



CANADA
DEPARTMENT OF FORESTRY
AND RURAL DEVELOPMENT

**ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
ALBERTA-NORTHWEST TERRITORIES-YUKON REGION
1966**

**FOREST RESEARCH LABORATORY
CALGARY, ALBERTA
INFORMATION REPORT A-X-6**



**FORESTRY BRANCH
JANUARY, 1967**

ANNUAL DISTRICT REPORTS

ALBERTA - NORTHWEST TERRITORIES - YUKON REGION

1966

(Forest Insect and Disease Survey)

by

J. K. Robins, N. W. Wilkinson, G. J. Smith,
V. B. Patterson, F. J. Emond, C. R. Layton,
J. Petty, J. P. Susut, E. J. Gautreau, R. W. Barry.

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

INFORMATION REPORT A-X-6

FORESTRY BRANCH

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

JANUARY 1967

INTRODUCTION

Technicians of the Forest Insect and Disease Survey were engaged in field activities from early April to late September in 1966. The status of major forest pests was determined by ground, aerial and boat surveys. Damage appraisals were conducted, special biological studies were carried out and many new host and distribution records were made. Although the weather over most of the Region was abnormally wet and cool during most of the field season, survey activities were not unduly hampered.

Populations of many species of insects were much lower than in previous years; foliage diseases were more prevalent. The spruce budworm outbreaks in the Northwest Territories decreased in intensity in contrast to northern Alberta where a number of new outbreaks were detected. The outbreak of forest tent caterpillar persisted in much the same areas and intensity as in 1965. Larch sawfly populations continued to decline. Needle rusts, needle casts and leaf diseases of poplars were widespread in southwestern Alberta. Winter drying of conifers was severe in many areas along the foothills.

The responsibility for surveys in the Yukon Territory was assumed from the British Columbia Region in 1966, necessitating minor changes in district assignments. District and supervisory responsibilities were as follows:

Southern Division
Supervisor - V. B. Patterson

District	1.	Crownst - Bow River	N. W. Wilkinson
District	2.	Clearwater	G. J. Smith
District	3.	National Parks	V. B. Patterson

Central Division
Supervisor - F. J. Emond

District	4.	Brazeau - Athabasca	F. J. Emond
District	5.	Lac la Biche	C. R. Layton

Northern Division
Supervisor - J. Petty

District	6.	Slave Lake - Grande Prairie	J. Petty
District	7.	Peace River	J. P. Susut
District	8.	Mackenzie	E. J. Gautreau
District	9.	Yukon Territory	R. W. Barry

SUMMARY OF INSECT AND DISEASE CONDITIONS

Large Aspen Tortrix, Choristoneura conflictana (Wlk.)

Noticeable defoliation by this insect has been absent from this Region for a number of years although populations have been building up in southern Alberta since 1963. During the past season, severe defoliation of trembling aspen occurred along the lower foothills from Highway 3 to the United States Boundary and in the Cypress Hills.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm populations were generally lower in the Northwest Territories in 1966 but considerably higher in northern Alberta. Outbreaks persisted along the Slave and Mackenzie rivers in much the same areas as in 1965 although damage was predominantly light to moderate. Many spruce stands which had sustained repeated severe attacks by spruce budworm and were in a poor condition in 1965, made a substantial recovery in 1966. In northern Alberta, a number of new outbreaks were surveyed along the Chinchaga, Hay, Athabasca and Peace rivers. Little overall change was noted in the older outbreaks around Loon Lake and along the Wabasca River.

Forest Tent Caterpillar, Malacasoma disstria Hbn.

The current outbreak of the forest tent caterpillar in Alberta was in its tenth year during 1966. Defoliation of aspen was restricted to the same general areas as in 1965. Moderate to severe defoliation occurred over about 360 square miles from the north shore of Lake Wabamun south to a line running west from the north end of Pigeon Lake. High larval mortality in early instars reduced the outbreak southwest of Vilna to about 50 square miles where light defoliation occurred. Hatching and early instar larval behaviour was studied in 4 plots established around Wabamun Lake.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Populations of this insect continued to decline throughout most of the Region. Severe defoliation of tamarack was largely confined to small patches between the Spence and Rabbitskin rivers, east of Fort Simpson and northeast of the Horn Mountains to the northern limit of this tree species. Moderate defoliation occurred sporadically between Edson and Pedley in west-central Alberta.

Foliage Diseases

As in 1965, weather conditions favoured a high incidence of foliage diseases. Needle rusts and needle casts of conifers and leaf diseases of deciduous hosts caused considerable damage to foliage in many areas in western Alberta. The most notable damage to spruce foliage was caused by a number of needle rusts, Chrysomyxa spp., and by the needle casts Bifusella crepidiformis Darker and Lophodermium macrosporum (Hartig) Rehm. The needle casts Elytroderma deformans (Weir) Darker, Hypodermella concolor (Dearn.) Darker, and Hypodermella montana Darker were prevalent on lodgepole pine. Poplar ink spot, Ciborinia whetzellii (Seaver) Seaver and poplar leaf spot, Marsonina tremuloidis (Ell. & Ev.) Kleb. were the most common foliage diseases of deciduous trees.

Weather Injury

Winter drying of conifers was widespread and severe along the foothills south of the North Saskatchewan River. An unusual feature of the past seasons injury was its prevalence along the lower slopes and in valley bottoms, contrary to its usual occurrence at higher elevations. Winter damage to aspen was conspicuous along the lower foothills south of the Bow River. Damage to many species of planted trees and shrubs was unusually severe in southern Alberta.

TABLE I

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE REGION IN 1965.

Causal Agent	Host	Remarks
<u>Insects</u>		
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry	Abundant on preferred host in southern Alberta, and at scattered points in central Alberta.
Strawberry root weevil, <u>Brachyrhynchus ovatus</u> L.	Conifers	Caused loss of an estimated one-half million coniferous seedlings at Provincial Tree Nursery at Oliver.

TABLE I - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Pear slug, <u>Caliroa cerasi</u> (L.)	Cottoneaster	Heavy infestations occurred at many points in Central and Southern Alberta. Particularly severe in Calgary and Edmonton.
Birch leaf miner, <u>Fenusa pusilla</u> (Lep.)	Birch	A serious pest of ornamentals in Calgary area in 1966 although populations down somewhat from 1965.
Lilac leaf miner, <u>Gracilaria syringella</u> (F.)	Lilac	Caused severe leaf damage to ornamental plantings in central and southern Alberta.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	Aspen	High populations persisted in the Rocky Mountain National Parks, along the foothills, in Northern Alberta, the Northwest Territories and the Yukon.
<u>Disease</u>		
Dwarf mistletoe, <u>Arceuthobium americanum</u> Nutt. ex Engelm.	Lp. pine	The incidence of this parasite on its host in 4 well defined areas around Jasper townsite averaged 44 per cent of living trees infected.
Shoestring root rot, <u>Armillaria mellea</u> (Vahl ex Fr.) Quéf.	Lp. pine D. fir	Caused mortality of lodgepole pine in a number of small patches along the foothills. Also killed young Douglas fir in Sinclair Pass and both young and mature Douglas fir in Banff townsite.

TABLE I - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Spruce cone rust, <u>Chrysomyxa pirolata</u> , Wint.	W. spruce	Prevalent throughout the Lac la Biche Forest and in the Cypress Hills. Caused significant damage to the very light cone crop in the foothills area.

ACKNOWLEDGMENTS

The field staff of the Forest Insect and Disease Survey gratefully acknowledges the assistance rendered by personnel of the Alberta Forest Service, the Provincial Agricultural Extension Services, and the Department of Indian Affairs and Northern Development.

SUMMARY OF AERIAL SURVEYS 1966

PURPOSE	DISTRICT	DATE	AIRCRAFT	COST PER HOUR	TOTAL HOURS	TOTAL COST
Spruce budworm	Mackenzie	June 29	Cessna 180 (Floats)	50.00	4:30	225.00
Forest tent caterpillar	Clearwater Brazeau-Athabasca Lac La Biche	June 30	Cessna 172	30.00	5:05	152.50
Spruce budworm	Mackenzie	July 5	Beaver (Floats)	74.00	4:00	296.00
Spruce budworm	Lac la Biche Grande Prairie-Slave Lake Peace River Mackenzie	July 5 to 8	Cessna 185 (Floats)	65.00	17:00	1142.00
Armillaria	Clearwater	July 6	Cessna 180	42.00	5:40	238.00
General survey	Crowsnest-Bow River	July 7	Cessna 180	42.00	3:30	147.00
Spruce budworm	Mackenzie	July 12 to 15	Cessna 185 (Floats)	65.00	14:45	975.00
Spruce budworm	Peace River	July 26	Helicopter J3		*1:30	
Tree line survey	Mackenzie	July 26 to 28	Beaver (Floats)	72.00	10:20	856.00
Western gall rust	Peace River	Aug. 3	Cessna 180	42.00	3:00	126.00
Larch sawfly	Mackenzie	Aug 8 to 10	Cessna 180 (Floats)		**6:00	

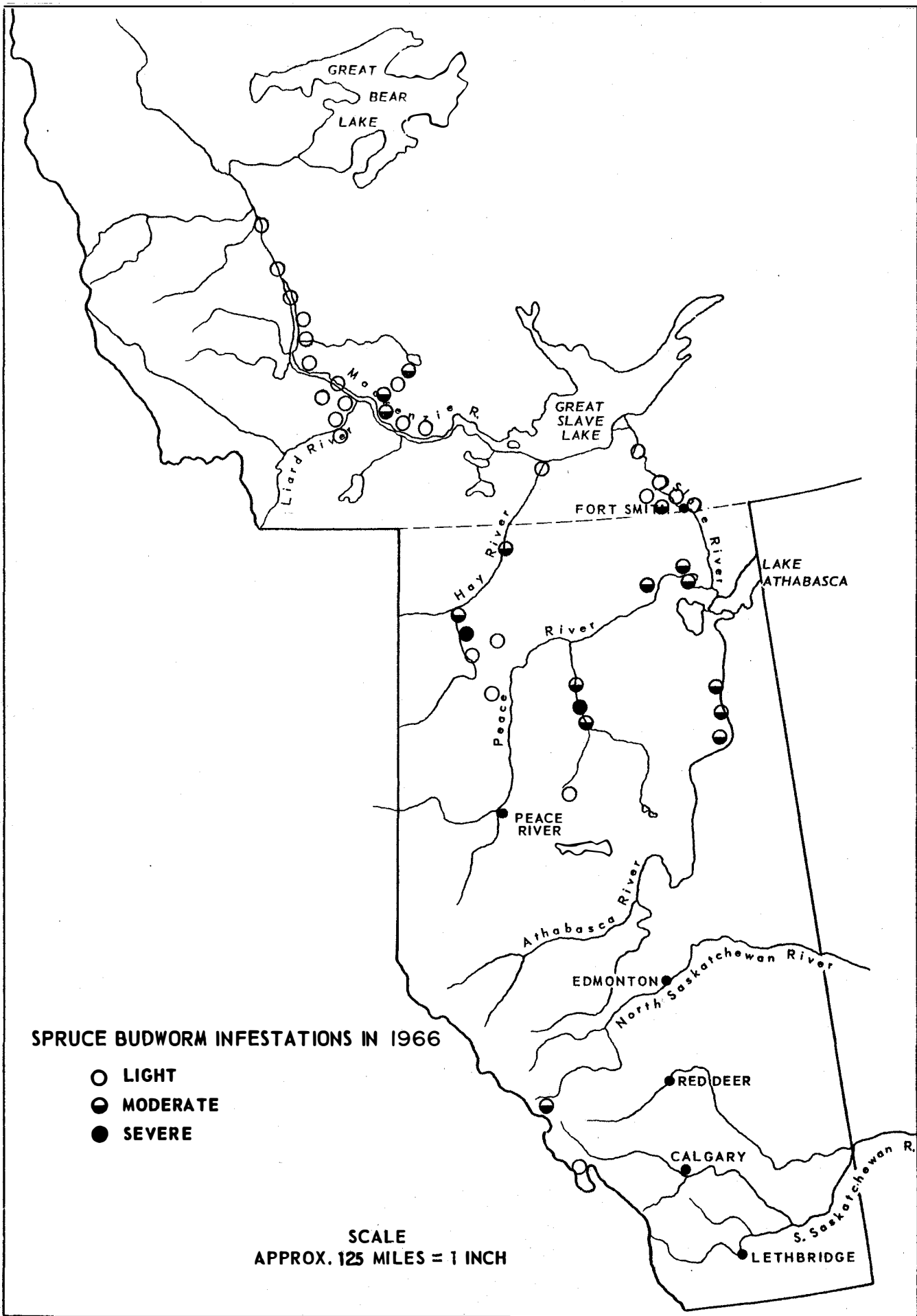
SUMMARY OF AERIAL SURVEYS 1966 (Cont'd.)

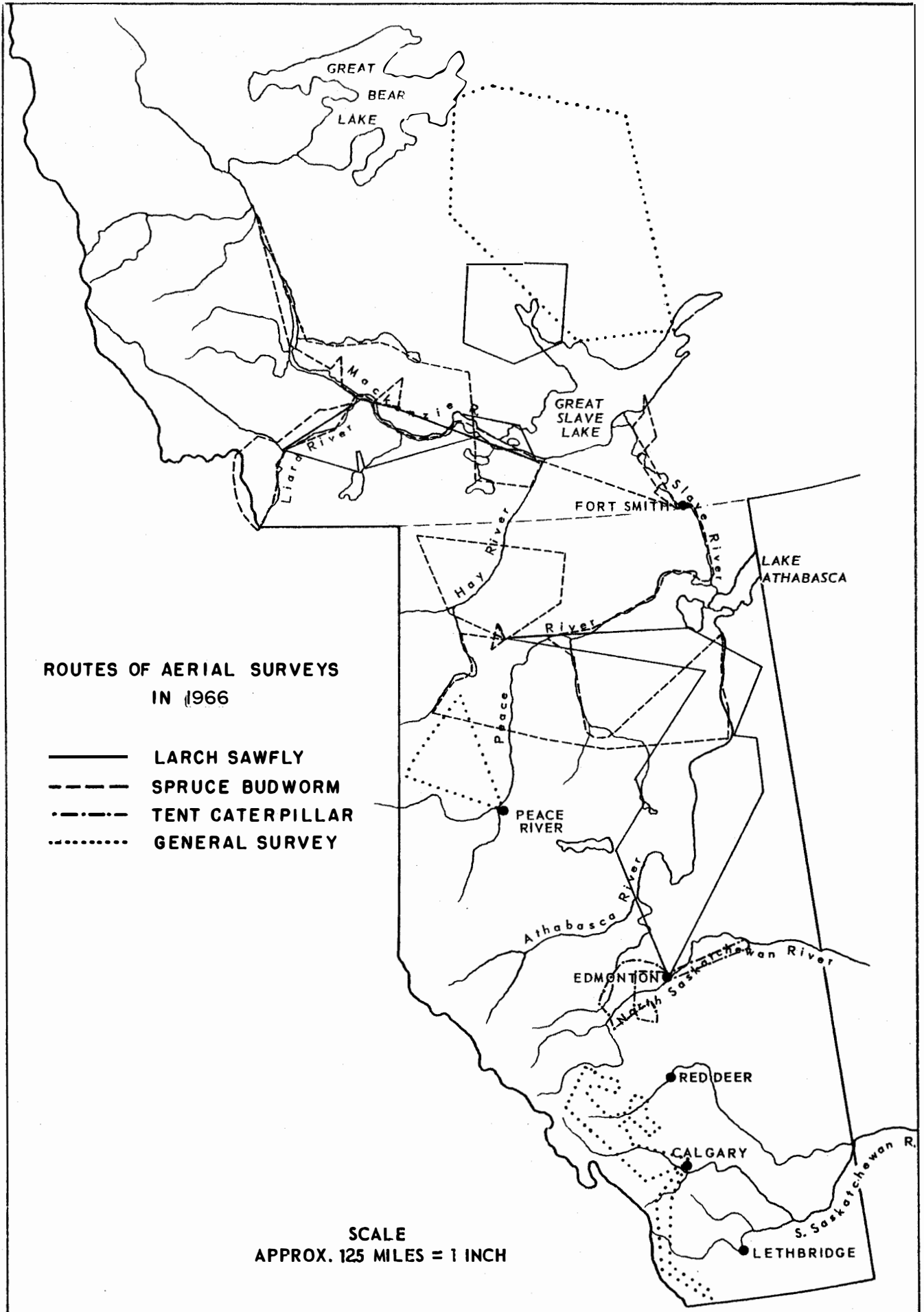
PURPOSE	DISTRICT	DATE	AIRCRAFT	COST PER HOUR	TOTAL HOURS	TOTAL COST
Larch Sawfly	Mackenzie	Aug. 15	Beaver (Floats)	72.00	6:15	492.50
Larch Sawfly	Brozeau-Athabasca Lac la Biche Slave Lake - Grande Prairie Peace River	Aug. 22	Cessna 185	55.00	8:55	499.84
TOTALS					<u>90:30</u>	<u>5149.34</u>

* Alberta Forest Service

** MacKenzie Forest Service

Note: Total cost includes pilot expenses





ANNUAL DISTRICT REPORT
CROWNEST-BOW RIVER DISTRICT
ALBERTA 1966

by
N. W. WILKINSON

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
JANUARY 1967

INTRODUCTION

Populations of the large aspen tortrix and poplar serpentine miner reached outbreak proportions in southern Alberta in 1966. The outbreak of linden looper near Pashley declined and in the same area there was an increase in the population of fall cankerworm. Low populations of leaf tier larvae were responsible for patches of light defoliation of aspen between Olds and the Saskatchewan Border. Populations of American aspen beetle and grey willow leaf beetle remained low in 1966. A low population of spruce bark beetles was active in the upper Racehorse Creek area. A few Douglas fir trees in the Porcupine Hills are being attacked each year by Douglas fir beetles.

Leaf rust on Populus spp. were widespread throughout the District. Caragana leaf spot was cause for concern by many shelterbelt owners. There was a slight increase in the intensity of poplar leaf spot in the District in 1966. Aspen shoot blight caused light damage to aspen along the foothills and in Cypress Hills Provincial Park. Stalactiforme rust caused severe damage to a stand of lodgepole pine north of Burmis. Shoestring root rot caused mortality of lodgepole pine in Waterton Lakes National Park and in Cypress Hills Provincial Park, and of Norway spruce and Douglas fir near Seebe. Red belt was prevalent in some coniferous stands in the District. Climatic damage of aspen was especially severe along the north end of the Porcupine Hills.

INSECT CONDITIONS

Fall Cankerworm, Alsophila pometaria (Harr.)

Populations of this cankerworm were higher in 1966 than in the previous year. In conjunction with the linden looper, Erannis tiliaria (Harr.), they were responsible for severe defoliation of shelterbelts in the area between Acadia Valley and Pashley. Populations were low near Acadia Valley and gradually increased to high near Pashley where they severely defoliated a stand of native Manitoba maple along Ross Creek.

Large Aspen Tortrix, Choristoneura conflictana (Wlk.)

The population level of this aspen defoliator was much higher in 1966 than in 1965. They reached outbreak proportions in the southern foothills and in the Cypress Hills. The build-up in the foothills occurred in an area 2 - 5 miles wide extending from 5 miles north of

Burmis to the United States Boundary; an estimated total of 75 square miles of aspen was defoliated in this area. From north of Burmis to Beaver Mines patches of aspen were severely defoliated. Southeast of Beaver Mines the severe defoliation was continuous to the United States Boundary. In the Cypress Hills a few miles south of Elkwater 100 - 150 acres of aspen was defoliated.

Egg counts in both outbreak areas indicate higher populations can be expected in 1967.

Needle Miner, Coleotechnites starki Freeman

The decline in the numbers of this needle miner in Cypress Hills Provincial Park continued in 1966. Sequential samples taken in the area indicated a nil population. Needle miner material was not available to continue investigations to determine what other species of needle miner was present in the area.

Spruce Bark Beetle, Dendroctonus obesus (Mann.)

A low population of this species of bark beetle was active in the upper watershed area of Racehorse Creek. Broods were found in wind-thrown and standing, overmature Engelmann spruce. The attacks on standing trees appeared to be a secondary cause of tree mortality in the area. The general stand form in this area is overmature and offers ideal conditions for a build-up of the population.

Douglas-fir Beetle, Dendroctonus pseudotsugae Hopk.

The populations of this bark beetle in the Porcupine Hills remained static. A few overmature Douglas fir trees have been attacked each year. Adults were collected in 1966 from infested trees near the north end of the Hills.

Linden Looper, Erannis tiliaria (Harr.)

In the outbreak area near Pashley the population level of this looper was greatly reduced in 1966 from that reported in 1965. However, north of this area there was a slight increase in their numbers. Near Acadia Valley high populations were found in a few Manitoba maple shelter-belts where they caused severe defoliation.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

There was a marked increase in the numbers of this poplar serpentine miner throughout the District in 1966. High populations caused severe damage to aspen leaves in the upper watershed area of Jumping

Pound Creek which includes Sibbald, Bateman, Cox and Moose creeks. Approximately 80 per cent of the aspen foliage in this area was mined and had the silvery appearance characteristic of severe infestation. Light to moderate leaf mining was evident throughout the remainder of the foothills, on the east slopes of the mountains and in the Cypress Hills.

DISEASE CONDITIONS

Poplar Leaf Spot, Marssonina tremuloidis (Ell. & Ev.) Kleb.

There was a noticeable increase in the occurrence and intensity of this poplar leaf spot in the foothills area of the District. Near Twin Butte the disease caused severe damage. Small areas of light to moderate damage occurred throughout the remainder of the District.

Leaf Rust, Melampsora occidentalis Jacks.

This leaf rust was common on Populus spp. throughout the District. It was especially noticeable in fringe areas of the foothills and in shelterbelts in the agricultural area. Poplar species other than aspen were the main hosts. The intensity of the disease was greater on ornamental and shelterbelt trees than on trees in forested areas. Infected leaves ripened prematurely and caused early leaf drop.

Leaf Spot, Septoria caraganae (Jacq.) Died.

This leaf spot of caragana was collected in Alberta for the first time in 1966. Infections were found in caragana plantations from Bassano east to the Saskatchewan Border. The effect of the disease was an early ripening or drying of the leaves and early leaf drop.

Aspen Shoot Blight, Venturia tremulae Aderh.

This aspen shoot blight was widespread throughout the District. It was especially noticeable in Cypress Hills Provincial Park and in fringe areas throughout the foothills. Regeneration aspen was more frequently infected than the more mature trees. The blackened, curled shoots and leaves were so common the trees appeared to have been damaged by early summer frost.

Red Belt

This condition, caused by winter drying, occurred in the following areas: eastern edge of the mountains from Moose Mountain to Willow Creek,

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE CROWNEST - BOW RIVER DISTRICT, 1966

Causal Agent	Host	Remarks
<u>Insects</u>		
Cooley spruce gall, <u>Adelges cooleyi</u> (Gill.)	W. spruce E. spruce N. spruce	Low populations active throughout the District.
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry Rose	High populations near Gleichen. Low populations near Empress and Milk River.
Leaf tier, <u>Compsolechia niveopulvella</u> Cham.	T. aspen	Low populations active from Olds to Saskatchewan Border.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	T. aspen Willow	No infestations found in 1966.
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	T. aspen	A slight increase from that reported in 1965.
Pine root collar weevil, <u>Hylobius</u> sp.	Lp. pine	Causing tree mortality in Cypress Hills Provincial Park.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	<u>Ribes</u> sp.	Low populations in the Milk River area.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	E. spruce	A slight increase was noticeable in the Crownsnest Pass.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Low populations a few miles east of Olds.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	Lp. pine	Low populations in the Crownsnest Pass and in Cypress Hills Provincial Park.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	W. spruce	Caused severe defoliation of a shelterbelt near Bassano.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	E. spruce	A slight increase in the number of infested terminals near Blairmore and in Waterton Lakes National Park.
Larch sawfly, <u>Pristiphora erichsonii</u> (Htg.)	W. larch	A medium population a few miles south of Coleman.
Leaf tier, <u>Pseudexentera improbana</u> <u>oregonana</u> Wlsh.	T. aspen	Low populations active near Olds.
Leaf roller, <u>Sciaphila duplex</u> Wlsh.	T. aspen	A low population from Delia to the Saskatchewan border and throughout the foothills.
<u>Disease</u>		
Shoestring root rot, <u>Armillaria mellea</u> (Vahl ex Fr.) Qué.	Lp. pine N. spruce D. fir	Causing tree mortality throughout the foothills and in Cypress Hills Provincial Park.
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	W. spruce	A high incidence of cone infection in Cypress Hills Provincial Park.
Pine needle cast, <u>Hypodermella montana</u> Darker	Lp. pine	Caused light damage a few miles south of Elkwater.
Stalactiforme rust, <u>Peridermium stalactiforme</u> Arth. & Kern	Lp. pine	Caused severe damage 10 miles north of Burmis.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Leaf spot, <u>Septogloeum rhopaloides</u> (Dearn.) & Bisby	T. aspen	Collected 30 miles north of Lundbreck. A new herbarium record for Alberta.

TABLE III

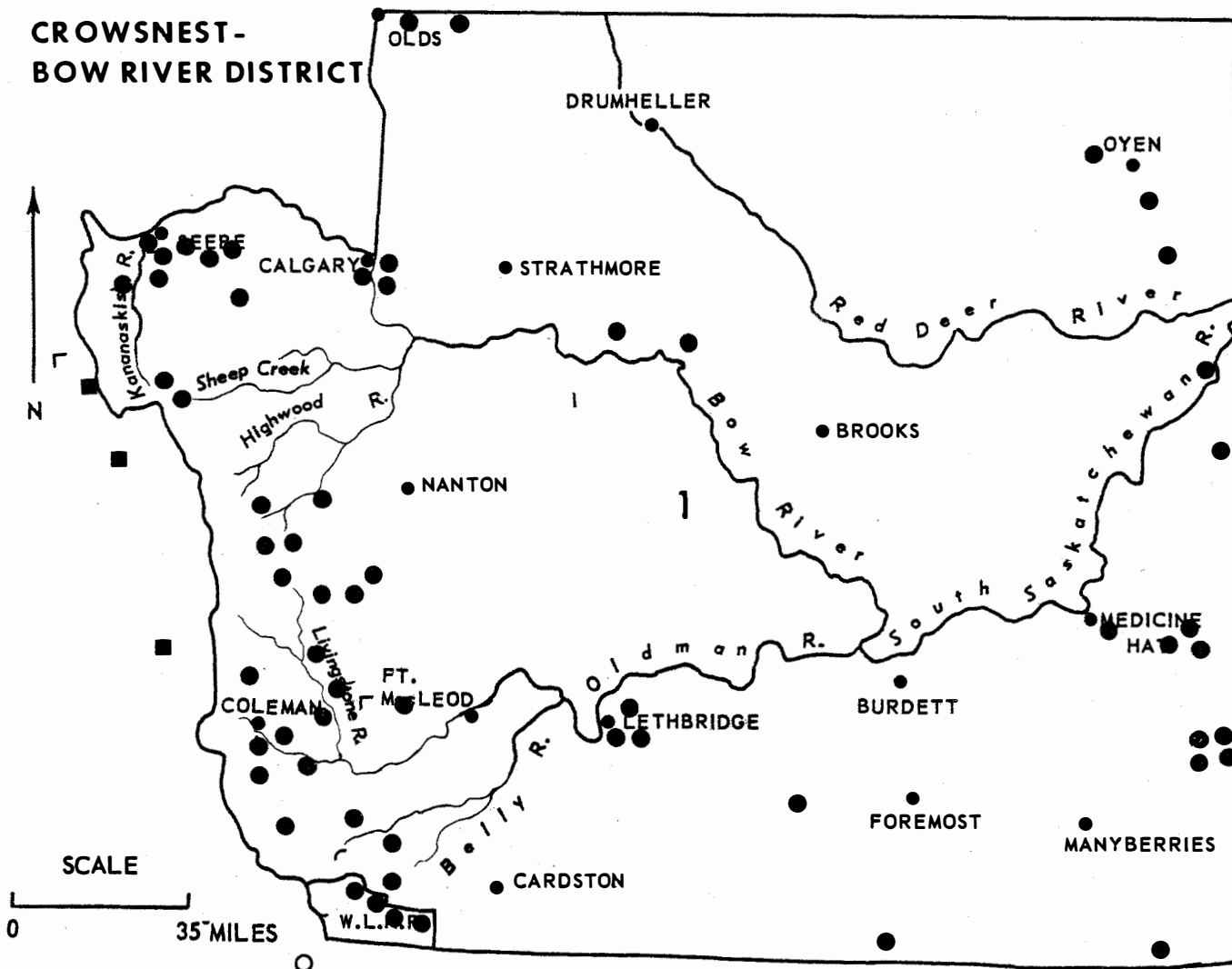
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE CROWSNEST - BOW RIVER DISTRICT

Outbreak number	Location	Causal organism	Remarks
1-2	2 miles south of Kananaskis Experimental Station.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1969.
1-4	5 miles south of Kananaskis Experimental Station.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1969.
1-7	Waterton Lakes National Park.	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	An increase of 2.5 percent in the number of trees infected.
1-8	Dutch Creek Road.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1969.
1-11	Crowsnest Forest Reserve.	<u>Cronartium ribicola</u> J. C. Fischer	To be re-examined in 1970.
1-12	13 miles north of Coleman on Trunk Road.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1969.
1-13	Elkwater	<u>Peridermium harknessii</u> J. P. Moore	To be re-examined in 1970.

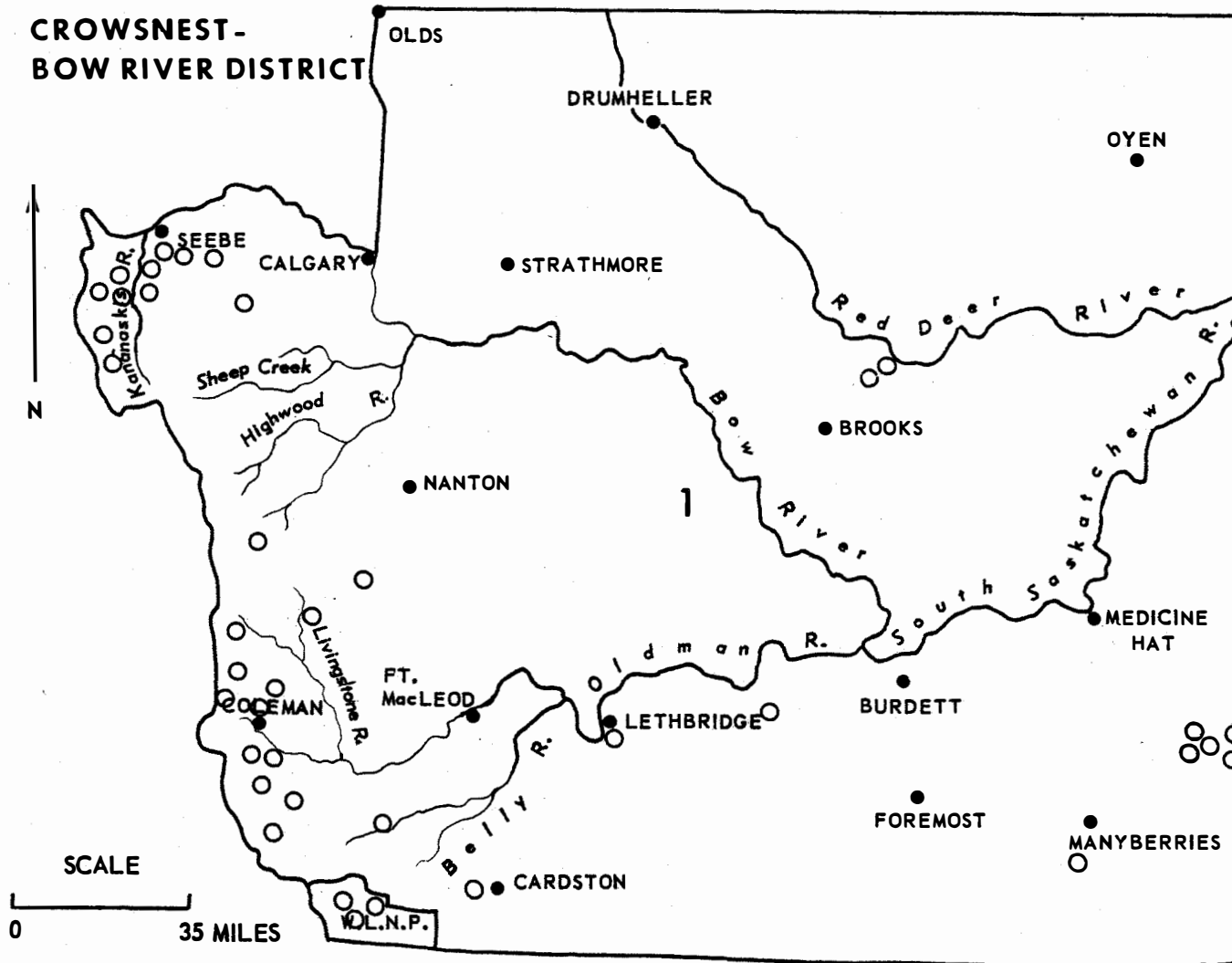
TABLE III - Summary of Recorded Disease Outbreaks - Cont'd.

Outbreak number	Location	Causal organism	Remarks
1-14	Blairmore	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1969.
1-15	Elkwater	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1970.

LOCATION OF POINTS WHERE INSECT
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966



LOCATION POINTS WHERE DISEASE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966



ANNUAL DISTRICT REPORT

CLEARWATER DISTRICT

ALBERTA 1966

by

G. J. SMITH

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

JANUARY 1967

INTRODUCTION

Forest insect damage was mostly of a minor nature in the Clearwater District in 1966. Populations of the forest tent caterpillar increased in the area between Pigeon Lake and North Saskatchewan River. Spruce budworm caused light damage in the Upper Saskatchewan River area. Larvae of the balsam-fir sawfly and the yellow-headed spruce sawfly caused severe defoliation in several spruce shelterbelts in the agricultural area of the District. Aphids and mites were also a problem in this area.

Foliage diseases, particularly red belt and needle cast of pine, were prevalent along the foothills from the Bow River to Nordegg. An outbreak of *Atropellis* canker was re-examined. Additional areas were recorded in which shoestring root rot had caused tree mortality.

INSECT CONDITIONS

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Larval populations of this budworm in the Upper Saskatchewan River Valley remained at approximately the same level as in 1964 and 1965. Light defoliation of spruce was evident along Owen Creek and between Corona Creek and the Banff Park boundary. Moths of this species were very numerous throughout the infested area in early August.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

There was an increase in the population of these caterpillars in the area between Pigeon Lake and the North Saskatchewan River in 1966. They caused patches of moderate to severe defoliation of trembling aspen south of the North Saskatchewan River within an area bounded on the east by an irregular line from Genesee southeast to Yoefeld, and on the south and west by a line from Yoefeld through Norbuck, Carnwood, Berry Moor and back to the River. Within the outlined area there were numerous locations in which the eggs failed to hatch and others in which no eggs were found. These conditions were believed to be the reason why defoliation was patchy.

During a fall survey it was noted that eggs deposited in this area in 1966 were distributed in a patchy manner similar to that of 1965. As

only a small number of eggs were found outside of the previously outlined area, no increase in the size of the defoliated area is expected in 1967.

Balsam - fir Sawfly, Neodiprion abietis (Harr.)

Larvae of this sawfly caused severe defoliation of spruce in a shelterbelt north of Trochu. Light defoliation of shelterbelt and ornamental spruce was observed near Gwynne, Benalto, Sylvan Lake, Spruceview, Didsbury and east of Trochu. Although larvae were numerous in native spruce stands along the Red Deer River northwest of Innisfail, defoliation was light.

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

This sawfly was present on planted spruce throughout the agricultural portion of the District. Moderate to severe defoliation was observed near the Calgary Airport, Trochu, Sylvan Lake, Red Deer and Rocky Mountain House. Light defoliation was observed near Cochrane, Westcott, Bowden, Spruceview, Hespero, Dukamel, Brightview and east of Trochu.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

In addition to the 20 dwarf mistletoe infected lodgepole pine stands recorded in 1965, 8 more were reported in 1966. These were found in the following locations: 2 miles southwest of Lost Lake, along Wildhorse Creek, along the north side of the Red Deer River, 6 miles southeast of Bighorn Creek, on McMurtry Ridge, along Wilson Creek, along upper Cutoff Creek, in the Lynch Creek area and 5 miles northwest of Rocky Mountain House.

There are now a total of 28 known mistletoe infected stands in the Clearwater-Rocky Forest and in the Bow Forest north of the Bow River.

Shoestring Root Rot, Armillaria mellea (Vahl ex Fr.) Qué1.

During an aerial survey of the foothills in early July, considerable dead or dying lodgepole pine was observed. In some areas small patches of trees were affected, while in other areas, only individual trees were affected. When ground checks were made later in the summer it was found that shoestring root rot infected all the dead or dying trees.

Patches of affected pine were found along Dogpound Creek, Grease Creek, south of Water Valley and at the head of Dry Creek. Single affected pine were found in the Keystone Lookout area, between James Ranger Station and Burnstick Lake, along lower Gloomy Creek and upper Tawadina Creek.

Near the mouth of the Bighorn River, patches of regeneration white spruce have been killed, resulting in "stand openings".

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

A recorded outbreak of this disease in the Chungo Creek area was re-examined in 1966. It was noted that the affected area was considerably larger than previously recorded, and it is now known to extend northwest beyond the Chungo Creek watershed for an undetermined distance into the Brown Creek watershed. In 2 of the plots sampled between the Blackstone River and Brown Creek, all the trees were infected and many had confluent multiple cankers extending the entire length of the tree.

Spruce Needle Rusts, Chrysomyxa spp.

Rusted spruce foliage was common in the coniferous forests of the District again in 1966 and severe discoloration of spruce stands was noted in the following locations: along Fallentimber Creek, West Stony Creek, Prairie Creek, Idlewilde Gap, upper Tay River, near the mouth of Philip Creek, in the Shunda Ranger Station area, along the Blackstone River, Chungo Creek, Buster Creek and east of Yoeford.

Poplar Ink Spot, Ciborinia pseudobifrons Whet.
Ciborinia whetzellii (Seaver) Seaver

These 2 species of poplar ink spot were prevalent on aspen along the road to the O'Chiese Indian Reserve and caused considerable foliage discoloration. C. whetzellii also caused discoloration in the Pigeon Lake, Winfield, Saunders and Alder Flats areas.

Pine Needle Cast, Elytroderma deformans (Weir) Darker

This organism caused severe damage to lodgepole pine foliage in the Morley Indian Reserve, along Dogpound Creek, in the O'Chiese Indian Reserve and in the Crimson Lake area. Light to moderate damage was intermittent along the foothills between the Bow and Brazeau rivers.

Red belt

This type of injury to conifers was severe and widespread in the drainage basins of the foothills and on the lower east slopes of the mountains between the Bow and North Saskatchewan rivers. In 1966 it was more prevalent in river valleys and low drainage basins than on high ridges or near timberline as in previous years.

Severely affected patches of conifers were too numerous to outline in detail but the general areas in which they occurred were as follows: in the South Ghost River and Lesueur Creek basins, upper Meadow Creek and Waiparous Creek basins, the valleys of the tributaries of Fallen timber and Burnt Timber creeks, along Wigwam Creek, upper Sheep Creek, the Panther River Valley, along the north side of the Red Deer River west of Wildhorse Creek, in the Yara Creek Valley, north of the Red Deer Ranger Station, in the upper James River Basin, along upper Bridgeland and Wilson creeks, on Strawberry Ridge, Limestone and Corkscrew mountains, in the upper Clearwater River Basin, along upper Elk Creek and in the Ram Falls area. Only 2 patches of red belt were observed north of the South Ram River area, one along upper Jock Creek and the other along the upper Joyce River. Isolated, affected patches were observed on the lower hills between the Ghost Ranger Station and the Little Red Deer River.

In severely red belted stands of lodgepole pine it was noted that a high percentage of the overwintering buds produced in 1965 had been killed. As a result, the severely affected trees appeared red throughout the summer and their sap flow was considerably reduced. These trees produced only a few new buds during 1966 and considerable mortality is expected in 1967.

Hyperparasites of Dwarf Mistletoe, Colletotrichum gloeosporioides Penz. sensu von Arx, Septogloeum gillii D. Ell.

A high percentage of the dwarf mistletoe plants on lodgepole pine in the Elk Creek area were killed by C. gloeosporioides this season. This organism was present in numerous other mistletoe infected stands but its beneficial effects were light.

S. gillii caused considerable mortality to mistletoe plants in the Upper Saskatchewan River area and was found in numerous other mistletoe infected stands.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Leaf tier, <u>Compsolechia niveopulvella</u> Cham.	T. aspen	Larvae numerous west of Highway 2 between Crossfield and Red Deer.
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	T. aspen	Severe infestation north of Water Valley along the Little Red Deer River.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Increase in larval populations noted in the County of Mountainview.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen B. poplar	Severe infestations along the Ghost River between the mouth of Waiparous Creek and Devils Gap.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	W. spruce	In a stand of young spruce on the west side of Brown Creek campground, 40 per cent of the terminals were infested. A study plot was established at this location.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	Ip. pine	Numerous infested terminals on regeneration pine along lower Hummingbird Creek.
Larch sawfly, <u>Pristiphora erichsonii</u> (Htg.)	Tamarack	Larval populations minimal.
<u>Disease</u>		
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	W. spruce	Severe damage noted in 15 locations along the foothills.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Needle cast, <u>Bifusella linearis</u> (Pk.) Hoehn.	L. pine	Severe needle loss in Upper Saskatchewan River and Ghost River diversion areas.
Spruce needle rust, <u>Chrysomyxa weirii</u> Jacks.	W. spruce	Severely infected stands noted in the upper James River, Eagle Lake and Scalp Creek areas.
Leaf spot, <u>Coccomyces hiemalis</u> Higgins	Pincherry	New herbarium record. Found one mile east of Alder Flats Lookout.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	Lp. pine	Light infections noted north of Warburg, near Pigeon Lake and in the Nordegg area.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	Lp. pine Toad flax	Caused mortality of young pine in upper Teepee Pole Creek area. Severely infected toad flax common throughout the District.
Hyperparasite of needle rust, <u>Darluca filum</u> (Biv.) Cast.	W. spruce	Severe on spruce needle rust in 8 locations along the eastern edge of the coniferous forest.
Pine needle cast, <u>Gloeocoryneum cinereum</u> Dearn.	Lp. pine	Damage widespread along the foothills.
Pine needle cast, <u>Hypodermella concolor</u> (Dearn.) Darker	Lp. pine	Patches of severely affected pine in Brown Creek-Chungo Creek area.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Pine needle cast, <u>Hypodermalla montana</u> Darker	Lp. pine	Severe along Skeleton Creek, between Blackstone River and Chungo Creek and in the Meadows Cabin area.
Balsam poplar leaf blight, <u>Linospora tetraspora</u> Thompson	B. poplar	Perfect stage of this fungus found for the first time in the Region.
Spruce needle cast, <u>Lophodermium filiforme</u> Darker	W. spruce	Caused severe defoliation in the Boggy Lake area.
Spruce needle cast, <u>Lophodermium macrosporum</u> (Hartig) Rehm	W. spruce	Severe damage noted 29 miles northwest of Nord-egg.
Spruce needle cast, <u>Lophodermium piceae</u> (Fckl.) Hoehn.	W. spruce	Caused severe defoliation near the mouth of Timber Creek.
Poplar leaf spot, <u>Marssonina tremuloidis</u> (Ell. & Ev.) Kleb.	T. aspen	Severe foliage discoloration noted near Ancona and north of Big Valley.
Larch needle rust, <u>Melampsora medusae</u> Thuem.	Tamarack	Light infection along road to O'Chiese Indian Reserve.
Canker and dieback, <u>Nectria cinnabarina</u> (Tode ex Fr.) Fr.	M. maple	Caused severe damage in a shelterbelt 6 miles south of Red Deer. New herbarium host record.
Needle cast, <u>Phaeocryptopus nudus</u> (Pk.) Petr.	A. fir	Found in Panther River and Seven Mile Creek areas. New herbarium host record.
Powdery mildew, <u>Podosphaera clandestina</u> (Wallr. ex Fr.) Lev.	Chokecherry	Caused severe foliage discoloration in the Winchell Coulee area. New regional record.

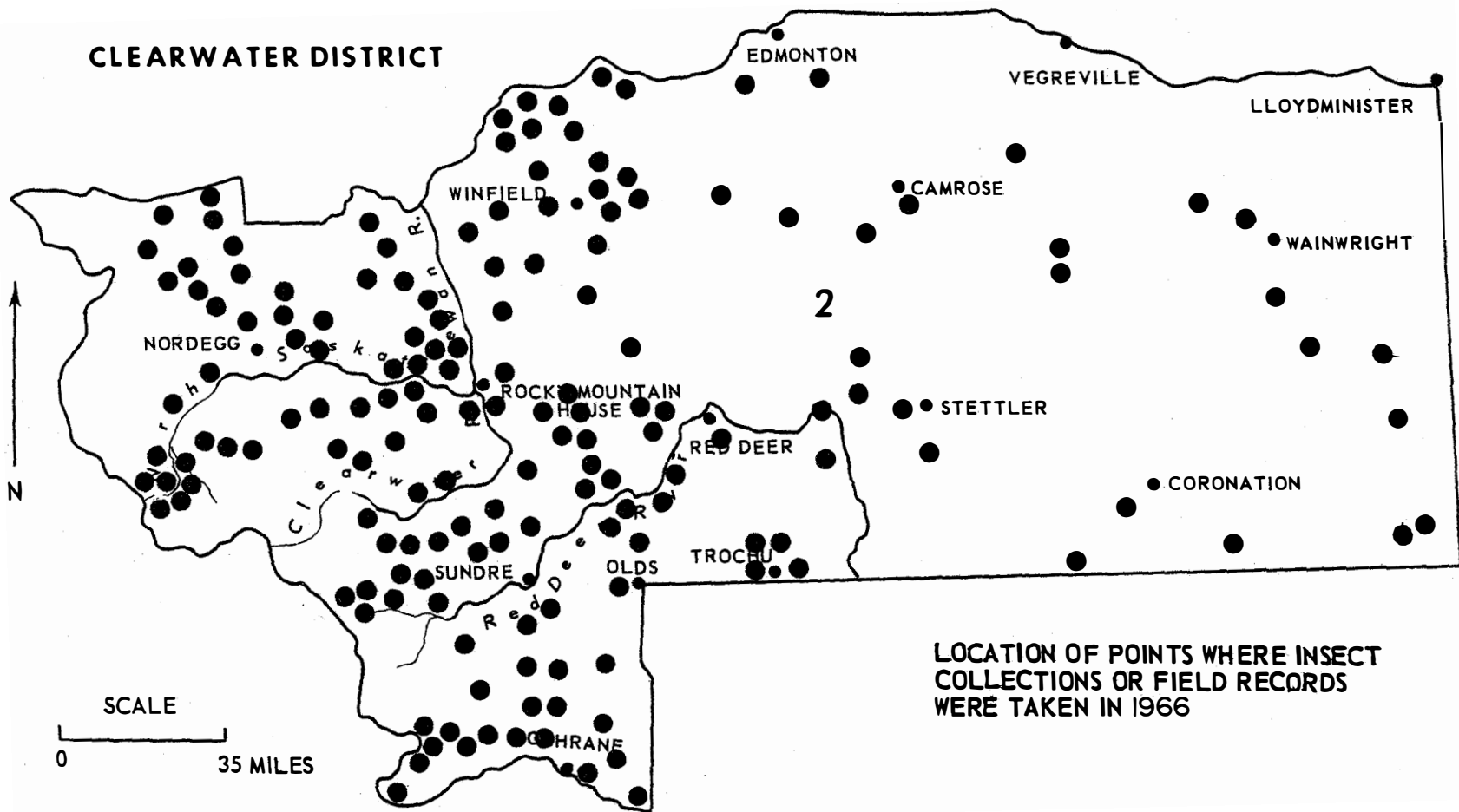
TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Douglas fir needle cast, <u>Rhabdocline pseudotsugae</u> Syd.	D. fir	Light damage in the Canmore - Exshaw area.
Spruce needle cast, <u>Sarcotrichila piniperda</u> (Rehm) Korf.	W. spruce	Patches of severe foliage loss in Sundre, Upper Saskatchewan River and Meadows Cabin areas.
Leaf spot, <u>Septogloeum rhopaloides</u> (Dearn.) & Bisby	T. aspen	Caused severe foliage dis- coloration in the Kang- ienos Lake, Winchell Coulee, James River and Upper Sask- atchewan River areas. New regional record.
Powdery mildew, <u>Sphaerotheca macularis</u> (Wallr. ex Fr.) W. B. Cke.	Indian paintbrush	Common in the Faraway Past- ure area. New regional record.
<u>Miscellaneous</u>		
Clumping of aspen	T. aspen	This type of damage was severe along the hills on the north side of Bear- berry Creek.
Hail damage	Lp. pine W. spruce A. fir	Severe branch breakage and red "flagging" was observed along the upper Elk Creek Valley, the result of a severe hailstorm in mid- summer 1965.
Pine needle cast, (Undescribed species)	Lp. pine	Caused severe foliage dis- coloration and needle loss along the height of land between the Blackstone River and Chungo Creek. Under investigation.
Spruce needle cast, (Undescribed species)	W. spruce	Sampled in 3 locations in northern part of Bow River Forest. Presently under investigation.

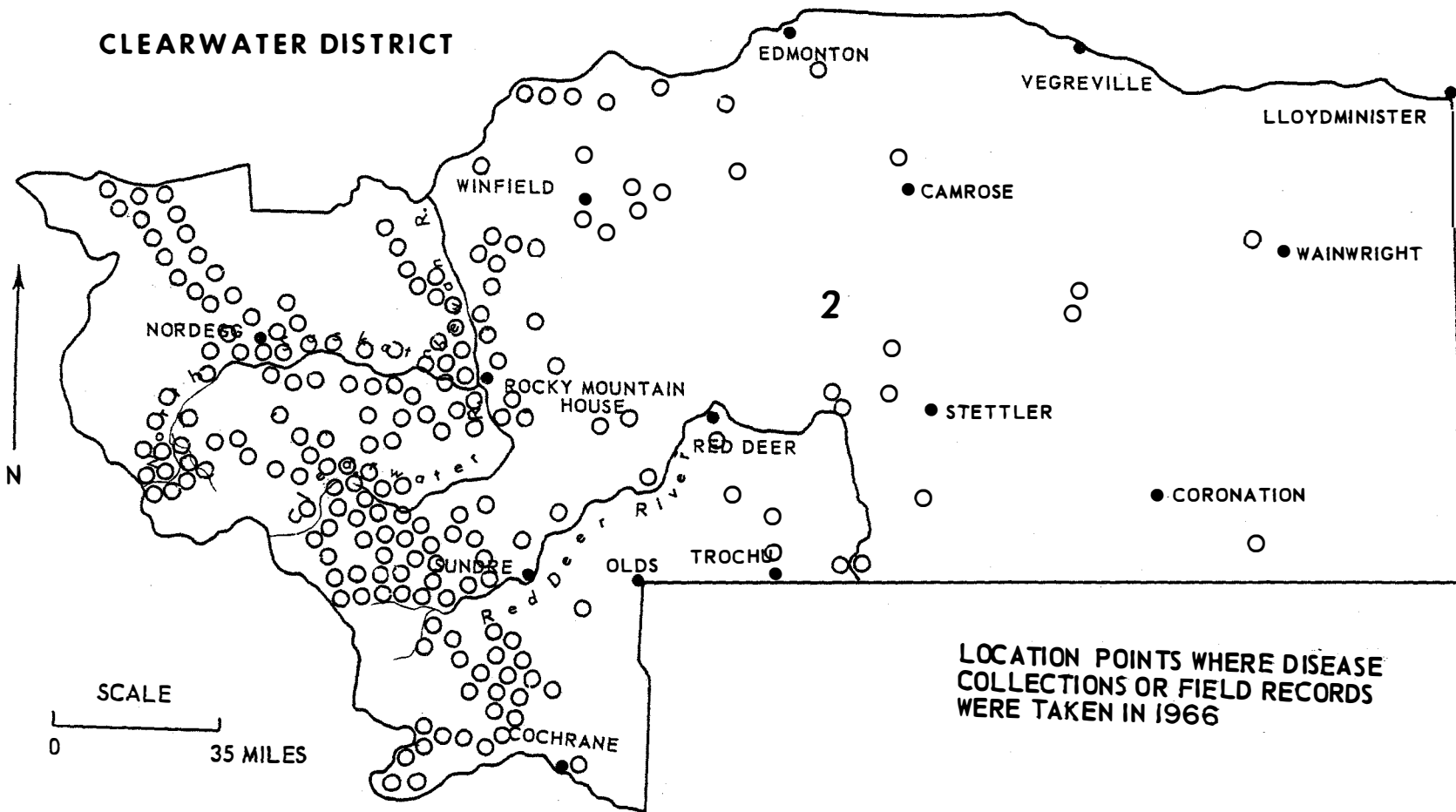
TABLE III

SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE CLEARWATER DISTRICT

Outbreak number	Location	Causal organism	Remarks
2-1	35 miles west of Caroline.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1969.
2-3	23 miles north of Nordegg. Chungo Creek area.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1966. See body of report.
2-7	12 miles north- east of Nordegg.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1969.



CLEARWATER DISTRICT



LOCATION POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966

ANNUAL DISTRICT REPORT
NATIONAL PARKS DISTRICT
ALBERTA 1966

by

V. B. Patterson

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
JANUARY 1967

INTRODUCTION

Defoliation by spruce budworm in the Saskatchewan Crossing area of Banff National Park was more severe than in 1965. An infestation of spruce budworm was also recorded along the Vermilion River in Kootenay National Park. The infestation of the poplar serpentine miner was again moderate to severe in Yoho and Kootenay national parks, more severe in Banff National Park and had almost disappeared in Jasper National Park. The lodgepole needle miner caused moderate discoloration on Mt. Norquay.

Spruce needle rusts were evident again on both primary and alternate hosts in many parts of the District. Two dwarf mistletoe outbreaks were re-examined.

BANFF NATIONAL PARK

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

The infestation of two-year-cycle spruce budworm that has been present for a number of years in the Saskatchewan Crossing area, continued at the same level. Since 1966 was the second year of their life cycle, considerably more feeding occurred than in 1965. By mid-July when feeding was almost complete, moderate to severe injury was evident. Moderate injury occurred to the current growth of mature spruce and severe injury occurred to understory spruce and alpine fir. Lodgepole pine was also attacked and most of the current years needles were destroyed on young trees in open areas.

A tally of current years buds on spruce was made in early June. Larvae were present in 86 per cent of the buds on mature trees and in 64 per cent of the buds on immature trees.

Leaf beetle, prob. Chrysomela sp.

This leaf beetle caused moderate injury to 2 species of willow and to silverberry in the Snow Pass area on Mt. White. Severe injury occurred to willow near the confluence of the Alexandra and North Saskatchewan Rivers.

Needle Miner, Coleotechnites starki Freeman

The infestation of lodgepole needle miner was still active and populations were at about the same level as in previous years. As 1966

was the second year of its two-year life cycle, injury was considerably higher than in 1965. The highest population occurred at the 5400 foot level on Mt. Norway and severe discoloration was evident in this area by mid-July.

In order to record population trends throughout the National Parks, 15 permanent sampling stations were established in areas known to be infested. The results of sequential sampling in these plots is shown in Table IV.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The infestation of the poplar serpentine miner was present in the same general area as in the past 2 years but increased in intensity in some locations.

Light to moderate injury occurred to aspen and balsam poplar in the Lake Minnewanka area and along Highway 1A from Eisenhower Junction to Lake Louise. In the Johnston Canyon - Mt. Eisenhower area severe injury occurred to aspen poplar.

DISEASE CONDITIONS

Spruce Needle Rust, Chrysomyxa empetri Schroet. ex Cumm.

This needle rust was recorded on the alternate host, crowberry, at 2 locations; severe damage occurred in the Hector Lake area and moderate damage occurred along the Smith Lake Trail.

Spruce Needle Rust, Chrysomyxa weirii Jacks.

This needle rust was present early in the summer on the 1965 foliage of white and Engelmann spruce. Moderate damage occurred to white spruce from Mile 2 to Mile 9 on the Spray River Road; moderate damage occurred to Engelmann spruce for one-half mile up the Paradise Valley Trail; light damage occurred on the Banff Golf Course, along Brewster Creek and along the Red Earth Trail.

Poplar Leaf Spot, Marssonina tremuloidis (Ell. & Ev.) Kleb.

In Banff Townsite, aspen poplar at several points throughout the town were moderately to severely infected with this leaf spot. Severe injury occurred along the Trans Canada Highway, approximately 6 miles east of Eisenhower Junction. In this area, which extended for about a mile along the Highway, foliage of aspen poplar appeared very ragged due to

the presence of the leaf spot combined with injury caused by 2 insect species, gall mites and poplar serpentine miner. Premature leaf-drop occurred in both areas.

JASPER NATIONAL PARK

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

Low populations of black-headed budworm were present in the vicinity of Patricia and Edith lakes and along the Celestine Lake Road. In the area west of Celestine Lake where moderate injury occurred in 1964 and 1965, injury in 1966 was light.

Cooley Spruce Gall, Adelges cooleyi (Gill.)

This spruce gall aphid was common throughout the Park. Old and new galls were present on white and Engelmann spruce at most locations inspected. High populations of nymphs were found in all stands of Douglas-fir, which is an alternate host for this species of insect.

Needle miner, Coleotechnites starki Freeman

Low populations of lodgepole needle miner were present along the Mt. Edith Cavell Road and near Sunwapta Falls. Results of sequential sampling carried out in these areas is shown in Table IV.

Bark Beetle, Dendroctonus ponderosae Hopkins

Along the Mt. Edith Cavell Road, numerous pine were attacked by these and a complex of other bark beetles. All infested trees were on the lower side of the road, where, due to road construction in recent years the base of the trunk had been covered with soil to a depth of 10-12 inches. It was in this area of the trunk that the injury occurred. Several of the trees had died recently and several others were dying.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

Re-examination of the dwarf mistletoe outbreak in Jasper Townsite

was carried out in the fall. Four representative areas were chosen and a total of 2071 trees tallied. The results are shown in Table VI.

Three hyperparasites of dwarf mistletoe were recorded at a number of locations in the Park (Table V). In Jasper Townsite all 3 species were found on the same tree.

Spruce Needle Rust, Chrysomyxa empetri Schroet. ex Cumm.

Light injury caused by this needle rust was recorded on the alternate host, crowberry, at 3 locations: along the Sunwapta River near Sunwapta Falls, on Mt. Edith Cavell, and along the Pyramid Tower Road.

Needle Cast, Elytroderma deformans (Weir) Darker

This needle cast caused light to severe injury to lodgepole pine along the Athabasca Valley from Jasper Townsite to Athabasca Falls. In several areas, foliage was sparse due to recurring infection over the past few years.

YOHO NATIONAL PARK

INSECT CONDITIONS

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

An infestation of poplar serpentine miner occurred in the same general area as in 1965. Severe injury occurred to aspen along the Kicking Horse Valley from Field to the south end of the Park. Moderate injury occurred in the Amiskwi, Otterhead and Ottertall valleys and along the road to Emerald Lake.

DISEASE CONDITIONS

Spruce Needle Rust, Chrysomyxa empetri Schroet. ex Cumm.

The alternate host of this rust, crowberry, was moderately infected in the Amiskewi Valley and severely infected on the north side of Lake Ohara.

KOOTENAY NATIONAL PARK

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

An infestation of spruce budworm was present along the Vermilion River from the Paint Pots to a point approximately 8 miles south of Vermilion Crossing, a total distance of 25 miles. Light to moderate injury occurred to the current years growth on spruce and fir throughout the area. The most severe injury occurred in the Numa Creek area. Near the Paint Pots, light injury was observed on lodgepole pine.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The poplar serpentine miner was present throughout the same area as in 1965. Moderate to severe injury occurred from Hector Gorge to the south end of the Park and through Sinclair Pass to Radium.

DISEASE CONDITIONS

Spruce Needle Rust, Chrysomyxa weirii Jacks.

A high incidence of this needle rust occurred on white spruce for 2.5 miles along the south end of Settlers Road and at the north end of this Road near its junction with Highway 93. In the Vermilion River Valley light to moderate injury occurred from Hector Gorge north to Numa Creek, a distance of 20 miles.

Pine Needle Cast, Elytroderma deformans (Weir) Darker

This needle cast caused moderate to severe injury to lodgepole pine along the Settlers Road and the Cross River Fire Road at the south end of the Park. Moderate injury occurred to the lower canopy of open growing pine near the confluence of the Vermilion and Kootenay rivers.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
<u>Miscellaneous</u>		
Cone insects	E. spruce W. spruce A. larch	18 collections of cones were submitted for special rearing.
<u>Disease</u>		
Shoestring root rot, <u>Armillaria mellea</u> (Vahl ex Fr.) Quél.	D. fir	Numerous young trees were killed in Sinclair Pass K.N.P. Young and mature trees were killed near Banff School of Fine Arts, B.N.P.
Fir needle cast, <u>Bifusella abietis</u> Dearn.	A. fir	Moderate damage to individual trees at 4 locations: Numa Creek and Paint Pots, K.N.P., Spray River Road, B.N.P., Pyramid Fire Road, J.N.P.
Spruce needle rust, <u>Chrysomyxa</u> sp.	E. spruce W. spruce	Severe damage near Healy Creek Warden Station, B.N.P. and Jonas Creek, J.N.P. Light damage in other widely separated areas throughout the District.
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	Wintergreen B. spruce E. spruce	Alternate host was lightly infected at numerous locations throughout the District. Light damage to cones at 2 locations.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	Lp. pine Goldenrod Aster	Moderate damage at a number of locations in Jasper, Kootenay and Yoho national parks
White pine blister rust, <u>Cronartium ribicola</u> J. C. Fischer	Current	Found on alternate host in Amiskwi Valley, Y.N.P. None found on pine.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Snow mould, <u>Herpotricha nigra</u> Hartig	E. spruce A. fir Juniper	Common throughout the Parks at elevations above 6000 feet.
Pine needle cast, <u>Hypodermella concolor</u> (Dearn.) Darker	Lp. pine	Severe at west end of Maligne Lake J.N.P. and near Hector Lake, B.N.P. Light near Saskatchewan Crossing and along Briant Creek Trail, B.N.P.
Snow mould, <u>Neopeckia coulteri</u> (Pk.) Sacc.	Lp. pine	Found at 6500 foot level in Marmot Basin, J.N.P.
Stalactiforme rust, <u>Peridermium stalactiforme</u> Arth. & Kern	Dwarf mistletoe brooms on Lp. pine	Found on 3 separate brooms in Hector Lake area B.N.P. This substantiates belief that dwarf mistletoe is an alternate host for this rust.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb.	A. fir Blueberry	Light throughout the Parks on the alternate host, blueberry. Moderate near the Paint Pots, K.N.P. and severe along the Shanks Tower Road, K.N.P. Light on coniferous host at a few locations in each Park.
Tar spot. <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Severe 10 miles north of Columbia Ice Fields, J.N.P. and in the Amiskwi Valley, Y.N.P.

TABLE III

SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE NATIONAL PARKS DISTRICT

Outbreak number	Location	Causal organism	Remarks
3-1	Geraldine Lake Road	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examine 1969.
3-2	Sundance Canyon	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965, 18% of pine infected. Re-examine 1969.
3-3	59.5 miles north Lake Louise Junction.	<u>Peridermium stalactiforme</u> Arth. & Kern	Re-examine 1968.
3-9	Snaring River	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examine 1968.
3-13	Jasper Townsite	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined 1966. Average infection 44%.
3-14	Marmot Basin Trail	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965. 32% of pine infected. Re-examine 1967.
3-19	Settlers Road	<u>Peridermium harknessii</u> J. P. Moore	Re-examined 1965. Only north end of outbreak tallied. 64% of pine infected. Re-examine 1967.
3-20	Between Mt. Eisenhower and Johnston's Canyon	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined 1966. Infection still active. Re-examine 1970.
3-21	Between Astoria and Whirlpool rivers	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examine 1967
3-22	Between Astoria and Whirlpool rivers	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965 but results inconclusive. Re-examine 1967.

TABLE IV

NEEDLE MINER SEQUENTIAL SAMPLING OF
PERMANENT SAMPLE PLOTS

Locality	Grid	Elevation	Larvae per 5 year tip	Category
Jasper National Park				
Mt. Edith Cavell Road	11-42-584	4600	.025	Light
Sunwapta Falls	11-46-581	5000	.25	Light
Banff National Park				
Lake Minnewanka	11-60-567	5400	3.57	Light
Stony Creek	11-59-569	6000	.15	Light
Johnstons Canyon	11-58-567	5200	21.92	Medium-Low
Mt. Eisenhower	11-56-568	5300	9.80	Light
Mt. Norquay-Parking Lot	11-59-567	6000	12.25	Medium-Low
-Middle plot	11-59-567	5700	22.82	Medium-Low
-Lower plot	11-59-567	5400	22.67	Medium-Low
Sulphur Mt.	11-59-566	5300	.52	Light
Massive Mt.	11-58-567	5100	13.62	Medium-Low
Lake Louise	11-55-569	5700	0	Nil
Yoho National Park				
Field - west	11-53-569	3800	0	Nil
Field - east	11-54-569	4600	3.90	Light
Kootenay National Park				
Hawk Creek	11-56-580	4500	9.37	Medium-Low

TABLE V

HYPERPARASITES OF DWARF MISTLETOE

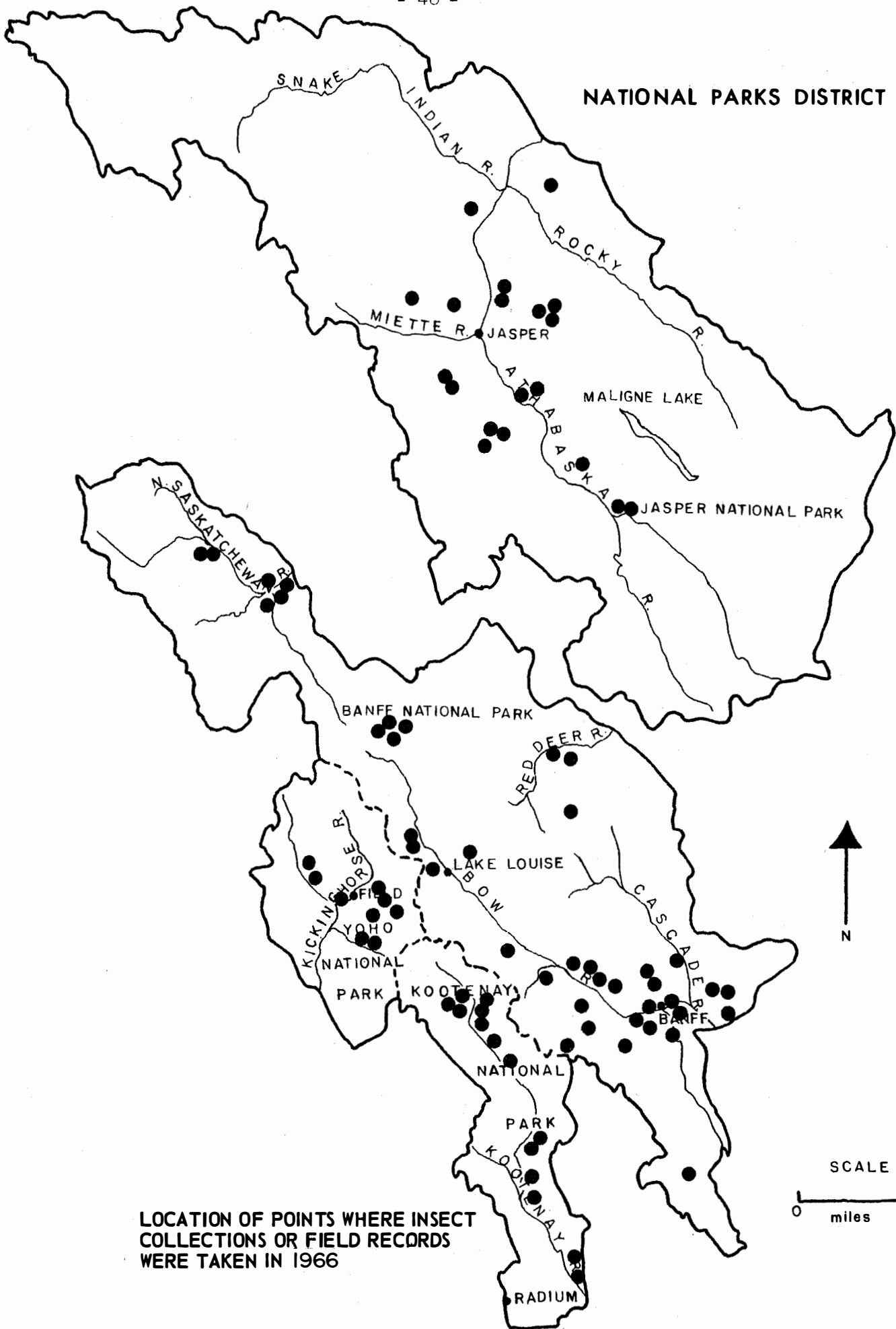
Hyperparasite	Park	Location
<u>Walrothiella arceuthobii</u> (Pk.) Sacc.	Jasper	Athabasca Falls Whirlpool River Jasper Townsite Jasper Airfield
	Banff	Nil
	Yoho	Nil
	Kootenay	Paint Pots Wardle Creek
<u>Colletotrichum gloeosporioides</u> Penz. sensu von Arx	Jasper	Athabasca Falls Sunwapta River Pyramid Lake Jasper Townsite Jasper Airfield
	Banff	Nil
	Yoho	Nil
	Kootenay	Wardle Creek
<u>Septogloeum gillii</u> D. Ell.	Jasper	Pyramid Lake Jasper Townsite
	Banff	Johnstons Canyon
	Yoho	Nil
	Kootenay	Wardle Creek

TABLE VI

DWARF MISTLETOE SEQUENTIAL SAMPLING, JASPER TOWNSITE.

Location	Method	No. of trees infected	No. of healthy trees	No. of dead trees
C.N.R. South	Line tally	93-(51%)	89	4
Athletic Field	Total tally	296-(30%)	674	8
Garden Lots (east half)	Total tally	309-(45%)	351	23
C.N.R. North	Line tally	185-(82%)	5	34

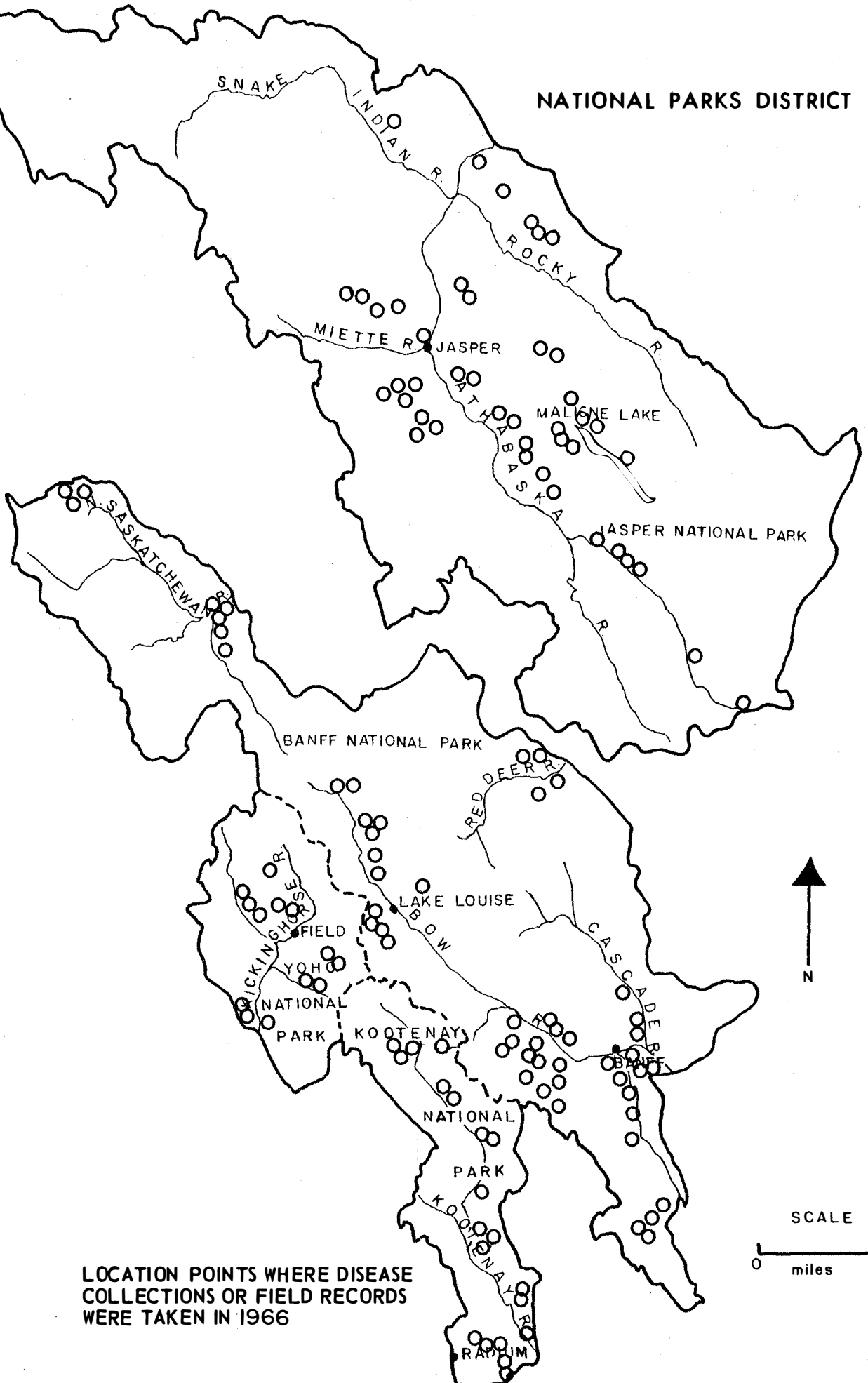
Average per cent of living trees infected 44.



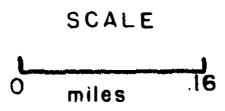
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966

SCALE
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NATIONAL PARKS DISTRICT



LOCATION POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966



ANNUAL DISTRICT REPORT
BRAZEAU-ATHABASCA DISTRICT
ALBERTA 1966

by
F. J. Emond

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

FORESTRY BRANCH
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
JANUARY 1967

INTRODUCTION

A significant decrease in defoliation by the forest tent caterpillar was evident during 1966, while their distribution in the District remained much the same as in 1965. Leaf beetle populations again fluctuated throughout the different areas in which they were collected, and damage to any one tree species was incidental. An increase in damage to spruce shelterbelts by the yellow-headed spruce sawfly was reported in the agriculture area. Population levels of the larch sawfly remained approximately the same as in 1965.

Needle rusts of spruce and fir were again common throughout the foothills area of the District. Foliage diseases of poplar were common in the District but there was a slight decline in intensity. Poplar shoot blights continued to cause moderate damage throughout the entire District. Cone and stem rust remained at the same level as in the previous year.

INSECT CONDITIONS

Leaf Beetle, Chrysomela semota Brown

This leaf beetle continued to be the most serious defoliator of regeneration balsam poplar in the District. Moderate to severe skeletonizing of poplar foliage was evident in the following areas: along Highway 16 from Pedley Junction to Edson, along Highway 43 from Sangudo to Whitecourt, from Westlock to Morinville and between Barrhead and Fort Assiniboine. Light skeletonizing was common between Edson and MacKay, from Highway 16 north to Peers, from Fort Assiniboine to Swan Hills and in several small areas between Whitecourt and Fox Creek.

Green Rose Chafer, Dichelonyx backi Kby.

The green rose chafer was common in the District in 1966. High populations were responsible for moderate to severe defoliation of wild rose, willow and other broadleaf species in the following areas: from Entrance north to the Hay River Crossing, along the Trunk Road between Hinton and Robb, and along Highway 43 between Hinton and Fallis. In these areas light to moderate damage was reported on spruce and pine where they were growing adjacent to the broadleaf species affected. Throughout the remainder of the District, damage was light.

Grey Willow Leaf Beetle, Galerucella decora Say

Adults of this leaf beetle were common in the District during 1966. Light to moderate damage was evident on broadleaf trees during the months of May, June and July. Although high populations were present in some areas no severe damage was reported.

Larvae of this species were responsible for moderate skeletonizing of willow in the area along the north side of Wabamun Lake between Fallis and Seba Beach. In the remainder of the District damage was light.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The distribution of the forest tent caterpillar remained much the same in 1966 as it was in 1965. Defoliation of aspen poplar showed a definite decline in some areas as compared to the defoliation in 1965, while in other areas it remained much the same.

The area north and south of Wabamun Lake, adjacent to Isle Lake and Seba Beach was under close observation from the time of larval emergence to pupation. Although sufficient egg bands were present to sustain the outbreak comparable with the previous year's outbreak, a combination of environmental factors, egg parasitism and virus disease contributed to keeping a normal hatch and larval survival down in some locations. This was especially evident north of Wabamun Lake, in the Isle Lake-Lac Ste. Anne area, and between Drayton Valley and Entwistle.

Moderate defoliation was present from Wabamun Lake to the North Saskatchewan River, bounded on the west by a line running from Gainford south and on the east by a line running south of Duffield. Throughout this general area, small, scattered patches of severe defoliation were evident.

Light to moderate defoliation occurred from the north shore of Wabamun Lake through to Isle Lake, Lac Ste. Anne and northeast to Onaway.

Light defoliation was reported between Drayton Valley and Entwistle, along the north and west shores of Isle Lake and Lac. Ste. Anne, south of Spruce Grove and Stony Plain, in the city of Edmonton and in a small area 12 miles northeast of Edson.

Mass collections of tent caterpillar cocoons were made at Wabamun Lake in July to determine the percentage of parasitism that occurred during the pupation period. The results were 43% adult emergence and 57% parasitized.

Sequential sample plots were established in aspen poplar areas situated in various parts of Edmonton to determine the degree of defoliation to be expected in that area in 1967. (See Table IV).

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

Although the distribution of the yellow-headed spruce sawfly remained much the same as in the previous year, a notable increase in damage caused by this sawfly was reported in 1966. Defoliation was again restricted mainly to ornamental spruces and planted spruce shelterbelts throughout the agricultural area and in Edmonton. On native spruce in the forest area, population levels remained low.

Moderate to severe defoliation was reported in the following areas: Edmonton, St. Albert, Westlock, Rossington, east and west of the Devon Corner on Highway 16 and between Spruce Grove and Stony Plain.

Light defoliation of ornamental spruce was evident in Edson, Barrhead, Whitecourt and Evansburg.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The population level of this sawfly remained approximately the same in 1966 as it was in 1965.

Moderate defoliation of tamarack was again commonplace on both sides of Highway 16 from Pedley to Niton Junction. Although damage was fairly extensive throughout this area defoliation was not continuous but appeared to follow a "hit and miss" pattern that has been evident in previous years.

In the remainder of the District, larvae could be found in most tamarack stands but no damage of any significance was reported.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa spp.

These rust fungi were again widespread and common in native spruce stands in the District during 1966. Although the fungi was common, the damage continued to follow an erratic pattern and was not continuous.

Moderate to severe damage was reported from the following areas: along the Trunk Road from Entrance north to the Simonette Tower, between Hinton and Edson, south of Edson to Robb, north of Edson to the Mayberne Tower and between Whitecourt and Fox Creek.

Light to moderate damage was reported along the Trunk Road between Hinton and the Brazeau River, from Coalspur to Mountain Park, between Peers and Whitecourt, from Fort Assiniboine to Swan Hills and from Swan Hills to Whitecourt along the Mobil Oil Road. In the remainder of the District light damage could generally be found in any native spruce stand or planted spruce that was inspected.

As a result of the previous year's infection, needle loss was extensive in both the Edson Forest and the Whitecourt Forest.

Needle Rusts of Fir, Pucciniastrum epilobii Otth. and Pucciniastrum goeppertianum (Kuehn) Kleb.

The outbreak of the fir needle rust, P. epilobii, continued to cause damage to fir foliage in the Camp 22 area of the Northwest Pulp and Power Company lease southeast of Hinton. Regeneration alpine fir in this area sustained moderate and severe damage. Needle drop was estimated at between 60 and 80 per cent as a result of the 1965 infection and a continuation of this type and degree of damage is expected from the 1966 infection. The alternate host of this rust, fireweed, was severely infected in this area.

Light damage was reported on alpine fir regeneration from Entrance north to the Simonette Tower and along the Hay River Road, and, on balsam fir regeneration 5 miles east of Fox Creek, between Whitecourt and Peers and 5 miles south of Swan Hills on the Fort Assiniboine Road.

P. goeppertianum, a similar rust fungi of firs, was present in the same general areas, but to a much lesser degree.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	48	15	Trembling aspen	51	15
Black spruce	4	1	Balsam poplar	25	15
Lodgepole pine	27	23	Willow	17	1
Jack pine	13	4	Birch	4	1
Tamarack	11	4			
Fir	3	10			
	106	57		97	32
Insect collections from miscellaneous hosts				27	
Disease collections from miscellaneous hosts				21	
GRAND TOTAL				340	

TABLE II
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE BRAZEAU - ATHABASCA DISTRICT, 1966

Causal Agent	Host	Remarks
<u>Insect</u>		
Poplar bud-gall mite, <u>Aceria parapopuli</u> (Kiefer)	T. aspen	Decrease in populations in 1966.
Black-headed budworm, <u>Acleris variana</u> (Fern.)	W. spruce	Low populations in native spruce stands.
Gall aphids on conifers, <u>Adelges</u> spp.	W. spruce B. spruce	Decrease in populations in 1966.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Birch skeletonizer, <u>Bucculatrix canadensisella</u> Chamb.	Birch	Medium populations in Edmonton area, high populations in Whitecourt area.
Pear slug, <u>Caliroa cerasi</u> (L.)	Cottoneaster Mt. ash G. ash Apple	Moderate to severe damage in Edmonton area.
Spruce budworm, <u>Choristoneura fumiferana</u> (Clem.)	W. spruce	Low populations in the forested area of District.
Leaf miner, <u>Gracilariidae</u>	T. aspen B. poplar Alder	Light damage to aspen and balsam poplar, moderate damage to alder.
Sawfly, <u>Nematus</u> sp.	Willow	Common throughout the District.
Sawfly, <u>Neodiprion</u> sp.	Lp. pine J. pine S. pine	Found in native lodgepole and jackpine stands and in Scots pine shelterbelts.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	W. spruce C. spruce	Common in planted shelterbelts and ornamentals.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen B. poplar	Low populations in the District.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	Lp. pine	Light damage in pine stands in the foothills area.
<u>Disease</u>		
Apiosporina witch's broom, <u>Apiosporina collinsii</u> (Schw.) Hönnel	Saskatoon	Common throughout the District.
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> Diet.	B. spruce	Present in most black spruce stands in the District.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Poplar ink spot, <u>Ciborinia whetzellii</u> (Seaver) Seaver	T. aspen	Light to moderate damage was common.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	Lp. pine	Light damage common in foothills area.
Hyperparasite of needle rust, <u>Darluca filum</u> (Biv.) Cast.	<u>Chrysomyxa</u> spp.	Found in all spruce needle rust infected stands in the District.
Fire blight, <u>Erwinia amylovora</u> (Burrill) Winslow	Apple Mtn. ash	Common in Edmonton and Stony Plain areas.
Hypoxyylon canker, <u>Hypoxyylon pruinatum</u> (Klotzche) Cke.	T. aspen	Light damage in the agricultural area.
Balsam poplar leaf blight, <u>Linospora tetraspora</u> Thompson	B. poplar	Medium incidence of this fungus in Edson and Whitecourt forests.
Larch needle rust, <u>Melampsora medusae</u> Thuem.	Larch	Low incidence in native larch stands throughout the District.
Aspen shoot blight, <u>Pollaccia radiosa</u> (Lib.) Bald. & Cif.	T. aspen	Moderate to severe damage to regeneration aspen in all areas in the District.
Red Belt	W. spruce Lp. pine	Moderate damage in the Cadomin-Mountain Park area.

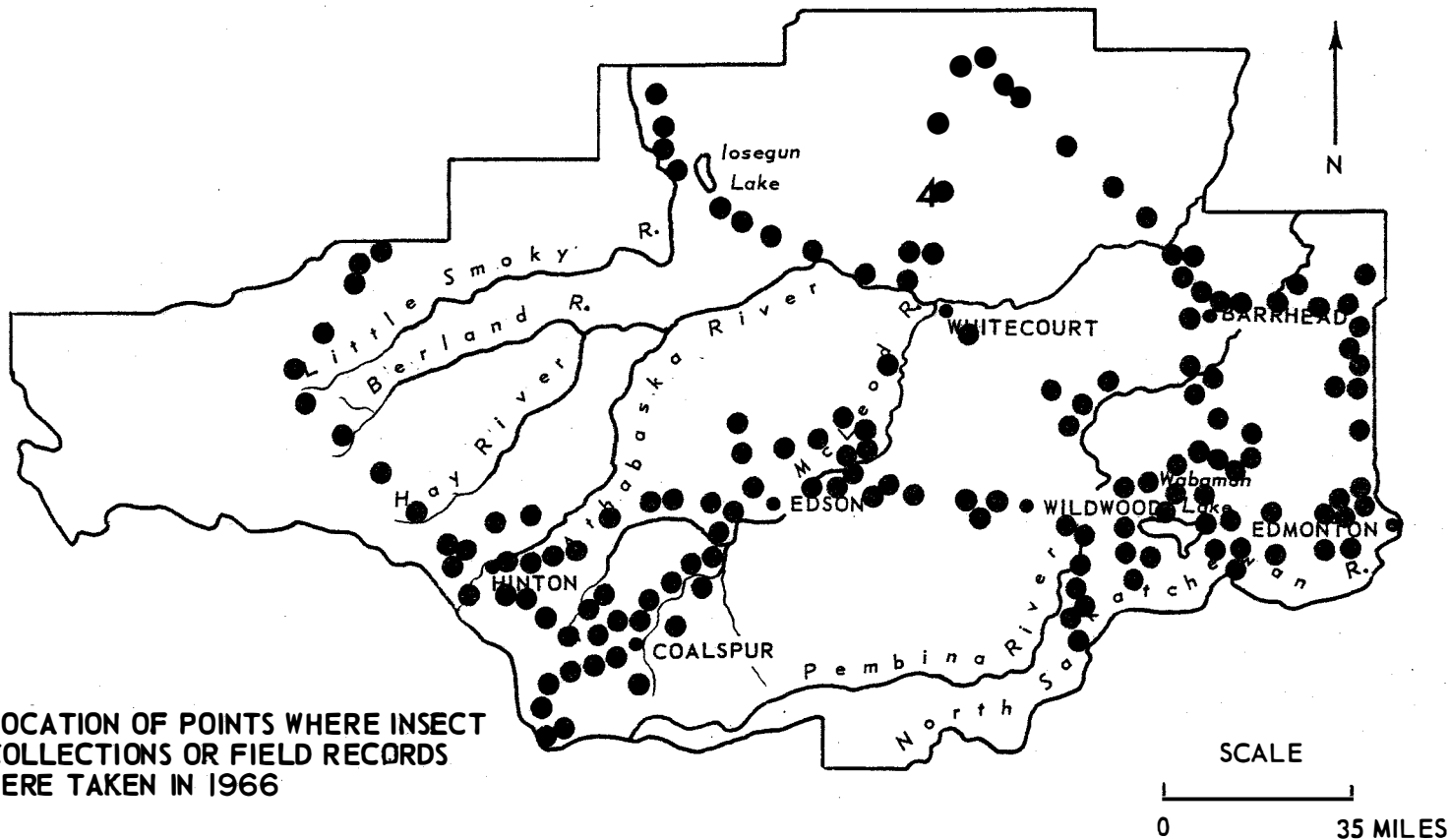
TABLE III
 SUMMARY OF RECORDED DISEASE OUTBREAKS
 UNDER INVESTIGATION IN THE BRAZEAU - ATHABASCA DISTRICT

Outbreak number	Location	Causal organism	Remarks
4-1	Lovett	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be examined in 1969.
4-3	Whitecourt	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be examined in 1967.
4-5	Robb	<u>Armillaria mellea</u> (Vahl ex Fr.) Qué1.	To be examined in 1967.
4-9	Hinton	<u>Peridermium harknessii</u> J. P. Moore	To be examined in 1967.
4-11	Hinton	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be examined in 1967.
4-12	Entrance	<u>Peridermium stalactiforme</u> Arth. & Kern	To be examined in 1967.
4-13	Robb	<u>Peridermium harknessii</u> J. P. Moore	To be examined in 1967.
4-14	Robb	<u>Peridermium stalactiforme</u> Arth. & Kern	To be examined in 1967.
4-18	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Examined in 1966. Light infection starting in regeneration.
4-19	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Examined in 1966. Light infection starting in regeneration.
4-20	Edson	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be examined in 1967.
4-21	Cadomin	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be examined in 1967.
4-22	Hinton	<u>Armillaria mellea</u> (Vahl ex Fr.) Qué1.	To be examined in 1967.
4-23	Entrance	Rodent damage	To be examined in 1967.

TABLE IV
RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1966.

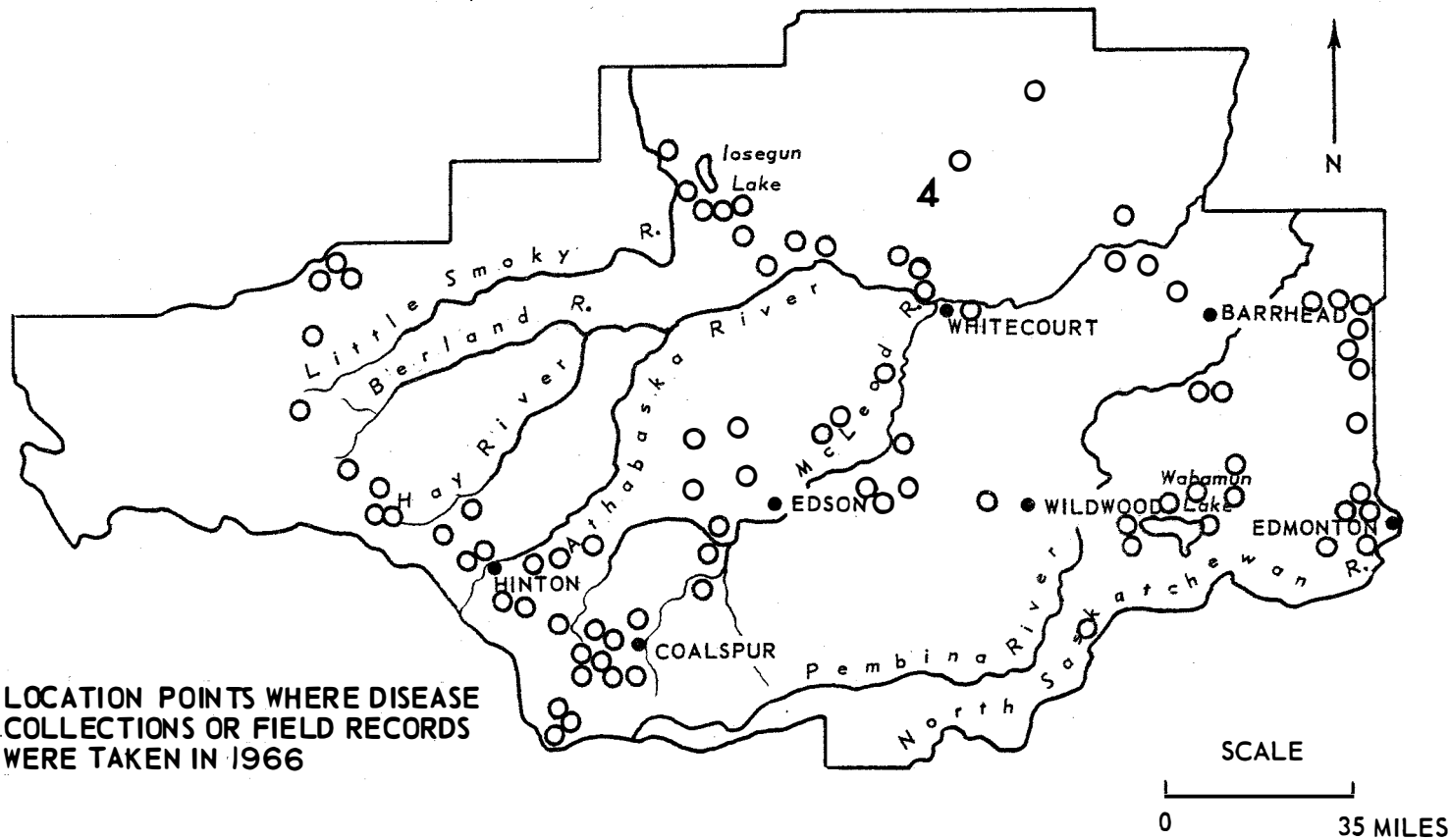
Location	Established 1966	Actual defoliation for 1966	Predicted defoliation for 1967
Edmonton City (Emily Murphy Park)	1966	Light	Light
Edmonton City (Ski Hill South side)	1966	Light	Light
Edmonton City (Jasper Place, N.)	1966	Light	Light

BRAZEAU-ATHABASKA DISTRICT



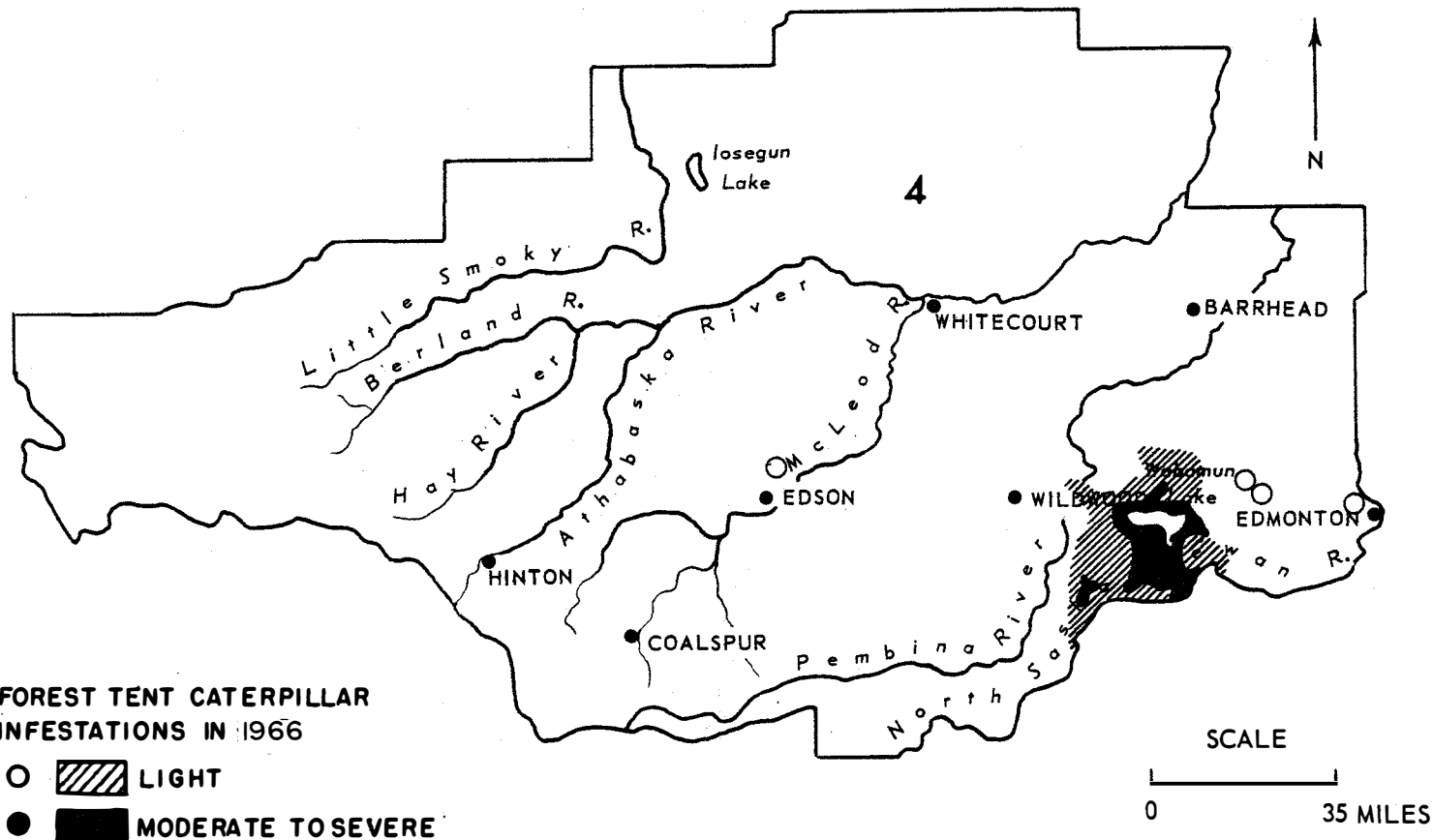
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966

BRAZEAU-ATHABASKA DISTRICT



LOCATION POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966

BRAZEAU-ATHABASKA DISTRICT



ANNUAL DISTRICT REPORT
LAC LA BICHE DISTRICT
ALBERTA 1966

by

C. R. Layton

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

JANUARY 1967

INTRODUCTION

In 1966 the spruce budworm reached outbreak proportions in the Lac la Biche District. Population levels of the forest tent caterpillar continued to decline. A number of farm shelterbelts in the central portion of the District were damaged by yellow-headed spruce sawfly. Populations of the larch sawfly remained low during 1966. Grey willow leaf beetle and American aspen beetle were present throughout the District. A high population of lodgepole terminal weevil was located in the District.

Spruce cone rust was the most damaging disease in the Lac la Biche District in 1966. Spruce needle rust decreased considerably from that reported in 1965. New distribution records for a number of diseases were made in the District during 1966.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

The spruce budworm became a significant defoliator of white spruce in the Lac la Biche District in 1966. Air and ground surveys detected a large new outbreak along the Athabasca River Valley north of Ft. McMurray. Moderate defoliation with patches of light defoliation interspersed throughout were evident in the following areas: from Ft. McMurray to Poplar Island, south of Ft. McKay, at the junction of the McKay and Dover rivers and around Bitumont. The largest area of moderate defoliation occurred on both sides of the Athabasca River in Townships 98 and 99, extending eastward from the River up to 2 miles and westward up Eymundson Creek for approximately 8 miles.

Grey Willow Leaf Beetle, Galerucella decora Say

Adults and larvae of the grey willow leaf beetle were responsible for light damage to willow and regeneration aspen throughout the southern portion of the District. In the following locations damage was observed: 3 miles north of Meanook, 4 miles north of Marwayne, near Frog Lake, 6 miles southwest of Cherry Grove, 5 miles south of Duvernay and in the St. Paul, Elk Point and Vilna areas.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Medium populations of American aspen beetle were located 26 miles north of Lac la Biche, 5 miles north of Goodridge and 15 miles south of

Beaverdam. In these areas moderate defoliation of regeneration aspen was evident. In the remainder of the District only low populations were detected.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The forest tent caterpillar continued to decline throughout the known areas of infestation near Vilna and Two Hills. Air and ground observations revealed that all defoliation throughout these infested areas was light. Aspen defoliation occurred in a 50 square mile area west of Vilna and a 75 square mile area northeast of Two Hills.

The hatch in the Vilna area was good, but by the end of May high mortality of first and second instar larvae greatly reduced the population throughout the infestation.

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

The yellow-headed spruce sawfly was present throughout most of the agricultural area of the Lac la Biche District in 1966. The heaviest concentration was evident on farm shelterbelts and ornamentals between Highways 45 and 28 from Edmonton to the Saskatchewan border. Some shelterbelts in this area were severely damaged.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The population level of larch sawfly remained low in the Lac la Biche District during 1966. Light damage could generally be found in all tamarack stands but was confined to a branch tip or two. An aerial survey conducted in the northern part of the District revealed light defoliation in widely separated areas.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

Examination of a previously reported outbreak of dwarf mistletoe on jack pine between Round Hill Tower and Goodwin Lake revealed that this disease is wide spread throughout the area. Heavy broomings, caused by dwarf mistletoe was observed from the air in many pine stands north of Ft. McMurray.

Spruce Needle Rusts, Chrysomyxa spp.

Damage caused by spruce needle rusts decreased considerably since 1965. Moderate damage was observed on white spruce 20 miles north of Cold Lake. In the remainder of the spruce stands of the District only light damage was present.

A hyperparasite of spruce needle rusts, Darluca filum (Biv.) Cast., was collected for the first time in the District near Gordon Lake and Hart Lake towers.

Spruce Cone Rust, Chrysomyxa pirolata Wint.

Spruce cone rust was widespread throughout the Lac la Biche District in 1966. Damage to the cone crop ranged from 5 per cent to approximately 75 per cent. Moderate to severe damage was reported near Pinehurt Lake, 3 miles south of Calling Lake and 21 miles northeast of Lac la Biche. In the Ft. McMurray area damage was light.

The alternate hosts of this rust, Pyrola spp., were only slightly infected.

Poplar Ink Spot, Ciborinia whetzellii (Seaver) Seaver

During an aerial survey a large area of moderate damage to aspen by poplar ink spot was detected southwest of Embarras in townships 104 and 105, ranges 11 and 12 west of the 4th meridian. Light to moderate damage was observed 14 miles south of Ft. McMurray, 10 miles southeast of Lac la Biche, one mile north of Cowpar Tower and at Embarras.

Stalactiforme Rust, Peridermium stalactiforme Arth. & Kern

This stem rust of pine, previously unreported in the Lac la Biche District, was located in jack pine stands along the highway to Ft. McMurray. In one area, 82 miles north of Wandering River, this disease was common but no concentration or heavy damage could be found.

Fir Needle Rust, Pucciniastrum epilobii Otth.

Severe damage was evident to regeneration balsam fir 30 miles northeast of Lac la Biche in the Touchwood Lake area. Damage was especially noticeable where fir was growing in close proximity to the alternate host, fire weed. Light damage was present in the Calling Lake area.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	19	11	Trembling aspen	54	9
Black spruce	6	2	Balsam poplar	20	4
Lodgepole pine	0	1	Misc. poplar	0	2
Jack pine	21	31	Willow	12	4
Balsam fir	3	6	Birch	3	1
Tamarack	16	0	Alder	5	0
	65	51		94	20
	Insect collections from miscellaneous hosts			31	
	Disease collections from miscellaneous hosts			28	
	GRAND TOTAL			289	

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE LAC LA BICHE DISTRICT, 1966

Casual Agent	Host	Remarks
<u>Insect</u>		
Bud-ball mite, <u>Aceria neoessigi</u> (K.)	T. aspen	Low populations in the southern part of the District.
Poplar bud-gall mite, <u>Aceria parapopuli</u> (Kieffer)	T. aspen	Low populations near Edmonton.
Black-headed budworm, <u>Acleris variana</u> (Fern.)	Spruce	Low populations at Lloydminister and Morinville.
Cooley spruce gall, <u>Adelges cooleyi</u> (Gill.)	Col. spruce W. spruce	Moderate damage at Calling Lake. Light damage in a shelterbelt at Islay.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Casual Agent	Host	Remarks
Gall aphid on conifers, <u>Adelges lariciatus</u> (Patch)	W. spruce B. spruce	Moderate damage near Athabasca and 21 miles north of Wandering River.
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry B. poplar	High population on chokecherry in the Smoky Lake and Bellis areas. Light damage to poplar near Edmonton.
Strawberry root weevil, <u>Brachyrhinus ovatus</u> L.	Coniferous seedlings	Severe damage at Oliver Nursery.
Eastern larch beetle, <u>Dendroctonus simplex</u> Lec.	Tamarack	High population in the Sandy Rapid area resulting in some mortality.
Green rose chafer, <u>Dichelonyx backi</u> Kby.	Rose Aspen Willow	Very common throughout the District. Severe damage near Warspite.
Woolly elm aphid, <u>Eriosoma americanum</u> (Riley)	Elm	Light damage in Oliver Nursery.
Leaf miner, <u>Gracilariidae</u>	Alder	Severe damage from Athabasca to Calling Lake and in the Glendon area.
Pine root collar weevil, <u>Hylobius</u> sp.	J. pine	This weevil caused low mortality to regeneration pine north of Cold Lake.
Willow leaf miner, <u>Lyonetia</u> sp.	Willow	Low populations north of Ft. McMurray.
Willow sawfly, <u>Nematus ventralis</u> Say	Willow	Stripping of willow tops was common throughout the District.
Sawfly, <u>Neodiprion</u> sp.	J. pine	Low population in the Conklin, Bruderheim and Bellis areas.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	W. spruce	High populations were observed on ornamental spruce in Lac la Biche.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Casual Agent	Host	Remarks
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Low populations in the south-eastern part of the District.
Pitch nodule maker, <u>Petrova albicapitana</u> (Busck)	J. pine	Low populations in the Calling Lake, Clyde, St. Vincent and Vilna areas.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen	Very low populations throughout the District.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	B. spruce	Collected at Conklin and Boyle.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	J. pine	Severe damage to regeneration jack pine 2 miles east and 4 miles south of Bellis. Stunting and dead spikes were prevalent in a 4 acre area.
<u>Disease</u>		
Shoestring root rot, <u>Armillaria mellea</u> (Vahl ex Fr.) Quél.	J. pine	Light damage to regeneration pine near Ardmore, Clyde, and Bellis.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	J. pine Aster Goldenrod	Light damage 32 miles north of Athabasca. The alternate hosts were severely infected in the District.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	J. pine, Toad flax	Light damage throughout the District. Toad flax was severely infected near Moose Lake.
Fire blight, <u>Erwinia amylovora</u> (Burrill) Winslow	Apple	Light damage occurred in Lac la Biche.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

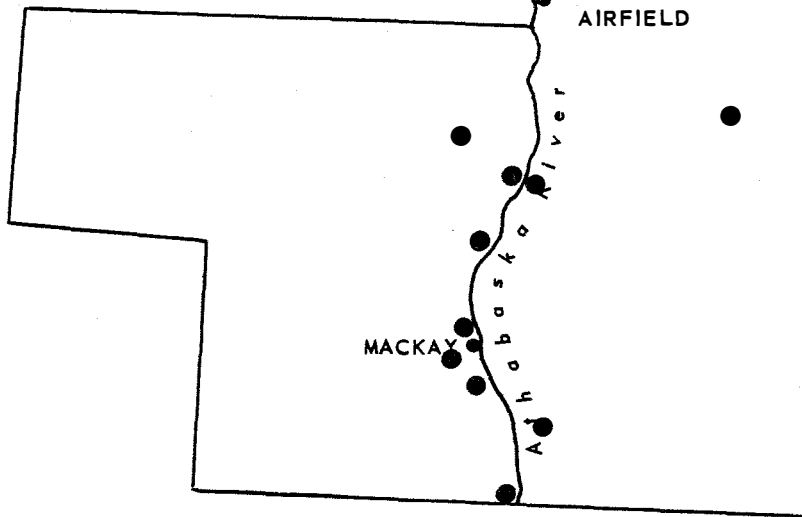
Casual Agent	Host	Remarks
Pine needle cast, <u>Hypodermella montana</u> Darker	J. pine	Caused light damage near Donatville.
Fir needle cast, <u>Hypodermella nervata</u> Darker	B. fir	Collected 37 miles north of Wandering River.
Spruce needle cast, <u>Lophodermium filiforme</u> Darker	W. spruce	Light damage 16 miles north of Lac la Biche.
Poplar leaf spot, <u>Marssonina tremuloidis</u> (Ell. & Ev.) Kleb.	T. aspen	Light damage in the south-east part of the District.
Fir needle cast, <u>Nothophaacidium abietinellum</u> (Dearn.) Reid & Cain	B. fir	Collected in the Calling and Touchwood lakes areas. New regional record.
Western gall rust, <u>Peridermium harknessii</u> J. P. Moore	J. pine	Common throughout the District but caused little damage.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb.	B. fir Bog cranberry	Collected from both hosts at House River.
Aspen shoot blight, <u>Venturia tremulae</u> Aderh.	T. aspen	Light damage observed throughout the District.
Hyperparasite of dwarf mistletoe, <u>Wallrothiella arceuthobii</u> (Pk.) Sacc.	J. pine	Damaged dwarf mistletoe plants lightly in the Ft. McMurray and Round Hill Tower areas.
<u>Miscellaneous</u>		
Hail damage,	Lp. pine Aspen B. spruce Willow	Heavy damage to foliage and bark was observed at Birch Mountain Tower. Some tip damage was evident on pine in the area.

TABLE III

SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE LAC LA BICHE DISTRICT

Outbreak number	Location	Causal organism	Remarks
5-3	60 - 94 miles north of Lac la Biche	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Examined in 1966. Heavy damage throughout the area.
5-4	Bellis	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examine in 1969.
5-7	Elk Island National Park	<u>Hypoxyylon pruinatum</u> (Klotzsche) Cke.	Examined in 1966. 28.5% of 42 trees checked were infected.

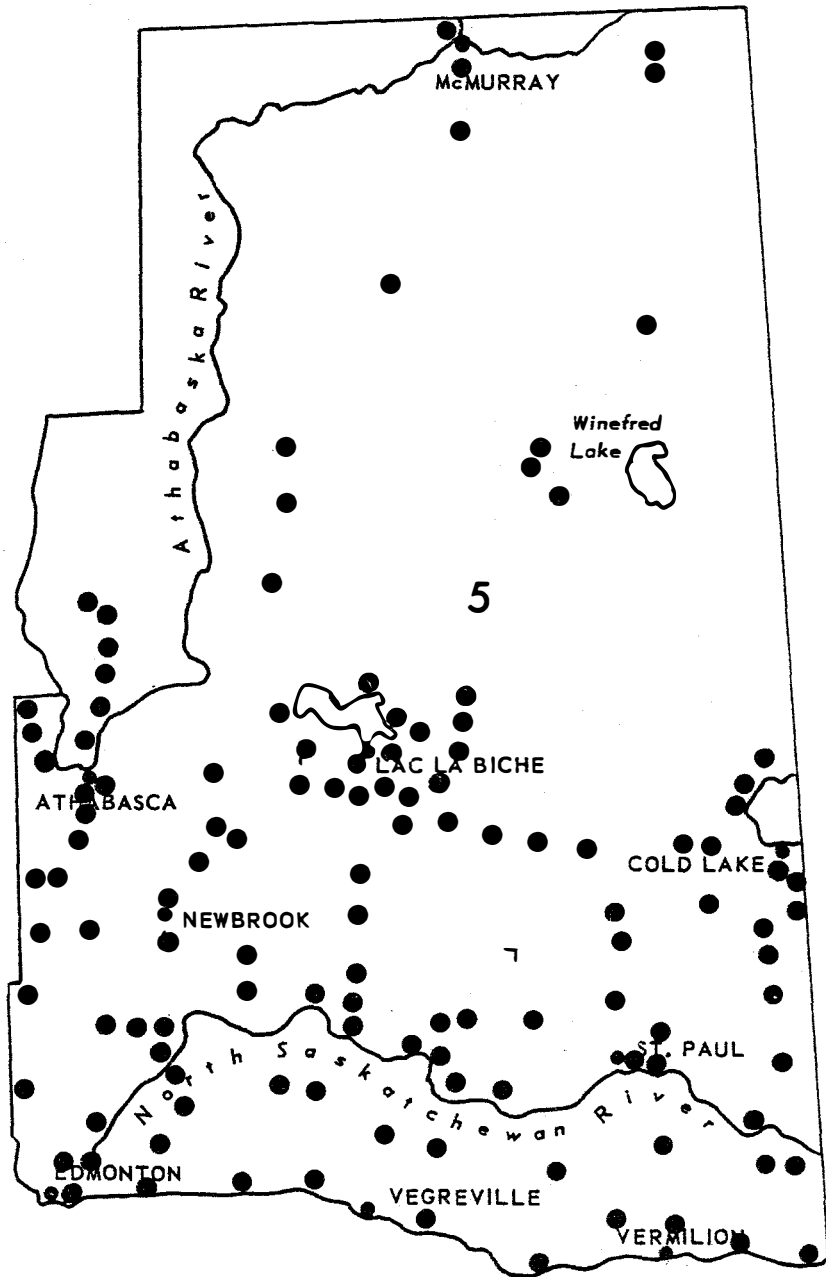
LOCATION OF POINTS WHERE INSECT
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966

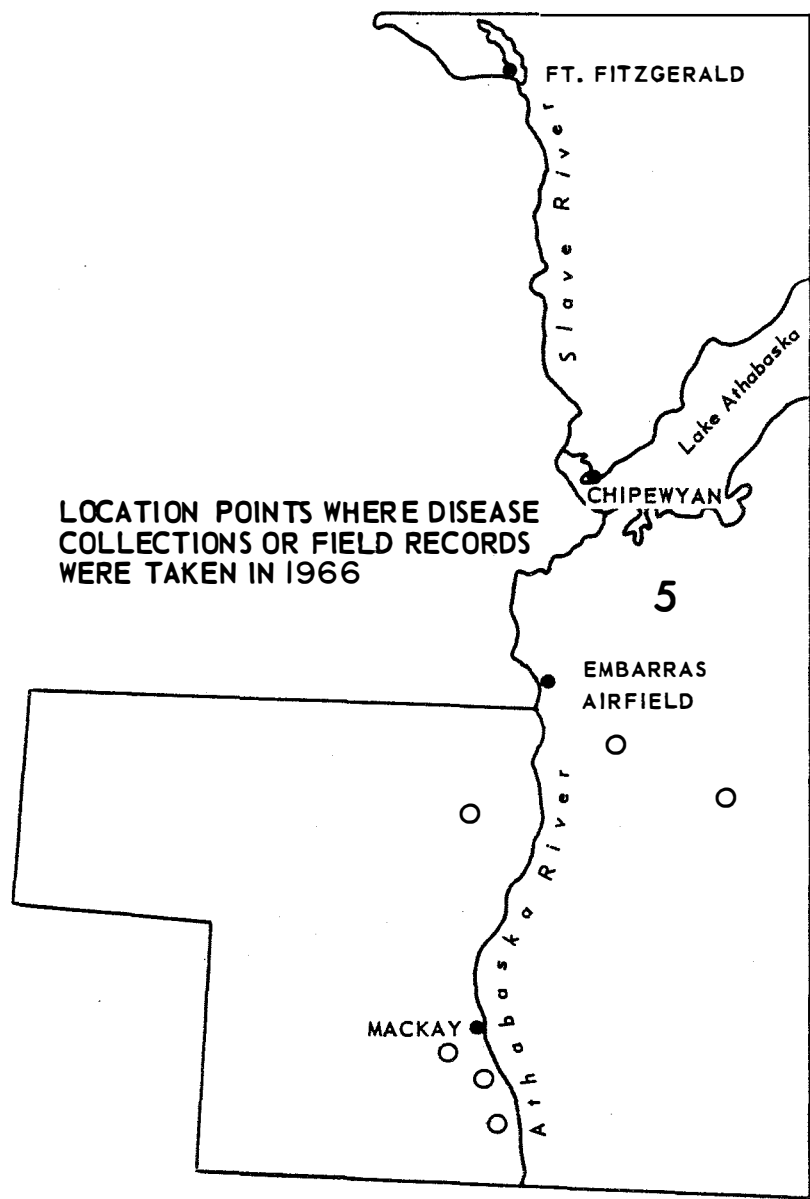


SCALE

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LAC LABICHE DISTRICT





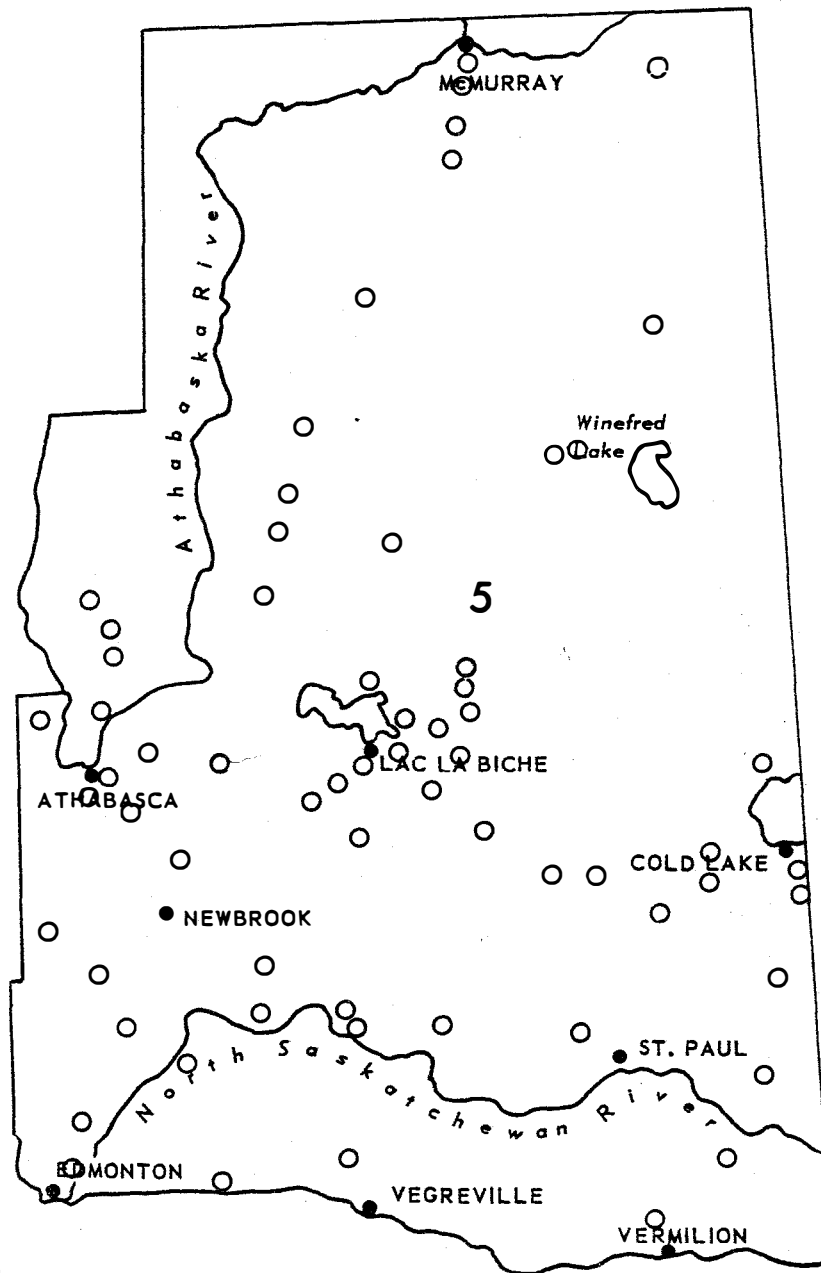
LOCATION POINTS WHERE DISEASE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966



SCALE

0 35 MILES

LACLABICHE DISTRICT



ANNUAL DISTRICT REPORT
GRANDE PRAIRIE-SLAVE LAKE DISTRICT
ALBERTA 1966

by
J. Petty

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

FORESTRY BRANCH
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
JANUARY 1967

INTRODUCTION

Spruce budworm was responsible for moderate to severe defoliation to mature spruce stands near Loon Lake and along the Wabasca River in the northern part of the Slave Lake Forest. The larch sawfly was present throughout the District and caused moderate or severe defoliation in a few areas. The pine root collar weevil was found in most pine stands in the Grande Prairie Forest and to a much lesser degree in the Slave Lake Forest. A cecidomyid, which destroys the new buds of spruce, was found throughout the District. A serious defoliator in past years, the forest tent caterpillar, was not found in the District in 1966.

Foliage diseases of poplar were again evident in many areas although not as severe as in 1965. Moderate to severe damage by spruce needle rusts was present in the Grande Prairie Forest and a hyperparasite, possibly Darluka sp., was present on the rust infections. Re-examination of the outbreak of Atropellis canker south of Grovedale proved that it covered an area much larger than originally outlined. Discoloration of pine needles over a large area was caused by a combination of a needle cast as yet undetermined, and a physiological condition.

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

In a stand of mature white spruce southeast of Loon Lake low populations of black-headed budworm were found in association with spruce budworm, Choristoneura fumiferana (Clem.). Numerous larvae of the black-headed budworm were collected along the Snuff Mountain Forestry Road southwest of Valleyview but only minimal defoliation was present. Although collected from many other areas, populations were low and noticeable defoliation was not evident.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Infestations of spruce budworm were present in the northern part of the Slave Lake Forest along the Wabasca River and southeast of Loon Lake. Severe defoliation was noted along the Wabasca River from a point 8 miles north of the mouth of the Loon River to the southeast corner of Township 97, Range 9, west of the 5th Meridian. From this point north to the top of Township 97 and west to within 4 miles of Talbot Lake defoliation

was moderate. The infestation near Loon Lake was more severe than in 1965. Light damage was evident along the Redearth Road 2 miles south of the Loon Lake turnoff and gradually increased to severe 8 miles south of the turnoff. South of this a few larvae were found but no notable damage was seen. Defoliation in this area has occurred over a number of years and some dead tops of intermediate and co-dominant trees were evident.

Pine Root Collar Weevil, Hylobius warreni Wood

In conjunction with the studies on this root collar weevil extensive sampling was carried out in the Grande Prairie Forest. Except in the extreme northwest part of this Forest, some degree of infestation was recorded wherever pine species occurred. Medium populations were recorded along the Kakwa Road south of Grovedale but throughout the remainder of the area populations were low. In stands of immature trees no mortality attributable to root collar weevils was evident, but in some areas of regeneration a low incidence of mortality resulted from attacks by weevils. Collections of this species of root weevil from black spruce in the Kar Creek area proved to be a new host record.

In the Slave Lake Forest a medium population on jack pine was recorded northwest of Slave Lake and a low population was noted in the Long Lake area.

Larch Sawfly, Fristiphora ericksonii (Htg.)

Populations of larch sawfly were generally low throughout the District in 1966. Moderate defoliation was present in tamarack stands south of the Cutbank River along the Kakwa Road, and south of Wembley. A small area, approximately 5 miles square, 5 miles north of Slave Lake had moderate to severe defoliation. Elsewhere in the District populations were sporadic and defoliation was light.

Cecidomyid Gall, Rhabdophaga swainei Felt

A cecidomyid in the buds of spruce was evident in all areas of the District and has been present for at least 4 years in some areas. It was found on both black and white spruce and showed no preference when both species were found in the same locale. The most severe damage occurred on regeneration and when the terminal bud was destroyed it caused a crooked stem or 2 or more leaders. This condition is causing concern to personnel of the forest industry. Although infestations were generally light, one area north of Sturgeon Lake had approximately 70 per cent of the buds on regeneration destroyed by this midge in 1966.

DISEASE CONDITIONS

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

Re-examination of the outbreak southwest of Grovedale revealed that a much larger area was affected than had been previously reported, although the exact area is still unknown. Three plots were established along the Kakwa Road south of Bald Mountain Creek, 3 along the Nose Mountain Cutoff and one 6 miles southwest of Nose Creek Bridge along the Two Lakes Road. The highest percentage of infected trees (86) was in the area along the Nose Mountain Cutoff and 18 miles south of Bald Mountain Creek. The incidence of the disease decreased towards the Two Lakes Road, south towards the Cutbank River and north towards the fringe of the pine. The average number of cankers per tree ranged from 1.4 to 4.4 in the plots.

Poplar Ink Spot, Ciborinia whetzellii (Seaver) Seaver

Infections of this ink spot on aspen were found throughout the Grande Prairie Forest and the northern part of the Slave Lake Forest. Generally, the damage was light but small patches of moderate or severe damage were found in many areas. These patches did not cover more than an acre in any one area.

Spruce Needle Rusts, Chrysomyxa spp.

Spruce needle rusts showed up in much the same area of the Grande Prairie Forest as in 1965. White spruce in the Saddle Hills again had moderate injury and defoliation in this area from the 1965 infections was very noticeable in the early part of 1966. Moderate damage was present along the Two Lakes Road from a point 36 miles southwest of Wembley south to Two Lakes. In this area, along Chinook Ridge and near Two Lakes, damage was severe on regeneration but only moderate on the larger trees. East of Nose Mountain Tower for approximately 10 miles damage was severe but decreased to moderate to and along the Kakwa Road. Along the Trunk Road south of Goodwin damage was generally moderate but some severe injury was noted.

Damage to black spruce was light in all areas of the District.

A hyperparasite, possibly Darluca filum (Biv.) Cast, was found in most areas with high rust incidence.

Balsam poplar Leaf Blight, Linospora tetraspora Thompson

This leaf blight on balsam poplar was again present in many areas of the Grande Prairie Forest although not as severe as in 1965. Infections

were found mainly on the foliage of regeneration and the lower branches of larger trees. The damage was predominant south of Highways 2 and 34 except in the Debolt-Valleyview area where it extended north of Sturgeon Lake to Puskwaskau tower.

Pine Needle Cast

Towards the end of August there were many areas in the Grande Prairie Forest where the older needles of lodgepole pine began to change color. Some of this discoloration was the result of a needle cast which as yet has not been determined but in some areas, particularly north of Sturgeon Lake, the discoloration and needle drop was probably due to a physiological condition.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	35	16	Trembling aspen	34	18
Black spruce	9	4	Balsam poplar	4	12
Colorado spruce	1	0	Willow	14	3
Lodgepole pine	25	13	Birch	2	1
Jack pine	2	2	Alder	1	1
Fir	2	3			
Tamarack	12	0			
Siberian larch	1	0			
	87	38		55	35
	Insect collections from miscellaneous hosts			16	
	Disease collections from miscellaneous hosts			15	
	GRAND TOTAL			246	

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE GRANDE PRAIRIE - SLAVE LAKE DISTRICT, 1966

Causal Agent	Host	Remarks
<u>Insect</u>		
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry	Light defoliation west of Dunvegan and south of Goodwin.
Leaf beetle, <u>Chalcoides</u> sp.	T. aspen	Low populations persist in aspen stands in the northern part of Grande Prairie Forest.
Eastern larch beetle, <u>Dendroctonus simplex</u> Lec.	Tamarack	Moderate infestation in a small stand of larch 45 miles northwest of Slave Lake.
Green rose chafer, <u>Dichelonyx backi</u> Kby.	W. spruce T. aspen Willow	Low populations general near Smith. Moderate defoliation in a small area northwest of Smith.
Grey Willow leaf beetle, <u>Galerucella decora</u> Say	Willow T. aspen	Adults found in many parts of the District. Moderate defoliation south of Kinuso and south of Grovedale.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	W. spruce	Light damage in shelter-belts west of Grande Prairie and near Woking. Moderate near Bonanza.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Low numbers throughout aspen stands in northern part of Grande Prairie Forest.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	W. spruce B. spruce	Light damage in many shelter-belts in the District. Moderate defoliation west of Grande Prairie, near Bonanza and Rycroft.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	W. spruce	Low populations through the Saddle Hills and south of Loon Lake.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	Lp. pine	Light damage to regeneration pine along Chinook Ridge.
Poplar borer, <u>Saperda calcarata</u> Say	T. aspen	Low populations in many areas of the District.
<u>Disease</u>		
Dwarf mistletoe, <u>Arceuthobium americanum</u> Nutt. ex Engelm.	J. pine	Light damage 56 miles northeast of Grouard.
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	B. spruce	Moderate in a small area 5 miles northwest of Valhalla Centre.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	Lp. pine Toad flax	Severe on regeneration pine southwest of Hazelmere. Moderate branch infections north of Grouard.
Poplar branch gall, <u>Diplodia tumefaciens</u> (Shear) Zalasky	T. aspen B. poplar	Many small aspen near Long and Loon lakes affected. Light damage on balsam poplar along the Simonette River.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

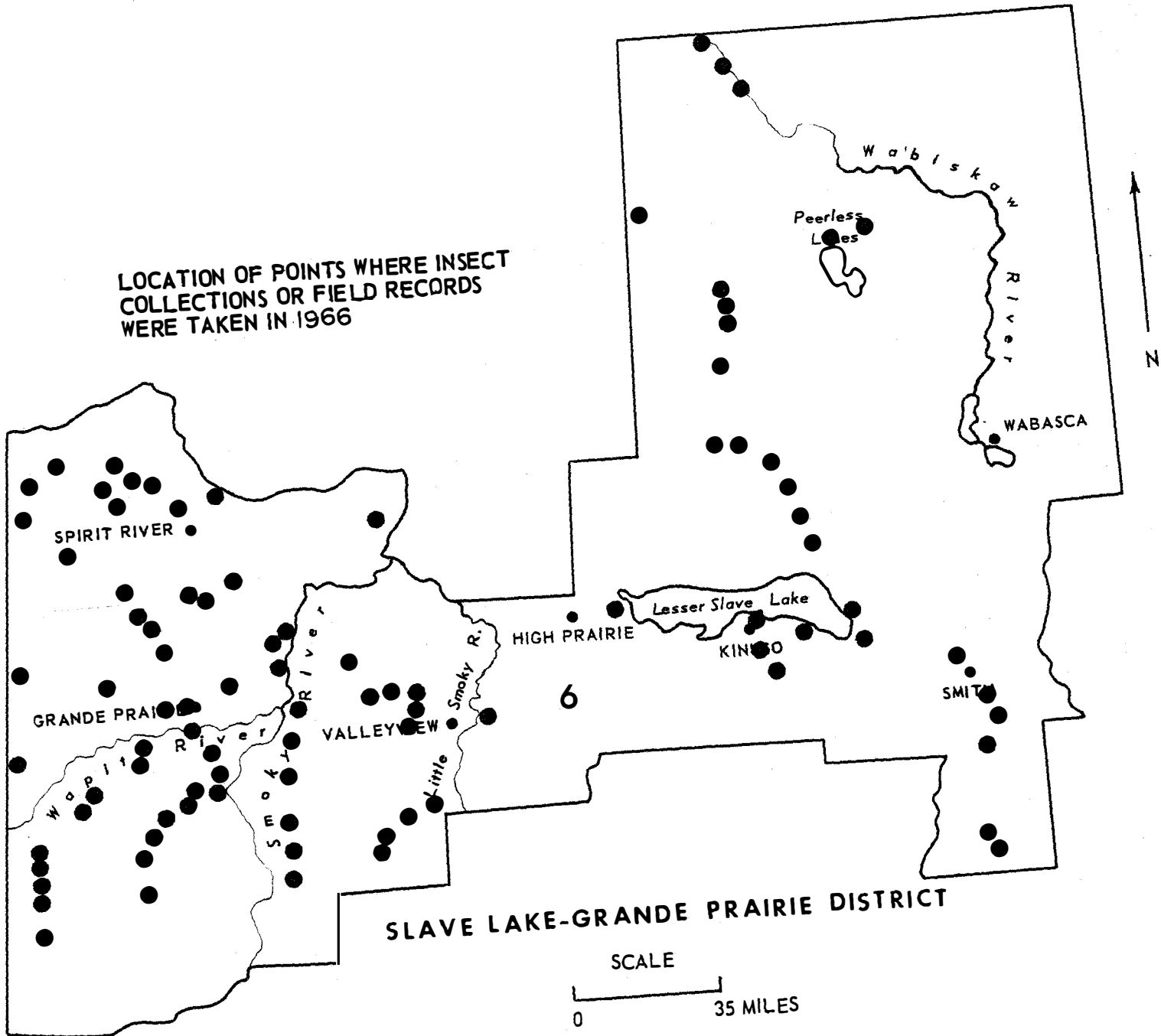
Causal Agent	Host	Remarks
Pine needle cast, <u>Elytroderma deformans</u> (Weir) Darker	Lp. pine	Low incidence on 50% of regeneration pine near Kar Creek along the Trunk Road.
Willow leaf rust, <u>Melampsora epitea</u> Thüm	Willow	Severe in a small area south of Wembley.
Aspen shoot blight, <u>Pollaccia radiosa</u> (Lib.) Bald. & Cif.	T. aspen	Common on regeneration poplar along roadsides throughout the District.

TABLE III

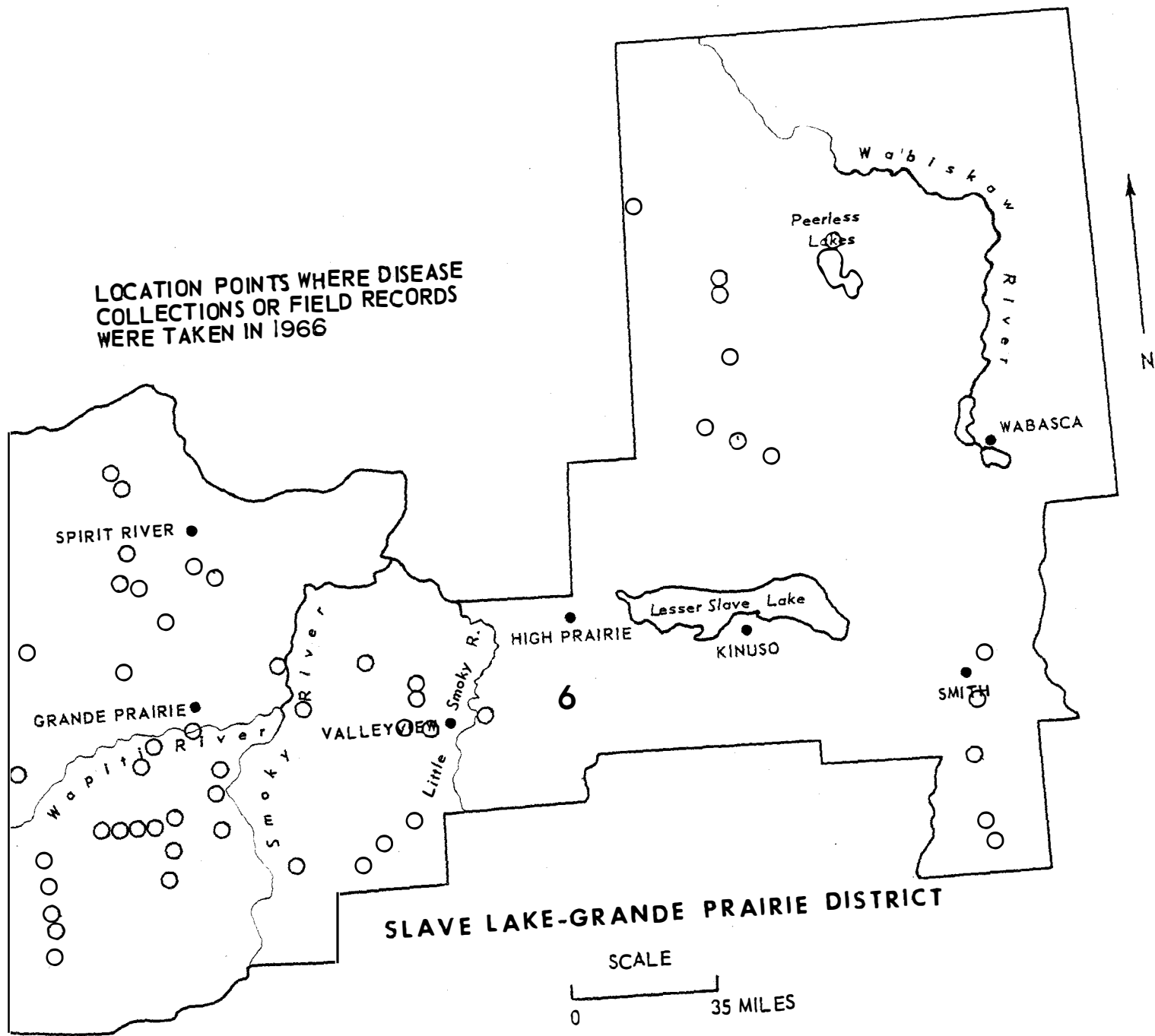
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT

Outbreak number	Location	Causal organism	Remarks
6-2	Grovedale	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1966. See body of report.
6-4	Grande Prairie	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1969.
6-5	Slave Lake	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1968.

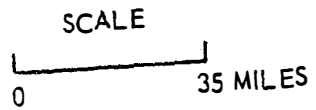
LOCATION OF POINTS WHERE INSECT
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966



LOCATION POINTS WHERE DISEASE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966



SLAVE LAKE-GRANDE PRAIRIE DISTRICT



ANNUAL DISTRICT REPORT
PEACE RIVER DISTRICT
ALBERTA 1966

by
J. P. Susut

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

FORESTRY BRANCH
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
JANUARY 1967

INTRODUCTION

Spruce budworm was the major cause of defoliation of spruce in the Footner Lake Forest. The outbreak in the Wabasca River area stayed relatively the same as in 1965 and new outbreaks were located along the Hay River and the Chinchaga River. Willow leaf miner caused moderate to severe damage throughout the northern portion of the District. Larch sawfly was present in many stands of tamarack but caused no appreciable damage.

Light damage by poplar ink spot was found throughout the Peace River Forest and along the Hay Lakes Road in the Footner Lake Forest. Spruce needle rusts caused severe damage in the southern part of the Clear Hills.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Two new outbreaks of spruce budworm were recorded in the Footner Lake Forest in 1966. One was located along the Hay River 4 miles north of Steen River and extended for a distance of 8 miles downstream. In this area moderate damage was evident east and west of the river for a distance of approximately one mile. No dead tops were seen. The other area was southeast of Habay along the Chinchaga River from its junction with the Hay River south to a point midway through Township 108. Moderate defoliation extended west of the Chinchaga River for 3 to 4 miles and east to Negus Creek. Between Townships 110 and 108 severe damage extended east of the Chinchaga River for 16 miles.

Moderate defoliation also occurred 12 miles west of High Level and in Township 112, Range 20, west of the 5th Meridian.

Along the Wabasca River severe defoliation occurred between Senex Creek and Muddy River, up the Muddy River for about 6 miles and south of the confluence of the Muddy and Wabasca Rivers for a distance of approximately 5 miles. Moderate defoliation occurred around the perimeter of this area and north along the Wabasca River from the mouth of Senex Creek to the lower part of Township 101, Range 9, west of the 5th Meridian. Patches of light and moderate defoliation were seen in the top of Township 101.

Pine Root Collar Weevil, Hylobius sp.

Root collar weevils were found in most pine stands in the southern part of the Peace River Forest. High populations were collected from individual trees in the Keg River and Worsley areas. The only collection made in the Footner Lake Forest was 4 miles north of Steen River.

Willow Leaf Miner, Lyontia sp.

This leaf miner was widely distributed throughout the central and northern part of the District. Severe damage to willow foliage occurred near creeks and muskegs in the High Level area and along the Hay Lakes Road. Damage was observed as far south as Harmon Valley.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Damage by the poplar serpentine miner was found throughout the District but was most noticeable in the northern portion of the District where it caused moderate damage at mile 6.2 of the Hay Lakes Road.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Larch sawfly caused very little defoliation in the Peace River District in 1966. All stands of larch supported low populations with the exception of one stand 9.5 miles west and 9 miles north of Clear Prairie, which supported a medium population. An aerial survey between Little Red River and High Level revealed no evidence of defoliation.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa spp.

Spruce needle rusts were found throughout the southern portion of the Peace River District. Some severe damage occurred northwest of Eureka River. All other areas had light damage.

Poplar Ink Spot, Ciborinia whetzellii (Seaver) Seaver

Light damage to aspen foliage by poplar ink spot was common throughout the Peace River District in 1966. Patches of moderate damage occurred 10 miles north of Bear Canyon and surrounding Cadotte Lake. A collection in the Meander River area constituted a northern extension of the disease in the Region.

Western Gall Rust, Peridermium harknessii J. P. Moore

Damage by this gall rust was found in many areas of the District. Galls were present on pine 10 miles southwest of Clear Prairie, along Watt Mtn. Road, north and south of Fort Vermilion, north of Eureka River and east of Harmon Valley.

The permanent sample plot established in the Clear Hills in Township 95, Range 12, west of the 6th Meridian was re-examined; of the 82 lodgepole pine examined, 73% were infected. No change was noted from the 1965 examination.

Stalactiforme Rust, Peridermium stalactiforme Arth. & Kern

This stem rust was found on lodgepole pine 6 miles west and 15.7 miles north of Eureka River, and 4.7 miles south of Clear Prairie. Cronartium coleosporioides, Arth., the stage of this rust on yellow rattle and Indian paint brush, was moderate to severe 4.7 miles south of Clear Prairie.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	28	10	Trembling aspen	38	27
Black spruce	4	8	Willow	15	6
Tamarack	11		Balsam poplar	12	21
Lodgepole pine	13	13	Birch	1	1
Jack pine	4	6	Alder	8	2
Balsam fir	3	2			
	63	39		74	57
	Insect collections from miscellaneous hosts			1	
	Disease collections from miscellaneous hosts			14	
	GRAND TOTAL				248

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE PEACE RIVER DISTRICT, 1966

Causal Agent	Host	Remarks
<u>Insect</u>		
Black-headed budworm, <u>Acleris variana</u> (Fern.)	W. spruce	Low populations in the Manning, Reno and Watino areas.
Cooley spruce gall, <u>Adelges cooleyi</u> (Gill.)	W. spruce	Low populations in the Peace River area.
Leaf beetle, <u>Chalcoides</u> sp.	T. aspen	Low populations throughout the southern portion of the District.
Eastern larch beetle, <u>Dendroctonus simplex</u> Lec.	Tamarack	Found attacking tamarack in the Meander River area.
Zimmerman pine moth, <u>Dioryetria zimmermani</u> Grt.	Lp. pine	Found attacking galls of western gall rust northwest of Clear Prairie.
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	T. aspen	Low populations in the southern portion of the District.
Leaf miner, <u>Gracilaria</u> sp.	Alder	Caused light damage throughout the District.
Spotted tussock moth, <u>Halisidota maculata</u> Harr.	Alder Maple	Light damage to ornamental trees in Peace River.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Light infestations in the Hines Creek, Worsley, Reno and Three Creeks areas.
Pitch nodule maker, <u>Petrova albicapitana</u> (Busck)	Lp. pine	Caused light damage to regeneration pine in the District.
Green-headed spruce sawfly, <u>Pikonema dimmockii</u> (Cress.)	W. spruce	Low populations in the High Level area.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

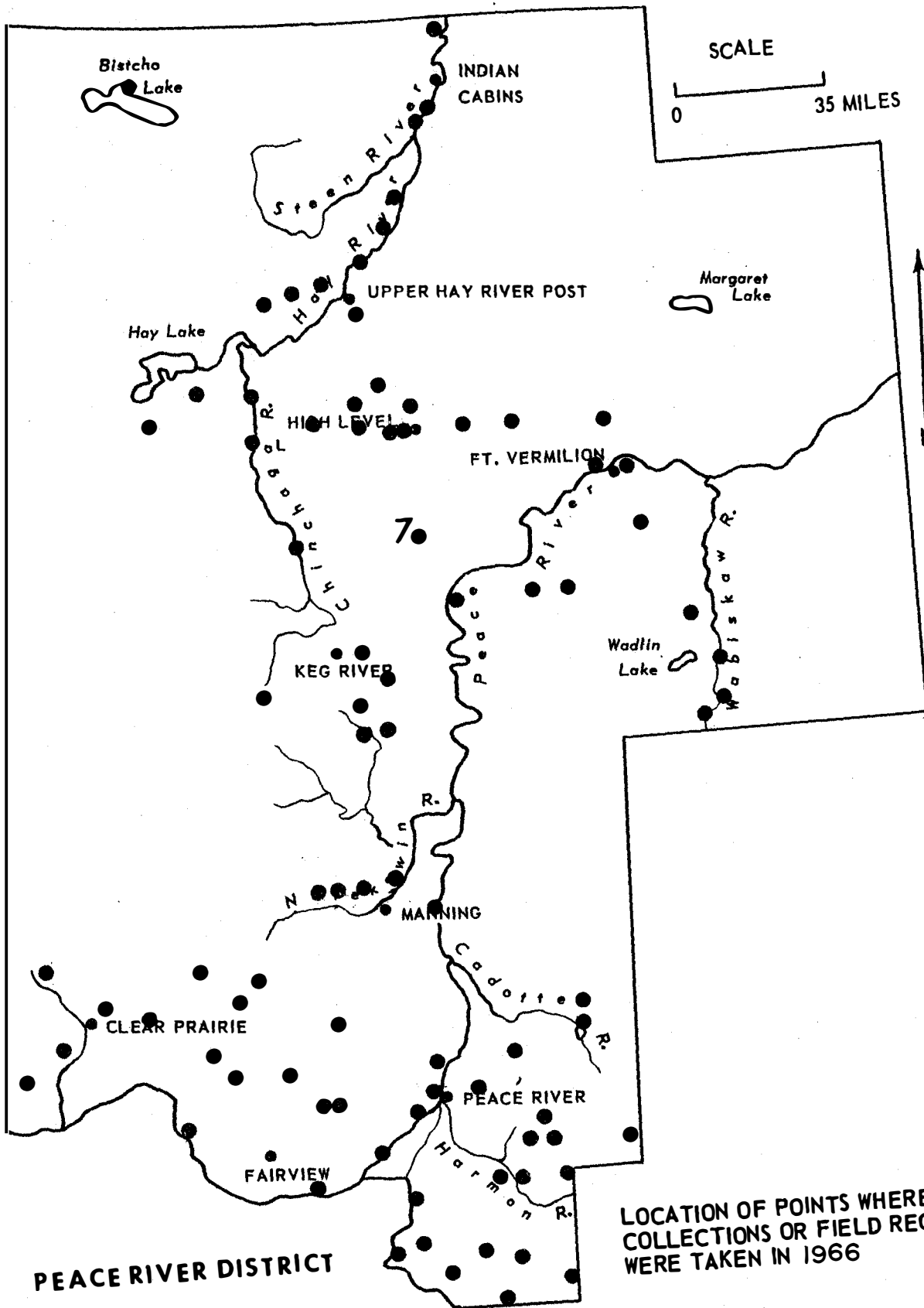
Causal Agent	Host	Remarks
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	W. spruce	Low populations of this weevil in the Fort Vermilion and Keg River areas.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping.	Lp. pine	Reproduction pine in the Clear Prairie, Eureka River, Hotchkiss and Keg River areas supported low populations of this weevil.
<u>Disease</u>		
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	B. spruce	Moderate damage northwest of Clear Prairie and north of Eureka River. Light damage northwest of Clear Hills and southwest of La Crete.
Spruce shoot rust, <u>Chrysomyxa woroninii</u> Tranz.	B. spruce Labrador tea	Small amount found on both hosts in Township 120, Range 11, west of the 5th Meridian. The collection on Labrador tea is a new record for Alberta.
Hyperparasite of rust, <u>Cladosporium</u> sp.	Lp. pine	Infecting western gall rust 18 miles southwest of Assumption.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	Aster	One collection made in the Eureka River area.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	Lp. pine Toad flax	Damage to pine was recorded 55 miles northeast of Peace River and north of Fort Vermilion. Toad flax was lightly infected throughout the District except east of Watino where severe infection occurred.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

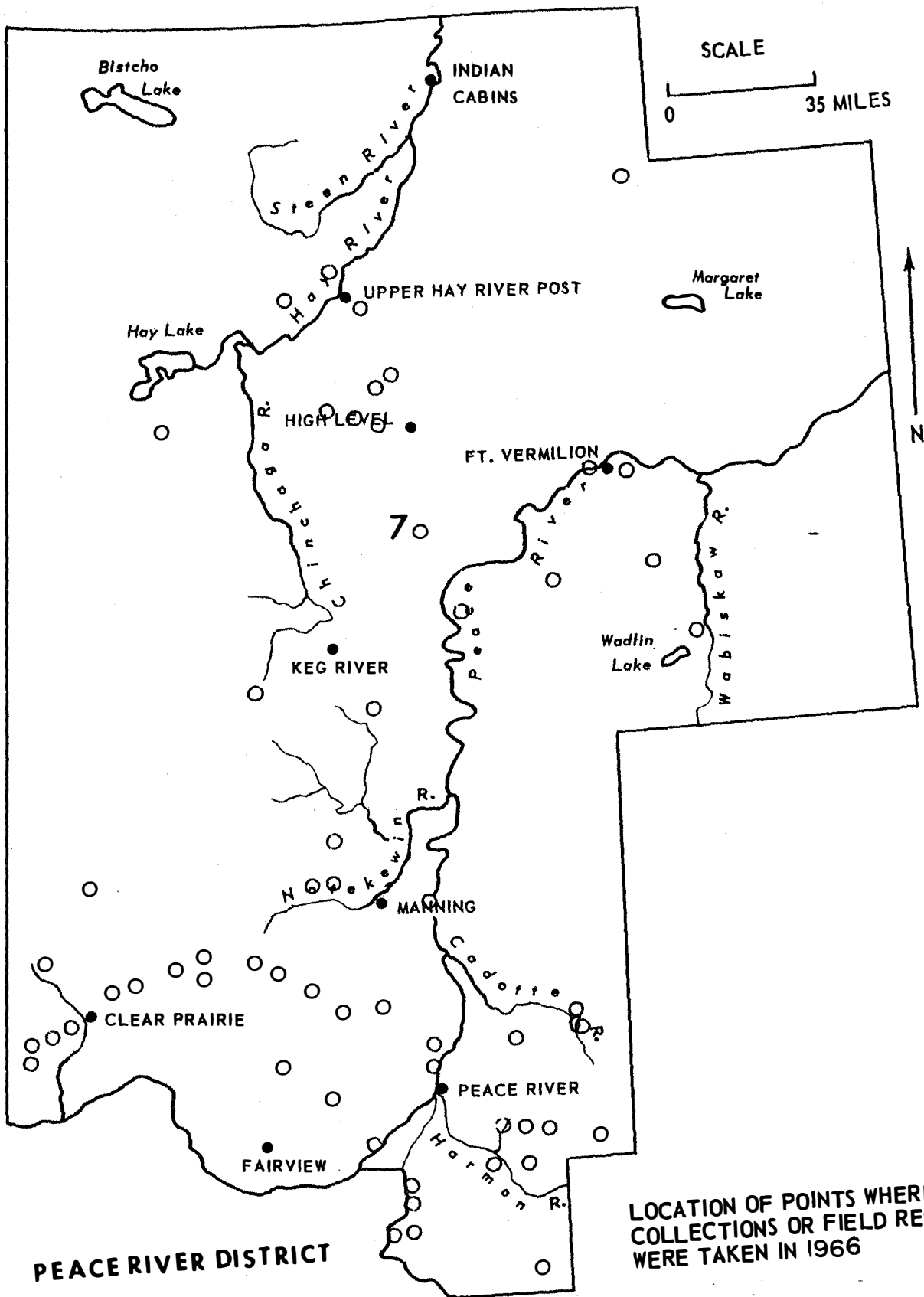
Causal Agent	Host	Remarks
Balsam poplar leaf blight, <u>Linospora tetraspora</u> Thompson	B. poplar	Moderate damage in the Peace River, La Crete and Hotchkiss areas.
Spruce needle cast, <u>Lophodermium macrosporum</u> (Hartig) Rehm	W. spruce	Collected 15 miles west of High Level.
Willow leaf rust, <u>Melampsora epitea</u> Thum.	Willow	Common throughout the District. Caused little damage.
Aspen shoot blight, <u>Pollaccia radiosa</u> (Lib.) Bald. & Cif.	T. aspen	General throughout the District on regeneration aspen.
Fir needle rust, <u>Pucciniastrum epilobii</u> Otth.	B. fir Fireweed	Light damage on B. fir northwest of Eureka River. Light damage on the alternate host fireweed, <u>Epilobium glandulosum</u> Lemh, at Clear Hills tower.
Spruce needle cast, <u>Sarcotrichila piniperda</u> (Rehm) Korf.	W. spruce	Collected 13.4 miles west of Notikewin and one mile east, 4 miles north of Harmon Valley.
Leaf spot of alder, <u>Septoria alnifolia</u> (Ell.) Ev.	Alder	Collected 2 miles west and 9.1 miles north of Peace River. A new record for the Region.
Shoot blight of balsam poplar, <u>Venturia populina</u> (Vuill.) Fabric	B. poplar	Light damage near Clear Hills.

TABLE III
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE PEACE RIVER DISTRICT

Outbreak number	Location	Causal organism	Remarks
7-2	Clear Hills, Twp. 59, Rge. 12, W-6	<u>Peridermium harknessii</u> J. P. Moore	Re-examined 1966. See body of report.
7-3	Mile 88 - 97 Mackenzie Highway.	<u>Peridermium</u> <u>stalactiforme</u> Arth. & Kern <u>Peridermium harknessii</u> J. P. Moore <u>Cronartium comptoniae</u> Arth.	Re-examined 1966. Results: 9% <u>P. stalactiforme</u> 10.5% - <u>P. harknessii</u> 2% - <u>C. comptoniae</u> .



LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966



LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1966

ANNUAL DISTRICT REPORT

MACKENZIE DISTRICT

N.W.T. 1966

by

E. J. GAUTREAU

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

JANUARY 1967

INTRODUCTION

The outbreak of the spruce budworm in the Northwest Territories continued, although populations along the MacKenzie and Slave rivers were much lower. A new spruce budworm outbreak was located along the Peace River in Wood Buffalo National Park. The larch sawfly was widespread in the District. Infestations of the willow leaf miner and poplar serpentine leaf miner persisted in the same areas as reported in 1965.

The known distribution of many common plants, diseases and insects were greatly extended as a result of an aerial survey made along the tree line north of Yellowknife.

A total of 132 plants were collected from the Mackenzie District for the Calgary herbarium in 1966.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Outbreaks of the spruce budworm have been reported in the Northwest Territories since the extension of surveys into the region in the mid 1950's. The outbreaks have for the most part been confined to the valleys along the Slave, Little Buffalo, Hay, Mackenzie and Liard rivers. In 1966 a new outbreak was located along the Peace River 32 miles east of the Fifth Meridian. The infestation extended east of this point for a distance of 20 miles along the River and defoliation ranged from light to severe. Light to moderate defoliation occurred 4 miles east of the Peace Point Ranger Station and extended for a distance of 16 miles down River.

The infestation between Fort Smith and Nagle Channel along the Slave River declined considerably. Defoliation was light in the town of Fort Smith and light to moderate between Fort Smith and Sawmill Island. North of Sawmill Island to Le Grande Detour only scattered pockets of light defoliation were observed. Along the north side of the Slave River from Mile 368 to Mile 374, defoliation was light to moderate except near Mile 372, where severe defoliation occurred to regeneration. Only scattered pockets of light defoliation were detected north of Le Grande Detour to Long Island. North of this area to Nagle Channel budworm populations declined to a low level.

Permanent plots established in 1965 to study the effects of budworm defoliation in the vicinities of Le Grande Detour and Long Island were re-examined. No further deterioration of spruce stands was noted and trees

which had been severely damaged in previous years produced an abundance of new shoots.

The spruce budworm outbreak along the Little Buffalo River commenced near the 60th parallel and extended north along the River to Seton Creek. Defoliation was mostly light with the exception of a large area of moderate defoliation which occurred west of Little Buffalo Falls to Salt Mountain.

The amount of defoliation caused by the spruce budworm along the Mackenzie River Valley decreased. Defoliation was generally light and boundaries of the outbreak showed relatively little change from that reported in 1965. Excellent foliage production occurred which was a direct contrast to the situation which had occurred in the past several years when most of the buds were mined and killed before growth commenced. This situation was particularly noticeable in the older parts of the outbreak near McGern Island and Blackwater River where spruce trees had been damaged by repeated severe defoliation. Permanent plots established in the above mentioned areas in 1964 were re-examined and no further deterioration was noted.

The infestations in the Martin and Ebbutt Hills declined from moderate intensity in 1965 to light in 1966. No serious defoliation was noted along the Liard and Willow rivers and the infestation continued to decline. Light to moderate defoliation occurred along the Rabbitskin River for 20 miles from its confluence with the Mackenzie River to the Horn Plateau. The infestation along the Hay River near Enterprise subsided. No defoliation was observed in this area.

Mass collections of spruce budworm larvae were obtained from the Mackenzie and Slave river outbreaks for comparison studies of various pathogens infecting spruce budworm.

Allegheny Spruce Beetle, Dendroctonus punctatus Lec.

Aerial and ground surveys in 1966 showed that Allegheny spruce beetle attacks were common. The highest percentage of infested white and black spruce was recorded in the area north of Yellowknife to the tree line. Tree mortality resulting from beetle attacks were evident near Mile 98 of the Yellowknife Highway, Lac Levis, Dumas Lake and Lac de Rocher.

Willow Leaf Miner, Lyonetia sp.

Infestations of the willow leaf miner persisted in the District. Moderate to severe browning of willow foliage occurred in the Mackenzie River Valley from Fort Providence to Wrigley, along the Liard River Valley from Fort Simpson to Fort Liard and along the lower part of the Nahanni River for an unknown distance. In the eastern half of the District a light to moderate infestation was detected along the Slave River from Great Slave

Lake to Lake Athabasca and along the Peace River in Wood Buffalo National Park. A light infestation occurred along the Mackenzie and Yellowknife highways.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

This species of leaf miner continued to be widespread, although populations along the Mackenzie and Liard rivers were lower in 1966. A severe infestation occurred along the Mackenzie River from Ft. Simpson to Camsell Bend. From Camsell Bend to the Blackwater River the infestations ranged from light to moderate with severe pockets. The severe infestation that prevailed along the Liard River in 1965 declined to light and moderate intensity. In the eastern part of the District low populations were present in Wood Buffalo National Park and along the Slave River.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The larch sawfly infestation in the Northwest Territories remained much the same as that reported in 1965. The only visible changes were slight reductions in the degree of defoliation to tamarack along the Yellowknife Highway and an increase in the size of the outbreak area north of the Horn River.

An aerial survey of tamarack stands south of the Mackenzie River was conducted during the first week of August. The area flown was from Hay River to Fort Simpson, Fort Simpson to Nahanni Butte, Nahanni Butte to Trout Lake and northeast to Fort Providence. The only damage detected along the flight was in pockets of light to moderate defoliation which occurred near the Rabbitskin River north of Jean Marie and west from here to Fort Simpson. Collections made in the Nahanni Butte, Cormack Lake and Trout Lake areas revealed that only low populations of this insect were present.

Ground surveys along the Yellowknife Highway revealed light to moderate defoliation from Fort Providence to Mile 80 and light defoliation from near Mile 80 to Yellowknife.

An aerial survey of tamarack stands in the Yellowknife area was conducted during mid-August. The area surveyed was from Yellowknife west to Fawn Lake, west along the Horn River to Pine Creek, north of Pine Creek to Cartridge Plateau, east to Reindeer Lake and south to Yellowknife. No defoliation was detected from Yellowknife to Fawn Lake. Pockets of light to moderate defoliation occurred from approximately 10 miles west of Fawn Lake along the Horn River to Pine Creek. North of the confluence of Pine Creek with the Horn River, pockets of light defoliation occurred near Clive Lake and near the southeast slopes of Cartridge Plateau. From Cartridge Plateau east to Reindeer Lake and south to Yellowknife, the only

damage detected was approximately 64 square miles of moderate to severe defoliation between McLellan Lake and Faber Lake.

In the Fort Smith area and Wood Buffalo National Park the larch sawfly was present in low numbers and defoliation was negligible.

DISEASE CONDITIONS

Spruce Needle Cast, Bifusella crepidiformis Darker

This spruce needle cast caused severe browning of white and black spruce foliage at Ellington Lake, near Augustus Lake, Vaillant Lake and Redrock Lake. Light to moderate damage occurred at Zinto Lake, Lac de Rocher and Desperation Lake. In the above mentioned areas damage was confined to the lower crowns of the trees. Elsewhere in the District light damage was observed in the Horn Plateau, Nahanni Range, Fort Providence and Rae areas.

Yellow Witch's Broom of Spruce, Chrysomyxa arctostaphyli Diet.

The known distribution of this rust on black and white spruce was extended northward to the tree line. Light damage was observed at Fort Liard, Cormack Lake, Fort Providence, near Lac Levis, Faber Lake, Zinto Lake, Ellington Lake, near Augustus Lake, Lac de Rocher and Desperation Lake. A collection made 50 miles northeast of Port Radium on the alternate host, bearberry, extended the known range northward.

Spruce Needle Rusts, Chrysomyxa weirii Jacks., Chrysomyxa ledicola Lagerh., Chrysomyxa ledi de Bary, Chrysomyxa empetri Schroet. ex Cumm. and Chrysomyxa spp.

An aerial survey along the tree line extended the known distribution of spruce needle rusts northward. Severe damage occurred to mature spruce at Lac de Rocher and on regeneration spruce on Cartridge Plateau. Elsewhere in the District only very light damage was observed. The known range of C. weirii on white spruce was extended to the Liard Range near Fort Liard. Damage was light in this area.

A northward extension of 3 species of spruce needle rusts on their respective alternate hosts was recorded. These were C. ledicola on Labrador tea at Itcher Lake, C. empetri on crowberry at Vaillant Lake and C. ledi on leather-leaf at Desperation Lake.

Spruce Shoot Rust, Chrysomyxa woroninii Tranz.

The northern distribution of this rust on spruce was extended to the tree line at Redrock Lake. Spruce and Labrador tea was lightly infected at the following locations: Horn Plateau, Ebbutt Hills, Cartridge Plateau, Ellington Lake, Zinto Lake, Faber Lake, near Augustus Lake, Redrock Lake, and Lac de Rocher. The collection of this rust on northern Labrador tea constituted new herbarium record for the region.

Comandra Blister Rust, Cronartium comandrae Pk.

Comandra blister rust was found in nearly all young jack pine stands examined. No severely infected stands were located although 10 - 20 per cent of jack pine bordering the highway between Fort Providence and Birch Lake had branch and stem infections.

The permanent plot established in 1965 to study the rate of spread of this disease was re-examined. Low mortality was noted in the plot.

The known range of this rust on the alternate host, northern comandra, was extended to within 65 miles of the tree line.

A hyperparasite of rusts Cladosporium sp. was collected on jack pine near Fort Providence. An insect, Dioryctria zimmermani Grt., was found in comandra blister rust cankers in many areas of the District. High populations were noted 60 miles north of Fort Providence along the Yellowknife Highway.

Sweet Fern Blister Rust, Cronartium comptoniae Arth.

This rust was first reported from the Northwest Territories in 1965. In 1966 surveys were conducted to determine its northern distribution on jack pine and on the alternate host Myrica gale L. Butt cankers on jack pine were found from the Northwest Territories Boundary to the northern limits of jack pine. The most northerly collections were made on jack pine and Myrica gale L. near Fishing Lake, 60 miles north of Yellowknife. In this area 20 per cent of the stand was infected with butt cankers. A parasite of rusts, Tuberculina maxima Rostr. was collected at Little Doctor Lake.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Needle miner, <u>Coleotechnites</u> sp.	B. spruce	Generally light, common in the Hay River area and along the Yellowknife Highway.
Leaf tier, <u>Compsolechia niveopulvella</u> Cham.	T. aspen	Low populations in the District.
Spruce coneworm, <u>Dioryctria renicullela</u> (Grote)	W. spruce B. spruce	Present in low numbers in association with the spruce budworm.
Zimmerman pine moth, <u>Dioryctria zimmermani</u> Grt.	J. pine	Comandra blister rust cankers heavily infested with this insect near Mile 60 Yellowknife Highway. Low populations elsewhere in the District.
Gall mite, <u>Eriophyidae</u>	Willow	Severe infestation in the area north of Yellowknife.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	Willow	Populations low in the District.
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	T. aspen	Low populations in W.B.N.P.
Leaf miner, <u>Gracilaria</u> sp.	Alder	Severe infestation in the town of Hay River.
Pine root collar weevil, <u>Hylobius warreni</u> Wood	J. pine	The known range of this weevil in Canada was greatly extended by the collection of specimens near Enterprise N.W.T.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	W. spruce B. spruce	Present in low numbers at Fort Smith, Fort Simpson and near Fort Providence.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

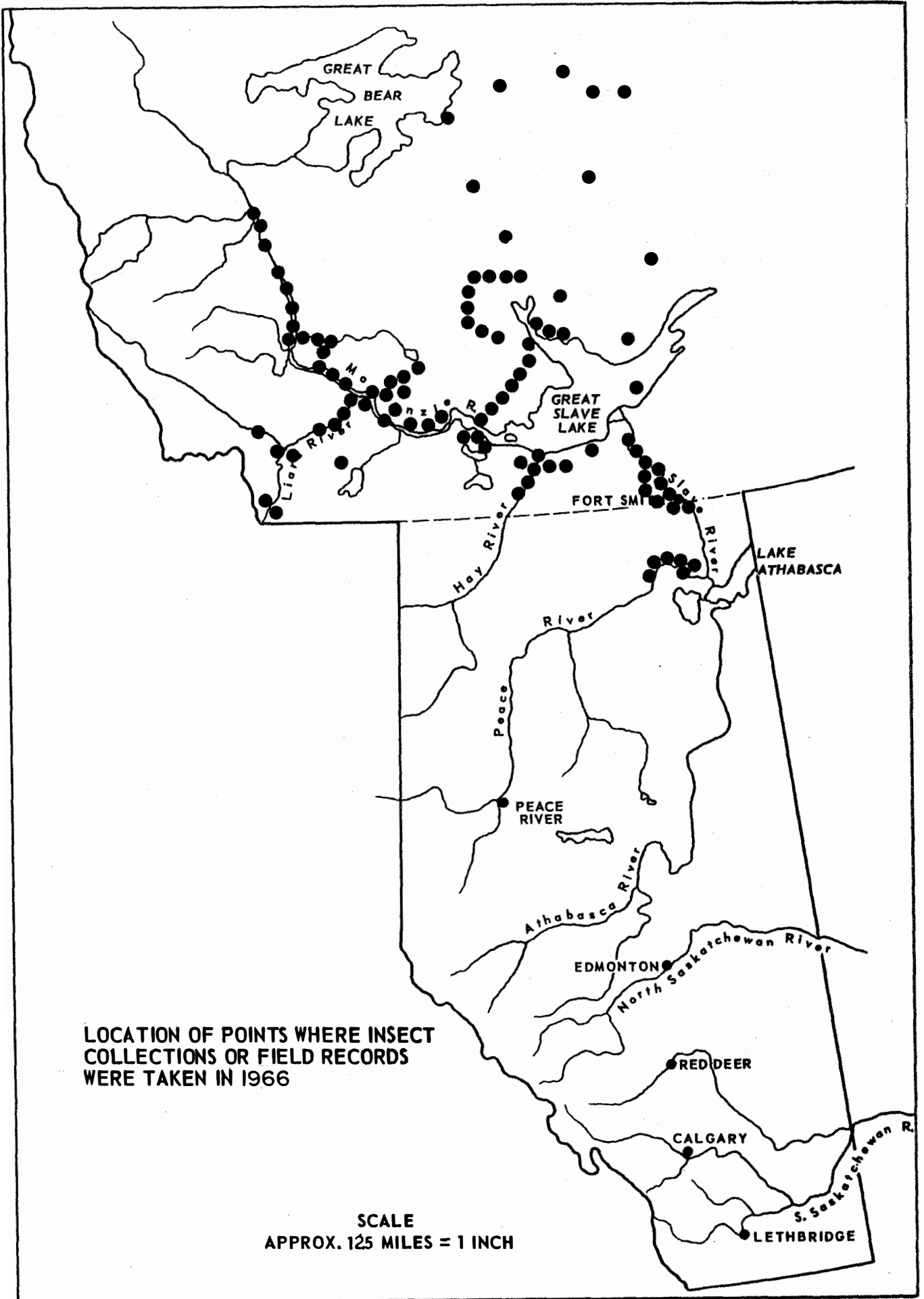
Causal Agent	Host	Remarks
Weevil, <u>Pissodes</u> sp.	J. pine	Collected from the root collar of jack pine regeneration 60 miles north of Yellowknife.
Leaf tier, <u>Pseudexentera</u> <u>improbana</u> <u>oregonana</u> Wlshm.	T. aspen	Low populations in the Fort Smith area.
<u>Disease</u>		
Spruce cone rust, <u>Chrysomyxa</u> <u>pirolata</u> Wint.	One-sided pyrola Green pyrola	Collected on these hosts near Rae. Range extension northward.
Pine needle rust, <u>Coleosporium</u> <u>asterum</u> (Diet.) Syd.	Aster	Collected near Fort Smith, Fort Providence and Nahanni Butte.
Leaf rust of raspberry, <u>Gymnoconia</u> <u>peckiana</u> (Howe) Trott.	Dwarf raspberry	Collected near Peace Point, new herbarium record for the N.W.T.
Needle rust of juniper, <u>Gymnosporangium</u> <u>cornutum</u> Arth. ex. Kern	Dwarf juniper	Light damage at Fort Liard Tower. Most northerly collection in Canada.
Needle rust of juniper, <u>Gymnosporangium</u> <u>tremelloides</u> Hartig	Dwarf juniper	Collected at Fort Laird Tower. New herbarium record.
Pine needle cast, <u>Hypodermella</u> <u>concolor</u> (Dearn.) Darker	Lp. pine	Light damage at Fort Liard Tower. Range extension northward.
Discomycete, <u>Lachnellula</u> <u>arida</u> (Phill.) Dennis	Lp. pine	Collected on <u>Cronartium</u> <u>comptoniae</u> Arth. canker at Cormack Lake.

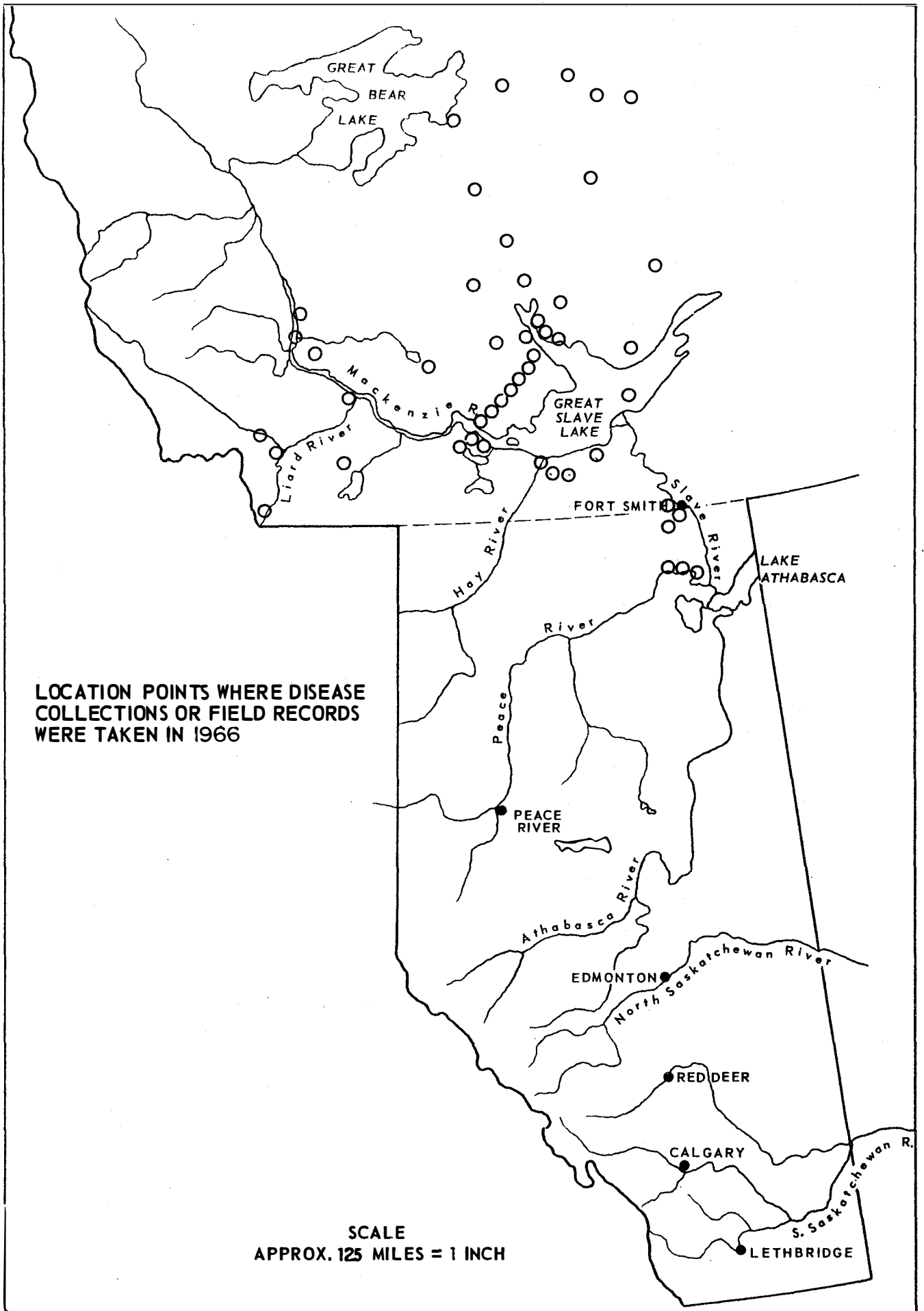
TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

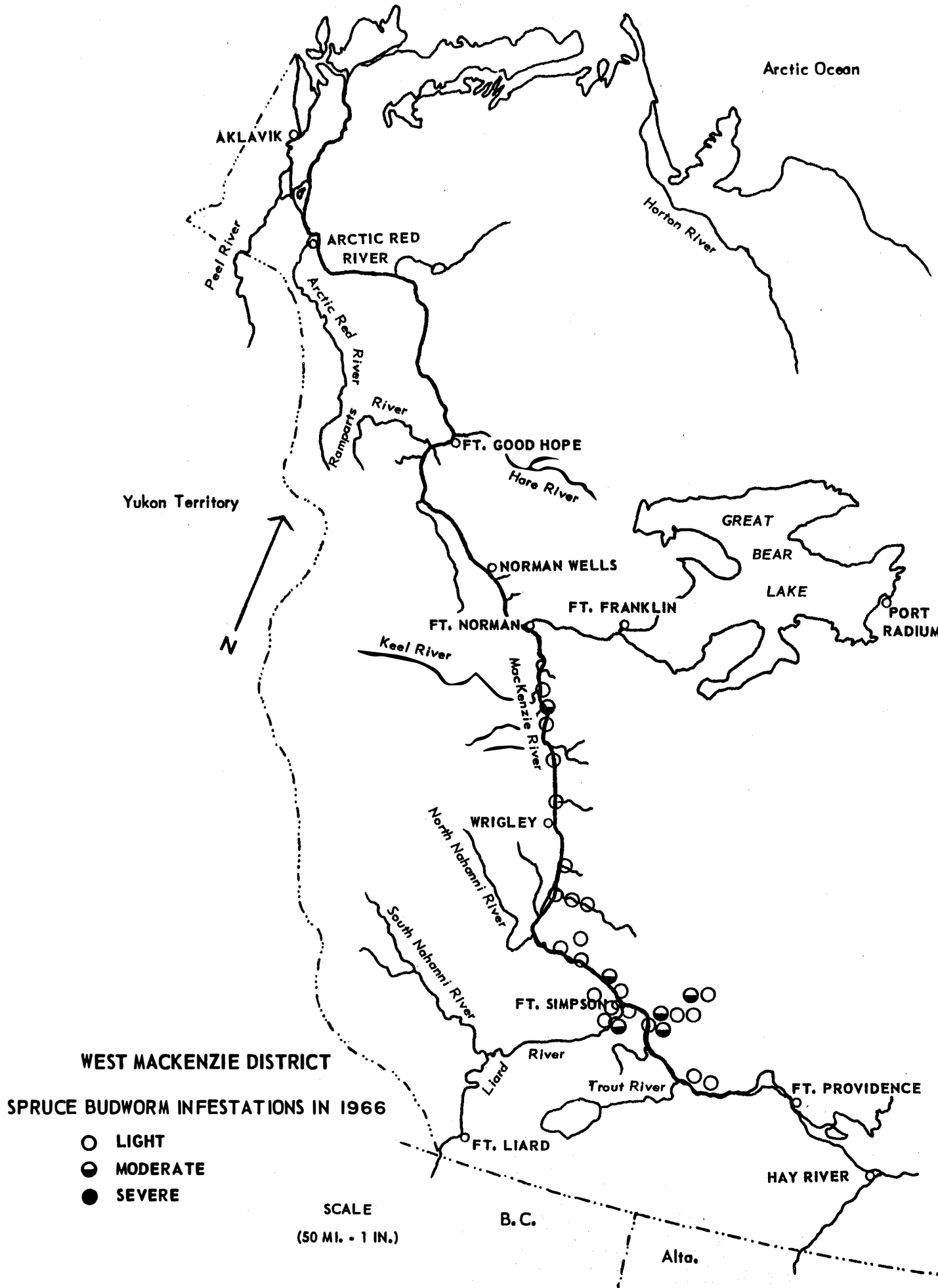
Causal Agent	Host	Remarks
Spruce needle cast, <u>Lophodermium filiforme</u> Darker	W. spruce	Light needle cast on spruce regeneration near Fort Providence.
Needle cast, <u>Lophodermium juniperinum</u> (Fries) DeNotaris	Dwarf juniper Creeping juniper	Range extension far northward. Collected 100 miles south of Coppermine.
Larch needle cast, <u>Lophodermium laricinum</u> Duby	Tamarack	New host record. Most northerly collection of this needle cast in the Region.
Pine needle cast, <u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	J. pine	Caused light foliage damage near Fort Providence.
Leaf spot, <u>Marssonina potentillae</u> (Desm.) Magn.	Marsh cinquefoil	Severe foliage damage at Hay River. New herbarium record for the District.
Willow leaf rust, <u>Melampsora epitea</u> Thuem.	Willow	Common in the District. Range extension to the tree line.
Decay fungi, <u>Melanconis alni</u> Tul. var. <u>marginalis</u> (Pk.) Wehm.	Alder	New distribution record for the Region.
Leaf spot, <u>Mycosphaerella populicola</u> G. E. Thompson	B. poplar	Caused light damage in the District. New herbarium record.
Canker and die back, <u>Nectria cinnabarina</u> (Tode ex Fr.) Fr.	Elderberry Alder	Light at the Fort Simpson Experimental Station.
Western gall rust, <u>Peridermium harknessii</u> J. P. Moore	J. pine Lp. pine	Moderate damage located near Fort Liard Tower. Light to moderate damage occurred at Trout and Cormack lakes.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Needle rust, <u>Pucciniastrum</u> sp.	W. spruce	Light infection at Wrigley and Fort Liard.
Spruce needle rust, <u>Pucciniastrum arcticum</u> Tranz	Dwarf raspberry	Range extension northward to Nahanni Butte.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn.) Kleb.	A. fir Cowberry	Light on these hosts at Fort Liard Tower. New herbarium record for the District on cowberry.
Leaf rust on alpine bearberry, <u>Pucciniastrum sparsum</u> (Wint.) E. Fischer	Alpine bearberry	Range extension north to the tree line. The telial stage of this rust on alpine bearberry was successfully innoculated to white spruce foliage at the Calgary Laboratory. This constituted a new North American record.
Tar spot, <u>Rehmiellopsis betulina</u> (Fr.) v. Arx.	Dwarf birch	Range extension far northward on this host.
Tar spot, <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Common in the District. Caused only light foliage damage.
Canker of willow, <u>Valsa salicina</u> (Pers. ex Fr.) Fr.	Willow	Range extension to the tree line.
Leaf spot, <u>Venturia dickieii</u> (Berk. & Br.) Ces. & de N.	Twin flower	New herbarium record.
Shoot blight of balsam poplar, <u>Venturia populina</u> (Vuill.) Fabric	B. poplar	Light infection near Fort Liard and Fort Providence.
Aspen shoot blight, <u>Venturia tremulae</u> Aderh.	T. aspen	Infection light near Wrigley and Fort Liard.







Arctic Ocean

AKLAVIK

ARCTIC RED RIVER

Harten River

Peel River

Arctic Red River
Ramparts River

FT. GOOD HOPE

Hare River

Yukon Territory

N

NORMAN WELLS

GREAT BEAR LAKE

FT. FRANKLIN

PORT RADIUM

FT. NORMAN

Keel River

Mackenzie River

WRIGLEY

North Nahanni River

South Nahanni River

FT. SIMPSON

WEST MACKENZIE DISTRICT

SPRUCE BUDWORM INFESTATIONS IN 1966

- LIGHT
- ◐ MODERATE
- SEVERE

SCALE
(50 MI. = 1 IN.)

B. C.

Alta.

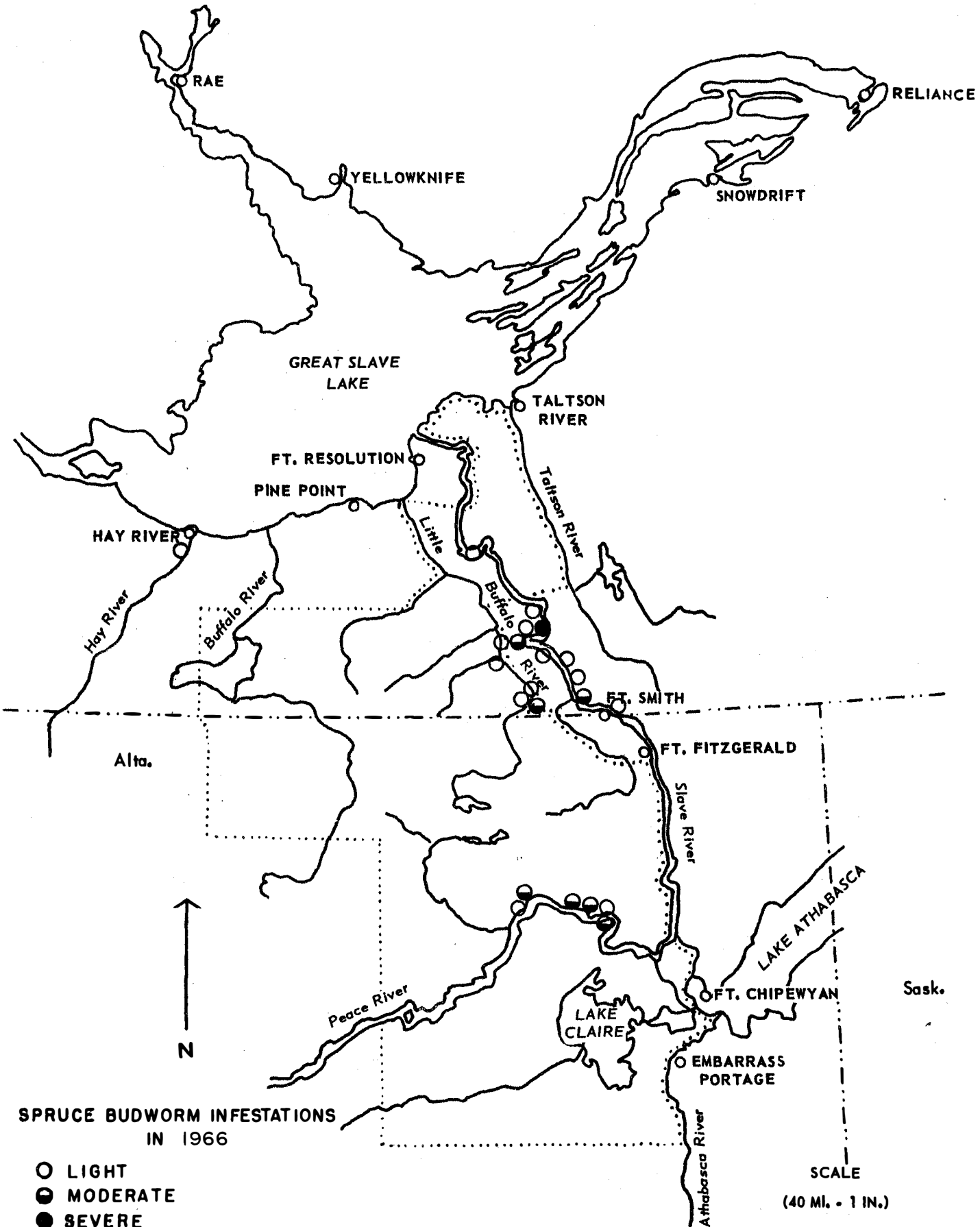
FT. LIARD

Trout River

FT. PROVIDENCE

HAY RIVER

EAST MACKENZIE DISTRICT



ANNUAL DISTRICT REPORT

YUKON DISTRICT

YUKON TERRITORY 1966

by

R. W. BARRY

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

FORESTRY BRANCH

DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT

JANUARY 1967

INTRODUCTION

The survey of the Yukon District in 1966 did not reveal any serious insect or disease outbreaks. Damage to aspen foliage was attributed mainly to a leaf roller and the poplar serpentine miner. Conifers were relatively free from attacks by insect.

Spruce needle rusts were evident throughout the District. Collections of spruce shoot rust were made in the west-central portion of the District. Needle casts of lodgepole pine and spruce were common throughout the District.

INSECT CONDITIONS

Cooley Spruce Gall, Adelges cooleyi (Gill.)

Damage to black and white spruce by the Cooley spruce gall aphid was relatively light in the Yukon in 1966. Very low populations were found 58 miles west of Dawson, 37 miles north of Whitehorse, 21 miles south of Carmacks and along the Alaska Highway from Watson Lake to the Yukon-Alaska Boundary. A high population on white spruce was reported 30 miles west of Haines Junction on the Alaska Highway.

Leaf Tier, Compsolechia niveopulvella Cham.

This leaf tier was common throughout the range of trembling aspen in the District in 1966. Low populations occurred along the Alaska Highway from Watson Lake to near Haines Junction, along the Mayo Highway from Whitehorse to Mayo, and 51 miles southeast of Ross River. Medium populations were observed along the Mayo Highway at Mile 76, 102, 118, and 139 and along the Alaska Highway at Mile 809. High populations were observed along the Alaska Highway at Mile 859, 885, and 990 and along the Dawson Highway at Mile 2.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The poplar serpentine miner was common to all aspen stands examined in the District in 1966. Moderate damage to trembling aspen leaves occurred along the Alaska Highway at Mile 784 and Mile 1152 and 80 miles north of Watson Lake. Severe damage was reported along the Canal Road, in the vicinity of Watson Lake, and in the Beaver Creek region. In all other aspen stands in the District, light damage was evident.

Low populations in widely scattered areas also occurred on balsam poplar and black cottonwood.

DISEASE CONDITIONS

Spruce Needle Cast, Bifusella crepidiformis Darker

This needle cast was common on spruce throughout the Yukon in 1966. Light damage to white spruce was evident at Mile 34 Dawson Highway, Mile 139 Haines Highway, Mile 1206 Alaska Highway and along the Mayo Highway at Mile 80 and Mile 160. The disease was responsible for moderate to severe "casting" of white spruce needles at Mile 120 Mayo Highway, Mile 82 and Mile 91 Dawson Highway, and Mile 101 Canol Road. Moderate to severe damage was observed in black spruce stands 88 miles southeast of Ross River and at Mile 30 Dempster Highway.

Spruce Needle Rusts, Chrysomyxa spp.

Spruce needle rusts were present in most black and white spruce stands examined in the Yukon in 1966 but dry weather hampered spore germination which resulted in a generally low incidence of infection. Light damage was evident along the Alaska Highway from Watson Lake to the Yukon-Alaska Boundary, north from Watson Lake on the Cantung Road for a distance of 110 miles, east of Ross River along the new highway to the Cantung Road, along the Mayo Highway from Mile 120 to 230, and in spruce stands surrounding Dawson. Moderate damage in stands of mature spruce was observed in the region west of Mile 1105 Alaska Highway to near Beaver Creek. Severe damage was present on a few regeneration spruce in the same area.

Spruce Shoot Rust, Chrysomyxa woroninii Tranz.

In 1966 this rust was found on the primary hosts, black and white spruce, from Mile 0 to Mile 45 Dempster Highway, west of Dawson to Mile 49 Sixty Mile Highway, and at Mile 1206 Alaska Highway. A collection on the alternate host, Labrador tea, was made 49 miles west of Dawson.

Pine Needle Casts, Hypodermella concolor (Dearn.) Darker
Hypodermella montana Darker

These needle casts were common in most pine stands examined in the Yukon District during 1966. H. concolor was responsible for light to moderate damage of the 1965 needles at Mile 722 Alaska Highway and Mile 189 and Mile 230 Mayo Highway.

Light damage caused by H. montana was present at Mile 780 Alaska Highway, 97 miles southeast of Ross River, and 116 miles north of Watson Lake on the Cantung Road. Severe damage to needles on mature pine was evident at Mile 53 Canol Road.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	18	68	Trembling aspen	52	17
Black spruce	3	12	Balsam poplar	10	22
Lodgepole pine	0	28	Black cottonwood	5	9
Alpine fir	0	4	Birch	1	2
Tamarack	1	2	Willow	3	32
	22	114		71	82
Insect collections from miscellaneous hosts					1
Disease collections from miscellaneous hosts					35
GRAND TOTAL					325

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE YUKON DISTRICT, 1966

Causal Agent	Host	Remarks
<u>Insects:</u>		
Poplar bud-gall mite, <u>Aceria parapopuli</u> (Kieffer)	T. aspen	Collections made at Mile 809 and Mile 884 Alaska Highway.
Gall aphid on conifers, <u>Adelges lariciatus</u> (Patch)	W. spruce	Low population 69 miles north of Watson Lake.
Wolly larch aphid, <u>Adelges strobilobius</u> (Kalt.)	B. spruce	Collections made 88 and 127 miles southeast of Ross River.
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	T. aspen	Low populations observed at Mile 45 and Mile 118 on the Mayo Highway.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Spruce gall aphid, <u>Pineus pinifoliae</u> (Fitch)	B. spruce W. spruce	Six collections taken at scattered points in Central Yukon.
<u>Diseases:</u>		
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> Diet.	B. spruce W. spruce	Common throughout the Yukon.
Spruce needle rust, <u>Chrysomyxa empetri</u> Schroet. ex Cumm.	Crowberry	One collection made at Mile 53 Canol Road.
Spruce needle rust, <u>Chrysomyxa weirii</u> Jacks.	W. spruce	One collection made at Mile 674 Alaska Highway.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	Lp. pine	Collections taken at Mile 735 and Mile 905 Alaska Highway.
Hyperparasite of needle rust, <u>Darlucia filum</u> (Biv.) Cast.	W. spruce	Mile 1145 Alaska Highway and Mile 30 Dempster Highway.
Pine needle cast, <u>Elytroderma deformans</u> (Weir) Darker	Lp. pine	One collection taken 5 miles southeast of Watson Lake.
Spruce needle cast, <u>Lophodermium filiforme</u> Darker	W. spruce	Infection causing severe damage 49 miles southeast of Ross River.
Spruce needle cast, <u>Lophodermium macrosporum</u> (Hartig) Rehm	B. spruce	One collection taken 127 miles southeast of Ross River.
Pine needle cast, <u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	Lp. pine	Found throughout the range of pine in the Yukon.
Willow leaf rust, <u>Melampsora epitea</u> Thüm	Willow	Common throughout the District.

TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Western gall rust, <u>Peridermium harknessii</u> J. P. Moore	Lp. pine	Collected 146 miles south- east of Ross River and at Mile 657 and Mile 838 Alaska Highway.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb.	A. fir	Light damage at Mile 92 Canol Road and Mile 715 Alaska Highway.
Tar spot, <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Common throughout the Yukon.
Shoot blight of balsam poplar, <u>Venturia populina</u> (Vuill.) Fabric	B. poplar	Six collections taken at scattered points in the District.
Aspen shoot blight, <u>Venturia tremulae</u> Aderh.	T. aspen	Collected at Mile 824 and Mile 1206 Alaska Highway, Mile 120 Mayo Highway and Mile 15 and Mile 58 Dawson Highway.

ARCTIC CIRCLE

YUKON TERRITORY

SCALE



PEEL RIVER

DAWSON

MAYO LANDING

YUKON RIVER

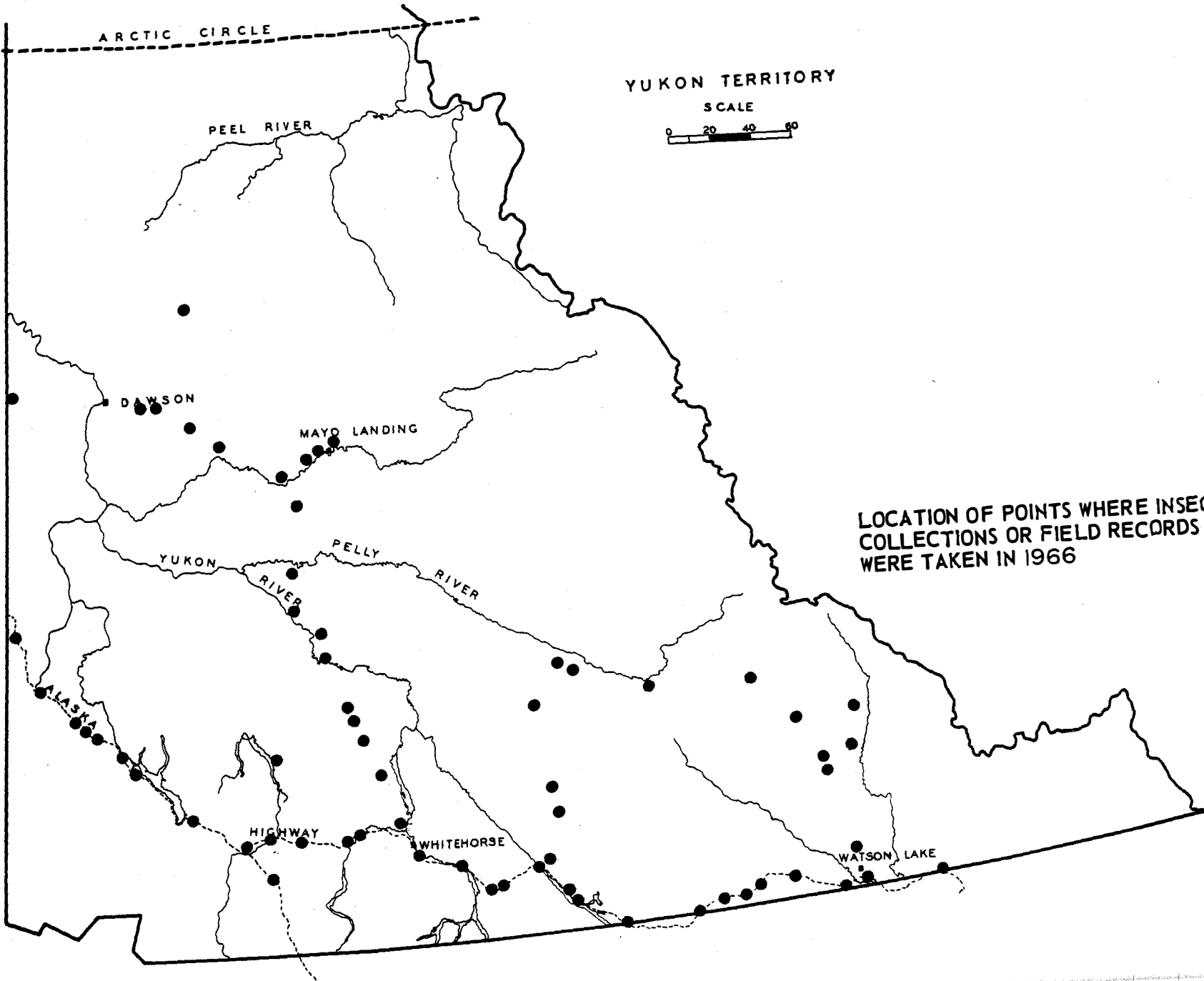
PELLY RIVER

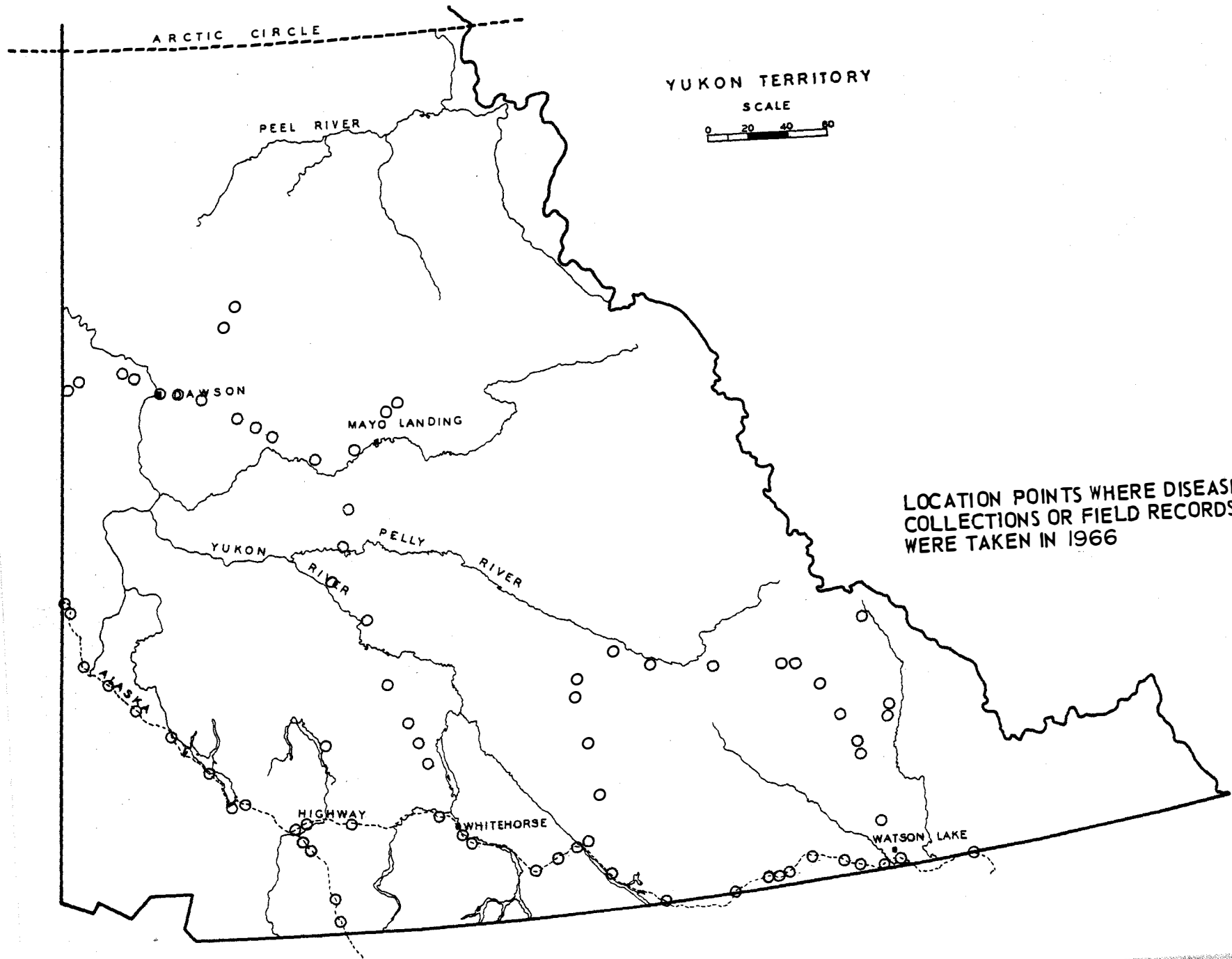
HIGHWAY

WHITEHORSE

WATSON LAKE

LOCATION OF POINTS WHERE INSECT
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1966





<u>Nematus</u> sp., Sawfly.....	56
<u>Nematus ventralis</u> Say, Willow sawfly.....	67
<u>Neodiprion</u> sp., Sawfly.....	56, 67
<u>Neodiprion abietis</u> (Harr.), Balsam-fir sawfly.....	24
<u>Oligonychus ununguis</u> (Jac.), Spruce spider mite.....	16, 56, 67, 78
<u>Operophtero bruceata</u> (Hulst), Bruce spanworm.....	16, 28, 68, 78, 87
<u>Petrova albicapitana</u> (Busck), Pitch nodule maker.....	68, 87
<u>Phenacaspis pinifoliae</u> (Fitch), Pine needle scale.....	16
<u>Phyllocnistis populiella</u> Cham., Poplar serpentine miner....	5, 13, 28, 37, 39, 40, 56, 68, 85, 95, 108
<u>Pikonema alaskensis</u> (Roh.), Yellow-headed spruce sawfly....	17, 24, 53, 64, 79, 99
<u>Pikonema dimmckii</u> (Cress.), Green-headed spruce sawfly....	53, 87
<u>Pineus pinifoliae</u> (Fitch), Spruce gall aphid.....	112
<u>Pissodes</u> sp., Weevil.....	100
<u>Pissodes engelmanni</u> Hopk., Engelmann spruce weevil.....	17, 28, 68, 79, 88
<u>Pissodes terminalis</u> Hopping, Lodgepole terminal weevil.....	28, 56, 68, 79, 88
<u>Pristiphora erichsonii</u> (Htg.), Larch sawfly.....	3, 17, 28, 53, 64, 75, 85, 95
<u>Pseudexentem improbana oregonana</u> Wlshm., Leaf tier.....	17, 100
<u>Rhabdophaga swainei</u> Felt, Cecidomyid gall.....	75
<u>Saperda calcarata</u> Say, Poplar borer.....	79
<u>Sciaphila duplex</u> Wlshm., Leaf roller.....	17

DISEASE

<u>Apiosporina collinsii</u> (Schw.) v. Höhnel, <u>Apiosporina</u> witch's broom..	56
<u>Arceuthobium americanum</u> Nutt. ex Engelm., Dwarf mistletoe...	5, 24, 38, 47, 64, 79
<u>Armillaria mellea</u> (Vahl ex Fr.) Quel., Shoestring root rot..	5, 17, 24, 42, 68
<u>Atropellis piniphila</u> (Weir) Loman & Cash, <u>Atropellis</u> canker.....	25, 76
<u>Bifusella abietis</u> Dearn., Fir needle cast.....	42
<u>Bifusella urepidiformis</u> Darker.....	4, 28, 79, 88, 96, 109
<u>Bifusella linearis</u> (Pk.) Hoehn., Needle cast.....	29
<u>Chrysomyxa</u> spp., Spruce needle rusts.....	4, 25, 42, 53, 65, 76, 85, 96, 109
<u>Chrysomyxa arctostaphyli</u> Diet., Yellow witch's broom of spruce	56, 96, 112
<u>Chrysomyxa empetri</u> Schroet. ex Cumm., Spruce needle rust....	37, 39, 96, 112
<u>Chrysomyxa ledi</u> de Barry, Spruce needle rust.....	96
<u>Chrysomyxa ledicola</u> Lagerh., Spruce needle rust.....	96
<u>Chrysomyxa pirolata</u> Wint., Spruce cone rust.....	6, 17, 42, 65, 100
<u>Chrysomyxa weirii</u> Jacks., Spruce needle rust.....	29, 37, 40, 96, 112
<u>Chrysomyxa woroninii</u> Tranz., Spruce shoot rust.....	88, 97, 109
<u>Ciborinia pseudobifrons</u> Whet., Poplar ink spot.....	25
<u>Ciborinia whetzellii</u> (Seaver) Seaver, Poplar ink spot.....	4, 25, 57, 65, 76, 85

<u>Coccomyces hiemalis</u> Higgins, Leaf spot.....	29
<u>Coleosporium asterum</u> (Diet.) Syd., Pine needle rust.....	29, 42, 57, 68, 88, 100
<u>Cronartium coleosporioides</u> Arth., The stage of <u>P. harknessii</u> and <u>P. stalactiforme</u> which occurs on the alternate host.	86
<u>Cronartium comandrae</u> Pk., Comandra blister rust.....	29, 68, 79, 88, 97,
<u>Cronartium comptoniae</u> Arth., Sweet fern blister rust.....	97 112
<u>Cronartium ribicola</u> J. C. Fischer, White pine blister rust.....	42
<u>Diplodia tumefaciens</u> (Shear) Zalasky, Poplar branch gall.....	79
<u>Elytroderma deformans</u> (Weir) D rker, Pine needle cast.....	4, 25, 39, 40, 80, 112
<u>Erwinia amylovora</u> (Burrill) Winslow, Fire blight.....	57, 68
<u>Fenusa pusilla</u> (Lep.), Birch leaf miner.....	5
<u>Gloeocoryneum cinereum</u> Dearn., Pine needle cast.....	29
<u>Gymnoconia peckiana</u> (Howe) Trott., Leaf rust of raspberry....	100
<u>Gymnosporangium cornutum</u> Arth. ex Kern, Needle rust of juniper.....	100
<u>Gymnosporangium tremelloides</u> Hartig, Needle rust of Juniper.....	100
<u>Herpotricha nigra</u> Hartig, Snow mould.....	43
<u>Hypodermella consolor</u> (Dearn.) Darker, Pine needle cast.....	4, 29, 43, 100, 109
<u>Hypodermella montana</u> Darker, Pine needle cast.....	4, 17, 30, 69, 109
<u>Hypodermella nervata</u> Darker, Fir needle cast.....	69
<u>Hypoxylon pruinatum</u> (Klotzche) Cke., Hypoxylon canker.....	57
<u>Lacknelliula arida</u> (Phill.) Dennis, Discomycete.....	100
<u>Linospora tetraspora</u> Thompson, Balsam poplar leaf blight.....	30, 57, 76, 88
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