FOREST INSECT SURVEY - RANGERS ANNUAL REPORT

of

BRITISH COLUMBIA COASTAL REGION

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FOREST INSECT INVESTIGATION

VICTORIA B. C.

I N D E X

1948 Forest Insect Survey

Annual Report

J. M. Swaine

J. M. SWAINE (H. E. Vey)

A. INTRODUCTION

This report deals with the forest insect survey as carried out by personnel on the M. V. "J. M. Swaine" during the 1948 insect season.

Due to the immensity of the territory covered by the "Swaine" in 1948 and the usual incumbent conditions of weather, as well as the nature of the terrain and lack of transportation facilities, stopping places were carefully chosen to give a maximum of coverage in the limited time available.

Throughout the season a total of 515 random samples were made and 9,872 insects were sent to the Vernon laboratory.

B. AREAS VISITED

From May 27 when the "Swaine" left Victoria, to August 31 when she returned the following areas were sampled:

1. Powell River
2. Quadra Island
3. Thurlow Islands
4. Port Neville
5. Alert Bay
6. Knight Inlet

7. Wakeman River.

8. Port Hardy

9. Quatsino Sound

10. Smith Sound

11. Rivers Inlet

12. Bella Coola

13. Ocean Falls

14. Green Inlet

15. Swanson Bay

16. Khutze Inlet

17. Butedall

18. Kitimat River (mouth and interior)

19. Lowe Inlet

20. Prince Rupert

21. Alice Arm

22. Nass River

23. Queen Charlotte Islands in the following places (1) Skidegate Inlet, (2) Sandspit, (3) Skidegate Lake, (4) Selwyn Inlet, (6) Cumshewa Inlet.

C. INSECT CONDITIONS

1. Quadra Island

Samples were taken at various random points near Granite Bay.

(a) Budworm on spruce. Eucordylea atrupictella

Large numbers of these larvae were found infesting terminal buds on all spruce in the area. Damage, though heavy, was confined to the needles under the new bud-cap.

No other insects of importance were found.

2. Thurlow Islands

Two areas were sampled at random in this area - Hemming Bay and Blind Channel.

(a) Green cedar looper - Eupithecia placidata

Several larvae were collected on cedar in the Blind Channel area.

(b) Budworm on spruce - Eucordylea atrupictella

Here again numerous larvae were collected from the new buds on spruce.

3. Port Neville

Random sampling was carried out in several places.

(a) green cedar looper - Eupithesia placidata

A surprisingly large number of these larvae were collected in this area.

4. Alert Bay

Several spruce samples were taken along the main road of the townsite. Large numbers of Eucordylea atrupictella were collected from the new terminal buds. Damage to the tips under the cap was quite considerable, being estimated in most cases at over 50 per cent.

5. Knight Inlet

Extensive random sampling was done in the following areas - Port Elizabeth, Gilford Bay, Glendale Cove, Klina Klini River, Franklin River, Wahshihilis Bay and Hoyeha Sound.

(a) Budworm on spruce buds - Eucordylea atrupictella

Large numbers of these larvae were found in spruce collections, in the Port Elizabeth and Gilford Bay areas. Damage to tips under the bud caps was found to be quite extensive. An estimated 60 per cent of all new buds were attacked on the trees examined. Three examples of collections from the Port Elizabeth area follow:

	No. of damaged buds	No. of larvae	No. of dead larvae
1.	43	45	3
2.	33	24	4
3.	26	15	10

Further sampling of the mouth of the Franklin River, near the head of the inlet, showed a large number of attacked buds. However relatively few larvae were found. In two cases 32 and 40 damaged buds were collected which produced 6 dead larvae; and 12 live and 4 dead larvae respectively.

(b) Hemlock looper - Lambdina fiscellaria lugubrosa

Two larvae of this insect were found near the mouth of the Klina Klini River.

(c) Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimmockii Cress. - spruce sawfly.

Small numbers of these larvae were found feeding on spruce near the mouth of the Franklin River.

(d) Willow leaf beetles - Galerucella carbo Lec.

Adults of this species were found on willow at the mouth of the Klina Klini River.

6. Wakeman River

Very little insect activity of any kind was recorded in this area. This may, however, be due to the extremely wet weather encountered during the stay there.

7. Port Hardy

(a) Hemlock sawfly - Neodiprion tsugae Midd.

A relatively small population of these larvae was recorded in hemlock collections. Numbers were never large with the exception of one collection where 31 larvae were found.

8. Quatsino Sound

Considerable random sampling was done throughout Quatsino Sound in the following places: Port Alice, Victoria Lake, Coal Harbour, Holberg Inlet, Thurburn Bay, Neroutsos Arm.

In addition to random sampling, 6 permanent sample points were set up in the hemlock sawfly infestation in the Port Alice - Victoria Lake area.

(a) Hemlock sawfly - Neodiprion tsugae Midd.

The infestation of this insect in the Port Alice area continued to spread during 1948. Large increases in population were recorded in all areas. An overall picture of the stands shows no apparent defoliation, but miriad larvae are found on the beating sheet after brushing a tree lightly, and in some areas the frass fall is faintly audible.

The attached map shows the approximate area and density of infestation.

(b) Hemlock looper - Lambdina fiscellaria lugubrosa Hlst.

A very small number of hemlock looper larvae were collected in the Port Alice area. In no one particular case were the numbers large enough to cause concern.

(c) Yellow headed spruce sawfly - Pikonema alaskensis Roh. Small collections of this insect were collected in the Port Alice, Holberg Inlet, and Coal Harbour areas.

9. Smith Sound

(a) Jack pine sawfly - Neodiprion sp.

A considerable number of these larvae were found on Indian Island in the vicinity of Takush Harbour.

(b) Alder sawfly - Hemichroa crocea Fourc. of special interest is the appearance of these larvae in this area coincident with that in the Gorge area of Victoria and also

the widespread distribution in Bute Inlet. Large collections of larvae were found at the head of Fly Basin. Due to the fact that a survey of this area has never before been attempted it is not known whether this is their first appearance; however the trees are quite healthy. Defoliation was estimated at approximately 10 per cent.

(c) Alder leaf beetles - Chrysomella aenicollis

Numerous larvae of this insect were found feeding on alder in the Fly Basin area of Smith Sound. The combined damage of this insect and that of the alder sawfly was estimated at approximately 30 per cent.

10. Rivers Inlet

Samples were taken in two areas in this vicinity - at the head of the inlet in the Owikeno Lake area, and in the Inrig Bay and north arm areas of Moses Inlet.

(a) Hemlock looper - Lambdina f. lugubrosa Hlst.

Numerous larvae were found on the shoreline of Owikena Lake, and along the logging road leading from the head of Rivers Inlet. A small number of larvae were also found in the Inrig Bay area as well as up the Clyak River a distance of 1 1/2 miles. The numbers were not large in any one case, but seem to indicate a general wide distribution throughout the Rivers Inlet area.

(b) Green cedar looper - Euthecia placidota

A small number of larvae of this insect were found in cedar collections in the Owikeno Lake area.

11. Bella Coola

Two areas were surveyed in this district - the Bella Coola - Tweedsmuir Park Road, and Dean Channel including both the Dean and Kimsquit River mouths.

(a) Hemlock looper - Lambdina f. lugubrosa Hlst.

A fairly large population of hemlock looper was recorded in all areas sampled in the vicinity of Bella Coola. Although there is no noticeable defoliation at present, this area should be carefully watched in the next few years. Fairly large numbers of larvae were found in spruce collections. Any increase in population should be regarded with a good deal of concern. Smaller numbers of larvae were also found in the Dean Channel area.

(b) Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimmockii Cress. spruce sawfly.

Larvae continue to be found in spruce collections in all areas. The numbers are never large, and no defoliation has been observed to date.

12. Ocean Falls

(a) Neodiprion sp.

Sawfly larvae were found on jack pine in the area 1/2 mile from dam on east shore of Link Lake. A great deal of feeding had been done on the pine foliage, though the number of larvae collected was not high. One large collection of sawfly larvae was also found on cedar in the same area. This was believed to be the same insect. Smaller numbers of larvae were also collected from hemlock.

13. Green Inlet

(a) Yellow headed - Pikonema alaskensis Roh. and green headed -Pikonema dimockii Cress. spruce sawfly.

(b) Spruce sawfly - Choristoneura fumiferana

Several collections from spruce showed one larva of this insect per collection . One larva was also recorded from hemlock.

14. Swanson Bay

No insects of any importance were recorded in this area, apart from yellow headed and green headed spruce sawfly larvae.

15. Khutze Inlet

Spruce sawfly - Choristoneura fumiferana

One larvae of this insect was found on spruce in this area.

Neodiprion abietes Large collections of these larvae were found on spruce in this area. A slight amount of defoliation was recorded on spruce in the area.

Green headed spruce sawfly - Pikonema dimmockii Cress.

Fairly large numbers of these larvae were recorded in spruce collections.

16. Butedale

Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimmockii Cress. spruce sawfly

Small numbers of these larvae were found in spruce collections in this area.

17. Kitimat River.

(a) Hemlock looper - Lambdina f. lugubrosa Hist.

One larva of this insect was found 1¾ miles north of the mouth of the river.

(b) Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimmockii Cress.

Numerous larvae of these insects were found in spruce collections near the mouth of the Kitimat River.

Green spruce looper - Semiothisa granitata

Larvae of this insect were found in fairly large numbers on hemlock throughout the interior portion of the river from Lakelse Lake south across the flat dividing ridge from the Skeena drainage to the Kitimat drainage.

(c) Carineta divisata Wlk.

Fairly large numbers of these larvae were recorded in hemlock collections throughout the interior Kitimat area. These larvae occurred in hemlock collections from Lakelse Lake south to the Kitimat River.

18. LOWE INLET

(a) Hemlock sawfly - Neodiprion tsugae Midd.

A small number of larvae of this insect were found in hemlock collections in this area.

(b) Malanolophia imitata - Wlk.

A considerable number of these larvae were found in most hemlock collections in the area. No single record of a large collection was made, however the incidence of this larva in most collections is worthy of note.

19. Prince Rupert.

(a) Hemlock sawfly - Neodiprion tsugae Midd.

Small numbers of hemlock sawfly larvae were recorded in most hemlock collections in this area.

(b) Alder sawfly - Hemichroa crocea Fourc.

These larvae were found in fairly large numbers on willow throughout the area. No record of them in alder collections was found, however it is probably just a matter of time.

20. Alice Arm

(a) Hemlock sawfly - Neodiprion tsugae Midd.

Small numbers of hemlock sawfly larvae were recroded in most hemlock collections in this area.

(b) Willow leaf beetle - Galerucella carbo Lec.

Large numbers of larvae of this pest were found on willow in the area. Defoliation was estimated to be approximately 60 per cent.

21. Nass River

(a) Hemlock sawfly - Neodiprion tsugae Midd.

A small population of these larvae was recorded in hemlock collections. The numbers were not large, and no defoliation was recorded.

(b) Tenthredinid on willow

A very large collection of sawfly larvae was made from one willow sample. Defoliation of this one tree was very heavy. No subsequent collections were found throughout the area.

(c) Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimockii Cress. spruce sawfly.

A fairly large number of these larvae was recorded in spruce collections in the area.

(d) Melanolophia imitata Wlk.

Small numbers of larvae of this insect were recorded throughout the area.

(e) Chrysomella aeneicollis

One very large collection of these larvae was made from alder in the vicinity of Iceberg Bay, at the mouth of the river.

22. Queen Charlotte Islands.

The Queen Charlotte Islands were visited in the following areas: Skidegate Inlet, Sandspit, Skidegate Lake, Selwyn Inlet, and Gurnshewa Inlet.

(a) Hemlock sawfly - Neodiprion tsugae Midd.

A large population, nearing infestation proportions were found throughout the Queen Charlotte Islands in 1946. Again in 1947, sawfly larvae were common, but the infestation was reported to be subsiding. In 1948 few traces of hemlock sawfly were found, but only in very small numbers per collection. One ground sample revealed no new cocoons whatsoever, and only a few old ones.

Some defoliation was recorded on spruce and hemlock in the Alliford Bay area. Parasite wasps were liberated during the 1946 feeding season.

(b) Alder sawfly - Hemichroa crocea Fourc.

A very heavy infestation was recorded in 1946. This infestation appears to continue in intensity throughout the entire islands in 1948, though in places there is some slight abatement. In 1946 alder patches on surrounding hillsides had a decided bare appearance. In 1948 the overall picture is much improved, and alder patches have a much greener appearance. Parasite wasps were observed in the Alliford Bay area attacking the sawfly larvae.

In the Cumshewa Inlet area the alder sawfly population seemed to be particularly heavy. A large number of alder sawfly adults were found. They appeared in hundreds not only on every beating regardless of host, but on ones clothing etc., in general making life unpleasant.

In the Skidegate Lake area numerous second generation larvae were found. These were as yet very tiny, having been hatched at most only a few days. This would indicate that the season was much farther advanced than in Skidegate Inlet, where large larvae of the first generation were still to be found.

Alder trees in the Cumshewa Inlet area have been heavily defoliated but their overall defoliation does not exceed 75 per cent.

(c) Yellow headed - Pikonema alaskensis Roh. and green headed - Pikonema dimockii Cress. spruce sawfly.

A small number of the larvae were found in spruce collections throughout the Queen Charlotte Islands.

P O W E L L R I V E R

Powell River Vats.

In May 1947 Mr. Richmond visited Powell River where he investigated a borer infestation in the ground wood storage tanks. At the time he obtained several specimens by putting in the boring holes on the side of the tank. These specimens were identified as Buprestes aurulenta, and he made certain tentative suggestions as to the control of the insect such as painting the tanks with a copper wood preservative.

During the summer the tanks were sprayed with Cuprinol but apparently this had no deterrent effect on the borer population for the next inspection in early November new boring holes were in evidence.

At this time an experiment was begun to determine what population of this borer was present in the tanks, and of the presence of Cuprinol in the holes would be a deterrent. Over an area 11½ feet X 10 feet on tank No. 3, ½ of the holes were plugged with a mixture of plaster and linseed oil, the other half being plugged with a mixture of Cuprinol and plaster. The insects would be forced to bore new outlets or push the plaster from the old boring holes.

On May 28, 1948 the tanks were revisited, at which time it was discovered that although none of the holes plugged with plaster and linseed oil had been broken open eight of those plugged with plaster and cuprinol had been opened. At the same time in the section of plaster and linseed oil plugged holes eight new emergence holes had appeared while in the plaster and Cuprinol plugged section there were seven new holes.

On September 28, 1948 the tanks were again visited at which time it was noted that although the numbers of old holes broken open remained approximately the same, the numbers of new holes in both cases had shown a remarkable increase. This fact would indicate the futility of using cuprinol as a means of control.

VAT NO. 3

	LINSEED OIL AND PLASTER													CUPRINOL AND PLASTER												
Board No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
November 4, 1947.	5	5	4	3	2	4	6	4	5	5	10	11	7	19	1	4	9	16	11	10	14	7	3	2	3	6
	Total 71													Total 97												

RE-EXAMINATION SHOWING NO. OF HOLES BROKEN OPEN

	LINSEED OIL AND PLASTER												CUPRINOL AND PLASTER											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
September 28, 1948		1			1		1				1			1						2		1			1	1
	Total 4													Total 6												

In May 1947 samples of a wood-boring beetle - Buprestis aurulenta - were obtained from holes in the storage tanks.

In May 1948 samples of a parasite to these beetles of the species Bombomima were found.

In September 1948 further insect samples were found. These consisted of (1) Termites which were found in the boring holes and (2) beetles of the family Ostomidae. These latter are generally found under bark, infesting granaries etc. The larvae of some attack and eat wood-boring and bark beetles.

RE-EXAMINATIONS SHOWING INCREASES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1							1		1	1	2	3		2		1				1	1	1		1	1

May 28, 1948

Total 8 Total 7

	2	3			4	2		2				2	2	1	1	1	1	3	1	3	1	1			1

September 28, 1948

Total 15 Total 16

RE-EXAMINATION SHOWING NO. OF HOLES BROKEN OPEN

LINSEED OIL AND PLASTER CUPRINOL AND PLASTER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
																1	3		1	2	1				

May 28, 1948

Total 0 Total 8

I. LOWER VANCOUVER ISLAND - E. G. Harvey.

This report covers the forest insect survey work done in that portion of Vancouver Island which lies to the south and east of the highway from Parksville to Port Alberni and the Alberni Canal. It also includes the Channel Islands which lie along the eastern coast of Vancouver Island between Nanaimo and Victoria.

For the convenience of this report this territory has been divided into eleven districts. Starting at the southern tip of the island and working from west to east, and from south to north they are -

1. Sooke - Goldstream
2. Victoria - Saanich
3. Jordan River - San Juan River.
4. Shawnigan Lake - Duncan
5. Gulf Islands.
6. Nitinat River - Cayeuse River.
7. Cowichan Lake.
8. Ladysmith - Nanaimo
9. Sarita River.
10. Alberni.
11. Parksville.

Each district will be dealt with separately and in the above order.

The survey work here reported was done by Insect Rangers of the Victoria staff with a few samples being sent in by students who were on the staff for the summer months only.

A total of 540 collections, containing approximately 15,000 insects, was made from 130 sample areas, and 23 permanent sample points were established.

As in 1947 the method of sampling was kept as uniform as possible, with the beating of three trees of a kind to a sample, and using the standard 7' x 9' beating sheet. There were exceptions to this rule which will be noted.

The accompanying map has the districts and sample points clearly marked so that the coverage attained can be seen at a glance.

A. DISTRICTS AND THEIR DESCRIPTIONS

1. SOOKE - GOLDSTREAM.

This district takes in the most southerly portion of Vancouver Island, bounded on the north and east by the southern boundary of the E. & N. Land Grant and the Island Highway. It contains several growing farming communities separated by low

mountains and hills with elevations up to 2,000 feet. Although there are no large logging operations in the area there are many small scale loggers and wood cutters working here.

Sample points and dates are as follows: -

(a) GOLDSTREAM - on the west side of the Island Highway 1/4 mile south of Goldstream Park - April 8.

(b) GOLDSTREAM - near the station on the road to Kapoor - April 8.

(c) HUMPBACK ROAD - 1/2 mile south of the reservoir between Goldstream and the Sooke Road - April 16

(d) LAGOON ROAD - at a branch in the road near the corner of National Defence property - April 22

(e) GLINZ LAKE ROAD - near end of logging road three miles north east of Glinz Lake. - May 6.

(f) METCHOSIN - inside National Defence Property on Signal Hill, overlooking William Head - April 14

(g) ROCKY POINT - between Becher Bay and Pedder Inlet - April 20.

(h) BEECHEY HEAD - about 1/2 mile from the end of the road - April 20.

(i) EAST SOOKE - 3 miles from end of road on south side of Sooke Inlet - April 26

(j) SOOKE RIVER - 4 miles up the river from Milne's landing - April 30.

(k) SOOKE - 2 miles beyond the village on the Otter Point Road April 30th

(l) KANGAROO ROAD - near the junction of the Kangaroo and Sooke Roads May 7th

All the sample points in this district were easily reached by road.

The timber type is predominantly Douglas fir throughout, being mixed with Grand fir, cedar and broad-leafed trees in the south and east, with a few hemlock, white and lodgepole pine in the western and northern parts of the district and the odd spruce in low areas.

Summary

Number of samples taken in this district 35

Approximate number of insects enclosed 695

All samples were made by the standard method except two. One of these was hand picked, and the other was taken from one tree only, no other trees of that kind being available at that point.

Halisidota argentata Pack. (silver spotted tiger moth) One larva only of this insect was found at sample point (a) where eleven larvae were found in 1947.

Eupithecia sp.

Loopers of this genus were found in small numbers through-

out the district. The majority of these were of the species E. placidata, eleven of which were found on cedar trees at sample point (d).

Most of the remaining insects were of minor importance, the majority of them being click beetles.

Permanent sample points established in this district

(c) Humpback Road

(d) Lagoon Road

(f) Metchosin

(h) Beechey Head

2. VICTORIA - SAANICH

This district takes in that part of the island which lies to the north and east of the Island Highway from Goldstream to Victoria, on the east side of Saanich Inlet. About half this area is taken up with farming communities and the metropolitan area of Greater Victoria. The rest, mainly on the western side, is covered with low mountains on which are many small logging and wood cutting operations. This district, containing most of the population of Vancouver Island, has several parks which may be considered of importance.

Sample points and dates are as follows: -

(a) VICTORIA

(i) Uplands - February 27, June 4, August 18, September 2.

(ii) Mt. Tolmie - February 27, June 21, September 2.

(iii) Cedar Hill Road - February 27, July 3, September 1.

(iv) Lakehill - February 27, June 4, August 18, September 1.

(v) Gorge Park - June 14, July 3, August 4.

(b) MT. DOUGLAS PARK

between the picnic grounds and the lookout - April 22, September 2.

(c) THETIS LAKE PARK -

on the east side of the lake - April 23.

(d) MT. FINDLAYSON -

about one mile north east of Goldstream Park - April 9.

(e) MUNN'S ROAD

by the junction with Durant's road - April 13.

(f) DURANT'S ROAD

by deserted farm at top of hill just west of Durrance Lake, near Tod Inlet - April 13

(g) JOHN DEAN PARK

on top of Mt. Newton - April 15

(h) NORTH HILL

by the rifle range in north Saanich - April 12

(i) CLOAKE HILL

by the end of the road on the west slope of the hill April 7

All the sample points in this district were easily reached by road.

The timber type here is fairly uniform with Douglas fir

predominating and mixed to varying degrees with grand fir, cedar and a few patches of lodgepole pine, with a liberal sprinkling of broad leafed trees. The low lying hills extending from the southern side of Mt. Douglas into the City of Victoria are mostly covered with stands of oak.

Summary

Number of samples taken in this district 101

Approximate number of insects enclosed 7,959

The number of insects taken should be broken down, as below, to show a true picture of insect populations, since large collections were made here in infestation areas.

At sample points (a) - (1), (2), (3), (4) and (7), in the stands of oak trees, 66 collections were made throughout the season containing about 6,500 oak looper larvae and pupae.

At sample points (a) - (5) and (6), in mixed stands containing alder trees, 3 collections were made containing about 700 alder sawfly larvae.

At sample point (a) - (5) one sample contained 65 larvae of Nymphalis antiopa.

The above mentioned 70 collections were made from one beating each and, in most cases, the collection contained only a small percentage of the larvae to be found on the beating sheat. The remaining 31 collections were made by the standard method.

Lambdina somniaria Hlst. (oak looper)

The oak looper infestation covers a much larger area than in previous years, and still appears to be spreading. The large collections of eggs, larvae and pupae showed a heavy mortality from parasitism, but the percentage is still not high enough to bring this insect under control. The oak trees, even though 100% defoliated now for several consecutive years show no signs of succumbing to the attack. However, the loopers, having been forced to seek new hosts or starve, have been feeding on the few Douglas fir trees which were growing in the oak stands. Most of these trees have now died as a result of this feeding.

Hemichroa crocea Fourc. (alder sawfly)

The alder sawfly, which has been found on Vancouver Island for the first time this year, was in infestation during 1948 near and in Victoria. Although there are only a few alder trees in this area, these were defoliated up to 100% twice during the summer by the first and second generations especially in the Gorge Park and around Portage Inlet.

The remaining insects were all of only minor importance.

Permanent sample points extablished in this district

(b) Mt. Douglas Park.

(c) Thetis Lake Park.

(f) Durant's Road

(g) John Dean Park

(h) North Hill

3. JORDAN RIVER - SAN JUAN RIVER

This district extends from the south west corner of the E. & N. Land Grant along the coast to Port San Juan and inland to the north and east to take in the watersheds of the Jordan and San Juan Rivers. Some of the mountains here have an elevation of over 3,000' but they are well timbered to the top and slope gradually down to the sea. The Jordan River watershed is the source of electric power for the City of Victoria.

Sample points and dates are as follows: -

(a) JORDAN RIVER - SOOKE ROAD

between Muir and Kirby Creeks - June 30

(b) JORDAN RIVER

(i) 1½ miles north east of the village - June 29

(ii) 6 miles north east of the village near end of the logging road - June 29

(iii) 8 miles west of the village beyond end of the logging roads - June 29

(c) PORT RENFREW ROAD

(i) 10 miles west of Shawnigan Lake - June 22

(ii) 18 miles west of Shawnigan Lake - June 25

(d) SAN JUAN RIVER

(i) mile 15 from Port Renfrew on railway - June 23

(ii) mile 12 from Port Renfrew on railway - June 23

(e) PORT RENFREW

(i) between the village and the beach camp - June 24

(ii) on the north side of the river just past the Indian settlement - June 24

(f) HARRIS CREEK

in block 62, 12 miles north east of Port Renfrew - June 24

A large section of this district has no road or trail in it. There are only two short stretches of public road, one on the coast extending for eight miles to the west of Jordan River and the other going west from Shawnigan Lake to the end of steel, about twenty-three miles east of Port Renfrew. The balance of this district is accessible only by logging company roads and railroads, or trails.

The timber type is mainly hemlock in the virgin stands, mixed with Douglas fir, cedar and in places some spruce, balsam fir, white and lodgepole pine. The regeneration stands, mainly in the western parts of the district, run heavily to Douglas fir.

Summary.

Number of samples taken in this district 30

Approximate number of insects enclosed 434

All samples were made by the standard method but two which were made from 30 trees in the former hemlock looper infestation areas in an endeavour to find some loopers which had survived.

Neodiprion sp. (sawfly larvae)

Larvae of this genus were found at sample point (e) (2) in numbers up to 37 in a collection on spruce trees, and in small numbers elsewhere. At sample points (d) (1) and (2) several larvae were found to be Neodiprion tsugae, but averaged less than one larva to a beating.

The spruce trees at Port Renfrew on which the sawfly larvae were found showed evidence of having been fed on by budworms, but no larvae were to be found at that date. The same conditions were found at Jordan River.

Although a thorough search was made for hemlock loopers along the San Juan River in the areas where these insects were numerous previous to 1946, not a single larva was found.

All other insects were of minor importance.

Permanent sample points established in this district

(e) Port Renfrew.

4. SHAWNIGAN LAKE - DUNCAN.

This district extends from Goldstream to Crofton on the east. It is bounded by the Island Highway and the Cowichan Lake Road on the north. The western boundary extends from Mayo to the south corner of the E. & N. Land Grant, and the south boundary follows the Land Grant boundary to Goldstream.

The eastern half of this district has numerous lakes, some of which form the Victoria City water supply. Most of

the roads are to be found in the east and north where the mountains are fairly low and small farming communities thrive. Many small logging operations are carried on here. Larger companies are working a little farther inland, where the mountains rise to an elevation of about 3,000'.

Sample points and dates are as follows:

(a) MALAHAT

on Island Highway by turn-off to Shawnigan Lake - April 27

(b) SHAWNIGAN LAKE ROAD

near turn-off to Sooke Lake - April 27

(c) PORT RENFREW ROAD

3 miles west of Shawnigan Lake - June 22

(d) COBBLE HILL

on the property of Mr. Cheeke - June 25

(e) GENOA BAY

near the end of the road - July 8

(f) COWICHAN STATION

on logging road about 5 miles to the west and south of the station - July 9

(g) INDIAN ROAD

2 miles west of Duncan - July 9

(h) CROFTON

on the Maple Bay road, 1/2 mile south of Crofton - July 9

All the sample points in this district were easily reached by road.

The timber type in this district is predominantly Douglas fir, mixed to varying degrees with hemlock, cedar, grand fir and broad-leafed trees.

Summary

Number of samples taken in this district 29

Approximate number of insects enclosed 607

All of these samples were made by the standard method but two which were hand picked.

Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)

Only one larva of this insect was found in this district. It was taken from a cedar tree at sample point (e)

Chrysomelidae (leaf beetles)

These insects, both in the larval and adult forms, were very prevalent throughout the district, especially Galerucella carbo on willow and Altica bimarginata on alder. In most areas the trees were defoliated up to 100%.

Nymphalis antiopa L. (mourning cloak butterfly)

Larvae of this insect were very numerous on a small willow at sample point (d), from which 62 larvae were taken. The tree was almost completely defoliated.

Other insects were all of minor importance with no species being unusually numerous.

Permanent sample points established in this district

(a) Malahat

(d) Cobble Hill

(e) Genoa Bay

5. GULF ISLANDS

This district consists of a series of islands on the south west side of the Straits of Georgia just east of the lower end of Vancouver Island extending from Nanaimo to the north end of the Saanich Peninsula. These islands are made up of low mountain ridges and rolling hills with small farming communities in the valleys and flats. The islands are all well timbered and most of them have small logging operations on them.

Sample points and dates are as follows:

(a) SALT SPRING ISLAND

(i) Southey Point - near the end of the road at the north end of the island - May 20

(ii) Mt. Maxwell Park - at the end of the road near the entrance to the park - May 20

(iii) Cusheon Lake - by the road just north of the lake - May 21

(iv) Beaver Point - near the end of the road at the south east corner of the island - May 21

(v) Musgrave Road - at the summit of the road between Musgrave and Fulford Harbour - May 21

(b) SOUTH PENDER ISLAND

by the road near the church - May 17

(c) NORTH PENDER ISLAND

about 1/2 mile south west of Hope Bay - May 16

(d) SATURNA ISLAND

(i) near Lyall Harbour - May 17

(ii) 2 miles east of Lyall Harbour - May 17

(e) MAYNE ISLAND

(i) near Miner's Bay - May 16

(ii) near the centre of the island - May 16

(f) GALIANO ISLAND

(i) behind Montague Harbour - May 15

(ii) Retreat Cove - May 14

(iii) across the island from Retreat Cove - May 14

(g) KUPER ISLAND

near the centre of the island - May 15

(h) THETIS ISLAND

along the road across the island - May 15

(i) VALDES ISLAND -

on the bluff above Blackberry Point - May 14

(j) GABRIOLA ISLAND

(i) near the school at Gabriola - June 11

(ii) near the eastern end of the island - June 11.

Salt Spring Island is reached by ferry from Swartz Bay, North Saanich, to Fulford Harbour. From there all sample points

on the island are accessible by road. Gabriola Island is reached by ferry from Nanaimo to Gabriola, from which point the island can be covered by road. All other islands in this district were visited by the J. M. Swaine and the sample points were reached by foot.

The timber types on these islands were found to be fairly constant with Douglas fir being predominant throughout. There are a few grand fir and cedar in the lower areas with a few hemlock and white pine at higher elevations. All the islands have a generous sprinkling of broad-leafed trees.

Summary

Number of samples taken in this district 80

Approximate number of insects enclosed 2,009

All samples were made by the standard method but one which was hand picked.

Choristoneura fumiferana Clem. (spruce budworm)

One larva only of this potentially harmful insect was found, at sample point (j) (i) on Gabriola Island.

Malacasoma pluvialis Dyar. (western tent caterpillar)

These insects were very plentiful on deciduous trees and shrubs on both North and South Pender Islands.

Syneta albida Lec. (western fruit beetle)

This leaf eating beetle was found in small numbers on alder throughout the district, being most plentiful on Mayne Island where up to 50 beetles were taken in one collection. The trees

here showed up to 50% defoliation.

Chrysomelidae (leaf beetles)

Leaf beetles were very plentiful, mainly Galerucella carbo and Altica bimarginata, on willow trees which showed heavy defoliation.

Permanent sample points established in this district - nil.

6. NITINAT RIVER - CAYCUSE RIVER.

This district lies west of the E. & N. Land grant boundary between Port San Juan and the Nitinat Lake, taking in the watersheds of the Gordon to the Little Nitinat Rivers. Although there are several mountains exceeding 3,000' in elevation here, there are many valleys with well timbered slopes. Much of this district is still virgin timber land and is only accessible by trail from the edges of the logging operations which skirt the northern and eastern sides of it.

Sample points and dates are as follows:

(a) CAYCUSE RIVER -

all along the trail from the end of steel, past the cabin, towards McClure Lake - June 17

(b) WILSON CREEK

by the trapper's cabin - June 23, November 2

(c) NITINAT RIVER

all along the river from the end of steel to Worthless Creek - June 15, August 10

(d) TUCK LAKE

in block 51A, near the end of the railway - August 10

(e) LITTLE NITINAT RIVER

(i) at mile 24 from Franklin River on Railway - July 15

(ii) just east of Francisa Lake - July 15

To get to sample points (a) and (b) in the Caycuse River and Wilson Creek, it is necessary to cross Cowichan Lake from Youbou to Camp 6 at the mouth of Towincut Creek; then go over the mountains 16 miles to the upper reaches of the Caycuse River. From the end of steel the sample points are reached by trail.

To get to sample points (c) and (d) in the Nitinat River and Tuck Lake, it is necessary to travel by logging railway from Youbou to Camp 3, thence to black 51A, from where trails lead to the areas sampled.

Sample points (e) (i) and (ii) are reached by logging road from Port Alberni to Franklin River, thence by logging railway to Camp B. on Coleman Creek, thence to Francisa Lake. From the end of steel it is necessary to travel by foot to the sample points. However, the grade is being built here and this area will be accessible by rail next year.

The timber type throughout this district is predominantly hemlock mixed to varying degrees with Douglas fir, cedar, balsam, and in a few places spruce and broad-leafed trees.

Summary.

Number of samples taken in this district 19

Approximate number of insects enclosed 133

Five samples were taken from atotal of 78 hemlock trees in a search for surviving hemlock loopers. The balance were all taken by the standard method.

Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)

There was only one larva of the hemlock looper found in this area, although an entensive search was made for them in the sections defoliated by this insect during the past few years.

Dendroctonus pseudotsugae Hopk. (Douglas fir bark beetle)

The following is quoted from a report made by Mr. H. A. Richmond - "On Vancouver Island the Douglas fir bark beetle has become quite active in areas of hemlock looper damage. Most important of these regions is the Wilson Creek tributary of the Caycuse River. In this area bark beetles are attacking the green healthy timber adjacent to the looper damaged stands. Current infestations are of a patchy nature, 20 to 30 trees per group . Attack has occurred apparently during mid-summer 1948 and while no signs of discoloration of foliage has yet developed, affected trees are heavily infested and their eventual death is certain in 1949. The eventual spread of this beetle infestation cannot be accurately predicted but in that its activity is almost certain for another two or three years, it becomes an important factor in salvage plans, and may alter

considerably the volume of remaining residual green timber in such areas adjacent to hemlock looper damaged timber."

Insects were very noticeably scarcer here, in the areas which were recently infested with hemlock loopers, than in any other district on the lower half of the island. From a total of 120 beatings made in this district only 133 insects were found, an average of just over one insect per beating.

Permanent sample points established in this district - nil

7. COWICHAN LAKE

This district takes in the valleys draining into Cowichan Lake and the Cowichan River valley to the east as far as Mayo, half way between Lake Cowichan and Duncan. There are wide, gently sloping valleys in the east and south, with narrower valleys and more abrupt hills and mountains surrounding the lake. Most of the lower slopes are logged off and are now covered with young regeneration, part of which has been planted.

Sample points and dates are as follows:

(a) SKUTZ FALLS

near the road by the river - July 13

(b) BLOCK 195

up the mountain south of Skutz Falls - August 25

(c) ROBERTSON RIVER

(i) about 10 miles up the river - September 11

(ii) about 5 miles up the river - September 11

(d) LENS CREEK

by the study plots - August 24

(e) HONEYMOON BAY

just above the booming grounds - August 25

(f) COWICHAN LAKE

by the laboratory - April 19, June 10, July 13, August 10, September 14

(g) MEADE CREEK

(i) near the entrance to the camp - August 26

)ii) half way up the main creek road - September 13

(iii) near the end of the west fork road - August 26

(h) YOUBOU

one mile east of the village - August 27

(i) COTTONWOOD CREEK

(i) one mile beyond Widow Creek Fork - August 27

(ii) five miles beyond Widow Creek Fork - August 10

(j) WIDOW CREEK

near end of logging road - August 27.

Most of this district can be reached by road, but in some parts the only means of access is by foot. Such is the case with Cottonwood Creek out of Youbou where it is necessary to walk from the Widow Creek junction up an old logging road for a distance of five miles through young regeneration to reach the uncut forest. To get to the headwaters of Lens Creek it is necessary to go up the Robertson River valley to the end of one

of the forestry roads and walk two or three miles along a trail.

The timber types in the virgin stands, which are mostly on the higher levels, is hemlock, Douglas fir, cedar, with a sprinkling of white pine and balsam. On the lower levels the regeneration is mainly Douglas fir, mixed with hemlock and cedar, and broad-leafed trees.

Summary.

Number of samples taken in this district 61

Approximate number of insects enclosed 550

All samples taken in this district were made by the standard method.

Chrysomelidae (leaf beetles)

Leaf beetles, especially Galerucella carbo and Altica sp., were very numerous on willow wherever willow were to be found in the district. Alder trees on the west fork of Meade Creek were found to be heavily defoliated by Chrysomela aenicollis and Altica bimarginata beetles and larvae.

Newtia phantasmaria Wlk. (green hemlock looper)

One larva and one pupa were found at Meade Creek.

Permanent sample points established in this district

(f) Cowichan Lake

(h) Youbou

8. LADYSMITH - NANAIMO

This district extends from the Chemainus River to just north of Wellington, taking in the waterhseds of the Chemainus and Nanaimo Rivers. There are several mountains here exceeding 4,000' in elevation, but long gentle slopes leading up to these mountains and wide valleys between them make this an important logging area. Most of the lower slopes have been logged off in the past and many of them are now covered with a good stand of second growth trees.

Sample points and dates are as follows:

(a) CHEMAINUS RIVER

near the upper end of the railway - September 9

(b) LADYSMITH

(i) block 59, beside a small lake - August 19

(ii) block 710, near the top of the mountain - August 20

(iii) block 1, a little below the water tank - August 20

(iv) block 51, at the end of steel on Chipman Cr.- August 20

(v) block 87, near the high bridge on Haslam Cr.-August 21

(c) CASSIDY

on a section of the old road running parallel to the highway near the airport - July 29

(d) TIMBERLANDS ROAD

near the Mayo mill - July 29

(e) QUENNELL LAKE

on the north side of the lake - July 29

(f) NANAIMO LAKES

(i) 4th lake trail, beyond the end of the road July 30

(ii) 2nd lake, on the north side, at the east end - July 30

(iii) 2nd lake, 2 miles north west of the lake - September 10

(iv) 1st lake, 3 1/2 miles north of the lake - September 10

(g) JUMP CREEK

(i) 2 miles west of the dam - September 11

(ii) 7 miles west of the dam - September 11

(iii) junction of Jump Creek and Nanaimo River - September 11

)h) NANAIMO

(i) 3 miles south west of the city, near dump - June 11

(ii) on street leading to Departure Bay - June 9

(i) WELLINGTON

just south of Brannen Lake - June 10

(j) DEPARTURE BAY

near the water tank, just above the biological station - June 9

These sample points were mostly reached by logging roads and railroads. To get to points (g) - (i) and (ii) above Jump Creek it is necessary to drive to the Nanaimo City Reservoir and then walk along a trail which skirts the dam from the end of the road.

The timber type throughout this district is predominantly Douglas fir, mixed to varying degrees with hemlock and cedar. In the eastern portion there are a few grand fir and patches of lodgepole pine, with some balsam and white pine farther inland. There is a liberal sprinkling of broad leaf trees in the lower areas with alder and willow appearing throughout along the road and in cut over areas.

Summary

Number of samples taken in this district	82
Approximate number of insects enclosed	1,072

All samples taken in this district were made by the standard method.

Choristoneura fumiferana Clem. (spruce budworm)

Larvae of this insect were found at two points in this district, two at (h) - (i) near Nanaimo and three at (j), Departure Bay.

Stilpnotia salicis L. (satin moth)

The silver poplars in Nanaimo, which were 100% defoliated by this larva in 1947, were found to have quite a few larvae again this year. However, they were not nearly so numerous as last year and they were noted to be heavily parasitized.

Chrysomelidae (leaf beetles)

The willow trees in this district were all heavily infested with beetles and larvae of Galerucella carbo. Alder trees in the

Nanaimo Lakes and Ladysmith districts were infested with both Chrysomela aenicollis and Altica bimarginata beetles and larvae.

Permanent sample points established in this district

(b) (i) block 59 Ladysmith

(c) Cassidy

(j) Departure Bay

9. SARITA RIVER

This district includes the area between the Alberni Canal and Nitinat Lake, extending east to the western boundary of the E. & N. Land Grant, and following the height of land on the west side of Little Nitinat River to Nitinat Lake.

Much of this area is still virgin timber land, a lot of which, the Klanawa and Sarita River valleys in particular, was heavily attacked by hemlock loopers from 1945 to 1947, leaving much dead timber.

Sample points and dates are as follows -

(a) KLANAWA RIVER

from 6 to 10 miles up from the mouth of the river - July 6, 7.

(b) POETT NOOK

(i) at the west end of the nook - May 31

(ii) Christie Bay - May 31

(iii) Frederick Creek - May 28

(iv) Frederick Lake - May 30

(v) Pachena Lake - May 30

(vi) Rosseau Lake trail - May 30

(c) SARITA RIVER

(i) 3 miles up from the mouth - May 29, July 25

(ii) near the west end of Sarita Lake - May 31

(d) COLEMAN CREEK

one mile below Camp B - July 14

None of the above sample points can be reached by road. The Coleman Creek sample point is reached by logging railway from Franklin River, via Port Alberni. To get into the Klanawa River valley it was necessary to fly to Blue Lake, which lies about 6 miles up from the mouth and adjacent to the river. From there the area was covered by foot, through heavy undergrowth with very few trails. The Sarita River and Poett Nook areas are accessible only by boat from Port Alberni to Christie Bay, thence by foot to the sample points. The Bloedel, Stewart and Welsh Co. are building roads at present from their camp at Christie Bay both up the Sarita River and in past Pachena Lake into the Klanawa River valley, so by next year it should be possible to cover these areas by logging road.

The timber type in this district is predominantly hemlock, mixed with cedar, balsam and in places some Douglas fir, spruce and a few broad-leaf trees.

Summary

Number of samples taken in this district 32

Approximate number of insects enclosed 398

All samples taken in this district were made by the standard method except three, which were hand picked.

Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)

Two larvae of this insect were found at (d) Coleman Creek, one each on a cedar and a willow.

Pissodes sitchensis Hopk. (spruce weevil)

A large percentage of the spruce trees at (b) (ii) Christie Bay, have been attacked by this weevil.

Galerucella carbo Lec. (willow leaf beetle)

Willow trees in the Poett Nook area were heavily infested with these leaf beetles and larvae.

Permanent sample points established in this district

(b) (i) Poett Nook

10. ALBERNI

This district is bounded by the E. & N. Land Grant boundary and the Alberni Canal on the west and the Alberni - Parksville highway on the north. The eastern boundary follows the 124 degree 30' longitudinal line southward to Mt. Hooper from where the southern boundary runs west to the E. & N. Land Grant boundary. Included are the watersheds of the Cameron River, China Creek and Franklin Creek. The area includes several mountains exceeding

5,000' in elevation but the lower slopes and valleys contain considerable timber and important areas of regeneration.

Sample points and dates are as follows:

(a) FRANKLIN CREEK

6 miles up from the mouth - July 17

(b) CHINA CREEK

near the dam, by the entrance to the watershed - July 16

(c) ROGERS CREEK

near the Alberni rifle range - July 13

(d) ALBERNI HIGHWAY

on the summit - August 9

(e) CAMERON RIVER TRAIL

at the end of the road leading south from the Alberni Highway - August 9

(f) CATHEDRAL GROVE

south west of Cameron Lake - August 10

(g) MT. ARROWSMITH TRAIL

south east of Cameron Lake - August 12

The above sample points were all reached by road but the road to point (e) is little better than a trail and it would not be advisable to attempt to reach this point in any vehicle which has not got four wheel drive.

The timber type in the western part of this district is hemlock, Douglas fir, cedar and a few white pine. This changes to Douglas fir, hemlock, cedar with some white and lodgepole pine in

the eastern part, with a mixture of broad leaf trees throughout. There are some reforested areas here which are mainly Douglas fir.

Summary

Number of samples taken in this district 29

Approximate number of insects enclosed 404

All samples taken in this district were made by the standard method except one, which was hand picked.

Pissodes sitchensis Hopk. (spruce weevil)

The spruce regeneration at point (a), Franklin Creek, has been heavily attacked by this weevil, many of them for three successive years. Most of these trees are now taking on a bushy appearance and have two or more leaders.

Lembdina fiscellaria lugubrosa Hlst. (hemlock looper)

One larva only of this insect was found in this district at (b) China Creek, on willow.

Chrysomelidae (leaf beetles)

Galerucella carbo were very numerous on willow throughout the district.

Permanent sample points established in this district

(b) China Creek

(d) Alberni Highway Summit.

11. PARKSVILLE

The boundary of this district extends from just north of Wellington to Parksville, thence to the west along the Alberni highway to the 124 degree 30' longitudinal line, thence to the south to the height of land at Mt. Moriarity, thence to the east to a point due south of Nanoose Bay, thence back to the point of commencement. It takes in the watershed of the Englishman's River, an area of rolling hills and long gentle slopes and a few small farming communities.

Sample points and dates are as follows:

(a) ERRINGTON

2 miles west of the village - September 12

(b) ENGLISHMAN'S RIVER

(i) Englishman's River Falls park - August 7, September 12

(ii) in block 155 - August 11

(iii) in block 142 - August 11

(c) PARKSVILLE

1 miles south west of village - August 7

(d) CRAIG

by the municipal gravel pit - August 6

(e) NANOOSE BAY

on the north side of the bay - August 6

(f) REDGAP

in block 350 - August 12

(g) LANTZVILLE

in block 183 - August 10

The above sample points are all accessible by road.

The timber type is predominantly Douglas fir throughout, mixed with cedar and hemlock and in places a few white pine, grand fir, and lodgepole pine. The lower levels and logged over areas have a liberal sprinkling of broad leaf trees.

Summary

Number of samples taken in this district 42

Approximate number of insects enclosed 744

Chrysomelidae (leaf beetles)

The willow trees throughout the district were infested with Galerucella carbo. The alder trees at (b) (i), Englishman's River Falls Park, were infested with Altica bimarginata

Permanent sample points established in this district

(b) (i) Englishman's River Falls Park

(c) Parksville

B. PERSONNEL CONTACTED

Mr. J. Mottishaw, chief forester, Bloedel, Stewart & Welch Co., Port Alberni.

Mr. Chas. Dunham, engineer, Bloedel, Stewart & Welch Co., Port Alberni.

Mr. Jack Bell, foreman, Bloedel, Stewart & Welch Co., Camp B, Coleman Creek

Mr. Banks, superintendent, Bloedel, Stewart & Welch Co., Sarita River Camp

Mr. J. C. Shaesgreen, superintendent, Comox Logging & Railway Co., Ladysmith

Mr. Mulholland, chief forester, Comox Logging & Railway Co., Ladysmith

Mr. J. Cliffe, foreman, Comox Logging & Railway Co., Ladysmith

Mr. Dewar, superintendent, Northwest Bay Logging Co. Parksville

Mr. G. Percy Jr., superintendent, C. P. S. Logging Co. Jordan River

Mr. Ferguson, superintendent, Malahat Logging Co., Port Renfrew

Most of the above men were very co-operative, providing both accommodation and transportation where needed. The one exception was Mr. G. Percy Jr. of the C. P. S. Logging Co. at Jordan River, whose attitude was very cool and unco-operative causing this ranger considerable inconvenience and loss of time.

LOWER VANCOUVER ISLAND

SCALE - 8 MILES TO 1 INCH

1948 FOREST INSECT SURVEY 1948

LEGEND

- LAND GRANT BOUNDARIES
- INTERNATIONAL BOUNDARIES
- SURVEY DISTRICT BOUNDARIES
- (0) SURVEY DISTRICTS
- CITIES
- SAMPLE POINTS
- OAK LOOPER INFESTATION
- ALDER SAWFLY INFESTATION
- BARK BEETLE INFESTATION

BY - E. G. HARVEY

PACIFIC OCEAN

JUAN DE FUCA STRAIT

GEORGIA STRAIT

CANADA
UNITED STATES

ALBERNI CANAL

ALBERNI
PORT ALBERNI
CAMERON L.
CAMERON R.
FRANKLIN CR.
COLEMAN CR.
FRANCISA L.
TUCK L.
LITTLE NITINAT R.
NITINAT
SARITA
SARITA L.
SARITA R.
POETT NOOK
PACHENA R.
KLANAWA R.
NITINAT L.
CAYCUSE
CAYCUSE R.
GORDON R.
HARRIS CR.
LENS CR.
ROBERTSON R.
PORT RENFREW
SAN JUAN R.
JORDAN R.
RESERVOIR
RIVER JORDAN
SOOKE
SOOKE R.
LEECH R.
SOOKE L.
PARKSVILLE
ENGLISHMAN R.
NANOOSE BAY
NANAIMO
4 TH.
NANAIMO LAKES
JUMP CR.
RESERVOIR
NANAIMO R.
LADYSMITH
THETIS I.
KUPER I.
CHEMAINUS
COWICHAN LAKE
YOUBOU
CHEMAINUS R.
LAKE COWICHAN
COWICHAN RIVER
DUNCAN
KOKSILAH R.
SHAWNIGAN L.
GABRIOLA I.
VALDES I.
GALIANO I.
MAYNE I.
GANGES
SALT SPRING I.
N. PENDER I.
SATURNA
S. PENDER I.
SIDNEY
VICTORIA
VANCOUVER

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (I)

124° 30′ 124° 00′ 123° 30′ 123° 00′
49° 00′ 48° 30′ 125° 00′

I. UPPER VANCOUVER ISLAND (D. Collis)

A. INTRODUCTION

This is a report of the work carried out in the Upper Island district of Vancouver Island from May 14 to September 5, 1948.

The district extends south from Kelsey Bay on the east coast to Parksville, including the adjacent islands. From there west along the west along the Parksville - Port Alberni Highway to Alberni, then down the Alberni Inlet and north to Tofino on the west coast of Vancouver Island.

Few public roads serve the area, therefore the success of the survey depended to a large extent upon the co-operation received from the logging operators, which was in all cases excellent.

The small dinghy and outboard motor acquired this season were invaluable in gaining coverage on the many lakes and inside waters.

A total of 556 collections was made in this district, all by the standard method, using the 7' x 9' beating sheet unless otherwise noted.

B. AREAS SURVEYED.

For the convenience of this report the upper island

district has been divided into seven areas as follows:

1. Kelsey Bay to Campbell River
2. Campbell River to Courtenay
3. Courtenay to Parksville
4. Alberni District
5. Great Central and Sproat Lakes
6. West Coast Area
7. Buttle Lake

1. KELSEY BAY TO CAMPBELL RIVER

(a) BOUNDARIES:

Northern and Eastern - - - - - - - coast line

Western - - - - - - - - - - - - 126 w. long.

Southern - - - - - - - - - - - - 50 n. lat.

(b) DESCRIPTION:

The area is broken by two mountain ranges, one along the coast from Salmon River south to Menzies Bay. The other, an extensive range in the interior of the island going as high as 7,000 feet. Between these ranges in the northern sector lies the Salmon River drainage system. This valley was once heavily timbered but has been almost completely logged off and is now being reforested by the companies and the British Columbia Forest Service. The same conditions exist in the flat south-eastern portions of the area around Campbell

River. However, large stands of mature timber remain on the higher ground in the western sector of the area.

(c) ROADS

The public road runs from Campbell River north to Kelsey Bay. It is rough and narrow, partially old logging roads with poor makeshift road between.

The Rock Bay Logging company road to Rock Bay is ten miles long and is another old logging railroad bed, consequently narrow with many trestles.

Bloedel Stewart and Welch Camp 5 on Brewster Lake is reached by a fair road from Campbell River. It is about 25 miles long.

While several other old logging roads exist they only give access to the country that has been logged and burnt. These areas of regeneration and reforestation are not as yet sufficiently mature for sampling.

(d) TIMBER TYPES:

Douglas fir is the predominant type in regeneration and the remaining mature valley timber. Other types include hemlock, white pine, cedar, alder and willow. On the higher ground hemlock and balsam are the predominant timber types.

(e) INSECT CONDITIONS:

Hemichroa crocea Fourc. (striped alder sawfly)

This insect was first reported in the Bute Inlet area

by Mr. L. Chamberlain of the British Columbia Forest Service. The second generation appeared on Vancouver Island in large numbers completely defoliating a patch of alder five miles north of Campbell River.

Throughout the area of attack, as shown on the map the defoliation varied from 10 to 100%. Much of this alder is the tall merchantable type useful in the furniture industry. Some has been utilized for this purpose.

Galerucella carbo Lec. (willow leaf beetle)

The attack of the willow leaf beetle was general throughout the upper island district of Vancouver Island along the coastal and low lying regions. Defoliation was heaviest in the Campbell River area.

Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)

Host - spruce. Location - north end of Gowlland Island
No. collected 1.

Nepytia phantasmaria Wlk. (false hemlock looper)

Host - balsam. Location - north end Gowlland Island
No. collected 1.

Host - balsam. Location - block 146 - shore of Brewster Lake. No. collected 1.

(f) SUMMARY

From the 40 sample points listed in area number one

seventy-eight random collections were made, plus 14 at the permanent points.

2. CAMPBELL RIVER TO COURTENAY.

(a) BOUNDARIES:

Northern	- - - - - - - - - - - -	50 north lat.
Eastern	- - - - - - - - - - - -	coastline.
Southern	- - - - - - - - - - - -	a line east and west through Courtenay
Western	- - - - - - - - - - - -	E. & N. Land Grant boundary.

(b) DESCRIPTION

The topography of this area is typical of much of the east coast of Vancouver Island. A reasonably level area 6 to 8 miles wide runs along the coast, from which the ground rises in steps to as high as 4,000 feet. This coastal plain and the lower hills have been completely logged off and other than a few small farms support regeneration, both natural and planted.

Logging operations now take place in the higher country and the locomotive has given way to large trucks.

(c) ROADS

This area is served by the Island Highway which runs along the coast through an area of small fruit and dairy farms.

A second public road runs from the village of Campbell River

to upper Campbell Lake, a distance of 18 miles over rough winding road.

Practically all other coverage was gained by company roads.

(d) TIMBER TYPES

The lower areas support a cover of Douglas fir, hemlock, white pine, lodgepole pine, cedar, alder and willow regeneration.

The remaining mature timber includes hemlock, balsam, Douglas fir, and cedar.

(e) INSECT CONDITIONS

Neodiprion tsugae Midd. (hemlock sawfly)

Larvae of this insect were found at the following positions:

HOST	LOCATION	No. collected
hemlock	1/2 mile east of Anderson Lake on trail	123
balsam	Anderson Lake	26
balsam	baseline at Plateau trail	2
hemlock	Anderson Lake trail at plateau trail	45
hemlock	3/4 mile west of Regan Lake	15
hemlock	1 3/4 miles west of Regan Lake	7

Lambdina fiscellaria lugubrosa Hlst.

balsam	junction of Forbidden Plateau road and power line	1.

Neoytia phantasmaria Wlk. (false hemlock looper)

HOST	LOCATION	No. collected
hemlock	1/2 mile east of Anderson	1

Halisidota argentata Pack. (silver spotted tiger moth)

hemlock	Elk Falls Park	2
hemlock	Island Highway - 1 mile south of Iron River	1
hemlock	Point Holmes Road	1

(f) SUMMARY

At the 41 sample points shown in area number 2, 65 random collections were made, plus 6 at the permanent sample points.

(g) see picture number three

3. COURTENAY TO PARKSVILLE

(a) BOUNDARIES

Northern - - - - - a line west through Courtenay

Eastern - - - - - coast line including Denman and Hornby Islands.

Western - - - - - a line from Comox Lake to Cameron Lake.

Southern - - - - - Parksville - Alberni Highway.

(b) DESCRIPTION

A narrow plain 4 to 6 miles wide runs along the coast from which the terrain rises gradually and becomes the Beaufort Range.

Most of the low lying, easily accessible country was logged 15 to 30 years ago and is now covered with a good stand of predominantly Douglas fir regeneration.

The logging throughout this area is done by trucks going as high as 3,000 feet in one instance.

(c) ROADS

The area is served by the Island Highway on the east coast and the Alberni Highway on the south. In the northern sector roads lead to Cumberland and Comox Lake. Another public road leads to Horne Lake.

A car ferry leaves from Buckley Bay for Denman Island where 25 miles of road gives access to the island.

Hornby Island is reached by dinghy from Graveley Bay on the east coast of Denman Island.

(d) TIMBER TYPES

(i) regeneration - Douglas fir, hemlock, cedar, white pine, balsam, lodgepole pine, alder and willow.

(ii) mature - Douglas fir, hemlock cedar and balsam.

(e) INSECT CONDITIONS

Other than that caused to the willow by the willow leaf beetle, no insect damage was found. Some notable insects were however, collected.

Halisidota argentata Pack (silver spotted tiger moth)

HOST	LOCATION	No. collected
Douglas fir	Church Road - Parksville	1
Douglas fir	junction of Langley Lake and power line	2
lodgepole pine	Little Qualicum Falls Park	4
	Van West Logging Company road	1
Douglas fir	two miles south of Courtenay	1

Eupithecia placidata Tayl. (green cedar looper)

HOST	LOCATION	No. collected
hemlock	Church Road - Parksville	2
cedar	junction Deep Bay Road and Island Highway	4
cedar	Little Qualicum Falls Park	9
cedar	Denman Island	2
cedar	Little Qualicum River	4

Neodiprion tsugae Midd. (hemlock sawfly)

hemlock	north side of Horne Lake	1

(f) SUMMARY

At the 35 sample points in area number 3, 108 collections were made, plus 33 at the permanent points.

(g) see picture number 4.

4. ALBERNI AREA

(a) BOUNDARIES

northern	49 degrees 30 min. north latitude
eastern.....	summit of Beaufort Range.
southern and western..	north side Great Central Lake south to Alberni.

(b) DESCRIPTION

This portion of Vancouver Island is largely a wide flat valley, rising smoothly in the east up the Beaufort Range and to the south-west along the more rocky country of Great Central Lake.

The southern portion of this valley is almost completely logged off and supports a very close stand of Douglas fir regeneration. Unfortunately much of it has been felled to make way for houses and small farms.

(c) ROADS

This district is served by two roads. The first runs from Alberni to A. P. L. Camp number 1, eleven miles north. The second from Alberni to Sproat and Great Central Lakes.

(d) TIMBER TYPES

Douglas fir is the predominant species throughout this area, both in regeneration and mature timber. However, as elsewhere, where the percentage of hemlock and balsam increases with altitude. Other types include cedar, white pine, spruce, lodgepole pine and several broad leaf trees.

(e) INSECT CONDITIONS

Lambdina fiscellaria lugubrosa Hlst. (western hemlock looper)

HOST	LOCATION	No. collected
hemlock	2 miles south of Great Central Lake	2
Neodiprion tsugae Midd. (hemlock sawfly)		
hemlock	south end Nimnim Lake	4
hemlock	west side Nimnim Lake	2
Nepytia phantasmaria Stkr. (false hemlock looper)		
hemlock	1/2 mile north of Sproat Lake	2
Douglas fir	1/2 mile north of Sproat Lake	1
hemlock	stamp River Bridge	7
Douglas fir	2 miles south of Great Central Lake	7
Douglas fir	Stamp River Bridge	2
Douglas fir	Stamp Falls Park	1
Melanolophia imitata Wlk. (green striped looper)		
hemlock	1/2 mile north of Sproat Lake	2
Douglas fir	1/2 mile north of Sproat Lake	2
hemlock	2 miles south of Great Central Lake	5
Douglas fir	2 miles south of Great Central Lake	1
cedar	Stamp Falls Park	2
Douglas fir	Stamp Falls Park	2
hemlock	1/2 mile north of A. P. L. Camp No. 1	3
Douglas fir	2 miles north of A. P. L. Camp No. 1	1

Altica ambiens Lec. (alder flea beetle)

This insect occurred regularly on alder throughout this area.

(g) SUMMARY

At the 14 sample points in area 4, 28 collections were made plus 4 from permanent points.

5. SPROAT AND GREAT CENTRAL LAKE AREAS

(a) BOUNDARIES

This area includes that land which surrounds Sproat and Great Central Lakes, plus the drainage systems of the Taylor and Drinkwater Rivers.

(b) DESCRIPTION

These lakes are very similar, lying parallel, with steep side hills running up from their shorelines.

The majority of this territory has been or is being logged by the "A" frame method, locomotives or trucks being used in the few existing valleys.

(c) ROADS

With no public and only one company road serving this area the dinghy and outboard motor were used extensively.

(d) TIMBER TYPES

The predominant timber type in this area is Douglas fir. Other types include hemlock, balsam, cedar, alder, maple, willow and dogwood.

(e) INSECT CONDITIONS

Neodiprion sp.

This insect was found in infestation in a jack pine stand 5 to 6 acres in extent at the west end of Great Central Lake. Some of the trees were defoliated from 50 to 90 per cent of the old foliage and up to 40 per cent of the 1948 growth.

At a point two miles from the west end of the lake these larva were found on a young Douglas fir. It was noted that the larva preferred the upper surface of the fir needle, leaving a skeleton needle.

All collections of this insect were hand picked with the exception of the white pine collection.

HOST	LOCATION	No. collected
jack pine	shore line - block 73 Great Central Lake	185
jack pine	shore line - block 73 Great Central Lake	98
white pine	shore line - block 73 Great Central Lake	7
Douglas fir	T. L. 628P - north side Great Central Lake	25
Melanolophia imitata Wlk		
hemlock	2 miles from east end Great Central Lake south shore	1
Douglas fir	4 miles from east end Sproat Lake south shore	3

Neodiprion tsugae Midd. (hemlock sawfly)

HOST	LOCATION	No. collected
hemlock	west end Great Central Lake	5
hemlock	7 miles from west end Great Central Lake	2
Nenytia phantasmaria Stkr. (false hemlock looper)		
cedar	east side Sterling Arm Sproat Lake	4
Eupithecia placidata (green cedar looper)		
cedar	1 mile from west end Great Central Lake	1
cedar	2 miles from west end Great Central Lake	1
Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)		
Douglas fir	2 miles from west end Sproat Lake north side	1

(f) SUMMARY

At the 25 random sample points 58 collections were made with 5 at the permanent points. All of these positions were reached by the dinghy or on foot.

(g) see pictures numbered 5, 6, 7 and 8.

6. WEST COAST AREA

(a) BOUNDARIES

east, south and western - the coast line from Port Alberni, south down the Alberni Inlet, around the west coast

and north to the head of Tofino Inlet.

Northern - a line from Tofino Inlet east to Port Alberni.

(b) DESCRIPTION

Along the coast is a rough rocky area of rolling hills almost completely uninhabited. In the interior the mountains rise to over 4,000 feet. No logging has been attempted here as yet.

All sample points were reached by foot or dinghy. The survey of Kennedy Lake was only made possible with the excellent co-operation received from the Kennedy Lake Logging Co.

(c) ROADS

Only one road exists running from Ucluelet to Tofino.

(d) TIMBER TYPES

The dominant species in this area is hemlock, much of which is very scrubby, especially along the coast. Here a ground cover of salal exists which is so thick it is impassable in spots.

Other types include red cedar, balsam, jack pine, and alder. Some Douglas fir is found in the interior.

(e) INSECT CONDITIONS

Neodiprion tsugae Midd. (hemlock sawfly)

HOST	LOCATION	No. collected
hemlock	6 miles north of Ucluelet	11
hemlock	5 miles north of Ucluelet	47
hemlock	cemetery - Ucluelet Road	45
hemlock	1/2 mile north of cemetery	45

NOTE: These larvae were found on the east side of the road only collections made on the west side were practically negative.

Lambdina fiscellaria lugubrosa Hlst. (hemlock looper)

hemlock	Nahmint Bay	1
spruce	block 614 west side Kennedy Lake	1

Melanolophia imitata Wlk.

hemlock	end of Air Force Road Kennedy Lake	2
hemlock	Nahmint Bay	1
hemlock	14½ mile mark Kennedy Lake trail	1

Eupithecia placidata (green cedar looper)

cedar	10 miles from Sproat Lake Kenneday trail	1
cedar	13 mile cabin Kennedy trail	1

(f) SUMMARY

At the 34 random sample points in area number 5, 58 collections were made plus 9 from the permanent points.

(g) see pictures number 9 and 10.

7. BUTTLE LAKE

(a) BOUNDARIES

That area which surrounds the lake.

(b) DESCRIPTION

This long narrow lake lies in the heart of Vancouver Island. It is practically surrounded by mountains rising to five and six thousand feet.

Small areas of reasonably level land exist around the many creek and river mouths, and also a good sized valley at each end of the lake, the northern one having been logged.

All but the northern tip of the lake lies in Strathcona Park and is therefore undeveloped commercially, access being gained by foot or air.

The survey was only made possible by Mr. C. S. Gonnason who loaned the department a large dinghy from his lodge on the lake.

(c) ROADS

No roads exist at or near the lake.

(d) TIMBER TYPES

Douglas fir predominates the stand, other types including

hemlock, balsam, red cedar, yellow cedar, alder and willow. A few alpine fir were found, a species which was unknown on Vancouver Island until this discovery.

(e) INSECT CONDITIONS

Neodiprion tsugae (Midd.) (hemlock sawfly)

HOST	LOCATION	No. collected
hemlock	north end Buttle Lake	1
hemlock	6 miles from south end Buttle Lake	1
Neodiprion sp.		
hemlock	2 miles from north end Buttle Lake east side	3
Douglas fir	south end Buttle Lake	1
Douglas fir	Phillips creek west side Buttle Lake	1
Douglas fir	2 miles south Marble Creek west side Buttle Lake	1
Jack pine	north end Buttle Lake	2
Melanolophia imitata (Wlk.) (green striped looper)		
Douglas fir	south end Buttle Lake	1
Douglas fir	2 miles from north end Buttle Lake west side	4
Nepytia phantasmaria (Wlk.) (false hemlock looper)		
Dogwood	north end Buttle Lake	1

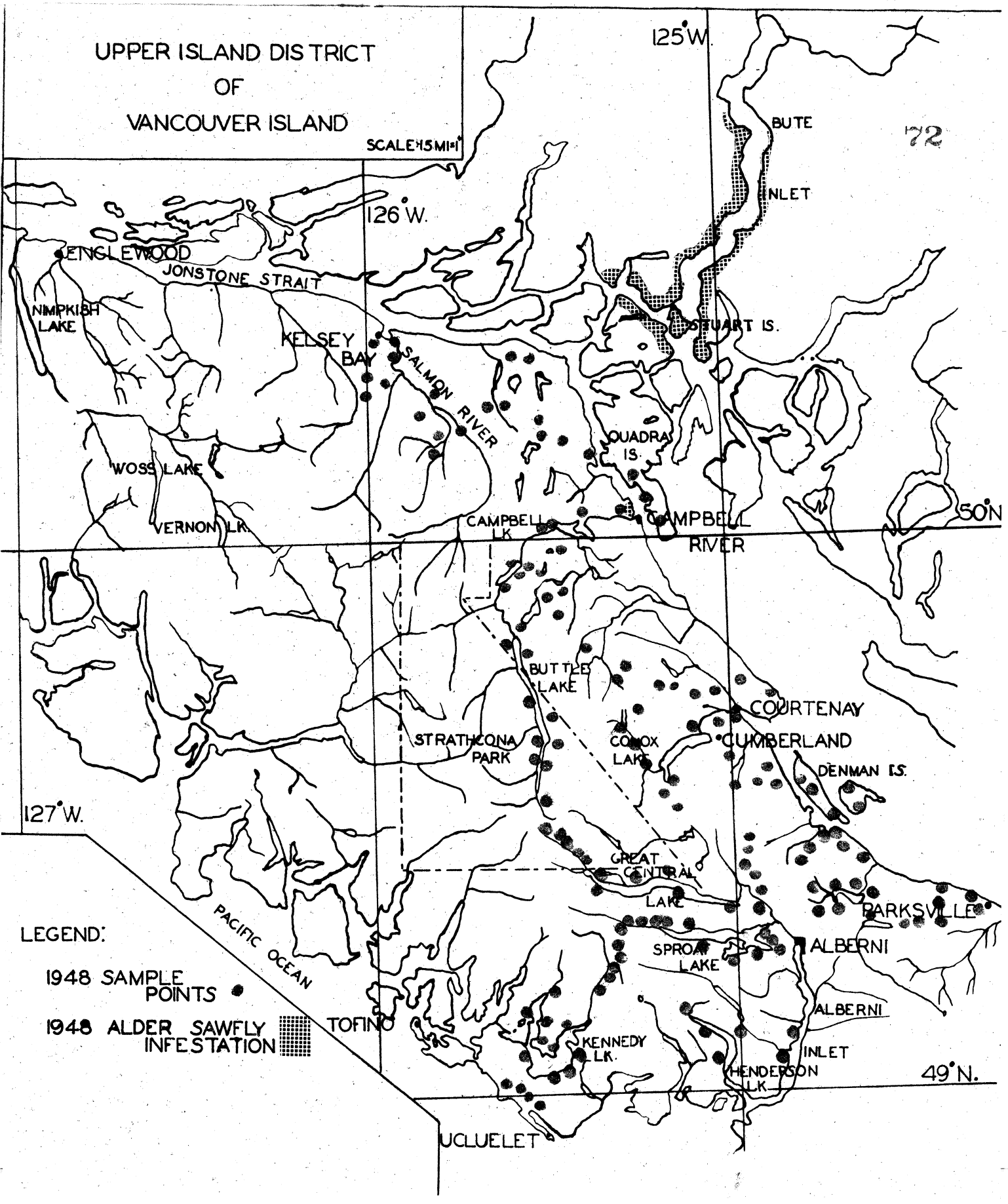
Eupithecia placidata (green cedar looper)

HOST	LOCATION	No. collected
cedar	mouth Wolf River Buttle Lake	2

(f) SUMMARY

At the 14 random sample points listed 45 collections were made, 10 more were taken at the permanent points.

(g) see picture number 11.


UPPER ISLAND DISTRICT
OF
VANCOUVER ISLAND
SCALE 15 MI = 1"
125°W.
126°W.
127°W.
50°N
49°N.
72
BUTE
INLET
ENGLEWOOD
JONSTONE STRAIT
NIMPKISH LAKE
KELSEY BAY
SALMON RIVER
STUART IS.
QUADRA IS.
WOSS LAKE
VERNON LK.
CAMPBELL LK.
CAMPBELL RIVER
BUTTLE LAKE
COURTENAY
CUMBERLAND
STRATHCONA PARK
COMOX LAKE
DENMAN I.S.
GREAT CENTRAL LAKE
PARKSVILLE
ALBERNI
SPROAT LAKE
ALBERNI INLET
PACIFIC OCEAN
TOFINO
KENNEDY LK.
HENDERSON LK.
UCLUELET
LEGEND:
1948 SAMPLE POINTS
1948 ALDER SAWFLY INFESTATION

Little Qualicum Falls Park
June 14, 1948

Timber Type

West End Great Central Lake
June 23, 1948

Della Falls

West End Sproat Lake
July 3, 1948.

Mature Douglas fir and cedar.

West End Great Central Lake
June 25, 1948.

Sawfly larvae defoliation on lodgepole pine

Kennedy Lake

View at 8½ mile cabin on Kennedy Lake trail.

Kennedy Lake
July 29, 1948.

Salal and huckleberry ground cover.

Buttle Lake
July 25, 1948.

Topography -Wolf River

LOWER MAINLAND - 1948.

I. INTRODUCTION.

This is a report of Forest Insect Investigations carried out over the period from May 18, 1948 to October 1, 1948. The area dealt with lies within the following boundaries, Sechelt Inlet to Hope, B. C. and from the mountain ranges approximately 25 miles north of Vancouver to the Canadian - U. S. border.

This area of the B. C. Coast Survey was covered for the most part by W. Taylor, but valuable aid and instructions were received from R. L. Fiddick and M. T. Hughes in areas which were deemed to be "two-man" trips. Certain of these, both for safety and efficiency reasons, were held in reserve till an extra man became available.

One of the chief factors which enabled this year's survey party to proceed more easily was the detail and completeness of the annual report tendered by M. T. Hughes on last year's survey of the same area.

A major difficulty, arising during the months of June and July, was the flood which occurred in the Fraser Valley. Though a certain part of the area to be surveyed was inundated, the major trouble was in the amount of "doubling back" required to complete these areas as the water receded and also other areas to which

there was no access because of floods.

Collections during the first part of the season were moderate in quantity with only the presence of Galerucella cerbo on willows as an outstanding condition but towards the middle of the summer the average temperature and weather conditions became so poor that in July insect quantity dropped off greatly.

Having passed the months of July and August, weather and climate improved considerably and so, in consequence, did the collections, till toward the end of September and the first of October collections of late season larvae were very good. The conclusion might be drawn from the above, that the whole insect cycle was delayed or "pushed back" some weeks by the abnormal spring and summer.

II. AREAS SURVEYED.

In order to add to, rather than completely rebuild the survey knowledge acquired by M. T. Hughes in the 1947 survey, the areas designated by him were followed closely again in 1948. They were as follows, and this was the chronological order; Fraser south, Chilliwack area, Burrard Inlet, Pitt River, North Vancouver (Greater Vancouver Watershed) Hope area, Indian River, Chehalis River, Howe Sound, Harrison Lake. As mentioned previously, strict adherence to this order was impossible due to flood and "two man" trips but the list given will give a reasonably accurate record.

A. Fraser's South.

A. Fraser South.

Description:- This area designated as Fraser south is bounded along its north boundary by the south bank of the Fraser River, on the south by the International (U. S. A. - Canada) boundary line, on the west by the straits of Georgia and on the east by a line running from the Fraser River just east of Sumas mountain to the border, west of Vedder mountain.

The general topography of this part of the Fraser valley is rolling, "rich-soiled" farming land, fairly flat and of no great elevation but east of New Westminster rises to an elevation of about 200 feet and forms a bench which stretches for the next 25 miles at much the same altitude. East of Abbotsford the terrain slopes down to the river level again and continues on a level plain to Sumas and Rosedale mountain. The timber types found are as follows, hemlock, cedar, Douglas fir, lodgepole pine, alder, and willow.

These areas occur in shelter belts, woodlots and decoration trees along the boundaries of farms and auto court areas. A few "wild" woods are still in evidence but these are being eliminated steadily by town expansion. No logging for commercial purposes is carried on.

B. Chilliwack Area.

Geographical description: Bounded by the following lines. East end of Sumas mountain at Fraser River, along shore to

Cheam View. Cheam View, south and east below Jones Lake then east to the head of Yola Creek, Silver Hope River area thence south to Chilliwack Lake and the border but including Paleface and adjacent mountains. West along International border to west end of Vedder mountain. North from there through Sumas drained area to starting point.

The area includes Cultus and Chilliwack Lakes, the east Fraser and all of the Vedder - Chilliwack River Valleys. Approximately one-third is flat rich farm and orchard land while two-thirds is mountain slopes and rugged ranges.

1. Topographical - Timber.

All timber sites are on mountain slopes which have yielded excellent logs for a great number of years. The climate being primarily wet, the second growth is fairly dense and thriving. Old logged sites are now covered by a dense growth of alder overstory with small regeneration conifers below.

Drainage from Cheam range is mainly Popkum Creek to the north, with many small unnamed creeks on either side. Drainage south from Cheam is into Wahleach Lake and south via Chipmunk and Ford Creeks into the Chilliwack River. Small creeks also run from Elk mountain south into the Chilliwack River.

This river is also fed by the Lihumitson, Tamihi, Anderson, Slesse, Nesakwatch and Centre Creeks, all flowing south from a

rugged range of mountains running along the international border.

Vedder mountain to the south-west has no clearly defined drainage system but growth has been excellent as is indicated by numerous past logging operations.

2. Logging.

Logging is being carried out on Rosedale mountain by B. C. Coast Logging, and on the west end of Vedder mountain and top of Chilliwack mountain by small operators, run in conjunction with sawmills. Neither of the latter operations is on a big scale. On the Chilliwack River a shingle mill operation is in progress on the east slope of Lihumitson Creek while a road is being built up Slesse Creek by another company.

C. Burrard Inlet

The boundaries of this area are as follows; Whytecliffe (Horseshoe Bay) on the west and Deep Cove on the east - a narrow strip reaching only about four miles north from the shoreline but containing a large area of mountain slopes, well watered, and almost completely southern in exposure. It contains three major river deltas and valleys which drain a large part of the Greater Vancouver Watershed and are in order, from the west, the Capilano, Lynn, and Seymour Rivers.

Logging was carried out in the early part of the century over all of the area with the exception of the very high reaches

on the mountain ridges above 3,000 feet, and sturdy second growth remains. Good pole and small saw log stands now exist. Regeneration from these is in most cases very dense. Timber types range from Douglas fir and pine on the more rocky terrain to hemlock, cedar and balsam in the wetter regions. Though several fires have occurred in each of the valleys in the past, fire patroling for a large part of the area now comes under the Greater Vancouver Water Division, and as a result, the fire situation has improved appreciably. This, coupled with the fact that regeneration after a burn is very rapid throughout the area, means that the snow retaining abilities of these slopes are assured. This is the more important function of the timber as compared to logging. Because of small volume, no logging is carried on at the present time, though several saw-mills exist along the shoreline.

D. Pitt River.

The Pitt River has been designated an area for two reasons. Topographically, the east and west mountains form a boundary on either side, hence the land in between became "Pitt River". The second reason is that this is almost strictly a dinghy job and as such must be planned to avoid having to return.

The west boundary consists of a series of 2,000 to 3,000 ft. ridges running from the rolling land north of the Pitt River, north to the higher mountains forty miles north of Port Coquitlam. The

east boundary runs from Stave Falls on the Fraser to the end of Alouette Lake, then northward to the rugged peaks of Garibaldi Park which border the Pitt River. The north boundary is governed by the extent to which one man can safely penetrate the Pitt River Valley.

In general the north portion and Pitt Lake sides are steep and rugged with those around Alouette being more gently sloped, but towards the Fraser River the whole aspect changes to flat lands and farms. Occasional woodlots are all that remain of the original timber.

The lower slopes of the ridges projecting into the valley floor have been logged completely and only regeneration alder stands remain. Abernathy - Lougheed Company thoroughly logged the Alouette Lake, southern portion of Pitt, and Coquitlam lakes. The north end of Alouette Lake is now Maple Ridge Logging Company land, while Pitt Lake contains only small hand logging operations; Bridal Falls being the primary one. However, the lake is used to transport B. C. Forest Products material to their camp at the head, or rather, five miles up the Pitt River. This camp as part of a large concern, is fairly extensive and well run, operations extend eastward up Corbold Creek to the edge of Garibaldi Park. The principal yield here is a good standard of hemlock and balsam with some small percentage of cedar.

E. Indian River.

Though designated as an area Indian River is separate only in that approach requires most of one day and hence must be thoroughly worked while in the area.

Its only access is via a derelict flume on the west side of a fairly large river. This flume is dangerous and great care must be exercised in travel along it. It reaches to about the seven mile mark then turns left up the side of the mountains. Further travel up-river is via the river bank.

The mountains on either side which in some cases come right down to the river's edge average approximately 4,000 feet and are heavily timbered and rugged, where fire has not taken toll.

Of special note is the 1928-30 looper infestation damage. During this period hemlock loopers (Lambdina fiscellaria lugubrosa Hlst.) caused almost 100 per cent defoliation of an area stretching from a point approximately four miles up the river, along both banks, to the 6-mile point. The terrain is now densely covered with regeneration hemlock and balsam in excellent health. The only remaining signs of the old damage are a few weathered snags, and great difficulty is encountered trying to collect even so much as a dozen hemlock loopers in the whole area.

F. North Vancouver.

Greater Vancouver Watershed.

This area has received close attention in the past because of the extreme importance to three quarters of a million people. The area received individual attention because of the obvious danger to snow water and rain "run-off". A serious defoliation or mortality would greatly affect the amount of water retained in the water supply catchments during the summer and the drinking water would suffer appreciably.

The areas are visited, usually, in conjunction with a watershed ranger, a year round employee who is thoroughly acquainted with his portion of the country.

The country is entirely mountain terrain, generally steep sided and can only be traversed via valley bottoms and creek beds. The exception to this is the Capilano River Valley which now has a power line road running through it as far as Phyllis and Furry Creek.

The timber is a good quality of mature and second growth Douglas fir, hemlock, cedar, and balsam with valley bottoms heavily covered in alder and willow. The Capilano Valley is the only one with signs of old logging having been carried out on an extensive scale. Since this time the area has been

closed to the public and a completely natural forest exists over most parts.

The drainage is good, by way of Lock Lomond (Seymour Creek) Palisade Lakes (Capilano River) Burwell Lake (Seymour Creek) and Coquitlam Lake (Coquitlam River), the above mentioned watersheds being the water supply for greater Vancouver.

Coverage has been improved in the Capilano area by the construction road built by Bridge River Power Company but the remaining areas are reached only by boat and trail as yet.

N. B. Before entering watershed areas a pass must be obtained from Mr. Gilbert (Sun Building) Greater Vancouver Water District supervisor. This is obtained by passing a rigid medical test only, then arrangements are made with Mr. W. Angus, watershed superintendent.

G. Hope Area.

The Hope area is almost all steep sided rugged mountain terrain, drained by narrow fast-running creeks. The area designated thus, runs along the north and south side of the Fraser through to Hope and beyond, to Kawkawa Lake. A vast part of this area of country is situated between the Fraser River and the International boundary.

The drainage is accomplished mainly by "Ruby-Garnet" creek on the north Fraser shore and the Silver-Hope, Hunter,

Lorenzettil, and Jones creeks on the south. Of these, the Silver, Hope, and Skagit rivers and Wahleach(Jones) creek are the main systems, the others being fast mountain streams.

The Silver Skagit is a vast valley some 45 miles long, 38 miles of which is above the international boundary. Jones Creek or Wahleach, has its source approximately 12 miles south behind the Cheam range, feeding Jones Lake and then amptying into the Fraser via Jones Creek, a narrow mountain stream. Alaska Pine (Jones Creek Logging) have carried out large scale operations on the east slope of the lake and are planning ahead to go back toward the head waters. All slopes of the creek and valley not already logged are heavily timbered with hemlock, cedar and balsam.

In general all valleys leading south have excellent timber stands and good drainage but road accessibility is a major difficulty. North of the Fraser a very steep and difficult operation is being carried on in the vicinity of Ruby and Garnet creeks. This is primarily a shingle mill operation of Hammond Furniture Company. East of Ruby Creek at the Katz a small operation is going on. These north slopes, though yielding an average stand are nearly all steep side hills.

The Nicolum River Valley east from Hope has no logging company operating for at least 20 miles, the timber remaining

from old logging being dense but of no great size or accessibility.

H. Chehalis River.

The Chehalis River and lake and Statlu Creek valleys combine to form this area which lies roughly parallel to and on the west side of Harrison Lake. The valley is about 2½ miles wide on the average, the south end of which appears to have been thoroughly logged many years ago judgingby the size of the regeneration. This fir, cedar, balsam stand continues to the 4 mile point where a small company is now operating on the west side. Also, intermittently, small salvage companies operate through this particular part.

Further into this valley the land falls under timber lease to Canadian Forest Products who also operate a beach camp and booming ground at the junction of the Chehalis and Harrison rivers. Though the area around the river camp is extensively logged there still remains much timber of excellent quality and quantity in the upper reaches of Statlu Creek and also across on the east slopes of the valley and into Thompson Valley. The yield is typical, being hemlock, Douglas fir, cedar, and balsam fir. Though white pine is in evidence it appears to be susceptible to blister rust and as a result loses much of its economic value.

The slopes bordering the lakeside, though not surveyed as yet, appear to be too steep for economical logging, but the

lakehead may be accessible should the transfer of logs down eight miles of lake be feasible.

I. Howe Sound.

This area is bounded on the west by a line leading from Sechelt north to Salmon Arm; north by a line from Salmon Arm across to Squamish and taking in the Mill Creek watershed. From there south-west including Bowen Island and the coast, west to Sechelt. Sechelt Inlet, Salmon Arm, the Clowholm lakes are not included in this area.

The west side area, including the following major creeks, Chapman, Roberts, Gibson, Dakota, Rainy, McNab, Cedar and Mill creeks for drainage, starts a gentle slope from tide water and rises gradually, at a 10 per cent slope to an average height of 3,000 feet. The eastern slopes are the site of many old logging operations but regeneration appears to be coming in strongly. Further north along the west side of Howe Sound only two logging operations are in progress, at McNab Creek (B. C. Forest Products) and on the north side of Rainy River (Franco Canadian). The remainder, north of Port Mellon is untouched and is a pulp wood reserve for Port Mellon (Sorg Paper Company, U. S. A.) and Woodfibre (B. C. Pulp & Paper).

On the east side of Howe Sound one company is logging at Furry Creek. This area was not surveyed this year due to lack of time but an area behind Britannia Beach and townsite, identical with

regard to timber type and topography, was included in the watershed coverage of Loch Lomond area.

J. Harrison Lake.

This is the largest single area covered on the mainland, but coverage is not yet thorough enough because of the great size and difficulty of reaching various points quickly. The major obstacle is that of lake travel by dinghy. This is a dangerous passage except during the month of August, unless the strict rule of staying off the lake between 1.00 P. M. and 6.00 P. M. is adhered to. Even this rule is not constant but every precaution should be taken during dinghy trips.

The area contains the watersheds of the following rivers and creeks, Fire and Sloquet at the north end, Big Silver, Hornet and Bear creeks on the east side and Trout Creek at the south end. On the west side, Twenty-mile Creek is the only accessible area, with the exception of a small area near Doctor point, which was railway logged many years ago. The islands in the middle are of no importance from standpoint of the survey.

At the north end of the lake, the Lillooet River empties a large volume of water into Harrison Lake, draining a vast rugged mountainous country to the north, and accessible only by river boat.

III. SPECIES CAUSING INJURY AT THE PRESENT TIME.

(a) Willow Leaf Beetle (Galerucella carbo).

This beetle occurred in all areas of the lower mainland with the exception of one. In the defoliated areas, damage as high as 95 per cent occurred and the average was 60 per cent - 70 per cent but on the west side of the Capilano Valley practically no defoliation was noted.

(b) Spotted Fall Web-worm (Hyphantria textor).

Webs and defoliation by this caterpillar caused mild defoliation (approximately 20 - 30 per cent) on alder, and occasionally on birch and wild cherry, throughout the Fraser Valley. Little defoliation was observed as altitude and mountainous terrain increased.

IV. SPECIES POTENTIALLY DANGEROUS OR KNOWN TO HAVE CAUSED DEFOLIATION

(a) Caripeta sp. (?Divisata)

This geometrid, though occurring in moderate numbers (average approximately 3 to a beating) was one of the most constant species of the whole area. Beginning about the last week in July specimens were plentiful and general, up to the middle of September, and could be found on Western hemlock, Douglas fir, cedar, spruce and grand fir. The larger numbers of these collections were obtained in the eastern areas of Harrison Lake and Hunter Creek.

Specimens were collected from Twenty-mile Creek (Harrison

Lake), Lillooet River, Echo Island (Harrison), Gibson's Landing, Grouse Mountain, Surrey, Suicide Creek, Chehalis Lake, Hope-Princeton Highway, Vedder Mountain, Alouette Lake, Cultus Lake, Chilliwack Lake, Pitt River, McNab Creek, east side Howe Sound, Sloquet Creek and other points.

(b) Semiothisa sp. - Specimens of this insect though not causing visible damage occur regularly in nearly all parts. Collections were made at the following points in small numbers. Twenty-mile Creek (Harrison area), Lillooet River, Echo Island, Gibson's Lending, Grouse Mountain, Green Timbers, Suicide Creek, Chehalis Lake, Hope area, Vedder Mountain, Alouette Lake, Cultus Lake, Chilliwack Lake, Pitt River, McNab Creek, east side Howe Sound.

(c) Melanolophia imitata (Wlk.) - Collections of these geometrids were taken on Vedder Mountain, Alouette Lake, Hope, Silver Lake (Skagit) Garnet Creek, Stave Falls, Steelhead, Lynn Creek, Coquitlam Park, Coquitlam Lake.

(d) Nepytia phantasmaria (Stkr.) Collections in very moderate numbers at Sloquet Creek, Vedder Mountain, Maple Ridge, Cultus Lake, Stave Falls, Lynn Creek, Coquitlam, Coquitlam Lake.

(e) Eupithetia Tayl. - Specimens collected in moderation at Suicide Creek, Chehalis Lake, Hope, Langley area, Coquitlam Lake.

(f) Oak Looper, (Lambdina somniaria Hlst.) No specimens of this insect collected.

(g) Choristoneura fumiferana (Clem.) - No larvae collected.

(h) Hemlock Looper (Lambdina fiscellaria lugubrosa (Hlst.))

This destroying insect is becoming rare following the last serious outbreaks in 1944-45-46. Specimens were collected in small numbers from Vedder Mountain, Dog Mountain, Skagit, Silver Lake, Garnet Creek, Stave Falls, Stanley Park, Indian River, Coquitlam, Coquitlam Lake, Indian Lake, Seymour Mountain, Seymour Creek, Pitt River, Palisade lakes trail. No visible defoliation was noted and in old defoliations larvae were very rare.

(i) Hemichroa crocea (Fourc.) - Larvae of this potential defoliator were collected in only one spot, Alouette Lake. Careful sampling in future is advisable.

(j) Neodiprion sp. Larvae of these sawflies were fairly numerous and were gathered from Chilliwack Mountain, Sloquet Creek, Hope, Dog Mountain, Jones Lake, Garnet Creek, Steelhead, Lynn Creek, Alouette Lake, Coquitlam, Coquitlam Mountain, Seymour Creek. Dog Mountain with some 80 - 100 larvae per collection should be surveyed closely.

(k) Malacosoma sp. No larvae collected.

(l) Blackheaded budworm (Acleris variana Fern.) No larvae of this serious potential defoliator were collected. Collections from McConnell Creek (an old defoliation area) did not yield any specimens.

(m) Adelgidae - Cone specimens of these gall aphids were collected from spruce in only one area, a woodlot behind Coquitlam. Damage to Sitka spruce in other areas appeared very slight.

(n) Dendroctonous monticolae Hopk. - Specimens of this serious killer were collected in only two places, Skagit River (from a blister rust kill) on white pine, and Jones Lake. The latter were taken from felled and bucked and green standing white pine.

(o) Dendroctonous pseudotsugae Hopk. Adults of this species were collected mainly from Douglas fir, at Cogburn Creek, Garnet Creek, Silver Creek and Rosedale Mountain.

(p) Ambrosia beetles - Though complaints from loggers in many areas such as Stave Lake, Pitt Lake, Vedder Mountain, Harrison Lake and Grouse Mountain about "pinworm" holes were constant, a check of these areas brought relatively few specimens.

W.T. Hughes

INTRODUCTION

The following report deals, generally, with the allotment of time, areas visited and work accomplished during the 3 months biting fly survey conducted along the Alaska Highway under the auspices of the Defence Research Board, Department of National Defence. This survey, conducted through June, July and August, by W.H.H. Mason (in charge), and W.T. Hughes, was principally aimed at acquiring knowledge of the various species of biting flies distributed along the course of the Alaska Highway.

While the majority of the time was spent with this object in view, good general collections were made of all types of insect species and particular attention was paid to the forest insects of the various host trees.

To simplify reporting of activities, collections, areas visited, and to avoid confusion of information, the report is divided generally under these two headings.

I Biting Fly Survey

II Forest Insects

1. Biting Fly Survey

(a) Introduction:

This report on the Biting Fly Survey along the Alaska Highway, is limited to a summary of rearing sites and data regarding photographs of biting fly habitats from which reared material was obtained. Personal suggestions, relative to clothing and equipment are included as are

those for further surveys of a similar nature. Information of scientific significance is omitted, this being contained in the report of Mr. W.R.M. Mason.

The information is grouped under the following headings:

(a) Rearing and collections

(b) Photography

(c) Clothing and equipment

(d) Future surveys

(b) Rearings and Collections:

The initial biting fly rearings and collections for species identification were made at Fort Nelson, B.C., 300 miles up the highway on June 6th. From this point rearings and collections were continued through June, July and August along the Canadian section of the Alaska highway northward to the Yukon-Alaska border at Snag, Y.T.

The northward trip occupied the first six weeks of the survey with the reared material being mainly mosquitoes. During the return trip south along the highway the majority of the rearings were those of black fly pupae.

Survey work was confined to areas immediately adjoining the 1221 miles of highway from Dawson Creek, B.C., to Snag, Y.T., except for collections and rearings made along the Haines Cutoff Highway, and those made along the Carcross Road.

Sixty-three separate rearings were completed from June 6th to Sept. 4th with a varying number of individuals per rearing. Of these 23 were carried out with mosquito larvae and pupae and in one instance

with eggs, while the balance of the rearings were of black fly pupae.

The following table shows locations, date and type of each rearing.

Date		Location	Alaska Highway Mileage	Rearing No.	Type of Rearing	
Arrive	Leave				Mosquito	Black Fly
June 4	June 15	Fort Nelson, B.C.	300	A-1		*
				A-2	*	
				A-3	*	
				A-4	*	
June 16	June 25	Lower Post, B.C. and Watson Lake, Y.T.	620	B-1	*	
				B-2		*
			634	B-3		*
				B-4	*	
				B-5	*	
				B-6	*	
				B-7	*	
				B-8	Mosquitoes	
				B-9		*
				B-10		*
June 26	July 12	Whitehorse, Y.T.	918	C-1	*	
				C-2	*	
				C-3	*	
				C-4	*	
				C-5	*	
				C-6		*
				C-7	*	
				C-8	*	
				C-9	*	
				C-10	*	
				C-11	*	
				C-12	*	(eggs)
				C-13		*
July 12	July 19	Chilkat Pass, B.C.	Mile 75 Haines Cutoff Highway	D-1	*	
				D-2		*
				D-3		*
				D-4	*	
July 20	July 27	Dry Creek, Y.T. and Snag Airport, Y.T.	1184	E-1	*	
July 27	July 28	Kluane Lake, Y.T.	1083	F-1		*

Date Arrive	Date Leave	Location	Alaska Highway Mileage	Bearing No.	Type of Bearing Mosquito	Type of Bearing Black Fly
July 29	Aug. 2	Chilkat Pass, B.C.	Mile 75 Haines Cutoff Highway	G-1		*
Aug. 2	Aug. 3	Haines Junction, Y.T.	1016	H-1		*
				H-2		*
Aug. 4	Aug. 13	Whitehorse, Y.T.	918	J-1	*	
				J-2		*
				J-3		*
				J-4		*
				J-5		*
Aug. 14	Aug. 14	Morley River, Y.T.	777	K-1		*
Aug. 15	Aug. 16	Rancheria, Y.T.	710	K-2		*
				K-3		*
				K-4		*
Aug. 17	Aug. 21	Lower Post, B.C.	620	L-1		*
		and		L-2		*
		Watson Lake, Y.T.	634	L-3		*
				L-4		*
				L-5		*
				L-6		*
				L-7	No-see-um	
				L-8		*
				L-9		*
Aug. 22	Aug. 23	Muncho Lake, B.C.	456	M-1		*
Aug. 23	Aug. 24	Summit Lake, B.C.	392	M-1		*
Aug. 24	Aug. 29	Fort Nelson, B.C.	300	N-1		*
				N-2		*
		(Jackfish Cr.)		N-3		*
		(Martin Cr.)		N-4		*
		(Indian Cr.)	232.5	N-6		*
Aug. 30	Aug. 30	Trutch, B.C.	201			
		(Buckinghorse R.)		O-1		*
		(Mason Cr.)		O-2		*
		(Beatton R.)		O-3		*

Collections of adults and immature stages of biting flies were also made at the various points shown in the table, the former being mounted or layered, the latter preserved in 80% alcohol.

(c) Photography

To give a clearer idea of the wide variation of natural habitats from which rearing material was obtained, photographs were made of these sites. This was done in the majority of cases but adverse lighting or weather conditions at some points made photography impossible.

The following pages show a number of these illustrations identified as to locations and rearing serial numbers.

Watson Lake, Y.T.
Mile 5, Airport Road
Insect Habitats - No-see-um
Rearing serial No. B-8
June, 25th, 1948.

(1) Carex Marsh

Lower Post, B.C.
Mile 620, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. B-1
June, 25th, 1948.

(2) Shallow pool on old roadway.

Lower Post, B.C.
Mile 620, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. B-1
June, 25th, 1948.

(3) Showing Pool, showing rearing cages.

Lower Post, B.C.
Mile 620, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. - B-4
June, 25th, 1948.

(4) Old dimused well.

Whitehorse, Y.T.
Mile 920, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-1
June 30th, 1948.

(5) Marsh at the margin of a small lake.

Whitehorse, Y.T.
Mile 920, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-2
June 30th, 1948.

(6) Small pool in marsh (Hand indicative of size)

Whitehorse, Y.T.
Mile 920, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-3
July 5th, 1948.

(7) Small grass shaded pool in marsh area
(Not indicative of size)

Whitehorse, Y.T.
Mile 920, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-4
July 5th, 1948.

(8) Large Log covered pool
(old Corduroy Road)

Whitehorse, Y.T.
Mile 920, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-5
July 5th, 1948.

(9) Small Clear Lake

Whitehorse, Y.T.
Mile 924, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-7
July 5th, 1948.

(10) Grass shaded pool in large marshy area.

Whitehorse, Y.T.
Mile 924, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-9
July 5th, 1948.

(11) Grass shaded pool in large marshy area.

Whitehorse, Y.T.
Mile 918, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-11
July 6th, 1948.

(12) Small roadside pool in the large permanent swamp on the south limits of Whitehorse.

Whitehorse, Y.T.
Mile 918, Alaska Highway
Insect Habitat - Mosquito
Rearing Serial No. C-11
July 6th, 1948.

(13) Showing close proximity of Whitehorse dwellings.

Whitehorse, Y.T.

Mile 916, Alaska Highway
(Whitehorse Rapids Park Area)

Insect Habitat - Mosquito

Rearing Serial No.

August 5th, 1948.

(14) Shaded permanent woodland pool.

Chilkat Pass, B.C.

Mile 75, Haines Cutoff Highway
(Road maintenance camp)

Insect Habitat - Mosquito

Rearing Serial No. B-1

July 17th, 1948.

(15) Compsite surface drainage pool
(above timberline, approx. 3500' elevation)

Watson Lake, Y.T.

Mile 627.5 Alaska Highway

Insect Habitat - Black Fly

Rearing Serial No. B-2

June 25th, 1948.

(16) Small, sedge bounded creek, flowing through highway culvert.

Watson Lake, Y.T.
Watson Lake Airport
Insect Habitat - Black Fly
Rearing Serial No. W-3
June 25th, 1948.

(17) Small creek, gravel and boulder bottom.

Watson Lake, Y.T.
Mile 2.3 Airport Road
Insect Habitat - Black Fly
Rearing Serial No. W-9
June 25th, 1948.

(18) Small sedge, margined, gravel bottom creek.

Watson Lake, Y.T.
Mile 632, Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. W-10
June 23rd, 1948.

(19) Small, rapid flowing creek.

Whitehorse, Y.T.
Mile 914, Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. C-6
July, 8th, 1948.

(20) Small, gravel and sandy bottomed creek, wooded margins.

Whitehorse, Y.T.
Mile 914, Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. C-13
July 8th, 1948.

(21) Small creek shown in Photo No. 21, showing boulder and sedge grown bottom near source.

Whitehorse, Y.T.
Mile 896, Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. J-3
August 13th, 1948.

(22) Lewes River, west bank and bridge.

Whitehorse, Y.T.

Mile 905, Alaska Highway

Insect Habitat - Black Fly

Hearing Serial No. A-5

August 13th, 1948.

(23) Small rapid flowing creek

Chilkat Pass, B.C.,

Mile 66, Haines Cutoff Highway

Insect Habitat - Black Fly

Hearing Serial No. B-2

July 17th, 1948.

(24) Small creek, above timberline, 4100' elevation, showing grass margins holding Black Fly pupae.

Chilkat Pass, B.C.

Mile 66, Haines Cutoff Highway

Insect Habitat - Black Fly

Hearing Serial No. B-3

July 17th, 1948.

(25) Same named small creek as Photo No. 24, showing boulders & rocks holding Black Fly pupae.

Haines Junction, Y.T.

Mile 15, Haines Cutoff Highway

Insect Habitat - Black Fly

Rearing Serial No. H-1

August 2nd, 1948.

(26) Kathleen Creek, bridge piling was heavily infested with pupae and larvae.

Haines Junction, Y.T.

Mile 15, Haines Cutoff Highway

Insect Habitat - Black Fly

Rearing Serial No. H-1

August 2nd, 1945.

(27) Heavily infested board, removed from Kathleen Creek)

Haines Junction, Y.T.

Mile 1019, Alaska Highway

Insect Habitat - Black Fly

Rearing Serial No. H-2

August 3rd, 1948.

(28) Pine Creek, numerous larvae and pupae on stone and sedge.

Carcross, Y.T.
Mile 18.5, Carcross Road
Insect Habitat - Black Fly
Rearing Serial No. J-4
August 10th, 1948.

(29) Small gravel bottomed boulder stream creek.

Pancheria, Y.T.
Mile 721 Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. K-2
August 14th, 1948.

(30) Upper Pancheria River, showing drift & piling heavily infested.

Pancheria, Y.T.
Mile 607, Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. K-4
August 15th, 1948.

(31) Lower Pancheria River, breeding site on submerged roots and branches.

Watson Lake, Y.T.
Mile 642.5 Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. L-8
August 20th, 1948.

(32) Liard River, showing breeding on drift & roots.

Lower Post, B.C.
Mile 618.6 Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. L-1
August 20th, 1948.

(33) Mill Creek, breeding site on roots and gravel bar.

Muncho Lake, B.C.
Mile 496, Alaska Highway
Insect Habitat - Black Fly
Rearing Serial No. M-1
August 23rd, 1948.

(34) Small rocky road side creek.

Summit Lake, B.C.

Mile 392, Alaska Highway

Insect Habitat - Black Fly

Rearing Serial No. N-2

August 24th, 1948.

(35) Small creek draining Summit Lake, breeding site rocks and sedge.

Fort Nelson, B.C.

Mile 300, Alaska Highway

Insect Habitat - Black Fly

Rearing Serial No. N-1

August 25th, 1948.

(36) Syrup Creek, breeding site, root and rocks.

Fort Nelson, B.C.

Mile 278, Alaska Highway

Insect Habitat, Black Fly

Rearing Serial No. N-3

August 28th, 1948.

(37) Jackfish Creek, breeding site rocks in small rapid.

Fort Nelson, B.C.
Mile 242.5, Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. N-4
August 28th, 1948.

(38) Martin Creek, breeding site, sticks, roots and gravel.

Fort Nelson, B.C.
Mile 233, Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. N-6
August 29th, 1948.

(39) Indian Creek, breeding site, rocks and gravel.

Trutch, B.C.
Mile 175 Alaska Highway
Insect Habitat - Black Fly
Bearing Serial No. C-1
August 30th, 1948.

(40) Buckinghorse River, breeding site, boulder and rocks.

Trutch, B.C.
Mile 715, Alaska Highway
Insect Habitat - Black Fly
Hearing Serial No. C-2
August 30th, 1948.

(41) Mason Cr., breeding site, boulder and rocks.

Trutch B.C.,
Mile 147, Alaska Highway
Insect Habitat - Black Fly
Hearing Serial No. C-3
August 30th, 1948.

(42) Beatton River, breading site boulder and rocks.

(d) Clothing and Equipment

To obtain 100% protection from the hoards of biting flies found in this northern area while working outdoors is a relatively impossible task. However, with the use of repellents and clothing supplied by the Dept. of National Defence, adequate protection was obtained whereby the aggravating annoyance of the flies was reduced to a minimum

The issue battledress clothing was easily penetrated by mosquitoes at any point where it was drawn tightly over the body, such as the knees, buttocks, elbows and shoulders. The only actually unpenetrable clothing was the windproof trousers and outer winter parka covering. Issue shirts had no noticeable deterring effect nor did shirts of heavier grade material or flannelette.

Headnets were effective in so far as protecting the face and neck from mosquitoes but were useless against the smaller pest such as black flies and no-see-ums. This fact, coupled with the stuffy discomfort and impairment to vision, made them of little use.

Gloves, other than the heavy leather M.T. driver's type, were of little use as protection.

The use of puttees and gaiters cut the black flies bites on the ankles and lower legs to a minimum.

Both the issued repellent and a number of commercial preparations were used with fairly acceptable results.

The relatively effective period of each application of repellent is shown in the table following.

Repellent	Effectiveness in Hours				Remarks
	Mosquitoes		Black Fly, Tabanids Punkies		
	Weather		Weather		
	Warm	Cool	Warm	Cool	
Issued	½ - ¾	1 - 1½	1 - 2	3 or more	Stings on removal, particularly with warm water.
"6 - 12"	½ - ¾	1 - 1½	1 - 2	3 or more	Less stinging on removal.
"6-22"	¾ - 1	1½ - 2	2	3 or more	No noticeable stinging on removal - more difficult to obtain complete protective coating because of paste form.
"Buzz-Off"	1½ - 1	1 - 1½	2	3 or more	Slight stinging on removal.

Complete protection of the face and hands from snipe flies could not be achieved with repellents though some deterring effect was noted immediately after the application.

Wearing apparel made of material similar in weight and weave as the windproof trousers and parka covering is suggested if a high degree of protection is sought through clothing. In addition to the protective quality of the windproof trousers, working comfort was greater than that of the U.S. battledress particularly on warm days . The pattern, of the battledress, however, is very suitable and recommended.

It is felt, that a person wearing clothing of material and pattern suggested above together with puttees and the use of the issued or an effective commercial repellent applied to the exposed parts of the body, protection would be both practical and to a high degree.

Ankle boots and puttees could be adequately replaced by a boot having a ten inch top without loss of protection from biting fly and at the same time give better support and comfort to the individual particularly in rough arduous terrain.

(e) Future Surveys

The presence of numerous mosquito adults at Fort Nelson, B.C., in early June and at Whitehorse in mid June seems to indicate that hatching and larval stages occur in May in these areas. It would, therefore seem advisable to commence future biting fly surveys for these areas in late April or early May.

Over an area as large as that traversed by the highway better coverage could quite possibly be obtained if two teams of two members each were sent out. One team based at Fort Nelson, B.C., could work north to Lower Post, and Watson Lake, Y.T., and south to Fort St. John and Dawson Creek, B.C. The other, based at Whitehorse, Y.T., could work north to Snag, Y.T., and south to Cancheria, Y.T.

It is felt, however, that if a team of two members were again sent to this area Whitehorse would prove to be the most central and easily accessible base for operation. Complete coverage could be obtained if co-operation were sought with the R.C.A.F. and use of their scheduled freight and supply flights available for transporting personnel from place to place and carrying material from field points to Whitehorse for rearing. W/C Wolkin, Commanding Officer of the R.C.A.F. at Whitehorse when interviewed this season expressed his willingness to co-operate in any way. He was hopeful in the possibility of obtaining

equipment and supplied to carry out spraying against mosquitoes in the immediate Whitehorse area in the spring of 1949, and expressed the desire should this spraying programme be carried out that a member or members of the Department be available for the recording of data.

A central laboratory would eliminate the continued disadvantage experienced this season in the moving and adapting of equipment and rearings to available accommodation along the highway. This would contribute greatly to the work accomplished and standardize method of rearing.

II Forest Insect Survey

INTRODUCTION

The following report summarizes the work accomplished for the Forest Insect Survey along the Alaska Highway during June, July and August of 1943. Contained herein will be a general topographical description of the area visited, timber types, location of collections, host trees and the distribution of insects of known economic importance. Areas where insect pests were in outbreak numbers will be discussed as well as contacts made with individuals who will benefit future survey work. Photographs are included to illustrate the text, being referred to at the point of description. Because of the nature of this report, Rivers, Lakes and settlements are identified with timber type descriptions and collection information rather than in the general topographical outline of the area.

Identification of tree species is based on foliage and fruit characteristics, using keys contained in "Trees and Shrubs of British Columbia" by B.C. Griffith, M.A., M.F., B.C. Dept. of Lands, 1934.

The information outlined above is grouped under the following headings:

(a) Description of area

(b) Timber types and economic importance

(c) Collections, host trees and methods of collection

(d) Insects of known economic importance

(e) Infestations

(f) Important contacts

(g) Photographs

(a) Description of Area

The Canadian section of the Alaska Highway extends from Dawson Creek, B.C., to Snag, Y.T., in a general north-westerly direction for 1221 miles through northern British Columbia and the southern Yukon. In its range from latitude, north 55° 45' and longitude 120° 15' to north 62° 30' and west 141°, the Alaska highway traverses the drainage systems of the Peace, the Upper Liard and the Upper Yukon Rivers. Elevations variations range from 1000' to 4256' as the Highway crosses the Rocky Mountains, Cassiar Mountains and the Coast Mountains, in its north-westerly progress to Alaska.

To simplify recording of data the area will be divided into four sections. The boundaries being formed by the natural land divisions of the yarralleling mountain ranges as follows:

(i) East of the Rocky Mountains

(ii) Rocky Mountains to the Cassiar Mountains
(Rocky Mountain trench)

(iii) Cassiar Mountains to the Coast Mountains

(iv) Coast Mountains to the St. Elias Range and the Alaska Border.

(i) East of the Rocky Mountains

This section is traversed by the first 300 miles of the Alaska Highway and has more acute general topographical changes than are found elsewhere along the course of the Highway. The general topography ranges from the relatively flat, typical prairie land of the west Peace River Block at Dawson Creek, B.C., to more rolling deeply cut

river valley terrain in the vicinity of Fort St. John. This rolling terrain gradually becomes a series of rounded or flat topped hills deeply eroded by river valleys and contains large areas of muskeg and bog (photographs 1, 2, 3, and 4.) West of Fort Nelson a more rough and broken series of plateau like hills occur, that is typical of foothill country (photograph No. 5). As the terminal ranges of the Rocky Mountains are reached this foothill terrain becomes more deeply cut by river valleys and rapidly mountainous with narrow steep sided valleys dominated by barren peaks at Summit Lake, B.C. (photograph No. 6.) From this point to the north-western foothills in the Liard River canyon the topography is rocky and mountainous, traversed by narrow steep sided river valleys and prominent barren ranges.

Both the highest and lowest elevations are encountered in this section of the highway, the former being the 800' elevation at the Muskwa River Crossing near Fort Nelson and the latter an elevation of 4256' at Summit Lake, B.C.

(ii) Rocky Mountains to the Cassiar Mountains

This section, drained by the Upper Liard River and its tributaries extends from the north-western Rocky Mountain foothills and the Liard River canyon to the Cassiar Mountain ranges to the west. It is generally a relatively wide flat mountain trench traversed by series of rolling hills and ridges with shallow river valley bottom and benchland (photograph numbers 7 and 8). In the more level areas small lakes and muskeg are present. While rock outcrops are present in the Kyland and Coal River valleys no high barren areas are encountered

until the highway crosses the northern range of the Cassiar Mountains in the Rancheria and Swift River area in the southern Yukon.

(iii) Cassiar Mountains to the Coast Mountains

This section, extending from the Swift River divide through the southern Yukon to Canyon Creek, is a composite series of rolling plateau-like hills and barren ranges separated by relatively wide valleys formed by the lakes and rivers of the Upper Yukon River drainage system. The barren rounded mountain ranges dominate in the Whitehorse area becoming more mountainous to the west as the coast mountains are crossed in the Champagne Area (photograph numbers 9 and 10).

(iv) Coast Mountains to the St. Elias Mountains and the Alaska Border

The highway follows a series of narrow steep sided mountain valleys framed by the Upper Yukon River tributaries, through most of this high mountain trench. The topography of this trench is predominately mountainous, rocky and barren with the exception of the rolling typical prairie land occurring to the east of Haines Junction and in the Shakwak Valley (photograph number 11.) The extremely high, glacial cover St. Elias Range dominates this section to the east and the locally named ranges of the coast mountains northward extention form a barren more rounded and lower eastern margin (photograph number 12.)

Tidewater is reached at the southern end of this section through the high barren mountainous Chilkat Pass which forms the divide between the Upper Alsek and Klehini Rivers.

(b) Timber Type and Economic Importance:

The principal forest species encountered in the vicinity of the highway were consistent in so far as stand composition varied chiefly

with local topographical conditions and site productivity.

The following list of tree species were identified in the forest cover stand along the margins of the highway:

Commercial species

White spruce	Picea canadensis (Mill) B.S.P.
Sitka spruce	Picea sitchensis (Bong.) Can.
* Black spruce	Picea mariana (Mill.) B.S.P.
Western hemlock	Tsuga heterophylla (Raf.) Sarg.
Black cottonwood	Populus trichocarpa T. & G.
Balsam poplar	Populus balsamifera L.
* Aspen poplar	Populus tremuloides Michx.
Lodgepole pine	Pinus contorta Dougl.
Tamarack	Larix americana Mich.
White Birch	Betula occidentalis Hook.

Non Commercial species

Mountain alder	Alnus tenuifolia Nutt.
Alaska white birch	
Dwarf birch	Betula glandulosa Michx.
Willow sp.	Salix sp.

(* Classed as commercial species due to use as fuel.)

Generally, well drained sites dominated in white spruce, white birch, aspen and balsam poplar, the aspen increasing in percentage on drier locations and the balsam poplar in the river bottom and benchland. Lodgepole pine was confined to dry sandy sites or where old heavy burn had occurred.

Black spruce and tamarack growing in pure or mixed stands preferred muskeg or sphagnum bog type sites.

Alder, birch and willow species generally formed the prevailing understory in the more mature forest stands.

All species and timber types were typical interior forest cover with the exception of the coast type cover extending from timber line south to tide water in the Klehini River Valley at the south end of the Chilkat Pass in B.C. and Alaska. Commercial Sitka spruce, cottonwood and western hemlock formed the dominant overstory with willow and alder undergrowth.

Western white birch decreased in development and distribution west of the Cassiar Mountain Range. This also appeared to be the limit of tamarack.

Alaska white birch was noted as a co-dominant and intermediate tree species in the Dry Creek-Snag area in the southern Yukon.

A hybrid poplar species was noted at Lower Post, B.C., Fort Nelson and Fort St. John in the river bottom benchland of the Liard, Muskwa and Upper Peace River respectively. Cuttings of these hybrids were bivalved at the terminal end and trivalved at the basal end. Branching, growth and physical appearance resembled those of the Black cottonwood (Populus trichocarpa Michx.) Dr. Moss, University of Alberta, states he found P. trichocarpa hybridizing freely with P. balsamifera and P. deltoides ssp. occidentalis in southern Alberta.

Large areas through which the highway passes have been heavily or completely burned leaving extensive barren and unproductive sites at the present time. Regeneration of the climax forest cover is

relatively slow on majority of the fire swept areas and the trend appears to be towards pure stands of Aspen poplar or extentions of the sub-climax lodgepole pine cover.

Timberline is generally at 4000' elevation creating large areas of scrub and non-commercial cover in the mountainous sections.

Muskeg and bog increase the non-productive forest sites over many lower levels and on the flat topped poorly drained hills.

The chief commercial use at the present time is fuel cutting and the use of logs for building purposes. Small sawmills, producing lumber for local markets are located at Charlie Lake, B.C., Fort Nelson, B.C., and Lower Post, B.C., (photograph numbers 15 and 16). The latter has a limited output and market and can hardly be classed as a productive commercial business.

(1) East of the Rocky Mountains

On the flat and rolling prairie country of the Peace River block, where cultivation has not been undertaken, mixed or relatively pure stands of white spruce, aspen, balsam, poplar and white birch occur on the most productive sites (photograph numbers 15, 16, and 17). Lodgepole pine predominates in the sandy areas and black spruce and tamarack appear in the poorly drained or muskeg areas. Well developed cottonwood growths are present on the narrow bottom land of the Peace River. Shelter belts of the cultivated sections predominate

with aspen and balsam poplar with occasional growths of white spruce and lodgepole pine. In the more hilly and deeply eroded country, between Blueberry and Prutch, B.C., of the Beatton and Sikanne Chief River Valleys, sub alpine type cover occurs on the higher ridges. Pure or mixed stands of aspen, balsam poplar, lodgepole pine and white spruce comprise this growth, sites varying the stand composition (photograph numbers 18 and 19). In the lower levels and flat topped hills of this section large non-productive areas of muskeg and pothole lakes occur with scrub black spruce and tamarack present in a limited degree. Heavy and complete burn in this section has enlarged the general non-productivity of forest growth.

In the Prophet-Muskwa River area in the vicinity of Fort Nelson, B.C., fine, thrifty, close growing stands of aspen, balsam poplar together with white spruce and some lodgepole pine are present on the better drained slopes. These stands, indicative of a highly productive and potentially commercial forest site are relatively immature, running from an estimated 30' to 60' in height and an average D.B.H. from 8 to 18 inches. (Photograph numbers 20, 21, 22, and 23.)

White birch is present in a limited percentage and tamarack-black spruce stands appear in the lower swamp areas of the valley bottoms (photograph numbers 24 and 25). Particularly fine growths of white spruce and hybrid poplar, noted in the general forest description, form valuable merchantable stands on the

better drained bottomlands of the Muskwa River (photograph numbers 26 and 27).

The high productivity and potential commercial value of the forest site in this section is hampered in some localities by muskeg and extensive burns giving rise to non commercial cover or barren areas. This is particularly true in the Prophet River Valley and at the junction of the Fetsa and Kwoka Rivers.

The higher mountainous foothill country of the Fetsa River, Summit Lake, McDonnel, Racing and Toad River Valleys, together with the valleys of Muncho Lake and the Trout River have only scattered areas of forest cover. This cover is confined to the valley bottoms or below an estimated 4000' elevation of the timber line. Aspen and balsam poplar growth dominate much of the productive forest land. Scattered patches of white spruce and lodgepole pine are present in mixed growth with the poplars, but generally appear in small pure stands. Willow species and Dwarf birches form the understory and cover above timber line.

The barren, mountainous nature and numerous forest fires have made the greater portion of this area a non-productive site for forest growth.

(ii) Rocky Mountains to the Cassiar Mountains

This section appears to be generally a highly productive forest site and except for the mountainous rocky foothills of

the Rocky and Cassiar Mountains to the north-east and north-west respectively, the majority of the benchland and valley bottoms are forested. White spruce, aspen, balsam poplar and western white birch grow in mixed immature stands on the higher better drained benchlands while black spruce and tamarack form the forest cover in the lower swampy and muskeg areas (photograph numbers 28 and 29). Pure lodgepole pine stands occupy the sandy dry sites and regenerate in areas where complete burn has eliminated the normal climax forest (photograph numbers 30 and 31). Scattered stands of mature white spruce reaching an estimated height of 70' with an average D.B.H. of 18" to 24" were noted in the main Liard River Valley at Lower Post, B.C., and at Watson Lake in the Yukon territory. Good balsam poplar development in the valley bottomlands is also present in these areas. Immature lodgepole pine and white spruce dominate the narrow valley bottom growth in the rocky mountainous and mainly non-productive areas of the foothills. (Photograph number 32.) Aspen, balsam poplar, alder and willow are present to a limited degree with black spruce and tamarack present in the swampy sections.

The majority of the forest stands show evidence of previous severe burn indicating that fire is apparently a limiting factor in the maturing of forest growth of this otherwise commercially productive area.

(iii) The Cassiar Mountains to the Coast Mountains

Forest cover in this area is mainly confined to the valley bottoms, marginal slopes and the lower hills. Barren areas are numerous throughout, particularly in the form of grassy alpine conditions on the higher slopes. Rounded barren mountains and large areas of heavy burn increase the non-productivity of this section as do the muskegs, rock outcrops, large and small lakes.

The bulk of the forest growth is composed of white spruce mixed with aspen and balsam poplar (photograph numbers 33 and 34). Lodgepole pine is prevalent on dry sandy sites, chiefly in pure stands and dominates the regeneration over many previously burned areas (photograph number 35 and 36). Black spruce has a scrubby open growth representative in the swampy and muskeg areas. Willow species and mountain alder form the principal understory growths. Merchantable white spruce growth, having an average D.B.H. of 20" is found in scattered stands in the vicinity of Whitehorse, (photograph number 37), the Teslin Lakes, Marsh Lake (photograph numbers 38 and 39), and the Wendenhall River Valleys.

At the present time the chief commercial uses are logs for construction purposes and principally fuel cutting.

(iv) The Coast Mountains to the St. Elias Range and the Alaska Border

The greater parts of this section being above timber line is non-productive and barren. Timber line varies from

3500' to 4000' depending on the slope and aspect. Very extensive and heavy burn has left only scattered stands of the original forest cover which predominated in white spruce, aspen and balsam poplar with mountain alder, Alaska white birch and willow sp. forming the understory. The spruce growth, appearing in almost pure stand composition, covers the lower slopes and moister valley bottomlands. The poplars dominate the growth on the drier sites which are interspaced with open grassy areas typical of the prairie foothills country (photograph numbers 40, 41, and 42). This is particularly evident in the Upper Aleek, Shakwak and Donjek Valleys in the vicinity of Haines Junction and Bear Creek, Dominion Government Experimental farm. In the northern valleys of the Kluane, Donjek and White Rivers, which are principally barren and mountain dominated, heavy and complete burn has eliminated most of the valley bottom forest cover (photograph numbers 43, 44, and 45.) In the Snag area fire has also caused extensive areas of heavy burn much of which has regenerated to aspen cover in pure stands or mixed with balsam poplar, Alaska white birch, mountain alder and willow sp. Light white spruce regeneration forms the understory in much of the more moderately burned-over areas (photograph numbers 46 and 47). Remnants of the previous merchantable growth of white spruce are present in isolated depressions to the north of Snag airport and in the Beaver Creek Valley at mile 1202 on the Alaska Highway. Extensive areas of "Niggerhead"

making supporting poor, usually open growing black spruce, increases the non-productivity and lack of commercial cover in this area, particularly to the north and immediate vicinity of Dry Creek, Y.T. (photograph numbers 48, 49, 50 and 51).

Merchantable, white spruce dominated, forest stands are present in the Upper Donjek Valley, in the Kluksbu area, in the vicinity of Champagne and on the lower western valley slopes at the junction of the Alsek and Shakwak Valleys. White spruce growth, within some of these stands, was estimated 50' to 70' in height with a D.B.H. from 12" to 24".

(c) Collections, Host Trees and Methods of Collection

The majority of insect collections obtained were in the vicinity of the Alaska Highway, the location being designated by the nearest Post Office and appropriate highway mileage. Road margin trees were avoided when making general host samples to insure against error that could quite possibly arise from poor feeding conditions for insect life due to partial suffocation resulting from excessive road dust. Elevations of collection sites were recorded from pocket aneroid readings and spherical positions were taken from National Topographic Series maps of the Alaska Highway.

The beating of tree foliage over a 7' X 9' mat was the principal method of collection. Wood and bark feeding insects were collected from hosts by removing the bark or cutting into the wood. Immature stages of insects feeding on the ground cover of the forest floor or open areas were obtained by use of a sweeping net. Numerous Cerambycidae and Buprestidae

adults were collected with the use of a net when disturbed in the act of oviposition or copulation on preferred host species. Occasional collections were obtained by picking insects from the host. This was done mainly in areas where high Chrysomelidae populations existed.

491 beatings were made on various host trees producing the majority of insect specimens for the 170 collections mailed to the Forest Insect Laboratory in Vernon, B.C.

The location, date, host trees and insect numbers of these collections are tabulated on the following pages.

Location	Alaska Highway Mileage	Spherical Position Latitude North	Spherical Position Longtitude West	Elevation	Host	Number Of Beatings	Number of Collections	Date	Number Of Insects	Section
Fort Nelson, B.C.	300	58° 48'	122° 44'	1240'	White spruce	5	1	June 13th	13	East of the Rocky Mountains
					White birch	3	1	" 13th	5	
					Mountain alder	3	1	" 13th	11	
					Balsam poplar	3	1	" 14th	16	
					Aspen poplar	3	1	" 14th	17	
					Willow	3	1	" 14th	21	
					Ground Cover (1)	Sweeping	1	" 14th	42	
					Totals	20	7		131	
Toad River, B.C.	414	58° 52'	125° 2'	2500'	Aspen poplar	-	2	June 15th	75	
					Balsam poplar	-	1	" 15th	61	
					Willow	-	1	" 15th	59	
					Totals	-	4		195	
Lower Post, B.C. & Watson Lake, Y.T.	620 to 635	59° 58' to 60°	128° 10'	2000'	White spruce	19	5	June 17th to June 24th	39	Rocky mountains to The Cassiar Mountains
					Aspen poplar	13	3		39	
					Tamarack	8	2		19	
					Balsam poplar	9	2		20	
					Black spruce	5	1		7	
					White birch	10	2		29	
					Mountain alder	4	2		55	
					Willow	17	5		123	
					Totals	78	22		386	

(1) Grass, Virginnia bluebell, bunchberry, equisetum, gooseberry, wild strawberry, Labrador tea, wildrose, raspberry & Moss.

Location	Alaska Highway Mileage	Latitude North	Longtitude West	Elevation	Host	Number of Beatings	Number of Collections	Date	Number of Insects	Section
Whitehorse, Y.T.	918	60° 45'	135° 5'	2100' to 2400'	White spruce	34	9	June 26th	194	Cassiar Mountains to Coast Mountains
					Lodgepole Pine	10	1	to	12	
					Willow	20	6	July 12th	159	
					Aspen poplar	18	4		37	
					Balsam poplar	19	5		96	
					Mountain alder	5	1		33	
					Ground cover sweeping		1		30	
					Totals	105	27		587	
Marsh Lake, Y.T.	883	60° 35'	134° 45'		White spruce	3	1	June 10th	15	
					Mountain alder	3	1		35	
					Willow	3	1		30	
					Ground cover sweeping		1		20	
					Totals	9	4		100	
Chilkat Pass, B.C.	From 1016 to Haines, Alaska.	60° 45' N. south to 59°26' N.	137° 30' W. east to 136° W.	0' to 4100'	Sitka spruce	12	4		60	Coast Mountains to St. Elias Range and Alaska Border
					Willow	10	4		106	
					Mountain alder	6	2	July 13th	35	
					Western hemlock	3	1	to	4	
					Dwarf birch (1)	12	4	July 19th	84	
					Dwarf willow (1)	12	4		114	
					Cottonwood	1	1		50	
					Balsam poplar	3	1		27	
					White spruce	15	2		26	
					Totals	74	23		506	

(1) & (2) Above timberline.

(3) and (4) Scrub willow, alder, equisetum, grass, Labrador tea and moss.

Location	Alaska Highway Mileage	Spherical Position Latitude North	Longtitude West	Elevation	Host	Number of Beatings	Number of Collections	Date	Number of Insects	Section
Dry Creek, Y.T. and Snag, Y.T.	1187	60°10'N.	140°30'W.	2500'	White spruce	3	2	July 19th	29	Coast Mountains to St. Elias Range and Alaska Border.
	1206	62°20'N.	140°50'W.	2500'	Black spruce	5	1	to	16	
					Mountain alder	6	2	July 26th	57	
					Willow	15	5		141	
					Alaska whitebirch	5	1		15	
					Aspen poplar	4	2		12	
					Balsam poplar	8	2		29	
					Ground cover 1)	sweeping	2		75	
					Total	46	17		374	
Donjack, Y.T.	1146	61°37'	139°5'	2500'	Balsam poplar	3	1	July 27th	74	
Burwash Landing, Y.T.	1094	61°23'	139	2500'	White spruce	10	1	July 27th	17	
					Balsam poplar	5	1		36	
					Willow	3	1		24	
					Ground cover 2)	sweeping	1		24	
					Total	18	4		101	
Destruction Bay, Y.T.	1084	61°30'	139°5'	2500'	Willow	—	1	July 27th	24	
Kluane, Y.T.	1053	61°2'	138°23'	2700'	White spruce	10	1	July 28th	14	
					Willow	3	1		44	
					Dwarf birch	3	1		35	
					Aspen poplar	3	1		34	
					Total	19	4		127	

(1) Wild rose, scrub willow, and alder, fireweed, grass equisetum, blueberry an moss.

(2) Wild rose, crub willow and alder, fireweed, grass, Lupin and Yarrow.

Location	Alaska Highway Mileage	Spherical Position Latitude North	Longtitude West	Elevation	Host	Number of eatings	Number of Collections	Date	Number of Insects	Section
Dezadeash Lake, Y.T.	South to Mile 127 on the Haines Cutoff Hi-way from 1016	60° 22' N	137°W.	3000'	White spruce	3	1		17	Coast Mountains to the St. Elias Range and Alaska Border.
					Willow	3	1	July 29	27	
					Aspen poplar	3	1		14	
					Totals	9	3		58	
Haines Junction, Y.T.	1016	60°46'	137°31'	2500'	White spruce	5	1	August 3	12	
					Willow	6	2		75	
					Dwarf birch	3	1		17	
					Aspen poplar	3	1		22	
					Mountain alder	3	1		15	
					Totals	20	6		141	
Canyon Creek, Y.T.	996	60°51'	137°3'	2500'	White spruce	5	Negative	August 4		
					Willow	3	1		63	
					Aspen poplar	3	1		25	
					Balsam poplar	3	1		21	
					Totals	14	3		109	
Champagne, Y.T.	970	60°48'	136°30'	2700'	White spruce	5	1	August 4	16	Cassiar Mountains to Coast Mountains
					Aspen poplar	3	1		13	
					Willow	3	1		18	
					Totals	11	3		47	
Whitehorse, Y.T.	918	60°45'	135°5'	1900'	Lodgepole pine	10	Negative	August 5	--	
					White spruce	5	Negative	August 5	--	
					Balsam poplar	3	1	to	19	
					Aspen poplar	6	2	12th	29	
					Willow	6	2		60	
					Totals	20	5		108	

Location	Alaska Highway Mileage	Spherical Location Latitude North	Longtitude West	Elevation	Host	Number of Beatge	Number of Collections	Date	Number of Insects	Section
Marsh Lake, Y.T.	883	60°35'	134°45'	2700'	White spruce	5	1	August 9	14	Cassiar Mountains to the Coast Mountains
					Mountain alder	3	1		18	
					Willow	3	1		57	
					Balsam poplar	3	1		13	
					Aspen poplar	3	1		12	
					Totals	17	5		114	
Carcross, Y.T.	Carcross Rd.	60°11'	134°13'	3000'	Lodgepole pine	10	Negative	August 10		
					Aspen poplar	3	1		16	
					Balsam poplar	3	1		39	
					Willow	3	1		21	
					Totals	19	3		76	
Swift River, Y.T.	733	60°	131°12'	3000'	White spruce	5	1	August 15	11	
					Mountain alder	3	1		11	
					Willow	3	1		15	
					Totals	11	3		37	
Rancheria, Y.T.	710	60°5'	130°41'	2800'	White spruce	5	Negative	August 16		
					Lodgepole pine	5	#			
					Willow	3	1		8	
					Totals	13	1		8	
Watson Lake, Y.T.	635	60°	128°10'	2000'	Lodgepole pine	10	Negative	August 18		Rocky Mountains to Cassiar Mountains
					Tamarack	10	6	to		
and Lower Post, B.C.	620	59°58'	128°10'	2000'	Mountain alder	3	1	August 20	12	
					Balsam poplar	-	1		20	
					Aspen poplar	-	1		20	
					Willow	3	1		22	
					Totals	26	4		74	

Location	Alaska Highway Mileage	Spherical Location: Latitude North	Spherical Location: Longtitude West	Elevation	Host	Number of Determinations	Number of Collections	Date	Number of Insects	Section
Coal River, B.C.	543	59°38'	127°	2000'	White spruce	5	1	August 21	12	Rocky Mt. to Cassier Mt.
					White birch	5	1		15	
					Totals	10	2		27	
Fort Nelson, B.C.	300	58°48'	122°40'	1200'	White spruce	10	2	August 24	22	
					White birch	5	1	to	17	
					Balsam poplar	5	2	August 28	13	
					Aspen poplar	5	1		9	
					Willow	3	2		31	
					Mountain alder	6	2		24	
					Totals	34	10		116	
Trutch, B.C.	201	57°40'	122°58'	1700'	Tamarack	3	1	August 29	26	East of the Rocky Mountains
					White spruce	3	1	and	8	
					Black spruce	5	Negative	30th	--	
					Lodgepole pine	5	Negative		--	
					Balsam poplar	3	1		6	
					Aspen poplar	3	1		6	
					Willow	3	2		24	
					Mountain alder	3	1		15	
					Totals	28	7		85	
Dawson Creek, B.C.	0	55° 45'	120°12'	2100'	White spruce	3	1	August 31	23	
					Balsam poplar	3	1		20	
					Willow	3	1		32	
					Totals	9	3		75	

Three collections were sent to the Dominion Laboratory of Forest Pathology at Victoria, B.C., from lodgepole pine stands in the vicinity of Blueberry, B.C., at mile 100 and 155 of the Alaska Highway and in the vicinity of Swift River, Y.T. at mile 755. The collections from pine stands at mile 100 and mile 755 contained needles from trees apparently affected by a needle-cast which was causing severe reddening of lodgepole pine needles over an extensive area at these points. Small gouty swellings relatively common on the limbs of lodgepole pine were contained in the collection made at mile 100. The needle-cast was identified as a Hendermella sp. and the gouty swelling of the limbs was attributed to Cronartium harknessii (Moore) Meinecke attack.

The following pages contain lists of the insects obtained from the various host trees along the margins of the Alaska Highway and adjoining roads. The identifications of these listed insects species were made by the Forest Insect Laboratory at Vernon, B.C. Included in the lists are the closest settlement or Post Office, date of collection, elevation, insect stage and the general spherical position of each collection.

WHITE SPRUCE (*Picea canadensis* (Mill.) B.S.P.

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-1-48	Fort Nelson, B.C.	June 13	54°48' N.	122°44'W.	1240'	Lepidoptera	Geometridae			Larva
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Acantholyda		Larvae
						"	"	Neodiprion		"
AH-13-48	Watson Lake, Y.T.	June 17	60°1' N.	128°10'	2000'	Coleoptera	Chrysomelidae	Syneta		Adult
						Lepidoptera	Phalaenidae			Larva
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	"
AH-16-48	Lower Post, B.C.	June 17	58°58'	128°10'	2000'	Coleoptera	Scolytidae	Dyoocetes	affaber	Adult & larva
AH-17-48	Lower Post, B.C.	June 21	"	"	"	Coleoptera	Cantharidae	Podaborus		Adult
						"	Elateridae	Dolopius		"
						Lepidoptera	Geometridae	Eupithecia		Larva
						"	Liparidae	Olene	griseofacta	"
						Hymenoptera	Tenthredinidae			"
AH-26-48	"	June 24	"	"	"	Coleoptera	Cantharidae	Podaborus		
						"	Chrysomelidae	Syneta		
						"	Elateridae	Dolopius		
							"	Indius	resplendens	"
						Diptera	Syrphidae			Larva
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larva
							"			
							"			

(Collection made from logs)

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-38-48	Whitehorse, Y.T.	July 1	60°40'N.	135°	2400'	Coleoptera	Cantharidae	Prodaborus		Adult
						"	Chrysomelidae			Larva
						"	Elateridae	Hypnoidus	tumescens	Adult
						Hymenoptera	Tenthredinidae			Larva
AH-40-48	"	July 2	60°43'N.	135°3'W.	2400'	Coleoptera	Elateridae	Dolopius		Adult
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	(Microlep)			"
AH-46-48	"	July 4	60°45'N.	135°5'W.	2500'	Homoptera	Cercopidae			Nymph
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
AH-57-48	"	July 9	60°43'N.	135°W.	2000'	Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
AH-89-48	Snag Airport, Y.T.	July 22	62°30'N.	140°40'W.	2500'	Homoptera	Aphididae			Nymph
						Lepidoptera	Phalaenidae			Larva
						"	Tortricidae			"
AH-96-48	Dry Creek, Y.T.	July 25	62°17'N.	140°35'W.	3000'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"

Collection No.	Location	Date	Latitude	Long-itude	Elevation	Order	Family	Genus	Species	Stage
AH-30-48	Lower Post, B.C.	June 25	58°58'N.	128°10'W.	2000'	Coleoptera	Cantharidae	Podaborus		Adult
						"	Chrysomelidae	Syneta		"
						"	Elateridae	Dolopius		"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae			Larva
						"	"			"
AH-34-48	Whitehorse, Y.T.	June 30	60°48'N.	135°3'W.	2100'	Coleoptera	Cantharidae	Silis		Adult
							Elateridae	Ludius		"
						Lepidoptera	Geometridae	Melanolophia	imitata	Larva
						Hemiptera				Nymph
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larva
AH-37-48	"	July 1	60°40'N.	135°W.	2400'	Coleoptera	Cantharidae	Podaborus		Adult
						"	Coccinellidae	Cleis	picta minor	"
						"	Dascillidae	Macropogon	piceus	"
						"	Elateridae	Ludius	ochreipennis	"
						"	Melyridae	Hoppingiana	hudsonica	"
						Diptera	Syriphidae			Larva
						Lepidoptera	(Microlep)			Pupae
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Acantholyda		Larva
						"	"	Pikonema	alaskensis	"
						"	"	"	dimmockii	"
AH-42-48	"	July 2	60°43'N.	135°3'W.	2400'	Coleoptera	Chrysomelidae			"
						Diptera	Syriphidae			"
						Homoptera	Aphididae	Cinara		Nymph & Adults

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-44-48	Whitehorse, Y.T.	July 3	60°40'N.	135° W.	2100'	Coleoptera	Chrysomelidae	Syneta		Adult
						"	Elateridae	Ludius		"
						"	Melyridae	Hoppingiana	hudsonica	"
						Diptera	Syrphidae			Larvae
						Neuroptera				"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larva
AH-48-48	Whitehorse, Y.T.	July 4th	60°45'N	135°5'W.	2500'	Coleoptera	Cantharidae	Podaberus		Adult
						"	Elateridae	Dolopius		"
						"	Melyridae	Hoppingiana		"
						Lepidoptera	Geometridae			Larva
						Neuroptera				"
						Hemiptera	Miridae			Adult
AH-54-48	Whitehorse, Y.T. (Mar Lake)	July 7	60°40'N.	135°W.	1900'	Coleoptera	Chrysomelidae			Pupa
						"	Elateridae	Ludius		Adult
						"	Melyridae	Hoppingiana		"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Neodiprion		Larva
						"	"	Pikonema	dimmockii	"
AH-55-48	Whitehorse, Y.T.	July 9	60°43'N.	135° W	2000'	Coleoptera	Coccinellidae			Larva
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family		Species	Stage
AH-59-48	Marsh Lake, Y.T.	July 10	60°35'N.	134°45'W	2500'	Coleoptera	Chrysomelidae			Pupa
						"	Elateridae	Ludius		Adult
						Diptera	Syrphidae			Larva
						Lepidoptera	Geometridae			"
						Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pikonema	alaskensis	"
						"	"	"	dimmockii	"
AH-63-48	Whitehorse, Y.T.	July 11	60°45'N	135°5'W	2500'	Coleoptera	Chrysomelidae			"
						"	Nelyridae	Hoppingiana		Adult
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larva
AH-78-48	Chilkat Pass, B.C.	July 16	59°45'N.	136°35'W	3500'	Coleoptera	Cantharidae	Podaborus		Adult
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	? Pikonema	alaskensis	Larva
AH-85-48	Chilkat Pass, B.C.	July 17	59°56'N.	136°50'W.	3100'	Coleoptera	Chrysomelidae	Syneta		Adult
						Homoptera	Aphididae	Cinara		"
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"
AH-93-48	Snag, Y.T.	July 24	62°20'N.	140°50'W.	2500'	Diptera	Syrphidae			Larva
						Lepidoptera	Phalaenidae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"
						"	"	"		cocoon

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-105-48	Burwash Landing, Y.T.	July 27	61°22' N	139° W	2600'	Diptera	Syrphidae			Larva
						Lepidoptera	Olethreutidae	Zieraphera		Pupa
						Homoptera	Aphididae			Nymph
						Hymenoptera	Argidae	Arge		Larva
AH-110-48	Kluane, Y.T.	July 28	61° N.	138°15'W	2700'	Diptera	Syrphidae			Larva
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"
AH-115-48	Dezadeash Lake, Y.T.	July 29	60°23'N	137° 2'W	3200'	Lepidoptera	Geometridae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"
						"	"	"		Cocoon
AH-119-48	Haines Junction, Y.T.	August 3	60°48' N	137°35'W	2650'	Coleoptera	Nordellidae	Anaspis		Adult
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larvae
AH-126-48	Champagne, Y.T.	August 4	60°43' N	136°30'W	2700'	Diptera	Syrphidae			Larva
						Homoptera	Aphididae			Adult
						Hymenoptera	Tenthredinidae			Larva
AH-134-48	Marsh Lake, Y.T.	August 9	60°35' N	134°45'W	2500'	Coleoptera	Elateridae			Adult
						"	Melyridae	Hoppingiana	hudsonica	"
						Diptera	Syrphidae			Larva
						Homoptera	Aphididae	Cinara		Adult

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-143-48	Swift River, Y.T.	Aug. 15	60° N.	131°12'W.	3000'	Diptera	Syrphidae	Adelges		Larvae
						Homoptera	Adelgidae			Nymph
AH-150-48	Coal River, B.C.	Aug. 21	59°39'N	127° W	1500'	Lepidoptera	Geometridae	Semiothisa	granitata	Larvae
						"	"			"
						"	Phalaenidae	Panthea		"
						"	Sphingidae			"
						"	Tortricidae			"
						Homoptera	Aphididae	Cinara		Adult
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larvae
AH-152-48	Fort Nelson, B.C.	Aug. 26	54°48' N	122°44'W	1240'	Coleoptera	Melodidae	Cyphon	variabilis	Adult
						"				"
						Homoptera	Adelgidae	Pineus	boycei	"
AH-156-48	Fort Nelson, B.C.	Aug. 27	"	"	1400'	Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"			Cocoon
						Lepidoptera	Geometridae	Protoboarmia	porcelaria	
						"	"		indicataria	Larva
										Pupa
AH-162-48	Trutch, B.C.	Aug. 29	58° 7'N	122°42'W	1700'	Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						Lepidoptera	Geometridae	Protoboarmia	porcelaria	
									indicataria	"
AH-168-48	Dawson Creek, B.C.	Aug. 31			2100'	Hymenoptera	Tenthredinidae	Pikonema	alaskensis	"
						"	"	"		Pupa
						Lepidoptera	Geometridae	Hydrioneura		Larva
						"	"	Protoboarmia	porcelaria	
									indicataria	"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-66-48	Chilkat Pass, B.C. (Klehini River Valley)	July 13	59°25'N	136°23'W	900'	Coleoptera	Cantharidae	Podaborus		Adult
						Hemiptera	Lygaeidae			Nymph
						Homoptera	Aphididae	Cinara		Adult
						Hymenoptera	Tenthredinidae	Pikonema	dimmockii	Larva
						"	"			Cocoon
						Lepidoptera	Tortricidae	Choriston-eura	fumiferana	Pupa & Adults
AE-70-48	Chilkat Pass, B.C.	July 14	59° 35'N	136°27'W.	3100'	Coleoptera	Cantharidae	Podaborus		Adults
						"	Chrysomelidae	Syneta		"
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						Lepidoptera	Tortricidae	Choriston-eura	fumiferana	Pupae & Adults
AE-73-48	Haines Alaska	July 15	59°15'N	135°30'W	0-50'	Coleoptera	Cantharidae	Prodaborus		Adult
						"	Elateridae	Ampedus		"
						Diptera	Syrphidae			Larva
						Homoptera	Aphididae	Cinara		Adult
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"
						Lepidoptera	Geometridae	Eupithecia	palpata	"
				BLACK SPRUCE (Picea mariana (Mill.) B.S.P.						
AE-22-48	Watson Lake, Y.T.	June 23	60° 5'N	128°20'W.	2000'	Coleoptera	Chrysomelidae	Syneta		Adult
						Homoptera	Aphididae			Nymph
						Lepidoptera	Geometridae			Larva
AE-97-48	Dry Creek, Y.T.	July 25	62°17'N	140°35'W.	3000'	Diptera	Syrphidae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pikonema	alaskensis	Larva
						"	"	"	dimmockii	"

TAMARACK (*Larix americana* Mich.)

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-15-48	Watson Lake, Y.T.	June 17	60°1'N.	128°10'W.	2000'	Coleoptera Diptera Homoptera	Elateridae Syrphidae Aphididae	Ludius		Adult Larvae Nymph
AH-33-48	Lower Post, B.C.	June 25	59°58' N.	128°10'W.	2000'	Homoptera Hymenoptera	Aphididae Tenthredinidae	?Cinara		Nymph Larva
AH-161-48	Trutch, B.C.	Aug. 29	58°9'N.	122°42'W.	1700	Homoptera Hymenoptera Lepidoptera "	Aphididae Tenthredinidae Geometridae "	Anoplonyx Semiothisa	(New species) Sexmaculata	Adult Larva " "

LODGEPOLE PINE (*Pinus contorta* Dougl.)

AH-35-48	Whitehorse, Y.T.	June 30	60°43' N.	135°3'W.	2100'	Coleoptera Coleoptera " Homoptera	Curculionidae Elateridae Melyridae Aphididae	Pissodes Ludius Hoppingiana		Adult " " "

WESTERN HEMLOCK (*Tsuga heterophylla*)

AH-69-48	Chilkat Pass B.C. (Klehini River	July 14	59°30'N.	136°27'W.	2000'	Coleoptera Hymenoptera " Lepidoptera	Chrysomelidae Tenthredinidae " Phalaenidae	Syneta ?Neodiprion	tsugae	" Larva Cocoon Larva

COTTONWOOD (*Populus trichocarpa* T. & G.)

AH-76-48	Haines Alaska	July	59°15'N.	135°35'W.	100 '	Coleoptera Homoptera Hymenoptera Lepidoptera "	Chrysomelidae Aphididae Tenthredinidae Geometridae Tortricidae	Chrysomela (gall-forming)	semicollis	Larva, Pupa & Adult Nymph Larva Larva Pupa

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-5-48	Fort Nelson, B.C.	June 14	58°48'N.	122°44'W.	1240'	Diptera	(Parasite)			Puparium
						Hymenoptera	"			Cocoon
						Lepidoptera	Gracilariidae	Phyllocnistis	populiella	Larva
AE-8-48	McDonnell River	June 15	58°52'N.	125°2'W.	2500'	Diptera	(Parasite)			Puparium
						Hymenoptera	Ichneumonidae	Glypta	fumiferana	Cocoons
						Lepidoptera	Tortricidae	Archips	conflictana	Larva & Pupa
						"	"			Larva
AE-11-48	Toad River, B.C.	June 15	58°52'N.	125°20'W.	2500'	Diptera	(Parasite)			"
						Hymenoptera	"			Cocoon
						"	Ichneumonidae	Glypta	fumiferana	"
						Lepidoptera	Tortricidae	Archips	conflictana	Larva & Pupa
AE-12-48	Watson Lake, Y.T.	June 17	60°1'N.	128°10'W.	2000'	Coleoptera	Coccinellidae	Coccinella	transverso-guttata	Adult
						Hymenoptera	Ichneumonidae	Glypta	fumiferana	Cocoon
						Lepidoptera	Gracilariidae	Phyllocnistis	populiella	Larva
						"	Tortricidae	Archips	conflictana	Larva & Pupa
AE-20-48	" "	June 21	60°10'N.	"	"	"	Geometridae			Larva
						"	Gracilariidae	Phyllocnistis	populiella	"
						"	Tortricidae	Archips	conflictana	Larva & Pupa
AE-20-48	" "	June 23	60°5'N.	"	"	Coleoptera	Chrysomelidae	Syneta		Adult
						Diptera	(Parasite)			Puparium
						Hymenoptera	Ichneumonidae	Glypta	fumiferana	Cocoon
						"	Tenthredinidae			Larva
						Lepidoptera	Gracilariidae	Phyllocnistis	populiella	"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-113-48	Kluane, Y.T.	July 28	61°N.	128°15'W.	2700'	Hymenoptera	Tenthredinidae	Pteronidea	limbata	Larva
						"	"	"		"
						"	"			"
						Lepidoptera	Geometridae	Eupyia	moilliettl	"
						"	"	Zale		"
						"	Tortricidae			"
AH-116-48	Dezadeash Lake, Y.T.	July 29	60°25'N.	137°W.	3000'	Hymenoptera	Argidae	Arge		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Arctiidae			"
						"	Geometridae			"
						"	(Microlep)			"
AH-117-48	Haines Junction, Y.T.	Aug. 3	60°16'N.	137°30'W.	2500'	Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Pyralidae	Tetralopha	asperatella	"
AH-124-48	Canyon Creek, Y.T.	Aug. 4	60°52'N.	137°4'W.	2500'	Coleoptera	Curculionidae			Adult
						Hymenoptera	Cimbicidae	Cimbex	americana	Larva
						"	Tenthredinidae			"
						Lepidoptera	Gracilariidae	Phyllocnistis	populiella	"
						"	Notodontidae	Cerura	borealis	"
						"	(Microlep.)			Pupa & Larva
AH-127-48	Champagne, Y.T.	Aug. 4	60°43'N.	136°30'W.	2700'	Coleoptera	Curculionidae	Sitona	flavisona	Adult
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			Larva & Cocoon
						Lepidoptera	Geometridae			"
						"	(Microlep.)			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-130-48	Whitehorse, Y.T.	Aug. 5	60°45'N.	135°W.	2100'	Diptera	(Parasite)			Pupa
						Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AH-138-48	Marsh Lake, Y.T.	Aug. 9	60°35'N.	134°45'W.	2500'	Coleoptera	Curculionidae			Adult
						Hymenoptera	Tenthredinidae	Pteronidea		Larva
						"	"			"
						"				Cocoon
						Lepidoptera	Geometridae			Larva
AH-139-48	Carcross, Y.T.	Aug. 10	60°15'N.	134°50'W.	2000'	Coleoptera	Chrysomelidae	Phytodecta	americana	Adult
						Homoptera	Cercopidae	Aphrophora		"
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae	Caripeta		"
						"	"			"
AH-158-48	Fort Nelson, B.C.	Aug. 27	58°48'N.	122°44'W.	1400'	Homoptera	Pentatomidae	Elasmostethus	cruciatus	Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Lasiocampidae	Eoicnaptera	americana	"
						"	Tortricidae			"
AH-165-48	Trutch, B.C.	Aug. 29	58°7'N.	122°42'W.	1700'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-4-48	Fort Nelson, B.C.	June 14	58°48'N.	122°44'W.	1240'	Hymenoptera	(Parasite)			Cocoon
						"	Tenthredinidae			Larva
						Lepidoptera	Tortricidae	Archips	conflictana	Pupa
						"	Phalaenidae			"
						Microleptera				"
AH-9-48	McDonnell River, B.C.	June 15	58°52'N.	125°2'W.	2500'	Diptera	(Parasite)			Larva
						Hymenoptera	Ichneumonidae	Glypta	fumiferanae	Cocoon
						Lepidoptera	Tortricidae	Archips	conflictana	Larva
AH-19-48	Watson Lake, Y.T.	June 21	60°10'N.	128°20'W.	2000'	Coleoptera	Cantharidae	Silis		Adult
						Hymenoptera	Ichneumonidae	Glypta	fumiferanae	Cocoon
						"	Tenthredinidae			Larva
AH-27-48	Lower Post, B.C.	June 24	59°58'N.	128°10'W.	2000'	Homoptera	Cicadellidae			"
						Hymenoptera	Tenthredinidae	Pteronidae		"
						"	"			"
AH-41-48	Whitehorse, Y.T.	July 2	60°43'N.	135°3'W.	2400'	Coleoptera	Carabidae			Adult
						Hymenoptera	Tenthredinidae	Pteronidae		Larva
						"	"			"
AH-50-48	Whitehorse, Y.T.	July 5	60°45'N.	135°3'W.	2500'	Coleoptera	Elateridae	Dolopius		Adult
						Homoptera	Aphididae	Cinara		Adult
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AH-56-48	Whitehorse, Y.T.	July 9	60°43'N.	135°W.	2000'	Homoptera	Aphididae			Nymph
						"	Cicadellidae			Adults
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						"	"			Cocoons

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-83-48	Chilkat Pass, B.C.	July 19	59°56'N.	136°47'W.	3000'	Homoptera	Aphididae			Nymphs
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Neodiprion		"
						"	"			Larva & Cocoon
						Lepidoptera	Lasiocampidae	Epicnaptera	americana	Larva
						"	Arctiidae			"
						"	Geometridae			"
						"	Sphingidae			"
AH-92-48	Snag, Y.T.	July 24	62°20'N.	140°50'W.	2500'	Diptera	Syrphidae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae			Larvae & Cocoons
						Lepidoptera	Geometridae			Larva
						"	Phalaenidae			Pupa
						"	Tortricidae			Larva
AH-98-48	Dry Creek, Y.T.	July 25	62°17'N.	140°35'W.	3000'	Coleoptera	Cantharidae	Podaborus		Adult
						Diptera	Syrphidae			Larva
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Phalaenidae			"
AH-104-48	Donjek, Y.T.	July 27	61°30'N.	139°20'W.	2500'	Coleoptera	Chrysomelidae	Chrysomela	4. quadriguttata	Adult
						Diptera	Syrphidae			Pupa & Larva
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Arctiidae	Acronicta	lepusculina	"
						"	Sphingidae			"
AH-106-48	Burwash Landing, Y.T.	July 27	61°22'N.	139°W.	2700'	Diptera	Syrphidae			"
						Homoptera	Aphididae			Nymph
						Hymenoptera	Cimbicidae	Cimbex	americana	Larva
						"	Diprionidae	Hemichroa		"
						"	Tenthredinidae			"
						Lepidoptera	Phalaenidae			"
						"	Tortricidae			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-125-48	Canyon Creek, Y.T.	Aug. 4	60°52'N.	137°4'W.	2500'	Coleoptera	Curculionidae			Adult
						"	Melyridae	Hoppingiana		"
						Homoptera	Aphididae	(gall forming)		"
						Hymenoptera	Diprionidae	?Hemichroa	thoracicus	Larva
						"	Tenthredinidae			"
						Lepidoptera	Gracilariidae	Phyllocnistis	populiella	"
AH-129-48	Whitehorse, Y.T.	Aug. 5	60°45'N.	135°W.	2100'	Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Papilionidae	Papilio		"
AH-137-48	Marsh Lake, Y.T.	Aug. 9	60°35'N.	134°45'W.	2500'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae			"
						"				Pupa
						Lepidoptera	Tortricidae			Larva
AH-141-48	Carcross, Y.T.	Aug. 10	60°15'N.	134°50'W.	2000'	Diptera	Syrphidae			Larva
						Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Pteronidea		Larva
						"	"			"
						Lepidoptera	Pyralidae	Tetralopha	asperatella	"
						"	Geometridae			"
AH-155-48	Ft. Nelson, B.C.	Aug. 26	58°48'N.	122°44'W.	1400'	Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AH-164-48	Trutch, B.C.	Aug. 29	58°7'N.	122°42'W.	1700'	Coleoptera	Chrysomelidae	Galerucella	punctipennis	Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae			"
AH-169-48	Dawson Creek B.C.	Aug. 31	55°55'	120°25'W.	2100'	Diptera	Syrphidae			"
						Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae	Paraphia	piniata	"
						"				"
						"	Pyralidae	Tetralopha	asperatella	"
						"	Tortricidae			"
						"				Pupa

ALASKA WHITE BIRCH (Betula alaskana Sarg.)

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-99-48	Dry Creek, Y.T.	July 25	62°17'N	140°35'W.	3000'	Hymenoptera	Argidae	Arge		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"

WESTERN WHITE BIRCH (Betula occidentalis Hook.)

AE-3-48	Fort Nelson, B.C.	June 14	58°48'N.	122°44'W.	1240	Hymenoptera	Tenthredinidae			"
AE-25-48	Lower Post, B.C.	June 24	59°58'N.	128°10°W.	2000	Coleoptera	Elateridae			Adult
						Diptera	Syrphidae			Larva
						Hemiptera	Pentatomidae	Elasmostethus	cruciatus	Adult
						"	"	Neadorus	lateralis	"
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae	Campaea	perlata	"
AE-31-48	Watson Lake, Y.T.	June 25	60°5'N.	128°10'W.	2100	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AE-149-48	Coal River, B.C.	Aug. 21	59°38'N.	127°W.	2000	Hymenoptera	Argidae	Arge		"
						"	Cimbicidae	Trichiosoma		"
						"				Pupa
						Lepidoptera	Geometridae	Protoboarmia	porcelaria	
									indictaria	Larva
						"	"	Semiothisa		"
						"	"			"
AE-151-48	Fort Nelson, B.C.	Aug. 26	58°48'N.	122°44'W.	1240	Coleoptera	Curculionae	Tychius	picirostris	Adult
						Hymenoptera	Diprionidae	Hemichroa	thoracicus	Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-71-48 (1)	Chilkat Pass, B.C.	July 14	59°40'N.	136°30'W.	4100'	Diptera	Syriphidae			Larva
						Hymenoptera	Tenthredinidae	Neodiprion		"
						"	"			"
						Lepidoptera	Phalaenidae			"
AE-80-48 (2)	"	July 16	59°45'N.	136°35'W.	4000'	Diptera	Syriphidae			"
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	(Microlepid)			"
AE-81-48 (3)	"	July 17	59°47'N.	136°35'W.	3500'	Homoptera	Aphididae			Adult
						"	Cercopidae			"
						Hymenoptera	Tenthredinidae	Pteronidea		Larva
						"	"			"
						Lepidoptera	Geometridae			"
AE-86-48	"	July 17	59°59'N.	136°50'W.	3000'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Tortricidae	Archips	rosaceana	"
						"	"			"
AE-112-48	Klunne, Y.T.	July 28	61°N.	138°15'W.	2700'	Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Tortricidae			"
AE-122-48	Haines Junction, Y.T.	Aug. 3	60°16'N.	137°30'W.	2500'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"

(1), (2), and (3) above timberline.

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-2-48	Fort Nelson, B.C.	June 13	54°48'N.	122°4[illegible]'W.	1240'	Coleoptera	Chrysomelidae			Larva
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Noctuidae	Autographa		"
						"	Geometridae	Metropis	crepuscularia	"
						"	"			"
AE-28-48	Lower Post, B.C.	June 24	59°58'N.	128°10'W.	2000'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			Prepupa
						"				Pupa
AE-29-48	" "	June 25	59°58'N.	128°10'W.	2000'	Homoptera	Aphididae			Nymph
						Lepidoptera	Phalaenidae			Larva
AE-51-48	Whitehorse, Y.T.	July 5	60°45'N.	135°5'W.	2500'	Coleoptera	Chrysomelidae			Pupa
						Homoptera	Cicadellidae			Adult & Nymph
						Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Cimbex	americana	"
						"	Tenthredinidae			"
						Lepidoptera	(Microlepid)			"
AE-60-48	Marsh Lake Y.T.	July 10	60°35'N.	134°45'W.	2500'	Coleoptera	Chrysomelidae			"
						Hymenoptera	Argidae	Arge		"
						"	Cimbicidae	Cimbex	americana	"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Tortricidae			"
AE-69-48	Chilkat Pass, B.C.	July 14	59°30'N.	136°27'W.	2000'	Homoptera	Cicadellidae			Nymphs
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Tortricidae	Archips	rosaceana	"
						"	(Microlepid)			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-7?-48	Haines, Alaska	July 15	59°15'N.	135°35'W.	0-50'	Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae	Hydriomena		"
						"				"
							?Tortricidae			Pupa
AH-102-48	Dry Creek, Y.T.	July 26	62°10'N.	140°30'W.	3000'	Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Arctiidae			"
						"	Geometridae	Epicnaptera	americana	"
AH-121-48	Haines Junction Y.T.	Aug. 3	60°15'N.	137°30'W.	2500'	Hymenoptera	Cimbicidae	Cimbex	americana	"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Tortricidae			"
						"				Pupa
AH-135-48	Marsh Lake, Y.T.	Aug. 9	60°32'N.	134°25'W.	2700'	Homoptera	Aphididae			Adult
						"	Cicadellidae			Nymph
						Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Cimbex	americana	"
						"	Tenthredinidae			"
						"				Cocoon
						Lepidoptera	Arctiidae	Acronicta		Larva
						"	Phalaenidae			"
AH-142-48	Swift River, Y.T.	Aug. 15	60° N.	131°12'W.	3000'	Hymenoptera	Cimbicidae	Cimbex	americana	"
AH-146-48	Lower Post, B.C.	Aug. 19	59°58'N.	128°10'W.	1900'	Hymenoptera	Argidae	Arge		"
						Lepidoptera	Drepanidae	Drepana	arcuata	"
						"	Geometridae	Eupithecia		"
						"	"			"
						"	Tortricidae			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-153-48	Fort Nelson, B.C.	Aug. 26	54°48'N.	122°44'W.	1200'	Hymenoptera	Diprionidae	Hemichroa	thoracicus	Larva
						"	Tenthredinidae			"
						Lepidoptera	Noctuidae	Autographa		"
						"	Geometridae			"
						"	Phalaenidae			"
						"				Pupa
AH-157-48	Fort Nelson, B.C.	Aug. 27	"	"	1400'	Hemiptera	Pentatomidae	Elasmostethus	cruciatus	Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae			"
AH-164-48	Trutch, B.C.	Aug. 29	58°7'N.	122°42'W.	1700'	Hymenoptera	Diprionidae	Hemichroa	crocea	"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae	Protoboarmia	porcelaria	
									indicataria	"
						"	"			"
						"	Noctuidae	Acronicta	grisea	"
						"	Tortricidae			"
						"	(Microlepid)			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-88-48	Dry Creek, Y.T.	July 21	62°17'N.	140°35'W.	2500'	Coleoptera	Coccinellidae			Larva
						Hymenoptera	Argidae	Arge		"
						"	Tenthredinidae			"
						Lepidoptera	Arctiidae			"
AH-91-48	Snag, Y.T.	July 24	62°20'N.	140°50'W.	2500'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae	Melanolophia	imitata	"
						"	"			"
AH-100-48	Dry Creek, Y.T.	July 25	62°17'N.	140°35'W.	3000'	Hymenoptera	Argidae	Arge		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Lasiocampidae	Epicnaptera	americana	"
						"	Noctuidae	Polia	legitima	"
						"	Phalaenidae			"
AH-101-48	" " " " "		62°10'N.	140°30'W.	2500'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae	Enypia	moilliett	"
AH-107-48	Burwash Landing, Y.T.	July 27	61°22'N.	139°W.	2700'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae	Eupithecia		"
						"	"			"
AH-6-48	Fort Nelson, Y.T.	June 14	58°48'N.	122°44'W.	1240'	Coleoptera	Chrysomelidae	Galerucella	carbo	Adult
						"	Elateridae	Ludius		"
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Pyralidae			"
						"	Tortricidae			"
						"	(Microlep.)			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-10-48	McDonnell River, B.C.	June 15	58°52'N.	125°2'W.	2500'	Diptera	(Parasite)			Puparium
						Hymenoptera	Ichneumonidae	Glypta	fumiferanae	Cocoon
						Lepidoptera	Tortricidae	Archips	conflictana	Larvae & Pupa
						"	(Microlep)			Larva
AH-15-48	Watson Lake, Y.T.	June 17	60°1'N.	128°10'W.	2000'	Coleoptera	Coccinellidae	Hippodamia	5-signata	Adult
						"	Elateridae	Dolopius		"
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae			"
						"	Tortricidae			"
AH-18-48	Lower Post, B.C.	June 21	58°58'N.	128°10'W.	2000'	Coleoptera	Cantharidae	Podabrus		Adult
						"	Chrysomelidae	Phytodecta	americana	Larva
						"	Elateridae	Ludius	propola	Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae	Eupia	moilliett	"
						"	"			"
						"	Tortricidae			"
						Neuroptera				"
AH-21-48	Watson Lake, Y.T.	June 21	60°5'N.	128°20'	2000	Coleoptera	Chrysomelidae	Phytodecta	americana	Adult
						Hemiptera	Pentatomidae	Mendorus	lateralis	"
						Hymenoptera	Tenthredinidae			Larva
AH-32-48	" "	June 25	60°10'N.	128°20'	2100'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenadae			"
						"	Tortricidae	Archips	conflictana	Pupa
AH-36-48	Whitehorse, Y.T.	June 30	60°43'N.	135°3'W.	2100'	Hemiptera	Miridae			Adult
						"	Pentatomidae			Nymph
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"				Pupa

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-39-48	Whitehorse, Y.T.	July 1	60°40'N.	135°W.	2400'	Coleoptera	Chrysomelidae			Pupa
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AE-45-48	"	July 3	"	"	"	Coleoptera	Melyridae	Hoppingiana		Adult
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			
AE-47-48	Whitehorse, Y.T.	July 4	60°45'N.	135°5'W.	2500'	Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Phalaenidae			"
AE-52-48	"	July 6	60°40'N.	135° W.	1800'	Homoptera	Aphididae			Nymph
						Hymenoptera	Tenthredinidae	Neodiprion		Larva
						"	"			"
						Lepidoptera	Geometridae	Lycia	ursaria	"
						"	"			"
						"				Pupa
AE-61-48	Marsh Lake, Y.T.	July 10	60°35'N.	134°45'W.	2500'	Hymenoptera	Argidae	Arge		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Liparidae (Microlep)	Hemerocampa	pseudotsugata	"
						"				Pupa
AE-64-48	Whitehorse, Y.T.	July 11	60°45'N.	135°5'W.	2500'	Homoptera	Aphididae			Nymph
						Hymenoptera	Argidae	Arge		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Lasiocampidae	Epicnaptera	americana	"
						"	Tortricidae	Archips	rosaceana	"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-65-48	Chilkat Pass, B.C.	July 13	59°25'N.	136°23'W.	900'	Coleoptera	Cantharidae	Podaborus		Adult
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
						"	(Microlep)			"
AH-72-48(1)	Chilkat Pass, B.C.	July 14	59°40'N.	136°30'W.	4100'	Coleoptera	Cantharidae	Podaborus		Adult
						"	Chrysomelidae	Galerucella	carbo	Larva
						Hymenoptera	Tenthredinidae	Pteronidae		"
						"				"
						Lepidoptera	Pyralidae			"
						"	(Microlep.)			Pupa
AH-75-48	Haines, Alaska	July 15	59°15'N.	135°35'W.	0' - 50'	Coleoptera	Cantharidae	Podaborus		Larva
						"	Chrysomelidae	Adoxus	obscurus	Adult
						"	"			Pupa
						"	Elateridae	Ludius		Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae			"
						"	Sphingidae	Smerinthus	cerisyi	"
AH-77-48	Haines, Alaska	July 15	59°20'N.	135°35'W.	500'	Coleoptera	Chrysomelidae	Chrysomela	scripticollis	Adult
										Pupa & Larva

(1) Above Timberline.

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-79-48 (1)	Chilkat Pass, B.C.	July 16	59°45'N.	136°35'W.	4000'	Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						"	(Parasite)			"
						Lepidoptera	Arctiidae			"
						"	Geometridae			"
						"	(Microlep)			Pupa
AE-82-48 (2)	"	"	July 17	59°47'N.	136°35'W.	3500'	Hymenoptera	Argidae	Arge		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	(Microlep)			Pupa
AE-84-48	"	"	July 17	59°59'N.	136°50'W.	3000'	Homoptera	Aphididae	Cinara		Adult
						"	Lygaeidae			"
						Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Cimbex	americana	"
						"	"	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
AE-87-48 (3)	"	"	July 18	59°50'N.	136°35'W.	3850'	Hymenoptera	Cimbicidae	Trichiosoma		"
	(Kelsall Lake)					"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
AE-109-48	Destruction Bay Y.T.	July 27	61°15'N.	138°50'W.	2700'	Diptera	Syrphidae			"
						Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Noctuidae	Acronicta	lepusculina	"
						"	"	Cerura	borealis	"
						"				Pupa
						"	(Microlep)			"

(1), (2), & (3) Above Timberline

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AE-111-48	Kluane, Y.T.	July 27	61°N.	138°15'W.	2700'	Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"	"		"
						Lepidoptera	Arctiidae	Hotolophus		"
						"	Noctuidae	cerura	borealis	"
						"	Geometridae			"
AE-114-48	Dezadeash Lake, Y.T.	July 29	60°25'N.	137°W.	3000'	Diptera	(Parasite)			"
						Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Lasiocampidae			"
						"				Pupa
AE-118-48	Haines Junction Y.T.	Aug. 3	60°16'N.	137°30'W.	2500'	Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Tortricidae	Archips	rosaceana	"
AE-120-48	Haines Junction Y.T.	Aug. 3	"	"	"	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Artiidae			"
						"	Geometridae			"
AE-123-48	Canyon Creek, Y.T.	Aug. 4	60°52'N.	137°4'W.	2500'	Hemiptera	Lygaeidae			Nymph
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae	Eulype	hastata	"
						"	Phalaenidae			"
						"				Pupa

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-128-48	Champagne, Y.T.	Aug. 4	60°43'N.	136°30'W.	2700'	Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
						"	Tortricidae			"
						"	(Microlep.)			Pupa
AH-131-48	Whitehorse, Y.T.	Aug. 5	60°45'N.	135°W.	2500'	Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			"
AH-144-48	Swift River, Y.T.	Aug. 15	60°N.	131°12'W.	3000'	Hemiptera	Miridae			Adult
						Hymenoptera	Tenthredinidae			Larva
						Lepidoptera	Geometridae	Hydriomena		"
						"	Phalaenidae			"
AH-145-48	Mancheria, Y.T.	Aug. 16	60°5'N.	130°41'W.	2800'	Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
AH-147-48	Lower Post, B.C.	Aug. 19	59°58'N.	128°10'W.	1900'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						Lepidoptera	Geometridae			"
AH-155-48	Port Nelson, B.C.	Aug. 26	58°48'N.	122°44'W.	1200'	Diptera	Cecidomyiidae	Rhabdophaga	strobiloides	"
AH-159-48	" "	Aug. 27	"	"	1400'	Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
AH-166-48,	Trutch, B.C.	Aug. 29	58°7'N.	122°42'W.	1700'	Hymenoptera	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Arctiidae			"
						"	Geometridae			"
						"	Noctuidae	Acronicta	grisea	"
AH-167-48	" "	Aug. 29	" "	" "	"	Diptera	Cecidomyiidae	Rhabdophaga	strobiloides	"
						Hemiptera	Miridae			Adult
						"				Nymph
						Homoptera	Aphididae			"

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-133-48	Whitehorse, Y.T.	Aug. 7	60°45'N.	135°5'W.	2500'	Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae	Semiothisa		"
						"	"			"
						"	Phalaenidae			"
AH-136-48	Marsh Lake Y.T.	Aug. 9	60°35'N.	134°45'W.	2700'	Coleoptera	Chrysomelidae			Adult
						Hymenoptera	Argidae	Arge		Larva
						"	Cimbicidae	Cimbex	americana	"
						"	"	Trichiosoma		"
						"	Tenthredinidae	Pteronidea		"
						Lepidoptera	Arctiidae	Lexis	bicolor	"
						"	Geometridae	Eulype	hastata	"
						"	"	Eupithecia		"
						"	"			"
						"	Noctuidae	Acronicta		"
						"	Phalaenidae			"
						"	Tortricidae			"
AH-141-48	Carcross, Y.T.	Aug. 10	60°15'N.	134°50'W.	2000'	Coleoptera	Chrysomelidae	Adoxus	obscurus	Adult
						"	"	Phytodecta	americana	"
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae			"
						"	Noctuidae	Acronicta		"
AH-170-48	Dawson Creek, B.C.	Aug. 31	55°55'N.	120°25'W.	2100'	Hymenoptera	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae	Protoboarmia	porcelaria indicatoria	"
						"	Sphingidae			"
						"	(Microlep)			"

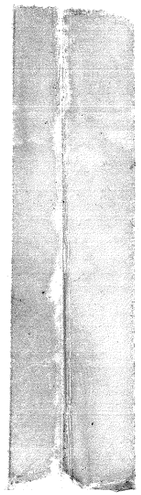
GROUND COVER

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-7-48 (1)	Fort Nelson, B.C.	June 14	58°48'N.	122°44'W.	1240'	Coleoptera	Anobiidae	Hydrobregma		Adult
						"	Chrysomelidae	Adoxus	obscurus	"
						"	"	Chalcoides		"
						"	"	Calerucella	carbo	"
						"	Coccinellidae	Hippodamia	tibialis	"
						"	"	Scymnus		"
						Hemiptera	Nabidae	Nabis		"
						"	Miridae			"
						"	Pentatomidae			"
						Hymenoptera	Ichneumonidae			"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae			Larva
										"
AH-62-48 (2)	Marsh Lake, Y.T.	July 10	60°35'N.	134°45'W.	2500'	Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Phalaenidae			"
AH-94-48 (3)	Snag, Y.T.	July 24	62°20'N.	140°50'W.	2500'	Diptera	Syrphidae			"
						Hymenoptera	Tenthredinidae			"
						Lepidoptera	Geometridae			"
						"	Lycaenidae	Incisalia	eryphon	"
						"	Phalaenidae			"
AH-103-48 (4)	Dry Creek, Y.T.	July 26	62°10'N.	140°30'W.	3000'	Coleoptera	Chrysomelidae	Chrysomela	aeneicollis	"
						Hymenoptera	Argidae	Arge		"
						"	Cimbicidae	Trichiosoma		"
						"	Tenthredinidae			"
						Lepidoptera	Geometridae	Eupithecia		"
						"	"			"
						"	Phalaenidae	Feralis	jocosa	"
						"	Tortricidae	Archips	rosaceana	"

(1) Grass, virginnia bluebell, bunchberry, equisetum, gooseberry, strawberry, wildrose, Labrador tea, raspberry & moss.
(2) Grass, fireweed, willow, alder, Labrador tea, strawberry & moss.
(3) Fireweed, grass, wildrose, willow, alder, equisetum & wild flowers.
(4) " " " " " " blueberry & moss.

Collection No.	Location	Date	Latitude	Longitude	Elevation	Order	Family	Genus	Species	Stage
AH-108-48 (1)	Burwash Landing, Y.T.	July 27	61°22'N.	139°W.	2700'	Diptera	Psychodidae			Puparium
						Homoptera	Lygaeidae			Adult
						Hymenoptera	Cimbicidae	Trichiosoma		Larva
						"	Tenthredinidae	Pteronidea		"
						"	"			"
						Lepidoptera	Geometridae	Eupithecia		"
						"	"			"
						"				"
										Pupa

(1) Fireweed, grass, wild rose, willow, alder, Lupin & Yarrow.



Negative samplings, which were mainly confined to lodgepole pine hosts and few in number are tabulated below.

Location	Alaska Highway Mileage	Host	Number of Beatings	Date
Blueberry, B.C.	100	Lodgepole Pine	5	June 3
Lower Post, B.C.	620	" "	10	June 20
Whitehorse, Y.T.	918	" "	10	July 11
Canyon Creek, Y.T.	996	" "	5	Aug. 4
Whitehorse, Y.T.	918	" "	5	Aug. 5
" "	918	White Spruce	5	Aug. 5
Swift River, Y.T.		Lodgepole Pine		Aug. 15
Ranchería, Y.T.		" "		Aug. 16
Lower Post, B.C.		" "	10	Aug. 19
" " "		Tamarack	10	" 19
Prutch, B.C.				
(Mason Creek)		Lodgepole Pine	5	" 30
		Black Spruce	5	" 30

In addition to the Forest Insect Survey collections tabulated and referred to in the text, forty preserved collections, principally wood boring or bark feeding coleoptera, were made. These collections together with mounted adult specimens relative to the Forest Insect Survey require identification and are not referred to in this report.

(d) Insects of Known Economic Importance

Adelgids (Adelges spp.) A few galls were found on regeneration white spruce at Swift River, Y.T.

Alaska Spruce Beetle (Dendroctonus borealis Hopk.)

An extensive area of dead merchantable white spruce at the northern end of the Chilkat Pass, Yukon Territory, is attributed to the destructive attack of this beetle. Mr. R. Jackson, Supt., Lands and Forest Division, Department of Mines and Resources reports a continuance of attack to the north east of this area in the white spruce stands of the Upper Donjek River Valley.

Ambrosia Beetles - Tunnels and larval galleries were numerous in white spruce logs and stumps at Fort Nelson, B.C. Heavy Ambrosia beetle attack was also present in white spruce logs at Lower Post, B.C.

American Poplar Leaf Beetle (Chrysomela americana Schffr.)

This chrysomelid was found in limited numbers on willow sp. at Watson Lake, Y.T., and at Carcross, Y.T., where numerous adults caused localized defoliation of willow sp. and aspen poplars.

Aspen Leaf Miner (Lithocolletis cravillella)

Larval mines were common on the foliage of the lower limbs of both aspen and balsam poplar from Dawson Creek, B.C. northwest along the Alaska Highway to Canyon Creek, B.C., at mile 1096. The heaviest attack being recorded at Lower Post, B.C.

Black Beetle (Monochamus scutellatus Say.)

Adults and larvae were common throughout the extent of the area traversed by the Alaska Highway in both felled and fire-killed timber.

Bronze Birch Borer (Agrilus anxius Gory.)

One adult specimen of this beetle was tentatively identified from a willow host at Carcross, Y.T.

Black Willow Leaf Beetle (Galerucella cavicornis Mann.)

Adult beetles were found in small numbers at Crutch, B.C., on willow and balsam poplar hosts.

Douglas Fir Tussock Moth (Hemerocampa pseudotsugata McD.)

Two larval specimens were obtained from a willow host at Marsh Lake, Y.T.

Green Larch Looper (Semiothisa sexmaculata Pack.)

A small number of larvae were obtained from tamarack beatings at Indian Creek, near Crutch, B.C.

Green Spruce Looper (Semiothisa granitata Green)

Larvae of this Geometrid were found on white spruce at Coal River, B.C.

Greenheaded Spruce Sawfly (Nikonsem dimmockii Cress.)

Larvae of this sawfly were found in small numbers on white spruce at Lower Post, B.C., Watson Lake, Marsh Lake, Whitehorse, Haines Junction, Chilkat Pass, Kluane, Dry Creek and Snag in the Yukon. Larvae were also found in Sitka spruce at the south end of the Chilkat Pass, in B.C.

Large Aspen Tortrix (Archips conflictana Walk.)

This tortricid caused 100% defoliation of the aspen, balsam poplar and willow in the Toad, Racing MacDonnel River valleys in B.C. Slight defoliation and damage to similar hosts were also recorded at Fort Nelson, B.C., Lower Post, B.C. and Watson Lake in the Yukon Territory.

Leaf Beetles (Chrysomela sanguullis) were recorded in localized outbreak on cottonwood and willow host in the vicinity of the Alaska-B.C. border in the Klehini River valley and in small numbers at Dry Creek, Y.T. on willow hosts.

Chrysomela 4 quadriguttata- Adults and larvae of this chrysomelid were in localized outbreak in the Donjek River valley, Y.T. at mile 1146 Alaska Highway. Balsam poplar was the preferred host.

Adoxus obscurus adults were collected from willow host at Carcross, Y.T. and Haines, Alaska.

Red Alder Sawfly (Hemichroa crocea Four.) One larval specimen was found on mountain alder at Indian Creek near Crutch, B.C.

Spruce Budworm (Choristoneura fumiferana Clem.) Slight defoliation was caused by this tortricid on the merchantable Sitka spruce in the Klehini River Valley at the south end of the Chilkat Lake, in B.C.

Yellow-headed Spruce Sawfly (Pikonema alaskensis Roh.)

This sawfly appeared to be common throughout the spruce stands along the extend of the Alaska Highway. Larvae in small numbers were obtained from white spruce host at Dawson Creek, Crutch and Fort Nelson in B.C., at Marsh Lake, Whitehorse, Haines Junction, Kluane, Dry Creek and Snag in the Yukon. Larvae were also obtained from both Sitka and white spruce in the Chilkat Lake area of B.C.

Western Rusty Tussock Moth (Notolophus antiqua badia Hy. Edw.)

Larvae of this arctiid were collected from a willow host at Snag, Y.T.

Willow Leaf Beetle (Galerucella cavicollis Lec.) Small numbers of adult beetles were found on willow at Fort Nelson, B.C. and on dwarf willow

growth above timber line in the Chilkat Pass in B.C.

No larval specimens or evidence of attack were recorded for the following primary forest insect pests:

Hemlock looper	Lambdina fiscellaria lugubrosa Hist.
False hemlock looper	Nepytia canosaria Wlk.
Black headed budworm	Acleris variana Fern.
Hemlock sawfly	Neodiprion tsugae Midd.
European Spruce sawfly	Gilpinia hercyniae Htg.
Larch sawfly	Pristiphora erichsonii Htg.
Jack pine sawflies	Neodiprion banksianae Roh.
	Neodiprion swainei Midd.
	Neodiprion lecontei Fitch.

(c) Infestations

The existence of three Forest Insect Outbreaks were recorded in the area traversed by the Alaska Highway and adjoining roads. The location, extent and damage resulting from these infestations will be discussed under the following headings:

(i) Large Aspen Tortrix Outbreak

(ii) Alaska Spruce Beetle Outbreak

(iii) Spruce Budworm Outbreak

(i) Large Aspen Tortrix Outbreak

This tortricid (Archips conflictana Walk.) caused 100% defoliation of the poplar dominated forest growth in the valley bottom stands of the McDonnell, Racing and Toad Rivers in B.C. (Photo Nos. 52,53,54, and 55). Extending along both margins of the Alaska Highway from mile 414 to 427, this infestation involved an estimated area, visible from the highway of

6000 acres. The general location of this portion of the highway is latitude 58°-40' to 50' north and longtitude 125°0'-22' west as it crosses the northern terminal ranges of the Rocky Mountains. The timber type, mainly comprised of a dense deciduous growth with pure patchy coniferous growth intermingled, covers the valley bottoms and adjoining slopes to timberline at approximately 4500' elevation. Trembling aspen and balsam poplar form the dominant overstory and combine with willow sp. in the intermediate and understory of the deciduous stands. White spruce, Lodgepole pine and black spruce form the scattered coniferous growth. At the present time these stands have little or no value commercially other than the furnishing of sylvan landscaping for the highway traveller.

Defoliation of the aspen, balsam poplar and willow sp. was 100% in the valley bottom stands and extended up some of the adjoining slopes, particularly in the Toad River valley. Generally, however, the defoliation of the host trees on the valley slopes was 50% or less. Collections made on June 15th from host trees suffering 100% defoliation showed a high percentage of parasitism, the principal parasite being _Glypta fumiferanae_.

The following table gives the approximate percentage of parasitism found in larvae and pupae contained in collections sent to the Forest Insect Laboratory at Vernon, B.C.

Archips conflictana	Parasite		
Larvae and pupae	_Glypta fumiferanae_	_Diptera_	_Hymenoptera_
178	59	6	9

Total number of parasites 72

Approximate parasitic percentage 40.5%

1949 buds collected from three trees in August 24th showed no indication of egg masses. These buds were taken from the outer two feet of a limb at the base and mid-third of the tree as well as from the terminal two feet of tree leader.

(ii) Alaska Spruce Beetle Outbreak

Information regarding the present outbreak of the Alaska Spruce Beetle (Dendroctonus borealis Hopk.) was obtained from Mr. R. Jackson, Supt. Lands and Forests Division, Department of Mines and Resources at Whitehorse, Y.T. Mr. Jackson was contacted in an effort to gain some information for the cause of high white spruce mortality in the forest growth at the north end of the Chilkat Pass, Y.T. He attributed this mortality to the destructive attack of Dendroctonus borealis Hopk. The mortality was first noted in 1944 and insect samples were sent to the Forest Insect Laboratory at Vernon, B.C., these being identified as Dendroctonus borealis Hopk. Since 1944 this beetle outbreak has continued from the south end of Dezadeash Lake along the west lake margin in a general north-easterly direction. At the present time, Mr. Jackson reported active attack on white spruce seven miles southwest of Champagne, Y.T. in the Upper Dezadeash River valley.

Mortality ranges above 50% in the white spruce growth visible along the Haines cutoff highway. White spruce, stands thus attacked extends from timberline, approximately 3500' elevation at mile 89 on the Cutoff Highway northward to the south end of Dezadeash Lake at mile 127 (Photo Nos. 56-57).

Previously to interviewing Mr. Jackson dead white spruce in the area along the Haines Cutoff Highway were examined. Galleries found in the bark of these dead trees indicated previous bark beetle attack but no recent active attack was noted. Collection AK-179-48 contains preserved dead specimens found in the bark of dead white spruce in this area.

While some stands of relatively mature white spruce have suffered from this outbreak it is difficult to estimate the commercial value of the forest cover loss in this area, fuel cutting for one small summer camp being the only commercial cutting at the present time.

(iii) Spruce Budworm Outbreak

A light Spruce Budworm (Choristoneura fumiferana Clem.) outbreak was recorded in the coast type forest of merchantable Sitka spruce, western hemlock and cottonwood at the south end of the Chilkat Pass Area in B.C. (Photo Nos. 58,59,60, and 61.) This outbreak extended southward on the coastal slopes of the Pass from timberline at 3100' over the Alaska-B.C. border to tidewater at Haines Alaska and was confined to the east slope of the Klehini River valley. The spherical position of this infestation is latitude 59°30' north and longitude 136°27' west.

Feeding was relatively similar at all elevations, approximately 5% on 1948 buds. Sitka spruce was the preferred host but some feeding was noted on the western hemlock. Examination of the terminal twigs seemed to indicate that the spruce budworm population is on the increase in this area. It appears to have begun in 1946, with 2% defoliation in 1947 increasing to 5% in 1948.

This defoliation variation between 1947 and 1948 buds could, however, indicate a two year life cycle of the spruce budworm in this area. The lighter 2% defoliation in 1947 being caused by small early instar larvae and the 5% in 1948, the result of more vigorous feeding by larvae of later instars.

No other evidence or information could be obtained to substantiate this supposition of the presence of a two year life cycle, 1948 being the flight year.

Collections were made along the 15 miles of the forested area in the B.C. section of the Klehini River Valley. Pupae and a few late instar larvae were obtained from these beatings in mid-July but the principal indication of the high budworm population was the large numbers of adults present at that time.

(f) Important Contacts:

R. Jackson, Supt. Lands and Forest Division, Whitehorse, Y.T., Dept. of Mines and Resources.

R. Chambers, Game Warden, Lands and Forest Division, Dept. of Mines and Resources, Kluane Game Reserve, Y.T.

An interview with Mr. Jackson on August 6th proved beneficial both from the standpoint of information obtained in regard to the Alaska spruce beetle (Dendroctonus borealis Hopk.) outbreak in the Chilkat Pass-Dezadeash Valley area and his willing offer of future co-operation. Greatly interested in the present and future work of the Forest Insect Survey, Mr. Jackson will have his field staff of Park Wardens and Rangers make bi-monthly Forest Insect Collections. These collections, commencing in 1949, will be sent to the Forest Insect Laboratory at Vernon, B.C. for identification.

Mr. Chambers has offered to forward a report to the Forest Insect Investigations', Victoria Office in the spring of 1949 on the trend of the Klehini Valley spruce budworm (Choristoneura fumiferana Clem.) outbreak.

(1)Sikanni Chief River Valley (Mile 163 Alaska Highway)

(2) Sikanni Chief River Valley

Showing River erotion & rolling terrain west of Fort St. John, B.C.

(3) Sikanni Chief River Valley

Large hilltop muskeg area
(white spruce, black spruce,
tamarack & willow sp.)

(4) Prophet River Valley (Mile 240, Alaska Highway)

Showing more rough and broken
country west of Fort Nelson, B.C.

(5) Tetsa River Valley (Mile 360, Alaska Highway)

Rocky Mountain Foothills,
Summit Lake, B.C.

(6) Tetsa River Valley (Mile 390, Alaska Highway)

Looking South-East

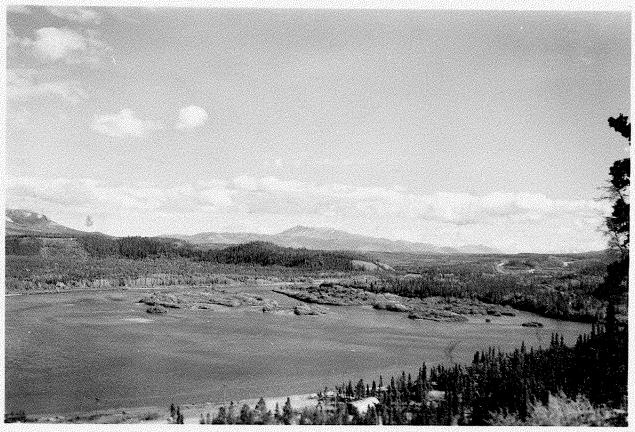
(7) Liard River Valley (Mile 626 Alaska Highway)

Looking East

(8) Liard River Valley (Mile 626 Alaska Highway)

Looking South

(9) Marsh Lake, Y.T. (Mile 883, Alaska Highway)

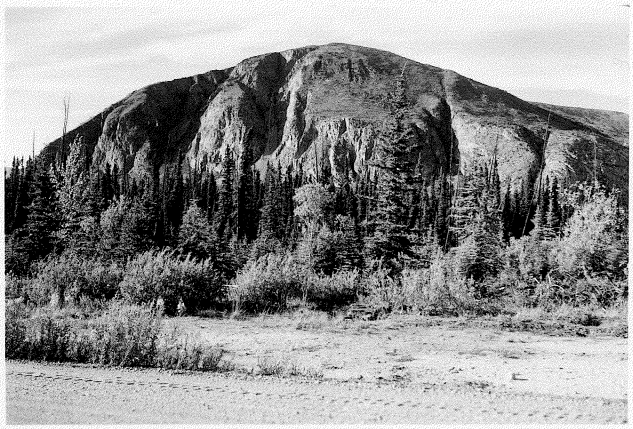


Showing Typical Depression-Like Valley and Barren Rounded Hills Whitehorse, Y.T.

(10) Lewes River Valley (Mile 918, Alaska Highway)

Showing St. Elias Range, Timberline, white spruce, aspen, poplar and open grassy prairie.

(11) Shakwak Valley (Mile 1010 Alaska Highway)



Showing typical rounded barren mountain of the Coast Range extensions.

(12) Canyon Creek, Y.T. (Mile 998 Alaska Highway)

Charle Lake, B.C. Mile 52, Alaska Highway.

(13) Fort St. John Lumber Co.

Lower Post, B.C. Mile 620, Alaska Highway.

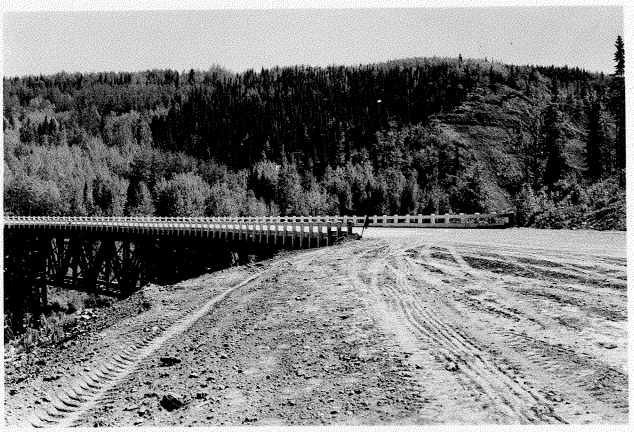
(14) Mill & Working Site.

Dawson Creek, B.C. (Kiskatinaw River Valley) Mile 20, Alaska Highway.

(15) Aspen poplar & white spruce stand.

Dawson Creek, B.C. (Kiskatinaw River Valley) Mile 20, Alaska Highway.

(16) Showing D.B.H. of Aspen Poplar-White Spruce Stand in Photograph No. 15. (Axe handle 18")

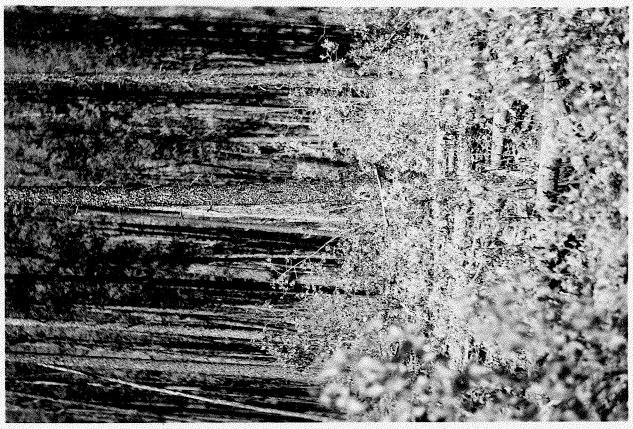


Dawson Creek B.C. Kiskatinaw River Valley Mile 20, Alaska Highway.

(17) Typical, small group, pure stand composition of the Peace River Area.

Blueberry, B.C. Mile 100 Alaska Highway.

(18) Lodgepole pine stand.



Blueberry, B.C. Mile 100, Alaska Highway.

(19) Showing D.B.H. of Lodgepole pine stand in Photograph No. 18. (Axe handle 18")

Fort Nelson, B.C. Mile 300, Alaska Highway.

(20) Showing D.B.H. of typical mixed stand (Axe handle 18")

Fort Nelson, B.C. Mile 300, Alaska Highway.

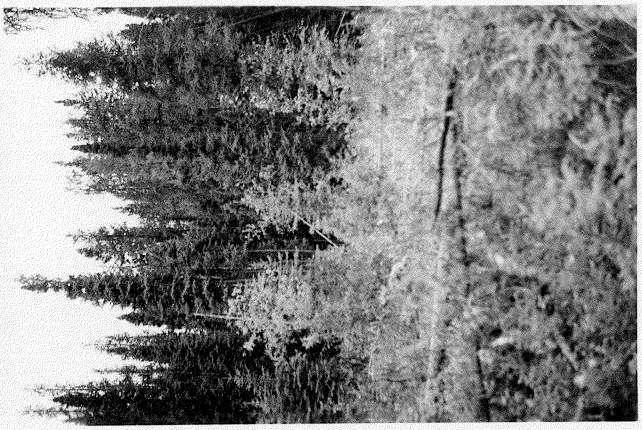
(21) White spruce stand with a small percentage of western white birch.

Fort Nelson, B.C. Mile 300, Alaska Highway.

(22) Aspen poplar, white spruce stand.

Fort Nelson, B.C. Mile 300, Alaska Highway.

(23) Aspen poplar, white spruce stand.



Indian Creek, B.C. Mile 233, Alaska Highway.

(24) Tamarack, black and white spruce stand.

Indian Creek, B.C. Mile 233, Alaska Highway.

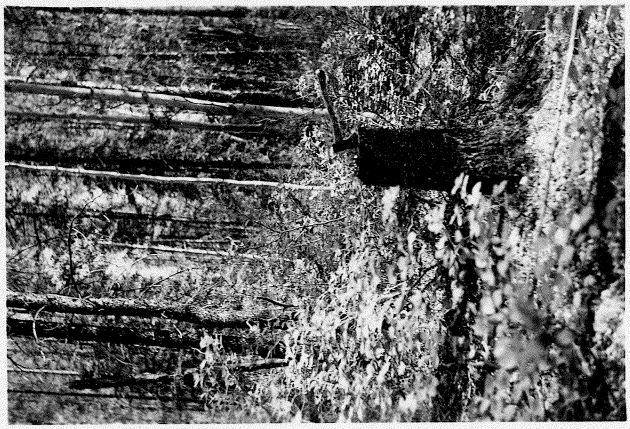
(25) Showing D.B.H. of stand in Photograph No. 24 and mountain alder understory (axehandle 18")

Fort Nelson, B.C. (Muska River Valley) Mile 298, Alaska Highway.

(26) Hybrid poplar stand

Fort Nelson, B.C. (Muska River Valley) Mile 298, Alaska Highway.

(27) Showing D.B.H. of stand in Photograph No. 26. (Axe handle 18")



Watson Lake, Y.T. Mile 632, Alaska Highway.

8) Mixed aspen, mountain alder, willow, white birch and white spruce. (Axe handle 18")

Lower Post, B.C. Mile 624, Alaska Highway.

9) Liard River Valley north-west view showing general forest growth of Section (ii)

Watson Lake, Y.T. Mile 632, Alaska Highway.

30) Pure Lodgepole pine regeneration on burned, sandy site.

Watson Lake, Y.T. Mile 640,
Alaska Highway.

) Typical pure Lodgepole pine stand on sandy dry site in the Liard River Valley (D.B.H. 3" to 4", height 30' to 40')

Rancheria, Y.T. Mile 710,
Alaska Highway.

2) Immature White spruce and Lodgepole pine.

Whitehorse, Y.T. Mile 916,
Alaska Highway.

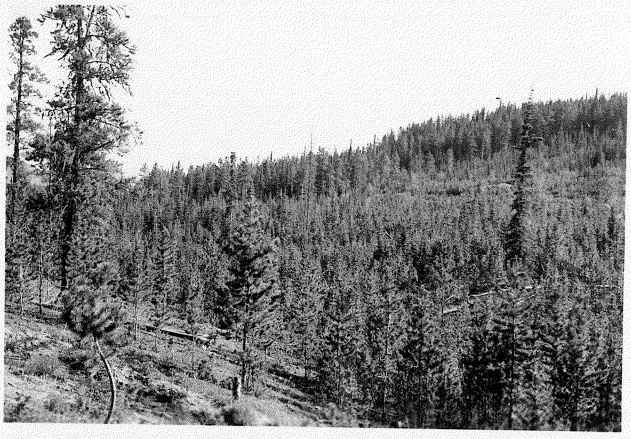
3) Mixed stand of white spruce, lodgepole pine, aspen & balsam poplar.

Whitehorse, Y.T. Mile 916, Alaska Highway.

34) Showing D.B.H. of overstory in stand in Photograph No. 33.

Whitehorse, Y.T. Mile 904, Alaska Highway.

35) Lodgepole pine regeneration on burned climax forest site.



Whitehorse, Y.T. Mile 904, Alaska Highway.

36) Lodgepole pine regeneration on burned climax forest site.

Whitehorse, Y.T. Mile 905, Alaska Highway.

37) Dominant white spruce growth with aspen poplar & lodgepole pine.

Marsh Lake, Y.T. Mile 883, Alaska Highway.

38) Uneven aged stand of white spruce with mountain alder, willow and white birch understory.

Marsh Lake, Y.T. Mile 883, Alaska Highway.

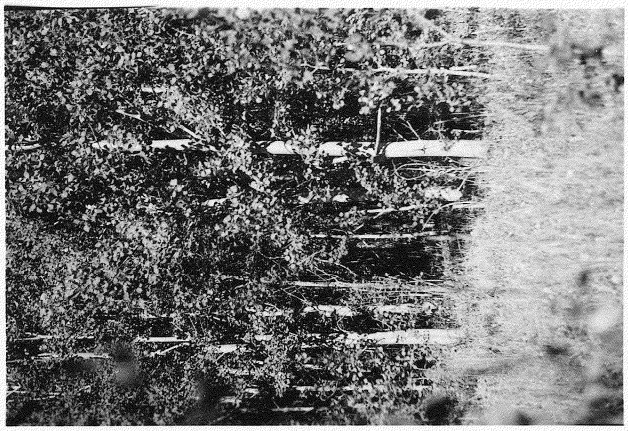
39) Showing D.B.H. of stand in photograph No. 38 (axe handle 18")

Haines Junction, Y.T. Mile 1019, Alaska Highway.

(40) General forest cover showing open grass prairie, poplar growth, white spruce cover slopes & timberline of section (iv)

Haines Junction, Y.T. Mile 1019, Alaska Highway.

(41) Aspen Grove



Haines Junction, Y.T. Mile 1019, Alaska Highway.

(42) Showing D.B.H. of stand in photograph No. 41 (axe handle 18")

Mile 1121, Alaska Highway.

(43) Donjack River Valley, looking north, showing light regeneration over old burn and typical barren hills.

Destruction Bay, Y.T. Mile 1083, Alaska Highway.

(44) Site of heavy burn, showing scrub willow and dwarf birch regeneration and surviving balsam and aspen poplar.

Destruction Bay, Y.T. Mile 1083, Alaska Highway.

(45) White and black spruce growth on site of old burn.

Snag Airport, Y.T. Mile 4, Airport Road.

(46) Surviving and regeneration forest cover on 11 year old burn.

Snag Airport, Y.T. Mile 4, Airport Road.

(47) Aspen poplar, balsam poplar, Alaska white birch & willow regeneration on 11 year old burn.

Dry Creek, Y.T. Mile 1190, Alaska Highway.

(48) General forest cover, showing open growth black spruce, aspen poplar and willow.

Dry Creek, Y.T. Mile 1190, Alaska Highway.

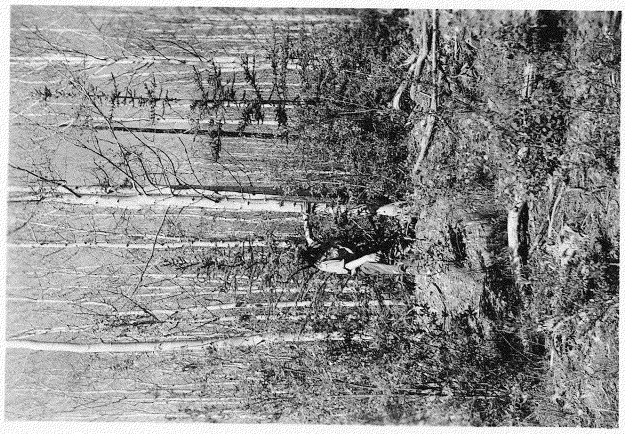
(49) Sparse, open growth forest of muskeg and bog site.

Dry Creek, Y.T. Mile 1180, Alaska Highway.

(50) "Niggerhead" muskeg area showing typical black spruce forest growth.

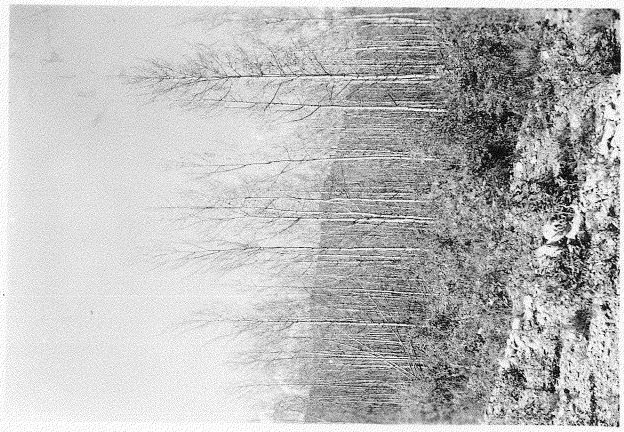
Dry Creek, Y.T. Mile 1180, Alaska Highway.

(51) General view to southwest, Dry Creek area.



McDonnell River Valley, B.C.
Mile 415, Alaska Highway.
Large aspen tortrix infestation.

(52) Showing stand density and D.B.H. of 100% defoliated growth.



McDonnell River Valley, B.C.
Mile 415, Alaska Highway.
Large aspen tortrix infestation.

(53) 100% defoliated poplar overstory.

McDonnell River Valley, B.C.
Mile 415, Alaska Highway.
Large aspen tortrix infestation.

(54) General view to the west showing 100% defoliation extending along the Racing River Valley.

McDonnell River Valley, B.C.
Mile 418, Alaska Highway.
Large aspen tortrix infestation.

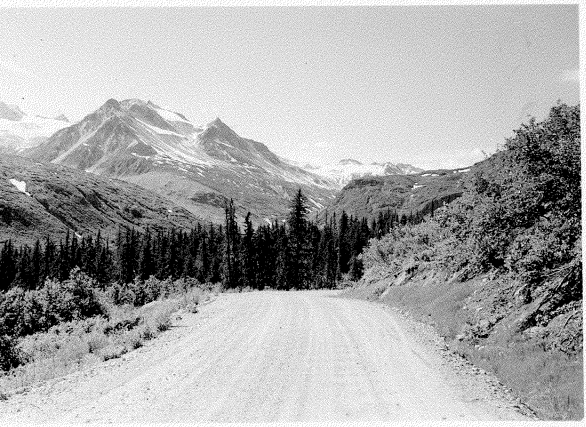
(55) General view to the north-east showing extensive area of defoliated poplar with patchy white spruce intermingled.

Chilkat Pass, B.C. Mile 91,
Haines Cutoff Highway.

(56) White spruce stand showing high tree mortality (see text Alaska spruce beetle outbreak)

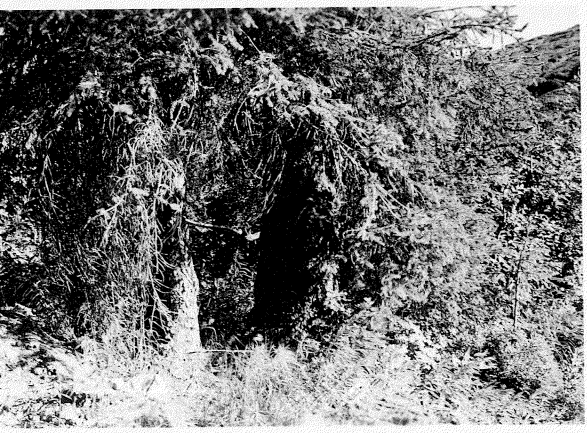
Chilkat Pass, B.C. Mile 91,
Haines Cutoff Highway.

(57) Showing extent of stand in photograph No. 56.



Chilkat Pass, B.C. Mile 59, Haines Cutoff Highway. Spruce budworm outbreak.

itka spruce and western hemlock stand of the Klehini River Valley. ooking west from timber line.



Chilkat Pass, B.C. Mile 56, Haines Cutoff Highway. Spruce budworm outbreak.

howing D.B.H. of stand in photograph No. 58 (axe handle 18")

Chilkat Pass, B.C. Mile 59, Haines Cutoff Highway. Spruce budworm outbreak.

itka spruce and western hemlock stand of the Klehini River Valley. ooking south from timber line.

Chilkat Pass, B.C. Mile 59, Haines Cutoff Highway. Spruce budworm outbreak.

) Open growing white spruce and mountain alder. Eastern timber line margin of the Klehini River Valley.

Chilkat Pass, B.C. Mile 66, Haines Cutoff Highway.

) Dwarf birch and willow growth above timber line, Chilkat Pass Summit, elevation 4100', aspect west.

Chilkat Pass, B.C. Mile 72, Haines Cutoff Highway.

) Dwarf birch and willow growth above timber line, aspect north east, elevation 3500'.

Watson Lake, Y.T. Mile 627 Alaska Highway.

(64) Typical variation of forest growth caused by site conditions. Tamarack, black and white spruce on the lower level, aspen poplar on the higher dry slope.

Carcross, Y.T. Mile 1, Carcross Road.

(65) Open growing lodgepole pine on extremely dry sandy site.

Rancheria, Y.T. Mile 720, Alaska Highway.

(66) General view of forest cover, Upper Rancheria River Valley, aspect southwest.

Rancheria, Y.T. Mile 687, Alaska Highway.

(67) White spruce stand, Lower Rancheria River Valley.

Haines Junction, Y.T. Mile 1016, Alaska Highway.

(68) Upper Alsek River Valley, looking east to Coast Mountains from Mile 5, Haines Cutoff Highway.

Pacific 1948 Coast Insect and Disease Species Index