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**ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
ALBERTA REGION
1961**

**INTERIM REPORT
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA**

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**CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
March, 1962**

ANNUAL DISTRICT REPORTS
ALBERTA
(Forest Insect and Disease Survey)

by

J.K. Robins, E.J. Gantreau, F.J. Edmond, J. Petty,
V.B. Patterson, N.W. Wilkinson, G. Smith
A. Machuk, G. Kleinhout

INTERIM REPORT 1961
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA
(Based on investigations carried out in 1961)

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
March, 1962

(This report may not be published in whole or part without
the written consent of the Director, Forest Entomology and
Pathology Branch, Department of Forestry, Ottawa, Canada)

INTRODUCTION

The following reports cover forest insect and disease conditions in Alberta, the Rocky Mountain National Parks, and the Mackenzie District of the Northwest Territories as determined by ground and aerial surveys in 1961. In carrying out these surveys, approximately 105,000 miles were travelled by motor vehicle, 1,700 miles by boat and 8,000 miles by air; 3,368 insect and 502 disease collections were made.

FIELD STAFF ASSIGNMENTS

A number of changes in staff and district assignments took place in 1961. P. F. La Rue, a member of the Survey staff since 1949, resigned to go into private business, and J. A. Watson transferred to field technician duties. To fill these vacancies, G. Kleinhout and E. J. Gautreau joined the Survey staff prior to the field season. District assignments and divisional responsibilities were as follows:

Southern Division - Supervisor - J. Petty

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

Central Division - Supervisor - V. B. Patterson

District 4 Brazeau-Athabaska	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 A. Machuk

District 8 Northwest Territories G. Kleinhout

ACCOMMODATION

A pre-fabricated log cabin and a storage shed were built at the Mount Eisenhower Field Station in the fall of 1961 to provide a permanent headquarters for the National Parks District. Only the Crowsnest-Bow River and Northwest Territories districts are now served by house trailers. Fences were built and the grounds landscaped at Grande Prairie and Lac La Biche. The water system at Entrance was improved.

TRANSPORTATION

An inboard-outboard marine engine was installed in the cruiser "Borealis," replacing the 2 outboards previously in use. This installation proved very satisfactory, giving a substantial reduction in fuel consumption and an increase in cruising speed.

AERIAL SURVEYS

More extensive use of aircraft for survey purposes was made in 1961 than in previous years. Aspen defoliation surveys accounted for about one-half of the 80 hours flown. The remaining time was used for

a larch sawfly survey in northwestern Alberta and the eastern portion of Wood Buffalo National Park and a spruce budworm survey in the western part of the Northwest Territories. A helicopter provided by the Alberta Forest Service was used to examine an area in northeastern Alberta where damage to jack pine had been reported.

SUMMARY OF INSECT CONDITIONS

Larch Sawfly, Pristiphora erichsonii (Htg.)

The larch sawfly is now established throughout the range of tamarack in Alberta and the District of Mackenzie. Moderate to heavy defoliation occurred throughout most of the region but an area west of the Swan Hills to the British Columbia border and extending northward to the 26th Baseline showed mostly light defoliation. Two factors may explain the low mortality. Tamarack being a deciduous tree produces new foliage each year and hence annual defoliation is less serious than it would be on other conifers. Secondly, low tree vigor, brought about by repeated insect attack results in a shortage of new branch tips which are required by the insect for egg laying sites, thus reducing insect populations.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Populations of the one-year-cycle spruce budworm increased in some spruce stands of the Region, but declined in others. The outbreak along the Mackenzie River between Fort Simpson and Norman Wells was at its lowest ebb since 1955. Moderate to severe defoliation of white spruce occurred in the vicinity of Fort Liard and up the valleys of the Petitot and Kotanelee rivers. Along the Slave River the outbreak increased in

intensity with moderate to severe defoliation occurring in patches of spruce from Fort Smith to within 25 miles of Great Slave Lake. In northern Alberta, moderate to severe defoliation of spruce and balsam fir was observed around Loon Lake and along the Wabasca River between the Loon and Muddy rivers. An increase in the severity of the Cypress Hills outbreak was noted.

In some of the spruce stands that have suffered moderate to severe defoliation for a number of years, damage in the form of dead tops, sparse foliage, and excessive branching has become evident.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Favorable weather in the spring of 1961 allowed the already extensive outbreaks of forest tent caterpillars to increase in area and intensity. Aspen stands covering an estimated 26,000 square miles were moderately to severely defoliated. The outbreak, first noted around Elk Point in 1957, tripled in area in 1961 to approximately 12,000 square miles, most of which supported high populations. Moderate to severe defoliation of aspen occurred on each side of the Peace River Valley between Dunvegan and Fort Vermilion. This outbreak comprised about 8,000 square miles. Between these 2 large outbreaks, smaller infestations in the moderate to severe category covered an aggregate of about 6,000 square miles.

OTHER NOTEWORTHY INSECTS

INSECT SPECIES	REMARKS
Aspen leaf miner, <u>Phyllocnistis populiella</u> Cham.	Found in almost all aspen stands in the Region. Heavy infestations in the National Parks, near Hinton, Ricinus and Stettler and in many areas along the Mackenzie, Liard and South Nahanni rivers.
Fall cankerworm, <u>Alsophila pometaria</u> (Harr.)	Little evident change in the status of this insect in 1961. Some heavy infestations in southwestern Alberta. Light to moderate in many areas south of Highway 1.
Grey willow leaf beetle, <u>Galerucella decora</u> Say.	Caused moderate to severe defoliation of willow at scattered locations in central Alberta from Lloydminster west to the Smoky River.
A pine needle-tier, <u>Argyrotaenia tabulana</u> Free.	Infested jack pine in an area of about 350 square miles in northeastern Alberta around Audet and Johnson lakes.
Poplar-and-willow borer, <u>Sternochetus lapathi</u> (L.)	Found in the Crowsnest Pass area infesting willow. This is believed to be the first report of its existence in Alberta.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	Increased in numbers in 1961. Medium to high populations found near Manning, Wetaskiwin, Lacombe, Stettler and Red Deer.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	Remained a relatively unimportant shelter-belt pest in 1961. Severe defoliation occurred near Bassano, Delia, Cochrane, Alix, Olds, Flamondin and Valleyview.

SUMMARY OF DISEASE CONDITIONS

Greater emphasis was placed on tree diseases in 1961. This was reflected in the 502 collections made this season compared to 124 in 1960. Many new extension, host and herbarium records were made. Particular attention was given to rust fungi and their alternate hosts.

Three previously unreported outbreaks of white pine blister rust, Cronartium ribicola J. C. Fischer on limber pine were found in the Crowsnest Pass and in Waterton Lakes National Park. Western gall rust, Peridermium harknessii J. P. Moore was found infecting up to 90 per cent of the hybrid pines over a number of square miles in the Clear Hills.

Abnormally hot, dry weather during the summer of 1961 caused considerable drought damage to farm shelterbelts in southern Alberta. Many stands of jack pine regeneration in northern Alberta and the adjacent Northwest Territories suffered severe rabbit damage. These rodents, near the peak of their population cycle, ate the bark of the young trees after the depletion of their preferred food.

SPECIAL FOREST INSECT SURVEYS AND PROJECTS

The following special surveys and sampling techniques were carried out in 1961.

(1) Sequential sampling methods were again used at 30 locations in central and northern Alberta to determine the severity of the larch sawfly outbreak. The technique involved was developed by the Winnipeg Laboratory and is based on the utilization of larch twigs for oviposition.

(2) A forecast of aspen defoliation in 1962 by the forest tent caterpillar was obtained by using a 3 category sequential egg sampling

technique. This method is a refinement of a system developed by the New York State Science Service. The accuracy of the forecasts obtained by these methods in 1960 was checked by visual observations at all plots in 1961.

(3) A project set up in 1958 to study the effect of early spring weather on forest tent caterpillar populations was continued in 1961. The site of this project was moved from Lac La Biche to Bezanson in the Grande Prairie area.

(4) A phenology project involving the seasonal growth of pine was continued at 21 locations throughout Alberta.

(5) Assistance was again given to the Forest Research Branch in a spruce seed production project. Plots in central and southern Alberta were examined and cone crops estimated.

(6) Mass collections of forest tent caterpillars, yellow-headed spruce sawflies, Neodiprion sawflies and larch sawflies were collected for rearing in parasite studies.

(7) Requests for material to be used in survey studies and for distribution records were met by special collections of the following: insects feeding on white spruce and tamarack, insects feeding in the tops of black spruce, bark inhabiting insects, wood borers, Cecidomiidae in spruce buds, Engelmann spruce weevils, leaf eating beetles, vagabond poplar galls, dipterous blotch miners on poplar, Neodiprion sawflies, borers in the roots of aspen and alder, needle miners, larvae of the Cecropia moth, pine root weevils and others.

(8) Collections of tent caterpillars, aphids, Chilocorus sp., spruce budworms and Pamphiliid larvae were made for research workers at other laboratories.

SPECIAL FOREST DISEASE SURVEYS

Particular attention was given to collections from living hosts in 1961. The following special collections and observations were made:

(1) Fruiting bodies of Polyporus tomentosus Fr. and Fomes pini (Thore ex Pers.) Lloyd were collected for laboratory culture experiments.

(2) Stem rust fungi were collected from alternate hosts.

(3) An attempt was made to collect new herbarium records of Hypoxyylon canker of poplar at high elevations, of Peniophora pseudo-pini Weresub & Gibson on jack pine and hybrid pines, and to extend the known range of Atropellis canker, hyper parasites of dwarf mistletoe, needle cast of Douglas fir, and others.

ACKNOWLEDGEMENTS

The field staff of the Forest Insect and Disease Survey greatly appreciate the assistance tendered 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 1961

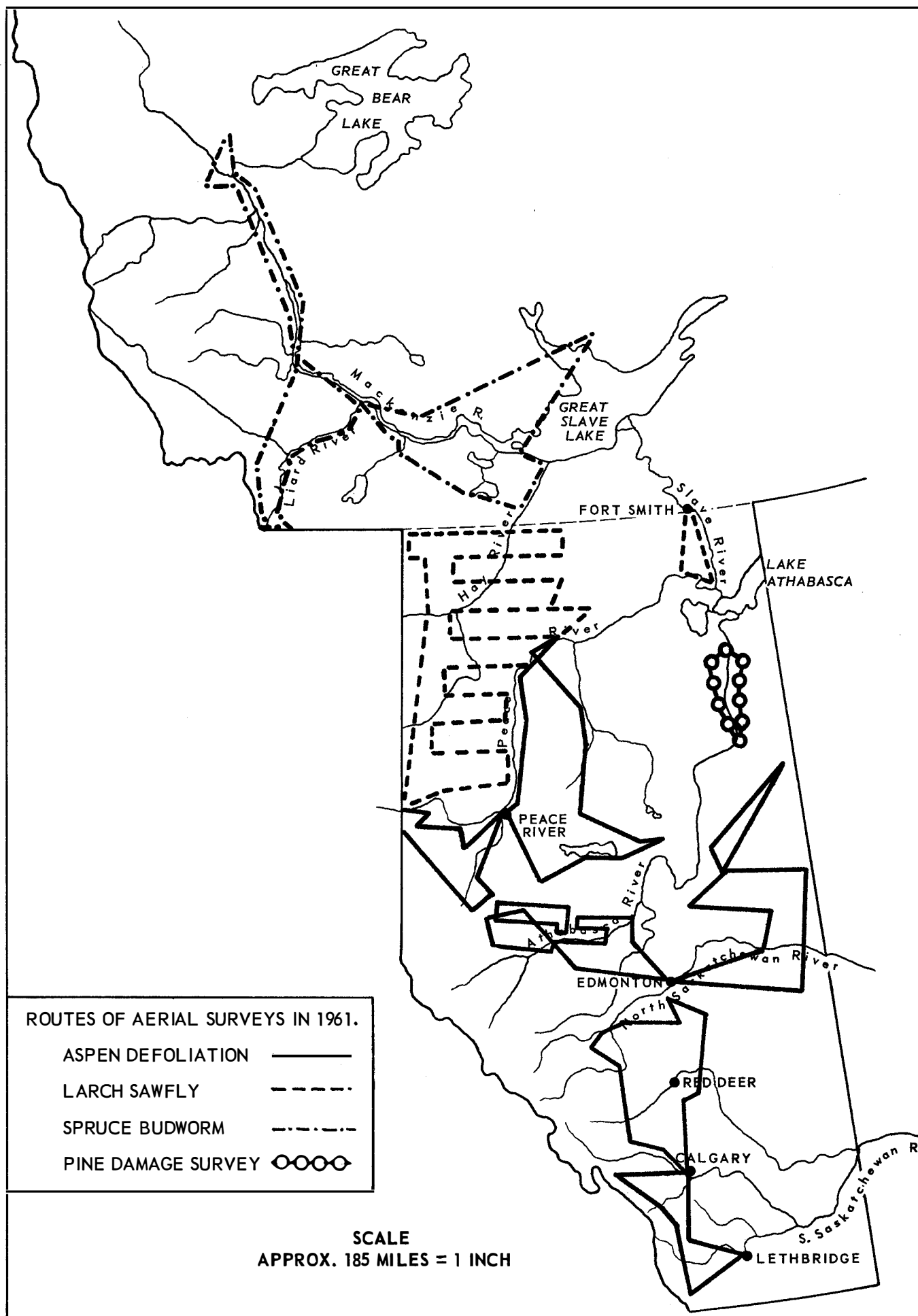
DISTRICT	PURPOSE	DATE	AIRCRAFT	COST PER HOUR	HOURS	COST			MISC.	HOURS PER DIST.	COST PER DIST.
						A	L	SB&L			
Crownsnest- Bow River	A	July 4	Cessna 172	20.00	2:45	55.00					
	A	July 6	Cessna 172	20.00	1:40	33.35				4:25	88.35
Clearwater	A	July 5	Cessna 172	20.00	6:40	133.35				6:40	133.35
Brazeau- Athabasca	A	July 5	Cessna 172	30.00	4:20	130.00					
	A	July 6	Cessna 172	30.00	1:45	52.50				6:05	182.50
Lac la Biche	A	July 7	Cessna 172	30.00	5:45	163.50					
	A	July 8	Cessna 172	30.00	2:35	62.50				8:20	226.00
		Sept. 7 & 8	Bell J		4:00				*	4:00	
Grande Prairie	A	July 8 & 9	Cessna 180 (floats)	51.00	7:45	395.25				7:45	395.25
Peace River	A	July 8 & 9	Cessna 180 (floats)	51.00	4:00	204.00					
	L	Sept. 7 8 & 9	Cessna 180 (floats)	51.00	17:00		867.00			21:00	1,071.00
Northwest Territories		July 21	Cessna 180	55.00	17:00			935.00		17:00	935.00
	SB	22 & 23	(floats)								
TOTALS					75:15	1,229.45	867.00	935.00			3,031.45

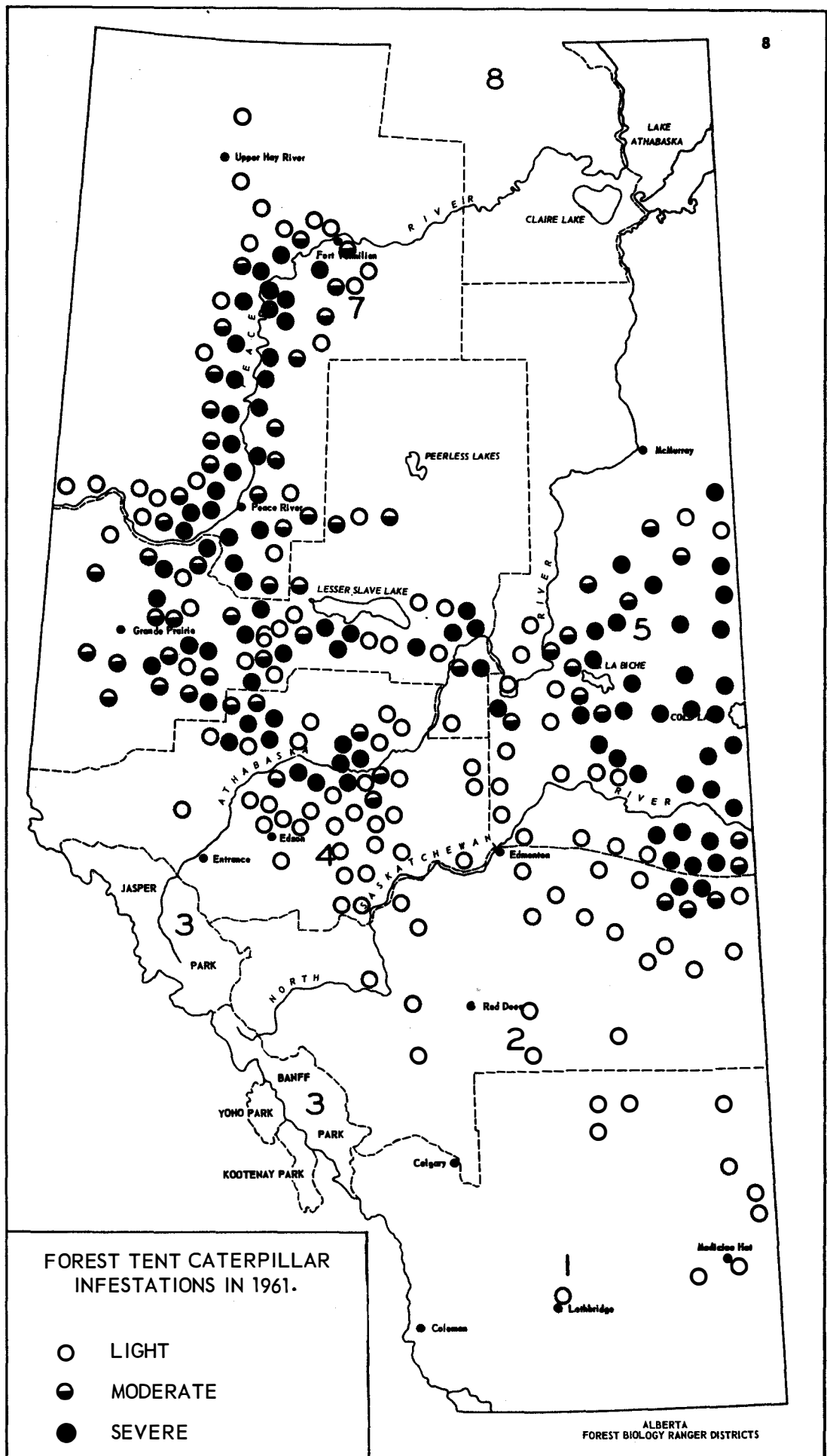
A Aspen defoliation surveys

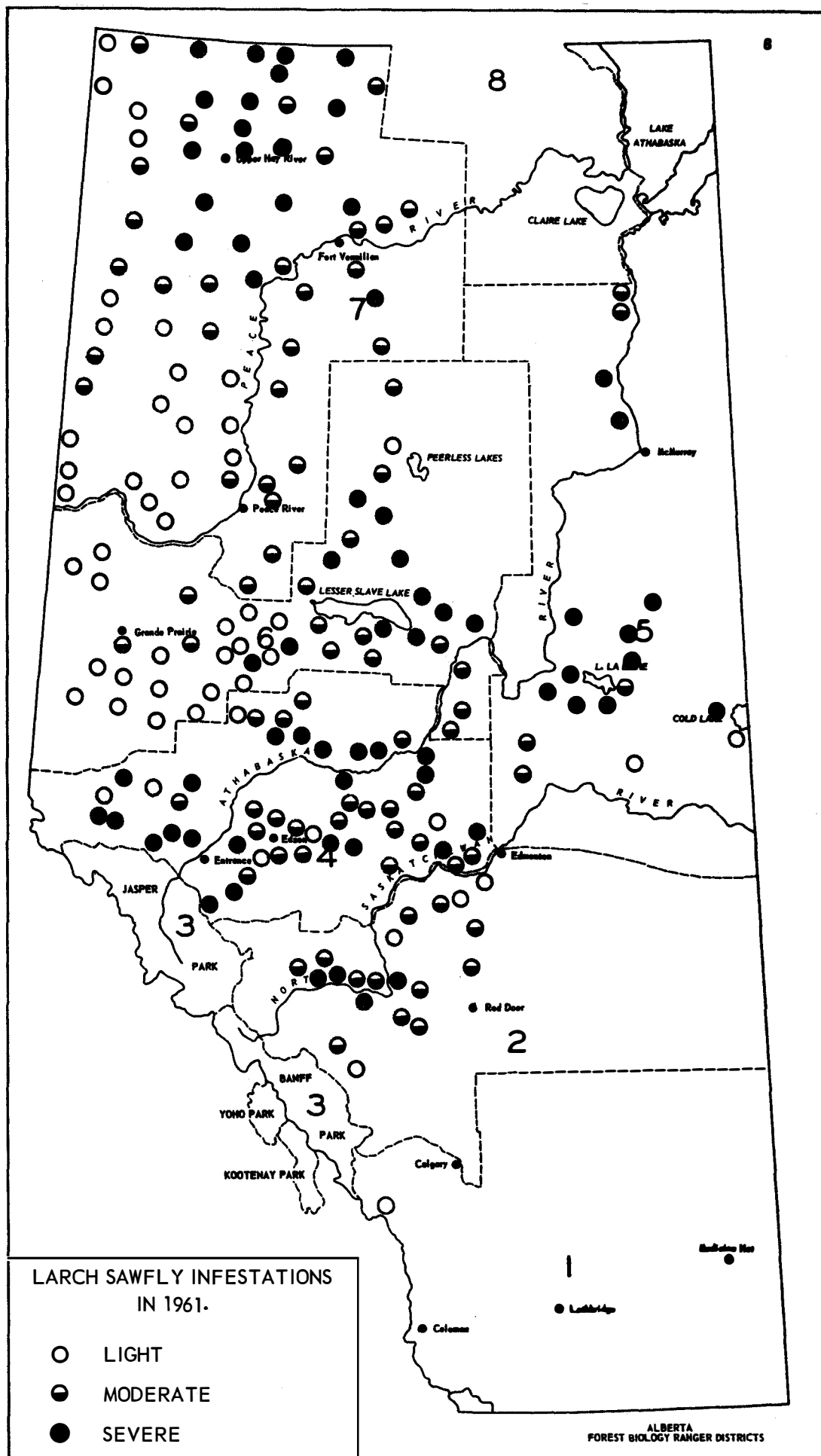
L Larch sawfly surveys

SB & L Spruce budworm and larch sawfly surveys

* Costs borne by the Department of Northern
Affairs and National Resources







ANNUAL REPORT
CROWNEST-BOW RIVER DISTRICT
ALBERTA 1961

by
E. J. GAUTREAU
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

The principal defoliator of aspen in the Crowsnest-Bow River District during 1961 was the American aspen beetle. Observations on the distribution and intensity of this insect show there has been a general increase from previous years. The most noteworthy increases occurred in the vicinities of Highwood and Shoep Ranger stations where aspen stands were completely defoliated. An increase in the incidence of forest tent caterpillar was noted in the eastern half of the District. Populations were generally low and defoliation was negligible. The Bruce spanworm, which caused severe aspen defoliation in recent years was not found in 1961. The fall cankerworm infestation in the agricultural shelterbelts continued unabated, and defoliation occurred in varying degrees of intensity.

Populations of the one-year cycle spruce budworm in the Cypress Hills remained at about the same level as in 1960. Light to moderate infestations persisted in the Graburn and Battle Creek areas. The poplar-and-willow borer was located for the first time in Alberta; south of Crowsnest Lake, willow were attacked and sustained severe injury.

White pine blister rust was prevalent throughout the Crowsnest Forest Reserve and Waterton Lakes National Park. Three new outbreaks on limber pine were located and a high percentage of the trees were severely attacked. A light infection of spruce cone rust occurred throughout the District and was collected for the first time in the Cypress Hills.

Drought conditions prevailed throughout the agricultural regions during most of the summer months and were responsible for considerable injury and scorching of foliage on shelterbelt trees.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Pine	57	44	M. maple	46	0
Spruce	53	18	Willow	33	0
D. fir	6	13	T. aspen	33	12
Larch	2	0	Poplar	23	4
A. fir	0	2	Alder	4	1
			Birch	2	0
Totals	118	77		141	17
Collections and Reports from Miscellaneous Hosts					64
GRAND TOTAL					417

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

In the eastern section of the Cypress Hills there has been an increase in the damage to spruce crowns due to the activity of the spruce budworm over the past several years. The greatest damage occurred in the Graburn Creek Valley. This was a moderate infestation with heavy patches and extended the length of the valley. The infestation along Battle Creek extended 3 miles east from Reesor Lake and varied from light to moderate. (See accompanying map).

A high incidence of spruce coneworm, Dioryctria reniculella (Grote) was found in conjunction with the spruce budworm. Both species were heavily parasitized by Diptera and Hymenoptera.

In September, J. Petty and the author conducted a survey to determine the current year's defoliation and the number of egg clusters per 18-inch branch tip. The sampling procedure was the same as that used by the Winnipeg Laboratory. Four plots were established in the Battle and Graburn Creek areas. The current defoliation results were as follows: Graburn Cabin 4.6 per cent; Texas Gate, 45 per cent; Spring, 23 percent; and Fire Road, 71 per cent.

Fall Cankerworm, Alsophila pometaria (Harr.)

The fall cankerworm continued as a ubiquitous pest of Manitoba maple, ash, and elm in the shelterbelts of the agricultural region. High populations caused severe damage at New Dayton, Magrath and Milk River. Large numbers of these loopers were also present at Cranford, Pearce and

Vauxhall and moderate defoliation resulted. Light infestations occurred east of Drumheller along Highway 9 except near Alsask, where a moderate infestation was apparent. South from Sibbald to Empress and west to Bindloss, Jenner and Patricia there was evidence of light defoliation. Details of these areas and the highly defoliated areas are shown on the accompanying map.

American Aspen Beetle, Gonioctena americana (Schaeff.)

The principal defoliator of trembling aspen in the District was G. americana. Although traces of defoliation were apparent on most aspen, several small "pockets" of extensive defoliation occurred near the Highwood and Sheep Ranger stations. "Pockets" of light to medium infestation were detected at Millarville and along Drywood, Todd, and Cow creeks. In Waterton Lakes National Park and Cypress Hills Provincial Park low populations were present.

Poplar-and-willow Borer, Sternochetus lapathi (L.)

A heavy infestation of this borer was located along Ptolemy Creek south of Crowsnest Lake for approximately 8 miles. Willow, 2 to 4 inches in diameter was heavily attacked and many stems were dead. The high populations and the extent of damage indicate that this insect has been present for several years. Although heavy infestations of this pest persist in British Columbia, this is the first record of its existence in Alberta.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Low populations of forest tent caterpillar were common in the agricultural region of the District. In Lethbridge and Medicine Hat light

defoliation occurred on shade and boulevard trees. Throughout the Bindloss, Delia, and Drumheller areas, colonies of larvae were frequently seen but damage was negligible. The heaviest damage observed was on willow along the roadside between Schuler and Hilda.

Tent Caterpillars, Malacosoma pluviale (Dyar) and Malacosoma lutescens (N. & D.)

Tents of M. pluviale and M. lutescens were found throughout the District. The eastern part of the District supported heavy populations on wild rose and chokecherry. In the Handhills, southeast of Drumheller, defoliation was severe. Numerous tents were observed on chokecherry bushes in Medicine Hat and in Elkwater Provincial Park, but injury to foliage was light. In the Crowsnest Forest Reserve and Waterton Lakes National Park, infestations were less intense and there was no evidence of serious damage.

Ugly-nest Caterpillar, Archips cerasivoranus (Fitch)

A heavy infestation of this caterpillar was present in Waterton Lakes National Park. Along the Viny Trail, numerous, compact webs were easily discernible on aspen, chokecherry, rose, saskatoon, and wolf willow. These shrubs were greatly distorted and the general area had an unsightly appearance. Isolated tents were observed in the vicinity of the Waterton Lakes Golf Course and along the Red Rock Canyon Road.

Spiny Elm Caterpillar, Nymphalis antiopa (L.)

Larvae of the spiny elm caterpillar were frequently observed throughout the District. Traces of defoliation occurred on willow near Pincher Creek, High River, Drumheller, Chinook, Bindloss, and Hilda. Although willow was the preferred host, collections were also made from aspen and northwest poplar.

Poplar Borer, Saperda calcarata Say

Several aspen stands in Waterton Lakes National Park were heavily attacked by the poplar borer. Voracious feeders, they were responsible for the weakening and death of numerous trees. In one locality along the Vimy Trail, 75 per cent of the trees were attacked, some having as many as 30 strikes. The infestation at the golf course varied from light to heavy and the areas of heavy infestations were plotted for future reference.

Spruce Coneworms, Diorystria reniculella (Grote) and Diorystria abietivorella D. & S.

An abundant cone crop on spruce was observed in the Cypress Hills during the current year. However, an investigation revealed that approximately 50 to 75 per cent of cones in the Graburn and Battle Creek valleys sustained damage by spruce coneworm. During the spruce budworm survey approximately 60 per cent of larvae collected were Diorystria sp.

Pine Root Collar Weevil, Hylobius sp.

Collections of a root collar weevil were made at 2 locations in the District. Light damage was evident in lodgepole pine stands west of Jumping Pound Ranger Station. In this area populations were low, and of 10 trees examined, all had accumulations of old damage but only one adult weevil and 2 larvae were found. The infestation on lodgepole pine in the Cypress Hills was re-examined and numerous larvae were collected from the majority of the trees. Adults were also found but in smaller numbers.

Pine Needle Scale, Phenacaspis pinifoliae (Fitch)

A light infestation of pine needle scale persisted on lodgepole pine and white spruce in the Cypress Hills. The outbreak south of Hillcrest was re-examined and found to have abated. This may be the result of the heavy populations of a predator, the twice stabbed lady beetle, Chilocorus stigma (Say), found in that area.

Gall Mites, Eriophyidae

Infestations by these mites were common in the shelterbelts and showed a preference for elm, poplar, and Manitoba maple. Light damage also occurred to the stems and branches of poplar. In the higher elevations, along the east slopes of the Rockies, an abundance of galls were frequently seen on the foliage of alder and mountain maple.

Gall Aphids, Adelges cooleyi (Gill.) Pineus pinifoliae (Fitch)

Heavy infestations of the Cooley spruce gall aphid, A. cooleyi, persisted in Waterton Lakes National Park and the Crowsnest Forest Reserve, especially in the Porcupine Hills and along the Kananaskis Trunk Road. Large numbers of this gall aphid were found on Douglas fir, the alternate host, in the vicinity of the Highwood Ranger Station, where the undersides of the needles were almost completely covered with small cottony tufts. In the Cypress Hills, where Douglas fir, does not occur, spruce stands were relatively free from this species. Another species of gall insect, P. pinifoliae was detected on spruce along the Cameron Lake Road in Waterton Lakes National Park.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

No appreciable change was detected in the prevalence of this pest. In Waterton Lakes National Park light injury occurred to open-growing spruce. Scattered attacks were located throughout the Crowsnest and Bow River Forest Reserves. A light infestation occurred in the Bragg Creek area and regeneration spruce on both sides of the highway was badly deformed. Insect parasites and predators of this spruce weevil were common throughout infested areas.

Bark Beetles, Scolytidae

In the southern end of the Crowsnest Forest Reserve and in Waterton Lakes National Park, limber pine, weakened by white pine blister rust, were attacked by a species of Pityophthorus. These beetles attacked infected twigs and branches and caused more rapid dying of the infected trees. Recently felled trees in a logging operation one mile south of Hillcrest were heavily infested by Ips pini (Say). Healthy trees were also attacked but due to the copious flow of pitch, no broods were established. Several collections of Dendroctonus murrayanae Hopk. were made in decadent trees, slash, and windfalls in the same general area.

Needle Miner, Eragora biopes Free.

An infestation of E. biopes on lodgepole pine was located along the Graburn Road in Elkwater Provincial Park. Sequential sampling showed a medium infestation with 278 needle miner pupae found in 12 branch tips. The only other known record of this species is from the Cypress Hills Provincial Park, Saskatchewan.

TABLE II

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE CROWSNEST-BOW RIVER DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
A leaf tier, <u>Compsolechia niveopulvella</u> Cham.	3	T. aspen	Populations of this insect were very low and damage to foliage was negligible.
Fall webworm, <u>Hypbantria cunea</u> (Drury)	1	Chokecherry	Few large nests found near Medicine Hat.
Balsam fir sawfly, <u>Neodiprion abietis</u> (Harr.)	2	W. spruce	Traces of defoliation along Kananaskis Trunk Road near Highwood Ranger Station.
A pitch nodule-maker, <u>Petrova</u> sp.	2	Lp. pine	Low populations in the District.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Chamb.	13	T. aspen	Light to medium infestations in the Porcupine Hills. "Pockets" of medium infestations in the Bow River Forest Reserve.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	3	W. spruce	One shelterbelt in the vicinity of Delia and another near Bassano heavily attacked.

Table II - Other Noteworthy Insects - Cont'd.

Insect species	Number of collections	Host	Remarks
A leaf tier, <u>Pseudexentera improbana</u> <u>oregonana</u> Wlshm.	3	T. aspen	Moderate to heavy infestations in the vicinity of Hilda and Chinook.
A looper, <u>Semiothisa perplexa</u> McD	2	Lp. pine	Low populations in Porcupine Hills.

DISEASE CONDITIONS

Rust Diseases

White pine blister rust, Cronartium ribicola J. C. Fischer, occurred at epidemic levels in Waterton Lakes National Park and in the Crowsnest Forest Reserve. In one locality 75 per cent of the crowns of limber pine were heavily infected with 6 to 12 cankers per tree. Branch and leader mortality was high. This extensive damage was ascribed primarily to the abundance of Ribes spp., the alternate host of C. ribicola. The distribution of this disease has increased during recent years. (See Table V outbreak numbers 1-16, 1-17, 1-18).

Light infections of the comandra blister rust, Cronartium comandrae Pk., were observed at 6 localities in the District. While on a survey of the Cypress Hills, a light incidence of this disease was located for the first time in that area. Rust on the alternate host Comandra pallida A.DC.

was also found in the same area.

Globose swellings on stems and branches of lodgepole pine caused by western gall rust, Peridermium harknessii J. P. Moore, were frequently observed in the District. The outbreak in the Cypress Hills was re-surveyed; 30 per cent of the trees were infected.

Spruce cone rust, Chrysomyxa pirolata Wint. was prevalent in the majority of spruce stands examined. The heaviest observed incidence was 2 miles east of Bragg Creek where 50 to 75 per cent of cones were infected. A light infection was detected in Elkwater Provincial Park. This constitutes the first record of the disease in that area.

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

Killing of white spruce, lodgepole pine, and Douglas fir by this root rot was common along the foothills of the Rockies and in the Cypress Hills. Douglas fir was the tree species most severely affected in Waterton Lakes National Park and in a stand of fir above the golf course, the mortality was high and symptoms of injury occurred on 50 to 75 per cent of living trees. In Elkwater Provincial Park, a light incidence of this disease was located on regeneration lodgepole pine.

Leaf Spot of Aspen, Marssonina tremuloidis Kleb.

Patches of aspen infected with M. tremuloidis were located north of Turner Valley. Although a high percentage of the foliage was affected there was no evidence of defoliation. A light infection of this disease was noted in Waterton Lakes National Park.

Drought

The abnormally hot and dry weather conditions that prevailed throughout most of the agricultural district during July and August were responsible for considerable foliage damage. By the middle of July the foliage of many broad-leaved trees in shelterbelts had a scorched appearance. By early August premature leaf fall had occurred in some areas south of Lethbridge. In one particular shelterbelt, west of Milk River, ornamental spruce was severely damaged and lost 50 to 75 per cent of their needles.

Foliage of open-growing aspen in the Cypress Hills were scorched probably as a result of the dry prevailing winds during August.

June temperatures were 7 to 8 degrees above normal in the District while precipitation was only 20 to 50 per cent of the average. August temperatures were 5 to 6 degrees above average while precipitation was again less than half the normal in most areas. Precipitation in the District during the summer months has been well below normal for the past 3 years and further drought symptoms in the shelterbelts can be expected in 1962.

TABLE III

OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE CROWNEST-BOW RIVER DISTRICT, 1961

Host	Organism	Locality	Remarks
Aspen, trembling	<u>Hypoxylon pruinatum</u> (Klotzsche) Cke.	Hanna	Not common in the agricultural regions.
	<u>Pleurotus ostreatus</u> Ja q. ex Fr.	Waterton	New herbarium record.
Fir, alpine	<u>Hypodermella abietis</u> <u>concoloris</u> (Mayr) Dearness	Waterton	New herbarium record.
Juniper, Rocky mountain	<u>Gymnosporangium nelsoni</u> Arth.	Brooks	New herbarium record.
Pine, lodgepole	<u>Coleosporium solidaginis</u> (Schw.) Thum.	Cypress Hills	New southern exten- sion.
Wintergreen sp.	<u>Pucciniastrum pyrolae</u> Diet. ex Arth.	Cypress Hills	New herbarium record.

TABLE IV

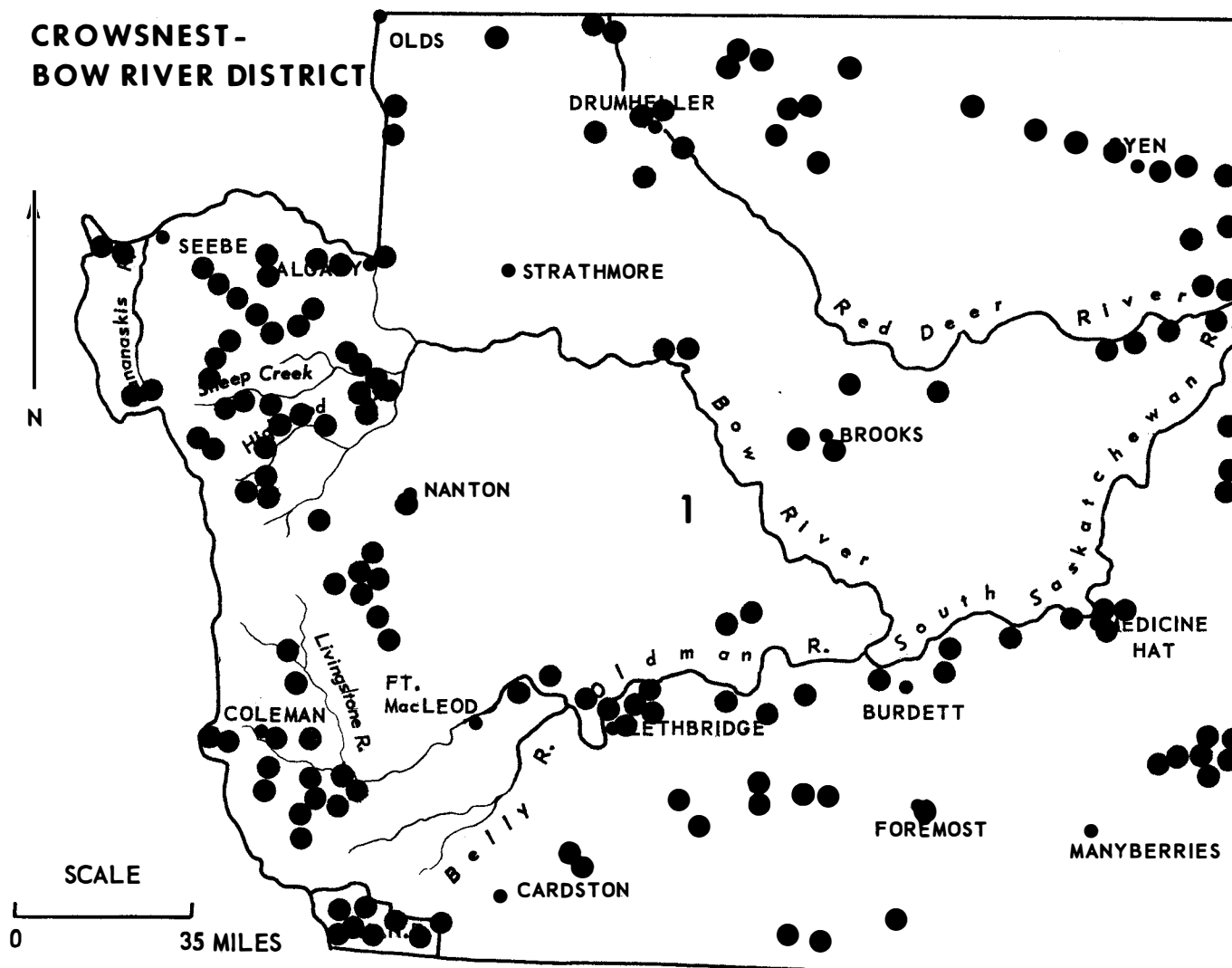
SUMMARY OF RECORDED DISEASE OUTBREAKS
STILL UNDER INVESTIGATION IN THE CROWNEST-BOW RIVER DISTRICT

Outbreak Number	Location	Causal Organism	Remarks
1-1	2 miles northeast of Castle Ranger Station	<u>Atropellis piniphila</u> (Weir) Lohman and Cash	Re-surveyed in 1961, 14 per cent of stand infected.
1-2	2.9 miles south of Kananaskis Experimental Station	<u>Atropellis piniphila</u> (Weir) Lohman and Cash	Active.
1-3	Crowsnest Forest Reserve	<u>Chrysomyxa pirolata</u> Wint.	Discontinued, less than 5 per cent of cones affected in 1961.
1-4	One-quarter mile south of Kananaskis Experimental Station	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not examined in 1961.
1-5	Kananaskis Valley in vicinity of Evans Thomas Creek	Red belt	No further damage.
1-6	Headwaters of York Creek	<u>Cronartium ribicola</u> J. C. Fischer	Discontinued, area logged out.
1-7	Waterton Lakes National Park	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	Active, re-examined in 1961.
1-8	Dutch Creek Road	<u>Arceuthobium americanum</u>	Not examined in 1961.
1-9	Dutch Creek area	<u>Hypodermella</u> sp.	Discontinued in 1961.
1-10	Waterton Lakes National Park	Red belt	Discontinued in 1961.
1-11	Waterton Lakes National Park	<u>Cronartium ribicola</u> J. C. Fischer	Active, examined 1961.

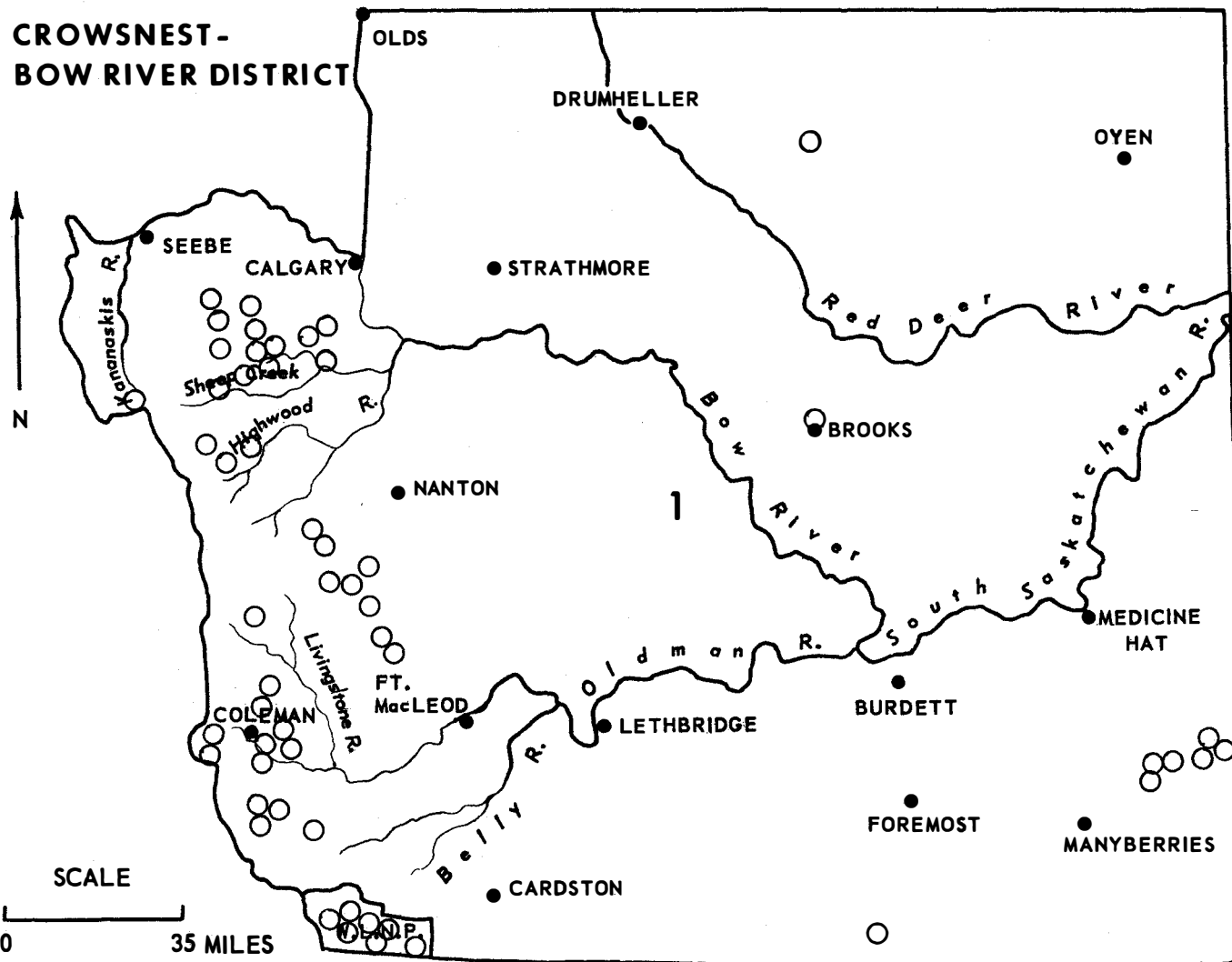
Table IV - Summary of Recorded Disease Outbreaks - Cont'd.

Outbreak Number	Location	Causal Organism	Remarks
1-12	13 miles north of Coleman on Trunk Road	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Active.
1-13	Elkwater	<u>Peridermium harknessii</u> J. P. Moore	Re-surveyed in 1961.
1-14	Blairmore	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Active.
1-15	Elkwater	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-surveyed 1961, 45 per cent of stand infected.
1-16	Hillcrest	<u>Cronartium ribicola</u> J. C. Fischer	New outbreak covering approximately 320 acres located 2 miles south of Hillcrest along Adanac Road.
1-17	Coleman	<u>Cronartium ribicola</u> J. C. Fischer	Located during 1961, covering approximately 640 acres, 2 miles south of Vicary Creek Mine Road.
1-18	Waterton Lakes National Park	<u>Cronartium ribicola</u> J. C. Fischer	Located during 1961, covering approximately 300 acres on Mt. Bertha.

CROWSNEST- BOW RIVER DISTRICT

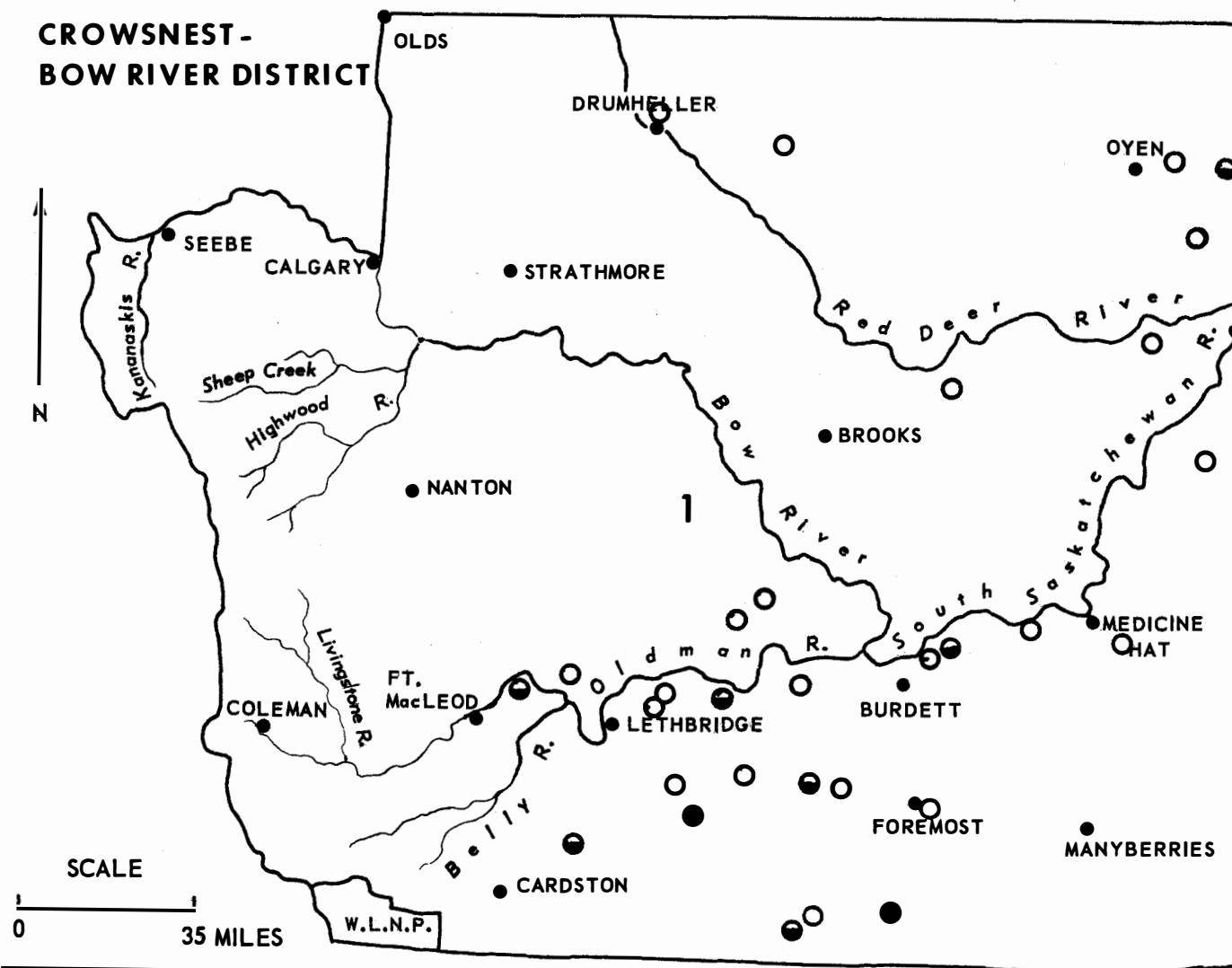


LOCATION OF POINTS WHERE INSECT COLLECTIONS
OR FIELD RECORDS WERE TAKEN IN 1961.



LOCATION OF POINTS WHERE DISEASE COLLECTIONS
OR FIELD RECORDS WERE TAKEN IN 1961.

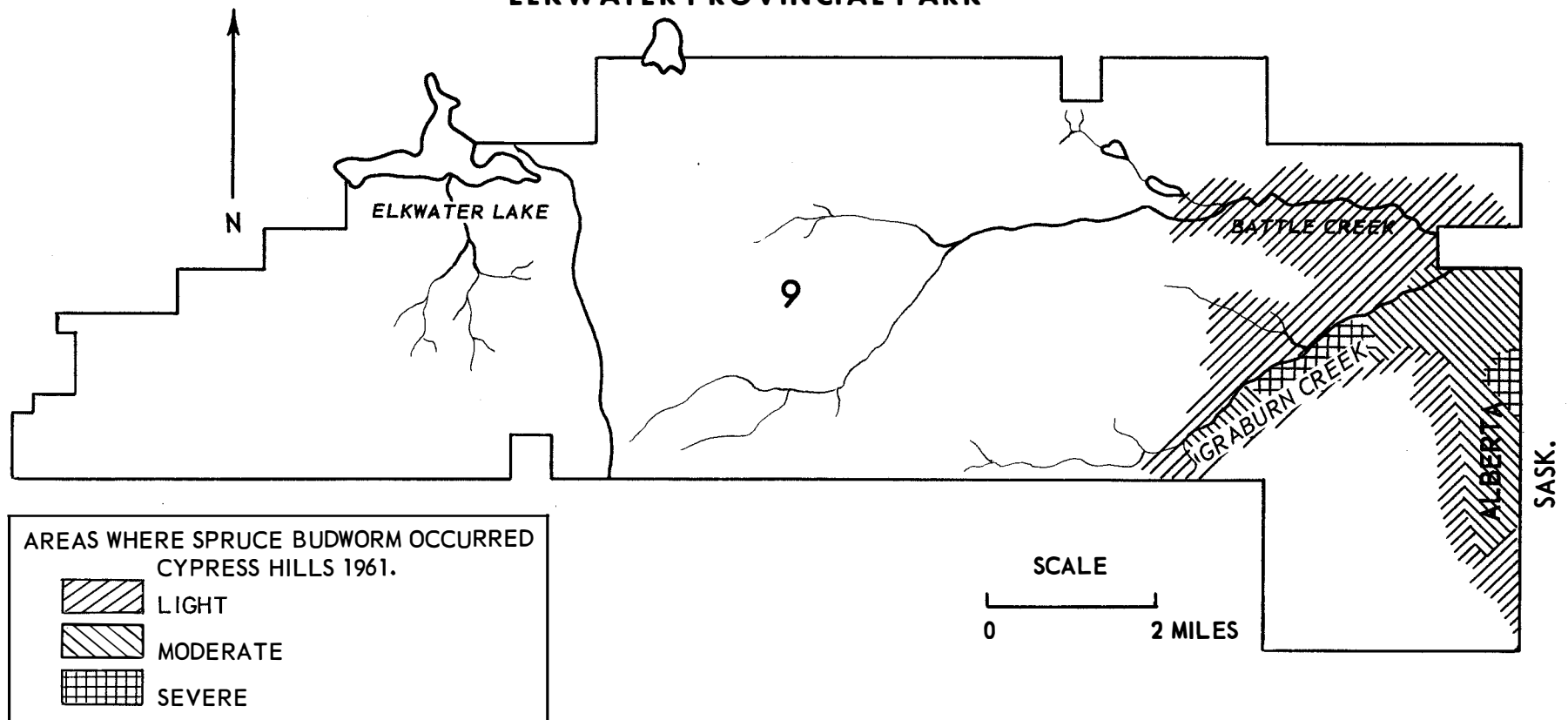
CROWSNEST- BOW RIVER DISTRICT



FALL CANKER WORM INFESTATIONS IN 1961.

- LIGHT
- ◐ MODERATE
- SEVERE

ELKWATER PROVINCIAL PARK



ANNUAL REPORT
CLEARWATER DISTRICT
ALBERTA 1961

by
F. J. EMOND
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

In the eastern half of the Clearwater District the major insect problems were concerned with 3 aspen defoliators, the forest tent caterpillar, the bruce spanworm and a leaf tier, Pseudexentera improbana oregonana Wlsh. These 3 species combined to cause moderate to severe defoliation of aspen in the Mannville-Lloydminster areas south of Highway 16.

In the western half of the District the larch sawfly was again present throughout the majority of larch stands inspected during the 1961 season. Only one area showed any defoliation increase. This was west of the town of Millet where moderate to severe defoliation was recorded. The grey willow leaf beetle was responsible for considerable damage to willow throughout the mid-western portion of the District.

No new disease outbreaks were reported during the 1961 field season. Two old outbreaks were re-examined in the Nordegg and Buck Lake areas. The majority of disease collections consisted of the fruiting bodies of the various root, butt and stem diseases. Collections of stem rusts of pine were made at a number of locations throughout the foothills regions, and a needle cast, Elytroderma deformans. (Weir) Darker was present in most pine stands inspected.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Spruce	78	19	T. aspen	124	7
Pine	35	24	Willow	27	5
Larch	19	0	Alder	7	0
Fir	2	0	Poplar	8	4
			Birch	3	1
Totals	134	43		169	17
Collections and Reports from Miscellaneous Hosts					17
GRAND TOTAL					380

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Defoliation by this species of tent caterpillar showed a slight increase during the 1961 season. A more widespread distribution was recorded in the northeast section of the District, bounded on the north by Highway 16 between Mundare and Lloydminster, and on south by Highway 13 between Bittern Lake and Provost. In this area, moderate to severe damage occurred south

of Highway 16 for 10 to 15 miles, with Vermilion as the approximate centre of severe defoliation. South of this area defoliation gradually declined from moderate to light along Highway 13, the southern boundary. Light defoliation was also recorded near Rocky Mountain House, Caroline, Sundre, Breton, Big Valley and Wetaskiwin.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Phillips	Not noticeable	Light	Not noticeable
Lougheed	Not noticeable	Light	Not noticeable
Hughendon	Not noticeable	Light	Not noticeable
Ribstone	Not noticeable	Light	Not noticeable
Rivercourse	Not noticeable	Light	Not noticeable
Provost	Not noticeable	Light	Not noticeable
Vermilion	Noticeable	Moderate	Noticeable
Lavoy	Not noticeable	Light	Not noticeable
Edgerton	Not noticeable	Moderate	Not noticeable
Babayan	Not noticeable	Light	Not noticeable
Mundre	Not noticeable	Light	Not noticeable

Bruce Spanworm, Operophtera bruceata (Hlst.)

It was very difficult to determine the defoliation caused by this species due to the presence of the forest tent caterpillar and a leaf tier, Pseudexentera improbana oregonana Wlshm., in the same area.

Medium to high populations of spanworm were recorded south of Highway 16 between Mannville and Islay where moderate to severe damage to scattered wood lots occurred. South from these points population levels decreased gradually from medium to low along Highway 13 between Camrose and Provost. Elsewhere in the agricultural area east of Highway 2 population levels were low and damage negligible. In the western half of the District only a few larvae were present in collecting samples and the damage was not noticeable.

A Leaf Tier, Pseudexentera improbana oregonana Wlshm.

This species of leaf tier was very much in evidence in the Wainwright, Hardisty and Camrose areas and along Highway 16 from Vegreville to Lloydminster. In the remainder of the District low populations of this leaf tier were observed except along the Trunk Road from Nordegg south to the Red Deer River where none were found.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The larch sawfly was again responsible for considerable damage in the majority of tamarack stands in the District. The heaviest defoliation occurred in a triangle formed by the Clearwater Ranger Station, Caroline and Rocky Mountain House. In this area, moderate to severe damage was recorded on regeneration and intermediate larches. On larger trees, only upper crown

defoliation was in evidence. Several small, isolated stands of regeneration larch between Horburg and Nordegg along Highway 11 were also severely defoliated.

Light to moderate damage was noted west of Nordegg along the Thompson Trail and in the vicinity of Chungo Creek. Light damage to small isolated stands of larch along the Trunk Road was recorded north and south of the Clearwater Ranger Station.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960	Infestation class 1961
2-1	Yoeftord	Moderate	Light	Light	Light
2-2	Rocky Mtn. House	Light	Severe	Severe	Moderate
2-3	Nordegg	Light	Light	Moderate	Light
2-4	Clearwater	Moderate	Moderate	Severe	Moderate
2-5	Caroline	Light	Moderate	Light	Moderate
5-3	Millet	Moderate	Light	Light	Severe

Grey Willow Leaf Beetle, Galerucella decorata Say

This species of leaf-eating beetle was responsible for moderate to severe skeletonizing of willow foliage in the following areas: Lacombe to Wetaskiwin, Pigeon Lake, Winfield, Alder Flats, south of Alder Flats

along the Forestry Road to Rocky Mountain House, Strachan, Condor, between Ricinus and Caroline and south of Caroline along the Garrington Ferry Road for a distance of 7 miles. In the majority of these areas, skeletonizing was confined to willow stands approximately 3 to 10 acres in size, except along the Forestry Road between Alder Flats and Rocky Mountain House where several defoliated areas exceeded 25 acres. Other small pockets of moderate to severe skeletonizing were noted in the Vegreville, Camrose, Stettler and Lloydminster districts. Elsewhere throughout the District both adults and larvae were collected but populations were low and damage, if any, was negligible.

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

Population levels of this sawfly in the Clearwater District remained at the same level as in 1960. With the exception of 2 areas, injury to individual shelterbelt and shade trees was light. Moderate to severe damage was noted one mile east of Cochrane and to individual trees in shelterbelts east of Edmonton along Highway 16. Light populations were recorded on several farm shelterbelts in the vicinities of Stettler, Lacombe, Camrose, Wetaskiwin and Olds. Throughout the forested areas of the District only the occasional larva was taken in beating samples.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

The spruce spider mite was found in the majority of shelterbelt, ornamental and shade trees inspected in the District. High populations with moderate to severe damage was noted on spruce in the Wetaskiwin, Lacombe, Red Deer and Stettler areas. In the remainder of the agricultural area low

populations of spider mite persisted and webbing and discoloration of needles was light. In the forested area of the foothills, damage to spruce by this mite was light.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Low populations of this leaf-eating beetle were found throughout the agricultural area of the District. In the Crimson Lake area, north of Rocky Mountain House, moderate to severe defoliation of aspen regeneration occurred. Over the remainder of the District low numbers of larvae and adults were collected from scattered locations and damage was light.

Gall aphids, Adelginae

Medium to high populations of these gall forming aphids were noted on both native and shelterbelt spruce throughout the agricultural areas of the District. Heavy populations were found in Red Deer and Wetaskiwin and along Highway 11 between Rocky Mountain House and Nordegg. In the remainder of the forested areas, low to medium populations persisted except along the Trunk Road between the Red Deer Ranger Station and Nordegg where very low populations were observed.

TABLE IV

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE CLEARWATER DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	4	W. spruce	Low populations in foothills area.
<u>Aphidae</u>	5	T. aspen Birch L. pine W. spruce	Common throughout the forested area.
Grey pine looper, <u>Caripeta angustiorata</u> Wlk.	7	Lp. pine	Fairly common in fall.
Leaf beetles, <u>Chrysomelidae</u>	7	T. aspen Willow	Found mainly in agricultural area, no serious defoliation.
A looper, <u>Eupithecia luteata</u> Pack.	7	W. spruce	Few taken in white spruce samples.
A looper, <u>Itame loricaria</u> Evers.	22	T. aspen	Commonly found in low numbers with other aspen defoliators.
Prairie tent caterpillar, <u>Malacosoma lutescens</u> (N & D)	8	Willow Rose Gooseberry	Fairly common throughout the eastern area.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	7	Birch Willow	Common in same area as the forest tent caterpillar.
Balsam-fir sawfly, <u>Neodiprion abietis</u> (Harr.)	5	W. spruce	Non-gregarious, found singly in beating samples.
A sawfly, <u>Neodiprion</u> sp.	8	Lp. pine S. pine	Light damage on native and shelterbelt trees.

Table IV - Other Noteworthy Insects - Cont'd.

Insect species	Number of collections	Host	Remarks
A pitch nodule-maker, <u>Petrova</u> sp.	5	Lp. pine	Caused light damage in the forested areas.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	13	T. aspen B. poplar	Medium populations in the Caroline and Stettler areas. Common in aspen stands.
Green-headed spruce sawfly, <u>Pikonema dimmockii</u> (Cress.)	15	W. spruce	Taken commonly in spruce collections.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	5	W. spruce	A few infested spruce tips found in the forested areas.
Green spruce looper, <u>Semiothisa granitata</u> Gn.	21	W. spruce	Collected from spruce in all areas.
A looper, <u>Semiothisa perplexa</u> McD.	10	Lp. pine	A few taken in pine samples.
Green larch looper, <u>Semiothisa sexmaculata</u> Pack.	6	Larch	Found in medium populations in larch stands.

DISEASE CONDITIONS

Pine Needle Cast, Elytroderma deformans (Weir) Darker

In all areas where this needle cast was found, damage was light and in most cases was confined to 5 and 6-year old needles. No damage was noted on the current years growth. Collections were made throughout the foothills at the following points: Rocky Mountain House, Crimson Lake,

Nordegg, Horburg, Winfield and near the Clearwater Ranger Station. Light damage was also noted on lodgepole and scots pines in shelterbelts in the Breton and Calmar areas and south of Sylvan Lake.

Western Gall Rust, Peridermium harknessii J. P. Moore

The typical globose swellings on branches and stems that are associated with P. harknessii were noted on lodgepole pine in the following localities: south of Alder Flats, Rocky Mountain House, Nordegg, Sundre, west of Sundre on the road to the Red Deer Ranger Station, south of the Ghost Ranger Station along the Trunk Road and in the vicinity of Exshaw along Highway 1-A. In all areas where these galls were found only light damage occurred.

Spruce Cone Rust, Chrysomyxa pirolata Wint.

Spruce cone rust occurred sporadically in spruce stands throughout the foothills area from Rocky Mountain House south to the Ghost Ranger Station. Collections and observations made in the Rocky Mountain House area revealed that only 5 per cent of the cone crop was affected. Farther south in the Red Deer and Ghost Range Station localities, 10 to 15 per cent of the cones were damaged. Throughout the remainder of the area only occasional light damage was noted.

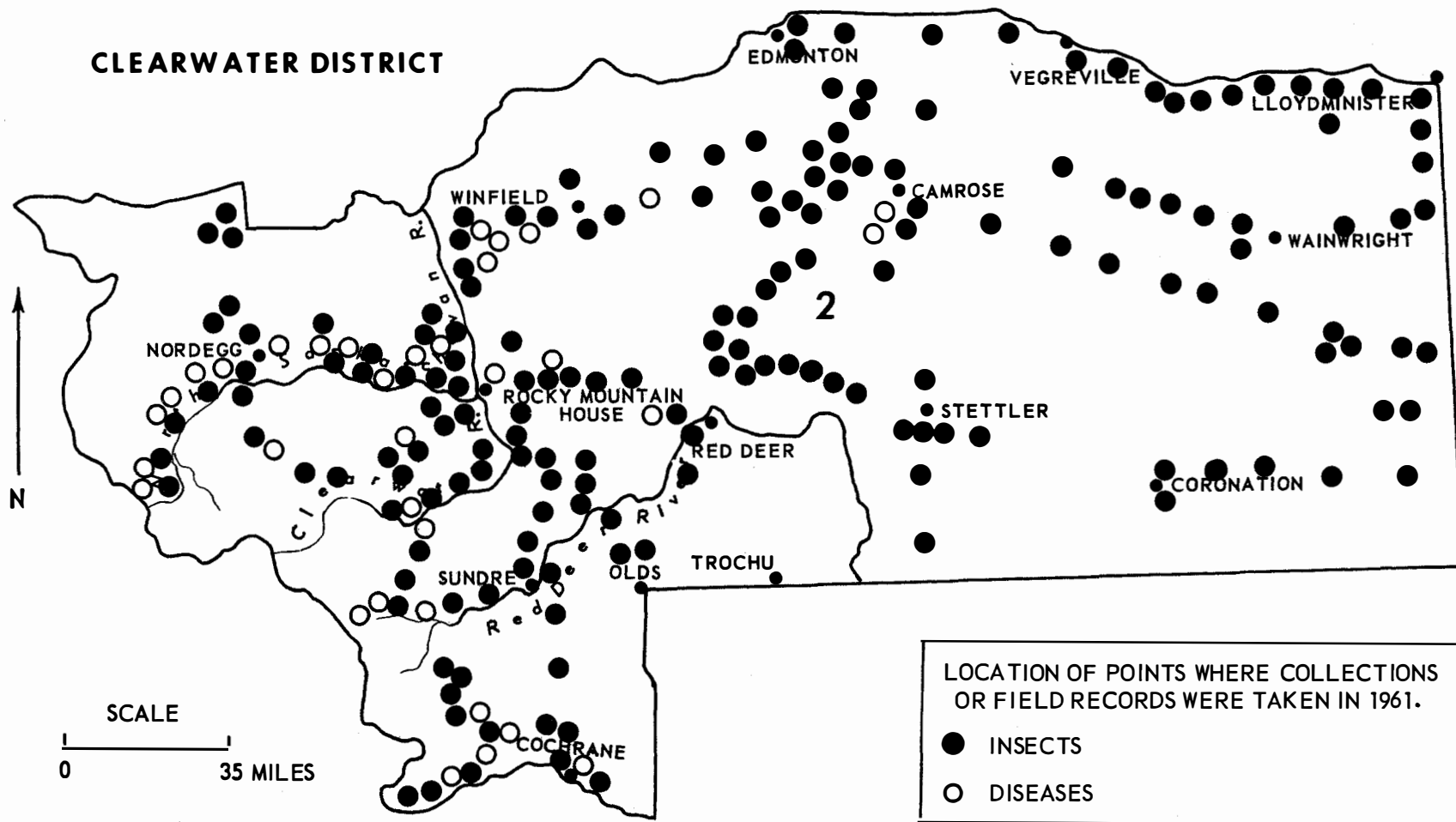
TABLE V
OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE CLEARWATER DISTRICT, 1961

Host	Organism	Locality	Remarks
Pine, lodgepole	<u>Atropellis piniphila</u> (Weir) Lohman & Cash		Widespread in varying degrees in the lodgepole pine stands throughout the District.
	<u>Cronartium comandre</u> Pk.		Scattered affected pines in the foothills region.
Poplar, balsam Poplar, Russian	Drought conditions	Carstairs and Olds districts.	Considerable bark and foliage damage in the agricultural area of the District.
Spruce, black	<u>Retinocylus abietis</u> (Crouan) Groves & Wells	7 miles north of Rocky Mountain House	Common canker in black spruce stands in this area. A new herbarium host record.
Spruce, white	<u>Flammula alnicola</u> (Fr.) Kummer	10 miles west of Red Deer Ranger Station on YaHa Tinda road.	Common in this area on mature spruce.
Willow	<u>Rhytisma salicinum</u> (Pers.) Fr.		Common on willow throughout the foothills area.

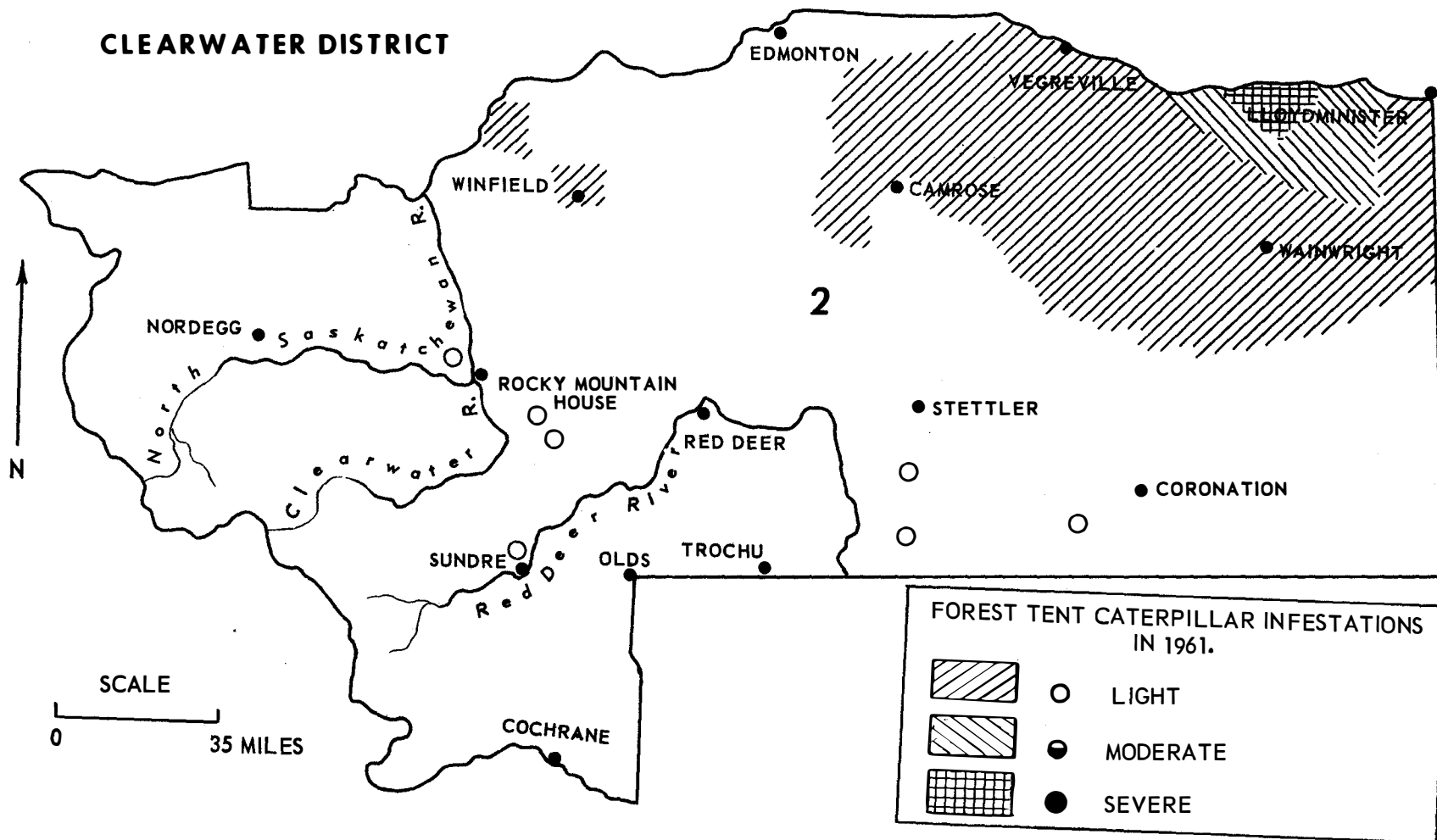
TABLE VI

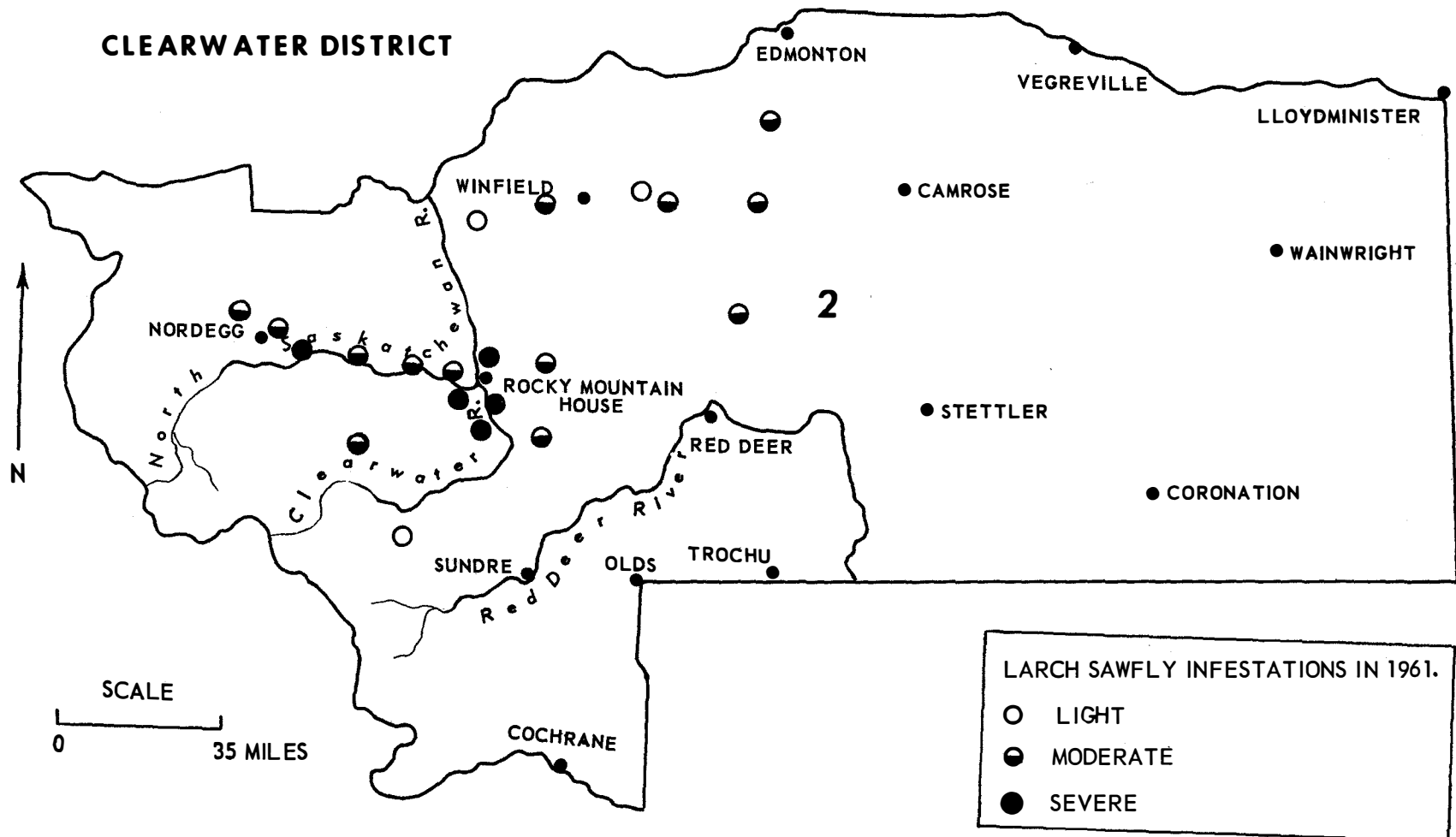
SUMMARY OF RECORDED DISEASE OUTBREAKS
STILL UNDER INVESTIGATION IN THE CLEARWATER DISTRICT

Outbreak Number	Location	Causal Organism	Remarks
2-1	18 miles north of Clearwater Ranger Station on Nordegg Road.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1962.
2-2	2 miles south of Clearwater Ranger Station on Trunk Road.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1962.
2-3	23 miles north of Nordegg, Chungo Creek area.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	82 per cent of 163 living trees infected.
2-6	15 miles west of Caroline.	<u>Arceuthobium americanum</u> (Nutt. ex Engelm.)	To be re-examined in 1962.
2-7	10 miles east of Nordegg.	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1963.
2-8	30 miles north of Rocky Mountain House.	Heat and smoke damage	Discontinued in 1961. Trees appear healthy this year.
2-9	16 miles west of Upper Saskatch- ewan Ranger Station.	<u>Arceuthobium americanum</u> (Nutt. ex Engelm.)	85 per cent of trees affected. Re-examine in 1965 for tree mortality.



CLEARWATER DISTRICT





ANNUAL REPORT
NATIONAL PARKS DISTRICT
ALBERTA 1961

by

J. PETTY
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

The status of the important insects and diseases in the National Parks District did not change appreciably in 1961 from that reported in 1960. Populations of the aspen leaf miner remained high in Jasper, Yoho and Kootenay National Parks and increased in Banff National Park.

Early instar larvae of the two-year cycle spruce budworm caused moderate damage in a small area near Saskatchewan Crossing in Banff National Park. Light infestations were found in several areas of Yoho National Park.

Three species of leaf-eating beetles caused moderate to severe defoliation in many areas of the National Parks District. Chrysomella aenicollis Schffr. was the species most frequently found, and was reported from all the National Parks except Kootenay. It was responsible for severe defoliation of willow in the Cascade Valley north of Banff. Another species, Chrysomella schaefferi Brown, caused moderate defoliation to willow near Wapta Falls in Yoho National Park and Chrysomella alnicola alnicola Brown, was responsible for severe defoliation of alder at the south end of the Ice River Road in Yoho National Park.

Winter mortality of the lodgepole needle miner was low during the 1960-61 winter. As a result there was little change in the population levels which were reported in 1960.

One new disease outbreak was recorded in the District and 7 were discontinued. The new outbreak was of Atropellis canker and was located 10 miles south of Jasper townsite along the Banff-Jasper Highway. Seven outbreaks of needle casts were discontinued because the disease had subsided. There were no foliage or secondary diseases apparent in those areas of Banff and Kootenay National Parks where drought conditions prevailed in 1960.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Pine	52	13	Willow	30	0
Spruce	47	9	T. aspen	28	0
D. fir	14	2	Poplar	3	0
A. fir	14	2			
Larch	8	1			
Totals	135	27		61	0
Collections and Reports from Miscellaneous Hosts					22
Grand Total					245

INSECT CONDITIONS

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Infestations of the poplar serpentine miner were again found throughout the National Parks District in 1961. Populations in Jasper National Park remained much the same as in 1960 but in Banff, Yoho, and Kootenay National Parks an increase was noted.

In Kootenay National Park heavy infestations of this leaf miner were found from Wardle Creek west and south to and along Settlers Road to

the Park Boundary. Trembling aspen in this area was heavily infested and had a silvery-white appearance. West from Settlers Road to Radium only light to moderate damage was seen, but above Radium the infestation was heavy.

Light damage to aspen in Yoho National Park was evident between the west gate of the Park and Leachcoil. South of Leachcoil to Wapta Falls, and from Leachcoil to Field, damage was heavy. A heavy infestation was reported at the south end of the Ice River Road.

In Banff National Park a light infestation occurred near the east gate and it gradually increased to moderate 7 miles west of Banff. Moderate infestations were found north of Banff to Lake Minnewanka and Two Jack Lake and up the Cascade Valley to Stoney Creek. From Stoney Creek north and west to Flint Park the damage was generally light with a few small patches of moderate injury. South of Banff, in the Spray Valley, to Fortune Cabin and Bryant Creek, light infestations were present with a few areas having moderate injury. West of Banff to Eisenhower Junction moderate infestations were present and in the vicinity of Hillsdale heavy damage was noted. West of Eisenhower Junction to Lake Louise and north to the Alexandra River injury was light.

Heavy infestations in Jasper National Park were present in the Athabasca Valley centering around Jasper townsite, Lake Annette, and Lake Edith. North of Jasper to Snaring River moderate to heavy infestations persisted, decreasing towards Fiddle Creek where only light injury was observed. Up the Snake Indian Valley to Seldom Inn, approximately 20 miles west of the Athabasca River, patches of moderate damage were found throughout a generally light infestation. Along the Miette Hot Springs Road moderate

damage occurred. For the first 9 miles along the road to Medicine Lake high populations were present and for the remainder of the distance to Medicine Lake there was moderate injury. From Jasper west to Geikie moderate damage occurred, and from Geikie to the Park Boundary damage was heavy in the valley bottoms and moderate on the hillsides. South of Jasper the heavy infestation was evident for 25 miles and gradually decreased to moderate as far south as aspen could be found. Up the Whirlpool Valley to a point 4 miles west of Moab Lake, moderate to heavy infestations were present. Moderate infestations were also present along the Athabasca River between Sunwapta Falls and the Chaba Valley.

Leaf Beetles, Chrysomella aenicollis Schffr., Chrysomella schaefferi Brown and Chrysomella alnicola alnicola Brown

In 1961 C. aenicollis caused defoliation of willow in many areas of the National Parks District. Most of the damage occurred at the higher elevations but this leaf beetle could also be found in valley bottoms. In Banff National Park heavy damage was found up the Cascade Fire Road north from Cuthead to Panther Lodge, and in the Sawback Creek area. Lighter infestations were found along Mount Coleman on the Banff-Jasper Highway and near Bourgeaux Cabin along the road to Sunshine Lodge.

Light infestations in Yoho National Park were found near Wapta Lake, Lake O'Hara, along the Amiskwi Valley, and along the Ice River Road. A heavy infestation was present 4.5 miles up the Otterhead Valley.

In Jasper National Park light infestations were recorded 20 miles up the Snake Indian Valley and up the Athabasca Valley 4 miles from Sunwapta Falls.

Light to moderate defoliation of willow, caused by C. schaefferi, was evident along the trail to Wapta Falls in Yoho National Park. Alder at the south end of the Ice River Road sustained moderate to severe defoliation by C. alnicola alnicola. This infestation was heaviest at the south end of the road and decreased to moderate 3 miles north of the Ice River.

Lodgepole Needle Miner, Evagora starki Free.

In Banff National Park sequential sampling for the lodgepole needle miner was carried out every 5 miles along Highway 1 for its length within the Park, and along the Banff-Jasper Highway between Saskatchewan Crossing and the Alexandra River Valley. Between Saskatchewan Crossing and the Alexandra River Valley 4 locations were sampled of which only one, 10 miles northwest of Saskatchewan Crossing, had larvae present in the sample. Between the east gate of the Park and the Banff-Yoho Boundary, low populations were found in the area from 5 miles west of Banff townsite to one-half mile west of Eisenhower Junction.

In Kootenay National Park, low populations were present in 3 of 4 areas sampled. These were Hawk Creek, Black Creek, and 2 miles west of Marble Canyon. The highest populations were found at Black Creek where there was an average of 4.2 larvae per branch tip.

Lodgepole pine were sampled at several locations in Yoho National Park but larvae were present at only 2 sites. These were above the Spiral Tunnels and 2 miles up the Yoho Valley.

Of the 4 areas sampled in Jasper National Park only one had larvae present. This was near Leach Lake south of Jasper.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Infestations of spruce budworm in Yoho National Park were found one-half mile up Yoho Valley, 5.5 miles up Amiskwi Valley, at Boulder Creek, and at the south end of the Ice River Road. Light defoliation of spruce, alpine fir, and Douglas fir was evident in these areas.

At Saskatchewan Crossing in Banff National Park, a medium population of spruce budworm was present. On many of the spruce up to 30 feet high, approximately 75 per cent of the current years foliage was damaged. This heavy damage was evident only in a small area one mile south of the Warden Station. Defoliation of alpine fir in this area was much lighter than of the spruce. Along the north side of the Saskatchewan River, from the highway east to the Park Boundary, light defoliation of spruce occurred.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

The distribution of this shoot weevil has not changed appreciably from 1960. In Kootenay National Park the infestation extends from Kootenay Crossing south to the south boundary of the Park and northwest along the Kootenay River to the north boundary of the Park. A permanent one acre plot at Mile 3.5 along Kootenay Fire Road above Kootenay Crossing was established to observe the annual incidence of weevil attack. Of the 185 regeneration spruce on the plot 40 were weevilled in 1961.

In Yoho National Park, an area near the Ottertail River, in which spruce have been infested in past years, has been cleared of trees, thus reducing the area affected. A few small spruce near Chancellor Peak Camp Ground and at the south end of the Ice River Road were infested with this weevil.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

A decided increase in the populations of spruce spider mite was evident in Banff townsite in 1961. The hot, dry weather in the early part of the season was probably the reason for this increase. Hedges of spruce, in particular, were heavily webbed and many of the needles were discolored as a result of the high mite populations. Individual trees also had higher populations than in 1960, but the damage was not as apparent as on the hedges. In Jasper townsite the populations remained low but there was an increase over those of the previous year. On the spruce at Jasper Park Lodge a moderate infestation was present and some discoloration was evident. A light infestation of spruce spider mite was found on Douglas fir near Sinclair Canyon in Kootenay National Park.

Tent Caterpillars, Malacosoma disstria Hbn. and Malacosoma pluviale (Dyar)

Tent caterpillars were more prevalent in the National Parks District in 1961 than they have been for a number of years. The forest tent caterpillar, M. disstria, caused light damage to aspen poplar near Radium in Kootenay National Park. It was also present near Leancoil and Wapta Falls in Yoho National Park but the amount of defoliation was negligible.

Tents of M. pluviale were found in Yoho National Park between Leancoil and Field and up the Amiskwi and Otterhead valleys. Only a few tents were found in any location and light damage resulted. Near Radium in Kootenay National Park this species caused light damage to rose, willow and black cottonwood.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The infestation of larch sawfly that has persisted on eastern larch for a number of years at Mile 4 along the Miette Hot Springs Road, Jasper National Park, increased in intensity in 1961. Moderate damage was general throughout the stand and a few trees suffered severe defoliation.

Alpine larch growing in the area between Cuthead Creek and Snow Pass along the Cascade Fire Trail in Banff National Park had light defoliation caused by larch sawfly during the past season.

Poplar Borer, Saperda calcarata Say

In stands of aspen poplar along the highway west of the main entrance to Banff National Park, and extending to a point 2 miles west of Carrot Creek, many aspen trees have been attacked by poplar borers. Infested trees were found one-half mile north of the highway along Carrot Creek. Some trees have had many attacks and, because of their weakened condition, a few have blown down.

Cooley Spruce Gall, Adelges cooleyi (Gill.)

Galls caused by A. cooleyi were found on spruce in all areas of the National Parks District. Only light infestations were found as compared to heavy infestations recorded in 1960. The stage of this gall aphid which occurs on Douglas fir was light on that species at the following places: Radium, and along Settlers Road in Kootenay National Park; Jasper townsite, Lake Annette, Lac Beauvert, and Pyramid Lake in Jasper National Park; Banff townsite, and east to the park gate in Banff National Park; at Boulder Creek, and one-half mile up Yoho Valley in Yoho National Park.

TABLE II

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE NATIONAL PARKS DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	6	W. spruce A. fir	Few larvae collected throughout District.
Green rose chafer, <u>Dichelonyx backi</u> Kby.	4	Rose Willow W. spruce	Caused light to moderate damage at Radium in K.N.P. and along Celestine Lake Road, J.N.P.
Root collar weevil, <u>Hylobius</u> sp.	3	Lp. pine	Collected at Leanchoil, Y.N.P. and Settlers Road and south of Kootenay Crossing, K.N.P.
Balsam-fir sawfly, <u>Neodiprion abietis</u> (Harr.)	7	D. fir W. spruce	Common throughout District. Light damage near Radium, K.N.P.
Spiny elm caterpillar, <u>Nymphalis antiopa</u> L.	7	Willow T. aspen	Few clusters found in Banff and Jasper National Parks. More common than in 1960.
Pitch nodule maker, <u>Petrova albicapitana</u> (Busck)	1	Lp. pine	Moderate infestation near Lac Beauvert, J.N.P.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	1	D. fir	Present near Radium, K.N.P.
Spruce bud scale, <u>Physokermes piceae</u> Schr.	1	W. spruce	Light infestation south end of Settlers Road, K.N.P.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	5	W. spruce B. spruce	Moderate defoliation to planted spruce east of Banff Airport. Heavy damage on small spruce north of Jasper.

DISEASE CONDITIONS

Rust Diseases

A number of rust diseases were collected from various parts of the National Parks District during 1961. Peridermium stalactiforme A. & K., a rust on the stems and branches of lodgepole pine, was found at widely separated points in Banff and Jasper National Parks. The locations in Jasper National Park were 22 miles up the Snake Indian Valley, and 3 miles up the Athabasca Valley from Sunwapta Falls; and in Banff National Park, 17.7 miles south of Banff in the Spray River Valley, and near Eisenhower Field Station. Another stem rust on pine, Cronartium comandrae Fk. was collected from a small area 2 miles northeast of Saskatchewan Crossing and in the Flint Park area in the Cascade Valley. The outbreak of western gall rust, Peridermium harknessii J. P. Moore, along Settlers Road in Kootenay National Park, was examined in 1961. Thirty per cent of the lodgepole pine in this area were infected.

A needle rust on spruce, Chrysomyxa ledicola Lagerh., was heavy in a small area in the Cascade Valley south from the bridge crossing the Cascade River for a distance of 2.5 miles.

Pine Needle Cast, Elytroderma deformans (Weir) Darker

The 2 areas in which needle cast on lodgepole pine was prevalent in 1960 were re-examined in 1961. These were along the Settlers Road in Kootenay National Park and north of the Whirlpool River Bridge in Jasper National Park. The damage in both localities was light and was caused by E. deformans instead of Loehodermium pinastri (Schrad. ex Fr.) Chev. as reported in 1960.

Leaf Spot of Aspen, Marssonina tremuloidis Kleb.

Some aspen bluffs in the Bow River Valley between Eisenhower Junction and Banff were affected by this leaf spot. In 1960 the infection was found mainly on the south side of the Bow River, whereas, in 1961 it was more prevalent on the north side of the river.

TABLE III

OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE NATIONAL PARKS DISTRICT, 1961

Host	Organism	Locality	Remarks
Spruce, engelmann	<u>Cytospora curreyi</u> Sacc.	Panther Creek, B.N.P.	New herbarium host record

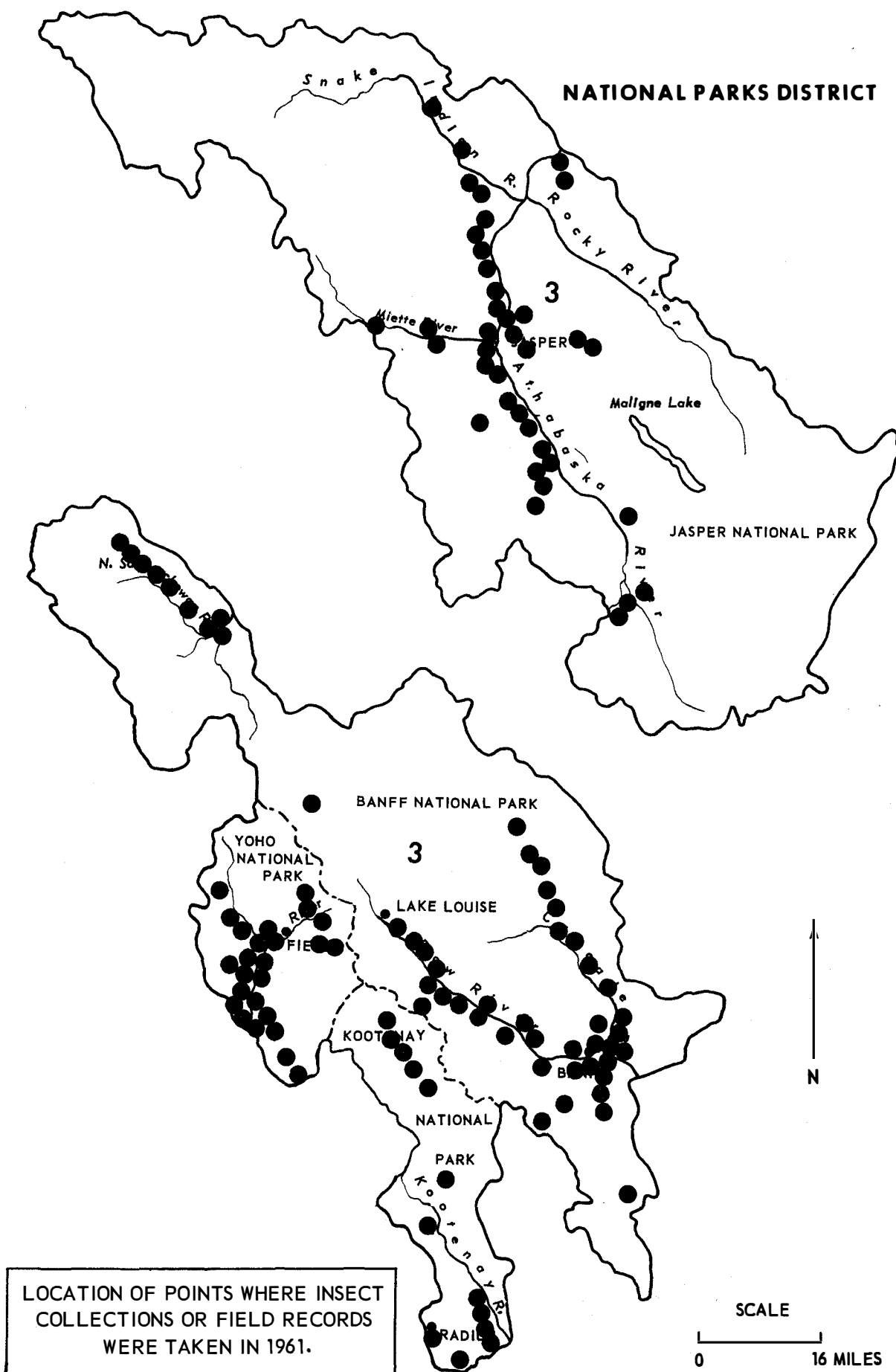
TABLE IV

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

Outbreak Number	Location	Causal Organism	Remarks
3-1	Geraldine Lake Road	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1963.
3-2	Sundance Canyon	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1961, 8 per cent trees infected.

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

Outbreak Number	Location	Causal Organism	Remarks
3-3	59.5 miles north Lake Louise Junction	<u>Peridermium stalactiforme</u> A. & K.	Not re-examined 1961.
3-9	Snaring River	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined 1961.
3-13	Jasper townsite	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined 1961.
3-14	Marmot Basin Trail	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Re-examined 1961, 33 per cent trees infected.
3-15	10 miles west Banff	<u>Rhabdocline pseudo-tsugae</u> Syd.	Re-examined 1961, very light infection.
3-16	10 miles south Jasper	<u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	Re-examined 1961, discontinued.
3-17	Settlers Road	<u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	Re-examined 1961, discontinued.
3-18	Settlers Road	<u>Hypodermella laricis</u> Tub.	Re-examined 1961, very light infection.
3-19	Settlers Road	<u>Peridermium harknessii</u> J. P. Moore	Re-examined 1961, 30 per cent trees infected.
3-20	Between Mount Eisenhower and Johnson's Canyon	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined 1961.
3-21	Between Astoria and Whirlpool Rivers	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined 1961.
3-22	Between Astoria and Whirlpool rivers	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	New outbreak 1961, 26 per cent trees infected.



ANNUAL REPORT
BRAZEAU-ATHABASKA DISTRICT
ALBERTA 1961

by

V. B. PATTERSON
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

This report covers tree insect and disease conditions in the Brazeau-Athabasca District in 1961. Defoliating insects were the most common tree pests and only deciduous hosts were affected to any extent. Damage by wood-eating insects occurred only in small localized areas and were of little importance.

The forest tent caterpillar outbreak in the District continued unabated and extended its boundaries in all directions from last year's focal points. Two species of leaf-eating beetles, the grey willow leaf beetle and Chrysomella aenicollis Schffr., caused considerable leaf skeletonizing of a number of broad-leaved species at several points throughout the District.

The larch sawfly was the most important species attacking conifers and was again present at varying population levels in almost every tamarack swamp in the surveyed area.

No new disease outbreaks were recorded. Two outbreak areas were re-examined and a third was surveyed in an attempt to re-determine its boundaries.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Larch	60	0	T. aspen	104	3
Spruce	34	11	Willow	59	0

Table I - Summary of Insect and Disease Collections - Cont'd.

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Pine	19	17	Poplar	18	1
Fir	0	4	Alder	12	0
			Birch	12	1
Totals	113	32		205	5
Collections and Reports from Miscellaneous Hosts					12
GRAND TOTAL					367

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The outbreak of the forest tent caterpillar covered a much larger area this year than in 1960. In this report the outbreak will be described under 3 general areas, all with fairly well defined boundaries, namely: Little Smokey-Fox Creek, Edson-Whitecourt-Blue Ridge, and Pembina Park-Lodgepole.

The Little Smoky-Fox Creek area includes the watersheds of the Little Smoky, Iosegun and Waskahegan rivers, and extends eastward to Two Creeks and westward into the adjoining Grande Prairie-Slave Lake District. Defoliation throughout this area followed a typical patchwork pattern with "islands" of severe defoliation interspersed with areas of moderate and light defoliation.

The ~~Edson-Whitecourt-Blue Ridge~~ area includes the outbreak that was present in the Whitecourt-Blue Ridge area in 1960 and an extension of its boundaries southwestward along the McLeod River to Edson. In this area, moderate to severe defoliation was almost continuous along the southern bank of the Athabasca River Valley from a point 8 miles west of Whitecourt to 2 miles east of Blue Ridge. On the north bank of the Athabasca River Valley defoliation was moderate to severe for 10 miles west and 3 miles east of the Blue Ridge Ferry and extended almost 12 miles back from the River.

Light injury continued both east and west of this area for 2 or 3 miles and southwest as far as Edson. Defoliation was negligible from Shining Bank Lake to Edson but there was evidence of the insects' presence at every location checked.

In the Pembina Park-Lodgepole area defoliation was also negligible, although larvae or cocoons were found at almost every check point along the roads in the triangle formed by Evansburg, Lodgepole and Chip Lake.

Along the eastern boundary of District 4, a few larval collections were made in the Clyde area and also near Devon. A single collection of cocoons was made along the Wildhay River, approximately 50 miles west of the known boundary of the ~~Edson-Whitecourt-Blue Ridge~~ area. Tent caterpillar adults, believed to be M. disstria, were collected at the Entrance cabin but no further evidence was found at this point. These widely separated area of light infestation are an indication that the forest tent caterpillar outbreak is still on the upswing.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Edmonton	Not noticeable	Nil	Nil
Blue Ridge	Noticeable	Severe	Severe
Whitecourt	Noticeable	Severe	Severe
Little Smokey	Noticeable	Severe	Severe
Entwistle+	Noticeable	Nil	Nil
+ Established 1961			

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The presence of the poplar serpentine miner was recorded throughout the District. Aspen poplar was the preferred host species but it also attacked balsam poplar in the Hinton-Rock Lake area.

Severe injury occurred in patches within a radius of 8 miles of Hinton. In these patches so many of the aspen leaves were mined that the trees had acquired the silver appearance which is a result of the feeding of this insect species. Injury over much of the remainder of this area was moderate. Moderate injury also occurred along the Wildhay River from Pinto Creek to Rock Lake and along the north shore of the lake, and near Galloway, Edson and Sterco. Elsewhere the infestation on aspen poplar was light.

A Leaf Tier, Pseudexentera improbana oregonana Wlshm.

Population levels of this leaf tier of aspen poplar were considerably lower than in 1960. Light injury occurred along the west side of the McLeod River from Yates to Whitecourt, increasing in intensity near Whitecourt. Northwest of Whitecourt Tower, injury was moderate along both sides of the McLeod River. Injury was also light within an area bounded roughly by Lodgepole, Chip Lake, Thunder Lake and Lake Wabamun and east of Lake Wabamun to Carvel. There was evidence of light injury along the east side of the District from Villeneuve to Dapp with a small area of moderate injury south of Clyde Corner.

Grey Willow Leaf Beetle, Galerucella decora Say

Population levels of the grey willow leaf beetle were higher this year in District 4 than in any previous year. The species was present either as larvae or adults throughout the season.

Larval feeding was responsible for moderate to severe injury to willow over large areas throughout the foothills west of the Athabasca River. The highest populations were in the valley bottoms but injury also occurred at altitudes up to 5,000 feet.

Injury to willow ranged from light to severe between Highway 16 and the Athabasca River from Hinton to the boundary of Jasper National Park. Light injury was general along the headwaters of the McLeod and Embarras rivers but severe skeletonizing occurred at a number of points along the McLeod River almost to Whitecourt. In a small area west of Baseline Lake, severe skeletonizing of willow occurred but elsewhere west of Whitecourt injury was light.

There was a heavy infestation from Pembina Provincial Park east to Carvel and severe skeletonizing of willow occurred almost continuously along Highway 16 in this area.

Light to moderate injury occurred in several other localized areas, namely: Lisburn, Niton, Pembina, Westlock, Lodgepole, Thunder and Romeo Lakes, and south of Wabamun Lake.

Although willow was the preferred host, aspen and balsam poplar were also damaged. Severe skeletonizing of these host species by adult beetles was recorded 15 miles west of Whitecourt. Larvae caused moderate skeletonizing of balsam poplar in the Hinton-Entrance area.

Larval feeding was responsible for almost all injury to willow. However, at a point along the McLeod River south of Hargwen, an extremely high adult population caused severe skeletonizing of this host species over an area of several acres.

A Leaf Beetle, Chrysomella aenicollis Schffr.

Adults of this beetle were found west of the Big Berland River along the Adams Creek Road; from Cabin Creek to Muskeg River; and at one location 10 miles south of Simonette Tower. At all locations the host was willow and these adults were feeding in conjunction with larvae of the grey willow leaf beetle. Combined injury by larval feeding of these 2 species had caused severe skeletonizing of the willow leaves.

A light infestation was found in the Whitehorse Creek area along the road between Mountain Park and Cadomin. Adults were collected in mid-June and again at the end of August. At the time of the last collection, moderate skeletonizing of willow had occurred. This was apparently due to larval

feeding, judging from the number of skin casts present on the leaves.

Gracillariidae on Alder

Blotch leaf miners of alder were present wherever this host was growing throughout the entire District, although over most of the area damage was negligible.

Moderate to severe injury occurred along the McLeod River from Rosevear to Whitecourt and for 20 miles west of Whitecourt along Highway 43. Light to moderate injury was recorded along the Pembina River Valley in Pembina Provincial Park. Light injury was recorded along the McLeod River south of Hargwen and in the area between Highway 16 and Brule Lake near Jasper National Park East Gate.

Larch sawfly, Pristiphora erichsonii (Htg.)

The larch sawfly infestation in the Brazeau-Athabasca District showed little distributional change from 1960. Almost all tamarack swamps in the surveyed area were affected to some extent. Two stands of larch were entirely free of larvae, a few others supported low populations, but the majority supported high populations and were moderately to severely defoliated.

There was moderate defoliation in most of the larch stands scattered throughout the agricultural area east of the Pembina River. A few stands were severely defoliated in the Barrhead and Stony Plain areas.

Between the Pembina and McLeod Rivers, the infestation pattern was more varied, ranging from very light to severe. Heaviest defoliation was at Chip Lake, Niton and Wolf Creek, but nearby stands were almost free of injury.

Moderate to severe defoliation occurred throughout the area west of the McLeod River and north of the Athabasca River. This was particularly

evident in the foothills west of Entrance, where only light injury was recorded in 1960. Defoliation this year was severe on a high percentage of the trees in all but 2 of the stands checked in this area.

TABLE III
RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960	Infestation class 1961
4-1	Edmonton	Severe	Moderate	Light	Severe
4-2	Gainford	Moderate	Light	Light	Moderate
4-3	Peers	Nil	Light	Nil	Light
4-4	Mercoal	Nil	Light	Moderate	Severe
4-5	Obed	Nil	Nil	Light	Moderate
4-6	Muskeg River	Nil	Nil	Nil	Moderate
4-7	Whitecourt	Severe	Moderate	Light	Severe
4-8	Iosegun Lake	Light	Nil	Nil	Light
4-9	Barrhead	Severe	Severe	Severe	Severe
3-1	Miette	Not checked	Not checked	Light	Severe

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

Infestations of the yellow-headed spruce sawfly were found only on planted spruce on the east side of the District and population levels were about the same as in 1960.

Sampling was carried out in 14 shelterbelts, representative of those growing in the area where the infestation has existed for a number of years. Of these, 6 were entirely free of any larval injury, 7 had a trace of injury and in one there was moderate injury to individual trees.

TABLE IV

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE BRAZEAU-ATHABASCA DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Spruce gall aphids, <u>Adelges</u> spp.	12	Spruce	Moderate to severe infestations on regeneration spruce in Edson area.
American aspen beetle, <u>Goniectena americana</u> (Schaeff.)	6	T. aspen	Not as common as in 1960. Light to moderate localized injury near Whitecourt and Fort Assiniboine.
Seed cone worm, <u>Laspeyresia youngana</u> (Kearf.)	2	Spruce	20 to 30 per cent of cones infested at Hargwen and Entrance check points.
Geometridae, <u>Rheumaptera hastata</u> L.	5	Alder	Light to heavy infestations at a number of locations from Robb to Simonette Tower.
Green larch looper, <u>Semiothisa sexmaculata</u> Pack.	14	Larch	Larvae taken in most larch samples after end of July. Medium populations at several points.

DISEASE CONDITIONS

Needle Rust, Chrysomyxa ledi de Bary

This needle rust was common on white spruce along the Fina Road between Oldman and Bessie creeks and along the Hay River Road west of Gregg Lake. The infection was moderate on small trees in the understory and light on mature trees.

Yellow Witches Broom, Melampsorella caryophyllacearum Schroet.

Yellow witches broom was found on mature and overmature alpine fir in 3 general areas in the Edson Forest Division. In an old burn below Mayberne Tower, north of Edson, approximately 50 per cent of the fire residuals were infected with from 1 to 3 brooms. West of Entrance, on the west branch of Solomon Creek, 25 per cent of the fir were infected in an area of approximately a mile square. Brooms were also found along the Yellowhead Trail west of Robb but here the infection was light.

Unhealthy Condition of Lodgepole Pine

In 1960, lodgepole pine along the Fina Road approximately 22 miles south and west of Whitecourt, were reported to be in an unhealthy condition. This stand was thoroughly investigated in 1961. Soil pits were dug but did not disclose any irregularities and pH values were normal. Excavated root systems showed normal root mortality.

External symptoms were evident only in the needles which had small, irregular, discolored areas of unknown origin. Only the last 2 years needles remained on the trees. Annual ring measurements showed a sudden growth reduction commencing 4 years ago. This date corresponds with gas well drilling

activities in the surrounding area. Air pollution is therefore a suspected cause of the unhealthy condition of these trees. Further investigations will be carried out in 1962 to determine if air pollution is the cause of this condition.

TABLE V

OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE BRAZEAU-ATHABASCA DISTRICT, 1961

Host	Organism	Locality	Remarks
Birch	<u>Schizophyllum commune</u> Fr. (C)	On Fina Road east of Windfall.	New herbarium record.

TABLE VI

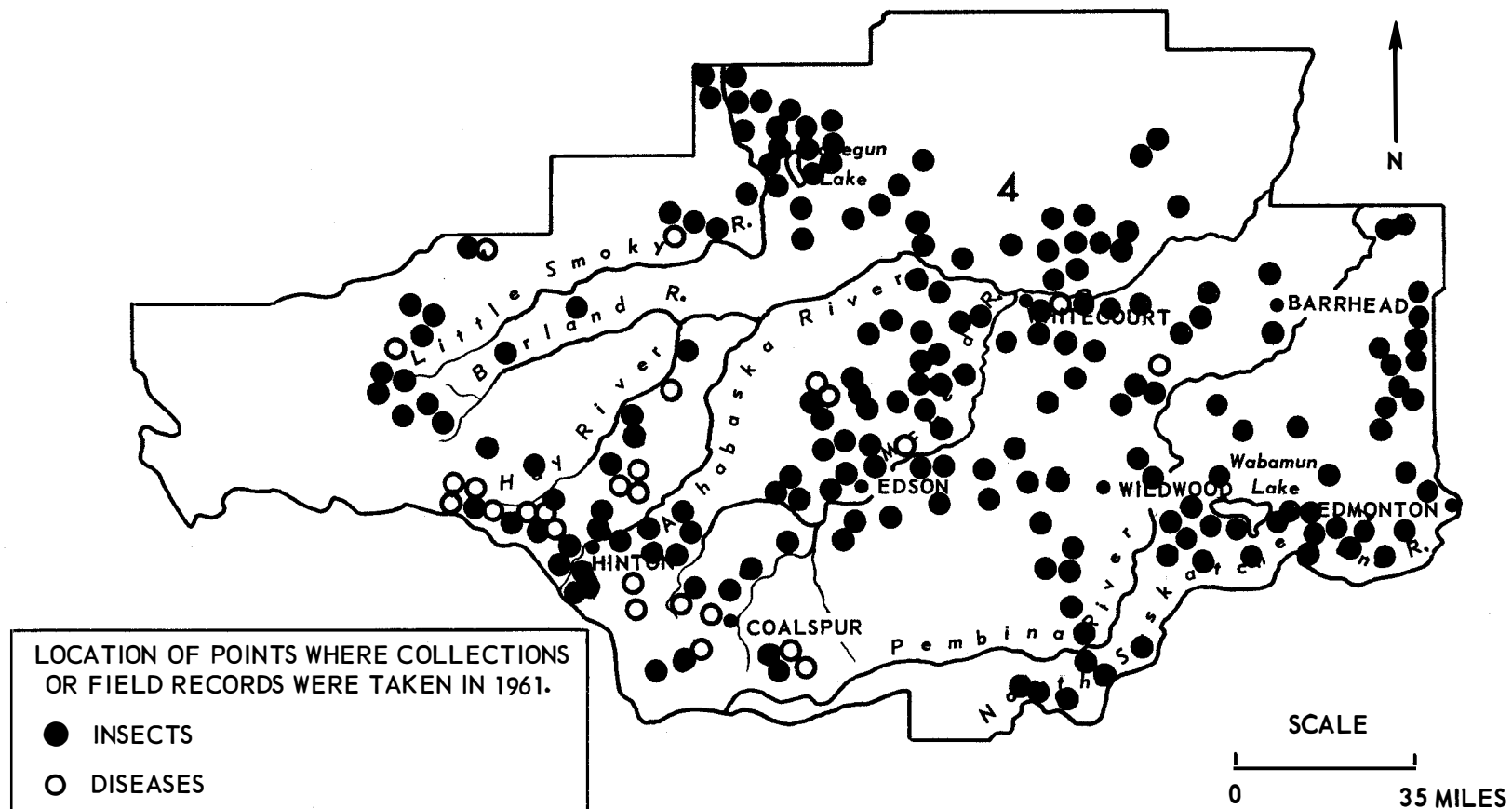
SUMMARY OF RECORDED DISEASE OUTBREAKS
STILL UNDER INVESTIGATION IN THE BRAZEAU-ATHABASCA DISTRICT

Outbreak number	Location	Causal organism	Remarks
4-1	Lovett	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1965.
4-3	Whitecourt	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be re-examined 1962 for area involved.
4-5	Robb	<u>Armillaria mellea</u> (Vahl. ex Fr.) Qué1.	To be re-examined 1962.
4-7	Mercoal	Red belt	To be re-examined 1962.

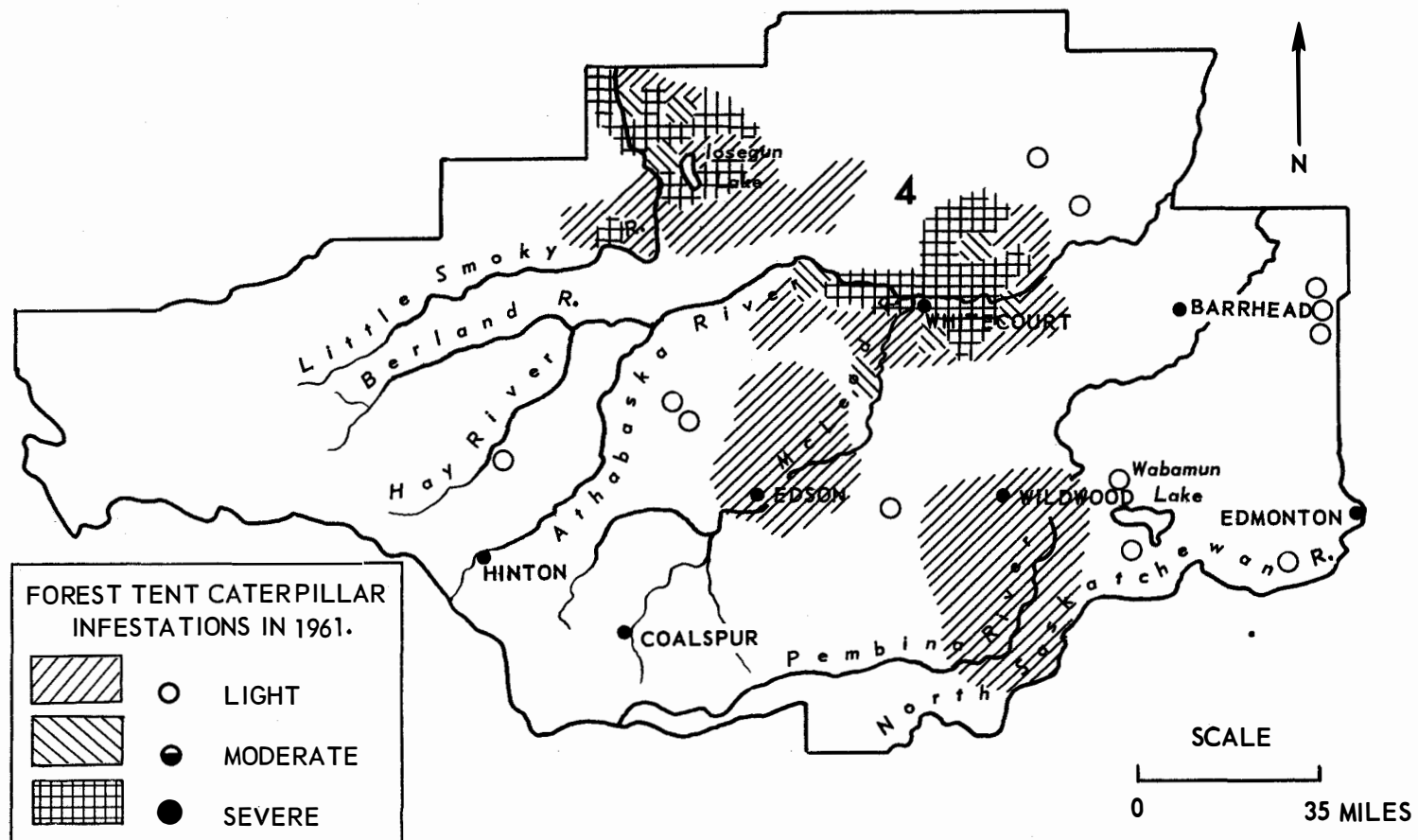
Table VI - Summary of Recorded Disease Outbreaks - Cont'd.

Outbreak number	Location	Causal organism	Remarks
4-8	Entrance	Red belt	To be re-examined 1962.
4-9	Hinton	<u>Peridermium harknessii</u> J. P. Moore <u>Peridermium stalactiforme</u> A. & K.	Re-examined 1961 - no apparent change.
4-10	Hinton	<u>Cronartium</u> sp.	Discontinued following 1961 re-examination.
4-11	Hinton	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1963.
4-12	Entrance	<u>Cronartium</u> sp.	To be re-examined 1963.
4-13	Robb	<u>Peridermium harknessii</u> J. P. Moore	To be re-examined 1963.
4-14	Robb	<u>Peridermium stalactiforme</u> A. & K.	To be re-examined 1963.
4-15	Whitecourt	Unknown cause of dying lodgepole pine.	First recorded in 1960. Further investigation in 1961 gave no conclusive results. Area to be tested in 1962 for air pollution.
4-16	Whitecourt	Needle rust	Very light infection in area in 1961. To be re-examined 1962.
4-17	Whitecourt	Needle rust	To be re-examined in 1962.
4-18	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Burned over in 1961. To be checked in 1962, for infected fire residuals.
4-19	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	To be checked during aerial survey 1962.

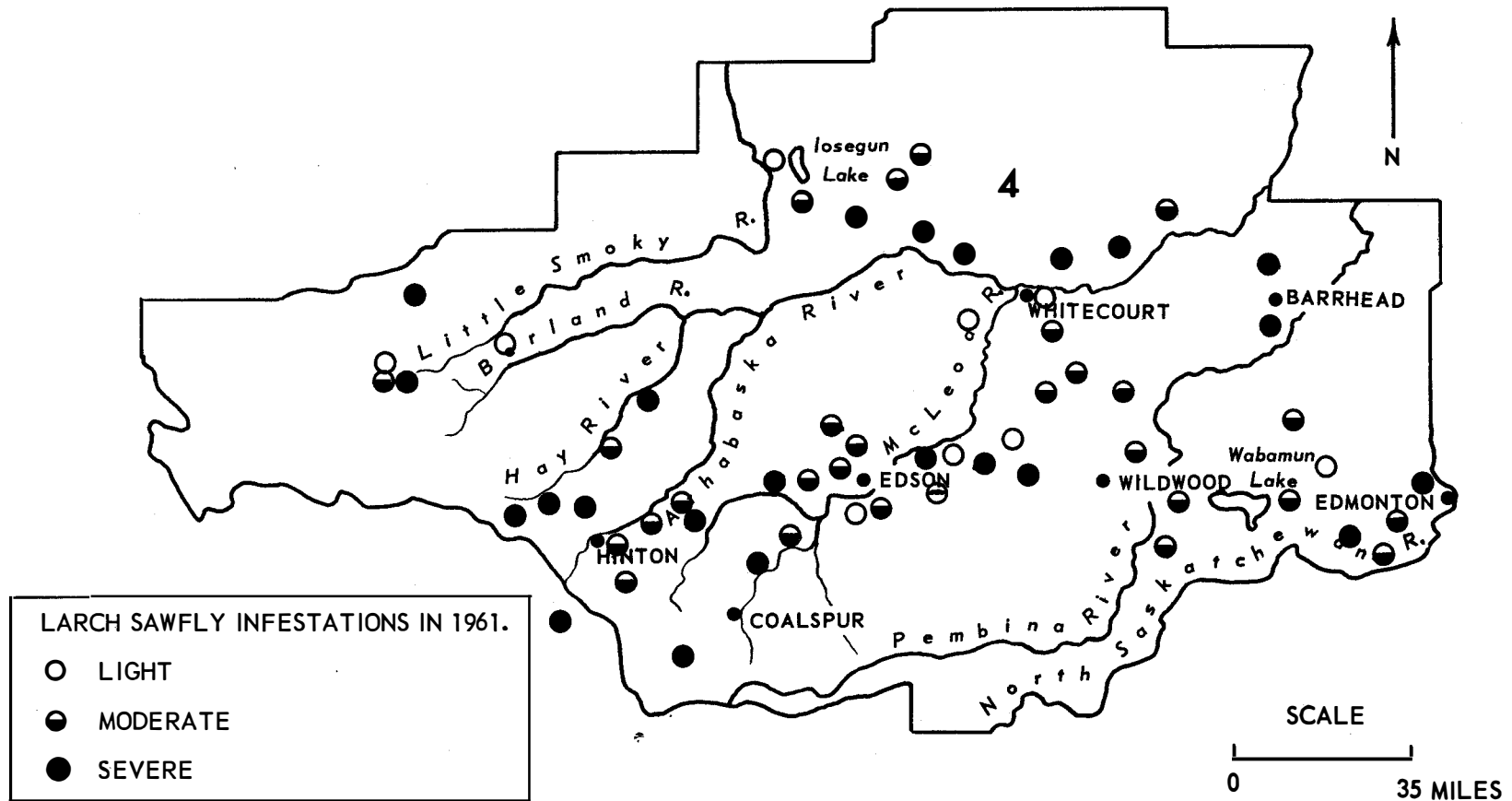
BRAZEAU-ATHABASKA DISTRICT



BRAZEAU-ATHABASKA DISTRICT



BRAZEAU-ATHABASKA DISTRICT



ANNUAL REPORT
LAC LA BICHE DISTRICT
ALBERTA 1961

by
N. W. WILKINSON
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

The forest tent caterpillar increased in numbers and enlarged its area of activities in 1961. The population level of Bruce spanworm was slightly higher this year and a larger area was infested. The leaf tier on aspen, Pseudexentera improbana oregonana Wlshm., was collected over a larger area but population levels were lower than in 1960.

Severe defoliation of larch, caused by the larch sawfly, occurred in much of the low lying areas north of Lac la Biche. South of Lac la Biche few tamarack occur and defoliation in this area was light to moderate.

An increase in the populations of the grey willow leaf beetle and the American aspen beetle occurred in 1961. Severe skeletonizing of willow, balsam poplar and aspen leaves took place over a larger area than in 1960. The yellow-headed spruce sawfly was found at a few widely separated shelter-belts in the District.

An outbreak of Hypoxyylon pruinatum (Klotzsche) Cke., in the southern part of the District, was investigated. Re-examination of known disease outbreak areas revealed little change from 1960 with exception of the poplar tar spot caused by Sclerotium sp. (Sclerotium confundens Whetz. in 1960 report) which has subsided.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Larch	11	0	T. aspen	145	15
Spruce	8	5	Willow	23	5
Pine	7	17	Poplar	5	3
Fir	0	3	Birch	0	3
Totals	26	25		173	26
Collections and Reports from Miscellaneous Hosts					39
Grand Total					289

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

The outbreak of the forest tent caterpillar in the Lac la Biche District continued to expand in 1961. The infestation now extends from Edmonton to the Saskatchewan Border and as far north as Garson Lake. The main area of severe defoliation covers approximately 11,700 square miles and is bounded, on the west by a line from Innisfree to Breynat, on the north by a line from Breynat to Gordon Lake, on the east by the Saskatchewan Border

to Prairie Lake then across to Islay and on the south by Highway 16. Smaller areas of severe defoliation occurred near Boyle and Athabasca.

Areas of moderate defoliation occurred at widely separated points; one lay east of a line from Islay to Prairie Lake and north of Highway 16. Another was approximately 4 miles wide and extends from Ipiatik Lake to Grist Lake. A third centred on Conklin and was 12 to 18 miles wide and 30 miles long. The fourth area, in the form of a triangle, extended from Caslan and Alpen Siding to a point at the northeast corner of Saddle Lake Indian Reserve. Northwest of Athabasca moderate defoliation with patches of severe defoliation occurred around Island Lake and to the west into the Slave Lake Forest Division. Low populations and traces of defoliation were found from Athabasca to Edmonton, in Edmonton and east to Innisfree. Sequential sampling, to determine egg abundance, indicated that the outbreak will continue unabated. Refer to Table II for information on location and degree of defoliation in 1961 and an estimate of defoliation that will occur in 1962.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Lac la Biche	Not noticeable	Light	Severe
Grassland	Not noticeable	Nil	Moderate
Calling Lake	Noticeable	Light	Severe
Athabasca	Not noticeable	Light	Severe
Rochester	Noticeable	Nil	Light
Ashmont	Noticeable	Severe	Severe
Elk Point (N)	Noticeable	Severe	Severe
Elk Point (S)	Noticeable	Severe	Severe
Dewberry	Noticeable	Moderate	Light
Vermillion (E)	Noticeable	Moderate	Severe
Mannville	Noticeable	Severe	Severe
Two Hills	Noticeable	Nil	Light
Andrew	Not noticeable	Nil	Light
Star	Not noticeable	Nil	Light
Warspite	Not noticeable	Light	Light
Vilna	Not noticeable	Light	Light
Brierville	Not noticeable	Severe	Severe
Wandering River	Not noticeable	Nil	Severe
Beauvallon	Noticeable	Severe	Severe
Cold Lake	Not noticeable	Severe	Severe
Bonnyville	Noticeable	Severe	Severe
Ellscoff	Not noticeable	Light	Moderate

Larch Sawfly, Pristiphora erichsonii (Htg.)

This sawfly was responsible for light to moderate defoliation of larch in that part of the District that lies south of a line from Tweedie to Athabasca. North of this line severe defoliation occurred as far as Conklin and east to the Saskatchewan Border. Larch regeneration was more severely attacked this year than in the past. Many of the older trees in this northern region appeared dead, others produced short needle growth and few new shoots. Better shoot growth and needle production was evident in the southern section where sites were comparatively dry. At Flamondin ornamental plantings of Siberian larch were severely attacked but application of chemical spray greatly reduced the numbers of this pest. The following table is a record of population intensity as indicated by sequential sampling.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960	Infestation class 1961
5-1	Calling Lake	Moderate	Moderate	Nil	Severe
5-2	Perryvale	Light	Severe	Light	Moderate
5-4	Cold Lake	Light	Light	Nil	Light
5-5	Lac la Biche	Moderate	Light	Nil	Severe
5-6	Speddon	Moderate	Nil	Nil	Nil

Grey Willow Leaf Beetle, Galerucella decora Say

This was the more abundant of the 2 species of leaf beetles that were found in the District. The population level of this insect was higher and distribution was more widespread than in 1960. It was responsible for the severe skeletonizing of leaves on willow, aspen and balsam poplar at a number of places in the District. Willows were more severely attacked than poplars. South of Lac la Biche the principal hosts were willows, north of this point the 3 tree hosts were attacked.

American Aspen Beetle, Gonioctena americana (Schaeff.)

This leaf eating beetle was more common and widespread than in 1960. However, population levels remained low except in a small area 5 miles east of Innisfree where populations were medium.

A Leaf Tier, Pseudexentera improbana oregonana Wlsh.

There was a substantial decrease in the numbers of this leaf tier from that which was reported in 1960. Damage sustained by aspen in the southwest section of the District and along Highway 16 was light with occasional small patches classified as moderate. Throughout the remainder of the District, larvae of this species were found in low numbers.

Bruce Spanworm, Operophtera bruceata (Hlst.)

Light to heavy infestations of this aspen defoliator were active along the south boundary of the District. Between Claysmore and Islay aspen bluffs were severely defoliated by this insect. Light to moderate defoliation occurred along Highway 16 from Elk Island Park to near Mundare

and from 3 miles west of Mannville to Claysmore. These infestations extended 4 or 5 miles north of Highway 16 and were considered to be the main areas of infestation. Low populations were found throughout the remainder of the District south of Lac la Biche.

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

White spruce shelterbelts sustained varied degrees of defoliation by this insect at 5 locations in the District. North of Flamondin one planting suffered severe defoliation in 1960 and again this year. New infestations at Boyle, Legal, Brierville and Lac la Biche caused light to moderate defoliation of the host trees.

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

Larvae of this insect were more abundant and widespread in 1961. The largest infested area was south of Elk Point and east of Two Hills. Light to medium populations were active throughout the greater part of this area except near Lindberg where approximately 160 acres supported a heavy population. Small infested areas were found northwest of Flamondin and north of Wandering River: at both of these locations, population levels were low.

Pine Needle Tier, Argyrotaenia tabulana Free.

The first instance of this needle tier occurring in outbreak proportions in Alberta was recorded this year. Moderate to severe defoliation occurred from the top of Township 103 to the line of hills running southwest from McClelland Lake to the Athabasca River and extended eastward from the River to near the eastern edge of Range 7, an area of

approximately 360 square miles. From the top of Township 102 to the Firebag River severe defoliation of the new growth occurred on most of the trees. Many of these trees were also suffering from moisture deficiency and as a result were almost completely red. These severely affected trees comprised an estimated 20 per cent of the stand.

TABLE IV

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE LAC LA BICHE DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Scale, <u>Aspidiotus popularum</u> (Marlatt)	0	T. aspen	The 2 known infestations have subsided.
Gall mite, <u>Eriophyidae</u>	2	T. aspen	There was a slight increase in the occurrence of these mites in 1961.
Striped alder sawfly, <u>Hemichroa crocea</u> (Fours.)	2	Alder	One light infestation near Winefred and another at Grist Lake.
Pine root collar weevil, <u>Hylobius</u> sp.	1	J. pine	A light infestation north of Truman.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	3	Willow	Only 1 colony in the area where each collection was taken.
Pitch nodule maker, <u>Petrova</u> sp.	2	J. pine	Low populations active on regeneration pine.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

Dwarf mistletoe collections and data were gathered for distribution records and laboratory use. It was found that the hyper-parasite Wallrothiella arceuthobii (Pk.) Sacc. was established in most of the mistletoe infected stands. A preliminary survey was conducted in the infected pine stand south-east of Winefred Lake. The average age of the trees in this stand was 50 years with an average D.B.H. of 4 inches. It appears that growth has been greatly retarded. An estimated 90 per cent of the trees were affected and as a result many were distorted and supported brooms. Some tree mortality has occurred and many of the broomed branches on living trees have died. W. arceuthobii was common on the aerial plants in this stand.

A Canker on Poplar, Hypoxyton pruinatum (Klotzsche) Cke.

This canker disease was found on aspen throughout the District. It occurred more frequently south of Lac la Biche than in the northern section of the District. Grazing may be a factor contributing to the more frequent occurrence in the southern area. This disease has caused many cankers and dead topped trees in Elk Island Park where it is well established. Fomes igniarius (L. ex Fr.) Kickx also is common on these trees in the Park and as a result a considerable amount of blow down has occurred. Buffalo grazing has retarded regeneration in this area and the mature trees are in a poor state of health.

Leaf Spot on Aspen, Sclerotium sp.

Re-examination of the outbreak of this disease in the Lac la Biche area revealed a further decline in 1961. Very few trees in the area were infected this year. A random sample of 10 trees at each of 4 locations gave negative results.

Needle Rust of Spruce, Chrysomyxa ledicola Lagerh.

This rust occurred sporadically on white spruce throughout the District. No severe outbreaks were found but its occurrence was more widespread than in 1960. The largest area infected was between Hylo and Caslan. A few trees were infected. near Newbrook and north of Calling Lake.

Yellow Witche's Broom, Chrysomyxa arctostaphyli Diet.

Infection by this rust was evident wherever black spruce occurs in the District. The intensity of the disease was light throughout the area surveyed.

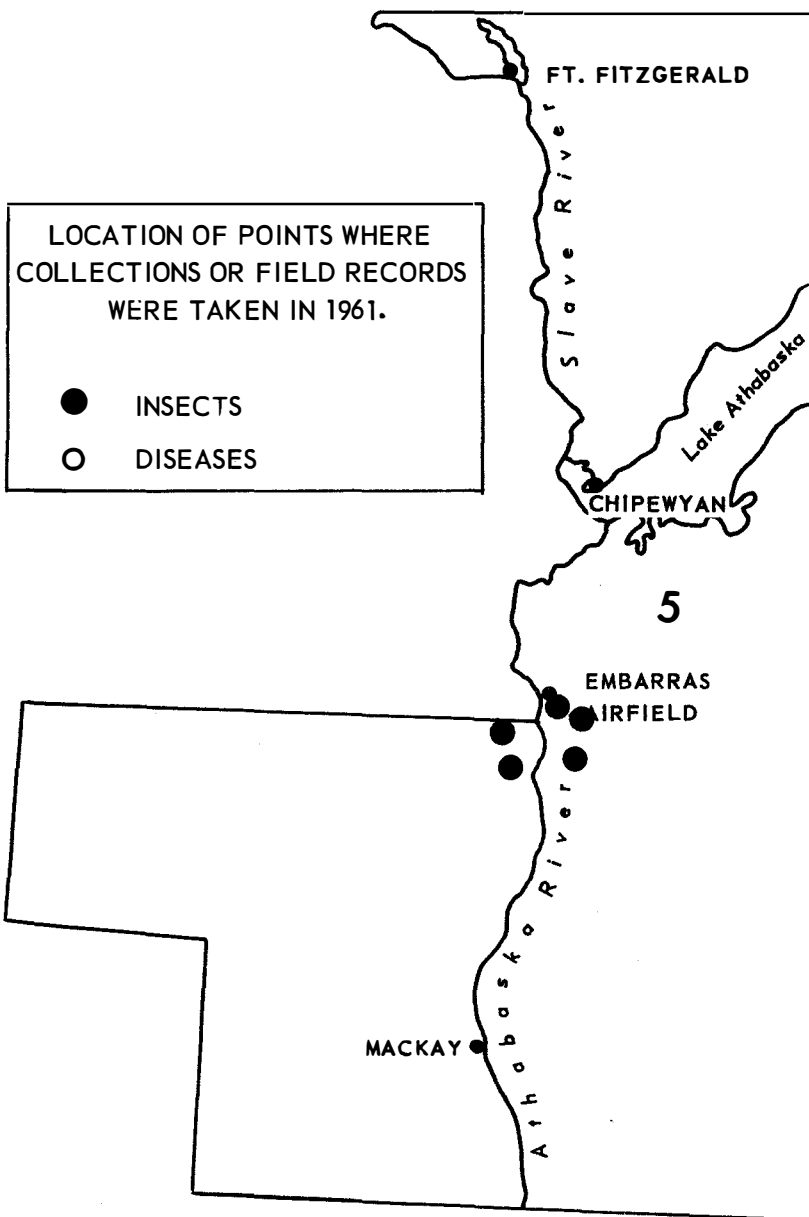
TABLE V
OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE LAC LA BICHE DISTRICT, 1961

Host	Organism	Locality	Remarks
Aspen, trembling	<u>Fomes igniarius</u> (L. ex Fr.) Kickx	Southwest of Lamont Southeast of Conklin	Many trees southwest of Lamont in Elk Island Park have been weakened by this disease.
Comandra	<u>Cronartium comandrae</u> Pk.	Cold Lake	A new host herbarium record.
Fir, balsam	<u>Fomes pinicola</u> (Sw. ex Fr.) Cke.	30 miles east of Conklin.	A new host herbarium record.
	<u>Melampsorella carvophyllacearum</u> Schroet.	34 miles north of Athabasca, 35 miles southeast of Conklin	Only one tree was infected at each location.
Pine, jack	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	10 miles north of Truman	A new eastward extension record.
	<u>Cronartium comandrae</u> Pk.	Cold Lake	A new eastward extension record.
	<u>Peniophora pseudo-pini</u> Weresub & Gibson	45 miles north of Lac la Biche	A new north-eastward extension record.

TABLE VI

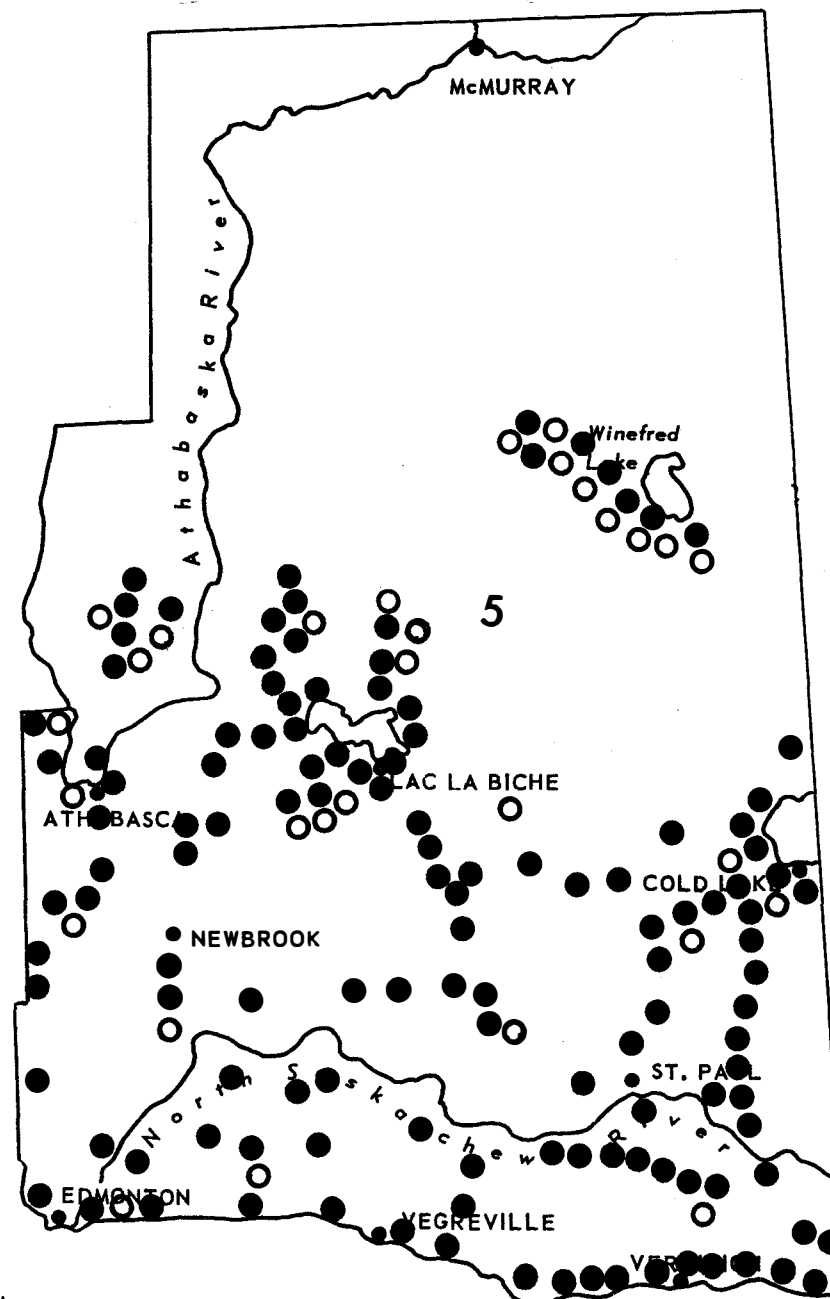
SUMMARY OF RECORDED DISEASE OUTBREAKS
STILL UNDER INVESTIGATION IN THE LAC LA BICHE DISTRICT

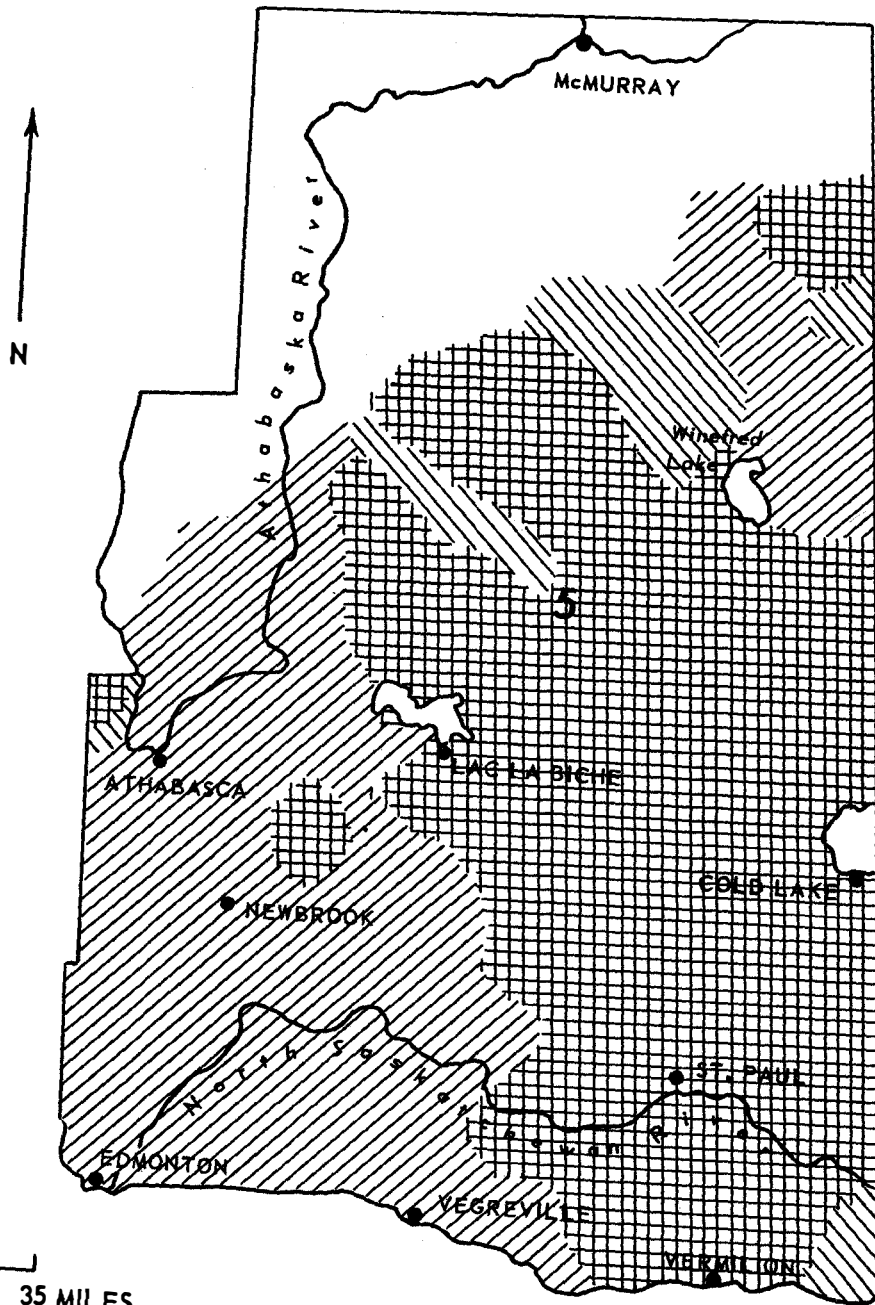
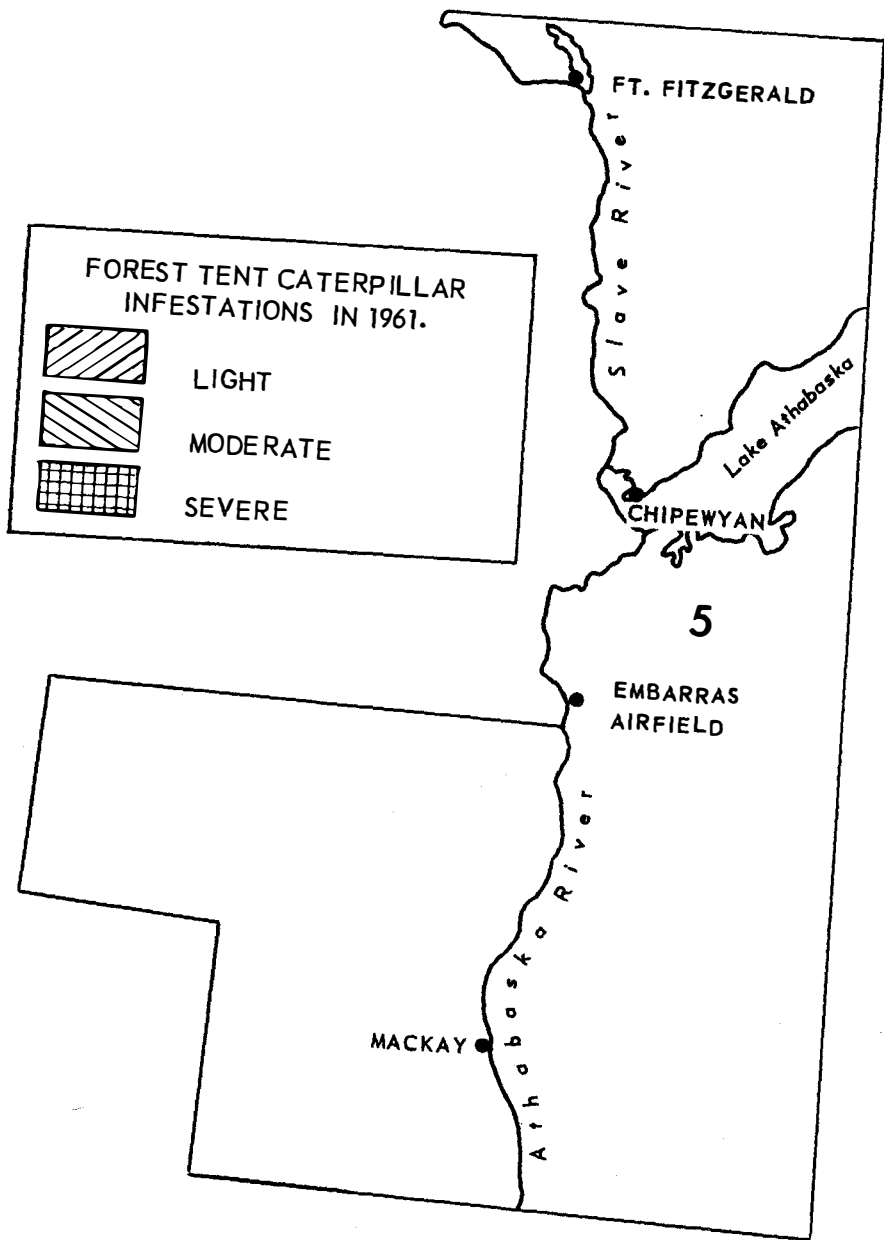
Outbreak Number	Location	Causal Organism	Remarks
5-3	60 miles north of Lac la Biche	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined in 1961.
5-4	Bellis	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Not re-examined in 1961.
5-5	Lac la Biche	<u>Sclerotium</u> sp.	Re-examined. Degree of infection was very low. Results of sampling were negative. Being re-examined in 1962.
5-6	Calling Lake	<u>Fomes igniarius</u> (L. ex Fr.) Kickx	Not re-examined in 1961.



SCALE
0 35 MILES

LAC LA BICHE DISTRICT





SCALE

0

35 MILES

LAC LA BICHE DISTRICT

ANNUAL REPORT
GRANDE PRAIRIE - SLAVE LAKE DISTRICT
ALBERTA 1961

by
G. SMITH
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

In the 1961 season, the most noticeable forest insect damage was the severe defoliation of aspen, larch, and spruce. The major aspen defoliator was the forest tent caterpillar which increased in numbers, resulting in numerous large areas of aspen being completely stripped of foliage. The various species of leaf rollers and miners on aspen caused only slight damage. Severe leaf skeletonizing by the grey willow leaf beetle resulted in discoloration of willow in scattered areas of the District. Discoloration was also visible on alder, and was caused by the alder blotch miner. As predicted in 1960, the larch sawfly severely defoliated large areas of larch in the Slave Lake Forest Division. There was a noticeable increase in severity of defoliation this season, north and east of Lesser Slave Lake. Spruce budworm infestations were observed in the Loon Lake area and along the Wabasca River northwest of the mouth of the Loon River.

No new disease outbreaks were recorded this season. The previously reported Atropellis piniphila (Weir) Lohman & Cash, and Peridermium harknessii J. P. Moore, on lodgepole pine, were found to have an extensive distribution over the foothills region south of Grand Prairie. Six new herbarium host records and 2 range extensions were recorded in the District in 1961.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Spruce	91	41	T. aspen	149	14
Pine	59	58	Willow	49	9
Larch	30	0	Poplar	16	4
Fir	2	2	Birch	1	6
Totals	182	101		215	33
Collections and Reports from Miscellaneous Hosts					30
GRAND TOTAL					561

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In the 1961 season, there were higher populations of these insects and the infested areas were larger than in 1960. These increases were partly due to ideal weather conditions during hatching and early larval development.

Most of the severe aspen defoliation caused by these insects in the District, occurred east of Range 5, west of the sixth meridian. There were sizeable severely defoliated areas at Wanham, in the Birch Hills, from Crooked Creek to Valleyview, on Snuff Mountain, east of Snipe Lake, in the Joussard-Driftpile-Kinuso area, the Smith-Fawcett Lake area, and small

patches at Hondo and Lawrence Lake.

Light to moderate defoliation surrounded most of the severely defoliated stands and appeared as a continuous infestation of varied intensity from the Smoky River to the south shore of Lesser Slave Lake.

In the western part of the District, small areas of moderate defoliation were observed south of Grande Prairie, south of the Wapiti River Ferry, and southwest of Spirit River. Larvae were present in most aspen stands in this region but rarely caused noticeable defoliation.

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

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Debolt	Noticeable	Light	Severe
Sturgeon Lake	Noticeable	Moderate	Severe
High Prairie	Not noticeable	Moderate	Severe
Driftpile	Not noticeable	Moderate	Severe
Slave Lake	Not noticeable	Light	Severe
Fawcett Lake	Not noticeable	Severe	Severe
Huallen	Not noticeable	Nil	Light
Demmitt	Not noticeable	Nil	Light
Baytree	Not noticeable	Nil	Light
Spirit River	Not noticeable	Nil	Light

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

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Tangent	Not noticeable	Light	Severe
Grovedale	Noticeable	Nil	Nil
Wanham	+	Severe	Severe

+ Plot established in 1961.

Spruce Budworm, Choristoneura fumiferana (Clem.)

A spruce budworm outbreak in the Loon Lake area affected several square miles of merchantable white spruce along the Red Earth Road approximately 4 miles east of the south end of the lake. The exact size of the infested area was difficult to determine due to the irregularity and inaccessibility of the stands. An aerial survey in early July revealed varying degrees of defoliation between the Red Earth Road and Loon Lake. At this time the centre of the infestation was severely defoliated and the fringes and isolated patches were moderately to lightly defoliated. During this survey, an area of light to moderate defoliation was also observed along the Wabasca River approximately 50 miles north of Loon Lake. This infestation commenced 10 miles north of the junction of the Loon and Wabasca rivers and continued northward along the banks of the Wabasca River to the northern boundary of the District.

During a trip into the Loon Lake area by vehicle in September it was found that a number of the intermediate and suppressed trees had died.

and on many others the branch tips were dead and very little new growth was produced in 1961. This has resulted in a very thin unhealthy appearance of the foliage. There were numerous dead tops among the larger trees and considerable "back feeding" on the old foliage. It is believed that this damage was the result of annual budworm defoliation for a number of years.

Larch Sawfly, Pristiphora erichsonii (Htg.)

An increase in the population levels of this sawfly was apparent throughout the District in 1961. In the Grande Prairie Forest Division, larch stands are small and dispersed, thus limiting the food supply and preventing a rapid "build up" of this insect. In this Division the degree of defoliation has remained much the same for several seasons and in no area can it be classed as severe.

In the Slave Lake Forest Division, larch is more prevalent, particularly to the north and east of Lesser Slave Lake. In this area there was a definite increase in the severity of defoliation this season. Patches of severe defoliation were also evident southwest of High Prairie.

Light to moderate defoliation was evident in small stands of larch in the vicinity of Fawcett, south of Kinuso, along the Little Smoky River, and along the forestry road south of Goodwin. Several small patches of light to moderate defoliation occurred south of Grande Prairie and in the White Mountain area.

TABLE III
RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960	Infestation class 1961
6-1	Grande Prairie	Light	Light	Light	Light
6-2	Flatbush	Moderate	Moderate	Moderate	Moderate
6-3	Slave Lake	Moderate	Light	Moderate	Severe
6-4	Grouard	Light	Light	Light	Severe

Oregon Fir Sawyer, Monochamus oregonensis Lec.

This insect, commonly known as the roundheaded borer, was present in down timber and slash in coniferous forests of the western part of the District. In 1961 a build up in populations of these borers occurred south of Grande Prairie in the areas burned over by spring forest fires. In the burn along the Cutbank River, an area of approximately 10,000 acres was examined and found to be infested throughout, with larval concentrations varying according to tree size and type of burn. Trees over 12 inches D.B.H. in light and moderate burn types were attacked first and by early October many of these trees had 12 borer holes per square foot, with an average penetration of 3 inches. Trees smaller than 12 inches D.B.H. had fewer borer holes and shallower penetration. The borers did not attack small patches of timber in which the fire had lingered and caused a severe type burn in which the bark was burned through or had been hot enough to dry out the cambium.

Due to the severe damage to salvageable timber there was considerable concern in the Alberta Forest Service and the lumber industry and it was doubted that salvage operations in the burned areas would be economically sound.

Grey Willow Leaf Beetle, Galerucella decora Say

The feeding of high populations of this insect on willow caused the leaves to dry and turn brown, resulting in a dead appearance to the infested areas at Smith, Fawcett Lake, south from Kinuso, south of High Prairie, and Valleyview, at Grouard, south from Nose Mountain, and along the Wapiti River, and in the Two Lakes area. In several locations, aspen and balsam poplar were also moderately attacked.

Spruce Gall Aphids, Adelges spp.

These insects were widely distributed over the entire District, rarely causing noticeable damage to native forest stands.

At the Beaverlodge Experimental Farm, planted shelterbelts of spruce were severely attacked by these aphids and galls were formed on a high percentage of the new foliage. This infestation was sprayed with a solution of malathion and water and it was hoped that 1962 populations would be greatly reduced.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

This weevil was found at widely separated points throughout the District and rarely attacked more than one or 2 trees in a stand. Low to medium populations were found in only 2 areas. Near Hondo, in a stand of white spruce regeneration, 16 ^{of} 50 tops examined were damaged, similarly

near Fawcett Lake, 8 of 40 trees had damaged tops.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

Leaf mining by this insect was noted in varying degrees of intensity throughout the District in aspen and balsam poplar stands. Damage was mostly light to moderate and in no instance was it severe enough to cause the typical "silver leaved" effect.

A Leaf Tier, Pseudexentera improba oregonana Wlsh.

This species was very common throughout the District, particularly in young stands of aspen. Although present in all stands of aspen sampled, the leaf rolling by this insect was never serious enough to be classed as severe, but in some instances thinned crowns were noted.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

Distribution of this tent caterpillar remained much the same as in 1960, but there was a marked increase in larval populations in the infested areas. Heavily infested areas of rose and saskatoon were observed near Saskatoon Lake, Spirit River, Rycroft, Wanham, Beaverlodge, Fawcett Lake, Flatbush, and Jarvie.

Pitch Nodule-makers, Petrova spp.

The nodules made by these insects were numerous in pine shelter-belt near Valleyview and in a forest stand south of Smith. Elsewhere in the District, nodules were frequently found on pine regeneration.

TABLE IV
OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE GRANDE PRAIRIE-SLAVE LAKE
DISTRICT, 1961

Insect species	Number of Collections	Host(s)	Remarks
Aphids	11	T. aspen Larch Lp. pine J. pine B. fir	Mostly gregarious stem feeders. Very numerous on regeneration aspen and pine.
Pine needle tier, <u>Argyrotaenia tabulana</u> Free.	3	Lp. pine J. pine W. spruce	Tied needles noticeable on pine south of Smith.
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	1	T. aspen	Outbreak reported at Smith in 1959, no evidence found this season.
Gall mite, <u>Eriophyidae</u>	9	T. aspen Willow	Many small infested areas throughout the District.
Alder leaf miner, <u>Gracilaridae</u>	2	Alder	Commonly found on alder.
Pine root collar weevil, <u>Hylobius</u> sp.	10	Lp. pine	Distributed throughout the Foothills. Very high populations south of Nose Creek.
Sawflies, <u>Neodiprion</u> spp.	7	J. pine Lp. pine W. spruce	Infested isolated pine stands in western portion of the District.
Bruce spanworm, <u>Operophtera bruceata</u> (Hbst.)	11	T. aspen	Populations very low this season.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	4	W. spruce	Light infestations on farm shelterbelts.

Table IV - Other Noteworthy Insects - Cont'd.

Insect species	Number of collections	Host(s)	Remarks
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	8	W. spruce B. spruce	Heavy in shelterbelts at Valleyview. Light populations elsewhere.
Green-headed spruce sawfly, <u>Pikonema dimmockii</u> (Cress.)	5	W. spruce	Found in the foothills region in samples taken from spruce.
Bark beetles, <u>Scolytidae</u>	14	W. spruce Lp. pine	Heavy concentration in fire killed timber south of Grande Prairie.
A looper, <u>Semiothisa</u> spp.	13	W. spruce Larch	Very numerous on larch and spruce.

DISEASE CONDITIONS

Atropellis Canker of Pine, Atropellis piniphila (Weir) Lohman & Cash

In the foothills region south of Grande Prairie this canker was prevalent in most of the dense stands of lodgepole pine. The heavily infected areas were not continuous, but presented a rather patchy pattern of heavy, moderate, and light infection. In the heavily infected areas a high percentage of the trees bear cankers, and in many instances multiple cankers appear on the same tree.

Western Gall Rust, Peridermium harknessii J. P. Moore

This rust was found in most pine stands throughout the District. Infections were mostly light, with the exception of heavily infected areas near Sherman Meadows Airstrip and north of Simonette Tower.

The size of these heavily infected areas was difficult to determine, particularly in the Sherman Meadows area where the rust galls occurred in the crowns of trees 30 to 50 feet in height. In the Simonette area, a high percentage of the regeneration pines were infected. A survey to determine the size and intensity of this infection is proposed for 1962.

Stalactiforme Rust, Peridermium stalactiforme A. & K.

Light infections of this pine stem and branch rust were found south of Grovedale, on Chinook Ridge, at Demmitt, White Mountain, Blueberry Mountain, and in the Simonette Tower area.

Cronartium coleosporioides Arth.

This organism is believed to be the telial stage of P. harknessii and P. stalactiforme on the alternate host plant, Castilleja miniata Dougl. (Indian paintbrush).

A new herbarium host record was established with the finding of this organism on C. miniata south of Grovedale. Because the 2 aforementioned rusts cannot be separated while in the telial stage, it is not known which rust will appear on pine in the event of re-infection next season from this source.

Comandra Blister Rust, Cronartium comandrae Pk.

Samples of this rust were taken from jack pine, lodgepole pine, jack pine-lodgepole hybrid, and 2 alternate host plants.

The areas surveyed were south of Grande Prairie, south of High Prairie, south of Smith, and 11 miles northeast of Smith. In no area was the infection heavy on the pines, but it was heavy on the alternate hosts south of Grande Prairie and south of High Prairie.

New herbarium host records were established from samples of this organism on the alternate hosts Geocaulon lividum (Richards) Fern., south of Grande Prairie, and Comandra pallida A.DC., south of High Prairie, and north-east of Smith.

Spruce Needle Rusts, Chrysomyxa ledi de Bary, Chrysomyxa ledicola Lagerh. Chrysomyxa empetri (Pers.) Schroet.

These 3 needle rusts occurred commonly throughout the District in 1961. Thirteen samples of these rusts were taken from lightly infected areas this season. Although the sampled areas were large, no infection was heavy enough to cause noticeable damage, other than that of an outbreak near Nose Mountain, (see Table VI, 6-3).

Needle Rust on Balsam Fir, Melampsora epitea Thuem.

A moderate infection of this rust was found in the Nose Mountain area on balsam fir. This rust also occurs on willow and was found on this host in 4 small, heavily infected patches.

This organism is not generally thought to be important on fir as it is not known to occur in outbreak proportions. With the finding of this rust on balsam fir, a new herbarium host record was established.

Spruce Cone Rust, Chrysomyxa pirolata Wint.

Observations revealed rust infected cones in 10 localities representing all regions of the District. These areas were lightly infected, and seed production was not seriously affected. The presence of cone rust is a potential hazard to spruce seed production, since under favorable conditions it may infect a very high percentage of the cone crop.

Winter Drying

Along the ridge south of Nose Mountain Tower, there are many patches of immature lodgepole pine which have died as a result of what is thought to be winter damage. This area is exposed to chinook winds which rapidly dry the foliage during the winter when the ground is frozen and there is no upward sap movement to replace the lost moisture. This is very injurious and occasionally fatal to stands growing in such locations.

TABLE V
OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT, 1961

Host	Organism	Locality	Remarks
Fir, balsam	<u>Melampsorella carvo-</u> <u>phyllacearum</u> Schroet	Nose Creek	Rust brooms found only in Nose Creek area.
Goldenrod	<u>Coleosporium solidaginus</u> Thuen.	Smith	First collection on this host made by Calgary Laboratory staff.
Pine, hybrid, jack lodgepole	<u>Hypodermella montana</u> Darker	Grande Prairie	Pine needle cast. New herbarium host record.
Pine, jack	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	Smith	Causing some mortality of pine regeneration
	<u>Elytroderma deformans</u> (Weir) Darker	Grande Prairie	Pine needle cast. Light infection.

Table V - Other Noteworthy Diseases - Cont'd.

Host	Organism	Locality	Remarks
Pine, lodge-pole	Damage of unknown origin	Simonette Oilfield	Tree injury and mortality occurred at some of the well-sites in this field. At most wells damage was confined to a narrow fringe surrounding the well-sites.
	<u>Elvetroderma deformans</u> (Weir) Darker	Grovedale, Snuff Mountain, South Wapiti, Grande Prairie	Pine needle cast. Light infection.
	<u>Hypodermella montana</u> Darker	Simonette Tower, South of Kinuso	Pine needle cast. New distribution record south of Kinuso.
Pine, lodge-pole	<u>Peniophora pseudo-pini</u> Weresub & Gibson	Porcupine River, Demmitt, Masreau Lake, Simonette Tower, Deer Mountain	Red stain of pine. Scattered distribution.
	Sapsucker damage	Blueberry Mountain, Economy Creek, South of High Prairie	Common in open stands of pine regeneration.
Spruce, black	<u>Chrysomyxa arctostaphyli</u> Diet.	South Wapiti, Two Lakes, Jossard, Chisholm	Yellow rust brooms found throughout the District.

Table V - Other Noteworthy Diseases - Cont'd.

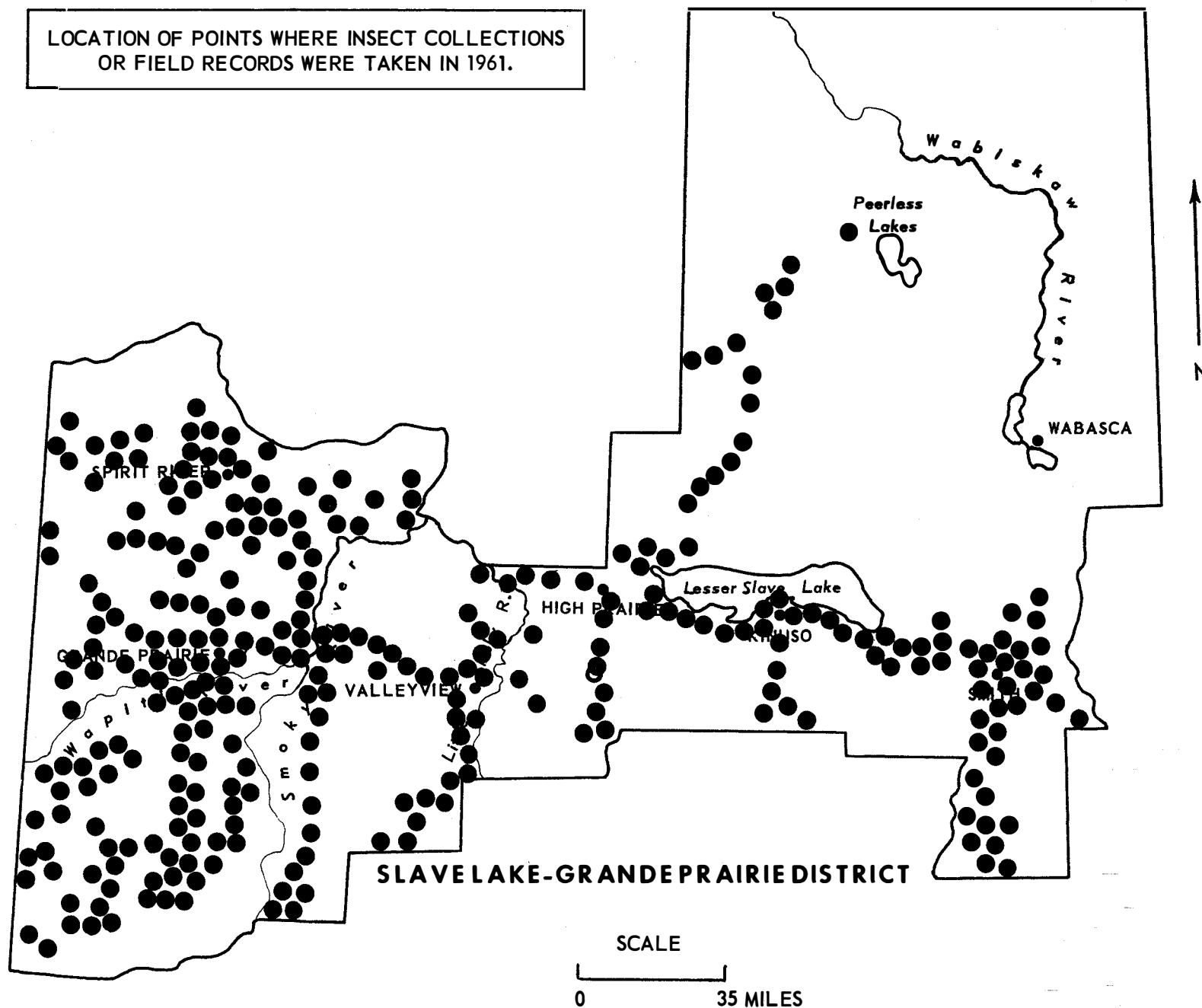
Host	Organism	Locality	Remarks
Spruce, white	<u>Bifusella crepidiformis</u> Darker	Nose Creek, Grovedale	Spruce needle cast. A new herbarium record.
	<u>Lenzites betulina</u> (L. ex Fr.) Fr.	Loon Lake	New herbarium host record.
	<u>Polyporus tomentosus</u> Fr.	Salt Prairie Tower	Root decaying fungus, fruiting bodies found in this area.

TABLE VI

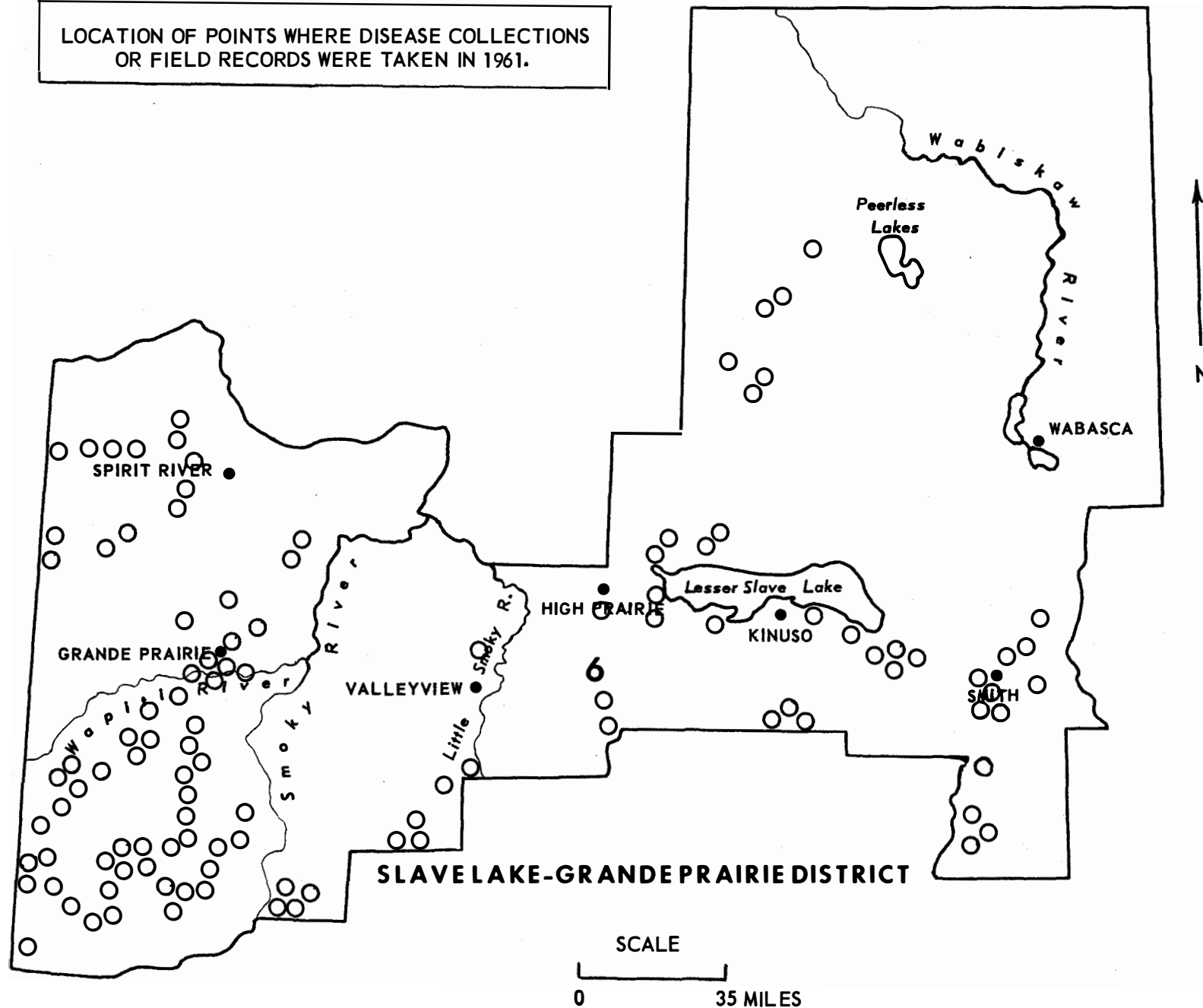
SUMMARY OF RECORDED DISEASE OUTBREAKS
STILL UNDER INVESTIGATION IN THE GRANDE PRAIRIE-SLAVE LAKE DISTRICT

Outbreak number	Location	Causal Organism	Remarks
6-2	Grovedale	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Located in 1961. Very large area infected.
6-3	Grovedale	<u>Chrysomyxa ledicola</u> Lagerh.	Heavy on regeneration spruce.
6-4	Grande Prairie	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined in 1961.

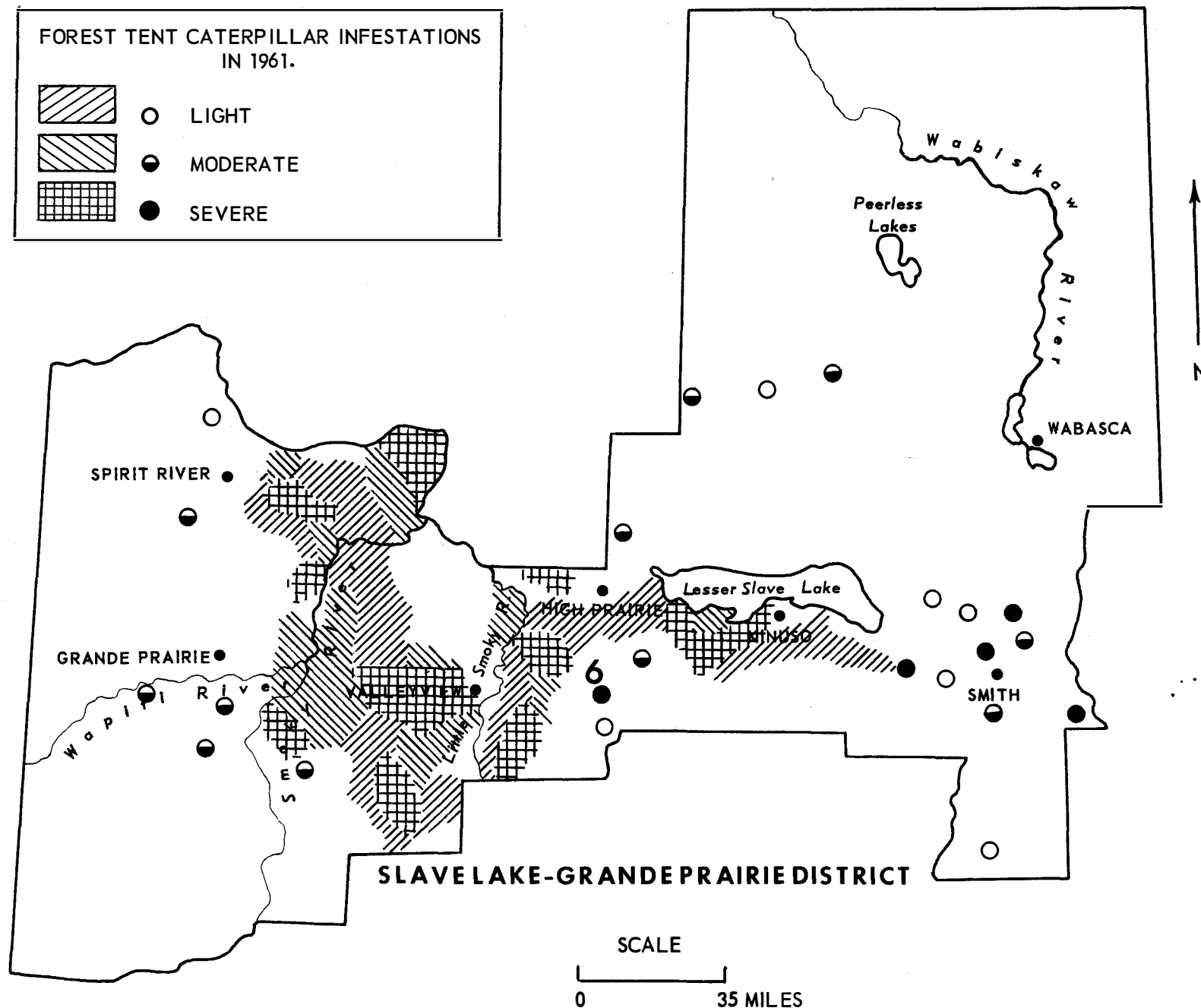
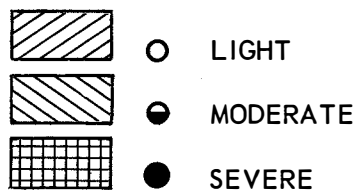
LOCATION OF POINTS WHERE INSECT COLLECTIONS
OR FIELD RECORDS WERE TAKEN IN 1961.



LOCATION OF POINTS WHERE DISEASE COLLECTIONS
OR FIELD RECORDS WERE TAKEN IN 1961.

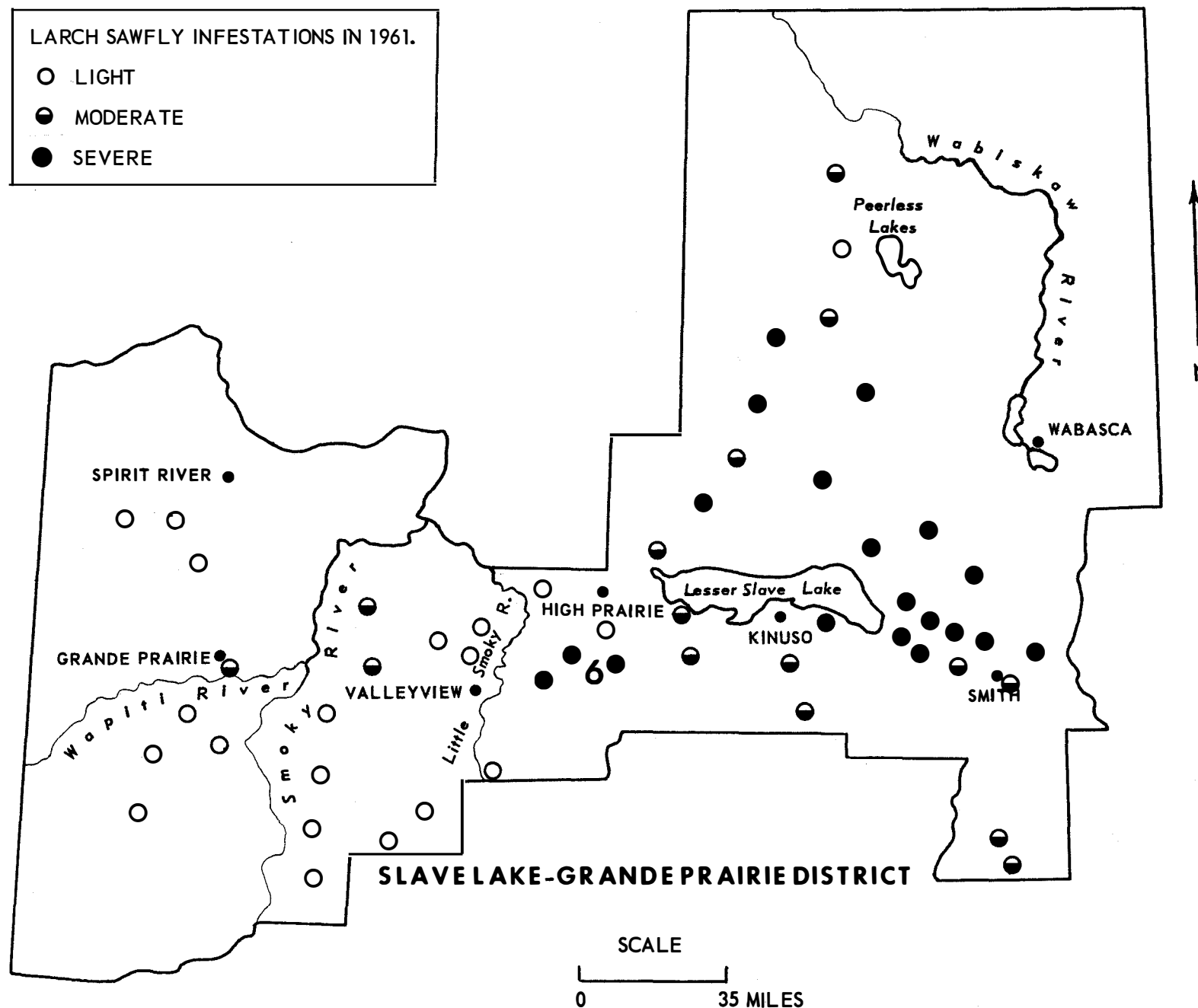


FOREST TENT CATERPILLAR INFESTATIONS
IN 1961.



LARCH SAWFLY INFESTATIONS IN 1961.

- LIGHT
- MODERATE
- SEVERE



ANNUAL REPORT
PEACE RIVER DISTRICT
ALBERTA 1961

by
A. MACHUK
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

The forest tent caterpillar continued to be the most important defoliator of deciduous trees in the Peace River District in 1961. A characteristic of the infestation was the eastward extension of the moderate to severe defoliation across the central portion of the District. The infested area nearly doubled in size to an estimated 17,600 square miles. Moderate to heavy defoliation occurred over an area of approximately 8,000 square miles.

The larch sawfly was again widespread in 1961. The infestation continued its northward and westward extension and now covers all the larch stands in the Peace River District. Spruce budworm caused varying degrees of defoliation to mature spruce and balsam fir along the Wabasca and Muddy rivers. Population levels of the yellow-headed spruce sawfly increased in the forested regions of the District, but there was a further decline in the agricultural areas. The poplar serpentine miner, previously confined to the northern portions of the District, was found frequently in aspen stands throughout the southern region. Leaf tiers and rollers remained at endemic levels.

The western gall rust, Peridermium harknessii, J. P. Moore was found in outbreak proportions in the Clear Hills. Rodent damage was prevalent in varying degrees of intensity, along the Mackenzie Highway in the northern half of the District. Jackpine was the principal species attacked and to a lesser degree white spruce and larch were damaged. Needle rusts and needles casts occurred sporadically throughout the District and caused negligible damage.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Spruce	35	9	T. aspen	100	0
Pine	32	8	Willow	29	2
Larch	29	1	Poplar	4	0
Fir	0	1	Birch	2	0
			Elm	1	0
Totals	96	19		136	2
Collections and Reports from Miscellaneous Hosts					12
Grand Total					244

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Severe defoliation by the forest tent caterpillar occurred along the Peace River from near the southern boundary of the District to Fort Vermilion, a distance of approximately 185 miles. The greatest extension in the infestation took place eastward from the Peace River through the Buffalo Head Hills to within a few miles of the Wabasca River. Larvae were also collected as far north as Steen River on the Mackenzie Highway, 55 miles beyond the northernmost 1960 collection.

A new outbreak of forest tent caterpillar was observed in Townships 104 and 105 in Ranges 22 and 23, West of the fifth meridian. This outbreak was about 30 miles west of the nearest known tent caterpillar infestation, and west of the Mackenzie Highway between Paddle Prairie and High Level. Defoliation in this area ranged from moderate to heavy over an area of approximately 40 square miles. The accompanying map shows the intensity and extent of the infestation based on ground and aerial surveys.

Diseased larvae were collected at 2 points, namely: a mile and a half south of Whitelaw, and 8 miles south of Donnelly. However, at both locations the percentage of diseased insects was low and it is doubtful if this factor will have any appreciable influence on population levels in 1962.

Surveys based on the occurrence of egg bands in 7 widely separated sequential sampling plots indicate that the infestations in the Peace River District will recur at similar or higher intensities and widespread defoliation will occur in 1962.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1961	Actual Defoliation 1961	Predicted Defoliation for 1962
Whitelaw	Noticeable	Severe	Severe
Peace River	Noticeable	Severe	Severe
Dixonville	Noticeable	Severe	Severe
Manning	Not noticeable	Light	Moderate
Ft. Vermilion	Noticeable	Severe	Severe
McLennan	Not noticeable	Light	Moderate
Donnelly	Noticeable	Moderate	Moderate

Larch Sawfly, Pristiphora erichsonii (Htg.)

Moderate to severe defoliation of most larch stands was general throughout the area north and east of a line drawn from Watino in the south through Hay and Bistcho lakes in the north. Several small areas of moderate damage west of this line were recorded near Rainbow Lake. West of Peace River through the Clear Hills to the British Columbia Boundary, scattered small stands of larch sustained light defoliation with the occasional small tree being moderately damaged.

The severely defoliated area extended to the Buffalo Head Hills in the south, the Chinchaga River and the Cameron Hills on the west and into the Northwest Territories on the north.

Rodent predation of larch sawfly cocoons showed a marked increase this season. At the permanent larch plot near Grimshaw upwards of 50 per cent of cocoons checked had been destroyed. At the Watino plot, 81 per cent of the cocoons examined had been opened by rodents.

The effect of the present outbreak of larch sawfly on tamarack stands is uncertain, although some mortality of tops and branches is already evident in the northern areas of the District.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960	Infestation class 1961
7-1	Grimshaw	Light	Light	Moderate	Moderate
7-2	Keg River	Light	Nil	Moderate	Moderate
7-3	High Level	Light	Nil	Light	Moderate
7-4	Watino	Severe	Moderate	Moderate	Moderate
7-5	Clear Prairie	Moderate	Light	Nil	Light

Spruce Budworm, Choristoneura funiferana (Clem.)

During aerial surveys of the northeastern portion of the District defoliation and discoloration of white spruce was observed in varying degrees of intensity along the Wabasca River commencing at a point approximately 10 miles north of the mouth of the Loon River and continuing in spruce stands on both sides of the Wabasca to a point approximately 4 miles north of the mouth of the Muddy River. Defoliation was also observed for about

8 miles upstream from the river mouth on both sides of the Muddy River. Defoliation was light at the south end of the infestation, gradually increasing to moderate and severe in the vicinity of the Muddy River. North of this point defoliation decreased. Four miles north of the junction of the Muddy and Wabasca rivers, defoliation was no longer visible from the air.

The most severe defoliation occurred from the mouth of the Muddy River for about 6 to 8 miles upstream along the Wabasca River, particularly on the west bank. Many dead tops were observed in this area, and some of the spruce and balsam fir in the understory appeared dead.

Several spruce budworm collections were taken near Mt. Watt Tower and Steen River but damage at these points was negligible.

Black-headed Budworm, Acleris variana (Fern.)

Increases in population levels of this species of insect were recorded in the northern forested regions of District 7 in 1961. The greatest numbers of larvae were found along the Mackenzie Highway from Mile 71 to Mile 235. Although populations have increased, no serious defoliation occurred at any of the points examined. Several scattered larval collections were taken in the Fort Vermilion area but damage was of a minor nature.

A Sawfly, Neodiprion sp.

The small infestation of this insect on lodgepole pine reported from the Shaftsbury area last year persisted, increasing in size and intensity this season. The outbreak covered an estimated 4 acres and many trees ranging from 2 to 3.5 inches D.B.H. and from 12 to 20 feet in height

suffered loss of up to 95 per cent of the old foliage. The species of *Neodiprion* involved has not yet been determined.

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

Insects of this species continued to increase in numbers in the forested regions of the District and there was a further decline in populations in the agricultural areas. The infestation on black spruce reported near Mile 100 Mackenzie Highway last year increased slightly in size but intensity of attack remained about the same. A peculiarity of this outbreak was that feeding was confined almost solely to the top quarter crown, where up to 100 per cent of all foliage was destroyed on some trees. In the agricultural areas random collections of larvae were taken from farm shelterbelts but populations were low and no serious defoliation occurred.

A Leaf Tier, *Pseudexentera improba oregonana* Wlshm.

One small area at Simons Lake, supported a medium population of this leaf tier in 1961. This small stand, comprising about 8 acres, had approximately 50 per cent of the foliage damaged. Throughout the remainder of the District scattered samples of this species were found in association with the forest tent caterpillar, but always in low numbers.

A Pitch Nodule-maker, *Petrova* sp.

A small area supporting a medium population of this species was recorded during surveys along the Mackenzie Highway. This occurred at Mile 258 where counts on young jackpine, growing under a stand of scattered, overmature jackpine, showed as many as 5 nodules per tree. Elsewhere in the District light scattered populations of this insect were encountered,

but were never numerous enough to cause any serious damage.

Pine Root Collar Weevil, Hylobius sp.

An infestation of this root weevil was found near the Shell Air-strip in the Clear Hills (Twp. 89, Rge. 12, W.6). Lodgepole pine regeneration ranging in height from 6 to 15 feet was found to be heavily infested in a small area. Hylobius sp. larvae were found in root collars on 4 out of 5 trees examined. Several dead pines with girdled root collars were observed in the immediate area. Some of the weakened trees had been attacked by bark beetles. In a random check of young lodgepole pine stands along the Mackenzie Highway south of Keg River, old root collar damage was noted at 2 out of 5 locations, but no insects were found nor was any tree mortality evident.

American Aspen Beetle, Gonioctena americana (Schaeff.)

Light to moderate damage was found on aspen reproduction in two small areas in 1961. Near Simons Lakes a small patch of aspen reproduction bordering a mature stand was moderately defoliated. Fourteen miles north of Fairview, aspen regeneration coming in under a canopy of lodgepole pine was moderately defoliated over an area of approximately 3 acres.

Western Tent Caterpillar, Malacosoma pluviale (Dyar)

This species showed a marked increase in numbers and expanded distribution in 1961. They were found almost everywhere in the southern portion of the District feeding on chokecherry, rose, willow, raspberry, and aspen regeneration. High populations were found near Peace River, Three Creeks, Clear Prairie, and Cherry Point. Almost complete stripping of roadside shrubs was common in these areas.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

A definite increase in this species was recorded in 1961, particularly in the southern regions of District 7. Mined leaves were in evidence both east and west of Peace River and medium populations were observed along a 10 mile section of the Notikewin Tower Road near the Whitemud River. Light to moderate damage was recorded near the Cadotte River northeast of Three Creeks and in scattered patches along the Mackenzie Highway.

Spruce Spider Mite, Oligonychus ununguis (Jac.)

Shelterbelt and ornamental white spruce in the North Star-Manning area again harbored medium to high populations of spider mite. A few trees have died from previous feeding damage, although the majority of trees do not appear to have been seriously damaged thus far.

TABLE IV

OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE PEACE RIVER DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Ugly-nest caterpillar, <u>Archips cerasivoranus</u> (Fitch)	1	Chokecherry	Declined to a low population level.
Birch skeletonizer, <u>Bucculatrix canadensisella</u> Chamb.	1	Birch	Found in low numbers at one location east of Deadwood.
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	1	T. aspen	Very light populations.

Other Noteworthy Insects - (Cont'd)

Insect species	Number of collections	Host	Remarks
A leaf tier, <u>Compsolechia niveopulvella</u> (Cham.)	1	T. aspen	Scarce in District.
A cone worm, <u>Dioryctria</u> sp.	2	B. spruce	Light damage to spruce cones near Mile 100 Mackenzie Highway.
A gall mite, <u>Eriophyidae</u>	4	T. aspen	Individual trees moderately attacked in Grimshaw-Dixonville area.
Balsam-fir sawfly, <u>Neodiprion abietis</u> (Harr.)	6	B. spruce	Low scattered populations in northern areas.
Spiny elm caterpillar, <u>Nymphalis antiopa</u> L.	1	Elm	Low populations near Fairview.
Bruce spanworm, <u>Operophtera bruceata</u> (Hlst.)	2	T. aspen	Low populations in Worsley-Clear Prairie area.
Green-headed spruce sawfly, <u>Pikonema dimockii</u> (Cress.)	8	W. spruce B. spruce	Low populations in association with <u>P. alaskensis</u> .
A weevil, <u>Pissodes terminalis</u> Hopk.	1	Lp. pine	Found in low numbers in one area only.
<u>Pyralidae</u>	1	Lp. pine	Found feeding in <u>P. harknessii</u> galls in Clear Hills.
White-pine tufted caterpillar, <u>Panthea furcilla</u> Pack.	1	Lp. pine	Moderate populations on Lp. pine in Shaftsbury district.

DISEASE CONDITIONS

Western Gall Rust, Peridermium harknessii J. P. Moore

Several new areas in which lodgepole pine regeneration and more advanced growth were affected by this rust were added to the known distribution this season. The highest incidence of P. harknessii was recorded in the Clear Hills in Twp. 89, Rge. 12, W. 6. Scattered light infections were observed near Keg River, southeast of Battle River Tower, and on the south shore of Bistcho Lake.

In the Clear Hills area, tree tallies to determine the incidence of P. harknessii were made on plots in 2 locations. On the first plot, near the Shell Air-strip, 95 per cent of the trees were infected. As many as 5 to 6 galls were found on the stem of an individual tree. On the second plot, 40 to 45 per cent of the trees were infected and about 6 per cent of the trees checked were dead due to infection. Mortality of lodgepole pine tops was quite common throughout this area as a result of complete girdling of the upper stem by this rust. It is thought that this rust, as a natural thinning agent, is rather beneficial at this degree of incidence, in the development of the stand. It is proposed that permanent sample plots be established in 1962 to study the spread and intensification of the disease organism in this area.

Rabbit Damage

There have been an increasing number of observations of rodent damage to jack pine regeneration in the northern areas of District 7 in 1961. Populations of rabbits are apparently again nearing a peak. Rodent damage was very conspicuous at scattered locations along the Mackenzie Highway from about Mile 220 through to the Northwest Territories,

with severe damage to regeneration jackpine being recorded over an extensive area near Mile 300. Other species of trees, principally white spruce and larch were also girdled, but not to the same extent as was jackpine. Jackpine trees up to one inch diameter at stump height were cut off at snow level and larger diameter trees were completely girdled, resulting in heavy mortality in the affected stands.

TABLE V

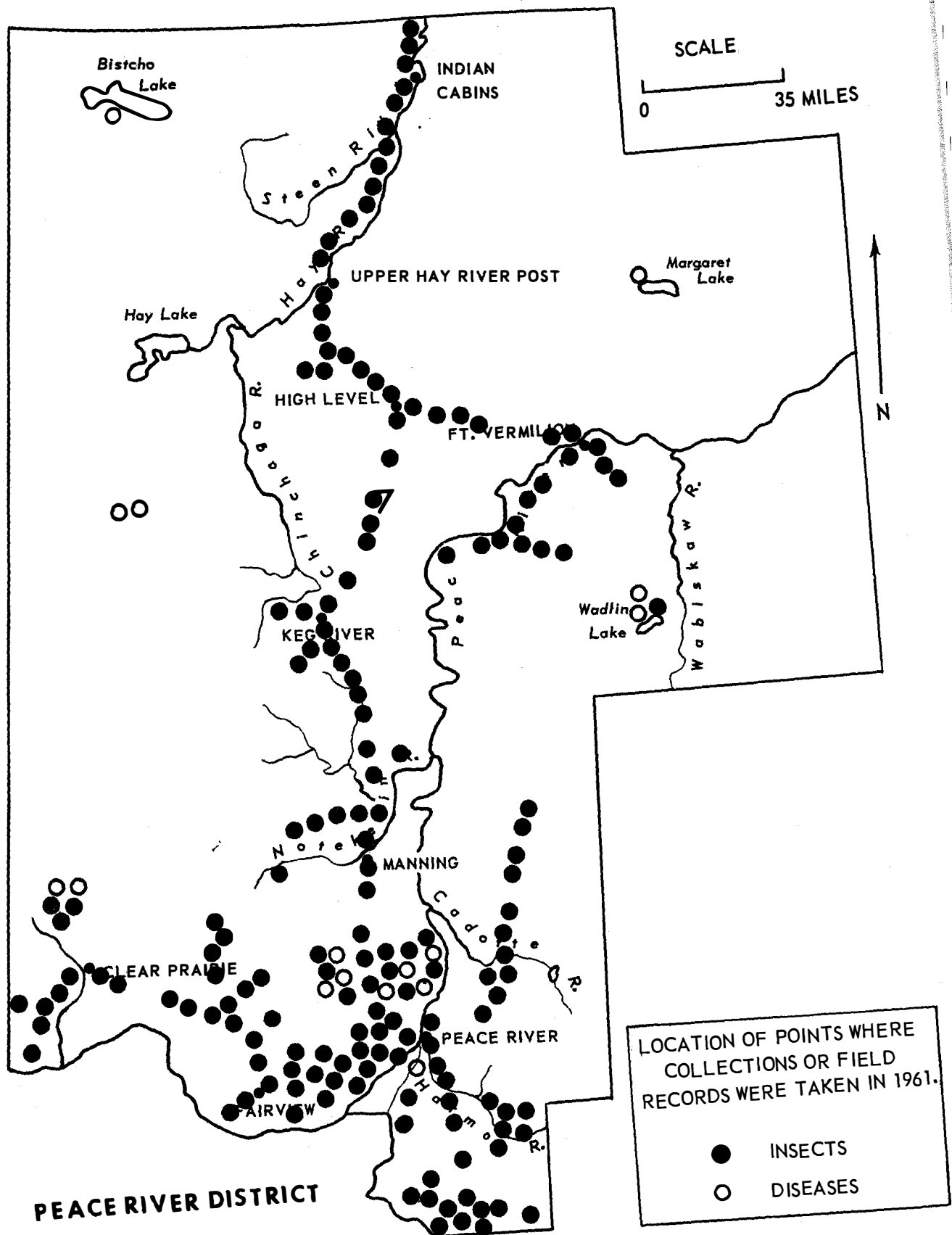
OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE PEACE RIVER DISTRICT, 1961

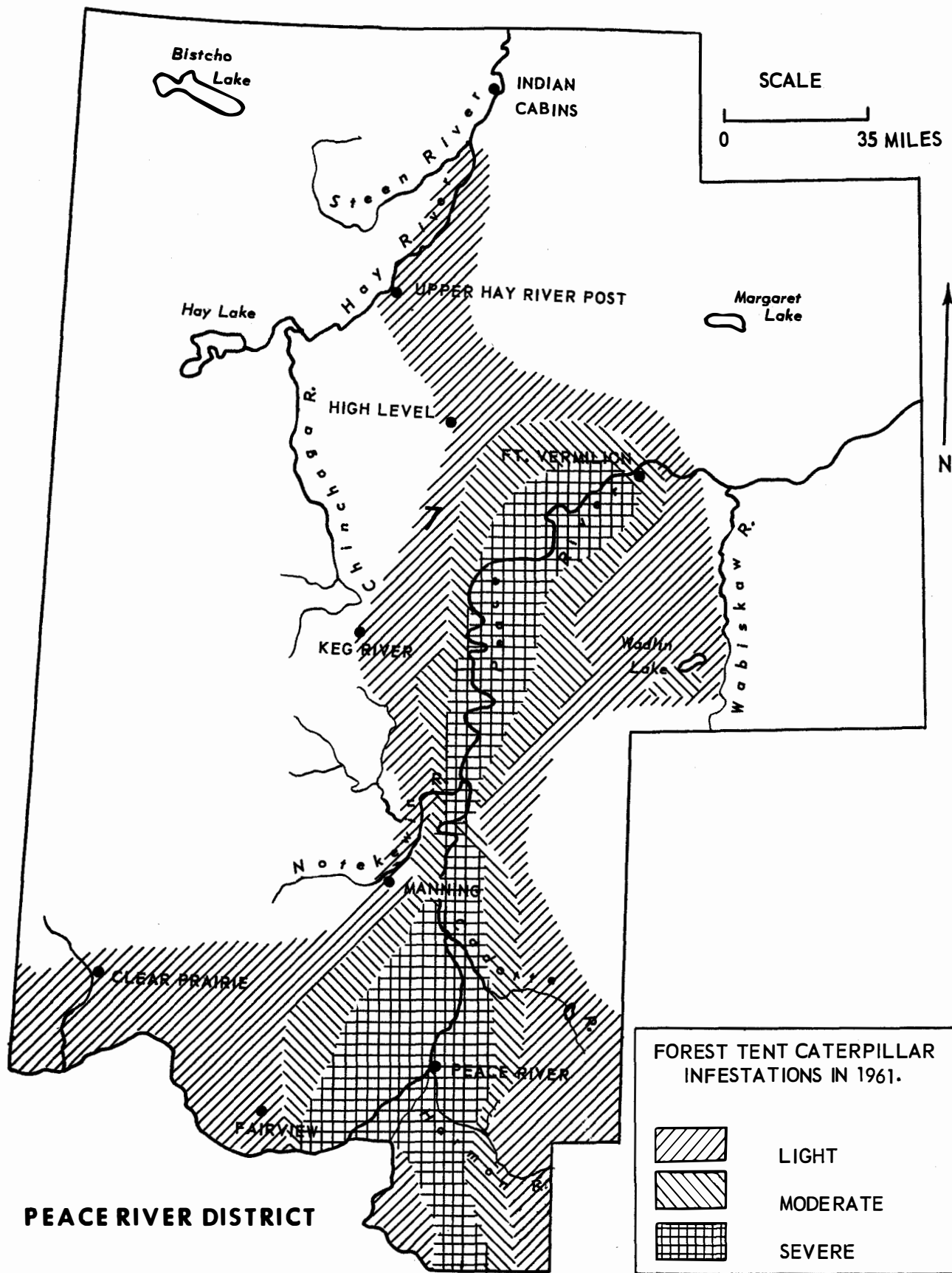
Host	Organism	Locality	Remarks
Fir, balsam	<u>Hypodermella mirabilis</u> Darker	Wadlin Lake	New herbarium record on balsam fir.
Pine, jack	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	21 Miles southeast of Deadwood	Heavy infection on overmature trees. Also found on regeneration.
Spruce, black	<u>Chrysomyxa ledicola</u> Lagerh.	Wadlin Lake	Low incidence of needle rust on scattered trees.

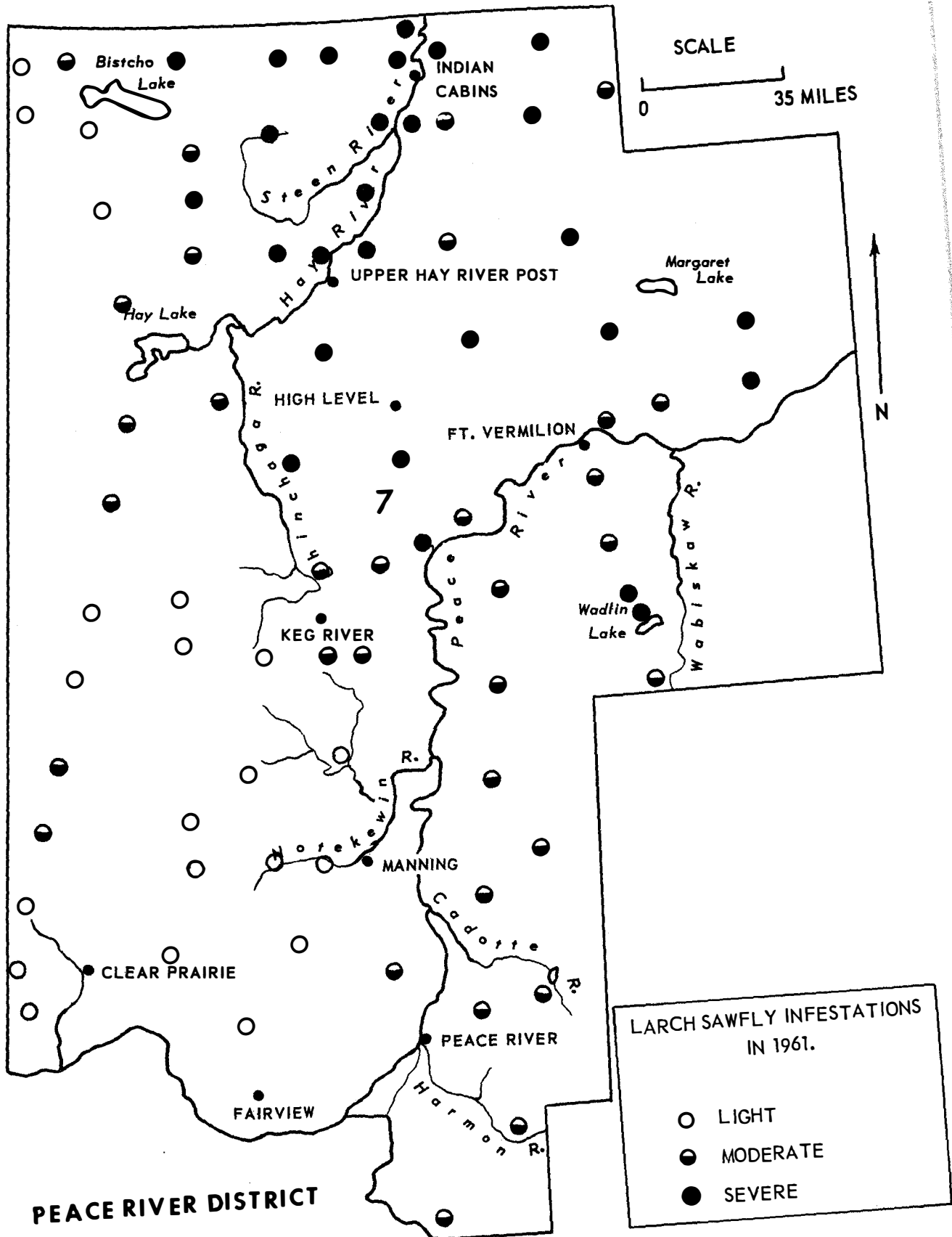
TABLE VI

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

Outbreak Number	Location	Causal Organism	Remarks
7-1	Mile 109 Mackenzie Highway	<u>Retinocyclus abietus</u> (Crouan) Groves & Wells	No new cankers observed in 1961.
7-2	Clear Hills (Twp. 89, Rge. 12, W.6)	<u>Peridermium harknessii</u> J. P. Moore	High incidence of rust galls on pine regeneration and advanced growth.







ANNUAL REPORT
NORTHWEST TERRITORIES DISTRICT
1961

by
G. KLEINHOUT
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1962

INTRODUCTION

In the survey of the Northwest Territories it was noted that spruce budworm populations had changed in 1961. An increase in numbers was recorded at Fort Simpson and along the Liard and Kotanelee rivers. Decreased populations were observed along the Mackenzie River from Camsell Bend to Fort Norman. New areas of spruce budworm defoliation were observed along the Slave River, at Fort Smith and north of McConnell Island. During the 1961 season the larch sawfly outbreak spread westward and northward from the Mackenzie Highway to the Redknife and Rabbitskin rivers and from 50 miles north of Fort Providence to Yellowknife. In the east Mackenzie District larch sawfly defoliation was again severe, with no change in boundaries since the 1960 season.

Rabbit damage was prevalent throughout the District. Several species of tree rusts were recorded in the central and western parts of the District.

TABLE I
SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Collections and Reports Insect	Disease	Deciduous Hosts	Collections and Reports Insect	Disease
Spruce	29	10	T. aspen	25	1
Larch	21	0	Willow	19	0
Pine	13	4	Birch	8	2
Fir	0	0	Poplar	7	1
Totals	63	14		59	4
Collections and Reports from Miscellaneous Hosts					35

GRAND TOTAL

175

INSECT CONDITIONS

Spruce Budworm, Choristoneura fumiferana (Clem.)

The outbreaks of spruce budworm along the valleys of the Mackenzie and Liard rivers were surveyed by aircraft and boat; the outbreak along the Slave River was surveyed by boat only. The former was conducted by C. E. Brown, A. Machuk and G. Kleinhout, the latter by J. K. Robins, R. Stevenson and G. Kleinhout.

Severe defoliation of white spruce was recorded near Fort Simpson along the Mackenzie and Liard rivers, along the Liard River from Muskeg River to the British Columbia Border and in the Kotaneelee Valley starting at the Liard River and continuing for a distance of 25 miles upstream. Along the Slave River severe defoliation occurred in the vicinity of Long Island and on the north bank of the river near Fort Smith. Due to previous defoliation many dead trees and tops were observed at Camsell Bend, Birch Island and upstream from the mouth of the Keelee River.

Moderate defoliation was recorded one mile south of Enterprise, south of the confluence of the Dahadinni and Blackwater rivers with the Mackenzie River, northward for 18 miles along the Liard River from its junction with the Muskeg River and on the north bank of the Petitot River southeast of Fort Liard. Scattered stands of white spruce along the Slave River sustained moderate defoliation commencing 3 miles south of McConnell Island and continuing upstream to near Brule Pt., at Le Grand Detour, and in a stand of timber 20 miles north of Salt River. Moderate defoliation also occurred in a stand of white spruce 12 miles north of McConnell Island on the east bank of the Slave River.

Light defoliation was recorded east of Fort Simpson on the north bank of the Mackenzie River, 4 miles southeast of the Spence River, at Camsell Bend, 6 miles north of Root River on the west bank of the Mackenzie River, on Birch Island, on the east side of the Mackenzie River from the Ochre River to within 4 miles north of the Johnson River, along the Blackwater River, along the Liard River from the Blackstone River to 14 miles south of the Netla River, along the Kotaneelee River Valley west of the Liard Range and at Fort Smith.

Larch Sawfly, Pristiphora erichsonii (Htg.)

The area infested by the larch sawfly increased in size and now extends west to the Redknife River and north to Yellowknife. Severe defoliation occurred in an area between the Slave River and a line running southwest from Pointe Desmarais on Great Slave Lake, passing Kakisa Lake and within approximately 30 miles west of Tathlina Lake, thence through the Cameron Hills and terminating near the Petitot River.

Moderate defoliation occurred in a strip approximately 15 miles wide west of the previously described area. Light defoliation occurred approximately 40 miles west of Tathlina Lake along the Kakisa and Redknife River valleys terminating in the vicinity of Redknife Lakes. Light defoliation was also in evidence from Fort Providence to Mile 80 along the Yellowknife Highway, and in the Rabbitskin River Valley southeast of Norwegian Lake. Traces of defoliation occurred from 80 miles north of Fort Providence to 13 miles northwest of Yellowknife and also 22 miles north of Yohin Lake. The latter is the most westerly extension of this insect known to this date.

Moderate defoliation was also recorded 16 miles northwest of Fort Simpson on the south bank of the Mackenzie River. Larch sawfly has not previously been reported from this area.

On the Alberta side of the Wood Buffalo Park an aerial survey was conducted west of the Slave River to a line from Peace Point on the Peace River to Fort Smith. Severe defoliation was recorded throughout this area.

Engelmann Spruce Weevil, Pissodes engelmanni Hopk.

These insects were found sporadically along the Slave River, with high populations at Long Island. Low populations occurred between Mile 14 and 16 north of Fort Providence along the Yellowknife Highway.

Pitch Nodule-maker, Petrova albicapitana (Busck)

This species was widely distributed in stands of jack pine regeneration along the Mackenzie and Yellowknife highways. Populations were low and no serious damage was observed.

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

This insect caused moderate defoliation of white spruce along the east bank of the Slave River approximately 15 miles north of Salt River. Light to moderate defoliation occurred from Mile 21 to Mile 63 along the Yellowknife Highway north of Fort Providence with a small area of severe defoliation centered near Mile 34. Traces of defoliation were observed at Cli Lake. In Wood Buffalo Park, light defoliation was reported along the Peace River near Carlson's Landing.

Poplar Serpentine Miner, Phyllocnistis populiella Cham.

The feeding of these leaf miners caused severe injury at Camsell Bend on the Mackenzie River and moderate injury near the mouth of the Dahadinni River.

In the Liard River area severe injury occurred along the Petitot River, while moderate discoloration was recorded near the mouths of the Matou and Poplar rivers. Light damage was noted at the Hot Springs in the Nahanni River Valley. Traces of this insect were observed along the Mackenzie and Yellowknife highways.

Larch Shoot Moth, Argyresthia laricella Kft.

An outbreak of this insect was recorded in 1961. A stand of young tamarack 6 miles northwest of Yellowknife was attacked. Severe damage indicated that large populations of this insect had been present in previous years, accounting for 60 to 80 per cent mortality of leaders on these trees. Light damage was evident along the Yellowknife Highway from Yellowknife to Frank Channel, while the occasional mined tip was found between Frank Channel and Fort Providence.

TABLE II
OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE NORTHWEST TERRITORIES DISTRICT, 1961

Insect species	Number of collections	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	5	W. spruce	Low populations found throughout area surveyed in the West Mackenzie District.
Balsam-fir sawfly, <u>Neodiprion abietis</u> (Harr.)	2	W. spruce	Found in low numbers at Camsell Bend and Cli Lake.
Bruce spanworm, <u>Operophtera bruceata</u> (Hlst.)	1	T. aspen	One collection taken near Hay River, N.W.T.

DISEASE CONDITIONS

Rabbit Damage

Rabbit damage was observed in a number of locations mainly on pine regeneration and to some extent on young larch and spruce. Severe damage occurred in places along the Mackenzie Highway from the Alberta border to Mile 43 and along the Yellowknife Highway from Mile 43 to Mile 47 northwest of Enterprise. Moderate damage, mainly in jack pine stands was observed along the Yellowknife Highway from Mile 43 to Mile 63 and at Mile 111 north of Fort Providence. In many instances the trees were girdled or completely cut off approximately 2 feet above the ground.

Red Belt

Severe discoloration of conifers due to climatic conditions was reported at the junction of the South Nahanni and Jackfish rivers and along the Franklin Mountains east of Wrigley.

Rust Diseases

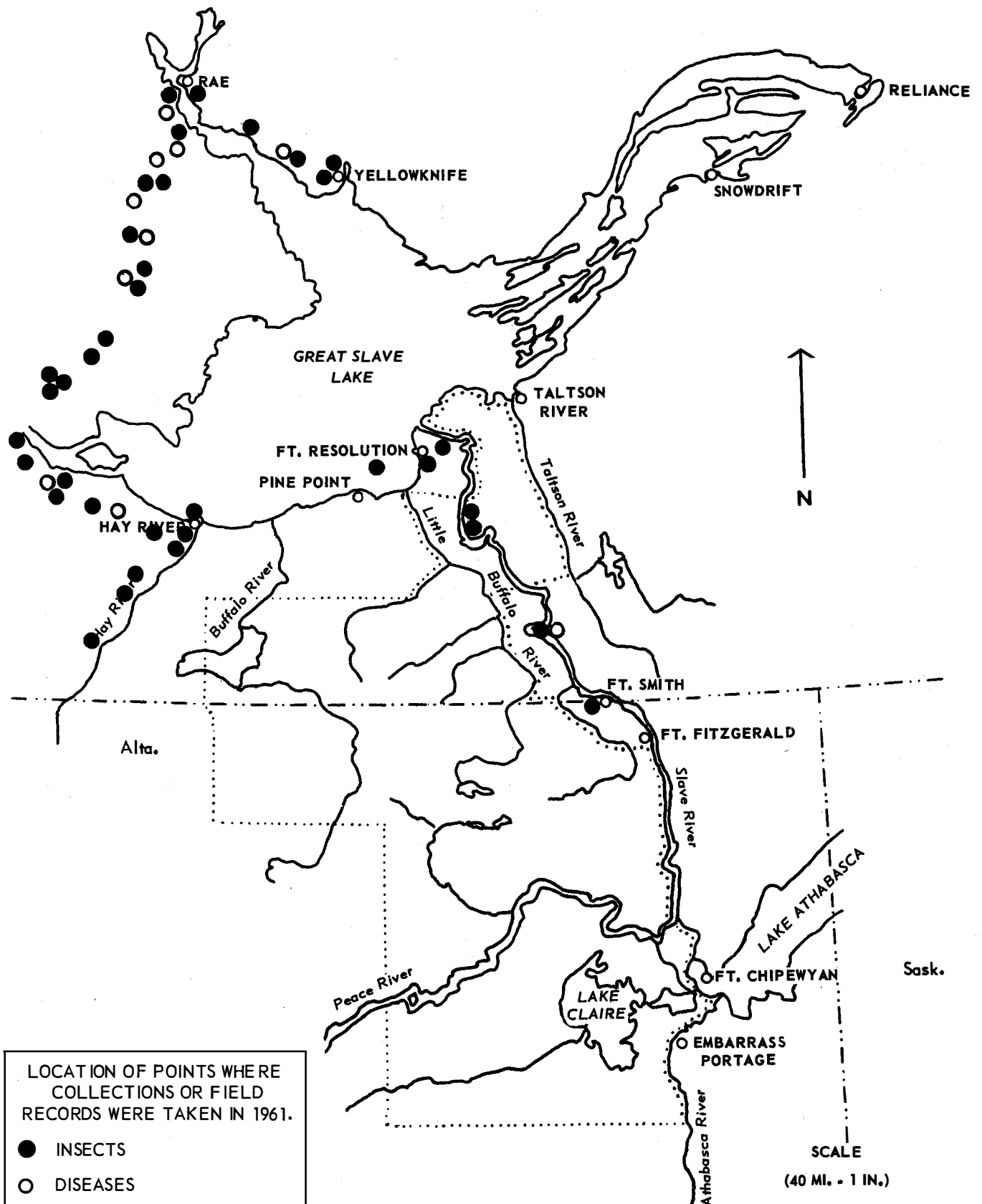
Three different species of spruce needle rust were observed in the West Mackenzie District. A light infection of Chrysomyxa ledicola Lagerh. was found on white spruce and on its alternative host, Labrador tea, 22 miles north of Yohin Lake. A light occurrence of Chrysomyxa ledi de Bary and Chrysomyxa weirii Jacks was observed on white spruce at Hot Springs in the South Nahanni River Valley.

Light infections of the blister rust, Cronartium comandrae Fk. were reported on jack pine along the Yellowknife Highway from Fort Providence to Yellowknife. A light infection of the western gall rust, Peridermium harknessii J. P. Moore, was observed in a young stand of jack pine 28 miles northwest of Enterprise.

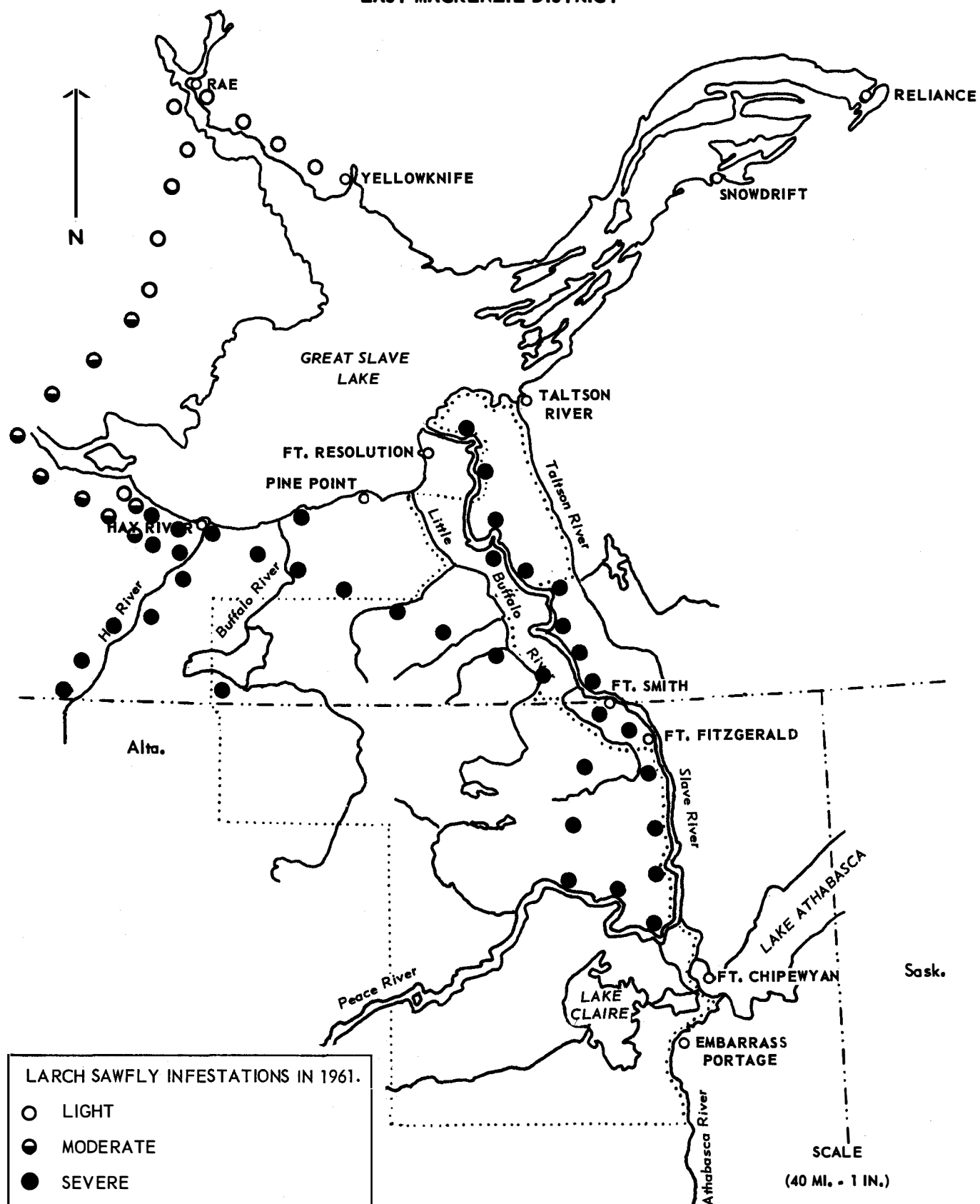
TABLE III
OTHER NOTEWORTHY DISEASES
WHICH OCCURRED IN THE NORTHWEST TERRITORIES DISTRICT, 1961

Host	Organism	Locality	Remarks
Alder	<u>Cryptodiaporthe oxystoma</u> (Rehm) Urban	Junction of Liard and Blackstone rivers.	First herbarium record.
	<u>Hypoxylon rubiginosm</u> (Pers. ex Fr.) Fr.	16 miles north- west of Fort Simpson.	First herbarium record.
Poplar, aspen	<u>Hypoxylon pruinatum</u> (Klotzsche) Cke.	Mile 97 Yellow- knife Highway	Range extension far northward.

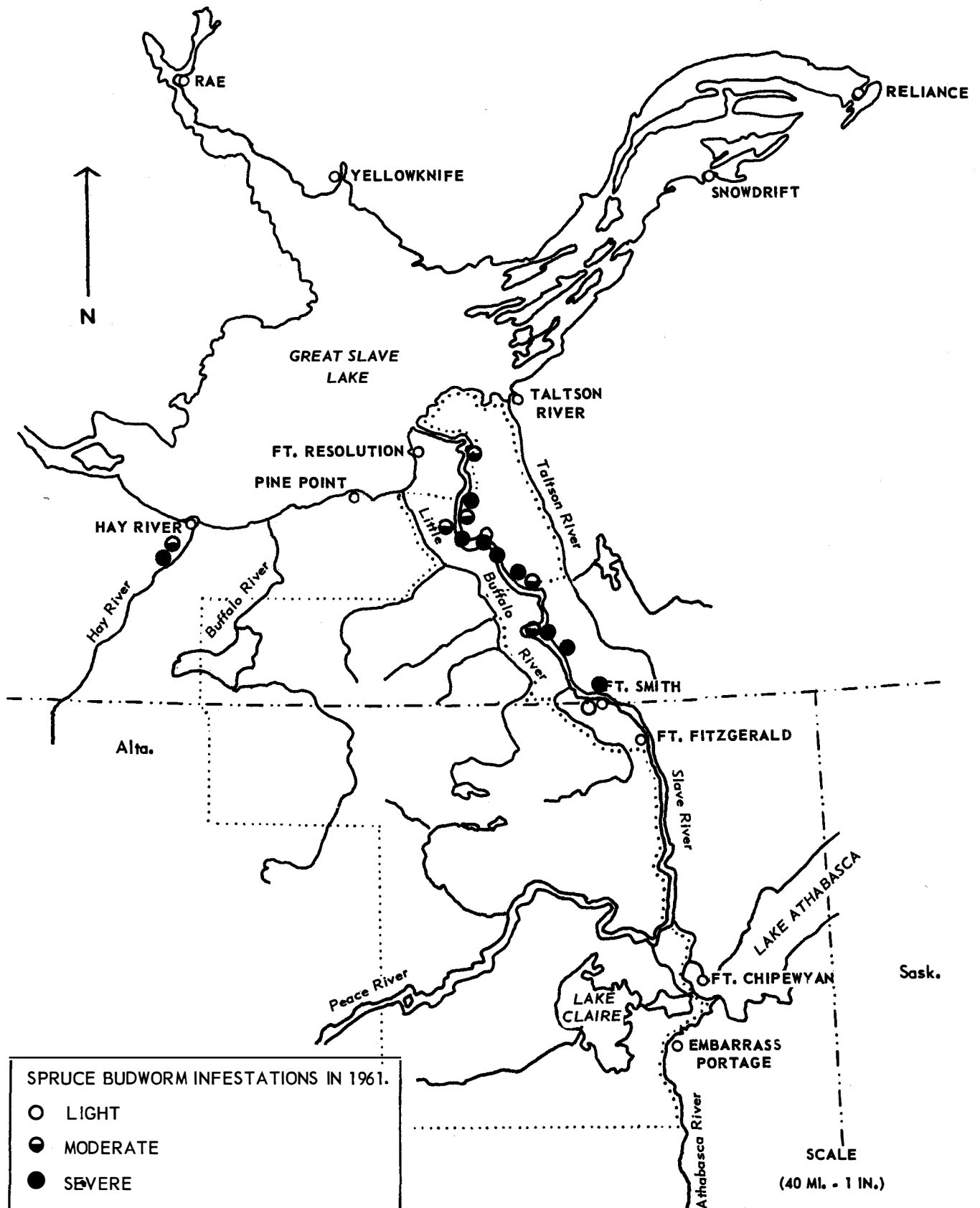
EAST MACKENZIE DISTRICT

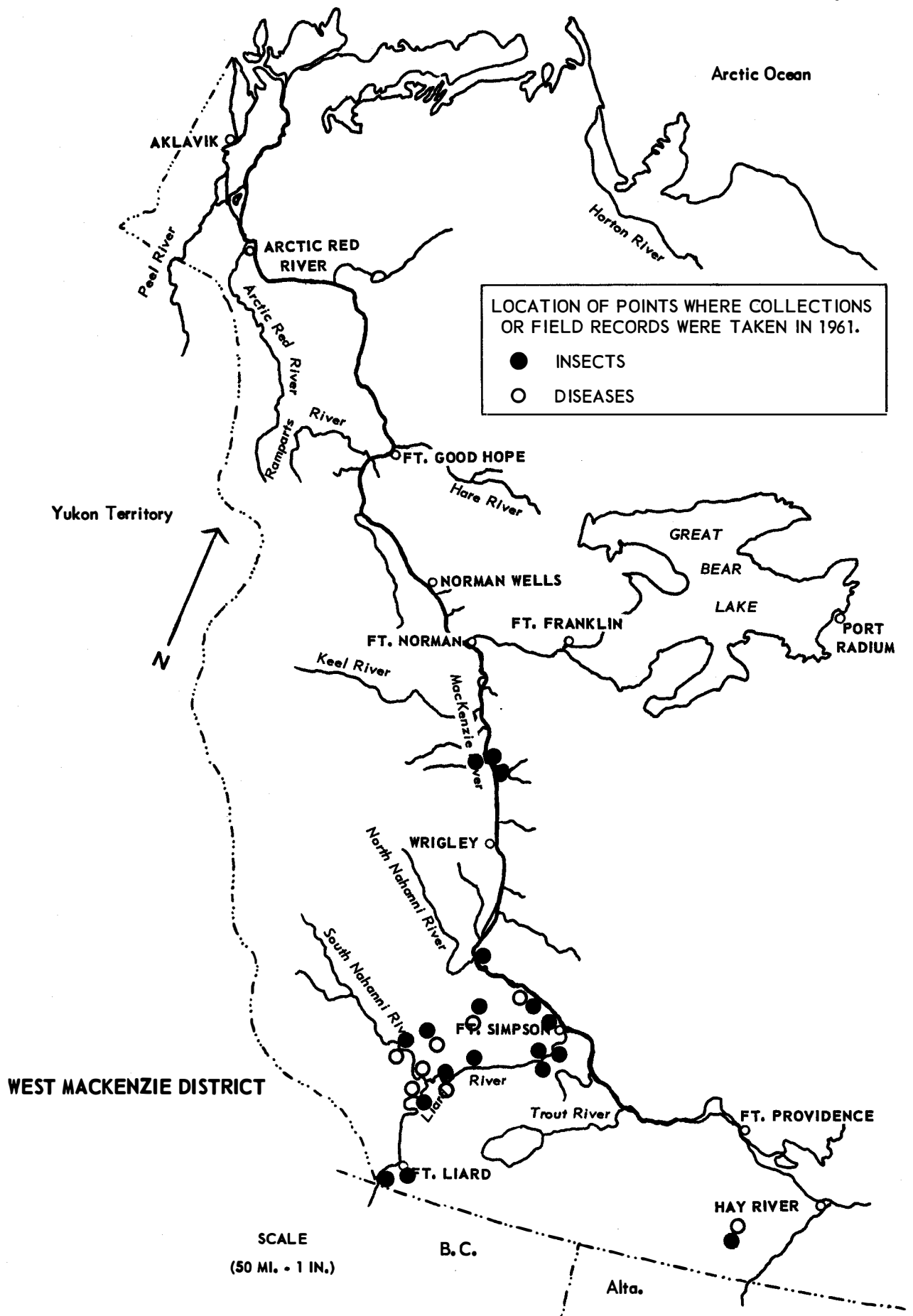


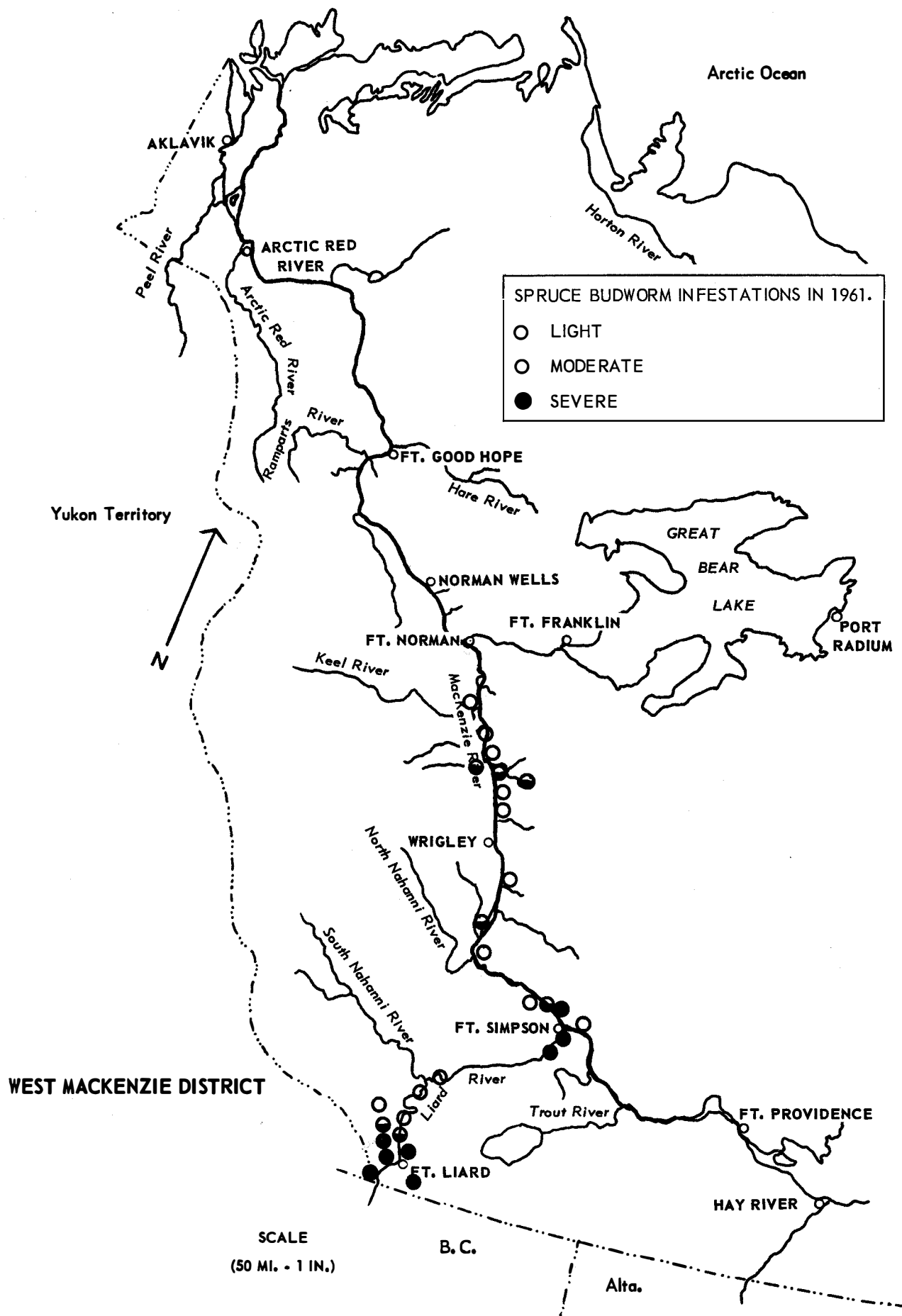
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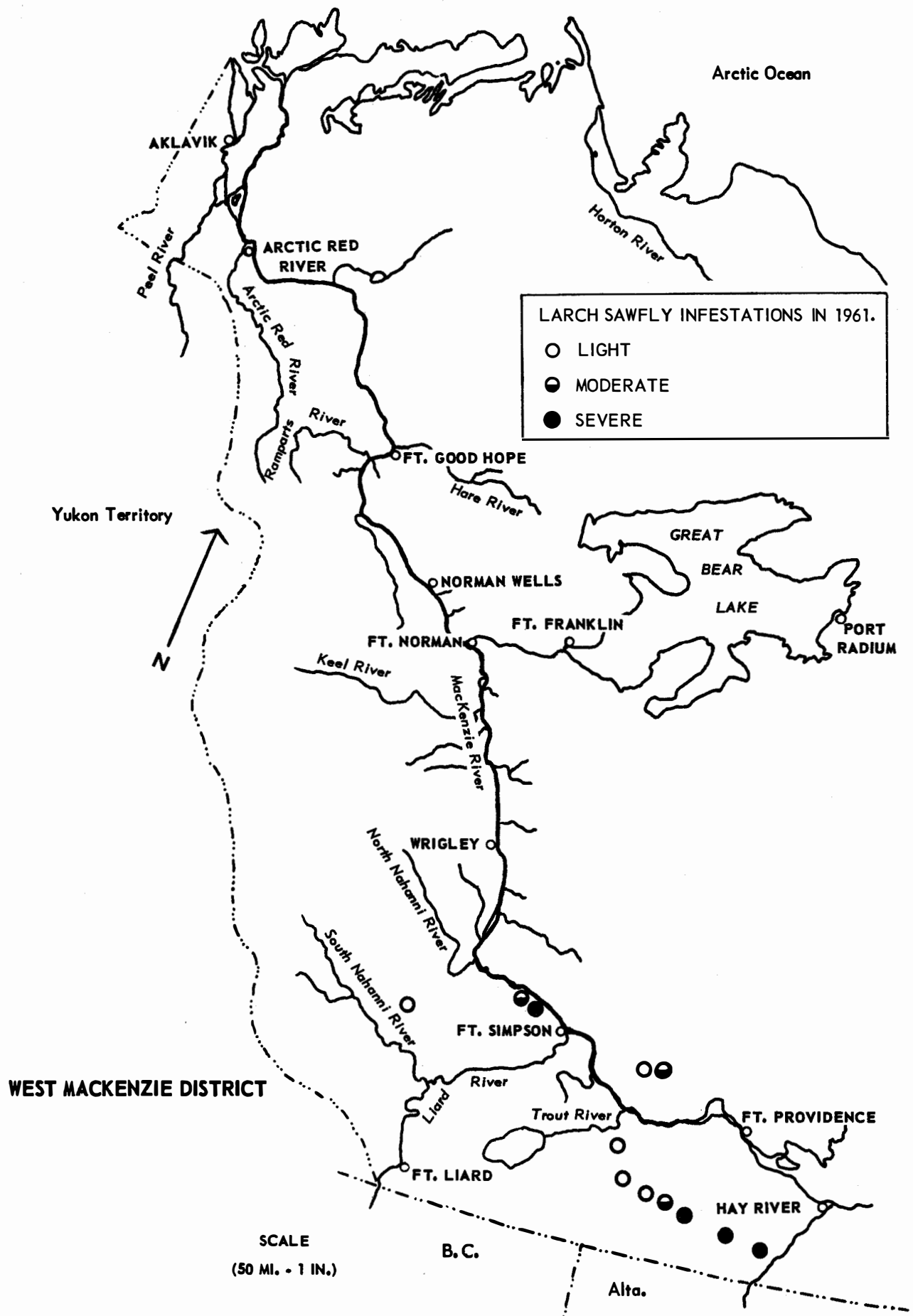


EAST MACKENZIE DISTRICT









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