

ANNUAL DISTRICT REPORT  
FOREST INSECT AND DISEASE SURVEY  
BRITISH COLUMBIA, 1970  
PART V, NELSON FOREST DISTRICT

by  
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VICTORIA, BRITISH COLUMBIA  
INFORMATION REPORT BC-X-51

DEPARTMENT OF FISHERIES AND FORESTRY  
MARCH, 1971

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## INTRODUCTION

This report outlines the status of forest insect and disease conditions in the Nelson Forest District for 1970 and attempts to forecast pest population trends. It places stress on the level of pest populations capable of sudden, damaging outbreaks.

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

Regular field work in the District this season began on May 4 and ended on September 30. Special surveys were as follows: aerial survey, August 24 to September 2; spruce beetle survey, September 8 to 18.

Numbers of larval defoliators found in field collections decreased slightly this year; 77% and 80% of beating collections in the west and eastern parts of the District, respectively, contained larvae. Details on individual insect and disease problems follow.

A total of 462 insect and 44 disease collections were made in the Nelson Forest District in 1970. Collection localities and drainage divisions are shown on Map 1.

Members of the British Columbia Forest Service, Woods Industry and Department of Fisheries and Forestry formed a Pest Control Committee in 1970 to obtain an inventory of beetle damaged timber, to determine the status of the spruce beetle and to promote salvage logging of attacked areas and control of beetle populations east of the Purcell Range.

A comprehensive survey was conducted during the summer in all spruce stands within this region where spruce beetle damage had been recorded from 1967 to 1969. The consensus of the survey was that beetle population and attack intensity had decreased.

West of the Purcell Range, however, two newly detected areas of 1969 beetle infestation were noted at Bruer and Placer Creeks.

Numbers of pine trees infested by mountain pine beetle decreased significantly throughout the District.

Douglas-fir beetle caused little Douglas-fir tree mortality in the dry belt areas of the District in 1970.

Heavy defoliation of western larch by larch casebearer occurred near Fruitvale, Salmo, Rossland, Creston and Yahk in 1970 and is expected to continue in 1971.

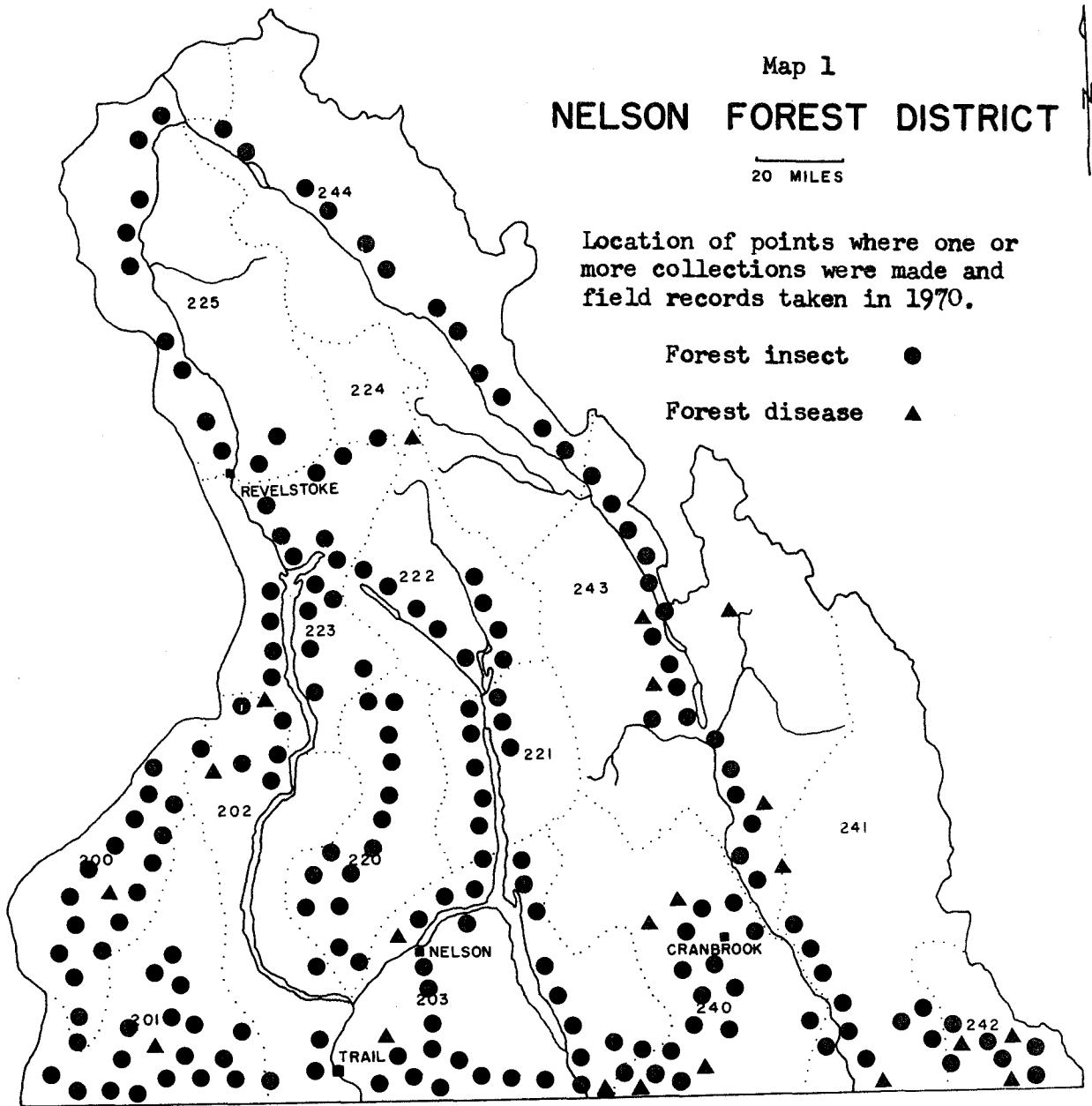
Map 1  
**NELSON FOREST DISTRICT**

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

Spruce beetle, Dendroctonus rufipennis (formerly D. obesus)

In 1967, infestations of spruce beetle were detected in mature Engelmann spruce stands in the southeast sector of Nelson Forest District. The epidemic expanded rapidly and by fall of 1969, beetles had killed a considerable volume of timber in the East Kootenay region. Although the epidemic declined in 1969, new damage was observed in the drainages of Kootenay Lake, Lardeau, Kidd and Kettle Rivers.

By 1970, the beetle population in the Flathead had subsided, although a moderate population persisted in the Fording River drainage and possibly in a few other undetected pockets east of the Purcell Mountains. Significant attacks on spruce stands west of the Purcell Range occurred a year or two later and a fairly numerous population is now overwintering in standing trees at Bruer, Placer and Pork Creeks and Howser Ridge. Attack in 1971 is expected to continue in this region and further tree mortality will follow. All mature stands of Engelmann spruce in the Nelson Forest District should be examined for spruce beetle in 1971.

A special report on the status of the spruce beetle in Nelson Forest District is available from the Forest Insect and Disease Survey at Victoria.

Douglas-fir beetle, Dendroctonus pseudotsugae

Mortality of Douglas-fir trees resulting from bark beetle attacks decreased in 1970. A total of 1,450 trees were counted from vantage points and by aerial surveys in 1969; 391 were counted in 1970.

The following table gives the number of beetle-killed Douglas-fir trees counted and the estimated volume loss for the years 1968 to 1970.

Period	Year of survey	No. of trees killed	Est. volume (ft <sup>3</sup> )
1966-1967	1968	695	36,030
1967-1968	1969	1,450	64,950
1968-1969	1970	391	23,280

Mountain pine beetle, Dendroctonus ponderosae

There was a significant decrease in the number of lodgepole pine killed by mountain pine beetle at Kallis Creek in the western sector of the District, and near Elk and Coyote Creeks and Redgrave in the eastern portion. Logging was responsible for the decrease in the latter three areas.

Western white pine mortality caused by mountain pine beetle increased in the interior wet belt area during 1969. Counts of red-topped trees increased from 540 in 1969 to 1,800 in 1970 (Table 1).

Table 1. Pine trees killed by mountain pine beetle  
as determined from aerial surveys,  
Nelson Forest District

Pine species	Period	Year of survey	No. of trees killed	Est. total volume (ft <sup>3</sup> )
Lodgepole	1966-67	1968	6,744	283,248
	1967-68	1969	7,700	323,400
	1968-69	1970	1,760	73,920
Western white	1966-67	1968	2,159	155,448
	1967-68	1969	540	38,880
	1968-69	1970	1,810	131,455

Dryocoetes - Ceratocystis complex

Aerial surveys in August indicated light to moderate mortality of alpine fir caused by the western balsam bark beetle Dryocoetes confusus in association with the disease Ceratocystis dryocoetidis in inaccessible areas from 3,000 to 5,000 feet elevation (Table 2).

Table 2. Location and number of alpine fir trees killed by western balsam bark beetle in association with the fungus Ceratocystis dryocoetidis as estimated by aerial survey, Nelson Forest District

Location	No. of trees	Est. volume (ft <sup>3</sup> )
Granby R.	120	2,400
Sawyer Cr.	25	500
Slewiskan Cr.	15	450
Fry Cr.	100	3,000
Lardeau Cr.	60	1,800
Halfway R.	10	300
Sullivan R.	175	5,250
White R.	20	500
Bighorn Cr.	100	4,000
Flathead R.	75	3,000
Total	700	21,200

### Defoliators

#### Larch casebearer, Coleophora laricella

Distribution of larch casebearer changed slightly in the western portion of the District. Samples containing casebearers were found from Anarchist Mountain east along the International Boundary to Christina Lake. Little change was noted east of Castlegar.

Survival of overwintering larval populations was good resulting in an intensification of infestation within existing boundaries. Severe browning of western larch was prevalent in June near Yahk, Creston, Fruitvale and Rossland.

Egg samples were taken from western larch trees at Salmo, Fruitvale and Castlegar in early August; successful hatching was 75, 84 and 87% respectively.

Five sampling locations established in 1966 near Salmo, Creston and Yahk were examined in May and October, 1970. Casebearers were counted on four 18 inch branch samples from mid-crown of each of four trees at each sample location (Table 3).

Table 3. Larch casebearer population at five plots,  
Nelson Forest District

Locality	Avg no. casebearers per 18 inch branch			
	1969		1970	
	May	October	May	October
Salmo	10	67	22	275
N. Creston	6	16	9	41
W. Creston	28	14	22	52
Rykerts	12	24	25	312
Yahk	11	13	5	120

#### Parasitism of Larch Casebearer

Native: In late May 2,600 larvae and pupae were collected from seven plots and reared to determine parasitism. By mid-June, 1,766 casebearer moths had emerged. A total of 108 parasites emerged; 104 Spilochalcis albifrons and one each of the following genera: Lytoysta, Necremnus, Bracon and Aclastus. Native parasites caused little mortality to larch casebearers in the five years since they have become established in British Columbia forests. The number of parasites reared and the percentage parasitism is shown in Table 4.

Table 4. Percentage parasitism in larch casebearer rearing,  
1966 to 1970, Nelson Forest District

Year	No. of casebearers reared	% parasitism
1966	1,004	0.7
1967	881	0.2
1968	1,360	4.0
1969	1,000	10.9
1970	1,766	6.1

Introduced: In 1969 an attempt was made to introduce Agathis pumila, a European parasite, established in Idaho and Montana, U. S. A. into casebearer populations in British Columbia. In 1970, no A. pumila were found in 200 casebearer larvae and pupae collected in the spring from each of the two release points and reared at the Victoria Laboratory and none was found in the 500 larvae collected in October for dissection.

#### Other Noteworthy Insects

##### A spruce weevil, Pissodes strobi

Seventeen 50-tree plots were examined in the eastern portion of the District to determine damage by spruce weevil to regeneration and pole-sized Engelmann spruce trees. At five locations over 10% of the leaders had been killed over the past two years. They were: Alexander Creek, 72%; Michel Creek, 44%; Moberley Bench, 26%; Sundown Creek, 20% and Morrissey, 14%.

##### Cone Insects

Examination of 20-cone samples at four locations indicated heavy damage to Engelmann spruce and moderate damage to Douglas-fir cones (Table 5). There was no insect damage to cones of western hemlock, western red cedar and western white pine.

Table 5. Location, percentage of cones infested and insect species causing damage in four 20-cone samples, Nelson Forest District, 1970

Location	Host	% cones infested	Insect species
Revelstoke	Engelmann spruce	100	<u>Laspeyresia youngana</u>
Golden	Engelmann spruce	33	<u>Hylemyia anthracina</u> <u>Dioryctria</u> sp.
Invermere	Douglas-fir	33	<u>Megastignus</u> sp. <u>Barbara colfaxiana</u> <u>Dioryctria</u> sp.
Rogers Pass	Douglas-fir	5	<u>Megastignus</u> sp.



Douglas-fir needle midges, Contarinia spp.

Damage to Douglas-fir Christmas trees caused by needle midges was light in most areas of Nelson Forest District. However, near Westbridge, 20% of the needles examined were infested compared to 8% in 1969.

Table 6. Other insects of current minor significance

Insect	Host	Locality	Remarks
<u>Accleris variana</u> Black-headed budworm	Western hemlock	Nelson District	Defoliator. Larvae scarce.
<u>Adelges cooleyi</u> Cooley spruce gall aphid	Douglas-fir	Nelson District	Sucking insect. Moderate to heavy population on understory trees.
<u>Hyphantria cunea</u> Fall webworm	Miscellaneous deciduous	Trail, Creston	Defoliator. Tents less numerous than in 1969.
<u>Lambdina fiscellaria</u> <u>lugubrosa</u> Western hemlock looper	Western hemlock	Wet belt area	Defoliator. Of 60 hemlock collections during larval period, 33% were positive, averaging 2.6 larvae.
<u>Melanolophia imitata</u> Green-striped forest looper	Western hemlock, Douglas-fir	Nelson District	Defoliator. Of 60 hemlock collections 33% were positive averaging 21 larvae. Of 52 Douglas-fir collections 29% were positive averaging 1.2 larvae.
<u>Nepytia freemani</u> A looper	Douglas-fir	Texas Cr.	Defoliator. One collection produced eight larvae, elsewhere populations were light.
<u>Stilpnotia salicis</u> Satin moth	Black cottonwood	Slocan City	Defoliator. Moderate to heavy defoliation of Park trees.

## 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 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

#### Foliage diseases

##### Elytroderma disease of pines, *Elytroderma deformans*

There was a general increase in the number of pine stands infected by this disease in the Nelson District.

At the request of British Columbia Forest Service a mature ponderosa pine stand was examined near Beaverdell.

The stand, approximately 50 acres in size, ranged between 75 and 100 years of age and occupied a south facing slope. Symptoms causing concern were foliage, twig and branch mortality and in some instances, stem mortality. The cause of the problem was traced to *Elytroderma deformans* which was fruiting on the past year's needles. The disease had been active for several years.

Elsewhere there was moderate to heavy needle cast of ponderosa pine from Anarchist Mountain to Midway and near Boswell.

Heavy infection on lodgepole pine by *Elytroderma* disease occurred near Kallis Creek in the western portion of the District and near Morrissey Creek and Copper Lake in the eastern sector. Areas of infection ranged from an estimated 200 acres near Kallis Creek to 15 acres in the eastern epidemic areas.

##### Needle cast, *Lophodermella concolor* and a needle blight, *Hendersonia pinicola*

Moderate defoliation caused by the combination of these two diseases was prevalent on lodgepole pine over an estimated 300 acres near Inonoaklin and Wauchope Creeks.

Extensive browning of lodgepole pine occurred in restricted areas near Moyie Lake and Hawkins Creek.

Larch needle blight, Hypodermella laricis

Severe browning of reproduction and pole-sized western larch caused by larch needle blight was prevalent over large areas of the Nelson Forest District in 1970.

Fir-fireweed rust, Pucciniastrum epilobii

This organism caused heavy loss of current year's foliage of regeneration alpine fir over most of the host range.

Table 7. Other diseases of current minor significance

Organism	Host	Locality	Remarks
<u>Coleosporium</u> <u>asterum</u>	Lodgepole pine	Quinn Cr.	Needle rust. Common on regeneration.
<u>Isthmiella</u> <u>quadrispora</u>	Alpine fir	Whitney Cr.	Needle blight. Common on regeneration.
<u>Lirula abietis</u> <u>concoloris</u>	Alpine fir	Whitney Cr.	Needle blight. Common on regeneration.