RANGERS ANNUAL REPORT

1951

RANGER'S ANNUAL REPORT

Victoria Laboratory R. L. Fiddick.

1951

INTRODUCTION

Mention of the forest insect ranger stations was not made in the 1950 annual report even though construction of the buildings was begun in the fall of that year. Three stations were built before the commencement of the 1951 field work and were occupied by the rangers and their families for the season.

The three stations are located more or less centrally in three of the ranger districts, one at Kye Bay near Courtenay on Vancouver Island, one at Cultus Lake in the lower Fraser Valley and the other at Lakelse Lake near Terrace in the Prince Rupert Forest District.

During the fall of 1950 and the spring of 1951 the rangers spent a total of 643 man days on the construction of these buildings. A carpenter supervisor was also employed during the construction of the Cultus Lake Station.

For the most part these stations fulfilled adequately the requirements for a summer headquarters in the ranger districts. The station at Terrace is ideally located for the coastal section of the Prince Rupert Forest District,

but the large interior portion of that district requires either a station located in the vicinity of Burns Lake or a trailer unit. Some preliminary work was done by M. T. Hughes on the matter of obtaining a special use permit on a section of B. C. Forest Service land at Pendleton Bay, Babine Lake.

The rangers commenced survey work in the field in May and continued through until near the end of September.

A serious handicap to the survey work was the prolonged fire closure of the Vancouver Forest District, due to drought. This closure extended from mid-July almost continuously to the end of September and resulted in a very poor distribution of collections as well as necessitating continual changing of programmes and shifting of personnel.

As the result of the limited distribution of collections during the season information on insect conditions in some of the important timber stands on Vancouver Island and the lower mainland is not available for 1951.

During the season a total of 2,961 collections was made and submitted to the Langford insectary. This total included 454 from the southern Island district, 601 from the northern Island district, 400 from the lower mainland district, 353 from the Prince Rupert District and 693 from the J. M. Swaine which was operating in the southern coastal area. The remainder were submitted by co-operators of the British Columbia Forest Service or industry.

A new development in the year was the collection of pathological samples by the rangers in conjunction with regular forest insect work. A total of 165 collections was made and submitted to the Forest Pathology office in Victoria.

A special survey project on spruce budworm population sampling was undertaken in the Prince Rupert and Fort George Forest Districts during late June and July. A report dealing with this project is included in the appendix of this annual report.

A slight increase was noted in the number of spruce budworm larvae in the Douglas fir stands of southern Vancouver Island.

A noticeable increase in the population and distribution of the black-headed budworm was recorded in the eastern interior section of the Prince Rupert Forest District. At Poett Nook on the west coast of Vancouver Island there was a rather alarming increase in the number of black-headed budworm larvae recorded in a number of collections. Elsewhere only an occasional larva was found during routine sampling.

The status of these and other insects are discussed by district in the main body of the report.

Special Projects.

Three rangers were engaged successively during October on plot work in connection with the project on " The Investigation

of Hemlock Looper Epidemics". The work at that time was concentrated in the Indian River Valley at the head of Indian Arm. The M. V. "J. M. Swaine" was used on this project for transporting personnel and equipment to the site and it also served as a headquarters.

Some progress was made toward the transferring of field information from the enclosure slips of previous years to the type designed for use in 1951.

1. AREAS SURVEYED.

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

S. J. Allen and K. Robertson.

The 1951 survey of the southern coastal area by the "J. M. Swaine" commenced May 29 on the Gulf Islands and ended in mid-September during which time survey work was carried out on the islands and mainland from Vancouver to Bella Coola and on Vancouver Island from Quatsino Sound to Barkley Sound. The enforced closure of the forest interrupted survey work for the period August 1 to August 24 when the boat was in the lower mainland area. This area was then partially opened and sampling was continued along road fringes and shore lines.

As usual the coastal survey was governed somewhat by weather conditions. Some time was lost, due to heavy winds and fog, in crossing Queen Charlotte Sound to Smith Inlet and

in rounding Cape Scott the northern most tip of Vancouver Island.

Personnel aboard the J. M. Swaine for the coastal survey were:

Forest Biology Ranger	-	S. J. Allen (in charge)
Forest Biology Ranger	-	K. Robertson
University Student	-	G. Jones
Cook	-	A. Davie
Engineer	-	E. Gilkin
Ship's Captain	-	G. J. McHugh.

Rangers E. G. Harvey, D. W. Taylor and D. G. Collis were on board while the vessel was engaged in their particular districts.

During the season several locations hitherto unsurveyed were visited. Information and photographs following will help to bring up to date the knowledge of coastal areas.

1. Quatsino Sound.

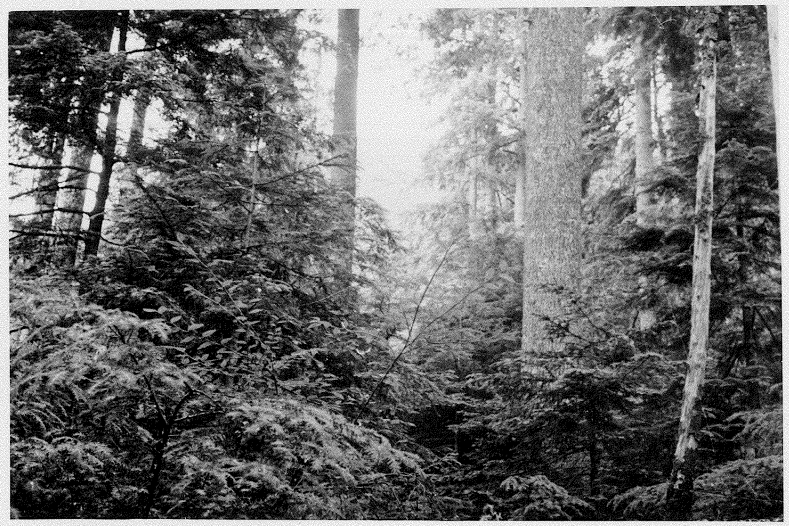
(a) Port Alice.

Survey work was carried out in this area in early July and at the same time some instruction was given to Mr. W. McGhee resident forester for Alaska Pine and Cellulose Company Ltd.

Mr. McGhee had been instructed by his company to establish and maintain, by liaison with the forest insect laboratory, an insect survey of timber holdings within their management license F. M. L. No. 6. Personnel of the J. M. Swaine together with

Mr. McGhee and several of his foresters established six permanent sampling plots in the Quatsino region in stands representative of timber types found in the area. These plots will be sampled twice annually by company forestry personnel and all material shipped to the Forest Insect Laboratory at Langford.

FML 6 No. 1 E side of Victoria Lake
Marker and Timber Type. 2 story hemlock-balsam.



FML 6 No. 2 Port Alice 1,500' elevation
2 story hemlock-balsam.

2. Johnstone Straits.

(a) West Thurlow Island.

An old grade running northwest from a clearing at the north end of Knox Bay runs well back into the timbered area. From the fork in the grade 100 yards from the beach the north grade is the better for walking.

(b) Port Neville.

A road, from the logging camp at grid 10-032.1-2648, runs north four miles to 1,000 ft. elevation. From here a variety of timber types and conditions are available.

(c) Forward Harbour.

An old deserted camp and logging road, at the head of the inlet, gives access to an area to the northwest of the camp.

3. Loughborough Inlet.

(a) Apple River

The river mouth is easily accessible but a dense thicket of elderberry a distance upstream makes sampling very difficult.

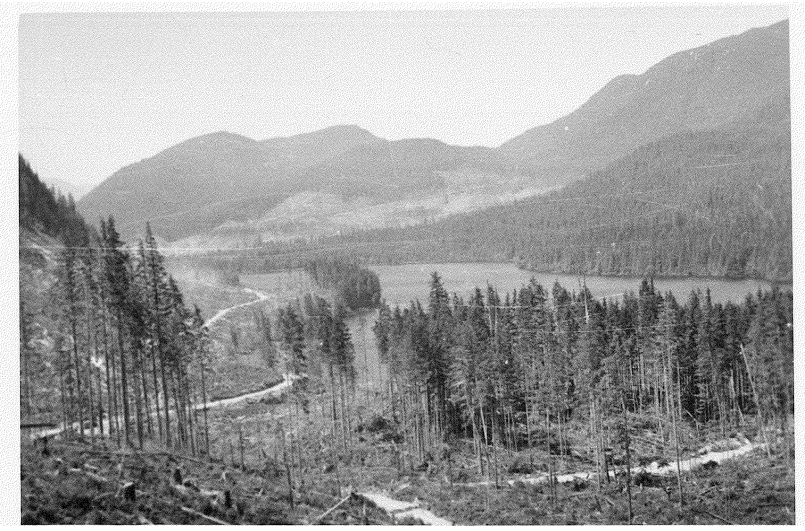
(b) Fraser Bay.

Abandoned logging camp on west shore. Roads branch about one half mile behind the camp. The right road leads toward Stafford Lake and is well above the river. At the end of the road there is no trail, but going is fairly easy through the huckleberry ground cover. The timber stand is two story mature and over mature in this area.

Hemlock-balsam 2 story mature at Fraser Bay.

(c) Heydon Bay

Logging roads of "Northwest Logging Company" run almost to Tom Brown Lake.



View showing roads from Heydon Bay looking north past Glendale Lake.

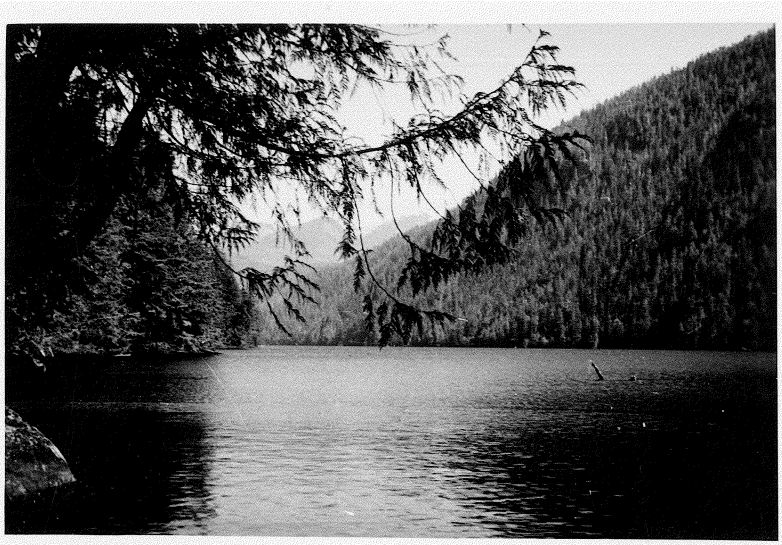
4. Smith Inlet.

Wyclees Lagoon.

From Anchor cove, Smith Inlet. East approximately one half mile is the entrance to this salt water lagoon. Here, there are rapids from low to three quarter tide and the higher tide must be used to enter or leave the lagoon. In Wyclees lagoon at the end of the creek from Long Lake, a trail can be found on the south side of the creek mouth. This trail is good and a portage could be made quite easily to Long Lake with a light boat or canoe.

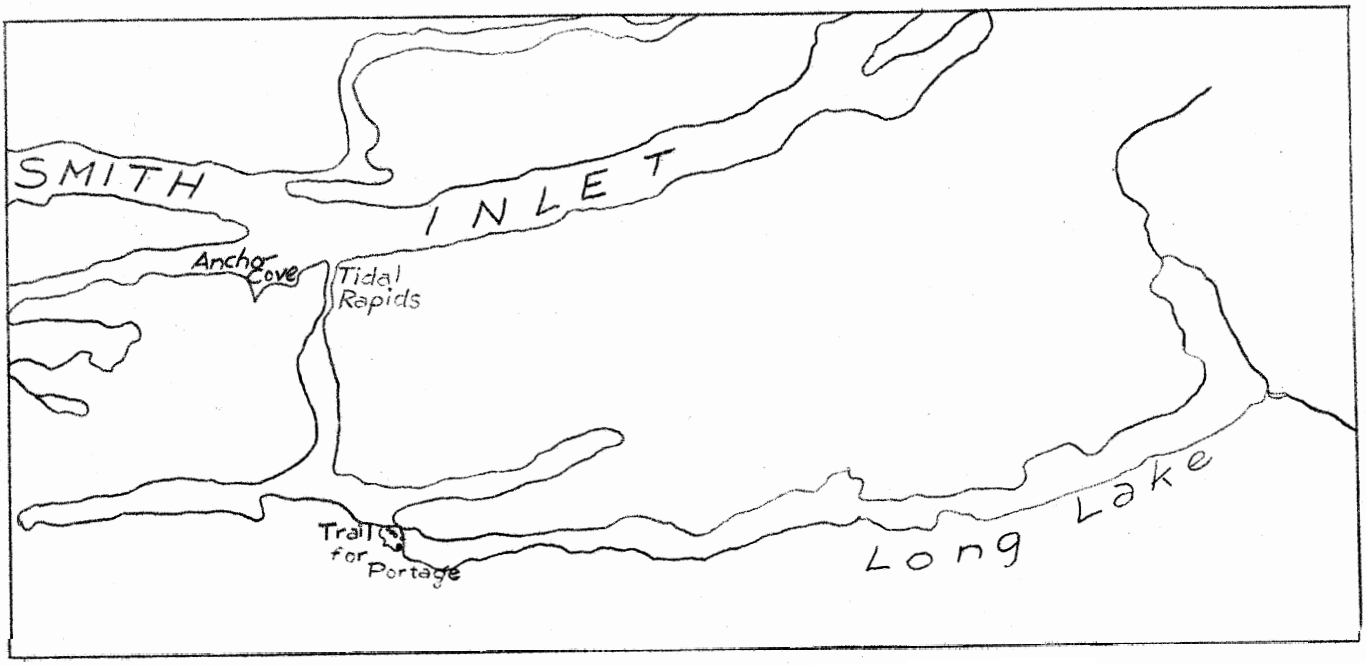
Entrance to Wyclees Lagoon.

Wyclees Lagoon looking towards creek valley from Long Lake.



Long Lake from west end.

Map



Generally, Smith Inlet area has very poor timber comprising over-mature cedar-hemlock scrub on very rocky terrain.

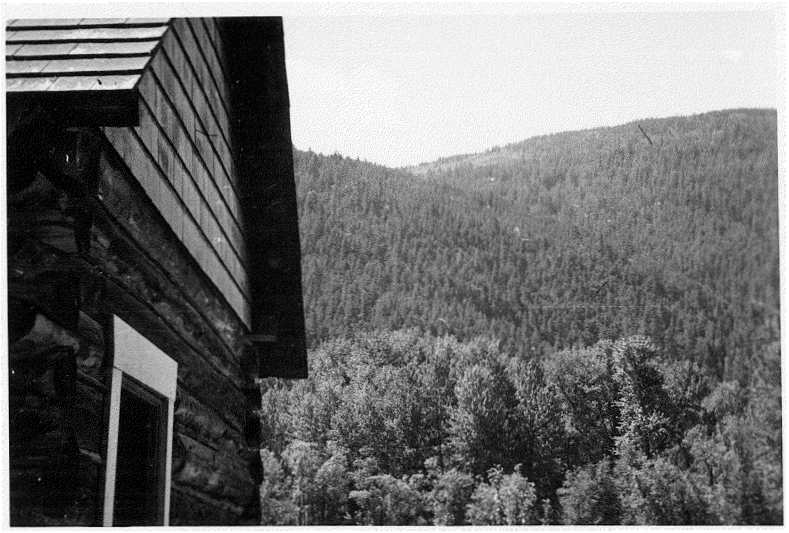
5. Burke Channel

Bella Coola

A reconnaissance was made from the end of the Bella Coola Valley road at Mosure Creek by trail to Atnarko approximately 6 miles to the east. The infestation of mountain pine beetle Dendroctonus monticolae Hopk. extends along the north slopes from the road end to Atnarko.

W. Benwell assistant forest ranger at Bella Coola is most helpful in supplying transportation for use in the valley.

In Atnarko, which is only a couple of isolated farms, B. Robson was most co-operative in supplying local information and offering lodging to survey personnel.



Bert Robson's house facing south towards fir and pine timbered slopes where bark beetles were active.

6. Esperanza Inlet.

Zeballos.

Logging roads now extend well beyond the old King Midas mine. Branch roads will make this area much more accessible as far as Zeballos Lake.

The Woss Lake map (1" = 1 mile) Department of Mines and Resources is best for use in this area.

7. Herbert Inlet.

On the east side of the inlet in T. L. 6283 stand several old shacks from which a road leads back for approximately one mile. A trail branches from this road 400 yards from the beach and leads into timbered areas up to 5,000 ft. elevation.

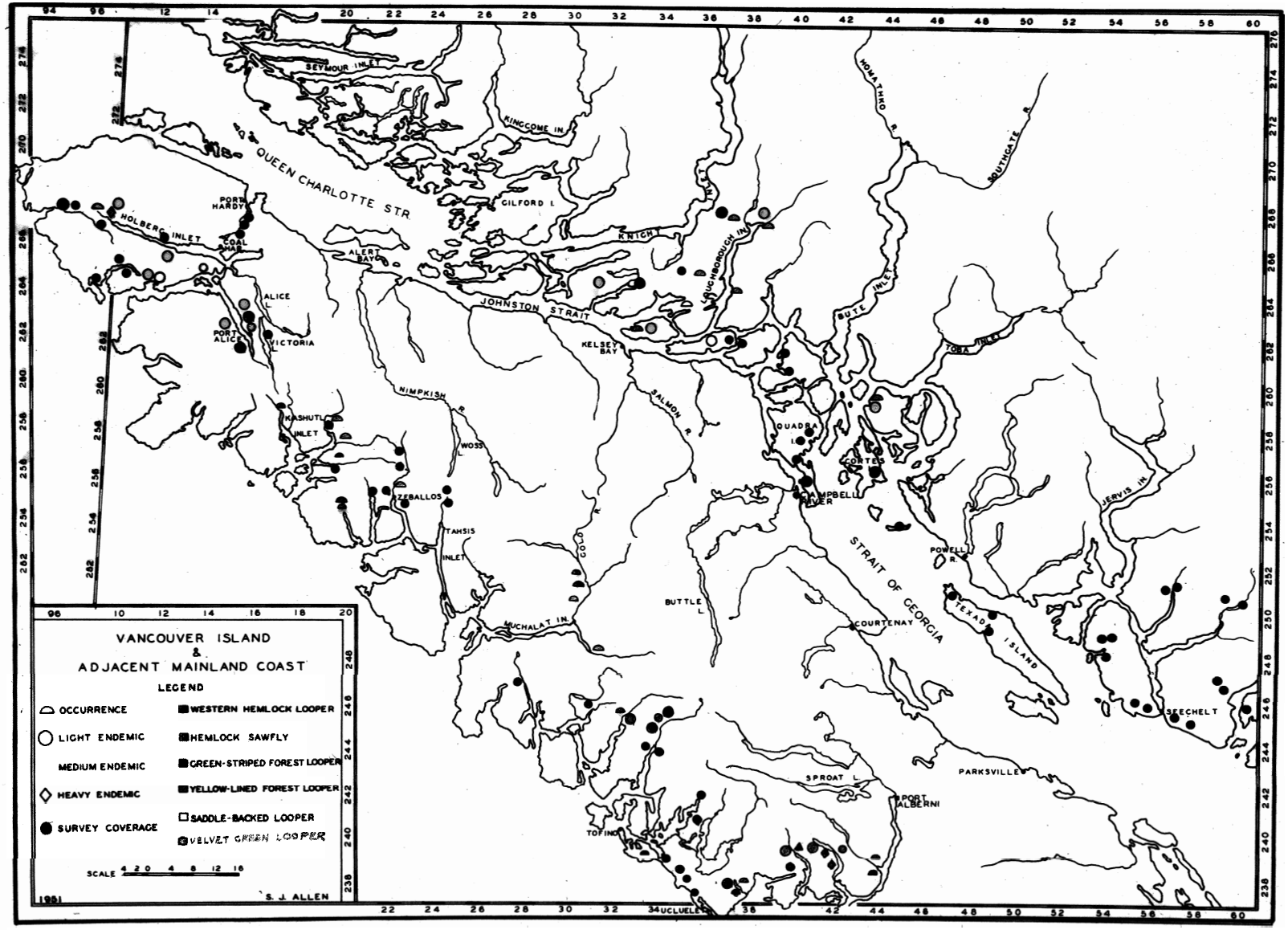
8. Effingham Inlet

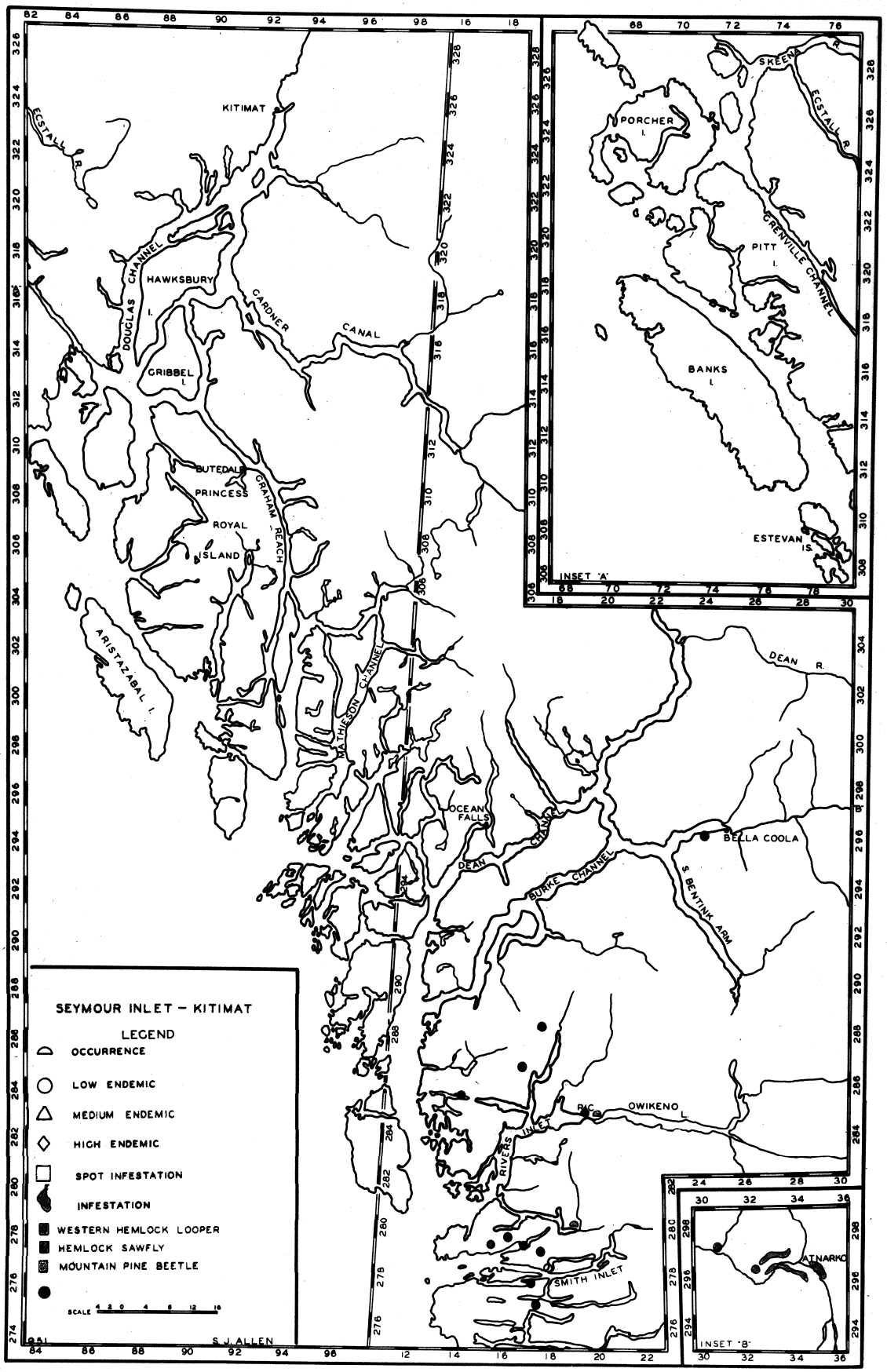
On the west side of the head of the inlet a trail runs for several miles into the valley.

Hemlock 2 story - Effingham Inlet.

Hemlock single story - Wennock River.

Scrub over-mature cedar - hemlock stand,
Draney Inlet.


VANCOUVER ISLAND
&
ADJACENT MAINLAND COAST
LEGEND
OCCURRENCE
LIGHT ENDEMIC
MEDIUM ENDEMIC
HEAVY ENDEMIC
SURVEY COVERAGE
WESTERN HEMLOCK LOOPER
HEMLOCK SAWFLY
GREEN-STRIPED FOREST LOOPER
YELLOW-LINED FOREST LOOPER
SADDLE-BACKED LOOPER
VELVET GREEN LOOPER
SCALE 4 2 0 4 8 12 16
1981
S. J. ALLEN
QUEEN CHARLOTTE STR
SEYMOUR INLET
KINGCOME IN.
GILFORD I.
HOMATHKO R.
KNIGHT INLET
LOUGHBOROUGH IN.
SOUTHGATE R.
PORT HARDY
HOLBERG INLET
COAL HARB.
ALERT BAY
ALICE L.
PORT ALICE
VICTORIA L.
JOHNSTON STRAIT
KELSEY BAY
BUTE INLET
TOBA INLET
NIMPKISH R.
SALMON R.
KASHUTL INLET
WOSS L.
QUADRA I.
CORTES I.
ZEBALLOS
TAHSIS INLET
CAMPBELL RIVER
JERVIS IN.
POWELL R.
STRAIT OF GEORGIA
BUTTLE L.
MUCHALAT IN.
COURTENAY
TEXADA ISLAND
SEECHELT
PARKSVILLE
SPROAT L.
PORT ALBERNI
TOFINO
UCLUELET


KITIMAT
ECSTALL R.
DOUGLAS CHANNEL
HAWKSBURY I.
GARDNER CANAL
GRIBBEL I.
BUTEDALE
PRINCESS ROYAL ISLAND
GRAHAM REACH
ARISTAZABAL I.
MATHIESON CHANNEL
OCEAN FALLS
DEAN CHANNEL
BURKE CHANNEL
DEAN R.
BELLA COOLA
S. BENTINK ARM
OWIKENO L.
RIVERS INLET
SMITH INLET
INSET 'A'
SKEENA R.
ECSTALL R.
PORCHER I.
GRENVILLE CHANNEL
PITT I.
BANKS I.
ESTEVAN IS.
INSET 'B'
ATNARKO
SEYMOUR INLET – KITIMAT
LEGEND
OCCURRENCE
LOW ENDEMIC
MEDIUM ENDEMIC
HIGH ENDEMIC
SPOT INFESTATION
INFESTATION
WESTERN HEMLOCK LOOPER
HEMLOCK SAWFLY
MOUNTAIN PINE BEETLE
SCALE 4 2 0 4 8 12 16
S.J. ALLEN

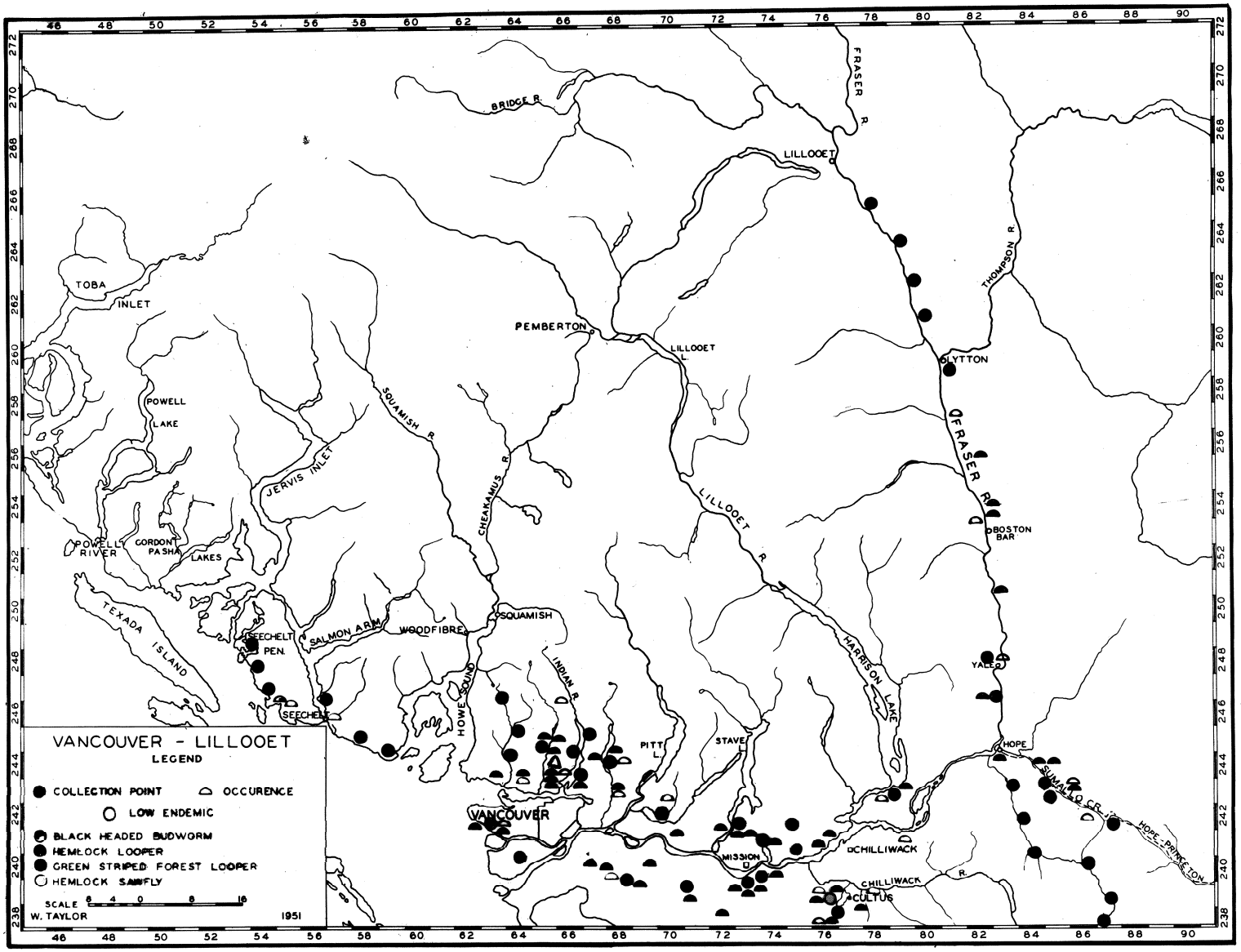
B. Lower Mainland and Fraser Valley.

D. W. Taylor.

The survey in this area was begun in early June and extended through to September 19. The extended closure of the Vancouver Forest District due to a prolonged spell of dry weather restricted survey activities and travel to highways and government maintained roads during the periods June 30, July 5, July 12, September 10, September 10, September 19, September 30. This restriction on forest travel reduced considerably the number of samples collected and the area covered, consequently large areas of valuable timber were not surveyed during the season.

A new ferry service between Horseshoe Bay and Gibsons Landing opened the whole of the Sechelt Peninsula and Jervis Inlet area for survey by truck and dinghy. This area which extends north from Howe Sound to Jervis Inlet is divided by Sechelt Inlet and varies considerably in topography from the east side of Sechelt Inlet to the west. On the west side the land is rolling and timbered mainly with stands of hemlock and Douglas fir. Elevations are seldom over 2,500 to 3,000 ft. To the east of Sechelt Inlet through to Howe Sound the mountains are heavily timbered on the lower slopes, though they are rugged and often up to 6,000 ft. elevation.

No new information is available to add to that of areas discussed in previous years.


VANCOUVER - LILLOOET
LEGEND
COLLECTION POINT
OCCURENCE
LOW ENDEMIC
BLACK HEADED BUDWORM
HEMLOCK LOOPER
GREEN STRIPED FOREST LOOPER
HEMLOCK SAWFLY
SCALE 8 4 0 8 16
W. TAYLOR 1951
FRASER R.
BRIDGE R.
LILLOOET
THOMPSON R.
TOBA INLET
PEMBERTON
LILLOOET L.
LYTTON
POWELL LAKE
SQUAMISH R.
JERVIS INLET
CHEAKAMUS R.
FRASER R.
POWELL RIVER
GORDON PASHA LAKES
LILLOOET R.
BOSTON BAR
TEXADA ISLAND
SECHELT PEN.
SALMON ARM
WOODFIBRE
SQUAMISH
HARRISON LAKE
YALE
SECHELT
HOWE SOUND
INDIAN R.
PITT L.
STAVE L.
HOPE
SUMALLO CR.
HOPE-PRINCETON
VANCOUVER
MISSION
CHILLIWACK
CHILLIWACK R.
CULTUS

It is impossible to compare insect populations of the season with those of 1950 with any accuracy, however, compilation of data from enclosure slips and identification slips does indicate a slight increase in the general insect population.

C. South Vancouver Island

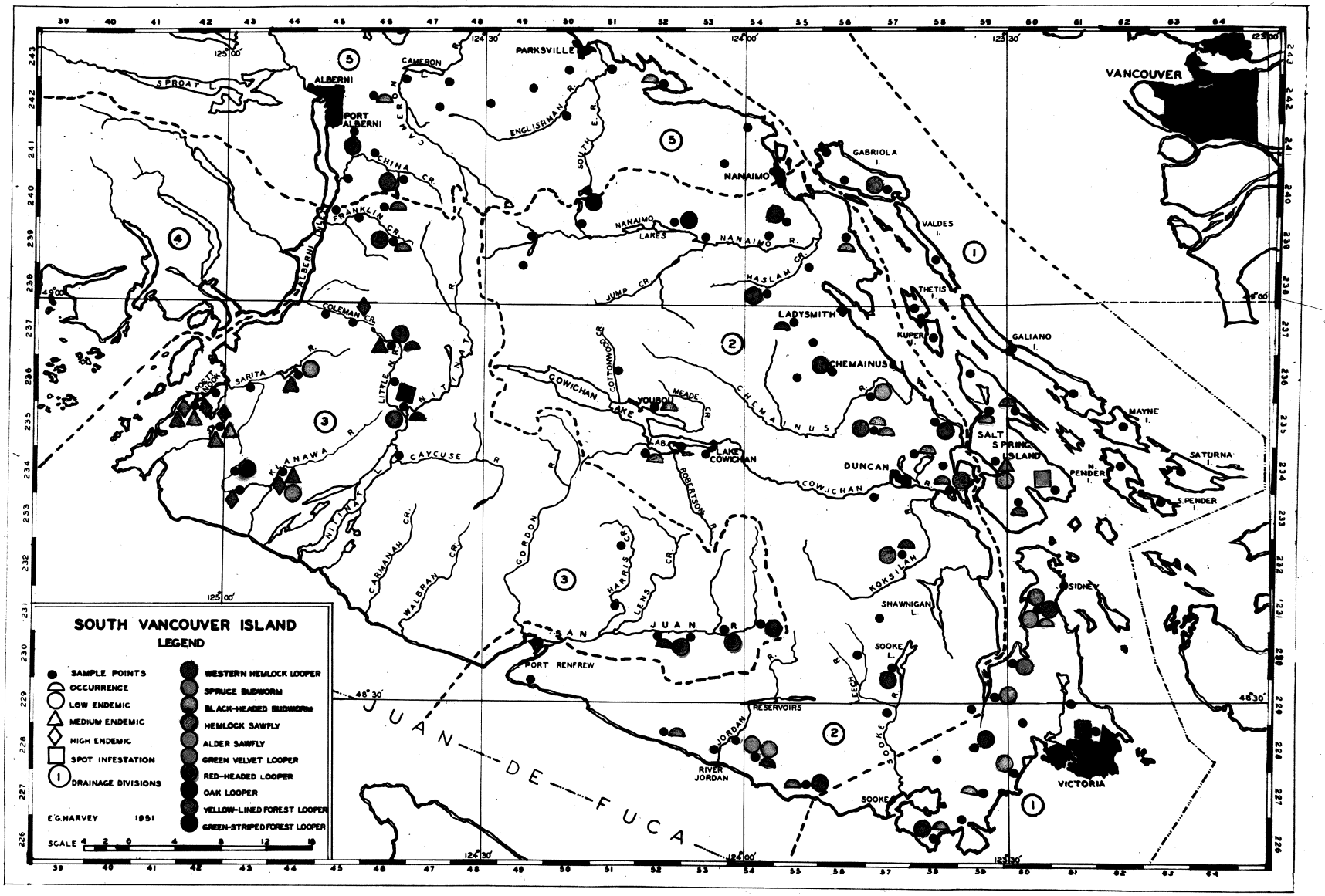
E. G. Harvey.

The summer of 1951 was very dry and hot. This made very nice working conditions in the woods for a while, but unfortunately, it created such a fire hazard that the forests in the entire district were closed, absolutely, to any kind of work or travel for a period of about six weeks. The end result with the survey was that large areas were only lightly touched. The number of collections made was not too greatly reduced since some collecting could be done in certain local areas, by special permit from the forest rangers, at times when the humidity was not too low.

Due to the forest closure there is no area information to add to the existing information gathered during the preceding years.

There were 582 collections made by the rangers in this district during the year - 125 from the vessel "J. M. Swaine" and 457 by working from the car.

A very great increase in the numbers of insects found was noted. This was particularly true in those areas on the west coast which suffered most from the depredations of the


SOUTH VANCOUVER ISLAND
LEGEND
SAMPLE POINTS
OCCURRENCE
LOW ENDEMIC
MEDIUM ENDEMIC
HIGH ENDEMIC
SPOT INFESTATION
DRAINAGE DIVISIONS
E.G. HARVEY 1951
SCALE
WESTERN HEMLOCK LOOPER
SPRUCE BUDWORM
BLACK-HEADED BUDWORM
HEMLOCK SAWFLY
ALDER SAWFLY
GREEN VELVET LOOPER
RED-HEADED LOOPER
OAK LOOPER
YELLOW-LINED FOREST LOOPER
GREEN-STRIPED FOREST LOOPER
JUAN DE FUCA
VANCOUVER
PARKSVILLE
ALBERNI
PORT ALBERNI
NANAIMO
LADYSMITH
DUNCAN
VICTORIA
SOOKE
SIDNEY
GABRIOLA I.
VALDES I.
GALIANO I.
MAYNE I.
SATURNA I.
PENDER I.
SALT SPRING ISLAND
SHAWNIGAN L.
LAKE COWICHAN
CHEMAINUS
PORT RENFREW
RESERVOIRS
RIVER JORDAN
SPROAT L.
CAMERON L.
ENGLISHMAN R.
SOUTH E. R.
NANAIMO LAKES
NANAIMO R.
HASLAN CR.
JUMP CR.
THETIS I.
KUPER I.
CHEMAINUS R.
COWICHAN LAKE
COTTONWOOD CR.
MEADE CR.
COWICHAN R.
ROBERTSON R.
KORSILAN
SOOKE L.
SOOKE R.
LEECH R.
JORDAN R.
GORDON R.
HARRIS CR.
LENS CR.
SAN JUAN R.
CARMANAH CR.
WALBRAN CR.
CAYCUSE R.
KANAWA R.
LITTLE NITINAT L.
NITINAT L.
SARITA R.
KLAHOOSE
COLEMAN CR.
FRANKLIN CR.
CHINA CR.
SOMENOS CR.
ALBERNI R.

238

hemlock looper from 1944 to 1947. In the Poett Nook area the trees showed heavy defoliation, due to the feeding of Melanolophia imitata, Nyctobia l. nigroangulata, Acleris variana, Neodiprion tsugae and to a lesser degree, a few other species of looper. The above mentioned larvae were found in numbers ranging from 40 to 140 each per collection.

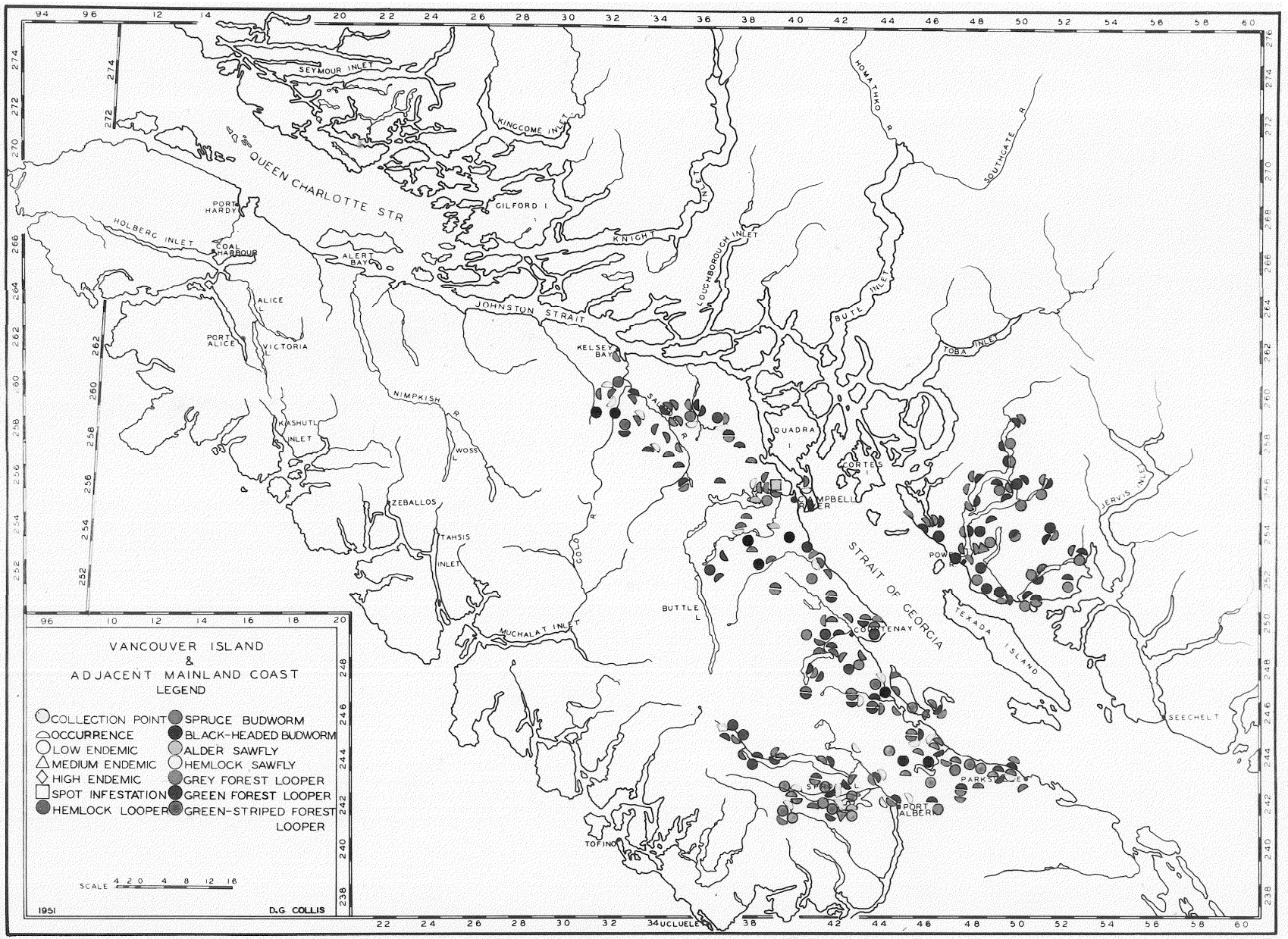
In 1948 no defoliator larvae were found in this area. In 1949 only three collections produced three larvae of Melanolophia imitata (Wlk.) and five larvae of Neodiprion tsugae Midd. During 1950 only three collections contained nine larvae of M. imitata, five larvae Nyctobia l. nigroangulata, 157 N. tsugae and four miscellaneous geometrids.

Records of the 1951 sampling show a substantial increase in the general insect population and a rather alarming increase in the population of the black-headed budworm in certain areas.

D. North Vancouver Island.

D. G. Collis.

The survey of north Vancouver Island district commenced in mid-May and extended through to mid-September although the long closure of the district due to dry conditions restricted the scope of the work considerably. During the closure it was possible at times to obtain a permit from certain forest rangers to work along roadsides or lakeshores only. Consequently the timber stands in the central portion of the district were not surveyed nor was the area north of the Kelsey Bay.


VANCOUVER ISLAND
&
ADJACENT MAINLAND COAST
LEGEND
COLLECTION POINT
OCCURRENCE
LOW ENDEMIC
MEDIUM ENDEMIC
HIGH ENDEMIC
SPOT INFESTATION
HEMLOCK LOOPER
SPRUCE BUDWORM
BLACK-HEADED BUDWORM
ALDER SAWFLY
HEMLOCK SAWFLY
GREY FOREST LOOPER
GREEN FOREST LOOPER
GREEN-STRIPED FOREST LOOPER
SCALE 4 2 0 4 8 12 16
1951
D.G COLLIS
SEYMOUR INLET
KINGCOME INLET
QUEEN CHARLOTTE STR
GILFORD I.
HOMATHKO R.
SOUTHGATE R.
PORT HARDY
HOLBERG INLET
COAL HARBOUR
ALERT BAY
KNIGHT INLET
LOUGHBOROUGH INLET
BUTE INLET
TOBA INLET
ALICE L.
PORT ALICE
VICTORIA
JOHNSTON STRAIT
KELSEY BAY
NIMPKISH R.
KASHUTL INLET
WOSS L.
ZEBALLOS
TAHSIS INLET
MUCHALAT INLET
BUTTLE L.
QUADRA I.
CORTES I.
CAMPBELL RIVER
COMOX
COURTENAY
STRAIT OF GEORGIA
TEXADA ISLAND
JERVIS INLET
POWELL RIVER
SECHELT
PARKSVILLE
PORT ALBERNI
TOFINO
UCLUELET

Insect populations in the district remained more or less static except for the alder sawfly which had practically disappeared from areas where it had caused defoliation in 1950.

An unidentified disease caused considerable die-back of limbs on alder along the entire east coast of the district and in the Alberni Valley.

Comparison of insect populations between 1951 and 1950 is impossible due to the limited distribution of collections.

E. Prince Rupert Forest District.

The beginning of the collecting season was somewhat retarded due to circumstances over which there was no local control. Despite this late start however, all hazard areas were thoroughly covered by the Forest Insect Survey as well as four areas not previously surveyed. A total of 354 insect collections were forwarded to the Langford insectary and 31 collections sent to the Dominion Forest Pathology Laboratory in Victoria. Approximately 10 hours of aerial survey work was carried out through the courtesy of the B. C. Forest Service and The Columbia Cellulose Company Ltd. In addition to survey work two weeks were spent on Project E-170 (Flooding Effect on Timber in Relation to Bark Beetle Attack) with W. E. Webb (in charge) as well as finishing work and land clearing at the Lakelse Lake Ranger Station during October and November.

Survey work outlined above is set forth in more detail under the following headings:

1. Survey schedule

2. Collections and Permanent Sampling stations

3. New Areas Surveyed.

4. Aerial Survey.

1. Survey Schedule

Burns Lake - Babine Lake, Spruce Budworm Infestation	June 19 to July 17
Francois Lake Nadine River	July 18 and 19
Tour Prince Rupert Forest District with H. A. Richmond	July 20 to 26
Taltapin Lake	July 26 to 29
Project E-170	July 30 to August 4
Tweedsmuir Park	August 5 to 12.
Lower Skeena River, Prince Rupert to Salvus	August 13 to 19
Nass River, Brown Bear and Paw Lakes	August 20 to 26.
Khutzeymateen Inlet	August 27 to 30.
Lower Skeena River, Salvus to Terrace	August 31 to September 2.
Kitimat River - Lakelse Lake	September 3 to 8.
Project E-170	September 9 to 16.
Babine Lake	September 17 to 23.
Lower Skeena River Terrace to Hazelton	September 24 to 30.

2. Collections and Permanent Sampling Stations.

HOST	COLLECTION	NEGATIVE COLLECTIONS	TOTAL
White spruce	159	9	168
Alpine fir	57	7	64
Hemlock	37	1	38
Balsam	20	-	20
Sitka spruce	16	-	16
Lodgepole pine	4	7	11
Douglas fir	4	-	4
Western red cedar	3	8	11
Mountain hemlock	3	-	3
White bark pine	0	1	1
Red alder	9		9
Willow	3		3
Aspen	2		2
Black cottonwood	1		1
Devil's Club	2		2
TOTAL	320	34	354

FOREST PATHOLOGY COLLECTION

HOST	Number of Collections
Hemlock	13
Mountain hemlock	4
Balsam	4
White spruce	4
Lodgepole pine	2
Douglas fir	1
Sitka spruce	1
White bark pine	
Western white birch	1
TOTAL	31

Eleven new permanent sampling stations were established during 1951. Nine within the Burns Lake- Babine Lake spruce budworm infestation and two in the Francois Lake Tweedsmuir Park area where high endemic populations of the black-headed budworm were encountered.

3. New Areas Surveyed.

(a) Tschesinkut Lake

This lake lies between the Burns Lake and Francois Lake valleys in a generally easterly and westerly valley drainage eastward to the Endako River east of Priestly.

The western end of the lake is accessible by car but complete coverage of the lake shore slopes can only be obtained by boat.

The forest cover is typical of the Burns Lake - South-bank arms described in the 1949 Annual Forest Insect Survey Report. Logging of the commercial spruce and pine growth is carried on along the eastern and south-eastern lake shore.

(b) Brown Bear and Paw Lakes.

These two 'pot-hole' lakes lie to the east and west of the mid Nass River Basin and at the present time are only accessible by air.

Timber stands in both areas are similar, being typical higher elevation coastal forest growth of balsam (Abies amabilis) hemlock (Tsugae heterophylla and mertensiana) and Sitka spruce. These stands are generally dominant in the former two species with only a low but relatively consistent spruce percentage. The stands generally throughout these areas are decadent and over mature.

No logging is being done in these areas at the present time.

(c) Khutzeymateen Inlet

This area is readily accessible from Prince Rupert by Columbia Cellulose Company camp tender.

Stands in this area are typically coastal hemlock - balsam types and very decadent. The dominating species is generally hemlock, up to 450 years, with co-dominant balsam, 250 years, with small percentages of cedar and Sitka spruce in scattered almost pure patches or as dominant and co-dominant trees in mixture with the main hemlock - balsam stand.

Insect populations in the district remained more or less static except for the alder sawfly which had practically disappeared from areas where it had caused defoliation in 1950.

An unidentified disease caused considerable die-back of limbs on alder along the entire east coast of the district and in the Alberni Valley.

Comparison of insect populations between 1951 and 1950 is impossible due to the limited distribution of collections.

E. Prince Rupert Forest District.

The beginning of the collecting season was somewhat retarded due to circumstances over which there was no local control. Despite this late start however, all hazard areas were thoroughly covered by the Forest Insect Survey as well as four areas not previously surveyed. A total of 354 insect collections were forwarded to the Langford insectary and 31 collections sent to the Dominion Forest Pathology Laboratory in Victoria. Approximately 10 hours of aerial survey work was carried out through the courtesy of the B. C. Forest Service and The Columbia Cellulose Company Ltd. In addition to survey work two weeks were spent on Project E-170 (Flooding Effect on Timber in Relation to Bark Beetle Attack) with W. E. Webb (in charge) as well as finishing work and land clearing at the Lakelse Lake Ranger Station during October and November.

Survey work outlined above is set forth in more detail under the following headings:

1. Survey schedule.

2. Collections and Permanent Sampling stations.

3. New Areas Surveyed.

4. Aerial Survey.

1. Survey Schedule

Burns Lake - Babine Lake, Spruce Budworm Infestation June 19 to July 17
Francois Lake Nadine River July 18 and 19
Tour Prince Rupert Forest District with H. A. Richmond July 20 to 26
Taltapin Lake July 26 to 29
Project E-170 July 30 to August 4
Tweedsmuir Park August 5 to 12.
Lower Skeena River, Prince Rupert to Salvus August 13 to 19
Nass River, Brown Bear and Paw Lakes August 20 to 26.
Khutzeymateen Inlet August 27 to 30.
Lower Skeena River, Salvus to Terrace August 31 to September 2.
Kitimat River - Lakelse Lake September 3 to 8.
Project E-170 September 9 to 16.
Babine Lake September 17 to 23.
Lower Skeena River Terrace to Hazelton September 24 to 30.

2. Collections and Permanent Sampling Stations.

HOST	COLLECTION	NEGATIVE COLLECTIONS	TOTAL
White spruce	159	9	168
Alpine fir	57	7	64
Hemlock	37	1	38
Balsam	20		20
Sitka spruce	16	-	16
Lodgepole pine	4	7	11
Douglas fir	4	-	4
Western red cedar	3	8	11
Mountain hemlock	3	-	3
White bark pine	0	1	1
Red alder	9	-	9
Willow	3		3
Aspen	2	-	2
Black cottonwood	1		1
Devil's Club	2		2
TOTAL	320	34	354

FOREST PATHOLOGY COLLECTION

HOST	Number of Collections
Hemlock	13
Mountain hemlock	4
Balsam	4
White spruce	4
Lodgepole pine	2
Douglas fir	1
Sitka spruce	1
White bark pine	1
Western white birch	1
TOTAL	31

Eleven new permanent sampling stations were established during 1951. Nine within the Burns Lake- Babine Lake spruce budworm infestation and two in the Francois Lake-Tweedsmuir Park area where high endemic populations of the black-headed budworm were encountered.

3. New Areas Surveyed.

(a) Tschesinkut Lake

This lake lies between the Burns Lake and Francois Lake valleys in a generally easterly and westerly valley drainage eastward to the Endako River east of Priestly.

The western end of the lake is accessible by car but complete coverage of the lake shore slopes can only be obtained by boat.

The forest cover is typical of the Burns Lake - South-bank arms described in the 1949 Annual Forest Insect Survey Report. Logging of the commercial spruce and pine growth is carried on along the eastern and south-eastern lake shore.

(b) Brown Bear and Paw Lakes.

These two 'pot-hole' lakes lie to the east and west of the mid Nass River Basin and at the present time are only accessible by air.

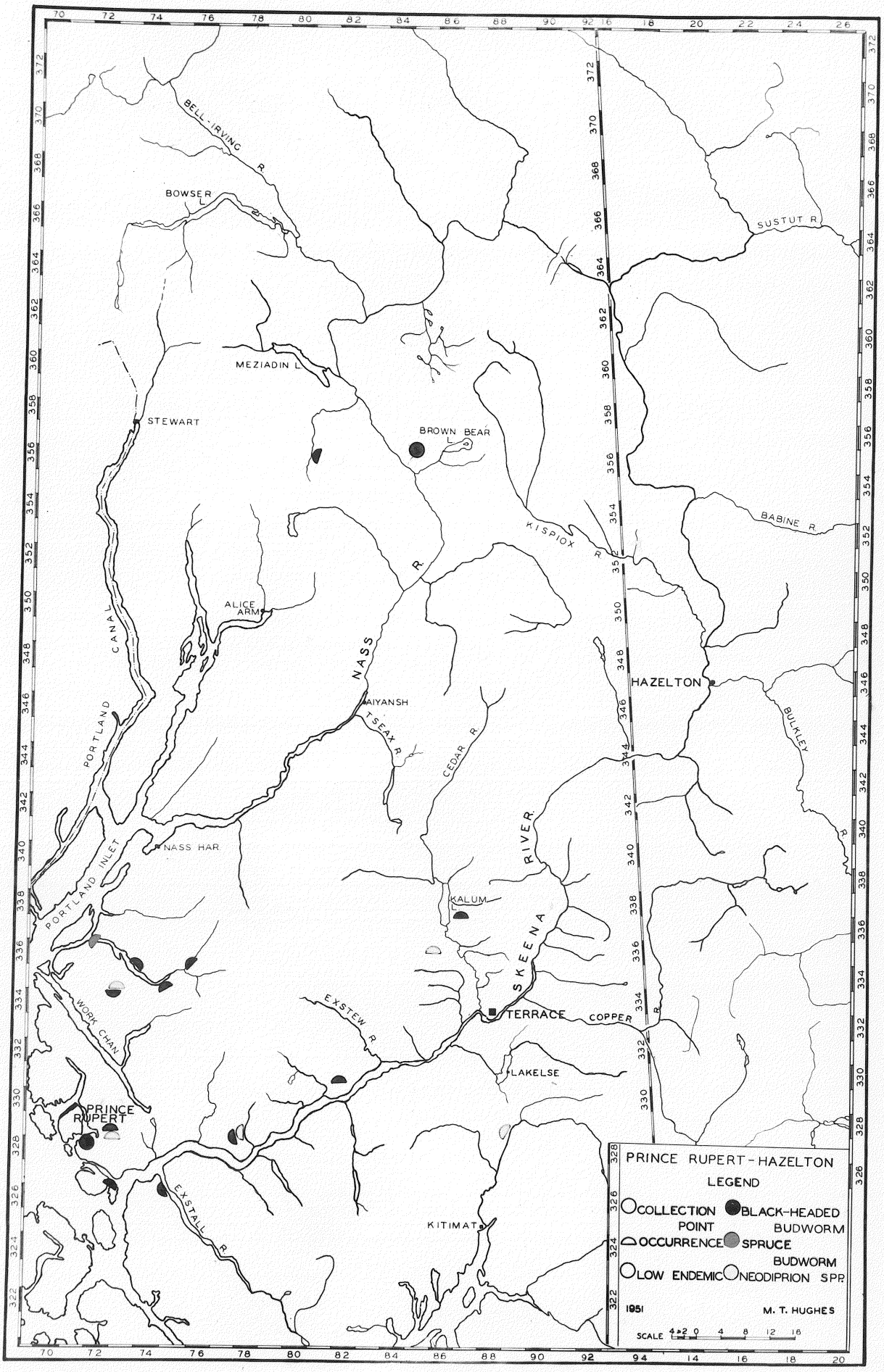
Timber stands in both areas are similar, being typical higher elevation coastal forest growth of balsam (Abies amabilis) hemlock (Tsugae heterophylla and mertensiana) and Sitka spruce. These stands are generally dominant in the former two species with only a low but relatively consistent spruce percentage. The stands generally throughout these areas are decadent and over mature.

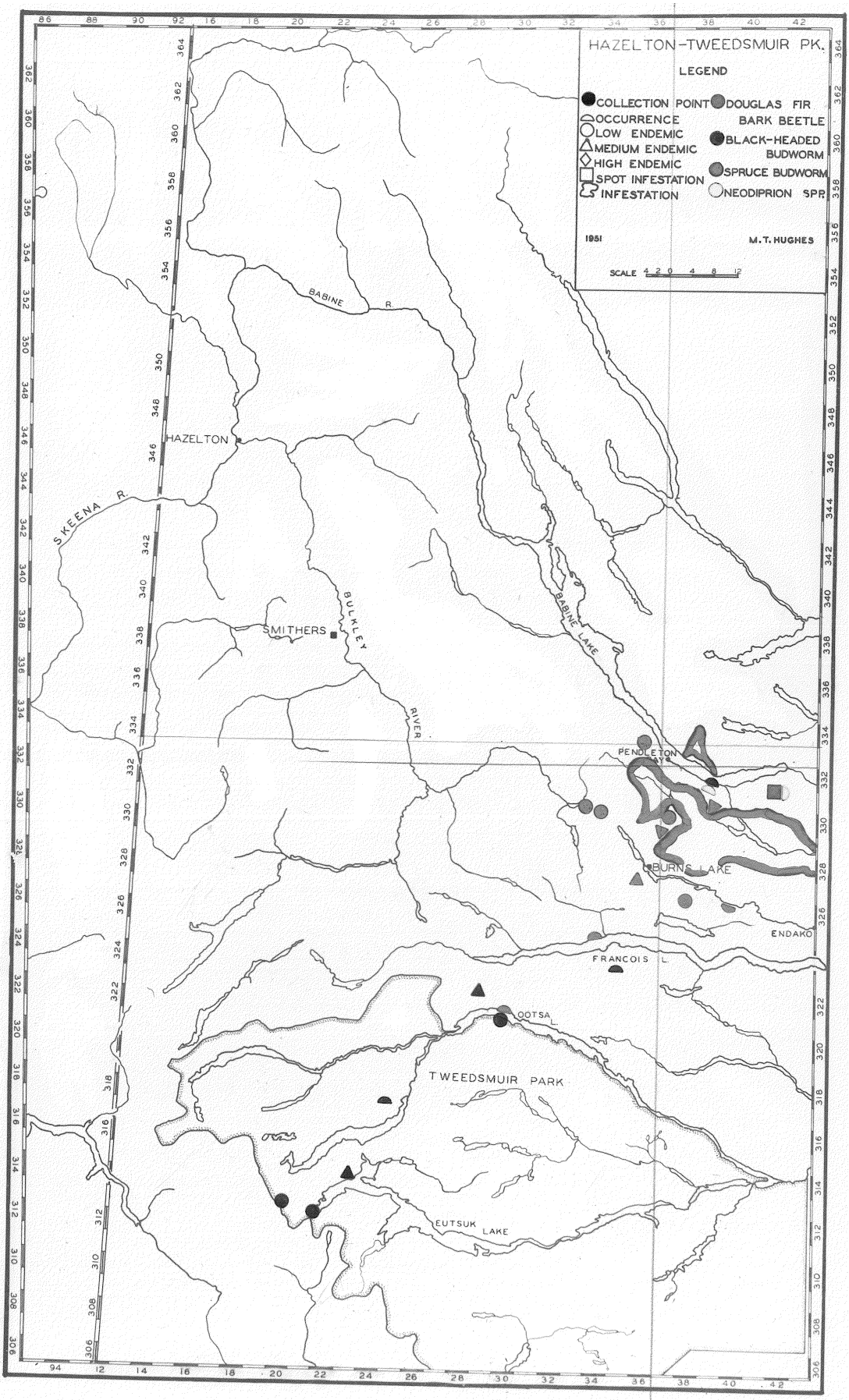
No logging is being done in these areas at the present time.

(c) Khutzeymateen Inlet

This area is readily accessible from Prince Rupert by Columbia Cellulose Company camp tender.

Stands in this area are typically coastal hemlock - balsam types and very decadent. The dominating species is generally hemlock, up to 450 years, with co-dominant balsam, 250 years, with small percentages of cedar and Sitka spruce in scattered almost pure patches or as dominant and co-dominant trees in mixture with the main hemlock - balsam stand.


BELL-IRVING R.
BOWSER L.
SUSTUT R.
MEZIADIN L.
STEWART
BROWN BEAR L.
KISPIOX R.
BABINE R.
ALICE ARM
NASS R.
PORTLAND CANAL
HAZELTON
KAIYANSH
TSEAX R.
CEDAR R.
BULKLEY R.
NASS HAR.
PORTLAND INLET
SKEENA RIVER
KALUM L.
WORK CHAN.
EXSTEW R.
TERRACE
COPPER R.
LAKELSE L.
PRINCE RUPERT
EXSTALL R.
KITIMAT
PRINCE RUPERT - HAZELTON
LEGEND
COLLECTION POINT
OCCURRENCE
BLACK-HEADED BUDWORM SPRUCE BUDWORM
LOW ENDEMIC
NEODIPRION SPP.
1951
M. T. HUGHES
SCALE 4 2 0 4 8 12 16


HAZELTON-TWEEDSMUIR PK.
LEGEND
COLLECTION POINT
OCCURRENCE
LOW ENDEMIC
MEDIUM ENDEMIC
HIGH ENDEMIC
SPOT INFESTATION
INFESTATION
DOUGLAS FIR BARK BEETLE
BLACK-HEADED BUDWORM
SPRUCE BUDWORM
NEODIPRION SPP.
1951
M. T. HUGHES
SCALE 4 2 0 4 8 12
BABINE R.
HAZELTON
SKEENA R.
SMITHERS
BULKLEY RIVER
BABINE LAKE
PENDLETON BAY
BURNS LAKE
ENDAKO
FRANCOIS L.
OOTSA L.
TWEEDSMUIR PARK
EUTSUK LAKE

Ten hours of aerial observation and survey were made over the following tabulated areas.

Helene Lake	Brown Bear Lake
Hanson Lake	Paw Lake
Taltapin Lake	Meziadin Lake
Henrietta Creek	Nass River
Sutherland River	Kinskuck River
Augier Lake	Tchitin River
Pinkut Lake	Tseax River
Pinkut Creek	Kitsumgallum River
Babine Lake	Cedar River

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

A Spruce Budworm, Choristoneura fumiferana (Clem.)

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

Only eight larvae of this insect were found during the season. They were collected in the Gulf Islands, Johnstone Straights Island and Narrows Arm. Hosts were Douglas fir, Sitka spruce and western hemlock.

2. Lower Mainland and Fraser Valley.

Eight collections of this species were obtained from the Hope-Yale area. Hemlock and fir were the hosts and the average number per collection was 5. The forest closure prevented sampling the Whytecliffe-Horseshoe Bay area where an increase in the number of larvae was recorded in 1950.

3. South Vancouver Island.

Larvae of the spruce budworm were found to be slightly increasing in number over that of the previous years. Thirty-nine larvae were found in 27 collections. Seventeen of these larvae were collected on Salt Spring Island. The remainder were found along the east coast of the district in Douglas fir stands. With two exceptions the host tree was Douglas fir. One larva each was collected from cedar and grand fir. All of these larvae were found during the month of June.

4. North Vancouver Island.

Spruce budworm larvae were found between May 29 and August 31 in 11 collections which averaged 1.2 larvae per collection. The average elevation of these collections was 500'.

During 1950, 19 samples averaging 1.46 larvae each were collected.

5. Prince Rupert Forest District.

Data and information concerning the present spruce budworm infestation in the Burns Lake - Babine Lake area is set forth in a special report by Chief Ranger R. L. Fiddick contained in section IV of this report. Spruce budworm occurrence in other areas of the Prince Rupert Forest District is tabulated below.

Khutzeymateen Inlet	Host	Number
Khutzeymateen River	H	3
Mouse Creek	S	1

While no spruce budworm hazard exists at the present time along the northern coastal area it is interesting to note the larvae collected in 1951 appeared to be in the 5th instar on August 29 and that collections on August 24 in 1950 at neighbouring Kwinamass River also contained 5th instar larvae. No spruce budworm larvae were obtained in 1950 in the Khutzeymateen area and no larvae were found in the Kwinamass River area in 1951. These seem to indicate that in these two adjoining coastal areas there is a localized variation in the flight years.

Spruce budworm were unrecorded in all other areas of district in 1951.

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

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

The hemlock looper appeared in 31 samples in the coastal area between Howe Sound and Barkley Sound. There was seldom more than one larvae per sample although Rivers Inlet and Bella Coola still support an endemic population of this insect. Douglas fir and western hemlock were the hosts.

2. Lower Mainland and Fraser Valley.

Since 1946, when the devastating outbreaks of hemlock looper in the coastal area subsided, larvae of this insect have been found only occasionally in this district. During the past season samples containing an average of 2.3

larvae were collected over most of the Fraser Valley on the north and south side of the river. One collection from Point Grey in the Vancouver City area contained 14 larvae. The host tree in this case was cedar although the area was covered with hemlock regeneration. Western hemlock was the most common host although increase was noted in the number of cedar samples containing hemlock looper larvae.

3. South Vancouver Island.

Only three larvae of the hemlock looper were found in this district during the season, two in the Little Nitinat River Valley and one in the Ladysmith area. One adult was collected in the fall near the Bear Creek Camp in the San Juan River Valley.

4. North Vancouver Island.

Only five larvae of this defoliator were found at separate points in the district from June 29 to July 18.

During 1950 only two larvae were collected.

5. Prince Rupert Forest District.

The marked decline continued in the number of hemlock looper larvae found in the lower Skeena River Valley from Scotia River to Hazelton. Only two larvae were collected throughout the area during 1951, these being taken from a Sitka spruce and hemlock host at Salvus, L-532 and in the Kitimat River Valley respectively.

Yearly average number of larvae per 3 beating collections are shown below.

YEAR	NUMBER OF COLLECTIONS	NUMBER OF LARVAE	
		Total	Average
1949	32	166	5.2
1950	34	16	.4
1951	38	2	.05

C Oak Looper, Lambdina somniaria (Hlst.)

The oak looper infestation which was centralized around Greater Victoria has practically subsided. Egg counts varied from none to thirty-six per half square foot of moss in the various localities which had been heavily defoliated during the past few years. Larval collections were in about the same proportions, ranging from four to two hundred and fifty per sample. Only in one or two small areas was the defoliation severe enough to be noticeable.

D Black-headed Budworm, Acleris variana Fern.

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

Larvae of this tortricid were collected in only nine samples on the Gulf Islands and central west coast of Vancouver Island.

2. Lower Mainland and Fraser Valley.

Collections containing this larva were few and two specimens per collection were maximum. Hosts were both Douglas fir and western hemlock and altitude varied from

160 feet to 2,260 feet. Fire season closure prevented a more thorough survey at the time this insect was most active.

3. South Vancouver Island.

A marked increase was noted in the number of black-headed budworm larvae collected during the season. Forty-five collections made throughout the district contained 190 larvae. At Poett Nook on the Alberni Inlet up to 40 larvae were found in a single collection. Eleven larvae per collection were recorded at Mt. Maxwell on Salt Spring Island.

4. North Vancouver Island.

Only ten of the total number of samples from this district contained larvae of this potentially destructive insect. The average number of larvae per collection were 1.2 and they were collected between May 29 and August 23.

No black-headed budworm larvae were recorded in this district in 1950.

5. Prince Rupert Forest District.

A slight increase in the larval numbers and distribution of the black-headed budworm was recorded throughout the Prince Rupert Forest District. This is particularly true in the eastern interior section of the district, where two small localized areas of light defoliation were recorded. Both areas of light defoliation are within Forest Insect Survey drainage basin number 44 and occur in immature spruce (Picea

glauca (Moench) Voss var. albertina (S. Brown) Sarg., balsam (Abies lasio carpa (Hook.) Nutt.) stands in the north-eastern Ootsa Lake Valley in the vicinity of Pearl Lake, L-693 and in the Eutsuk Lake Valley, Tweedsmuir Park at St. Thomas Bay.

Defoliation was confined to 1951 foliage with the maximum defoliation not exceeding 50 per cent of this foliage. The largest infestation and highest over all percentage defoliation occurred at St. Thomas Bay. Defoliation and insect numbers were higher on balsam hosts in both areas. It was noted that defoliation and bud damage increased on the more exposed section of host foliage particularly on fringe trees bordering open areas.

In the Pearl Lake infestation Zeiraphera ? diniana larvae were also common particularly on spruce hosts.

Tabulation of larval numbers, host and location where the black-headed budworm was recorded during 1949, 1950 and 1951 is shown below.

PLACE	HOST	1949	1950	1951
Palling Land Div. L-4090	Sw	0	0	1
Babine Lake, ex T. S. X-46994	F	0	0	1
Babine Lake strip No. 6	Sw	0	0	1
Babine Lake strip No. 6	Ba	0	0	3
Pearl Lake, L-693, Ootsa Lake	Sw	0	-	11
Pearl Lake, L-693, Ootsa Lake	Ba	0		31
Wistaria, B. C., Ootsa Lake	Sw	0		10
Wistaria, B. C., L-681 Ootsa Lake	Sw	0		10
Sinclair Lake, Tweedsmuir Park	Sw	0		7
Sorrel Creek, Tweedsmuir Park	Hm	0		16
Sorrel Creek, Tweedsmuir Park	B	0	-	10
Sorrel Creek, Tweedsmuir Park	Ba	0	-	13
Sorrel Creek, Tweedsmuir Park	H	0		10
Eutsuk Lake, St. Thomas Bay Tweedsmuir Park	Sw	0		28

(continued)

(continued)

PLACE	HOST	1949	1950	1951
Eutsuk Lake, St. Thomas Bay, Tweedsmuir Park.	Ba	0		45
Whitesail Lake (west end) Tweedsmuir Park.	Hm	0	-	10
Whitesail Lake (west end) Tweedsmuir Park	B	0	-	8
Morse Basin	H	0	-	22
Morse Basin	B	0		3
Morse Basin	S	0	-	8
Prudhomme Lake	S	0	0	3
Prudhomme Lake	Hm	1	5	0
Prudhomme Lake	Pl	2	1	0
Prudhomme Lake	H	4	5	2
Rainbow Lake	Hm	10	4	4
Green River, lower Skeena River Valley.	S	0	0	2
Green River, lower Skeena River Valley.	H	4	1	2
Exchamsiks River, lower Skeena River Valley.	Hm	0	0	1
Exchamsiks River, lower Skeena River Valley.	H	0	0	3
Brown Bear Lake, upper Nass River Valley	Ba	-	-	11
Paw Lake, upper Nass River Valley	B	-		3
Paw Lake, upper Nass River Valley	H			5
Paw Creek, upper Nass River Valley	B	-		1
Paw Creek, upper Nass River Valley	H	-	-	2
Mouse Creek, Khutzeymateen Inlet	H	-	0	3
Khutzeymateen Inlet, 100'	H		0	1
Khutzeymateen Inlet, 500'	H		0	3
Khutseymateen Inlet, 500'	H	-	0	1
Kitsumgallum Lake	S	3	1	1
St. Croix Creek, lower Skeena	Ba	0	0	1
Salvus, B. C. L. 532 (River)	H	0	1	0
Kitimat River	H	1	1	0
Onion Lake	H	3	0	0
Onion Lake	Ba	4	0	0
Babine Provincial Forest P.S.S. BL-6	Sw	3	0	0
Eutsuk Lake, Connelly Bay Tweedsmuir Park	Sw	1		-
Eutsuk Lake, Connelly Bay Tweedsmuir Park	Pl	1	-	-
Telkwa River, P. S. S. S-2	B	2	0	0
Morice River, P. S. S. H-4	Sw	1	0	0
Driftwood Creek	Sw	1	-	-
Khyex River P. S. S. T-10	H	3	0	0
Kyex River P. S. S. T-10	B	4	0	0

E Hemlock Sawflies, Neodiprion spp.

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

Hemlock sawfly Neodiprion tsugae Midd. larvae were found this year between May 30 and July 29 from Mayne Island to Henderson Lake including the mainland coast and the east and west coasts of Vancouver Island. Since the last survey of the Quatsino region of northern Vancouver Island in 1949 the sawfly population has decreased noticeably in the area between Port Alice and Victoria Lake. An extremely heavy population was present in the area at that time. In Naysash Inlet, Draney Inlet, Newton Arm. Holberg Inlet and Quatsino village where this sawfly was present in moderate numbers in 1949 the population remained more or less static. Listed below are the samples in which larvae appeared in moderate to large numbers.

LOCATION	Maximum No. Larvae per Collection	Average No. Larvae per Collection	No. Samples	Host
Redonda I.	19	19	1	H
W. Thurlow I.	10	6	2	H
Apple River	14	7	2	H
Naysash Inlet	35	30	2	H
Boswell Inlet	29	29	1	H
Draney Inlet	66	33	3	H
R.I.C. (Wannock R.)	152	47	4	H
Port Alice	63	21	9	H
Holberg	120	25	12	H
Quatsino village	31	16	2	H
Bedwell Sound and River	12	6	3	H

Neodiprion abietis

This sawfly appeared between the Gulf Islands and Barkley Sound on the coastal survey. The greatest number of larvae per collection was on Vancouver Island. Thirteen samples produced an average of 4.1 larvae per collection. Hosts of this insect were principally Douglas fir and Sitka spruce.

2. Lower Mainland and Fraser Valley.

The limited distribution of samples in 1951 may account for the fact that only 41 collections contained hemlock sawfly larvae at an average of 6.2 larvae per collection as against 10.5 larvae per collection in 1950. Larvae were collected at varying elevations from 80' to 2,100'. Hemlock was the preferred host although 5 larvae were collected from a Douglas fir near Yale.

Neodiprion abietis

The average larval count for this sawfly dropped from 4.5 to 2.8 per collection. This decline is a factor which will be followed closely in future with relation to distinguishing between abietis and tsugae. In the past many of the former were identified tentatively as tsugae and it is possible the count may increase after revision. The maximum number in one collection was from the Yale area where 11 larvae were found. Among the hosts, Douglas fir was by far the most common, though two hemlock and a grand fir collection were noted.

The largest collections came from the Fraser Canyon an almost exclusively fir area.

3. South Vancouver Island.

Larvae of Neodiprion spp., mostly N. tsugae were found in 77 collections scattered throughout the district. The total of 498 larvae was found individually or in small numbers except in the Poett Nook area where individual collections contained up to 95 larvae. In this area collections also contained a large number of black-headed budworm larvae and several species of geometrid.

4. North Vancouver Island.

A total of 392 hemlock sawfly larvae were collected in the district between May 31 and August 17. The 32 collections in which this insect was present were from widely scattered points and they averaged 12.2 larvae each.

Listed below are the collections in which more then 9 larvae appeared.

DATE	LOCATION	HOST	NO. COLLECTED
June 7	2 miles S Echo Lake	H	19
June 9	Junction of Rock Bay-Sayward	H	36
June 9	SE corner L 97-Oyster R.	B	30
July 8	1 mile SE Della Falls	H	40
July 8	L 729 Della Falls	H	137
July 10	S end L 835 Memekay R.	H	49
July 10	centre-N side	H	24
July 10	centre-N side	B	13

Neodiprion abietis Harr.

One hundred and forty-two larvae were collected from 17 widely dispersed points in the district. Collections averaged 8.3 larvae each.

Listed below are the collections containing more than 9 larvae:

DATE	LOCATION	HOST	No. Collected
July 8	SE corner L 729 Della Falls	B	17
July 12	NW side Bk 146	H	69
July 10	S end L 855 Memekay River	B	15

5. Prince Rupert Forest District.

Twelve larvae of the hemlock sawfly Neodiprion tsugae Midd. were collected from August 7 to September 7. Yearly comparisons of larval numbers, host and location are tabulated below:

PLACE	HOST	NUMBERS		
		1949	1950	1951
Sorrel Creek, Eutsuk Lake, Tweedsmuir Park	Hm	4	-	3
Prudhomme Lake	H	*10	2	1
Kwinitsa River lower Skeena Valley	H	*41	0	2
Khutseymateen Inlet	H	0	0	1
Kitimat River L-2694	H	0	0	1
Pine Lake, Kitsumgallum River	H	0	0	1

* Collection made in June when early instar larvae were feeding gregariously.

Neodiprion sp.

PLACE	HOST	NUMBERS		
		1949	1950	1951
Burns Lake	Sw	0	1	1
Babine Lake ex-T. S. X-46994	F	0	0	1
Babine Lake ex-T. S. X-33677	Sw	0	1	1

F Striped Alder Sawfly, Hemichroa crocea Fourc.

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

This insect which caused severe alder defoliation in several areas on the coast during the past two or three years was found in only two collections in the Gulf Islands in 1951.

2. Lower Mainland and Fraser Valley.

As in 1950 larval collections of this defoliator were negative.

3. South Vancouver Island.

There is at the present time only one small active infestation of alder sawfly in the district. This is at Beaver Point on the south-east end of Salt Spring Island. Larvae were collected in small numbers at Port Alberni, Cowichan Lake, Genoa Bay and Victoria.

4. North Vancouver Island.

In sharp contrast to 1950 this insect caused practically no defoliation during 1951. In the Powell River

area, where feeding had been so extensive in 1950 no larvae were found.

At Campbell River, mainly on the north side of John Hart Lake a few first generation larvae were collected. These were heavily parasitized.

Two new locations were recorded one at Oyster Bay where a few separate trees were defoliated and the second on Two Rivers Arm of Sproat Lake. Here only eighteen larvae were collected.

5. Prince Rupert Forest District.

The light infestation of striped alder sawfly in the regeneration growth at Seal Cove, Tsimpean peninsula showed a marked decline in both larval numbers and defoliation. Damage by this tenthredinid in the Lakelse Lake area was recorded at Khutzeymateen Inlet and again at L-532 Salvus, B. C.

G Spruce Sawflies, Pikonema spp.

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

These insects appeared in 57 samples distributed throughout the Johnstone Straights, Queen Charlotte Sound and the west cost of Vancouver Island areas. One hundred and thirty larvae were collected. Sitka spruce was the preferred host.

2. Lower Mainland and Fraser Valley.

Only 12 larvae of the species Pikonema alaskensis, Roh. were collected during the season. Five of these were taken from a spruce tree at Point Grey at an elevation of

80 feet and seven from a hemlock on Grouse Mountain at an elevation of 3,200 ft.

3. South Vancouver Island.

There is no record of any Pikonema spp. larvae being collected in this area in 1951. Only 4 larvae were collected during the previous season.

4. North Vancouver Island.

No Pikonema spp. larvae were collected during the season although five collections containing larvae of this species were collected at Campbell River in 1950.

5. Prince Rupert Forest District.

Twenty-six larvae of these sawflies were collected from spruce host throughout the district from July 10 to September 1st. These larvae were present in 20 collections averaging 1 per collection with a maximum number of 3 larvae.

H Tent Caterpillars, Malacosoma sp.

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

Again, as during last year, sampling produced negative results for tent caterpillars.

2. Lower Mainland and Fraser Valley.

No record of tent caterpillar in this district for 1951.

3. South Vancouver Island.

Near Port Renfrew, where a number of tent caterpillar were collected last year, sampling produced negative results as it did in the remainder of the district.

4. North Vancouver Island.

No tent caterpillar recorded in this district for 1951.

5. Prince Rupert Forest District.

No activity of this forest insect pest was recorded in the district in 1951.

J. Dendroctonus Bark Beetles, Dendroctonus spp.

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

The mountain pine beetle Dendroctonus monticolae Hopk. in the upper Bella Coola Valley was given only a visual check as limited time restricted a thorough survey.

This visual check covered six miles of valley from Mosure Creek to Atnarko. The infestation is evident along this stretch on both north and south slopes of the mountain. Bright red foliage indicated that the infestation is still active in the patches of affected timber. It is not positive that bark beetles are the sole reason for these intermittently killed patches along this section of the valley. Two days at least will be needed for a thorough examination of this part and transportation to and from Anosure Creek which is fifty miles inland, by road, from Bella Coola.

2. Lower Mainland and Fraser Valley.

Several instances of red top trees were noted in this district during the season but the enforced closure of the forest prevented closer examination.

3. South Vancouver Island.

Since the decline of the Douglas fir beetle infestation in Wilson Creek there has been no record of a beetle attack in the district.

4. North Vancouver Island.

No record of Dendroctonus spp. attack in this district in 1951.

5. Prince Rupert Forest District.

Activity of the Alaska spruce bark beetle, Dendroctonus borealis Hopk., was confined in the main to logging slash areas and no recorded attack on stands of growing timber was made in 1951.

At Ootsa Lake, Tweedsmuir Park, occasional mature western white spruce (Picea glauca (Moench) Voss var. albertiana (S. Brown) Sarg.) and pine (Pinus contorta Dougl. var. latifolia Engelm.) show attack by Dendroctonus murrayana Hopk.? but tree vigour in all cases had resulted in the drowning out of attacking adults. A similar condition was recorded in this area in 1949.

Dendroctonus monticolae Hopk. was also unrecorded in growing timber stands.

Check examination of high hazard areas in 1949 and 1950 at T. S. 47826, T. S. 49447, L-6613 Palling Land Division, L-4268 Smithers and ex T. S. X-35950 Babine Lake reveal no bark beetle activity other than a normal endemic population feeding

in logging slash or wind throw.

A small isolated infestation of the Douglas fir bark beetle (Dendroctonus pseudotsugae Hopk.) occurred at the south east end of Babine Lake in the residual Douglas fir growth of ex T. S. X-46994. A complete report of examinations and survey work is found in a special report in Section IV of this report.

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

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

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

Larvae of this looper were found continuously from June 7 to August 3. The population in the Johnstone Straits, Smith and Rivers Inlets and the Bella Coola Valley was small. Hosts were western red cedar and Douglas fir. Heaviest populations were found at Effingham Inlet and Henderson Lake on the west coast of Vancouver Island. Disease was prevalent in larvae collected in the areas of heavy population and only a few larvae arrived at the insectary alive. Defoliation in no case was noticeable.

It was found during the survey of Vancouver Island that numbers of this insect were inclined to vary fairly directly with the timber type present. Collections show

Douglas fir timber types as unpopular hosts while hemlock mixed stands were preferred, especially hemlock-cedar stands which are typical of the Barkley Sound area.

Timber types were found to be hosts to this insect in the following areas.

In the Quatsino Sound to Kyuquot Sound area, pure hemlock stands were most evident. Populations were small to moderate averaging 3 to 9 larvae per collection.

In the area from Sydney Inlet to Bedwell Sound, mixed hemlock stands prevailed. Populations were moderate averaging 3 to 15 larvae per collection.

In the Maggie Lake to Henderson Lake region, hemlock-cedar stands are dominant. Populations were found most numerous here, averaging 23 to 72 larvae per sample.

In the drier rocky regions such as the head of Muchalat Inlet and Nahmint Bay, where Douglas fir is dominant, this insect was quite scarce.

Listed below are the collections containing moderate to large numbers of this insect together with location and host.

LOCATION	Maximum	Average	No. Samples	Host
Port Alice	32	18	3	H
Tahsish River	7	6	4	H
Zeballos	12	9	12	H
Tahsis	20	17	3	H
Sydney Inlet	36	19	3	H
	18	15	2	B
Shelter Inlet	26	16	3	H
Herbert Inlet	9	5	5	H

(continued)

LOCATION	Maximum	Average	No. Samples	Host
Bedwell Sound	44	20	4	B
	32	17	4	H
	16	12	2	S
Tofino Inlet	16	10	2	B
	12	7	3	H
	7	7	1	C
Kennedy Lake	14	10	5	C
	10	8	4	H
Maggie Lake	17	11	4	H
	43	21	3	C
Effingham Inlet	101	52	3	C
	32	25	5	H
Henderson Lake	145	45	4	H
	120	59	3	C
	36	21	3	B
Nahmint Bay	6	3	3	H
	4	4	1	C

2. Lower Mainland and Fraser Valley.

This geometrid was the most common species collected during the survey. One hundred and eight collections distributed over the district contained larvae of this looper and the average number of larvae per sample was 3.1 as compared to 5.2 in 1950. Host trees varied greatly among the conifers and no preference was shown toward any one host. Alder, dogwood and vine maple collections contained a few of the larvae. The highest individual collection came from the Seymour River Valley and held 14 larvae. Larvae first appeared in collections in mid-June and were collected through to the first week in September at elevations ranging from 40 feet to 2,260 feet.

3. South Vancouver Island.

Up to 140 larvae of this species were mailed in individual collections from Poett Nook to Nitinat Lake in areas where the hemlock looper had been in outbreak a few years previously. These 140 larvae were less than half the number obtainable from a three tree beating. Larvae were so plentiful that it could be considered a light infestation. In the above area it was accompanied by large populations of black-headed budworm, hemlock sawfly and other geometrids.

In the Parksville area only 6 collections, out of 23, contained 8 larvae.

Elsewhere in the district 179 collections distributed over the area contained an average of 16 larvae each.

Larvae were found continuously from June 6 to August 31 at elevations below 2,000 ft.

4. North Vancouver Island.

Five hundred and twenty-six larvae of this species were collected in the district, excluding that portion of the Barclay Sound surveyed by personnel from the J. M. Swaine. Collections for 1951 averaged 3.7 larvae each as against 1.7 average for 1950. Larvae were collected at varying elevations between June 7 and August 23.

The table below lists the collections which contained more than 9 larvae.

DATE	LOCATION	HOST	NO. COLLECTED
June 20	north side Horne Lake	H	14
June 28	L 566 Two Rivers Arm	H	48
June 28	Gracie Creek	H	21
June 28	Gracie Creek	F	34
June 30	2½ miles west on Taylor River	H	13
June 30	4 miles west on Taylor River	H	23
July 4	L 36 Kelsey Bay.	H	11
July 7	north side Sproat Lake	H	19
July 7	north side Sproat Lake	F	11
July 12	Bk 146 Salmon River Valley	H	12

5. Prince Rupert Forest District.

Three larvae of this geometrid were obtained from balsam or hemlock hosts at Paw Lake, Nass River and at Khutzeymateen Inlet, from August 23 to 29.

B. Grey Forest Looper, Caripeta divisata Wlk.

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

The grey forest looper was found together with Semiothisa granitata but in more varied numbers and was more dispersed. The first collections were obtained at Zeballos on July 17, and the last collections at Britain River on September 15. The table below gives the population in relation to area.

LOCATION	Maximum	Average	No. Samples	Host
Pender Harbour	8	5	8	F, H, Bg, Pl.
Sechelt	20	5	12	H, F, Bg, C.
Clowhom Lakes	12	8	3	H.
Narrows Arm	11	4	8	H, F, S, Pl.
Texada Island	6	2	11	F, H.
Savory Island.	4	3	2	F.

2. Lower Mainland and Fraser Valley

Collections were first obtained during the last week in July and continued through to the end of September. In this period 65 collections contained this species of caripeta and averaged 4 larvae per collection. Compared to the 1950 average of 3.75 larva per collection, the slight increase is evident. The common hosts were western hemlock and Douglas fir with an occasional balsam and cedar yielding a small number. This year's distribution included the Fraser Valley, and the north slopes of the Burrard Inlet and the Sechelt watersheds through to Irvings Landing.

3. South Vancouver Island.

In the latter half of the season larvae of this geometrid were quite common, usually in company with Semiothisa granitata Guen. A total of 143 larvae was collected in 48 samples.

4. North Vancouver Island.

The first larva of this insect was found on July 5. Collections containing this insect became more frequent towards the middle of that month and remained generally constant to the end of the survey on September 25. During this period 138 collections averaged 3.4 larvae each, showing an increase over the 1950 average of 2.5.

Collections containing over 9 larvae follow:

DATE	LOCATION	HOST	NO. COLLECTED
August 15	Forbidden Plateau Rd	H	11
August 22	NW corner TL 3055 Lund	H	16
August 22	W side of Okeover Arm	H	11
September 1	L 2563 Powell Lake	H	23
September 1	W side Inland Lake	H	14
September 10	Van West Logging Co.	H	11
September 10	Van West Logging Co.	F	11

5. Prince Rupert Forest District.

Thirty-seven larvae of this geometrid were obtained in 17 collections made in the coastal area of the district. Host trees were white spruce, hemlock, cedar, balsam and Sitka spruce. Larval collections were obtained from July 17 to September 8 and only one collection, from hemlock host in the Exchamsiks River Valley exceed 10 larvae per three beating collection.

C Green Velvet Looper, Oporinia autumnata (Gn.)

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

From Howe Sound to Rivers Inlet and Quatsino Sound, 20 samples contained the green velvet looper. They averaged 3.1 larvae per sample. Elevations ranged from sea level to 3,000 feet. Western hemlock was its primary host and amabilis fir its secondary. The green velvet looper appeared in greater numbers in the Quatsino Sound area than in any other. Populations were light and well distributed.

2. Lower Mainland and Fraser Valley.

Eleven samples containing 9 larvae of the green velvet looper were collected from hemlock, balsam and cedar. The

forest closure prevented sampling in areas where this insect was known to be more numerous in previous years.

3. South Vancouver Island.

There is no record of this species having been collected in this district during the season.

4. North Vancouver Island.

Between June 6 and July 11 only 25 larvae of this species were collected from 15 separate points in the district. It was impossible, due to the fire closure, to survey several areas where this looper was found in moderate numbers in 1950.

5. Prince Rupert Forest District.

Small numbers of the species Oporinia pulchraria were collected from alpine fir, hemlock and balsam hosts from July 11 to August 23 at Babine Lake, Augier Mountain and in the Ness River Valley.

D. Green Hemlock Looper, Nepytia phantasmaria Stkr.

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

There is no record of this insect for 1951 even though sampling was done in the Bella Coola Valley where few larvae were collected in 1950.

2. Lower Mainland and Fraser Valley.

Larvae of the green hemlock looper were collected from twenty-four different points in the district, at elevations varying from 60 feet to 1,140 feet. The average number of larvae

per collections was 2.9 as compared to 1.6 in 1950. Though western red cedar was an occasional host, hemlock and Douglas fir were most preferred and in that order.

3. South Vancouver Island.

Like the hemlock looper, the green hemlock looper was very scarce this year, only seven larvae having been found during the season. Three of these were in one collection from Duncan. The others were taken singly between Cowichan Lake and Port Alberni.

4. North Vancouver Island.

Larvae of this geometrid were found at nine locations during 1951 between June 8 and August 25.

5. Prince Rupert Forest District.

This insect is not recorded for 1951.

E. Green Spruce Looper, Semiothisa granitata Guen.

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

First found at Kashutl Arm on July 11, this insect appeared in small numbers very constantly in samples until the survey ended, September 15, at Britain River. Numbers were very small on Vancouver Island, but increased somewhat in the lower mainland as can be seen in the following table:

LOCATION	MAXIMUM	AVERAGE	NO. SAMPLES	HOST
Kashutl Arm	2	2	2	S
Zeballos	2	2	4	H, B.
Burman River	2	1	6	H, S, F.
Gold River	2	1	7	F, H.
Shelter Inlet	4	2	3	H.
Bedwell River	2	2	3	H, B.
Pender Harbour	7	4	8	F, H, Bg, Pl.
Sechelt	11	6	8	H, F, Bg.
Clowhom Lakes	8	5	3	H.
Narrows Arm	20	7	7	H, F, S.
Texada Island	13	3	9	F, H, C, Pl.
Savary Island	12	6	4	F, H, Pl.

2. Lower Mainland and Fraser Valley.

A total of 74 collections containing this insect was made in the lower mainland district and averaged 3.3 larvae per collection. The largest number of larvae per collection was 19 and came from Coquitlam at an elevation of 60 feet. Another collection containing a moderate number of larvae was from Elk Mountain at an elevation of 2,060 feet. Larvae first appeared during the last week in July and were found consistently until late September. Hosts varied widely although a slight preference was shown for hemlock .

3. South Vancouver Island.

This looper was found only during the latter half of the season. One hundred and thirty-eight larvae were taken in 57 collections, usually in company with Caripeta divisata.

4. North Vancouver Island.

Three hundred and forty-five of these larvae were collected from 183 locations between July 12 and September 25.

Only 3 collections contained more than 10 larvae.

5. **Prince Rupert Forest District.**

Twenty-six larvae were obtained in 14 collections made from spruce, balsam and hemlock host in the coastal forest region of the district. **Collections were made from August 17** to September 8.

This was a marked decline in abundance when compared with larval number in the same region from August 10 to September 9 last year when 675 larvae were obtained in 50 collections with a high figure of 127 larvae for one collection and a 13.5 larval average per 3 beating collection.

F. Brown Banded Looper, Gabriola dyari Tayl.

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

Found in small numbers in scattered collections, this insect appeared in thirty-one samples from the Gulf Islands, Howe Sound, Johnston Straights and Quatsino region. Western hemlock and Douglas fir were the hosts.

2. Lower Mainland and Fraser Valley.

Only two larvae of this looper were collected in this area in July four weeks later than any recorded in 1950.

3. South Vancouver Island.

No record of this insect for 1951.

4. North Vancouver Island.

At five separate points in the district an equal number of larvae were found from June 22 to September 24.

G. Eupithecia sp.

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

The green cedar looper Eupithecia unicolor appeared in greater numbers during the season on western red cedar in the Gulf Islands at elevations from sea level to 500 feet. Twenty-two samples here averaged 3.5 larvae per sample. Elsewhere only an occasional larva was found.

A geometrid identified only as Eupithecia sp. was relatively common on the west coast of Vancouver Island. Preferred host trees were Douglas fir and western hemlock.

2. Lower Mainland and Fraser Valley.

Forty-two samples averaging .7 larvae each were collected in this district between Vancouver and Hope along the north and south slopes bordering the Fraser River and within the Fraser Canyon. Hemlock and cedar were the most common hosts.

3. South Vancouver Island.

Larvae of this genus were quite common throughout the district with 339 specimens submitted in 146 collections. The larvae were of several species and no large numbers of any one species were found.

4. North Vancouver Island.

One hundred and sixty-three larvae of this species were found at widely distributed points in the district between July 4 and September 14. No preference in host was shown. Collections averaged 1.5 larvae each but at upper Quinsam Lake

11 larvae were collected from a balsam host.

5. Prince Rupert Forest District.

Thirty-five larvae were present in 27 collections throughout the district from June 29 to September 5. Host were spruce, balsam, hemlock, and pine.

H. Transverse-banded looper, Hydriomena sp.

1. Prince Rupert Forest District.

Four collections from spruce and hemlock in the coastal forest region of the district contained larvae of this geometrid.

J. Saddled Larch Looper, Ectropis crepuscularia, Schiff.

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

Coincident with the green striped forest looper Melanolophis imitata (Wlk.), this insect was found very generally in small numbers from Brittania Beach on June 5 to Henderson Lake on Barkley Sound on July 30. Host, location and number of insects are listed below:

LOCALITY	Maximum	Average	No. Samples	Host
Port Alice	3	2	8	H.
Holberg	14	6	3	H.
Capreno Bay	31	18	2	H.
Artlish River	5	2	4	H, C.
Zeballos	5	2	6	H, B.
Tahsis	5	2	4	H, B.
Sydney Inlet	9	4	8	H, B, C.
Shelter Inlet	5	2	5	H, B, C.
Moyeha River	1	1	2	H.
Bedwell River	8	3	7	H, B, S.
Maggie Lake	5	3	3	H, C.
Pipestem Inlet	5	3	3	H, B. C.
Effingham Inlet	10	3	9	H, B. C.
Henderson Lake	16	4	7	H, C.
Uchuck Creek	4	2	7	H, B. C.

2. Lower Mainland and Fraser Valley.

Samples containing this insect were collected in most of the south exposures from North Vancouver to Hatzic Prairie. One larva was collected at 2,000 ft. elevation on the Hope-Princeton highway. This was unusual since all the other larvae were collected well below the 1,000 ft. level.

K. Spotless Fall Webworm, Hyphantria textor Harv.

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

This insect appeared quite numerous and regularly on red alder during the latter part of the survey although the fire closure prevented the collection of many larvae during their most active period. Only four samples were submitted from the Sechelt area. Defoliation of red alder regeneration was quite noticeable.

2. Lower Mainland and Fraser Valley.

This deciduous defoliator was collected throughout the whole area, below 500 feet. A larval count was of no consequence in view of the fact that the supply was unlimited at each collection point. A visual check disclosed a definite increase in percentage of defoliation over the 1950 season. Hosts were practically every species of deciduous tree common to the area.

3. South Vancouver Island

This species of insect was quite common on deciduous trees along the east coast of Vancouver Island.

4. North Vancouver Island.

The web of this insect was noticeable throughout the lower elevations of the district. Representive samples from all areas were submitted to the insectary. Alder was the most common host.

L. Silver Spotted Tiger Moth, Halisidata argentata Pack.

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

Larvae of this insect were found only in the Gulf Islands in 3 samples, two from Douglas fir and one from western hemlock.

2. Lower Mainland and Fraser Valley.

One sample only was collected during the season. Thirty-five larvae were taken from a regeneration fir on Sechelt Peningula.

3. Prince Rupert Forest District.

Four larvae of the species Halisidota m. angulifera were collected from red alder hosts at Seal Cove and Green River in mid-August.

M. Green Striped Spruce Caterpiller, Feralia jocosa (Guen.)

Fourteen larvae of this cutworm were collected throughout the district from July 11 to September 8 from spruce, fir, balsam and hemlock.

N. **Nyctobia** sp.

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

The species **Nyctobia** l. **nigroangulata** (Stkr.) was found generally with the green striped forest looper from Valdes Island on May 31 to Nahmint Bay on July 30. The largest collections came from the west coast of Vancouver Island, but only a few of these contained more than ten insects.

2. **Lower Mainland and Fraser Valley**.

Collections from hemlock and fir hosts contained 22 larvae of this geometrid. They were collected from late June to mid-July at elevations of 110 to 700 feet.

3. South Vancouver Island.

In the Poett Nook area this looper was found in large numbers, up to 70 per collection, along with many other insects, particularly Melanolophia imitata, Acleris variana and Neodiprion tsugae. A total of 459 larvae were found in 64 collections, most of which were taken in the hemlock stands in the north-west portion of the district.

4. North Vancouver Island.

Forty larvae of this green geometrid species Nyctobia l. nigroangulata (Stkr.) were collected at various points in the area between May 29 and August 16.

5. Prince Rupert Forest District.

Four larvae of Nyctobia l. nigroangulata were obtained from white spruce, alpine fir and hemlock host from July 19 to August 15 at Nadina River, Pearl Lake and Morse Basin.

O. Microlepidoptera

Prince Rupert Forest District.

Zieraphera ? diniana were common in small number on white spruce and balsam hosts in the interior section of the district, particularly on the margins of the Burns Lake - Babine Lake spruce budworm infestation. Larvae of this species were also associated with black-headed budworm abundance and were collected from June 28 to July 25. The average number of larvae per 3 beating collection was slightly more than 3 with the high number collected being 9.

P. Douglas Fir Cone Moth, Barbara calfaxiana (Kearf.)

South Vancouver Island.

Fifteen collections of Douglas fir cones, taken in the Douglas fir timber belt from Alberni south along the eastern side of Vancouver Island to East Sooke contained larvae of the cone moth.

Q. Syneta spp.

Prince Rupert Forest District.

One S. albida was collected from a balsam at Whitesail Lake in Tweedsmuir Park. Adults of S. carinata were collected at Paw Lake in the Nass River Valley from hemlock and balsam hosts.

R. Western Rusty Tussock Moth, Notolophus antiquus badius (Hy. Edw.)

1. Lower Mainland and Fraser Valley.

Only three samples contained larvae of this moth. In one collection 4 larvae came from a cedar host. All collections were above 500 ft. elevation.

2. Prince Rupert Forest District.

Two larvae of this defoliator were collected from a hemlock at Salvus, B. C.

S. Green Rose Chafer, Dichelonyx backii Kby.

1. Prince Rupert Forest District.

The localized infestations of adult beetles on aspen, willow and cottonwood at Topley, Rose Lake and Burns Lake which occurred in 1949 and 1950 had completely subsided.

T. Enypia spp.

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

Larvae of the species E. packardata (Tay.) were collected early in the season on the Johnstone Strait Islands and during the latter part of the season in the Sechelt area and Texada Island.

2. Lower Mainland and Fraser Valley.

Larvae of E. packardata (Tay.) and E. venata were collected in small numbers at widely separated points in the district. Douglas fir and hemlock were the most common hosts.

3. South Vancouver Island.

One hundred and seventy-two larvae of E. packardata Tay. were collected in samples throughout the district.

U. Pissodes spp.

Prince Rupert Forest District.

Damage to the leaders of open growing spruce regeneration by P. sitchensis Hopk. and P. engelmanni Hopk. was again recorded at Terrace, Topley, Burns Lake, Morice River, Cedarvale and Kitsequecla River.

EXAMINATION OF DEAD SPRUCE L-4268

Smithers, B. C.

M. T. Hughes March 1951.

At the request of C. Gibson, Ranger, British Columbia Forest Service, Smithers, B. C., an examination was made of the dead spruce growth on L-4268, September 25, 1950. This examination was made by the writer and Assistant Ranger A. C. MacPherson British Columbia Forest Service.

Examination of the open growing overmature spruce-balsam stand in a ten-acre area showed 75 per cent of the overstory spruce was dead with an estimated loss of 5 to 6 M f. b. m. All dead spruce trees had been heavily infested and killed by Dendroctonus borealis Hopk. Reddening of the needles on dead trees occurred in the late spring and early summer of 1950. This fact as well as the light needle drop

at the time of examination indicates that the infestation occurred in 1949 with adult emergence taking place in the spring of 1950.

Associated with this beetle attack was an advanced root and butt rot (?Fomes pinicola) in all dead trees. This decay together with the overmature condition of the stand undoubtedly were the underlying causes for this localized bark beetle outbreak.

No active infestation was found during examination.

SPRUCE BARK BEETLE CONTROL PROJECT

Palling, B. C.

Re-examinations of this area in the unsurveyed area to the east of L-66B, Palling, B. C. were made in 1950 on June 8th, July 4th, July 28th and September 12th.

Dendroctonus borealis Hopk. activity was unrecorded within the controlled area during these examinations.

Examination of adjoining logging slash revealed a marked decline in Dendroctonus broods in the fresh slash and that as a result of the summer drying of bark surfaces on this slash a high mortality rate of these broods had occurred.

SPRUCE BUDWORM SURVEY

Central British Columbia

1951.

The budworm survey in Central British Columbia in 1951 was confined to bud population sampling in and around known infested areas.

These areas were mapped in 1950 from the air and from mountain top vantage points when defoliation and reddening of the foliage in the affected areas was quite noticeable.

This type of mapping was impossible during 1951 as this was the first year of a two-year life cycle and the small budworm larvae were active for only a short time before hibernating and feeding was confined entirely to the new buds. Defoliation consequently was scarcely noticeable and therefore a map of the complete budworm infestation was an impossibility.

Limitations on the number of personnel employed on the budworm survey restricted the work to the more accessible areas. Further employment of ranger personnel at that time on the budworm survey would have seriously restricted normal survey activities during a period when the rangers should be most active in their areas.

Areas of infestation

The four areas where bud population sampling was done were.

1. Burns Lake-Babine Lake in the Prince Rupert Forest District.
2. Nation River in the Fort George Forest District.
3. Hart Highway - Parsnip River in the Fort George Forest District.
4. Wells - Browron Lake in the Fort George Forest District.

Little is known of the status of the spruce budworm north of these infestations but verbal reports by forest rangers and air service pilots indicated that in 1950 the infestations were very extensive.

Sampling procedure.

Bud sampling was done either along strips or randomly whichever was the most suitable to the terrain.

Strips were run from known position in the area for distances of 1/2 to 3 miles and samples were taken at 20 chain intervals throughout the length of the strip.

Random sampling was done around the perimeter of the infestation as well as in the infested areas themselves to determine the approximate spread and increase of the infestation over that of the preceding year.

Method of sampling.

A standard sample was established and used in all areas for the sake of uniformity.

The standard sample consisted of sixty buds counted on twelve branches selected randomly at mid-crown from four sides of each of three trees of the same species. The terminal and four surrounding buds of each branch were inspected and recorded as to the number infested.

The number of larvae per bud were not recorded as the accuracey of this type of sampling would have been very doubtful when the larvae commenced to hibernate. However, as many as 8 larvae were counted in one bud.

Each area is discussed separately below and the accompanying map shows the extent of the infestation in 1950 and the location of bud sampling done in 1951 as well as the percentage of buds infested.

Burns Lake - Babine Lake.

This infestation which was fairly extensively mapped in 1950 is in a stand of timber which is fairly accessible to a railhead and a number of mills. For this reason the timber affected is commercially more valuable than that in the more isolated infested stands.

During 1950 a number of strips were run at widely dispersed locations in the area for the purpose of recording population, defoliation, timber type, etc. Information from these strips could not be compared with 1951 material but should serve as a useful comparison in 1952.

A number of understory trees which were heavily defoliated in 1950 were dead when examined in 1951 and some top killing had occurred where defoliation was extremely heavy.

Most of the 1950 strips were examined and a number of randome samples were made at known points throughout the area.

This infestation as mapped in 1950 covered an area of approximately 380 square miles, bounded on the west by a line from Burns Lake village north to Babine Lake and as far east as Helene Lake north of Endako.

The infestation over this area was medium to heavy in intensity and was found to be light in some areas outside of the boundaries of the 1950 attack. This new attack extended westward from the old infestation around Palling and along Babine Lake.

The infestation in the area between Burns Lake and Pendleton Bay on Babine Lake is generally medium in intensity and continues that wasy eastward to Taltapin Lake. At Taltapin Lake the infestation is heavy with an average of 79 per cent of the buds infested.

At the eastern end of Babine Lake the infestation was medium to heavy in a stand of timber along the lake shore. In four samples 64.5 per cent of the buds examined were found to be infested.

On Silver Island in Babine Lake only 6 trees were examined and an average of 59 per cent of the buds were infested.

On the northern shore of Babine Lake directly across from Donald Landing the infestation was heavy over the full length of a 100 chain strip.

Nation River.

This infestation is in a somewhat isolated area north of Fort St. James.

All that is known of the extent of this infestation is the small area of defoliation mapped in 1950 and the branch tip sampling of 1951 which was of necessity confined to accessible areas near the roads.

At a point approximately 18 road miles north east of the Nation River bridge mining road branches off the main Manson Creek road and runs east to the Nation River a distance of 15 miles.

The infestation extends eastward along this road for a distance of 12 miles. The budworm population is light to medium for the first 6 miles and from there on to the boundary of the spruce-balsam stands it is heavy.

Timber type in the area of light to medium infestation is predominantly lodgepole pine with an understory of white spruce. The area of heavy infestation supports a mixture of spruce and balsam with a mixed understory.

From the intersection of the Manson Creek road and the mining road south to Sylvester Creek the infestation is light to medium in intensity. Timber type here is a mixture of spruce and balsam.

Between Sylvester Creek and Nation River the timber type is predominantly lodgepole pine with scattered small stands of spruce and a spruce understory.

The sampling in this section was confined to the understory and scattered spruce. The budworm population here was light to medium.

South of Nation River for a distance of 15 miles the timber is pure lodgepole pine, and does not support a budworm population. From here to within a few miles of Fort St. James the timber is lodgepole pine with a spruce understory. This understory supports a light budworm population.

Hart Highway - Parsnip River.

In this area sampling was done in the vicinity of the Hart Highway from several miles north of Prince George north to a point several miles north of Fort McLeod.

Defoliation was recorded and mapped in areas east of the Parsnip River in 1950 but as yet there is no means of access into this country from the west.

Timber along this section of the Hart Highway is a mixture of spruce and balsam with patches of pure lodgepole pine on the dry and burned over areas.

Branch sampling in this area commenced at the Muldown Road about 8 miles north of Prince George and extended north to mile 56.2, about 2 miles north of Fort McLeod. From Muldown Road north to the Salmon River the infestation was light with 8 per cent or less of the buds infested. Timber here is white spruce with an understory of balsam.

West of Summit Lake a mile long strip was run through a similar two storied stand. The infestation here was somewhat heavier with a high of 65 per cent of the buds infested. In five samples an average of 37.3 per cent of the buds were infested.

North of Summit Lake to Kerry Lake the infestation is light to medium in intensity.

One mile south of Kerry Lake a strip was run north east for a distance of one mile through a stand of spruce-balsam. Here the infestation was medium to heavy with an average of 71.3 per cent of the buds infested. A similar condition prevailed at Altezega Creek north of Kerry Lake. Five samples taken along a mile strip through a spruce balsam stand showed an average of 67.3 per cent of the buds infested.

From Kerry Lake to Fort McLeod, except for one half mile strip six miles south of Fort McLeod, sampling was done randomly. The infestation here was medium to heavy except for a small area just south of Fort McLeod where only 5 per cent of the buds were found to be infested.

A technical study was begun in this area in 1951, with headquarters at Hart Lake, to study the effect of forest types etc. on the budworm population.

Wells - Browron Lake Area.

Branch sampling in this area was done mainly along the old mining roads and trails which criss-cross this section of the country.

The sampling was done randomly at measured distances from known points in the area.

A heavy larval population was present from Kibee Lake, which is 2½ miles by trail east of Bowron Lake, west and south-west on both sides of the main road to Barkerville then south-east to the headwaters of Cunningham Creek.

A similar population was present in the area between Barkerville and Wells.

In this area below 4,500' elevation the timber type is a mixture of spruce and balsam with spruce being the slightly more dominant species.

West of Wells along Lightning Creek to Cottonwood the larval population was light to medium. In only one sample was there more than 38 per cent of the buds infested.

Timber type here is mainly a spruce-balsam mixture interspersed with stands of lodgepole pine. There is a spruce-balsam understory in the pine stands which supports a small bud-worm population.

Results of the bud population sampling, as limited as they were in comparison with the area concerned, would indicate that the infestation will continue next year to cause severe defoliation of spruce-balsam stand over large areas in Central British Columbia. A slight increase in size of the areas concerned will no doubt be evident in 1952 as is shown by the westward spread of the Burns Lake - Babine Lake infestation.

Timber type throughout this section of the province is somewhat similar, being for the most part spruce-balsam stands broken by large areas of lodgepole pine on the dry and burned over sites. These intervening stands of lodgepole pine are probably all that prevents the four areas from being part of one huge infestation covering most of the Prince George Forest District and the eastern portion of the Prince Rupert District.