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

This report is an excerpt from the Annual District Reports for 1963. The introduction was prepared by J. K. Robins, Supervisor of Survey Field Technicians and the District report by the Survey Field Technician whose name appears on the cover.

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.

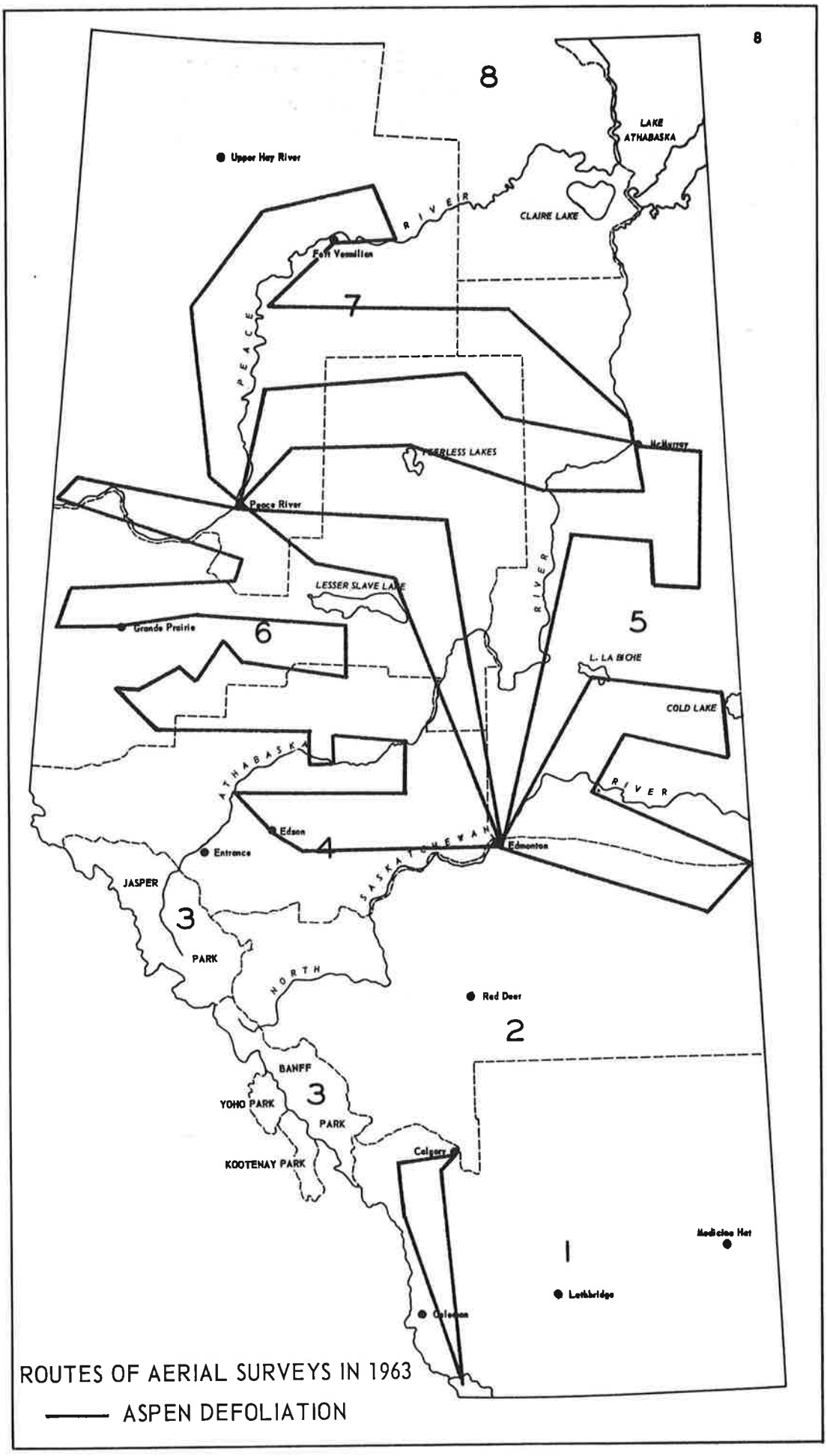
ACKNOWLEDGMENTS

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

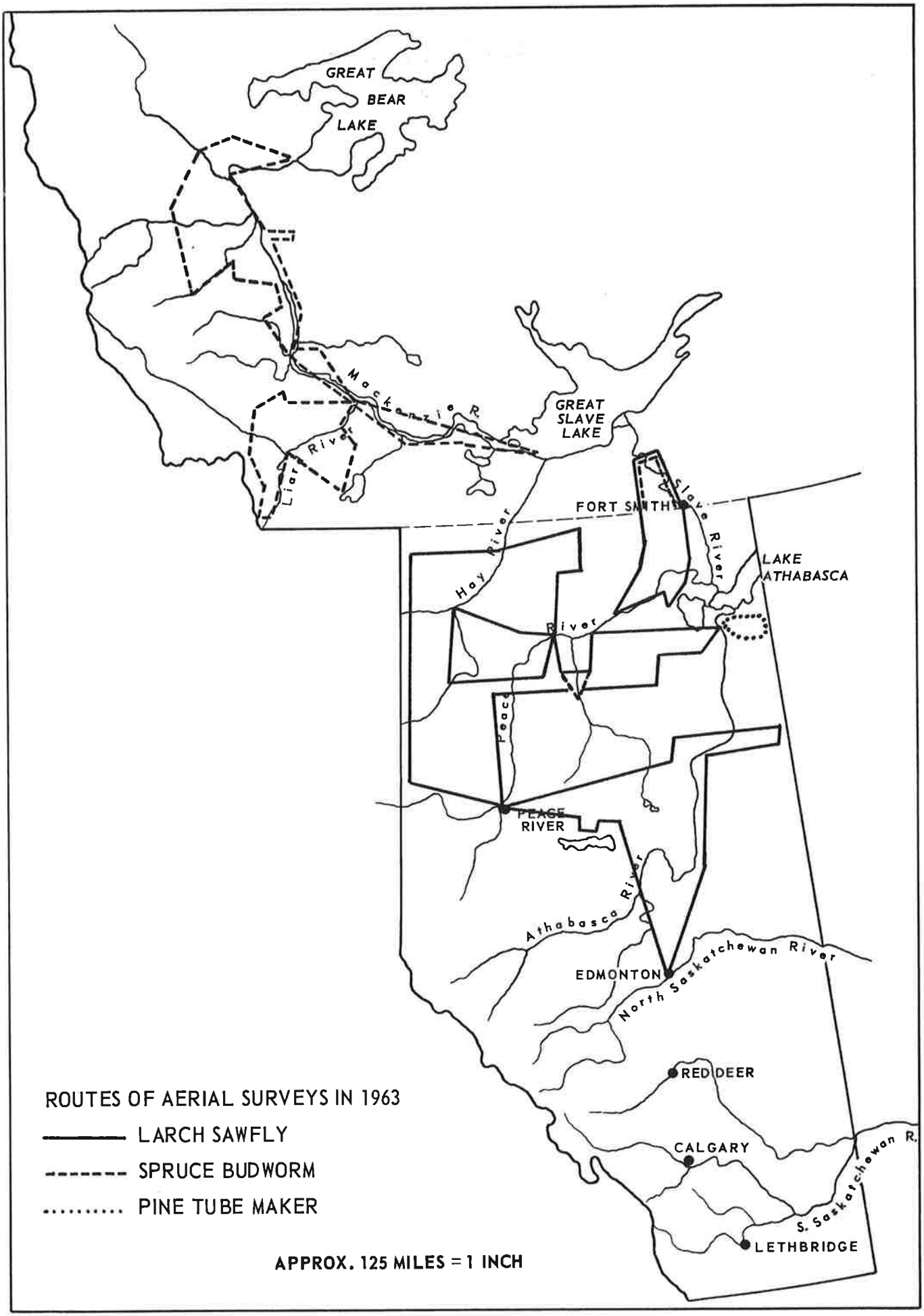
PURPOSE	DISTRICT	DATE	AIRCRAFT	COST PER HOUR	TOTAL HOURS	TOTAL COST
Forest tent caterpillar	Lac La Biche	June 4	Courier	*	3:00	*
Forest tent caterpillar	Clearwater, Brazeau-Athabasca, Lac La Biche, Grande Prairie, Peace River	June 20-24	Cessna 172	30.00	19:40	611.60**
Forest tent caterpillar	Lac La Biche, 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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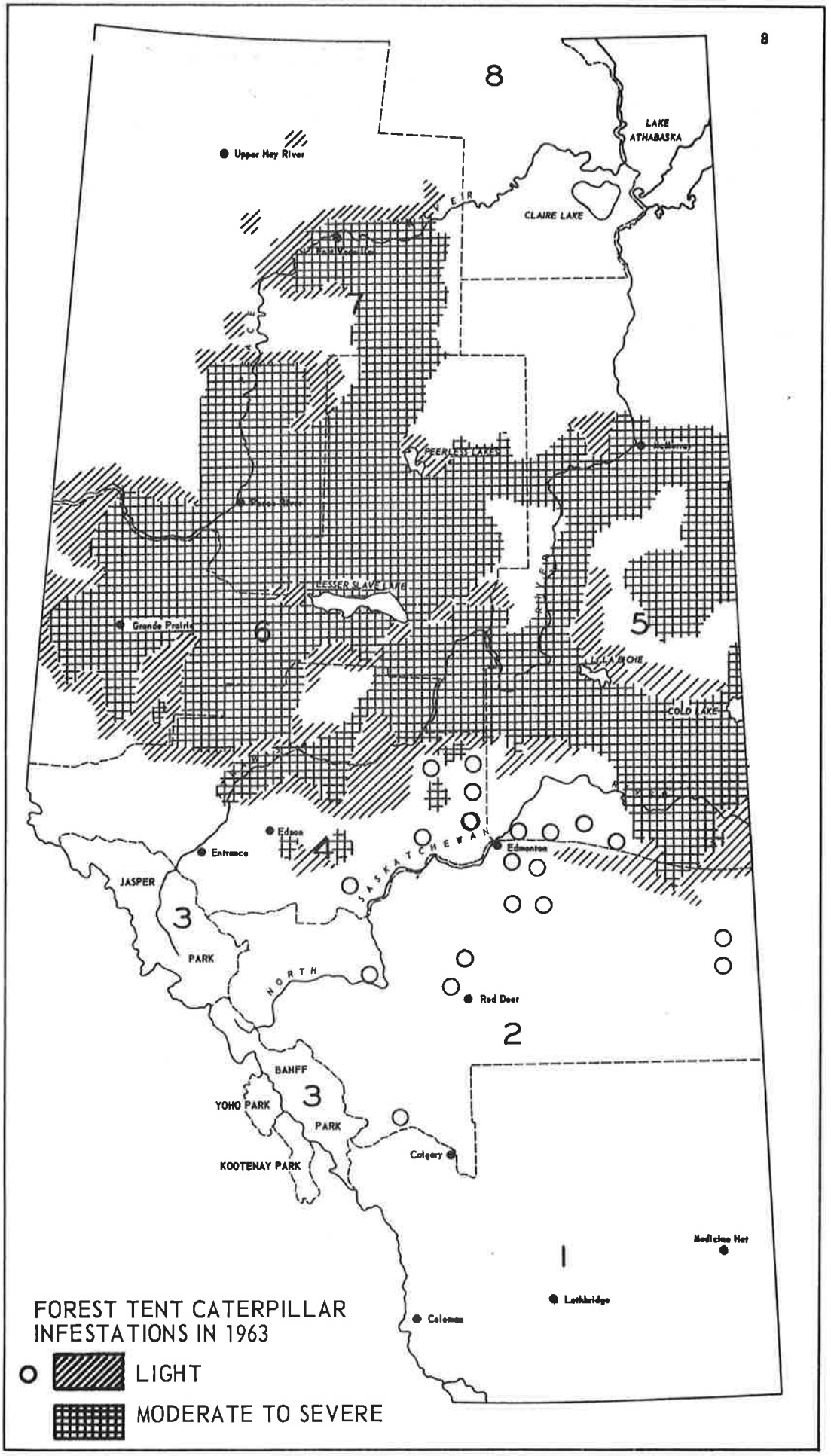
Peace
PEACE
RIVER
Athabasca River
EDMONTON
North Saskatchewan River
RED DEER
CALGARY
S. Saskatchewan R.
LETHBRIDGE
ROUTES OF AERIAL SURVEYS IN 1963
LARCH SAWFLY
SPRUCE BUDWORM
PINE TUBE MAKER
APPROX. 125 MILES = 1 INCH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PEERLESS LAKES
McMurray
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Grande Prairie
LA BICHE
COLD LAKE
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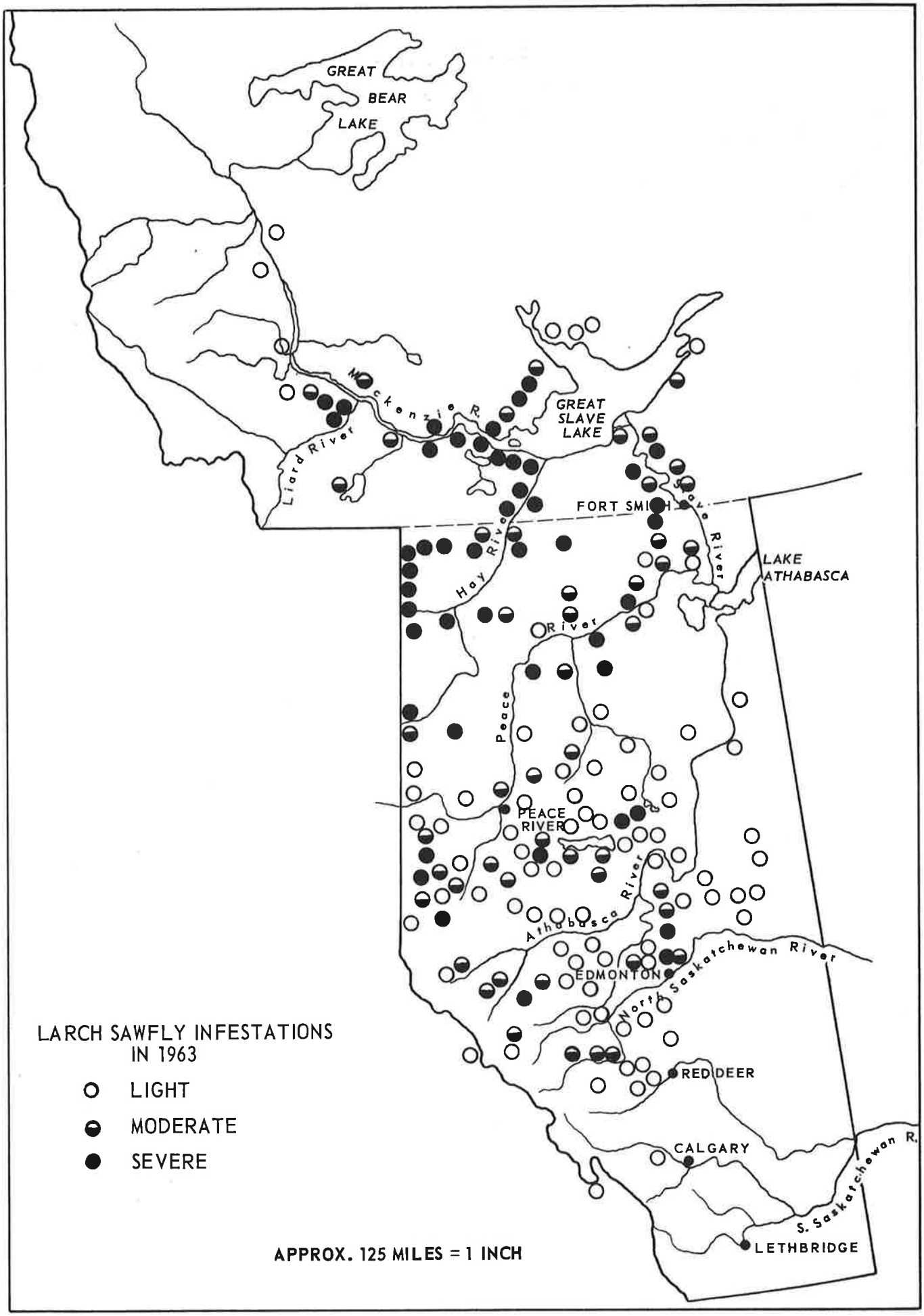
Entrance
Edmonton
SASKATCHEWAN
JASPER
PARK
NORTH
Red Deer
BANFF
YOHO PARK
PARK
KOOTENAY PARK
Calgary
Medicine Hat
Lethbridge
Coleman
FOREST TENT CATERPILLAR
INFESTATIONS IN 1963
LIGHT
MODERATE TO SEVERE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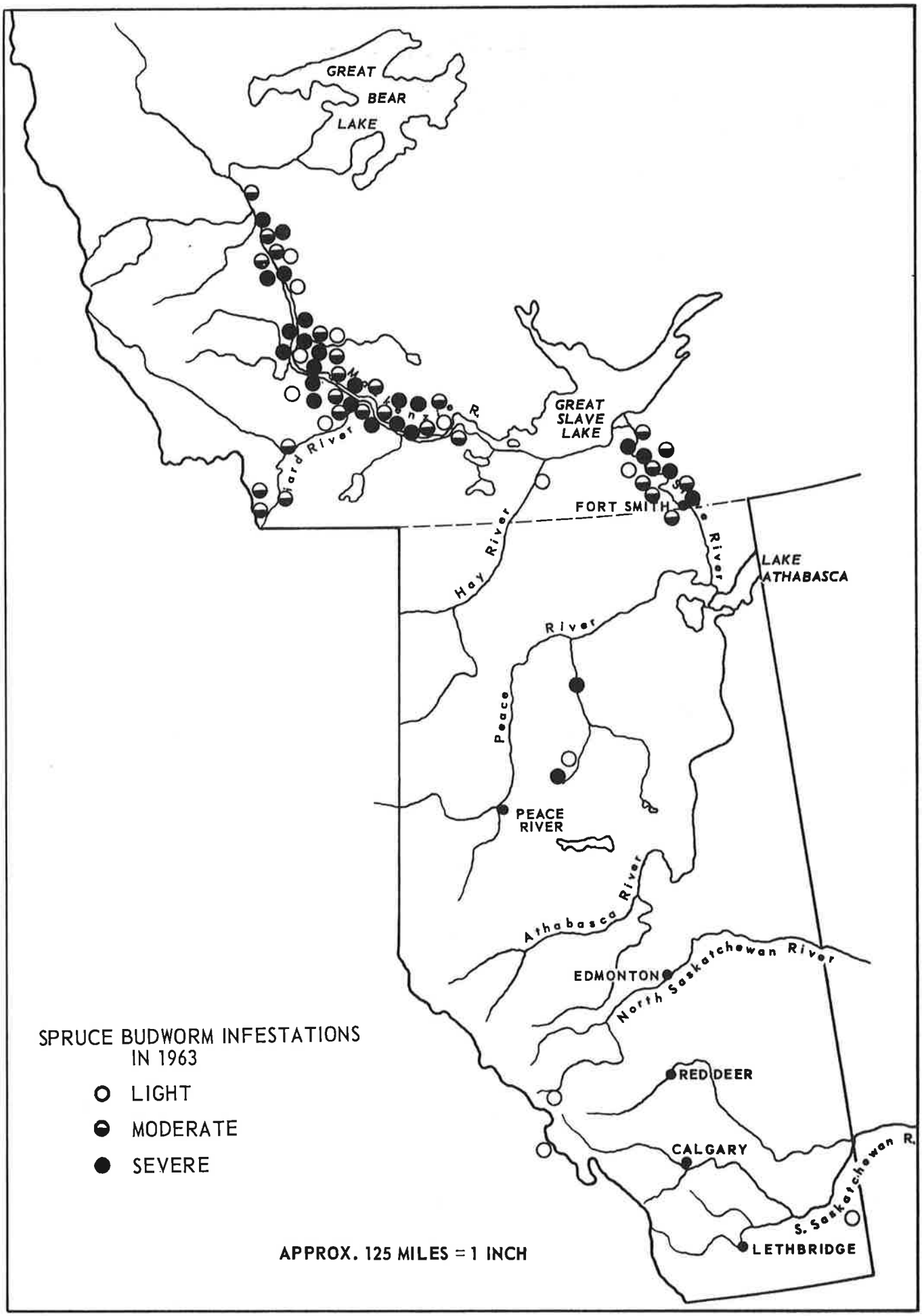
RED DEER
CALGARY
S. Saskatchewan R.
LETHBRIDGE
LARCH SAWFLY INFESTATIONS
IN 1963
LIGHT
MODERATE
SEVERE
APPROX. 125 MILES = 1 INCH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Athabasca River
EDMONTON
North Saskatchewan River
RED DEER
CALGARY
S. Saskatchewan R.
LETHBRIDGE
SPRUCE BUDWORM INFESTATIONS
IN 1963
LIGHT
MODERATE
SEVERE
APPROX. 125 MILES = 1 INCH

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.

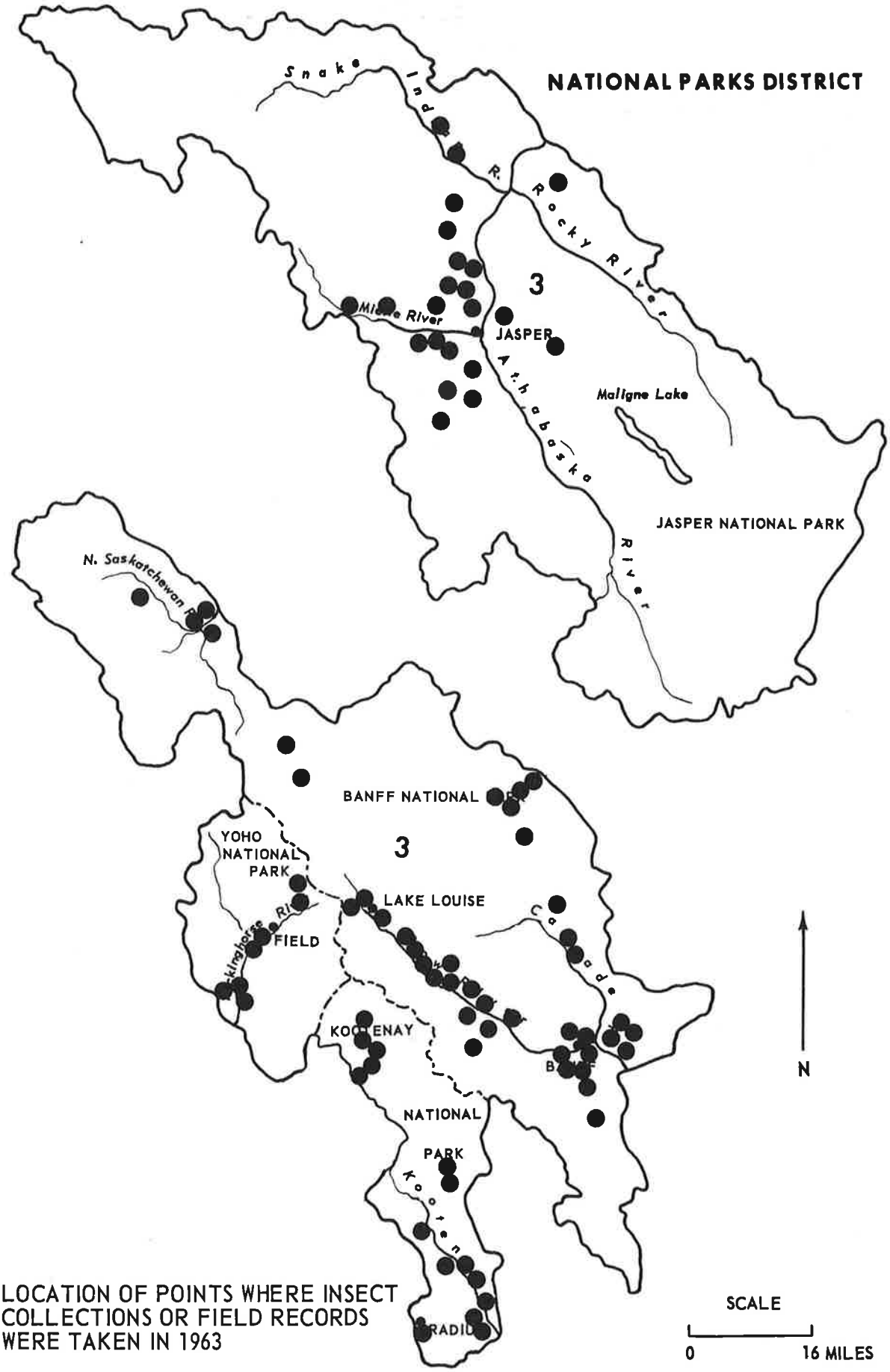
Table II - Other Noteworthy Insects and Diseases - Cont'd.

Causal Agent	Host	Remarks
Diseases		
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.

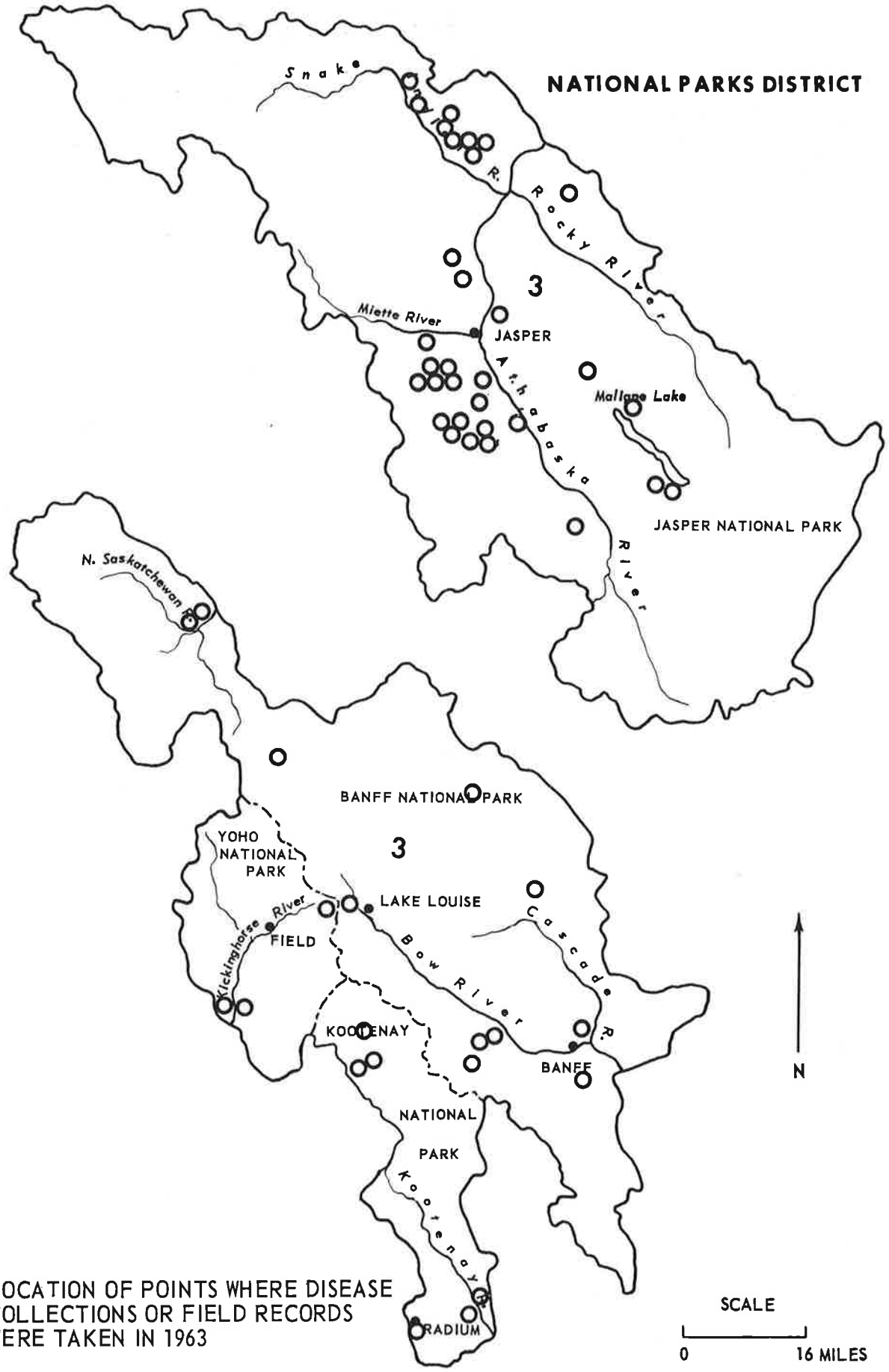
TABLE III

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. Eisen-hower 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