heber River trail follows the north side of the river to the southwest end of block 5, crosses over to the south and switches back to the north side again within about 3 miles. The trail to Crest Lake, where the main Heber River swings north, is straight across the river bed and not to the north as the signs and blazes indicate. Although most of the trail throughout this part of the country is in good condition, it is easily lost because of poor blazing.

2. Powell River Area.

This area rises gently north-east for a distance of 5 to 8 miles from the Strait of Georgia to the coast mountains. The Powell, Haslem, Horseshoe, and Gordon Pasha Lake valleys cut further back inland.

Originally the lower areas supported one of the best stands of Douglas fir in British Columbia. The area, now almost completely logged, is growing excellent stands of second-growth Douglas fir and extensive stands of alder. On the higher elevations hemlock and amabilis fir are the main timber species, with smaller amounts of red cedar intermixed.

The main government road follows the coast from Lund south to Thunder Bay at the entrance to Jervis Inlet. A British Columbia Forest Service road runs up the Horseshoe Valley following the old Bloedel, Stewart and Welch main line to a lookout station. Several other secondary roads and railway beds serve other areas.

Mr. Black of the British Columbia Forest Service is situated in the Powell River courthouse and is an excellent contact for assistance in this area.

Transportation from
Comox to the Powell
River area -
June 23, 1950.



3. Sayward.

The Salmon River Logging Company changed from locomotive to entirely truck operations during 1950, making the area much more accessible for sampling.

4. Campbell River.

The eastern portion of the Campbell River area was logged a number of years ago and now supports a vigorous stand of predominantly Douglas fir regeneration.

Regeneration in the
Roberts Lake area -
May 25, 1950. Old
burn in background.



Regeneration in the
Mohun Lake area -
June 14, 1950.



Two logging companies in this region have made changes which affect survey travel.

(a) The Elk River Timber Company

This company is building a road around the north-west side of upper Campbell Lake. This road should join with the Elk River Valley road during the 1951 season.

(b) The Iron River Logging Company.

The operations of this company are now being handled for the H. R. MacMillan Company by a contract logger. This makes the future availability of the roads uncertain.

5. Sproat Lake - Kennedy Lake Area.

The five-mile cabin on the Kennedy Lake trail has collapsed, the eight-mile cabin is in fair condition, and the thirteen-mile cabin is in poor condition.

E. Prince Rupert Forest District.

Information summarized in this section on data pertinent to forest insect survey work in the Prince Rupert Forest District will be, for convenience, recorded as in the 1949 Annual Report, under the 9 smaller areas listed below.

1. Burns Lake Ranger District.
2. Southbank Ranger District.
3. Houston Ranger District.
4. Smithers Ranger District.
5. Hazelton Ranger District.
6. Terrace Ranger District.
7. Prince Rupert Ranger District.
8. Queen Charlotte Island Ranger District
9. Bella Coola Ranger District.

Data will be recorded under the following headings:

- (a) Description of Area.
- (b) Timber Type and Economic Importance.
- (c) Route and Methods of Travel.
- (d) Collection and Permanent Sampling Stations.
- (e) Personal Contacts.
- (f) Aerial Survey.
- (g) B. C. Forest Organization.
- (h) Photographs.

Information set forth under the foregoing outline will only apply to areas not previously surveyed or recorded prior to 1950 or where changes have occurred due to logging, fire, road improvements and other variations between 1949 and 1950 which will directly effect forest insect survey work.

1. Burns Lake Ranger District.

Forest Insect Survey work was carried out in this district from June 6th to August 1st with the exception of June 27 and 28th and July 11, 12, and 13th.

The extended survey period in this region was caused by wide spread spruce budworm infestation recorded in the district. Survey work was conducted by the writer alone or in conjunction with Mr. H. A. Richmond, Mr. E. D. A. Dyer, and Mr. R. L. Fiddick.

Areas through which the survey was made included Babine Lake, Morrison Lake, lower Fulton River, Pinkut, Augier, Taltapin, Helene, Burns, Star and Decker lakes, Pinkut Cross, Henrietta, Tintegal creeks, Endako River east to Endako, as well as the unsurveyed area to the east of the Palling Land Division.

(a) Description of Area.

The area of this ranger district has been enlarged to include the north-western half of Babine Lake, formerly in the Houston Ranger district and the north shore area of Francoise Lake, formerly in the Southbank Ranger District. Apart from these variations the area description adheres to the 1949 outline.

(b) Timber Type and Economic Importance.

Refer to 1949 Annual Report for the full description of this section. Logging operations during the past year have expanded throughout the entire district, particularly in the Pinkut, Taltapin, Augier lakes area as well as at the Red Bluff, Wright's Bay and Hagen Arm areas of Babine Lake (Photograph No.).

(c) Route and Methods of Travel.

To the Taltapin Lake area a logging road extends from mile 10 on the Burns Lake-Pendleton Bay road east to the west end of Taltapin and Conlon's mill. The road is 12 miles long and some sections require chains. Travel in the lake area is by boat or foot. All mapped trails are over-grown with the exception of the Silver Island Trail. Refer to the 1949 report for other areas.

(d) Collections and Permanent Sampling Stations.

A total of 212 forest insect collections were made in this ranger district in 1950 from the following host trees.

Spruce	68
Balsam (true fir species)	92
Lodgepole pine	25
Douglas fir	1
Aspen	5
Cottonwood	3

Willow	9
Birch	3
Alder	4
Dogwood	1
Fireweed	1
TOTAL	<u>212</u>

Thirty-seven permanent sampling stations are now established within the timbered area of this ranger district, 7 in 1949, 26 in 1950 plus 2 transferred from the Houston and Southbank ranger districts. The general locations of permanent sampling stations established in 1950 are shown below.

<u>P.S.S. No.</u>	<u>Location.</u>	
BL - 8	Palling Land Division	T. S. X-47826
BL - 9	Endako River	T. S. X-45675
BL -10	Babine Lake	L - 6684.
BL -11	Tintegal, B. C.	T. S. X-46775
BL -12	Taltapin Lake	L - 5016
BL -13	Taltapin Lake	T. S. X-49712
BL -14	Taltapin Lake	Line No. 11, NE 1/4 29-330
BL -15	Babine Forest Reserve	
BL -16	Taltapin Lake at Pinkut Creek	
BL -17	Taltapin Lake at Pinkut Creek	
BL -18	Taltapin Lake	L-5017
BL -19	Morrison Lake	
BL -20	Augier Lake	
BL -21	Babine Lake	L - 1873
BL -22	Babine Lake	T. S. X-33677
BL -23	Babine Lake	

(continued)

<u>P.S.S. No.</u>	<u>Location.</u>	
BL - 24	Babine Lake	T. S. X-46444
BL - 25	Taltapin Lake	
BL - 26	Taltapin Lake	T. S. X-49713
BL - 27	Taltapin Lake	
BL - 28	Boer Mountain	
BL - 29	Star Lake	
BL - 30	Babine Lake, Pierre Creek	T. S. X-40002
BL - 31	Babine Lake	T. S. X-46551
BL - 32	Pinkut Creek	
BL - 33	Decker Lake	

(e) Personal Contacts.

The following people were contacted during the year.

S. T. Strimbolt	Ranger B. C. Forest Service	Burns Lake, B. C.
J. Keefe	Asst. Ranger B. C. Forest Service	Burns Lake, B. C.
R. Paulson	Asst. Ranger B. C. Forest Service	Burns Lake, B. C.
P. Burt	Asst. Ranger B. C. Forest Service	Pendleton Bay, B. C.
A. Tourond	Asst. Ranger B. C. Forest Service	Topley Landing, B. C.
R. L. Brooks	Asst. Ranger B. C. Forest Service	Francoise Lake, B. C.
E. Howard	Lookout B. C. Forest Service	Savory Mountain
J. Mowat	Lookout B. C. Forest Service	Boer Mountain
D. Murray	Lookout B. C. Forest Service	Parrot Mountain
H. Loss	Patrolman B. C. Forest Service	Fort Babine
E. Bee	Mgr. Co-op Planer Mill Limited	Burns Lake, B. C.
M. Mathieson	Forester, Quality Spruce Company	Pendleton Bay, B. C.
C. Saunders	Mill owner	Pendleton Bay, B. C.
E. Johnson	Mill owner	Pendleton Bay, B. C.
H. Long	Mill owner	Palling, B. C.
G. Anderson	Mill owner	Palling, B. C.

(f) Aerial Survey.

Approximately ten air hours of aerial survey flights were made in the district through the courtesy of the B. C. Forest Service. Areas over which flights were made are listed below.

Babine Lake	Cross Creek
Pinkut Lake	Henrietta Creek
Taltapin Lake	Pinkut Creek
Augier Lake	Chapman Lake
Burns Lake	Hanson Lake
Decker Lake	Fulton River
Star Lake	Morrison River
Nellian Lake	Shovel Creek.
Morrison Lake	

(g) B. C. Forest Service Organization.

Headquarters	Burns Lake, B. C. (Provincial Government Offices)
Field Stations	Babine Lake Pendleton Bay Topley Landing Fort Babine Francoise Lake Francoise Lake, P. O.
Lookout Stations	Boer Mountain, Burns Lake Pendleton Mountain, Augier Lake Old Fort Mountain, Babine Lake Parrot Mountain, Francoise Lake Savory Mountain, Savory, B. C.

(a) The Elk River Timber Company

This company is building a road around the north-west side of upper Campbell Lake. This road should join with the Elk River Valley road during the 1951 season.

(b) The Iron River Logging Company.

The operations of this company are now being handled for the H. R. MacMillan Company by a contract logger. This makes the future availability of the roads uncertain.

5. Sproat Lake - Kennedy Lake Area.

The five-mile cabin on the Kennedy Lake trail has collapsed, the eight-mile cabin is in fair condition, and the thirteen-mile cabin is in poor condition.

E. Prince Rupert Forest District.

Information summarized in this section on data pertinent to forest insect survey work in the Prince Rupert Forest District will be, for convenience, recorded as in the 1949 Annual Report, under the 9 smaller areas listed below.

1. Burns Lake Ranger District.
2. Southbank Ranger District.
3. Houston Ranger District.
4. Smithers Ranger District.
5. Hazelton Ranger District.
6. Terrace Ranger District.
7. Prince Rupert Ranger District.
8. Queen Charlotte Island Ranger District
9. Bella Coola Ranger District.

Data will be recorded under the following headings:

- (a) Description of Area.
- (b) Timber Type and Economic Importance.
- (c) Route and Methods of Travel.
- (d) Collection and Permanent Sampling Stations.
- (e) Personal Contacts.
- (f) Aerial Survey.
- (g) B. C. Forest Organization.
- (h) Photographs.

Information set forth under the foregoing outline will only apply to areas not previously surveyed or recorded prior to 1950 or where changes have occurred due to logging, fire, road improvements and other variations between 1949 and 1950 which will directly effect forest insect survey work.

1. Burns Lake Ranger District.

Forest Insect Survey work was carried out in this district from June 6th to August 1st with the exception of June 27 and 28th and July 11, 12, and 13th.

The extended survey period in this region was caused by wide spread spruce budworm infestation recorded in the district. Survey work was conducted by the writer alone or in conjunction with Mr. H. A. Richmond, Mr. E. D. A. Dyer, and Mr. R. L. Fiddick.

Areas through which the survey was made included Babine Lake, Morrison Lake, lower Fulton River, Pinkut, Augier, Taltapin, Helene, Burns, Star and Decker lakes, Pinkut Cross, Henrietta, Tintegal creeks, Endako River east to Endako, as well as the unsurveyed area to the east of the Palling Land Division.

(a) Description of Area.

The area of this ranger district has been enlarged to include the north-western half of Babine Lake, formerly in the Houston Ranger district and the north shore area of Francoise Lake, formerly in the Southbank Ranger District. Apart from these variations the area description adheres to the 1949 outline.

(b) Timber Type and Economic Importance.

Refer to 1949 Annual Report for the full description of this section. Logging operations during the past year have expanded throughout the entire district, particularly in the Pinkut, Taltapin, Augier lakes area as well as at the Red Bluff, Wright's Bay and Hagen Arm areas of Babine Lake (Photograph No.).

(c) Route and Methods of Travel.

To the Taltapin Lake area a logging road extends from mile 10 on the Burns Lake-Pendleton Bay road east to the west end of Taltapin and Conlon's mill. The road is 12 miles long and some sections require chains. Travel in the lake area is by boat or foot. All mapped trails are over-grown with the exception of the Silver Island Trail. Refer to the 1949 report for other areas.

(d) Collections and Permanent Sampling Stations.

A total of 212 forest insect collections were made in this ranger district in 1950 from the following host trees.

Spruce	68
Balsam (true fir species)	92
Lodgepole pine	25
Douglas fir	1
Aspen	5
Cottonwood	3

Willow	9
Birch	3
Alder	4
Dogwood	1
Fireweed	1
TOTAL	<u>212</u>

Thirty-seven permanent sampling stations are now established within the timbered area of this ranger district, 7 in 1949, 26 in 1950 plus 2 transferred from the Houston and Southbank ranger districts. The general locations of permanent sampling stations established in 1950 are shown below.

<u>P.S.S. No.</u>	<u>Location.</u>	
BL - 8	Palling Land Division	T. S. X-47826
BL - 9	Endako River	T. S. X-45675
BL -10	Babine Lake	L - 6684.
BL -11	Tintegal, B. C.	T. S. X-46775
BL -12	Taltapin Lake	L - 5016
BL -13	Taltapin Lake	T. S. X-49712
BL -14	Taltapin Lake	Line No. 11, NE 1/4 29-330
BL -15	Babine Forest Reserve	
BL -16	Taltapin Lake at Pinkut Creek	
BL -17	Taltapin Lake at Pinkut Creek	
BL -18	Taltapin Lake	L-5017
BL -19	Morrison Lake	
BL -20	Augier Lake	
BL -21	Babine Lake	L - 1873
BL -22	Babine Lake	T. S. X-33677
BL -23	Babine Lake	

(continued)

<u>P.S.S. No.</u>	<u>Location.</u>	
BL - 24	Babine Lake	T. S. X-46444
BL - 25	Taltapin Lake	
BL - 26	Taltapin Lake	T. S. X-49713
BL - 27	Taltapin Lake	
BL - 28	Boer Mountain	
BL - 29	Star Lake	
BL - 30	Babine Lake, Pierre Creek	T. S. X-40002
BL - 31	Babine Lake	T. S. X-46551
BL - 32	Pinkut Creek	
BL - 33	Decker Lake	

(e) Personal Contacts.

The following people were contacted during the year.

S. T. Strimbolt	Ranger B. C. Forest Service	Burns Lake, B. C.
J. Keefe	Asst. Ranger B. C. Forest Service	Burns Lake, B. C.
R. Paulson	Asst. Ranger B. C. Forest Service	Burns Lake, B. C.
P. Burt	Asst. Ranger B. C. Forest Service	Pendleton Bay, B. C.
A. Tourond	Asst. Ranger B. C. Forest Service	Topley Landing, B. C.
R. L. Brooks	Asst. Ranger B. C. Forest Service	Francoise Lake, B. C.
E. Howard	Lookout B. C. Forest Service	Savory Mountain
J. Mowat	Lookout B. C. Forest Service	Boer Mountain
D. Murray	Lookout B. C. Forest Service	Parrot Mountain
H. Loss	Patrolman B. C. Forest Service	Fort Babine
E. Bee	Mgr. Co-op Planer Mill Limited	Burns Lake, B. C.
M. Mathieson	Forester, Quality Spruce Company	Pendleton Bay, B. C.
C. Saunders	Mill owner	Pendleton Bay, B. C.
E. Johnson	Mill owner	Pendleton Bay, B. C.
H. Long	Mill owner	Palling, B. C.
G. Anderson	Mill owner	Palling, B. C.

(f) Aerial Survey.

Approximately ten air hours of aerial survey flights were made in the district through the courtesy of the B. C. Forest Service. Areas over which flights were made are listed below.

Babine Lake
Pinkut Lake
Taltapin Lake
Augier Lake
Burns Lake
Decker Lake
Star Lake
Nellian Lake
Morrison Lake

Cross Creek
Henrietta Creek
Pinkut Creek
Chapman Lake
Hanson Lake
Fulton River
Morrison River
Shovel Creek.

(g) B. C. Forest Service Organization.

Headquarters

Burns Lake, B. C.
(Provincial Government Offices)

Field Stations

Babine Lake
Pendleton Bay
Topley Landing
Fort Babine
Francoise Lake
Francoise Lake, P. O.

Lookout Stations

Boer Mountain, Burns Lake
Pendleton Mountain, Augier Lake
Old Fort Mountain, Babine Lake
Parrot Mountain, Francoise Lake
Savory Mountain, Savory, B. C.

Photographs.

Francois Lake, B. C.
June 7, 1950.



(1) Aspen buds showing retarded growth due to late spring.

Burns Lake, B. C.
June 10, 1950.



(2) Aspen grove, showing retarded growth due to late spring.

Endako, B. C.
June 15, 1950.



(3) Showing advanced Poria monticola decay and associate camponotus sp. galleries in mature lodgepole pine
T. S. X-45675.

Endako, B. C.
June 15, 1950.



(4) Showing Camponotus sp. galleries in incipient Poria monticola decay lodgepole pine T. S. X-45675.

Endako, B. C.
June 15, 1950.



(5) Lodgepole pine stand T. S. X-45675.



(6) Hand hewn lodgepole pine ties T. S. X-45675.

Pierre Creek,
Babine Lake, B. C.



(7) Residual spruce-balsam stand Babine Provincial Forest.

Pierre Creek
Babine Lake, B. C.



(8) Selectively cut spruce log, Babine Provincial Forest.

Taltapin Lake, B. C.
June 21, 1950.



(9) Showing stand density, spruce-pine-balsam stand, spruce budworm (Choristoneura fumiferana Clem.) Babine Provincial Forest. T. S. X-49712.



(10) Showing crown thinning caused by spruce budworm (Choristoneura fumiferana Clem.) spruce-pine-balsam stand Babine Provincial Forest. T. S. X-49712.

Taltapin Lake, B. C.
June 21, 1950.



(11) Showing D.B.H. spruce-pine-balsam stand (axe handle
14" inches).



Unsurveyed area to east
of 16612 Palling Land
Div., B. C.
July 27, 1950.

(12) 100 per cent defoliation of balsam understory caused
by Choristoneura fumiferana Clem.

Unsurveyed area to east
of L66B Palling Land
Div., B. C.
July 27, 1950.



- (13) 100 per cent defoliation caused by spruce budworm
(Choristoneura fumiferana Clem.) in pure alpine fir
(abies Strip No. 12.

Helene Lake, B. C.
June 13, 1950.



- (14) Early second year feeding on alpine fir understory by spruce
budworm (Choristoneura fumiferana Clem.)



Babine Lake, B. C.
July 20, 1950.

(15) Showing 20 per cent defoliation to spruce overstory
Strip No. 6 caused by spruce budworm.

Babine Lake, B. C.
July 20, 1950.



(16) Showing 100 per cent defoliation to balsam understory
Strip No. 6 caused by spruce budworm.

2. Southbank Ranger District.

Survey work was carried out in this district on June 7th and 8th on south slope of Francoise Lake in the Southbank area and at Ootsa Lake.

(a) Description of Area.

Refer 1949 Annual Report for this information.

(b) Timber Type and Economic Importance.

Refer 1949 Annual Report for the original description. There has been a marked increase in logging operation in this district in areas outside the boundary of Tweedsmuir Park. This is particularly true in the Wisteria area of Ootsa Lake and at the west end of Francoise Lake.

(c) Route and Methods of Travel.

Refer 1949 Annual Report.

(d) Collections and Permanent Sampling Stations.

Twelve samplings were made in this district all with negative results.

Hosts and samplings are as follows:

<u>HOST</u>	<u>SAMPLINGS</u>
Spruce	2
Balsam	2
Lodgepole pine	2
Aspen	2
Cottonwood	2
Willow	<u>2</u>
TOTAL	12

No new permanent sampling points were established in 1950.

(e) Personal Contacts.

W. Antilla	Ranger B. C. Forest Service,	Southbank, B. C.
P. Piché	Asst. Ranger B. C. Forest Service,	Ootsa Lake
W. McNeil	Mgr. Circle Guides	Ootsa Lake

(f) Aerial Survey.

No aerial survey was made in this district.

(g) B. C. Forest Service Organization.

Headquarters	Southbank P. O. Francoise Lake.
Field Station	Ootsa Lake P. O. Ootsa Lake
Lookout Station	Verdun Mountain Ootsa Lake.

3. Houston Ranger District.

Survey dates for this ranger district were June 12th and 28th.

Areas visited were Perow, Topley, Forestdale and the lower Morice River valley.

(a) Description of Area.

See the 1949 Annual Report for this description.

(b) Timber Type and Economic Importance.

Refer to the 1949 Annual Report.

An increased logging and milling production has also occurred in this district, particularly in the Perow, Topley and Morice River areas.

Clear-burning of approximately 600 acres by a forest fire in the accumulated slash area to the north-west of Perow occurred in early July. A survey of this area for dangerous bark beetle attack in fire scarred trees will be made in 1951.

(c) Route and Methods of Travel.

See the 1949 Annual Report.

Cat-logging roads in the Morice River Valley now extend to
Houston

(d) Collections and Permanent Sampling.

Six collections were obtained in this district.

<u>HOST</u>	<u>COLLECTIONS</u>
spruce	4
lodgepole pine	1
aspen	1
TOTAL	<u>6</u>

No new permanent sampling stations were established.

(e) Personal Contacts.

D. Smith	Ranger B. C. Forest Service	Houston, B. C.
S. McNeil	Asst. Ranger B. C. Forest Service	Houston, B. C.
T. Riddler	Asst. Ranger B. C. Forest Service	Topley, B. C.
W. Wiley	Rancher L-2636	Topley, B. C.

(f) Aerial Survey.

No aerial survey was made in this district.

(g) B. C. Forest Service Organization.

Headquarters	Houston, B. C.
Field Station	Topley, B. C.
Lookout Station	Barrett Hat Mountain Sugar Loaf Mountain

4. Smithers Ranger District.

The only Forest Insect Survey work carried out in this ranger district in 1950 was limited to examination of forest tent caterpillar defoliation of aspen in the vicinity of Teldova and spruce bark beetle damage at L-4268, Smithers. Rates of examinations were July 11th and September 21st respectively.

(a) Description of Area.

See the 1949 Report.

(b) Timber Type and Economic Importance.

See the 1949 Report.

(c) Route and Methods of Travel.

See the 1949 Report.

(d) Collections and Permanent Sampling Station.

Two collections were obtained in this district, the hosts being aspen and spruce.

No increase in permanent sampling stations was made.

(e) Personal Contacts.

C. Smith	Ranger B. C. Forest Service	Smithers, B. C.
C. Dahlie	Asst. Ranger B. C. Forest Service	Smithers, B. C.
A. MacPherson	Asst. Ranger B. C. Forest Service	Smithers, B. C.

(f) Aerial Survey.

No aerial survey was made.

(g) B. C. Forest Service Organization.

Headquarters	Smithers, B. C.
	Court House.

5. Hazelton Ranger District.

Survey work in this district was carried out from September 7 to 10. Areas surveyed were the lower Skeena River Valley in the vicinity of Dorreen, Cedarvale, Kitwanga and Skeena Crossing, the Kitsegucla River upstream for 8 miles, the Kispiox River as far as McCully Creek and the upper Skeena lower valley in the vicinity of Hazelton and the junction of Shegunia River.

(a) Description of Area.

See the 1949 Annual Report.

(b) Timber Type and Economic Importance.

See the 1949 Annual Report.

(c) Route and Method of Travel.

(i) Dorreen area

The only scheduled transportation to this area at the present time is by railroad from Cedarvale or Terrace, however, the Skeena River may be crossed by dinghy from Sorenson's Logging Camp 4 miles east of Pacific, B. C. The Fiddler Creek valley is accessible for 6 miles north of Dorreen on the Doreen Mining Company road.

(ii) Kitsegucla River Valley.

This area is accessible for 16 miles from Skeena Crossing, B. C. on mining and logging roads on the east slope of the valley. Car travel is limited to the first 6 miles.

Refer to 1949 Annual Report for other areas.

(d) Collections and Permanent Sampling Stations.

A total of 43 collections of forest insects were obtained in this district from the listed tree species.

Spruce	9
Cedar	8
Hemlock	6
Lodgepole pine	5
Balsam (true fir species)	4
Aspen	3
Birch	2
Cottonwood	1
Alder	1
Willow	4
TOTAL	<u>43</u>

Five permanent sampling stations were established during the 1950 survey bring the total number of stations to 10 for this district. General locations of the 5 stations established during 1950 are shown below.

<u>P. S. S. No.</u>	<u>Location.</u>
HZ - 6	Dorreen, B. C., Fiddler Creek Valley
HZ - 7	Dorreen, B. C., Fiddler Creek Valley
HZ - 8	Junction of Kitwancool and Kitwanga Rivers
HZ - 9	Kitseguecla River Valley.
HZ - 10	Kispiox River Valley.

(e) Personal Contacts

L. G. Taft, Ranger, B. C. Forest Service Hazelton, B. C.
 F. Bugg Mill owner, Kitseguecla River, Skeena Crossing, B. C.

(f) Aerial Survey.

No aerial survey was made in this district.

(g) B. C. Forest Service Organization.

Headquarters	Hazelton, B. C.
Field Station	New Hazelton, B. C. Doreen, B. C.

6. Terrace Ranger District.

Survey work was carried out within this district from August 8th to September 6th. Areas surveyed were the lower Skeena River valley from Scotia River east to Dorreen including its tributary drainage systems listed below.

North Valley Slope

Khyex River
 Kwinitsa River
 Kaisks River
 Echamsiks River
 Exstew River
 Shames River
 Zymogotatiz River
 Kitsumgallum River and Lake

South Valley Slope

Scotia River
 Lakelse Lake
 Onion Lake
 Scully Creek
 Zymoetz River
 Gold Creek
 St. Croix Creek
 Le Gate Creek
 Chindemash Creek

The eastern headwaters of the Kitimat River west from Onion Lake were also sampled for forest insects.

(a) Description of Area.

Refer to the 1949 annual report.

(b) Timber Type and Economic Importance.

Refer to 1949 annual report.

Increased logging operations have occurred at Gold Creek, St. Croix Creek and in the vicinity of Pacific B. C. Heavy mill run dimension or timbers of spruce, hemlock and cedar are the principal products of these operations.

(c) Route and Methods of Travel.

(i) West lower Kitsumgallum River

Follow the Columbia Cellulose logging road thence by road location trail to Pine Lake and Luncheon Creek.

(ii) Lean-to Creek.

A logging road now extends from Kitsumgallum Lake Road to L-1402 Kitsumgallum River block.

Refer to the 1949 annual report for other areas.

(d) Collections and Permanent Sampling Stations.

One hundred and seventy forest insect collections were obtained in this district from the following host trees.

HOST	COLLECTIONS
Hemlock	39
Balsam (true fir species)	21
Lodgepole pine	4
Cedar	26
Spruce	22
Alder	18
Cottonwood	19

Willow	9
Dogwood	1
Aspen	3
Birch	5
Maple	1
Devils Club	<u>2</u>
TOTAL	170

Thirteen permanent sampling stations were established during the 1950 survey making a total of 34 stations within the district. General locations of the 1950 stations are as follows:

<u>P.S.S. No.</u>	<u>Location</u>
T - 22	Kasiks River
T - 23	Lean To Creek L-1402
T - 24	Kitsumgallum River L-1406
T - 25	Kitsumgallum River L-1408
T - 26	Pine Lake L-1409
T - 27	Luncheon Creek L-1412
T - 28	Pine Lake, west end
T - 29	Maroon Creek
T - 30	Clear Creek
T - 31	Kitimat River
T - 32	Kitimat River L-26945
T - 33	Onion Lake
T - 34	Chimdemash Creek

(e) Personal Contact

Refer to the 1949 Annual Report.

R. Johnson Woods Superintendent Columbia Cellulose Co. Ltd
Terrace, B. C.

(f) Aerial Survey

Aerial survey was not made in the district.

(g) B. C. Forest Service Organization.

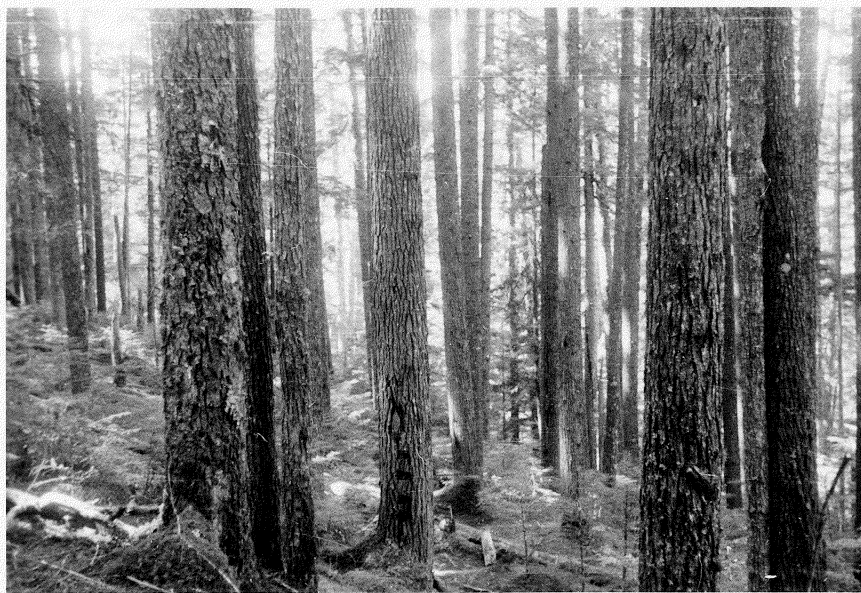
Headquarters	Terrace
Field Station	Kitsumgallum Lake Lakelse Lake
Lookout	Thornhill, Terrace, B. C. Kitsumgallum Lake.

Clear Creek, B. C.
August 1950



(17) Dense Sitka spruce-cedar-hemlock stand typical of Upper Kitsumgallum River drainage.

Luncheon Creek, B. C.
August 15, 1950.



(18) Over mature hemlock-balsam-spruce stand
West Kitsumgallum River.

Kitimat River, B. C.
August 27, 1950



(19) Pure over mature hemlock stand showing density D.B.H.



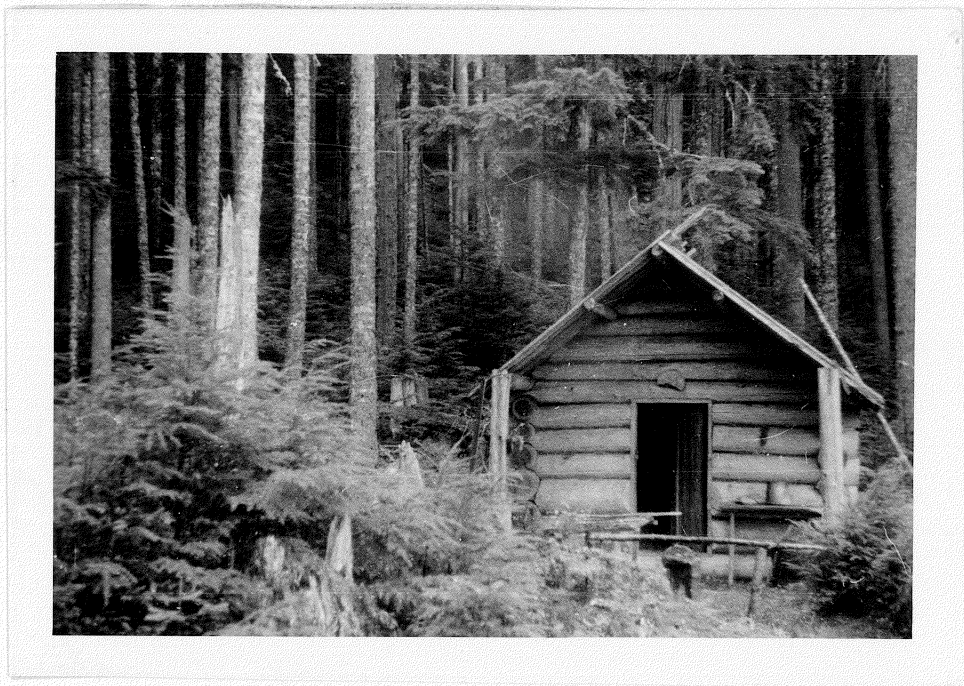
(20) Showing clear bole and crown form pure hemlock stand
in Photograph No. 19.

Kitimat River, B. C.
August 27, 1950.



(21) Showing thick hemlock-balsam-cedar-spruce stand

Kitimat River, B. C.
August 27, 1950.



(22) Showing stand density of stand in Photograph No. 21.

7. Prince Rupert Ranger District.

Insect survey work carried out by the writer in this district was confined to the Rainbow and Prudhomme Lake areas, the tidal section of the Skeena River mouth and the Green River Valley on August 5 to 8.

(a) Description of Area.

Refer to the 1949 Annual Report.

(b) Timber Type and Economic Importance

Refer to the 1949 Annual Report

(c) Route and Methods of Travel.

Refer to the 1949 Annual Report.

(d) Collections and Permanent Sampling.

Fourteen forest insect collections were obtained in the areas surveyed from the following hosts.

<u>HOST</u>	<u>COLLECTIONS</u>
Hemlock	4
Balsam (true fir species)	2
Cedar	4
Spruce	1
Lodgepole pine	1
Alder	<u>2</u>
TOTAL	14

No permanent sampling stations were established.

(e) Personal Contacts

M. W. Gormely	District Forester	Prince Rupert, B. C.
M. O. Kullander,	Asst District Forester	
	B. C. Forest Service	Prince Rupert, B. C.
L. B. B. Boulton	Forester Management Div.	
	B. C. Forest Service	Prince Rupert, B. C.
J. Scott,	Inspector of licensed scalers,	
	B. C. Forest Service	Prince Rupert, B. C.
F. Goretzen,	Radio Div., B. C. F. S.	Prince Rupert, B. C.

J. MacDonald,	Fire Inspector, B. C. F. S.	Prince Rupert, B. C.
H. Whalen,	Asst Ranger - B. C. F. S.	Prince Rupert, B. C.
E. G. Forbes,	Commissoner-of-lands	Prince Rupert, B. C.
H. Barr,	Office Mgr., Columbia Cellulose Company Limited	Prince Rupert, B. C.
D. Doswell,	Transportation Mgr., Columbia Cellulose Co. Ltd.	Prince Rupert, B. C.
H. Reid,	Supt. Coast Division Columbia Cellulose Co. Ltd.	Prince Rupert, B. C.

(f) Aerial Survey.

No aerial survey was made in this district.

(g) B. C. Forest Service Organization.

District Forester's Office
Provincial Government Building, Prince Rupert, B. C.

Patrol Boats M/V Lillian D
M/V White Spruce Prince Rupert, B. C.

8. Queen Charlotte Ranger District
and the
Bella Coola Ranger District.

The Forest Insect Survey of these districts in 1950 was made by parties from the M/V "J. M. Swaine". (Refer 1950 Annual Report by E. G. Harvey).

IV SPECIAL REPORTS.

Examination T. S. X-47826 and T. S. X-49447 Palling, B. C.

M. T. Hughes

April, 1950.

Introduction.

The examinations of T. S. X-47826 and T. S. X-49447 for the presence of Dendroctonus borealis Hopk. were made following a report by J. Keefe, Assistant Ranger, Burns Lake Ranger District, B. C. Forest Service, that this bark beetle was causing some mortality of the spruce growth on these sales. It was felt that immediate examination of these areas was necessary because of the close proximity of the Spruce Bark Beetle Control Project at Palling, B. C. in 1949. This is particularly true with regard to T. S. X-49447.

T. S. X-47826.

(a) Location

The starting point of T. S. X-47826 is located 16 chains south and 30 chains east of the N. E. corner of L. 6612, Palling Land Division (CR. 5, Babine Forest Reserve, R. 5 Map No. 3).

(b) Timber Type

The residual stand as well as the stand beyond the boundaries of the sale is composed of Engelmann spruce, lodgepole pine and balsam with individual dominance varying on different sites. Recent logging and milling has been only applied to the spruce growth in the area.

(c) Findings

No active attack of Dendroctonus borealis Hopk. was found to be present in the green standing timber at the time of examination, April 2nd. Subsequent enquiry, however, indicated that during early winter cutting a number of trees cut and milled contained numerous overwintering beetle broods.

Examination of stumps of recently cut spruce growth showed that this species is over mature. Annual ring counts indicate the stand to be approximately 200 years old with an early suppression period of 40 years followed by 120 years of regular productive growth. Trees 18 inch D. B. H. showed, on the average, a growth increment of only one quarter inch for the past 22 years. This examination of stumps and logs also showed a very high percentage of red ring rot is present in the spruce growth. This rot, possibly Fomes Pini (Thore) Lloyd and Fomes Pinicola (Sw.) Cke., varied from early discoloration to an advanced crumbling appearance of the heart wood. The presence of this rot in the logs containing overwintering bark beetle broods was noted by Assistant Ranger J. Keefe.

Numerous small diameter spruce snags were scattered throughout the area examined. These snags showed old bark beetle attack as well as the presence of red ring rot.

T. S. X-49447

(a) Location

The starting point of T. S. X-49447 is the N. E. corner of T. S. X-38951 in the unsurveyed area to the east of L. 6613 of the Palling Land Division.

(b) Timber Type

Similar to T. S. 47826

(c) Findings

Examination of this area revealed conditions similar to those found on T. S. X-47826 but with a small percentage of rot and fewer spruce snags of small diameter.

Five trees of merchantable size were found to have been killed by Dendroctonus borealis Hopk. attack during the past season and at the time of examination, April 3, a few overwintering adult beetles were present in the roots and trunk below snowline. No larvae or adult beetles were found in the galleries of the upper trunk. The condition of these galleries as well as the bark indicated adults had emerged during the spring of 1949 and that the lower trunk and roots were re-attacked resulting in the present residual population of overwintering beetles.

Summary.

An appreciable reduction of the slight insect hazard on both timber sales is expected by the burning of the slabs of logs from infested trees. On T. S. X-47826 this has been done and on T. S. X-49447 it will be done when logging and

milling commences. The small residual overwintering beetle population in the stumps and waste of infested trees is expected to be absorbed by the new slash present on both sales when the spring flight period occurs. For this reason, it is felt, at the present time no great insect hazard exists for the residual or uncut stands in these areas and that no applied control is necessary. The Dendroctonus borealis Hopk. is, undoubtedly, the final factor resulting in the death of some of the spruce growth in these areas. The high percentage of rot however and the overmature condition of the stands are strong contributing factors to bark beetle attack and to the subsequent death of timber.

Regular examinations of both areas will be carried out through 1950 and any increase of the insect hazard will be reported.

Re-examination T. S. X-47826 and T. S. X-49447

Pelling, B. C.

M. T. Hughes

December 1950.

Re-examination of Timber Sales X-47826 and X-49447
Babine Forest Reserve, east of L.6613 and L.6612, Pelling
Land Division were carried out on June 8th, July 4th, July 27th
and September 12, 1950. These examinations showed no noticeable
increase in the bark beetle (Dendroctonus borealis Hopk.)
population or hazard recorded during the original examination
of these sales in April of this year.

No bark beetle attack in standing green timber was
found on either sale. Exposed green slash areas which were
attacked showed mortality of the Dendroctonus broods where
rapid drying of bark surfaces had occurred.

SPRUCE BUDWORM INFESTATION

Prince Rupert Forest District

British Columbia

M. T. Hughes

December 1950.

Introduction

The information presented in the following report summarizes Forest Insect Survey work carried out and data obtained on the present spruce budworm (Choristoneura fumiferana Clem.) infestation in the south eastern section of the Babine Forest Reserve, Prince Rupert Forest District. Information is set forth under the following headings:

- A. { Area
(Timber types and Economic Importance)
- B. Methods of Sampling and Survey.
- C. Defoliation, Development, Disease and Parasitism.
- D. Summary.
- E. Photographs.
- F. Map.

Data is compiled from aerial observations, field notes, collection slips, and cruise sheets of ground survey studies made by H. A. Richmond, E. D. A. Dyer, R. L. Fiddick and the writer.

Co-operation extended by M. W. Gormely, District Forester and all members of the British Columbia Forest Service, Prince Rupert Forest District, is gratefully acknowledged, particularly with regard to aerial survey trips and assistance in overcoming ground transportation difficulties.

A total of 16 such strips were made within or at the margin of infested areas.

(c) Egg and Hibernaculum collections

The collection of egg masses and hibernaculae in heavily infested areas was carried out in the latter half of September. All collections were made on the foliage of understory trees. Two lineal feet of limb at the base, middle, and top of the crown were examined and collections recorded. The total number of hibernacula and egg masses obtained from all sample tree foliage was also recorded. Twenty such collections were made.

(d) Aerial Survey.

Three aerial flights were made over the infested and adjoining areas on June 13th, June 28th, and September 14th.

C. Defoliation, Development, Disease, Parasitism.

Examination and sampling of spruce, balsam, and pine hosts in the foregoing outlined areas indicated the spruce budworm was causing defoliation damage to a varying degree. While this budworm outbreak is a serious threat to the timber stands of these areas it has not yet reached the stage where a high percentage of defoliation or timber mortality of large areas will result.

In the majority of cases the defoliation did not exceed 20 per cent of total tree foliage, being confined, mainly, to the 1950 bud growth. This was particularly true with regard to spruce and pine. Balsam, generally, was more susceptible to attack and subsequently suffered more defoliation. This was particularly severe on the understory and regeneration growth of this species.

A. Area and Timber Type

The infested area, estimated at 352 square miles, lies generally north of Burns Lake, B. C., in the south eastern section of the Babine Forest Reserve within the grid squares 35 to 44 and 328 to 335 of lune No. 10.

The outbreak appears to be centered in a series of adjoining lake and creek valleys formed by Henriette, Helene, Taltapin, Augier, Pinkut, Summit and Babine lakes, Henriette, Pinkut and Cross creeks. Light defoliation was also recorded by aerial survey near the mouth of Tachek creek, south west Babine Lake (grid squares 32-338 and 33-338) as well as a small area within grid square 35-329 on the south west slope of Decker Lake. These small isolated infestations cover areas of approximately 1 square mile and 1/2 square mile respectively.

The terrain is generally, rolling and hilly traversed by many smaller lakes and streams with elevations ranging from 2,200' to 3,000'. Barren or wooded mountains rarely exceed 4,000'.

Spruce (Picea glauca (Moench) dominates the spruce-balsam or spruce-balsam-pine forest types that are prevalent in the valley bottoms and poorly drained slopes throughout the infested area. Balsam (Abies lariocarpa (Hook.) Nutt.) occurs where better drainage is found giving way to pure lodgepole pine (Pinus contorta Dougl. var latifolia Engelm.) stands on the higher or drier slopes and ridges. Repeated burning of these basic types has eliminated the climax species from many natural sites, resulting in increased areas of pure pine or pine dominated stands. Aspen also tends to occur in pure groves on burnt over sites.

Understory growth is principally spruce-balsam with a higher percentage of balsam stems. Pure balsam understory was common particularly under pure pine stands growing on old burned over sites.

Logging and the manufacturing of lumber for local, eastern Canadian and export markets are the principal sources of income in the district. This infestation directly effects 50 per cent of the merchantable timber stands meeting these present market demands through Decker and Burns Lake communities. The average daily cut is 75M f.b.m. with a monthly production of 1,500 M f.b.m. Stumpage and royalty rate on this cutting ranges from \$3.00 to \$5.00 per M f.b.m. with mill run lumber prices throughout the latter half of 1950 ranging between \$50.00 to \$65.00 per M f.b.m. according to grade and market fluctuation.

B. Methods of Sampling and Survey.

Methods of sampling and survey work in the infested area were as follows:

(a) Beatings

The beating of one to three trees over a 7' x 9' sheet as a method of obtaining larvae collections from host trees was used to indicate the presence of budworm larvae, larval numbers, development stages and physical conditions of larvae collected.

(b) Strip cruises.

Survey strips were used to obtain defoliation percentages, stand composition trends, the extent of infested areas and to obtain, if possible, some idea of timber types most susceptible to budworm damage.

A total of 16 such strips were made within or at the margin of infested areas.

(c) Egg and Hibernaculum collections

The collection of egg masses and hibernaculae in heavily infested areas was carried out in the latter half of September. All collections were made on the foliage of understory trees. Two lineal feet of limb at the base, middle, and top of the crown were examined and collections recorded. The total number of hibernacula and egg masses obtained from all sample tree foliage was also recorded. Twenty such collections were made.

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In the majority of cases the defoliation did not exceed 20 per cent of total tree foliage, being confined, mainly, to the 1950 bud growth. This was particularly true with regard to spruce and pine. Balsam, generally, was more susceptible to attack and subsequently suffered more defoliation. This was particularly severe on the understory and regeneration growth of this species.

Within infested timber stands defoliation in small areas was recorded as high as 50 to 75 per cent on overstory growth while associated understory defoliating particularly on balsam, ranged from 75 to 100 per cent. Some mortality of regeneration occurred in extreme cases. Complete defoliation of the overstory was found in only one small area. In this instance balsam growth of a balsam dominated stand (overstory: 70 per cent balsam, 20 per cent spruce, 10 per cent pine; understory 100 per cent balsam) suffered severe defoliation averaging 75 per cent over 4 acres with individual tree defoliation being 100 per cent. This area was 190 chains on strip No. 12 in the unsurveyed area to the east of L6612, Palling Land Division. Areas where defoliation exceeded the average of 20 per cent are listed in the following table.

Location	Lune No.	Strip No.	Over-Story	Under-Story	Mortality
Taltapin Lake TSX-49712	40-330	-	25%	50%	some regeneration
Taltapin Lake	40-330	1	30%	30-50%	some regeneration
Taltapin Lake	41-330	2	30%	30-40%	some regeneration
Helene Lake	43-329	-	40%	40%	nil
Taltapin Lake	39-329	9	25%	50%	some regeneration
Star Lake	37-329	15	30%	30%	some regeneration

The following table shows stand composition percentage and associated defoliation percentages of tree species in the infested area of the sixteen strip surveys.

PINE DOMINANT STANDS

Pine		Pine - Balsam				Pine - Spruce				Pine - Balsam - Spruce			
100%		80%-100% pine		50%-80% pine		80%-100% pine		50%-80% pine		80%-100% pine		50%-80% pine	
No US	US	No US	US	No US	US	No US	US	No US	US	No US	US	No US	US
Pl	Pl US	Pl B	Pl B US	Pl B	Pl B US	Pl S	Pl S US	Pl S	Pl S US	Pl B S	Pl B S US	Pl B S	Pl B S US
5	1.3 5.3	10 10	3 20 32.5	- -	1 7.5 10	10 17.5	9.1 12.2 21.5	10 10	3 7.5 12.5	0 10 10	5 5 5 25	10.8 15 15.8	56 13.4 13.4 16.1

BALSAM DOMINANT STANDS

Balsam		Balsam - Pine				Balsam - Spruce				Balsam - Pine - Spruce			
100%		80%-100% balsam		50%-80% balsam		80%-100% balsam		50%-80% balsam		80%-100% balsam		50%-80% balsam	
No US	US	No US	US	No US	US	No US	US	No US	US	No US	US	No US	US
B	B US	Pl B	Pl B US	Pl B	Pl B US	B S	B S US	B S	B S US	Pl B S	Pl B S US	Pl B S	Pl B S US
-	30 25	- -	- - -	- -	3 7.5 10	- -	18.3 18.3 25	- -	- - -	- - -	23.3 23.3 23.3 40	20 20 20	27.5 32 32 51

SPRUCE DOMINANT STANDS

Spruce		Spruce - Pine				Spruce - Balsam				Spruce - Pine - Balsam			
100%		80% - 100% spruce		50%-80% spruce		80%-100% spruce		50%-80% spruce		80% - 100% spruce		50% - 80% spruce	
No US	US	No US	US	No US	US	No US	US	No US	US	No US	US	No US	US
S	S US	Pl S	Pl S US	Pl S	Pl S US	B S	B S US	B S	B S US	Pl B S	Pl B S US	Pl B S	Pl B S US
-	15 15	10 25	5.8 10.8 20.8	- -	- - -	25 25	18.7 18.7 46.2	10 10	- - -	- - -	- - -	9.3 18.1 18.7	16.9 18.4 18.1 35

S - spruce
Pl - lodgepole pine

B-Balsam (true firs)
US - Understory

Spruce budworm development within this area appears to be through a two-year life cycle. This is borne out by the following comparisons of 1949 and 1950 survey records. In 1949 larvae were collected at P. S. S. BL-3, 4 and 6 on June 17, 18 and 19 respectively while in 1950 late instar larvae or adults were collected at these stations on June 19, July 19, and June 18 respectively.

Pupae were first recorded in the infested area on June 19, however, abundant pupal collections were not obtained until mid July.

First recorded adult emergences were on the 15th of July with heavy flights occurring during the last week in July and the first week in August.

Copulation of mature adults was recorded first on July 20.

Oviposition was unrecorded by August 1st but examination of the infested areas in September revealed numerous hatched egg mass.

Hibernacula and egg mass collections between September 15th to 24th revealed little information due to lack of experience in this type of work on the writer's part. Egg mass collected and examined did, however, show that generally all eggs had hatched successfully and that an average understory balsam fir (3" d.b.h. ht. 15') had 2.9 egg masses per 2 lineal foot of branch.

Disease studies conducted by Miss D. Featherstonhaugh on larval cadaver from collections being reared at the Langford insectary showed only a negligible percentage of occurrence.

The following table summarizes known disease activity.

Larvae Collected	Examined	Cause	Mortality	
			Number	%
7469	338	unknown	110	32.5%
		bacteria	171	50.5%
		polyheadial bodies	8	2.7%
		fungus	49	14.4%

Parasitism in larval collections ranged from .3 per cent to 33.3 per cent with a general parasitic percentage for all collections of 3.3 per cent, dipterous parasites forming .5 per cent and hymenopterous parasitism being 2.8 per cent.

Date	No. of larvae collected	Parasitized larvae		Parasite			
		number	%	Dipterous		Hymenopterous	
				No.	%	No.	%
June 12 to July 15	5304	.32	.6	12	.2	20	.4
July 16 to August 1	2165	214	9.9	24	1.1	190	8.8

Area where the parasitic % exceed that of the 9.9% average are tabulated below:

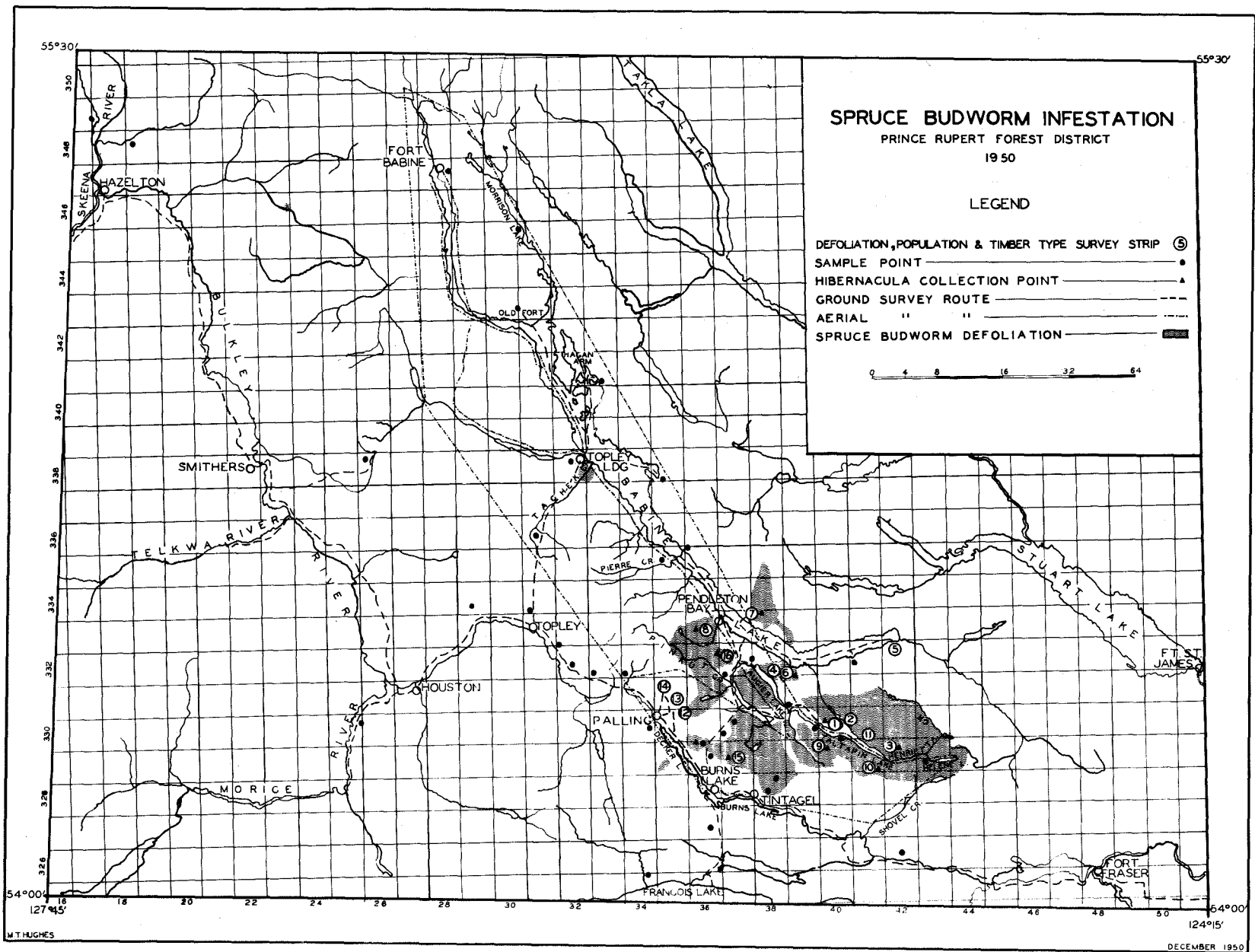
Date	Area	Numbers collected	Percentage of Parasitism
July 21	Babine Lake Strip No. 6	87	33.3%
July 21	Babine Lake Strip No. 6	152	30.3% (H 23.7 D6.6)
July 22	Babine Lake Strip No. 8	115	20% (H 14 D 6)
July 22	Tatlapin Lake	90	17.8%
August 1	Pinkut Creek	246	16.7% (H 13.4 D 3.3)

S U M M A R Y

Foregoing information indicates that an increase over the 1949-50 spruce budworm population can be expected for the next 2-year life cycle of 1951-52 in this area. This anticipated increase will undoubtedly cause an associated increase in defoliation and mortality particularly to balsam regeneration and understory trees in 1952.

While disease and parasitism as natural means of control are at present very limited in the area as a whole, the possibility of these agents exerting a more definite check on the 1951-52 population cannot be over-looked.

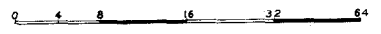
Should this anticipated increase in populations occur the hazard from possible bark beetle attack cannot be disregarded. This danger may become particularly acute within the infested areas where logging has or is being carried on and has through the medium of accumulated logging slash created a relatively high endemic bark beetle population.



SPRUCE BUDWORM INFESTATION
 PRINCE RUPERT FOREST DISTRICT
 1950

LEGEND

- DEFOLIATION, POPULATION & TIMBER TYPE SURVEY STRIP (S)
- SAMPLE POINT (•)
- HIBERNACULA COLLECTION POINT (▲)
- GROUND SURVEY ROUTE (---)
- AERIAL " " (---)
- SPRUCE BUDWORM DEFOLIATION (shaded area)



W.T. HUGHES

DECEMBER 1950

REPORT OF FOREST INSECT SURVEY 1950

GREATER VANCOUVER WATERSHED

by

Mr. W. D. Taylor

The forested areas of the Greater Vancouver Water District were covered by Mr. D. W. Taylor in co-operation with a watershed ranger appointed by Mr. Gilbert through Mr. W. Angus. In most cases this ranger was Mr. David Main, who is both interested in and acquainted with the problems from previous years. A total of ninety-three collections was made between June 11th and August 19th from which 632 larvae of defoliating species were sent to Langford laboratory and were subsequently identified. The attached list gives the actual data on specific insects.

It is regrettable that, due to a rail strike, shipping of live material to our laboratory was impossible hence certain areas, designated below, were not surveyed. It is planned that the areas left unsurveyed will be given primary consideration in 1951.

A geographical description of the areas surveyed is deemed unnecessary in this report in view of the fact that they are well known to Mr. Gilbert and his staff. Briefly they are as follows:- Coquitlam Lake and River, Seymour Mountain, Seymour Valley and River banks, Burwell Mountain, and Capilano River valley as far as West Cap and Furry Creek cabin. The areas left unsurveyed were Cathedral Creek and Mountain (Palisade lakes trail) and Loch Lomond. Additional information on areas adjacent to the boundaries of the watershed has been included in this report

because it would seem of equal importance to investigations within the watershed itself.

This report is based on information accumulated during the 1950 survey period. From this it can be concluded that no immediate threat from forest insects exists at this time. One of the most dangerous forest insects, the western hemlock looper, is present in very low numbers. Although a greatly increased population is not anticipated in 1951 a constant check by sampling must be continued in the watershed. Other defoliators may at any time become a hazard to the safety of the watershed stands but during the 1950 season none were sampled in sufficient numbers to cause alarm. The importance of the watershed is such that a constant survey must be maintained to reveal the beginning of any insect outbreak. The thoughtful co-operation of the watershed rangers is very much appreciated and the importance of this cannot be too greatly stressed. The best protection of the watershed depends on the alertness of all personnel who have access to these forest stands.

Summary of Insect Conditions, 1950.

Insects Known to Have Caused Damage
in These Areas in Previous Years.

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hlst.).-

Number of insects collected - 4.

Remarks - As indicated, only four larvae of this very serious defoliator were collected. Previous damage in the watershed, by this species occurred at Coquitlam Lake (1929-30) and Burwell-Seymour Creek; the latter area both in 1929-30 and in 1946-47.

Insects Potentially Dangerous.

Hemlock Sawfly, Neodiprion species.

Number of insects collected - 238.

Remarks - Rarely has damage of an economic nature been known, on the coast, to date. However, fairly large collections have been made at widely scattered points, hence the species will remain under close observation.

Insects of Minor Importance.

Ectropis crepuscularia Schiff.- No common name.

Number of insects collected - 41.

Remarks - There are no records of defoliation. Only a very slight increase in population generally has been noted.

Green Hemlock Looper, Nepytia phantasmaria (Stkr.).-

Number of insects collected - 22.

Remarks - No record of defoliation. Population constant.

Green Velvet Looper, Oparinia autumnata (Gn.).-

Number of insects collected - 23.

Remarks - There is no record of defoliation by this species and the population remains constant.

Green Striped Forest Looper, Melanolophia imitata (Wlk.)

Number of insects collected - 260.

Remarks - This species seems consistent in relatively large numbers though there has been no record of defoliation to date.

Gray Forest Looper, Caripeta divisata (Wlk.).-

Number of insects collected - 8.

Remarks - Collections of this species are constant but in small numbers. There are no records of defoliation.

Tent Caterpillar, Malacasoma pluviale (Dyar).-

Number of insects collected - 16.

Remarks - A very slight defoliation on alder was recorded but no record of serious defoliation to forested areas can be found.

Willow Leaf Beetle, Galerucella carbo (Lec.)

Number of insects collected - 20.

Remarks - The population proved very small as compared to 1948 where extensive defoliation of willow and alder was recorded.