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**ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
ALBERTA - N.W.T. - YUKON REGION**

1965

**FOREST RESEARCH LABORATORY
CALGARY, ALBERTA**

DEPARTMENT OF FORESTRY

March 1966

ANNUAL DISTRICT REPORTS
ALBERTA
(Forest Insect and Disease Survey)

by

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

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY
March 1966

INTRODUCTION

The 1965 field season for the Forest Insect and Disease Survey, Alberta-Northwest Territories Region, commenced in early May and was terminated in late September. During this period, the status of major forest pests was determined by ground, aerial and boat surveys; damage appraisals were carried out in a number of outbreaks, special population and behavior studies were continued and many host and distribution records were taken. The spruce budworm outbreaks in northern Alberta and the Northwest Territories were of major concern in 1965. The forest tent caterpillar outbreak continued to decline. Scattered patches of moderate to severe defoliation were confined to central Alberta. Larch sawfly populations were at a relatively low level in all but the extreme northern range of tamarack. Foliage diseases were widespread and severe in central Alberta.

Major changes in district assignments were made in 1965. District and supervisory responsibilities were as follows:

Southern Division
Supervisor - V. B. Patterson

District 1.	Crowsnest-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	R. W. Barry

Northern Division
Supervisor - J. Petty

District 6.	Slave Lake-Grande Prairie	J. Petty
District 7.	Peace River	C. R. Layton
District 8.	Northwest Territories	E. J. Gautreau

SUMMARY OF INSECT AND DISEASE CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm outbreaks in northern Alberta and the Northwest Territories covered much the same aggregate area and at similar intensities as in 1964, with characteristic population shifts within the outbreak areas. Light damage to spruce forests was reported for the first time from a number of localities in northwestern Alberta. The Wabasca outbreak increased in area with extensions up the Mikkwa and Owl rivers. Light to severe damage was sustained by most white spruce stands along the Slave River between Fort Smith and Nagel Channel, a distance of about 170 miles. The outbreak along the Mackenzie River varied in intensity and extended downstream from the Horn River for 360 miles to the Redstone River. Spruce budworm populations were again low in the Liard River Valley.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Forest tent caterpillar populations continued to decline. Sufficient viable egg bands were present in the spring of 1965 to maintain the outbreak in aspen stands over most of the area of about 15,000 square miles which was moderately to severely defoliated in 1964. However, severe larval mortality in early instars reduced the outbreak to about 30 square miles around Lake Wabamun and approximately 200 square miles in scattered patches in the Vilna-Two Hills area.

Sequential sampling of egg bands was again carried out in the fall of 1965. Again sufficient egg bands were present in the outbreak area to maintain high populations in 1966. Hatching studies and observations of larval behavior will be continued in the spring of 1966.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The epicenter of the larch sawfly outbreak continued its northwestward trend in 1965. Although no surveys were carried out along the northern limits of the outbreak it is believed that it may have reached the northern limit of tamarack. Patches of moderate to severe defoliation were observed along the Yellowknife Highway between Fort Providence and Yellowknife with light to moderate defoliation west to the Horn Mountains. Severe defoliation of tamarack was found from the Rabbitskin River north to the Horn Mountains. Moderate to severe defoliation occurred at a number of locations in central Alberta. Adverse flying conditions forced cancellation of the larch sawfly survey planned for northern Alberta in late August.

Foliage Diseases

In the southern two-thirds of Alberta where weather conditions favored the proliferation of leaf fungi, severe damage to the foliage of coniferous and deciduous trees was widespread. Foliage diseases of conifers included needle rust of white spruce, alpine fir, lodgepole pine and jackpine and needle casts of white, Engelmann and black spruce, alpine fir and lodgepole pine. Leaf blights of aspen and balsam poplar and poplar ink spot were the most common foliage diseases of deciduous trees.

Armillaria Root Rot, Armillaria mellea (Vahl ex Fr.) Quél

A number of previously unreported outbreaks of this disease were found in west-central Alberta in 1965. In the Clearwater Forest, mortality of lodgepole pine regeneration was observed near Ricinus and Nordegg, south of the Baptiste River and in the Parker Creek area. Near the East Gate of Banff National Park mortality was evident in a stand of mature Douglas fir and in adjacent regeneration white spruce and lodgepole pine.

TABLE I

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

Causal Agent	Host	Remarks
<u>Insect</u>		
Linden looper, <u>Erannis tiliaria</u> (Harr.)	M. maple	Defoliated about 100 acres of Manitoba maple along Ross Creek near Medicine Hat.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	Poplar Willow	Populations declined considerably from 1964. Light to moderate defoliation occurred in the Barrhead, Fort Assiniboine and Hinton areas.
Pine root collar weevils, <u>Hylobius</u> spp.	Lp. pine	Many new infestations found in 1965. Caused light damage to pine regeneration in Kootenay National Park.

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

Causal Agent	Host	Remarks
<u>Willow leaf miner,</u> <u>Lyonetia</u> sp.	Willow	High populations persisted in many areas in extreme northern Alberta and in the Northwest Territories.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	Spruce	Populations increased notably in central Alberta and in the Peace River area. Elsewhere damage was generally light.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen	Severe infestations were present in Yoho, Kootenay and Waterton Lakes national parks, in northern Alberta and in the Liard River Valley.
Poplar borers, <u>Saperda calcarata</u> Say	T. aspen	High populations found in aspen bluffs in east-central Alberta.
<u>Diseases</u>		
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	W. spruce	Due to a very light cone crop, little apparent damage to spruce cones was noted in 1965.
Winter drying of conifers	Lp. pine	Severe injury occurred in many mountain valleys in Banff National Park, in the Kananaskis Valley and in the Liard Valley in the Northwest Territories.

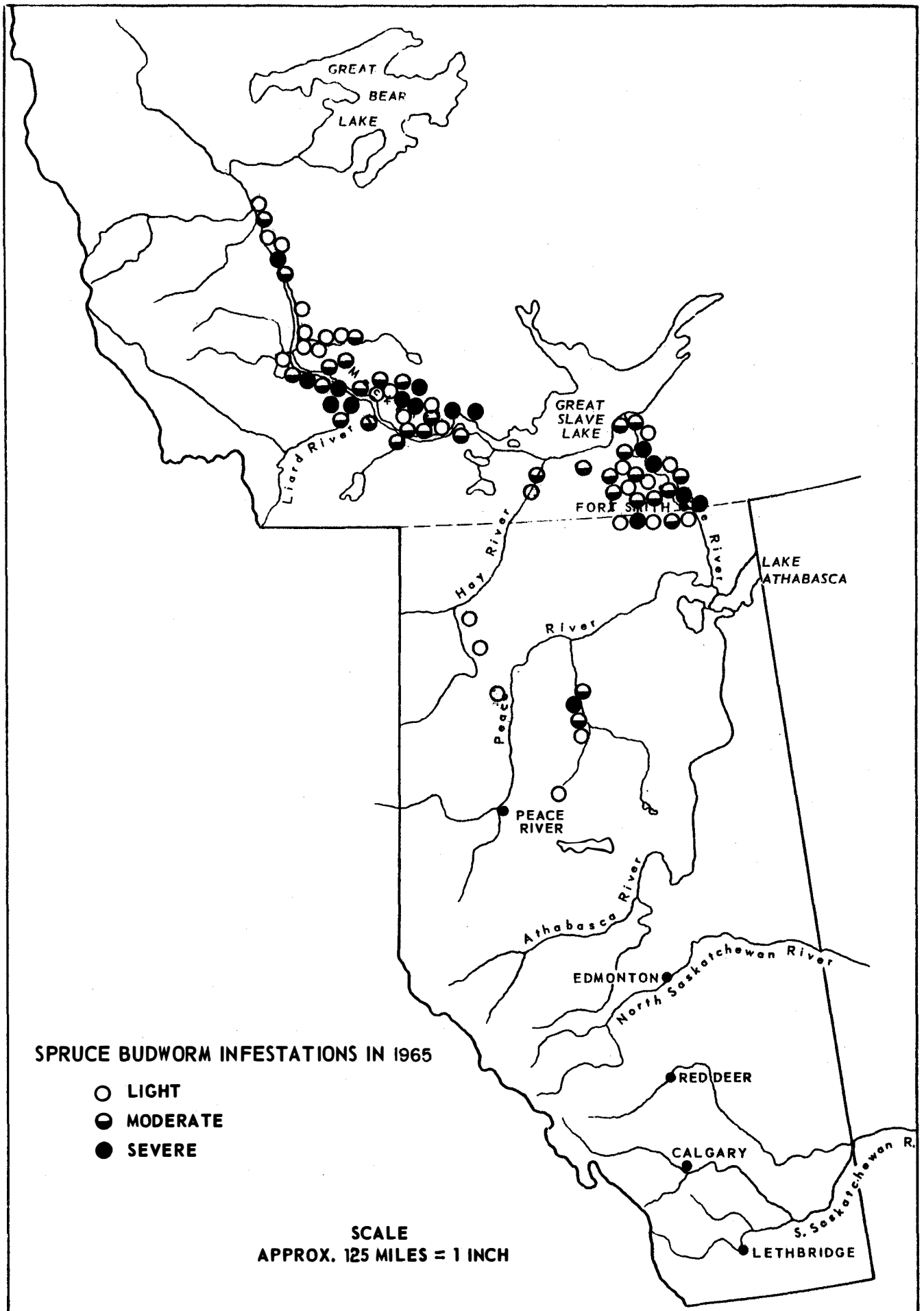
ACKNOWLEDGEMENTS

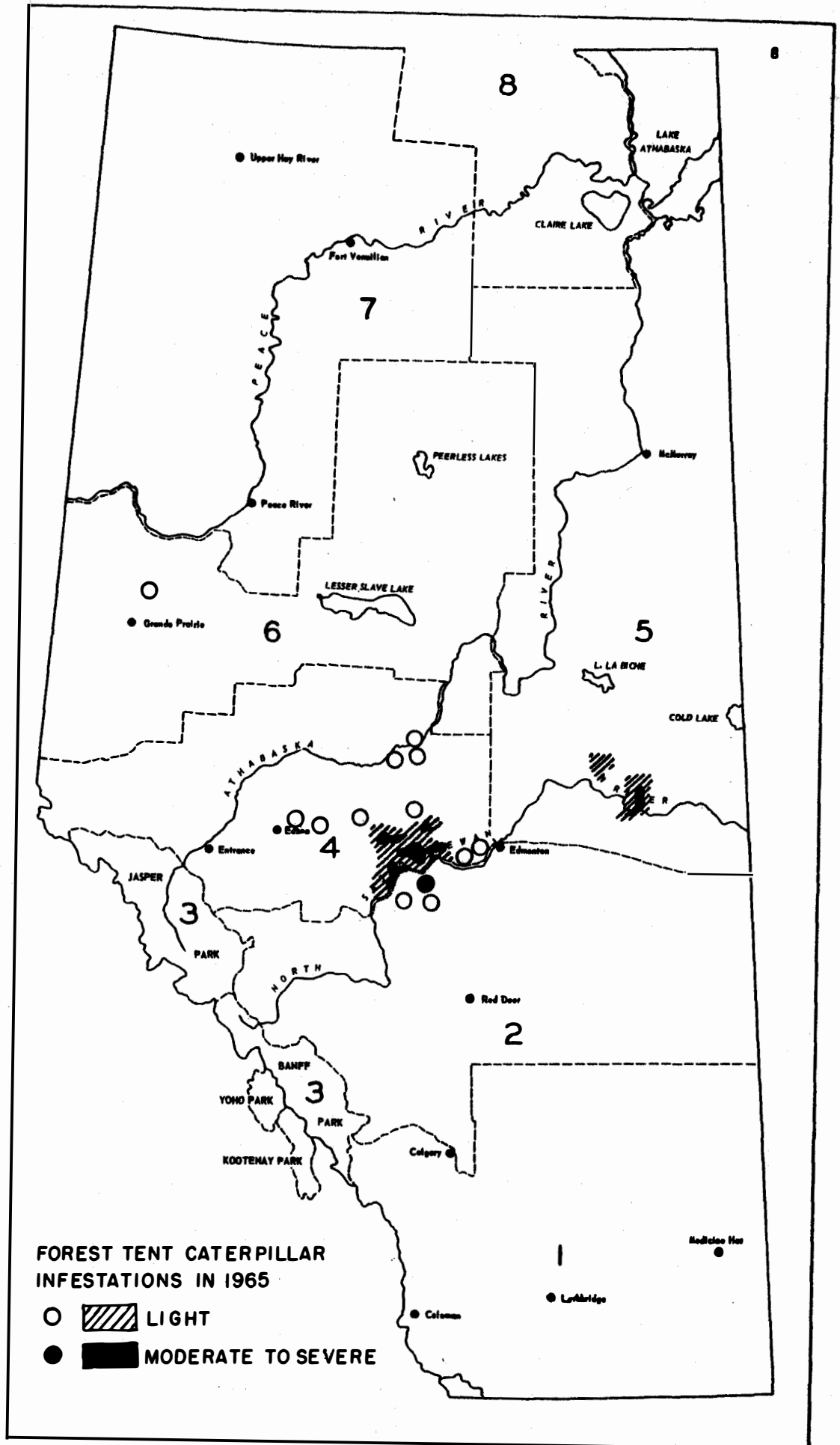
The field staff of the Forest Insect and Disease Survey gratefully acknowledges the assistance rendered by personnel of the Alberta Forest Service, the Provincial Agricultural Extension Service and the Department of Northern Affairs and National Resources.

SUMMARY OF AERIAL SURVEYS 1965

PURPOSE	DISTRICT	DATE	AIRCRAFT	COST PER HOUR	TOTAL HOURS	TOTAL COST
Spruce budworm	Peace River	June 3.	Helicopter J3		*3:30	
Foothills survey	Crowsnest-Bow River Clearwater, National Parks, Brazeau- Athabasca	June 24 to July 2.	Cessna 180	42.00	16:30	693.00
Forest tent caterpillar	Clearwater, Brazeau-Athabasca, Lac la Biche	June 25 to July 2.	Cessna 172	30.00	6:45	202.50
Spruce budworm	Mackenzie	June 26.	Helicopter J2		**2:00	
Spruce budworm	Mackenzie	July 12- 15.	Cessna 185 (Floats)	65.00	15:50	1029.17
Spruce budworm	Mackenzie	July 29.	Cessna 185 (Floats)	65.00	3:15	211.25
Spruce budworm	Mackenzie	July 29.	Beaver (Floats)		**2:00	
Spruce budworm	Peace River, Grande Prairie	Aug. 11	Cessna 180	47.00	3:15	152.75
Larch Sawfly	Mackenzie	Aug. 19	Beaver (Floats)	62.00	3:15	201.55
Spruce budworm	Peace River	Sept 7- 11.	Helicopter J3 Beaver (Floats)		*22:20	
TOTALS					78.40	2490.22

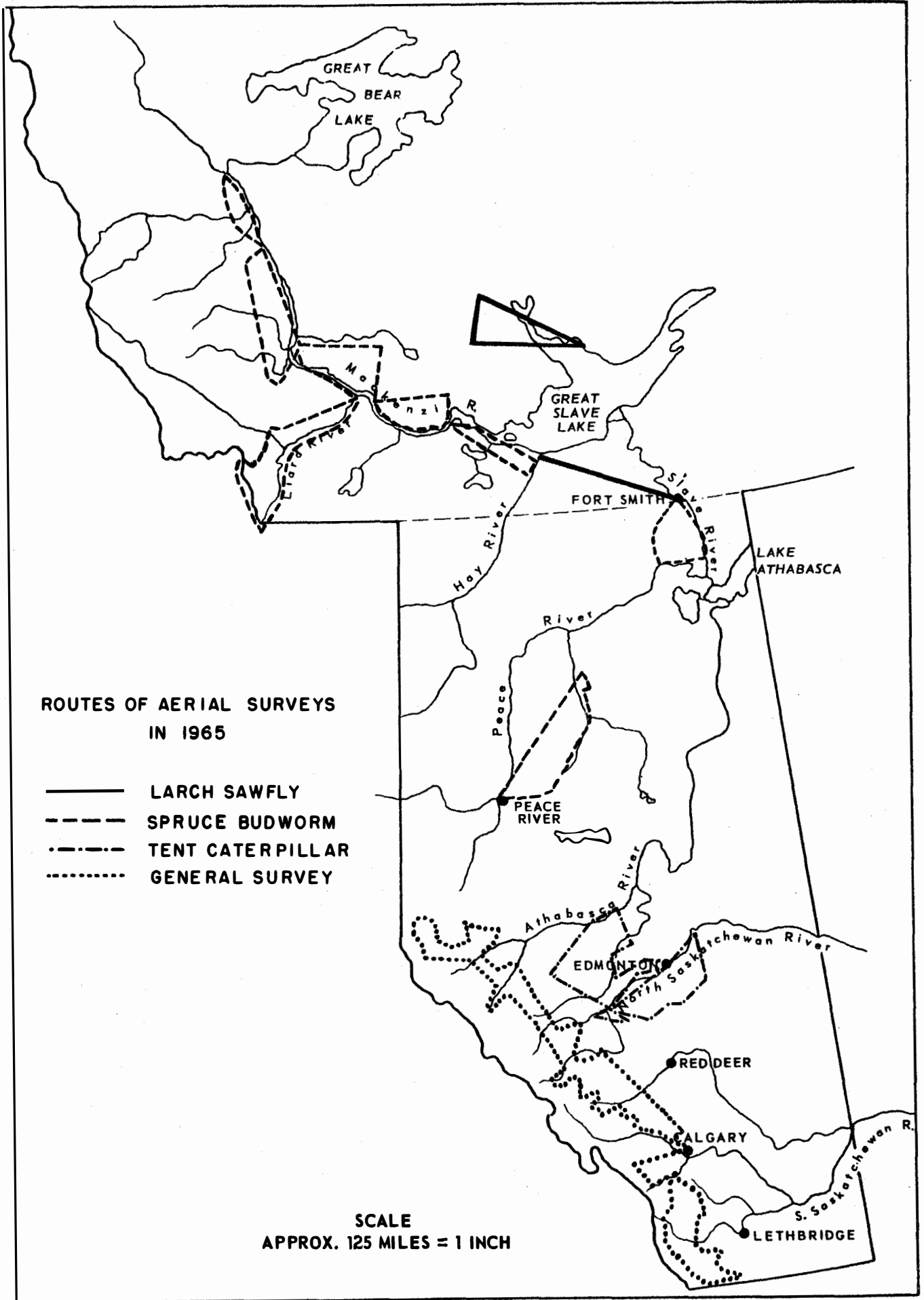
* Alberta Forest Service
 ** Mackenzie Forest Service





FOREST TENT CATERPILLAR
INFESTATIONS IN 1965

-  LIGHT
-  MODERATE TO SEVERE



ANNUAL DISTRICT REPORT
CROWNEST-BOW RIVER DISTRICT
ALBERTA 1965

by
N. W. WILKINSON

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY

March 1966

INTRODUCTION

The population of linden looper near Medicine Hat continued to expand in 1965. A poplar borer, Agrilus sp., continued to be active in shelterbelts and aspen bluffs in the agricultural area of the District. There was a decline in the number of needle miner in Cypress Hills Provincial Park. Fall cankerworm populations were much lower than in 1964 although their distribution was much the same. Low populations of leaf tier larvae were responsible for patches of light defoliation of aspen along the foothills and from Hanna to the Saskatchewan Border. Populations of the American aspen beetle and the gray willow leaf beetle have practically disappeared from the District. Populations of spruce spider mite which were low in the Medicine Hat area were further reduced by heavy spring rains. The poplar and willow borer continued to be active in the Crowsnest Forest and in Waterton Lakes National Park.

Winter drying conditions caused red belting of conifers in some areas of the District. Fire blight caused concern in many urban areas. Dwarf mistletoe continued active in the District and was recorded for the first time in Waterton Lakes National Park. Shoestring root rot was recorded for the first time on lodgepole pine in Waterton Lakes National Park and Cypress Hills Provincial Park. Atropellis canker was found throughout the pine growing areas of the District.

INSECT CONDITIONS

Fall Cankerworm, Alsophila pometaria (Harr.)

The populations of this insect were much lower in 1965 than in the previous year. Collections were taken from Manitoba maple in shelterbelts from Bindloss south to Pashley, indicating that the distribution was much the same as in 1964. However, a low population was found in a shelterbelt 14 miles east of Pulteney, 175 miles west of the range recorded in 1964. A few larvae were also collected from white elm in Lethbridge.

Leaf Tier, Compsolechia niveopulvella Cham.

Low populations of this leaf tier were present in trembling aspen stands between Priddis and Twin Butte, from Hanna east to the Saskatchewan Border and 12 miles west of Strathmore. This was a slight increase in their numbers over that reported in 1964.

Linden Looper, Erannis tiliaria (Harr.)

The outbreak of this looper in a native stand of Manitoba maple

near Medicine Hat continued unabated in 1965. Complete defoliation occurred over an area of 100 acres, an increase of 20 acres over that reported in 1964. Flood conditions prevailed in this area for 30 days or more and may have interrupted normal pupation.

Needle Miner, Recurvaria sp.

The needle miner infestation in Cypress Hills Provincial Park declined in 1965. The usual yellowish green appearance of lodgepole pine caused by hollowed out needles, did not materialize. Investigations are being conducted to determine what species of needle miners are involved.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Adults and larvae of this leaf beetle were found on poplar species in the foothills from the Bow River to Waterton Lakes National Park. Nowhere were populations high enough to cause noticeable damage.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

Populations of spruce spider mite caused some damage to spruce in Medicine Hat and the surrounding area. Heavy rains during the early part of the season reduced their numbers and resulted in populations being held at a low level.

Pitch Nodule Maker, Petrova metallica (Busck)

Light infestations of this pitch nodule maker on pine were active in the Crownsnest Pass and in Cypress Hills Provincial Park. Very few nodules were found in these areas which indicated that populations were low. Collections were taken near Coleman, Blairmore and Elkwater.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

A new distribution record was established with the finding of this parasitic plant in Waterton Lakes National Park. Aerial plants were numerous on lodgepole pine along the east boundary of the Park one mile north of the United States Border. The usual symptoms of swelling and brooming had not developed which indicated a recent invasion of the area.

Examination of a previously reported outbreak 25 miles north of Coleman revealed 17.3 percent of the 750 trees examined were infected. In

another infected area 8.5 miles south of Blairmore 24 percent of the 80 trees examined supported the disease.

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

This disease was active in pine stands throughout the mountains and foothills from the Bow River to the United States boundary and in the Cypress Hills. Examination of a stand of pine 3 miles south of the Kananaskis Forest Experiment Station revealed 44.4 percent of the 250 trees examined were infected.

Winter Drying Conditions

The red belt caused by this condition was restricted to small areas of pine in the area between the Blairmore Range south of Burmis and the Kananaskis Forest Experiment Station, in the Porcupine Hills and in Cypress Hills Provincial Park. Many of the trees did not produce new growth in 1965 which indicated the terminals were severely damaged. This condition was also found on spruce in Cypress Hills Provincial Park.

Climatic Damage

Throughout the District, poplar in small, widely separated areas were damaged by adverse weather conditions. There was a marked decrease in the number of leaves produced by the affected trees and in some areas clumping of leaves occurred. Some of the affected stands were adjacent to, and at the same elevation as stands of pine affected by winter drying conditions.

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

Causal Agent	Host	Remarks
Poplar borer, <u>Agrilus</u> sp.	T. aspen	Active throughout the agricultural area and foothills.
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry	Light infestation near Empress.
Pine tube maker, <u>Argyrotaenia tabulana</u> Free.	Lp. pine	Light infestation in the Cypress Hills.
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	T. aspen	Low populations in the Crowsnest Pass and the Cypress Hills.
Leaf beetle, <u>Chrysomela scripta</u> Fab.	Willow Poplars	Caused moderate defoliation near Medicine Hat and in the Lethbridge-Coaldale area.
Leopard moth, <u>Cossidae</u>	W. Elm	Some trees in Medicine Hat severely attacked.
Douglas-fir beetle, <u>Dendroctonus pseudotsugae</u> Hopk.	D. fir	Low populations in the Porcupine Hills.
Woolly elm aphid, <u>Eriosoma americanum</u> (Riley)	W. elm	Low populations throughout the agricultural area.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	T. aspen	Low population in the Cypress Hills.
Fall webworm, <u>Hyphantria cunea</u> (Drury)	Apple	One colony found in Magrath.
Bark beetle, <u>Ips engelmanni</u> Sw.	E. spruce	A low population in wind-thrown timber in the Castle River area.
Pine engraver beetle, <u>Ips pini</u> (Say)	Lp. pine	Low populations in Waterton Lakes National Park and 20 miles north of Coleman.

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

Causal Agent	Host	Remarks
Bark beetle, <u>Ips tridens</u> (Mann.)	E. spruce	A low population active in old log decks north of Coleman.
Blister beetle, <u>Lytta sphaericollis</u> Say	Lilac	High population 8 miles southwest of Medicine Hat.
Prairie tent caterpillar, <u>Malacosoma lutescens</u> (N. & D.)	Rose	A low population near Empress.
Western tent caterpillar <u>Malacosoma pluviale</u> (Dyar)	Saskatoon	A low population in Streeter Basin.
Poplar vagabond aphid, <u>Mordwilkoja vagabunda</u> (Walsh)	Plains cottonwood	A light infestation in Dinosaur Provincial Park.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	A low population near Lundbreck.
Rusty tussock moth, <u>Orgyia antiqua</u> (L.)	Cotoneaster	Found in Calgary.
Boxelder aphid, <u>Periphyllus negundinis</u> Thos.	M. maple	A low population on shelter-belts throughout the agricultural area.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	Lp. pine	Low populations throughout the Cypress Hills and in the Crowsnest Pass.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen	High numbers caused severe damage in an area of one acre in Waterton Lakes National Park.
Bark beetle, <u>Pityophthorus alpinensis</u> (Hopping)	A. larch	A low population in Highwood Pass.
Larch sawfly, <u>Pristiphora erichsonii</u> (Htg.)	Larch	Light infestation at K.F.E.S. and 1 mile south of Coleman.

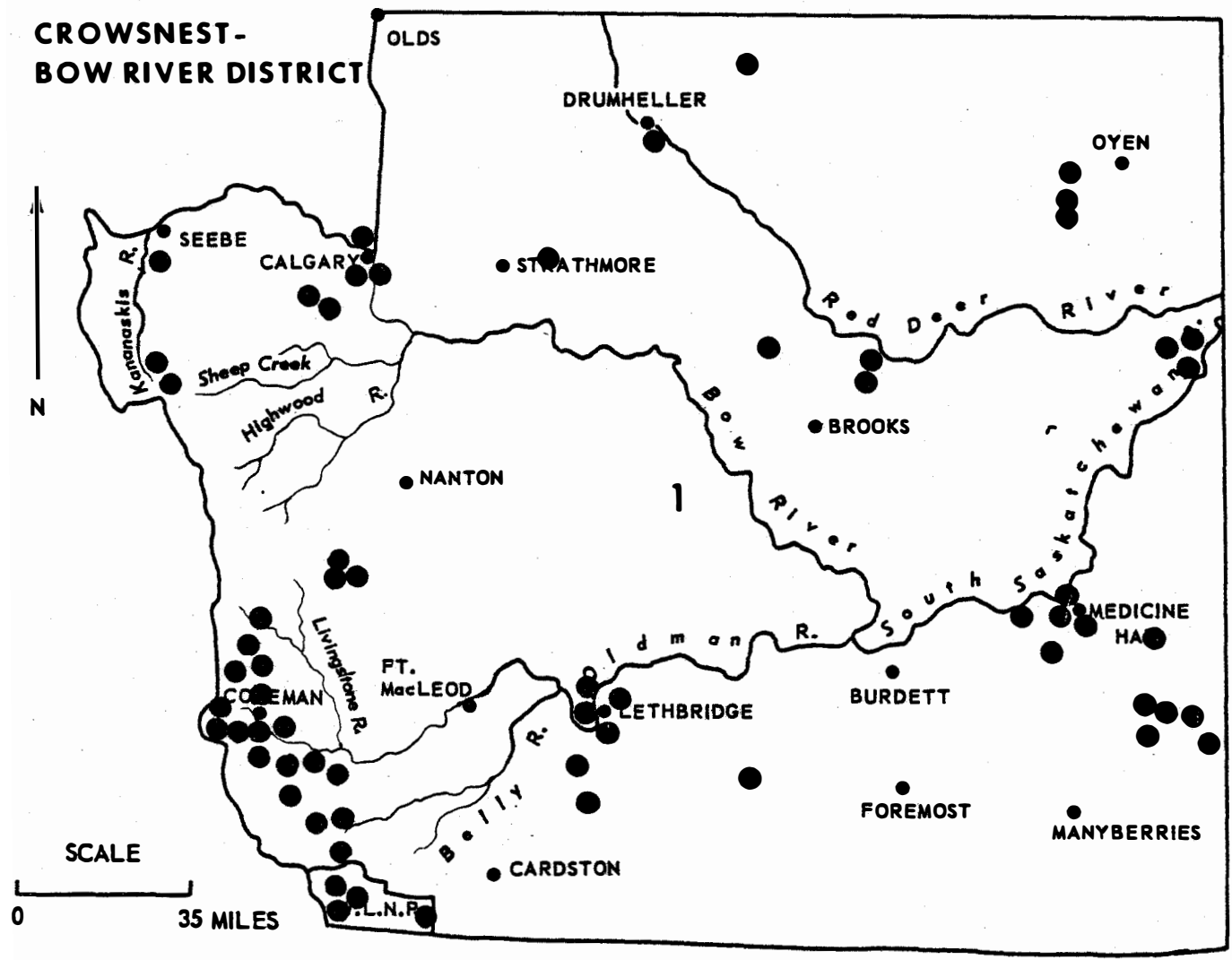
Table II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Bark beetle, <u>Procryphalus mucronatus</u> Lec.	T. aspen	Light infestation in Streeter Basin.
Leaf tier, <u>Pseudexentera improbana</u> <u>oregonana</u> Wlshn.	T. aspen	Light infestation 12 miles west of Strathmore.
Poplar and willow borer, <u>Sternochetus lapathi</u> (L.)	Willow	Active in the southwest corner of the District.
<u>Disease</u>		
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> Diet.	E. spruce	Present throughout Waterton Lakes National Park.
Poplar ink spot, <u>Ciborinia whetzellii</u> (Seaver) Seaver	T. aspen	Patches of infected trees in the Cypress Hills, near Pickle Jar Creek and 18 miles south of Hillcrest.
Comandra blister rust, <u>Cronartium comandrae</u> Peck	Toad-flax	Infected plants were found in open grassland east of Burmis.
White pine blister rust, <u>Cronartium ribicola</u> J. C. Fisher	L. pine <u>Ribes</u> sp.	Common in the southwest mountain region.
Fire blight, <u>Erwinia amylovora</u> (Burrill) Winslow	M. ash <u>Prunus</u> spp.	Active in urban areas.
White heart rot, <u>Fomes fraxinophilus</u> (Pk.) Cke.	Buffalo berry	New herbarium record.

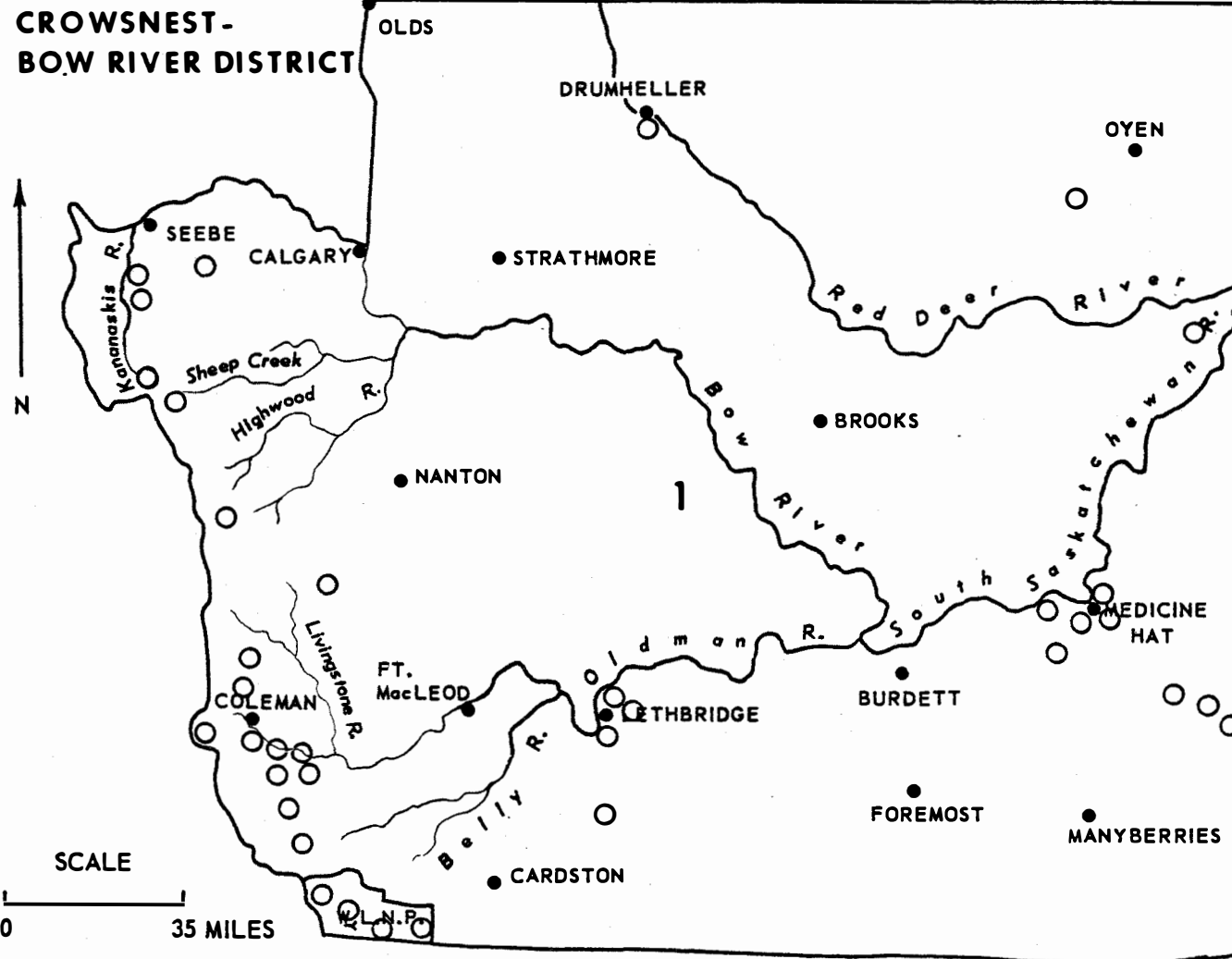
TABLE III
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE CROWSNEST-BOW RIVER DISTRICT

Outbreak number	Location	Causal organism	Remarks
1-1	2 miles north-east of Castle Ranger Station	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Discontinued in 1965.
1-2	2 miles south of Kananaskis Experiment Station	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1965. See report section.
1-4	5 miles south of Kananaskis Experiment 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.) Quéf.	To be re-examined in 1966.
1-8	Dutch Creek Road	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1965. See report section.
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.
1-14	Blairmore	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1965. See report section.
1-15	Elkwater	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1970.
1-11	Crowsnest Forest Reserve	<u>Cronartium ribicola</u> J. C. Fischer	To be re-examined in 1970.

LOCATION OF POINTS WHERE INSECT
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1965



LOCATION OF POINTS WHERE DISEASE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1965



ANNUAL DISTRICT REPORT

CLEARWATER DISTRICT

ALBERTA 1965

by

G. J. SMITH

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

DEPARTMENT OF FORESTRY

March 1966

INTRODUCTION

Forest insect damage was mostly of a minor nature in the Clearwater District in 1965. The forest tent caterpillar defoliated aspen in small scattered patches in the north-central region south of the North Saskatchewan River. Three species of poplar borers contributed to the deterioration of aspen bluffs in the parkland and prairie region. Damage caused by larch sawfly larvae was light. Larvae of the balsam-fir sawfly and the yellow-headed spruce sawfly caused varying degrees of defoliation in shelterbelts in the agricultural region. Discoloration of shelterbelt and ornamental spruce by the spruce spider mite was common in the settled areas of the District.

A survey was carried out in a newly reported outbreak of shoestring root rot and five other disease outbreaks were re-examined. Red belt was light along the mountains between the headwaters of the Ghost River and the Bighorn Range. Foliage diseases were responsible for widespread foliage discoloration of the deciduous forests after mid-summer.

INSECT CONDITIONS

Poplar Agrilus, Agrilus sp.

Throughout the eastern region of the District, boring by these insects was a contributing factor in the deterioration of trembling aspen bluffs. Their galleries created entry ports and internal avenues for the establishment and spread of destructive decay and canker fungi. The galleries also caused swelling and, in trees that supported several active larvae, the sapflow was impeded.

Aphids, Cinara sp.

Damage caused by various species of these aphids was moderate on lodgepole pine in several locations along the foothills. By midsummer their feeding had caused yellowing of the foliage which later turned black due to mold which grew in the honeydew secreted by the insects.

A Leaf Tier, Compsolechia niveopulvella Cham.

Larvae of this insect were collected from aspen at 16 locations in 1965. Populations were medium within the triangle formed by Innisfail, Morningside and Stettler. Elsewhere, populations were low.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

There was a marked breakup and decline in populations of these

caterpillars in 1965. A high percentage of the eggs hatched but larval survival was generally low. There were, however, areas where survival was higher and small patches of moderate to severe defoliation occurred. These were east of Breton and in a strip approximately five miles wide along the North Saskatchewan River between Berrymoor and Genesee. Patches of light defoliation were observed from this area south to Buck Creek, Norbuck and Warburg. Larvae of this insect were present in the remainder of the northern half of the District as far east as Kitscoty but caused no noticeable defoliation.

Table II indicates defoliation of aspen expected in 1966 in the vicinities of the permanent sampling stations where egg band sampling was carried out.

Balsam-fir Sawfly, Neodiprion abietis (Harr.)

Larvae of this sawfly caused moderate to severe defoliation to white spruce in shelterbelts 2 miles east of Bittern Lake, one-half mile south of Botha and 5 miles east of Trochu. Light defoliation of spruce was observed in native stands along the Battle River 12 miles west of Galahad and in shelterbelts 8 miles north of Bashaw, 3 miles west of Red Deer, 2 miles west of Spruce View and 10 miles northwest of Carstairs.

Spruce Spider Mite, Oligonychus unguis (Jac.)

Damage to large, densely branched ornamental and shelterbelt spruce was noted in cities, towns and farms in the central and eastern region of the District. Damage was moderate to severe at 14 of 25 locations inspected, indicating that this was the major insect pest of spruce throughout the District. In many instances the damage was not easily seen as it was overshadowed by the vigorous new growth resulting from ample moisture.

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

Larvae of this sawfly were found in 18 spruce shelterbelts and ornamental spruce plantings. Moderate to severe defoliation was observed near the Calgary Airport, Cochrane, Sullivan Lake, Rocky Mountain House, Gilby and west of Sylvan Lake. Light defoliation, confined to a few trees, was found in each of the following locations: near Carstairs, Harmattan, Spruce View, 6 miles west of Penhold, 5 miles west of Red Deer, near Hespero, Fenoka, Gwynne and Auburndale.

Poplar Borer, Saperda calcarata Say

These borers were numerous and caused widespread damage to drought-weakened trembling aspen in bluffs throughout the eastern half of the District. Their boring resulted in sap loss and impeded sap flow and created open ports and internal avenues for entry and spread of destructive fungi. In severely attacked trees which had much of the heartwood and sapwood destroyed, considerable mortality and wind breakage occurred. This species of borer was also present in the western half of the District but only light damage was noted.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

This organism was noted in many locations along the foothills and mountain slopes in the District. In that portion of the Bow River Forest north of the Bow River, mistletoe infected lodgepole pine was found in the following locations: 8 miles southwest of Water Valley, 3 miles northwest of Harold Creek Cabin, near the Waiparous River Campground, in patches between Fallentimber Creek and Stud Creek and along the oil well road in the Panther River area. Infected white spruce was found near Benjamin Creek.

In the Clearwater-Rocky Forest, mistletoe was found on lodgepole pine in the following areas: 10 miles west of Ricinus, between Corkscrew Mountain and Elk Creek, along Gloomy Creek, Cripple Creek, Indian Creek and Joyce River, at Windy Point, along the Siffleur River and on the north side of the North Saskatchewan River from one mile northeast of Whirlpool Point to Owen Creek.

The infected areas varied in size from a few acres to several square miles. In most instances the boundaries of the large infected areas are not definitely known. The intensity of the disease was highest in the Panther River area. In 1966, a detailed survey will be carried out in the mistletoe infected area between Corkscrew Mountain and Elk Creek.

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

In 1965 the Alberta Forest Service brought to our attention an area between Parker Creek and upper Walton Creek in which considerable pole sized lodgepole pine had died. As this was a remote area, examination was made possible by Alberta Forest Service four wheel drive vehicle and helicopter.

The examination revealed that shoestring root rot caused severe damage to approximately 700 acres of timber. The trees in the center of this area were 100 per cent infected and 90 per cent were dead. Many had blown down due to root and basal decay. In the fringe of this area infected trees were found, but these were mostly suppressed or overmature.

Infected lodgepole pine and spruce were found southeast of the Parker Creek area on Highland Ridge, in Frozenman Coulee and along upper Dogpound Creek. Similar damage was noted near Crimson Lake, at the mouth of Grace Creek, in the upper Colt Creek area and along Whiterabbit Creek.

Mortality of regeneration lodgepole pine and spruce was noted in the following areas: 10 miles west of Ricinus, in the Strachan area, on Corkscrew Mountain, in the Colt Creek burn and in the burn 7 miles southeast of the O'Chiese Indian Reserve.

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

Four recorded outbreaks of this disease of lodgepole pine were re-examined in 1965. Outbreaks numbered 2-1 and 2-2, in the Clearwater Forest, were found to be confluent and were recorded and described integrally as outbreak number 2-1. This outbreak covered a known area of approximately 150 square miles described as follows: the north half of Township 34 and the west half of Township 35, Range 9; the north half of Township 34, all of Township 35 and the west half of Township 36, Range 10; the north half of Township 35 and all of Township 36, Range 11; the east half of Township 36, Range 12. Random counts were carried out in this area; of 473 trees tallied, 91.4 per cent were infected with an average of 6.8 cankers per tree.

Outbreaks numbered 2-7 and 2-10, east of Nordegg, were also found to be confluent and were recorded and described integrally as outbreak 2-7. This outbreak is known to extend from the Stolberg area northward to the Nordegg River in Townships 41 and 42, Range 13, and Townships 42 and 43, Range 14. Random counts were carried out in this area; of 130 trees tallied, 87.2 per cent were infected with an average of 4.1 cankers per tree.

In both outbreaks, the intensity of the disease varied from light in open growing stands to 100 per cent in dense stands. Infection occurred in an irregular pattern, governed by changes in forest cover type.

Spruce Needle Rusts, Chrysomyxa spp.

Rusted spruce foliage was common in the northwestern region of the District in 1965. Fourteen samples of rust were collected from a cross section of the area between the head of the Tay River and Cooking Lake. Severe discoloration was observed in the following areas: Upper Tay River, Jackfish Lake, along the road to Grace Creek, Faraway Pasture, Alder Flats, Buck Creek, Carnwood and Looma. Light discoloration was observed along Chungo Creek, near Crimson Lake, Rocky Lookout, Leslieville and Hoadley.

Poplar Ink Spot, Ciborinia whetzellii (Seaver) Seaver

In the region surrounding Rocky Mountain House and extending northeast to Thorsby, poplar ink spot was present in most stands of trembling aspen. Severely discolored stands were observed between Horburg and the O'Chiese Indian Reserve, and in the Faraway Pasture, Alder Flats, Buck Creek, Alsike, Breton, Winfield and Hoadley areas.

Pine Needle Cast, Coryneum cinereum Dearn.

This needle cast, collected for the first time in the District, was widespread in lodgepole pine stands along the foothills. In many instances, all needles except those of the current year turned brown in August; no fruiting bodies of the fungus appeared until mid-September. Noticeable stand discoloration was observed in the McCue Creek, Parker Creek, Marble Mountain, Seven Mile Creek, Baseline Cabin and Nordegg areas.

Comandra Blister Rust, Cronartium comandrae Pk.

Although few infected pines were found, the alternate host, Comandra pallida A.D.C., was severely infected throughout the District. Representative samples of infected plants were collected from 20 locations at 45 mile intervals. Infected plants on the eastern prairies were approximately 200 miles from the nearest known infected pine.

Pine Needle Cast, Elytroderma deformans (Wier) Darker

Moderate to severe damage by this needle cast on lodgepole pine, affecting only the 1964 needles, was observed in the following areas: Morley Indian Reserve, Frozenman Coulee, Highland Ridge, Seven Mile Creek, at the mouth of Ram River and Brazeau River Bridge. Light damage was observed in 10 other locations along the foothills from the Bow River to the Brazeau River.

Balsam Poplar Leaf Blight, Linospora tetraspora Thompson

In the early part of August discoloration of balsam poplar foliage, caused by leaf blight, became evident throughout the District. L. tetraspora was the most prevalent of four different fungi present in samples of infected leaves. It caused severe discoloration and early leaf drop along the valleys of the Red Deer, Clearwater and North Saskatchewan rivers and in many stands across the central region of the District. Elsewhere, this disease was present but was usually secondary to other leaf discoloring fungi.

Spruce Needle Cast, Lophodermium macrosporum (Hartig) Rehm

This needle cast, which affected only the 1964 needles of white spruce, caused patches of severe needle drop along Dog Pound Creek, the Red Deer, James and Clearwater rivers and in the Sundre-Rocky Mountain House area. Light damage was found near the Brazeau River Bridge and in several locations along the Trunk Road between the Ram River and Nordegg. Evidence of severe damage caused by this organism was found on the 1963 needles of the spruce in the Corona Creek area.

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

Poplar leaf spot caused discoloration of aspen foliage throughout the central and eastern regions of the District. Patches of severe discoloration occurred in the following areas: Cochrane, Sundre, Burnt Lake, Morningside, Ponoka, Looma, Vegreville, Donalda, Hardisty, Auburndale, Edgerton, Fleet and Big Valley.

Hyperparasites of Dwarf Mistletoe, Colletotrichum gloeosporioides Penz. sensu von Arx, Septogloeum gillii Ellis, Wallrothiella arceuthobii (Pk.) Sacc.

Light to moderate damage, caused by these beneficial organisms on the aerial plants of dwarf mistletoe, was noted in six locations in the foothills. C. gloeosporioides, found for the first time in the District.

caused considerable mistletoe mortality in the Burnt Timber Creek area. S. gillii was moderate near Whirlpool Point and light near the mouth of Elk Creek. Damage to dwarf mistletoe, caused by W. arceuthobii was moderate on Corkscrew Mountain and light along Idlewilde Creek.

Red Belt

The aerial survey of the mountains and foothills of the District revealed small patches of red belt in stands of lodgepole pine in the following locations: on the east slopes of Black Rock, Oliver and Dormer mountains, upper Dormer River, the east and west slopes of Limestone Mountain, near Falls Lookout, on the east slopes of the Bighorn Range and in the Faraway Pasture area. Numerous pine stands along the ridges between Keystone Lookout and Ram Lookout still showed foliage damage caused by red belt in the winter of 1963-64.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	61	37	Trembling aspen	79	56
Engelmann spruce	5	5	Balsam poplar	10	25
Black spruce	4	2	Willow	14	9
Lodgepole pine	21	75	Birch	2	4
Limber pine	0	4	Alder	2	1
Alpine fir	1	6			
Tamarack	12	0			
	104	129		107	95
Insect collections from miscellaneous hosts				19	
Disease collections from miscellaneous hosts				98	
GRAND TOTAL				552	

TABLE II
RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1965

Location	Predicted defoliation for 1965	Actual defoliation for 1965	Predicted Defoliation for 1966
Leslieville	Light	Nil	Nil
Rimbey	Light	Nil	Nil
Sundre	Nil	Nil	Nil
Penhold	Nil	Nil	Nil
Winfield	Nil	Nil	Nil
Lindale *		Moderate	Severe

* Plot established in 1965

TABLE III
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE CLEARWATER DISTRICT, 1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Cooley spruce gall, <u>Adelges cooleyi</u> (Gill.)	W. spruce D. fir	Severe infestations on white spruce at Bigknife Park, Lacombe, Castor and on Douglas fir east of Canmore.
Sawfly, <u>Anoplonyx</u> sp.	Tamarack	Numerous larvae found in Rocky Mtn. House area.
Spruce budworm, <u>Choristoneura fumiferana</u> (Clem.)	W. spruce	Caused light damage in Corona Creek area. Evidence of larval feeding in Skeleton Creek area.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	Willow B. poplar	Severe damage to small patches of willow near Rocky Mtn. House, Berrymoor, Breton, Jarrow, Nevis and Sundre.

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

Causal Agent	Host	Remarks
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	T. aspen	Patches of light damage observed from Simons Valley northwest to Caroline.
Pine root collar weevil, <u>Hylobius</u> sp.	Lp. pine	Larvae active in most pine along the foothills between the Bow and Brazeau rivers.
Bark beetle, <u>Ips perturbatus</u> Eich.	W. spruce	Individual living trees near Nordegg and Prairie Creek were infested in 1965.
Geometridae, <u>Itame loricaria julia</u> Evers	T. aspen	Larvae collected in 12 locations in central and eastern regions.
Willow leaf miner, <u>Lyonetia</u> sp.	B. poplar	Caused light damage in the central region.
Prairie tent caterpillar, <u>Malacosoma lutescens</u> (N. & D.)	Chokecherry	Common in the Hughenden, Wainwright and Provost areas.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	Water birch	Numerous tents observed along the Trunk Road near Fallentimber Creek, Stud Creek and Ram River.
Poplar twig borer, <u>Oberea schauimi</u> Lec.	T. aspen	Light infestations found in six locations in the eastern region.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Populations low in 1965.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	S. pine W. spruce	Light infestation found in farm shelterbelt 10 miles south of Provost.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen	Severe infestation 4 miles northwest of Morley. Light in Canmore area.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	W. spruce	Populations low in 1965.

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

Causal Agent	Host	Remarks
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	Lp. pine	Samples of infested terminals taken from six locations along the Trunk Road from Waiparous River to Blackstone River.
Bark beetle, <u>Fityophthorus</u> sp.	Lp. pine	Light infestation in trees weakened by root rot 10 miles southwest of Ricinus.
Larch sawfly, <u>Pristiphora erichsonii</u> (Htg.)	Tamarack	Present in all tamarack stands examined. Defoliation not noticeable unless viewed from within the stands.
<u>Disease</u>		
Apiosporina witch's broom, <u>Apiosporina collinsii</u> (Schw.) v. Höhnel	Saskatoon	Severe infections noted along the Battle River.
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	W. spruce	Severe damage along Wigwam Creek, Scalp Creek, Elk Creek and 2 miles west of Whirlpool Point.
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> Diet.	W. spruce B. spruce	Brooms numerous along the David Thompson Highway between Nordegg and the Cline River.
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	W. spruce B. spruce Pink wintergreen	Light damage along upper Red Deer and Clearwater rivers and in a spruce shelterbelt near Vegreville.
Pine needle rust, <u>Coleosporium asterum</u> (Diet.) Syd.	Lp. pine Aster Goldenrod	Light infection on pine in Colt Creek area. Collected from alternate hosts in several western locations.
The stage of <u>P. harknessii</u> and <u>P. stalactiforme</u> which occurs on the alternate host, <u>Cronartium coleosporiodes</u> Arth.	Cow wheat Indian paint brush	Common along the foothills.

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

Causal Agent	Host	Remarks
<u>Cytospora canker,</u> <u>Cytospora chrysosperma</u> (Pers.) Fr.	T. aspen Nw. poplar	Common in the eastern half of the District.
Black knot of cherry, <u>Dibotryon morbosum</u> (Schw.) T.S.	Chokecherry	Common in the eastern half of the District.
Hyperparasite of needle rust, <u>Darluca filum</u> (Biv.) Cast.	W. spruce	Severe on spruce needle rust 6 miles north of Looma. New distribution record.
Fire blight, <u>Erwinia amylovora</u> (Burrill) Winslow	Apple Mayday Mtn. ash	Caused serious damage in towns and cities of the central and eastern region.
White trunk rot, <u>Fomes igniarius</u> (L. ex Fr.) Kickx	T. aspen	Contributing factor in deterioration of aspen in eastern half of District.
Pine needle cast, <u>Hendersonia pinicola</u> Wehm.	Lp. pine	Collected 20 miles northeast of Rocky Mtn. House and near the junction of the Ram and North Saskatchewan rivers.
Pine needle cast, <u>Hypodermella concolor</u> (Dearn.) Darker	Lp. pine	Severely infected stands in Panther River, Ram Falls and Chungo Creek areas. Light damage in four other locations in the foothills.
Pine needle cast, <u>Hypodermella montana</u> Darker	Lp. pine	Light to moderate damage occurred in six widely separated locations along the foothills.
Fir needle cast, <u>Hypodermella nervata</u> Darker	A. fir	Collected in Colt Creek, Cripple Creek and Seven Mile Creek area.
Hypoxylon canker, <u>Hypoxylon pruinaum</u> (Klotzsche) Cke.	T. aspen	A contributing factor in deterioration of aspen in eastern half of District.
Juniper needle cast, <u>Lophodermium juniperinum</u> (Fries) De Notaris	Juniper	Along Cline and Blackstone rivers.

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

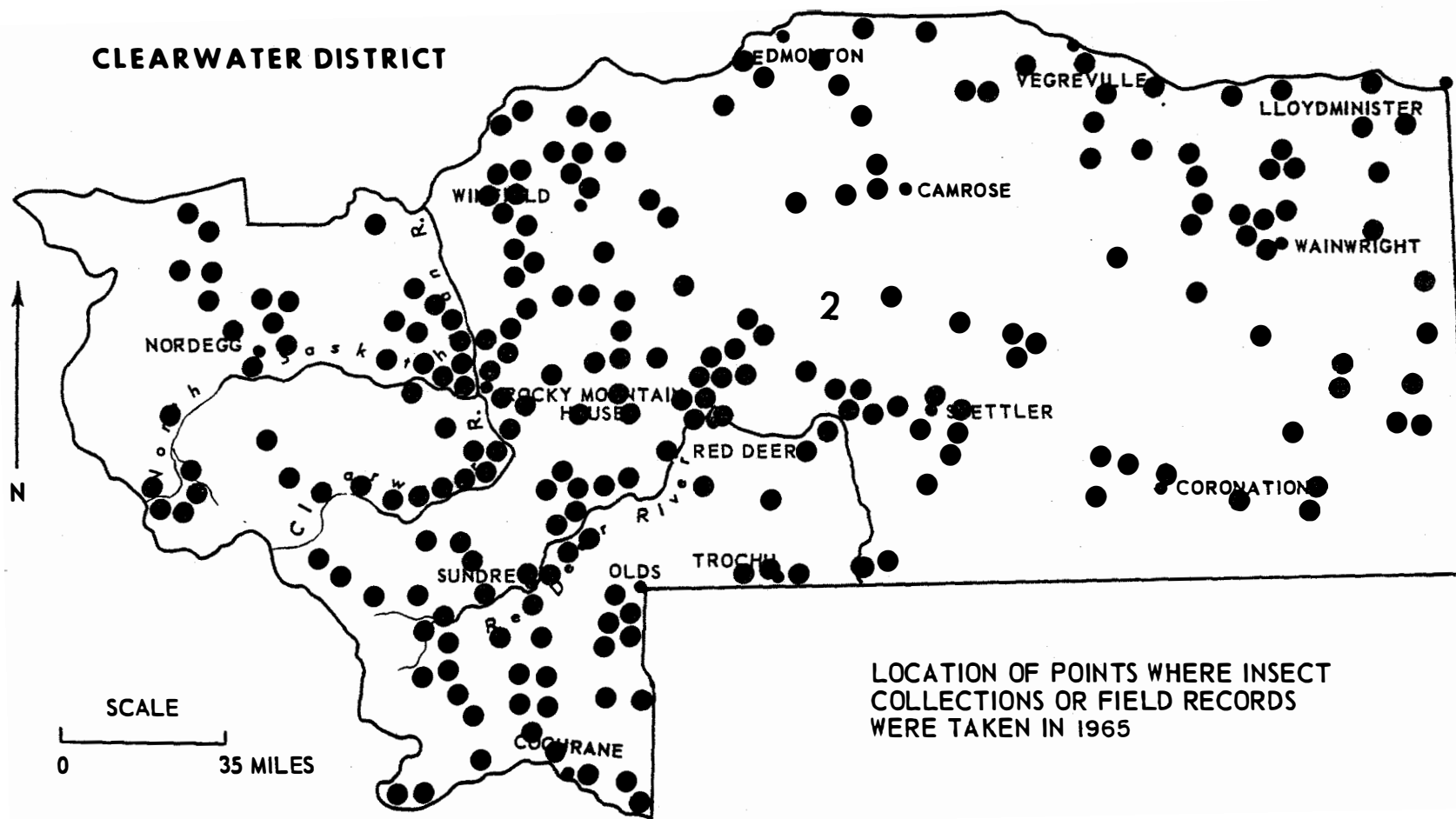
Causal Agent	Host	Remarks
<u>Pine needle cast,</u> <u>Lophodermium pinastri</u> (Schr. ex Fr.) Chev.	Lp. pine	Common throughout the foothills. Moderate damage in Skeleton Creek area.
<u>Leaf cast,</u> <u>Lophodermium sphaerioides</u> (Alb. & Schw.) Rehm	Labrador tea	New distribution record.
<u>Poplar branch gall,</u> <u>Macrophoma tumefaciens</u> Shear	T. aspen B. poplar	Common in eastern half of the district on aspen. Galls numerous on balsam poplar in Red Deer River Valley west of Rumsey.
<u>Willow leaf rust,</u> <u>Melampsora epitea</u> Thuem.	Willow	Caused severe discoloration and early leaf drop throughout the District.
<u>Larch needle rust,</u> <u>Melampsora medusae</u> Thuem.	T. aspen Nw. poplar	Considerable leaf discoloration on aspen in western half of District. New herbarium record on Northwest poplar.
<u>Leaf rust,</u> <u>Melampsora occidentalis</u> Jacks.	B. poplar	Patches of severe infection throughout the western region.
<u>Yellow witch's broom of fir,</u> <u>Melampsorella caryophyllacearum</u> Schroet.	Chickweed	First record on this host in the District.
<u>Red root and butt rot of conifers,</u> <u>Polyporus tomentosus</u> Fr.	Lp. pine	Fruiting bodies found in Windy Point area.
<u>Leaf rust,</u> <u>Puccinia caricis-shepherdiae</u> J. J. Davis	Wolf willow	New herbarium host record.
<u>Leaf rust,</u> <u>Puccinia comandrae</u> Pk.	Toad flax	Light infection in Rocky Mtn. House area.
<u>Fir needle rust,</u> <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb.	A. fir Grouseberry Bog cranberry	New herbarium host records on grouseberry and bog cranberry.

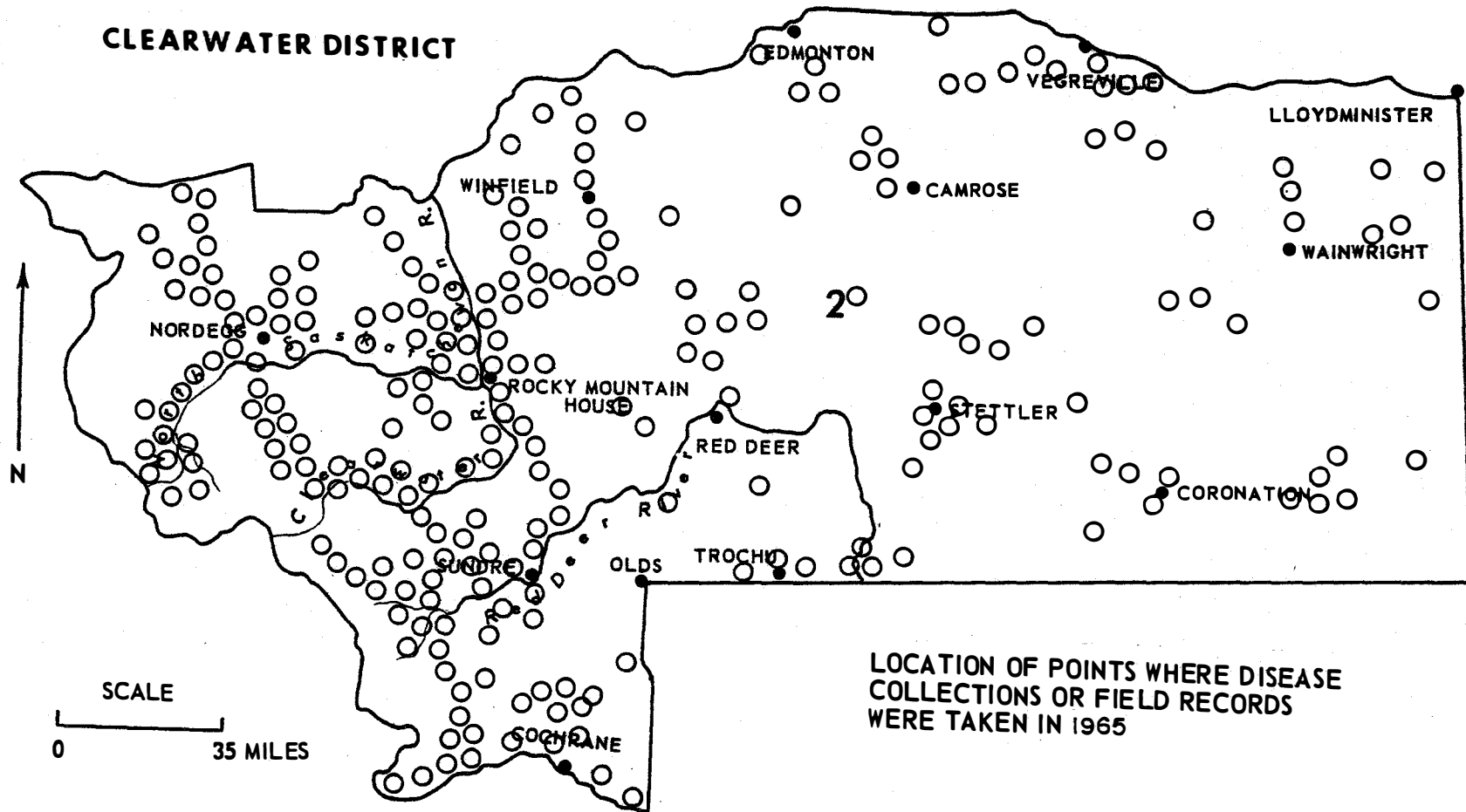
TABLE III - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Rust on pyrola, <u>Pucciniastrum pyrolae</u> Diet. ex Arth.	Wintergreen	Light damage at four locations in the foothills region.
Leaf rust, <u>Pucciniastrum vaccinii</u> Wint. Jørstad	Bog cranberry Grouseberry Low billberry	New herbarium host records in the District.
Tar spot, <u>Rehmiellopsis betulina</u> (Fr.) v. Arx	Dwarf birch	New herbarium host record.
Black canker of spruce <u>Retinocyclus abietis</u> (Crouan) Groves & Wells	W. spruce	Cankers common on suppressed trees in dense stands north of Nordegg.
Tar spot, <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Caused discoloration and early leaf drop throughout the foot- hills region.
Poplar leaf spot, <u>Septoria populicola</u> Pk.	B. poplar	New distribution record. Caused patches of severe foliage discoloration along the Medicine River between Medicine Lake and Benalto and in the Breton-Buck Creek area.
Witch's broom of birch, <u>Taphrina nana</u> Johans.	Birch	Collected northwest of Cochrane.

TABLE IV
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	Re-examined in 1965. See body of report.
2-2	Within the same area as outbreak 2-1.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1965. See body of report.
2-3	23 miles north of Nordegg, Chungo Creek area.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1966.
2-6	15 miles west of Caroline.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Discontinued in 1965.
2-7	12 miles northeast of Nordegg.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1965. See body of report.
2-9	16 miles southwest of Upper Sask. Ranger Station.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1965 to determine area affected. Much of the heavily infected area has been cleared for highway right-of-way. Remaining area of 4 square miles lightly infected.
2-10	Within the same area as outbreak 2-7.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined in 1965. See body of report.





LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1965

ANNUAL DISTRICT REPORT
NATIONAL PARKS DISTRICT
ALBERTA 1965

by

V. B. PATTERSON

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY

March 1966

INTRODUCTION

Defoliation by spruce budworm in the Saskatchewan Crossing area of Banff National Park was lighter than in 1964 but the infested area had extended northward. The black-headed budworm was not as common as in 1964 and the only noticeable defoliation was near Celestine Lake in Jasper National Park. The infestation of the poplar serpentine miner was moderate to severe in Kootenay and Yoho national parks, light to moderate in Banff National Park, and light in Jasper National Park.

Spruce needle rusts were evident again in many parts of the District and caused moderate to severe injury. Red belt occurred in four separate areas in Banff National Park. Three Atropellis outbreaks and one western gall rust outbreak were re-examined.

BANFF NATIONAL PARK

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

A light infestation of black-headed budworm occurred on white spruce north of Saskatchewan Crossing from Arctomys Creek to the Alexander River. There were also light infestations on white spruce in the Spray River Valley and at the north end of Banff Airstrip.

Cooley Spruce Gall Aphid, Adelges cooleyi (Gill.)

This gall aphid was responsible for light injury to the new growth of white spruce in Banff Townsite and in the Saskatchewan Crossing area. Eggs and nymphs of this species were found on the alternate host, Douglas fir, 2 miles west of Banff Townsite.

Spruce Budworm, Choristoneura fumiferana (Clem.)

An infestation of two-year-cycle spruce budworm has persisted for a number of years in the Saskatchewan Crossing area. The affected stand is overmature Engelmann spruce and alpine fir on the north slope of Mt. Murchison. Populations were sufficiently high to kill most of the new buds and as a result there was very little new foliage. Due to a combination of the budworm injury and to heartrots, which are known to be present, the stand has a ragged and grey appearance. Further study is required in order to assess the actual damage of either the insect or disease organism.

Low populations of spruce budworm were recorded north of Saskatchewan Crossing for approximately 8 miles, indicating that the infestation is spreading.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Populations of the poplar serpentine miner were at about the same level as in 1964. Light to moderate injury occurred to aspen and balsam poplar in the Lake Minnewanka area and along Highway 1A from Banff to Lake Louise.

Needle Miner, Recurvaria starki Free.

Injury to lodgepole pine by this needle miner was not as noticeable as in 1964. This was partly due to the fact that 1965 was the first year of the two-year life cycle of this species and therefore the larvae were small and required only small amounts of foliage. In 1964 a decline in their population levels was reported and this was reflected in the amount of injury that occurred during the current summer.

Sequential sampling at eight locations was carried out in September. A medium-low population was recorded one mile up Johnston Canyon at the 5,200 foot level, and low populations were recorded on Massive Mountain, Mt. Inglismaldi, Mt. Eisenhower and 10 miles north of Saskatchewan Crossing. Negative results were obtained from sequential sampling along the Mt. Temple Ski Road, at Bow Lake and in Paradise Valley.

Three fifty-branch-tip samples were taken from Mt. Norquay where injury has occurred for a number of years. Populations at the 5,600 and 5,800 foot level were low and at the 5,400 foot level were medium-high.

DISEASE CONDITIONS

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

This pathogen was recorded in an area near the east gate and along Highway 1 for approximately 3 miles. The hosts affected were Douglas fir, lodgepole pine and Engelmann spruce. The highest incidence of infection occurred approximately 300 yards north of the gate on the ridge paralleling the highway. In a 3 acre area approximately 90 per cent of the mature Douglas fir as well as some of the regeneration pine and fir were dead. Outside of this area, mortality was confined to individual trees or to small patches of trees.

Spruce needle rusts, Chrysomyxa ledi de Bary, Chrysomyxa ledicola Lagerh., and Chrysomyxa sp.

Chrysomyxa ledi was recorded on white spruce near the confluence of the North Saskatchewan and Alexander rivers. The infection was moderate on most trees in the understory and light on the lower branches of mature trees. The alternate host of this rust species, ~~Labrador tea~~, was severely infected along the Red Earth Fire Road at the foot of Massive Mountain.

A severe infection of C. ledicola was recorded on Labrador tea in the Saskatchewan Crossing area at the foot of Mt. Murchison.

An undetermined species of Chrysomyxa needle rust was collected up to the 6,200 foot level in the Mt. Temple ski area. Moderate injury occurred to Engelmann spruce, particularly on trees in the understory,

Red Ring Rot, Fomes pini (Thore ex Pers.) Lloyd

Red ring rot was found in both living and dead Engelmann spruce in the Lake Agnes area west of Lake Louise and at the south end of the Red Earth Fire Road at the confluence of Red Earth and Pharaoh creeks.

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

These two species of needle casts were present in the Spray River Valley. In an area 3 miles south of the Banff Springs Hotel, H. concolor was severe on suppressed trees in pure stands of lodgepole pine. In a very dense stand of even-aged lodgepole pine 10 miles farther south, H. montana was severe on almost all suppressed trees. H. montana was also recorded along Stony Creek in the Cascade River Valley, and along Healy and Brewster creeks.

Stalactiforme Rust, Peridermium stalactiforme Arth. & Kern

This stem and branch rust of lodgepole pine was recorded in four general areas. The areas, with estimated per cent of trees infected in brackets, were as follows: Mistaya-Waterfowl lakes (15-20); Saskatchewan Crossing (25); Mile 15.5 Spray River Valley (40); Mile 9.5 Cascade River Valley (30). Some branch and tree mortality has occurred due partly to the feeding of rodents on the rust infected areas.

Red Belt

This type of climatic injury was recorded in the southern half of the Park in the following four areas: on the east face of Copper Mountain, approximately 500 feet above Red Earth Creek, where damage to lodgepole pine occurred in a narrow band for about 2 miles along the mountain; in the Spray River Valley approximately 15 miles south of Banff Springs Hotel where injury extended for 2 miles along the west face of Goat Mountain about 600 feet above the valley bottom; on Mt. Eisenhower in a band approximately 300 feet wide from the fire lookout tower to the north end of the mountain and for a short distance along Protection Mountain; in the Red Deer River Valley at Mile 35 on the Cascade Fire Road, in the general area that was affected by red belt in 1964. The current injury did not occur on both sides of the Red Deer Valley as in 1964, but only on the north face of Mt. White.

JASPER NATIONAL PARK

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

Low populations were present throughout the area north of Jasper to the Park boundary but noticeable defoliation occurred only in the Snake Indian Valley west of Celestine Lake.

Cooley Spruce Gall Aphid, Adelges cooleyi (Gill.)

This spruce gall aphid was common west of Jasper to Pyramid Lake and along the Yellowhead Highway, north of Jasper along the Athabasca Valley and up the Snake Indian Valley to Seldom Inn. The monomorphic form of this species, ~~which occurs on Douglas fir~~, was severe in the Celestine Lake area.

Spruce Budworm, Choristoneura fumiferana (Clem.)

A few larvae of the spruce budworm were recorded throughout the Athabasca Valley north of Jasper and in the Snake Indian Valley. The most noticeable injury occurred 21 miles north of Jasper near the confluence of the Snake Indian and Athabasca rivers. This was in a stand of white spruce at the 4,000 foot level on a well drained site exposed to the prevailing winds. Due to the poor growing conditions, new shoot production was limited and most of the new foliage was destroyed by budworm.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The severe leaf miner infestation that existed in aspen stands in the area north and west of Jasper in previous years, had almost completely disappeared. Light injury occurred at isolated points throughout this area in 1965.

Needle Miner, Recurvaria starki Free

Sequential sampling for needle miner on lodgepole pine was carried out in September. Low populations were recorded at Honeymoon Lake, along the Marmot Basin Fire Road and along the Mt. Edith Cavell road.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt.ex Engelm.

Lodgepole pine from Athabasca Falls north to the Jasper airfield was severely infected by dwarf mistletoe and heavy brooming had occurred throughout most of the area on both sides of the Athabasca River. Many of the pine have acquired a ragged appearance due to the brooming and some branch mortality has occurred. Along the Whirlpool River, in an open area where young pine are coming up under mature infected trees, the disease has caused severe deforming of the young trees. Many are brooming low on the trunk and these brooms are growing upward into two or more main stems.

At the south end of the airfield near Henry House Siding, some branch mortality was recorded in 1963. This condition has worsened, resulting in the death of a number of trees. Although the site is poor, mistletoe infection is no doubt the main cause of mortality.

YOHO NATIONAL PARK

INSECT CONDITIONS

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Moderate to severe injury occurred along the Kicking Horse River Valley from the Ottertail River to the south end of the Park. By the end of June most of the aspen poplar foliage in this area had acquired the silver sheen typical of the injury caused by the leaf mining habits of this insect.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa empetri (Pers.) Shroet., Chrysomyxa ledi de Bary, and Chrysomyxa sp.

Light damage caused by C. ledi occurred on Engelmann spruce near the confluence of the Yoho and Kicking Horse rivers. Along the Lake O'Hara Fire Road from Mile 1 to Mile 3, Engelmann spruce was moderately infected with C. empetri. Along the Ottertail Fire Road from Mile 2 to 8, Engelmann spruce was infected with an undetermined species of Chrysomyxa rust. A hyperparasite of this rust, tentatively determined as Darluca filum Biv. Cast, was present throughout most of this area.

Indian Paint Fungus, Echinodontium tinctorium Ell. & Ev.

This pathogen was recorded in Alpine fir at four locations. Fruiting bodies were found on living trees at two locations in the Yoho Valley, and at one location in the Otterhead Valley. In the Ice River Valley typical decay was found in slash but fruiting bodies were found only on one dead stag-topped tree.

Red Ring Rot, Fomes pini (Thore ex Pers.) Lloyd

Red ring rot was recorded in several locations in the Park and on a variety of hosts. Sporophores were found on living and dead Engelmann spruce throughout the Yoho, Ice River and Otterhead valleys and around Lake O'Hara; on living Douglas fir in the Ice River Valley; on living and dead lodgepole pine in the Otterhead Valley. Infected pine in the Otterhead Valley had been weakened by the rot resulting in considerable wind breakage.

KOOTENAY NATIONAL PARK

INSECT CONDITIONS

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Moderate to severe injury occurred throughout the aspen stands south of Hector Gorge, particularly along the Cross River Fire Road, Settler's Road, and in the Radium area.

Larch Sawfly, Pristiphora erichsonii Htg.

The infestation of larch sawfly on western larch along Settlers Road remained at the same low level as in previous years and injury was negligible. A few larvae of this species were collected along the Cross River Fire Road on the same host species.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa ledi de Bary, Chrysomyxa ledicola Lagerh. and Chrysomyxa sp.

These three closely related species of needle rusts were recorded at a number of locations throughout the Park in 1965. Light damage caused by C. ledi was recorded on white spruce along the Simpson River Trail at the foot of Mt. Shanks. On the east side of the Kootenay River, along the Cross River Fire Road, white spruce was infected with C. ledicola but injury was very light. This species of rust caused moderate to severe injury to the alternate host, Labrador tea, in the Paint Pots-Numa Creek area and light injury along the Dolly Varden Fire Road. At the south end of the Dolly Varden Fire Road, white spruce was severely infected with an undetermined species of Chrysomyxa rust. For approximately 2 miles along the road, most of the spruce in the understory and a number of mature trees were orange in color due to the rust.

Spruce Needle Rust, Chrysomyxa weirii Jacks.

This species of rust was recorded at a number of locations along the east side of the Kootenay River. Light injury occurred to white spruce along the Cross River Fire Road near the south end of the Park. Further north, severe injury occurred to the same host along the East Kootenay Fire Road.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host	Collections		Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	27	12	Trembling aspen	7	5
Engelmann spruce	3	38	Balsam poplar	0	4
Misc. spruce	1	2	Willow	0	3
Lodgepole pine	22	51			
Misc. pine	1	0			
Douglas fir	8	12			
Alpine fir	2	13			
Misc. larch	2	2			
	66	130		7	12
Insect collections from miscellaneous hosts				8	
Disease collections from miscellaneous hosts				27	
GRAND TOTAL				250	

TABLE II
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE NATIONAL PARKS DISTRICT
1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Leaf beetle, <u>Chrysomela aenicollis</u> Schffr.	Willow	Light injury in Banff and Yoho national parks.
Douglas fir beetle, <u>Dendroctonus pseudotsugae</u> Hopk.	D. fir	Small infested areas on ridge above Swede Creek in Sinclair Pass, K.N.P.

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

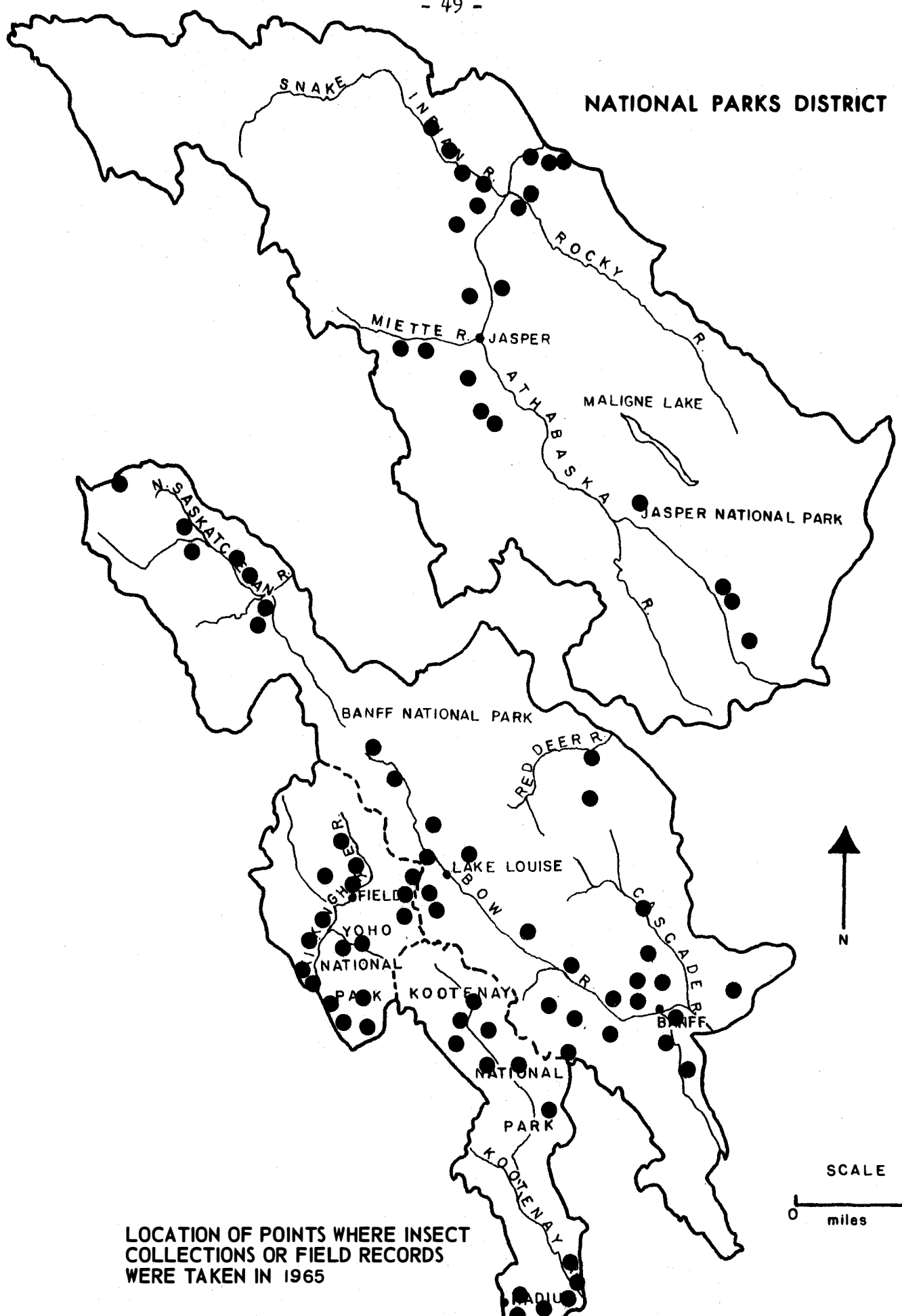
Causal Agent	Host	Remarks
Leaf miner, <u>Gracilariidae</u>	Unidentified	Severe infestation on small broadleaf plant along nature trails in Radium area, K.N.P.
Pine root collar weevil, <u>Hylobius</u> sp.	Lp. pine	Few young pine killed near south end of Settlers Road, K.N.P.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	E. spruce	Widespread throughout Kootenay River drainage system. Incidence about the same as in previous years.
Poplar and willow borer, <u>Sternochetus lapathi</u> (L.)	Willow	Found near west gate of Yoho National Park. New distribution record.
<u>Disease</u>		
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	E. spruce W. spruce	Severe on Englemann spruce in Lake Louise area, B.N.P. Light on white spruce along Cross River Fire Road, K.N.P.
Hyperparasite of rust, <u>Cladosporium</u> sp.	Lp. pine	Infecting western gall rust, <u>Peridermium harknessii</u> J. P. Moore in K.N.P. New herbarium record.
Cytospora canker, <u>Cytospora</u> sp.	E. spruce	Common along Cascade Fire Road and Mt. Temple Ski Road.
White trunk rot, <u>Fomes igniarius</u> (L. ex Fr.) Kickx	B. poplar	Ice River Valley, Y.N.P. New host record.
Decay of coniferous trees, <u>Fomes cajanderi</u> Korst.	D. fir	Collected in Ice River Valley, Y.N.P. New host record.
Snow mould, <u>Herpotrichia nigra</u> Hart.	E. spruce	Common at high altitudes in narrow valleys in Banff and Yoho national parks.

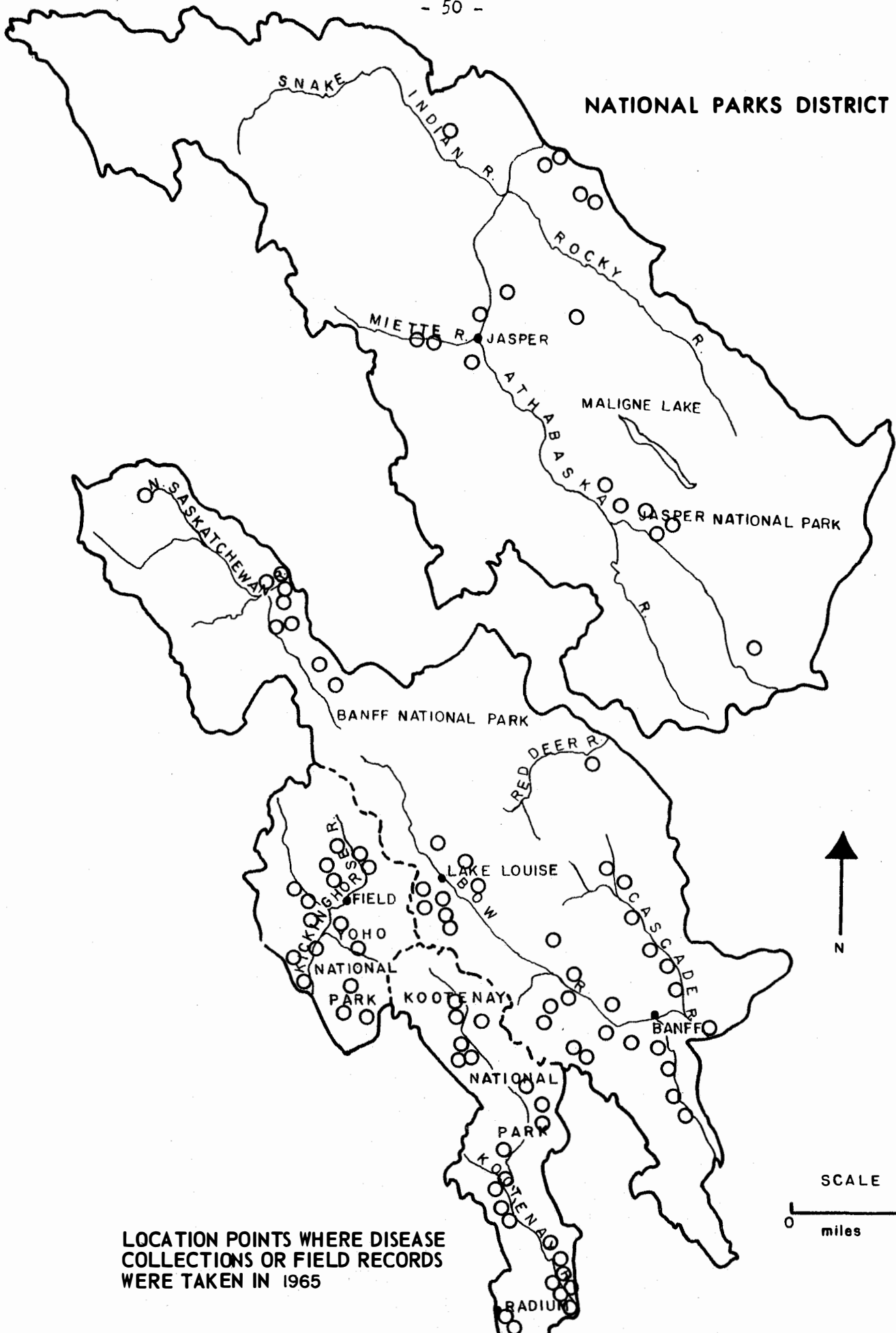
TABLE II -- Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Fir needle cast, <u>Hypodermella nervata</u> Darker	A. fir	Common on understory fir in Banff and Yoho national parks.
Cedar leaf blight, <u>Keithia thujina</u> Durant	Cedar	Low incidence at confluence of Yoho and Kicking Horse rivers, Y.N.P. New distribution record.
Juniper needle cast, <u>Lophodermium juniperinum</u> (Fr.) de Notaris	Juniper	Common near confluence of Alexandra and North Saskatchewan rivers, B.N.P.
Poplar leaf spot, <u>Marssonina tremuloidis</u> (Ell. & Ev.) Kleb.	T. aspen	Severe on shade trees in Jasper Townsite
Larch needle rust, <u>Melampsora medusae</u> Thuem.	T. aspen B. poplar	Found on these alternate hosts along David Thompson Highway, B.N.P. and near Athabasca Falls, J.N.P.
Snow blight of conifers, <u>Phacidium abietis</u> (Dearn.) Reid & Cain	D. fir	Caused moderate to severe needle drop at confluence of Yoho and Kicking Horse rivers, Y.N.P.
Slash fungi, <u>Phyllotopsis nidulans</u> (Pers. ex Fr.) Sing.	A. fir	Ottertail Fire Road, Y.N.P. New herbarium record.
Hyperparasite of dwarf mistletoe, <u>Walrothiella arceuthobii</u> (Pk.) Sacc.	Lp. pine	Found in Banff, Jasper and Kootenay national parks.

TABLE IV
 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	To be re-examined in 1969.
3-2	Sundance Canyon	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965 18% of pine infected.
3-3	59.5 miles north Lake Louise Junction	<u>Peridermium stalactiforme</u> Arth. & Kern	To be re-examined 1968.
3-9	Snaring River	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1968.
3-13	Jasper Townsite	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1966.
3-14	Marmot Basin Trail	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965 32% of pine infected.
3-19	Settlers Road	<u>Peridermium harknessii</u> J. P. Moore	Re-examined 1965. Only north end of outbreak tallied. 64% of pine infected.
3-20	Between Mt. Eisenhower and Johnston's Canyon	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1966.
3-21	Between Astoria and Whirlpool rivers	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1966.
3-22	Between Astoria and Whirlpool rivers	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1965. Results inconclusive. To be re-examined 1966.





LOCATION POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1965

SCALE
0 miles 16

ANNUAL DISTRICT REPORT
BRAZEAU-ATHABASCA DISTRICT
ALBERTA 1965

by

F. J. EMOND

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY

March 1966

INTRODUCTION

A definite decline in population levels and a significant decrease in the size of the outbreak of the forest tent caterpillar was evident in the Brazeau-Athabasca District in 1965. Leaf beetle populations fluctuated throughout the different areas in which they were collected, and damage by all species reported was considered not important. Populations of the larch sawfly and the yellow-headed spruce sawfly remained at approximately the same level as in the previous year.

Due to an excessively wet season, needle rusts of spruce and foliage diseases of poplars were common and widespread in 1965. Cone rusts showed a definite decline and stem rusts remained at about the same level as in 1964.

INSECT CONDITIONS

A Leaf Beetle, Chrysomela semota Brown

Moderate and severe leaf skeletonizing of open grown regeneration balsam poplar was common in the following locations: from Hinton east to Edson, along Highway 16, south of Whitecourt along Highway 43 for 5 miles and between Drayton Valley and Entwistle along Highway 57. In the Hinton-Edson area, severe damage was most evident between Galloway and Hornbeck junctions and between Obed and Hargwen.

Grey Willow Leaf Beetle, Galerucella decora Say

Adults of this species were responsible for light damage to foliage of trembling aspen, balsam poplar, willow and various fruit trees in the District during May, June and July. Damage was especially noted in the Edson-Stony Plain-Edmonton and the Barrhead-Westlock areas.

Skeletonizing of willow foliage by larvae was light in all areas of the District with the exception of the Camp 22 area, 20 miles southeast of Hinton, where moderate damage was reported.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Adults and larvae of this leaf beetle were responsible for light to moderate defoliation of regeneration and immature aspen poplar in the following areas: one mile west of Edson along Highway 16, one mile north of the Edson Airport, 2 miles east of Entwistle, 5 miles south of Whitecourt along Highway 43, near the village of Nojack, 2 miles west of Wildwood and between Drayton Valley and Entwistle along Highway 57.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In 1965, defoliation of aspen poplar by the forest tent caterpillar decreased sharply from that reported in 1964. Thirty square miles of severe defoliation was recorded in 1965 as compared to 3,800 square miles reported in 1964. Moderate and light defoliation was reduced from 2,200 square miles in 1964 to approximately 200 square miles in 1965.

Severe defoliation was evident in only one location. This was along the south shore of Wabamun Lake between the Sundance and Kapasiwin beach areas. Severe defoliation in this area was sporadic for a distance of 8 to 10 miles south of the lake shore.

Moderate and light defoliation was recorded from Entwistle south to Drayton Valley, from Drayton Valley east along the North Saskatchewan River Valley to a point south of Stony Plain, and from here north to Onaway and west to Lac Ste. Anne.

Light damage was reported near Wolf Creek, southwest of Fort Assiniboine, near Majeau Lake and southeast of Stony Plain. One of the factors believed responsible for the decline in populations was the presence of the flesh fly, Sarcophaga aldrichi Park., an important parasite of the tent caterpillar. Other contributing factors were a Polyhedral virus disease and unfavourable weather conditions which occurred soon after larval emergence in the spring.

Sequential sampling plots were established at various points throughout the 1965 outbreak area to determine the degree of defoliation to be expected in 1966. (See Table II)

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

Population levels of this sawfly remained at the same approximate level as in the past few years. Most planted spruce shelterbelts in the agricultural area of the District sustained some degree of damage. On native spruce in the forested area of the District only the occasional larva or adult was found.

Moderate and severe defoliation of shelterbelt and ornamental spruce was reported in the following areas: St. Albert, Edmonton, Stony Plain, 5 miles west of Westlock, Barrhead, and in the vicinity of the Devon Corner.

Light damage was noted at Edson, Hinton, Westlock and Spruce Grove.

Larch Sawfly, Pristiphora erichsonii (Htg.)

An increase in population levels of this sawfly was recorded in 1965. Moderate to severe defoliation of tamarack was present in a hit and miss pattern

along Highway 16 from a point one mile west of Obed to Niton Junction. Moderate defoliation was evident in several small stands of tamarack from one mile south of the Lovett Ranger Station to the south boundary of the District. In the remainder of the District, larvae could generally be found in low numbers but caused no significant damage.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa spp.

These rust fungi were widespread in native spruce stands throughout the District during 1965. Moderate to severe damage was recorded in the following general areas: 30 miles north of Muskeg along the Trunk Road, from Entrance to Jarvis Lake, 3.5 miles south of Entwistle, along the Mobil Oil Road north and west of Whitecourt and between Whitecourt and the Little Smoky River. In the remainder of the District light damage could generally be found wherever spruce occurred. Some isolated light damage was also found in planted spruce shelterbelts at various locations in the District.

Balsam Poplar Leaf Blight, Linospora tetraspora Thompson

Due to excessive moisture conditions which prevailed in 1965, this fungus, which causes a characteristic browning and discolouration of poplar foliage, was responsible for considerable damage throughout the area east of the foothills. The disease was especially evident in the following general areas: between Whitecourt and Little Smoky River, between Whitecourt and Peers, from Edson to Chip Lake, and near Drayton Valley, Robb and Fort Assiniboine.

Aspen Shoot Blight, Pollaccia radiosa (Lib.) Bald. & Cif.

A more widespread distribution of P. radiosa was recorded during 1965 throughout the entire range of aspen poplar in the District. This disease causes foliage discolouration and shrivelling of the new shoots and produces a personified "shepherd's crook" appearance on the shoot. This typical damage was evident in most aspen regeneration, but in some instances was also found affecting immature trees. Damage to immature trees was light.

Severe damage was recorded in the following general areas: 5 miles northwest of Robb, 4 miles west of Edson, from Peers to Whitecourt, Fox Creek, Swan Hills, Westlock, Robb south to the Pembina River and between Entrance and the Simonette Tower.

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

Alpine fir regeneration was severely infected by P. epilobii in the Camp 22 area of the North West Pulp and Power lease southeast of Hinton. This rust, which is believed to infect only the current years growth, was responsible for a needle loss of approximately 80 per cent of the 1964 foliage and a continuation of this type of damage is expected from the 1965 infection. Light damage was recorded from Entrance north to Jarvis Lake and east to Gregg Lake.

P. geoppertianum, another rust of alpine fir, was present in the same area, 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	31	15	Trembling aspen	69	26
Black spruce	11	9	Balsam poplar	21	7
Lodgepole pine	17	7	Willow	32	6
Tamarack	21	2	Birch	6	0
Alpine fir	7	7	Alder	4	0
	87	40		132	39
Insect collections from miscellaneous hosts				7	
Disease collections from miscellaneous hosts				10	
GRAND TOTAL				315	

TABLE II
RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1965

Location	Established	Actual defoliation for 1965	Predicted defoliation for 1966
Wabamun Lake	1965	Moderate	Moderate
Drayton Valley	1965	Light	Light
Entwistle	1965	Moderate	Light
Sangudo	1965	Light	Light
Lac Ste. Anne	1965	Moderate	Severe
Fort Assiniboine	1965	Light	Nil

TABLE III
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE BRAZEAU-ATHABASCA DISTRICT, 1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Poplar bud-gall mite, <u>Aceria parapopuli</u> (Kieffer)	T. aspen	Damage and populations less than in the previous season.
Gall aphids on conifers, <u>Adelges</u> spp.	W. spruce B. spruce	Light and moderate damage in the foothills.
Birch skeletonizer, <u>Bucculatrix canadensisella</u> Chamb.	Birch	Light injury in Edmonton and Westlock areas.
Pear slug, <u>Caliora cerasi</u> (L.)	Cottoneaster Mtn. ash Apple	Common on ornamentals in the Edmonton-St. Albert district.

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

<u>Blotch miner,</u> <u>Gracilariidae</u>	B. poplar T. aspen Alder	Light damage in many areas of the District.
<u>Leaf beetle,</u> <u>Magdalis</u> sp.	Lp. pine W. spruce Willow	Moderate to severe injury to pine southeast of Hinton in Camp 22 area.
<u>Spruce spider mite,</u> <u>Oligonychus ununguis</u> (Jac.)	W. spruce C. spruce	Remained at approximately the same level as in 1964.
<u>Poplar serpentine miner,</u> <u>Phyllocnistis populiella</u> Cham.	T. aspen B. poplar	Light damage throughout the District.
<u>Disease</u>		
<u>Shoestring root rot,</u> <u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	Lp. pine	Common in regeneration pine stands, incidental significance.
<u>Yellow witch's broom of</u> <u>spruce,</u> <u>Chrysomyxa arctostaphyli</u> Diet.	B. spruce	No change in intensity through- out range of this host.
<u>Spruce cone rust,</u> <u>Chrysomyxa pirolata</u> Wint.	W. spruce B. spruce	Light damage during 1965.
<u>Fire blight,</u> <u>Erwinia amylovora</u> (Burrill) Winslow	Apple	Common in St. Albert, Edmonton and Stony Plain.
<u>Willow leaf rust,</u> <u>Melampsora epitea</u> Thuem.	Willow	Heavy throughout foothills area of the District.
<u>Douglas fir needle rust,</u> <u>Melampsora epitea</u> Thuem. race <u>M. bigelowii</u> Thuem.	Larch	Light infections near Hay River Ranger Station and at Camp 22 southeast of Hinton.
<u>Stalactiforme rust,</u> <u>Peridermium stalactiforme</u> Arth. & Kern	Lp. pine	Low incidence throughout Robb and Nojack areas.

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

Causal Agent	Host	Remarks
Leaf mold, <u>Uncinula salicis</u> (DC.) Wint.	B. poplar T. aspen	Common on young trees in latter part of season.
Shoot blight of balsam poplar, <u>Venturia populina</u> (Vuill.) Fabric	B. poplar	Common in regeneration areas.
Weather damage to spruce tips	W. spruce	Significant damage throughout foothills.

TABLE IV

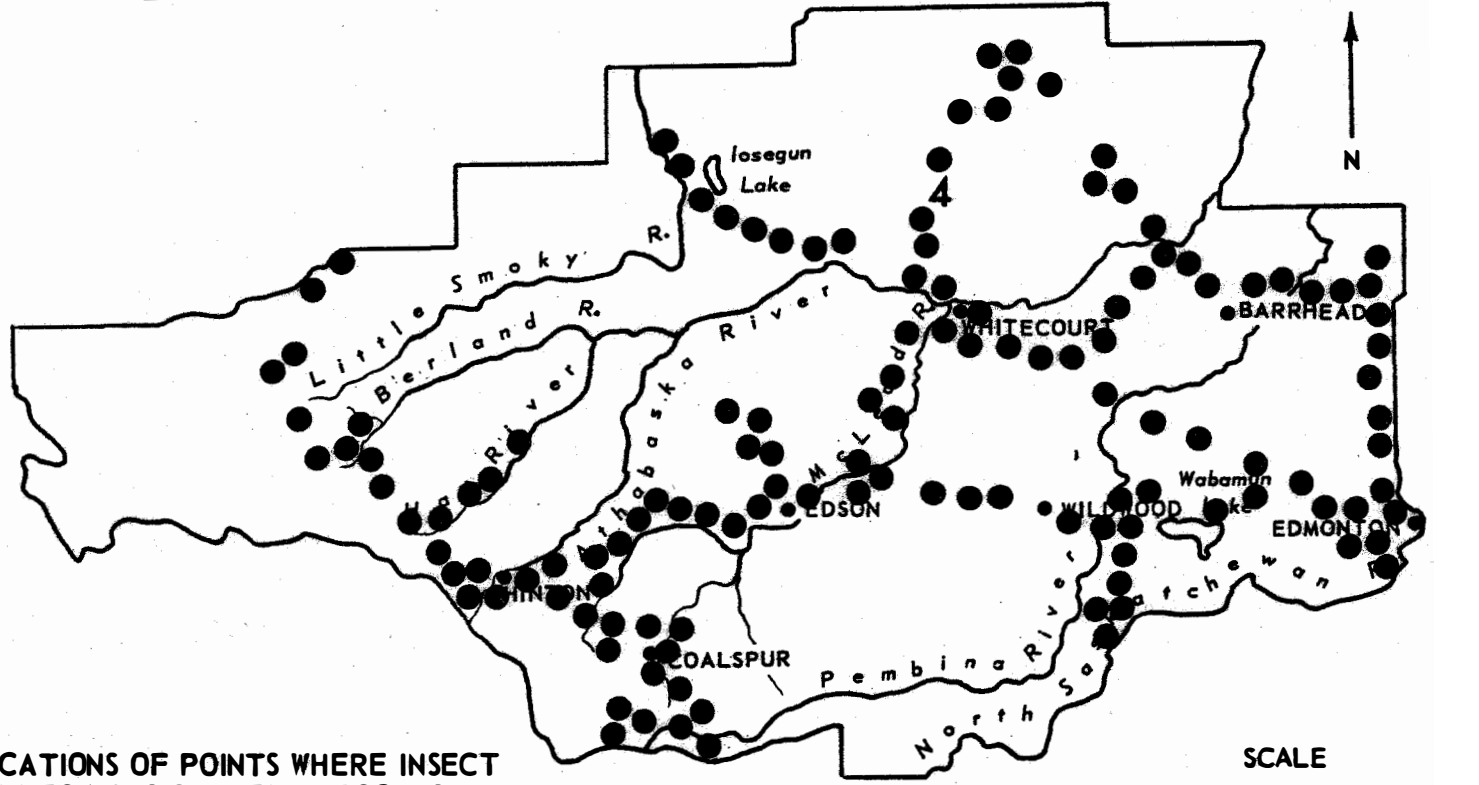
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE BRAZEAU-ATHABASCA DISTRICT

Outbreak number	Location	Causal organism	Remarks
4-1	Lovett	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Examined 1965. 79 per cent of trees inspected were infected. Average of 3 cankers per tree.
4-3	Whitecourt	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1966.
4-5	Robb	<u>Armillaria mellea</u> (Vahl ex Fr.) Quéf.	To be re-examined 1966.
4-9	Hinton	<u>Peridermium harknessii</u> J. P. Moore <u>Peridermium</u> <u>stalactiforme</u> Arth. & Kern	To be re-examined 1967.

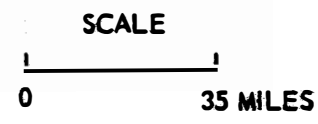
Table IV - Summary of Recorded Disease Outbreaks - Cont'd.

Outbreak number	Location	Causal organism	Remarks
4-11	Hinton	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1967.
4-12	Entrance	<u>Peridermium</u> <u>stalactiforme</u> Arth. & Kern	To be re-examined 1967.
4-13	Robb	<u>Peridermium harknessii</u> J. P. Moore	To be re-examined 1966.
4-14	Robb	<u>Peridermium</u> <u>stalactiforme</u> Arth & Kern	To be re-examined 1966.
4-18	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1966.
4-19	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Area reserved for study of the spread of dwarf mistletoe in pine regeneration.
4-20	Edson	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1967.
4-21	Cadomin	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1967.
4-22	Hinton	<u>Armillaria mellea</u> (Vahl ex Fr.) Quéf.	To be re-examined 1967.
4-23	Entrance	Rodent damage	To be re-examined 1967.

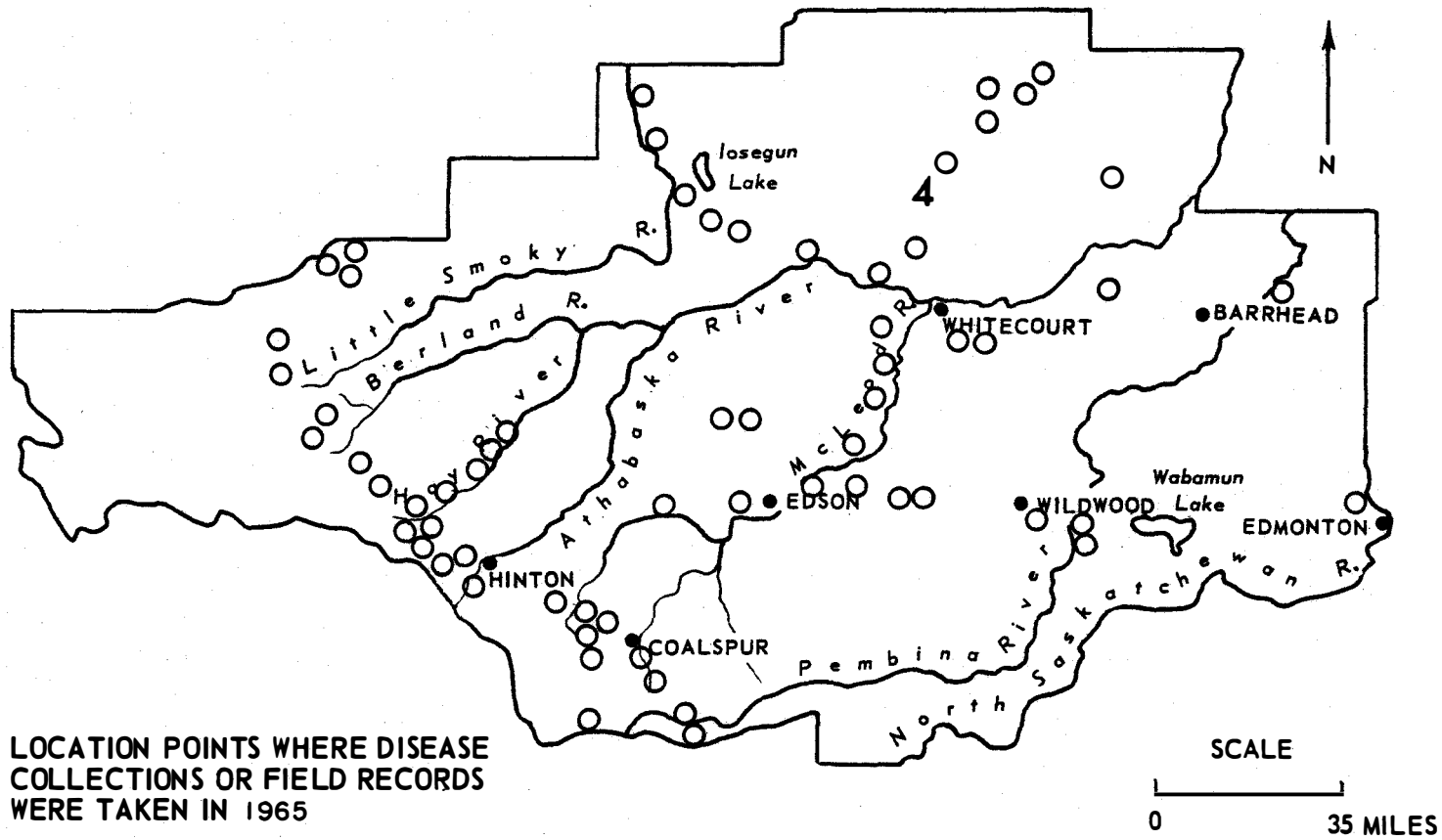
BRAZEAU-ATHABASKA DISTRICT



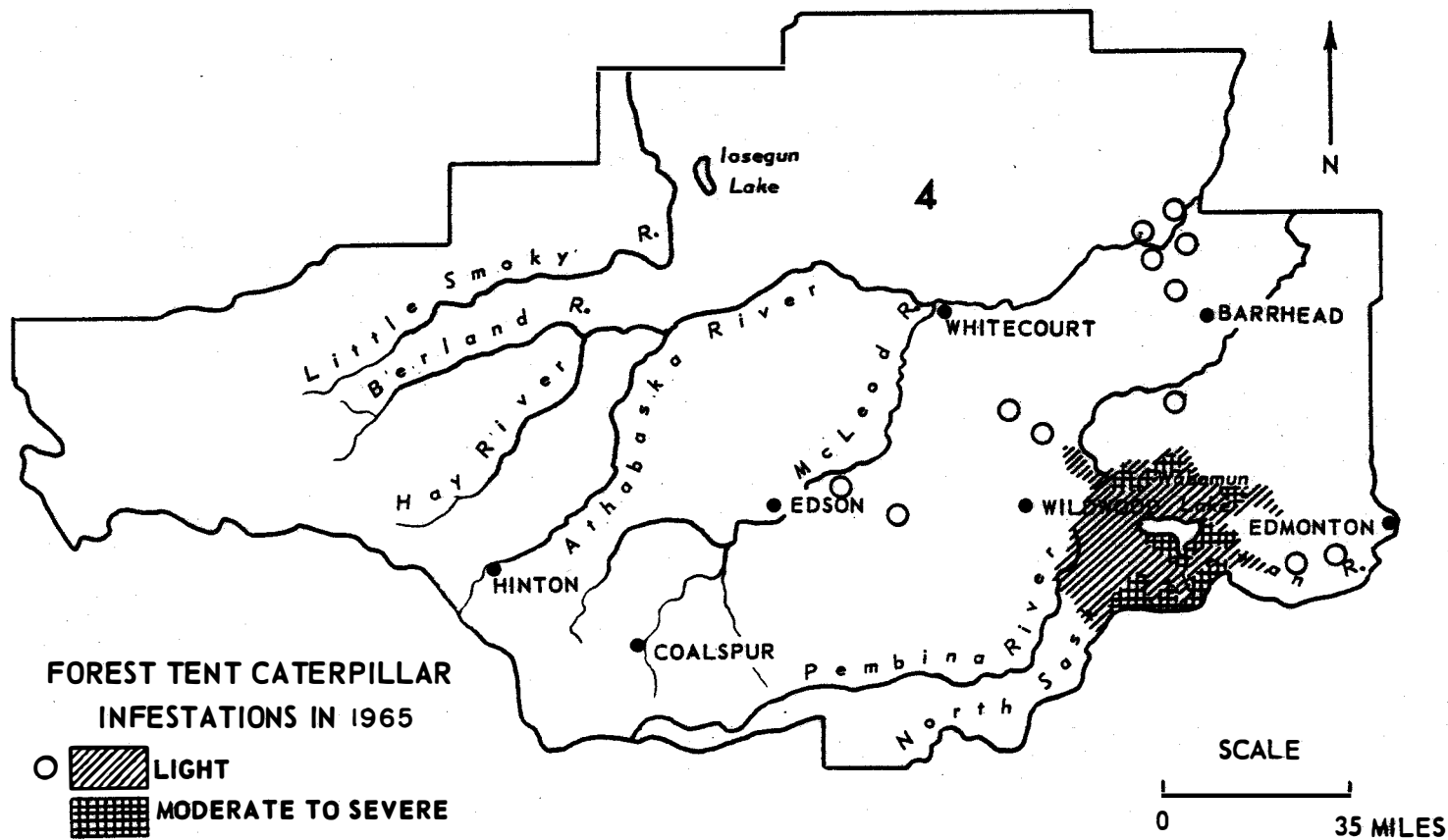
LOCATIONS OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1965



BRAZEAU-ATHABASKA DISTRICT



BRAZEAU-ATHABASKA DISTRICT



ANNUAL DISTRICT REPORT
LAC LA BICHE DISTRICT
ALBERTA 1965

by
R. W. BARRY

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY
March 1966

INTRODUCTION

The decline in the population of the forest tent caterpillar in the Lac la Biche District continued in 1965. A more widespread distribution of the prairie tent caterpillar was recorded throughout the south-east portion of the District. A decrease in damage to spruce in farm shelterbelts by the yellow-headed spruce sawfly was evident again in 1965. Population levels of larch sawfly remained comparable to that reported in 1964.

An outbreak of spruce needle rusts resulted in damage to black and white spruce trees throughout the District in 1965. The poplar leaf spot caused severe damage to trembling aspen at several points in the southern part of the District. The aspen shoot blight was responsible for considerable damage to trembling aspen throughout the District.

INSECT CONDITIONS

Grey Willow Leaf Beetle, Galerucella decora Say

Adults of the grey willow leaf beetle were responsible for light damage to trembling aspen throughout the southern part of the District. Medium and high populations were reported near Mannville and Mundare respectively. Larvae caused light damage to willow foliage in the Dewberry and Vimy areas. Moderate damage was evident near Garth; severe damage occurred near Ardmore, Boyle, Cold Lake, Lac la Biche, and Redwater.

Arctiidae, Haploa lecontei Guer.

This rare insect was first collected in Alberta along the Clearwater River east of McMurray in 1964. In the first week in June, 1965, a collection of larvae was made from the same area to confirm the tentative identification of this insect. H. lecontei was responsible for light defoliation of dogwood, rose and willow in this area.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The decline in the forest tent caterpillar infestation continued in 1965. Defoliation of trembling aspen was recorded over 200 square miles in 1965 as compared to 5,500 square miles in 1964. This defoliation occurred near Two Hills and Vilna. North-east of Two Hills moderate defoliation was reported in an area of approximately 60 square miles. Surrounding this was an equal area of light defoliation. West of Vilna 80 square miles of light defoliation was recorded.

The regular hatching study plot was not maintained in the District in 1965; instead, a series of observation points were set up in the area in which the infestation was concentrated. The selected points were: 34 miles south of Lac la Biche, 3.5 miles east of Vilna, 1.5 miles south of Ashmont, 5.5 miles north of Elk Point, and 1.5 miles east of Beauvallon. The purposes of these observation points were to record the general behaviour of the larvae, to maintain a check on their numbers, and to determine a reason for the infestation collapse.

A good hatch, which commenced May 8, occurred throughout the observation area, 20 days before the aspen completely foliated. On May 16 first instar larvae, suspected to be diseased, were collected 3.5 miles east of Vilna and 32 miles south of Lac la Biche. Following a severe snow storm on May 17 a sharp decline in the numbers of larvae was noticed, and by May 22 only a few larvae were found at the five observation points.

Table II at the conclusion of this report summarizes the degree of 1965 defoliation and predicts the defoliation expected to occur in 1966.

Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.)

The prairie tent caterpillar was present throughout the southeastern portion of the District in 1965. Light damage to chokecherry, rose, and willow was evident from Hairy Hill to Blackfoot. Moderate damage to rose, chokecherry and saskatoon was evident near Dewberry, north to Elk Point, and Hazeldine.

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

A decline in the numbers of the yellow-headed spruce sawfly was evident throughout the southern part of the accessible portion of the District in 1965. Moderate damage to white spruce shelterbelts was evident near Lac la Biche, Bellis, and Wandering River. Light damage was evident from Ft. Saskatchewan to Ardmore. No severe damage to spruce was noted in the District in 1965.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt ex Engelm.

Collections of dwarf mistletoe on jack pine 11 miles east of Glendon and 2 miles south of McMurray increased the known distribution of this disease in the Lac la Biche District. Re-examination of a previously reported outbreak of dwarf mistletoe near Bellis revealed that 55% of 40 trees examined were infected. The infection rate was highest in the middle of the plot and tapered off abruptly toward the plot boundaries.

Spruce Needle Rusts, Chrysoomyxa spp.

Spruce needle rusts caused light damage to white and black spruce from Highway 45 north to Ft. MacKay. Severe damage occurred in white spruce stands north of Lac la Biche, near Heart Lake Tower, and Rich Lake; in black spruce stands near Abee, Lac la Biche, Plamondon, and Rochester.

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

An increase in the distribution and amount of damage to trembling aspen by the poplar leaf spot was evident in the Lac la Biche District in 1965. Severe damage to trembling aspen foliage occurred in the following locations: 18 miles east of Rich Lake, 5 miles east of Ardmore, 2.5 miles south of Gibbons, 3 miles west of Vilna, 1.2 miles south of Egremont, 2 miles east of Willingdon, and 7.5 miles east of Lavoy.

Aspen Shoot Blight, Pollaccia radiosa (Lib.) Bald. & Cif.

In 1965 P. radiosa caused considerable damage to regeneration and pole-size trembling aspen in an area from Highway 16 north to McMurray.

Leaf and Twig Blight of Balsam Poplar, Venturia populina (Vuill.) Fabric

This disease was collected in the District for the first time. The disease caused light damage at McMurray, in Elk Island National Park, 2.5 miles east of Mundare, 22 miles northwest and 10 miles north of Athabasca, and 13 miles northeast of Lac la Biche. Severe damage occurred 24.5 miles southeast of Lac la Biche.

Table II - Results of Sequential Sampling - cont'd.

Location	Predicted defoliation for 1965	Actual defoliation for 1965	Predicted defoliation for 1966
Calling Lake	Light	Nil	Nil
Cold Lake	Light	Nil	Nil
Dewberry	Severe	Nil	Nil
Elk Point (N)	Severe	Nil	Nil
Elk Point (S)	Severe	Light	Nil
Ellscott	Light	Light	Nil
Grassland	Light	Nil	Nil
Lac La Biche	Light	Nil	Nil
Mannville	Nil	Nil	Nil
Rochester	Moderate	Light	Nil
Star	Severe	Light	Nil
Vermilion	Moderate	Nil	Light
Vilna	Severe	Light	Severe
Wandering River	Nil	Nil	Nil
Warspite	Light	Nil	Nil

TABLE III

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE LAC LA BICHE DISTRICT, 1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Poplar bud-gall mite, <u>Aceria parapopuli</u> (Kieffer)	T. aspen	Found throughout the southern portion of the District.
Gall aphid on conifers, <u>Adelges lariciatus</u> (Patch)	W. spruce	Low populations throughout the District.
Woolly larch aphid, <u>Adelges strobilobius</u> (Kalt.)	B. spruce	Common throughout the District. High population 30 miles north of Athabasca and medium populations near Boyle and Lac la Biche.

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

Causal Agent	Host	Remarks
<u>Ugly-nest caterpillar,</u> <u>Archips cerasivoranus</u> (Fitch)	Chokecherry Rose	Collection made 7.5 miles north of Clyde.
<u>Oblique-banded leaf roller,</u> <u>Choristoneura rosaceana</u> Harr.	Alder T. aspen	Low population on alder near Edmonton. Low populations on aspen throughout southern part of the accessible portion of the District.
<u>Leaf tier,</u> <u>Compsolechia niveopulvella</u> Cham.	T. aspen	Low populations throughout the southern portion of the District.
<u>American aspen beetle,</u> <u>Gonioctena americana</u> (Schaeff.)	T. aspen	Low populations throughout the southern portion of the District.
<u>Leaf miner,</u> <u>Gracilaridae</u>	Alder	Heavy populations from Highway 16 north to Ft. MacKay.
<u>Geometridae,</u> <u>Itame loricaria julia</u> Evers.	T. aspen	Found near Ashmont, Bremmer, and Vegreville.
<u>Leaf beetle,</u> <u>Orsodacne atra</u> (Ahr.)	T. aspen	Low populations in the south-east portion of the District.
<u>Tortricidae,</u> <u>Pandemis canadana</u> Kft.	T. aspen	Low populations in the south-east portion of the District.
<u>Pitch nodule maker,</u> <u>Petrova albicapitana</u> (Busck)	J. pine	Low populations throughout the District.
<u>Poplar serpentine miner,</u> <u>Phyllocnistis populiella</u> Cham.	T. aspen	Low populations throughout the District.
<u>Larch sawfly,</u> <u>Pristiphora erichsonii</u> (Htg.)	Tamarack	A few larvae present in District but damage was negligible.

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

Causal Agent	Host	Remarks
Leaf tier, <u>Pseudexentera improbana</u> <u>oregonana</u> Wlshm.	T. aspen	Low populations near Myrnam, Vermilion, and Andrew.
<u>Disease</u>		
Apiosporina witch's broom, <u>Apiosporina collinsii</u> (Schw.) v. Höhnel	Saskatoon	Collected near Edmonton, Rochester, Star and McMurray.
Shoestring root rot, <u>Armillaria mellea</u> (Vahl ex Fr.) Quél.	J. pine	Collected 11 miles east of Smoky Lake
Poplar ink spot, <u>Ciborinia whetzellii</u> (Seaver) Seaver	T. aspen	Light damage near Anzac, Cherry Grove, Vermilion, and in Elk Island National Park.
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> (Diet.)	B. spruce	Common throughout the central and southern part of the District.
White trunk rot, <u>Fomes ignarius</u> (L. ex Fr.) Kickx	T. aspen	Collections made near Frog Lake, Beauvallon, and Star.
Hypoxyton canker, <u>Hypoxyton priunatum</u> (Klotzsche) Cke.	T. aspen	Collections made near Willington and Smith Lake.
Pine needle cast, <u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	J. pine	Caused light damage near Truman, Calling Lake, and 26.5 miles north of Lac la Biche.
Birch leaf rust, <u>Melampsoridium betulinum</u> (Fr.) Kleb.	W. birch	Collected near Plamondon. New herbarium record for the District.
Birch leaf spot <u>Septoria betulicola</u> Pk.	W. birch	Collected near Lac-la Biche. New herbarium record for the District.

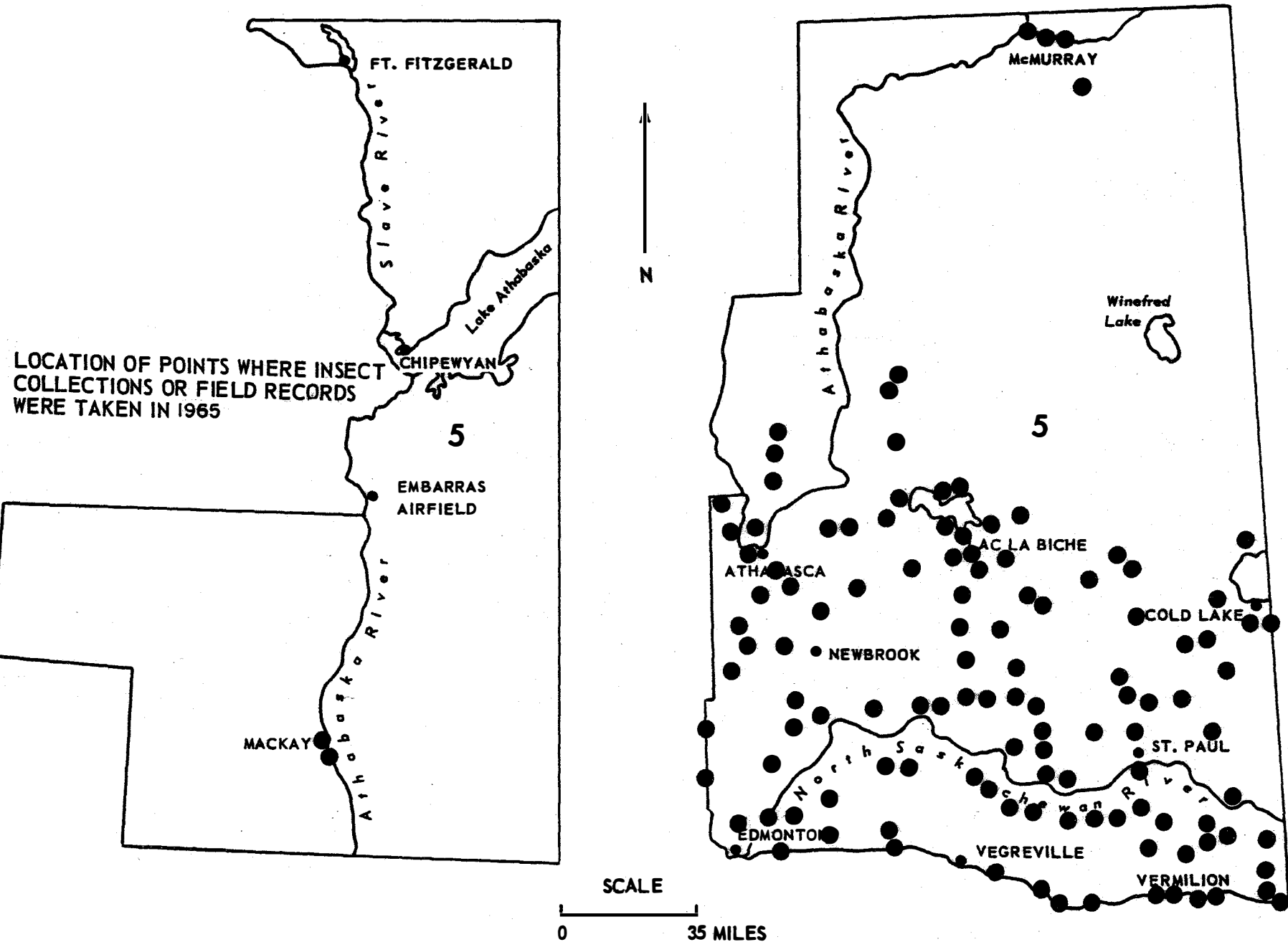
TABLE III - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Hyperparasite of dwarf mistletoe, <u>Wallrothiella arceuthobii</u> (Pk.) Sacc.	J. pine	Four collections made in the District in 1965.

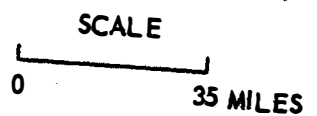
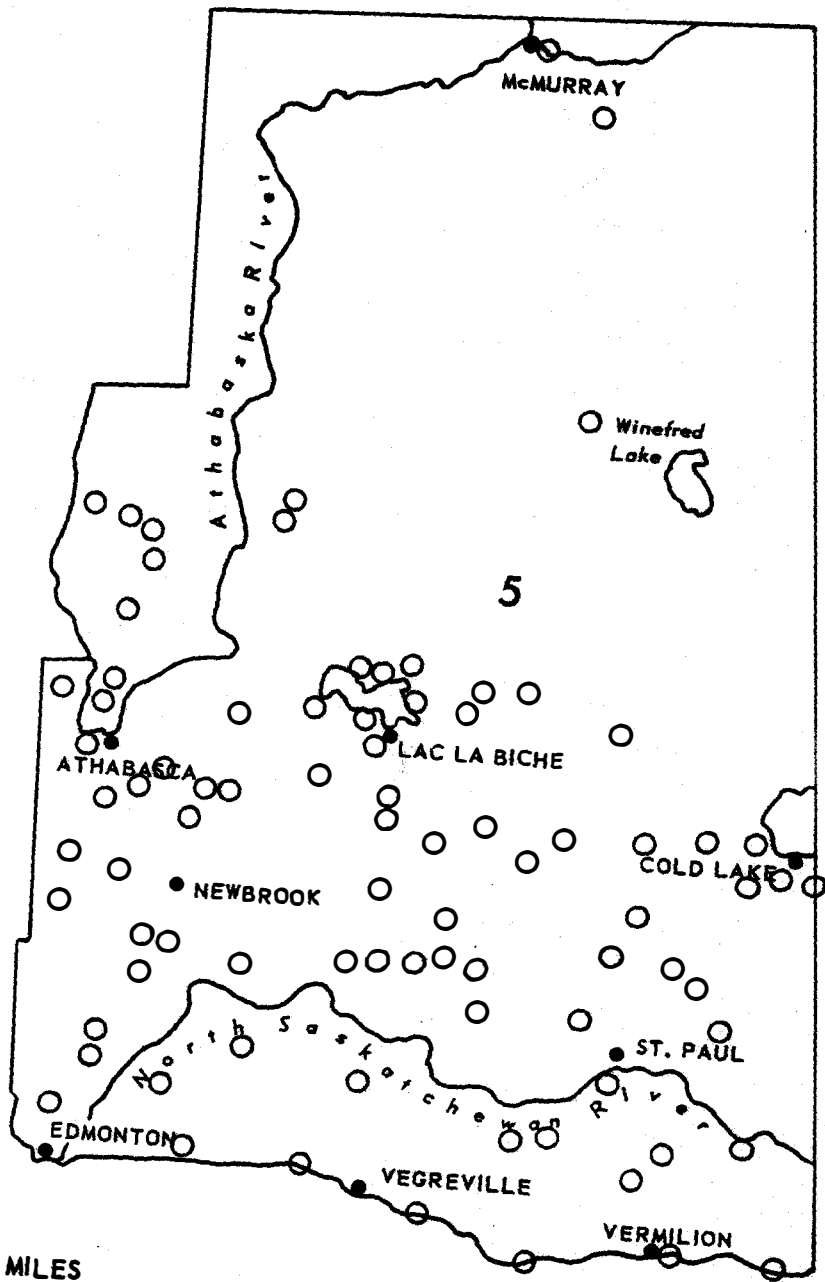
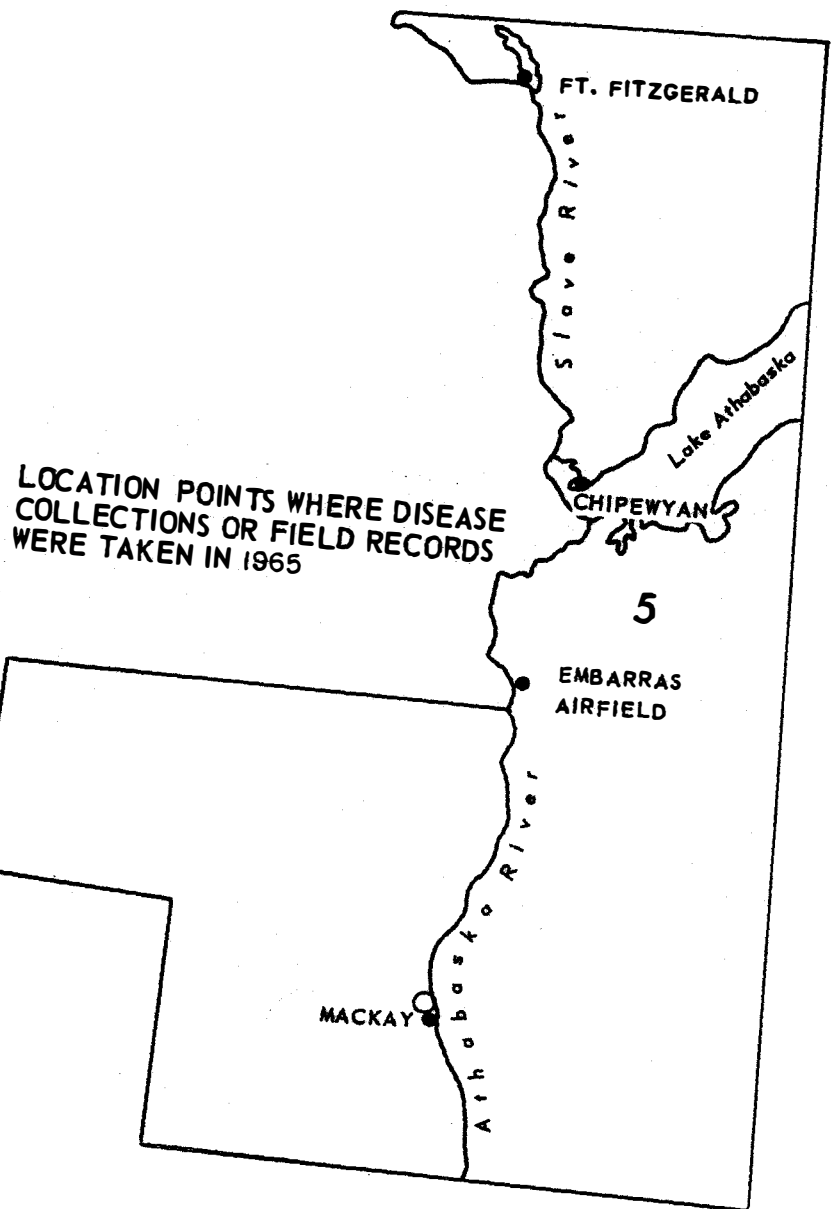
TABLE IV

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

Outbreak number	Location	Causal organism	Remarks
5-3	60 miles north of Lac la Biche	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined in 1966.
5-4	Bellis	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1965. See body of report.
5-6	Calling Lake	<u>Fomes igniarius</u> (L. ex Fr.) Kickx	Discontinued 1965.
5-7	Elk Island National Park	<u>Hypoxyylon priunatum</u> (Klotzsche) Cke.	To be re-examined in 1967.



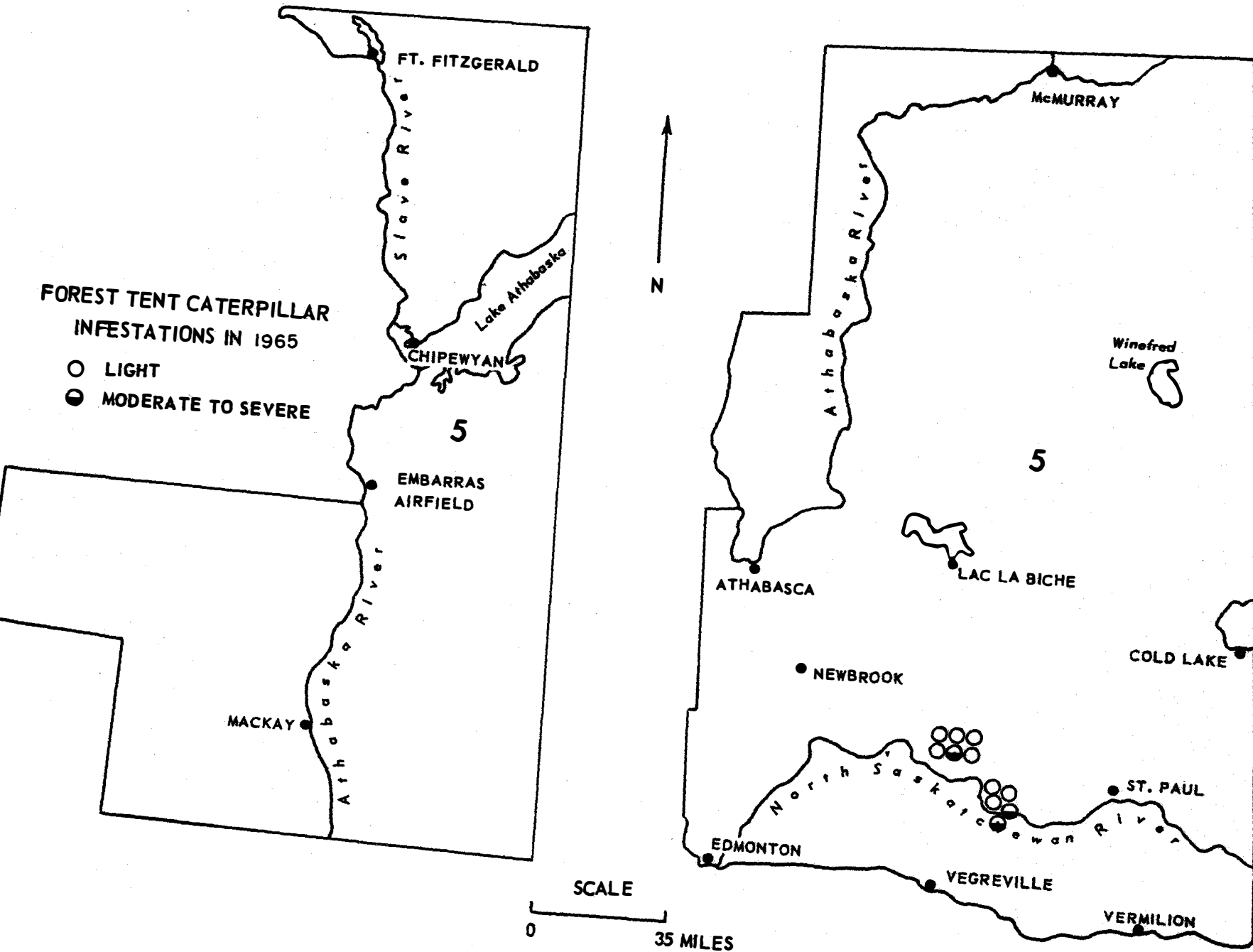
LAC LABICHE DISTRICT



LAC LA BICHE DISTRICT

**FOREST TENT CATERPILLAR
INFESTATIONS IN 1965**

- LIGHT
- MODERATE TO SEVERE



LAC LA BICHE DISTRICT

ANNUAL DISTRICT REPORT
GRANDE PRAIRIE-SLAVE LAKE DISTRICT
ALBERTA 1965

by
J. PETTY

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY
March 1966

INTRODUCTION

Defoliation caused by spruce budworm was noted in three areas in the Slave Lake Forest. A continuing decline in the forest tent caterpillar population was evidenced by the fact that defoliation occurred in only one small area in 1965. The larch sawfly was present in most tamarack stands throughout the District and in some areas caused moderate defoliation. The yellow-headed spruce sawfly was of major concern to owners of farm shelterbelts in the District.

Foliage diseases of poplar species were widespread throughout the District in 1965. In the southern part of the Grande Prairie Forest moderate damage caused by spruce needle rusts was common. Late in the season a hyperparasite, possibly Darluc sp., was found on the rust infections. Seed production of dwarf mistletoe was reduced by a hyperparasite, Wallrothiella arceuthobium (Pk.) Sacc. A new record was established in finding Colletotrichum gloeosporioides Penz. sensu Von Arx (E), a hyperparasite of dwarf mistletoe.

Collections of an undescribed needle cast of spruce were made periodically during the season along Chinook Ridge for special studies in the Laboratory.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm was responsible for defoliation in three separate stands of mature white spruce in the northern part of the Slave Lake Forest. The northernmost stand was along the Wabasca River in Township 96, Ranges 8 and 9, west of the 5th meridian, and was an extension of the outbreak in the Footner Lake Forest. Moderate defoliation occurred in this area. South of this, two small areas of light defoliation were recorded. One was along the west side of the Loon River north of Lafond Creek and the other was in Township 86, Range 9, west of the 5th meridian southeast of Loon Lake. Eighteen per cent of the larvae collected from this latter area were parasitized.

Grey Willow Leaf Beetle, Galerucella decora Say

Although populations of this leaf beetle were present in many areas of the District, severe defoliation occurred only in one small area, 20 miles south of Valleyview. Adults were present on aspen in the early part of the season north of Hycroft, north of Grouard and along the south and east sides of Lesser Slave Lake. Larval populations were low in these areas and defoliation was minimal.

Pine Root Collar Weevil, Hylobius sp.

Root collar weevils were found in most areas of the southern part of the Grande Prairie Forest in 1965. A low incidence of mortality of regeneration lodgepole and jack pine was noted in burned over areas and along roadsides. Although weevils or their damage were found on many immature trees, no mortality could be directly attributed to Hylobius sp. No damage was found on spruce or larch in the area.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The outbreak of forest tent caterpillar that has been present in the District in past years has decreased to a point where defoliation was not noticeable in 1965. In areas where moderate to severe defoliation occurred in 1964, the number of larvae have decreased to a point where only a few colonies were present. In the hatching study plot southeast of Woking, many eggs and in some instances, complete egg bands failed to hatch. This situation was common in all areas where egg bands were found in any quantity. After hatching was completed many larvae disappeared from the trees, the reason for which could not be determined.

Light defoliation was recorded in a 6 square mile area west of Kadot Lake. In this area some larvae were killed by disease and a high percentage of late instar larvae were killed by parasites. Other areas of the Grande Prairie Forest where tent caterpillar were found were: within an 8 mile radius of Woking, 9 miles north of Rycroft, west of Spirit River, Peoria, Teepee Creek, along the Smoky River east of Bezanson, west of Grande Prairie and near Hythe.

In the Slave Lake Forest, low populations were reported from Kinuso, Slave Lake, Chisholm Corner and Fawcett.

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

Moderate to severe defoliation occurred in some spruce shelterbelts in the Rycroft-Woking area and near Belloy. Moderate defoliation was noted west of High Prairie and light infestations were observed on shade trees in Grande Prairie.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The population of larch sawfly remained at a low level throughout the Grande Prairie-Slave Lake District. Defoliation of Siberian larch in shelterbelts west of Grande Prairie and at the Beaverlodge Experimental Farm was light to moderate and was held at this level by the use of chemical sprays. Moderate defoliation of tamarack occurred along the Wapiti River south of Wembley and Grande Prairie. Light defoliation was evident in the small stands of tamarack along the Two Lakes Road south of Nose Creek and near Disaster Creek south

of Grovedale. In the remaining areas of the Grande Prairie Forest defoliation was minimal.

Low populations persisted in the Slave Lake Forest west of High Prairie, between Slave Lake and Smith and northeast of Slave Lake along the Wabasca Road. Defoliation in these areas was negligible.

Cecidomyid Gall, Rhabdophaga swainei Felt

In many areas of the District damage to the apical buds on the lateral and terminal shoots of spruce was evident. Damage occurred on both black and white spruce and was found mainly on the small open-grown trees. The populations were generally low in the District except northwest of Valhalla and near Hondo. It was reported that up to 30 per cent of the tips were infested in the Hondo area.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

The outbreak of dwarf mistletoe on jack pine along the Wapiti River south of Grande Prairie was re-examined in 1965. This outbreak is not continuous but groups of infected trees can be found in a 6 square mile area. Of 185 trees tallied in 3 plots, 18.4 per cent were infected. On the dominant trees there was an average of 14 brooms per tree and on the understory an average of 1.3 aerial plants per tree. Some mortality of the large mistletoe brooms on mature jack pine was evident along the Marten River northwest of Slave Lake. The same condition prevailed in small, isolated stands of jack pine south of Smith.

The hyperparasite, Walrothiella arceuthobii (Pk.) Sacc. was found in all of these areas and it was particularly prevalent in the latter two, reducing the seed crop by a very noticeable amount.

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

Shoestring root rot was found in two areas of the Grande Prairie Forest. One area was 6 miles south of Grande Prairie along the north side of the Wapiti River, and the second was along Nose Mountain Road one mile east of Nose Creek Bridge. In both localities infection were found on trees which were dying or had been recently killed. All of the infected trees were infested or had been damaged by a root collar weevil, Hylobius sp.

Spruce Needle Rusts, Chrysomyxa spp.

Spruce needle rusts were present in many stands of white spruce throughout the southern part of the Grande Prairie Forest. Along the Two Lakes Road, damage which was light near Pinto Creek, gradually increased in intensity to moderate south to Chinook Ridge. Along Chinook Ridge infections were heavier on the southwest side of the trees and near the tops of the trees, due probably to the prevailing winds. Along the Imperial Road damage was noted 9 miles north of the Cutbank River and south from this point for a distance of 25 miles. A gradual increase from light to moderate damage was noticed along the Trunk Road from Economy Creek Tower to Simonette Tower.

Light damage was noted southeast from Slave Lake to Smith and north from Slave Lake to Wabasca Lake.

Poplar Ink Spot, Ciborinia whetzelli (Seaver) Seaver

This disease of aspen foliage was widespread throughout the District. Generally, the damage was light, with small, moderate patches interspersed throughout the area. The organism was common north of Salt Prairie to Redearth and west from Whitefish Tower along the road to Harmon Valley. It was also present along Highway 34A between Triangle and Valleyview. The same pattern of damage was noted south of Goodwin along the Trunk Road from the Simonette River to Economy Creek Tower and in the areas south of the Wapiti River where aspen poplar was found. Light damage was present west of Hazelmere to the British Columbia Boundary.

Comandra Blister Rust, Cronartium comandrae Pk.

This stem rust was found in two widely separated areas. In one area, 12 miles west of Hazelmere near the Alberta-British Columbia Boundary, many regeneration lodgepole pine were infected. Severe infections on the alternate host, Geocaulon lividum (Richard) Fern., were found in this vicinity. In the other area, 81 miles north of Grouard, rust cankers on the branches of immature jack pine were common. Rodents had chewed out many of these cankers, which in turn caused the mortality of the branch, resulting in a very noticeable flagging effect on the trees.

Comandra pallida A.DC., the other alternate host, was severely infected along the north shore of Lesser Slave Lake near Marten River.

Cytospora Canker, Cytospora chrysosperma (Pers.) Fr.

This canker was commonly found in aspen stands which were infested by forest tent caterpillar in previous years. The insects produced a mat on which to rest or molt. This mat often encircled the stem or branch which died beyond that point. The fungus invaded these necrotic areas.

Balsam Poplar Leaf Blight, Linospora tetraspora Thompson

Moderate to severe discoloration of balsam poplar foliage became apparent throughout the southern part of the Grande Prairie Forest about mid-August and by the first week in September the foliage had begun to drop. L. tetraspora was the causal agent of this damage. The northern boundary of this discoloration was roughly Township 75 and the eastern and western boundaries were Highway 43 and the Alberta-British Columbia Boundary respectively. In the south and west part of the District the amount of damage decreased as the presence of the host species decreased.

Western Gall Rust, Peridermium harknessii J. P. Moore

Galls caused by this rust were common on regeneration lodgepole pine along the Two Lakes Road southwest of Grovedale and along the Nose Mountain Cutoff west of the Kakwa Road. The infected trees were small, 12 - 18 inches in height and grew along the roadsides. On a high percentage of the infected trees galls were found on the main stem at ground level and most of these trees were dead above the galls.

Light infections were present on lodgepole pine near Demmitt and on jack pine along the Redearth.

Aspen Shoot Blight, Pollaccia radiosa (Lib.) Bald. & Cif.

Shoot blight was present in all areas where aspen was found in the District. Representative collections were made at Big Mountain Creek south of Grovedale, near Tangent and northwest of Joussard. Regeneration aspen along the roadsides appeared to be most susceptible but in a few areas larger trees were also affected. Although some new shoots on the larger trees were affected, most of the damage was in the form of necrotic areas in the leaves. This condition was found mainly in the northern part of the Grande Prairie Forest west of the Smoky River.

Shoot Blight of Balsam Poplar, Venturia populina (Vuill.) Fabric

Twig blight was found along the Forestry Trunk Road south of Goodwin and north of Grouard along the Redearth Road. The damage, which was moderate in intensity, was noted only on regeneration.

Clumping of Aspen

Clumping of aspen was severe in some areas of the District in 1965. Southwest of Beaverlodge to Rio Grande and Hinton Trail damage was prevalent along the fence rows and at the edges of the 'bluffs' where there was no protection from the elements. Trees which were protected showed little or no damage. Severe damage was also present southeast of Woking and north and west of Spirit River.

TABLE II
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT, 1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Black-headed budworm, <u>Acleris variana</u> (Fern.)	W. spruce	Low populations throughout the District.
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	Chokecherry Alder	High population in a small area 20 miles south of Goodwin.
Leaf beetle, <u>Chalcoides</u> sp.	T. aspen	Low populations general in the north part of the Grande Prairie Forest.
American aspen beetle, <u>Gonioctena americanum</u> (Schaeff.)	T. aspen	Caused moderate defoliation in a small area 123 miles northeast of Grouard. Elsewhere populations were low.
Leaf miner, <u>Gracillariidae</u>	Alder	Caused moderate damage southwest of Grovedale and along north shore of Lesser Slave Lake.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	Rose	Low populations found at three widely separated points.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	W. spruce	Caused light damage in Smith.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Collected in beating samples in agricultural areas of the Grande Prairie Forest.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	W. spruce	Light infestations at Smith, along the Wabasca Road and 47 miles south of Goodwin.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopping	Lp. pine	Low populations persist southwest of Grande Prairie along Chinook Ridge.

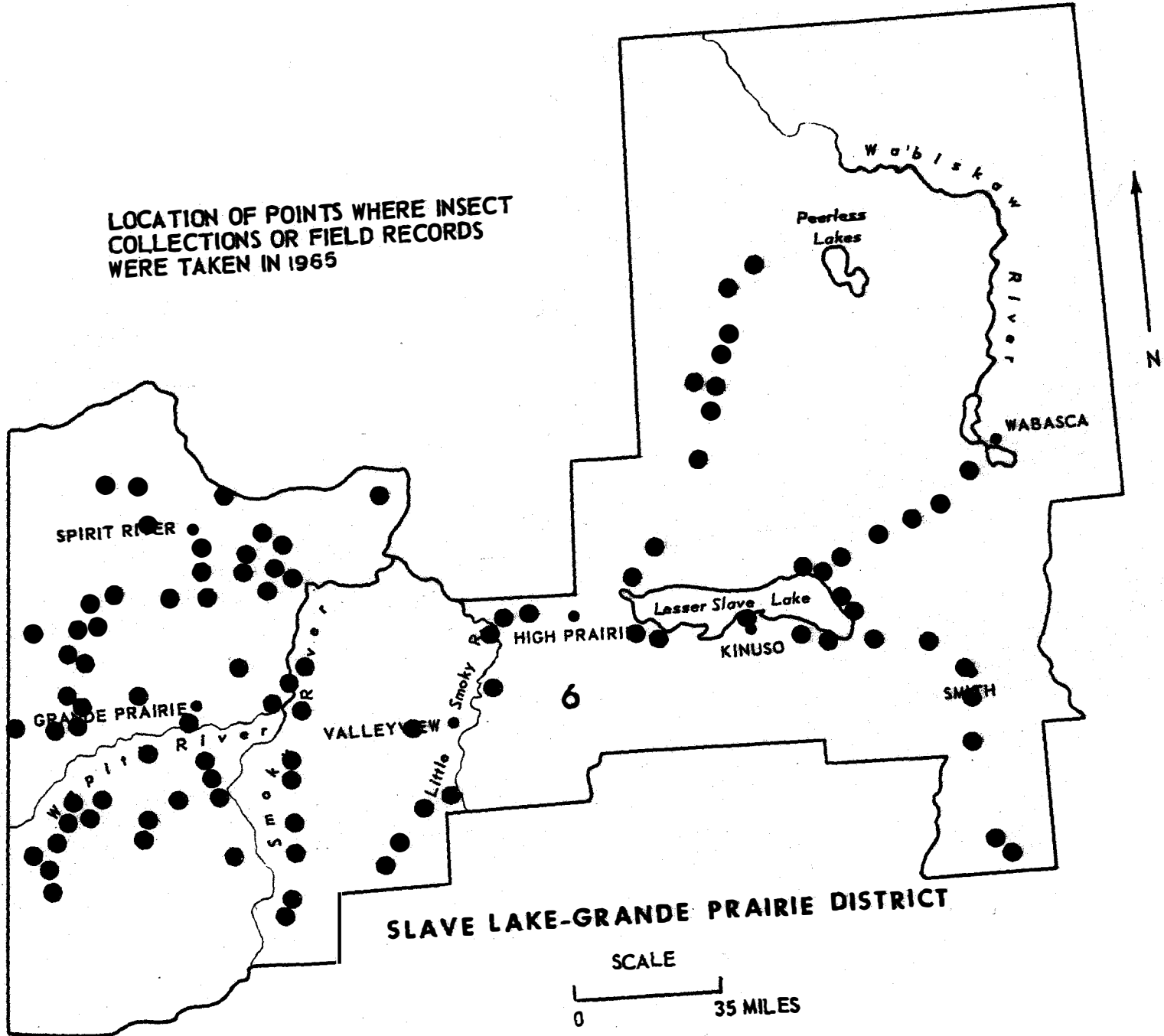
TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Poplar borer, <u>Saperda calcarata</u> Say	T. aspen	Found in many areas of the District.
<u>Disease</u>		
Atropellis canker, <u>Atropellis piniphila</u> (Weir) Lohman & Cash	Lp. pine	Extensive stands of pine affected south of the Wapiti River and west of the Smoky River.
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	W. spruce	50% infection of light cone crop 6 miles east of Slave Lake.
Hyperparasite of needle rust, <u>Darluca filum</u> (Biv.) Cast.	<u>Chrysomyxa</u> spp.	Severe on spruce needle rust along Chinook Ridge. Also found north of Simonette Tower.
Poplar branch gall, <u>Macrophoma tumefaciens</u> Shear	B. poplar	Found along the Smoky River east of Bezanson.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb.	Crowberry	Found 10 miles south of the Cutbank River and 20 miles north of Two Lakes.

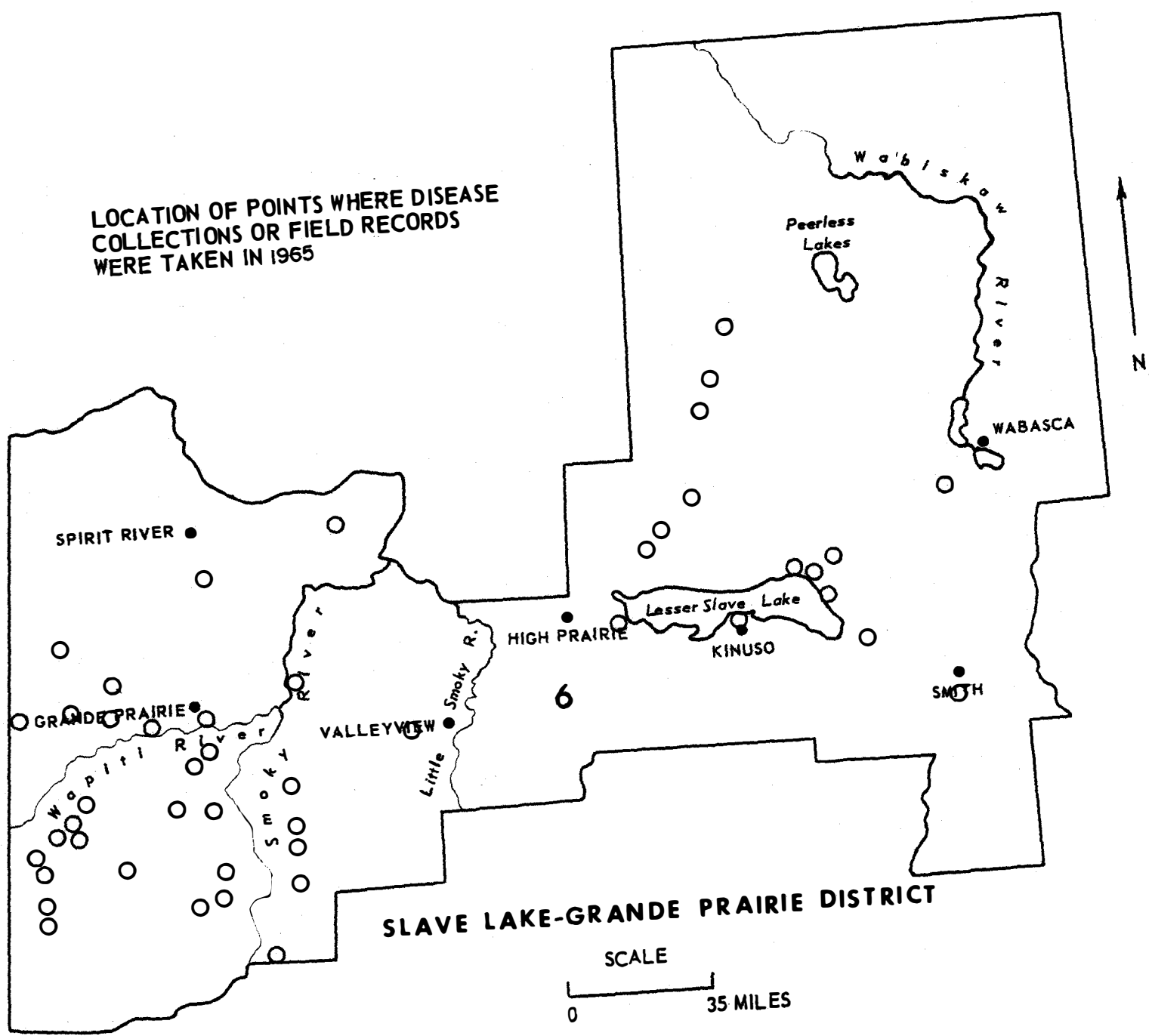
TABLE III
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT

Outbreak number	Location	Causal organism	Remarks
6-2	Grovedale	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1966.
6-4	Grande Prairie	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1965. See report section.
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 1965



LOCATION OF POINTS WHERE DISEASE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1965



ANNUAL DISTRICT REPORT
PEACE RIVER DISTRICT
ALBERTA 1965

by
C. R. LAYTON

FOREST RESEARCH LABORATORY
CALGARY, ALBERTA

DEPARTMENT OF FORESTRY
March 1966

INTRODUCTION

Spruce budworm was the major insect pest in the Peace River District and the outbreak along the Wabasca River remained much the same as in 1964. Three new outbreaks were reported in 1965. An increase in the populations of yellow-headed spruce sawfly, Bruce spanworm, American aspen beetle and poplar serpentine miner was recorded in the District. Forest tent caterpillar populations continued to decline while larch sawfly remained at approximately the same level as in the previous year. The willow leaf miner caused moderate to severe damage in the northern part of the District.

Stalactiforme rust caused severe damage to regeneration lodgepole pine near Clear Prairie. Poplar ink spot caused severe damage to aspen foliage in many areas throughout the District. Needle rusts of conifers were present in epidemic proportions in the southern part of the Clear Hills. A permanent sample plot was established in the Clear Hills to study the effects of western gall rust on lodgepole pine.

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

Low populations of black-headed budworm were recorded in the Three Creeks, Dixonville and Hotchkiss areas and along the road to Naylor Hills Tower. Light damage to white spruce was evident in the Deadwood area and along the road to Hawk Hills Tower. Elsewhere throughout the District damage was negligible.

Spruce Budworm, Choristoneura fumiferana (Clem.)

An aerial survey of the spruce budworm outbreak along the Wabasca River was made in mid-July. Severe defoliation was recorded at the junction of the Muddy and Wabasca rivers, extending up the Muddy River for approximately 4 miles. Severe defoliation was also recorded at the junction of the Wabasca River and Senex Creek, extending up the Creek for a distance of approximately 5 miles. Moderate defoliation occurred along the Wabasca River from Township 96 to a point 1.5 miles south of its junction with the Muddy River and north of the Muddy River to within 3 miles of Senex Creek. Moderate defoliation also occurred along the Muddy River from the northeast corner of Township 98 to the middle of Township 99 and south to the height of land in Township 98, Range 11, west of the 5th meridian. Light to moderate defoliation was observed along the Wabasca River in Township 101, along Senex Creek in Township 98 and along the Mikkwa River in Townships 100 and 101.

A ground survey was conducted in the above area September 8-10, 1965. Sixty, one-tenth acre plots were set up throughout the infested area. Mortality

within these plots ranged from nil to 26 per cent with an average of 5.9 per cent. Dead tops were prevalent throughout the area.

Three new outbreaks of spruce budworm were located in the District. In the Footner Lakes Forest light damage was observed from mile 19.5 to mile 27 on the Hay Bay Trail and in Township 109, Range 21, west of the 5th meridian, 10 miles southwest of High Level. In the Peace River Forest, 12 miles south and 3.5 miles west of Keg River, light defoliation was evident in a mixed stand of white spruce and balsam fir.

American Aspen Beetle, Gonioctena americana (Schaeff.)

An increase in populations of the American aspen beetle was noted in the southern portion of the District in 1965. Defoliation of regeneration aspen occurred in the Three Creeks and Harmon Valley areas, 14 miles north of Peace River, 5.5 miles north of Eureka River, near La Crete, and along the Sulphur Lake Road.

Willow Leaf Miner, Lyonetia sp.

This willow leaf miner was again widely distributed throughout the northern part of the Peace River District. High populations were recorded in the High Level and Ft. Vermillion areas. During an aerial survey, severe damage to willow foliage was observed along creeks and muskegs in the Talbot Lake area.

In the southern part of the District a few larvae were found near Reno, 20 miles south of Peace River.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The forest tent caterpillar continued to decline and no defoliation was evident in the Peace River District in 1965. In the Watino area, where a medium hatch occurred, few larva lived beyond the second instar. Low populations were present in the Fairview-Dunvegan area.

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

The yellow-headed spruce sawfly was the most destructive insect of planted spruce in the agricultural areas of the District. Severe defoliation was recorded in the Three Creeks and Reno areas. In these areas, where previous attacks were evident, some tree mortality had occurred. In the Donnelly, Grimshaw, Fairview and Peace River areas light to moderate damage was evident.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

Engelmann spruce weevil caused severe damage in a stand of open-grown regeneration white spruce along the Hay Bay Trail, 29 miles northwest

of High Level. Ninety per cent of the trees in a one-quarter acre area were deformed as a result of previous years attacks.

Low populations were present in the Ft. Vermilion, La Crete, Three Creeks, Grimshaw and Worsley areas.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Larch sawfly was present in all tamarack stands which were surveyed in the Peace River District. In most instances populations were low and damage was confined to a few branch tips per tree, with the exception of the Harmon Valley area where defoliation of tamarack was moderate. No larch sawfly aerial survey was conducted in the District this year.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa spp.

Spruce needle rusts were common in many of the spruce stands in the southern part of the Clear Hills. They reached epidemic proportions on white spruce near Clear Hills Tower and along Running Lake road, northeast of Worsley. Both white and black spruce along the Doig Tower Road were moderately infected by needle rusts. Light damage to black spruce was evident near Last Lake, 18 miles west of Grimshaw.

Poplar Ink Spot, Ciborinia whetzellii (Seaver) Seaver

Browning of aspen foliage and early defoliation, as a result of this disease, was common in the Peace River District in 1965. Severe damage occurred along the road to Boundary Lake from 5 miles south of Clear Prairie to the junction of the Cherry Point road, a distance of 12 miles. Moderate to severe damage was observed west of Dixonville, from mile 3 to mile 15 of the Sulphur Lake Road. "Pockets" of light to moderate damage were recorded in the Three Creeks, Harmon Valley, Keg River and Hotchkiss areas and along the Chinchaga Tower Road.

Pine Needle Rust, Coleosporium asterum (Diet.) Syd.

Pine needle rust caused moderate damage to jack pine foliage in the Carcajou and Meander River areas. Light damage occurred on jack pine 12 miles west of Peace River.

Collections of pine needle rust on the alternate host, aster, were made in four different localities which constituted a new herbarium record for the Peace River District.

Western Gall Rust, Peridermium harknessii J. P. Moore

A survey of stands of Lodgepole pine near Watt Mountain Tower revealed that although there was a high incidence of galls on the mature trees they were inactive. Regeneration pine in this area was lightly infected.

The outbreak of western gall rust in Township 59, Range 12, west of the 5th meridian in the Clear Hills, was re-examined and a permanent plot was established to study the effects of the rust. In this plot, of 82 lodgepole pine checked, 73 per cent were infected by stem and branch galls.

Light damage was observed on jackpine 20 miles southwest of Worsley and in the Ft. Vermilion area.

Stalactiforme Rust, Peridermium stalactiforme, Arth. & Kern

A small stand of regeneration lodgepole pine, 4.7 miles south of Clear Prairie, was severely infected by stalactiforme rust. Cronartium coleosporioides, (D. & H.) Arth., the stage of this rust on indian paint brush and yellow rattle, was moderate to severe on these hosts in the same area. The collection of this rust on yellow rattle is a new herbarium record for the District.

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

Causal Agent	Host	Remarks
Gall aphid on conifers, <u>Adelges lariciatus</u> (Patch)	W. spruce B. spruce	Low population throughout the District.
Aspen leaf beetle, <u>Chrysomela crotchi</u> Brown	T. aspen	Light damage to foliage 9 miles west of Girouxville and 9 miles south of Berwyn.
Spruce bark beetle, <u>Dendroctonus obesus</u> (Mann.)	W. spruce	Low populations in the High Level, Tompson Landing, Keg River and Talbot Lake areas.
Eastern larch beetle, <u>Dendroctonus simplex</u> Lec.	Tamarack	Found attacking weakened tamarack in the Harmon Valley, Dixonville and Grimshaw areas.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	Willow T. aspen	Low population throughout the southern half of the District.
Pine root collar weevil, <u>Hylobius pinicola</u> (Couper)	B. spruce	Found attacking black spruce 5 miles east of Keg River.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	T. aspen Willow	Low population observed in the Watino area.
Balsam-fir sawfly, <u>Neodiprion abietis</u> (Harr.)	W. spruce	White spruce along the Hay Lakes Road supported low populations of this insect.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	W. spruce	Ornamental and shelterbelt spruce in Fairview, Girouxville and Peace River were lightly damaged. Light infestation on open grown spruce at mile 83 of the McKenzie Highway.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	A population increase was evident in the south and southwest part of the District. Damage was light.

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

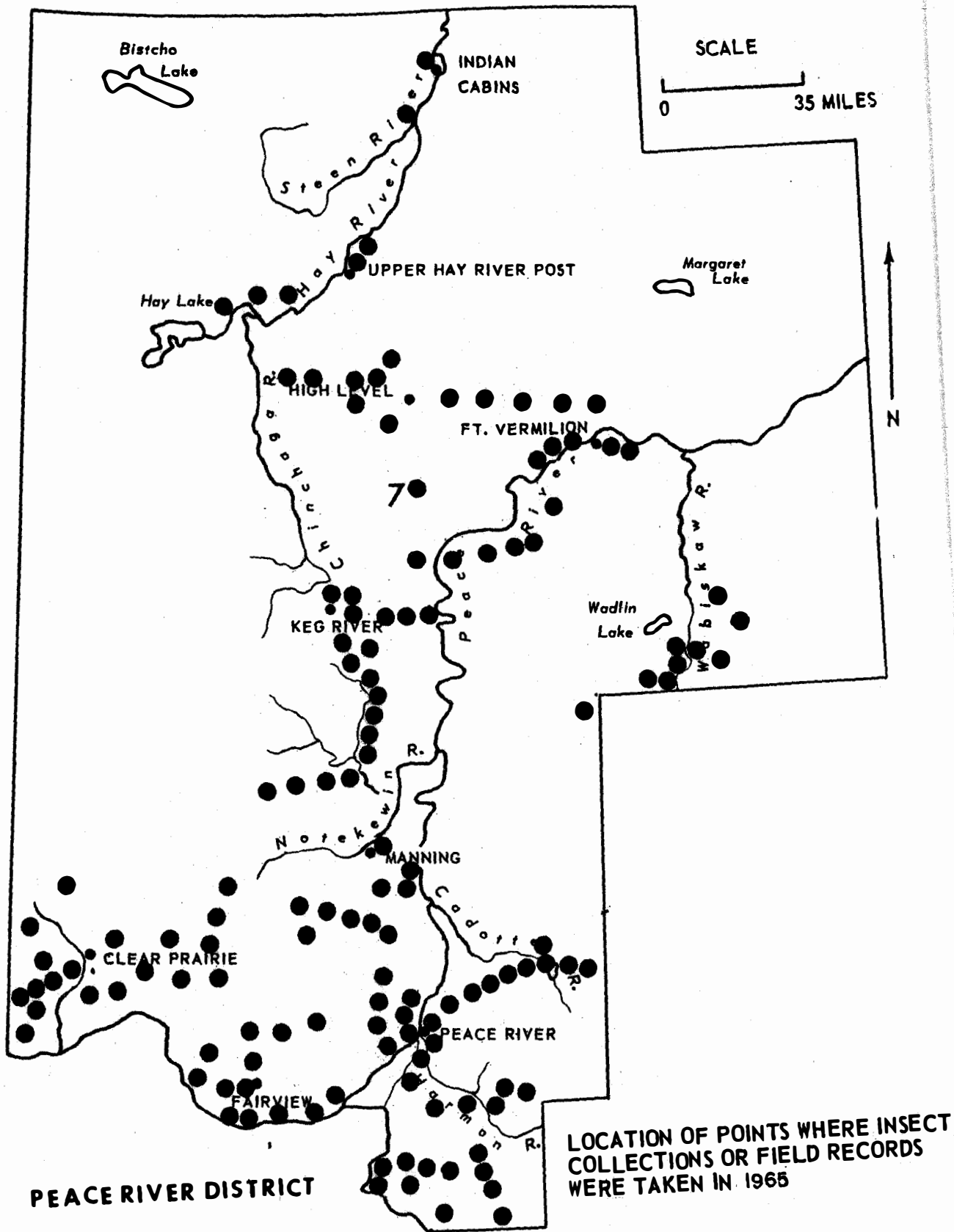
Causal Agent	Host	Remarks
Pitch nodule maker, <u>Petrova albicapitana</u> (Busck)	J. pine	Caused light damage to regeneration pine throughout the District.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	T. aspen	Moderate damage in High Level-Meander River area. Severe damage along the Hay Lakes Road.
Green-headed spruce sawfly, <u>Pikonema dimmockii</u> (Cress.)	W. spruce	Low population throughout the District.
Lodgepole terminal weevil, <u>Pissodes terminalis</u> Hopking	Lp. pine	Reproduction lodgepole pine near Running Lake in the Worsley area supported low populations of this weevil.
<u>Disease</u>		
Spruce needle cast, <u>Bifusella crepidiformis</u> Darker	B. spruce	Moderate damage 12 miles north of Eureka River.
Spruce needle rust, <u>Chrysomyxa empetri</u> (Pers.) Schroet.	B. spruce Crowberry	Light damage on the alternate host at Mile 25 Doig Tower Road.
Spruce needle rust, <u>Chrysomyxa ledicola</u> Lagerh.	W. spruce Labrador tea	Labrador tea was severely infected in the southwest part of the District.
Spruce cone rust, <u>Chrysomyxa pirolata</u> Wint.	Wintergreen	Wintergreen plants were lightly infected at Mile 25 of the Doig Tower Road.
Comandra blister rust, <u>Cronartium comandrae</u> Pk.	Lp. pine Toad flax	Damage to lodgepole pine was recorded 15 miles northeast of Worsley. Toad flax was moderately infected throughout the District.
Pine needle cast, <u>Hypodermella concolor</u> (Dearn.) Darker	Lp. pine	Light damage to foliage 21 miles south of Keg River.

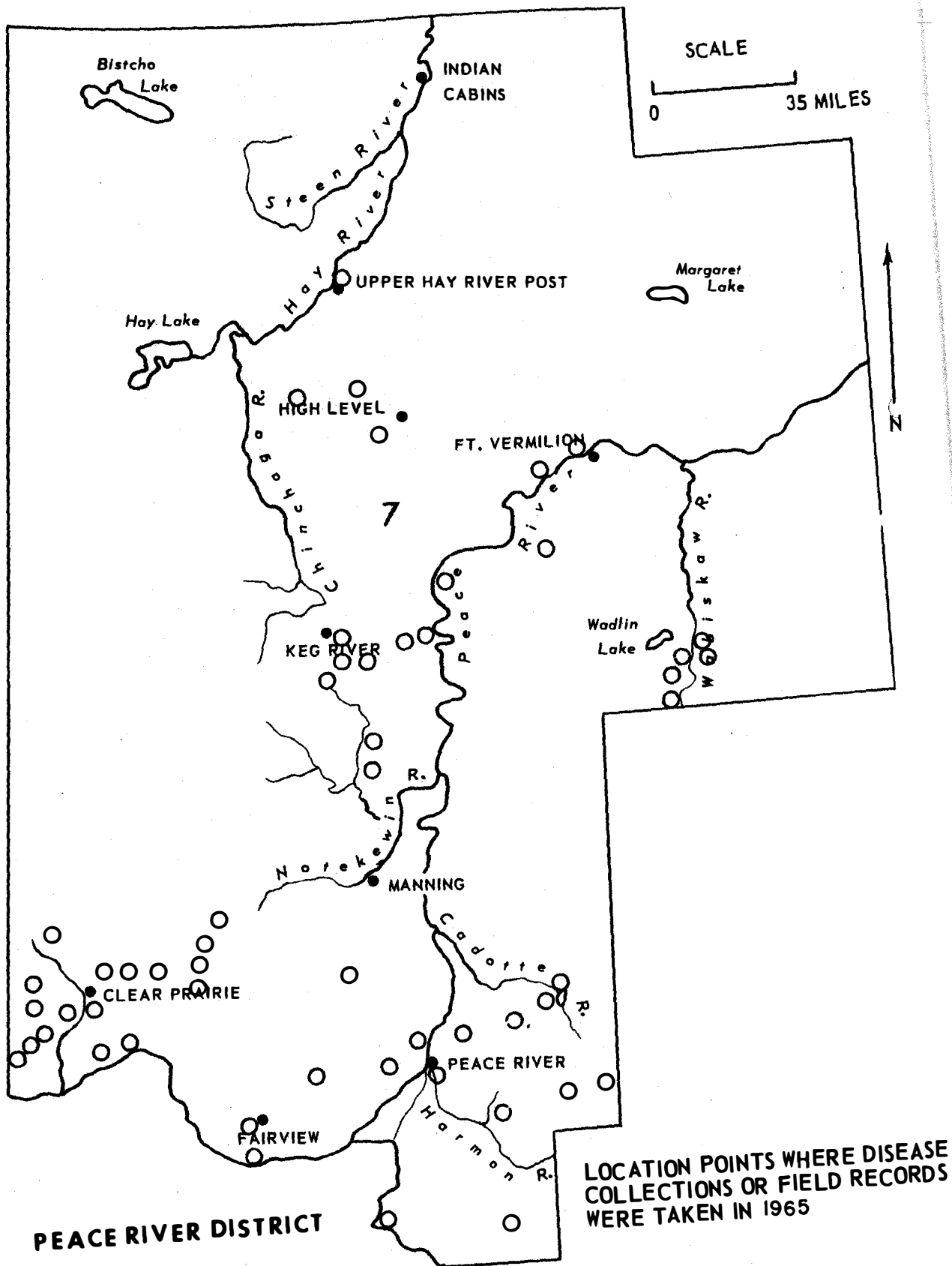
TABLE II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Fir needle cast, <u>Hypodermella nervata</u> Darker	B. fir	Light damage in the Talbot Lake area.
Poplar branch gall, <u>Macrophoma tumefaciens</u> Shear	B. poplar	Collections were made at Watino and 13 miles north of Peace River. New herbarium record for this District.
Poplar leaf spot, <u>Marssonina tremuloidis</u> (Ell. & Ev.) Kleb.	T. aspen	Small "pockets" of severe damage was noted in the McLennan, Harmon Valley, Keg River, Hotchkiss and Meander River areas.
Willow leaf rust, <u>Melampsora epitea</u> Thuem.	Willow B. fir	Common throughout the District. Collection on the alternate host, balsam fir, was a new herbarium record for this District.
Fir needle rust, <u>Pucciniastrum epilobii</u> Otth.	B. fir Fireweed	Severe damage near Clear Hills tower. A new host record for Alberta on the alternate host, fireweed <u>Epilobium glandulosum</u> Lehm.
Fir needle rust, <u>Pucciniastrum goeppertianum</u> (Kuehn) Kleb	B. fir Bog cranberry	Bog cranberry in the Clear, Hawk and Naylor hills was lightly infected by this rust. New herbarium record for the District.
Tar spot, <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Evident on foliage in the Boundary Lake area.
Snow blight, <u>Sarcotrichila balsamea</u> (J. J. Davis) Korf.	B. fir	New herbarium record for Alberta. Found near Talbot Lake.
Birch leaf spot, <u>Septoria betulicola</u> Pk.	Birch	Foliage in the Boundary Lake area was lightly infected. New herbarium record for this District.

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 1965. (See report section.)
7-3	Mile 88-97 Mackenzie Highway	<u>Peridermium stalactiforme</u> Arth. & Kern	To be re-examined in 1966.





ANNUAL DISTRICT REPORT

MACKENZIE DISTRICT

1965

by

E. J. GAUTREAU

FOREST RESEARCH LABORATORY

CALGARY, ALBERTA

DEPARTMENT OF FORESTRY

March 1966

INTRODUCTION

The outbreak of the spruce budworm in the Mackenzie District continued in 1965. The larch sawfly caused severe defoliation of small areas north of the Mackenzie River but only low populations were observed elsewhere. The poplar serpentine miner maintained outbreak proportions over a wide area west of Great Slave Lake. Infestations of the willow leaf miner, first reported in the District in 1964 increased in 1965.

Late frost in June caused moderate to severe injury to trembling aspen foliage in the Ft. Smith area and in Wood Buffalo National Park. The climatic damage known as red belt, was prevalent in the mountainous areas west of Ft. Liard. Sweet fern blister rust, a disease of pines, previously unreported from Alberta and the Northwest Territories was located near Rae. A permanent sample plot was established along the Yellowknife Highway to study the effects of Comandra blister rust in a severely infected jack pine stand.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

The extensive areas of mature white spruce that occur along the valleys of the Mackenzie, Liard, Slave, and Little Buffalo rivers, have been severely damaged by the spruce budworm. The persistent outbreak of this pest has now been in progress for at least 18 years and still shows no signs of abating. Due to successive years of severe defoliation, some mortality of white spruce has occurred throughout the infested area.

In the following paragraphs a general picture of spruce budworm activities in the Mackenzie District is given. See accompanying maps.

The infestation along the Slave River extends from Caribou Island, 25 miles south of Ft. Smith, to Nagel Channel, a distance of approximately 196 miles. Although the infestation was not continuous throughout this area, most stands are infested to some degree.

In the above area, defoliation to white spruce was light between Caribou Island and Ft. Smith, moderate in the town of Ft. Smith and between Ft. Smith and Cunningham Landing. North of Cunningham Landing to Le Grande Detour Cutting Block, only scattered pockets of defoliation were observed. Throughout Le Grande Detour Cutting Block, defoliation ranged from moderate to severe. See Table III for a brief summary of plot work conducted in this area.

In the Brûlé Point Cutting Block, defoliation was moderate to severe along the west bank of the River at the south end of the Block, and light to moderate along the east and west banks of the River near the north end of the Block. In the Wynn Cutting Block, defoliation was moderate. Near Pointe Enneyeuse a small pocket of light defoliation occurred. Dead spruce tops from previous years defoliation were also noted in this area. In the Long Island Cutting Block, defoliation ranged from moderate to severe. From approximately 6 miles north of Long Island to McConnel Island, moderate to severe defoliation was evident. Only scattered pockets of damage occurred between McConnel Island and Ring Lake and from Ring Lake to Nagel Channel. A ground check in the Nagel Channel area revealed that 50 per cent of the dominant trees had dead tops. This damage appeared to be fairly recent.

The spruce budworm infestation along the Little Buffalo River was mapped by aerial survey. The infestation commenced approximately 4 miles north of the 60th parallel and extended north along the Little Buffalo River to the Klewi River. Defoliation ranged from light to moderate with the exception of a large area of severe defoliation occurring east of the Little Buffalo River to Salt Mountain. Severe defoliation also occurred along the Little Buffalo River west of Le Grande Detour Cutting Block. Along the Nyarling River, 20 miles southwest from its confluence with the Little Buffalo River, a small pocket of moderate defoliation was detected. This indicates that the spruce budworm infestation along the Slave River in the vicinity of Long Island has spread westward.

The spruce budworm infestation along the Mackenzie River extends from the mouth of the Horn River to near the confluence of the Redstone and the Mackenzie Rivers, a distance of approximately 360 miles. Although the infestation is not continuous throughout the area, most mature spruce stands located along the banks of the Mackenzie River and its tributaries were infested to some degree. Severe defoliation occurred at the following locations: at the mouth of the Horn River and up the valley for an unknown distance, at the mouth of the Spence River and up the Valley for 10 miles, along the Rabbitskin River for 30 miles and north of the Rabbitskin River to the Horn Mountains, south of the Mackenzie River in the Ft. Simpson area, and south along the Martin River for 16 miles. Only scattered pockets of severe defoliation occurred from the confluence of the Martin River to Camsell Bend and north to the Blackwater River.

Extensive areas of moderate defoliation occurred between Morrisey Creek and Trout River, near Jean Marie Creek, from Barrens Landing to Camsell Bend, from the Martin Hills to the Mackenzie River and from the mouth of the Trail River to the Ebbutt Hills. The Willow River infestation ranged from light to moderate and extended up the Valley from its confluence with the Mackenzie River to Gunn Rapids.

The spruce budworm infestation along the Liard River Valley extended from near Ft. Simpson to 10 miles north of the Poplar River. No defoliation occurred from the Poplar River to Ft. Liard which indicated that the spruce budworm infestation previously reported in this area collapsed.

The infestation along the Hay River Valley near Enterprise continued at about the same level as reported in 1964. The infestation began near Louise Falls and extended for a distance of 16 miles along the Valley towards Hay River.

Defoliation throughout the area was light with the exception of a small pocket of moderate to severe defoliation near Enterprise.

Willow Leaf Miner, Lyonetia sp.

The willow leaf miner was first reported in the District in 1964 when populations began building up along the Slave River and in the Hay River area. In 1965 this leaf miner caused severe browning of willow foliage in the Mackenzie River Valley from Ft. Providence to Wrigley, along the Liard River Valley from Ft. Simpson to Ft. Liard, and along the South Nahanni River from Nahanni Butte to Fishtrap Creek. In the eastern half of the District, infestations of varying intensities were detected from the Northwest Territories Boundary to Enterprise, along the Slave River from Great Slave Lake to Ft. Smith, and in Wood Buffalo National Park near Peace Point and Carlson Landing.

In addition to appraisal surveys, considerable information on the life history of Lyonetia sp. in the Mackenzie District was obtained in 1965.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Infestations of the poplar serpentine miner persisted on trembling aspen and balsam poplar throughout most of the Mackenzie District. Mined leaves were found in all poplar stands, but only in the area west of Ft. Providence were these insects numerous enough to give the trees the silvery appearance characteristic of a severe infestation. The extent of the infestation was determined by ground, boat, and aerial surveys.

Moderate to severe foliage damage was observed west of Mills Lake along the Mackenzie River Valley to Ft. Norman, along the Liard River Valley from the mouth of Matou River to the Northwest Territories-Yukon Boundary, and along the South Nahanni River Valley for an unknown distance. Elsewhere in the District, light infestations occurred along the Yellowknife Highway from Rae to Ft. Providence, in the vicinity of Ft. Smith and in Wood Buffalo National Park.

Larch Sawfly, Pristiphora erichsonii Htg.

The intensity of the larch sawfly infestation that has persisted in the Mackenzie District for the past several years, continued to decline, although it was still widely distributed throughout the District. With the exception of small patches of severe defoliation of tamarack near Ft. Simpson and Jean Marie, no other noticeable defoliation was detected in the area south of the Mackenzie River and Great Slave Lake. North of the Mackenzie River this insect caused patches of moderate to severe defoliation along the Yellowknife Highway between Ft. Providence and Yellowknife. An aerial survey was made of tamarack stands west of Yellowknife to Pine Creek and north to Lac la Martre. The survey revealed that the larch sawfly caused pockets of light to moderate defoliation from Yellowknife west to Bras d'or Lake. No defoliation was detected from Bras d'or Lake west to the Yellowknife Highway. From the highway west to the Horn River defoliation

ranged from light to moderate with severe pockets. Severe defoliation occurred along the Horn River from near Fawn Lake to a point 12 miles west of the junction of Pine Creek with the Horn River and north of this area to Windflower Lake. From Windflower Lake to Lac la Martre and southeast to Yellowknife, defoliation ranged from light to moderate with severe pockets.

An aerial survey during the last week of July in the Hay River, Ft. Smith, and Wood Buffalo National Park areas, revealed that no defoliation of tamarack had occurred. Numerous landings were made throughout the area and ground checks showed only low populations of larch sawfly.

High mortality of tamarack was detected during the aerial survey in Wood Buffalo National Park from near Demicharge Rapids on the Slave River to Carlson's Landing. It was not known what caused the mortality, although it was suspected that a high water table, which had occurred in the area a few years previously, was responsible. Ground checks showed that high populations of larch sawfly had also been present in the area at approximately the same time.

High predation of larch sawfly cocoons occurred in the area north of the Mackenzie River during the winter of 1964-65. Ground checks made in the area during early June revealed that a high percentage of cocoons had been destroyed by either mice or shrews.

DISEASE CONDITIONS

Comandra Blister Rust, Cronartium comandrae Pk.

This stem rust is widely distributed throughout jack pine stands in the Mackenzie District. Some branch mortality has occurred but as yet no severe tree mortality has been detected. North of Ft. Providence a permanent sample plot was established at Mile 109.5 of the Yellowknife Highway. The purpose of the plot is to determine the rate of spread of the disease in the stand and the length of time taken before a tree is girdled by rust cankers. In the plot 722 trees were tagged and 45.8 per cent of these were infected. Tagged trees will be examined yearly.

Sweet Fern Blister Rust, Cronartium comptoniae Arth.

This disease of pines, previously unreported from the Alberta-Northwest Territories Region, was located in the Mackenzie District of the Northwest Territories in 1965. A collection of the telial stage of this rust was made on the alternate host, Myrica gale L. at Rae. The range of this rust in Canada was previously known only from Nova Scotia to Saskatchewan and along the Pacific Coast.

Frost Damage

Late frost in June resulted in severe injury to trembling aspen foliage over an extensive area. Ground and aerial surveys in Wood Buffalo National Park revealed that browning of aspen leaves was severe along the Peace Point Road from Salt River to Cherry Mountain and along the Little Buffalo River from Conibear Lake north to the Sass River. The leaves of mature aspen appeared to be the most severely affected. Only light foliage damage occurred to birch, willow, saskatoon, and balsam poplar. The foliage of conifers was not affected.

Red Belt

Adverse weather conditions during the winter of 1964-65 caused red belting of pine in small areas in the mountain regions west of the Liard River and between the La Biche and the Kotaneelee ranges. Severe red belt occurred near the headwaters of the La Biche River and in the Tlogotsho Range. Pine mortality caused by this condition in previous years was observed in the above mentioned areas.

Wind Damage

A snow storm, combined with winds of high velocities in early September of 1964, caused patchy but severe blowdown to jack pine stands in several localities. The most severe damage occurred to stands bordering the Mackenzie Highway near Enterprise and along the Pine Point Road. A damage appraisal survey near Enterprise revealed that 50 per cent of the pine were blown down and 80 per cent of the standing trees had 6 feet or more on their tops broken off. Black spruce and tamarack growing in the same area suffered only light damage.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections		Host Deciduous	Collections	
	Insect	Disease		Insect	Disease
White spruce	104	6	Willow	27	7
Tamarack	35	1	Aspen	18	5
Jack pine	8	17	Balsam poplar	6	1
Black spruce	1	7	Birch	5	5
			Alder	3	4
	148	31		59	22
				8	
				87	
			GRAND TOTAL	355	

TABLE II
OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE MACKENZIE DISTRICT, 1965

Causal Agent	Host	Remarks
<u>Insect</u>		
Gall mite, <u>Aceria neoessigi</u> (K.)	T. aspen	Populations remained low in 1965.
Black-headed budworm, <u>Acleris variana</u> (Fern.)	W. spruce B. spruce	Low populations scattered throughout the District.
Cooley spruce gall, <u>Adelges cooleyi</u> (Gill.)	W. spruce	Light infestation in the Ft. Smith area.

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

Causal Agent	Host	Remarks
Gall aphid on conifers, <u>Adelges lariciatus</u> (Patch)	W. spruce	Present in low numbers in W.B.N.P.
Spruce bark beetle, <u>Dendroctonus obesus</u> (Mann.)	W. spruce	Low numbers of these beetles present in windthrown spruce in the District.
Green rose chafer, <u>Dichelonyx backi</u> Kby.	B. poplar	Present in the Ft. Smith area.
Spruce cone worm, <u>Dioryctria renicullela</u> (Grote)	W. spruce	Found in association with spruce budworm along the Slave and Mackenzie rivers.
Zimmerman pine moth, <u>Dioryctria zimmermani</u> Art.	J. pine	Comandra blister rust cankers heavily infested with this insect near Mile 60 Yellowknife Highway.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	Willow	Low populations in the Ft. Smith area and along the Slave River.
Weevil, <u>Hylobius congener</u> Dalla Torre	W. spruce	Collected along the Slave River at Le Grande Detour.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	Saskatoon	Low populations along the Mackenzie River near Ft. Providence.
Oregon fir sawyer, <u>Monochamus oregonensis</u> (Lec.)	W. spruce J. pine	Present in large numbers around logging operation near Spence River.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	T. aspen	Low populations in aspen stands south of Ft. Smith.
Leaf roller, <u>Sciaphilla duplex</u> Wlshn.	T. aspen	Low populations near Enterprise.

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

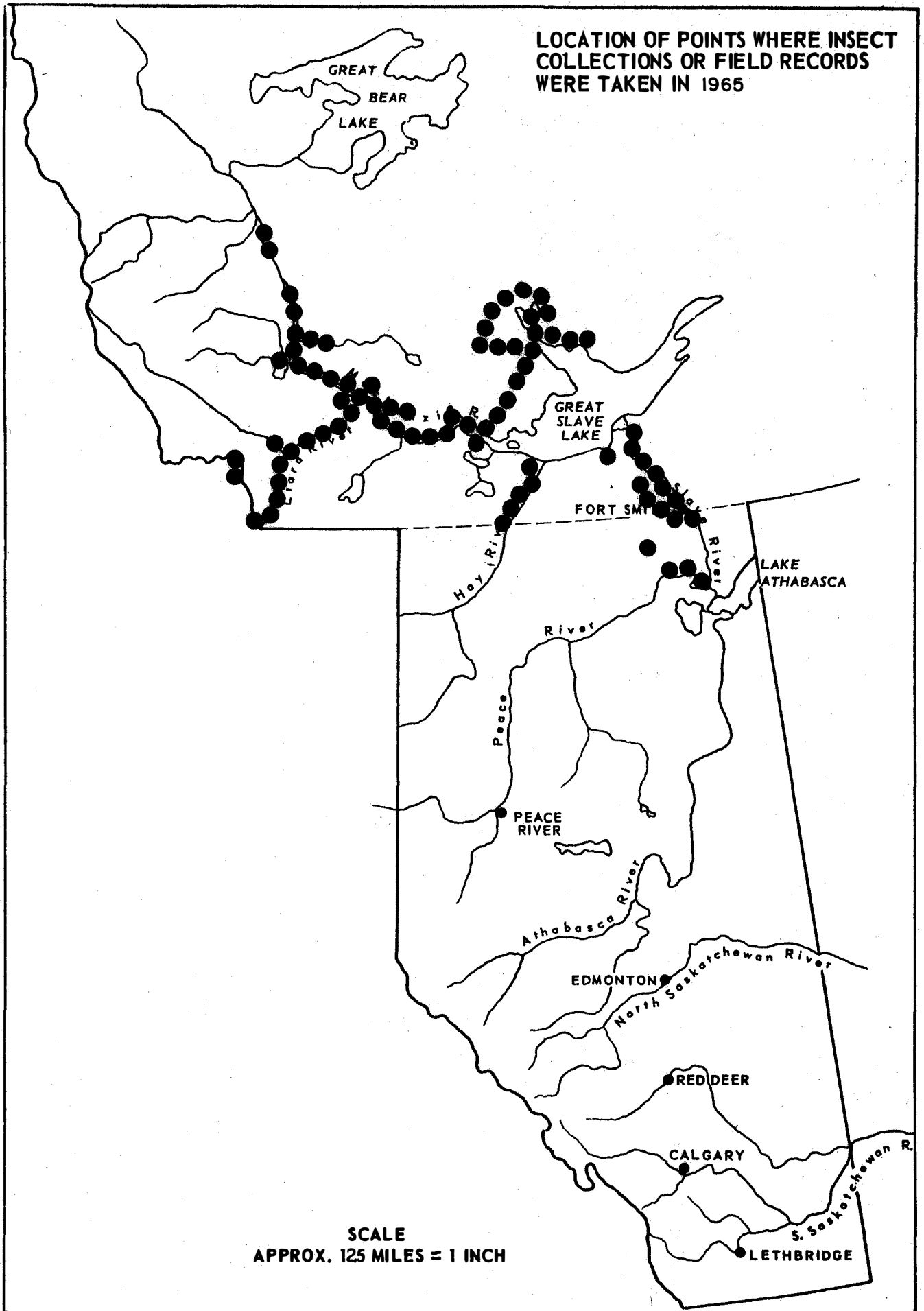
Causal Agent	Host	Remarks
<u>Disease</u>		
Yellow witch's broom of spruce, <u>Chrysomyxa arctostaphyli</u> Diet.	W. spruce B. spruce	Common in the District.
Spruce needle rust, <u>Chrysomyxa empetri</u> (Pers.) Schroet.	Crowberry	Collected at Rae, Ft. Providence and Camsell Bend.
Spruce needle rust, <u>Chrysomyxa ledi</u> de Bary	Leather leaf	Alternate host of <u>C. ledi</u> heavily infected in the District.
Spruce needle rust, <u>Chrysomyxa ledicola</u> Lagerh.	Northern Labrador tea	Collected on this host near Ft. Simpson. New herbarium host record.
Spruce needle rust, <u>Chrysomyxa</u> sp.	W. spruce B. spruce	Common in the District. Not causing serious damage.
Needle cast, <u>Lophodermium juniperinum</u> (Fries) De Notaris	Dwarf juniper Creeping juniper	Range extension northward to Yellowknife. New herb- arium host record on creep- ing juniper.
Willow leaf rust, <u>Melampsora epitea</u> Thuem.	Willow	Common throughout the District. Caused little damage.
Leaf rust, <u>Melampsorium betulinum</u> (Fr.) Kleb.	Birch	Collected on birch regeneration near Rae. Range extension northward.
Powdery mildew, <u>Phyllactinia guttata</u> (Fr.) Lev.	Alder	Caused leaf blight of alder growing along the Mackenzie River.
Tar spot, <u>Rehmiellopsis betulina</u> (Fr.) v. Arx.	Birch	Foliage of birch lightly infected near Camsell Bend and McGern Island.
Tar spot, <u>Rhytisma salicinum</u> (Pers.) Fr.	Willow	Common in the District. Caused light damage.

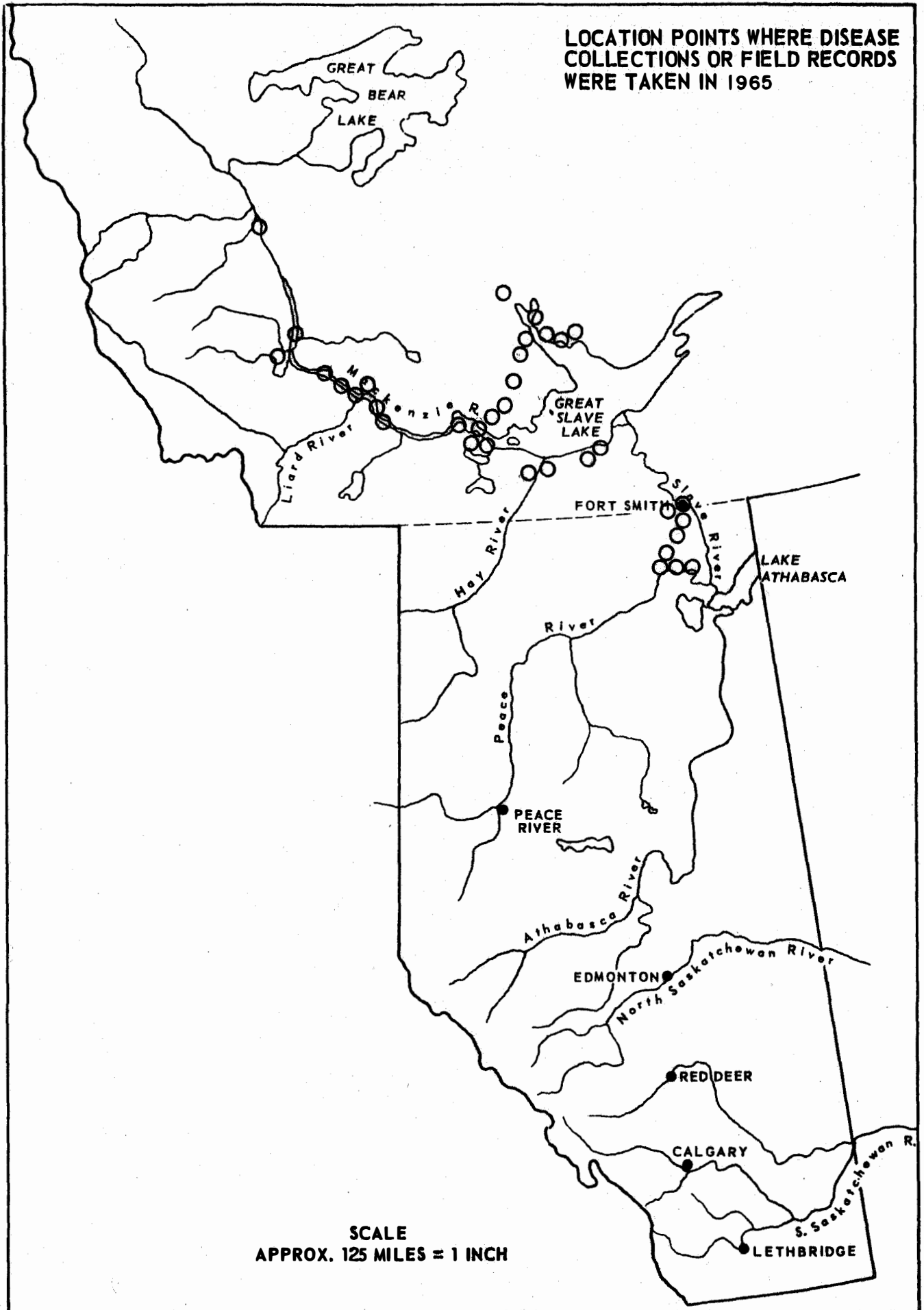
TABLE III
SUMMARY OF PLOT WORK CONDUCTED ALONG
THE SLAVE RIVER IN THE LE GRANDE DETOUR AREA, 1965

Plot Location	Per cent Mortality	Per cent Dead tops	Remarks
Mile 352-354 west bank of Slave River	17	38	This stand was severely defoliated in 1965. Trees have less than 50 per cent of foliage remaining. High mortality has resulted to regeneration.
Mile 358 east bank of Slave River	8	46	Light to moderate defoliation occurred to dominant trees and severe defoliation to regeneration.
Mile 363 north bank of Slave River	4.2	91.7	Regeneration severely defoliated. Numerous mature spruce had over 6 feet of their tops dead.
Mile 367 east bank of Slave River	2.5	100	This stand suffered severe defoliation in 1965. Budworm observed feeding on alder, rose and Saskatoon.
Mile 374 north bank of Slave River	11	20	Stand only lightly defoliated in 1965. Most trees had lots of new growth. Some have forked tops due to budworm damage in previous years.

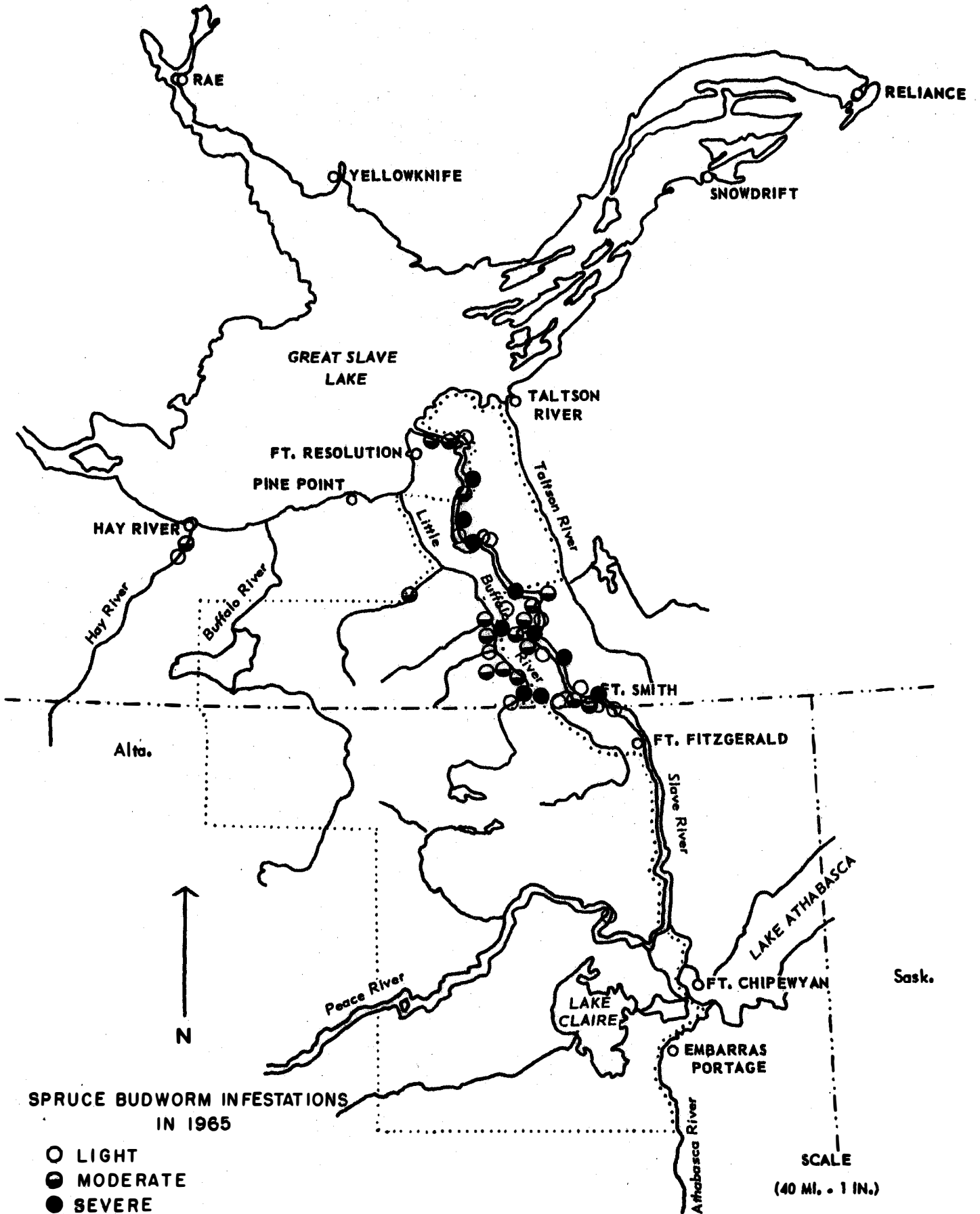
* Mileages indicated are taken from the River Chart of the Slave River - number 6302. (Mile Zero at Waterways.)

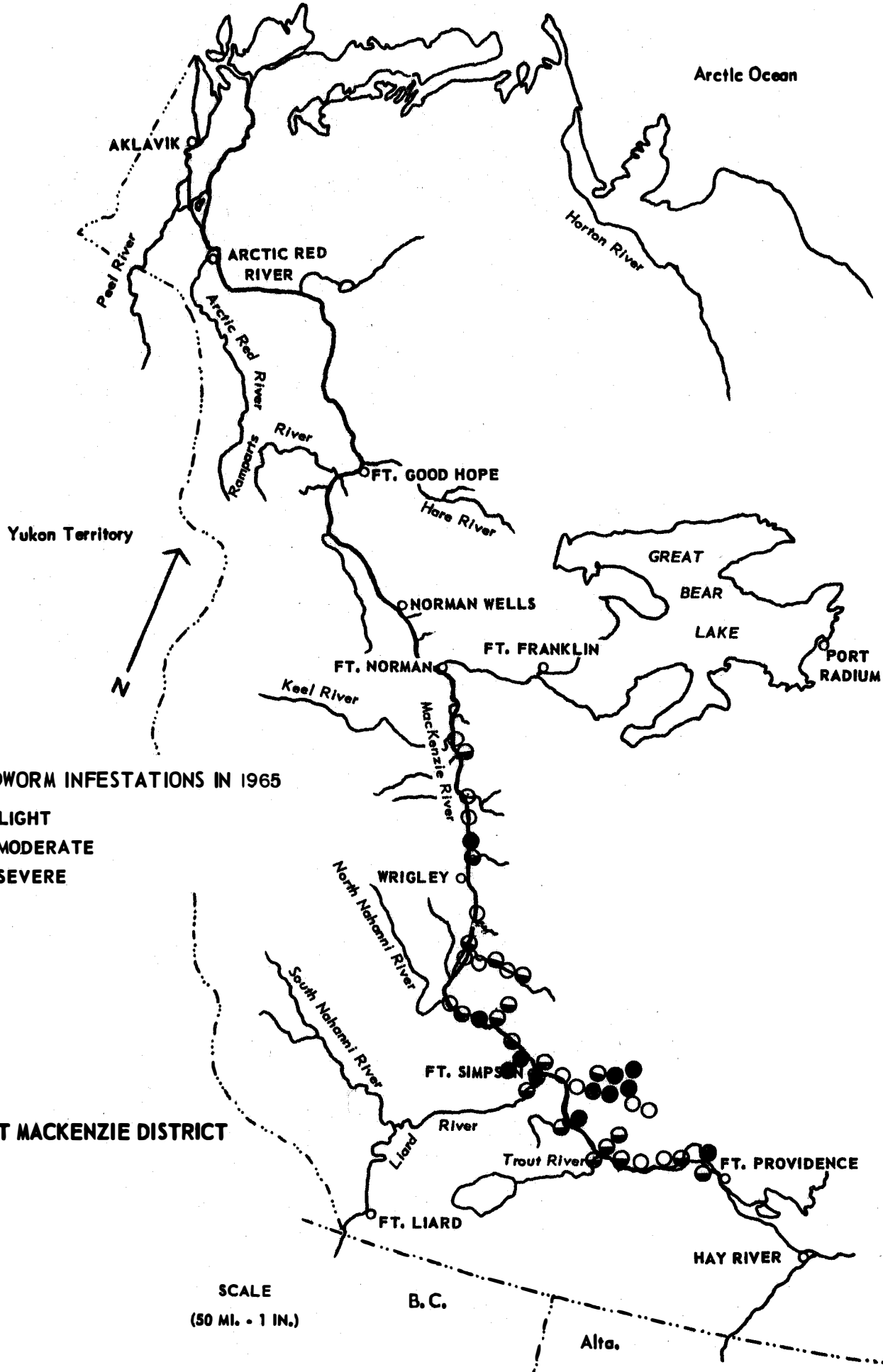
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1965





EAST MACKENZIE DISTRICT





SPRUCE BUDWORM INFESTATIONS IN 1965

- LIGHT
- ◐ MODERATE
- SEVERE

WEST MACKENZIE DISTRICT

SCALE
(50 MI. = 1 IN.)

B. C.

Alta.

INSECT CONDITIONS

<u>Aceria nebesigi</u> (K.), Gall mite	92, 105
<u>Aceria parapopuli</u> (Kiefer), Poplar bud-gall mite	56, 68
<u>Acleris variana</u> (Fern.), Black-headed budworm	38, 41, 82, 88, 105
<u>Adelges</u> spp, Gall aphid on conifers	56
<u>Adelges cooleyi</u> (Gill.), Cooley spruce gall	14, 28, 38, 41, 92, 105
<u>Adelges lariciatus</u> (Patch), Gall aphid on conifers	68, 93, 106
<u>Adelges strobilobius</u> (Kalt.), Woolly larch aphid	68
<u>Agrilus</u> sp., Poplar borer	15, 22
<u>Alsophila pometaria</u> (Harr.), Fall cankerworm	11
<u>Anoplonyx</u> sp., Sawfly	28
<u>Archips cerasivoranus</u> (Fitch), Ugly-nest caterpillar	15, 69, 82
<u>Argyrotaenia tabulana</u> Free., Pine tube maker	15
<u>Bucculatrix canadensisella</u> Chamb., Birch skeletonizer	56
<u>Caliora cerasi</u> (L.), Pear slug	56
<u>Chalcoides</u> sp., Leaf beetle	82
<u>Choristoneura conflictana</u> (Wlk.), Large aspen tortrix	15
<u>Choristoneura fumiferana</u> (Clem.), Spruce budworm	3, 28, 38, 41, 76, 88, 100
<u>Choristoneura rosaceana</u> Harr., Oblique-banded leaf roller	69
<u>Chrysomela aeneicollis</u> Schffr., Leaf Beetle	45
<u>Chrysomela crotchii</u> Brown, Aspen leaf beetle	93
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