

LIBRARY  
PACIFIC FOREST RESEARCH CENT  
806 WEST BURNS ROAD  
VICTORIA, B.C.

Canada  
PFR  
adr  
1973  
pt. 6

ANNUAL DISTRICT REPORT  
FOREST INSECT AND DISEASE SURVEY  
BRITISH COLUMBIA, 1973  
PART VI, CARIBOO DISTRICT

by  
D. F. Doidge<sup>1/</sup>

PACIFIC FOREST RESEARCH CENTRE  
CANADIAN FORESTRY SERVICE  
VICTORIA, BRITISH COLUMBIA  
INTERNAL REPORT

DEPARTMENT OF THE ENVIRONMENT  
April, 1974

---

<sup>1/</sup>  
Forest Research Technician, Forest Insect and Disease Survey, Victoria

## INTRODUCTION

This report outlines the status of forest insect and disease conditions in the Cariboo District for 1973, and forecasts pest population trends. Emphasis is placed on pests capable of sudden, damaging outbreaks.

Forest pest infestations reported to the Forest Insect and Disease Survey by public or private cooperators assist in the interpretation of the general pest situation and in gauging population trends.

Regular field work in the District extended from May 31 to August 17. Special surveys were as follows: one week in May on black cottonwood seed collecting; one week in June collecting corky bark of trembling aspen for disease studies; one week in October on forest tent caterpillar egg sampling.

A total of 200 insect and 50 disease collections were submitted in 1973. Map 1 shows the collection localities and drainage divisions.

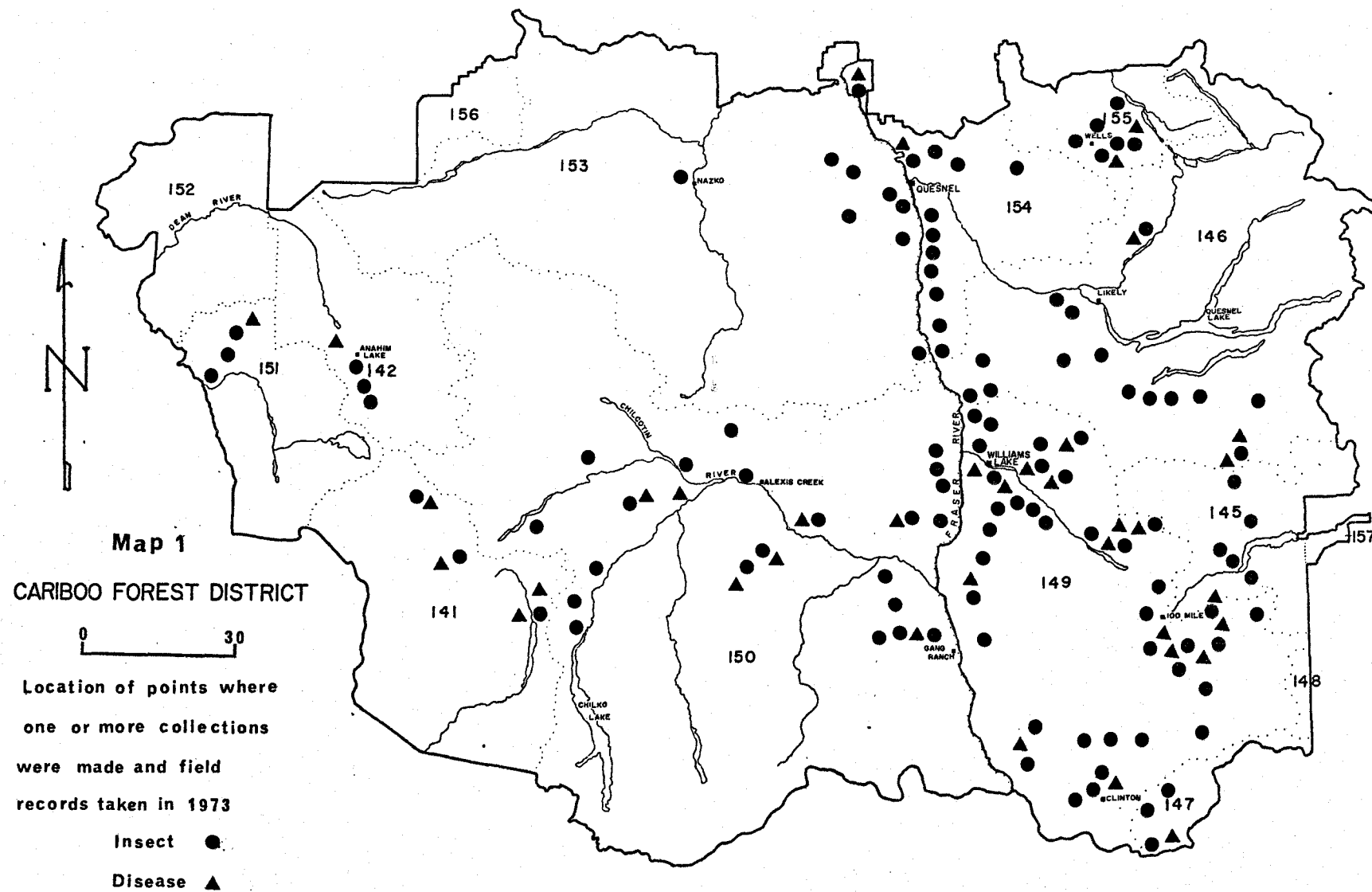
The numbers of larval defoliators found in field collections decreased slightly in the District, with the Chilcotin area showing the greatest drop. Throughout the District, 60% of the collections contained larvae, compared with 71% in 1972. Although the per cent positive collections dropped almost 10% the average number of larvae per positive collection doubled in 1973.

Bark beetles are potentially the most destructive insects in the Cariboo Forest District, even though at present they are at low population levels. Numbers of dead beetle-killed Douglas-fir trees quadrupled in 1973 along the Fraser River. Mountain pine beetle, spruce beetle and western balsam bark beetle remained at a low population level.

Forest tent caterpillar populations increased in the Quesnel and Horsefly areas and caused severe defoliation of trembling aspen over some 175,000 acres. Two-year-cycle spruce budworm lightly defoliated alpine fir near Hendrix Lake and western blackheaded budworm slightly damaged alpine fir near Wingdam. Populations of other defoliating insects remained at low levels.

Disease problems were mainly restricted to stem and gall rusts of lodgepole pines in the Cariboo and Chilcotin areas. Dwarf mistletoe continued to infect lodgepole pine stands throughout the District.

Details on individual insect and disease problems appear in subsequent sections.



## FOREST INSECT CONDITIONS

### Currently Important Insects

#### Bark Beetles

##### Douglas-fir beetle, *Dendroctonus pseudotsugae*

Populations of this bark beetle continued an upward trend for the third consecutive year. Increases were favored through availability of suitable host material in the form of predisposed overmature Douglas-fir caused by drought conditions, damaged trees associated with right-of-way clearing and cold-decked logs left in the woods over the breeding period. Beetle-killed trees were generally restricted to areas along the Fraser River in the vicinities of Williams and McLeese lakes, where there was a total of 1700 dead trees compared with only 80 in 1972. The highest numbers of red-tops were at: San Jose River, southeast of Williams Lake (500), Meldrum-Buckskin creeks, west of the Fraser River (400), Hawks Creek Valley, near Soda Creek (300), McLeese Lake (200), Williams Lake River, east and west sides (200), and Gaspard Creek (100).

The warm, dry summer of 1973 could cause Douglas-fir trees to be more susceptible to beetle attack in 1974. Higher populations of bark beetles are predicted for 1974 but this could be altered should the areas be subjected to unusual low snow cover and severe fluctuating temperatures during the winter of 1973-74.

##### Mountain pine beetle, *Dendroctonus ponderosae*

This beetle remained at a low population level in both ponderosa and lodgepole pine stands. An increase is expected in 1974.

##### Spruce beetle, *Dendroctonus rufipennis*

This beetle also remained at low population levels in the hazard areas around Quesnel Lake.

#### Defoliators

##### Forest tent caterpillar, *Malacosoma disstria*

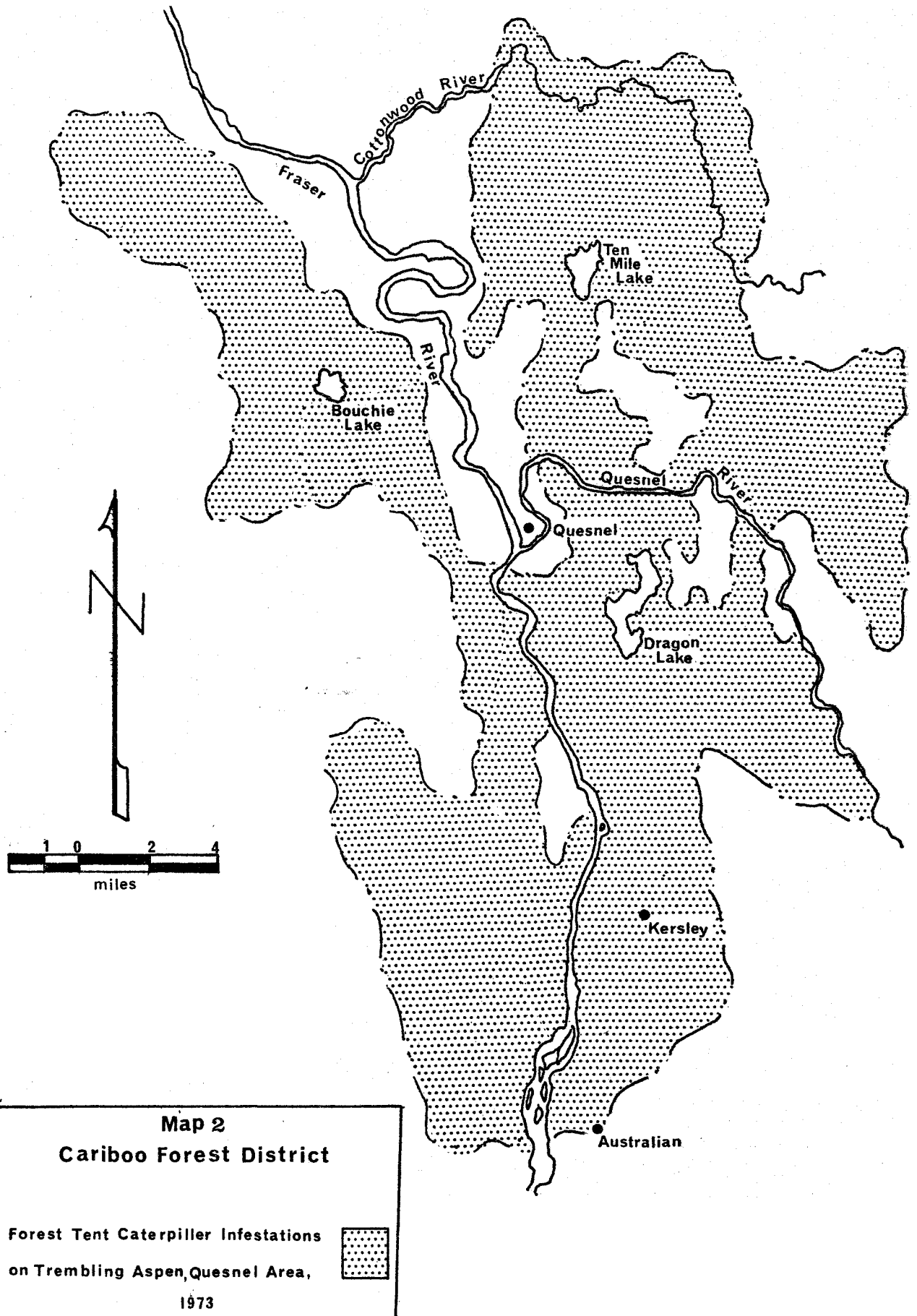
Defoliation of trembling aspen by forest tent caterpillars increased from 9,000 acres in 1972 to 175,000 acres in 1973. The "Quesnel" infestation (Map 2) extended from Australian in the south to Greening on the northern boundary of the District, 20 miles along the Wells-Barkerville

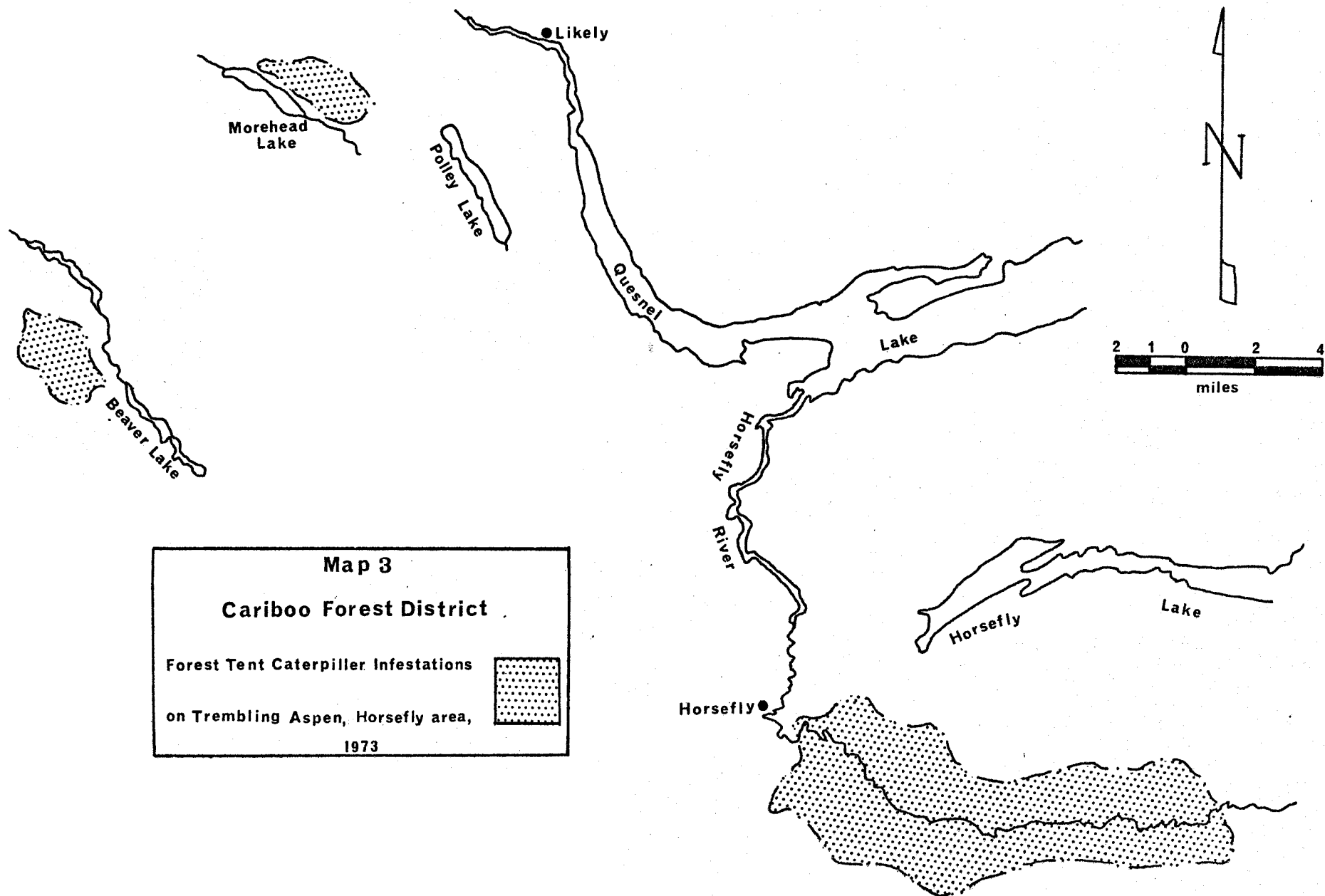
road, 15 miles along the Blackwater and six miles along the Nazko road from Bouchie Lake. The area bounding the old Quesnel Highway along Moose Heights to the Cottonwood River was also severely defoliated, as was the area from Australian to Quesnel on the west side of the Fraser River, a total of 150,000 acres. The "Horsefly River Valley" infestation (Map 3), occurred north of Morehead Lake, at the northwest end of Beaver Lake and 12 miles along the Horsefly River to Black Creek, a total of 25,000 acres. An indication of the tremendous population of tent caterpillars was the vast numbers of larvae crossing Highway #97 for three miles north of the Cottonwood River bridge on June 20. Larvae were so numerous on the road surface that they created a driving hazard. *Malacosoma* overwinter as eggs in masses banded around twigs of aspen. During the first week in October egg counts were made at three locations to determine the 1974 population (Table 1).

Table 1. Forest tent caterpillar egg counts on trembling aspen, Quesnel area, Cariboo District, 1973

Location	Tree No.	DBH	No. egg masses required to completely defoliate a tree of particular DBH	No. egg masses collected
Hush Lake	1	5"	14	28
	2	6"	19	8
	3	5"	14	96
Dragon Lake	1	3"	9	74
	2	6"	19	123
	3	4"	11	67
Quesnel River	1	6"	19	69
	2	5"	14	33
	3	5"	14	40

Only one tree sampled had less than the required number of egg masses to cause complete defoliation, therefore it is expected that the high populations will continue in 1974.





**Map 3**  
**Cariboo Forest District**  
Forest Tent Caterpillar Infestations  
on Trembling Aspen, Horsefly area,  
1973

One-year-cycle spruce budworm, *Choristoneura occidentalis*

Douglas-fir trees near Stuie on the extreme western border of the District continued to support a low population of *C. occidentalis* and light defoliation was noticeable. In 1973 sector traps baited with magicaps containing a pheromone (sex attractant) were set out near Stuie to attract adult males in a low population situation (Table 2).

Table 2. Number of *C. occidentalis* adults in Soolure traps, Cariboo District, 1973

Location	Trap no.	No. of adults attracted
Stuie # 1	1	3
	2	damaged
	3	0
	4	11
	5	14
Stuie # 2	1	9
	2	8
	3	3
	4	8
	5	14

The soolure traps were successful in attracting adult male moths, and predictions, based on larval beating samples and moth trapping, are for a continuing low population for 1974.

Two-year-cycle spruce budworm, *Choristoneura biennis*

Spruce budworm defoliated alpine fir and Engelmann spruce near Hendrix Lake, east of Hundred Mile House. About 75% of the current year's growth was destroyed on understory and codominant trees for about two miles east of the townsite. It is predicted that in 1974 populations of the budworm will increase throughout the areas of past outbreaks, specifically at Bowron Lakes and in the valleys of the Swift and Cottonwood rivers.

Sectar traps containing a pheromone attractant were set out in past hazard areas to determine if there were any off cycle adults flying. No adults were captured.

Western blackheaded budworm, *Acleris gloverana*

Blackheaded budworm defoliated 60% of the current year's growth on alpine fir between Wingdam and Beaver House Pass on the Wells-Barkerville road. This was the first damaging population of the insect since 1967 when 47,000 acres of western hemlock in the Quesnel - Mitchell lakes area was defoliated. Numbers of larvae in the Wingdam area indicated a moderate population which is expected to continue in 1974.

Other Noteworthy Insects

Conifer sawfly, *Neodiprion* spp.

This insect caused light defoliation of Engelmann spruce understory trees near Buffalo and Ruth lakes, east of Lac la Hache. There were 93 and 47 larvae respectively in single three-tree beating samples. Throughout the District generally *Neodiprion* spp. was one of the most common insects collected on Engelmann spruce, Douglas-fir, lodgepole pine and white spruce, with 24% of the beating collections containing an average of six larvae. No damage is expected in 1974.

Cooley spruce gall aphid, *Adelges cooleyi*

This sucking insect attacks Douglas-fir and spruce. Its presence on Douglas-fir is indicated by small white tufts of wool on the needles. As this insect is a pest of Christmas tree size Douglas-fir, causing needle discoloration and drop, five permanent study plots were established in the District in 1973. The percentage of current year's needles infested at the plots were: Clinton (34), 108 Mile House (50), Williams Lake (37), McLeese Lake (21), Ten Mile Lake (7). This was a light population and no change is expected in 1974.

On spruce the aphid produces cone-like galls on the branch tips. These galls are red when they are forming. Very noticeable damage occurred along the Hendrix Creek Forest Development Road, where galls were present on up to 100% of branch tips of Engelmann spruce.

A needle midge, *Contarinia* spp.

This needle midge infests the needles of Douglas-fir causing them to become distorted and discolored. Even light infestations can degrade Christmas trees and mar the appearance of shade trees. Five permanent study plots were established in 1973 to assess damage. The method used to check for infested needles was to examine each needle on five branch tips from each of five trees; percentage of infested needles were: Clinton (1), 108 Mile House (2), Williams Lake (2), McLeese Lake (4), Ten Mile Lake (1). No needle midge problem exists in the District and none is expected in 1974.

Pine terminal weevil, *Pissodes terminalis*

A terminal borer of reproduction lodgepole pine was common throughout the Chilcotin area of the District on trees 10-30 feet in height, usually in old burns or along roadsides. One of the most noticeable areas of damage was along the Bella Coola Highway between Tatla Lake and Anahim. A count of infested trees was made along the highway for one-half mile in a mixed age stand on the west side of the Dean River crossing. Terminal weevils had infested 170 trees and it was further estimated that 15-20% of the pine were infested in the area. Pine terminal weevils will probably continue to infest lodgepole pine throughout the Chilcotin and to a lesser extent the Cariboo in 1974.

Table 3. Other insects of current minor significance

Insect	Host(s)	Locality	Remarks
<i>Dryocoetes-Ceratocystis</i> complex	Alpine fir	General	Bark beetle in association with a fungus, <i>Ceratocystis dryocoetidis</i> , was at a low level.
<i>Mindarus abietinus</i> Balsam twig aphid	Alpine fir	Keithly Creek, Barkerville, Blackwater, Hendrix Lake	Sucking insect. Up to 70% of current growth on scattered trees was infested.
<i>Pikonema alaskensis</i> Yellow-headed spruce sawfly	Engelmann spruce, white spruce	100 Mile House, Nazko	Defoliator. Low populations; 20% of collections positive with an average of 3 larvae.
<i>Pikonema dimmockii</i> Green-headed spruce sawfly	Engelmann spruce, white spruce	100 Mile House, Umiti Creek	Defoliator. Low populations; 25% of collections positive with an average of 2 larvae.
<i>Pissodes strobi</i> Spruce weevil	White spruce	Wells-Bowron Lake road	Terminal borer. Common along Antler Creek on Wells-Bowron Lake road on trees 10-30 feet high.

## FOREST DISEASE CONDITIONS

The organisms currently causing tree mortality, growth loss, and quality reduction attributed to diseases are dwarf 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 making 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 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 and Branch Diseases

##### Lodgepole pine dwarf mistletoe, *Arceuthobium americanum*

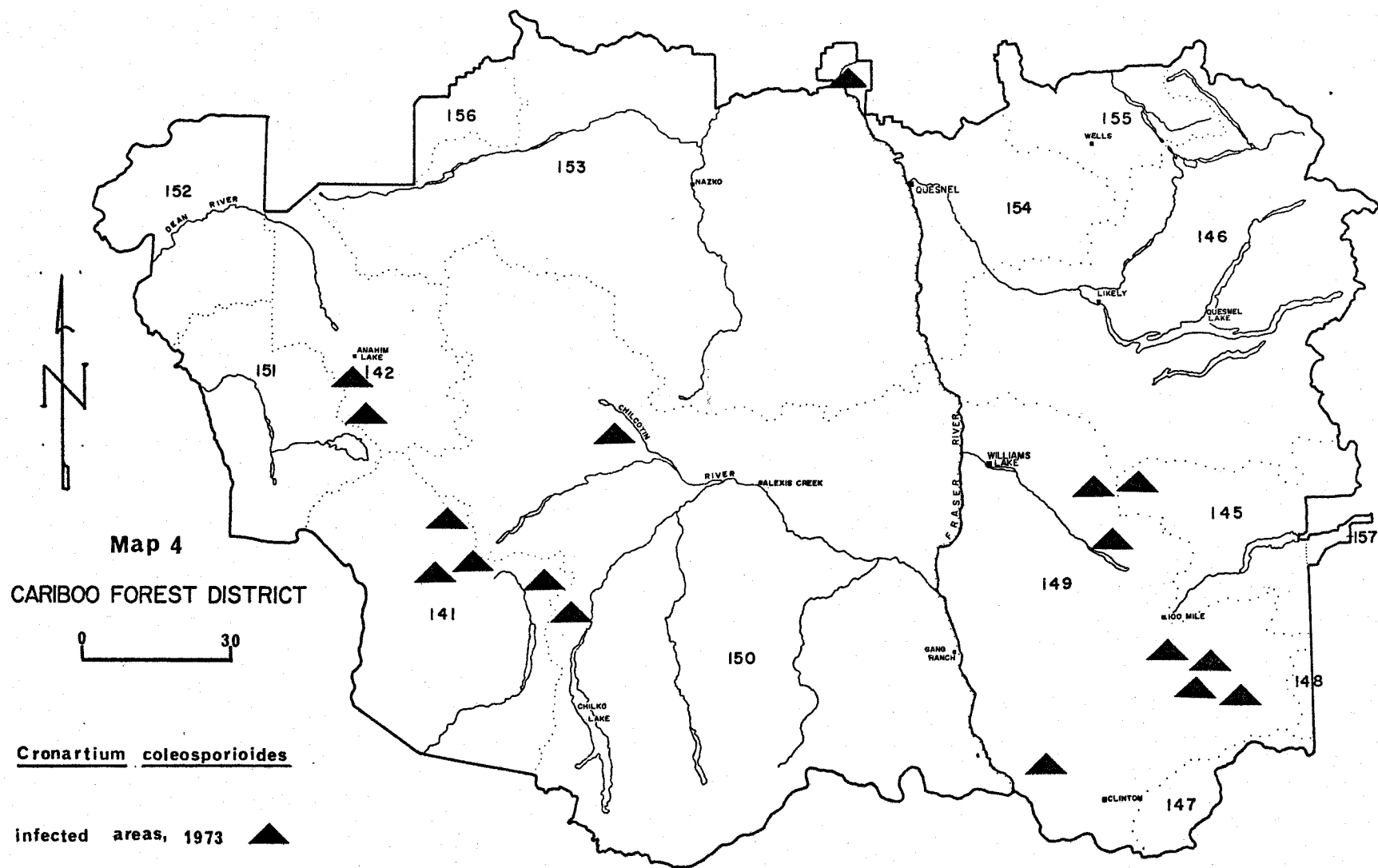
Mistletoe is the most important parasite of lodgepole pine in the District. Parasitic plants exist only on living hosts and seriously retard their growth. Cumulative growth loss between a healthy 81-100-year-old lodgepole pine stand and a moderately to severely infected stand has been estimated at 546 cubic feet per acre. In 1972, 700 miles of lodgepole pine stands in the Cariboo were examined and 21% of these stands were in the moderate to severe category of infection by dwarf mistletoe. This is a continuing problem that requires more intensive management of the pine stands. Recommendations for control<sup>1/</sup> of the pest have been set out and should be practiced where feasible. These recommendations include: preventing establishment of the disease in regeneration by planning clear-cut borders, clear-cutting infected stands and promoting higher participation of mistletoe resistant species in future stands.

##### Stalactiform rust, *Cronartium coleosporioides*

This rust was prevalent throughout reproduction lodgepole pine stands in the Cariboo and Chilcotin areas (Map 4). Stalactiform rusts cause branch and tree mortality by girdling, although on larger stems the principal result is growth loss. Once the rust is established on the primary host (lodgepole pine) the disease is perennial and will continue until the host is dead. Plots in reproduction stands at Lac la Hache had 50% of the trees infected, at Spout Lake 100%, Lavoie road, TFL #5 25% and Chilko Lake 80%. With the disease firmly established in these areas, it could spread and cause greater damage.

---

<sup>1/</sup> Dwarf Mistletoes in British Columbia by J.A. Baranyay, F.P.L. #44.



Atropellis canker, *Atropellis piniphila*

This canker of lodgepole pine was common in the Cariboo area of the District. A special survey in the Chilcotin showed that Atropellis is relatively scarce west of the Fraser River. Up to 80% of the trees in a pocket of lodgepole pine were infected in Tweedsmuir Park.

Elytroderma disease of pines, *Elytroderma deformans*

This needle cast infects both ponderosa and lodgepole pines in the District. A permanent study plot at Clinton in ponderosa pine showed an increase of about 10% for the third consecutive year (see graph). However the infection is still classified as moderate and increased infection is not expected.

Fir-fireweed rust, *Pucciniastrum epilobii*

This rust was noticeable throughout the alpine fir stands in early July. Infection was considered light but with scattered areas of moderate to severe infection. Current year's growth of alpine fir was 60-80% infected in a young stand for about one mile near Antler Creek, north of Wells. Lighter damage occurred at Hendrix Lake, Umiti and Keithley creeks where the growth was 10-20% infected. No permanent damage is expected.

Physiological Diseases

Winter drying

In 1972 about 800 acres of Douglas-fir and lodgepole pine along the Marble Range northwest of Clinton suffered winter drying. This year about 300 acres of lodgepole pine were damaged on the southwest side of Mt. Bowman at about 6,000 feet elevation.

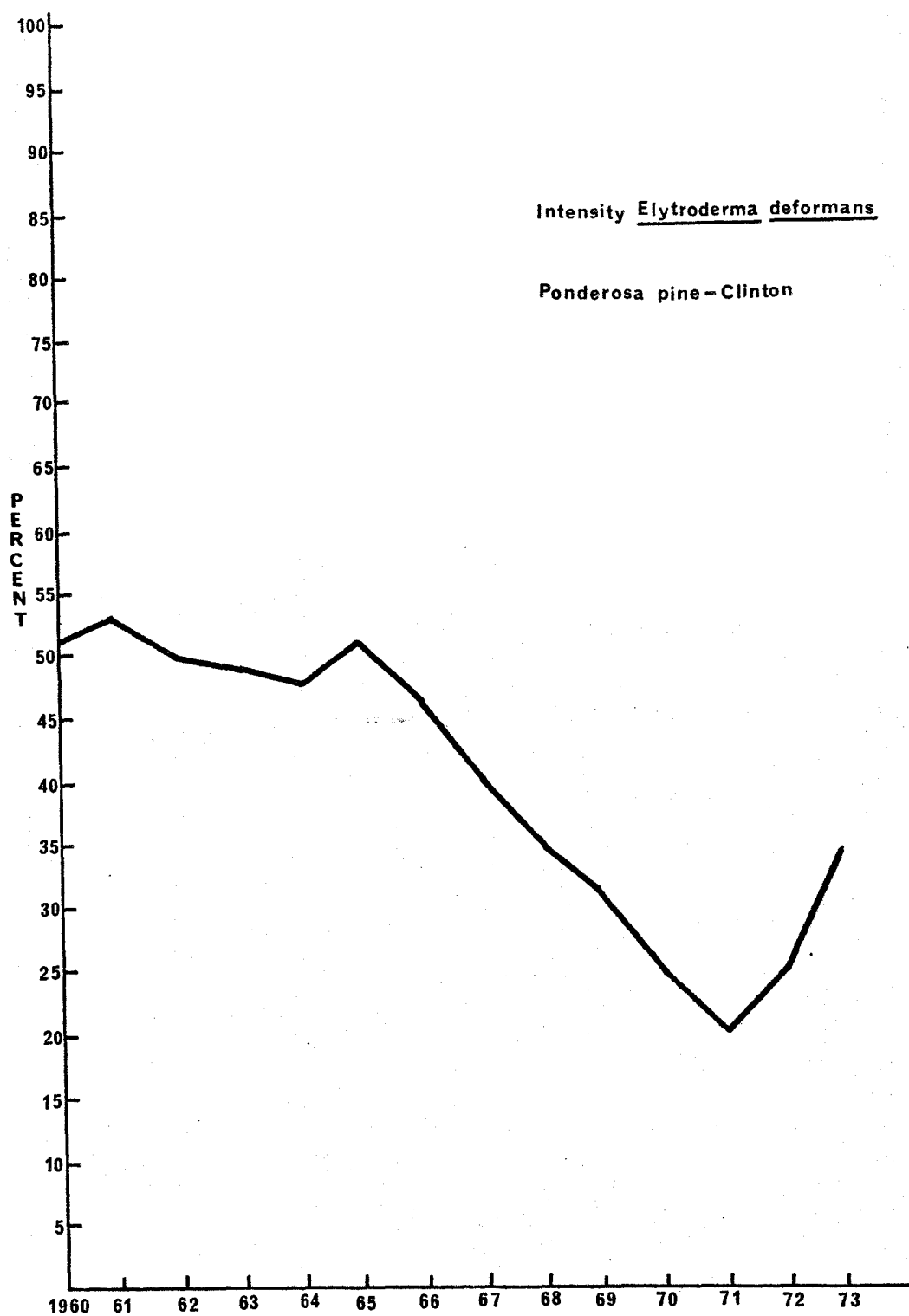
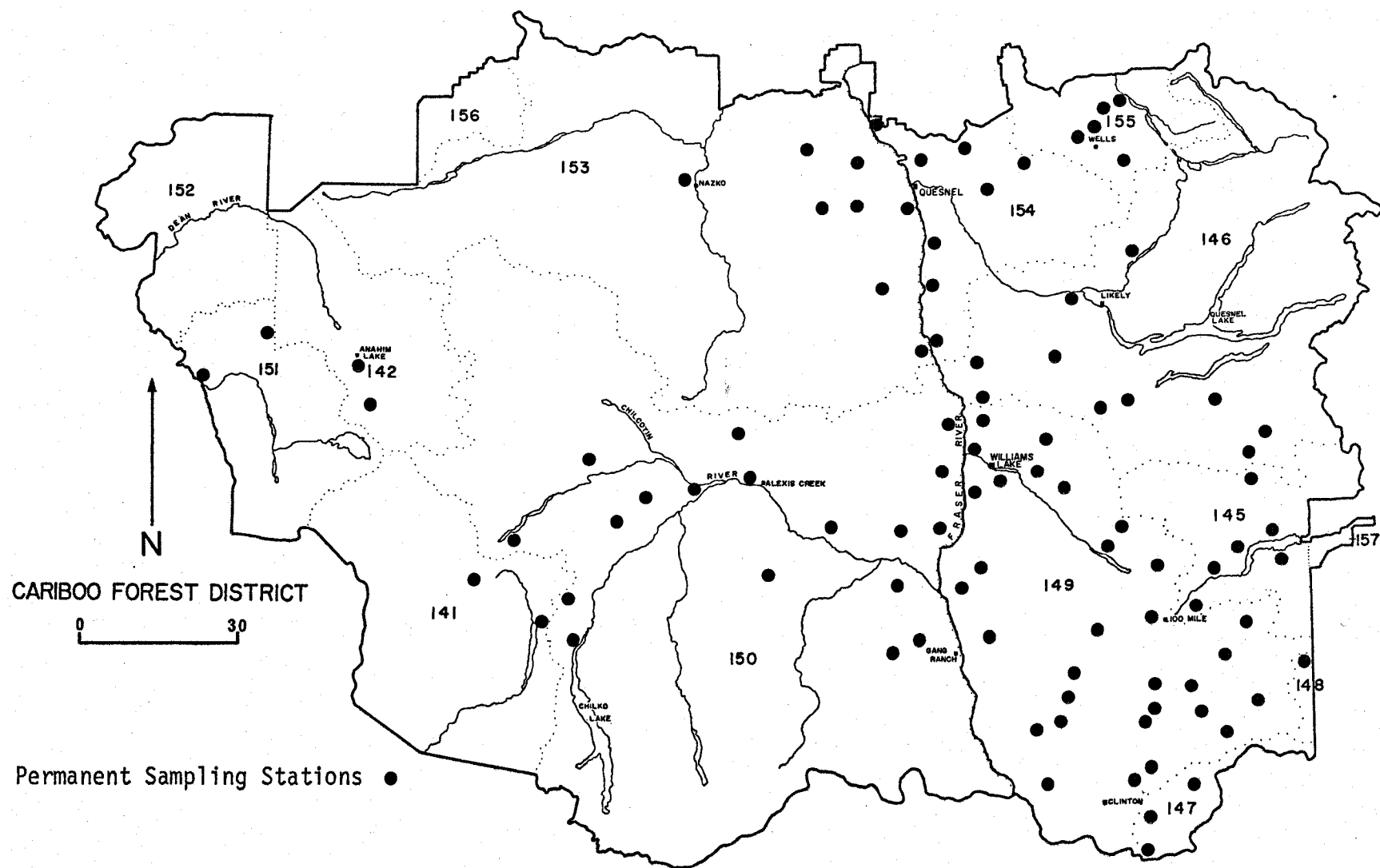


Table 4. Other diseases of current minor significance

Organism	Host(s)	Locality	Remarks
<i>Limacinia alaskensis</i>	Alpine fir	Barkerville, Hendrix Lake	Mild sooty mould.
<i>Lirula abietis-</i> <i>concoloris</i> Needle blight	Alpine fir	Barkerville, Hendrix Lake	Foliage disease. Causes shedding of previous years needles, therefore is particularly damaging to Christmas trees.
<i>Lophodermella concolor</i> Needle cast	Lodgepole pine	Riske Creek, Williams Lake	Kills year-old needles; trees turn straw-colored in May and June and needles fall in July.
<i>Melampsorella caryophyllacearum</i> Fir broom rust	Alpine fir	Antler Creek, Umiti Creek	Causes witches' brooms; most important rust on true firs.
<i>Phragmidium</i> sp. Leaf rust	Rose	General	Common rust affecting leaves of wild roses throughout District.
<i>Puccinia coronata</i> Leaf rust	Soopollallie	Horsefly	Common.
<i>Puccinia evandallii</i> Leaf rust	Snowberry	Lee's Corner	Common in Chilcotin.
<i>Puccinia mesomajalis</i> Leaf rust	Queens cup	Horsefly	Common in Quesnel Lakes area.
<i>Venturia populina</i> Leaf blight	Black cottonwood	Hendrix Lake	Causes leaves to blacken and die.



# CARIBOO DISTRICT

## Appendix I

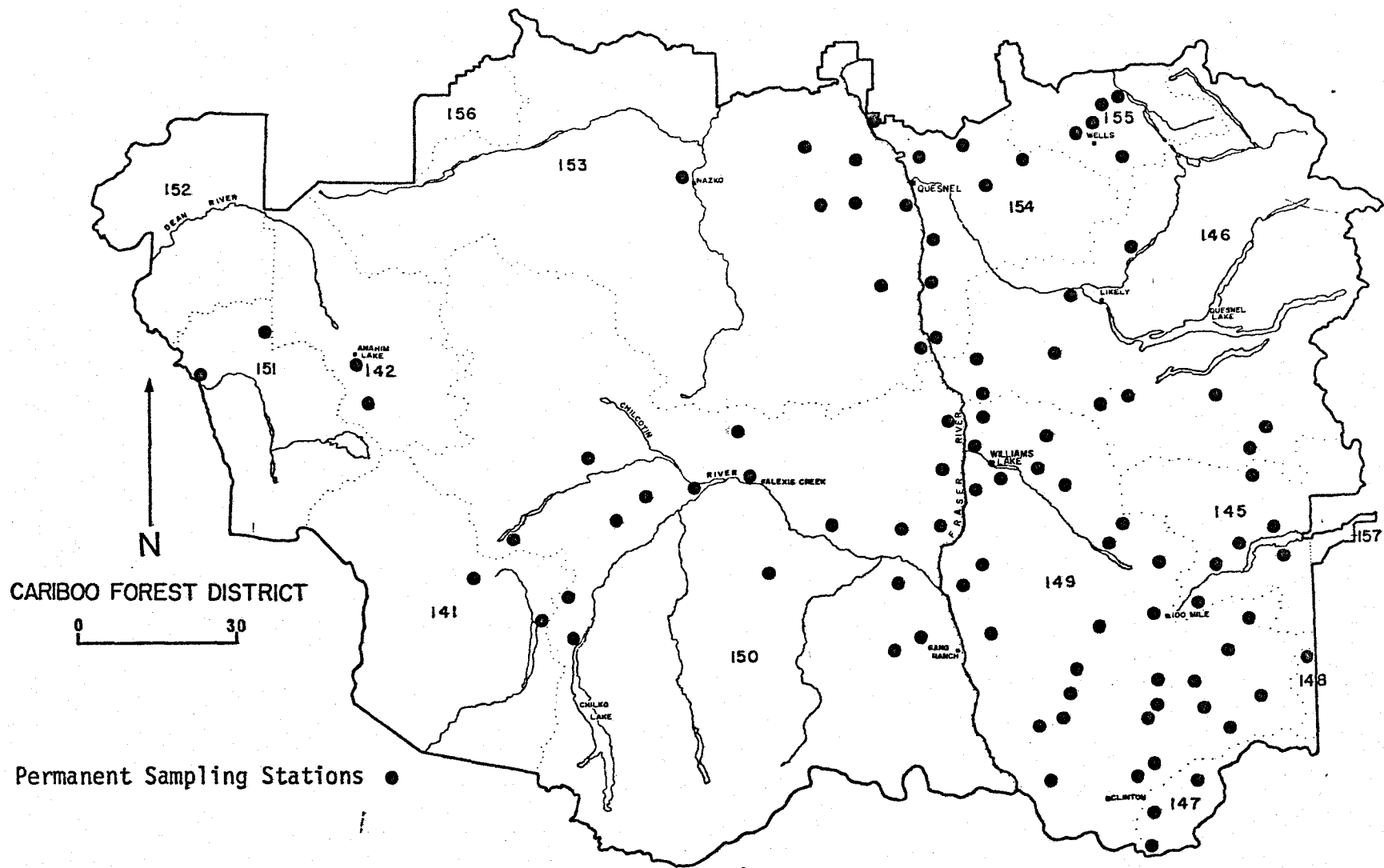
### Permanent Sample Stations

A few permanent sampling stations were established in the Cariboo area during the 1960's prior to the formation of the Cariboo Forest District. With the formation of the District and the assignment of a survey ranger it became necessary to increase the number of PSS's to follow defoliator population trends. Following is a list of permanent sample stations showing hosts sampled and dates established.

Tree species sampled	Year established											Total
	61	62	63	64	65	67	68	69	70	71	73	
Douglas-fir	8	9	2	-	1	1	1	1	1	32	7	63
Lodgepole pine	5	10	2	2	3	2	-	1	1	27	4	57
Engelmann spruce	4	5	-	1	1	-	-	-	-	11	4	26
Alpine fir	-	1	-	1	4	1	-	1	2	3	3	16
White spruce	-	2	-	-	3	2	-	-	3	3	3	16
Rocky Mtn juniper	-	-	-	-	-	-	1	-	-	3	-	4
Ponderosa pine	-	-	-	-	-	-	1	-	-	1	-	2
Black spruce	-	-	-	-	-	-	-	-	-	1	-	1
Western hemlock	-	-	-	-	-	-	-	-	-	-	1	1
White bark pine	-	-	-	1	-	-	-	-	-	-	-	1
Total	17	27	4	5	12	6	3	3	7	81	22	187*

\* At some PSS's more than one tree species is available for sampling and it is possible to obtain 187 three-tree samples from 103 stations.

Sample station records, including descriptions, are in the Cariboo District file in room 6 of the Survey building, P.F.R.C.



## Appendix II

### Tree Damage Appraisal Plots

There is one "spruce budworm" appraisal plot in the Cariboo District, established during an infestation in the 1950's. When populations increase again to damaging levels the number of plots may be increased. Douglas-fir beetle has been a problem insect in the Chilcotin and Cariboo and for that reason a number of plots were established to follow population trends and forecast damage.

Following is a list of permanent sample stations showing pest, plot location and purpose.

Pest	Plot location	Date established	Purpose
Spruce budworm	Barkerville	1955	Population trend and damage appraisal.
Douglas-fir beetle	Helena Lake	1955	Infestation trend and damage appraisal.
	Place Lake	1955	
	Lac la Hache    six plots	1959	
	Williams Lake	1965	
Needle miners	Clinton, 108 Mile House, Williams, McLure and Ten Mile lakes	1973	Infestation trend.
Elytroderma disease of pines	Clinton	1969	Infection intensity.

Plot records are in the Cariboo District file in room 6 of the Survey building, P.F.R.C.

### Appendix III

#### Pest Reports

<u>Title</u>	<u>Author</u>	<u>Date</u>
Aspen defoliation in Cariboo District	D. F. Doidge	June 25, 1973

#### Information Reports

Forest Insect and Disease Conditions, 1973, Cariboo District	D. F. Doidge	March, 1974
---	--------------	-------------

## Appendix IV

### Exotic Plantations

Non-native trees were planted in a burned area in the Cariboo Forest District in 1961. The Forest Insect and Disease Survey assumed the responsibility of inspecting this plantation for evidence of pest introduction or their susceptibility to native pests.

Prior to 1970 all plantations were inspected annually; since then an inspection schedule has been used to insure inspection of all plantations over a 5-year period.

Listed below are all remaining exotic plantations in the Cariboo Forest District.

Exotic plantation records are on file with the Appraisal group of the F.I.D.S. in the Survey building, P.F.R.C.

XP No.	Tree species	Location	Date established	Year last examined	No. trees remaining
183	<u>Pinus</u> <u>sylvestris</u>	Knife Creek	1960	1973	?

V  
Appendix IV

Liaison

Workshop for British Columbia Forest Service and industry personnel, May 16, 1973.

- Subject - Insect Problems in Cariboo Forest District
- Important Forest Diseases in Cariboo Forest District. J. A. Baranyay.

Department of Fisheries personnel, Nanaimo, re. aquatic insect sampling.