ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
ALBERTA REGION
1963

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

March, 1964

ANNUAL DISTRICT REPORTS

ALBERTA

(Forest Insect and Disease Survey)

by

J. K. Robins, J. Petty, F. J. Emond,
V. B. Patterson, N. W. Wilkinson, G. Smith,
E. J. Gautreau, A. Machuk

INFORMATION REPORT 1963
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA
(Based on investigations carried out in 1963)

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
March, 1964

INTRODUCTION

Forest insect and disease conditions in Alberta and the District of Mackenzie were surveyed by personnel of the Forest Insect and Disease Survey from early May until early October in 1963. Highlights of the field season included the sampling and mapping of the forest tent caterpillar, larch sawfly and spruce budworm outbreaks, increased survey activities in the Northwest Territories and the acquisition of many new host and distribution records of tree diseases.

Weather for the most part favored field activities. Despite a heavy field program and a shortage of one field technician the season's objectives were largely met. In the execution of field duties, 124,000 miles were travelled by motor vehicle, 10,400 miles by air and 2,950 miles by boat; 2,160 insect and 869 disease collections were made.

The field technician assigned to the Mackenzie District, G. Kleinhout, resigned in the fall of 1962 and his position remained vacant during the 1963 field season. As a result, some district re-assignments were necessitated. E. Gautreau was transferred from the Crowsnest-Bow River District to the Peace River District replacing A. Machuk who took over the vacant Mackenzie District. J. Petty with the assistance of personnel from adjoining districts, assumed responsibility for the Crowsnest-Bow River District as well as the National Parks District. District assignments and divisional responsibilities were as follows:

Southern Division
Supervisor - J. Petty

District 1.	Crowsnest-Bow River	J. Petty
District 2.	Clearwater	F. J. Emond
District 3.	National Parks	J. Petty

Central Division
Supervisor - V. B. Patterson

District 4.	Brazeau-Athabasca	V. B. Patterson
District 5.	Lac La Biche	N. W. Wilkinson

Northern Division
Supervisor - A. Machuk

District 6.	Slave Lake-Grande Prairie	G. J. Smith
District 7.	Peace River	E. J. Gautreau
District 8.	Mackenzie	A. Machuk

SUMMARY OF INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Surveys carried out by boat and aircraft along the Mackenzie, Liard and Slave rivers revealed a considerable expansion in the outbreak of spruce budworm in the Northwest Territories. Although damage was less severe than in many previous years in the Liard Valley and in the Mackenzie Valley below Camsell Bend, moderate to severe damage was noted from Mills Lake to Camsell Bend, from the Mackenzie River to the Ebbutt Hills, up the Rabbitskin River for about 40 miles and in most white spruce stands between the Liard and Mackenzie rivers west to Sibbeston Lake. The Slave River outbreak increased in size and intensity in 1963 extending from McConnell Island to Fort Smith and west to the Little Buffalo River.

In some areas where moderate to severe defoliation has occurred for a number of years, many dead tops and considerable mortality was noted. At the mouth of the Blackwater River an estimated 65 per cent of the spruce had dead tops. On the southern portion of Long Island in the Slave River, tree mortality was estimated at between 30 and 40 per cent. Most of the trees had suffered top killing.

In Alberta, the outbreak at the junction of the Muddy and Wabiskaw rivers was less severe than in 1962. Moderate to severe defoliation of white spruce occurred over an area of about 12 square miles compared to 50 square miles in 1962. Some expansion of the small outbreak around Loon Lake was noted. In the Cypress Hills, spruce budworm populations continued to decline, light to moderate damage being confined to the valleys of Battle and Graburn creeks. In the National Parks first-year larvae of the two-year-cycle spruce budworm caused light damage in the vicinity of Saskatchewan Crossing.

A Needleminer, Evagora starki Free.

The needle miner E. starki again caused noticeable damage to a number of lodgepole pine stands in the National Parks. Favorable weather conditions during the winter of 1962-63 and an abnormally mild fall contributed to the threat of more serious damage occurring in 1964 when the present generation completes larval development. As in the previous year, the most severe damage occurred in the valley between Stony Squaw Mountain and Mount Norquay where sequential sampling revealed the presence of medium-high populations. Severe discoloration and needle drop occurred in this area. A medium-high population has also persisted on the slopes of Massive Mountain.

Medium-low populations were recorded one mile up Johnston Creek on the southeastern slope of Mount Eisenhower in Banff National Park and at Black Creek in Kootenay National Park.

Low populations were found in Banff National Park along the Bow Valley from Banff townsite to within 8 miles of Lake Louise, in Kootenay National Park at Hawk Creek and Marble Canyon and in Yoho National Park near Field.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The forest tent caterpillar outbreak occupied much the same area as in 1962 when 75,000 square miles of aspen forests in central and northern Alberta were moderately to severely defoliated. Some extension of the outbreak occurred along the southern and western fringes. This was more than offset, however, by a decline in populations in older portions of the outbreak along the Saskatchewan Border and at higher elevations throughout most of the area. The 1963 outbreak was more patchy than in the previous year, reflecting an increase in parasitism and diseases and a general decline in the vigor of the outbreak. The results of sequential sampling carried out in September indicate a continued deterioration in 1964, particularly in the older parts of the outbreak.

Larch Sawfly, Pristiphora erichsonii (Htg.)

During recent years it has been observed that the epicentre of the larch sawfly outbreak, first noted around Cold Lake in 1949, has been progressing across the Region in a northwesterly direction. This trend was again evident in 1963, when most of the moderate to severe defoliation of tamarack occurred north of the Peace River. In the wake of this movement, insect populations in the older portions of the outbreak have shown a steady decline; in 1963 very few larch sawflies could be found in some tamarack stands which had previously supported high populations. North of the Peace River, moderate to severe defoliation occurred in the majority of tamarack stands northwest to a line running through Camsell Bend and Yellowknife.

SUMMARY OF DISEASE CONDITIONS

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

A damage appraisal survey was carried out in a 73 year old stand of lodgepole pine and white spruce near Hinton, known to be infected with this disease. Thirty-one per cent of the lodgepole pine

had been killed. No evidence of damage to the younger white spruce was noted. Permanent sample plots established in an immature stand of lodgepole pine in 1959 near Robb were re-examined. A. mellea proved to be the most destructive infectious agent present in the stand.

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

A survey was carried out in a newly reported outbreak of this disease near Robb. Seventy-two per cent of the trees were infected with an average of 3 cankers per tree. A similar survey of a 70 year-old stand near Mayberne Tower north of Edson revealed a 46 per cent incidence of the disease with an average of 2 cankers per tree.

Cankers of Poplar, Cytospora chrysosperma (Pers.) Fr., and Septoria musiva Pk.

At the request of the Alberta Department of Agriculture, a survey of the disease conditions in farm shelterbelts was carried out. Of the 176 shelterbelts examined, 106 were infected with C. chrysosperma and 16 with S. musiva. These diseases were most prevalent in the unirrigated parts of the southeast quarter of the Province. Shelterbelts weakened by drought, competition with grasses and soil compaction appeared to be the most susceptible to these canker diseases.

Climatic Damage

The climatic damage to lodgepole pine known as "red belting" was prevalent in many areas in 1963. The most severe damage occurred along ridges running back from the Athabasca River from Rocky River to the Park Gates, south of Grande Prairie and in the mountain ranges west of the Liard River. Severe discoloration of lodgepole pine stands also occurred in the Clearwater Forest Division.

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE ALBERTA REGION, 1963

Causal Agent	Host	Remarks
Insect		
Poplar bud-gall mite, *Aceria parapopuli* (Kiefer)	N.W. poplar	Galls caused by this mite were again prevalent in shelterbelts in southern Alberta.
Fall cankerworm, *Alsophila pometaria* (Harr.)	M. maple	Generally low populations in southern Alberta. Moderate damage occurred in extreme southwestern Alberta.
Pine tube maker, *Argyrotaenia tabulana* Free.	J. pine	The outbreak of these insects reported in northeastern Alberta in 1962 collapsed in 1963. Moderate damage was reported along the Yellowknife Highway.
Spruce bark beetle, *Dendroctonus obesus* (Mannh.)	W. spruce	Preliminary observations indicate that the outbreak of these beetles around Big Island in Wood Buffalo National Park covers about 50 square miles with tree mortality averaging about 5 per cent.
A needle miner, *Evagora biopes* Free.	Lp. pine	Caused considerable discoloration of pine foliage along the Graburn Road in the Cypress Hills.
Grey willow leaf beetle, *Galerucella decora* Say	Willow	Caused moderate to severe damage along the foothills from the Highwood River to Grande Prairie and in a triangle formed by Innisfree, Vermilion and Lac La Biche.

Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Insect		
Spruce spider mite, *Oligonychus ununguis* (Jac.)	W. spruce	Caused light to moderate injury to planted spruce in many areas in Peace River region and at Ft. Smith; elsewhere damage was light.
Poplar serpentine miner, *Phyllocnistis populiella* Cham.	T. aspen	High populations found along the Mackenzie River from Ft. Providence to Norman Wells and in scattered locations along the foothills.
Yellow-headed spruce sawfly, *Pikonema alaskensis* (Roh.)	W. spruce	Populations were light over most of Alberta with increases at some localities in central Alberta. Light to moderate defoliation of native spruce occurred at scattered points in the Northwest Territories.
Disease		
Needle rusts, *Chrysomyxa ledi* de Bary *Chrysomyxa ledicola* Laegerh.	W. spruce	Caused light damage at scattered locations throughout Alberta and the Northwest Territories.
Pine needle rust, *Coleosporium asterum* (Diet.) Syd.	Lp. pine	Caused severe damage to pine foliage at 3 locations; in the Kananaskis Valley, 15 miles northeast of Sturgeon Lake and 24 miles south of Goodwin.
White pine blister rust, *Cronartium ribicola* J. C. Fischer	W.B. pine	A collection of this stem rust near Geraldine Lake in Jasper National Park extended the known range of this organism about 180 miles northward.

Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Disease		
Western gall rust, Peridermium harknessii J. P. Moore	Lp. pine	Heavy infections found on mature pine in the vicinities of Notekewin Tower and Watt Mountain Tower.
Stalactiforme rust, Peridermium stalactiforme A. & K.	Lp. pine	A new outbreak of this rust about 1.5 square miles in extent was reported near Saskatchewan Crossing in Banff National Park.

SPECIAL SURVEY ACTIVITIES

In addition to general sampling and detection surveys, the following special surveys, sampling procedures and co-operative activities were carried out:

(1) The severity of the larch sawfly outbreak was determined at 29 locations using a sequential sampling technique based on the utilization of oviposition sites.

(2) Defoliation of aspen by the forest tent caterpillar predicted for 1964 was estimated at 61 locations using a 3 category sequential sampling procedure based on egg masses. The accuracy of the predictions for 1963 were checked by defoliation estimates made at all sampling stations.

(3) The study of the effects of early spring weather on the development of the forest tent caterpillar was continued in 1963. Weather stations were established at Grovedale, Peace River and Lac La Biche. Weather records were taken and larval behavior was recorded during the larval hatching period.

(4) The phenology of lodgepole and jack pine was recorded at 39 locations throughout Alberta and the Northwest Territories.

(5) Observations on the phenology of dwarf mistletoe on lodgepole pine were made at 5 locations.

(6) Field personnel assisted the Forest Research Branch in a study of spruce seed production. Plots in central and southern Alberta were examined. Cone crops were estimated and seed traps were serviced.

(7) Research workers in other laboratories were assisted by collections of 9 species of insects, and one disease organism. Special emphasis was placed on the collection of 18 species or groups of insects and 13 disease organisms for special studies or distribution records.

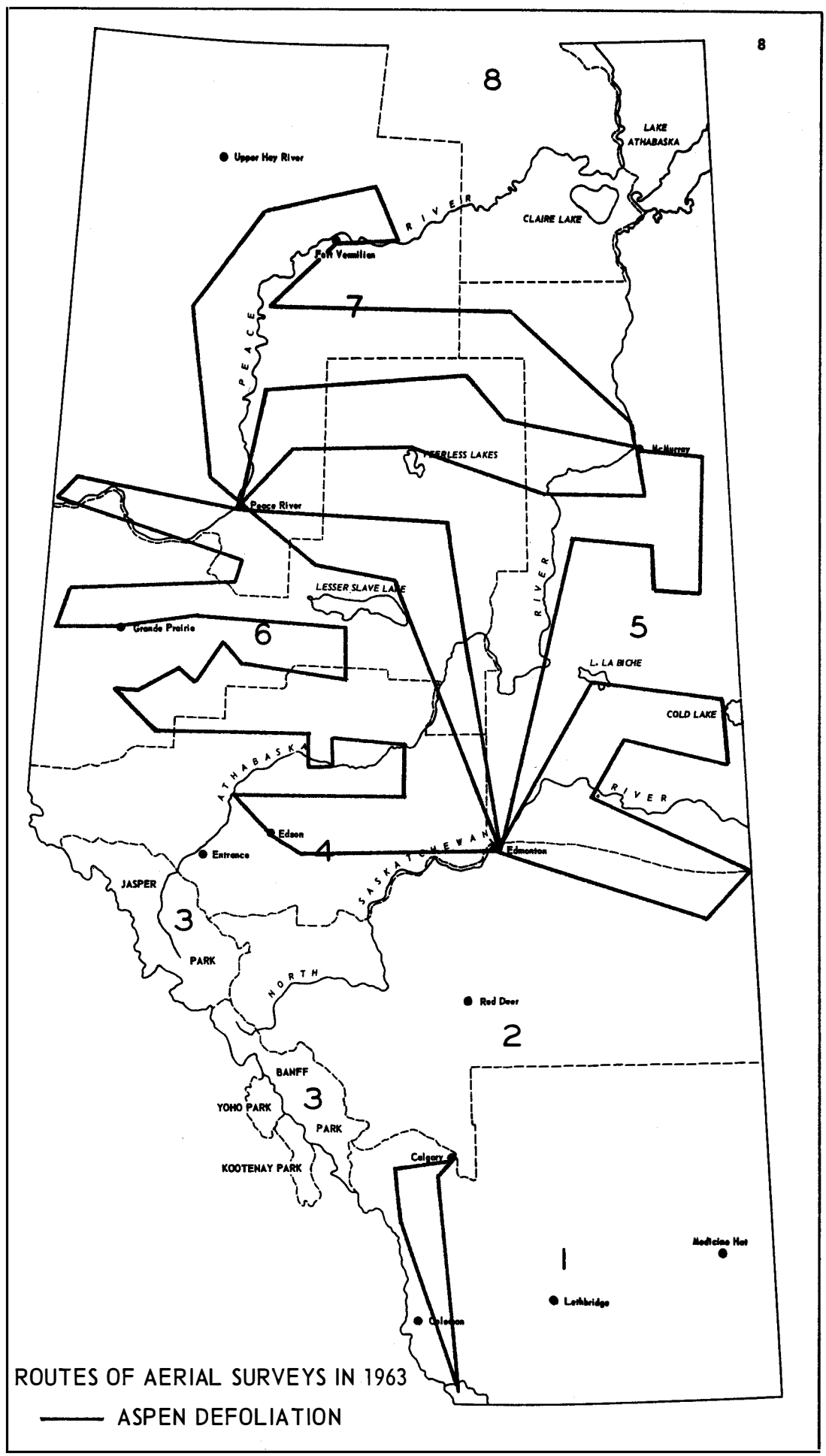
ACKNOWLEDGMENTS

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

SUMMARY OF AERIAL SURVEYS 1963

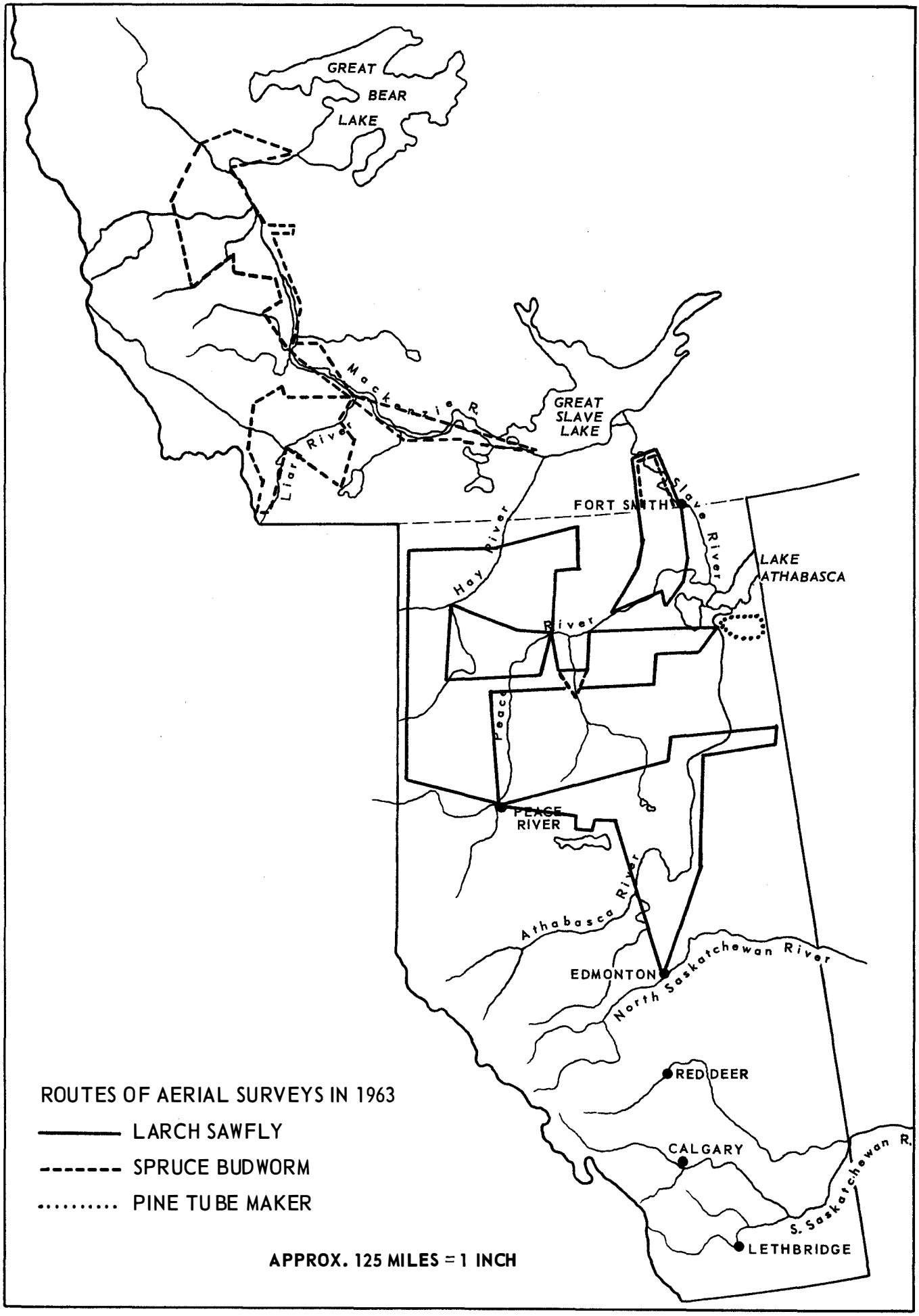
PURPOSE	DISTRICT	DATE	AIRCRAFT	COST PER HOUR	TOTAL HOURS	TOTAL COST
Forest tent caterpillar	Lac La Biche	June 4	Courier	*	3:00	*
Forest tent caterpillar	Clearwater, Brazeau-Athabasca, Lac La Biche, Grande Prairie, Peace River	June 20-24	Cessna 172	30.00	19:40	611.60**
Forest tent caterpillar	Lac La Biche, Grande Prairie, Peace River	June 20-24	Cessna 180 (Floats)	55.00	19:05	1,094.58**
Aspen defoliators	Crowsnest-Bow River	June 24	Cessna 180	30.00	2:30	75.00
Spruce budworm	Mackenzie District	July 9-13	Cessna 180 (Floats)	55.00	20:00	1,137.60**
Larch sawfly Bark beetles	Mackenzie District	August 15	Cessna 180 (Floats)	54.00	5:00	270.00
Larch sawfly Pine tube maker	Lac La Biche, Grande Prairie, Peace River	August 23-28	Cessna 172	30.00	26:30	820.45**
Bark beetles	Brazeau-Athabasca	Sept. 6	Bell Ranger	*	2:00	*
			TOTALS		97:45	4,009.23

* Cost borne by Alberta Forest Service
** Pilots expenses included



ROUTES OF AERIAL SURVEYS IN 1963

—— ASPEN DEFOLIATION


GREAT
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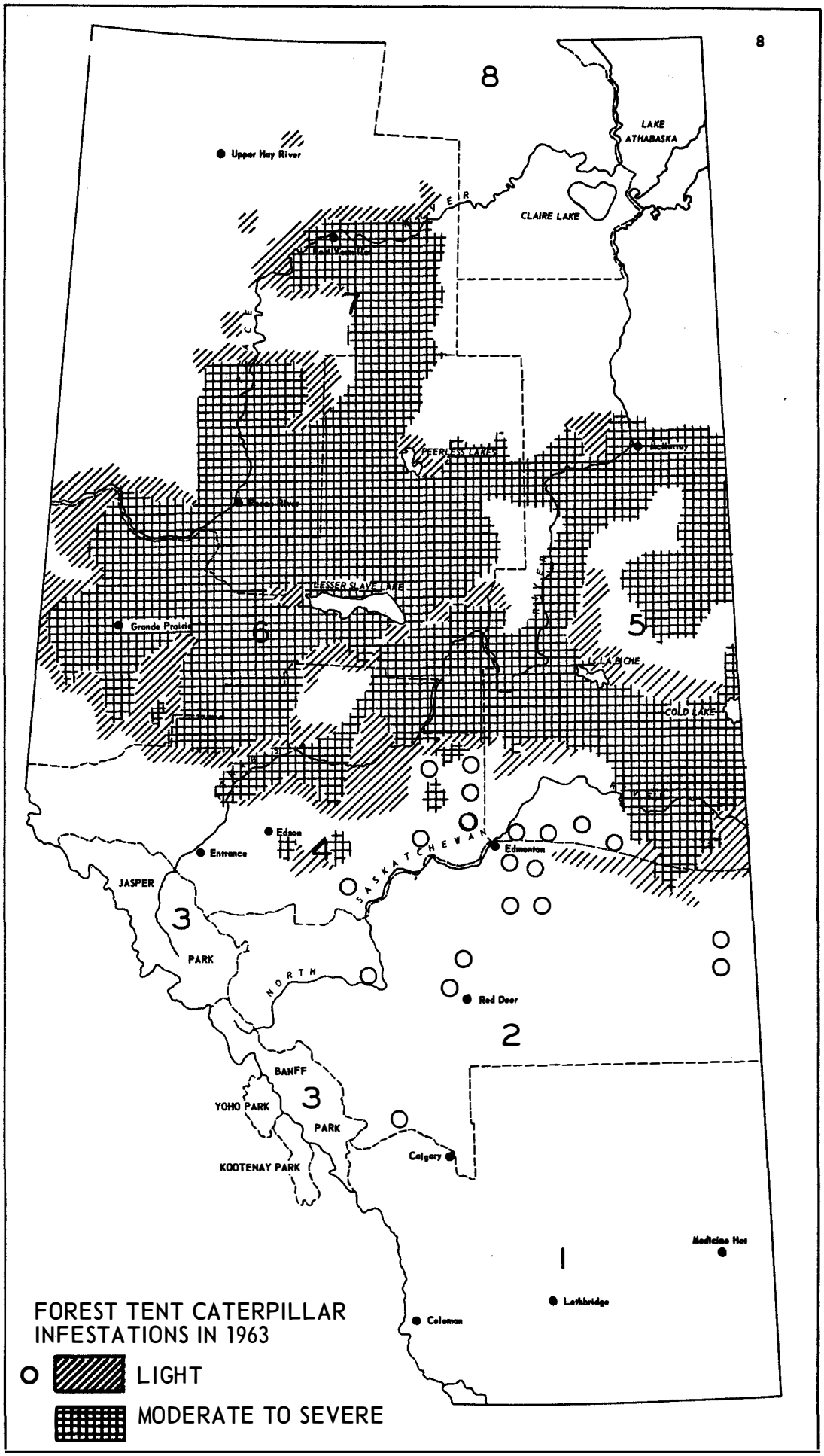
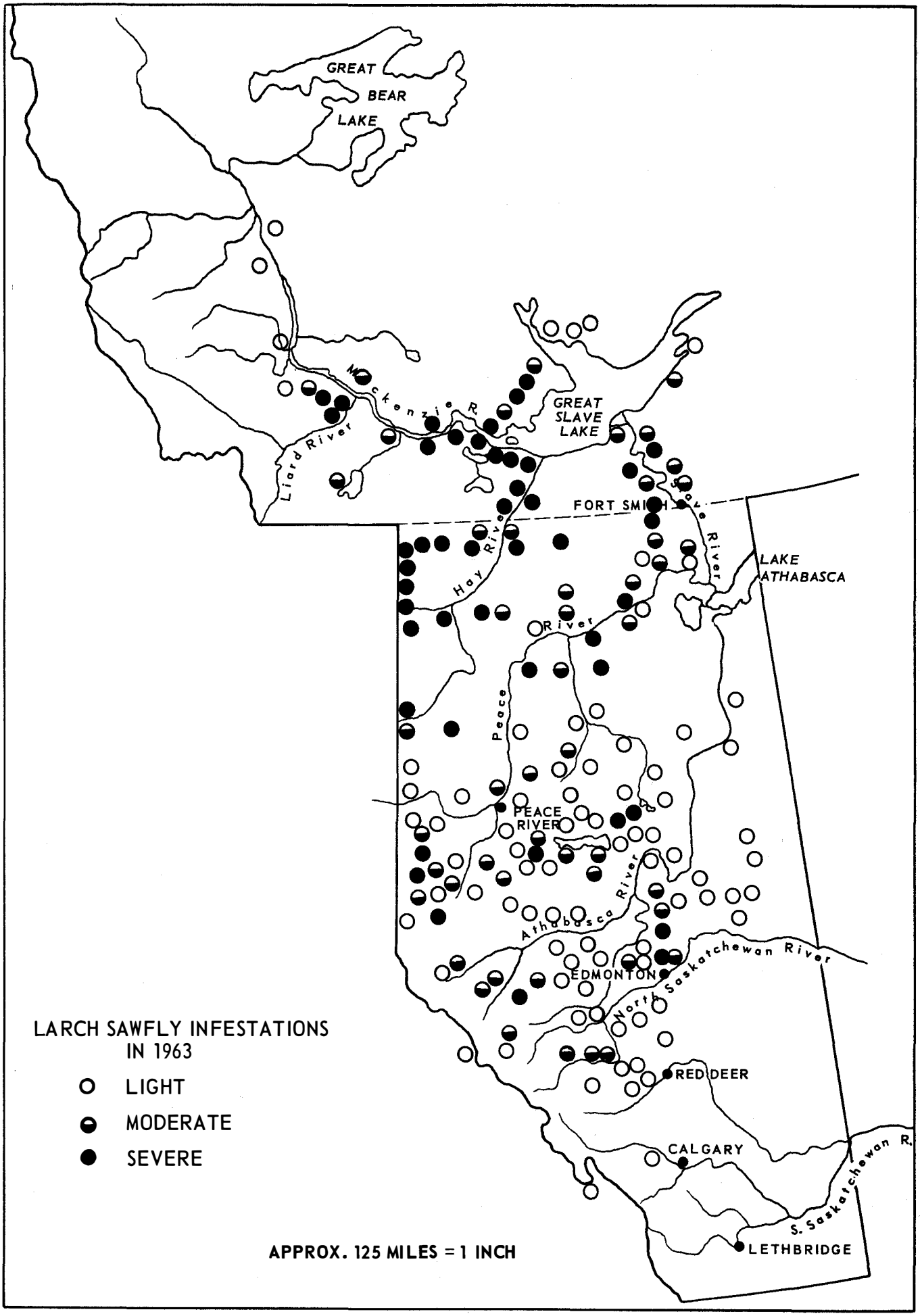
LAKE
Mackenzie R.
Liard River
GREAT
SLAVE
LAKE
FORT SMITH
Slave River
Hay River
LAKE
ATHABASCA
River
Peace
PEACE
RIVER
Athabasca River
EDMONTON
North Saskatchewan River
RED DEER
CALGARY
S. Saskatchewan R.
LETHBRIDGE
ROUTES OF AERIAL SURVEYS IN 1963
LARCH SAWFLY
SPRUCE BUDWORM
PINE TUBE MAKER
APPROX. 125 MILES = 1 INCH


8
LAKE ATHABASKA
Upper Hay River
CLAIRE LAKE
7
PEERLESS LAKES
McMurray
LESSER SLAVE LAKE
Grande Prairie
6
5
LA BICHE
COLD LAKE
Edson
Entrance
4
Edmonton
SASKATCHEWAN
JASPER
3
PARK
NORTH
Red Deer
2
BANFF
3
YOHO PARK
PARK
KOOTENAY PARK
Calgary
Medicine Hat
1
Lethbridge
Coleman
FOREST TENT CATERPILLAR
INFESTATIONS IN 1963
LIGHT
MODERATE TO SEVERE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LARCH SAWFLY INFESTATIONS
IN 1963
LIGHT
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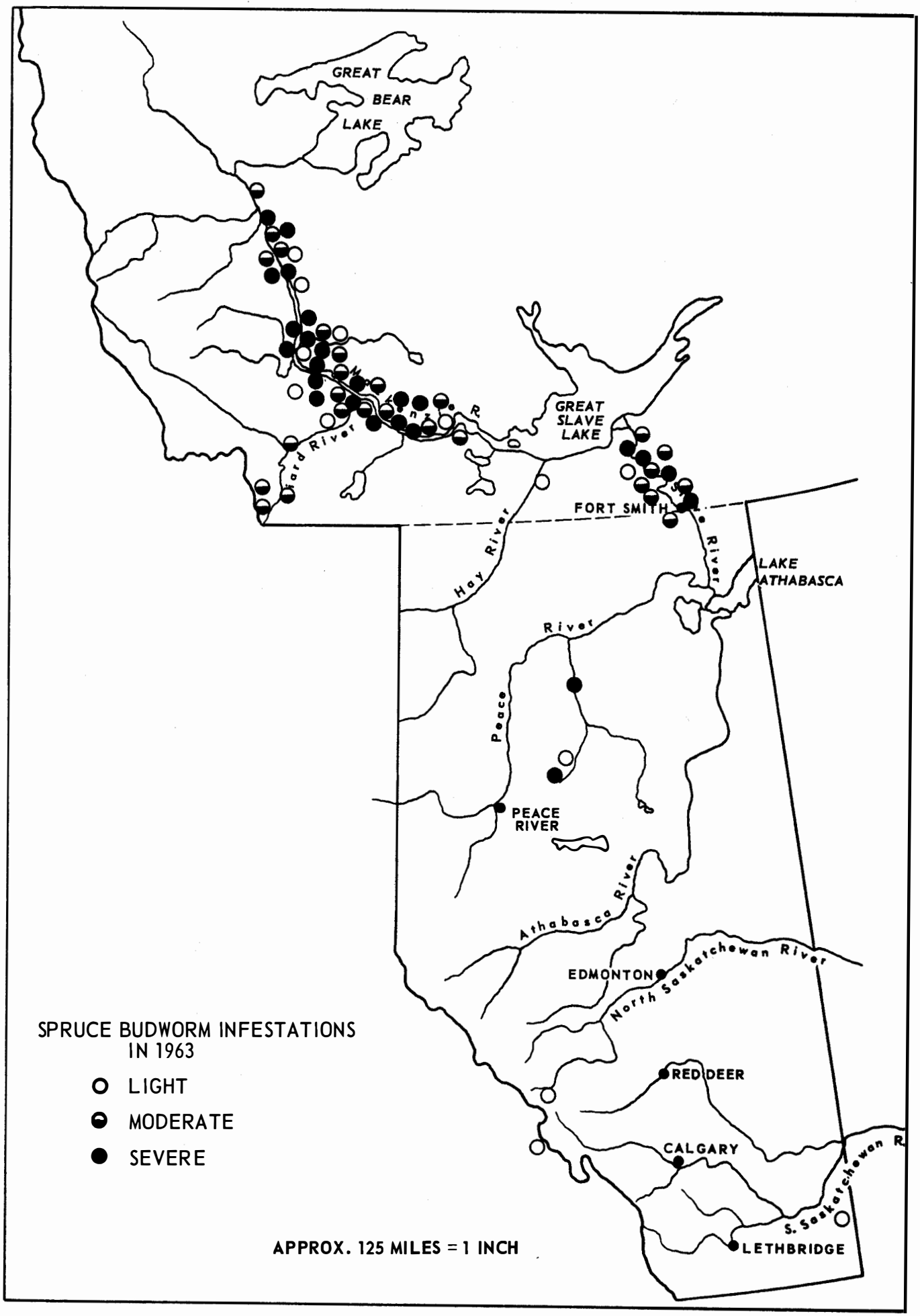
SEVERE
APPROX. 125 MILES = 1 INCH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FORT SMITH
Hay River
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ATHABASCA
River
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PEACE
RIVER
Athabasca River
EDMONTON
North Saskatchewan River
RED DEER
CALGARY
S. Saskatchewan R.
LETHBRIDGE
SPRUCE BUDWORM INFESTATIONS
IN 1963
LIGHT
MODERATE
SEVERE
APPROX. 125 MILES = 1 INCH

ANNUAL DISTRICT REPORT

CROWSNEST BOW-RIVER DISTRICT

ALBERTA 1963

by

J. PETTY

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

The 1963 season was one in which notable injury to shelterbelts in the agricultural areas occurred as a result of drought conditions during the winter and early spring. Populations of fall cankerworm declined but moderate injury in some shelterbelts was evident. The poplar bud-gall mite continued to cause concern to the owners of poplar shelterbelts. Medium populations of grey willow leaf beetle adults were present in many shelterbelts in the early part of the season. The larvae were responsible for moderate to severe defoliation of willow in the northwest part of the District later in the year.

In Cypress Hills Provincial Park a decline in spruce budworm populations was noted and medium populations of a needle miner caused discoloration in stands of lodgepole pine. Many red topped Douglas fir trees, the result of an infestation of the Douglas-fir beetle, were seen along the west slopes of the Porcupine Hills.

There were no new disease outbreaks recorded in 1963. Cytospora canker has become established in many shelterbelts resulting in the death of many branches and in some instances, the tops of the trees. There is evidence that Stalactiforme rust has become established in stands of regeneration lodgepole pine along the Kananaskis Trunk Road. Light infections of pine needle rust were found along Ribbon Creek and in Marmot Creek Basin.

INSECT CONDITIONS

Poplar Bud-gall Mite, Aceria parapopuli (Kiefer)

This gall mite continued to cause concern to owners of poplar shelterbelts in the District. In shelterbelts where severe infestations were present the amount of foliage produced by the trees in 1963 was light. At 2 locations where northwest poplar and Russian poplar were growing in close proximity to one another, it was noted that the northwest poplar was heavily infested and the foliage sparse, while on the Russian poplar there were no galls seen and a normal complement of foliage was present.

Cooley Spruce Gall, Adelges cooleyi (Gill.)

Light infestations of Cooley spruce galls were found in all areas of the Crowsnest-Bow River District. Comparing the number of new galls found to the number of old galls present on the trees, the infestations were much lighter than in previous years. The form of this gall on Douglas fir was light on that host in Waterton Lakes National Park and through the Crowsnest Pass between Hillcrest and the Alberta-British Columbia Border.

In Medicine Hat the "monomorphic cycle" was found to be common on white spruce.

Fall Cankerworm, Alsophila pometaria (Harr.)

Populations of fall cankerworm were generally low throughout the agricultural part of the District. Moderate infestations were found on shelterbelts between Taber and Barnwell, at Winnifred, Wrentham and east of Milk River. A severe infestation was reported southeast of Granum. In many areas of southern Alberta, shelterbelts have deteriorated as a result of defoliation by fall cankerworm and drought over the past few years. This has resulted in many dead branches and sparse foliage.

Large Aspen Tortrix, Choristoneura conflictana (Wlk.)

An increase in populations of the large aspen tortrix was noted in 1963. In Cypress Hills Provincial Park larvae of this species were found in association with other leaf rollers of aspen but not in large enough numbers to cause an appreciable amount of defoliation. Light damage to aspen poplar was found throughout the Porcupine Hills, particularly in the Dry Coulee Watershed and, south and west of the Porcupine Ranger Station.

Spruce Budworm, Choristoneura fumiferana (Clem.)

The infestation of spruce budworm in the Cypress Hills Provincial Park appears to be on the decline. Moderate defoliation of the current year's foliage was evident along Graburn Creek and near Graburn Cabin on Battle Creek. Light defoliation persisted in the stands of spruce along the Alberta-Saskatchewan Border. The spruce coneworm, Dioryctria reniculella (Grote), was found in association with the spruce budworm. Collections from Graburn Creek contained 48.5 per cent spruce coneworm, 37 per cent spruce budworm and 14.5 per cent other defoliators, while from Battle Creek the percentages were, spruce budworm 72.7, spruce coneworm 13.5 and other defoliators 13.8.

A Leaf Tier, Compsolechia niveopulvella Cham.

Stands of aspen poplar throughout the western part of the District and in the Cypress Hills supported low populations of this leaf tier. A moderate infestation was noted south and west of Calgary city limits for a distance of 10 miles. Elsewhere in the District it caused light damage.

Douglas-fir Beetle, Dendroctonus pseudotsugae Hopk.

On the aerial survey of the District it was noted that there were numerous red topped Douglas fir trees throughout the southern portion of the Porcupine Hills. Investigations revealed that the large number of red topped trees which were evident in a small valley immediately south of Damon Creek were caused by Douglas-fir beetle. Other areas where individual trees or small groups of trees which were infested were: Playle Creek, North Creek, and in the valleys leading into Sharples Creek.

A Needle Miner, Evagora biopes Free.

An infestation of this species of needle miner was present in stands of lodgepole pine in the eastern part of Cypress Hills Provincial Park. In an area along Graburn Road, 6 miles east of Highway 48, the pine stands had taken on a yellow color as a result of many mined needles. Light damage was observed east of this area to the Saskatchewan Boundary and north to Battle Creek.

Sequential sampling was done at 3 locations in the fall. These were one-half mile south of Graburn Cabin, 2 miles south of Graburn Cabin and along Graburn Road 6 miles east of Highway 48. Light infestations were recorded at the first 2 locations mentioned and at the latter it was medium-low.

Grey Willow Leaf Beetle, Galerucella decora Say

Adults of the grey willow leaf beetle were present in many shelterbelts of the agricultural part of the District in the early summer. Generally, the infestations were light but moderate defoliation of hybrid poplars occurred at Lomond, Nobleford, Wrentham and Winnifred and to narrow leaf cottonwood along Willow Creek 7 miles south of Granum. Moderate to severe defoliation of native willows was observed between the Highwood and Bow rivers west of Highway 2 for a distance of 25 miles. Light infestations were noted on willow at Sibbald Flats and in the Marmot Creek Basin.

American Aspen Beetle, Gonioctena americana (Schaeff.)

The American aspen beetle caused moderate defoliation of willow in the Dry Coulee Watershed area of the Porcupine Hills, and of aspen poplar along the road to Red Rock Canyon in Waterton Lakes National Park. Light infestations were present in the Cypress Hills, the Porcupine Hills and the southwest part of the District from Waterton Lakes National Park north to the Highwood River.

Forest Tent Caterpillar, Malacosoma disstria Hbn., Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.), Western Tent Caterpillar, Malacosoma pluviale (Dyar)

The forest tent caterpillar was found only at Vauxhall where light damage to Russian poplar was noted.

Tents of the prairie tent caterpillar were found in the southern part of the District, between Medicine Hat and Ft. Macleod, where light damage to wild rose and chokecherry occurred.

The western tent caterpillar was responsible for moderate defoliation of wild rose in the Hussar, Wayne and Hanna areas. With the exception of the above areas and one collection made near Whitlaw, this species was confined mainly to the southwestern part of the District. Birch, poplars, Saskatoon, rose and alder in Waterton Lakes National Park sustained light injury, and rose, willow and gooseberry in the Crowsnest Pass and along the Trunk Road near Wilkinson Summit supported low populations.

Pine Needle Scale, Phenacaspis pinifoliae (Fitch)

Infestations of pine needle scale on lodgepole pine were present at several locations in the Crowsnest Pass. In an area one mile southeast of Hillcrest along the Adanac Road, severe infestations were found on regeneration lodgepole pine but on the pole size trees the infestation was light. Another area where regeneration pine were severely infested was one-half mile south of Coleman. A light infestation was present near Island Lake, and limber pine 4 miles east of Burmis supported low populations. The twice-stabbed lady beetle, a predator, was collected from these areas.

A light infestation of pine needle scale was present on lodgepole pine throughout Cypress Hills Provincial Park.

DISEASE CONDITIONS

Comandra Blister Rust, Cronartium comandrae Pk.

One collection of this rust on the secondary host, Comandra pallida, was submitted from the Kananaskis Forest Experiment Station at Seebe. A very light infection on lodgepole pine was evident in the area.

White Pine Blister Rust, Cronartium ribicola J. C. Fischer

No extensive surveying was carried out in 1963 for this rust, although damage was noted throughout the southwestern part of the District. Collections were made from limber pine in the Porcupine Hills and 9 miles north of Burmis, and from white bark pine 3.5 miles north of Lynx Creek Ranger Station. It was also collected on the secondary host, Grossularia sp. along the Ptolemy Creek Road. In many areas rodents had chewed out the rust cankers on the primary hosts.

Cytospora Canker, Cytospora chrysosperma (Pers.) Fr.

Many shelterbelts in the agricultural part of the District have been weakened by drought and winter drying in the past few years. Cytospora has become established in these weakened trees and has resulted in mortality of many branches and, in some areas, the tops of the trees. Northwest poplar, Russian poplar and some willow have been affected.

Cronartium coleosporoides Arth. (Uredial and Telial Stage of Peridermium harknessii J. P. Moore and Peridermium stalactiforme A. & K.)

Collections of this rust from Indian paint brush were made one mile west of the Castle River Ranger Station and 64 miles north of Coleman along the Kananaskis Trunk Road. In both areas it was too late in the season to collect the rust from the lodgepole pine which was present. Rodent damage was evident on the pine and some mortality had occurred indicating the presence of P. stalactiforme.

Poplar Ink Spot, Sclerotium sp.

Aspen in 2 areas in the Crowsnest Pass were infected by poplar ink spot. A small area of severe infection was noted 1.3 miles up Ptolemy Creek Road. Infected leaves were collected from this area

in an attempt to obtain overwintering spores for identification purposes. The other area was 6 miles north of Burmis, where a light infection was present.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	16	1	Trembling aspen	31	7
Engelman spruce	11	0	Balsam poplar	2	0
Miscellaneous spruce	4	0	Northwest poplar	21	7
			Russian poplar	8	1
Lodgepole pine	20	2	Miscellaneous poplar	6	0
Limber pine	6	3			
Miscellaneous pine	1	1	Willow	20	4
Douglas fir	2	1	Manitoba maple	31	1
Alpine fir	5	0			
			Green ash	4	0
Alpine larch	1	0			
Miscellaneous larch	3	0	Elm	7	0
			Birch	1	0
	69	8		131	20
Insect collections from miscellaneous hosts					11
Disease collections from miscellaneous hosts					5
			GRAND TOTAL		244

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE CROSNEST-BOW RIVER DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Ugly-nest caterpillar, *Archips cerasivoranus* (Fitch)	Chokecherry	Light infestations in Crowsnest Pass and Waterton Lakes National Park.
A leaf beetle, *Calligrapha verrucosa* Suffr.	Willow	Light defoliation north of Hilda and along Bow River southwest of Hays.
Twice-stabbed lady beetle, *Chilocorus stigma* (Say)	Pine needle scale	Found in infestations of pine needle scale in Crowsnest Pass area.
A pine budworm, *Choristoneura lambertiana* Busck	L. pine	Light damage in a small area 4 miles east of Burmis.
Balsam-fir sawfly, *Neodiprion abietis* (Harr.)	E. spruce A. fir	Several colonies caused light defoliation to small trees in Waterton Lakes National Park.
Spruce spider mite, *Oligonychus ununguis* (Jac.)	W. spruce	Moderate infestation in Medicine Hat. Light infestation near Foremost.
Poplar serpentine miner, *Phyllocnistis populiella* Cham.	T. aspen	Caused light damage in all aspen stands in foothills and Cypress Hills.
Engelman spruce weevil, *Pissodes engelmanni* Hopk.	W. spruce	Light infestations near Jumpingpound Ranger Station, Willow Creek, Chief Mtn. Highway, Waterton Lakes National Park.
Larch sawfly, *Pristiphora erichsonii* (Htg.)	E. larch	Light defoliation to planted larch in Kananaskis Forest Experiment Station.

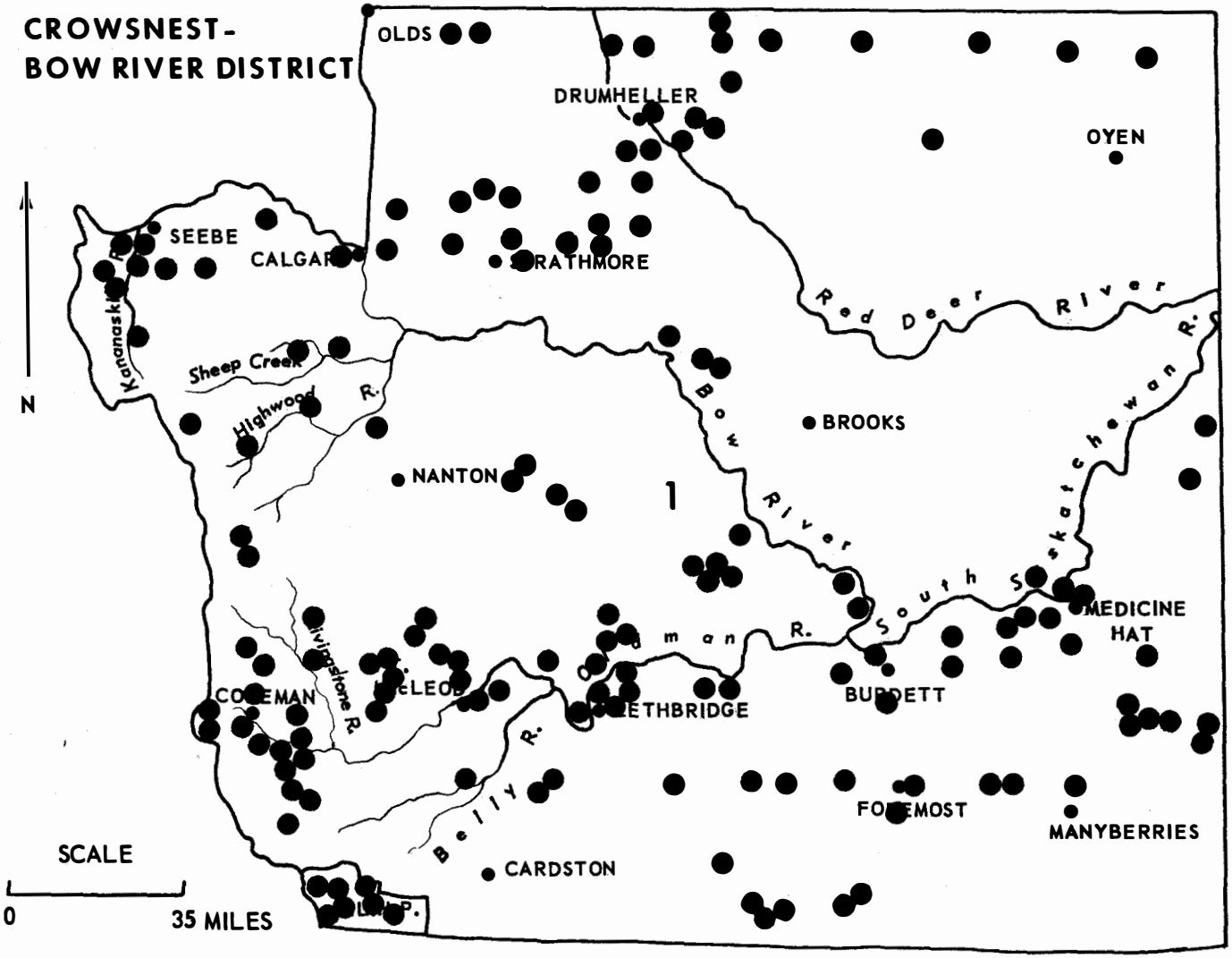
Table II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Insect		
A leaf tier, *Pseudexentera improbana oregonana* Wlshm.	T. aspen	Found in Porcupine Hills and Cypress Hills Provincial Park.
Poplar borer, *Saperda calcarata* Say	T. aspen	Moderate infestations in Waterton Lakes National Park and along foothills from Crowsnest Pass to Bow River.
Poplar and willow borer, *Sternochetus lapathi* (L.)	Willow	No visible change in status from that reported in 1963.
Disease		
Pine needle rust, *Coleosporium asterum* (Diet.) Syd.	Lp. pine	Light infection on pine at Marmot Basin and along Ribbon Creek.
Gymnosporangium sp.	Saskatoon	Heavy on few trees along the road to Red Rock Canyon, Waterton Lakes National Park.
Hypoxylon canker, *Hypoxylon pruinatum* (Klotzsche) Cke.	T. aspen	Light infections near Knights Lake, Waterton Lakes National Park.

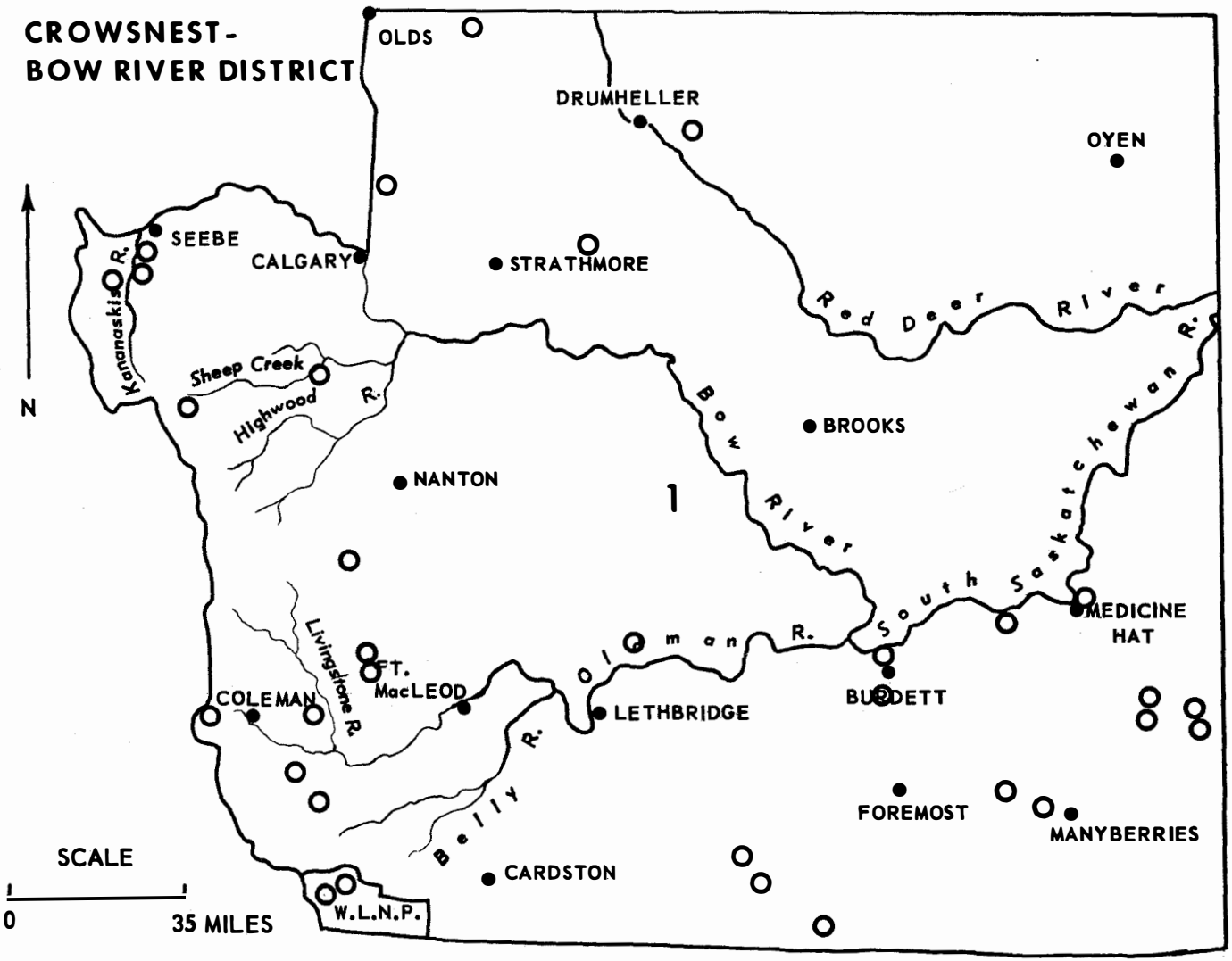
TABLE III

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

Outbreak number	Location	Causal Organism	Remarks
1-1	2 miles northeast of Castle Ranger Station	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1965.
1-2	2 miles south of Kananaskis Experiment Station	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1964.
1-4	One-quarter mile south Kananaskis Experiment Station	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1964.
1-7	Waterton Lakes National Park	Armillaria mellea (Vahl. ex Fr.) Quél.	A control experiment using fungicides carried out in 1963.
1-8	Dutch Creek Road	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1964.
1-12	13 miles north of Coleman on Trunk Road	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1964.
1-13	Elkwater	Peridermium harknessii J. P. Moore	To be re-examined 1965.
1-14	Blairmore	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1965.
1-15	Elkwater	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1965.
1-11	Waterton Lakes National Park	Cronartium ribicola J. C. Fischer	Areas of high intensity infections and there is a northward extension of this disease.
1-16	Hillcrest	Cronartium ribicola J. C. Fischer	
1-17	Coleman	Cronartium ribicola J. C. Fischer	
1-18	Waterton Lakes National Park	Cronartium ribicola J. C. Fischer	



LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963



LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

ANNUAL DISTRICT REPORT

CLEARWATER DISTRICT

ALBERTA 1963

by

F. J. EMOND

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

Very little change in the status of important insects was evident in the Clearwater District during 1963 from that reported in 1962. A decrease in defoliation by the forest tent caterpillar was noted in the Vermilion area, but the general distribution of this insect in the District remained much the same. The grey willow leaf beetle was again responsible for considerable damage to broad leaf trees throughout the entire District. Adults of this species caused moderate damage to shelterbelts in early summer while larvae were responsible for moderate to severe defoliation of willow in the latter part of the season. A more widespread distribution of the Bruce spanworm and of a leaf tier, Compsolechia niveopulvella Cham., was noted in stands of aspen in the agricultural area east of Highway 2 and in the southwest portion of the District. Larch sawfly infestations remained at approximately the same level as in the previous year.

No new disease outbreaks were reported during the 1963 field season. One previous outbreak of dwarf mistletoe on pine was re-examined and no change was evident in its intensity or boundaries. Red belting or climatic injury to pine and spruce was very much in evidence throughout the mountain area of the District. Clumping of aspen, which is generally associated along with red belting, was present in the same general areas.

INSECT CONDITIONS

Gall Aphids on Conifers, Adelginae

Damage to spruce tips by these gall forming aphids was extensive in the forested part of the District. Moderate to severe damage was observed in the Canmore, Rocky Mountain House, Nordegg, Sundre and Olds districts. Light to moderate damage occurred from Cochrane north to Cremona and along the Trunk Road from its junction with Highway 1A and the Red Deer River. From the Red Deer River north to Nordegg, population levels of this insect were light and damage negligible.

In the agricultural part of the District light damage was noted in several spruce shelterbelts and ornamental spruce plantings in the Wetaskiwin, Camrose, Red Deer, Clive and Stettler areas. In the remainder of the District galls caused by Adelges spp., could usually be found wherever spruce occurred, but damage was light.

A Leaf Tier, Compsolechia niveopulvella Cham.

A noticeable increase in the distribution of this leaf tier was recorded during the 1963 field season. Light to moderate defoliation of aspen was noted in the general area from Cochrane, north to Cremona, along the Trunk Road from Highway 1A to the Ghost Ranger Station and in the Lacombe-Stettler area east of Highway 2. Light damage was prevalent in aspen stands near Wainwright, east of Camrose and north and south of Hardisty. Low populations were present throughout the remainder of the District but the amount of damage was negligible.

Grey Willow Leaf Beetle, Galerucella decora Say

Skeletonizing of willow foliage by larvae of this species was again very evident in the western half of the District. Moderate to severe defoliation was noted in the following areas; Alder Flats, north and south of Rocky Mountain House, west of Rocky Mountain House to Nordegg along Highway 11, Strachan, Caroline, Sundre, Cremona and north of Cochrane. Light to moderate defoliation was evident near Lacombe, Red Deer, Wetaskiwin, Pigeon Lake, Breton and along the Trunk Road from Nordegg south to its junction with Highway 1A.

In the eastern half of the District, a noticeable increase in defoliation of willow was noted throughout the entire general area. Moderate to severe damage was observed in the majority of the willow patches that were inspected during the season.

Damage by adults of this species to native deciduous and shelterbelt trees was common particularly in the eastern half of the District. The damage was experienced during the months of June and July when "swarming" or "migrations" by adults of this species is common.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Adults and larvae of the American aspen beetle were commonly found in beating samples throughout the north eastern part of the District. Light to moderate defoliation of aspen was noted along Highway 16 from Vermilion east to Lloydminster and south to Wainwright and Viking. In the remainder of the agricultural area low populations were found in most aspen stands inspected but damage was light. Only a few adults and larvae were collected throughout the forested area of the District with the exception of Crimson Lake and Strachan. In these areas, moderate to severe defoliation was recorded on aspen poplar regeneration.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In the eastern half of the District damage to aspen by larvae of this species was again evident in the Vermilion area. Severe defoliation was noted east and west of town for a distance of 4 to 5 miles and south along Highway 41 to Grizzly Creek. From this point moderate to severe infestations were recorded along the Grizzly Creek Valley in both directions for approximately 5 miles and in the vicinity of the town of Kitscoty. From these areas of moderate to severe damage, light defoliation was evident east to Lloydminster, west to Mundare and south to Highway 14. Collections of larvae were also made at the following locations: Wetaskiwin, Bittern Lake, Sedgewick, Czar, Provost and Cooking Lake.

In the western half of the District collections were made near Sylvan Lake, Rocky Mountain House, Crimson Lake, Lacombe and seven miles west of Cochrane along Highway 1A. Light defoliation was evident in these areas. For predicted defoliation for 1964 at pre-determined points, refer to table II.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

High populations of this species of tent caterpillar were evident in some areas of the eastern portion of the District. Severe defoliation of "prairie rose" was noted south of Vermilion, east of Wainwright along Highway 14 to the Saskatchewan border, south of Bodo, south of Provost, near Blackfoot and south of Stettler. In the remainder of this area, although low populations and light defoliation were generally found wherever rose occurred, damage was light.

In the western half of the District moderate to severe defoliation of willow and scrub birch was noted along the Forestry Trunk Road from a point 16 miles south of Nordegg to the Red Deer River. From the Red Deer River south to Cochrane, population levels of this species gradually decreased and damage was classified as light.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

Discoloration of spruce needles and webbing caused by this mite was found to be common in the majority of spruce shelterbelts and ornamental spruce that were inspected during the season. Medium high populations, causing light to moderate damage, were noted in the following areas: New Norway, Wetaskiwin, Vermilion, Stettler, Olds and South Edmonton. Low populations with resultant light damage persisted throughout the remainder of the shelterbelt area. In the forested part of the District damage to native spruces remained light.

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

The status of this insect in the Clearwater District remained approximately the same as in the previous year. Moderate to severe defoliation to planted spruce was especially noted in South Edmonton, Leduc, one mile east of Cochrane, Auburndale, Clive and east of Stettler. Light defoliation was evident near Vermilion, New Norway, southwest of Bowden and at Cremona. In the foothills part of the District beating samples from native spruce yielded only the occasional larva and damage was light.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Larch sawfly damage in tamarack stands throughout the District remained at much the same level in 1963 as in 1962. Light to moderate defoliation was evident in larch stands north of Nordegg along the Trunk Road, east of Nordegg along Highway 11 to Rocky Mountain House, south of the Clearwater Ranger Station, near Bluffton and Winfield, southeast of Caroline and north of Alder Flats. Low populations caused light damage to Siberian larch shelterbelts in the vicinities of Wetaskiwin, Lacombe, Auburndale, Blackfalds and south of Edmonton.

A Leaf Tier, Pseudexentera improbana oregonana Wlshm.

The status of this insect showed very little change throughout the aspen range of the District during 1963. Low to medium populations generally were found wherever aspen was sampled. Light to moderate defoliation was especially noted near Mannville, Vermilion, Blackfoot, Canmore, Wainwright and Stettler. Damage by this species in all other parts of the District remained light.

DISEASE CONDITIONS

Clumping of Aspen

Clumping of aspen, generally a result of a late frost during the early part of the spring season, was very much in evidence at several locations in the District. Severe damage was noted in the foothills area where "red belting" of pine and spruce occurred. Heavy "clumping" was noted in the following general areas: northeast of Crossfield, 40 miles west of Rocky Mountain House along Highway 11, one mile south of Blackfalds, 22 miles south of the Clearwater River along the Trunk Road and 4 miles south of Bottrel.

Pine Needle Cast, Elytroderma deformans (Weir) Darker

This needle cast of pine continued at a low endemic level throughout the pine areas of the District. In all areas where this needle cast was found damage was usually light and in the majority of cases was confined to the older needles. Collections were made at the following locations: one mile south of the Red Deer River along the Trunk Road, 10 miles north of Rocky Mountain House, Crimson Lake, 7 miles north of Cremona, Rimbey, Dovercourt, southwest of Bergen, west of Morley along Highway 1A, 4 miles south of the Ghost Ranger Station and south of Codner.

Red Belt

Red belting or climatic injury, as it is sometimes called, was again quite prominent on lodgepole pine and white spruce along the Trunk Road for its length in the District. Severe red belting was noted 21 miles south of the Clearwater River on either side of the valley as well as along the valley bottom. Severe damage was also observed on spruce along the highway from mile 2 to mile 4 south of Bottrel. Light damage was evident along both sides of the Trunk Road from Nordegg south to the Clearwater River, in the vicinity of the Upper Saskatchewan Ranger Station, 10 miles south of the Ghost Ranger Station, 40 miles west of Rocky Mountain House along Highway 11, southeast of Mountain Park and from the Brazeau River south to Lookout Creek and Nordegg.

Spruce Needle Rusts, Chrysomyxa spp.

Little change in the distribution of needle rusts affecting spruce was noted in the Clearwater District during 1963. A slight increase in Chrysomyxa empetri (Pers.) Schroet. was noted on black spruce along the Trunk Road 19 miles north of the Ghost Ranger Station. Light infections of C. empetri were also found one mile south of the Ram River and 18 miles north of Nordegg. C. ledicola Laegerh. was responsible for light damage on regeneration white spruce 2 miles southeast of Strachan, near Crimson Lake, south of Bottrel and 3 miles west of Water Valley. This rust was fairly common on Labrador tea, its alternate host, in the above areas. C. ledi de Bary was found on white spruce at only one location during 1963, 10 miles north of Rocky Mountain House along the forestry road to Alder Flats.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	100	12	Trembling aspen	97	11
Black spruce	5	3	Balsam poplar	14	8
Lodgepole pine	15	17	Willow sp.	31	4
Scots pine	4	0	Manitoba maple	13	C
Larch sp.	20	1			
	144	33		155	23
Insect collections from miscellaneous hosts					36
Disease collections from miscellaneous hosts					8
GRAND TOTAL					399

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1963

Location	Predicted defoliation for 1963	Actual defoliation for 1963	Predicted defoliation for 1964
Phillips	Light	Light	Light
Lougheed	Light	Light	Light
Hughenden	Light	Light	Light
Ribstone	Light	Light	Light
Rivercourse	Light	Light	Light
Provost	Light	Light	Light
Vermilion	Severe	Severe	Light
Lavoy	Light	Light	Light
Fabyan	Light	Light	Light
Mundare	Light	Light	Light
Ryley	Light	Light	Light

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1960	Infestation class 1961	Infestation class 1962	Infestation class 1963
2-1	Yoeford	Light	Light	Light	Light
2-2	Rocky Mtn. House	Severe	Moderate	Moderate	Moderate
2-3	Nordegg	Moderate	Light	Moderate	Moderate
2-4	Clearwater	Severe	Moderate	Moderate	Light
2-5	Caroline	Light	Moderate	Moderate	Light

TABLE IV

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE CLEARWATER DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Poplar bud-gall mite, *Aceria parapopuli* (Kiefer)	Shelterbelt poplars T. aspen	Common throughout the eastern agricultural area in shelterbelts.
Black-headed budworm, *Acleris variana* (Fern.)	W. spruce	Fairly high populations in the Rocky-Ricinus areas.
Pine tube maker, *Argyrotaenia tabulana* Free.	Lp. pine	Slight increase in lodgepole pine stands north of Cochrane to the Red Deer River.
Green rose chafer, *Dichelonyx backi* Kby.	T. aspen M. maple W. spruce	Found associated with the willow leaf beetle on broad leaf trees and on spruce in the foothills area.
A sawfly, *Diprionidae*	Juniper (Communis)	Found causing moderate damage to juniper in the Garrington Ferry area.
A pyralid, *Griselda radicana* Wlshm.	W. spruce	Fairly common in spruce beating samples.
A looper, *Itame loricaria lilia* Evers.	T. aspen	Usually found in association with other aspen defoliators throughout the District.
Prairie tent caterpillar, *Malacosoma lutescens* (N. & D.)	Prairie rose Chokecherry	Responsible for moderate damage in the northeast portion of the District.
A sawfly, *Neodiprion* sp.	Lp. pine S. pine	Light damage to native and shelterbelt pine.
Poplar serpentine miner, *Phyllocnistis populiella* Cham.	T. aspen B. poplar	Common throughout the entire District in native and shelterbelt trees.

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

Causal Agent	Host	Remarks
Insect		
Green-headed spruce sawfly, Pikonema dimmockii (Cress.)	W. spruce	Low populations in the western half of the District.
Engelmann spruce weevil, Pissodes engelmanni Hopk.	W. spruce	Light damage to native spruce in the forested area of the District.
Green larch looper, Semiothisa sexmaculata Pack.	Larch	Considerable numbers collected in larch beating samples.
Disease		
Dwarf mistletoe, Arceuthobium americanum Nutt. ex Engelm.	Lp. pine	No change in intensity or infestation areas of the District.
Atropellis canker, Atropellis piniphila (Weir) Lohman & Cash	Lp. pine	Common throughout the pine stands in the foothills area.
Yellow witch's broom of spruce, Chrysomyxa arctostaphyli Diet.	W. spruce B. spruce (primary hosts) Bearberry (alternate host)	Found commonly on both alternate and primary hosts in the western half of the District.
Cytospora canker, Cytospora chrysosperma (Pers.) Fr.	T. aspen R. poplar N.W. poplar	Widespread infections in eastern agricultural area of the District, usually found on previously damaged trees.
Stalactiforme rust, Peridermium stalactiforme A. & K.	Lp. pine	Light infestation of this rust found west of Nordegg.
Tar spot, Rhytisma salicinum (Pers.) Fr.	N.W. poplar Willow T. aspen	Responsible for light damage to shelterbelt and native broadleafs in all areas.

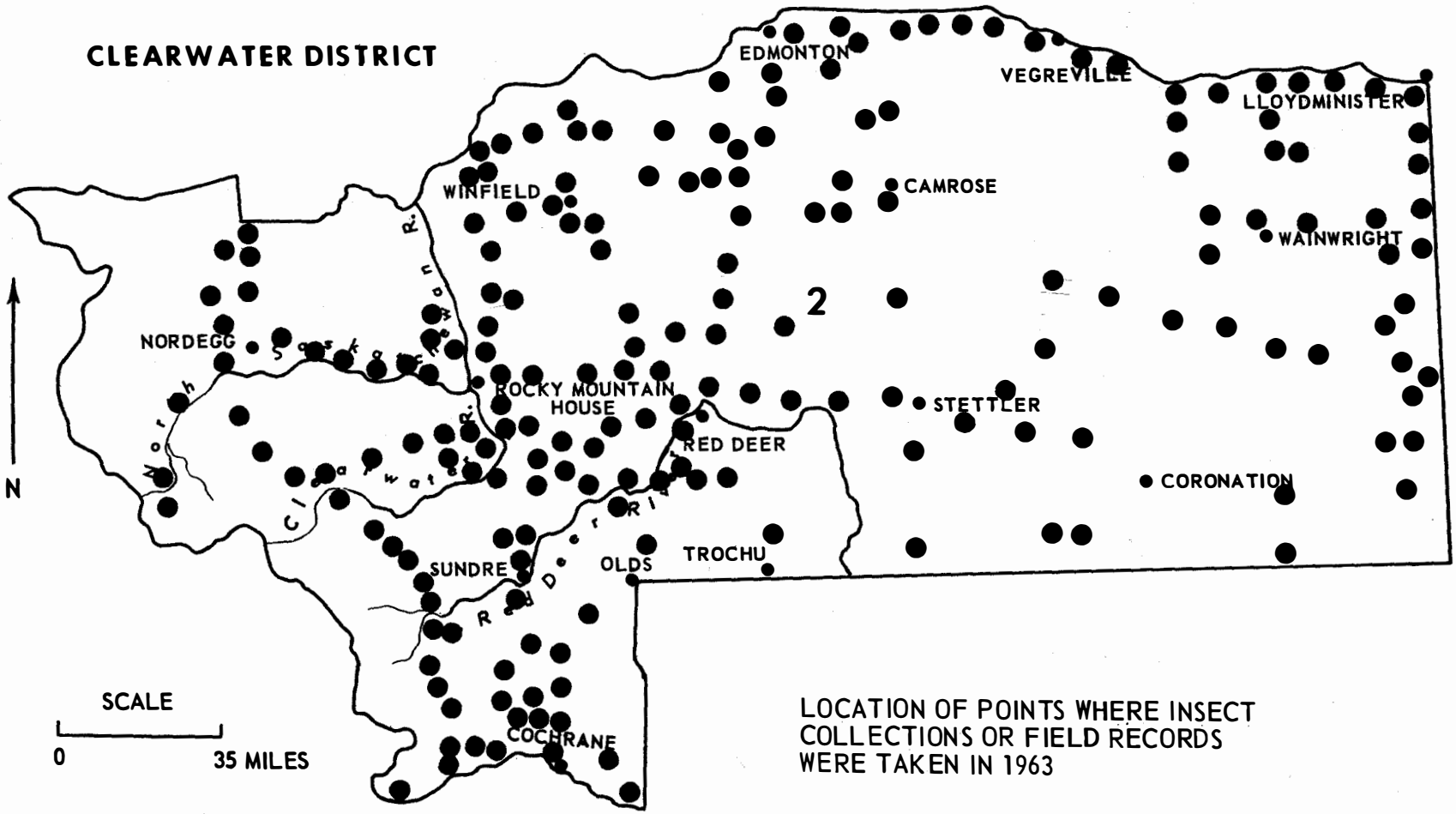
Table IV - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Disease		
Rodent damage	Lp. pine T. aspen B. poplar	Considerable damage in the following areas: Alder Flats, Warburg and Calmar.
A needle cast of spruce, Sarcotrichila piniperda (Rehm) Korf.	W. spruce	Small area of infected spruce near James River Bridge. First record of this cast in Alberta.
Septoria canker of poplar, Septoria musiva Pk.	B. poplar R. poplar N.W. poplar T. aspen	Found commonly throughout the eastern part of the District.

TABLE V

SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE CLEARWATER DISTRICT

Outbreak number	Location	Causal Organism	Remarks
2-1	18 miles north of the Clearwater Ranger Station along the Trunk Road.	Atropellis piniphila (Weir) Lohman & Cash	Re-examination due in 1965
2-2	2 miles south of the Clearwater Ranger Station along the Trunk Road.	Atropellis piniphila (Weir) Lohman & Cash	Re-examination due in 1965
2-3	23 miles north of Nordegg, Chungo Creek area.	Atropellis piniphila (Weir) Lohman & Cash	Re-examination due in 1965
2-6	15 miles west of Caroline	Arceuthobium americanum Nutt. ex Engelm.	Examined during 1963 - little change.
2-7	10 miles east of Nordegg.	Atropellis piniphila (Weir) Lohman & Cash	Re-examination due in 1965
2-9	16 miles west of the Upper Saskatchewan Ranger Station.	Arceuthobium americanum Nutt. ex Engelm.	Re-examination due in 1965


CLEARWATER DISTRICT
EDMONTON
VEGREVILLE
LLOYDMINISTER
WINFIELD
CAMROSE
WAINWRIGHT
2
NORDEGG
ROCKY MOUNTAIN HOUSE
STETTLER
RED DEER
CORONATION
TROCHU
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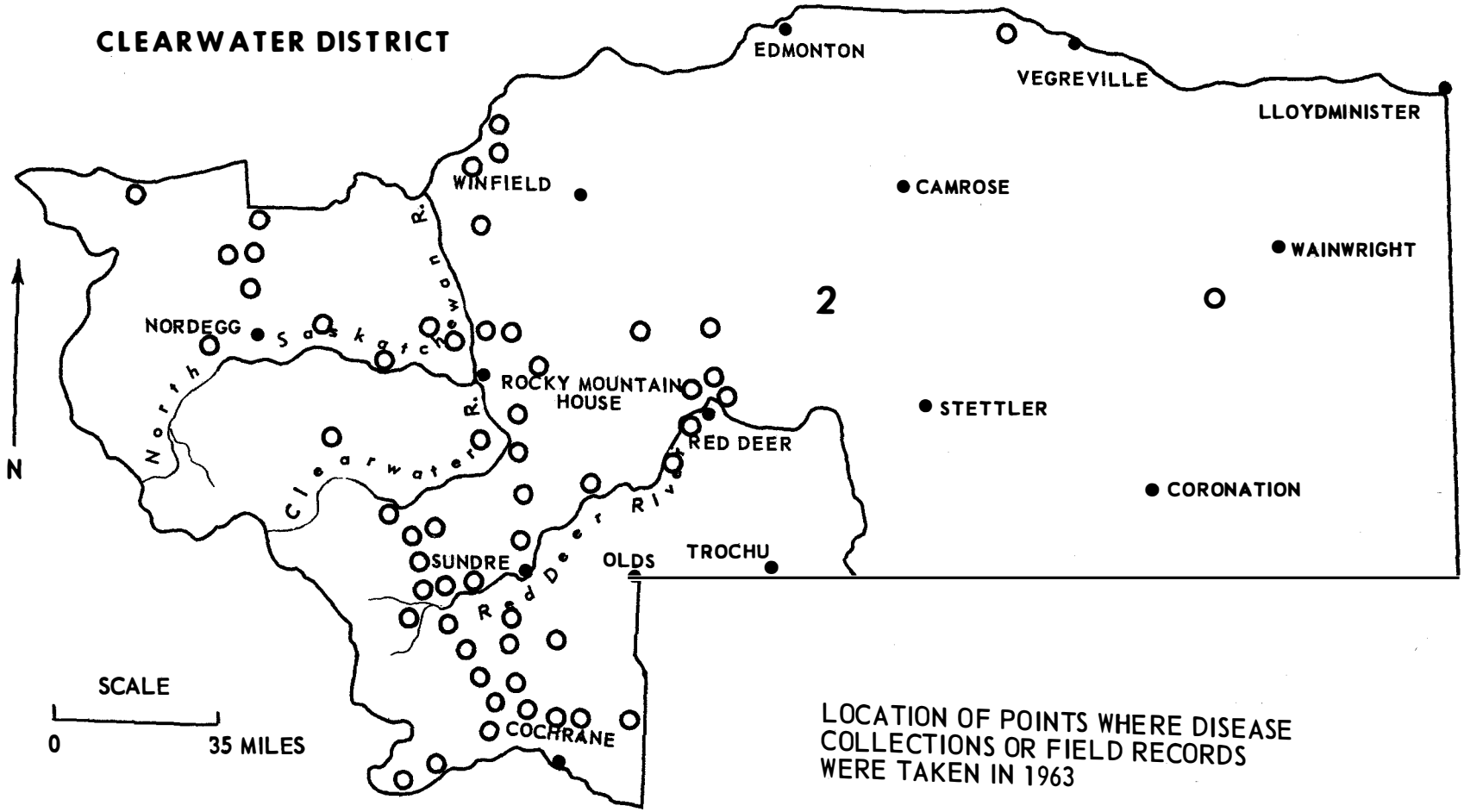
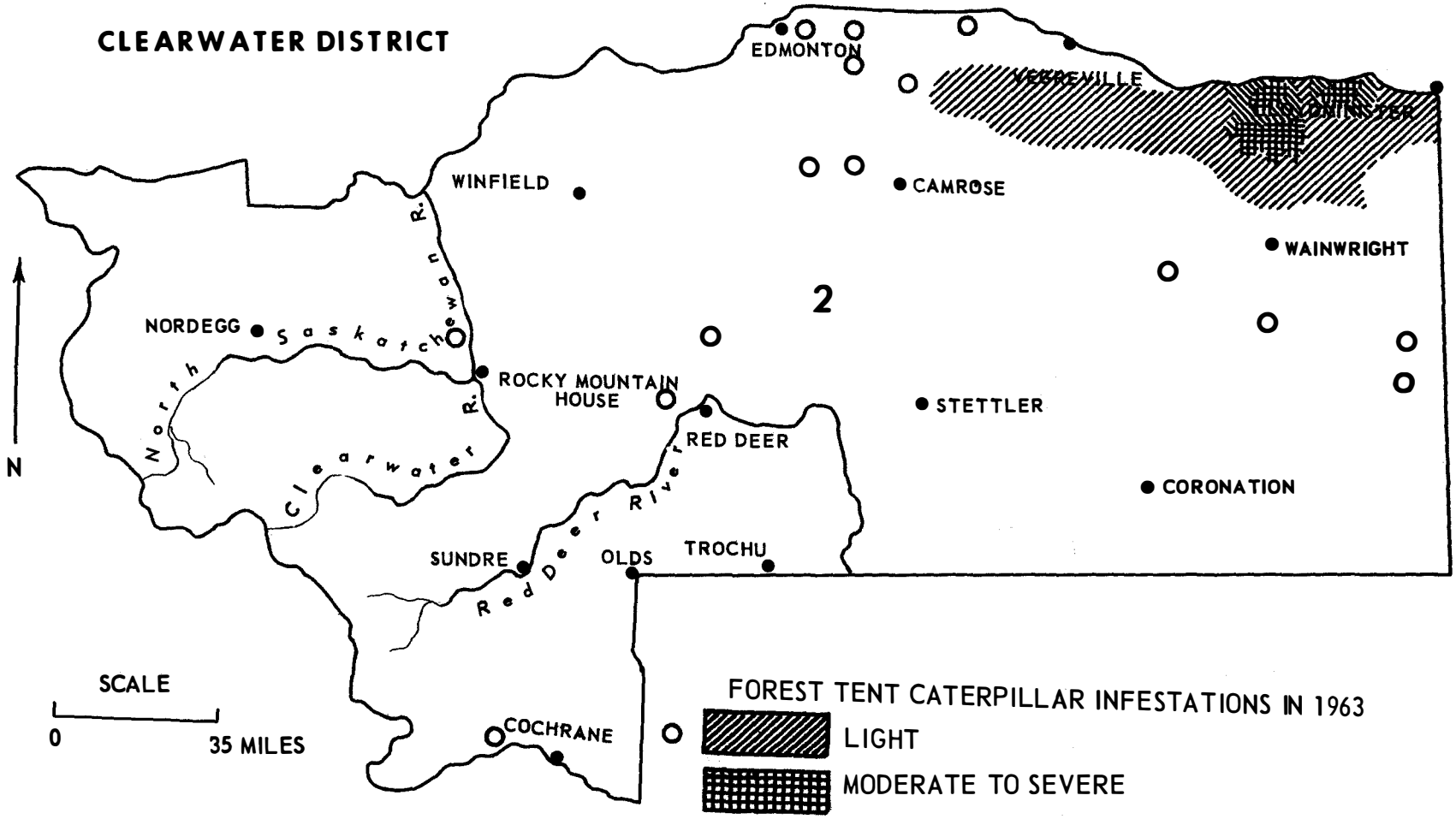
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963



LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963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VERMILLION
WAINWRIGHT
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RED DEER
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Red Deer River
SCALE
0
35 MILES
COCHRANE
FOREST TENT CATERPILLAR INFESTATIONS IN 1963
LIGHT
MODERATE TO SEVERE

ANNUAL DISTRICT REPORT

NATIONAL PARKS DISTRICT

ALBERTA 1963

by

J. PETTY AND V. B. PATTERSON

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

Populations of lodgepole needle miner remained at much the same level as in 1962 and, in some areas of the Bow River Valley caused noticeable discoloration in stands of lodgepole pine. The spruce budworm infestation which has persisted near Saskatchewan Crossing, Banff National Park, has resulted in some mortality to the tips of spruce. A decrease in population levels of the poplar serpentine miner was evident in 1963, although severe injury was noted in parts of Kootenay and Jasper National parks. Damage to spruce regeneration by the Engelman spruce weevil was the same as in the previous year but a high degree of parasitism appeared prevalent. Infections of stalactiforme rust and comandra blister rust were recorded in a stand of regeneration lodgepole pine along the Saskatchewan River in Banff National Park. Light infections of spruce needle rusts were found between Lake Louise and Banff in Banff National Park and in the northern part of Kootenay National Park. Extensive areas of red belt occurred in the northern part of Jasper National Park with severe discoloration evident on the Fiddle, Miette and Jacques mountain ranges.

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

Numerous early instar larvae of the two-year-cycle spruce budworm were again present in Saskatchewan River Crossing area of Banff National Park. The defoliation over the past few years has resulted in some mortality to the tips of spruce, and on many of the trees the 1963 growth was limited. Most of the new shoots that were produced in 1963 were injured by budworm feeding. No change in the size of the infested area from that reported in 1962 was noted.

Ligh infestations occurred in Yoho National Park at the mouth of the Yoho Valley and in Kootenay National Park along Floe Creek for 1.5 miles from its junction with the Vermilion River.

Cooley Spruce Gall, Adelges cooleyi (Gill.)

Galls caused by cooley spruce gall aphid were found in low numbers on white and Engelman spruce in all areas of the National Parks District. There was a marked decline in the numbers of galls present from previous years. The stage of this gall which feeds on Douglas fir was light on that host species wherever it occurred in Banff, Kootenay and Yoho national parks.

A Needle Miner, Evagora starki Free.

Mortality of lodgepole needle miner larvae in the winter of 1962-63 was low and populations remained at much the same level as in 1962. In the valley between Mt. Norquay and Stony Squaw Mountain needle miners have caused noticeable needle drop and discoloration of lodgepole pine. At the lower end of the road to Mt. Norquay Ski Lift the infestation class (using the sequential sampling) was light, and at the 5000 foot level, 1.6 miles up the road, it was medium high. Many of the trees at this point have been severely defoliated and only the 1963 growth remains on the trees. At the parking area below the ski lift the infestation class was medium high but the defoliation not as severe.

A medium-high infestation was present at the 500 foot elevation on Massive Mountain above Wolverine Creek. A medium-low infestation was recorded one mile up Johnston Creek on the southeastern slopes of Mt. Eisenhower. Light infestations were present along the Bow River Valley from a point 8 miles southeast of Lake Louise to Banff townsite, and on the lower slopes of Mt. Inglismaldie one mile northeast of Johnson Lake. Of three locations sampled in Kootenay National Park, Black Creek had a medium-low infestation and Hawk Creek and 1.8 miles west of Marble Canyon had light infestations. A light infestation was present 2 miles west of Field in Yoho National Park.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Although found in all areas of the National Parks District, a decline in population levels of the poplar serpentine miner was noted in 1963. In Kootenay National Park moderate infestations were present around the campsite at Radium and east of Radium along Sinclair Pass to Sinclair Summit. From this point to the Kootenay River and north and south along the Kootenay Valley severe infestations were evident on all aspen poplar. Light infestations were present in Yoho National Park between Leanchoil and the west entrance to the Park. Near Baker Creek in Banff National Park a moderate infestation occurred while throughout the remainder of the Park aspen poplar showed light damage.

In Jasper National Park moderate injury occurred south and west of the townsite from Whistler Mountain to Pyramid Lake, north of the lake along the road to Pallisade Lookout Tower, and in the vicinity of the Snaring River Warden Station. Moderate to severe injury was noted along the Yellowhead Pass Road from Jasper Townsite to the British Columbia Boundary. Severe infestations were present in the Snake Indian Valley from Devona to the Shalebanks Warden Cabin, and along the Medicine Lake Road from Lake Edith to the bridge crossing the Maligne Canyon.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

Again in 1963 Egelmann spruce weevils have caused damage to regeneration spruce along the Kootenay River Valley in Kootenay National Park. Thirty-nine tips were weevilled in 1963 at Kootenay Crossing on a one-acre plot containing 152 Engelmann X white spruce hybrids. A high degree of parasitism appeared prevalent this past season. This species was also seen in very low numbers near Leanchoil in Yoho National Park.

Lodgepole Terminal Weevil, Pissodes terminalis Hopk.

At Saskatchewan Crossing in Banff National Park, and in Kootenay National Park near Radium and along the Settlers Road, the leaders of some regeneration lodgepole pine had been damaged by lodgepole terminal weevil. Some of these leaders were caged in the spring for the purpose of collecting adult weevils in the fall for identification. At Saskatchewan Crossing the infested area is 4 miles long and one mile wide whereas at the other locations the size of the infested area was small.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Light defoliation of western larch was observed along the Settlers Road in Kootenay National Park. Alpine larch in the Snow Creek Pass area of Banff National Park was examined for larch sawfly damage but no infestation was present.

DISEASE CONDITIONS

Spruce Needle Rusts, Chrysomyxa spp.

Light infections of spruce needle rusts were found in Kootenay and Banff national parks in 1963. In Kootenay National Park Chrysomyxa ledi de Bary infections were evident along the trail to Floe Lake and near the Paint Pots, 2 miles west of Marble Canyon. In these areas some of the smaller trees had a high percentage of the 1963 needles infected.

Light damage to white spruce by a needle rust tentatively identified as Chrysomyxa ledicola Laegerh., occurred along the Spray River Valley south of the Youth Hostel for a distance of 6 miles. There were 2 light infections: C. ledicola 26 miles north of Lake Louise and C. ledi along the Healy Creek Fire Road.

Western Gall Rust, Peridermium harknessii J. P. Moore

In the area along Settlers Road, Kootenay National Park, galls caused by this rust were common on regeneration lodgepole pine. A moderate infection was noted one mile south of the Banff-Windermere Highway and extended for a distance of 1.5 miles along the Settlers Road. South of this area to the Park Boundary the number of infected trees and the number of galls per tree was less.

Stalactiforme Rust, Peridermium stalactiforme A. & K.

This rust was present in an extensive area of lodgepole pine regeneration near Saskatchewan Crossing in Banff National Park. This area, 3 miles long and 3/4 miles wide, extends along the north side of the Saskatchewan River from Saskatchewan River Bungalows east to the Park Boundary. Rodents have chewed out many of the rust cankers and in doing so girdled the trees causing some mortality throughout the stand.

Red Belt

This condition of lodgepole pine was more extensive in Jasper National Park than it has been for a number of years. The areas most severely affected were the Fiddle, Miette and Jacques ranges. On the Fiddle Range there was a discoloration almost continuously along the Fiddle River and Sulphur River valleys to Miette Hot Springs. On Ashler Ridge discoloration was continuous for almost its full length. There is evidence of mortality on the southwest face of this ridge due to red belt injury for 3 successive years.

Light to moderate injury occurred along the northeast face of the Miette Range, that forms part of the Fiddle River Valley. Severe injury occurred along the bottom of the Miette Range on the southwest face and extended southeast along the Rocky River Valley as far as could be seen.

There were a number of other areas in which discoloration of lodgepole pine occurred. These were on the northwest face of the Jacques Range above Jasper Lake, on Esplanade Mountain southwest of Snaring Station, and in the Moosehorn Valley on Roche Ronde and Bedson Ridge.

White Pine Blister Rust, Cronartium ribicola J. C. Fischer

White pine blister rust was recorded on white bark pine at 2 locations in Jasper National Park; one rust canker was found at the 5200 foot elevation along the Geraldine Lake Road, and the other canker was found one mile west of the Tonkin Valley View Point on the Edith Cavell Road.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	13	1	Trembling aspen	11	2
Engelman spruce	7	2	Balsam poplar	1	0
Miscellaneous spruce	0	2			
			Willow	7	1
Lodgepole pine	39	7			
Douglas fir	2	1			
Alpine fir	2	2			
Alpine larch	3	3			
	66	18		19	3
Insect collections from miscellaneous hosts					2
Disease collections from miscellaneous hosts					6
GRAND TOTAL					114

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE NATIONAL PARKS DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Black-headed budworm, *Acleris variana* (Fern.)	A. fir W. spruce E. spruce	Light infestation mouth of Yoho Valley, Y. N. P. and at golf course Banff National Park.
A leaf beetle, *Chrysomela aeneicollis* Schffr.	Willow	Light infestations at Healy Creek and 21 miles north of Banff, Banff National Park and along Floe Creek, Kootenay National Park.
Grey willow leaf beetle, *Galerucella decora* Say	Willow	Light damage along Red Deer River north of Banff. Moderate north-east of Fiddle Creek to east gate Jasper National Park.
Forest tent caterpillar, *Malacosoma disstria* Hbn.	A. poplar	Light damage near Radium, Kootenay National Park.
Western tent caterpillar, *Malacosoma pluviale* (Dyar)	Willow Poplar Birch	Tents found near Leanchoil, Y. N. P. and around Radium, K. N. P.
Pine needle scale, *Phenacaspis pinifoliae* (Fitch)	Lp. pine	Light infestations near Radium, K. N. P.
Disease		
Shoestring root rot, *Armillaria mellea* (Vahl. ex Fr.) Quél.	A. fir	Responsible for death of few trees along Healy Creek, B. N. P.
Pine needle rust, *Coleosporium asterum* (Diet.) Syd.	Lp. pine	Light damage common along Settlers Road, K. N. P.
Comandra blister rust, *Cronartium comandrae* Pk.	Lp. pine	Light incidence found in conjunction with *P. stalactiforme* at Sask. Crossing, B. N. P.

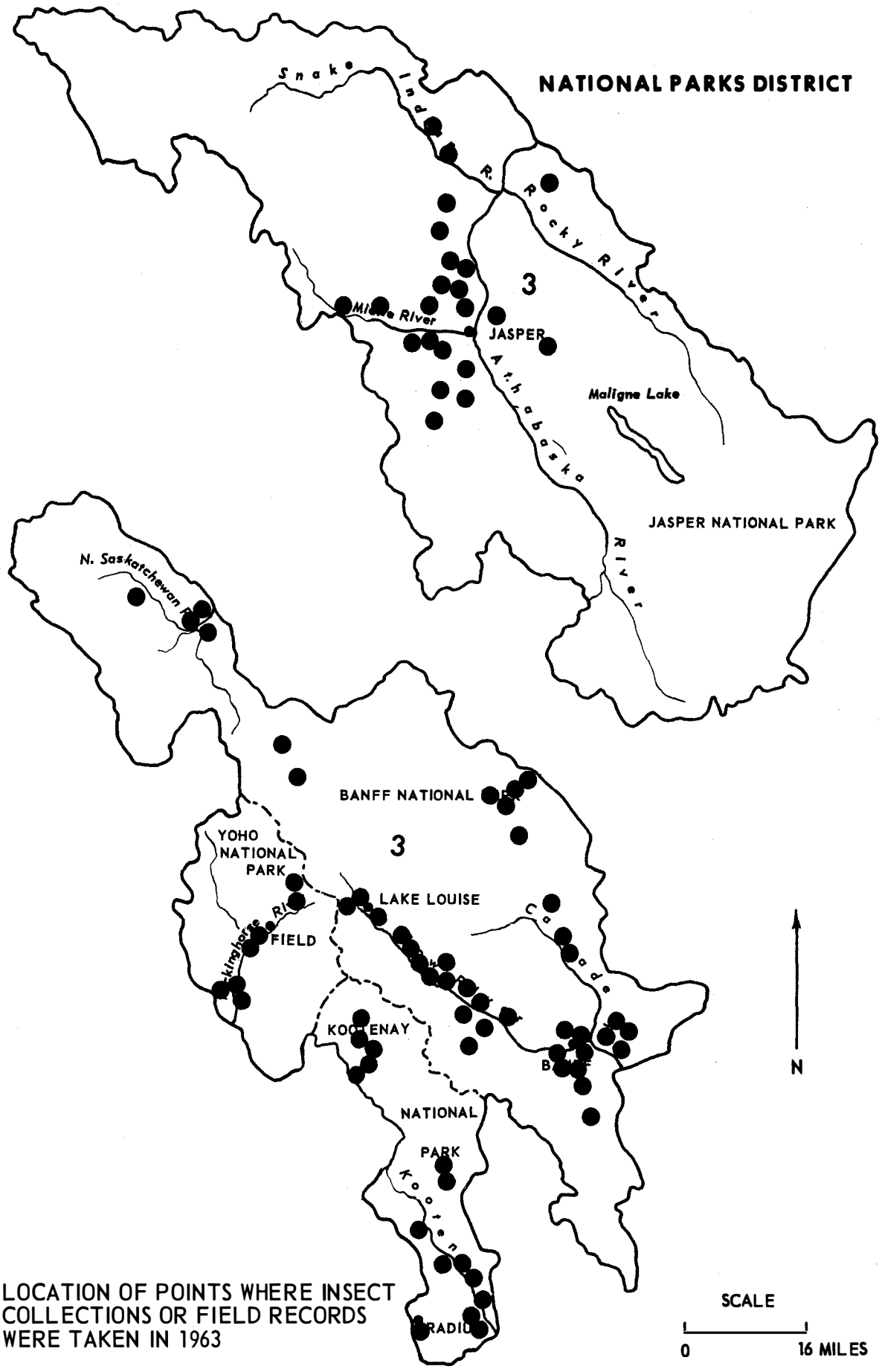
Table II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Disease		
Indian paint fungus, *Echenodontium tinctorium* Ell. & Ev.	A. fir	One conk found along Geraldine Lake Road, J. N. P.
Fruit stem rust, *Gymnosporangium clavipes* (Cke. and Pk.)	Juniper	Light on juniper in Settlers Road area, K. N. P.
Pine needle cast, *Hypodermella montivaga* (Petrak) Dearn.	Lp. pine	4 miles west of Lake Louise, caused light damage.
Douglas fir needle rust, *Melampsora albertensis* Arth.	D. fir	Common near Radium Campground area of Kootenay National Park.
Foliage rust, *Melampsora epitea* Thuem. race *M. bigelowii*	A. larch	Collected for Dr. Ziller near Sunshine Lodge, Banff National Park.

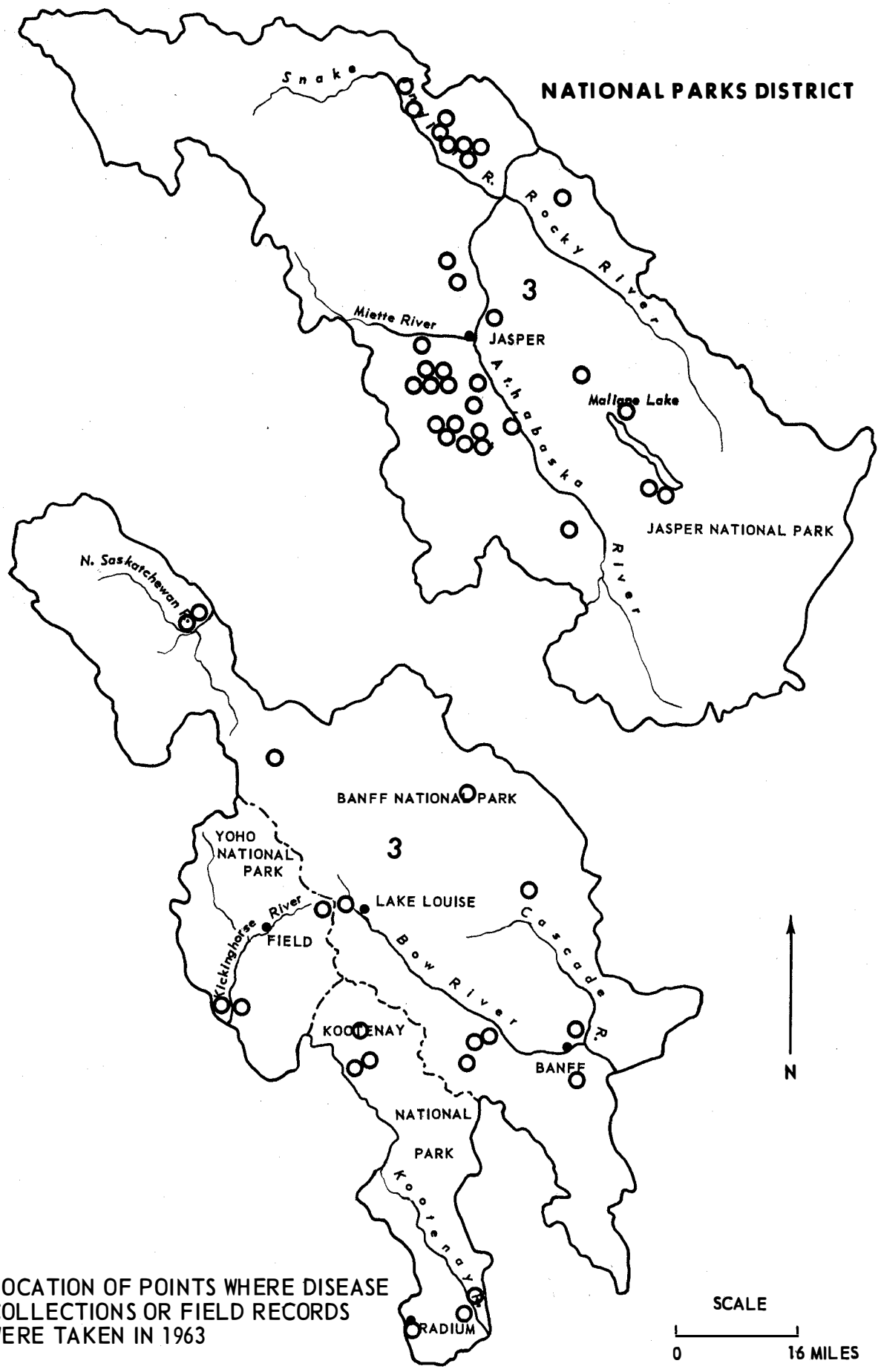
TABLE III

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

Outbreak number	Location	Causal Organism	Remarks
3-1	Geraldine Lake Road	Atropellis piniphila (Weir) Lohman & Cash	35% trees affected. Average of 2.5 cankers/ tree.
3-2	Sundance Canyon	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1965.
3-3	59.5 miles north Lake Louise Junction	Peridermium stalactiforme A. & K.	To be re-examined 1964.
3-9	Snaring River	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1964.
3-13	Jasper Townsite	Arceuthobium americanum Nutt. ex Engelm.	100 per cent infection. Trees dying.
3-14	Marmot Basin Trail	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1965.
3-15	10 miles west of Banff	Rhabdocline pseudotsugae Syd.	To be re-examined 1964.
3-18	Settlers Road	Hypodermella laricis Tub.	Re-examined 1962. Very light infection.
3-19	Settlers Road	Peridermium harknessii J. P. Moore	To be re-examined 1965.
3-20	Between Mr. Eisenhower and Johnston's Canyon	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1966.
3-21	Between Astoria and Whirlpool rivers	Arceuthobium americanum Nutt. ex Engelm.	To be re-examined 1966.
3-22	Between Astoria and Whirlpool rivers	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1965.



LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963



LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

ANNUAL DISTRICT REPORT

BRAZEAU-ATHABASCA DISTRICT

ALBERTA 1963

by

V. B. PATTERSON

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

The outbreak of forest tent caterpillar in the Brazeau-Athabasca District expanded in 1963 and the focal points of defoliation were considerably different from 1962. The infestation of grey willow leaf beetle was not as widespread as in 1962 and noticeable injury occurred only in the foothills. Defoliation by the larch sawfly was lighter than it has been for a number of years. Populations of the yellow-headed spruce sawfly were at the same low levels of the past few years.

No new disease outbreaks were recorded. Two areas, reported in 1962 to be infected with Atropellis canker, were surveyed this year.

INSECT CONDITIONS

Grey Willow Leaf Beetle, Galerucella decora Say

Adults of the grey willow leaf beetle were present in May and June throughout the area south of Highway 16 and east of the Pembina River. High populations were present on aspen poplar at a number of points but injury was negligible. Low populations were recorded outside this area at Cynthia, Obed, Edson and Whitecourt. Adult beetles were responsible for moderate injury to the upper crowns of small trees in the Carvel area.

Larval feeding caused considerable skeletonizing of willow leaves along the foothills on the western side of the District in late July and August. Severe skeletonizing occurred over an area of 4 to 5 acres southwest of Jarvis Lake. Light skeletonizing occurred along Solomon and Moberly creeks and along the Hay River. In the vicinity of the Jasper National Park east gate, moderate skeletonizing of willow occurred from Highway 16 north to the Athabasca River.

Pine Root Collar Weevil, Hylobius sp.

Root collar weevils were recorded in 3 separate areas. One of these areas was on the west side of Entrance Provincial Park in the general area where they were found in 1962. However, this year, one adult found on tamarack was determined as Hylobius pinicola (Couper), a new distribution record for this species.

In the Burleigh Creek area, 6 miles southeast of Muskeg Ranger Station, 7 lodgepole pine examined showed evidence of root collar

weevil damage; 3 of these trees contained larvae. A number of lodgepole pine in the area were either dead or dying due to the feeding of these insects.

Along the Mayberne Tower Road north of Edson, evidence of injury was found at 2 locations. In a mature stand of lodgepole pine, 10 miles north of Edson, 5 representative trees were examined. All showed evidence of injury but none were currently infested. Farther north at a point approximately 2.5 miles south of Mayberne Tower, 8 trees were examined; 6 showed evidence of weevil damage and of these, 3 contained larvae.

Bark Beetles, Ips perturbatus Eich.

The permanent sample plot, set up near Peppers Lake in 1962 to assess the damage being done by bark beetles was re-examined in 1963. There was no evidence of movement of the insects to standing, living trees. The only trees currently infested were a few on the west side of the seed strip that had been blown down by wind.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The pattern of defoliation caused by the forest tent caterpillar in 1963 was considerably different from that in 1962. The boundaries of the infestation extended outward in almost every direction. However the intensity of infestation within these boundaries changed and the focal points of the severely defoliated areas shifted.

The severe defoliation that occurred in 1962 in the large area centered around Iosegun Lake was reduced to moderate in 1963 excepting for a narrow band along the northern border of the District. However, moderate defoliation extended 30 miles west of the edge of last year's infestation and light defoliation continued another 20 miles.

The narrow band along the Athabasca and Berlund rivers west of Two Creeks that was moderately defoliated in 1962 was severely defoliated in 1963 and continued in this category for another 20 miles southwest along both sides of the Athabasca River Valley.

The area surrounding Whitecourt on the west and south has been severely defoliated for a number of years but in 1963 only moderate defoliation occurred. South and west of this area, as far as Edson, the defoliation pattern was irregular and mostly light interspersed with patches of moderate and severe.

East of Whitecourt to Blue Ridge severe defoliation occurred as it has for a number of years. The infestation changed from severe to light just east of Blue Ridge. This condition continued east to the

District boundary with patches of moderate and severe defoliation in the Barrhead-Pibroch area.

Moderate defoliation extended into the Swan Hills about 15 miles farther than in 1962. Severe defoliation occurred in that part of the District which lies east of the Swan Hills.

From Edson east to Chip Lake along Highway 16 and for 20 miles south of the highway the pattern of defoliation was irregular with large areas of moderate defoliation interspersed with patches of light and severe. This represents a sharp rise in populations in this area from 1962 when only widely separated patches of defoliation occurred.

Light defoliation occurred generally in Edmonton and along the east side of the District as far north as Morrinville. From Morrinville north to Dapp a rather unusual defoliation pattern occurred. Aspen growing along line fences and around farm houses were moderately or severely defoliated but aspen bluffs in grain fields usually showed little or no evidence of being infested.

Mass collections of larvae and pupae were made in permanent sample plots at Whitecourt and Little Smoky Settlement. Subsequent rearing of these insects revealed a high percentage of parasitism and high mortality due to the presence of a virus disease.

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

Populations of the yellow-headed spruce sawfly were at a low level again in 1963. Throughout the area where this pest occurs representative shelterbelts were chosen for recording purposes.

Moderate defoliation occurred to individual trees in shelterbelts in the Stony Plain-Winterburne area but overall injury was light. Light infestations occured in the St. Albert-Clyde area west of Highway 2. A farm shelterbelt west of Westlock wasseverely defoliated for half of its length. A few other shelterbelts in the Westlock area were lightly infested but the majority were free of sawfly.

A survey was made in Edmonton where injury occurred in a hit and miss pattern depending on whether control measures had or had not been carried out. The most severe injury occurred in the north end of the city along the St. Albert Trail where a number of individual trees around private homes were severely defoliated.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Defoliation by the larch sawfly was lighter throughout most of the District than it has been for a number of years. Moderate to

severe defoliation of larch occurred at a few widely separated points, mainly in the western half of the District. High populations were present around Obed Lake and east to Medicine Lodge and severe defoliation took place. High populations were present in the Entrance Provincial Park area west of Entrance but the resulting injury was not proportionally high due to the rank growth of foliage on the tamarack. Moderate defoliation occurred north of Barrhead in the few tamarack stands that remain in the area.

Most of the tamarack failed to produce any needles in an area along the Coal Branch Road near Fidler Station. These are small open growing trees at an elevation of 4800 feet on which records have been kept for the past 7 years. The infestation class from 1957 to 1959 was light; in 1960 moderate; in 1961 and 1962 severe. In 1962 the foliage was sparse but some was produced over most of the crown. In 1963, foliage appeared only in the extreme lower crown which would have been covered by snow during the winter. Considerable red belt of pine occurred in this area during the winter of 1962-63 and therefore weather conditions may have contributed to the lack of foliage on the trees already weakened by insect attack.

DISEASE CONDITIONS

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

A damage appraisal survey was carried out in a 73 year old stand of lodgepole pine and white spruce north of Hinton on the Athabasca Ranch property. This outbreak was first reported in 1962. Four sample plots were established and all trees on each were inspected. Infection was found only in the roots of lodgepole pine. There was a total of 173 lodgepole pine in the plots; 54 were infected, 52 of these were dead. Aspen and white spruce in the plots were not infected.

Atropellis Canker, Atropellis piniphila (Weir) Lohman & Cash

A survey of this disease of lodgepole pine was made along the Hinton-Grande Prairie Road between Muskeg Ranger Station and Simonette Tower. From Mile 2.2 to Mile 4.2 the infection was moderate and from Mile 16.3 to Mile 19.3 severe.

A light to moderate infection was recorded along the Craigs Mill Road north of Cadomin. Small branch cankers were common north of the old mill site. A mile north of this area approximately 30 per cent of the pine were infected with one or more cankers per tree.

An area on the Coal Branch north of Fidler was surveyed for this disease. Six sample plots were set up between Highway 47 and the abandoned Kaydee well-site. Seventy-two per cent of the trees inspected in these plots were infected with an average of 3 cankers per tree.

The same type of a survey was carried out in the Edson area north of Mayberne Tower. Three plots were established and 10 trees on each were tallied. The incidence of infection was 46.7 per cent with an average of 1.6 cankers per tree.

Fire Blight, Erwinia amylovora (Burrill) Winslow et al

A severe infection of fire blight was recorded on apple trees near Stony Plain. Two light infections were examined in Edmonton. These were only a few of the many infections that had been reported to the District Agriculturist at Stony Plain and to the University of Alberta at Edmonton.

Red Belt

This type of climatic disease was more prevalent along the foothills on the western side of District 4 than it has been for several years. Two general areas were affected, Moberley Creek-Rock Lake west of Entrance and Cadomin-Mountain Park at the south end of the Coal Branch Road.

Severe "red-belting" of lodgepole pine occurred west of Moberley Creek Ranger Station in a band approximately a mile wide and 2 miles long. For another 6 miles west, damage was noticeable but not nearly as severe (altitude 4700 feet). Severe damage also occurred along the Solomon River Valley for about 2 miles starting at a point 16 miles west of Entrance (altitude 4400 feet). In the Hay River Valley approximately 4.5 miles east of Rock Lake damage occurred in a small area on the south-facing slope about 200 feet above the road.

Considerable damage was recorded in the general area of Cadomin. Both sides of the valley were affected north of the junction of the Cadomin and Luscar roads. Another small area was affected across the valley bottom between Cadomin and the lime plant (altitude 5300 feet).

Lodgepole pine was severely affected on the ridges south and east of Grave Flats Tower, east of Mountain Park. Another small area one half mile long in the Cardinal River Valley west of the tower was severely reddened. At this location even the winter buds were damaged and very few new needles were produced (altitude 5300 feet).

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	14	11	Trembling aspen	118	6
Engelman spruce	4	4	Balsam poplar	5	3
Black spruce	1	5	Miscellaneous poplar	1	0
Miscellaneous spruce	1	0	Willow	21	2
Lodgepole pine	15	43	Birch	2	0
Miscellaneous pine	1	6			
Tamarack	31	0			
Miscellaneous larch	2	0			
Balsam fir	0	2			
Miscellaneous fir	0	2			
	69	73		147	11
Insect collections from miscellaneous hosts					7
Disease collections from miscellaneous hosts					7
			GRAND TOTAL		314

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1963

Location	Predicted defoliation for 1963	Actual defoliation for 1963	Predicted defoliation for 1964
Edmonton	Light	Nil	Light
Whitecourt	Severe	Moderate	Light
Little Smoky	Severe	Severe	Moderate
Blue Ridge	Severe	Moderate	Moderate
Entwistle	Nil	Nil	*
Ft. Assiniboine	Moderate	Moderate	Severe
Edson	Moderate	Light	Moderate

* Moderate to severe category.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1960	Infestation class 1961	Infestation class 1962	Infestation class 1963
4-1	Edmonton	Light	Severe	Moderate	*
4-2	Gainford	Light	Moderate	Moderate	Light
4-3	Peers	Light	Moderate	Light	Light
4-4	Mercoal	Moderate	Severe	Severe	Light
4-5	Obed	Light	Moderate	Moderate	Severe
4-6	Muskeg River	Light	Moderate	Moderate	**
4-7	Whitecourt	Light	Severe	Moderate	Light
4-8	Iosegun Lake	Light	Light	Light	Light
4-9	Barrhead	Severe	Severe	Severe	Moderate
3-1	Miette	Light	Severe	Moderate	Severe

* Light to moderate zone
** Not examined 1963

TABLE IV

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE BRAZEAU-ATHABASCA DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
American aspen beetle, *Gonioctena americana* (Schaeff.)	T. aspen	Light infestations Duffield-Devon area and along Coal Branch Road.
A looper, *Itame loricaria julia* Evers.	T. aspen	Found in most beating samples along the Coal Branch Road and around Fort Assiniboine.
Western tent caterpillar, *Malacosoma pluviale* (Dyar)	Rose	Few tents in Whitecourt area and west to Two Creeks.
Poplar serpentine miner, *Phyllocnistis populiella* Cham.	T. aspen	Low populations. Light infestation in Hinton-Entrance area and west to Rock Lake.
Leaf tier, *Pseudexentera improbana oregonana* Wlshm.		None found in the District in 1963 following a rapid population decline over the past few years.
Disease		
Pine needle cast, *Elytroderma deformans* (Weir) Darker	Lp. pine	Light to moderate along west side of Entrance Provincial Park. Moderate 12 miles north of Whitecourt along Judy Creek Road.
Hail damage	Lp. pine W. spruce T. aspen	Ten miles north of Edson along Mayberne Tower Road. Pine severely injured, spruce less severely injured, aspen scarred and stripped of foliage.
Pine needle cast, *Hypodermella montana* Darker	Lp. pine	Light infestation near Red Cap Forestry Cabin east of Mountain Park, moderate to one tree near Cabin Creek Ranger Station and light to moderate along Craigs Mill Road, north of the old mill site.

TABLE V

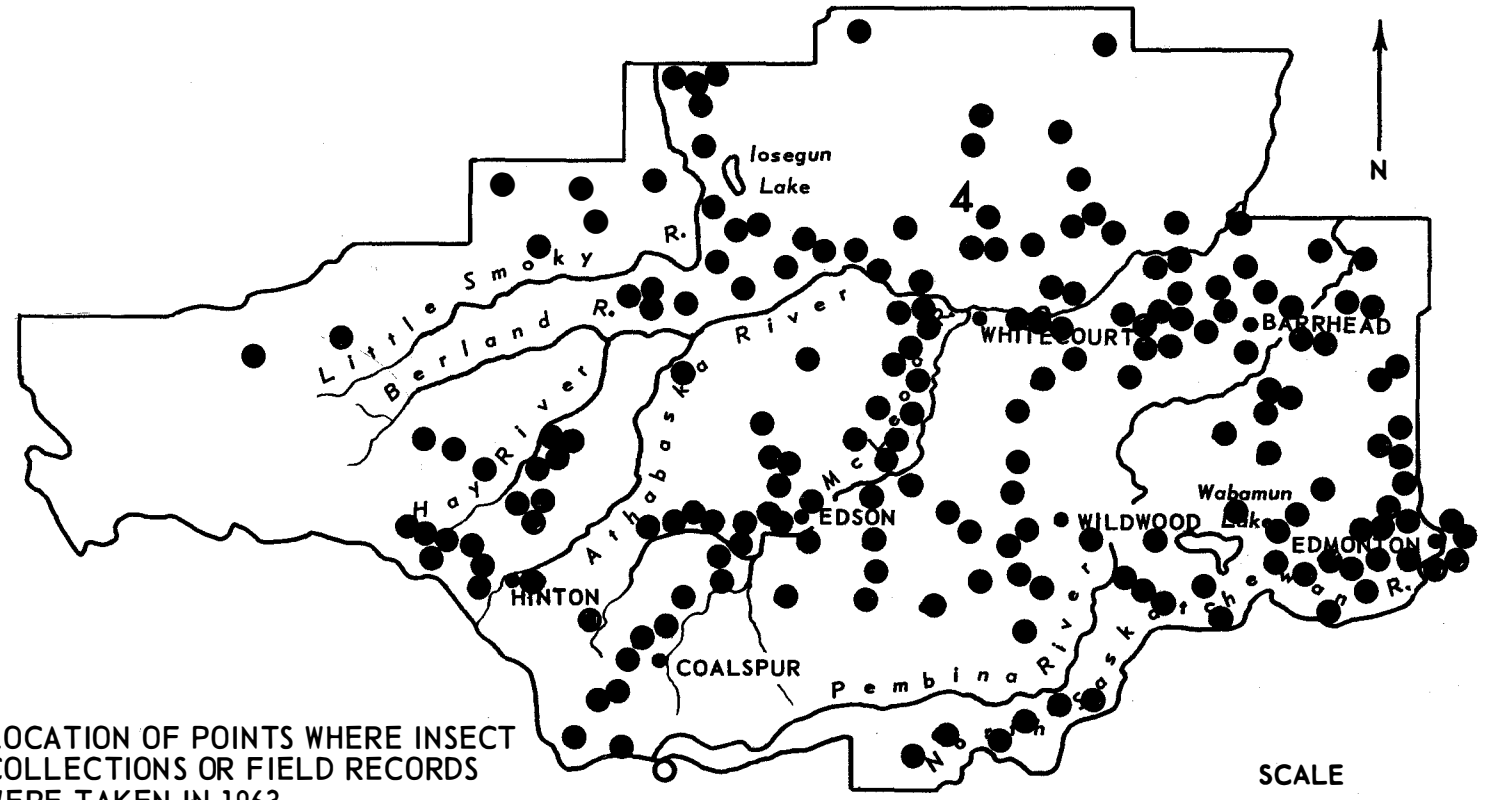
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE BRAZEAU-ATHABASCA DISTRICT

Outbreak number	Location	Causal organism	Remarks
4-1	Lovett	Atropellis piniphila (Weir) Lohman & Cash	To be re-examined 1965
4-3	Whitecourt	Arceuthobium americanum Nutt. ex Engelm.	Re-examined 1962, boundaries unchanged.
4-5	Robb	Armillaria mellea (Vahl. ex Fr.) Quél.	Re-examined 1962. Mortality caused by A. mellea was 15.3 per cent, an increase of 1.6 per cent over 1959 data.
4-9	Hinton	Peridermium harknessii J. P. Moore	Re-examined 1963. 20 per cent of trees checked were infected with P. harknessii.
		Peridermium stalactiforme A. & K.	50 per cent of trees checked were infected with P. stalactiforme.
4-11	Hinton	Atropellis piniphila (Weir) Lohman & Cash	Re-examined 1963. 34 per cent of trees checked were infected with an average of 3.5 cankers per tree.
4-12	Entrance	Peridermium stalactiforme A. & K.	Re-examined 1963. 22.2 per cent of trees checked were infected and 7.4 per cent were dead.
4-13	Robb	Peridermium harknessii J. P. Moore	Re-examined 1962. No change in intensity from 1959 data.
4-14	Robb	Peridermium stalactiforme A. & K.	Re-examined 1962. Incidence slightly decreased from 1959 data.
4-15	Whitecourt	Unknown cause of dying lodgepole pine.	Re-examined 1962. Unhealthy condition of pine believed to be due to restricted aeration and adverse soil conditions.

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

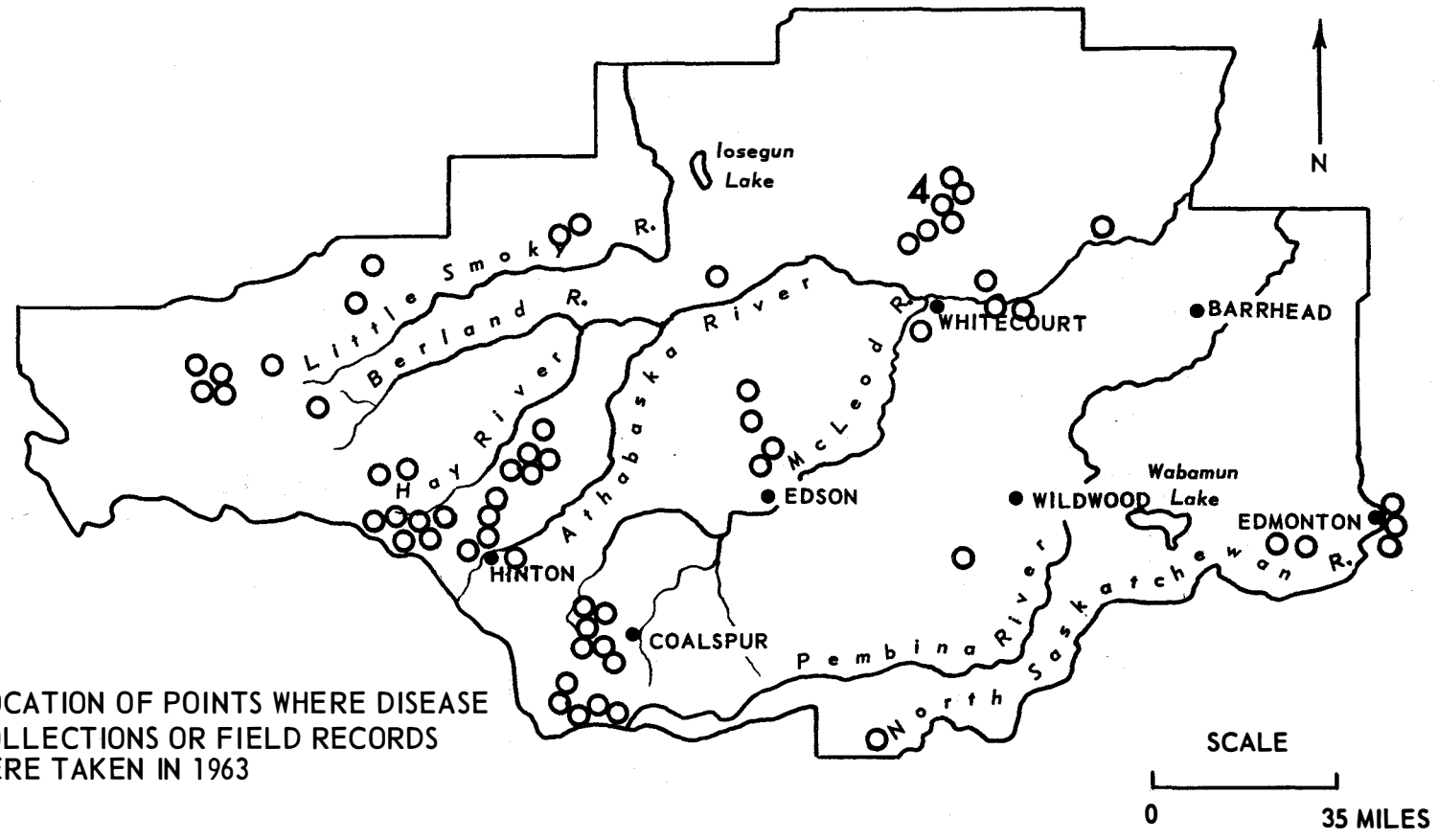
Outbreak number	Location	Causal organism	Remarks
4-18	Fort Assiniboine	Arceuthobium americanum Nutt. ex Engelm.	Re-examined 1962 following 1961 fire. There are still a number of old infected fire residuals and "islands" of young uninfected pine.
4-19	Fort Assiniboine	Arceuthobium americanum Nutt. ex Engelm.	Area reserved for study of the spread of dwarf mistletoe in pine regeneration.
4-20	Edson	Atropellis piniphila (Weir) Lohman & Cash	Examined 1963. 46.7 per cent of trees checked were infected with 1.6 cankers per tree.
4-21	Cadomin	Atropellis piniphila (Weir) Lohman & Cash	Examined 1963. 72 per cent of trees checked were infected with 3.1 cankers per tree.
4-22	Hinton	Armillaria mellea (Vahl. ex Fr.) Quél.	Examined 1963. 31 per cent of pine checked were infected. Other species not affected.
4-23	Entrance	Rodent damage	Examined 1963. Suspected rust infection on which rodents feed.

BRAZEAU-ATHABASKA DISTRICT



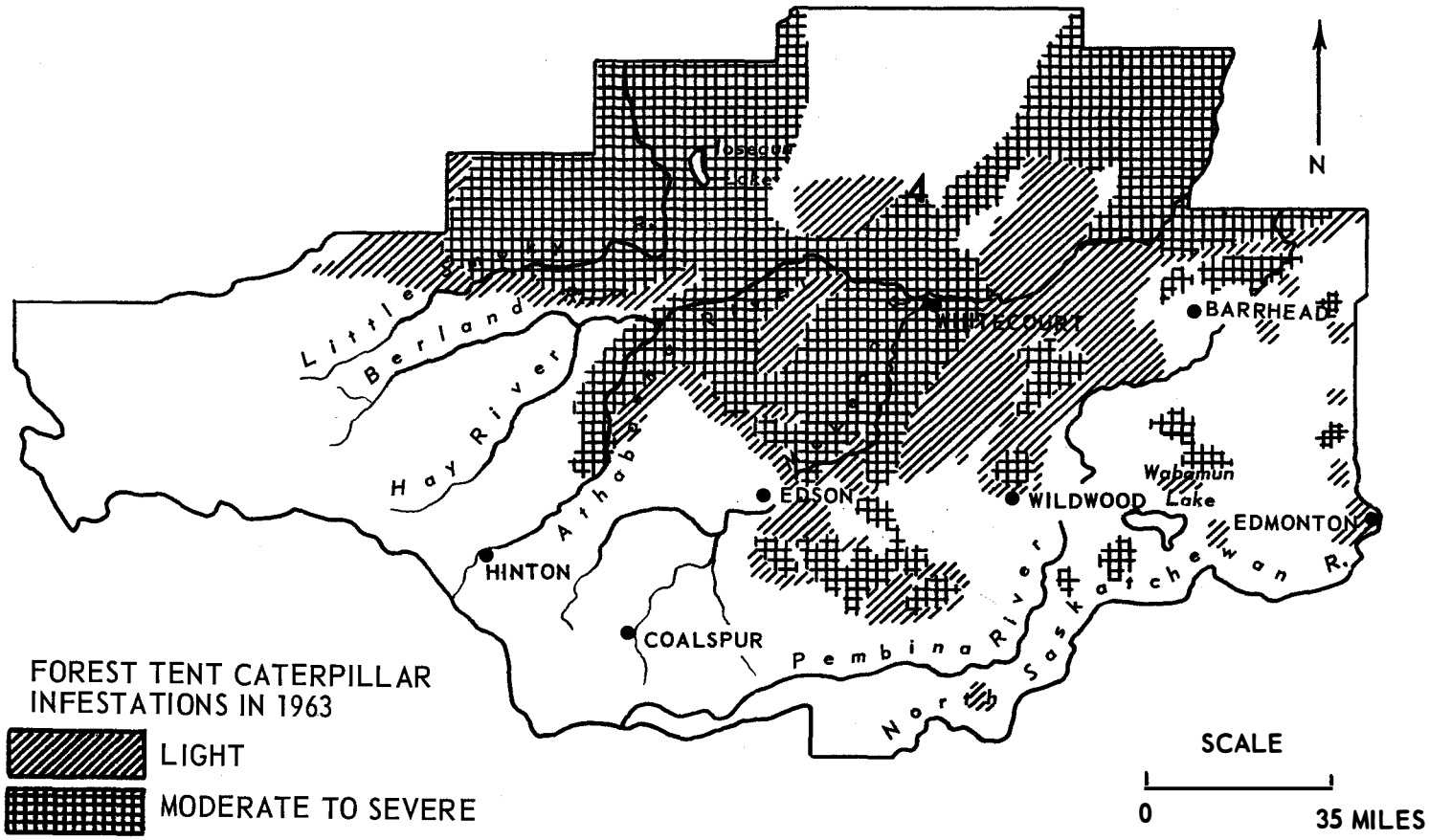
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

BRAZEAU-ATHABASKA DISTRICT

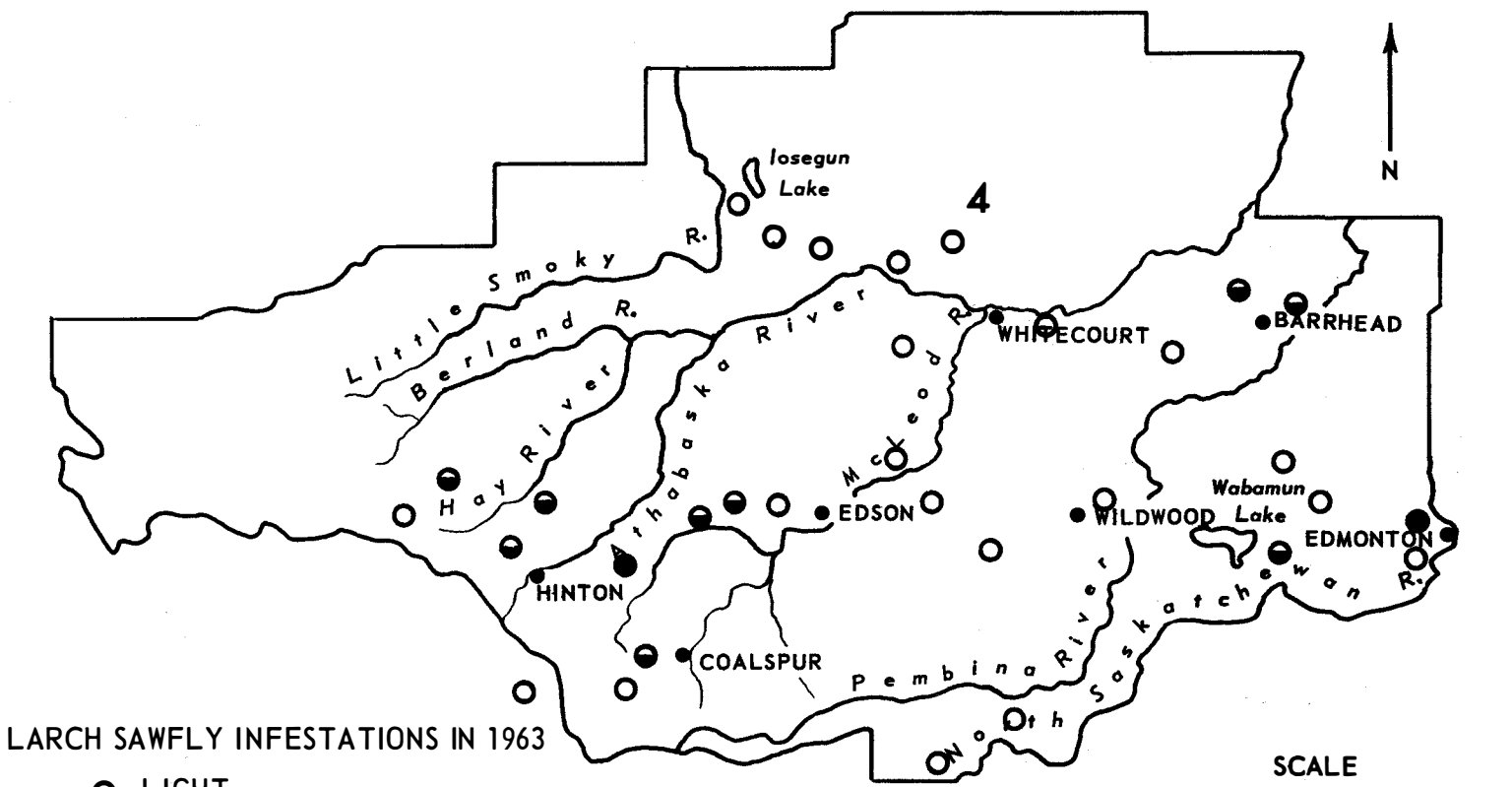


LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

BRAZEAU-ATHABASKA DISTRICT



BRAZEAU-ATHABASKA DISTRICT



LARCH SAWFLY INFESTATIONS IN 1963

- ○ LIGHT
- ◒ MODERATE
- ● SEVERE

ANNUAL DISTRICT REPORT

LAC LA BICHE DISTRICT

ALBERTA 1963

by

N. W. WILKINSON

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

The forest tent caterpillar was the most destructive forest insect in the Lac La Biche District during 1963. Signs of what may be the start of a decline in this outbreak were evident in the south-east section of the infested area. A slight decrease in the numbers of grey willow leaf beetles was noticeable this year.

The decline of the larch sawfly population, which started in 1962, continued in 1963. As a result of this decline very little defoliation of larch occurred in the Lac La Biche District this year. The yellow-headed spruce sawfly was responsible for increased defoliation of shelterbelts in the District. The outbreak of the pine tube maker in the Embarras-Richardson Lake region has collapsed to the extent that no specimens could be found in numerous samples taken from jack pine in the area.

INSECT CONDITIONS

Pine Tube Maker, Argyrotaenia tabulana Free.

The outbreak of this pine tube maker in the Embarras-Barber Lake-Richardson Lake region appears to have collapsed. No larvae of this species were found in beating and hand picked samples taken from jack pine in the area. A few larvae of a budworm, Christoneura sp., were found in these collections.

Grey Willow Leaf Beetle, Galerucella decora Say

Populations of this insect were lower this year and not as widespread as in 1962. Medium populations of adults were responsible for patches of severe skeletonizing of willow leaves in a triangular area from Innisfree and Vermilion to Lac La Biche. Damage was light throughout the remainder of the District south of Lac La Biche. There was a marked decrease in the numbers of larvae this year as compared to 1962 which resulted in little damage being done in this stage.

Pine Root Collar Weevil, Hylobius sp.

Collections of larvae and adults were taken from jack pine at widely separated points in the District. Tree mortality, the result of attack by this insect, was evident near Cold Lake, Lac La

Biche, Embarras and Crow Lake. At each of these locations very few trees were infested. This sporadic occurrence suggests a low population scattered over a wide area of the District.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In 1963 the forest tent caterpillar was the most destructive forest insect in the Lac La Biche District and the area infested was slightly larger than in 1962. The major change was a northern extension of 36 miles which extends across the full width of the District. The infestation now covers 24,700 square miles and is throughout most of that part of the Lac La Biche District south of Township 92. Approximately two-thirds of the infested area supported a high population of caterpillars and sustained severe defoliation. Throughout the southeast section of this are populations ranged from low through medium to high, where in previous years populations were high. Besides the extension to the north there was a noticeable increase in population numbers southwest of a line from Athabasca to Mannville. This increase was responsible for patches of light, moderate and severe defoliation where in previous years patches of light defoliation only occurred.

A good hatch occurred throughout the infested area but was more uneven than in past years. First and fourth instar larvae were found at the same time in many locations especially in the southeast section of the infestation.

Hatching began at approximately the same time throughout the outbreak area. Development through the instar stages appeared normal. However, many larvae were stunted and in an emaciated condition by the time they reached the cocoon spinning stage. This condition was undoubtedly due to starvation and disease which resulted in high mortality during the last larval instar and pupal stage.

Sequential samples taken throughout the District to determine egg abundance indicate a decrease in populations. Refer to the map and Table II at the end of this report for information on location and degree of defoliation in 1963 and an estimate of defoliation that will occur in 1964.

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

A slight increase in the population level of this sawfly was evident in the Lac La Biche District in 1963. Defoliation of spruce was more widespread than in previous years. Light to moderate defoliation occurred in numerous white spruce shelterbelts in the south half of the District. Near Lac La Biche, St. Paul and Bonnyville some shelterbelts were severely defoliated. Native growing black spruce was also attacked in the Lac La Biche area where moderate to severe defoliation occurred to young trees and to the tops of mature trees.

Larch Sawfly, Pristiphora erichsonii (Htg.)

A marked decrease in the numbers of larch sawfly was evident in the Lac La Biche District in 1963. The extent of damage caused by this insect was confined to small patches of light defoliation near Lac La Biche, Calling Lake and Fort McMurray and moderate to severe defoliation in Township 102, Ranges 7 and 8, W. 4. In many stands of larch defoliation was not evident. This condition may have been due to the drowning of larch sawfly pupae by a high water table which existed throughout the north half of the District this year. This excess of water appears to have also caused the loss of tree vigor resulting in meagre needle production and in some areas tree mortality.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

Observations and gathering of data on the phenology of dwarf mistletoe on pine was continued in the Lac La Biche District this year.

Spruce Needle Rust, Chrysomyxa woroninii Tranz.

This rust, previously unrecorded in Alberta was found on white spruce at Namur Lake 60 miles northwest of Fort McMurray. The only collections of this rust previously recorded in North American were taken at Great Whale River, Quebec from white spruce, and west of Dawson, Yukon from the alternate host Labrador tea. Other distribution records of its occurrence places this rust in northern Europe and Kamchatka in northeast Asia. This known distribution and the abundance of Labrador tea at tree line throughout northern Canada suggests this rust is circumboreal and may rank with Chrysomyxa empetri (Pers.) Schroet. and Chrysomyxa ledicola Laegerh. as one of the complex of factors deterring the invasion of the barrens by spruce.

Hypoxylon Canker, Hypoxylon pruinatum (Klotzke) Cke.

The status of this canker disease on poplar in the Lac La Biche District was reported in 1961. A permanent study plot was established in 1963 in Elk Island National Park to study the effects of this disease on trembling aspen in the parkland region of Alberta where it is most abundant. Re-examination of this plot will continue for the duration of the study.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	39	6	Trembing aspen	170	10
Black spruce	7	1	Balsam poplar	10	0
Lodgepole pine	1	2	Hybrid poplar	30	38
Jack pine	29	4	Willow	11	6
Balsam fir	10	9	Birch	4	6
Larch	29	1	Alder	4	0
	115	23		229	60
Insect collections from miscellaneous hosts					11
Disease collections from miscellaneous hosts					22
			GRAND TOTAL		460

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1963

Location	Predicted defoliation for 1963	Actual defoliation for 1963	Predicted defoliation for 1964
Lac La Biche	Severe	Severe	Light
Grassland	Severe	Severe	Moderate *
Calling Lake	Severe	Severe	Light
Athabasca	Severe	Severe	Severe
Rochester	Moderate	Severe	Severe
Ashmont	Severe	Severe	Light
Elk Point (N)	Severe	Severe	Severe
Elk Point (S)	Severe	Severe	Light
Dewberry	Severe	Severe	Light
Vermilion	Light	Light	Light
Mannville	Light	Light	Light
Two Hills	Nil	Nil	Nil
Andrew	Light	Nil	Light
Star	Light	Nil	Light
Warspite	Light	Moderate	Moderate
Vilna	Light	Light	Severe
Brierville	Severe	Severe	Light
Wandering River	Severe	Severe	Light
Beauvallon	Severe	Severe	Light
Cold Lake	Light	Moderate	Light
Bonnyville	Severe	Severe	Light
Ellscott	Severe	Severe	Severe

* Marginal between Moderate and Severe

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1960	Infestation class 1961	Infestation class 1962	Infestation class 1963
5-1	Calling Lake	Nil	Severe	Light	Light
5-2	Perryvale	Light	Moderate	Moderate	Discontinue
5-4	Cold Lake	Nil	Light	Light	Nil
5-5	Lac La Biche	Nil	Severe	Light	Light

TABLE IV

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE LAC LA BICHE DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Gall aphids on conifers, *Adelges lariciatus* (Patch)	W. spruce	A medium population north of Boyle to Wandering River.
Ugly-nest caterpillar, *Archips cerasivoranus* (Fitch)	Pin cherry	A light infestation near Fedora.
Poplar scale, *Aspidiotus popularum* (Marlatt)	T. aspen	A low population near Rochester.
Spruce budworm, *Choristoneura fumiferana* (Clem.)	W. spruce B. fir	A few larvae collected at Fort McMurray and Embarras.
Woolly elm aphid, *Eriosoma americanum* (Riley)	Elm	Caused light damage in Dewberry area.
American aspen beetle, *Gonioctena americana* (Schaeff.)	T. aspen	Populations low this year.

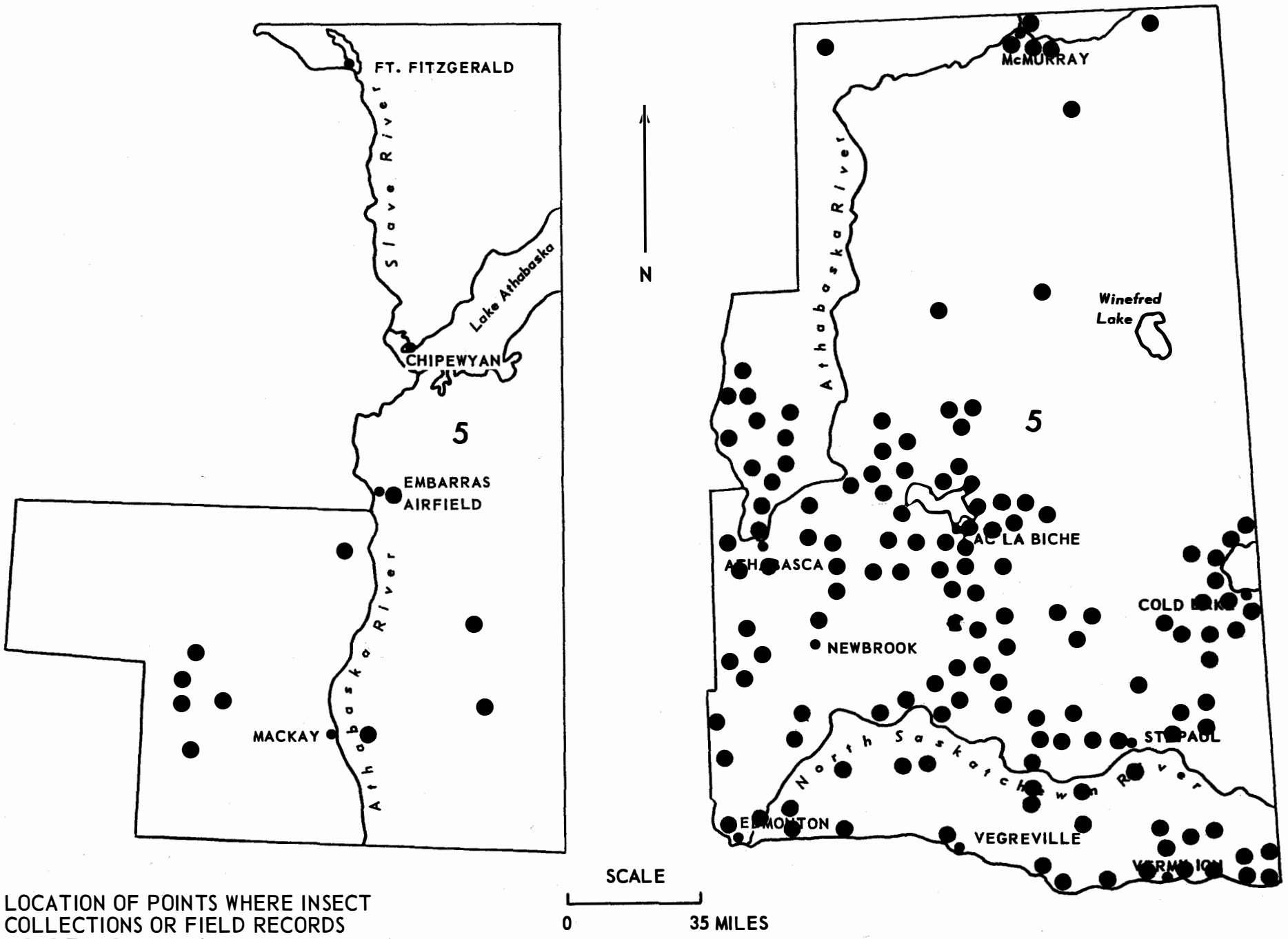
Table IV - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Insect		
Boxelder aphid, *Periphyllus negundinis* Thos.	M. maple	Caused light damage in the Dewberry area.
A pitch nodule maker, *Petrova* sp.	J. pine	Populations remained low this year.
A weevil, *Pissodes* sp.	W. spruce J. pine	Populations remained low this year.
Poplar borer, *Saperda calcarata* Say	T. aspen	A severe attack on aspen near Warspite.
Disease		
Shoestring root rot, Armillaria mellea (Vahl. ex Fr.) Quél.	W. spruce	A light infection near Lac La Biche in a plantation of native W. spruce.
Yellow witch's broom, *Chrysomyxa arctostaphyli* Diet.	Kinnikinnick	Collected at 5 locations from the alternate host.
Spruce needle rust, *Chrysomyxa ledi* de Bary	W. spruce Labrador tea	Collected from the primary host at Crow Lake north of Lac La Biche, and from the alternate host 60 miles north of Fort McMurray.
Spruce needle rust, *Chrysomyxa ledicola* Laegerh.	Labrador tea	Collected at 4 locations from the alternate host.
Comandra blister rust, *Cronartium comandrae* Pk.	Comandra sp.	Light infections on the alternate host at 3 locations.

TABLE V

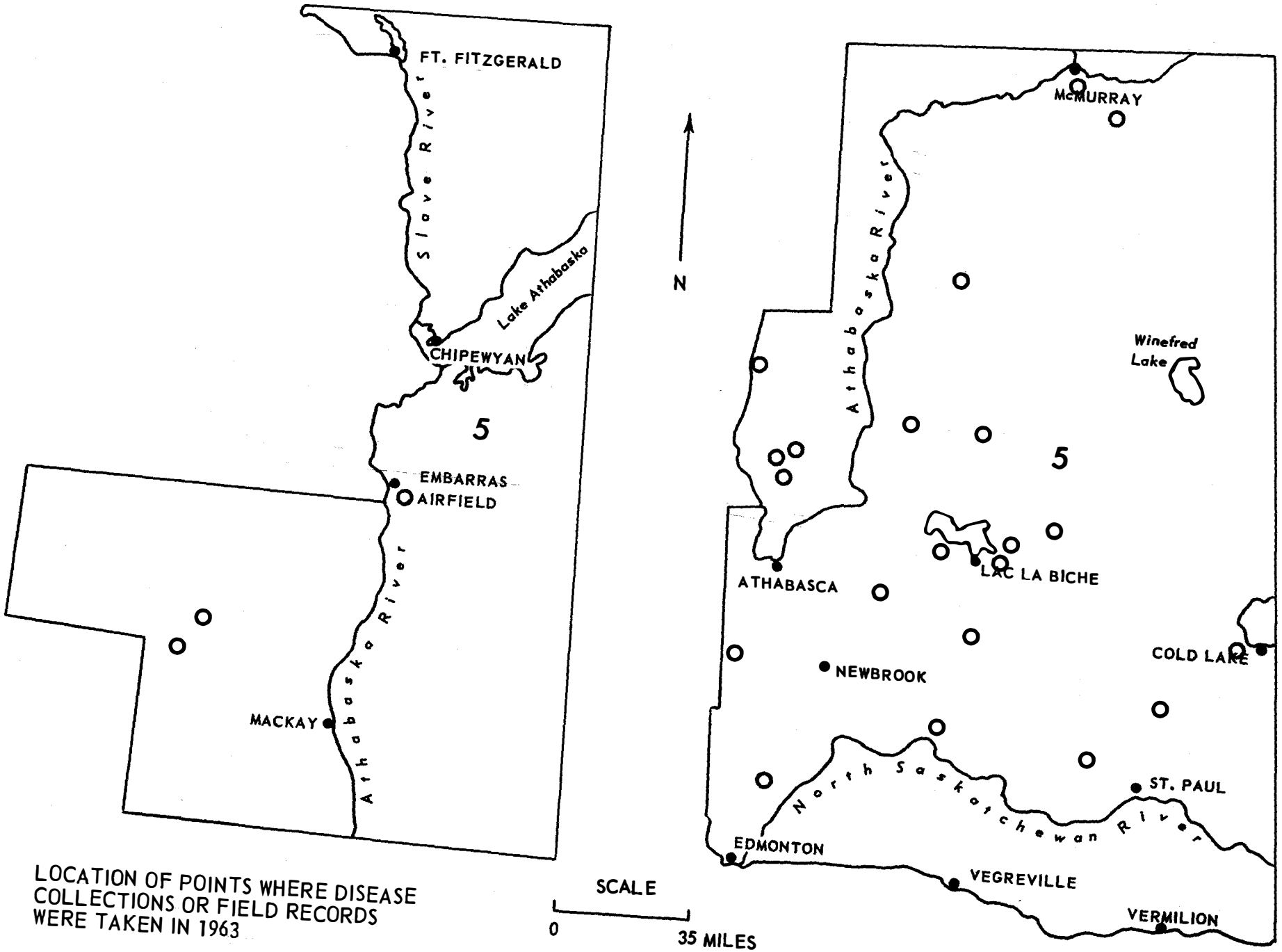
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE LAC LA BICHE DISTRICT

Outbreak number	Location	Causal organism	Remarks
5-3	60 miles north of Lac La Biche	Arceuthobium americanum Nutt. ex Engelm.	Not examined in 1963
5-4	Bellis	Arceuthobium americanum Nutt. ex Engelm.	Not examined in 1963
5-6	Calling Lake	Fomes igniarius (L. ex Fr.) Kickx	Not examined in 1963
5-7	Elk Island N. P.	Hypoxylon pruinatum (Klotzsche) Cke.	A study plot was established this year.



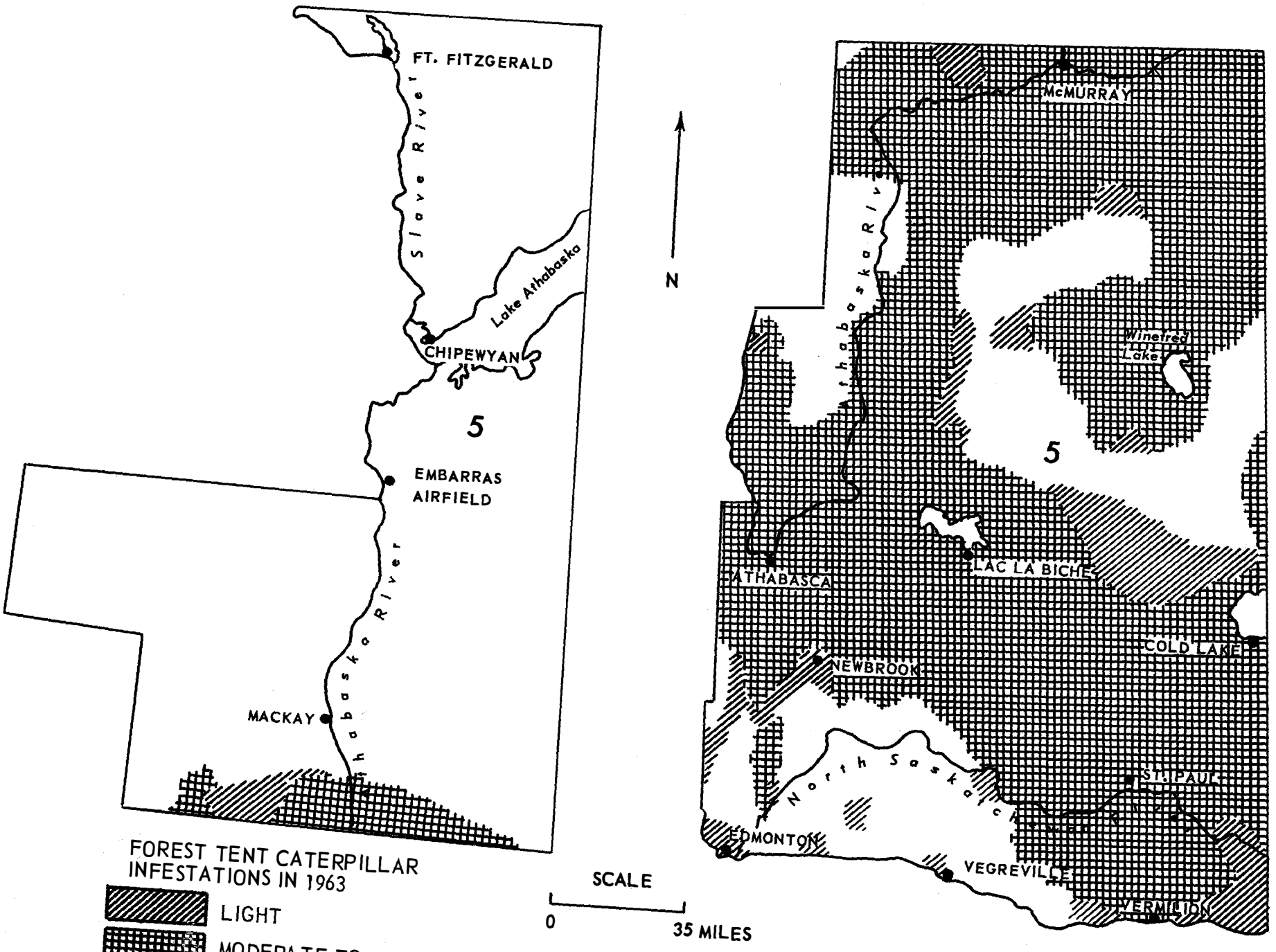
LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

LAC LA BICHE DISTRICT

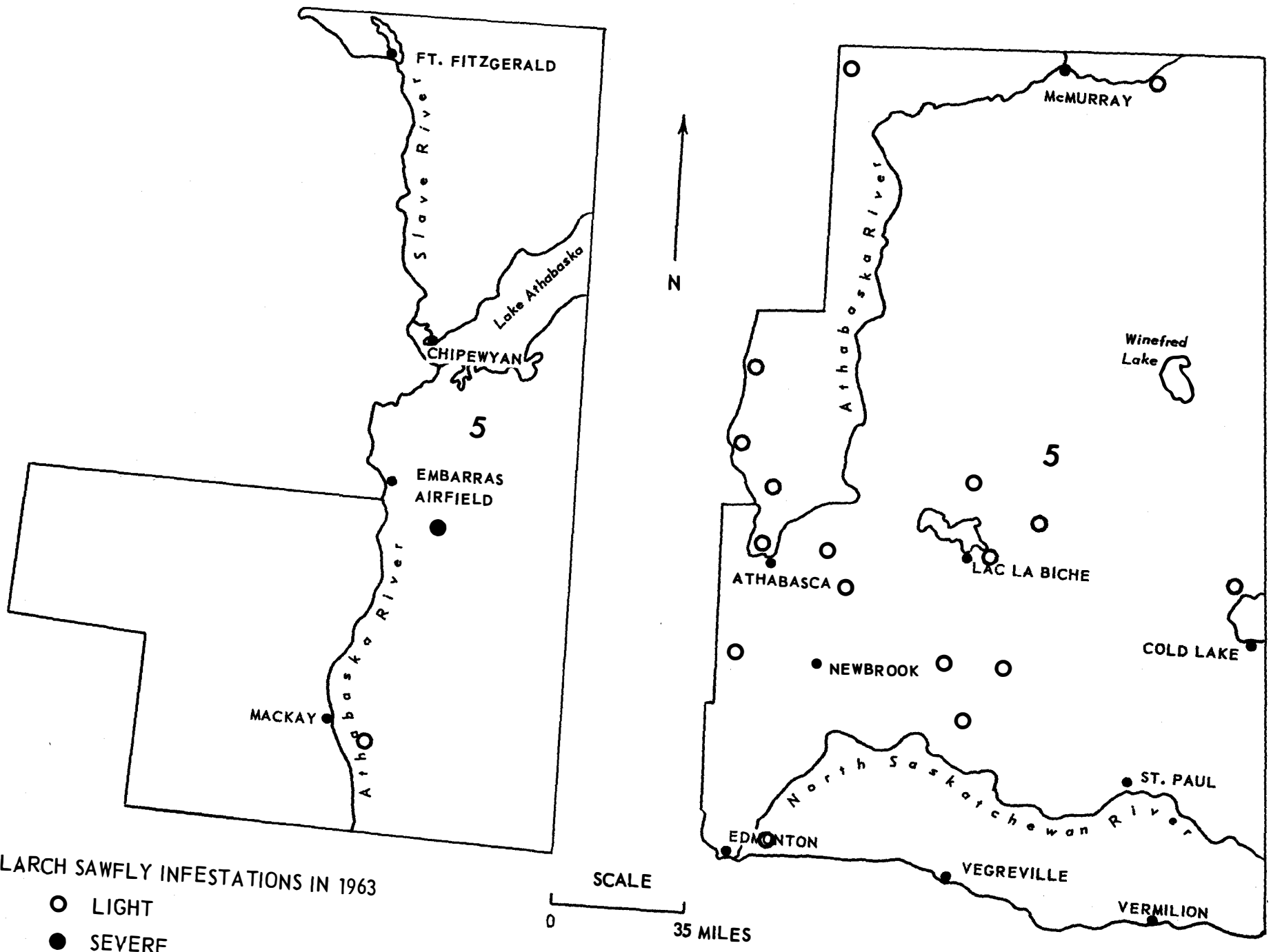


LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963

LAC LA BICHE DISTRICT



LAC LA BICHE DISTRICT



LAC LA BICHE DISTRICT

ANNUAL DISTRICT REPORT

GRANDE PRAIRIE-SLAVE LAKE DISTRICT

ALBERTA 1963

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G. SMITH

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MARCH 1964

INTRODUCTION

For the third consecutive year the forest tent caterpillar was the major insect pest which attacked deciduous forests in the Grande Prairie-Slave Lake District. Due to the dominance of these caterpillars, the amount of damage to aspen foliage caused by other insects could not be determined. Damage by the larch sawfly decreased, and in several areas to such an extent that the appearance and vigor of the larch was the best seen for a number of years. Defoliation caused by the spruce budworm near Loon Lake was much the same as reported last year but was lighter in the Talbot Lake-Wabasca River area. A number of farm shelterbelts were partially defoliated by the yellow-headed spruce sawfly.

One new disease outbreak was recorded and others were re-examined. Needle cast and needle rust were common in the District but damage was heavy in only a few locations. The second consecutive year of winter damage to conifers in the foothills killed and weakened a considerable amount of merchantable timber. Numerous new regional records of tree diseases were established in the District.

INSECT CONDITIONS

Wood Borers, Cerambycidae

In standing winter killed and injured spruce and pine on the north slope of Nose Mountain, numerous larvae of this family of wood boring insects were found. In recently killed trees the larvae had penetrated the heartwood and were well established. Many small larvae were found in the cambium of injured trees with little living foliage and a reduced sap flow. It is possible that the damage caused as they develop may prevent recovery and survival of these trees.

Adult wood borers found elsewhere in the District were identified as to species and are included in this report under separate species headings.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Re-examination of the spruce budworm outbreak in the Loon Lake area revealed that, as in 1962, most of the current year's foliage in the centre of the infestation was destroyed. Although this infest-

ation has been active for a number of years, mortality and permanent damage, such as dead tops and branch tips on merchantable trees, was light and not as extensive as to the understory. The spread of insects from this area appears limited as only a few larvae were found in spruce stands within a 30 mile radius of the outbreak.

As the outbreak east of Talbot Lake was not examined this season, the only spruce budworm found elsewhere in the District were in young spruce north of Sturgeon Lake.

Spruce Bark Beetle, Dendroctonus obesus (Mannh.)

A conifer stand on the north slope of Nose Mountain, recently damaged by "red belt" was attacked this summer by various species of bark beetles, the most numerous being the species D. obesus in the dying spruce. This infestation will be re-examined in 1964 to determine the extent and severity of attack on injured trees.

Grey Willow Leaf Beetle, Galerucella decora Say

Infestations of this beetle were small and widely scattered this season and skeletonizing of willow was noticeable in only a few locations. Patches of severe leaf skeletonizing were observed west of the Pinto Creek bridge, north of Valleyview and north of Smoky Tower. Light to moderate patches of damage were observed near Loon Lake, Wabasca Lake, Mountain Creek and west of Proctor Lake.

American Aspen Beetle, Gonioctena americana (Schaeff.)

As in 1962, these insects were numerous in aspen stands in the eastern region of the District near Whitefish Tower, Fawcett Lake, Ranch, Lawrence Lake and Steele Lake. The defoliation they caused was noticeable only for a short period in early June before the forest tent caterpillar completely stripped the aspen foliage from these areas.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In 1963, the total area infested by these caterpillars increased but populations and severity of defoliation decreased in several areas in the centre of the infestation. North and west of Grande Prairie where patchy defoliation was reported in 1962, severe defoliation was observed this year from Grande Prairie to Brainard and north through Blueberry Mountain to the Peace River. Patchy, light defoliation continued westward from Brainard into British Columbia and from Blueberry Mountain to the Gordondale-Bonanza areas. In the southeast region of the District,

defoliation was severe from Smith to Jarvie between the Athabasca River and the western edge of the Lac La Biche District. This constituted an increase in infested area of approximately 800 square miles.

The most noticeable areas in which larval populations declined were from Sturgeon Lake southwesterly to the conifers in the foothills and to the north and south of Lesser Slave Lake (as mapped). Parasites, disease and starvation from overpopulation were believed the main causes of population decline in these areas.

The map accompanying this report outlines the infestation in the District and the category of the defoliation. Table II provides the actual defoliation categories for 1963 and a prediction of the degree of defoliation of aspen expected in 1964 in the vicinities of the permanent sampling stations where egg band sampling was carried out.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

There was a noticeable increase in populations of these caterpillars this season. Eight small, severe infestations were reported from the central and eastern regions and numerous light infestations from the western region. Damage was confined to open growing shrubbery and small alder, willow and aspen.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

Along Highway 2 between Faust and Wagner the large spruce had a very dirty and unhealthy appearance due to the mass of webbing on the foliage cuased by these mites. This was most noticeable near the highway where dust had lodged in the webbing and accumulated throughout the latter part of the summer.

Elsewhere, light to moderate infestations were found near Utikuma Lake, north of Hythe and in spruce shelterbelts and ornamentals near Grande Prairie.

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

Larval populations of these sawflies have remained almost static from year to year and were found in the same shelterbelts and isolated spruce stands as reported last season. Severe defoliation of young spruce was observed near Bezanson, Crooked Creek, Puskwaskau Tower, along the Lesser Slave River and in a few shelterbelts around Grande Prairie. Light defoliation was observed in shelterbelts in the Wembley, Buffalo Lake, Westmark and Valleyview areas.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

Three previously unreported infestations of this weevil were found this season. In one of these, in young spruce along Highway 2 northwest of Smith, 50 leaders of 300 counted were infested or damaged from previous infestation. Forty infested and damaged leaders were counted along a 2 mile stretch of the road, twelve miles north of Hythe. A number of damaged leaders were also observed northwest of Lawrence Lake. Current damage was light in the previously reported infestations near Hondo and south of Fawcett Lake.

Larch Sawfly, Pristiphora erichsonii (Htg.)

Defoliation of larch by this sawfly was considerably less than in 1962, and for the first time in recent years some stands were almost untouched. Severe defoliation was observed in a few scattered stands in the area north of Lesser Slave Lake to the northern boundary of the District. Severe damage also occurred in small patches north of Jarvie Corner, northeast of Valleyview, north of Kakwa Tower, southeast of Hinton Trail and in a shelterbelt of Siberian larch on the Beaverlodge Experimental Farm. In other infestations, defoliation ranged from moderate to light and nil.

The accompanying map shows the distribution of this sawfly and the category of defoliation at these points. Table III indicates the infestation classes at the permanent sampling stations for the past 4 years.

Poplar Borer, Saperda calcarata Say

The presence of these borers was noted in numerous stands of mature aspen across the District. Groups of infested trees were observed and sampled north of Spurfield, near Duck Lake, near Steele Lake and south of Ellenwood Lake. The latter area has been infested for a number of years and was the most extensive found to date.

Yellow-horned Horntail, Urocerus gigas flavicornis F.

This insect is known to be a carrier of the fir decaying fungus Stereum chaillettii (Pers. ex Fr.) Fr. in the Maritime Provinces. This season a specimen of the insect collected from balsam fir in the Smoky Tower area was forwarded to the Fredericton Laboratory and cultures of the fungus were obtained from within its body. This was the only specimer examined from Western Canada and was a new record of the association between S. chaillettii and the yellow-horned horntail in this region.

DISEASE CONDITIONS

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

This fungus was quite active in jack pine regeneration along the Wabasca Trail near Cabin Creek this season. In a dense young stand averaging 5 feet in height, random, small circular patches of the trees have been killed by this disease and scattered single trees throughout the stand were infected and their foliage was turning yellow. Fruiting bodies of this fungus were numerous in several other coniferous stands in the eastern region of the District.

Spruce Needle Rust, Chrysomyxa ledicola Laegerh.

Forty-eight miles south of Goodwin along the Forestry Trunk Road, several square miles of black spruce were discolored as a result of a heavy infection of this needle rust. A small patch of heavily infected white spruce was found along the Lesser Slave River north of Mitsue Lake. All other infections found on spruce were light and scattered although the alternate host, labrador tea, was heavily infected in most regions of the District.

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

This rust was heavy in 2 small stands of young pine in the Grande Prairie Forest Division this season. One infected stand was 24 miles south of Goodwin and the other was west of Puskwaskau Tower. Elsewhere in the District several light infections on pine were found and the alternate hosts Aster sp. and Solidago sp. were found infected at 17 locations.

Cronartium coleosporioides Arth.

This organism, which forms rust galls or cankers on stems and branches of pine, was found for the first time in Alberta infecting the alternate host, Melampyrum lineare Desr. and was a new herbarium host record for the region. Infections on this host were found along the ridge south of Smoky Tower, 20 miles south of Grovedale, 7 miles southeast of Hinton Trail, 4 miles north of Fawcett and in the Deep Valley Creek area.

Comandra Blister Rust, Cronartium comandrae Pk.

Three stands of blister rust infected pine, not previously reported, were found in the District this season. Light infections on pine regeneration were sampled in the Deep Valley Creek and Marten River areas. A moderate infection, in which young trees were dying, was found in the Muddy Creek area.

Newly reported patches of infected alternate hosts of this rust, Comandra pallida A. DC. and Geocaulon lividum (Richards) Fern. were located on Nose Mountain, near Teepee Creek and southeast of Hinton Trail.

Leaf Blight of Balsam Poplar, Linospora tetraspora Thompson

This fungus, which causes early discoloration and drop of balsam poplar leaves, was noticeable in numerous locations in the District in late August and early September. Stands affected by this blight south of Hondo, had completely turned color by the end of August and appeared as though stricken by early frost.

Pine Needle Cast, Lophodermium pinastri (Schrad. ex Fr.) Chev.

This was the most damaging and widespread needlecast found in the District this season. Although 22 samples were collected and most of the pine stands examined were infected, the overall damage was not heavy, other than in a few stands in which all except the current and 1962 needles had been cast. This occurred in young pine 22 miles south of Grovedale, 18 miles north of Grouard, along Simonette Ridge and Chinook Ridge.

Larch Needle Rust, Melampsora medusae Thuëm.

A light infection of this rust was found on larch north of Whitefish Tower. Later in the season the alternate host, trembling aspen, was found infected throughout the District. In some areas the uredia of this rust on the aspen leaves were so numerous that the leaves were discolored.

Yellow Witch's Broom of Fir, Melampsorella caryophyllacearum Schroet.

Rust brooms on fir caused by this organism have been common in the District for a number of years, but it had not been found on the known alternate hosts. In 1963, it was found on the alternate hosts Cerastium vulgatum L. and Stellaria calycantha (Ledeb.) Bong. in the

Nose Mountain area. These findings constituted new herbarium records in Alberta.

Western Gall Rust, Peridermium harknessii J. P. Moore

This rust was found on pine in 2 locations not previously reported. One lightly infected stand was along the Wabasca Trail 60 miles northeast of Lesser Slave Lake and another was along the north side of the Wapiti River south of Grande Prairie.

The large infected area north of Simonette Tower, reported in 1961, was thoroughly examined in September and only a low number of stem galls were found, although branch galls were numerous throughout the area.

Hyperparasite of Dwarf Mistletoe, Wallrothiella arceuthobii (Pk.) Sacc.

Dwarf mistletoe on pine was found infected by this organism in 4 locations this season. Heavy infections were found along the Marten River north of Lesser Slave Lake and along the Athabasca River east of Smith. Light infections were found 4 miles north of Fawcett and along the Wapiti River south of Grande Prairie.

Red Belt

This damage to conifers, which is the result of winter drying of foliage, was again common in the District. Most of the red belt areas reported in 1962 were similarly affected this year and considerable injury and mortality has resulted from 2 consecutive winters of such damage.

In co-operation with the Alberta Forest Service, a survey of damage was carried out in the basin at the head of Grayling Creek on the north slope of Nose Mountain. In this area it was found that approximately 700 acres of mixed merchantable and pole sized spruce and pine was damaged to such an extent that much of it had died. Surviving trees had very little foliage and were not expected to recover.

Severe damage was observed in numerous other locations on the north and west slopes of Nose Mountain but was mostly in younger stands which were not closely examined. Similarly damaged stands were observed high up the east side of Torrens Mountain, near Smoky Tower and in the Mink Lake area north of Lesser Slave Lake.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	59	23	Trembling aspen	108	22
Black spruce	5	3	Balsam poplar	7	8
Lodgepole pine	17	39	Willow	21	7
Jack pine	14	26	Birch	4	10
Balsam fir	7	4	Alder	9	4
Larch	48	4			
	150	99		149	51
Insect collections from miscellaneous hosts					15
Disease collections from miscellaneous hosts					107
GRAND TOTAL					571

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1963

Location	Predicted defoliation for 1963	Actual defoliation for 1963	Predicted defoliation for 1964
Debolt	Severe	Severe	Light
Sturgeon Lake	Severe	Light	Light
High Prairie	Severe	Severe	Severe
Driftpile	Severe	Severe	Moderate
Slave Lake	Severe	Moderate	Light
Fawcett Lake	Severe	Severe	Light
Huallen	Severe	Severe	Severe
Demmitt	Severe	Severe	Severe
Baytree	Light	Light	Severe
Spirit River	Moderate	Severe	Severe
Tangent	Severe	Severe	Severe
Grovedale	Severe	Moderate	Severe
Wanham	Severe	Severe	Severe

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1960	Infestation class 1961	Infestation class 1962	Infestation class 1963
6-1	Grande Prairie	Light	Light	Moderate	Severe
6-2	Flatbush	Moderate	Moderate	Moderate	Moderate
6-3	Slave Lake	Moderate	Severe	Severe	Light
6-4	Grouard	Light	Severe	Severe	Moderate

TABLE IV

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Black-headed budworm, *Acleris variana* (Fern.)	W. spruce	Larvae in low numbers near Whitefish Tower and Loon Lake.
Gall aphids on conifers, *Adelges lariciatus* (Patch)	W. spruce	Small, scattered infestations across the District.
Ugly-nest caterpillar, *Archips cerasivoranus* (Fitch)	Pin cherry	High populations along the east end of Lesser Slave Lake.
Pine tube maker, *Ar.yrotaenia tabulana* Free.	J. pine Lp. pine	Almost disappeared from Grande Prairie and Smith areas.
Fringed looper, *Campea perlatta* Gn.	T. aspen	Present in most aspen beating samples.
A leaf beetle, *Chrysomela semota* Brown	B. poplar	Two small infestations found in western region of the District.
Aphids, *Cinara* spp.	W. spruce Lp. pine Larch	Colonies very numerous throughout the District.
A leaf tier, *Compsolechia niveopulvella* Cham.	T. aspen	Collected in the Whitefish Tower area.
Eastern larch beetle, *Dendroctonus simplex* Lec.	Larch	A small infestation found in living larch 9 miles west of Grovedale.
Spotted tussock moth, *Halisidota maculata* Harr.	Crab apple Manitoba maple Ash	Numerous on urban plantings at Grande Prairie.
Pine root collar weevil, *Hylobius* sp.	J. pine Lp. pine	High populations as reported in 1962, caused low mortality to pine regeneration in southwestern region of District.

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

Causal Agent	Host	Remarks
Insect		
A looper, *Itame loricaria lulia* Evers.	T. aspen	Larvae present in most aspen beating samples.
Oregon fir sawyer, *Monochamus oregonensis* (Lec.)	W. spruce Lp. pine	Numerous adults were still emerging from timber killed by fire in 1961 along Cutbank River.
A sawfly, *Neodiprion* sp.	J. pine	Moderate infestation on pine along the Smoky River east of Bezanson.
Bruce spanworm, *Operophtera bruceata* (Hlst.)	T. aspen	Populations low throughout the District.
A pitch nodule maker, *Petrova albicapitana* (Busck)	Lp. pine	Populations static for past 3 seasons.
Spruce needle miner, *Taniva albolineana* Kft.	Norway spruce	Moderate infestation on planted shelterbelt at Beaverlodge Experimental Farm.
Disease		
Atropellis canker, *Atropellis phiniphila* (Weir) Lohman & Cash	Lp. pine	Some tree mortality observed in severely infected area south of Grande Prairie.
Clumping of aspen	T. aspen	Several square miles severely affected on the north slope of Nose Mountain.
Spruce needle rust, *Chrysomyxa ledi* de Bary	W. spruce	Light infections north of Deer Mountain Tower.
Spruce cone rust, *Chrysomyxa pirolata* Wint.	Wintergreen	Although few cones were produced by the spruce, this rust was found on the alternate host.
Spruce needle rust, *Chrysomyxa weirii* Jacks.	W. spruce	Light infection found in Long Lake area, north of Peerless Lake.

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

Causal Agent	Host	Remarks
Disease		
Black knot of cherry, Dibotryon morbosum (Schw.) T.S.	Pin cherry	Heavy infection along east end of Lesser Slave Lake.
Pine needle cast, Elytroderma deformans (Weir) Darker	Lp. pine	Light infections near Hinton Trail and Fawcett. Medium infection along the Latornell River near its junction with Kar Creek.
Pine needle cast, Hypodermella concolor (Dearn.) Darker	Lp. pine	Found along Chinook Ridge. Range extension northward.
Pine needle cast, Hypodermella montana Darker	Lp. pine J. pine	Light infections found south of Grande Prairie, north of High Prairie and on Deer Mountain.
Leaf cast, Lophodermium hysteroides (P.) ex Sacc.	Serviceberry	Found south of Grovedale. New herbarium record.
Leaf cast, Lophodermium maculare (Fr.) De Not	Bilberry	Found south of Grovedale and near head of West Prairie River. New herbarium record.
Spruce needle cast, Lophodermium macrosporum (Hartig) Rehm	W. spruce	Light infection along Wabasca Trail near the Willow River.
Willow leaf rust, Melampsora epitea Thuëm.	Willow Larch	Found on larch near Haglund Creek and in numerous locations on willow.
Leaf rust, Melampsora occidentalis Jacks.	B. poplar	Light infection found northwest of Snipe Lake.
Birch leaf rust, Melampsoridium betulinum (Fr.) Kleb.	Birch	Found in Deer Mountain area. New herbarium host record and range extension.

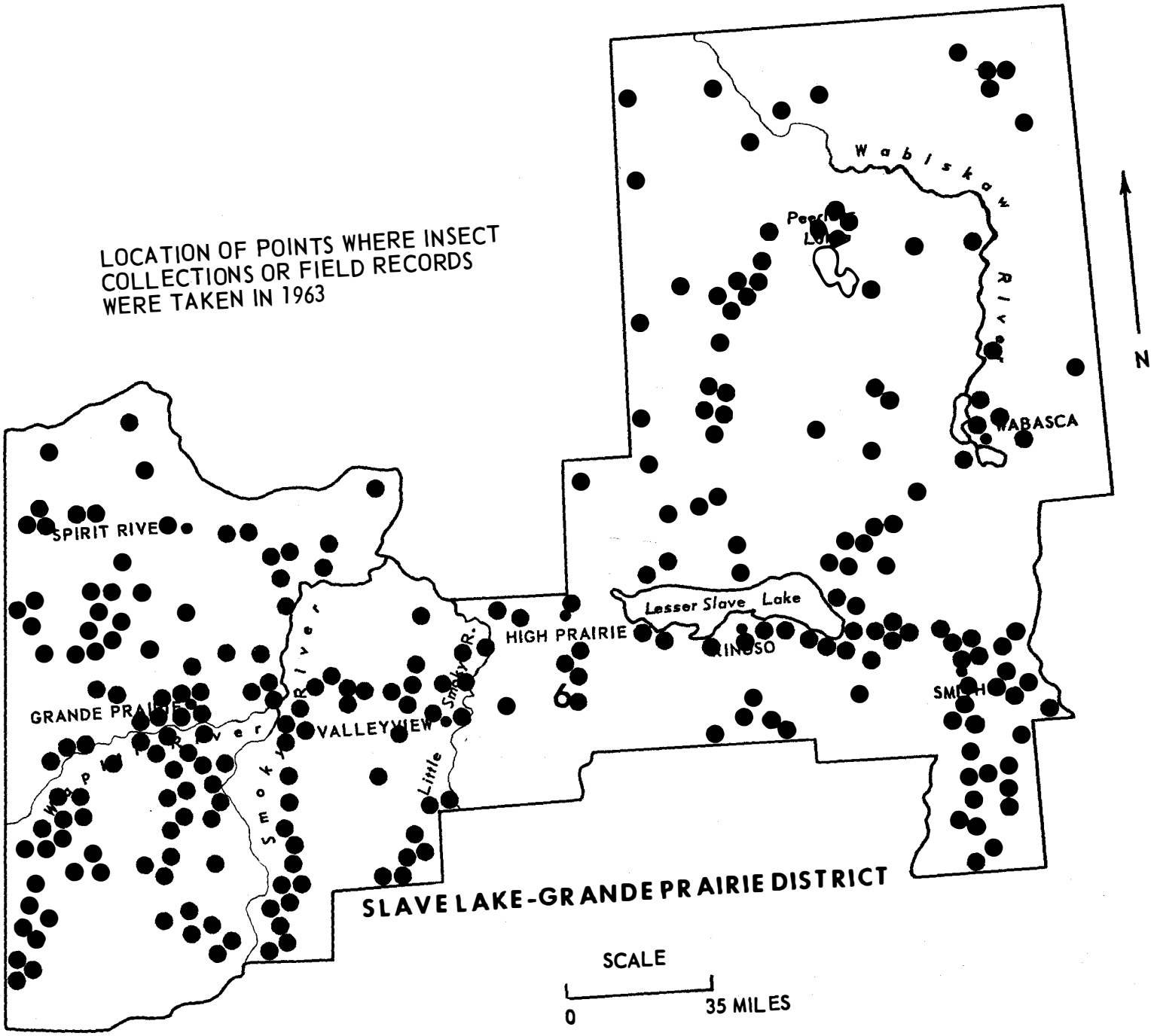
Table IV - Other Noteworthy Insects and Diseases - Cont'd.

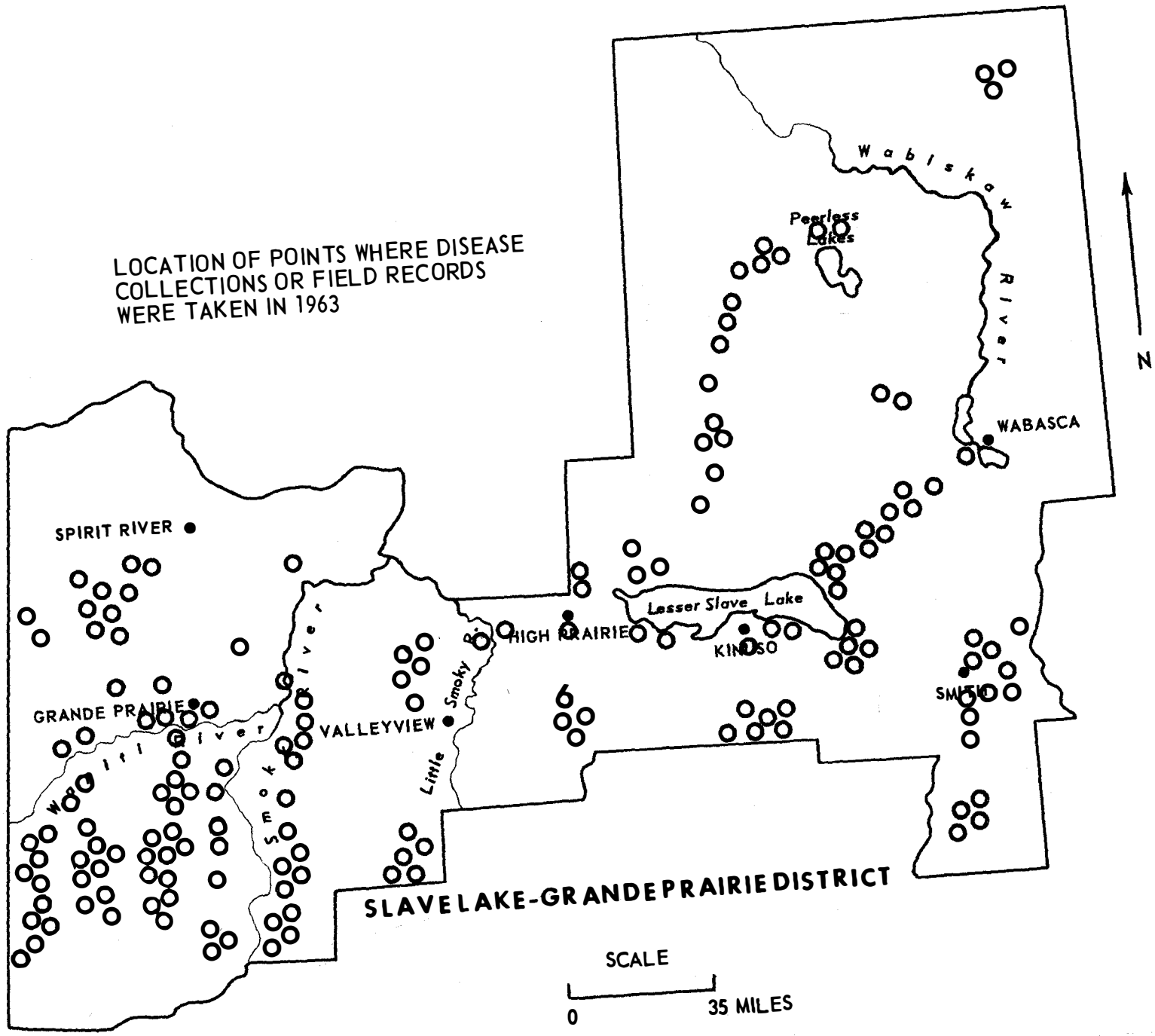
Causal Agent	Host	Remarks
Disease		
Alder leaf rust, *Melampsoridium hiratsukanum* Ito ex Hirat.	Alder	Moderate infection north of Fawcett. New herbarium record.
Stalactiforme rust, *Peridermium stalactiforme* A. & K.	Lp. pine	Previously unrecorded infection found along Simonette Ridge.
Aspen shoot blight, *Pollaccia radiosa* (Lib.) Bald. & Cif.	T. aspen	Common on aspen regneration in the area north of Lesser Slave Lake.
Red root and butt rot, *Polyporous tomentosus* Fr.	W. spruce	Fruiting bodies found in the Deep Valley Creek area.
Rust, *Pucciniastrum vaccinii* Wint. Jørstad	Bilberry	Light infection in Deer Mountain area. New herbarium host record.
Tar spot, *Rhemiellopsis betulina* (Fr.) V. Arx.	Birch	Light infection in Deer Mountain area. New herbarium record.
Hyper parasite of dwarf mistletoe, *Septogloeum gillii* Ellis	J. pine	Light infection 7 miles south of Grande Prairie. Range extension northwestward.
Tubercularia vulgaris Tode	Mountain elder	In several locations in foothills south of Grande Prairie. New herbarium host record.
Mildew, *Uncinula salicis* (D.C.) Wint.	T. aspen	Found south of Grovedale. New herbarium host record.

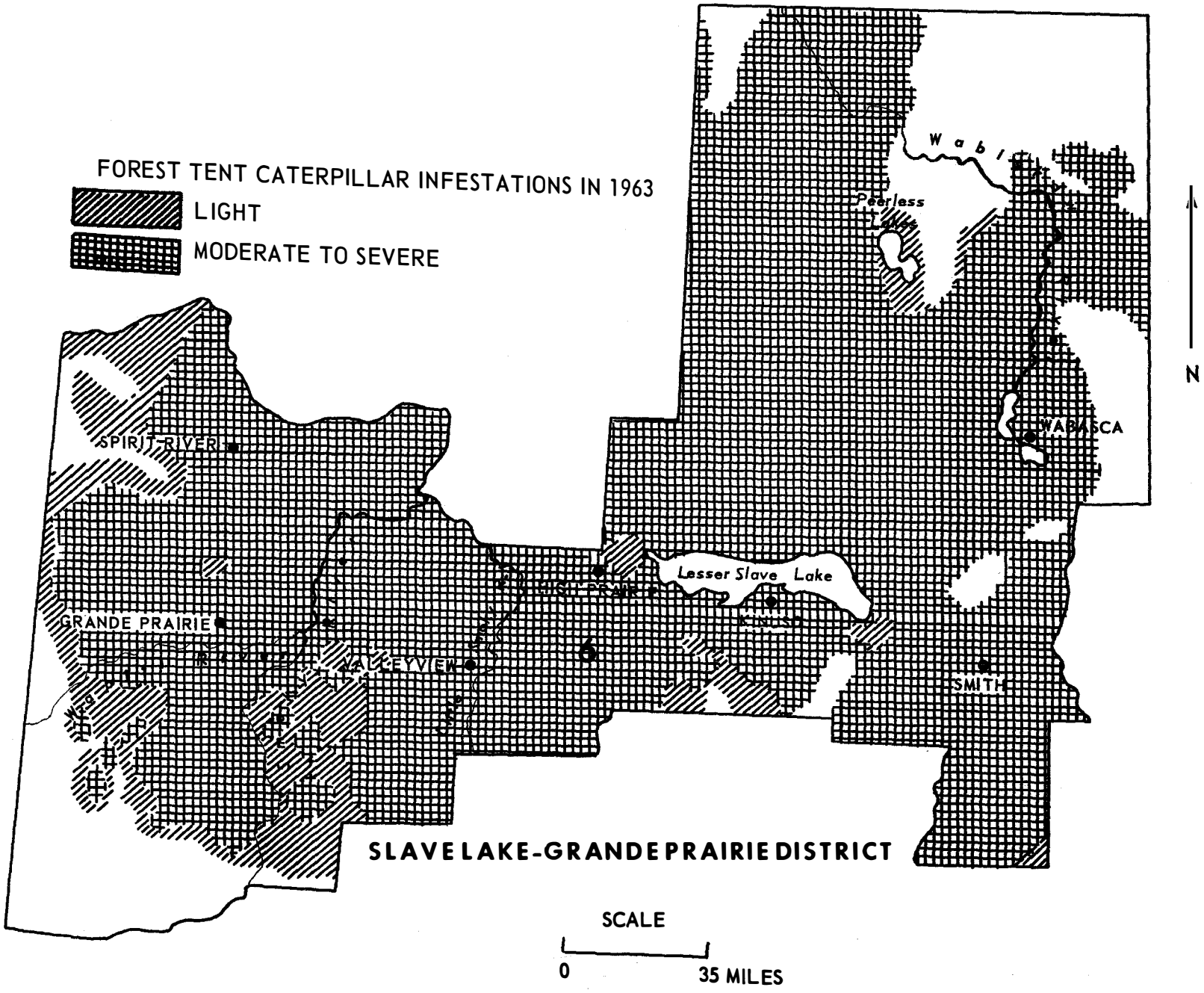
TABLE V

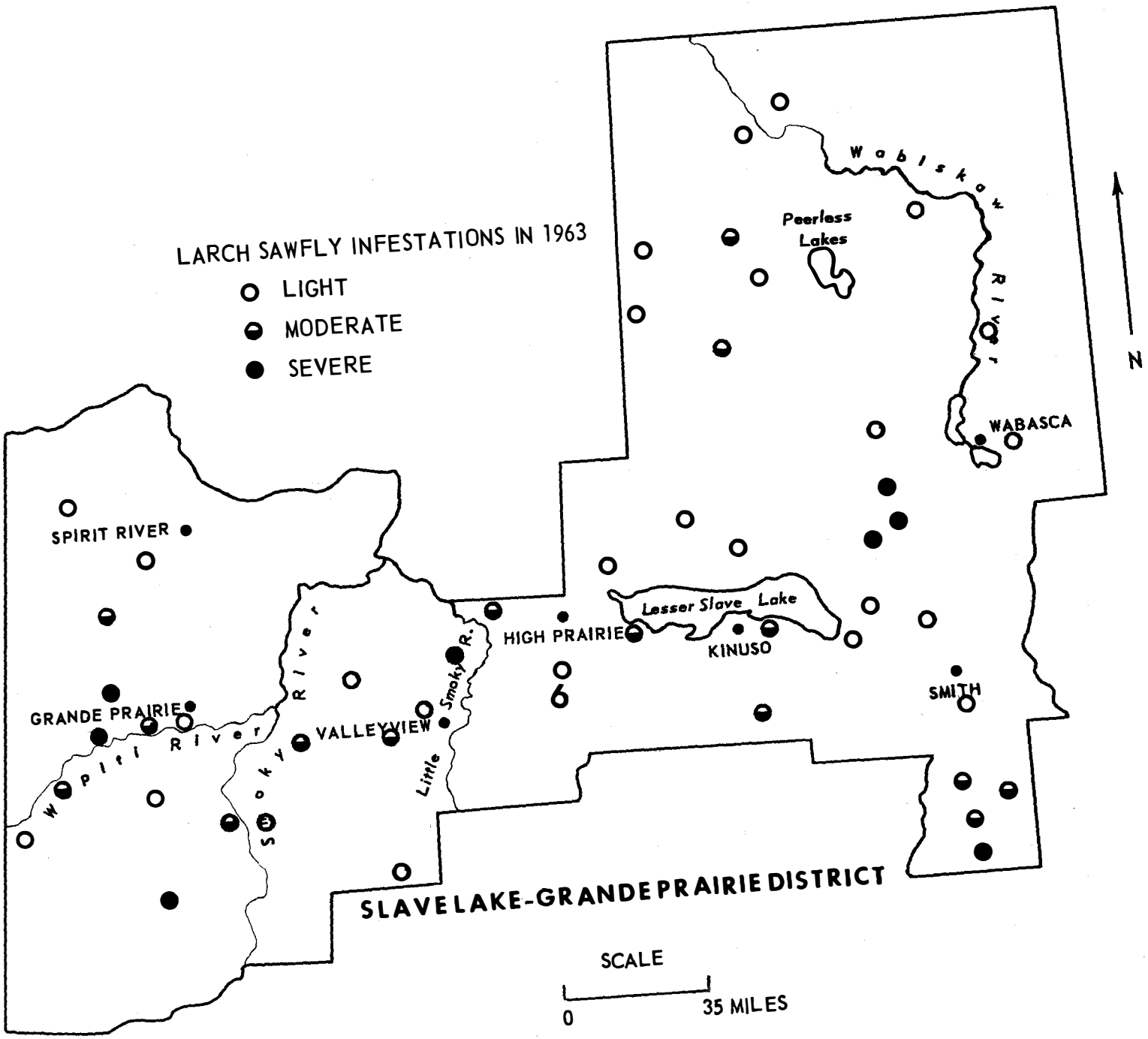
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT

Outbreak number	Location	Causal organism	Remarks
6-2	Grovedale	Atropellis piniphila (Weir) Lohman & Cash	Caused mortality to lodgepole pine girdled by cankers.
6-5	Slave Lake	Arceuthobium americanum Nutt. ex Engelm.	Newly reported outbreak. High incidence on old jack pine.


LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963
Wabiskaw River
N
SPIRIT RIVE
GRANDE PRAIRIE
VALLEYVIEW
Smoky R.
Little
HIGH PRAIRIE
Lesser Slave Lake
SMITH
ATHABASCA
SLAVE LAKE-GRANDE PRAIRIE DISTRICT
SCALE
0
35 MILES


LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963
Wabiskaw River
Peerless Lakes
N
WABASCA
SPIRIT RIVER
Lesser Slave Lake
HIGH PRAIRIE
KINUSO
SMITH
GRANDE PRAIRIE
Wapiti River
Smoky River
VALLEYVIEW
Little Smoky
SLAVE LAKE-GRANDE PRAIRIE DISTRICT
SCALE
0
35 MILES


FOREST TENT CATERPILLAR INFESTATIONS IN 1963
LIGHT
MODERATE TO SEVERE
Peerless Lake
SPIRIT RIVER
GRANDE PRAIRIE
VALLEYVIEW
WABASCA
Lesser Slave Lake
SMITH
N
SLAVE LAKE-GRANDE PRAIRIE DISTRICT
SCALE
0
35 MILES


LARCH SAWFLY INFESTATIONS IN 1963
LIGHT
MODERATE
SEVERE
N
Wabiskaw River
Peerless Lakes
WABASCA
SPIRIT RIVER
Lesser Slave Lake
HIGH PRAIRIE
KINUSO
SMITH
GRANDE PRAIRIE
Wapiti River
Sooky River
VALLEYVIEW
Smoky R.
Little
SLAVELAKE-GRANDE PRAIRIE DISTRICT
SCALE
0
35 MILES

ANNUAL DISTRICT REPORT

PEACE RIVER DISTRICT

ALBERTA 1963

by

E. J. GAUTREAU

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

The principal defoliators in the Peace River District in 1963 were the larch sawfly, forest tent caterpillar, and spruce budworm. The larch sawfly again defoliated many of the larch stands throughout the range of this tree species in the District. Forest tent caterpillar populations remained much the same as in 1962 except for the Naylor, Hawk and Buffalo Head hills where populations had declined this season. The spruce budworm infestation along the Wabasca and Muddy rivers remained active causing severe damage to spruce stands over an area of about 12 square miles as compared with 50 square miles in 1962. Population levels of the yellow-headed spruce sawfly showed little change from 1962. The grey willow leaf beetle was present throughout most of the District but generally caused only light skeletonizing of willow foliage.

Late spring frosts caused severe clumping of aspen foliage in the Naylor, Hawk and Buffalo Head hills. Adverse weather during the winter of 1962-63 caused moderate "red belting" to spruce stands along the northeast slopes of the Buffalo Head Hills. Re-examination of the outbreak of black canker on spruce near Mile 109 Mackenzie Highway revealed no change from that reported in 1962. No new disease outbreaks were located in 1963.

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

No increase in population levels of the black-headed budworm were observed in the northern forest regions of District 7 in 1963. Low numbers of these insects were recorded on black and white spruce from High Level to Indian Cabins. Several scattered collections were taken from beating samples in the Clear Hills area but damage was minor.

Spruce Budworm, Choristoneura fumiferana (Clem.)

An aerial survey of spruce budworm damage was conducted this season along the Wabasca and Muddy rivers from the north half of Township 97, Range 9, W. 5, to the top of Township 99, Range 9, W. 5, and up the Muddy River to the northwest corner of Township 98, Range 10, W. 5. Severe defoliation had occurred over an area of 12 square miles as compared to 50 square miles in 1962. Defoliation along the Muddy River was severe in Sections 15, 16, 20, 21, 22, 27, 28, and 32, Township 98,

Range 10, W. 5. Moderate defoliation had occurred at the junction of the Muddy and Wabasca rivers, and in Sections 4, 6, and 7, Township 99, Range 9, W. 5. With the exception of the areas mentioned, light defoliation had occurred along the Wabasca River from Section 27, Township 97, Range 9, W. 5 to Section 33, Township 99, Range 9, W. 5. Elsewhere in the District low populations of spruce budworm were recorded near Tompkins Landing and on scattered open grown trees southwest of Peace River along Shaftesbury Trail.

Green Rose Chafer, Dichelonyx backi Kby.

Adults of this species were recorded in a number of widely separated locations. A larch plantation at the Fairview Agricultural Station was heavily infested and had to be sprayed. Light infestations also occurred on spruce in the same area. Low populations were recorded on aspen, rose and willow near Grimshaw, Brownvale, Whitelaw and Last Lake.

Grey Willow Leaf Beetle, Galerucella decora Say

Low populations of the grey willow leaf beetle were found throughout most of the Peace River District. Pockets of light to moderate injury were observed in the agricultural area south of Peace River. Between Warrensville and Steen River along the Mackenzie Highway, low populations caused very little damage. In the western half of the District light defoliation occurred to willow in the vicinity of the Notikewin Tower.

A Blotch Miner, Gracilaria sp.

Populations of blotch miners on willow were exceedingly high in the northern portion of the District from Meander River to Indian Cabins. Low to medium populations occurred south of Meander River to High Level and east to Ft. Vermilion. This insect appears to be confined to the northern portion of the District.

Pine Root Collar Weevil, Hylobius warreni Wood

The known range of the pine root collar weevil in Alberta was greatly extended by the collection of adult specimens at 2 locations in the District. This insect was commonly found infesting lodgepole pine stands in the Clear Hills. A small stand of lodgepole pine regeneration, situated along the eastern edge of Running Lake (13 miles north of Worsley) supported high populations of weevil larvae. Low pine mortality was noted in the area. A light infestation of this insect on lodgepole pine was located near the Battle River Tower Road south of

Keg River. Elsewhere in the District numerous stands of pine and spruce were examined but no damage was recorded.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The outbreak of the forest tent caterpillar in the Peace River District continued in 1963. The infested area extended in a narrow band from the southern boundary of the District near Cherry Point to Clear Prairie and spread eastward following the southern fringes of the Clear Hills to Township 87, Range 1, W. 6. From here the infestation spread northward to the vicinity of High Level and continued eastward into the Slave Lake Forest Division. (See accompanying map for further detail).

Populations remained much the same as in 1962. Virus diseases caused high larval mortality at Forest View, Magloire Lake, Peace River, and in the Deadwood area. High mortality, probably due to starvation, was observed one mile south of Watino. In this area, dead larvae were piled an inch high and 3 feet wide along edges of the roadway for approximately a mile. Refoliation in the severely defoliated area was very slow and the new leaves were small. Many stands of aspen did not refoliate fully.

Very little defoliation occurred this season in the Naylor, Hawk and Buffalo Head hills area where moderate to severe defoliation was reported in 1962. Egg bands observed in these areas failed to hatch. It is believed that late spring frost in the first week of May accounted for this decline in population.

Mass collections of late instar larvae and pupae were taken in the Guy, Fort Vermilion and Peace River areas to determine the incidence of parasites and disease. These larvae and pupae were reared and the results obtained revealed high mortality due to a combination of the above factors.

Results of the egg band survey conducted throughout the District in the fall to forecast the status of this insect in 1964 are tabulated in Table II.

A Tortricid, Pandemis canadana Kft.

Larvae of this insect were recorded in a number of widely separated locations in the Peace River District. Low populations occurred on aspen in the vicinities of Girouxville, Peace River, Fairview, Hines Creek, Hotchkiss, Keg Post, La Crete, Meander River and Indian Cabins. Some noticeable defoliation had occurred in the vicinity of Tompkins Landing.

A Pitch Nodule Maker, Petrova albicapitana (Busck)

High populations of this insect were present in lodgepole pine regeneration west of Clear Prairie. In an area 14 miles southwest of Clear Prairie 80 per cent of 20 lodgepole pines examined were infested, with active larvae on main terminal 18 inches from the tip. In this locality numerous tops had become weakened and broken off by wind and snow. Elsewhere in the District a widespread distribution was noted but populations were low and had caused no conspicuous damage.

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

As in previous years, this insect was the principal defoliator of roadside and hedgerow spruce in the agricultural areas of the District. Light to moderate defoliation occurred on spruce plantations in the vicinities of Donnelly, Jean Cote, Nampa, Three Creeks and Clear Prairie. A general decline in the populations of this pest was noted near Mile 100 Mackenzie Highway where moderate to severe damage had occurred in previous years. This season only very light damage was noted in the area. Low populations were also noted on black spruce bordering the Mackenzie Highway between Meander River and Steen River.

Larch Sawfly. Pristiphora erichsonii (Htg.)

The larch sawfly was the most widely distributed forest insect recorded at infestation levels in the Peace River District. Larch stands which have been severely defoliated for several years produced little foliage in 1963. New shoots were less abundant and shorter in length than usual.

An aerial survey of larch stands revealed light to moderate defoliation from the Twentieth Base Line in the south to the Twenty-sixth Base Line in the north. This is a distinct change from 1962 when moderate to severe damage occurred in the same area. Defoliation was generally severe north of the Twenty-sixth Base Line with the exception of small pockets of light to moderate damage west of Bistcho Lake near the Petitot River, and in the vicinities of Steen River, High Level and Ft. Vermilion. The general distribution and severity of the larch sawfly infestation in the Peace River District is indicated on the accompanying map. Sequential sampling was carried out at 4 points in the District to determine the degrees of infestations based on the percentage of shoots curled by oviposition. The results are shown in Table III.

DISEASE CONDITIONS

Clumping of Aspen

Late spring frosts caused severe clumping of aspen foliage in the northern section of the District. This general thinning and clumping of foliage near the branch tips was widespread throughout the Naylor, Hawk and Buffalo Head hills. Due to the severe injury to new shoots and buds, many aspen stands in the above areas were without foliage until mid-June. Birch foliage was also severely affected in the vicinity of the Buffalo Hills Tower.

Spruce Needle Rust, Chrysomyxa ledicola Laegerh.

This needle rust was common on black and white spruce usually causing only light damage. Open grown white spruce bordering the highway near Rocky Lane and Ft. Vermilion were moderately infected.

A Leaf Blight of Balsam Poplar, Linospora tetraspora Thompson

This leaf blight was widely distributed throughout the Peace River District. Heavy infections were noted in the Peace River, Hotchkiss, Keg River, Carcajou and Fort Vermilion areas. The detection of this disease in the District has extended its known range far northward in Alberta.

Western Gall Rust, Peridermium harknessii J. P. Moore

Globose swellings on stems and branches of lodgepole pine caused by western gall rust were common in the District. Infections were mostly light, with the exception of a heavily infected area near Watt Mountain Tower. The outbreak in the Clear Hills, Twp. 59, Rge. 12, W. 6 was not examined in 1963 due to the inaccessibility of the area.

Red Belt

Adverse weather during the winter of 1962-63 caused moderate "red belting" to white spruce in an area along the Buffalo Head Hills. Approximately 35 square miles were involved, from 4 miles east of the Buffalo Hills Tower to Birch Creek. This type of winter drying which discolours and kills the needles was confined to the tops and west sides of the trees. There was no other noticeable area of "red belting" found in the District.

Black Canker of Spruce, Retinocyclus abietis (Crouan) Groves & Wells

Re-examination of the outbreak of this disease on white spruce 46.5 miles north of Manning along the Mackenzie Highway revealed that 27.5 per cent of the stand was infected with an average of 2 cankers per tree. There was no change in the status of the outbreak from that reported in 1962.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Disease	Host Deciduous	Collections Insect	Disease
White spruce	48	39	Trembling aspen	130	38
Black spruce	13	10	Balsam poplar	5	2
Lodgepole pine	32	26	Willow sp.	38	5
Jack pine	8	2	Birch sp.	2	6
Balsam fir	3	9	Alder	4	7
Larch sp.	88	1	Manitoba maple	2	0
	192	87		181	58
Insect collections from miscellaneous hosts					11
Disease collections from miscellaneous hosts					21
GRAND TOTAL					550

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR, 1963

Location	Predicted defoliation for 1963	Actual defoliation for 1963	Predicted defoliation for 1964
Whitelaw	Severe	Moderate	Severe
Peace River	Severe	Severe	Moderate
Dixonville	Severe	Moderate	Light
Deadwood	Severe	Severe	Light
La Crete	Severe	Moderate	Light
McLellan	Severe	Severe	Moderate
Donnelly	Severe	Moderate	Severe

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Stateion number	Location	Infestation class 1960	Infestation class 1961	Infestation class 1962	Infestation class 1963
7-1	Grimshaw	Moderate	Moderate	Severe	Moderate
7-2	*High Level				Light
7-3	*Steen River				Moderate
7-5	Clear Prairie	Nil	Light	Moderate	Light

* Location of High Level plot changed in 1963
* New plot established at Steen River in 1963

TABLE IV

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE PEACE RIVER DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Gall aphids on conifers, Adelges lariciatus (Patch)	W. spruce	Common in the District.
Fruit tree leaf roller, Archips argyrospila (Wlk.)	Willow	Light infestation near Steen River.
A leaf beetle, Calligrapha verrucosa Suffr.	Willow	Light infestation along the Peace and Harmon rivers.
Oblique-banded leaf roller, Choristoneura rosaceana Harr.	Saskatoon T. aspen Willow	Light infestation in the District from Peace River to La Crete.
A leaf beetle, Chrysomela alnicola alnicola Brown	Willow	This beetle caused light damage to willow along the Mackenzie Highway near Steen River.
Aspen leaf beetle, Chrysomela crotchi Brown	T. aspen	Caused light defoliation in the vicinity of Rocky Lane.
A leaf tier, Compsolechia niveopulvella Cham.	T. aspen	Light infestations in the Grimshaw, Hines Creek, Eureka River, Dixonville, and Keg River areas.
Eastern larch beetle, Dendroctonus simplex Lec.	Larch	Commonly found attacking weakened larch near La Crete and Steen River.
American aspen beetle, Gonioctena americana (Schaeff.)	T. aspen	Caused light defoliation near Harmon Valley, Benjamin, Brownvale and Hines Creek.
Wooly elm aphid, Eriosoma americanum (Riley)	Elm	Light infestation near Peace River and Fairview.
A looper, Itame loricaria julia Evers.	T. aspen	Light populations general throughout the District, no serious defoliation.

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

Causal Agent	Host	Remarks
Insect		
Western tent caterpillar, *Malacosoma pluviale* (Dyar)	T. aspen Willow	Common in the District as far north as Steen River.
Balsam-fir sawfly, *Neodiprion abietis* (Harr.)	W. spruce B. spruce	Light infestation between Steen River and Indian Cabins.
Sawflies, *Neodiprion* sp.	J. pine Lp. pine Spruce	Light population general throughout the District.
Spruce spider mite, *Oligonychus ununguis* (Jac.)	Spruce	Caused light to moderate damage to ornamental spruce in the Fairview and Hines Creek areas.
Bruce spanworm, *Operophtera bruceata* (Hlst.)	T. aspen	Larvae were collected in small numbers near Peace River and Whitelaw.
A pitch nodule maker, *Petrova metallica* (Busck)	Lp. pine	Low populations of this insect in the District caused light damage to pine branches.
Spruce gall aphid, *Pineus pinifoliae* (Fitch)	B. spruce	Low populations along the Mackenzie Highway between Hotchkiss and Meander River.
A leaf tier, *Pseudexentera improbana oregonana* Wlshm.	T. aspen	Light infestations in the Grimshaw, Hines Creek, Eureka River, Dixonville, and Keg River areas.
Pruce needle miner, *Taniva albolineana* Kft.	W. spruce B. spruce	Light mining of foliage in the Hines Creek, Harmon Valley, and Steen River areas.

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

Causal Agent	Host	Remarks
Disease		
Shoestring root rot, *Armillaria mellea* (Vahl ex Fr.) Quel.	Lp. pine Larch B. fir	Common in the District in over-mature stands. New harbarium record on larch and balsam fir.
Spruce needle cast, *Bifusella crepidiformis* Darker	W. spruce B. spruce	Light infections common, not causing serious damage.
Yellow witch's broom of spruce, *Chrysomyxa arctostaphyli* Diet.	Bearberry	Alternate host of C. *arctostaphyli*, heavily infected throughout the District.
Spruce needle rust, *Chrysomyxa ledi* de Bary	B. spruce	Foliage of black spruce in the Meander River area lightly infected.
Spruce cone rust, *Chrysomyxa pirolata* Wint.	Wintergreen	Alternate host of C. *pirolata* heavily infected near the Notikewin Tower. New herbarium record for District 7.
Spruce needle rust, *Chrysomyxa weirii* Jacks.	W. spruce	Range extension northward to Eureka River.
Comandra blister rust, *Cronartium comandrae* Pk.	Northern comandra	Alternate host of C. *comandrae* heavily infected near Watt Mountain Tower. New herbarium record for District 7.
Comandra blister rust, *Cronartium comandrae* Pk.	Toad flax	Alternate host of C. *comandrae* heavily infected at Girouxville, Peace River, North Star, and Fort Vermilion. New herbarium record for District 7.
Broom rust, *Gymnosporangium nidus avis* Thaxt.	Creeping juniper	Range extension northward to Peace River.
Pine needle cast, *Hypodermella montana* Darker	Lp. pine	Light infection in the vicinity of Hines Creek. New herbarium record for District 7.

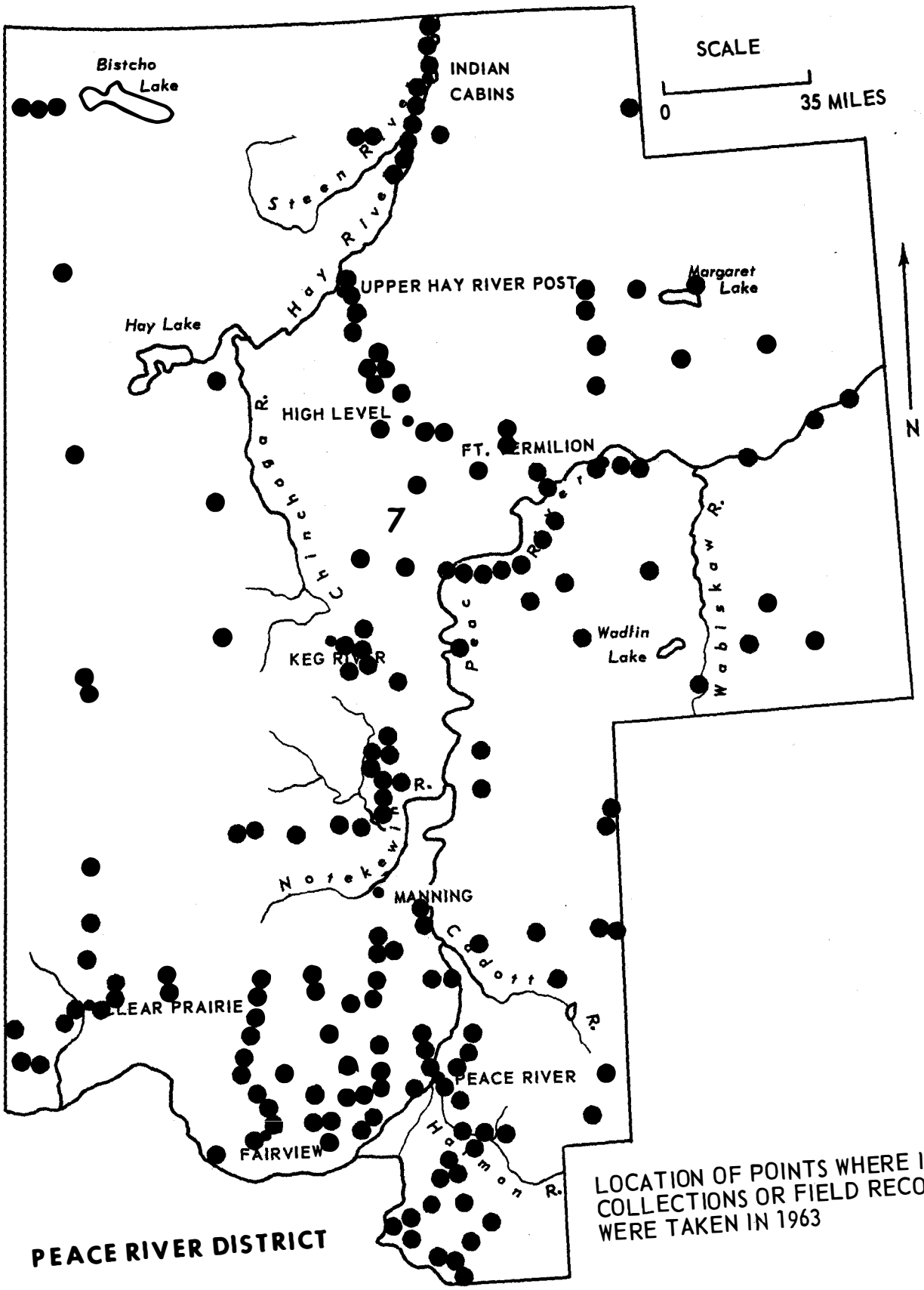
Table IV - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Disease		
Pine needle cast, *Hypodermella montivaga* (Petrak) Dearn.	Lp. pine	Pine foliage lightly infected in the Clear Hills north of Eureka River. New herbarium record for District 7.
Fir needle cast, *Hypodermella nervate* Darker	B. fir	Light infection on this host near Clear Prairie and Eureka River. New herbarium record.
Spruce needle cast, *Lophodermium filiforme* Darker	W. spruce B. spruce	Light infection on white spruce at Tompkins Landing and Fort Vermilion and on black spruce at Meander River. New herbarium record for District 7.
Pine needle cast, *Lophodermium pinastri* (Schrad. ex Fr.) Chev.	Lp. pine	Pine foliage was lightly infected in the Benjamin area. New herbarium record for District 7.
Poplar leaf spot, *Marssonina tremuloidis* (Ell. & Ev.) Kleb.	T. aspen	This leaf spot was scarce in the District. Small pockets of heavy infections noted near Boyer River.
Tar spot, *Rechmiellopsis betulina* (Fr.) V. Arx.	Birch	Foliage of birch was heavily infected in the vicinity of Steen River. New herbarium record.
Poplar ink spot, *Sclerotium* sp.	T. aspen	Aspen foliage was lightly infected in the vicinities of Benjamin, Clear Prairie, and Hotchkiss. New herbarium record for District 7.

TABLE V

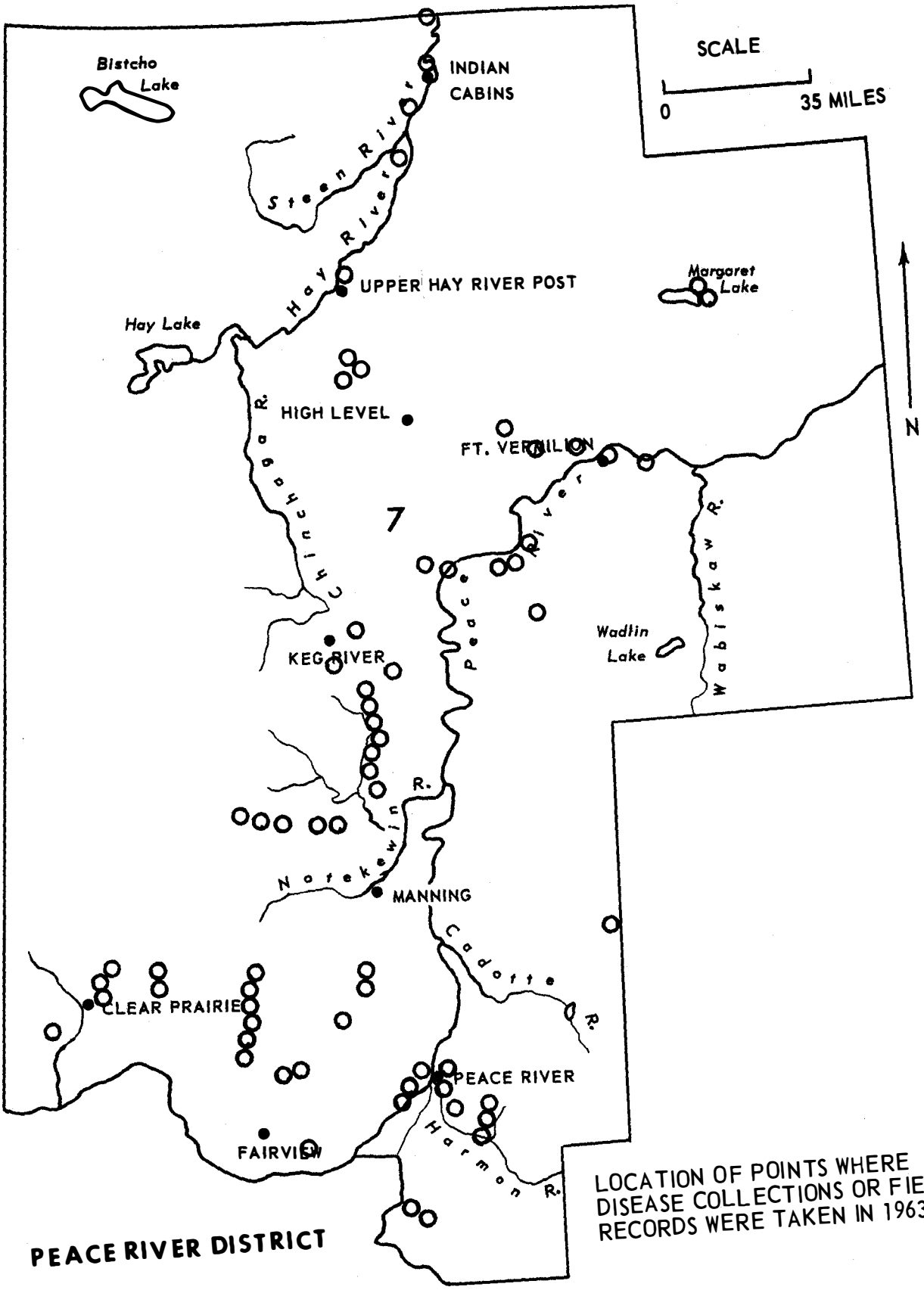
SUMMARY OF RECORDED DISEASE OUTBREAKS
UNDER INVESTIGATION IN THE PEACE RIVER DISTRICT

Outbreak number	Location	Causal Organism	Remarks
7-1	Mile 109 Mackenzie Highway	Retinocyclus abietis (Crouan) Groves & Wells	27.5 per cent of the stand infected with an average of 2 cankers per tree.
7-2	Clear Hills Twp. 59, Rge. 12, W. 6	Peridermium harknessii J. P. Moore	Outbreak not examined in 1963.
7-3	Mile 88-97 Mackenzie Highway	Peridermium stalactiforme A. & K.	High incidence of stem cankers on young pine.



PEACE RIVER DISTRICT

LOCATION OF POINTS WHERE INSECT COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963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0
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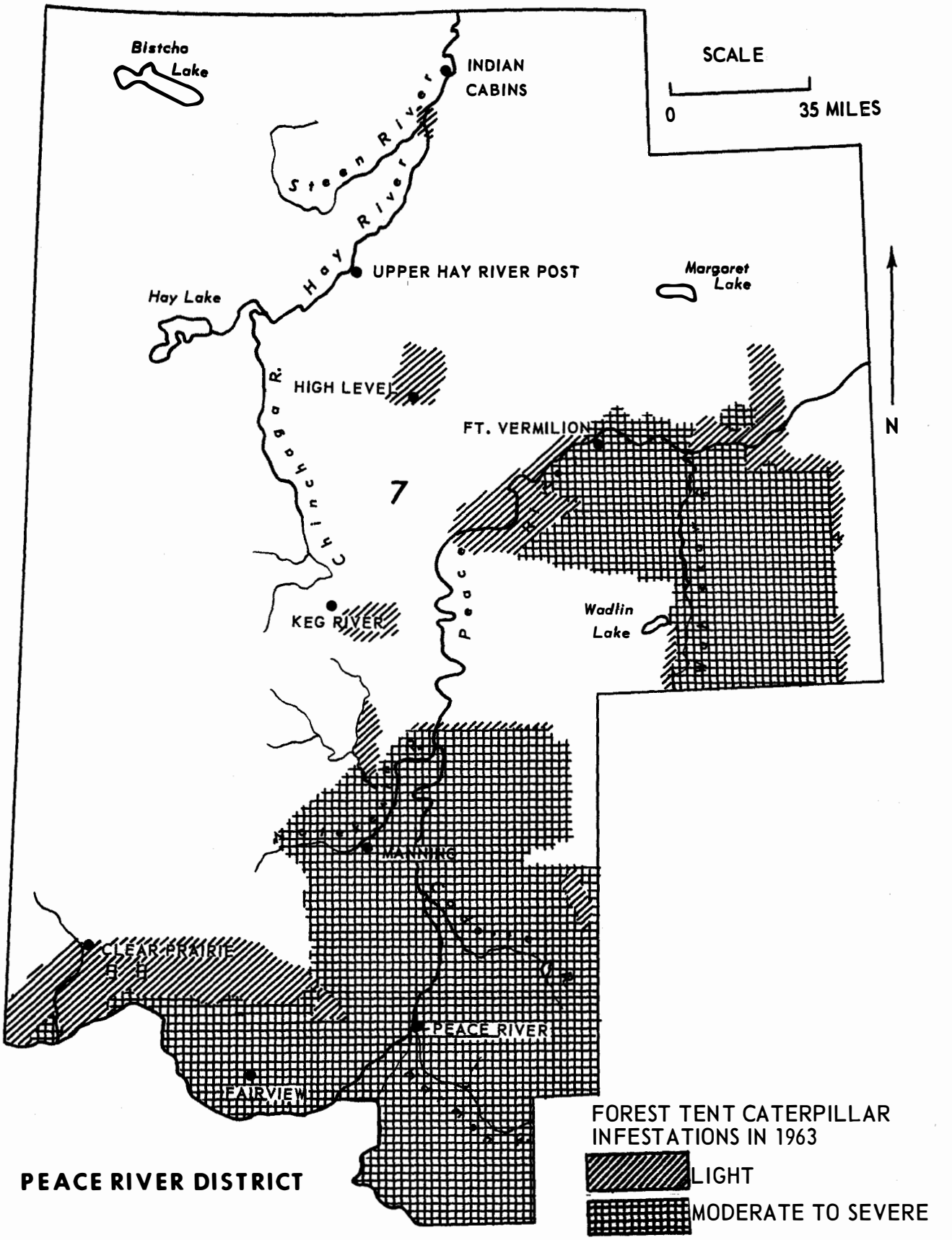
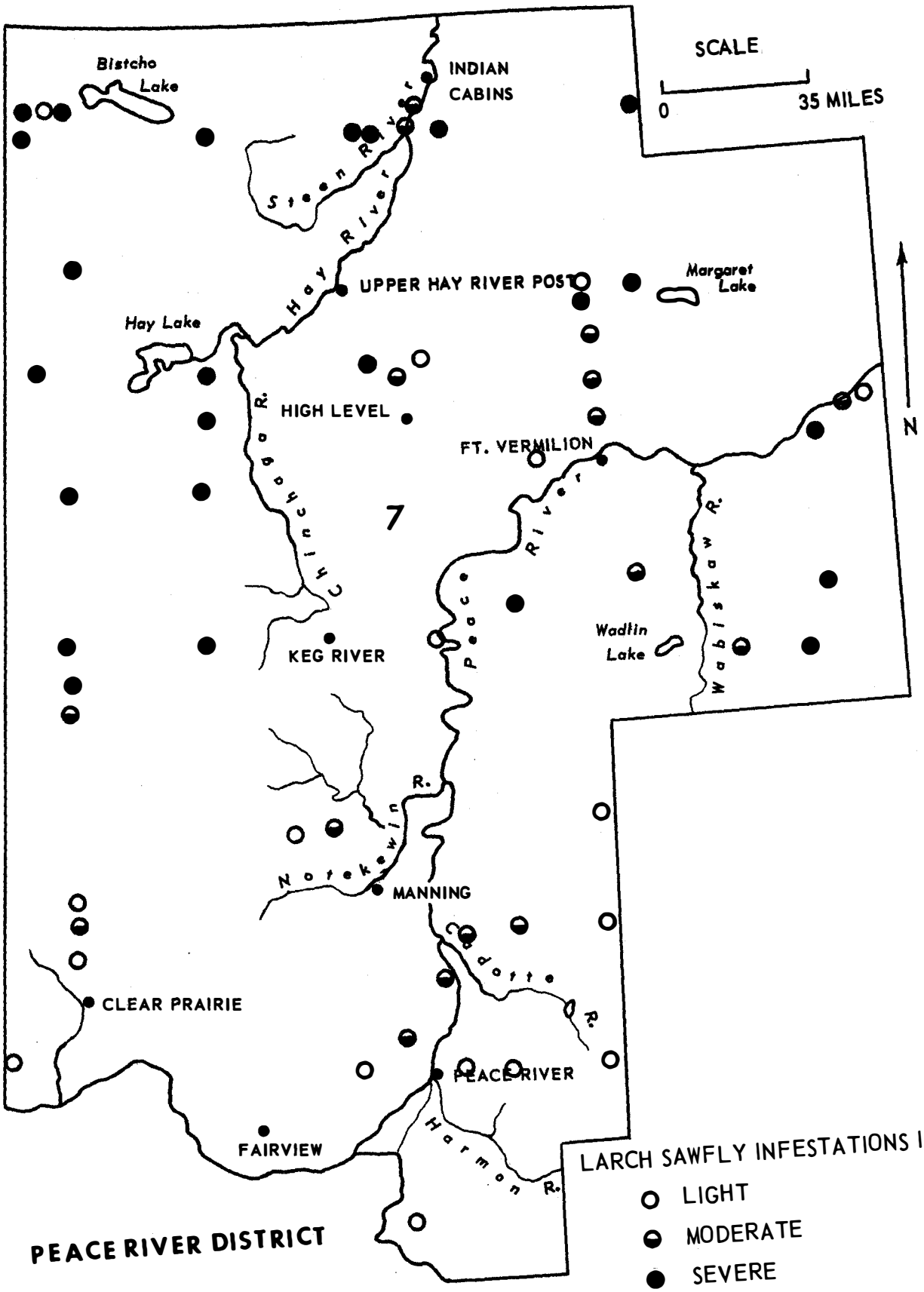
FAIRVIEW
PEACE RIVER DISTRICT
LOCATION OF POINTS WHERE DISEASE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1963



PEACE RIVER DISTRICT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PEACE RIVER DISTRICT
LARCH SAWFLY INFESTATIONS IN 1963
LIGHT
MODERATE
SEVERE

ANNUAL DISTRICT REPORT

MACKENZIE DISTRICT

1963

by

A. MACHUK

INFORMATION REPORT

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1964

INTRODUCTION

The most important insects in the Mackenzie District in 1963 were the spruce budworm, the larch sawfly and the poplar serpentine miner. Although defoliation by the spruce budworm in the Ft. Liard area was not nearly as severe as in previous years, damage caused by this insect in the Mackenzie River Valley and Slave River areas was more extensive and widespread. The larch sawfly infestation continued at high levels on the western side of the District, while at the same time there was a marked decline in populations in Wood Buffalo Park. The poplar serpentine miner was present in high numbers in most aspen stands along the Mackenzie River between Ft. Providence and Norman Wells. Populations of bark beetles were higher than in 1962 and noticeable damage to mature spruce was recorded in stands along the Peace River between Fifth Meridian and Trident Creek. High populations of wood borers infested decked sawlogs at Swanson's Sawmill along the Peace River near Peace Point. Yellow-headed spruce sawflies caused light to moderate defoliation to open grown spruce at scattered locations in the eastern half of the District. Populations of the pine tube maker declined to a low level and noticeable damage was confined to 2 small areas along the Yellowknife Highway.

The climatic damage known as "red belting" was prevalent in the mountainous areas west of Ft. Liard. Chrysomyxa woronini Tranz., a spruce needle rust previously reported from only 2 other locations in Canada, was found this year approximately 50 miles northwest of Ft. Simpson in the Ebbutt Hills. Needle rusts and needle casts were collected at various locations throughout the Mackenzie District but in most instances damage was negligible. Jack pine mistletoe was prevalent over a small area 31 miles south of Pine Lake in Wood Buffalo Park. The larch needle rust was present in most larch stands examined but infections were light. Collections of Chrysomyxa arctostaphyli Diet., on its alternate host, bearberry, were made to determine its distribution throughout the District. The pathogen, Pollaccia radiosa (Lib.) Blad. & Cif., which infects aspen, was quite rare in the District. The accompanying table (Table I) is a summary of insect and disease collections by hosts, taken in the Mackenzie District in 1963.

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

A general increase in populations of the black-headed budworm on white and black spruce was noted in the Mackenzie District in 1963. Larvae of this species were commonly taken in beating samples from all regions of the District although no serious damage was observed. Low populations were found at the following locations: 29 miles south of Hay River, near Browning's Camp along the Mackenzie River, Camsell Bend, Ft. Wrigley, 50 miles northwest of Norman Wells, Trout Lake and Little Doctor Lake.

Pine Tube Maker, Argyrotaenia tabulana Free.

Insects of this species declined in numbers in the central portion of the District where they were quite numerous in 1962. Moderate damage to jack pine regeneration was recorded over a small area 100 miles northeast of Ft. Providence adjacent to the Yellowknife Highway. Light damage to a few scattered open grown pine occurred at a point 4 miles northwest of Yellowknife. Although this insect was present in most jack pine stands examined between Ft. Providence and Yellowknife, conspicuous damage occurred only at the 2 locations mentioned.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Aerial and boat surveys in the Mackenzie District revealed a considerable expansion of the spruce budworm outbreak along the Mackenzie and Slave rivers and an almost total collapse of the infestation in the Liard River Valley. Previously infested areas along the Mackenzie and Slave rivers increased in size and severity of attack and several previously uninfested areas were observed this season. Although damage was markedly reduced in the Liard River Valley, moderate to severe defoliation, interspersed with pockets of light damage, was recorded in most spruce stands along the Mackenzie River from Mills Lake to a point 2 miles north of Birch Island above Ft. Norman. Moderate to severe defoliation was observed for the first time at a considerable distance from the Mackenzie River, as much as 35-40 miles, in the Rabbitskin River-Horn Mountain area.

Severe defoliation occurred at the following locations: at the mouth of Jean-Marie Creek and up the creek valley for about 6 miles, along the Rabbitskin River upstream from the Mackenzie River for a distance of 35 miles, from Ft. Simpson downstream to within 35 miles of Camsell Bend, on McGern Island, up the Willowlake River for approximately 30 miles, north of the River Between Two Mountains, at the mouth of the Wrigley River

and about 4 miles upstream, near the Ochre, Blackwater and Dahahini rivers and up these streams for several miles. Severe defoliation also occurred on the south, east and northeast slopes of the Ebbutt Hills and in scattered stands of spruce west of Ft. Simpson between the Liard and Mackenzie rivers to the vicinity of Sibbeston Lake. Along the Liard River severe damage was recorded from Ft. Simpson to approximately 8 miles south of the Airport. From this point scattered pockets of light to moderate damage were recorded along the Liard River to within 10 miles of the mouth of the Poplar River where no defoliation was evident. In the Ft. Liard area the outbreak has collapsed leaving only a few scattered pockets of damage. Light to moderate defoliation occurred 5 miles north of Ft. Liard and in widely separated areas along the La Biche and Kotaneelee rivers.

On the eastern side of the District the infestation along the Slave River spread westward to the Little Buffalo River. Moderate to severe defoliation, interspersed with pockets of light damage occurred along the Slave River from the south end of McConnell Island to within 10 miles of the mouth of the Salt River. Very little defoliation occurred from this point to approximately 4 miles east of Bell Rock where moderate to severe damage was observed for a distance of 10 miles along the north side of the river opposite Ft. Smith. Light to moderate damage was observed in spruce stands surrounding Ft. Smith. West of Ft. Smith light, moderate and severe defoliation occurred at various locations along the Little Buffalo River. Light damage was observed near the road crossing along the Salt River.

Low spruce budworm populations were noted in most spruce stands examined in Wood Buffalo Park but no significant damage was observed.

Mortality continued in spruce stands which have suffered several years of severe spruce budworm defoliation. Dead trees are quite common on Long Island where it was estimated that between 30 and 40 per cent of the trees are either dead or in such poor condition that survival is unlikely. In the Blackwater River area dead tops occurred on about 65 per cent of the trees. As reported last season, heavy mortality of white spruce has occurred along the Mackenzie River between the Redstone River and Old Fort Point.

The accompanying map depicts locations and degrees of defoliation as determined during ground and aerial surveys.

Spruce Bark Beetle, Dendroctonus obesus (Mannh.)

A ground and aerial survey was made of the area in the vicinity of Big Island in Wood Buffalo Park from which bark beetle infested spruce were reported in 1962. The infestation extended along the Peace River from Fifth Meridian to Trident Creek. Damage visible from the air

varied considerably over the 50 or more square miles involved. This area supports large stands of mature to overmature white spruce interspersed with scattered trembling aspen, balsam poplar and birch. No extensive ground checks were carried out, although a cruise strip 2400 feet long by one third chain wide was run through a stand considered to be representative of the area involved, and all spruce trees 8 inches D.B.H. and larger were examined and tallied. The cruise area supported a total of 114 spruce trees ranging from 8 to 28 inches D.B.H. Of this total, 2 living trees were infested, 4 were dead from bark beetle damage, and one tree was dead from undetermined causes. Analysis of cruise data indicates that approximately 5 per cent of the spruce trees are either dead or infested by this species of bark beetle. Small numbers of these beetles were also present in windfallen spruce 20 miles northeast of Ft. Resolution along the Slave River.

Spotted Tussock Moth, Halisidota maculata Harr.

A marked increase in numbers and expanded distribution of these insects was noted this season, particularly on the eastern side of the District. This species was quite common near Ft. Simpson, Ft. Providence, along the Slave River between Ft. Smith and Ft. Resolution and at scattered locations along the eastern side of Great Slave Lake between the mouth of the Slave River and Snowdrift. Light patchy defoliation to willow occurred near the above mentioned locations but no serious damage was observed.

A Wood Borer, Melanophila sp.

A severe infestation of wood borers was observed at Swanson's Sawmill along the Peace River in Wood Buffalo Park. Approximately 2 million f.b.m. tree length spruce decked in the millyard were heavily attacked by insects of this genus. According to the foreman at the millsite this infestation has been present for several years in logging slash in the surrounding forest. However, very little borer damage to sawlogs has occurred due to the fact that each year milling has been completed by the end of August, at which time borers had not penetrated beyond slab depth.

Balsam-fir Sawfly, Neodiprion abietis (Harr.)

Larvae of this sawfly were more common this season in collections taken from white and black spruce, however they were not abundant enough to cause serious defoliation. Light populations were recorded at

several widely separated points this season, namely: 50 miles northeast of Ft. Providence, Mile 130 Mackenzie River, 30 miles southwest of Ft. Good Hope along the Mackenzie River and at Little Doctor Lake.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Populations of this leaf miner increased markedly throughout the District in 1963, particularly on the western side. Most aspen stands along the Mackenzie River from Ft. Providence to Norman Wells were heavily attacked, causing the silvery appearance characteristic of a severe infestation. High populations were also present at scattered locations along the Liard River and along the highway between the Alberta Border and Ft. Rae. Low populations were present throughout Wood Buffalo Park, along the Slave River between Ft. Smith and Ft. Resolution and at scattered locations along the eastern side of Great Slave Lake as far north as Snowdrift.

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

Populations of this sawfly increased in numbers over that reported in 1962. Defoliation of single branches and entire crowns of individual and groups of trees was common on open grown trees and regeneration in natural forests in District 8. Scattered patches and single trees of white spruce regeneration were moderately defoliated along a 23 mile stretch of the Yellowknife Highway north of Ft. Providence. Scattered open grown spruce near the village of Ft. Providence were severely damaged. Light to moderate defoliation was evident on scattered spruce along the road to Salt River, 24 miles west of Ft. Smith. Moderate damage was recorded at various locations along the Pine Lake Road in Wood Buffalo Park and along the south shore of Pine Lake. Light to moderate defoliation was noted at various locations along the Mackenzie Highway between the Alberta Border and Enterprise. Collections of these sawflies were taken on the western side of the District as far north as Kelly Lake but populations were low in most areas sampled along the Mackenzie River. Ornamental spruce at Ft. Simpson were moderately defoliated.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

Regeneration black and white spruce were commonly attacked by this weevil throughout the eastern portion of the District. Usually, however, only slight damage was observed at collecting points. In Wood Buffalo Park weeviled black and white spruce were most noticeable along

the Pine Lake Road. Sporadic damage to spruce leaders also occurred west of Ft. Smith along the road to Salt River. North of Ft. Providence weeviled spruce terminals were considerably less evident than last year. No evidence of this weevil was found in the Mackenzie District west of Ft. Providence. The parasites Eurytoma pissodis Gir. and Lonchea corticis Tayl. were found in significant numbers in collections from Wood Buffalo Park, the latter being more numerous.

Larch Sawfly, Pristiphora erichsonii (Htg.)

This was the most widely distributed forest insect recorded at infestation levels in the Mackenzie District in 1963. Populations declined markedly on the eastern side, while on the western side damage was severe and widespread. Activity by this serious defoliator of tamarack was characterized in 1963 by a continued northwestern expansion of the outbreak and a reduction in size of the infested areas on the eastern side. New outbreaks were detected to the north and west of the main infestation area.

In the central and western portions of the District moderate to severe defoliation was recorded along the Mackenzie and Yellowknife highways to a point 88 miles northeast of Ft. Providence. From this location, defoliation was moderate gradually decreasing to light near Frank Channel. Very little damage occurred between Ft. Rae and Yellowknife although individual regeneration trees were moderately defoliated. Northeast of Yellowknife larvae were common in most tamarack stands examined but damage was negligible. Moderate to severe defoliation was recorded in scattered stands along the Mackenzie River as far north as Camsell Bend, and between the Liard and Mackenzie rivers west of Ft. Simpson. Severe defoliation was also observed over a small area along the eastern shore of Great Slave Lake near the La Loche River. Although larch sawflies were present in all tamarack stands examined in Wood Buffalo Park, only light to moderate damage in widely separated patches was observed. Scattered patches of light and moderate defoliation were observed between Ft. Smith and Great Slave Lake. Low populations were present at Cloverleaf and Blackwater lakes, the northernmost collection points.

In most tamarack stands along the Mackenzie and Yellowknife highways between the Alberta Border and Ft. Rae, needle growth was short and shoot production sparse this year. Tree mortality, dead tops and branches occurred at scattered locations between Enterprise and Ft. Providence.

The accompanying map shows the distribution and severity of defoliation by the larch sawfly as determined by ground and aerial surveys.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

An area of previously reported mistletoe infected jack pine in Wood Buffalo Park was examined this season. The infected area is about 31 miles south of Pine Lake along the road to Peace Point. Mature and overmature trees were heavily infected and brooms appeared on about 90 per cent of the trees. Infections were also observed on jack pine regeneration throughout the area. Although this outbreak has been present for a number of years, and dead tops and branches are quite common, very little tree mortality has occurred to date.

Spruce Needle Cast, Bifusella crepidiformis Darker

This needle cast was found at widely separated points throughout the District. Light infections on black and white spruce were found at Snowdrift, near Redcliff Island, 37 miles northwest of Ft. Smith, Blackwater Lake, Wrigley Lake and Ebbutt Hills.

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

This rust was common on both black and white spruce throughout the range of the host trees in the District, but caused no serious damage. Light to moderate infections of this rust on the alternate host, bearberry, were observed at Trout Lake, Blackwater Lake, Ft. Wrigley and near Ft. Liard.

Spruce Needle Rust, Chrysomyxa ledi de Bary

The needle rust C. ledi was collected commonly throughout the District from black and white spruce. The incidence of this rust was generally higher than in 1962. C. ledi was found severely infecting fringe trees near Ft. Resolution and 36 miles south of Ft. Smith in Wood Buffalo Park. Infections caused by this fungus were severe on the alternate host, labrador tea, near Wrigley Lake although spruces in this area were only lightly infected.

Spruce Needle Rust, Chrysomyxa ledicola Laegerh.

Fringe trees at Merryweather Lake were found to be moderately infected with C. ledicola. Light to moderate infections also caused by this rust were recorded at Cormack Lake, Little Doctor Lake, 35 miles south of Ft. Simpson along the Liard River and at Ft. Resolution. Severe infections on the alternate host, labrador tea, were observed at Cloverleaf Lake, Fort Good Hope and in the Ebbutt Hills.

Spruce Needle Rust, Chrysomyxa empetri (Pers.) Schroet.

Collections of C. empetri were confined to the eastern side of the District, where moderate damage was recorded on scattered white spruce regeneration near Ft. Resolution. Moderate to severe infections were observed on several scattered trees near the mouth of the La Loche River and the eastern side of Great Slave Lake.

Spruce Needle Rust, Chrysomyxa woronini Tranz.

This fungus, previously reported from only two other locations in Canada, was found this year in the Mackenzie District approximately 50 miles northwest of Ft. Simpson in the Ebbutt Hills. Young black spruce growing along a lake shore were found to have about 5 per cent of the new shoots infected.

Larch Needle Rust, Melampsora medusae Thuem.

This rust was the most common disease attacking tamarack foliage in the central portion of the District. It was present in all larch stands inspected between the Alberta Border and Ft. Rae. Although infections were widespread very little significant damage was observed. Light infections on the alternate host, trembling aspen, were recorded at scattered locations along the Mackenzie and Yellowknife highways adjacent to tamarack stands. Six mass collections of infected trembling aspen leaves were forwarded to Dr. Ziller at Victoria, B.C. for cultural studies.

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

This disease of aspen foliage and shoots, which was common in 1962, virtually disappeared this season. Very light infections were found at only 3 locations in the District: 33 miles south of Ft. Smith in Wood Buffalo Park, 68 miles south of Hay River and 20 miles northeast of Ft. Providence.

Red belt

Adverse weather conditions during the winter of 1962-63 caused large areas of severe "red belting" of pine in the mountain regions west of the Liard River. Severe "red belt" occurred between the Liard and La Biche ranges along the Kotaneelee River Valley in a band varying in width from one to 3 miles for a distance of approximately 30 miles. Severe "red belt" was also observed between the La Biche and Kotaneelee ranges but in this instance damage was not continuous, but appeared in scattered patches varying in length from 3 to 7 miles and one to 2 miles in width. Mortality of pine caused by adverse climatic conditions in previous years was observed between the above mentioned mountain ranges.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Collections Disease	Host Deciduous	Collections Insect	Collections Disease
White spruce	69	21	Trembling aspen	36	16
Black spruce	18	17	Willow	29	12
Tamarack	36	6	Birch	14	6
Jack pine	20	19	Balsam poplar	12	3
Lodgepole pine	0	2	Alder	9	3
Alpine fir	0	2			
	143	67		100	40
Insect collections from miscellaneous hosts					8
Disease collections from miscellaneous hosts					19
			GRAND TOTAL		377

TABLE II

OTHER NOTEWORTHY INSECTS AND DISEASES
WHICH OCCURRED IN THE MACKENZIE DISTRICT, 1963

Causal Agent	Host	Remarks
Insect		
Poplar bud-gall mite, *Aceria parapopuli* (Kiefer)	T. aspen	Light scattered populations between N.W.T. Border and Enterprise.
Woolly larch aphid, *Adelges strobilobius* (Kalt.)	B. spruce	Infestations generally light, but severe on scattered trees at Enterprise, Ft. Providence and Blackwater Lake.
A leaf beetle, *Chrysomela aeneicollis* Schffr.	Willow	Low populations near Snowdrift and Redcliff Island.
Aspen leaf beetle, *Chrysomela crotchi* Brown	T. aspen	Caused light defoliation to scattered aspen regeneration 28 miles southeast of Ft. Providence.
A leaf beetle, *Chrysomela semota* Brown	B. poplar	Balsam poplar regeneration lightly defoliated along Liard River 5 miles southeast of Ft. Simpson.
A leaf tier, *Compsolechia niveopulvella* Cham.	T. aspen	Noticeable increase in populations in central portion of District 8.
Spruce coneworm, *Dioryctria reniculella* (Grote)	W. spruce	Commonly found associated with spruce budworm in Enterprise-Ft. Providence area. Populations lower than in 1962.
Grey willow leaf beetle, *Galerucella decora* Say	T. aspen Willow	Light populations in Wood Buffalo Park.
American aspen beetle, *Gonioctena americana* (Schaeff.)	T. aspen	Light scattered populations in eastern and central portions of District 8.

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

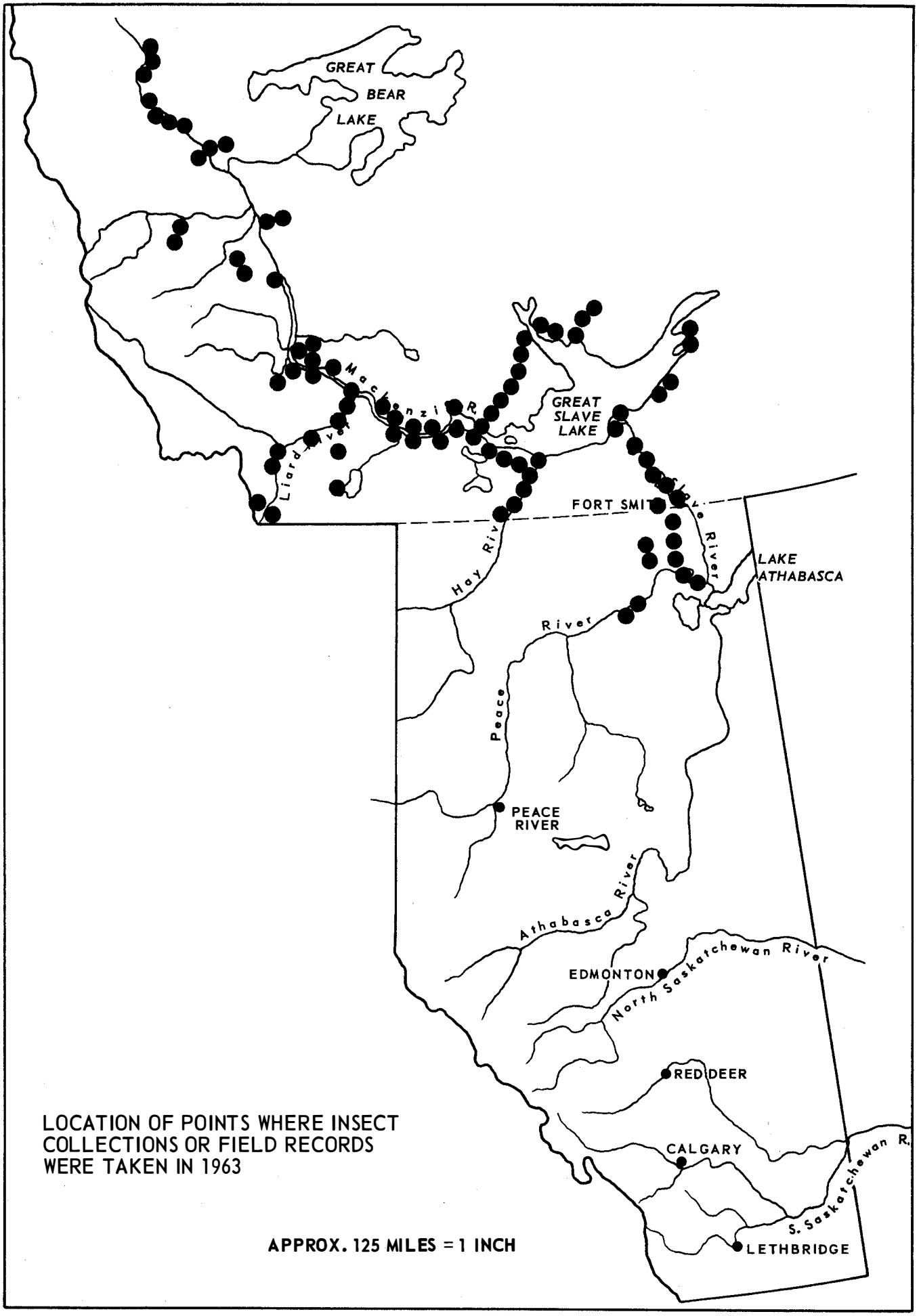
Causal Agent	Host	Remarks
Insect		
A leaf miner, *Gracillaria* sp.	Alder B. poplar Birch	Light to moderate leaf mining near Ft. Resolution, Browning's Landing and Ft. Providence.
Striped alder sawfly, *Hemichroa crocea* (Fourc.)	Alder	Lightly defoliated alder near mouth of Great Slave River.
A bark beetle, *Ips perturbatus* Eich.	W. spruce B. spruce	Common on windfallen spruce in Wood Buffalo Park.
Pine engraver beetle, *Ips pini* (Say)	J. pine	Light populations near mouth of La Loche River along Great Slave Lake.
Spiny elm caterpillar, *Nymphalis antiopa* L.	Willow	Caused light to moderate damage to willow over a small area near Ft. Simpson.
Spruce spider mite, *Oligonychus ununguis* (Jac.)	W. spruce	Shade and ornamnetal trees moderately infested at Ft. Smith.
Bruce spanworm, *Operophtera bruceata* (Hlst.)	T. aspen	Populations remained low in 1963.
A pitch nodule maker, *Petrova albicapitana* (Busck)	J. pine	Common on pine regeneration in eastern half of District.
Spruce bud scale, *Physockermes piceae* Schr.	W. spruce	Several trees moderately infested 3 miles south of Hay River. Low populations 25 miles south of Ft. Simpson.
Spruce gall aphid, *Pineus pinifoliae* (Fitch)	W. spruce	Light scattered populations throughout District 8.
Ragged spruce gall aphid, *Pineus similis* (Gillete)	W. spruce B. spruce	Severe damage to regeneration near Pine Lake.
A bark beetle, *Polygraphus rufipennis* Kby.	W. spruce	Light populations near Buffalo River 41 miles west of Ft. Smith, and near Ft. Liard.

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

Causal Agent	Host	Remarks
Insect		
A leaf tier, *Pseudexentera improbana oregonana* Wlshm.	T. aspen	At low population levels throughout District 8.
A wood borer, *Saperda* sp.	B. poplar T. aspen	Common in Wood Buffalo Park and along Liard River north of Nahanni Butte.
Green larch looper, *Semiothisa sexmaculata* Pack.	Tamarack	Light to moderate populations in Wood Buffalo Park and near Ft. Resolution.
A needle miner, *Taniva albolineana* Kft.	W. spruce B. spruce	Caused light damage near Ft. Smith and Ft. Good Hope.
A budworm, *Zeiraphera fortunana* Kft.	W. spruce B. spruce	Well distributed throughout the District. Caused little damage.
Disease		
Shoestring root rot, *Armillaria mellea* (Vahl. ex Fr.) Quél.	J. pine	Jack pine lightly infected 32.5 miles west of Ft. Smith. Range extension northward.
Pine needle rust, *Coleosporium asterum* (Diet.) Syd.	Goldenrod	Goldenrod heavily infected near Pine Lake in Wood Buffalo Park. No infections observed on pine.
Comandra blister rust, *Cronartium comandrae* Pk.	J. Pine	Heavy infections on fringe trees 40 miles northeast of Ft. Providence.
Fir needle cast, *Hypodermella mirabilis* Darker	A. fir	Light needle infections near Fort Liard Tower. First record from District 8.
Brown cubical pocket rot, *Lenzites saepiaria* (Wulf. ex Fr.) Fr.	W. spruce	Common on windfallen timber throughout the District.

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

Causal Agent	Host	Remarks
Disease		
Spruce needle cast, *Lophodermium filiforme* Darker	B. spruce	Light infections on black spruce at Trout Lake. New herbarium host record and range extension.
Pine needle cast, *Lophodermium pinastri* (Schrad. ex Fr.) Chev.	J. pine	Jack pine foliage lightly infected along Mackenzie River 20 miles southeast of Camsell Bend. Range extension northward.
Willow leaf rust, *Melampsora epitea* Thuem.	Willow Tamarack	Common throughout the District. Caused little damage.
Western gall rust, *Peridermium harknessii* J. P. Moore	J. pine	Common along Mackenzie and Yellowknife highways but not seriously affecting host trees.
Stalactiforme rust, *Peridermium stalactiforme* A. & K.	J. pine Lp. pine	Light scattered infections along Yellowknife Highway and near Ft. Liard Tower.
Black canker of spruce, *Retinocyclus abietis* (Crouan) Groves & Wells	W. spruce B. spruce	Low incidence near Flett Rapids along Liard River and in Ebbutt Hills.
Tar spot, *Rhytisma salicinum* (Pers.) Fr.	Willow	Common along Slave River north of Ft. Smith. Most northerly occurrence in District near La Loche River, Great Slave Lake.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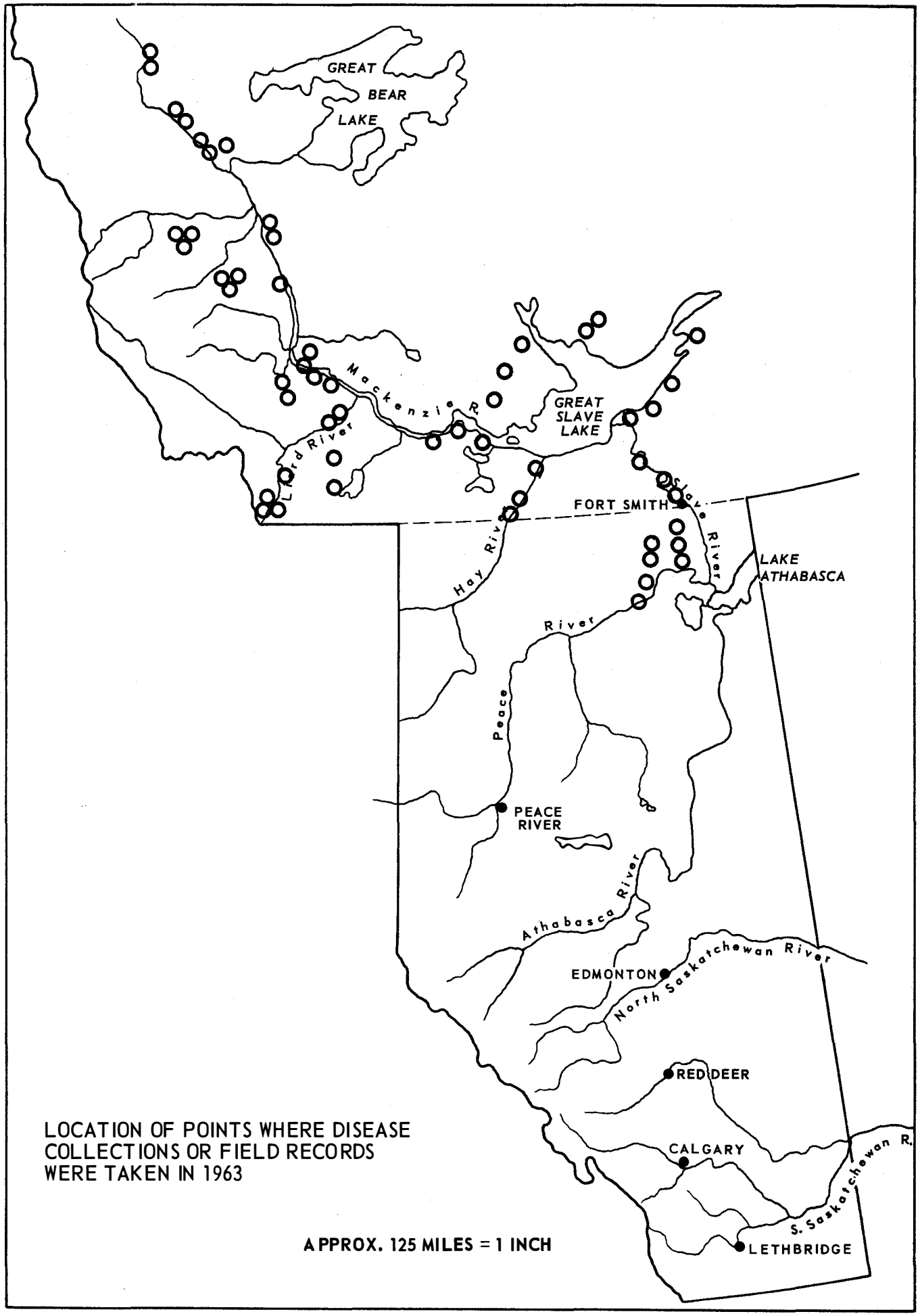
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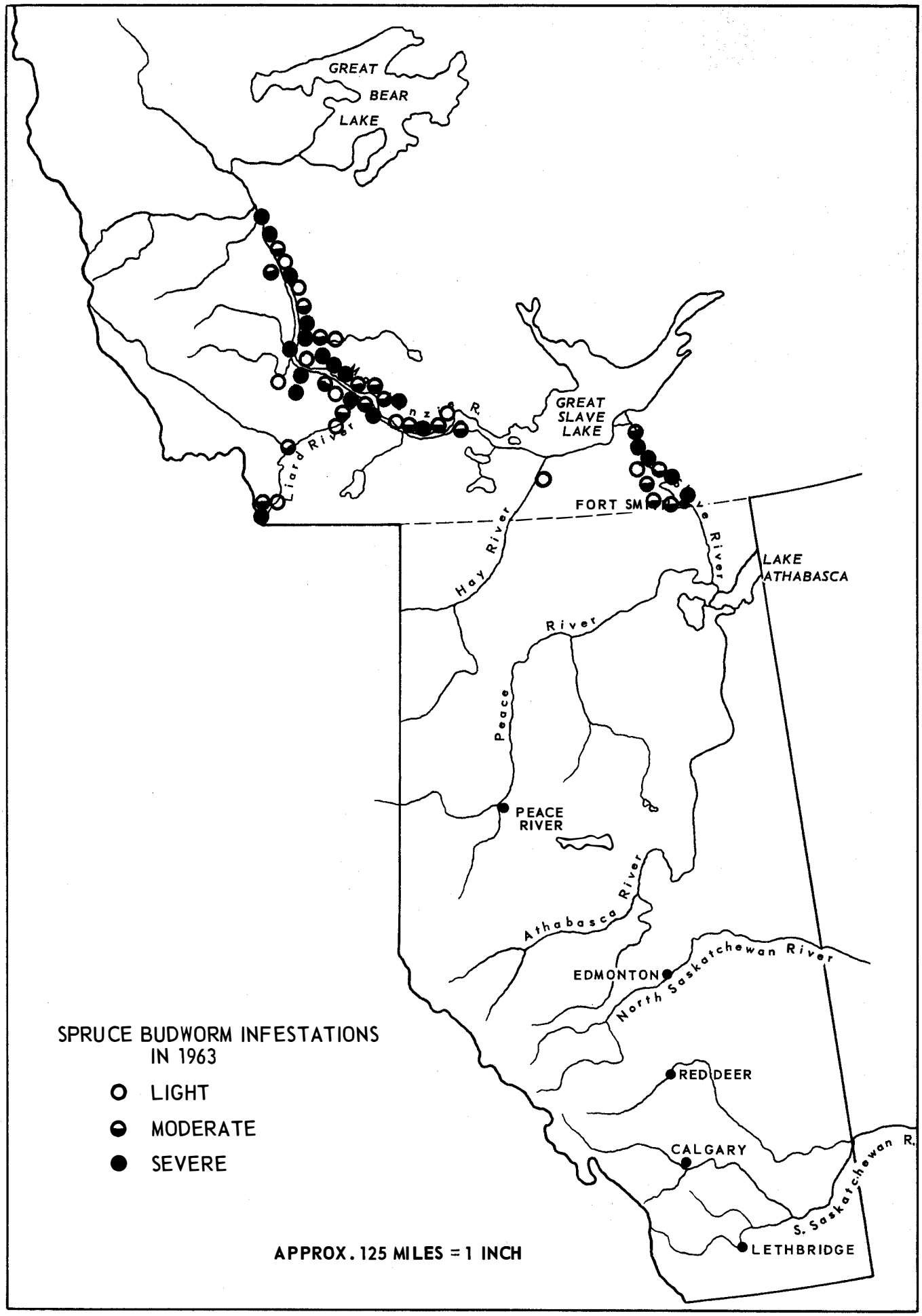
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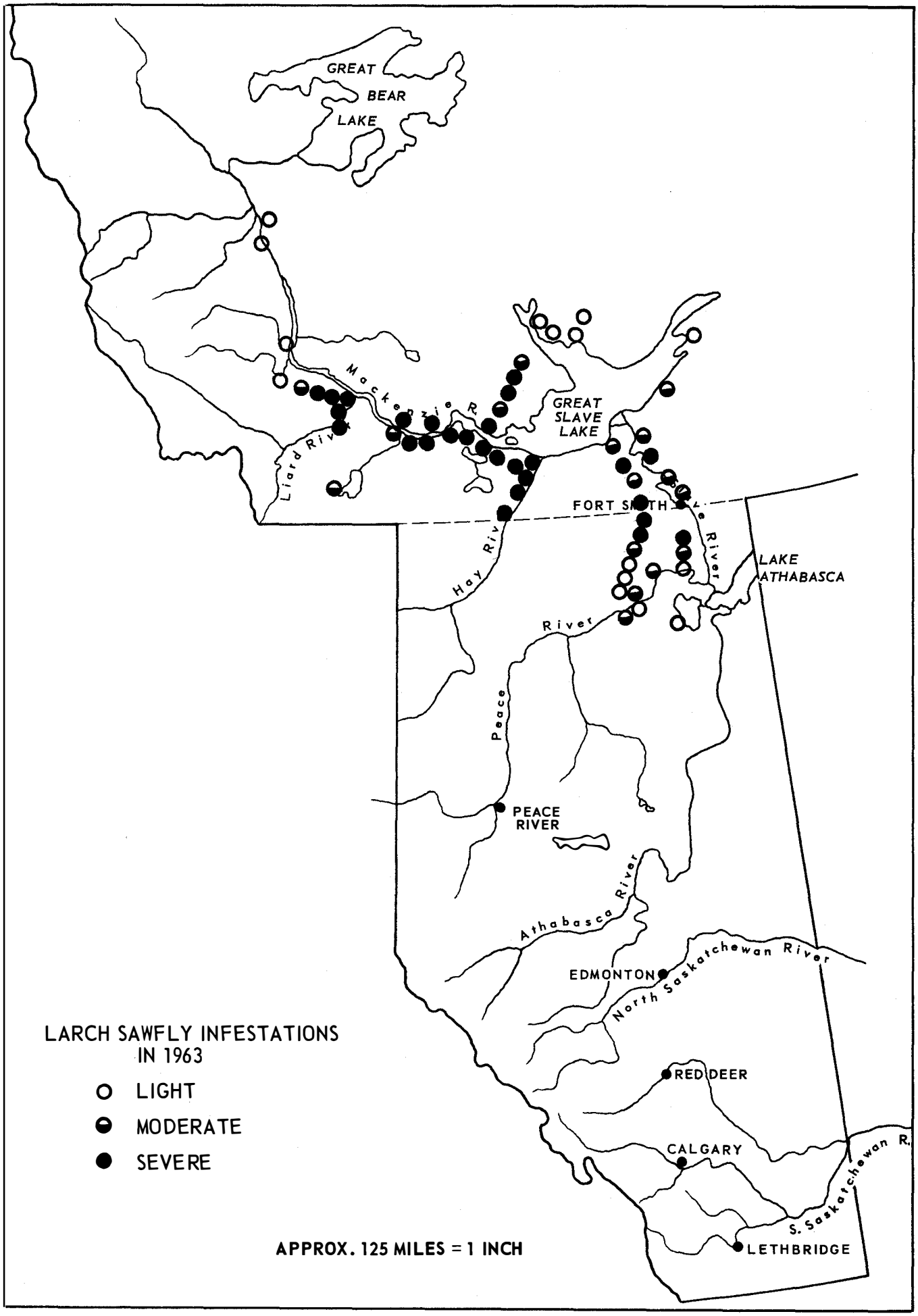
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INSECT CONDITIONS

Aceria parapopuli (Kiefer), Poplar bud-gall mite..... 5,10,26,48,91
Acleris variana (Fern.), Black-headed budworm..... 26,35,65,70,83
Adelginae, Gall aphids on conifers..... 19
Adelges cooleyi (Gill.), Cooley spruce gall..... 11,30
Adelges lariciatus (Patch), Gall aphids on conifers..... 53,65,77
Adelges strobilobius (Kalt.), Woolly larch aphid..... **91**
Alsophila pometaria (Harr.), Fall cankerworm..... 5
Archips argyrospila (Wlk.), Fruit tree leaf roller..... 77
Archips cerasivoranus (Fitch), Ugly nest caterpillar..... 16,53,65
Argyrotaenia tabulana Free., Pine tube maker..... 5,26,48,65,83
Aspidiotus popularum (Marlatt), Poplar scale..... 53
Calligrapha verrucosa Suffr., A leaf beetle..... 16,77
Campea perlatta Gn., Fringed looper..... 65
Cerambycidae, Wood borers..... 56
Chilocorus stigma (Say), Twice stabbed lady beetle..... 16
Choristoneura conflictana (Wlk.), Large aspen tortrix..... 11
Choristoneura fumiferana (Clem.), Spruce budworm..... 2,11,30,53,56,70,83
Choristoneura lambertiana (Busck), A pine budworm..... 16
Choristoneura rosaceana Harr., Oblique banded leaf roller. 77
Chrysomela aeneicollis Schffr., A leaf beetle..... 35,91
Chrysomela alnicola alnicola Brown, A leaf beetle..... 77
Chrysomela crotchi Brown, Aspen leaf beetle..... 77,91
Chrysomela semota Brown, A leaf beetle..... 65,91
Cinara sp., An aphid..... 65
Compsolechia niveopulvella Cham., A leaf tier..... 12,19,20,65,77,91
Dendroctonus obesus (Mannh.), Spruce bark beetle..... 5,57,84
Dendroctonus pseudotsugae Hopk., Douglas-fir beetle..... 12
Dendroctonus simplex Lec., Eastern larch beetle..... 65,77
Dichelonyx backi Kby., Green rose chafer..... 26,71
Dioryctria reniculella (Grote), Spruce cone worm..... 91
Diprionidae, A sawfly..... 26
Eriosoma americanum (Riley), Woolly elm aphid..... 53,77
Evagora biopes Free., A needle miner..... 12
Evagora starki Free., A needle miner..... 2,5,31
Galerucella decora Say, Grey willow leaf beetle..... 5,12,20,35,38,48,57,71
Genioctena americana (Schaeff.) American aspen beetle..... 13,20,45,53,57,77
Gracilaria sp., Leaf miners..... 71,92
Griselda radicana Wlshm., A pyralid..... 26
Halisidota maculata Harr., Spotted tussock moth..... 65,85
Hemichroa crocea (Fourc.), Striped alder sawfly..... 92
Hylobius sp., Pine root collar weevil..... 38,48,65
Hylobius pinicola (Couper), Pine root collar weevil..... 38
Hylobius warreni Wood, Pine root collar weevil..... 71

Ips perturbatus Eich., A bark beetle..... 39,92
Ips pini (Say), Pine engraver beetle..... 92
Itame loricaria julia Evers., A looper..... 26,45,66,77
Malacosoma disstria Hbn., Forest tent caterpillar..... 3,13,21,35,39,49,57,72
Malacosoma lutescens (N. & D.), Prairie tent caterpillar. 13,26
Malacosoma pluviale (Dyar), Western tent caterpillar..... 13,21,35,45,58,78
Melanophila sp., A wood borer..... 85
Monochamus oregonensis (Lec.) Oregon fir sawyer..... 66
Neodiprion sp., A sawfly..... 26,66,78
Neodiprion abietis (Harr.), Balsam fir sawfly..... 16,78,85
Nymphalis antiopa L., Spiny elm caterpillar..... 92
Oligonychus ununguis (Jac.), Spruce spider mite..... 6,16,21,58,78,92
Operophtera bruceata (Hlst.), Bruce spanworm..... 66,78,92
Pandemis canadana Kft., A tortricid..... 72
Periphyllus negundinis Thos., Box elder aphid..... 54
Petrova sp., A pitch nodule maker..... 54
Petrova albicapitana (Busck), A pitch nodule maker..... 66,73,92
Petrova metallica (Busck), A pitch nodule maker..... 78
Phenacaspis pinifoliae (Fitch), Pine needle scale..... 13,35,78
Phyllocnistis populiella Cham., Poplar serpentine miner.. 6,16,26,31,45,50,86
Physokermes piceae Schr., Spruce bud scale..... 92
Pikonema alaskensis (Roh.), Yellow-headed spruce sawfly.. 6,22,40,49,58,73
Pikonema dimmockii (Cress.), Green-headed spruce sawfly.. 27
Pineus pinifoliae (Fitch), Spruce gall aphid..... 92
Pineus similus (Gillette), Ragged spruce gall aphid..... 92
Pissodes sp., A weevil..... 54
Pissodes engelmanni Hopk., Egelmann spruce weevil..... 16,27,32,59,86
Pissodes terminalis Hopk., Lodgepole terminal weevil..... 32
Polygraphus rufipennis Kby., A bark beetle..... 92
Prisiphora erichsonii (Htg.), Larch sawfly..... 3,16,22,32,40,59,73,87
Pseudexentera improbana oregonana Wlshm., A leaf tier.... 17,22,45,78,93
Saperda sp., A borer..... 93
Saperda calcarata Say, Poplar borer..... 17,54,59
Semiothisa sexmaculata Pack., Green larch looper..... 27,93
Sternochetus lapathi (L.), Poplar and willow borer..... 17
Taniva albolineana Kft., Spruce needle miner..... 66,78,93
Urocerus gigas flavicornis F., Yellow-horned horntail.... 59
Zeiraphera fortunana Kft., A budworm..... 93

DISEASE CONDITIONS

Arceuthobium americanum Nutt. ex Engelm., Dwarf mistletoe. 27,50,88
Armillaria mellea (Vahl. ex Fr.) Quel., Shoestring root rot..... 3,35,41,54,60,79,93
Atropellis piniphila (Weir) Lohman & Cash, Atropellis canker..... 4,27,41,66
Bifusella crepidiformis Darker, Spruce needle cast..... 79,88
Chrysomyxa spp., Spruce needle rust..... 23,32
Chrysomyxa arctostaphyli Diet., Yellow witch's broom of spruce..... 27,54,79,88
Chrysomyxa empetri (Pers.) Schroet., Spruce needle rust... 89
Chrysomyxa ledi de Bary, Spruce needle rust..... 6,54,66,79,88
Chrysomyxa ledicola Laegerh., Spruce needle rust..... 6,54,60,74,89
Chrysomyxa pirolata Wint., Spruce needle rust..... 66,79
Chrysomyxa weirii Jacks., Spruce needle rust..... 66,79
Chrysomyxa woroninii Franz., Spruce needle rust..... 50,89
Coleosporium asterum (Diet.) Syd., Pine needle rust..... 6,17,35,60,93
Cronartium coleosporiodes Arth., The stage of P. harknessi and P. stalactiforme which occurs on the alternate host..... 14,60
Cronartium comandrae Pk., Comandra blister rust..... 14,35,54,61,79,93
Cronartium ribicola J. C. Fischer, White pine blister rust 6,14,33
Cytospora chrysosperma (Pers.) Fr., Cytospora canker..... 4,14,27
Dibotryon morbosum (Schw.) T.S., Black knot of cherry..... 67
Echenodontium tinctorium Ell. & Ev., Indian paint fungus.. 36
Elytroderma deformans (Weir) Darker, Pine needle cast..... 23,45,67
Erwinia amylovora (Burrill) Winslow, Fire blight..... 42
Gymnosporangium sp., Rust..... 17
Gymnosporangium clavipes (Cke. and Pk.), Fruit stem rust.. 36
Gymnosporangium nidus avis Thaxt., Leaf rust..... 79
Hypodermella concolor (Dearn.) Darker, Pine needle cast... 67
Hypodermella mirabilis Darker, Pine needle cast..... 93
Hypodermella montana Darker, Pine needle cast..... 67,79
Hypodermella montivaga (Petrak) Dearn., Pine needle cast.. 36,45,80
Hypodermella nervate Darker, Fir needle cast..... 80
Hypoxylor priunatum (Klotzsche) Cke., Hypoxylon canker... 17,50
Lenzites saepiaria (Wulf. ex Fr.) Fr., Brown cubical pocket rot..... 93
Linospora tetraspora Thompson, A leaf blight of balsam poplar..... 61,74
Lophodermium filiforme Darker, Spruce needle cast..... 80,94
Lophodermium hysteroides (P.) ex Sacc., Leaf cast..... 67
Lophodermium macrosporum (Hartig) Rehm, Spruce needle cast 67
Lophodermium maculare (Fr.) De Not, Leaf cast..... 67
Lophodermium pinastri (Schrad. ex Fr.) Chev., Pine needle cast..... 61,80,94

Marssonina tremuloidis (Ell. & Ev.) Kleb., Poplar leaf spot..... 80
Melampsora albertensis Arth., Douglas fir needle cast..... 36
Melampsora epitea Thuem., Willow leaf rust..... 36,67,94
Melampsora medusae Thuem., Larch needle cast..... 61,89
Melampsora occidentalis Jacks., Leaf rust..... 67
Melampsorella caryophyllacearum Schroet., Yellow witch's broom of fir..... 61
Melampsoridium betulinum (Fr.) Kleb., Birch leaf rust..... 67
Melampsoridium hiratsukanum Ito ex Hirat, Alder leaf rust. 68
Peridermium harknessii J. P. Moore, Western gall rust..... 7,33,62,74,94
Peridermium stalactiforme A. & K., Stalactiforme rust..... 7,27,33,68,94
Pollacia radiosa (Lib.) Bald. & Cif., Aspen shoot blight.. 68,89
Polyporus tomentosus Fr., Red root and butt rot of conifers 68
Pucciniastrum vaccinii Wint. Jrstad, Rust..... 68
Rehmiellopsis betulina (Fr.), Tar spot..... 68,80
Retinocyclus abietis (Crouan) Groves & Wells, Black canker of spruce..... 75,94
Rhytisma salicinum (Pers.) Fr., Tar spot..... 27,94
Sarcotrichila piniperda (Rehm) Korf., Needle cast of spruce..... 28
Sclerotium sp., Poplar ink spot..... 14,80
Septogloeum gillii Ellis, Hyperparasite of dwarf mistletoe..... 68
Septoria musiva Pk., Septoria canker of poplar..... 28
Tubercularia vulgaris Tode, Stem fungus..... 68
Uncinula salicis (D.C.) Wint., Leaf mold..... 68
Wallrothiella arceuthobii (Pk.) Sacc., Hyperparasite of dwarf mistletoe..... 62

MISCELLANEOUS

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Hail damage..... 45
Red belt..... 23,33,42,62,74,90
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