

ANNUAL DISTRICT REPORT  
FOREST INSECT AND DISEASE SURVEY  
BRITISH COLUMBIA, 1970  
PART II, PRINCE RUPERT FOREST DISTRICT

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## INTRODUCTION

This report outlines the status of forest insect and disease conditions in the Prince Rupert Forest District for 1970 and, where feasible, attempts to forecast pest population trends.

Reports of forest pest outbreaks to the Forest Insect & Disease Survey by public or private cooperators helps in the interpretation of the general pest situation and improves our ability to gauge population trends.

Regular field work in the District in 1970 began in late May and ended in early September. Special surveys were as follows: assessment of spruce gall aphid damage to Sitka spruce plantations, cone collections for insect and disease damage, tent caterpillar egg sampling, and distribution of dwarf mistletoe on western hemlock and lodgepole pine.

Thirty-five hours were used on aerial reconnaissance and for sampling permanent plots on the mainland coast, Queen Charlotte Islands, Tweedsmuir Park and Babine Lake.

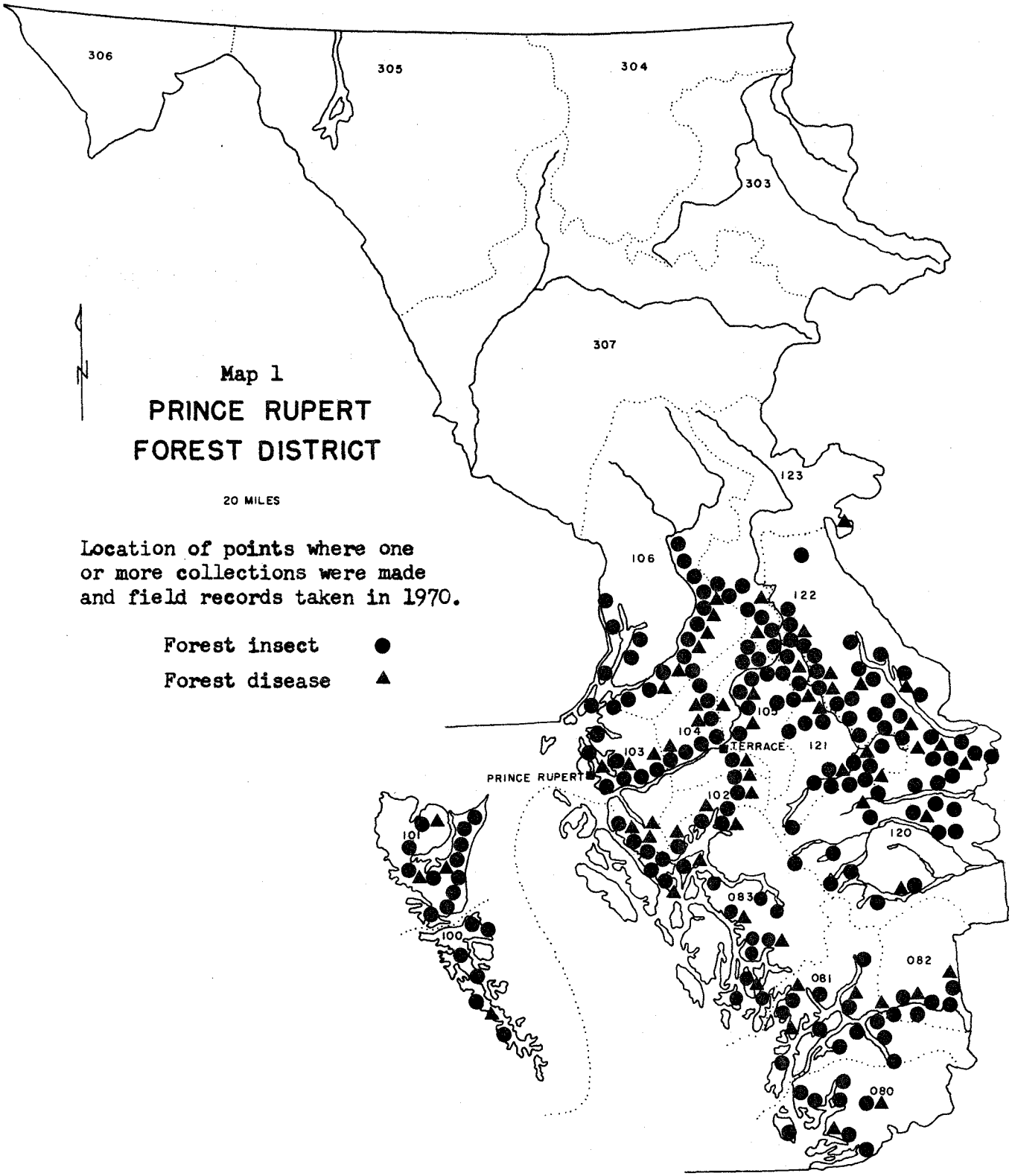
A total of 534 insect and 110 disease collections were made at permanent and random sample plots. Collection localities and drainage divisions are shown on Map 1.

Numbers of larval defoliators found in field collections decreased in the coastal part of the District in 1970; 63% of the beating samples contained larvae, compared with 78% in 1969. In the Interior, 70% of the samples contained larvae compared to 67% in 1969. Details on individual insect and disease problems appear in subsequent sections.

Generally, populations of defoliating insects and bark beetles remained at low density. The saddleback looper population in the Kitimat area collapsed, and spruce budworm was at a low population level in the same area. Tent caterpillars again caused moderate to heavy defoliation of deciduous trees in the Skeena and Nass River Valleys. Spruce gall aphids caused noticeable damage to Sitka spruce and Douglas-fir plantations near Nelson River, north of Terrace.

Foliage of trembling aspen was again infected with a shoot and foliage blight in the eastern part of the District at Houston, Burns Lake and Francois Lake.

Dwarf mistletoe distribution surveys of western hemlock and lodgepole pine extended the known range of mistletoe diseases at several localities.



Map 1  
**PRINCE RUPERT  
 FOREST DISTRICT**

20 MILES

Location of points where one  
 or more collections were made  
 and field records taken in 1970.

- Forest insect ●
- Forest disease ▲

## FOREST INSECT CONDITIONS

### Currently Important Insects

#### Bark Beetles

Alpine fir mortality caused by the Dryocoetes - Geratocystis Complex

Deterioration of alpine fir in high elevation stands was still evident in the eastern part of the District but in many cases mortality had declined from 1968. Up to 15% tree mortality was noted along the Morice River, north arm of Babine Lake and south of Gunanoot Lake. Moderate mortality was evident in stands along McKendrick Creek, Sustut River and adjacent to McDonnell Lake near Smithers, where more than 30% of the stands were effected.

Mountain pine beetle, Dendroctonus ponderosae

Approximately 1,000 red-topped lodgepole pine were counted along the Cranberry River at Weegett Creek, and 200 at Burdick Creek near Hazelton. No ground checks were made as the area is inaccessible. Occasional red-topped lodgepole pine trees were noted along the east shore of Babine Lake.

#### Defoliators

Spruce budworm, Choristoneura spp.

Spruce budworm populations remained relatively light in 1970. The one-year-cycle budworm, Choristoneura fumiferana, caused light to moderate defoliation of white spruce and alpine fir in the Liard River area. This outbreak was an extension of a larger infestation in the Prince George Forest District and extended east to Liard Hot Springs.

The one-year-cycle budworm, C. orae caused no visible defoliation in the Kitimat area, where there was a light population on amabilis fir and Sitka spruce. Egg counts made in late August indicated a light larval population in 1971.

The one-year-cycle budworm, C. occidentalis caused light to moderate defoliation of the current year's growth on Douglas-fir on an area extending five miles west and eight miles east of Firvale along the Bella Coola Road. Beating collections taken at five locations averaged 15 larvae per sample.

Two-year-cycle budworm, C. biennis remained at low density in the Babine Lake and Morice Forest areas.

Saddleback looper, Ectropis crepuscularia

No larvae were found in western hemlock, amabilis fir and Sitka spruce stands in the Kitimat Municipality, Emsley Cove and Bish Creek where loopers were abundant in 1969. Numerous diseased larvae were evident in 1969, and disease probably contributed to the collapse of the population.

A light population persisted at Eden Lake on Graham Island, Queen Charlotte Islands. Beating samples from western red cedar and western hemlock averaged 95 and 75 larvae respectively.

Tent caterpillars, Malacosoma spp.

Forest tent caterpillars, Malacosoma disstria defoliated approximately 600 acres of trembling aspen in the Aiyansh (Nass River) area. Egg mass counts made in the infested areas in August showed a high overwintering population: the forecast is for heavy defoliation in 1971.

Alder trees along the Bella Coola River from Hagensborg to Bella Coola, and to Flagstone Point, were also heavily defoliated by M. disstria.

Western tent caterpillar, M. californicum pluviale caused moderate to heavy defoliation of black cottonwood and other species of deciduous trees and shrubs along the Nass River from Kiseden Camp to Aiyansh and along the Skeena River from Terrace to Kwinitza. Egg counts made at Canyon City (Nass River), and Exstew and Terrace (Skeena River) revealed a high overwintering egg population which may lead to heavy defoliation in 1971.

Sucking Insects

Cooley spruce gall aphid, Adelges cooleyi

Douglas-fir and adjacent Sitka spruce plantations near Nelson River, were examined at the request of the British Columbia Forest Service, Prince Rupert District Office, to assess the significance of spruce gall aphid damage. Forest Insect and Disease Survey reports showed that these aphids have been present in the plantations since 1960 when one small transplant Douglas-fir was heavily infested. Since then the aphid has become a chronic pest of Douglas-fir and Sitka spruce trees in the Nelson River plantations.

Twenty-six acres of Douglas-fir plantations were established from 1957 to 1960; the seedlings were of coastal and interior provenance. Trees in the plantations range in height from 4 to 20 feet; the adjacent Sitka spruce planted from 1960 to 1966 range from 2 to 15 feet.

Samples consisting of one 12-inch branch from each of 25 trees were taken in seven Sitka spruce and 10 Douglas-fir plots in the plantations. The number of galls were counted on the branches from Sitka spruce, and estimates were made of the percentage of infested needles on Douglas-fir branches (Tables 1 and 2). Intensity of attack on Douglas-fir was arbitrarily classified as follows: 1 to 25% of needles infested - light, 26-50% - medium and 51% or more - heavy.

Table 1. Cooley spruce gall aphid damage in Sitka spruce plantations at Nelson River, Erlandsen Creek and Beaver River Flats, August, 1970

Location	Provenance of Douglas-fir	Percentage of tips with spruce galls
Nelson R. Br. 34A adjacent to XP 126B	Coast	41
Nelson R. Br. 34A adjacent to XP 207	Coast	22
Nelson R. Br. 34 1 mi. N. of D. fir plant.	Coast	12
Nelson R. Br. 45A adjacent to XP 146	Interior	3
Erlandsen Cr. Br. 3 adjacent to XP 127	Interior	0
Beaver R., Br. 543800 5 mi. N. of D. fir plant.	Interior	0
Nelson R. Br. 45 1.5 mi. N. of D. fir plant.	Interior	6

Sitka spruce was more heavily infested by spruce gall aphids when adjacent to heavily infested Douglas-fir.

Heavy spruce gall aphid attacks in plantations at Nelson River have stunted and deformed some of the spruce trees.

Table 2. Cooley spruce gall aphid damage in Douglas-fir plantations at Nelson River and Erlandsen Creek, August, 1970

Plantation number	Provenance	Location	Degree of attack
126A	Coast	Br. 34, Nelson R.	Medium
126B	Coast	Br. 34A, Nelson R.	Medium
160	Coast	Br. 34A, Nelson R.	Heavy
161	Coast	Br. 34A, Nelson R.	Heavy
206	Coast	Br. 34A, Nelson R.	Medium
207	Coast	Br. 34A, Nelson R.	Heavy
127	Interior	Br. 3, Erlandsen Cr.	Light
128A	Interior	Br. 34, Nelson R.	Light
128B	Interior	Br. 34, Nelson R.	Light
146	Interior	Br. 45A, Nelson R.	Light

Douglas-fir trees of coastal provenance were more heavily infested by A. cooleyi than Douglas-fir from the Interior.

Aphid feeding on Douglas-fir caused the needles to turn yellow; heavy attacks caused browning and premature shedding of the foliage, in the plantations at Nelson River.

#### Green spruce aphid, Neomyzaphis abietina

Spruce aphids appeared in 1970 on Sitka spruce in the old infestation areas around Prince Rupert and Port Edward after a year's absence. Damage was much lighter than in 1968, and was confined to open-growing and border trees along roadways and shorelines. Approximately 30% of the old foliage of Sitka spruce trees along the exposed coastline south of Safety Cove, on Calvert Island, Bella Coola district, were infested by the green spruce aphid.

#### Terminal Borers

##### A weevil, Pissodes strobi

Plots of 25 trees each were examined at Morice River, Buck Flats, Byman Creek, Topley Landing and Chapman Lake for weevil attack. An average of 28% of the trees had current leader damage. Tree heights ranged from 15 to 30 feet. Lodgepole pine saplings in adjacent mixed and pure stands were also attacked, with an average of 20% of current leaders infested.

## Cone Insects

There was an above average cone crop in many parts of the District in 1970. In order to determine the incidence of cone-insect damage, 20-cone samples were taken from three trees of each of one or more species at 18 areas. A total of 37 cone samples were collected. Fifty-seven per cent of the Sitka spruce samples were infested with a spruce seed moth Laspeyresia youngana, and 28% with a spruce cone maggot Hylemya anthracina. White spruce cones were 33% infested with L. youngana and 16% with H. anthracina. Amabilis fir and alpine fir cones were 100% infested with Megastigmus lasiocarpae. All samples from western hemlock, western red cedar and lodgepole pine were free of insect damage.

Table 3. Results of examination of cones from Sitka spruce, white spruce, amabilis fir and alpine fir, Prince Rupert District, 1970

Tree species	Locality	% cones infested		
		<u>Laspeyresia youngana</u> spruce seed moth	<u>Hylemya anthracina</u> spruce cone maggot	<u>Megastigmus lasiocarpae</u> fir seed chalcid
Sitka spruce	Lava L.	5	15	
	Nelson R.	5	5	
	Kwinitsa	10		
	Salvus	15		
White spruce	Fishpan Lakes	10	20	
	Chapman L.	15		
Amabilis fir	Legate Cr.			100
	Kitimat			25
Alpine fir	Meziadin Rd.			25
	Nelson R.			10
	Fishpan Lakes			8
	Chapman L.			10



## Other Noteworthy Insects

### Black-headed budworm, Acleris variana

Black-headed budworm populations generally remained light in 1970. There were 26 larvae in a collection from white spruce at Collins Lake in the Morice Forest. At Topley Landing 13 larvae were collected from alpine fir and 6 from white spruce. Populations are expected to remain at a low level in 1971.

### Western winter moth, Erannis vancouverensis

White birch trees within the forest tent caterpillar infestation at Canyon City were defoliated by this looper. The infestation appeared to be confined to a few acres.

### Western hemlock looper, Lambdina fiscellaria lugubrosa

Hemlock looper populations generally remained low. No larvae were found at Deep Bay in Dean Channel where there were moderate populations in 1969.

### Yellow-headed spruce sawfly, Pikonema alaskensis

White spruce plantations on Branch 45A Nelson River which have suffered heavy defoliation by spruce sawfly, Pikonema alaskensis, for the past three years had some trees with dead leaders and lateral branches, caused by this defoliation. The infestation subsided in 1970 with very few larvae present.

### Leaf beetles, Galerucella sp.

Several hundred acres of willow bushes in an old burn along the Nelson River north of Terrace were again heavily defoliated by leaf beetles. This has been a chronic area for leaf beetle damage for the past several years.

### Aspen leaf miner, Phyllocnistis populiella

Aspen leaf miner populations were again light to moderate throughout the range of trembling aspen. The heaviest damage occurred at Priestly Station where 80% of the leaf surfaces were mined. Lighter damage ranged from 15% at Pendelton Bay to 26% at Moricetown. The population of this insect is expected to continue at a similar level in 1971.

Table 4. Other insects of current minor significance

Insect	Hosts	Locality	Remarks
<u>Dendroctonus rufipennis</u> Spruce beetle	White spruce	Parrot Lakes, Walcott, Babine L.	Bark beetle. Light attacks on fringe trees along swamps north of Parrot Lakes and southwest of Walcott. Scattered single-tree attacks along north Babine L.
<u>Epirrita autumnata</u> Green velvet looper	Alpine fir	Widespread	Defoliator. Populations decreased to low level.
<u>Hylobius warreni</u> Root weevil	Lodgepole pine	Bulkley Valley, Burns and Ootsa Lakes	A root weevil. Caused mortality of scattered exposed saplings.
<u>Neodiprion</u> spp. Conifer sawflies	Most conifers	Widespread	Defoliator. Larvae found in 13% of beating samples. Largest collection was 75 larvae from lodgepole pine at Evelyn Station near Smithers.

#### FOREST DISEASE CONDITIONS

The organisms currently causing much of the tree mortality, growth loss, and quality reduction attributed to diseases are mistletoes and stem and root rot fungi. These organisms, once established in a stand, persist for many years. They usually intensify at a slow rate which makes annual summaries of their status repetitious; for this reason the following report may omit mention of some of the more important diseases. Emphasis is placed on new outbreaks, the status of the annually varying foliage diseases and abnormal weather conditions, i.e., frosts, drought, snow damage, etc., which immediately affect tree appearance and often cause dieback and mortality. Other aspects of the Disease Survey dealing with mortality, growth loss, and factors influencing the occurrence of the more important diseases are summarized elsewhere.

## Currently Important Diseases

### Stem Diseases

Dwarf mistletoe, Arceuthobium spp.

Dwarf mistletoe distribution surveys in western hemlock and lodgepole pine stands were continued in 1970. The known range of hemlock mistletoe Arceuthobium campylopodum f. tsugensis has been extended from Iceberg Bay on Portland Inlet north to Stewart, and from Kiskosh Inlet on Douglas Channel south to Roscoe Inlet near Ocean Falls along the mainland coast. On the Queen Charlotte Islands mistletoe was found on hemlock from Naden Harbour in the north to Burnaby Island in the south. Lodgepole pine was found infected with hemlock mistletoe south of Port Clements, and near Terrace. Mistletoe infections were found on amabilis fir at Bish Creek south of Kitimat and south of Terrace. These collections represent the first records of hemlock mistletoe on lodgepole pine and amabilis fir in these areas.

The known range of lodgepole pine dwarf mistletoe A. americanum was extended from Ootsa Lake south to Redfern Rapids in Tweedsmuir Park and from Telkwa west along the Skeena River to Cedarvale.

Indian paint fungus, Echinodontium tinctorium

Mature and overmature western hemlock stands throughout the upper Nass and Skeena River valley were found heavily infected by this fungus. Foresters reported over 50% infection in logging operations in the upper Nass River valley. Infections of up to 30% were encountered along the Skeena and Kispiox rivers, north of Hazelton.

### Foliage Diseases

Poplar leaf and shoot blight, Venturia populina

Foliage discoloration and light early defoliation occurred in five to ten acre patches of trembling aspen from Burns Lake to Endako, throughout the Southbank region, along the entire Bulkley valley and from Hazelton to Cedarvale. Defoliation was assessed from branch samples taken at the following locations; Priestly Station Road 12%, Pendelton Bay 33%, Smithers 15%, and Moricetown 10%. The disease is expected to continue at its present level in 1971.

A leaf rust, Melampsora spp.

Heavy rust infections were prevalent on willow spp. and lighter infections on trembling aspen and black cottonwood in the Nelson River area north of Terrace and at Clayton Falls near Bella Coola. Trees at Nelson river had up to 50% of the foliage affected while up to 80% of the leaves were blistered in 5 acre patches at Clayton Falls.

A spruce broom rust, Chrysomyxa arctostaphyli

Rust brooms were common on white spruce throughout the eastern portion of the District. Heavy concentrations in the Burns Lake and Southbank Ranger Districts and at Hudson's Bay Mountain near Smithers occasionally affected up to 20% of the stems.

Non-infectious Diseases

Winter damage to conifers

Conifers damaged by low temperatures during the winter of 1968-69 were examined at a number of areas in the Nelson River north of Terrace and in the Prince Rupert area. It was found generally that the trees had made a good recovery. Some dieback on leader and lateral branches was evident. Western hemlock trees around Prince Rupert had thinned foliage. Trees that had made a poor recovery were Douglas-fir trees extended beyond their range in plantations at Nelson River; numerous trees had dead leaders and lateral branches, and were generally in poor shape. Winter-damaged cedar trees in the Port Edward area made poor recovery probably because they are also suffering from fume damage.

Flood damage to conifers

Aerial surveys in the Kitlope Lake area south of Kemano revealed a number of spots where flooding has been killing conifers, mostly Sitka spruce. Damage was evident along the shores of Kitlope Lake and along the banks of the Kitlope and Tezwa Rivers. This damage appears to be a recurring problem as old grey and red trees were evident.

Exotic Plantations

There are 39 plantations of a variety of introduced trees in the District. Under a plan of rotation, at least 15 are examined yearly to determine the occurrence and effect of native insects and diseases on these trees.

Douglas-fir plantations in the Nelson River area have made a poor recovery following the 1968-69 winter damage. Numerous trees have dead leaders and lateral branches and generally look in poor shape.

Heavy infestations of Cooley spruce gall aphid, Adelges cooleyi were evident at these plantations. Aphid feeding has caused the needles to turn yellow and the heavier attacks have caused browning and premature shedding of the foliage. This damage has also contributed to the dieback.

Larch and pine plantations were generally in good condition with good growth. Some snow damage was evident on ponderosa pine trees at Nelson River.

Other Noteworthy Diseases

Table 5. Other diseases of current minor significance

Organism	Hosts	Locality	Remarks
<u>Armillaria mellea</u>	White spruce, lodgepole pine	Doris L., Morice R.	Root rot. Common in recent dead white spruce. New host record on lodgepole pine.
<u>Cronartium coleosporioides</u>	Lodgepole pine	Buck Cr., Owen L.	A stem rust. Light infections to saplings.
<u>Endocronartium harknessii</u>	Lodgepole pine	Bulkley Valley, Burns L., Southbank	A gall rust. Common throughout the range of the host tree.
<u>Isthmiella quadrispora</u>	Alpine fir	Bear and Gunanoot Lakes	Needle disease. Discoloration prevalent on 1968-69 foliage.
<u>Potebniamyces balsamicola</u> var. <u>balsamicola</u>	Alpine fir	McKendrick and Driftwood creeks; Bear and Morice Lakes	A branch canker. Moderate flagging in high elevation stands.