



ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
PRINCE RUPERT DISTRICT

1966

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FOREST RESEARCH LABORATORY
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MAY, 1967

FOREST INSECT AND DISEASE SURVEY

BRITISH COLUMBIA

1966

PRINCE RUPERT FOREST DISTRICT

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PRINCE RUPERT FOREST DISTRICT

S. J. Allen^{1/}

There was a complete changeover of personnel in the Prince Rupert District in 1966. S. J. Allen replaced D. H. Ruppel in West Prince Rupert District, J. S. Monts replaced A. K. Jardine in the East Prince Rupert District and M. Bedford took over the survey of the South Prince Rupert District.

Aircraft were used to assist in the detection survey of the South Prince Rupert District and inaccessible areas north of Prince Rupert and Queen Charlotte Islands.

East and West Prince Rupert rangers collaborated in aerial surveys, damage appraisal plot examinations and for the survey of Tweedsmuir Park lakes in early August.

Field headquarters of the East Prince Rupert District was moved from Babine Lake to a more central and convenient location on the Experimental Farm near Smithers.

Spruce beetle attacks were at a low level and balsam mortality decreased noticeably in 1966 in East Prince Rupert District although some activity was still evident.

Spruce tip moth attacks on Queen Charlotte Islands were very light in 1966.

Western hemlock mortality from an unknown cause was recorded on an area at Kleanza Creek near Terrace.

^{1/} Forest Research Technician, Forest Insect and Disease Survey, Senior Ranger, Victoria, B. C.

HOST TREE ABBREVIATIONS

<u>Abbrev.</u>	<u>Common name</u>	<u>Abbrev.</u>	<u>Common name</u>
A or Po	aspen or poplar - general	F	fir - general
tA	trembling aspen	alF	alpine fir
b Co	black cottonwood	aF	amabilis fir
Al	alder	H	hemlock - general
B	birch - general	wH	western hemlock
wB	white birch	mH	mountain hemlock
C	cedar - general	L	larch - general
wC	western red cedar	-L	miscellaneous larch
yC	yellow cedar	P	pine - general
D	Douglas-fir	lP	lodgepole pine
		sP	shore pine
		whP	white bark pine
		pP	ponderosa pine
		-P	miscellaneous pines
		S	spruce - general
		wS	white spruce
		sS	Sitka spruce
		-S	miscellaneous spruce

FOREST INSECT AND DISEASE SURVEY

WEST PRINCE RUPERT DISTRICT

1966

FOREST INSECT AND DISEASE SURVEY

WEST PRINCE RUPERT DISTRICT

1966

S. J. Allen

INTRODUCTION

Survey work in the West Prince Rupert District commenced on June 7 after the new field station at Smithers was prepared for occupancy. There were no serious outbreaks of insects or diseases in the District in 1966 but appraisal of plots in recent outbreaks was continued.

Totals of 327 forest insect and 56 forest disease collections were taken during the season. Table 1 lists collections by host and Maps 1 and 2 show locations where collections were taken. Table 2 lists insect and disease problems.

Table 1
Collections by Hosts
West Prince Rupert District, 1966

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Cedar, western red	17		Alder, mountain	1	
Douglas-fir	2	7	Alder, red	3	3
Fir, alpine	26	2	Alder, Sitka	1	
Fir, amabilis	23	4	Apple species	1	
Hemlock, mountain	4		Aspen, trembling		2
Hemlock, western	150	8	Birch, western white		2
Larch, European		2	Cottonwood, black	3	
Pine, lodgepole	5	1	Dogwood, redosier	1	
Pine, ponderosa		1	Poplar, miscellaneous	1	6
			Willow	1	1
Spruce, Sitka	71	6	No host	3	
Spruce, western white	10		Miscellaneous	3	11
Totals	308	31	Totals	18	25
GRAND TOTALS				326	56

Defoliators

Green-striped Forest Looper, Melanolophia imitata Wlk.

Green-striped forest looper populations in the District remained at a low level in 1966 (Table 3). No larvae were found on the Queen Charlotte Islands. Seven study plots established on the Queen Charlotte Islands during the infestation of 1964 were examined for defoliation and top-kill during September, 1966 (Table 4). Top-kill and mortality were present in plot 1 and trees in the other six plots showed vigorous recovery in the form of new foliage growth.

Table 2
Currently Important Insect and Disease^{1/} Problems
by Drainage Divisions
West Prince Rupert District
1966

Insect and disease problems	Principal host(s) ^{2/}	Importance by ^{3/} drainage divisions						
		100	101	102	103	104	105	106
DEFOLIATORS								
Green-striped forest looper	wH, wC, D, sS, aF, alF	2	2	1	1	1	1	1
Western hemlock looper	wH, wC, sS, aF, alF, D	0	0	2	1	2	2	2
Black-headed budworm	wH, sS, aF, alF	1	2	2	1	1	2	2
FOLIAGE DISEASES								
<u>Melampsora</u> rusts on Douglas-fir XPs	D	0	0	0	0	4	0	0

^{1/} Includes only weather-induced and foliage diseases subject to notable annual fluctuation.

^{2/} Refer to host code in Forest District Introduction.

^{3/} High population and/or widespread outbreak in progress - 5
Scattered high population and/or significant damage in restricted areas - 4
Rising population and/or moderate numbers of insects and/or potential problem - 3
Static or falling population and/or no potential problem - 2
Endemic population and/or no significant damage - 1

Table 3

Summary of Green-striped Forest Looper Collections by Drainage Divisions,
West Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
100	27	24	31	3.7	0	0	1.0	-	-
101	31	42	31	29.0	0	0	133.7	-	-
102	14	9	13	64.3	11.1	15.4	3.0	1.0	1.0
103	7	20	26	0	0	0	-	-	-
104	5	12	13	0	0	7.7	-	-	1.0
105	8	9	9	37.5	22.2	11.1	1.7	1.0	1.0
106	43	15	45	7.0	6.7	2.2	1.7	3.5	1.0
Totals	135	131	168	18.5	3.1	3.0	49.6	1.6	1.0

Table 4

Ocular Estimate by Crown Classes, of Defoliation, Top-kill, and Mortality
Caused by Green-striped Forest Looper, Queen Charlotte Islands

Plot	Crown class	Tree sp.	No. trees	Defoliation			Top-killed '66		Dead/ '66	
				1964	1965	1966	No.	Av.ft.	insects	other
1	D	wC	34	98	91	33	5	8	18	0
Port Clements west end of Lot 1828		wH	27	91	81	25	10	13	7	0
	CD	wC	18	98	93	33	2	8	9	0
		wH	16	97	89	32	6	14	6	0
	I	wC	23	97	93	56	1	12	10	0
		wH	15	90	83	27	3	15	2	0
	S	wC	33	92	90	52	2	20	12	0
		wH	18	85	78	23	0	---	1	0
	Totals		184	94	86	36	29	12	65	0
2	D	wH	15	60	44	2	0	---	0	0
Port Clements Masset Road Lot 412	CD	wC	1	63	63	0	0	---	0	0
		wH	17	51	37	1	0	---	0	0
	I	wH	12	39	25	3	0	---	0	0
	S	wC	4	46	33	0	0	---	0	0
		wH	7	43	30	5	0	---	0	0
Totals			56	50	36	2	0	---	0	0

Table 4 - Cont'd

Plot	Crown class	Tree sp.	No. trees	Defoliation			Top-killed'66		Dead/'66	
				1964	1965	1966	No.	Av.ft.	insects	other
3	D	wC	11	49	41	3	0	---	0	0
Port Clements		wH	7	57	52	23	2	12.5	0	0
Masset Road	CD	wC	2	55	50	0	0	---	0	0
Lot 424		wH	9	69	57	22	2	12	0	0
	I	wC	1	30	25	0	0	---	0	0
		wH	7	55	50	13	0	---	0	0
	S	wC	1	50	45	0	0	---	0	0
		wH	25	47	45	17	1	4	1	1
Totals			63	53	47	10	5	10.6	1	1
4	D	wC	4	37	21	0	0	---	0	0
Port Clements	CD	wC	5	57	42	7	0	---	0	0
Masset Road		wH	8	51	34	0	0	---	0	0
Lot 404	I	wC	4	42	35	6	0	---	0	0
		wH	42	45	32	3	0	---	0	0
	S	wC	1	75	46	0	0	---	0	0
		wH	19	48	36	2	0	---	0	0
Totals			83	47	33	3	0	---	0	0
5	D	wC	3	37	28	0	0	---	0	0
Port Clements		wH	1	40	32	2	0	---	0	0
Masset Road	CD	wC	6	46	38	0	0	---	0	0
E. end		wH	7	43	36	3	0	---	0	0
Lot 1828	I	wC	13	45	36	5	0	---	0	0
		wH	45	39	38	2	0	---	0	1
	S	wC	4	40	31	3	0	---	0	0
		wH	25	34	31	6	0	---	0	0
Totals			104	39	35	3	0	---	0	1
6	D	wC	7	30	21	7	0	---	0	0
Port Clements		wH	5	30	13	2	0	---	0	0
Tlell Road,	CD	wH	17	29	18	0	0	---	0	0
approx. 2½ mi.	I	wC	6	36	29	5	0	---	0	0
SE./Port		wH	28	32	20	2	0	---	0	0
Clements	S	wH	29	23	17	2	0	---	0	1
Totals			92	29	18	2	0	---	0	1
7	D	wC	14	26	0	0	0	---	0	0
S. end of		wH	13	16	0	0	0	---	0	0
Mayer Lake	CD	wC	13	26	0	0	0	---	0	0
		wH	10	25	0	0	0	---	0	1
	I	wC	20	29	0	0	0	---	0	0
		wH	5	23	0	0	0	---	0	1
	S	wC	12	24	0	0	0	---	1	0
		wH	4	25	0	0	0	---	0	0
Totals			91	25	0	0	0	---	1	2

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hulst)

The hemlock looper population increased slightly in 1966 in the Terrace-Kitimat area and Skeena and Nass River valleys (Drainage Divisions 102, 105 and 106) (Table 5). A total of 21 positive collections contained 36 larvae compared to 9 collections containing 14 larvae in 1965.

Table 5

Summary of Western Hemlock Looper Collections by
Drainage Divisions, West Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
100	27	24	31	0	0	0	--	--	--
101	31	40	31	0	2.5	0	--	1.0	--
102	14	30	13	7.1	3.3	30.8	1.0	1.0	2.9
103	7	42	27	0	0	3.7	--	--	1.0
104	6	55	36	0	5.5	11.1	--	2.7	1.6
105	8	70	53	12.5	4.3	3.8	1.0	1.0	2.3
106	45	49	70	4.4	2.0	14.3	1.0	1.0	1.5
Totals	138	310	261	2.9	2.9	8.1	1.0	1.6	1.8

Black-headed Budworm, Accleris variana (Fern.)

The black-headed budworm population increased slightly over the 1965 population in Drainage Divisions 101, 102, 105 and 106 (Table 6).

Table 6

Summary of Black-headed Budworm Collections by Drainage Divisions,
West Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
100	27	24	37	0	0	0	---	---	---
101	32	42	37	3.1	0	5.4	1.0	---	2.3
102	14	9	30	7.1	11.2	3.3	1.0	1.0	3.5
103	7	6	29	0	0	0	---	---	---
104	2	8	22	0	0	0	---	---	---
105	0	0	18	---	---	5.5	---	---	1.0
106	30	15	62	13.5	0	4.8	1.5	---	1.8
Totals	112	104	235	5.4	1.0	3.0	1.3	1.0	2.1

Other Noteworthy Insects

Balsam Mortality Caused by Dryocoetes-Ceratocystis Complex

No sign of current balsam mortality was recorded in the Bell-Irving River Valley where extensive mortality was recorded during 1965 air surveys. Balsam mortality has been recorded in this area for two decades and has resulted from a number of factors including attack by insects and disease following predisposition by overmaturity, drought or winter damage.

Spruce Terminal Damage

During 1966 terminal damage on Sitka spruce reproduction at Sandspit was reduced to a minimum with only an occasional leader showing damage. Lateral damage caused by Zeiraphera sp., Rhabdophaga sp. and bud damage from late frost in April was more noticeable in 1966. However, new buds flushed and resumed normal lateral growth.

Similar damage occurred in the Juskatla area where about 5% of the 1966 terminals had been snipped off with a clean cut between the node and the tip by an unknown agent.

The tendency of this tree species to outgrow leader damage and to develop new leaders and laterals has been evident in advanced reproduction stands at Sandspit, Skidegate Lake and Juskatla. Former terminal damage calloused over and the trees maintained good form. Plots at Skidegate Narrows, Maude Island and Skidegate Lake were dropped in 1966 since the trees had grown to large to examine properly.

Aspen leaf miner Phyllocnistis populiella (Chamb.)

In most areas there was a decline in the number of aspen leaf surfaces infested on individual trees but a marked increase in the number of insects per leaf (Table 7). Cocoon parasitism and adult emergence varied little from last year (Table 8).

Table 7

Aspen Leaf Surfaces Mined and Number of Adults Produced per 100 Leaf Surfaces, West Prince Rupert District

Plot location	Total number of leaves			Percentage of leaf surfaces mined			No. of cocoons per 100 leaf surfaces		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
Cedarvale	624	390	456	16.1	65.0	22.4	10	55	47
Oliver Cr.	579	484	509	55.8	81.7	33.0	5	58	61
Terrace	636	454	344	93.2	38.9	36.3	45	7	121
Beam Stn. Rd.	669	645	521	41.0	49.5	9.4	47	2	34
Averages	627	494	457	51.5	64.0	24.3	27	30	66

Table 8

Mortality of Aspen Leaf Miner in 100-cocoon Samples at Four Locations, West Prince Rupert District

Plot location	% Emerged			% Parasitized			% Dead		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
Cedarvale	19	48	44	45	36	42	36	16	21
Oliver Cr.	36	49	38	23	20	58	41	31	4
Terrace	64	18	17	16	55	55	20	27	7
Beam Stn. Rd.	63	6	32	14	57	38	23	37	27
Averages	45.5	30.2	32.8	24.5	42.2	48.2	30.0	27.7	14.2

Table 9

Other Insects of Current Minor Significance

Insect	Hosts	Locality	Remarks
<u>Choristoneura fumiferana</u> (Clem.) spruce budworm	alF, wH, sS	Kitimat and Cedarvale	Defoliator, drop from 1965, found singly in three samples.
<u>Epirrita autumnata</u> (Gn.) Green velvet looper	wH, aF, alF	Throughout District	Defoliator, light population found in 31 collections.
<u>Malacosoma disstria</u> Hbn. Western tent caterpillar	-----	None	Defoliator, none seen in 1966, one web seen in 1965.
<u>Neodiprion</u> spp. Sawflies	wH, aF, alF, sS, lP	Throughout West Prince Rupert District	Defoliator, small numbers, similar to 1965.
<u>Neomyzaphis abietina</u> (Wlk.) Spruce aphid	sS	Queen Charlotte Islands, Nass R.	Sucking insect, very light attack, some association with foliage disease <u>Lophodermium</u> sp.
<u>Nyctobia limitaria</u> (Wlk.) Yellow-lined forest looper	wH, aF, alF, sS, wC	Throughout District	Defoliator, small numbers, slight increase over 1965.
<u>Pikonema alaskensis</u> Roh. Yellow-headed spruce sawfly	sS, wS	Coastal areas and Queen Charlotte Islands	Defoliator, very light population similar to 1965.
<u>Pikonema dimmockii</u> Cress. Green-headed spruce sawfly	sS, wS	Throughout District	Defoliator, very light population similar to 1965.
<u>Pineus</u> spp. Aphids	sS	Erlandsen Cr. and Juskatla	Sucking insect, similar appearance to Balsam woolly aphid, <u>Adelges piceae</u> Ratz., on bark, -(stem attack).
<u>Zeiraphera</u> sp. A spruce tip moth	sS, wS	Terrace-Skeena Crossing	Defoliator, small numbers, None found on Queen Charlotte Islands in 1966.

FOREST DISEASE CONDITIONS

Currently Important Diseases

Hemlock Mortality

Dying hemlock reported by the Rayonier Company Forester in the Sewell Inlet - Tasu Sound area was checked from the air during September. Many snags in the area indicated that the timber had been dying for some time, probably from decadence and weakening by black-headed budworm attacks from 1954 to 1958. There was a small amount of dying hemlock and some western red cedar with reddening foliage. Trees along the drier ridges appeared to be suffering from drought conditions. A ground check of the area was not made.

At Kleanza Creek near Terrace, 27% of the western hemlock on a small area had been killed as a result of unknown causes. Of 78 trees checked, 21 were dead and 20 had lost all but their upper crown foliage. Some of the trees which were 100% defoliated still had living moist sapwood and phloem. Old mycelial fans of Armillaria mellea (Fr.) Kummer were present on the roots and stem. Branch cankers associated with Caliciopsis pseudotsugae Fitzp. and Botryosphaeria tsugae Funk were found on branches of living and dead trees. These latter two fungi are secondary agents which reflect the non-vigorous condition of the host.

Exotic Plantations

Twenty-eight exotic plantations were examined in 1966 for symptoms of disease. Ten plantations were Douglas-fir, six European larch, one Japanese larch, seven hybrid poplars, two yellow pine, two red pine and one western white spruce. The species most subject to attack by disease were Douglas-fir and the hybrid poplars planted throughout Erlandsen Creek, Nelson River and Nass River plantation areas. In 1966, Douglas-fir plantations showed a marked recovery from dieback caused by Sclerophoma sp. in 1964 and 1965. Trees in these plantations showed good form and growth in 1966. No signs of new attack were found. During the early part of August, the 1966 foliage of 90% of the Douglas-fir saplings in the Nelson River and Erlandsen Creek plantations was infected with rusts caused by Melampsora occidentalis Jacks. and M. medusae Theum. The alternate host of M. medusae, trembling aspen, Populus tremuloides, was also infected in the Nelson River area.

Exotic hybrid poplars were attacked by wilt and dieback diseases as in previous years and although their lineal growth normally is greater than that of the native black cottonwood, they were killed back so often that their growth rate was seriously retarded and about 5% of the stems were killed.

Both European and Japanese larch plantations appeared in good condition, especially where willow and aspen formed a shield against the elements. Where the latter tree species were scarce, the larch saplings suffered from whipping, snow bending and some breakage. No harmful organisms were found on Larix species plantations this year.

Table 10 shows the diseases found in exotic plantations.

Table 10
Exotic Plantation Examinations, West
Prince Rupert District, 1966

XP no.	Location	Exotic Species	Remarks
124	W. Kalum Nursery	<u>Populus 'Regenerata'</u>	24% of trees infected by <u>Cryptosporium</u> sp.
126A	Nelson R.	Douglas-fir	90% of trees infected by <u>Melampsora medusae</u> Thuem.
126B	Nelson R.	Douglas-fir	94% of trees infected by <u>M. medusae</u>
127	Erlandsen Cr.	Douglas-fir	90% of trees infected by <u>M. occidentalis</u> Jacks.
128	Nelson R.	Douglas-fir	90% of trees infected by <u>M. medusae</u>
160	Nelson R.	Douglas-fir	Dieback and infection by <u>M. medusae</u>
209	Nass R.	<u>Populus 'Regenerata'</u>	Dieback caused by <u>Melanconium</u> sp.
210	Nass R.	<u>P. 'Regenerata'</u>	Dieback caused by <u>Crypto-</u> <u>sporium</u> sp.
211	Nass R.	<u>P. 'Robusta' Bachelieri</u>	Dieback caused by <u>Melan-</u> <u>conium</u> sp.
212	Nass R.	<u>P. 'Robusta' Issendorf'</u>	Canker caused by <u>Cytospora</u> sp.
232	Nelson R. (bridge)	<u>Populus</u> sp.	Dieback caused by <u>Melan-</u> <u>conium</u> sp.

Other Noteworthy Diseases

Table 11

Other Diseases of Current Minor Significance

Organism and disease	Hosts	Locality	Remarks
<u>Chrysomyxa ledicola</u> Lagerh. Rust disease	sS	Sandspit and Prudhomme L.	Alternate host Labrador tea, light occurrence.
<u>Gymnosporangium nootkatense</u> Arth. Rust disease	Mountain ash	Skeena Station	Also found on yellow cedar, light occurrence
<u>Hypoderma robustum</u> Tub. A needle cast	aF	Shames R.	Associated with defoliation of 1965 needles.
<u>Lophodermium macrosporum</u> (Hartig) Rehm Twig dieback	sS	Juskatla and Yakoun R.	Found in association with spruce aphid feeding.
<u>Melanconium</u> sp. dieback of branches	wB	Coyote Cr.	Dieback on main stem and branches, (new host record).
<u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb. ?Dieback of branches	wH	Ishkheenickh R.	Associated with yellowing of foliage on under-branches.

WEST PRINCE RUPERT
DISTRICT (MAINLAND)

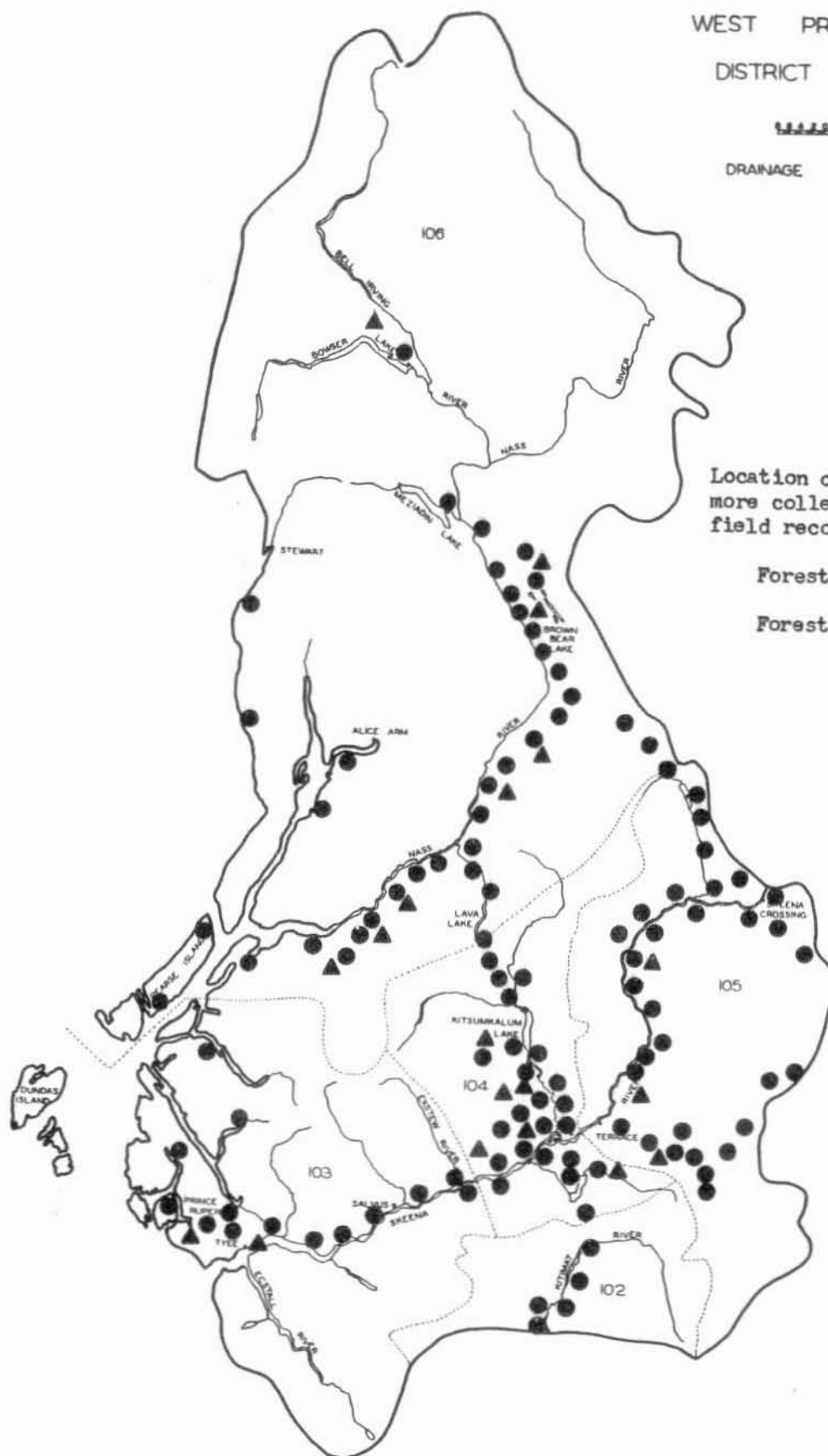


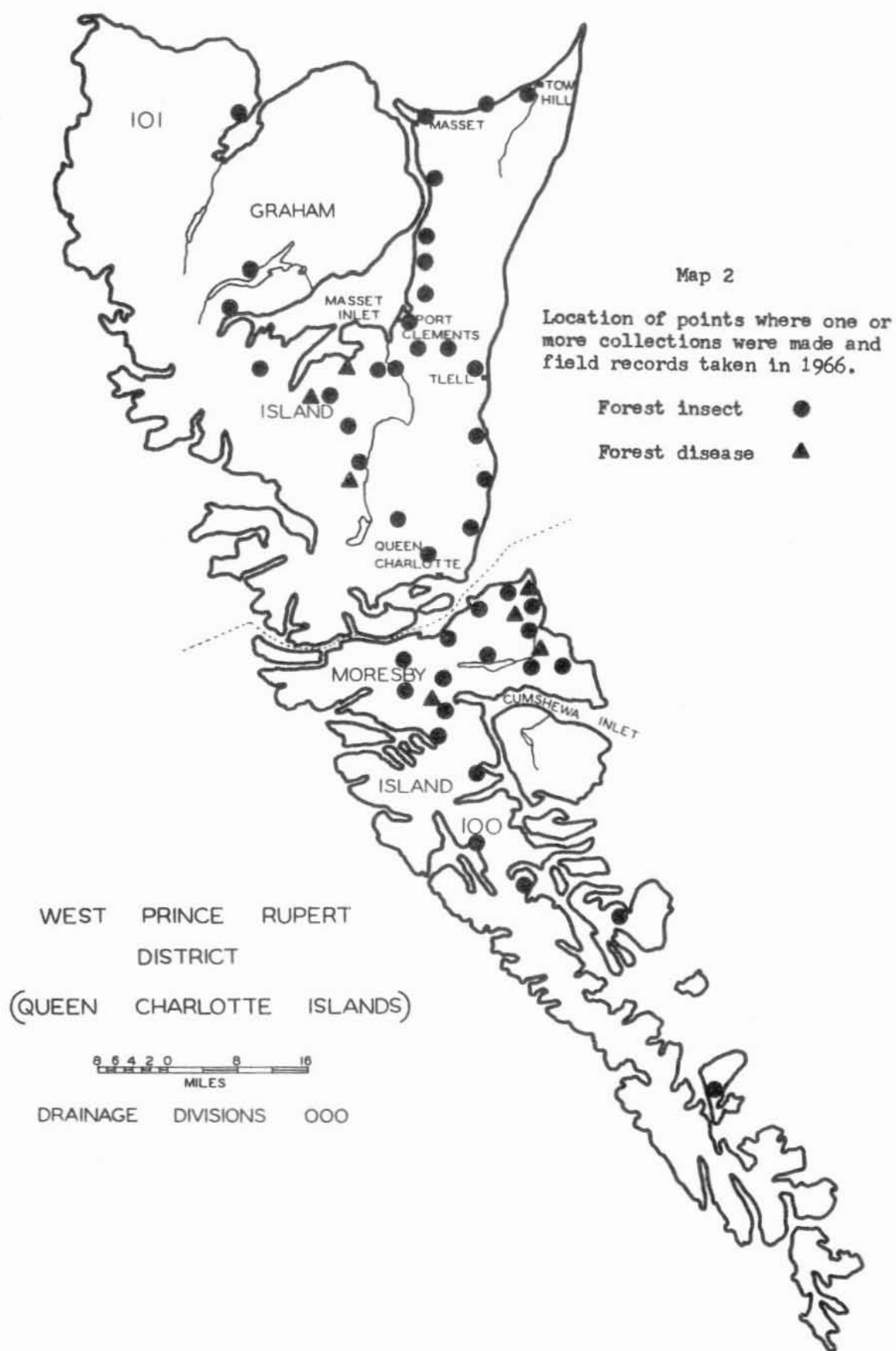
DRAINAGE DIVISIONS 000

Map 1

Location of points where one or more collections were made and field records taken in 1966.

Forest insect ●
Forest disease ▲





FOREST INSECT AND DISEASE SURVEY

SOUTH PRINCE RUPERT DISTRICT

1966

FOREST INSECT AND DISEASE SURVEY

SOUTH PRINCE RUPERT DISTRICT

1966

M. R. Bedford^{1/} and D. S. Ruth^{2/}

INTRODUCTION

The 1966 Forest Insect and Disease Survey of the District was carried out between July 6 and July 20. A float-equipped aircraft was used to cover the coastal area and a truck for the Bella Coola Valley.

The insect population generally was at a low level throughout the District. A total of 191 forest insect and 15 forest disease collections was submitted to the Victoria Laboratory.

Insect and disease collections by hosts are shown in Table 1. The location of collections and Drainage Division boundaries are shown on Map 1. Principal insect and disease problems in each Drainage Division are shown in Table 2.

^{1/} Forest Research Technician, Forest Insect and Disease Survey Ranger, Victoria.

^{2/} Forest Research Technician, Entomology Section, Victoria.

Table 1

Collections by Hosts

South Prince Rupert District, 1966

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Cedar, western red	32	1	Alder, green	2	
Cedar, yellow	2		Alder, red	4	2
Douglas-fir	22	3	Ash, western	1	
Fir, alpine	2		mountain		
Fir, amabilis	10	3	Cottonwood, black	2	
Fir, grand	1		Crabapple, Pacific	1	
Hemlock, western	57	1	Maple, species	1	
Pine, lodgepole	7	1	Willow, species	5	
Pine, whitebark	1	1	Miscellaneous	1	1
Pine, shore	1	1	No host	2	
Spruce, Sitka	36	1			
Spruce, white	1				
Totals	172	12	Totals	19	3
			GRAND TOTALS	191	15

Table 2
Currently Important Insect and Disease^{1/} Problems
by Drainage Division
South Prince Rupert District, 1966

Insect and disease problems	Principal hosts ^{2/}	Importance by drainage divisions ^{3/}			
		080	081	082	083
DEFOLIATORS					
Green-striped forest looper	wC, D, wH	-	3	2	3
Spruce budworm	sS	-	-	-	3
Western hemlock looper	wC, wH, S	-	3	3	-
TERMINAL BORERS					
Spruce weevil	S	-	-	3	-
WEATHER DAMAGE					
Frost damage	wC	-	-	4	-

- ^{1/} Includes only weather-induced and foliage diseases subject to notable annual fluctuation.
- ^{2/} Refer to host code in Forest District introduction.
- ^{3/} High population and/or widespread outbreak in progress - 5.
Scattered high populations and/or significant damage in restricted areas - 4.
Rising population and/or moderate numbers of insects and/or potential problem - 3.
Static or falling population and/or moderate numbers and/or no problem at present - 2.
Endemic population and/or no significant damage - 1.
Not sampled and/or no host and/or not found - 0.

FOREST INSECT CONDITIONS

Currently Important Insects

Defoliators

Green-striped Forest Looper, Melanolophia imitata Wlk.

There was a slight increase in the population of the green-striped forest looper over the previous year. The majority of larvae were found in D. D. 082. Forty larvae were taken in 21 positive collections.

Spruce Budworm, Choristoneura fumiferana (Clem.)

The population of spruce budworm remained low in 1966. Eight larvae were collected from one positive sample of Sitka spruce west of Bish Creek, south-west of Kitimat on the north-west side of Douglas Channel.

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hulst.)

The population of western hemlock looper increased slightly compared with 1965. Eight larvae were taken in thirty-one positive collections, mostly in Drainage Division 082.

Terminal Borers

Spruce Weevil, Pissodes sitchensis (Hopk.)

Approximately 40% of the Sitka spruce regeneration near Hagensborg and in the lower Salloomt Valley near Bella Coola were attacked by the spruce weevil in 1966. Some of the larger trees which had been attacked in previous years had grown multiple leaders.

Table 3

Other Noteworthy Insects

Other Insects of Current Minor Significance

Insects	Hosts	Locality	Remarks
<u>Acleris variana</u> (Fern.) Black-headed budworm	H, 1P, W	South Bentinck Arm and Bella Coola Valley	Defoliator, population at low level in 1966. Seven larvae were collected from 3 positive samples.

Table 3 - Continued

Other Insects of Current Minor Significance - Continued

Insects	Hosts	Locality	Remarks
<u>Adelges cooleyi</u> (Gill) Cooley spruce gall aphid	D, S	Bella Coola Valley	Sucking insect prevalent on needles of Douglas-fir. Causes galls on alternate host spruce.
<u>Ectropis crepuscularia</u> (Schiff.) Saddle-backed looper	wC, bF, wH, S	Smith Inlet, Salloomt Valley	Defoliator, 11 larvae collected from 6 positive samples.
<u>Lithocolletis</u> <u>salicifoliella</u> (Cham.) Willow leaf-miner	W spp.	Bella Coola Valley	The leaf-miner infes- tation between Firvale and Stule subsided to a moderately low level in 1966.
<u>Neodiprion</u> spp. Hemlock sawfly	C, D, F, wH, 1P, S	Widespread	Defoliator, common in all drainages in small numbers.
<u>Neophasia menapia</u> (F and F) Pine butterfly	1P	Noosgulch River Valley	Defoliator, one larva collected.
<u>Nyctobia limitaria</u> (Wlk.) Green balsam looper	wC, yC, D, bF, wH, S	Widespread	Defoliator, 53 larvae collected from 24 positive samples. Maximum of 15 larvae in one collection.
<u>Oryia antiqua</u> <u>badia</u> (Hy. Edw.) Rusty tussock moth	wC, bF, wH, S	Noosatsum Creek	Defoliator, 10 larvae collected from 5 positive samples.
<u>Pikonema alaskensis</u> (Roh.) Yellow-headed spruce sawfly	S	Widespread	Defoliator, common in small numbers throughout District.
<u>Pikonema dimmockii</u> (Cress.) Green-headed spruce sawfly	S	Widespread	Defoliator, common in small numbers throughout District.
<u>Zeiraphera</u> spp.	sS	Kitlope Lake	Defoliator, moderate feeding on current terminals of spruce in coastal areas.

FOREST DISEASE CONDITIONS

Currently Important Diseases

Fifteen disease collections were made in the District. Two collections were new host records, and are listed under "Other Noteworthy Diseases".

Weather Damage

Frost Damage

Western red cedar in the Salloomt River Valley appeared to have been damaged by early spring frost. The needles of the trees had turned brown, especially on the exposed side of the valley. Alder and willow trees in the Bella Coola Valley were also affected by the frost.

Table 4

Other Noteworthy Diseases

Other Diseases of Current Minor Significance

Organism and Disease	Hosts	Locality	Remarks
<u>Bifusella</u> n. sp. Needle cast	alF	Young Creek	Needle cast, occurring on alpine fir.
<u>Hypodermella abietis-concoloris</u> (Mayr) Dearn. Needle cast	alF	Young Creek	Needle cast, causing damage to true firs in this area.
<u>Sclerophoma pithyophila</u> (Corda) Fungus	whP	East of Young Creek	New host record. Fungus found on needles of white-bark pine. Under observation.
<u>Coryneum thuinum</u> Dearn. Fungus	wC	Nusatsum Valley	Fungus causing needle blight, potentially damaging.

FOREST INSECT AND DISEASE SURVEY

EAST PRINCE RUPERT DISTRICT

1966

FOREST INSECT AND DISEASE SURVEY

EAST PRINCE RUPERT DISTRICT

1966

J. S. Monts^{1/}

INTRODUCTION

The forest insect and disease survey of the East Prince Rupert District commenced in late May and was completed in early September. Due to a late spring, annual spruce budworm plot examinations were carried out in mid-June in conjunction with general sampling. Defoliator populations increased in all drainages in 1966.

A four hour bark beetle aerial survey over the Babine Lake, Chapman Lake and Goosley Lake areas indicated only light new attacks by spruce beetles in several small areas.

The Tweedsmuir Park lakes were surveyed in mid-August by boat with the assistance of S. J. Allen.

A total of 331 forest insect and 40 forest disease collections are listed by hosts in Table 1. Map 1 indicates the location of points where one or more collections were made and the boundaries of the Drainage Divisions referred to in the text of this report.

^{1/} Forest Research Technician, Forest Insect and Disease Survey, Victoria, B. C.

Table 1
Collections by Hosts
East Prince Rupert District, 1966

Coniferous hosts	Forest insects	Forest diseases	Broad-leaved hosts	Forest insects	Forest diseases
Cedar, western red	11		Maple, species		1
Douglas-fir	3		Poplar, species	1	
Fir, alpine	76	12	Aspen, trembling	2	
Fir, amabilis	4	2	Willow	1	
Fir, species	1		Miscellaneous	3	8
Hemlock, mountain	7	1	No host	7	
Hemlock, western	25				
Pine, lodgepole	56	7			
Pine, Scots	1				
Pine, whitebark	2	1			
Spruce, white	128	8			
Spruce, species	3				
Totals	317	31	Totals	14	9
GRAND TOTALS				331	40

Table 2
Currently Important Insect and Disease^{1/} Problems by Drainage Divisions
East Prince Rupert District

Insect and disease problems	Principal hosts ^{2/}	Importance by drainage divisions ^{3/}			
		120	121	122	123
BARK BEETLES					
Spruce bark beetle	wS	2	2	2	1
Mountain pine beetle	lP	0	0	1	0
<u>Dryocoetes</u> - <u>Ceratocystis</u> complex	alF	1	2	2	1
DEFOLIATORS					
Black-headed budworm	wS, alF	3	4	1	2
Western hemlock looper	alF, wH	1	3	2	1
Two-year-cycle spruce budworm	alF, wS	1	1	1	1
LEAF MINERS					
Aspen leaf miner	tA	2	2	2	2
TERMINAL BORERS					
Engelmann spruce weevil	wS	1	2	1	0
WEATHER DAMAGE					
Frost damage to alpine fir	alF, wS	1	2	2	1
CONE DISEASES					
A cone rust	wS	3	3	2	0
STEM DISEASES					
Branch canker of alpine fir	alF	1	2	1	1

^{1/} Includes only weather-induced and foliage diseases subject to notable annual fluctuation.

^{2/} wS - white spruce, Decid. - deciduous species, alF - alpine fir (etc.). Refer to host code in Forest District introduction.

^{3/} High population and/or widespread outbreak in progress - 5. Scattered high populations and/or significant damage in restricted areas - 4. Rising population and/or moderate numbers and/or potential problem - 3. Static or falling population and/or moderate numbers and/or no potential problem at present - 2. Endemic population and/or no significant damage - 1. Not sampled and/or no host and/or not found - 0.

FOREST INSECT CONDITIONS

Currently Important Insects

Bark Beetles

Spruce Beetle, Dendroctonus obesus (Mann.)

The spruce bark beetle population remained at a low level in 1966 as determined by aerial observations, ground checks, and trap-tree felling. During aerial surveys in late August only light attacks were observed west of Babine Lake and north of Goosley Lake; no new attacks occurred along the Morice River. Trap logs were felled at Smithers Landing, Taltapin and Goosley lakes in late May and examined for beetle attacks in mid-September. Beetle populations and development at these three locations are shown in Table 3.

Table 3

Spruce Beetle Development in Trap Logs,

East Prince Rupert District

Location	Position of log	Total number of insects			% living adults			% living larvae		
		1964	1965	1966	1964	1965	1966	1964	1965	1966
Smithers Landing	open	853	- ^{1/}	55	9.4	—	11.5	90.6	—	88.5
	shade	471	—	153	17.8	—	6	82.2	—	94
Taltapin Lake	open	214	55	44	43.4	90.9	10	56.6	9.1	90
	shade	409	31	58	35.2	90.3	20.8	64.8	9.7	79.2
Morice Access Road	open	305	50	* ^{2/}	32.8	22.0	*	67.2	78.0	*
	shade	343	76	*	16.3	8.0	*	83.7	92.0	*
Goosley Lake	open	* ^{2/}	*	171	*	*	9.2	*	*	90.8
	shade	*	*	185	*	*	10	*	*	90
Totals		2,595	212	666	21.5	52.0	94.4	78.5	47.2	88.7

^{1/} Logs not attacked.

^{2/} Logs not established at these points.

Mountain Pine Beetle, Dendroctonus ponderosae Hopk.

The number of lodgepole pine attacked by the mountain pine beetle decreased in the areas of the former infestation. A few recently attacked trees were observed in the Wright Bay area during aerial surveys. Salvage logging in the Wright Bay and Hagan Arm areas of Babine Lake during 1964-65 helped to reduce the infestation that had reached a peak in 1962-63. Mountain pine beetle populations are expected to remain at a low level in 1967.

Balsam Mortality Caused by the Dryocoetes-Ceratocystis Complex

Balsam mortality was recorded again in 1966 in conjunction with spruce beetle aerial surveys in late August. Current mortality in balsam stands appeared to be somewhat reduced. Light to medium mortality occurred in concentrated areas at Chapman Lake, Nadina Lake, Cronin Mine Road, and southwest of Old Fort. The appraisal crew examined the recently established plots and strips but found only very light attacks in the areas of the former infestation.

Defoliators

Black-headed Budworm, Acleris variana (Fern.)

A marked increase in the occurrence of this defoliator was found throughout the District in 1966, (Table 4). Collections of 52 and 47 larvae were taken from alpine fir and white spruce respectively in the Morice Forest at Gosnell Creek. Samples of 10 to 15 larvae were common along the Morice West Forest Development Road. More than 12% of collections taken in Drainage Division 120 contained larvae of this insect. Indications point toward a rising population in 1967, (Table 4).

Table 4

Summary of Black-headed Budworm Collections by Drainage Divisions,
East Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
120	80	87	82	12.5	16.1	12.2	3.6	3.4	1.7
121	28	19	47	25.0	5.3	31.9	4.8	1.0	9.9
122	11	34	55	18.1	20.6	0.0	2.2	2.7	—
123	0	0	13	—	—	15.3	—	—	2.2
Totals	119	140	197	15.9	15.7	12.6	3.9	3.1	6.3

Western Hemlock Looper, Lambdina fiscellaria lugubrosa (Hulst)

There was no appreciable increase in the population of this insect in the East Prince Rupert District in 1966 (Table 5). Larvae were present in small numbers in collections made in Drainage Divisions 121 and 122. The largest sample of 18 larvae was collected from alpine fir north of Sealy Lake in Drainage Division 122.

Table 5

Summary of Western Hemlock Looper Collections by Drainage Divisions,
East Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
120	50	79	35	0	0	0	—	—	—
121	31	60	52	1.9	5.0	7.5	2.9	4.2	5.1
122	35	122	68	0	1.6	13.2	—	1.0	1.5
123	2	19	11	0	10.5	0	—	2.3	—
Totals	118	280	166	4.8	2.5	7.8	2.9	2.7	2.6

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

No larvae were found and no current defoliation occurred on any of the branch samples examined at the five established plot locations in 1966. Because of late bud development plot work was postponed until late June and early July and only a trace of larval activity was noted during the larval period (Table 6). The largest random sample contained three larvae collected from alpine fir at Milk Creek (Drainage Division 121). No egg masses were found in late summer at the five plots. White spruce and alpine fir trees, heavily stunted from continuous defoliation since 1950, have made excellent recovery during the past three years and are again putting on good terminal and lateral growth.

Table 6

Summary of Two-year-cycle Spruce Budworm Collections by Drainage Divisions,
East Prince Rupert District

Drainage division	Number of samples taken during larval period			% samples containing larvae			Average number of larvae per positive sample		
	1964	1965	1966	1964	1965	1966	1964	1965	1966
120	88	10	11	1.1	0.0	9.1	1.0	0.0	1.0
121	57	90	59	3.5	1.1	3.4	1.0	1.0	2.2
122	75	109	81	40.0	6.4	11.1	11.0	3.4	1.5
123	12	27	11	8.0	3.7	0.0	1.0	1.0	0.0
Totals	232	236	162	14.6	3.8	7.4	10.0	2.9	1.6

Leaf Miners

Aspen Leaf Miner, Phyllocnistis populiella Cham.

The aspen leaf miner infestation in the East Prince Rupert District continued wherever the host tree, trembling aspen, was found. The four study plots established in 1963 were again examined in 1966 (Table 7). The infestation will probably remain widespread at varying levels of intensity in 1967.

Table 7

Aspen Leaf Surfaces Mined and Number of Aspen Leaf Miner Adults Produced
per 100 Leaf Surfaces, East Prince Rupert District

Plot location	Total No. of leaves		% leaf surfaces mined		Average No. of cocoons per 100 leaf surfaces	
	1965	1966	1965	1966	1965	1966
Priestly Station Road	447	434	38.9	29.9	78	68
Babine Lake	597	524	93.2	63.3	130	86
Moricetown	452	451	81.4	52.8	99	74
2 miles west of Telkwa	476	525	82.7	56.1	83	67
Average	493	483.5	75.7	50.5	97	73.7

Table 8

Mortality of Aspen Leaf Miner in 100 Cocoon Samples at Four Locations

East Prince Rupert District

Location	% emerged		% parasitized		% dead	
	1965	1966	1965	1966	1965	1966
Priestly Stn. Rd.	38	65	49	24	13	10
Babine Lake	60	77	32	15	8	8
Moricetown	41	44	30	39	29	17
2 Mi. W. of Telkwa	39	58	41	28	20	14
Average	44.5	61	38	26.6	17.5	12.4

Terminal Borers

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

Weevils attacked about 10% of the leaders of Engelmann spruce, in a stand of reproduction, for a distance of 4 miles in the Telkwa River Valley. Lighter damage occurred in the Morice River Valley and at Buck Flats where 5% of the leaders were attacked on two 2-mile check strips.

Other Noteworthy Insects

Table 9

Other Insects of Current Minor Significance

Insect	Hosts	Locality	Remarks
<u>Epirrita autumnata</u> Gn. Green velvet looper	alF, wS	Moricetown	Defoliator, 7 larvae from one sample on alpine fir.
<u>Epirrita pulchraria</u> (Taylor) A white-striped Forest Looper	aF, mH	Tahtsa Lake	Defoliator, 12 positive collections averaged 2.6 larvae.
<u>Melanolophia imitata</u> Wlk. Green-striped forest looper	alF, wS	Bulkley Valley	Defoliator, low population. 14 positive collections contained an average of 3.2 larvae.

Table 9 - Continued

Other Insects of Current Minor Significance

Insect	Hosts	Locality	Remarks
<u>Pikonema alaskensis</u> Roh. Yellow-headed spruce sawfly	wS, 1P	Burns Lake	Common defoliator, collected in small numbers. 23 posi- tive collections contained 32 larvae.
<u>Pikonema dimmockii</u> (Cress.) Green- headed spruce sawfly	wS, 1P	Francois Lake	Defoliator, common in DD 120. 38 positive collections contained an average of 1.7 larvae.
<u>Neodiprion</u> sp. Sawflies	wS, alF, 1P	Kispiox River	Defoliator, widespread distribution in DD 123. No population increase.
<u>Nyctobia limitaria</u> (Wlk.) Green balsam looper	alF, wH	Hazelton	Defoliator, low populations. 2 positive collections averaged 4 larvae, in DD 122.
<u>Ecotropis crepuscularia</u> Schiff. Saddleback looper	alF, S	North Skeena	Defoliator, continued low populations. 7 positive collections averaged 1.5 larvae.
<u>Caripeta divisata</u> Wlk. Grey spruce looper	alF, wS	Tweedsmuir Park	Defoliator, low level. 6 positive collections averaged 1.3 larvae.
<u>Feralia</u> sp. A cutworm	alF, wH	North Skeena	Defoliator, scattered occurrence; 11 positive collections contained 14 larvae.
<u>Eupithecia</u> sp. A looper	1P, wS	Babine Lake, North Skeena	Defoliator, scattered occurrence; 4 positive collections contained 3 larvae.
<u>Adelges cooleyi</u> Gill. Cooley spruce gall aphid	wS	Smithers, Telkwa	Sap-sucking insect, common in regeneration stands and private arboretums.

FOREST DISEASE CONDITIONS

Currently Important Diseases

Weather Damage

Winter Injury

Foliage on laterals of alpine fir and white spruce were discoloured as a result of winter injury at Cronin Mine Road, Glacier Gulch and Telkwa River. Below zero temperatures in mid-March preceded by a two week period of mild weather may have caused this flagging condition. Injury to white spruce was light but in some cases 10 to 15% of alpine fir foliage was discoloured.

Cone Diseases

A Cone Rust, Chrysomyxa pirolata Wint.

An otherwise good cone crop on white spruce was heavily attacked by rust at Ootsa Lake, Francois Lake and Buck Flats (Drainage Divisions 120 and 121). Forty percent of the cones on exposed regeneration trees at Buck Flats and from 15 to 20% of the cones in regeneration stands at Ootsa Lake and Francois Lake were infected. Wintergreen, Pyrola spp., the alternate host of this rust, was present in all the stands infected by Chrysomyxa pirolata.

Stem Diseases

A Branch Canker on Alpine Fir

Red flagging caused by a canker disease Scleroderris abieticola Zeller and Goodd. occurred on 15% of the laterals in roadside alpine fir stands from Nadina Lake south of Tahtsa Reach. Light damage was observed for a distance of 30 miles in roadside stands on the Morice Access Road. This canker occurs about 18 inches from the branch tip, causing mortality of the outer portion of the branch.

Other Noteworthy Diseases

Table 10

Other Diseases of Current Minor Significance

Organism and Disease	Hosts	Locality	Remarks
<u>Arceuthobium americanum</u> Nutt. ex Engelm. Lodgepole pine dwarf mistletoe	1P	Telkwa River	Common dwarf mistle- toe with the hyperpara- site, <u>Wallrothiella</u> <u>arceuthobii</u> (Peck) Sacc.

Table 10 - Continued

Other Diseases of Current Minor Significance

Organism and Disease	Hosts	Locality	Remarks
<u>Chrysomyxa arctostaphyli</u> Diet. Spruce broom rust	wS	Burns Lake	Causes witches broom; common in DD 122.
<u>Cronartium ribicola</u> J. C. Fisch. ex Rab. White pine blister rust	whP	Tahtsa Lake	Several trees infected with rust galls.
<u>Hyalopsora aspidiotus</u> (Magn.) Magn. A needle rust	aF aF	Telkwa, Whitesail Lake	Light infections of an orange rust on previous needles.
<u>Hypoderma robustum</u> Tub. A needle cast	aF	Whitesail Lake	Light discolouration of foliage.
<u>Hypodermella abietis-</u> <u>concoloris</u> (Mayr) Dearn. A needle cast	aF	Telkwa River	Light infections on 2 year and older needles.
<u>Hypodermella punctata</u> Darker. A needle rust	aF	Eutsuk Lake	Found in one collection.
<u>Peridermium harknessii</u> J. P. Moore. Western gall rust of pines	1P	Burns Lake	Rust galls prevalent on regeneration trees.
<u>Puccinia dioicae</u> Magn. A plant rust	<u>Epilobium</u> <u>angusti-</u> <u>folium</u>	Owen Lake	Alternate host - <u>Carex</u> spp. (First record on this host for B. C.)
<u>Tuberculina maxima</u> Rostr. A hyperparasite	1P	Smithers	Purple mould inhibiting the fruiting of <u>Cronartium comandrae</u> Peck. (New host record.)

