Not for Publication

ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY

MANITOBA-SASKATCHEWAN REGION

1965

INFORMATION REPORT

FOREST RESEARCH STATION
WINNIPEG, MANITOBA

DEPARTMENT OF FORESTRY

MARCH, 1966

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FOREST INSECT AND DISEASE SURVEY

MANITOBA-SASKATCHEWAN REGION

1965

by

V. Hildahl, A.E. Campbell, K.L. Mortensen,
G.N. Still, L.L. McDowall, R.W. Hancox,
R.C. Tidsbury, B.B. McLeod,
R. Van den Abeele and C.L. Rentz

INFORMATION REPORT

FOREST RESEARCH STATION

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DEPARTMENT OF FORESTRY

March 1966

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by

V. Hildahl

CANADA DEPARTMENT OF FORESTRY
FOREST INSECT AND DISEASE SURVEY
WINNIPEG, MANITOBA

March 1966

1.1 INTRODUCTION

Field activities of the Forest Insect and Disease Survey were commenced in all forest districts of the Manitoba-Saskatchewan Region by May 10 and were completed by late October. Cool, wet weather prevailed throughout most of the growing season (temperatures ranged from three to five degrees below the long-term average and many areas received above normal precipitation), which led to a greatly reduced number of forest fires, and more widespread and severe frost damage. Despite the adverse weather conditions, the season's objectives of the survey were largely accomplished, and 4,182 insect and 1,772 disease collections were submitted by the Rangers to the Laboratory for processing (Table 1).

Forest insect conditions during the 1965 season were highlighted by the almost total collapse of the forest tent caterpillar outbreak, and by significant increases in populations and areas affected by the spruce and jack-pine budworms. Populations of the larch sawfly remained widespread but defoliation was noticeably lighter, particularly in the northern areas. Infestations of the black-headed budworm, aspen and American leaf beetles, spruce and balsam-fir sawflies, spruce spider mite, and fall cankerworm declined, but those of the pine needle scale and gray willow-leaf beetle continued at about the same infestation levels as in 1964. Disease conditions remained relatively unchanged; late spring frosts, hailstorms, and high winds caused notable damage in several localities. Leaf and twig blights of broad-leaved trees were common throughout the Region, and numerous localized infections of Macrophoma gall, Hypoxylon canker and Cytospera canker were detected in poplar stands in the southern sections. The incidence of needle and cone rusts on conifers was generally low despite the cool, wet weather.

1.2 SUMMARY OF FIELD OPERATIONS

1.2.1 DISTRICT ASSIGNMENTS:- Transfers and new appointments necessitated changes in assignments and responsibilities for some of the field technicians with the Forest Insect and Disease Survey. J.J. Lawrence was transferred to the Disease Section as senior laboratory technician, and his position of sub-regional supervisor was filled by B.B. McLeod. J.W. Arthurs and R.J. Devlin joined the Survey in January and April respectively, and were assigned to laboratory duties with the Insect Section. Thus, the field staff operated with only nine rangers who were assigned sub-regional and district responsibilities as follows:

SOUTHEASTERN SURVEY DIVISION

SUPERVISOR -- A.E. Campbell

District 00	Southern Manitoba	A.E. Campbell
District 01	Eastern Manitoba	K.L. Mortensen
District 11	Southern Saskatchewan	G.N. Still

CENTRAL SURVEY DIVISION

SUPERVISOR -- L.L. McDowall

District 02	Northern Manitoba	R.W. Hancox
District 03	Western Manitoba	L.L. McDowall
District 05	Hudson Bay, Saskatchewan	R.C. Tidsbury

NORTHWESTERN SURVEY DIVISION

SUPERVISOR -- B.B. McLeod

District 06	Prince Albert, Saskatchewan	B.B. McLeod
District 07	Meadow Lake, Saskatchewan	C.L. Rentz
District 08	Northern Saskatchewan	R. Van den Abeele
District 12	West-Central Saskatchewan	Vacant (Surveys jointly by B. McLeod and C. Rentz)

1.2.2 FIELD FACILITIES AND EQUIPMENT:- No additions were made to the existing Ranger field accommodations in 1965, and maintenance consisted primarily of interior painting at The Pas, Hudson Bay and Prince Albert cottages. The lawn was levelled and seeded at Hudson Bay, and the water system at Prince Albert was relocated in the storage shed. Furthermore, new manhole cribbing and covers were installed for the septic tanks at Prince Albert.

One new compact station wagon vehicle was purchased as a replacement for the sedan delivery previously in use in the Northern District of Manitoba. The 18' Prospector canoe assigned to the Northwestern Survey Division was repaired and the canvas hull replaced with fibre glass.

1.2.3. DETECTION SURVEYS AND SUB-PROJECTS: This year marked the first full year of operation of an integrated Forest Insect and Disease Survey unit at Winnipeg. The main changes in the season's field-work program involved greater emphasis on surveys of major tree diseases, developing new methods of assessing damage caused by diseases, and participating in a co-operative small mammal population survey in forest stands. Larval sampling of the larch sawfly was intensified to determine the establishment and rate of spread of the recently released parasite, Holocremnus sp. nr. nematorum. Forest tent caterpillar egg-band sampling was reduced in all districts excepting Eastern Manitoba due to almost complete collapse of the outbreak, and larval population sampling of the fall cankerworm was discontinued in Southern Saskatchewan. Egg-mass sampling and defoliation estimates of the spruce budworm and population studies of the boxelder twig borer were maintained on the same basis as in 1964. The "minimum" sampling plan initiated in 1963 was continued to ensure systematic and representative coverage of each District during the early, mid and late parts of the season.

In carrying out the detection surveys and special projects the Rangers travelled 157,300 miles by road and 450 miles by boat. In addition,

TABLE 1

Forest Insect and Disease Collections from Principal Host Trees
Manitoba and Saskatchewan
1965

Forest Districts	Tree Species																							
	wS		bS		bF		jP		tL		tA		bPo		wB		mM		wE		Misc.		Totals	
	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D
Southern Man.	32	8	4	5	4	1	49	10	10	-	50	13	10	1	5	1	32	3	17	7	133	16	346	65
Eastern Man.	49	7	40	19	28	13	88	21	57	3	164	40	22	3	41	7	1	-	4	8	198	24	692	145
Western Man.	79	16	26	9	7	2	11	2	37	2	84	55	33	9	21	3	12	2	7	-	128	25	445	125
Northern Man.	70	10	78	36	29	14	31	15	33	-	85	43	39	13	64	11	-	-	4	-	193	79	626	221
Southern Sask.	44	13	-	-	-	-	-	-	5	-	58	31	6	2	6	-	33	4	31	4	232	87	415	141
Hudson Bay, Sask.	71	5	29	14	12	3	29	6	40	-	80	15	44	8	23	-	15	-	11	-	103	11	457	62
Prince Albert, Sask.	54	15	16	16	2	4	54	46	60	3	82	65	35	52	16	8	-	-	-	-	85	57	404	266
Northern Sask.	47	19	29	23	20	4	21	26	15	-	49	50	17	21	37	21	-	-	-	-	83	56	318	220
Meadow Lake, Sask.	15	9	12	6	-	-	20	7	25	-	64	32	18	14	13	-	4	1	-	-	46	15	217	84
West-Central Sask.	15	3	-	-	-	-	-	-	-	-	39	29	5	3	-	-	29	11	20	4	83	21	191	71
Totals	476	105	234	128	102	41	303	133	282	8	755	373	229	126	226	51	126	21	94	23	1284	391	4111	1400

I = Insect Collections

D = Disease Collections

approximately 205 hours of flying time were utilized for mapping important insect and disease outbreaks, of which 28.5 and 36 hours were provided by the Provincial Forestry Branches of Manitoba and Saskatchewan respectively; their co-operation is hereby gratefully acknowledged.

Aircraft travel is summarized by Province in Table 2, and aerial survey routes are shown on Figure 1. Table 3 indicates the time in days devoted by individual Rangers to Survey sub-projects during the current season.

TABLE 2

Summary of Aircraft Travel
Manitoba and Saskatchewan
1965

Province	Type of Flying	Type of Aircraft	No. of Hours	Approx. Mileage	Approx. area Surveyed (sq.mi.)*
Manitoba	Chartered	Cessna 172	8:30	1,025	4,100
		Cessna 180	57:45	5,775	23,100
		Beaver	5:00	550	2,200
	Provincial Forestry Branch	Beaver	28:30	3,140	12,560
Saskatchewan	Chartered	Cessna 150	6:45	675	2,700
		Cessna 172	16:30	1,980	7,920
		Cessna 180	46:15	5,090	20,360
	Provincial Forestry Branch	Otter	8:30	1,020	4,080
		Beaver	19:00	2,090	8,360
		Super-Cub	6:30	650	2,600
		Helicopter	2:00	160	640
TOTALS			205:15	22,155	88,620

* Based on observations of approximately 2 miles on each side of flight lines.

1.3 IMPORTANT FOREST INSECTS

1.3.1 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- The total area affected by this defoliatior of spruce and balsam fir increased notably (Fig. 2). The Namew Lake infestation (along the Manitoba-Saskatchewan border northwest of The Pas) increased in size from 910 square miles in 1964 to about 1500 square miles. It expanded mainly northwestward to include most of the spruce-fir stands in the Wildnest, Mari, McArthur, Mirond and Pelican lakes areas. Furthermore, new

TABLE 3

Days Spent on Survey Sub-Projects
Manitoba and Saskatchewan
1965

Technician, Forest Research (Ranger)	Survey Sub-Project by Number						
	1	2	3	4	5	6	7
A.E. Campbell	5.0	12.0	5.0	2.0	2.0	Nil	4.0
K.L. Mortensen	8.0	14.0	5.0	8.0	2.0	Nil	4.0
G.N. Still	2.0	1.0	2.0	4.0	8.0	Nil	5.0
L.L. McDowall	3.0	6.0	8.0	Nil	4.0	Nil	3.5
R.W. Hancox	2.5	11.0	17.5	Nil	4.0	Nil	3.5
J. Arthurs	1.0	2.0	7.0	Nil	Nil	Nil	Nil
R.C. Tidsbury	2.0	5.0	6.0	Nil	1.0	Nil	3.5
B.B. McLeod	7.0	12.5	5.0	2.0	14.0	1.0	4.0
R. Van den Abeele	3.0	8.0	3.0	0.5	5.0	Nil	4.0
C.L. Rentz	5.0	10.0	Nil	4.0	10.0	Nil	4.0
R.J. Devlin	Nil	Nil	Nil	Nil	8.0	Nil	Nil
TOTALS	38.5	81.5	58.5	20.5	58.0	1.0	35.5

1. Forest tent caterpillar egg-band sampling.
2. Larch sawfly studies.
3. Spruce budworm studies.
4. Population sampling of the boxelder twig borer.
5. Elm bark beetle sampling.
6. Pine tube moth studies.
7. Small mammal population survey.

localized infestations of moderate to severe intensity occurred over some 68 square miles in the vicinity of Pita Lake, in patches at Kipahigan, Belcher, Manawan, Wintego and Deschambault lakes, and on islands and shorelines of Trade, LaRonge and Besnard lakes.

The old infestations along the Birch River and on Budd's Point in Cumberland Lake continued; in the former location, noticeable defoliation was limited to a few acres in tp. 54, rge. 5, W 2nd mer., and low populations in the latter were offset by relatively severe defoliation covering some five square miles on the east side of the lake. In Manitoba, moderate to severe defoliation persisted in the Dawson Bay area and on Birch Island of Lake Winnipegosis, and at Sisipuk Lake in the Churchill River system. In addition, new patches were recorded on Moose Island and near Sandy Bar Point in Lake Winnipeg, on Rose Island in Swan Lake and along the northeast shore of Pelican Lake.

Light larval populations, causing no detectable defoliation, were noted at scattered locations in southeastern Manitoba, in the Spruce Woods and Duck Mountain Forest reserves, in Riding Mountain National Park, and at Highrock, Granville, Harding and Footprint lakes. In Saskatchewan, similar populations were recorded in the Pasquia and Porcupine hills, Prince Albert National Park, Greenwater Provincial Park, Cypress Hills Provincial Forest, at Buffalo Narrows, and on spruce plantings at Meetoos, Rosthern, Melfort, Resource, Piapot, Swift Current and Moose Jaw.

1.3.2 JACK-PINE BUDWORM, Choristoneura pinus Free.:- Marked increases in populations and the development of several new infestations of this serious defoliator of jack pine was an important feature of the season (Fig. 3). In Manitoba, the areas of moderate to severe defoliation increased in the Interlake Section north of Gypsumville from about 600 to 1700 square miles, in the Sandilands Forest Reserve between Vassar and Marchand from 25 to 135 square miles, and in the Belair Forest Reserve from 7 to 30 square miles. High populations persisted also in the Rosenburg area in the Interlake Section, and moderate to severe defoliation was recorded for the first time in a 25 square mile area along the Poplar River to west of Weaver Lake, in a few scattered patches near Lake St. Martin, and in plantations of Scots and jack pines near Shilo in the Spruce Woods Forest Reserve.

In Saskatchewan, significant population increases resulted in moderate to severe defoliation of most jack pine stands within about 625 square miles of the Fort à la Corne Provincial Forest and adjacent Indian Reserve, and 235 square miles of the Nisbet Provincial Forest. New infestations of similar intensity affected areas of about 14 square miles in the Canwood Provincial Forest, 16 square miles south of Bittern Creek, 30 square miles near Smeaton and Snowden, 480 square miles along the Hanson Lake Road including the southern parts of the Nipawin Provincial Park, 310 square miles west of Pinehouse Lake, and 4 square miles near Brownell Lake. Elsewhere, light larval populations were recorded in the Porcupine Provincial Forest, at Hudson Bay and Nipawin, and near Candle, Whiteswan, Reindeer, and Chitek lakes; in Scots and jack pine plantations at Caron and Creelman; and on lodgepole pine in the Cypress Hills Provincial Park.

1.3.3 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- The larch sawfly was the most widely distributed forest insect pest in the Region (Fig. 4). However, damage was generally less severe than in 1964, particularly in areas where larval development was retarded by sub-normal temperatures during late May and June. In Manitoba, defoliation of tamarack was moderate to occasionally severe in the Northwest Angle, Sandilands and Agassiz Forest reserves, between East Braintree and Falcon Lake, east of Lake Winnipeg in the Mukutawa, Belanger, and Gunisao river valleys, along the west side of Lake Winnipeg between Riverton and the Dauphin River, and from Swan River north to Westray. Infestations declined notably and defoliation was only light throughout Riding Mountain National Park, and in the vicinity of Tadoule, Nejanilini, Neultin, Egenolf and Brochet lakes.

Defoliation increased from light to severe in tamarack stands along the east slopes of the Pasquia Hills, near Christie and Christopher lakes, and along the Birch and Skunk Creeks, and to moderate in the Duck Mountain and Greenwater Lake Provincial parks, and Porcupine and Carrot River Provincial forests in Saskatchewan. It remained moderate to severe along the Overflowing and Birch rivers, throughout most of the Fort à la Corne and Nisbet Provincial forests and Prince Albert National Park, and near Crutwell and MacDowall. Planted larch again suffered light to moderate defoliation at Indian Head, near Wolseley, and in the Cypress Hills Provincial Forest.

1.3.4 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- The outbreak of this defoliatior that commenced in 1960 almost completely collapsed in 1965 (Fig. 5). All that remained of the severe infestations that affected most of the major trembling aspen stands in the forested areas of both provinces during the peak years of 1962 and 1963 was a small patch (about 600 acres) in the vicinity of Lake St. George in the Interlake section, and about 640 square miles along the Manitoba-Ontario boundary. The latter extended in a narrow band northward from Shoal Lake to the Manigotagan River and appeared to be a westerly extension of the current outbreak in Ontario. Only low larval populations were recorded elsewhere throughout the old infestation areas of both provinces.

The collapse was probably due to the accumulated effects of parasites, particularly the pupal parasite, Sarcophaga aldrichi Park., which occurred in high numbers in 1963 and 1964, and to the adverse weather conditions that prevailed during and immediately following the larval emergence period.

1.3.5 FALL CANKERWORM, Alsophila pometaria (Harr.):- Populations were generally lower than in recent years but numerous localized infestations still persisted. Although defoliation was most severe on white elm and green ash, the characteristic "shot-holing" of foliage also was conspicuous on Manitoba maple and basswood. Associated with the fall cankerworm in some areas were significantly higher populations of the spring cankerworm, Paleacrita vernata (Peck.).

In Manitoba, light to moderate defoliation occurred in parts of Metropolitan Winnipeg, at scattered points along the Red River between Emerson and Selkirk, in the Beausejour, Carberry and Griswold areas, and in field windbreaks near Lyleton. In Saskatchewan, moderate to severe defoliation was recorded in shelterbelts in the Alameda, Creelman, Halbrite, Indian Head, Southey, Foam Lake, Watson, Keeler, Eyebrow, Stewart Valley, Gull Lake, Duncairn and Frontier areas, and of boulevard plantings in Regina and Moose Jaw.

1.3.6 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Aceria parapopuli (Keifer) (Poplar bud-gall mite)	Poplars, hybrid Aspen, trembling	Southern Saskatchewan	Particularly heavy infestations caused severe damage to trees, particularly in the Swift Current-Kyle-Mortlach area.
Acleris variana (Fern.) (Black-headed budworm)	Spruce, black and white Fir, balsam	Manitoba and Saskatchewan	Populations remained widespread but most infestations decreased in intensity; up to 70 per cent defoliation of black spruce on islands in Lac la Ronge.

1.3.6 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Bucculatrix canadensisella Cham. (Birch skeletonizer)	Birch, white	Manitoba and Saskatchewan	Populations declined notably in old infestations along Churchill River in Manitoba; light elsewhere.
Chrysomela crotchi Brown (Aspen leaf beetle)	Aspen, trembling	Manitoba and Saskatchewan	Occurred commonly as far north as Churchill River, but skeletonizing noticeably lighter than in 1964.
Gonioctena americana (Schaef.) (American aspen beetle)	Aspen, trembling	Manitoba and Saskatchewan	Common in both provinces; moderate to severe foliage skeletonizing recorded in localized patches.
Hylurgopinus rufipes (Eichh.) (Native elm bark beetle)	Elm, white	Southern sections of Manitoba and Saskatchewan	Populations occurred as far north as The Pas in Manitoba and west to Outlook and Milden, Saskatchewan.
Neodiprion abietis complex (Balsam-fir sawfly)	Spruce, white and black Fir, balsam	Manitoba and Saskatchewan	Populations declined markedly, but light to moderate infestations persisted at widely scattered points (Fig. 6).
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	Spruce, white and black Pines, jack and lodgepole	Manitoba and Saskatchewan	Highest populations recorded on spruce planting in southern sections of the provinces; light, scattered infestations on pines.
Pikonema alaskensis (Roh.) (Yellow-headed spruce sawfly)	Spruce, white and black	Manitoba and Saskatchewan	Less abundant than in 1964 but occurred commonly on spruces in both provinces; occasionally caused severe defoliation (Fig. 7)
Oligonychus ununguis (Jac.) (Spruce spider mite)	Spruce, white	Southern sections of Manitoba and Saskatchewan	Populations were the lowest in recent years, probably due to the cool, wet weather.

1.4 IMPORTANT FOREST DISEASES

1.4.1 INDUSTRIAL FUME DAMAGE:- Damage to forest trees caused by sulphur dioxide fumes emanating from the smelter plant was again detected in the smoke easement area around Thompson, Manitoba. Light foliage discoloration was noted on white spruce, black spruce, jack pine, trenbling aspen, balsam poplar, white birch, speckled alder and serviceberry at Harding, Wintering, Isbister and Natawahunan lakes, and along the Nelson and Burntwood rivers. Moderate damage to the foliage of trembling aspen and jack pine occurred within a small area a few miles south of Thompson.

1.4.2 FROST INJURY:- Late spring frosts seriously affected the developing foliage of most broad-leaved trees and shrubs in many parts of the Region. Damage was most severe to trembling aspen with frost-killed foliage occurring over extensive areas of both provinces. The young leaves of bur oak were almost completely destroyed throughout most of the Spruce Woods Forest Reserve. Light damage to Manitoba maple foliage was reported in the Carberry-Sidney area and along the Red River valley, and up to 50 per cent of the current needle growth of white spruce was killed in localized areas of southeastern Manitoba.

1.4.3 STORM DAMAGE:- A severe hailstorm accompanied by near cyclonic winds in late August caused extensive damage in a trembling aspen-white birch stand in the Rabbit Creek-Potato Lake area in northern Saskatchewan. The foliage was stripped from all trees, and about 75 per cent of the stand suffered broken limbs or trunks and many were uprooted within a four-square-mile area.

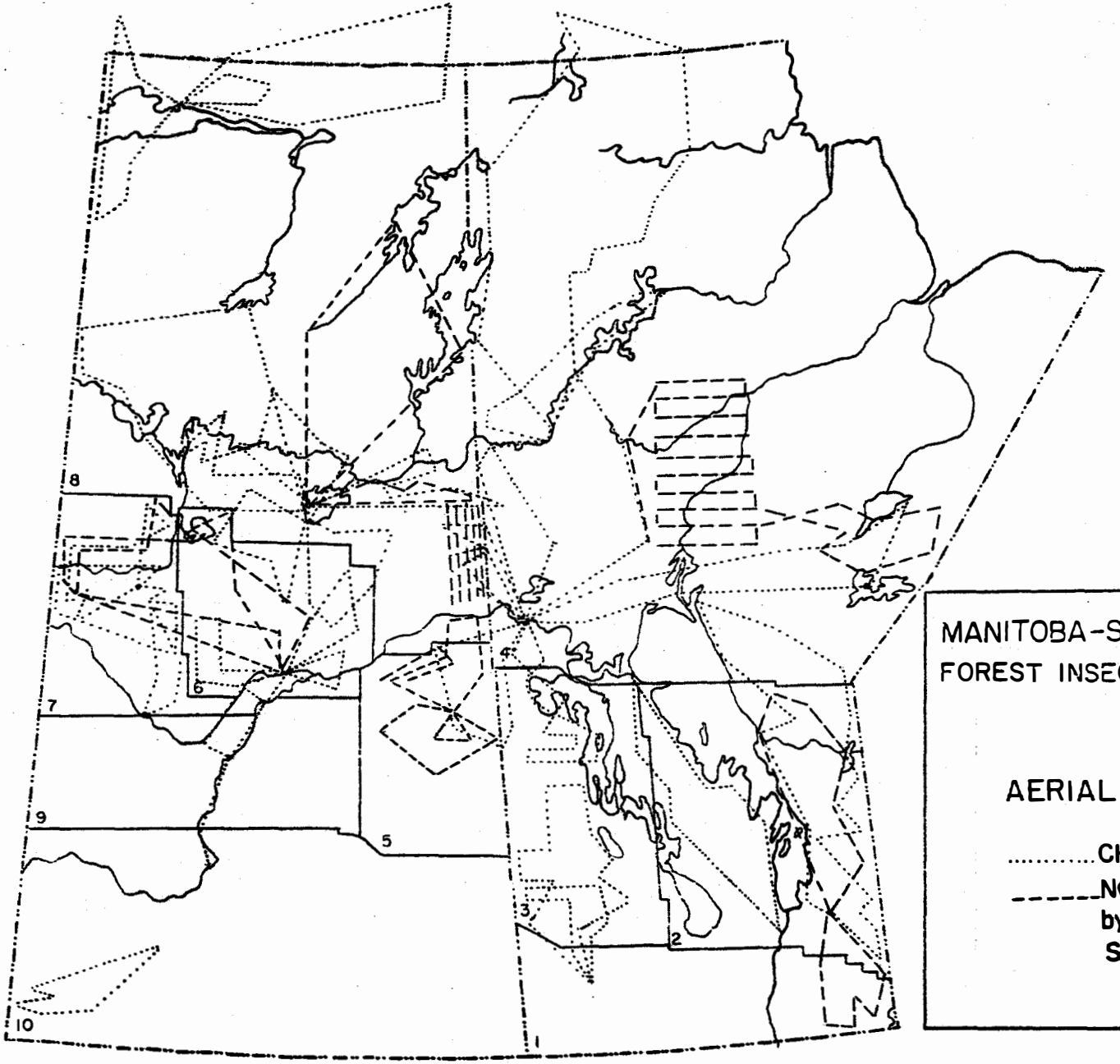
In northern Manitoba, the effects of hailstorms in 1964 were observed at numerous locations extending from Landing Lake southeasterly to Red Sucker Lake; the largest covered approximately 600 square miles and extended from Red Sucker Lake northward around Sharpe Lake to Edmund Lake.

1.4.4 SPRUCE NEEDLE RUST, *Chrysomyxa* spp.:- Spruce needle rusts were recorded throughout the range of white and black spruce in the Region. *C. ledicola* Lagerh. was the most widespread and was collected as far north as Uranium City, Saskatchewan and Neultin Lake in Manitoba. Light to moderate infections of *C. ledi* de Barry were recorded in the Beaver Creek, Pine Dock, Hecla Island, Riverton, Burntwood Lake, Laurie Lake and Lynn Lake areas of Manitoba, and in the Emma Lake, Christopher Lake, Mayview and Big Sandy-Twigge lakes areas of Saskatchewan.

1.4.5 LEAF AND TWIG BLIGHTS OF POPLARS, *Pollaccia* spp.:- Infections occurred throughout the range of native poplars in both provinces. *P. radiosa* (Lib.) Bald. & Cif. was common on trembling aspen regeneration from Whitemouth Lake in southeastern Manitoba and the Cypress Hills in southwestern Saskatchewan north to Lake Athabasca. *P. elegans* Serv. on balsam poplar was most notable at Harding Lake, Thicket Portage, Little Grand Rapids and Buffalo Bay on Lake of the Woods in Manitoba. Similar infections were noted at Skunk Creek, Reindeer Lake, along the La Ronge Highway, and in the Cypress Hills and Nisbet Provincial forests in Saskatchewan.

1.4.6 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Ciborinia whetzelii (Seav.) Sear. (Ink spot)	Aspen, trembling	Riding Mountain National Park and Flin Flon, Manitoba; Cypress Hills, Neeb and Buffalo Narrows, Saskatchewan	Infections common at most locations; 30 per cent of foliage damaged in localized patches.
Cronartium comandrae Pk. (Commandra blister rust)	Pine, jack	Whitemouth Lake and Dallas Lake, Manitoba; Pierceland, Sask.	Light infections; alternate stage found on Comandra sp. at Whitemouth Lake.
Hypodermella ampla (J.J.Davis Dearn. (Needle cast)	Pines, jack and lodgepole	East Braintree, Manitoba; Cypress Hills Prov. Forest, Saskatchewan	Heavy infections on individual trees at both locations.
Linospora tetraspora Thompson (Leaf spot)	Poplar, balsam	Southern sections of Manitoba and Saskatchewan	Particularly common in south-eastern Manitoba, and in Pasquia Hills and Prince Albert National Park in Saskatchewan.
Macrophoma tumefaciens Shear (Macrophoma gall)	Aspen, trembling Poplar, balsam	Manitoba and Saskatchewan	Moderate to heavy infection in localized areas; recorded as far north as La Ronge in Saskatchewan.
Marsonina populi (Lib.) Magn. (Leaf spot)	Aspen, trembling	Manitoba and Saskatchewan	Moderate to heavy infection in localized areas; recorded as far north as La Ronge in Saskatchewan.
Melampsora bigelowii Thuem. (Larch-willow rust)	Willow	Manitoba and Saskatchewan	Widespread but light infections in most areas; severe foliage damage noted at Erinferry, Saskatchewan.
Melampsorella cerastii (Pers.) Schroet. (Yellow witches' broom)	Fir, balsam	Island, God's and Paint lakes, Manitoba	Seventy-five per cent of trees infected at Island lake; only occasional brooms elsewhere.
Peridermium harknessii J.P. Moore (Globose gall rust)	Pines, jack and lodgepole	Manitoba and Saskatchewan	Localized moderate to severe infections of jack pine in numerous localities; moderate damage to lodgepole pine in Cypress Hills, Sask.



SURVEY DISTRICTS

MANITOBA
1. Southern
2. Eastern
3. Western
4. Northern

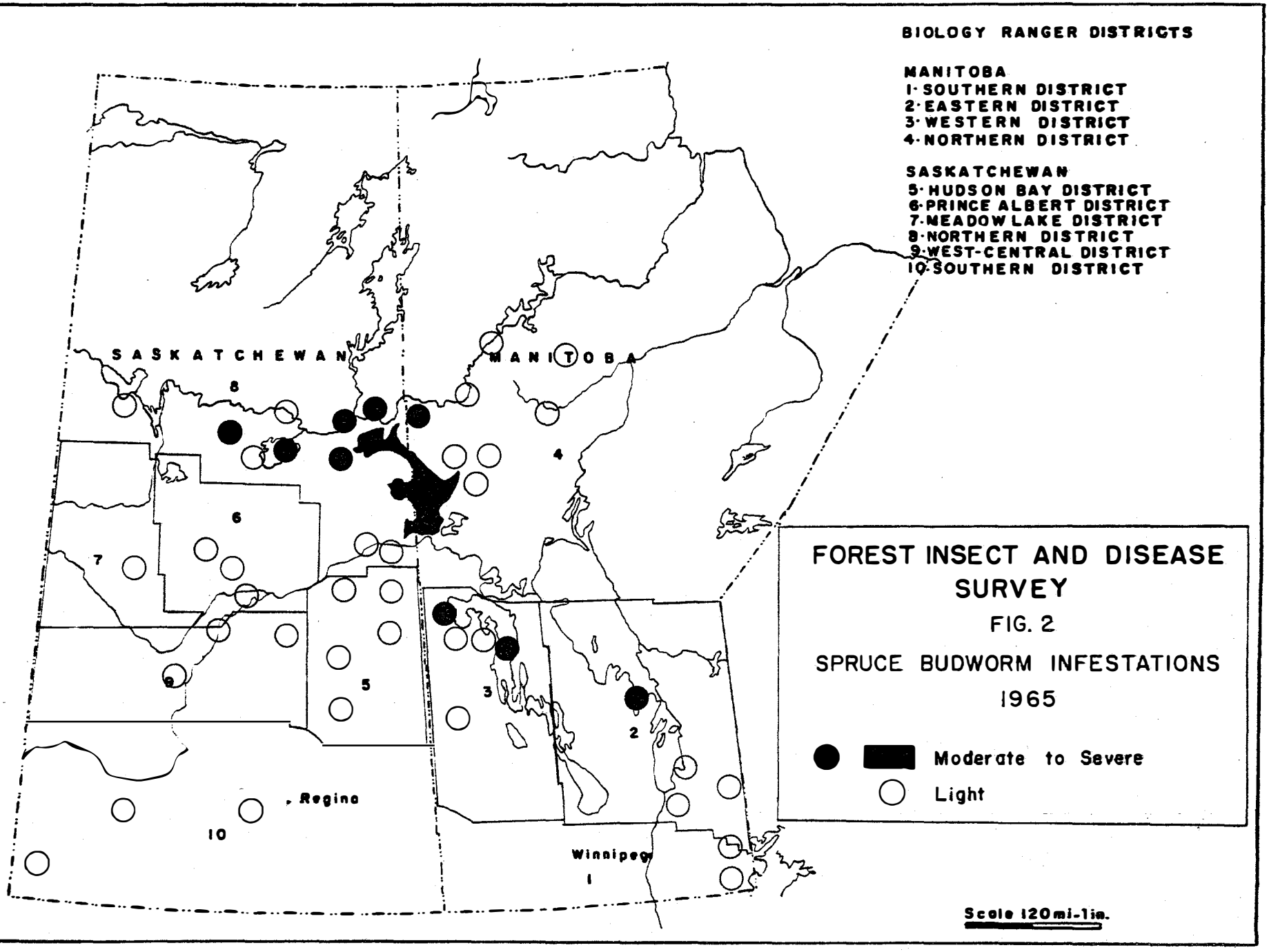
SASKATCHEWAN
5. Hudson Bay
6. Prince Albert
7. Meadow Lake
8. Northern
9. West-central
10. Southern

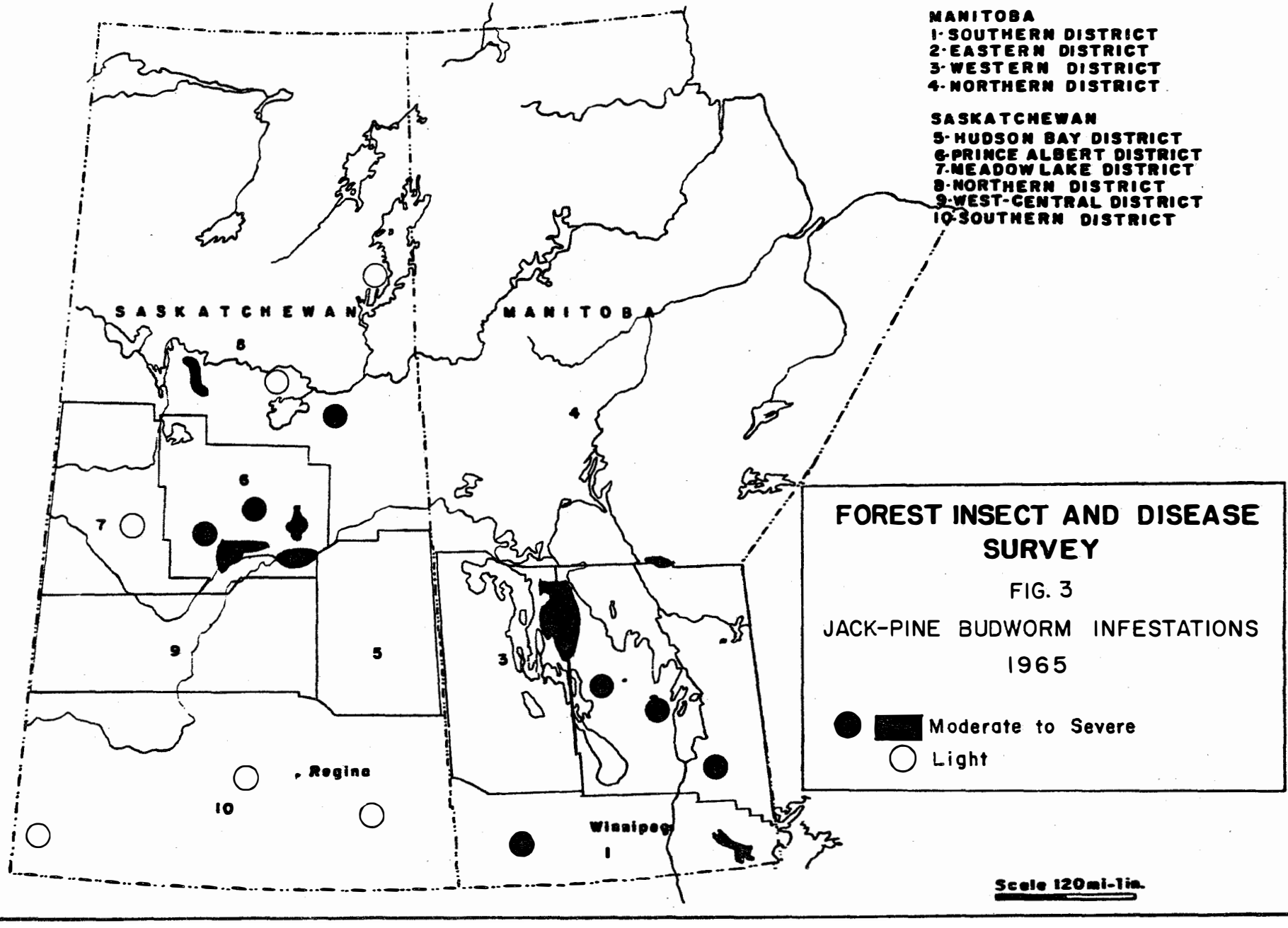
MANITOBA-SASKATCHEWAN REGION
FOREST INSECT AND DISEASE SURVEY

Fig. I
AERIAL SURVEYS - 1965

.....CHARTER
_____NON-CHARTER - Provided by Sask. and Man. Forest Service.

Scale 120 mi - 1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
1-SOUTHERN DISTRICT
2-EASTERN DISTRICT
3-WESTERN DISTRICT
4-NORTHERN DISTRICT
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FOREST INSECT AND DISEASE SURVEY
FIG. 2
SPRUCE BUDWORM INFESTATIONS
1965
Moderate to Severe
Light
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
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SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
8
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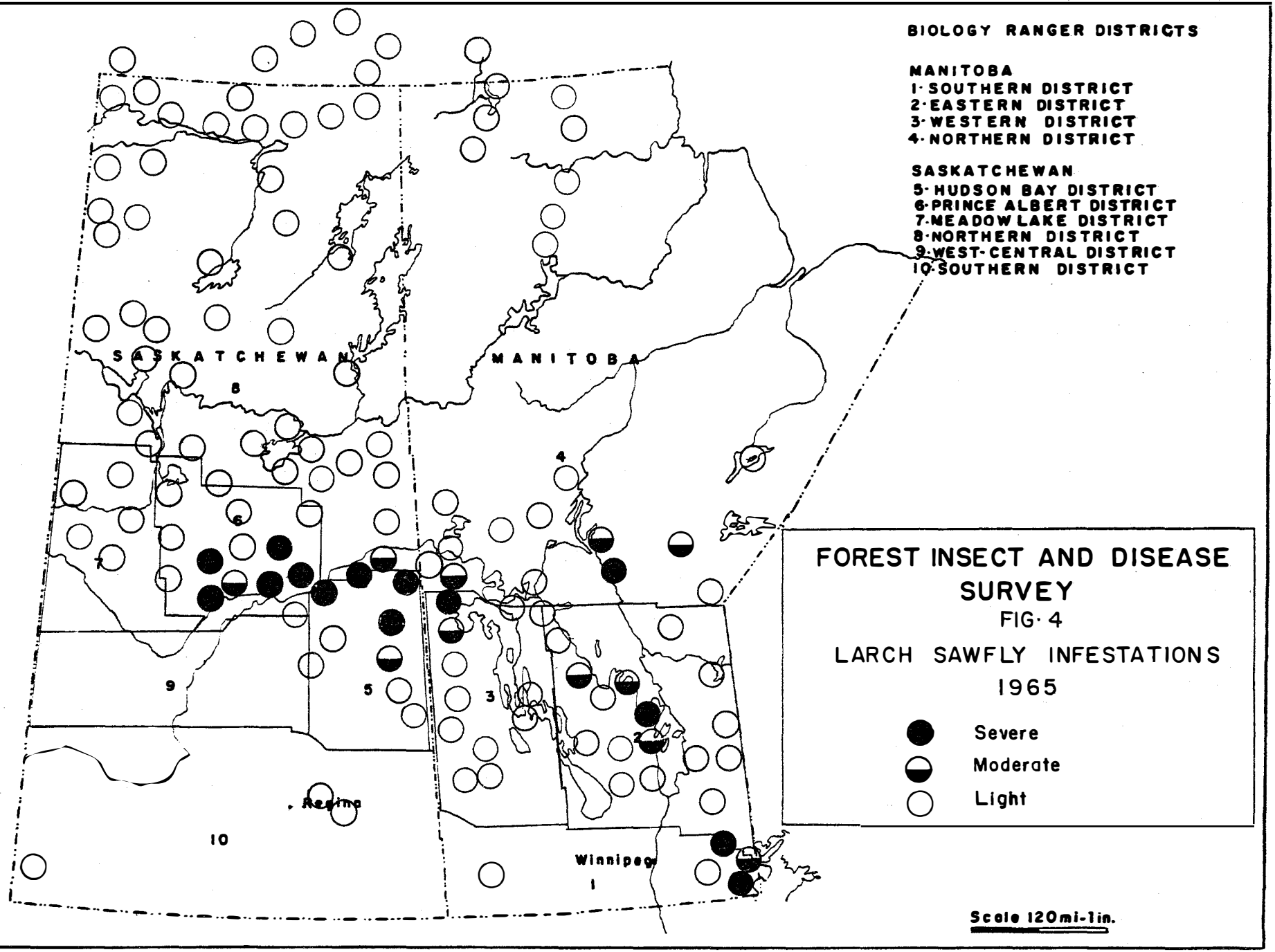
3
10
Regina
Winnipeg
1
FOREST INSECT AND DISEASE SURVEY
FIG. 3
JACK-PINE BUDWORM INFESTATIONS
1965
Moderate to Severe
Light
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
1-SOUTHERN DISTRICT
2-EASTERN DISTRICT
3-WESTERN DISTRICT
4-NORTHERN DISTRICT
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
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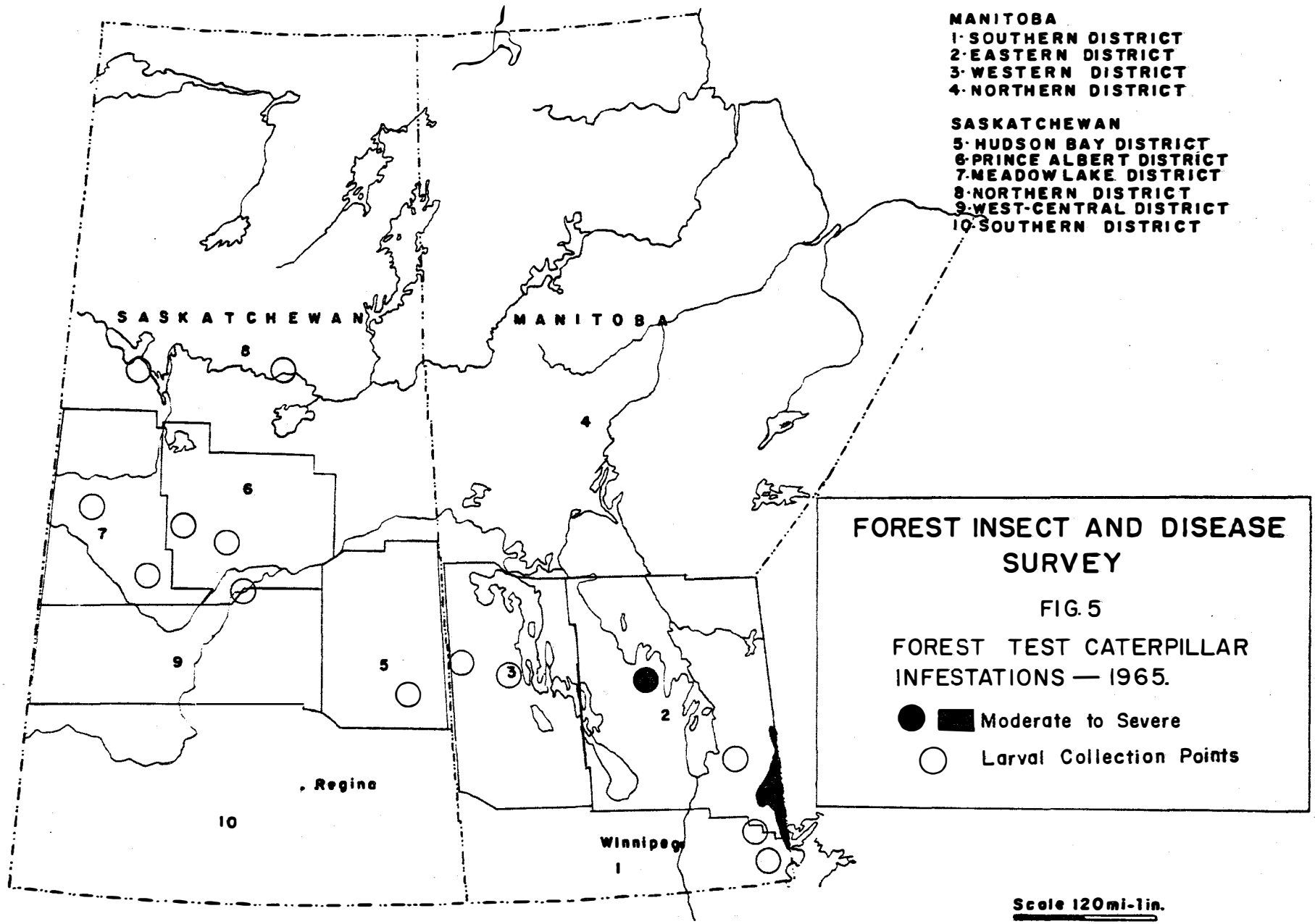
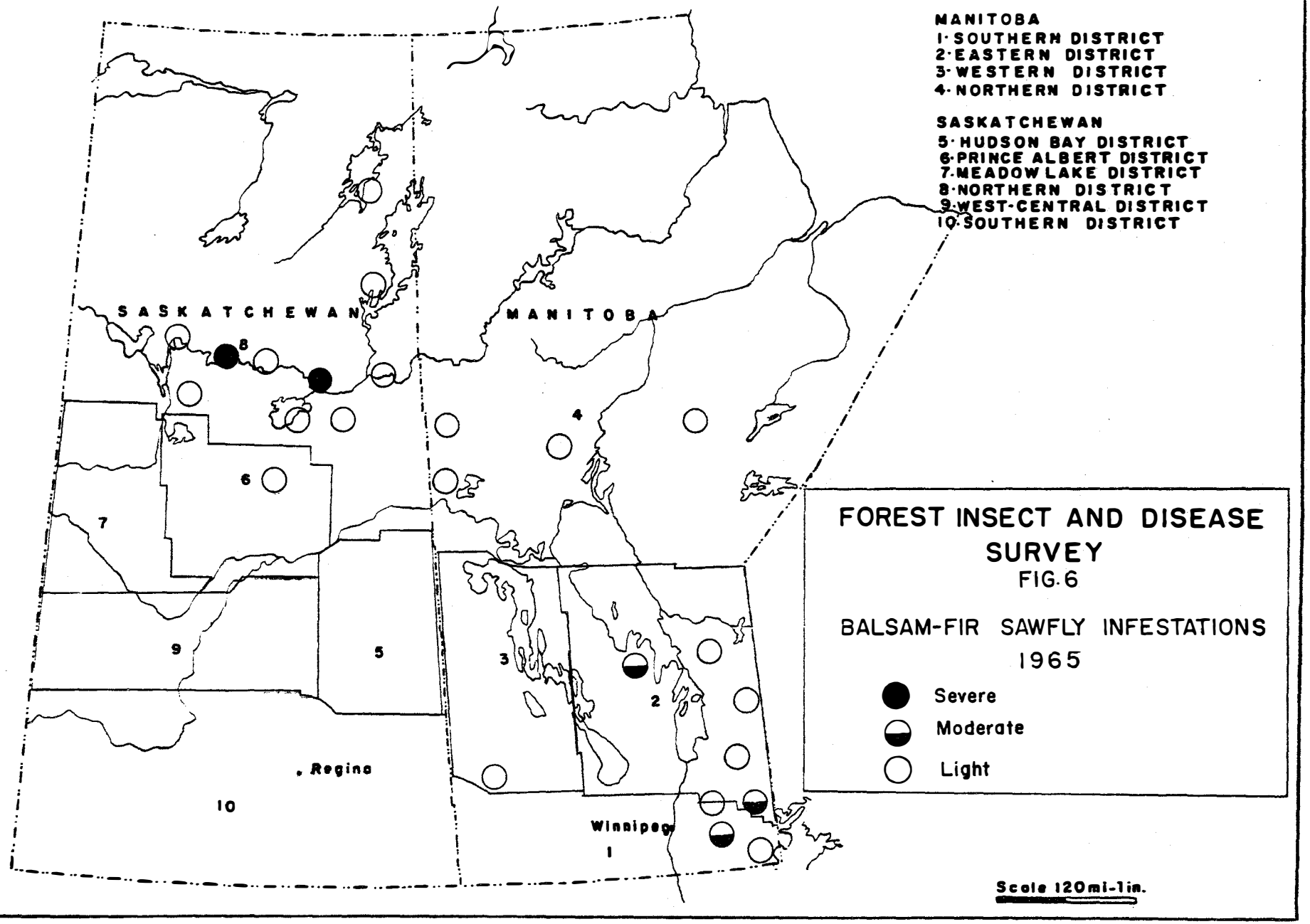
10
1
Regina
Winnipeg
FOREST INSECT AND DISEASE SURVEY
FIG. 4
LARCH SAWFLY INFESTATIONS
1965
Severe
Moderate
Light
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
1-SOUTHERN DISTRICT
2-EASTERN DISTRICT
3-WESTERN DISTRICT
4-NORTHERN DISTRICT
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOWLAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
8
4
6
7
9
5
3
2
Regina
10
Winnipeg
1
FOREST INSECT AND DISEASE SURVEY
FIG. 5
FOREST TEST CATERPILLAR INFESTATIONS — 1965.
Moderate to Severe
Larval Collection Points
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
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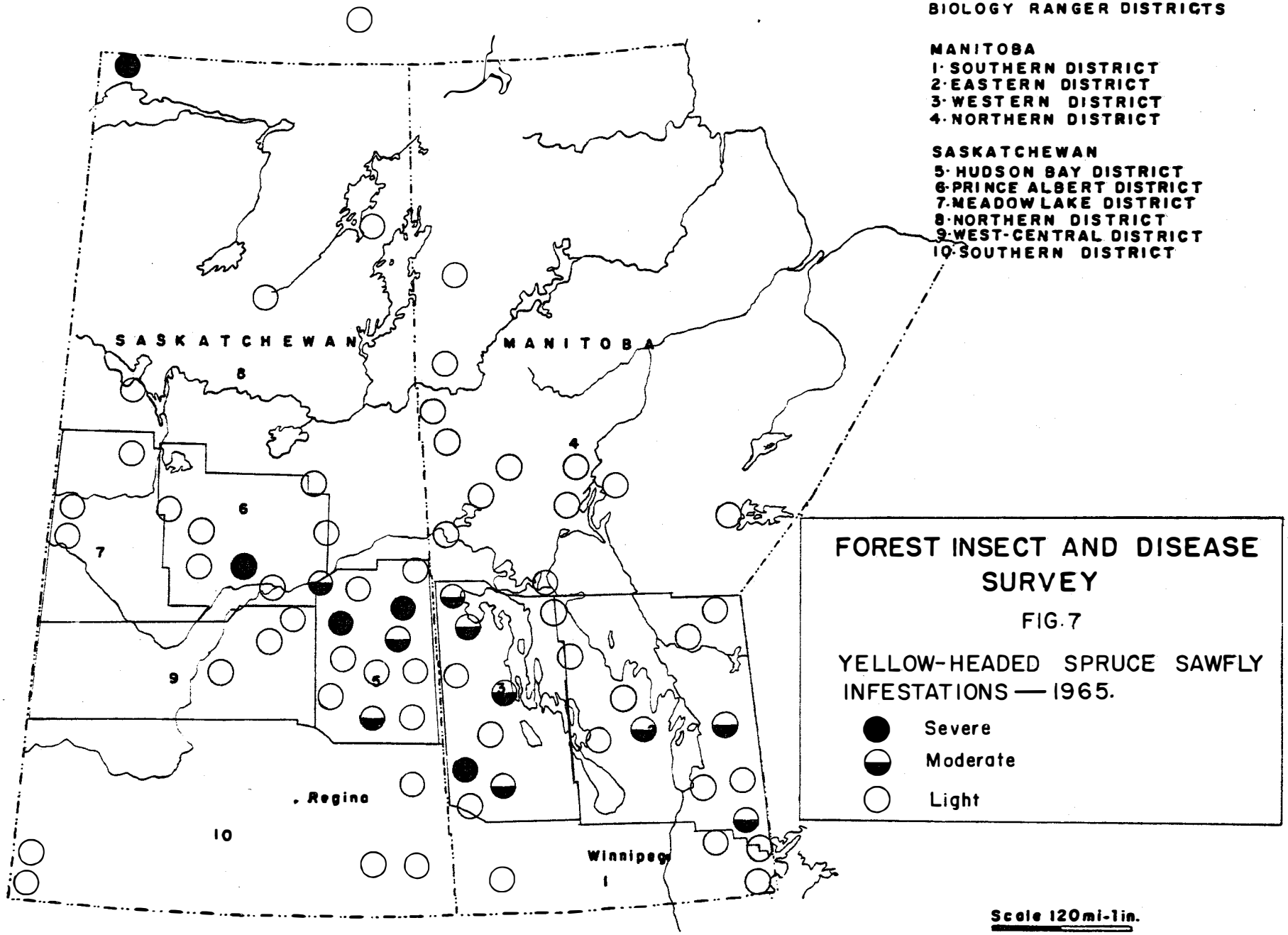
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FOREST INSECT AND DISEASE SURVEY
FIG. 6
BALSAM-FIR SAWFLY INFESTATIONS
1965
Severe
Moderate
Light
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
1·SOUTHERN DISTRICT
2·EASTERN DISTRICT
3·WESTERN DISTRICT
4·NORTHERN DISTRICT
SASKATCHEWAN
5·HUDSON BAY DISTRICT
6·PRINCE ALBERT DISTRICT
7·MEADOW LAKE DISTRICT
8·NORTHERN DISTRICT
9·WEST-CENTRAL DISTRICT
10·SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FOREST INSECT AND DISEASE SURVEY
FIG. 7
YELLOW-HEADED SPRUCE SAWFLY INFESTATIONS — 1965.
Severe
Moderate
Light
Scale 120mi-1in.

2. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT AND INTERLAKE SECTION OF MANITOBA

1965

by

A. E. Campbell

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

2.1 INTRODUCTION

Field surveys to determine the incidence of insects and diseases on forest, shelterbelt and shade trees were conducted from early May to late October, through the Interlake area of the Eastern District and the western part of the Southern District. Totals of 490 insects and 65 disease collections were submitted to the Winnipeg laboratory. In addition to general sampling and special collections and surveys, the following survey projects were continued: (1) forest tent caterpillar egg band counts to forecast population and infestation trends; (2) boxelder twig borer population counts; (3) Eucosoma gloriola studies re leader and lateral damage to young jack pine in the Sandilands Forest Reserve; (4) larch sawfly cocoon collections using the larval drop-tray method to determine the incidence of parasites and disease; (5) special larval and cocoon collections of the larch sawfly to determine the dispersal of the parasite Holocremnus sp. nr. nematorum from a central release point; (6) sequential sampling of larch sawfly egg populations to determine intensity of infestation; and (7) mistletoe broom counts in jack pine and black spruce stands to determine mortality of host trees.

Approximately 10 hours of chartered flying time were used for aerial reconnaissance of inaccessible areas and mapping infestations of the jack-pine budworm, forest tent caterpillar, and the larch sawfly. The co-operation and assistance received from personnel of the Renewable Resources Branch of the Department of Mines and Natural Resources is gratefully appreciated.

Cool, wet weather prevailed during most of May and June, and late spring frosts caused conspicuous damage to the foliage of most tree species, particularly in the Spruce Woods Forest Reserve. The most significant change in insect conditions was the near collapse of the forest tent caterpillar, and the marked expansion of the jack-pine budworm outbreak from approximately 600 square miles in 1964 to approximately 1700 square miles in the Interlake section. Infestations of the fall cankerworm declined notably and defoliation by the larch sawfly was light except for patches of moderate to severe from Washow Bay north to Pine Dock. Populations of the aspen leaf beetle were widespread with the highest number occurring in small localized areas in the central part of the Interlake. There was no change in the status of important diseases; Hypoxylon canker of trembling aspen occurred commonly in the forested and agricultural areas, and light to moderate needle rust infections were confined to the northern section of the Interlake.

2.2 INSECT CONDITIONS

2.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- This insect was found on most tamarack examined throughout the District, but it was more abundant on Hecla Island and north of Riverton through Beaver Creek to Pine Dock and west to the Mantago River, and in the vicinity of Annama, Kinawa and Fisher bays of the Interlake (Fig.1). Although it caused moderate to severe defoliation in localized patches, feeding damage was most conspicuous along the Pine Dock Road. Light feeding was recorded on individual trees along Highway No. 6 from Ashern, Grahamdale, Fairford, Gypsumville, Devils' Lake to Grand Rapids and between Hodgson through Lake St. George to Jackhead, Elsewhere larval populations remained at low levels.

Foliage production, leader and shoot growth was very good in all stands examined. Sequential sampling of egg populations was carried out in plot No. 101 north of Riverton and following are the results:

Location	Plot No.	No. of shoots examined	No. of curled shoots	Infestation rating 1965
Riverton	101	223	4	Light

A total of 1649 cocoons were collected from plot 101 to determine the incidence of parasites and disease. Subsequent dissections of 200 cocoons indicated that effective parasitism of larch sawfly larvae was 12.5 per cent by Bessa harveyi (T.T.) and three per cent by Mesoleius tenthredinis Morley.

2.2.2. JACK PINE BUDWORM, Choristoneura pinus Free:- The previous infestation centered in tp. 38, rge. 12, W.P. mer. in the Interlake expanded and increased in severity. No change was recorded in the Rosenberg infestation, and a small but severe infestation persisted in jack and Scots pine plantations near Shilo in the Spruce Woods Forest Reserve (Figure 2).

Aerial surveys and periodic ground checks of jack pine stands between Gypsumville and Grand Rapids indicated a marked expansion from approximately 600 to 1700 square miles, within which defoliation was moderate to severe on mature and light to moderate on young trees. Moderate to severe defoliation was also observed from the air on individual trees in small localized stands east and south of Lake St. Martin in tp's. 27 and 28, rge's. 5 and 6, W.P. mer. In the Rosenberg area moderate feeding damage was confined to mature trees through the area, and for the second consecutive year, moderate to severe defoliation was recorded in jack pine and light to moderate in Scots pine plantations covering 200 to 300 acres

near Shilo in the Spruce Woods Forest Reserve.

Forest fires have occurred at intervals during past years throughout much of the Interlake section and as a result, stands of jack pine are not continuous but generally occur in patches ranging in size from 1 to 300 acres and consisting of one or more age classes.

Observations of natural control factors of budworm populations were made periodically through the infestation, but none were detected. Two special collections of late instar larvae and pupae were made to determine, by rearing, the incidence of parasites and disease, but the results are not available at this writing.

2.2.3. PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- Light infestations were recorded on jack pine at Hodgson, Gypsumville, Grand Rapids and in the Spruce Woods Forest Reserve. Similar infestations occurred on white spruce at Reston, Killarney, Holland, Hnausa, Hecla Island, Mantago Lake, Spruce Woods Forest Reserve, East Kildonan Park in Metropolitan Winnipeg, and on black spruce at Riverton, Fairford, Grand Rapids and Hodgson.

2.2.4. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- A small but severe infestation affecting approximately 250 acres of mature and young spruce and balsam fir was detected on Little Moose Island in Lake Winnipeg. Small numbers of larvae were also taken from white spruce and balsam fir at Dallas, Rosenberg, Carberry and in the Spruce Woods Forest Reserve, but defoliation was negligible.

2.2.5. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- The heaviest larval concentrations occurred on black spruce between Washow Bay and Hodgson where light to moderate feeding damage was recorded. Light defoliation was also noted at Dallas, Red Rose, Lake St. George, Gypsumville, Grand Rapids and in the Spruce Woods Forest Reserve.

2.2.6. BALSAM FIR SAWFLY, Neodiprion abietis complex:- Populations decreased in all areas except between Dallas, Red Rose and Lake St. George. However, feeding on the old foliage of white spruce and balsam fir in these areas was light.

2.2.7. FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- The severe infestation between Lake St. George and Lake St. Andrew in the Interlake section all but terminated. The infestation was reduced to approximately 600 acres and is centered at Lake St. George tower site. Feeding damage through the remaining infestation area was moderate to severe, but occurred mostly in localized patches. Elsewhere in the District no collections were made.

The decline was probably due to starvation in the early part of the season caused by retarded foliage development, and to the increased numbers of the parasitic fly Sarcophaga aldrichi Park.

Mass collections of late instar larvae and pupae were made to determine the incidence of parasites and disease.

Egg band surveys were carried out at predetermined sampling points to predict the extent and severity of defoliation in 1966, and the results are shown in the following table.

TABLE I

Forest Tent Caterpillar Egg-band Surveys

Interlake Section of Manitoba - 1965

(Based on the examination of 3 co-dominant trembling aspen trees at each sampling point.)

Location	Av.d.b.h. of trees (inches)	Av. ht. of trees (feet)	Av. Crown depth (feet)	Av. no.of egg bands per tree	Defoliation forcast for 1966.
Riverton	2	21	17	0.0	Nil
Hodgson	2	26	17	0.0	Nil
Red Rose	3	33	18	0.0	Nil
Lake St. George	7	46	15	0.3	Light
Lake St. George	5	42	22	0.3	Light
Lake St. George	2	25	14	0.3	Light
Lake St.Andrew	9	57	15	0.3	Light
Jackhead	2	29	19	0.0	Nil
Hodgson	2	26	15	0.0	Nil
Calders Dock	3	25	15	0.0	Nil
Gimli	2	28	15	0.0	Nil
Stonewall	3	31	21	0.0	Nil
Ashern	3	32	20	0.0	Nil
Grahamdale	4	33	20	0.0	Nil
Gypsumville	4	37	24	0.0	Nil
Grand Rapids	3	31	19	0.0	Nil
Eriksdale	3	30	21	0.0	Nil
Inwood	2	29	21	0.0	Nil
Holland	3	32	19	0.0	Nil
Selkirk	3	30	19	0.0	Nil
Charleswood	2	27	17	0.0	Nil

2.2.8. THE FALL CANKERWORM, Alsophila pometaria (Harr.):- Populations of this insect were much lower than in 1964. Although there was no evidence that the cold weather and late spring frosts had any serious effects on foliage growth of white elm, Manitoba maple and green ash, these factors may have retarded early larval development and contributed to the over-all decline of populations.

Generally light defoliation was recorded in shelterbelts in the Lyleton area and along the Red River from Selkirk to Emerson including the park areas of Metropolitan Winnipeg. However, patches of moderate to severe defoliation of white elm and Manitoba maple and light shot hole damage to white ash was conspicuous in localized areas. Light defoliation of Manitoba maple also occurred at Carberry. The spring cankerworm Paleacrita vernata (Peck) occurred in small numbers with the fall cankerworm, but it was not possible to determine the extent of feeding damage that it caused.

2.2.9. BOXELDER TWIG BORER, Proteoteras willingana (Kft.):- Light populations and light twig damage was present on most Manitoba maple examined in farm shelterbelts and parks through the District. Population counts were continued at three locations and the results are shown in Table 3.

TABLE 3

Boxelder Twig Borer Population Counts

Southwestern Manitoba - 1965

(Based on examination of four branches 36-inches long from three crown levels of five trees at each sample plot.)

Location	Av. ht. (ft.)	Av. crown depth (ft.)	Av. crown width (ft.)	No. of Twigs Examined and Twig Borer Populations by Crown Levels					
				Lower		Mid.		Upper	
				No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Holland	27.6	25.2	11.6	570	35	792	64	931	113
Sidney	16.6	14.0	6.8	478	12	780	32	669	35
Souris	17.6	14.2	8.4	453	23	546	50	712	77

2.2.10. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- The insect occurred commonly on trembling aspen and occasionally on balsam poplar throughout most of the District, but the highest populations were recorded between Narcisse and Chatfield and west of Gimli, in the Interlake. Feeding damage in these areas ranged from moderate to severe in localized patches. Elsewhere, light leaf skeletonizing on individual trees was observed at Fairford, Warren, Hodgson, Riverton, Fraserwood, Inwood, Woodlands, Ashern and Devil's Lake in the Interlake area. Small numbers of adults and larvae were also taken from trembling aspen throughout agricultural areas in the vicinity of Poplar Point, Brandon, Portage la Prairie, Oak Lake, Souris, Deleau, Glenboro and the Spruce Woods Forest Reserve.

2.2.11. FALL WEBWORM, Hyphantria cunea (Drury):- Populations of this insect remained at about the same level as in 1964. Light to moderate defoliation was confined to individual white birch, willow and dogwood, in the forested areas near Washow Bay, Pine Dock and Lake St. George in the Interlake section and light on caragana and Manitoba maple shelterbelts at Scarth in the agricultural area of southwestern Manitoba.

2.2.12. ASPEN BLOTCH MINER, Lithocalletis salicifoliella Cham.:- Occurred commonly on young trembling aspen but caused noticeable leaf mining on individual trees throughout the Interlake section. Highest larval concentrations were recorded in the vicinity of Gimli, Stonewall and Camp Morton where damage ranged from light to moderate.

2.2.13. ASPEN WEBWORM, Tetralopha asperatella (Clem.):- This insect was present on most tembling aspen examined during the latter part of the season. Light to moderate webbing of foliage was noted in the vicinity of Stonewall, Teulon, Meleb, Lundar, Oakview, Riverton, and light at Hodgson, Mantago Lake and Hecla Island.

2.2.14. LEAF ROLLERS ON TREMBLING ASPEN, Tortricid spp:- Several species of leaf rollers were recorded throughout the forested and agricultural areas. Light to moderate foliage damage occurred in isolated patches at Warren, Woodlands, Riverton, Gimli, Middlechurch, Lake St. Andrew, Carberry and the Spruce Woods Forest Reserve. The species of leaf rollers occurring in order of abundance were: Sciaphila duplex Wlshm.; Archippus packardianus Fern.; Pandemis canadana Kft.; Choristoneura rosaceana Harr. and Gracillaria negundella Cham.

2.2.1[illegible] OTHER NOTEWORTHY INSECTS

Insect	Host(s)	Locality	Remarks
Acleris variana (Fern) (Black-headed budworm)	Spruce, white	Hodgson, Riverton, and Spruce Woods Forest Reserve	Low populations; no noticeable damage.
Acrobasis betulella Hlst. (Birch tube maker)	Birch, white and willow	Rosenberg, Riverton, Dallas and Gypsumville	Light infestations on scattered trees.
Altica populi Brown (A flea beetle)	Poplar, balsam	Gimli, Stonewall, Komarno, Deloraine, Hartney, Little Moose Island and Turtle Mountain Provincial Park	Light populations; light skeletonizing in localized areas.
Chermes lariciatus (Patch) (A gall aphid)	Spruce, white	Lake St. George, Gypsumville and Spruce Woods Forest Reserve	Light increase in populations; no conspicuous damage.
Corythucha arcuata (Say) (The oak lacebug)	Oak, bur	Woodlands, Morris, Silver Plains, Killarney and St. Jean Baptiste	Light to moderate feeding damage caused curling, whitening, and then browning of foliage.
Croesus latitarsus (Nort.) (Dusky birch sawfly)	Birch, white	Riverton, Camp Morton and Killarney	Light populations; no serious damage.
Gonioctena americana (Schaef.) (American aspen beetle)	Aspen, trembling	Hodgson, Chatfield, and Clandeboye	Populations decreased; no appreciable defoliation.
Lecanium coryli L. (Lecaniine scale)	Elm, white	Selkirk, Glenboro, Holland, Sidney, Middlechurch and Parks of Metropolitan Winnipeg	Light infestations; no conspicuous damage observed.

2.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Macremphytus varianus (Nort.) (A sawfly)	Dogwood	Inwood, Fraserwood, Rosenberg and Hecla Island	Light to moderate defoliation in localized areas.
Malacosoma lutescens (N. and D.) (Prairie tent caterpillar)	Chokecherry	Carberry, Melbourne and Spruce Woods Forest Reserve	Light populations; no serious damage observed.
Nepytia canosaria (Wlkr.) (False hemlock looper)	Spruce, white	Carberry, Brandon Jct. and Spruce Woods Forest Reserve	Increased populations; light defoliation on individual trees.
Nymphalis antiopa (L.) (Mourning-cloak butterfly)	Aspen, trembling and willow	Lake Francis and Argyle	Light defoliation on individual trees.
Oligonychus ununguis (Jacot) (Spruce spider mite)	Spruce, white	Killarney and parks in Metropolitan Winnipeg	Low populations; no serious damage.
Phyllocnistis populiella Cham. (Aspen leaf miner)	Aspen, trembling and poplar, balsam	Gimli, Camp Morton, Deleau, Winkler and Warren	Light mining damage to young growth.
Phytophaga rigidae (Osten Sacken) (Willow beaked-gall midge)	Willow	Deloraine, Pipestone, Cartwright, St. Laurent, Mantago Lake, Warren, and Beaver Creek	Low populations; twigs lightly infested
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white	Lake St. George, Melita, Carberry and Turtle Mountain Provincial Park	Light defoliation on individual trees.
Rhabdophaga strobiliodes (Walsh) (Willow cone gall midge)	Willow	Pipestone, Cartwright, Chatfield, Warren and Turtle Mountain Provincial Park	Common in some areas; light infestation.

2.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Saperda calcarata Say. (Poplar borer)	Poplar, balsam	Beaver Creek	Low populations; light damage.
Saperda concolor Lec. (Poplar gall saperda)	Poplar, balsam and willow	Deloraine, Pipestone, Boissevain, Cartwright, Hodgson and Turtle Mountain Provincial Park	Common in all areas; light twig damage.
Saperda moesta Lec. (Poplar twig borer)	Poplar, balsam	Little Moose Island and Turtle Mountain Provincial Park	Low populations; no serious damage.
Saperda tridentata Oliver. (Elm borer)	Maple, Manitoba, elm, white and oak, bur	Otterbourne, Winnipeg, Killarney, La Riviere and Carberry	Individual trees attacked; light to moderate infestations.
Semiothisa spp. (Loopers)	Pine, jack and tamarack	Grand Rapids, Hodgson, Gypsumville and Mantago Lake	Low populations; no serious defoliation observed. S. bicolorata Fabr. on jack pine and S. sexmaculata Pack. on tamarack.
Toumeyella numismaticum (Pettit and McDaniel) (Pine tortoise scale)	Pine, jack	Hodgson, Rosenberg and Red Rose	Light infestations on young trees.

2.3 DISEASE CONDITIONS

2.3.1. MISTLETOE OF JACK PINE, Arceuthobium americanum Nutt.:- Localized patches of light to moderate infections were observed in mature jack pine stands approximately ten miles south of Grand Rapids, and in the vicinity of Devils and Chitek lakes. The infected stands ranged in size from one to fifty acres, and dead trees supporting one or more brooms were common.

2.3.2. EASTERN DWARF MISTLETOE, Arceuthobium pusillum Pk.:- Moderate to severe infections occurred in black spruce stands on Hecla Island, in the northern section of the Interlake, and on white spruce at Devils Lake and the Spruce Woods Forest Reserve.

Heaviest concentrations of mistletoe brooms occurred in black spruce stands covering approximately 1020 acres at the southwest end of Hecla Island and within 250 acres along the Pine Dock road in sec. 19, tp. 28, rge. 5, E.P. mer. Cruise strip counts taken on four and one-half acres at the latter location indicated that about 74 per cent of the trees were infected and five per cent were dead.

Moderate infections on individual white spruce was observed about ten miles north of Glenboro in the Spruce Woods Forest Reserve, and one-half mile south of Devils Lake in the Interlake. No tree mortality was observed, but an occasional dead broom was observed on living trees in both areas.

2.3.3. HYPOXYLON CANKER, Hypoxylon pruinatum (Klotsche) Cke:- This disease occurred in all trembling aspen stands examined. It was most common in the agricultural areas of southwestern Manitoba and in the settled areas of the Interlake section. Damage ranged from light to moderate and occasionally moderate to severe in localized areas. Light to moderate infection was general in areas surrounding Fairford, Clarkleigh, Mantago Lake, Oakview and in the Spruce Woods Forest Reserve. Localized patches of moderate to severe occurred at Woodlands, Fraserwood, Inwood, Sandford and Gimli.

Counts in a sixty-year-old stand west of Gimli covering two acres showed that 40 per cent of the 1202 trees checked were infected and 15 per cent were dead.

2.3.4. OTHER NOTEWORTHY DISEASES

Organism and Disease	Host(s)	Locality	Remarks
Chrysomyxa ledi de Bary (Needle rust)	Spruce, white and spruce, black	Riverton, Beaver Creek, Gypsumville and Hecla Island	Light to moderate infection in localized patches.
Cronartium comandrae Peck (Comandra rust of jack pine)	Pine, jack	Red Rose	Light infections in localized patches.
Cytospora chrysosperma (Pers.) Fr. (Cytospora canker)	Aspen, trembling	Argyle	Light infection.
Discula quercina (Westd.) Arx. (Leaf spot)	Oak, bur	Winnipeg	One collection; no serious damage recorded.
Drepanopeziza populorum (Desm.) V. Hohn (Leaf spot)	Aspen, trembling	Souris and Deleau	Very light infection.
Fomes pinicola (Swartz ex Fr.) Cke (Brown cubical rot)	Fir, balsam	Little Moose Island	One collection, light infection.
Hypsizygus tessellatus (Bull. ex Fr.) Sing. (Mushroom)	Maple, Manitoba	Holland	Light infection on individual trees.
Melampsora abietcapraearum Tub. (Leaf rust)	Willow	Riverton	Very light damage to foliage.
Melampsora bigelowii Thuem. (Larch-willow rust)	Tamarack and willow	Riverton and Lake Francis	Scattered patches of light infection.
Melampsora medusae Thuem. (Leaf rust)	Aspen, trembling	Fraserwood, Deleau and Souris	Light infection.

2.3.4. OTHER NOTEWORTHY DISEASES (CONT'D)

Organism and Disease	Host(s)	Locality	Remarks
Nothophacidium abietinellum (Dearn.) Reid and Cain (Snow blight)	Fir, balsam	Little Moose Island	Very light damage to the foliage.
Peridermium harknessii J.P. Moore (Western gall rust)	Pine, jack	Gypsumville, Grand Rapids, Dallas, Fairford and Easterville	Common in localized areas; no serious damage observed.
Pestalozzina unicolor (Berk. and Curt.) Sacc. (Leaf spot)	Oak, bur	Winnipeg	Light infection.
Pollaccia radiosa (Lib.) Bald. and Cif. (Leaf and twig blight of poplar)	Aspen, trembling	Woodlands, Poplarfield and Lake Francis	Occurred commonly; light to moderate infection in localized areas.
Puccinia peridermiospora (Ell. and Fr.)Arth. (Ash rust)	Ash	Lyleton.	Light infection in one area.
Rhizosphaera pini (Corda) Maubl. (Needle cast)	Fir, balsam	Little Moose Island	Light infection on young trees.
Rhytisma salicinum Pers. ex Fr. (Tar spot)	Willow	Camp Morten and Souris	Light damage to foliage.
Sclerophoma pithyophila (C'da) Hohn. (Snow blight)	Pine, Scots	Spruce Woods Forest Reserve	Light infection on foliage.

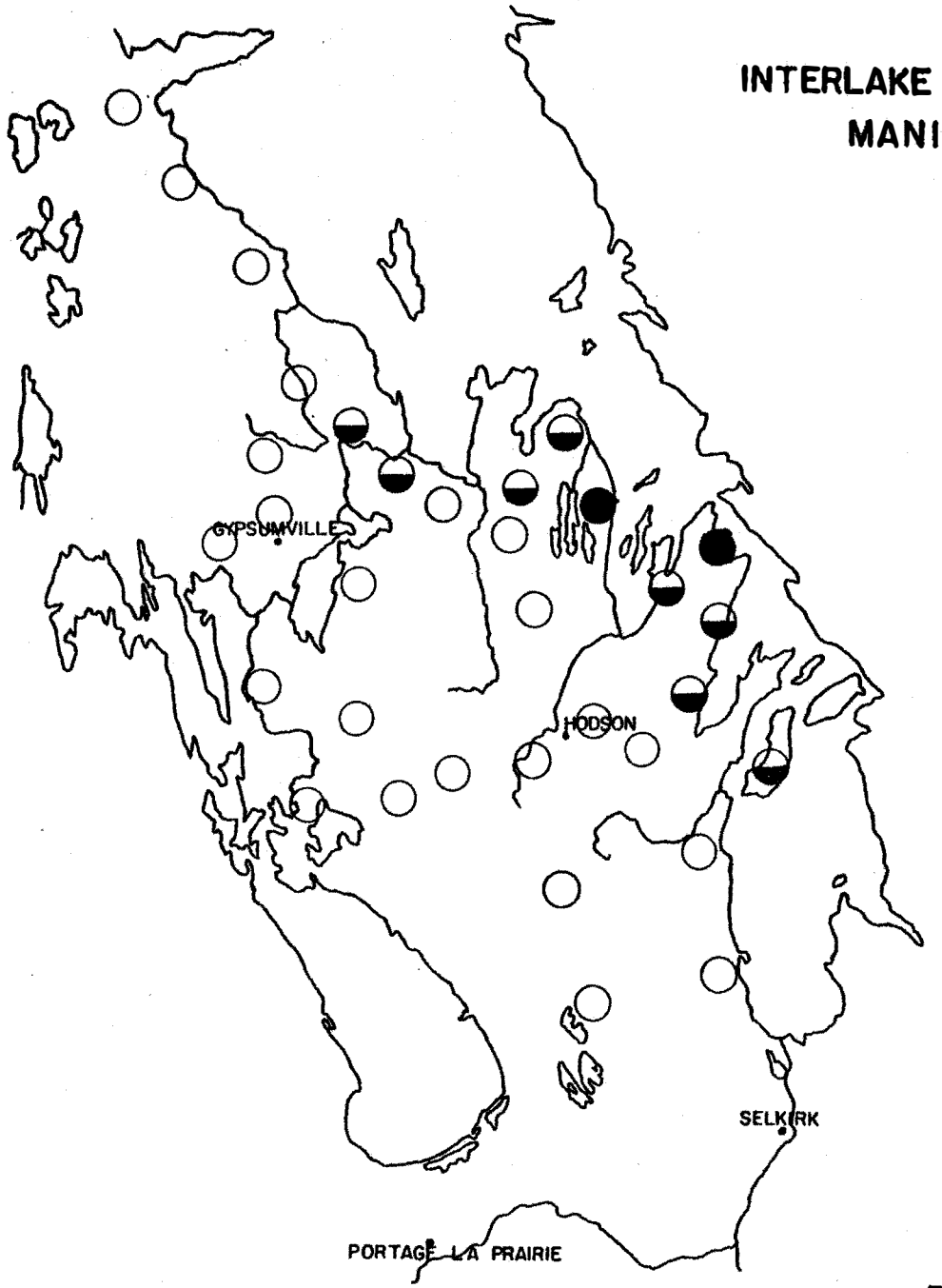


FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS – 1965.

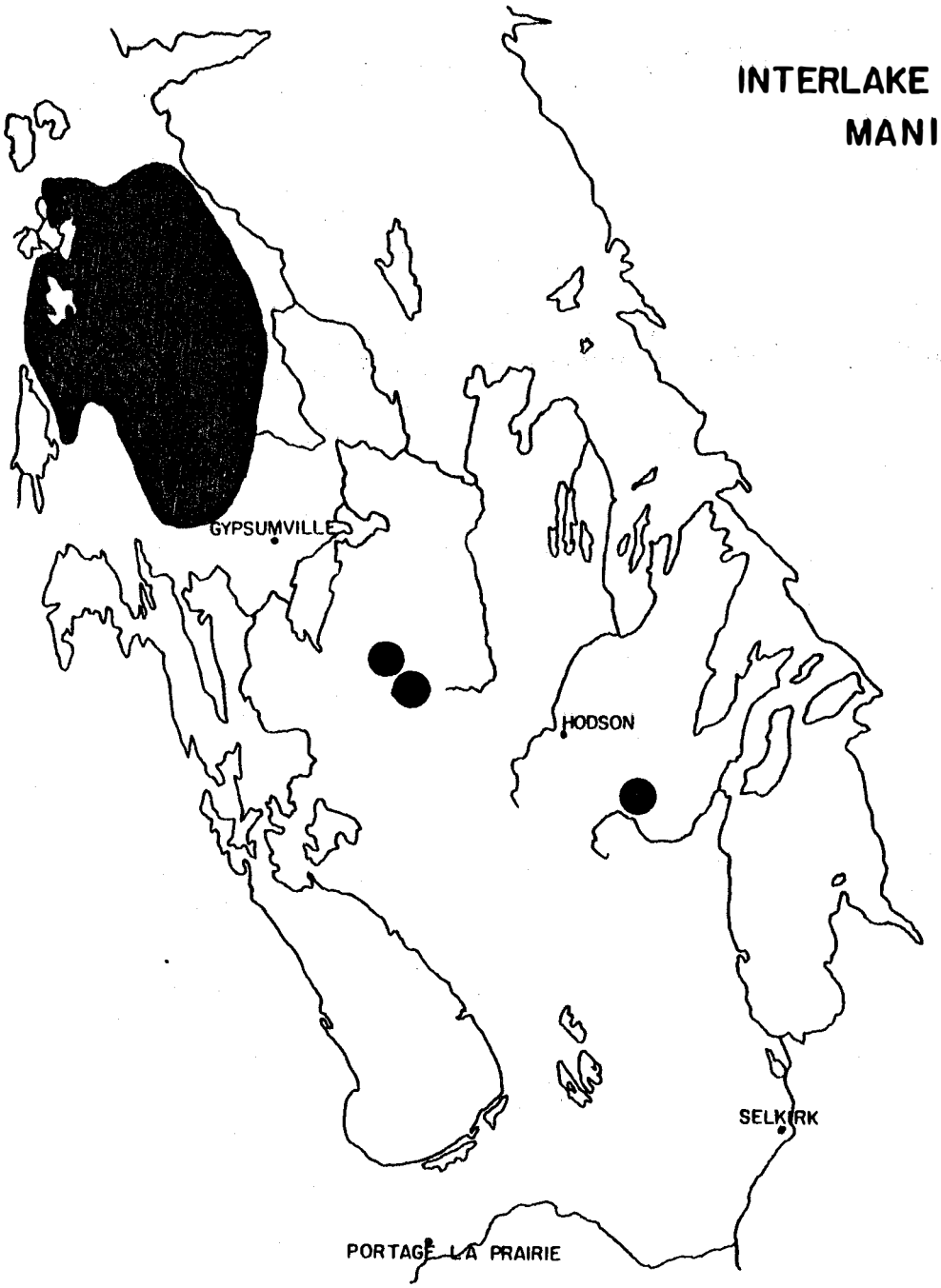
LIGHT

MODERATE

SEVERE

20 0 20 40

SCALE: 1 in. equals 32 mi.



FIG·2

JACK PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965·

AREAS OF CONTINUOUS MODERATE TO SEVERE DEFOLIATION.

20 0 20 40

SCALE: 1 in. equals 32 mi.

3. ANNUAL DISTRICT REPORT

EASTERN MANITOBA

1965

by

K. L. Mortensen

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

3.1 INTRODUCTION

This report covers the area of Eastern Manitoba lying east of the Red River and Lake Winnipeg from the United States border north to Norway House, Gunisao and Elliot lakes.

During the period from mid-May to mid-October totals of 548 insect and 145 disease samples were submitted to the Forest Research Laboratory in Winnipeg. Approximately 20 hours of aerial surveys were conducted to reach inaccessible areas for mapping insect outbreaks. Of this, ten hours were supplied by the Manitoba Government Air Services through the Department of Mines and Natural Resources.

A number of mass collections of insects were made for parasite studies; these included the forest tent caterpillar, prairie tent caterpillar, eastern tent caterpillar, jack-pine budworm, yellow-headed spruce sawfly, larch sawfly and a leaf roller on Manitoba maple.

Strip cruises were carried out to determine the extent and severity of the pine shoot moth in the Sandilands Forest Reserve and of mistletoe brooms on jack pine in the Belair Forest Reserve.

Four major insect infestations occurred in the area surveyed: the forest tent caterpillar continued to completely defoliate aspen throughout much of the southeastern part of the Whiteshell Provincial Park; the jack-pine budworm caused moderate to heavy defoliation of jack pine stands in the Piney-Badger-Sandilands area, in the Belair Forest Reserve north of Stead and between Weaver and Many Bays lakes in the northern part of the District; the larch sawfly was again heavy in tamarack stands throughout the Hadashville - East Braintree - Falcon Lake area; and a number of Manitoba maple shelterbelts in the Ile Des Chene - Niverville area were moderately defoliated by the leaf roller, Archips negundana Dyar. Other insects occurring commonly throughout the District but causing no widespread damage, were: the yellow-headed spruce sawfly, the balsam-fir sawfly, the pine shoot moth, pine sawflies, pine needle scale, fall webworm and eastern and western tent caterpillars.

The most widespread annual diseases were the aspen leaf and twig blight, Pollaccia radiosa (Lib.) Bald. Cif., which was general on aspen reproduction, and the spruce needle rust Chrysomyxa ledicola Lagerh. , also general on most young black spruce. The most common perennial diseases were; the globose rust gall, Peridermium harknessii

J.P. Moore, which was common throughout most jack pine stands in the Sandilands and Belair Provincial Forests; heavy infections of jack pine mistletoe caused by Arceuthobium americanum Nutt. in the Belair Provincial Forest and black spruce mistletoe, Arceuthobium pusillum Pk. on black spruce in the East Braintree - Hadashville area.

3.2 INSECT CONDITIONS

3.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Larch sawfly populations continued to increase throughout the area surveyed (Figure 1). High populations and resultant heavy defoliation occurred in tamarack stands in the Hadashville - Falcon Lake - Whitemouth Lake area. Moderate defoliation occurred in many tamarack swamps throughout the Northwest Angle Forest Reserve extending south along the Reed River. In the Northern District, heavy defoliation was observed near the mouths of the Mukutawa and Belanger rivers, and moderate defoliation in the Bennett Lake - Gunisao Lake area. An increase in populations was noted in most other accessible tamarack stands, but defoliation was generally light.

Sequential sampling of larch sawfly egg populations was continued at four locations, with the following results:

Location	Plot No.	No. of shoots examined	No. of shoots curled	Infestation rating - 1965
Pointe du Bois	109	60	0	light *
Telford	102	90	4	light
Agassiz	110	50	0	light
Piney	102	50	0	light

* light represents from 0-35 per cent defoliation.

A total of 114 larvae were dissected from cocoons collected in plot 109 at Pointe du Bois. Effective parasitism of the larch sawfly larvae was 30 per cent by Bessa harveyi (T.T.) and nil by Mesolieus tenthredinis Morley. Approximately four per cent of the larvae contained encapsulated eggs of the M. tenthredinis Morley.

3.2.2. JACK-PINE BUDWORM, Choristoneura pinus Free.:- The jack-pine budworm continued to increase and three separate, severe infestations were mapped (Figure 2). The largest, covering approximately 136 square miles, was in the Sandilands Forest Reserve running from Piney to the Marchand Ranger Headquarters. Although this area consists mainly of jack pine, some of the Scots pine plantations were also moderately defoliated. In the Belair Forest Reserve, the infestation boundaries increased encompassing most of the jack pine in the reserve from the hamlet of Stead, north for about 10 miles. In the northern part of the Eastern District, a small but severe infestation involving about 26 square miles, occurred between Weaver and Many Bays lakes.

In addition, larvae were collected at the following points, but no appreciable defoliation was recorded: West Hawk Lake, Hadashville, Sprague, Caddy Lake and Berens River.

3.2.3. BALSAM-FIR SAWFLY, Neodiprion abietis complex: - Populations of the balsam-fir sawfly declined in 1965. Larvae were common throughout the Eastern and Southern Districts, but defoliation was generally very light. Moderate defoliation of occasional branches occurred on a few scattered black spruce trees at East Braintree and Rennie, and on white spruce at White Lake and Spruce Siding.

3.2.4. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Populations remained much the same as in 1964; very light defoliation occurred at many scattered points throughout the region surveyed but serious defoliation was confined to individual white and black spruce along roadsides and around summer cottages. Such instances were noted at White Lake, Rennie, Sasaginnigak Lake, Spruce Siding and East Braintree.

3.2.5. PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- Very light populations occurred in mature stands of jack pine and white and black spruce at East Braintree, Stead, Victoria Beach, Belair, Pine Falls, Sprague and Eaglenest, Caddy, Falcon and Moose lakes.

3.2.6. SAWFLIES ON JACK PINE, Neodiprion spp.:- The most common species of sawfly attacking pine in the area surveyed was N. virginianus complex. Twenty-two collections were made from 14 different localities. N. nanulus nanulus Schedl. was collected from jack pine at Moose Lake, Garner Lake and Pine Falls; N. maurus Roh. from Betula and Wallace lakes, and N. banksianae Roh. from Big Whiteshell Lake.

3.2.7. WHITE-PINE WEEVIL, Pissodes strobi (Peck):- Low populations were widely scattered throughout the jack pine stands in the region surveyed. A light attack occurred on black spruce in the vicinity of Cat Lake, and in a mixed pine plantation at Buchan. In the latter, Scots pine was more commonly attacked than jack pine.

3.2.8. PINE WEBWORM, Tetralopha robustella Zell.:- Low populations were widely scattered throughout the area, but damage was light and generally confined to jack pine regeneration. Attacks on jack pine seedlings caused some concern among Forestry Research workers in the Piney area.

3.2.9. FOREST TENT CATERPILLAR, Malacosma disstria Hbn.:- Severe infestations were confined mainly to the Whiteshell Provincial Park. Heavy defoliation of deciduous trees occurred along the Manitoba-Ontario boundary from Shoal Lake north to Snowshoe Lake, a distance of approximately 65 miles. The western perimeter of the infestation extended through Waugh, West Hawk Lake, Caddy Lake, along the Whiteshell and Winnipeg rivers north to Bird Lake and Snowshoe Lake (Figure 3).

Patches of light to moderate defoliation occurred around the shores of Gem and Garner lakes to the north of the main infestation, and larval collections were made elsewhere at Moose Lake, Hadashville, Whitemouth and Pine Falls.

The infestations reported in 1964 in the Manigotagan, Bear River, Bisset and Aikens, Carroll and Dogskin lakes area collapsed. Similar declines were also noted in the area around Pointe du Bois and west of Bird Lake.

Egg surveys conducted in late fall indicate that moderate defoliation will continue in 1966 in the Falcon-West Hawk-Big Whiteshell lakes area, barring the effects of adverse weather or other factors. A summary of the egg-band counts is shown in Table 1.

TABLE I

Forest Tent Caterpillar Egg-Band Survey Records - 1965

Eastern Manitoba

(Based on the examination of three co-dominant trembling aspen at each point.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown depth (ft.)	Av. No. of egg-bands per tree	Defoliation forecast 1966
West Hawk Lk.	4.0	28.0	15.0	24.6	Severe
West Hawk Lk.	4.0	27.6	12.3	10.3	Moderate
West Hawk Lk.	5.0	34.3	19.0	20.3	Severe
White Lake	5.2	35.6	17.6	25.6	Severe
Falcon Lake	3.3	30.0	15.0	0.3	Light
Falcon Lake	3.3	30.0	15.0	0.3	Light
Falcon Lake	4.6	30.6	14.6	11.6	Moderate
Falcon Lake	3.3	28.3	16.3	1.3	Light
Falcon Lake	4.3	26.6	19.6	0.3	Light
Falcon Lake	4.0	29.3	23.0	0.0	Nil
Caddy Lake	3.6	29.3	16.3	0.3	Light
Rennie	3.6	24.3	17.0	0.3	Light
Otter Falls	4.0	27.3	19.6	1.0	Light
Seven Sisters	4.3	35.6	22.3	0.3	Light
Pinawa	3.6	31.6	19.6	0.0	Nil
Pointe du Bois	3.6	36.3	13.0	2.6	Light
Pointe du Bois	4.6	26.6	14.6	2.3	Light
Bird River	3.0	21.0	16.6	0.0	Nil
Bird Lake	3.0	21.6	17.0	0.0	Nil
Bird Lake	7.3	60.6	17.6	3.0	Light
Davidson Lake	5.0	37.3	17.3	0.0	Nil
East Braintree	4.0	28.3	17.3	0.0	Nil
Darwin	3.6	29.0	16.6	0.0	Nil
Siegs Corner	3.6	29.0	15.6	0.0	Nil
Hadashville	3.6	27.0	17.3	0.0	Nil
Marchand Ranger Stn.	3.6	23.7	16.0	0.0	Nil
Red Rock Lake	4.0	34.3	16.0	0.6	Light
Big Whiteshell Lk.	3.3	26.6	15.0	14.6	Severe
Betula Lake	4.0	29.3	16.6	3.6	Light
Nutimik Lake	3.6	27.0	16.3	0.3	Light
Manigotagan	3.6	26.6	20.0	0.0	Nil
Long Lake	3.3	27.6	23.0	0.0	Nil
Beresford Lake	4.6	38.3	24.3	0.3	Light

3.2.10. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Adult populations were low but widespread in Eastern Manitoba. Very light defoliation occurred at Manigotagan and in the Agassiz Forest Reserve, but high larval populations failed to develop. Larvae were collected from trembling aspen at Moose Lake, Eagle-nest Lake and Hadashville, but only very light defoliation occurred at these points.

3.2.11. AMERICAN ASPEN BEETLE, Gonioctena americana (Schaeffer):- Populations were general, but low, throughout the region surveyed. Very light defoliation of trembling aspen occurred in the Agassiz Forest Reserve, near East Braintree and at Manigotagan Lake.

3.2.12. GRAY WILLOW LEAF BEETLE, Galerucella decora Say:- Populations of the gray willow leaf beetle declined to very low levels in 1965. Light skeletonizing of willow foliage was noted at East Braintree, Falcon Lake, Pine Falls, Elliot Lake, Aikens Lake and Caddy Lake.

3.2.13. ASPEN BLOTCH MINER, Lithocolletis salicifoliella Chamb.:- Damage by this blotch miner was widespread throughout the District; an apparent increase in abundance over 1964. Trembling aspen re-production was moderately infested at Betula Lake, Black River, Manigotagan, Wallace Lake, Falcon Lake and Hadashville.

3.2.14. UGLY-NEST CATERPILLAR, Archips cerasivoranus (Fitch):- Patches of moderate to heavy infestation occurred throughout much of the southeastern part of Manitoba. Nests on chokecherry were particularly abundant along the East Braintree-Moose Lake road and the Hadashville - Marchand Ranger Station road. In the Eastern District occasional nests were found in the Milner Ridge and Manigotagan Lake area.

3.2.15. A LEAF ROLLER, Archips negundana Dyar.:- Moderate to heavy defoliation of Manitoba maple trees was recorded in a number of shelterbelts in the Ile Des Chenes - Niverville area. This insect does not commonly cause serious defoliation. A mass collection of larvae was made from a shelterbelt three miles east of Niverville on June 30 and sent to the laboratory for further studies.

3.2.16. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Alsophila pometaria (Harr.) (Fall canker-worm)	Maple, Manitoba and elm, white	Beausejour	Heavy defoliation to a portion of recreational park.
Acleris variana (Fern.) (Black-headed budworm)	Spruce, white and black	Widely scattered throughout Eastern Manitoba	Very low populations.
Arge pectoralis (Leach) (Birch sawfly)	Alder	Eardley, Aikens, Gunisao and Red Rock lakes	Occasional alder clumps lightly defoliated.
Argyrotaenia tabulana Free. (A pine tube moth)	Pine, jack	Sprague and West Hawk Lake	Only an occasional needle attacked.
Bucculatrix canadensisella Cham. (Birch skeletonizer)	Birch, white	Weaver Lake and West Hawk Lake	Very light infestation.
Choristoneura fumiferana (Clem.) (Spruce budworm)	Spruce, white Fir, balsam	Hadashville, Dencross, Pine Falls, Moose Lake, Bird River and Rennie	Single larva only in each collection.
Eucosma gloriola Heinrich (A shoot moth)	Pine, jack	Pointe du Bois, Julius, Pine Falls, and Hadashville	Light infestations.
Halisidota maculata (Harr.) (Spotted tussock moth)	Alder	Gunisao and Family lakes	Moderately high numbers of larvae; very light defoliation.
Hyphantria cunea (Drury) (Fall webworm)	Willow, Alder, Maple, Manitoba	Widley scattered throughout southern half of Eastern Manitoba	Occasional clumps moderately defoliated.
Hylurgopinus rufipes (Eichh.) (Native elm bark beetle)	Elm, white	East Selkirk and Pinawa	Bark and wood samples.

3.2.16. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Malacosoma americanum (F.) (Eastern tent caterpillar)	Rose, Chokecherry	Sandilands and Belair Forest reserves	Moderate populations in scattered patches.
Malacosma pluviale (Dyar) (Western tent caterpillar)	Birch, white Willow and Chokecherry	Whiteshell Provincial Park and Bird Lake	Low populations.
Petrova albicapitana (Busck) (Pitch nodule maker)	Pine, jack	Scattered throughout Eastern Manitoba	Generally very light infestations.
Pikonema dimmockii (Cress.) (Greenheaded spruce sawfly)	Spruce, white and black	Scattered throughout most spruce stands	Populations very low.
Proteoteras willingana (Kft.) (Boxelder twig borer)	Maple, Manitoba	Buffalo Bay and Niverville	Generally low populations.
Phyllophaga anxia (Lec.) (White grub)	Sod	Red Rock Lake	Four adults found in seeded lawn.
Semiothisa sexmaculata Pack. (A looper)	Larch, tamarack	Scattered throughout the District	Generally low populations.
Tetralopha asperatella Clem. (A webworm)	Aspen, trembling	Throughout the district	Populations generally low.
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	Pine, jack and Scots	Widely scattered throughout the District	Heavy on sP ornamentals in one yard at Steinbach, Manitoba.

3.3 TREE DISEASE CONDITIONS

3.3.1. WESTERN GALL RUST, Peridermium harknesii J.P. Moore: - This gall rust was common on jack pine in the Vassar - Piney area, throughout the Belair Provincial Forest, and in the Hadashville, Pointe du Bois, Moose Lake and Caddy Lake areas. In the Northern District of Manitoba, a very light infection was noted at Elliot Lake. A light infection was found on the alternate host, cow wheat, at Pine Falls.

3.3.2. COMANDRA RUST OF JACK PINE, Cronartium comandrae Peck:- Very light infections occurred on jack pine at Falcon Lake, Pointe du Bois, West Hawk Lake and Rennie. Light infections were also found on the alternate host, pale comandra, in the Sandilands Forest Reserve near Hadashville and Whitemouth Lake.

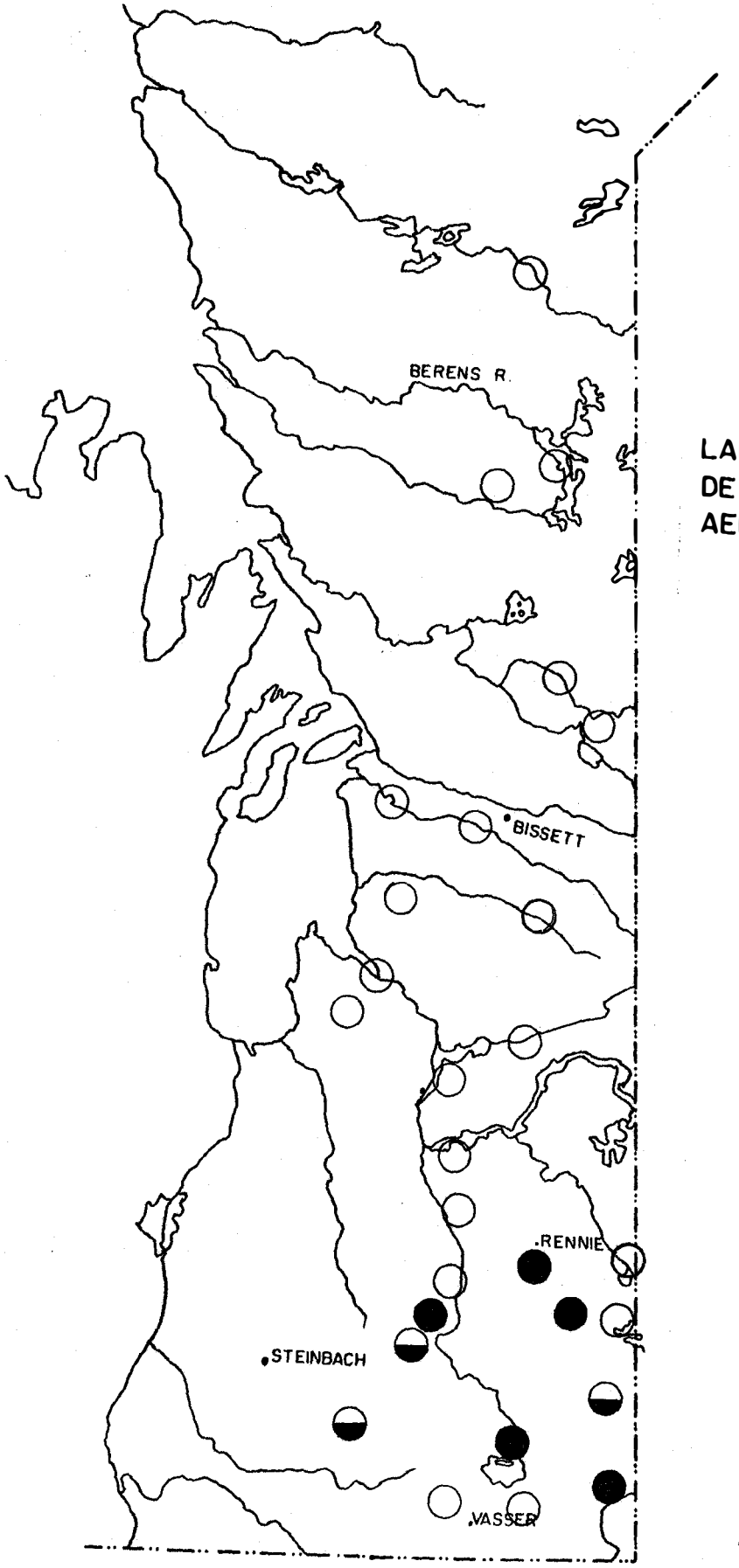
3.3.3. SPRUCE NEEDLE RUST, Chrysomyxa ledicola Lagerh:- Heavy infections occurred on young black spruce in the Telford - Pointe du Bois - Cat Lake area. Lighter infections were found as far north as Family Lake. Rust was heavy on a number of planted Colorado spruce in a farm yard at River Hills.

3.3.4. LEAF AND TWIG BLIGHT, Pollaccia radiosa (Lib.) Bald. and Cif.:- This blight was common throughout the forested area from Little Grand Rapids in the north to Shoal Lake in the south. Damage was generally light and confined to trembling aspen reproduction. At Eaglenest Lake, up to 30 per cent of aspen reproduction foliage, growing along the shorelines, was affected. Approximately ten per cent of trees in similar locations at Weaver Lake were affected.

3.3.5. DWARF MISTLETOE, Arceuthobium americanum Nutt.:- Heavy infections were common throughout the Belair Forest Reserve and surrounding jack pine stands. Strip cruises, covering approximately three acres, in some of the heaviest infections showed 54 per cent of the trees supported from one to 16 brooms. Tree mortality averaged six per cent, with 95 per cent of the dead trees having brooms. Wallrothiella arceuthobii (Pk.) Sacc., occurred on a number of mistletoe plants examined in the Belair area. Light infections of mistletoe occurred in the Sandilands Forest Reserve from Dawson Cabin to Hadashville.

3.3.6. OTHER NOTEWORTHY DISEASES:-

Disease and Organism	Host(s)	Locality	Remarks
Chrysomyxa pirolata Wint. (Cone rust)	Spruce, black	Cat Lake	Very light infection on one tree only.
(Frost Damage)	Larch, Tamarack	Traverse Bay	Moderate in one swamp.
Diplodia tumefaciens (Shear) Zalasky (Macrophoma galls)	Aspen, trembling	Falcon Lake, Eaglenest Lake, Garner Lake and Lac du Bonnet	Very light infections.
Gymnosporangium clavipes (Cke & Pk) Cke & Pk (Rust)	Serviceberry	Red Rock Lake and Otter Falls	Light infection.
Hypoxylon pruinatum (Klotsche) Cke (Hypoxylon canker)	Aspen, trembling	Widely scattered throughout District.	Generally very light.
Melampsorella caryophyllacearum Schroet. (Yellow witches' broom)	Fir, balsam	Hadashville	Only one tree affected.
Polyporus tomentosus Fr. (White pocket rot)	Spruce, white	Birds Hill	One fruiting body only found.
Polyporus sulfureus (Bull.) Fries	Ash, green	East Selkirk	Large conk found on one large tree.
Pollaccia elegans Serv. (Leaf and twig blight)	Poplar, balsam	Little Grand Rapids and Shoal Lake	Very large infection on one small tree at each location.
Radulum casearium (Morgan) Lloyd (Slash fungus)	Aspen, trembling	Bird, West Hawk, Caddy and Eardley lakes	Occasional fruiting bodies on slash.



EASTERN MANITOBA

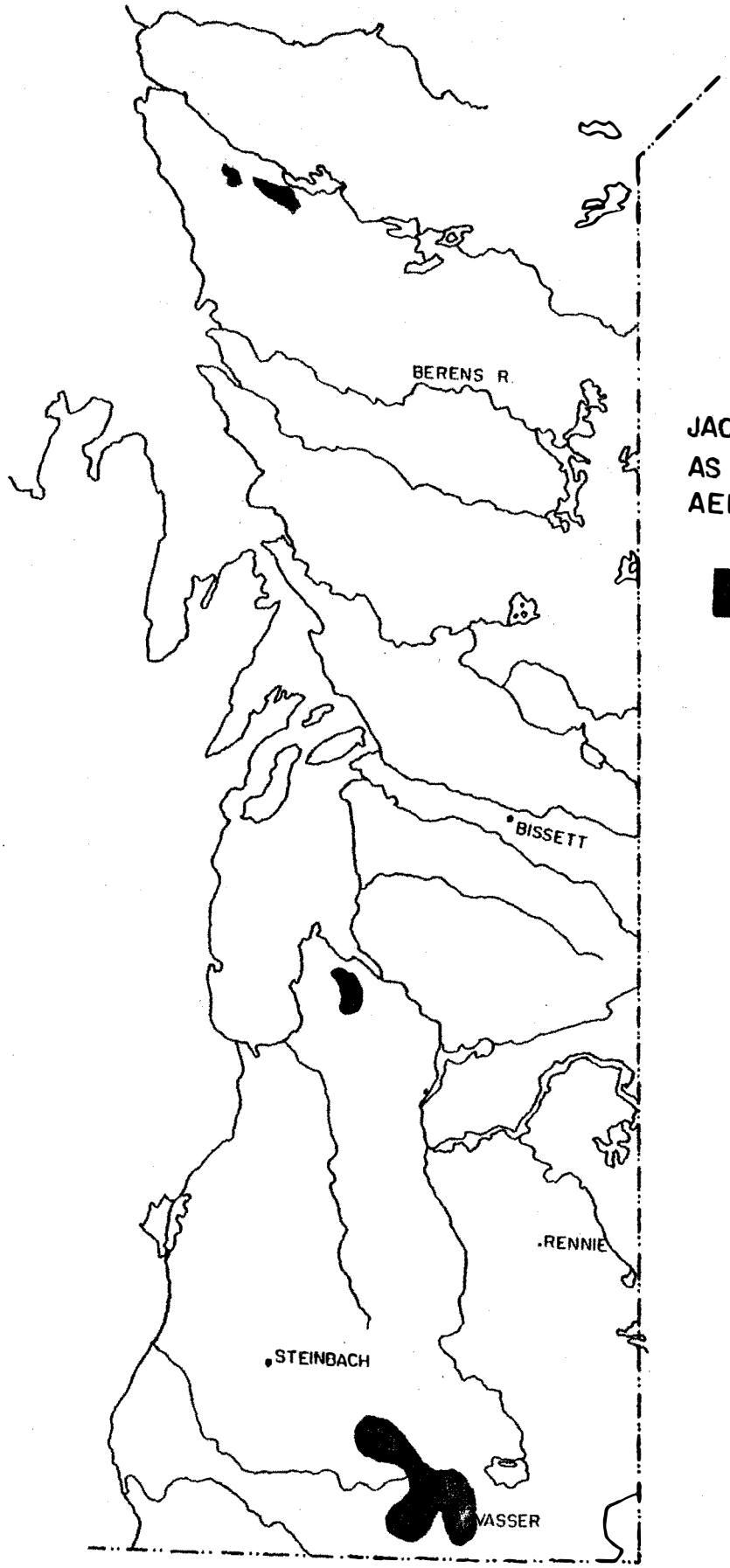
FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965.

- LIGHT
- MODERATE
- SEVERE

20 0 20 40

SCALE: 1in. equals 32 mi.



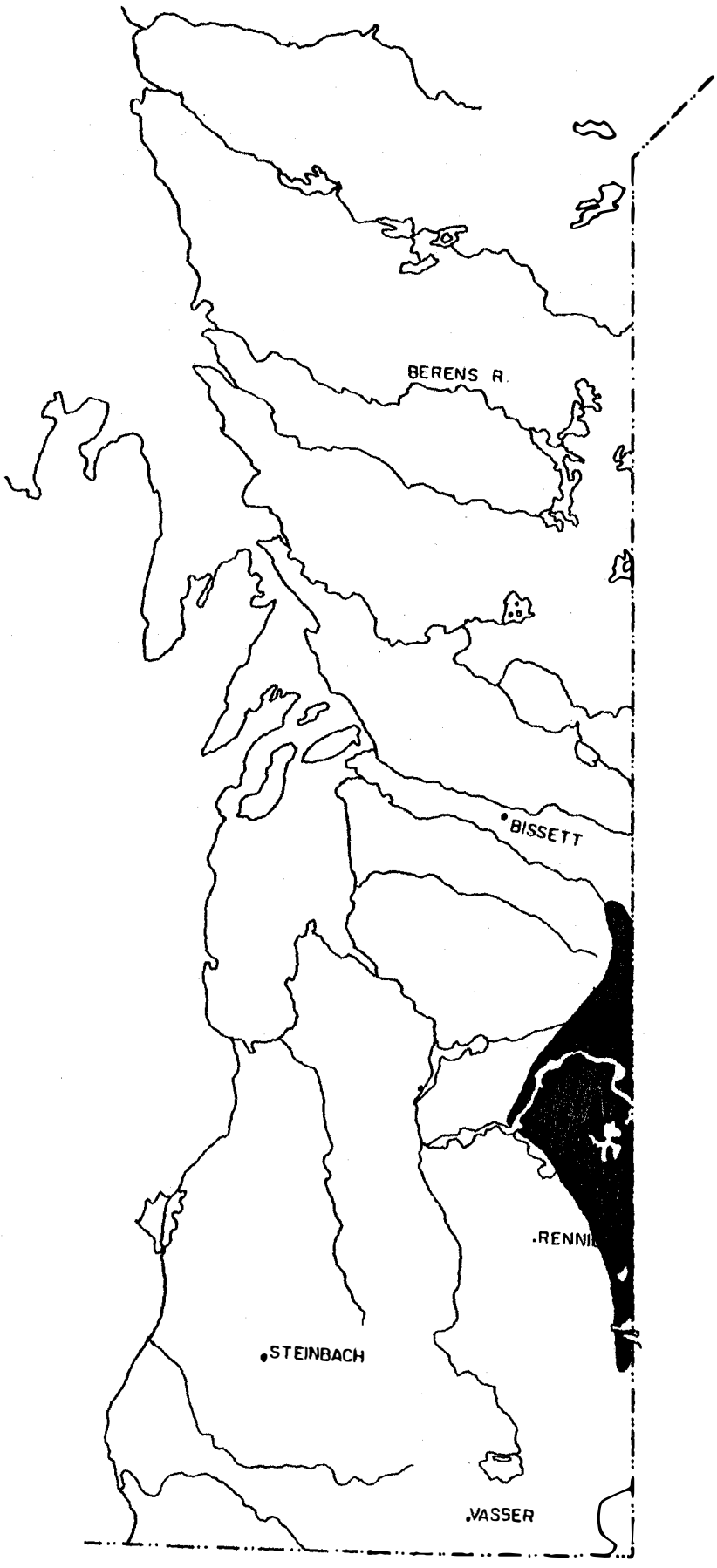
EASTERN MANITOBA

FIG. 2

JACK PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965.

AREAS OF CONTINUOUS MODERATE TO SEVERE DEFOLIATION.

20 0 20 40
SCALE: 1in. equals 32 mi.



EASTERN MANITOBA

FIG. 3

FOREST TENT CATERPILLAR INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1965.

MODERATE TO SEVERE DEFOLIATION.

20 0 20 40
SCALE: 1in. equals 32 mi.

4. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT OF SASKATCHEWAN

1965

by

G. N. Still

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

4.1 INTRODUCTION

This report deals with forest insect and disease conditions in the Southern District of Saskatchewan. Surveys were carried out from mid-May to mid-October, and 415 insect and 141 disease collections were submitted. In addition to general sampling and special collections, the following survey sub-projects were carried out: egg mass and defoliation surveys of the spruce budworm; larval population sampling of the boxelder twig-borer; and a small mammal survey in the Cypress Hills Provincial Park.

Three hours and 30 minutes of chartered flying were used for aerial reconnaissance of the Cypress Hills Provincial Park. The co-operation and assistance received from personnel of the Saskatchewan Department of Mines and Natural Resources and the Canada Department of Agriculture is gratefully acknowledged.

The fall cankerworm was the most prominent and widespread defoliator, and caused moderate to severe defoliation of farm shelterbelts at numerous locations, and spider mite infestations were common on spruce plantings throughout the District. The aspen leaf beetle was also widespread, but moderate to severe skeletonizing was restricted to one area.

Conspicuous frost damage occurred at numerous locations, particularly to aspen foliage in the Moose Mountain Provincial Park. Relatively heavy infections of Atropellis canker on lodgepole pine were recorded in the Cypress Hills Provincial Park. Poplar twig blight, leaf rusts and tar spot on willow were widely distributed throughout the District. Needle rust infections on white spruce and lodgepole pine ranged from moderate to severe in the Cypress Hills Provincial Park.

4.2 INSECT CONDITIONS

4.2.1. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Populations of this defoliator remained low and caused only light defoliation of scattered individual white spruce trees in the

Cypress Hills Provincial Park and on planted white spruce in the Moose Jaw, Swift Current and Cardell areas.

Egg mass and defoliation surveys were initiated in 1960 in the West Block of the Cypress Hills Provincial Park. Results of these surveys, as shown in Table 1, indicate that the outbreak commenced to decline in 1961 and has now reached very low levels.

TABLE 1

Results of Egg-mass and Defoliation Surveys in the Cypress Hills Provincial Forest

(Based on examination of two 18" branch tips from the mid-crown of 5 trees at each sample point.)

Years	No. of points sampled	Total area of foliage examined (sq. ft.)	Average No. of egg masses per 100 sq.ft. of foliage	Subsequent defoliation (per cent) at sample points
1960	4	259	74	74
1961	17	302	49	38
1962	16	258	26	25
1963	4	71	15	6
1964	4	76	7	1
1965	4	78	1	**

** Defoliation estimates will be taken in July, 1966.

4.2.2. SPRUCE SPIDER MITE, Oligonychus ununguis (Jac.):- Light to moderate infestations occurred on planted white spruce at the Coffey Ranch south of Carlyle, and on Colorado spruce in park areas of Yorkton and at Elrose. Light infestations were also commonly noted on spruce plantings at Alsask, Wymark, Indian Head, Yorkton, Maryfield, Katepwa Beach, Grenfell, Weyburn, and Mossbank.

4.2.3. JACK-PINE BUDWORM, Choristoneura pinus Free.:- Larvae were recorded on lodgepole pine at three locations. However, populations were low and defoliation was very light. Collections were taken in the Cypress Hills Provincial Park, and in plantations at Creelman and Caron.

4.2.4. SPRUCE PINEAPPLE GALL APHID, Chermes lariciatus (Patch):- The current needle growth of individual trees and occasionaly small patches of white spruce were lightly to moderately infested in the Cypress Hills Provincial Park, and in the City Park at Yorkton. Elsewhere, light infestations occurred at Wolseley, Creelman, in the Moose Mountain Provincial Park, and in the South Fork and Eastend areas.

4.2.5. BLACK-HEADED BUDWORM, Acleris variana (Fern.):- Light populations were recorded on native white spruce in the West Block of the Cypress Hills Provincial Park, and on plantings in the Moose Mountain Provincial Park. In both instances defoliation was negligible.

4.2.6. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- The larch sawfly caused light to moderate defoliation of several Siberian larch at the Department of Natural Resources headquarters in the West Block of the Cypress Hills Provincial Park, and in tamarack plantations on the Indian Head Forest Nursery Station, and at Wolseley.

4.2.7. FALL CANKERWORM, Alsophila pometaria Harr.:- The fall cankerworm was widely distributed and caused light to severe defoliation of Manitoba maple, white elm, Chinese elm, red maple, green ash and some planted poplar species in farm shelterbelts throughout the District (Figure 1). Manitoba maple suffered moderate to severe defoliation seven miles south of Regina, and similar conditions were recorded in farm shelterbelts throughout the area extending from 12 miles south of Carlyle to

one mile south of Alameda. Moderate to severe infestations also occurred in the vicinities of Frontier, Antelope, Simmie, Vesper, Duncairn, Webb, Stewart Valley, Waldeck, Caronport, Central Butte, Eyebrow, Keeler, Chamberlain, Southey, Indian Head, Halbrite, Creelman, Markinch and Montmarte. Light to moderate defoliation of white elm was recorded in the City Park at Yorkton.

4.2.8. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- The heaviest concentrations of this insect occurred between Indian Head and McLean, where moderate to severe skeletonizing of trembling aspen occurred in localized areas (Figure 2). Light to moderate skeletonizing was also recorded in the Wood Mountain Regional Park, Moose Mountain Provincial Park, and in the Kelliher area. Scattered populations were commonly found elsewhere in the District, but skeletonizing was light.

4.2.9. GRAY WILLOW LEAF BEETLE, Galerucella decora Say:- High populations of adults were observed on willow during the early summer in the East Block of the Cypress Hills Provincial Park. However, larval populations were lower than expected in the latter part of the summer, and only light foliage skeletonizing was recorded. Elsewhere, moderate to severe skeletonizing occurred in scattered patches in the vicinity of Kelliher, and light patches at Churchbridge, Indian Head, Elbow, Rosetown, Kindersley, Cardell, Duff, Moose Mountain Provincial Park and on an occasional planted poplar at Craik.

4.2.10. POPLAR BUD GALL MITE, Aceria parapopuli (Kiefer):- Infestations of this gall mite occurred on trembling aspen and a variety of hybrid poplars examined throughout the District, but it was most abundant on cottonwoods and Northwest poplar west of Moose Jaw.

Light to moderate infestations were recorded on individual trees along the South Saskatchewan and Qu'Appelle rivers, and at Shackleton, Maple Creek and Instow. Moderate to severe damage was noted in a nursery at Estevan and in the vicinity of Chaplin. In the latter area, numerous current and old galls were observed on the branches of trees that had been attacked for several years.

4.2.11. UGLY NEST TORTRIX, Archips cerasivoranus (Fitch):- Scattered nests were commonly found on chokecherry throughout the District, and caused light to moderate feeding damage to individual shrubs. Numerous nests were observed in the Besant Provincial Campsite near Caron, at Willowbrook and in the Moose Mountain Provincial Park. Other collection points were at Wapella, Lebret, Wood Mountain, Outlook and Kyle, but only occasional, scattered nests were found.

4.2.12. BOXELDER TWIG-BORER, Proteoteras willingana Kft.:- Light populations of twig borers were common on Manitoba maple shelterbelts throughout the District. Larval counts at seven permanent sample points are shown in Table 2.

TABLE 2.

Boxelder Twig Border Population Counts
Southern District of Saskatchewan - 1965

(Based on the examination of four branches 36 inches long from each of the three crown levels of five trees at each sample point.)

	Tree Data			No. of Twigs Examined and Twig Borer Populations by Crown Level					
				LOWER		MID		UPPER	
Location	Av. ht. (ft.)	Av. Crown depth (ft.)	Av. Crown width (ft)	No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Swift Current	22.0	18.6	14.4	568	31	514	13	481	10
Maple Creek	16.6	12.2	12.0	470	8	497	18	545	11
Moose Jaw	15.0	13.0	12.6	735	39	811	31	769	55
Carlyle	18.6	15.2	11.6	600	68	615	52	628	69
Willowbrook	17.8	15.0	13.6	755	45	602	36	618	27
Indian Head	15.6	13.0	16.6	881	34	952	62	936	99
Findlater	19.8	17.0	17.6	684	9	681	5	524	9

4.2.13. PRAIRIE TENT CATERPILLAR, Malacosma lutescens (N. & D.):- Large numbers of tents were recorded on chokecherry and rose bushes in localized areas in the vicinity of the Besant Provincial Campsite and defoliation ranged from light to severe. Elsewhere throughout the District, only an occasional scattered tent was observed, and light to moderate defoliation was confined to individual shrubs.

4.2.14. NATIVE ELM BARK BEETLE, Hylurgopinus rufipes (Eichh.):- Heavily infested, scattered individual native white elm were found along the South Saskatchewan River at Outlook, along the Souris River at Estevan, and along the Qu'Appelle River at Lumsden and north of Broadview.

4.2.15. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acrobasis betulella Hulst. (Birch tube maker)	Birch, water	Wood Mountain Regional Park	Light scattered infestations.
Acronicta spp. (Dagger moths)	Maple, Manitoba Ash, Willow, Birch, white Poplar	Throughout the District.	Light larval populations but no appreciable defoliation. A. americana Harr. on maple and ash in the Assiniboia and Cardell areas; A. dactylina Grt. on willow along the Maple Creek; A. impressa on willow in the Moose Mtn. Provincial Park; A. lepusculina Gn. on poplar in the McLean Prov. Campsite; A. quadrata Grt. on birch in the Round Lake area.
Altica alni (Harris) (Flea beetle)	Willow	Broadview	Low populations; no visible damage.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Archips negundana (Leaf roller)	Maple	Indian Head, Moose Jaw, Mossbank, Cardell and Ernfold	Light leaf rolling common.
Biston cognataria (Guenee) (Pepper-and-salt moth)	Birch, white Maple, Manitoba Aspen, trembling Willow	Churchbridge, Rocanville, Indian Head, Goodeve and Broadview	Light populations; no visible defoliation.
Buccalatrix canadensisella Chambers (Birch skeletonizer)	Birch, white and water	Wood Mountain Regional Park, Round Lake and Moose Mountain Provincial Park	Very light skeletonizing.
Calligrapha alni Schffr. (Leaf beetle)	Aspen, trembling Willow	Western half of District	Scattered very light defoliation.
Cecidomyia negundinis Gill. (Boxelder gall midge)	Maple, Manitoba	Throughout District	Light infestations on scattered individual trees.
Chermes cooleyi Gillette (Cooley spruce gall aphid)	Spruce, white	Throughout District	Moderate damage to new growth of individual trees; infestations generally light.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Elbow Provincial Forest, Maple Creek and Cypress Hills Provincial Park	Scattered light infestations.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Chrysomela scripta F. (Cottonwood leaf beetle)	Cottonwood	Along the South Saskatchewan River northwest of Stewart Valley	Light to moderate defoliation of scattered young trees.
Cimbex americana Leach (Elm sawfly)	Elm, white	Assiniboia	Low populations; no appreciable defoliation.
Compsolechia niveopulvella (Cham.) (Leaf roller of aspen)	Aspen, trembling	Wood Mountain Regional Park, Broadview, Indian Head, Elbow, and White City	Light leaf rolling.
Corythucha elegans Drake (Lace bug)	Chokecherry Willow	Caron and Scout Lake	High populations caused light to moderate and occasional severe leaf discolouration.
Dichelonyx backi (Drake) (Green rose chafer)	Aspen, trembling Birch, water poplar, balsam Willow	Cypress Hills Provincial Park	Scattered concentrations of high populations; no appreciable damage.
Dioryctria sp. (Snout moth)	Spruce, white	Ernfold and West Block Cypress Hills Provincial Park	Moderate to severe infestations of cones on individual patches of trees.
Dioryctria renicullela (Grote) (Spruce coneworm)	Spruce, white	West Block Cypress Hills Provincial Park and Moose Mtn. Provincial Park	Scattered light populations; no appreciable damage.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Epicauta fabricii (LeConte) (Ash-grey blister beetle)	Caragana	Carlyle, Moose Jaw and Assiniboia	Notably high populations.
Eriosoma americanum (Riley) (Woolly elm aphid)	Elm, white	Throughout District	Light infestations common.
Erannis tiliaria (Harris) (Linden looper)	Maple, Manitoba Elm, white	Birsay, Indian Head and Maple Creek	Light populations associated with A. pometaria (Harris)
Epinotia solandriana Linn. (Leaf roller)	Poplar Willow Aspen, trembling	Regina, Goodeve and CypressHills Provincial Park	Light leaf rolling.
Eriophyes fraxinflora (Felt) (A mite)	Ash, green	Wascana Park (Regina), River-hurst and Buffalo Pond Provincial Park	Light to moderate infestations in scattered patches and on individual trees.
Gonioctena americana Schff. (American aspen beetle)	Aspen, trembling	Cypress Hills Provincial Park	Scattered patches of light to moderate defoliation of reproduction.
Halisidota maculata (Harris) (Spotted tussock moth)	Willow Maple, Manitoba	Wymark, Blad-worth, Moosomin, Maple Creek, Duff and Broad-view.	Scattered patches of light defoliation; notable numbers of larvae along the Maple Creek.
Homoglaea hircina Morr. (Owlet moth)	Aspen, trembling Cottonwood	McLean Pro-vincial Campsite, Caron and Stewart Valley	Low populations; no noticeable defoliation.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Hyphantria cunea (Drury) (Fall webworm)	Maple, Manitoba Chokecherry Elm, white Ash, green Birch, white	Buffalo Pond Provincial Park and Round Lake	Occasional moderate to severe webbing and defoliation.
Itame loricaria Evers. (A looper)	Willow Aspen, trembling Ash, green	Broadview, Indian Head, Elbow, White City and Regina	Low populations; no appreciable defoliation.
Leptocoris trivittatus (Say) (Boxelder bug)	Maple, Manitoba	Indian Head Forest Nursery Station and Estevan City Park	Extremely high populations observed in the Estevan City Park congregating in large masses on tree trunks, leaves and on the ground. High incidence of eggs. Only light populations at Indian Head.
Lepyrus palustris Scop. (A weevil)	Willow Poplar Cottonwood Aspen, trembling	Broadview, Duff, Cypress Hills Provincial Park, Churchbridge, Indian Head and Stewart Valley	Light populations common.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	Aspen, trembling	McLean Provincial Campsite and Duff	Scattered patches of light leaf mining.
Lopidea dakota Knight (Caragana plant bug)	Caragana Maple, Manitoba	Throughout District	Relatively high populations, but little noticeable damage.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Magdalis armicollis (Say) (Red elm bark weevil)	Elm, white	Hyde	Lightly infested individual trees; some parasitism by Chalcid sp. and Braconid sp. noted.
Mordwilkoja vagabunda (Walsh) (Poplar vagabond aphid)	Aspen, trembling Cottonwood	Caron, Duff, Goodeve, McLean Provincial Campsite, Lemsford Ferry Regional Park and Langenburg	Light to moderate infestations on individual trees and in occasional small, localized patches.
Nematus unicolor Marl. (Sawfly)	Birch, white	Moose Mountain Provincial Park	Scattered light defoliation.
Neodiprion virginianus complex (A sawfly)	Pine, lodgepole	Cypress Hills Provincial Park	Individual trees lightly defoliated.
Nymphalis antiopa (L.) (Mourning-cloak butterfly)	Cottonwood Willow Elm	Caron, Briercrest, and Clearwater Lake	Small localized patches of light to moderate defoliation of willow at Clearwater Lake. Scattered light defoliation of individual trees elsewhere.
Oberea schaumi Lec. (Long-horned wood borer)	Aspen, trembling	Whitewood	Light infestation.
Operophtera bruceata (Hulst.) (Bruce spanworm)	Aspen, trembling Maple, Manitoba Chokecherry Willow	Throughout District	Light populations common.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Orsodacne atra Ahr. (Leef beetle)	Aspen, trembling Willow	Duff, Cypress Hills Provincial Park and Moose Mountain Provincial Park	Scattered patches of light defoliation (associated with G. americana (Schffr.) in the Cypress Hills).
Orthosia hibisci Gn. (An owlet moth)	Poplar Caragana Willow Ash, green	Caron, Moosomin, and Carlyle	Light populations but no visible damage.
Paleacrita vernata (Peck) (Spring canker-worm)	Elm, white	Swift Current	Associated with A. pometaria (Harr.); caused light defoliation.
Pandemis canadana Kft. (A tortricid)	Ash, green Caragana Willow Aspen, trembling	Throughout District	Light leaf rolling.
Pemphigus populi transversus Riley (Poplar petiole gall aphid)	Cottonwood	Val Marie, Briercrest, Morse, Stewart Valley and Eston	Light infestations.
Petrova albicapitana (Busk.) (Pitch nodule maker)	Pine, Scots and lodgepole	Indian Head Forest Nursery Station and Cypress Hills Provincial Park	Lightly infested individual trees; occasional branch mortality.
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	Spruce, white Pine, Scots and lodgepole	Throughout District	Individual trees light to moderately infested in the Mossbank, Indian Head, Wolseley and Yorkton areas; light infestations elsewhere.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Phyllocnistis populiella Cham. (A leaf miner)	Aspen, trembling Poplar, balsam	Maple Creek, Whitewood and Cypress Hills Provincial Park	Light leaf mining.
Phytophaga rigidae (Osten Sacken) (Willow beaked-gall midge)	Willow	Throughout District	Scattered patches and individual clumps lightly to moderately infested.
Pikonema alaskensis (Roh.) (Yellow-headed spruce sawfly)	Spruce, white	Throughout District	Light defoliation of individual trees.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white	Moose Mountain and Cypress Hills Provincial parks, South Fork and Eastend	Low populations; no appreciable defoliation.
Rhabdophaga strobiloides (Walsh) (Willow cone gall)	Willow	Carlyle, Duff, Kelliher, Moosomin, Caron, McLean, Indian Head and Whitewood	Individual trees or small patches lightly to moderately infested.
Saperda calcarata Say (Poplar borer)	Aspen, trembling	Broadview	Localized heavy infestation.
Saperda concolor Lec. (Long-horned wood borer)	Willow	Caron, Strongfield, Duff, Indian Head, and Whitewood	Occasional clumps moderately to severely infested, but generally light.

4.2.15. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Saperda tridentata Olivier (Elm borer)	Elm, white	Hyde	Lightly infested individual trees.
Sciaphila duplex Wlshm. (Leaf roller)	Aspen, trembling	Throughout District	Light leaf rolling.
Semiothisa spp. (Loopers)	Pine, lodgepole Tamarack Spruce, white	Cypress Hills and Moose Mountain Provincial parks, Indian Head, Wolseley and South Fork	Notable populations of S. bicolorata Fabr. on lodgepole pine in the Cypress Hills; high populations of S. sexmaculata Pack. associated with P. erichsonii (Htg.) on tamarack at Wolseley and Indian Head; light populations of S. signaria dispuncta on white spruce in South Fork and in the Moose Mountain Provincial Park.
Taniva albolineana (Kearfott) (Spruce needle miner)	Spruce, colorado	Swift Current and Indian Head	Very light needle mining.
Xylomyges dolosa Grt. (Owlet moth)	Aspen, trem ling Poplar, balsam	Goodeve, Moosomin, McLean Provincial Campsite and Moose Mountain Provincial Park	Light populations; no visible damage.

4.3 DISEASE CONDITIONS

4.3.1. ATROPELLIS CANKER OF PINE, Atropellis piniphila (Weir) Lohman and Cash:- Relatively heavy infections of this canker persist in the Park Block of the Cypress Hills Provincial Park. Thirty trees were examined at three separate points, and approximately 57 per cent were infected. Rust galls, caused by Peridermium harknessii J.P. Moore occasionally occurred on the same trees with the canker.

4.3.2. FIRE BLIGHT, Erwinia amylovora Osr.:- Fire-blight caused concern to residents of Indian Head. Numerous crab-apple trees were killed by the disease, and branch and limb mortality was heavy at several locations throughout the town. Crab-apple trees at 14 locations were moderately to severely infected.

4.3.3. GLOBOSE RUST OF PINE, Peridermium harknessii J.P. Moore:- Patches of infection of lodgepole pine by this rust were common in the Cypress Hills Provincial Park. Individual trees were moderately to severely infected, and an occasional dead tree had resulted from heavy infections.

4.3.4. NEEDLE RUST, Chrysomyxa weirii Jacks.:- Patches of moderately infected white spruce occurred in the Cypress Hills Provincial Park. Last year's needle growth was moderately to severely infected on scattered trees, and considerable defoliation was observed.

4.3.5. LEAF AND TWIG BLIGHT OF POPLAR, Pollaccia radiosa (Lib.) Bald. and Cif.:- This leaf and twig blight occurred commonly on trembling aspen reproduction throughout the District. The most intense infections were recorded in the Moosomin - Moose Mountain Provincial Park area, and in the Cypress Hills Provincial Park.

4.3.6. CYTOSPORA CANKER, Cytospora chrysosperma Pers. ex Fr.:- Cytospora canker is widely distributed throughout the District, in association with drought-weakened trees. The infection was recorded on cottonwoods and Northwest poplar as well as trembling aspen. Random sampling was carried out at three points in the vicinity of Whitewood; of the 30 trees examined, 43 per cent were infected with the disease, and most were dead.

4.3.7. CHERRY SHOT-HOLE, Coccomyces hiemalis Higgins:- Widespread infections occurred along the Qu'Appelle River Valley, particularly in the Round Lake area. Occasional patches of chokecherry were moderately to severely defoliated and light damage was common. Patches of light to moderate damage were recorded near Indian Head and in the Estevan area. Light infections also occurred in the Cypress Hills Provincial Park and in the Wymark area.

4.3.8. WITCHES BROOM, Apiosporina collinsii (Schw.) Hohn:- Moderate to severe brooming of Saskatoon was common in localized areas. Particularly intense patches of the infection occurred at the Moosomin and McLean Provincial campsites. Collections were also taken in the Wood Mountain Regional Park, and in the Pine-Cree Park area, near South Fork.

4.3.9. TAR SPOT OF WILLOW, Rhytisma salicinum Pers. ex Fr.:- Patches of light to moderate infections of this tar spot of willow were observed in the Cypress Hills Provincial Park and light infections were recorded at the McLean Provincial Campsite, in the Wood Mountain Regional Park and along the Maple Creek.

4.3.10. PORCUPINE DAMAGE:- Considerable mortality of Scots pine occurred in the plantation at Mortlach due to severe bark stripping by porcupines. In the Cypress Hills Provincial Park, individual lodgepole pines were killed in the same manner, and light bark stripping was observed at scattered points. The porcupine population is well distributed throughout the District, and dead animals were a common sight along highways and roads.

4.3.11. FROST DAMAGE:- Late spring frosts caused moderate to severe damage to trembling aspen foliage in the southeast portion of the District, particularly throughout the Moose Mountain Provincial Park. Elsewhere, light damage was common on most tree species, but leaf recovery was good.

4.3.12. OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Asteroma salicis Rob. & Desm. (Leaf blight)	Willow	Cypress Hills Provincial Park and Wood Mountain Regional Park	New regional record; light localized infections.
Bifusella crepidiformis (Needle cast)	Spruce, white	Cypress Hills Provincial Park	New regional record; light needle infections.
Ceuthospora phacidoides Grev.	Juniper, ground	Cypress Hills Provincial Park	New regional record.
Chrysomyxa arctostaphyli Diet. (Rust brooms)	Spruce, white	Cypress Hills Provincial Park	Scattered light brooming of individual trees.
Ciborinia whetzelii (Sear.) (Ink spot)	Aspen, trembling	Kelliher and Cypress Hills Provincial Park	Very light leaf infections.
Cytospora horrida Sacc. (Canker)	Birch	Cypress Hills Provincial Park	New regional record.
Dothiorella pyrenophora (Fr.) Sacc. var. Salicis Karst. (Dieback)	Willow	Cypress Hills Provincial Park	New regional record.
Fomes igniarius (L. ex Fr.) Kickx. (Heart rot of poplar)	Aspen, trembling	Throughout District.	Infections common.
Gloeocoryneum cinereum (Dearn.) Weindlmayr (Needle cast)	Pine, lodgepole	Cypress Hills Provincial Park	New regional record.

4.3.12. OTHER NOTEWORTHY DISEASES (CONT'D)

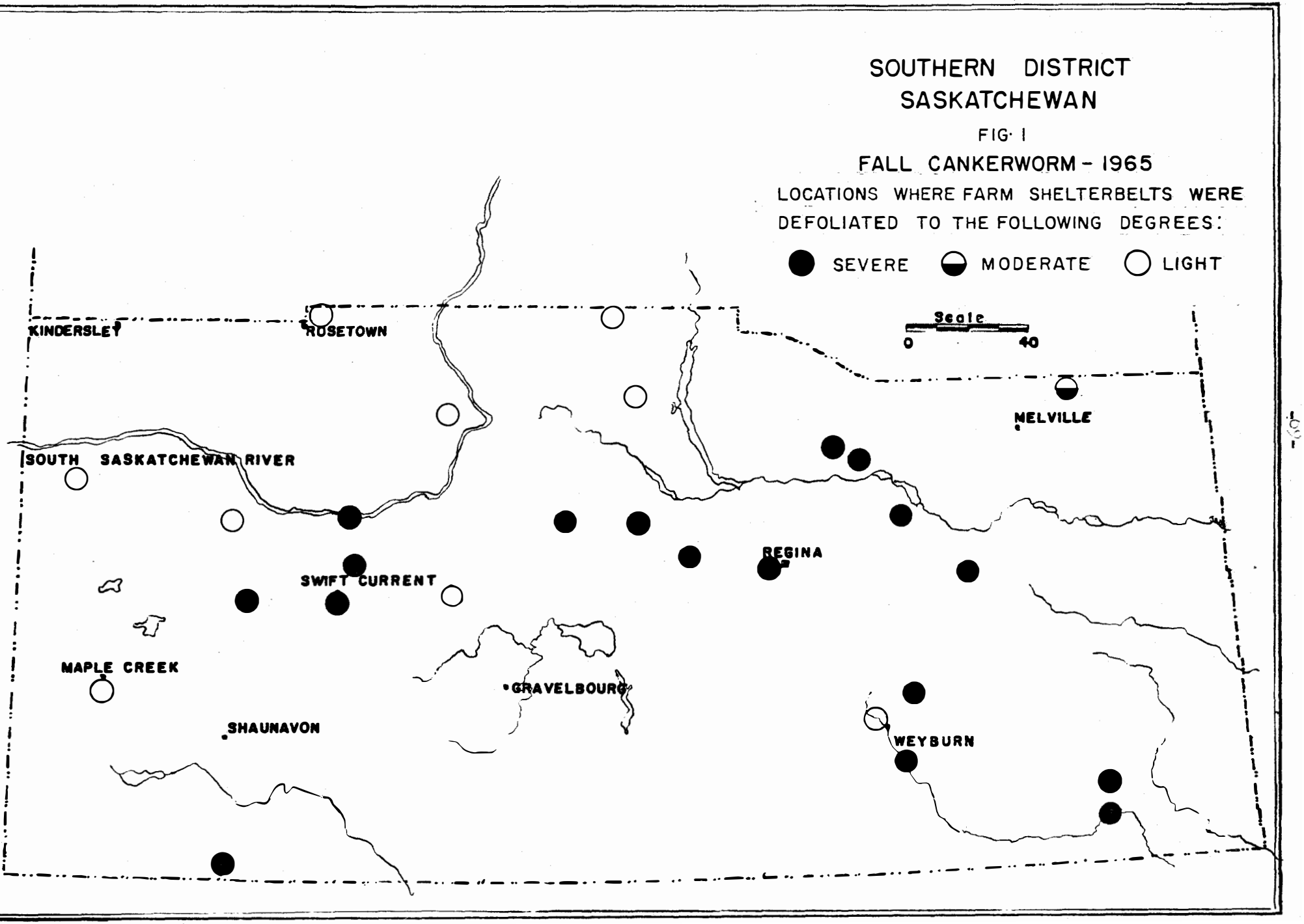
Disease and Organism	Host(s)	Locality	Remarks
Godronia seriata (Fries) Birch Seaver (Dieback)	Birch	Cypress Hills Provincial Park	New regional record.
Gymnosporangium sp. (Leaf rust)	Hawthorn Saskatoon	Throughout District.	Patches of light, moderate and severe infections.
Gymnosporangium clavariaforme (Jacq.) D.C. (Leaf rust)	Saskatoon	Stewart Valley	Patches of heavy leaf infections.
Gymnosporangium nidusavis Thaxt. (Leaf rust)	Saskatoon	Outlook Regional Park	Patches of severe leaf infections.
Hypodermella ampla (J. J. Davis) Dearn (Needle cast)	Pine, lodgepole	Cypress Hills Provincial Park	Heavy needle infections on individual trees.
Hypoxylon pruinatum (Klotsche) Cke. (Hypoxylon canker)	Aspen, trembling	Throughout District.	Common; light damage in patches.
Hysterium acuminatum Fries (Leaf spot)	Juniper, ground	Cypress Hills Provincial Park	New regional record.
Lophium elatum Grev. (Saprophyte)	Spruce, white Aspen, trembling	Cypress Hills Provincial Park	New regional record.
Lophodermium juniperinum (Fr.) deNot (Needle cast)	Juniper, ground	Cypress Hills Provincial Park	New regional record.

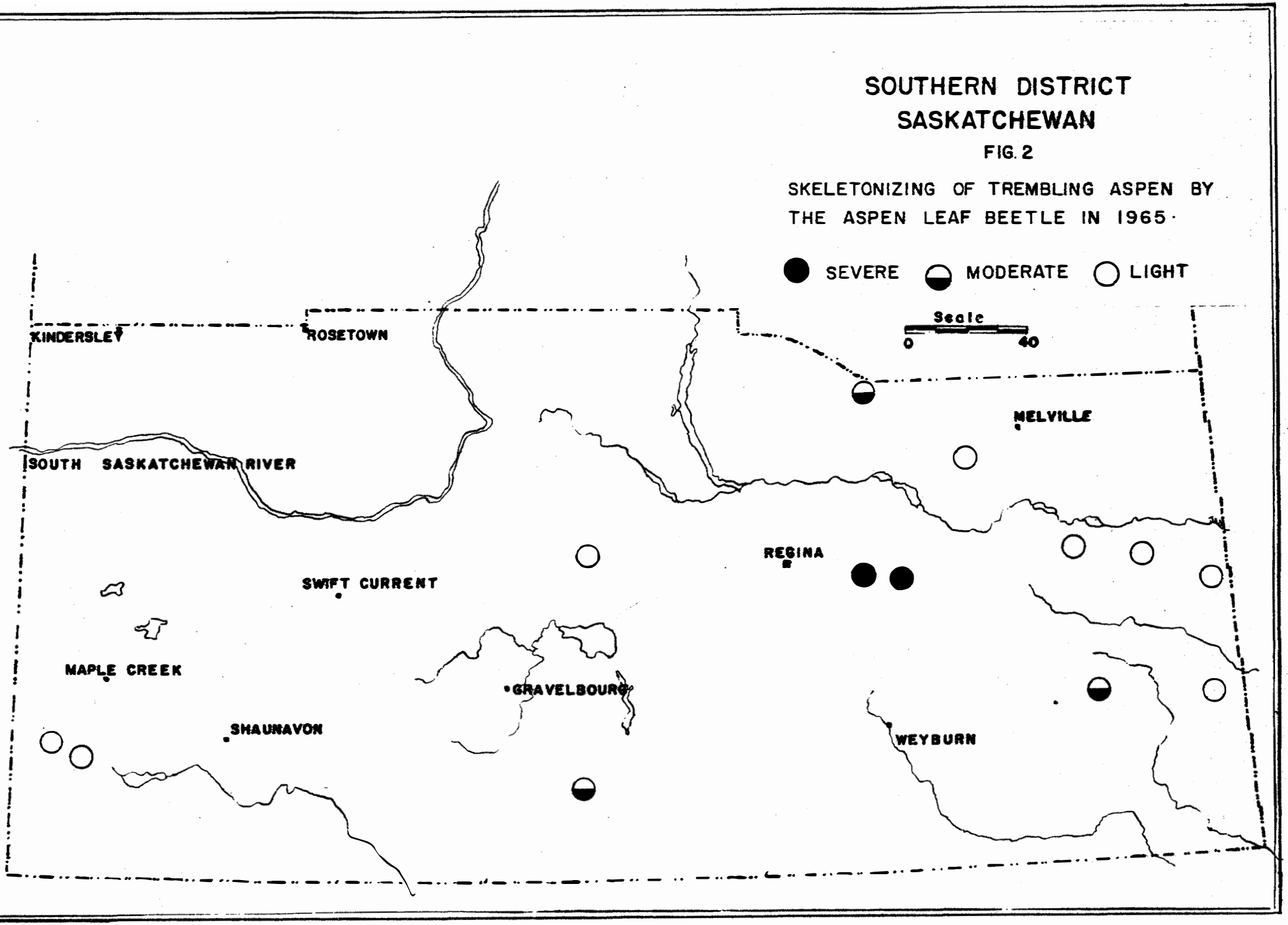
4.3.12. OTHER NOTEWORTHY DISEASES (CONT'D)

Organism and Disease	Host(s)	Locality	Remarks
Lophodermium piceae (Fckl.) V. Hohn (Needle cast)	Spruce, white	Cypress Hills Provincial Park	Light needle infection.
Diplodia tumefaciens (Shear) Zalasky (Macrophoma gall of poplar)	Aspen, trembling	Wapella	Light to moderate infections.
Melampsora abieti-capraearum Tub. (Leaf rust)	Willow	Wymark and Bladworth	Occasional trees moderately to severely infected; generally light.
Melampsora bigelowii Thuem. (Larch-willow rust)	Willow	Throughout District.	Particularly heavy patches along Maple Creek and at the McLean Provincial Campsite.
Nectria cinnabarina (Tode ex Fr.) Fr. (Canker and dieback)	Caragana, Aspen, trembling	Cypress Hills Provincial Park and Scout Lake	Light infections.
Peniophora polygonia (Pers. ex Fr.) Bourd & Galz. (Decay)	Aspen, trembling	Cypress Hills Provincial Park	New regional record.
Phomopsis strobi Syd. (Needle cast)	Pine, lodgepole Spruce, white	South Fork and Cypress Hills Provincial Park	New regional record. Light needle damage common.

4.3.12. OTHER NOTEWORTHY DISEASES (CONT'D)

Organism and Disease	Host(s)	Remarks	Locality
Phyllosticta viridis Ell. & Kell. (Leaf spot)	Ash, green	Lumsden	Leaves moderately to severely infected on reproduction.
Pleurostromella acerina Petrak (Dieback)	Maple, Manitoba	Cypress Hills Provincial Park	New regional record.
Pollaccia elegans Serv. (Leaf and twig blight of poplar)	Poplar, balsam	Cypress Hills Provincial Park	Scattered light infections.
Sclerophoma pithyophila (C'da.) Hohn. (Snow blight)	Spruce, white	South Fork	New regional record.
Septoria caraganae (Jacq.) Died. (Leaf spot)	Caragana	Sanctuary	New regional record.
Sporidesmium sp. poss. larvatum (Saprophyte)	Juniper, ground	Cypress Hills Provincial Park	New regional record.
Taphrina pruni (Fckl) Tul. (Plum pocket)	Chokecherry	Goodeve, Indian Head and Wymark	Scattered, localized patches of moderate to severe fruit damage.


SOUTHERN DISTRICT
SASKATCHEWAN
FIG. I
FALL CANKERWORM - 1965
LOCATIONS WHERE FARM SHELTERBELTS WERE DEFOLIATED TO THE FOLLOWING DEGREES:
SEVERE
MODERATE
LIGHT
Scale
0
40
KINDERSLEY
ROSETOWN
MELVILLE
SOUTH SASKATCHEWAN RIVER
REGINA
SWIFT CURRENT
MAPLE CREEK
GRAVELBOURG
SHAUNAVON
WEYBURN


SOUTHERN DISTRICT
SASKATCHEWAN
FIG. 2
SKELETONIZING OF TREMBLING ASPEN BY THE ASPEN LEAF BEETLE IN 1965.
SEVERE
MODERATE
LIGHT
Scale
0
40
KINDERSLEY
ROSETOWN
MELVILLE
SOUTH SASKATCHEWAN RIVER
REGINA
SWIFT CURRENT
MAPLE CREEK
GRAVELBOURG
SHAUNAVON
WEYBURN

5. ANNUAL DISTRICT REPORT

WESTERN DISTRICT OF MANITOBA

1965

by

L. L. McDowall

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March 1966

5.1 INTRODUCTION

Variable weather conditions prevailed in the early part of the 1965 season. Heavy snow and frost during the latter part of May, followed by continued cool wet weather in June retarded foliage development and delayed insect activity.

Field surveys were conducted from mid-May through to mid-October. During this period approximately 12 hours of charter flying time was utilized to cover otherwise inaccessible areas and to determine boundaries of major insect outbreaks and disease infections. Totals of 445 insect and 125 disease samples were submitted to the Winnipeg Laboratory for processing. The co-operation and assistance extended by government personnel and private co-operators during the season is gratefully acknowledged.

Survey sub-projects continued in 1965 were as follows: larch sawfly cocoon collecting to determine parasite dispersal; sequential sampling of larch sawfly eggs to determine defoliation intensity; forest tent caterpillar egg-band survey to forecast population trends; and egg population sampling of the spruce budworm. In addition, several special collections were made for personnel of the Winnipeg and other laboratories and general inquiries dealing with insect and tree disease problems were answered.

The most notable change in insect conditions was the complete collapse of the forest tent caterpillar after several years of severe defoliation. The larch sawfly was again the most widely distributed insect but a sharp decline in populations occurred through the southern sections of the District. A slight increase in populations and distribution of the spruce budworm was noted in the Dawson Bay-Pelican Lake area. A general increase in populations of the yellow-headed spruce sawfly, spruce gall aphid, gray willow-leaf beetle and the fall webworm were recorded.

Disease surveys were intensified in 1965 resulting in new distribution records of common pathogens and the collection of several new fungi. Moderate to severe frost damage to the foliage of deciduous trees was recorded in a number of areas. Needle rusts of spruce were widely distributed through portions of the Riding Mountain National Park, Duck Mountain and Porcupine Forest reserves. Leaf spots and twig and leaf blight of poplars were general throughout the District.

5.2 INSECT CONDITIONS

5.2.1 LARCH SAWFLY, *Pristiphora erichsonii* Htg.:- Population levels remained essentially the same as in previous years in the northern portion of the District but were considerably lower in the southern section (Fig. 1). Sawfly emergence was somewhat retarded and a wide range of instars were present in most stands throughout the feeding period.

Very light defoliation occurred in Riding Mountain National Park and surrounding areas. Sparse foliage production was evident in a number of tamarack swamps, which was attributed to freezing temperatures and heavy

snow in the latter part of May and continuing cool weather during June and July. Generally light defoliation was recorded through the Duck Mountain Forest Reserve with the exception of light to moderate feeding occurring on scattered reproduction in the vicinity of Singush Lake. North of Mafeking to the Overflowing River, overall defoliation was moderate with occasional patches of moderate to severe north of the Red Deer River and light to moderate between Baden and Powell. A small stand of tamarack, east of Whitefish Lake in the Porcupine Forest Reserve was moderately defoliated, but elsewhere in the District defoliation ranged from only a trace to light.

Sequential sampling of egg populations was carried out in four permanent plots and infestation ratings, based on the utilization of current shoots for oviposition are shown below:

Location	Number of shoots examined	Number of curled shoots	Infestation Rating 1965
Norgate Road, R.M.N.P. #108	80	3	Light
Central Road, R.M.N.P. #107	60	1	Light
Cowan #111	100	4	Light
Steeprock #104	120	6	Light

A total of 200 larvae were dissected from cocoons collected in plot 108, Riding Mountain National Park. Effective parasitism was 33 per cent by Bessa harveyi (T.T.) and 7 per cent by Mesolieus tenthredinis Morley.

5.2.2 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Several changes in the status of the spruce budworm were noted in 1965. Although an increase in populations and distribution was recorded, infestations were still restricted to localized areas (Fig. 2). In the Dawson Bay area, overall defoliation of white spruce was light with occasional trees along the shoreline showing light to moderate defoliation. This infestation is more or less confined to a two mile area south of the Dawson Bay Fisheries road, with light defoliation of scattered trees south to the Red Deer River.

New areas of light defoliation of both white spruce and balsam fir were recorded on Rose Island in Swan Lake and light to moderate along the northeast shore of Pelican Lake. In the latter area the infestation covered approximately two square miles. Moderate to severe defoliation, covering ten square miles occurred in the northern half of Birch Island. Light to moderate defoliation of scattered white spruce was recorded at the northern tip of Maggie Island. Single larval collections were made at the Overflowing River and in the central portion of the Duck Mountain Forest Reserve. Aerial surveys conducted over Riding Mountain National Park failed to register any defoliation in areas where heavy infestations were reported in previous years.

5.2.3 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Populations of this sawfly increased noticeably and they were more widespread in 1965. In Riding Mountain National Park, defoliation of white spruce ranged from light to moderate in the twonsite of Wasagming, at Rolling River, Katherine, Whitewater, Whirlpool and Ministic lakes. Moderate to heavy defoliation of scattered spruce was re-

corded from Audy Lake south to the Park boundary. Elsewhere defoliation was light and confined to single open growing trees. Larvae were also collected from black spruce in this area but caused only a trace of defoliation. Relatively high larval populations were present in black spruce stands from Mafeking north to the Overflowing River. However, defoliation, ranging from moderate to heavy occurred in scattered patches and was more or less confined to the uppermost foot of foliage.

Populations were generally light and widely distributed throughout the remainder of the District and defoliation ranged from a trace to light.

5.2.4 BLACK-HEADED BUDWORM, Acleris variana (Fern.):- Low populations of this species occurred on both white and black spruce in Riding Mountain National Park but in all instances defoliation was very light. Larval collections were also made at several scattered locations in the Duck Mountain Forest Reserve and at Swan, Pelican and Armit lakes but only a trace of defoliation was noted.

5.2.5 SPRUCE GALL APHID, Chermes lariciatus, (Patch):- A slight increase in populations and distribution was recorded in 1965. Galls were found commonly throughout the Riding Mountain National Park; moderate to severe damage occurred to a small patch of black spruce at Rolling River and light to moderate on white spruce in the vicinity of Whirlpool and Audy lakes. In addition, light populations were observed at the Overflowing River, Minitonas, Sandy Bay, Rose Island, Pelican and Whitefish lakes.

5.2.6 WHITE-PINE WEEVIL, Pissodes strobi (Peck):- This insect was collected from both jack pine and black spruce. In the Riding Mountain National Park a light to moderate infestation was recorded on open growing black spruce in the vicinity of Whirlpool River. Light leader damage occurred along the Mt. Agassiz Road and at Moon Lake. Infested leaders were common in jack pine plantations south of Birch River along No. 10 Highway. A single collection was made from jack pine regeneration at Cowan.

5.2.7 UGLY-NEST CATERPILLAR, Archips cerasivoranus (Fitch):- Populations were relatively light through most of the District. However, heavy concentrations of nests were recorded on choke cherry at Mile 4 Norgate Road, Katherine and Audy lakes in Riding Mountain National Park, and at Ochre River and McCreary. Very light populations occurred on scattered choke cherry along the central road in Duck Mountain Forest Reserve.

5.2.8 GRAY WILLOW-LEAF BEETLE, Galerucella decora Say:- High populations of this beetle were prevalent throughout the District and moderate to severe skeletonizing of willow foliage was common in a number of areas. In Riding Mountain National Park, severe skeletonizing was recorded between miles 12 and 17 along the Audy Lake Road, south of Audy Lake to the Park Boundary, at mile 17

on the Norgate Road, and along the north shore of Clear Lake. Elsewhere skeletonizing ranged from light to moderate. Several small patches of aspen south of Audy Lake suffered light to moderate damage to the foliage.

In the agricultural areas, moderate to severe skeletonizing occurred in the vicinity of Norgate, Horod, Crawford Park, Rackham, Sandy Lake, Erickson and Eden. Light populations were recorded through the extreme southeast portion.

Although populations were somewhat lower in the northern section, light to moderate skeletonizing was common in the Duck Mountain and Porcupine Forest reserves, as well as in the Dauphin, Garland, Camperville, Swan River, Birch River, Mafeking and Baden areas.

5.2.9 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Although adult beetles were found commonly throughout the District, a marked decline was recorded in overall larval population. Light skeletonizing of both trembling aspen and balsam poplar occurred in the southern portion of Riding Mountain National Park, and at widely scattered points in the Duck Mountain and Porcupine Forest reserves. Very light populations were noted at Lakeland, Glenella, Clanwilliam, Erickson, and Newdale in the agriculture areas.

5.2.10 AMERICAN ASPEN BEETLE, Gonioctena americana (Schaef.):-

Populations were relatively light and widely distributed in 1965. A small stand of pale type aspen along the Norgate Road and scattered reproduction in the vicinity of Katherine Lake was lightly defoliated. Several small patches of light defoliation were recorded between Childs Lake and the west boundary of the Duck Mountain Forest Reserve and six miles north of Birch River in the Porcupine Forest Reserve. Elsewhere defoliation ranged from a trace to light and was usually confined to single open growing trees.

5.2.11 FALL WEBWORM, Hyphantria cunea (Drury):- Although an increase in populations and distribution was recorded in 1965, defoliation remained light. In all instances not more than three trees were infested and larvae were collected from both Manitoba maple and balsam poplar. Following is a list of collection points: Gladstone, Neepawa, Woodside, Rossburn, Plumas, Mafeking and north of Birch River in the Porcupine Forest Reserve. Two mass collections were taken for rearing and the recovery of the parasite, Compsilura concinnata Mg.

5.2.12 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):-

Although this tent maker was widely distributed and collected from both chokecherry and rose, populations were relatively low and caused very little defoliation. It was most prevalent in the agriculture areas of Sandy Lake, Oakburn, Strathclair, Grandview, Glenella and Ochre River.

5.2.13 FOREST TENT CAPTERPILLAR, Malacosoma disstria Hbn.:- A complete collapse of all major infestations in the District occurred in 1965. Heavy snow and freezing temperatures during the latter part of May and continuing cool weather in June was a contributing factor in the termination of the outbreak. Aspen foliage in many areas suffered heavy frost damage.

Only three larval collections were made, two in the Porcupine Forest Reserve and a third at Camperville. Defoliation was light at all points and confined to single trees. A note of interest was the exceptionally high populations of the parasitic fly, Sarcophaga aldrichii Park. in the Whitefish Lake area. The rapid build up in populations of this parasite during the past two years was also a contributing factor in the overall decline of the forest tent caterpillar.

Egg-band surveys conducted in the fall to forecast population trends showed that further decreases will occur in 1966. The results are shown in the following table with a comparison of counts in 1964.

Summary of Forest Tent Caterpillar Egg-band Sampling
Riding Mountain National Park and Western District of Manitoba
1965
(based on examination of 3 co-dominant trembling aspen at each point)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown depth (ft.)	Av. No. of egg-bands per tree		Defoliation forecast for 1966.
				1964	1965	
Western District						
Rossburn (4 miles south)	3.3	27.8	19.3	0.0	0.0	Nil
Neepawa (8 miles east)	3.1	20.3	12.0	0.0	0.0	Nil
Dauphin (6 miles west)	3.0	22.5	15.3	0.0	0.0	Nil
Winnipegosis (2 miles south)	3.3	26.0	13.6	0.0	0.0	Nil
Camperville (2 miles west)	3.0	25.3	14.0	44.6	0.0	Nil
Whitefish Lake (Porcupine For. Res.)	4.5	30.5	16.3	12.0	0.0	Nil
Birch River (4 miles north)	4.0	28.5	15.5	17.6	0.0	Nil
Riding Mountain Nat. Pk.						
Wasagaming	5.6	35.5	18.6	0.0	0.0	Nil
Audy Lake Road	4.0	26.3	16.5	0.0	0.0	Nil
North Gate	4.5	28.5	16.3	0.0	0.0	Nil

5.2.14 MOURNING-CLOAK BUTTERFLY, Nymphalis antiopa (Linn.):-

Observations and collection of this species showed that defoliation ranged from light to moderate on individual scattered trees. Trembling aspen along the Norgate Road and in the vicinity of Katherine and Audy lakes in Riding Mountain National Park suffered light to moderate defoliation. Light defoliation of willow was recorded at Dauphin Lake, Swan River, Mafeking and on Rose Island in Swan Lake.

5.2.15 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acrobasis betulella Hlst. (Birch tube maker)	Birch, white	Ethelbert	Localized infestation; light damage.
Alsophila pometaria (Harr) (Fall canker-worm)	Maple, Manitoba	Amaranth	Very light populations; no defoliation.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Audy Lake. (Riding Mtn. Nat. Park)	Single collection; Low populations
Feralia jocosa (Gn.) (Green striped spruce caterpillar)	Spruce, white Fir, balsam	Riding Mtn. Nat. Park and Duck Mountain For. Reserve	Light scattered populations.
Fenusa dohrnii Tischb. (Alder leaf miner)	Alder	Southern half of District	Populations lower than previous year; defoliation light.
Halisidota maculata (Harr) (Spotted tussock moth)	Aspen, trembling Poplar, balsam Alder Willow	Throughout District	Found commonly but causing no damage.
Hemicroa crocea Four. (Striped alder sawfly)	Alder	Overflowing River Armit Lake and Swan River	Single larvae per collection point.
Itame loricaria Evers. (A looper)	Willow	Riding Mtn. Nat. Park and Camperville	Very light populations; no defoliation.

5.2.15 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Lambdina fiscellaria (Guen.) (Hemlock looper)	Spruce, white Fir, balsam Willow	Rose Island and Whitewater Lake	Low larval populations.
Lepyrus palustris Scop. (A weevil)	Aspen, trembling	Overflowing River	One collection; no damage.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	Aspen, trembling	Throughout District	Scattered light infestations.
Malacosoma pluviale (Dyar.) (Western tent caterpillar)	Rose	Riding Mtn. National Park	Single nest at mile 10 along the Norgate Road.
Mordwilkoja vagabunda (Walsh) (Poplar vagabond aphid)	Aspen, trembling	Riding Mtn. National Park, Duck Mtn. and Porcupine Forest reserve	Widely distributed; very light damage.
Nematus limbatus (Cress) (Willow sawfly)	Willow	Overflowing River	Light defoliation of several willow clumps.
Neodiprion spp. (Jack pine sawflies)	Pine, jack	Whitefish Lake and Cowan	Single colonies of N. maurus Roh. and N. virginianus complex; trace of defoliation.
Orgyia antiqua (Linn) (Rusty tussock moth)	Willow	Rossburn and Porcupine For. Reserve	Very light populations; no defoliation.
Pikonema dimmockii (Cress) (Green-headed spruce sawfly)	Spruce, white and black	Throughout District	Common; usually found in association with the yellow-headed spruce sawfly but caused very little defoliation.
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	Spruce, white	Gilbert Plains	Damage light; two trees infested.

5.2.15 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Petrova albicapitana Busk. (Pitch nodule maker)	Spruce, white	Riding Mtn. National Park	Populations low; no damage.
Phytophaga rigidae O.S. (Beaked willow gall)	Willow	Northern portion of District	Widely scattered in low numbers.
Proteoteras willingana (Kft.) (Boxelder twig borer)	Maple, Manitoba	Ethelbert and Amaranth	Very low populations
Rhabdophaga strobiloides (Walsh) (Willow cone gall)	Willow	Riding Mtn. National Park and parts of Northern portion of District	Light gall populations; widely distributed.
Schizura concinna (J.E. Smith) (Red-humped caterpillar)	Aspen, trembling	Riding Mtn. National Park	Single collection; trace of defoliation.
Tetralopha asperatella (Clem.) (A webworm)	Aspen, trembling	Roblin area and Duck Mountain Forest Reserve	Light damage occurred in small patches.
Zeiraphera fortunana Kft. (Spruce bud moth)	Spruce, white	Riding Mtn. National Park and Duck Mtn. Forest Reserve	Widely scattered; no visible defoliation.

5.3 DISEASE CONDITIONS

5.3.1 FROST DAMAGE:- Heavy snowfall accompanied by freezing temperatures between May 26 and May 28, followed by continued cool weather caused widespread injury to the foliage of aspen and, to a lesser degree, other deciduous trees. In most instances damage was patchy and ranged from light to moderate. However, ground and aerial surveys showed that moderate to severe damage occurred through most of the Minnedosa and Birdtail valleys. Patches of light to moderate damage were common throughout the Riding Mountain National Park and light damage occurred along the southern slopes of the Duck Mountain and Porcupine Forest reserves. Light scattered patches occurred in the Winnipegosis, Camperville, Duck Bay area. Refoliation was slow in the affected regions and new leaves which were smaller in size remained pale in color throughout the season. A trace of frost damage was also recorded to the new growth of spruce and larch but did not appear to have any lasting effects.

5.3.2 SPRUCE NEEDLE RUST, Chrysomyxa ledicola Lagerh.:- This rust was collected from black spruce in three areas: Riding Mountain National Park where infection was light at the South Gate, Moon Lake and along the Mt. Agassiz Road; in the Duck Mountain Forest Reserve where light to moderate infections were present on young open growing trees at Singush, Blue and Wellman lakes; and at Whitefish Lake in the Porcupine Forest Reserve.

5.3.3 YELLOW WITCHES' BROOM OF SPRUCE, Chrysomyxa arctostaphyli Diet.:-

Although this disease was widely distributed throughout the western half of the District, conspicuous brooming was observed in only two locations; the first in a small stand of black spruce along the Rolling River Road in Riding Mountain National Park and the second on scattered trees along the east shore of Whitefish Lake in the Porcupine Forest Reserve.

5.3.4 INK SPOT, Ciborinia whetzelii (Seav.) Seav.:- Commonly found throughout Riding Mountain National Park, with the heaviest infection (ranging from moderate to heavy) of aspen occurring between Miles 8 and 9 along the Audy Lake Road. Several other small patches of light damage were recorded between Gilbert Plains and Grandview along Highway No. 5.

5.3.5 LARCH-WILLOW RUST, Melampsora bigelowii Thuem.:- Scattered localized patches of willow were lightly infected in the McKinnon-Scott Creek area and at Whitewater and Audy lakes in the Riding Mountain National Park. Other areas of light infection occurred in the Ochre River, Dauphin, Ashville region and at the Waterhen and Overflowing rivers.

5.3.6 TWIG AND LEAF BLIGHT OF ASPEN, Pollacia radiosa (Lib.) Bald. & Cif.:-

Although this pathogen was generally found throughout the District overall damage was light. It was most prevalent in the Riding Mountain National Park, in the southern portion of the Duck Mountain Forest Reserve and in

the agriculture areas of Shoal Lake, Newdale, Russell, Birtle and Oakburn. It was usually collected from scattered reproduction aspen.

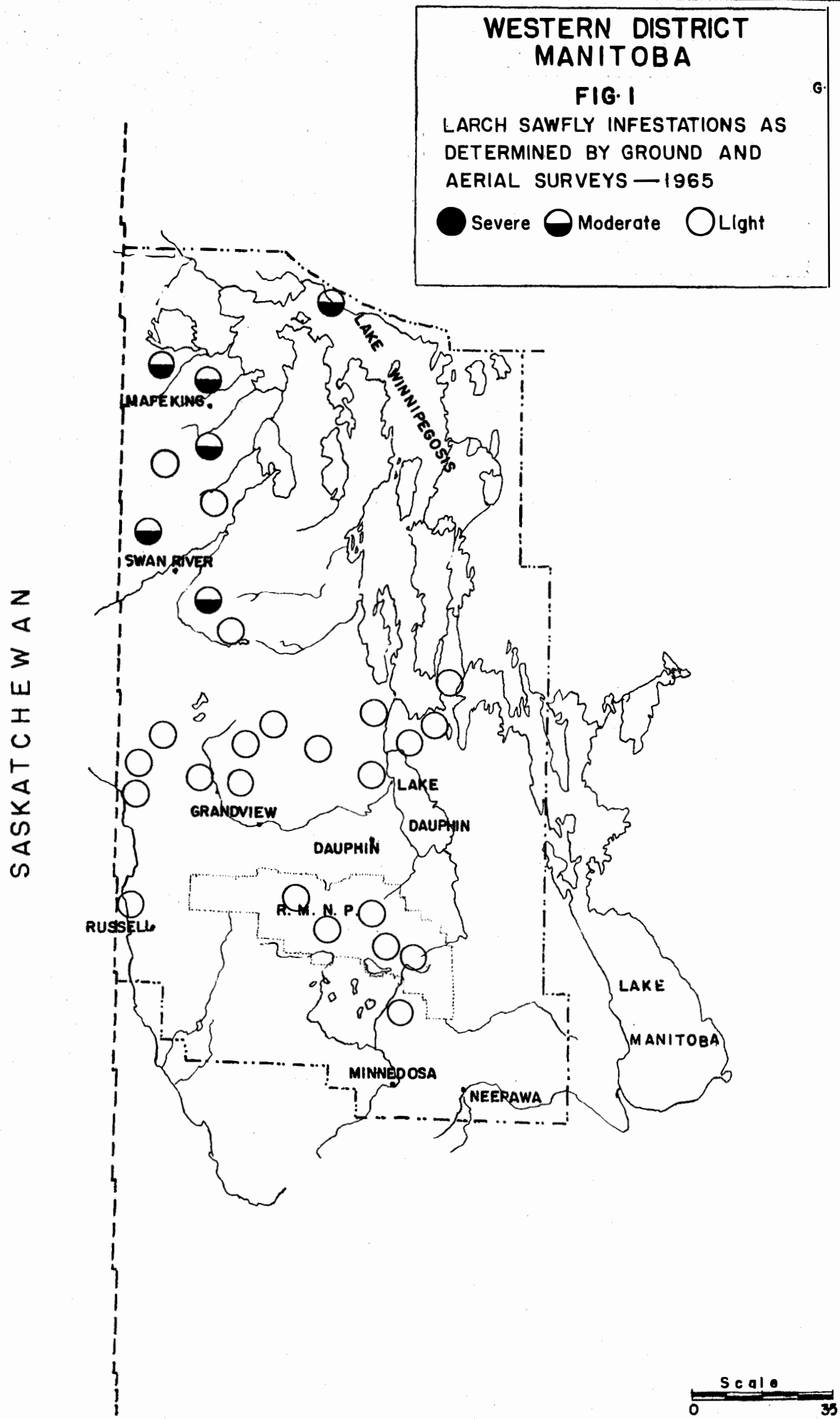
5.3.7 A LEAF SPOT, Septoria musiva Pk.:- Widespread infections of this pathogen were recorded in 1965. Scattered patches of light to moderate damage were common throughout the Riding Mountain National Park, Duck Mountain Forest Reserve and in the Durban-Benito - Bowsman-Birch River section. Continuous moderate to severe leaf spotting occurred from Ashville east to Dauphin, Ochre River and St. Rose. Localized patches of light infection were recorded around Winnipegosis, Meadow Portage, Toutes Aides and south to Methley.

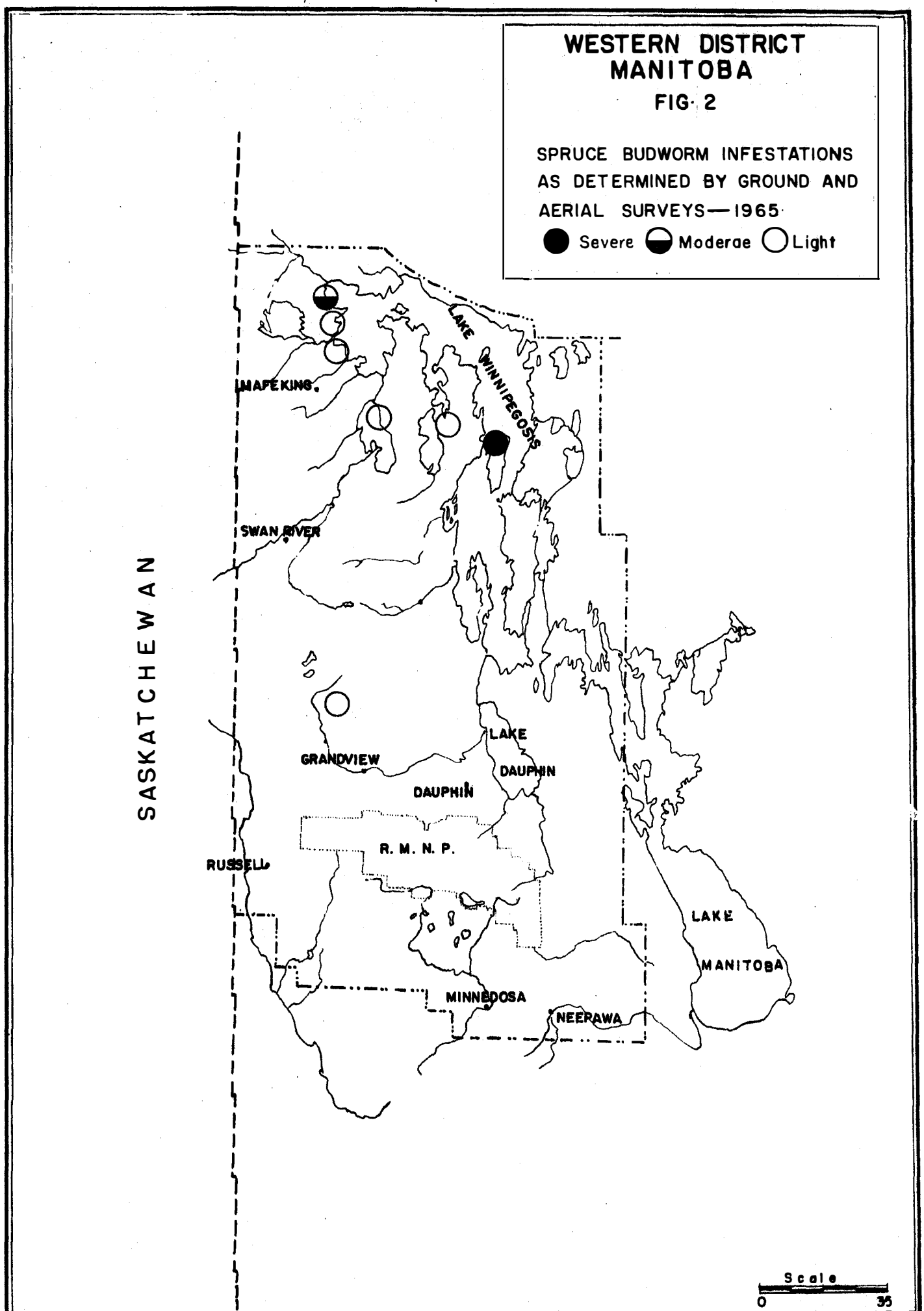
5.3.8 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Jack-pine mistletoe)	Pine, jack	Cowan	Occasional broom on scattered trees.
Chrysomyxa weirii Jacks. (Spruce needle rust)	Spruce, white	Riding Mountain National Park	Light infection in a small patch of white spruce located in Forest Research area.
Drepanopeziza populorum (Desm.) V. Höhn (Leaf spot)	Aspen, trembling	Roblin	Scattered light damage from Roblin west to Man.-Sask. boundary.
Fomes igniarius (L. ex F.) Kickx (White trunk rot)	Aspen, trembling	Riding Mountain Nat. Park, Porcupine For. Res. & Swan Lk.	Found commonly throughout these areas.
Fomes pinicola (Swartz). Cke. (Cubicle rot)	Spruce, white	Riding Mountain Nat. Park and Duck Mtn. For. Reserve	Collections from widely scattered locations.
Hypoxylon pruinatum (Klotscho) Cke. (Hypoxylon canker)	Aspen, trembling	Camperville, Porcupine and Duck Mtn. For. reserves & Swan River	General throughout the district but most common in these areas.
Melampsora medusae Thuem (Larch aspen rust)	Aspen, trembling	St. Rose, Shevlin, McCreary and Erickson	Infections light at all locations.

5.3.8 OTHER NOTEWORTHY DISEASES:- (Cont'd)

Organism and Disease	Host(s)	Locality	Remarks
Diplodia tumefaciens (Shear) Zalasky (Macrophoma gall)	Aspen, trembling Poplar, balsam	Generally distributed through district	Localized infections; light branch mortality.
Peridermium harknessii Moore (Gall rust)	Pine, jack and Scots	Cowan Birch River	Galls collected from single trees.
Phragmidium speciosum (Fr.) Cke. (Leaf rust)	Rose	Northern half of District	Heavy infection at Dawson Bay and the Overflowing River near black spruce stands.


WESTERN DISTRICT
MANITOBA
FIG. 1
LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965
Severe
Moderate
Light
SASKATCHEWAN
MAPE KING
SWAN RIVER
LAKE WINNIPEGOSIS
GRANDVIEW
DAUPHIN
LAKE DAUPHIN
R. M. N. P.
RUSSELL
LAKE MANITOBA
MINNEDOSA
NEEPAWA
Scale
0
35


WESTERN DISTRICT
MANITOBA
FIG. 2
SPRUCE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1965
Severe
Moderae
Light
SASKATCHEWAN
MAFEKING
LAKE WINNIPEGOSIS
SWAN RIVER
GRANDVIEW
LAKE DAUPHIN
DAUPHIN
R. M. N. P.
RUSSELL
LAKE MANITOBA
MINNEDOSA
NEEPAWA
Scale
0
35

6. ANNUAL DISTRICT REPORT

NORTHERN DISTRICT OF MANITOBA

1965

by

R. W. Hancox

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

6.1 INTRODUCTION

Surveys to determine the distribution and intensity of forest insects and diseases were carried out in Northern Manitoba and in the Amisk - Cumberland lakes area of Saskatchewan from May 10 to October 14. During this period 626 insect and 221 disease samples were submitted to the Winnipeg laboratory. Approximately 39 hours of chartered flying time and 18 hours 35 minutes supplied by Manitoba Government Air Service and 3 hours 35 minutes by Saskatchewan Department of Natural Resources were utilized for surveys and general mapping in inaccessible areas. The co-operation of the personnel of the Renewable Resources Branch of the Manitoba Department of Mines and Natural Resources, the Manitoba Government Air Service and the Department of Natural Resources of Saskatchewan in carrying out this work is gratefully acknowledged.

Cool, wet weather accompanied by heavy frosts prevailed throughout May and early June. Temperatures remained cool during July, but were near normal during the remainder of the season. The adverse spring weather retarded foliage growth and insect development by about two weeks, and probably contributed to the termination of the forest tent caterpillar outbreaks in Northern Manitoba. These conditions also retarded larval development of the spruce budworm, but had little or no effect on populations. The spruce budworm infestation at Namew Lake extended northward to Kisseynew Lake, covering an additional 36 square miles in Manitoba and north and west to the Mari - Wildnest lakes area of Saskatchewan. There was a marked decrease in larch sawfly populations in the northern section of the District.

Disease conditions remained unchanged. Yellow witches brooms on black spruce were common throughout the District.

Special and mass collections of insects were made for research projects at the Winnipeg and other laboratories. Subprojects and special sampling methods were continued as follows: (1) egg population sampling of spruce budworm; (2) strip cruises for the appraisal of tree mortality caused by the spruce budworm; (3) larch sawfly cocoon collections to determine the parasite complex; (4) sequential sampling of larch sawfly egg populations; (5) forest tent caterpillar egg band survey to forecast infestation levels in 1966; and (6) a small mammal survey was carried

out at three locations. The sixth annual survey of the Thompson-Smoke-Easement area was carried out, and the results are shown in the appropriate section of this report.

6.2 INSECT CONDITIONS

6.2.1. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- High populations of the spruce budworm persisted throughout the Namew Lake infestation. In 1965, it covered an area of 951 square miles, with some 886 square miles of moderate to severe and 65 square miles of light defoliation of balsam fir and white spruce (Figure 2). There was a northward extension from the Embury Lake area to Kisseynew Lake, covering an area of 36 square miles in Manitoba. This extension also occurred westward into Saskatchewan, to the Mari - Wildnest lakes area. There was no notable change in the western boundary; the infestation decreased from moderate to light defoliation over 25 square miles west of Rocky Lake, increased from light to moderate in an 8-square mile area east of Rocky Lake, extending southward to Root Lake, almost terminated in a 6-square mile area south of Egg Lake to Atik, and expanded to include 5 square miles west of Pothier Lake. In the area from Simonhouse Lake east to Iskwasum Lake, infestation intensity decreased from moderate to light and patches (about one square mile) of moderate defoliation were noted north of Iskwasum Lake along the Grassy River, along the southeast shore of Third Cranberry Lake (about 5 square miles), and in a 2-square mile area along the south and east shores of Second Cranberry Lake.

Elsewhere, moderate to severe defoliation of spruce and balsam fir was recorded on islands in Sisipuk Lake on the Churchill River, and light to moderate defoliation occurred over some 1000 acres of mature white spruce near Sandy Bar Point on Playgreen Lake, 15 miles west of Norway House.

Generally low populations, with defoliation ranging from a trace to 10 per cent of the current foliage, was recorded at Reed, Elbow, Granville, Highrock, Chisel and Harding lakes, and at Nelson House.

Mortality of spruce and balsam fir was noted in patches up to 15 acres, along the north shore of Rocky Lake, between Egg and Goose lakes, at Sturgeon Landing, between Goose and Athapapuskow lakes, around Athapapuskow Lake at South Bay, West Arm, North Arm and Sourdough Bay area, at Schist Lake, Mystic Lake, at the north ends of Saskoba and Maraiche lakes, along the east side of Amisk Lake from Denare Beach to Meridian Creek, and along the west side of Missi Island. Some light mortality was also observed along the north shore of Simonhouse Lake.

Egg sampling was again carried out at 12 sample plots, the results of which are not yet available.

Relatively high egg populations were noted throughout the area during the latter part of the season, indicating that the infestation will continue at the moderate to severe level in 1966.

6.2.2. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Aerial surveys revealed a marked decrease in population of the larch sawfly in the northern section of the District (Figure 1). On August 18, 1965, larvae were noted just hatching in the Chipewyan - Tadoule lakes area, along the Wolverine River to Nejanilini Lake, in the Neultin, Windy lakes area, and south to Lac Brochet. As a result only light defoliation was detected, and very few curled shoots were observed.

Low larval populations occurred throughout the southern section, except at The Bog, where up to 60 per cent defoliation was recorded. Defoliation, ranging from a trace to light, was noted at Radio Range, Westray, Prospector, Reed - Chisel, Herblet, Ospwagan, Cormorant and Gods lakes, and west of Dunlop.

6.2.3. BLACK-HEADED BUDWORM, Acleris variana (Fern.):- This budworm was found commonly in most spruce and balsam fir stands throughout the District. However, populations remained low and feeding damage ranged from only a trace to a maximum of 10 per cent. The highest populations were recorded at Paint, Wekusko, Wintering and Big Sand lakes.

6.2.4. BALSAM-FIR SAWFLY, Neodiprion abietis complex:- Populations of this sawfly were at very low levels throughout northern Manitoba. The highest populations were noted at Rocky Lake, where up to 20 per cent defoliation was recorded in a small localized patch of white spruce. A trace of defoliation occurred on white spruce at Elbow Lake and Thicket Portage, and on black spruce at Oxford Lake.

6.2.5. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Populations remained low and defoliation was light and generally confined to a few twigs per branch in widely scattered spruce stands. White spruce was lightly defoliated at Nelson House, Harding, Isbister, Wintering, Sipiwesk, Island, Reed, Chisel, Wekusko, Morton and Cormorant lakes, Grand Rapids, Westray and the Radio Range near The Pas. Black spruce was lightly defoliated at Natawahunan, Ospwagan, Wintering, Cauchon, Sipiwesk, Island, Eyrie, Russel and Morton lakes.

6.2.6. GREEN-HEADED SPRUCE SAWFLY, Pikonema dimmockii (Cresson):- This sawfly was common in spruce stands throughout the District. It was most abundant on white spruce at Cauchon Lake, where 20 per cent defoliation was recorded on 50 per cent of the trees. A trace to light defoliation occurred on white spruce at Cranberry Portage, Wintering, Witchai, Isbister, Ospwagan, Duck, Island, Reed, Chisel and Wekusko lakes, at Thicket Portage and Radio Range, and on black spruce at Wintering, Cauchon, Reed, Herblet, Eyrie, Laurie, Burntwood and Lynn lakes, and at Radio Range, Thompson, Wabowden, Sawbill Bay and Grand Rapids.

6.2.7. SPRUCE PINEAPPLE GALL APHID, Chermes lariciatus (Patch):- Light to moderate populations of this gall-forming aphid were observed at widely scattered points. Moderate populations occurred on white spruce at Iskwasum, Elbow, Harding and Duck lakes and on black spruce along the Nelson and Burntwood rivers and at Sipiwesk Lake. Low populations were noted on white spruce at Reed, Wintering, Wekusko, Chisel and Simonhouse lakes, at Thicket Portage, Radio Range and Grand Rapids, and on black spruce at Ospwagan, Wintering, Egg and Herblet lakes.

6.2.8. SAWFLIES ON JACK PINE, Neodiprion spp:- Populations were very low and widespread, thus caused no serious defoliation. The species occurring in order of abundance were: N. virginian complex, N. maurus Roh., and N. nanulus nanulus Schedl.

N. virginianus complex occurred in jack pine stands at Westray and Sisipuk Lake on the Churchill River. Defoliation ranged from a trace to light at Westray and two trees were 20 per cent defoliated at Sisipuk Lake. N. maurus caused light defoliation on an occasional tree at Amisk Lake, and N. nanulus nanulus caused a trace of defoliation on occasional branches near Easterville.

6.2.9. FOREST TENT CATERPILLAR, Malacosoma disstria (Hbn.):- The forest tent caterpillar infestation in the Northern District of Manitoba completely terminated in 1965. Only one larval collection was made near The Pas airport, and no defoliation was recorded. Although several egg bands were collected in the Channing - Big Island Lake area, most were unhatched and no living larvae were observed. On May 13, several colonies of newly hatched larvae were observed in The Pas, but following a snow storm May 18 and several days of killing frost, no forest tent caterpillar larvae were present. This adverse weather may have been an important factor in the decline of this insect.

Egg-band surveys were carried out at 9 widely scattered points, and results were negative in all cases, as indicated in the following table:-

TABLE 1

Forest Tent Caterpillar Egg-Band Survey Records - 1965

Northern District of Manitoba

(Based on the examination of 3 co-dominant trembling aspen at each point.)

Location	Av. dbh (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands per tree	Defoliation forecast 1966
Amisk Lake, Sask.	2.5	28	22	0	Nil
Channing, Man.	3.0	29	23	0	Nil
Radio Range, The Pas airport.	2.5	28	14	0	Nil
Cranberry Portage.	2.5	28	21	0	Nil
Big Island Lake.	3.0	25	19	0	Nil
Wanless.	2.5	30	20	0	Nil
Man.-Sask. boundary - Carrot River Valley.	2.5	30	20	0	Nil
Westray.	3.0	23	17	0	Nil
Reed Lake.	4.0	32	15	0	Nil

6.2.10. ASPEN LEAF BEETLE, Chrysomela crotchi, Brown:- Populations of this beetle were generally lower in 1965. Relatively high numbers occurred at Radio Range and near Cranberry Portage, where up to 30 per cent defoliation was recorded on young aspen up to 2-1/2 inches d.b.h. Defoliation, ranging from a trace to light, occurred at Big Island, Simonhouse, Reed, Elbow, Amisk, Egg, Granville and Burntwood lakes, and at Channing, Westray, near Grand Rapids, and Easterville.

6.2.11. THE BIRCH LEAF SKELETONIZER, Buccalatrix canadensisella Cham.:- Aerial surveys revealed moderate skeletonizing of birch along the Churchill River from Granville to Southern Indian lakes, and on several islands in Highrock Lake. Birch foliage was 30 per cent skeletonized at Granville, Molson and Island lakes, and a trace to light skeletonizing occurred at Sipiwesk, Duck, Cotton, Red Sucker, Laurie, Russel, Highrock, Morton and Kiskitto lakes.

6.2.12. GRAY WILLOW LEAF BEETLE, Galerucella decora (Say):- Relatively high populations of adults occurred throughout most of the District during the early part of the season, but resultant larval populations were low. Moderate skeletonizing of willow foliage occurred in a small area at Radio Range, and a trace to light was recorded at Westray, in the Carrot River Valley west of The Pas, at Root, Island, Amisk, Goose, Elbow, Wekusko and Gods lakes, near Cranberry Portage, Atik, Snow Lake, Wabowden and Grand Rapids.

6.2.13. ASPEN BLOTCH MINER, Lithocolletis salicifoliella Cham.:- Lower populations of this blotch miner were evident in 1965. Light infestations damaged 20 per cent of the aspen foliage at Reed and Chisel lakes, and 10 per cent at Simonhouse Lake. A trace of foliage damage was also observed at Radio Range, Cranberry Portage, Amisk Lake, along the Nelson River, at Westray and near Grand Rapids and Easterville.

6.2.14. STRIPED ALDER SAWFLY, Hemichroa crocea (Fourcroy):- This sawfly caused up to 40 per cent defoliation of alder clumps along lake shores of Neultin Lake, 30 per cent at Cormorant Lake, and up to 20 per cent at Granville, Eyrie, Lac Brochet, Highrock and Kiskitto lakes. Very light defoliation occurred at other widely scattered points throughout the District.

6.2.15. A WILLOW SAWFLY, Nematus limbatus Cress : - Defoliation of willow ranging from 10 to 30 per cent was recorded in The Pas - Prospector area, at Chisel, Wekusko, Simonhouse, Sisipuk, and Granville lakes, in the Snow Lake - Wekusko area, near Westray, and at The Bog.

6.2.16. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Aceria parapopuli (Keifer) (Poplar bud gall mite)	Aspen, trembling	Big Island, Patrick lakes, Nelson River	Light damage at collection points.
Adoxus obscurus (Linn.) (Western grape rootworm)	Birch, white Poplar, balsam, Willow Pine, jack	North Star Road, Simonhouse Lake, Chisel, Wekusko lakes area	Low populations; very light feeding.
Altica ambeins alni (Harr.) (Alder flea beetle)	Alder	Egg Lake area	Low populations of adults; light defoliation.
Altica populi Brown. (Poplar flea beetle)	Alder Poplar balsam	Sisipuk Lake, Westray	A trace to light defoliation.
Anoplonyx canadensis Hgtn. (A sawfly)	Tamarack	Windy and Gods lakes	Very low populations; no conspicuous damage.
Anoplonyx luteipes (Cress.) (A sawfly)	Tamarack	Radio Range, Chisel, Reed, Herblet lakes, Wabowden area	Low populations; no noticeable defoliation.
Aphid sp. (A plant louse)	Alder Fir, balsam	Throughout the District	Common on alder foliage; light on balsam fir at Cranberry Portage.

6.2.16. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	Cherry, Choke	Rocky Lake, Radio Range	Localized infestations; light to moderate feeding damage.
Arge clavicornis Fab. (The sawfly)	Alder, Willow, Birch, white	At widely scattered points	Low populations; a trace of defoliation.
Arge pectoralis Leach. (Birch sawfly)	Alder	Burntwood and Cormorant lakes	Localized infestation; 20 to 30 per cent defoliation on some clumps.
Argyrotaenia occultana Free. (A leaf roller)	Fir, balsam	Morton Lake	Very low populations.
Badebecia urticana Hbn. (A leaf roller)	Aspen, trembling	Root Lake	Light damage to leaves on occasional trees.
Campaea perlata Gn. (The fringed looper)	Willow, Aspen, trembling	Westray, Atik, Sisipuk and God's lakes	Low populations; light feeding damage.
Cecidomyia balsamicola Lintner. (Balsam gall midge)	Fir, balsam	Egg Lake	Needles lightly infested.
Chermes cooleyi Gill. (Cooley spruce gall aphid)	Spruce, white	Nelson House, Cormorant Lake	Light damage to needles.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Sisipuk Lake	20 per cent of aspen foliage damaged in small area.

6.2.16. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Choristoneura pinus Free. (Jack-pine budworm)	Pine, jack	Grand Rapids	Occasional larvae; a trace of defoliation.
Chrysomela knabi Brown. (A leaf beetle)	Poplar, balsam	Oxford Lake	Very low populations; no visible damage.
Cicadellid sp. (A leaf hopper)	Aspen, trembling, Alder, Willow, Poplar, balsam, Birch, white	Throughout the District	Moderately high populations at most sample points.
Croesus latitarsus Norton. (Dusky birch sawfly)	Birch, white	Russel Lake	light defoliation on occasional trees.
Dimorphoptoryx pinguis (Nort.) (A sawfly)	Birch, white	Witchai, Isbister, Sisipuk, Chisel, Simonhouse lakes	Low populations; defoliation ranging from a trace to 10 per cent.
Dioryctria reniculella (Grote) (Spruce coneworm)	Spruce, black and white	Throughout the forested area	Low populations, except at Amisk Lake where moderate populations were recorded.
Ectoedemia populella Busch (Ribbed petiole gall)	Aspen, trembling	Oxford Lake	Light damage in a localized area.
Epinotia solandriana Linn. (A leaf roller)	Aspen, trembling	Sisipuk and Granville lakes	Low population; light damage to the foliage.

6.2.16. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Eriophyes sp. (A mite)	Aspen, trembling, Birch, white, Alder, Willow, Poplar, balsam	Throughout the district	Common; damage ranged up to 60 per cent.
Eupithecia filmata Pears. (A looper)	Spruce, white spruce, black	At widely scattered points	No visible defoliation; low populations.
Eupithecia luteata Pack. (A looper)	Spruce, white, Spruce, black, Tamarack	Widely scattered sample points	Low population; no noticeable defoliation.
Fenusa dohrnii Tischbein (European alder leaf miner)	Alder	Egg, Chisel, Sisipuk, Granville, Southern Indian, Highrock lakes. Westray and Pine Island	Damage ranged from a trace at Westray to 60 per cent of foliage at Chisel Lake.
Gonioctena americana (Schaeffer) (American aspen beetle)	Aspen, trembling	The Pas and Cranberry Portage	Defoliation ranging up to 20 per cent.
Gracillarid sp. (A blotch miner)	Willow, Birch, white, Alder	Reed, Paint lakes, Wabowden	80 per cent of foliage damaged on 50 per cent of willow clumps near Wabowden. Light at other points.
Griselda radicana Wlshm. (A leaf roller)	Spruce, white, Fir, balsam	Wintering and Sisipuk lakes	Very low populations; no noticeable defoliation.
Halisidota maculata (Harris) (Spotted tussock moth)	Alder, Willow, Aspen, trembling, Poplar, balsam	Simonhouse, Kiskitto, Gods lakes and Westray	A trace to light defoliation.

6.2.16. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Hylurgopinus rufipes Eichhoff. (Native elm bark beetle)	Elm	5 mi. west of The Pas	First record of elm bark beetle in northern Manitoba.
Lithophane amanda Sm. (An owlet moth)	Birch, white Alder	Wintering, Cross, Cotton lakes	Very low populations.
Malacosoma pluviale (Dyar) (Western tent caterpillar)	Birch, white, Alder, Willow, Ash, mountain	Amisk and Cross lakes	Up to 40 per cent defoliation of white birch at Amisk Lake; 10 per cent at Cross Lake.
Meroptera pravella Grt. (A pyralid moth)	Aspen, trembling	Highrock Lake	Low populations.
Mordwilkoja vagabunda Walsh. (Poplar vagabond aphid)	Aspen, trembling	Aspen groves throughout the District	Low populations; damage ranged up to 20 per cent.
Nematus populi (Marl) (A sawfly)	Aspen, trembling	Cranberry Portage	Localized infestation; 10 per cent defoliation.
Operophtera bruceata (Hulst) (Bruce spanworm)	Aspen, trembling, Willow	Westray and Radio Range	No conspicuous defoliation.
Orgyia antiqua (L.) (Rusty tussock moth)	Willow, Poplar, balsam, Alder, Birch, white	At widely scattered points	Very low populations; no evidence of feeding damage.
Orsodacne atra Ahr. (A leaf beetle)	Aspen, trembling, Poplar, balsam, Birch, white, Willow	Paint, Sisipuk, lakes and North Star Road	Low adult populations; a trace of defoliation.

6.2.16. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Pandemis canadana Kft. (A leaf roller)	Aspen, trembling, Willow	Root and Sisipuk lakes	Very low numbers.
Pemphigus populi transversus Riley (Poplar petiole gall aphid)	Poplar, balsam, Aspen, trembling	Highrock, Sisipuk, Wintering, Harding, Reed and Oxford lakes	Severe on balsam poplar at Highrock Lake; light at all other sample points.
Petrova albicapitana Busck. (Pitch nodule maker)	Pine, jack	Radio Range, Simonhouse and Chisel lakes	Low populations; very light damage.
Phratora americana canadensis Brown. (A leaf beetle)	Aspen, trembling, Birch, white	Reed and Natawahunan lakes	Low adult populations; a trace of defoliation.
Phyllocolpa sp. (A sawfly)	Poplar, balsam, Aspen, trembling, Willow	Throughout the District	Widespread light to moderate damage to foliage.
Phytophaga rigidae (Osten Sacken) (Willow cone gall midge)	Willow	Widely scattered points	Moderate on several clumps at Radio Range and Herblet Lake; light at all other points.
Pissodes strobi (Peck) (White-pine weevil)	Pine, jack	Root lake and Radio Range	Low adult populations.
Pristiphora siskiyouensis Marl. (A sawfly)	Birch, white	Chisel and Gods lakes	Infestation light in both areas.
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	Willow	Throughout the District.	Generally distributed; damage light.

6.2.16 OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Sciaphila duplex Wlshm. (A leaf roller)	Aspen, trembling	Cranberry Portage, Wekusko and Sisipuk lakes	Light feeding at all collection points.
Semiothisa sexmaculata Pack. (Green larch looper)	Tamarack	Tamarack stands throughout the District	Common in most tamarack stands; highest populations at Gods Lake.
Syneta pilosa Brown. (A leaf beetle)	Spruce, black, Spruce, white, Fir, balsam	Throughout the forested area	Low adult populations; no conspicuous damage.
Tetralopha asperatella Clem. (Aspen webworm)	Poplar, balsam, Aspen, trembling	Reed and Highrock lakes	Very low populations; a trace of feeding damage.
Toumeyella numismaticum (P. & McD.) (Pine tortoise scale)	Pine, jack	Sawbill Bay	Light infestation.
Trichiocampus irregularis (Dyar) (A sawfly)	Willow	Eyrie, Big Sand, Neultin and Chatwin lakes; Lac Brochet.	30 to 40 per cent defoliation at Neultin and Chatwin lakes; light at all other points sampled.
Trichiosoma triangulum Kby. (A sawfly)	Poplar, balsam, Aspen, trembling, Birch, white	Widely scattered points	Very light infestations.
Zale duplicata largera Sm. (An owlet moth)	Pine, jack	Patrick Lake	Low adult populations.
Zeiraphera fortunana Kft. (spruce bud moth)	Spruce, white	The Pas Airport, Reed and Wekusko lakes	Populations very low; trace of damage.

6.3. TREE DISEASE CONDITIONS

6.3.1. A RUST BROOM, Chrysomyxa arctostaphyli, Diet.:- Rust brooms caused by this pathogen were common on black spruce, with the highest incidence of brooming occurring in the south and central sections of the District. Brooms were noted in the Bog - Westray area, near Prospector, at Reed and Chisel lakes, from Wekusko to Wabowden, throughout the Thompson Smoke Easement area, at Oxford, Northern Indian and Neultin lakes, and at Lac Brochet. Infections varied from 1 to 3 brooms on 10 to 20 per cent of the trees. The heaviest infection was recorded on black spruce at Cross Lake, and near Lac Brochet. Six brooms were observed on a large mature white spruce on Pine Island in Cumberland Lake.

6.3.2. SPRUCE NEEDLE RUSTS, Chrysomyxa spp.:- The spruce needle rusts, C. ledi, de Barry and C. ledicola, Lagerh., were widely scattered throughout the District. C. ledi was recorded on white spruce at Granville Lake and on black spruce at Chisel, Chatwin, Lynn and Burntwood lakes. Infections were generally light with only an occasional needle per branch attacked. C. ledicola was most common, and was found in black spruce stands at Paint, Neultin, Chatwin, Lynn, Laurie, Russel, Highrock and Kiskitto lakes. The most severe infection occurred at Chisel Lake, where up to 75 per cent of the new needles were infected. Elsewhere, infection ranged from a trace to 20 per cent. Light infections also occurred on white spruce at Chisel Lake. C. ledicola was found on the alternate host, Ledum sp., at Natawahunan, Harding and Chipewyan lakes and at Windy Lake in the N. W.T.

6.3.3. A GLOBOSE RUST GALL, Peridermium harknessii J.P. Moore:- Light to moderate infections of this rust gall were recorded in jack pine stands at Radio Range, west of Reed Lake, near Wekusko and Wabowden and at Sisipuk and Russel lakes. Old rust galls were numerous at Wabowden and no new galls were found at Sisipuk Lake, where previously recorded.

6.3.4. INK SPOT OF ASPEN, Ciborina bifrons (Sear) Sear:- Trembling aspen up to 3 inches dbh were infected by this ink spot from The Pas area to Flin Flon and from Simonhouse Lake to Chisel and Herblet lakes. Infections, ranging up to 10 per cent of the foliage, were recorded at Radio Range, Cranberry Portage, Neso, Simonhouse, Chisel and Herblet lakes. At Egg Lake, the foliage on aspen from 3 to 5 inches dbh was 20 per cent infected, and up to 50 per cent on 1 to 3 inch dbh trees.

6.3.5. A LEAF AND TWIG BLIGHT, Pollaccia radiosa (Lib.) Bald. and Cif.: - This blight was common on young trembling aspen throughout the southern section of the Region. Moderate to severe damage occurred near Cranberry Portage and Thompson, at Sisipuk, Ospwagan, Cauchon, Chisel, Egg and God's lakes. Light to moderate infections were noted near Goose, Reed, Herblet, and Highrock lakes, Radio Range and at Westray.

6.3.6. A LEAF AND TWIG BLIGHT, Pollaccia elegans Serv.:- Balsam poplar was infected by this blight at widely scattered points. The most conspicuous damage was recorded at Cranberry Portage where the foliage on 1/2-inch dbh trees was 60 per cent infected. Young balsam poplar at Harding Lake showed 40 per cent infection, while 20 per cent of the foliage was infected at Neso Lake, Thicket Portage, and Westray.

6.3.7. LARCH-WILLOW RUST, Melampsora bigelowii Thuem:- Light infections of this rust on willow were widespread throughout the District. Collections were taken at Reed, Chisel, Herblet, Paint and God's lakes, Radio Range, Bakers Narrows, Prospector and Westray.

6.3.8. TAR SPOT, Rhytisma salicinum (Pers.) Fr.:- Moderate to severe infection of willow was recorded at Windy Lake in the N.W.T., and Neultin Lake in the northern section of the District. Light to moderate attacks occurred at Herblet, Sisipuk, Granville, Southern Indian, Chatwin, Highrock and God's lakes, Lac Brochet and Wekusko.

6.3.9. POWDERY MILDEW, Uncinula salicis (Dc. ex Mer.) Wint.:- Moderate to severe infections of this disease were noted on willow at Southern Indian and Highrock lakes. Light infection occurred at Burntwood and Kiskitto lakes. Balsam poplar was also lightly infected at Kiskitto Lake.

6.3.10. MACROPHOMA GALLS, Diplodia tumefaciens (Shear) Zalasky:- A light infection was recorded near the mouth of the Overflowing River, where galls were found on 4 out of 10 trembling aspen and 3 out of 10 balsam poplar.

6.3.11. FUME DAMAGE: - Sulphur dioxide fumes caused discolouration of foliage on several tree species in patches within a radius of 6 miles around the smelters at Flin Flon and Thompson. At Flin Flon the most conspicuous browning occurred south and west of the smelter, and at Thompson in an arc from the southwest to the southeast. Discoloration of foliage was most conspicuous on white birch, trembling aspen,

and willow; damage ranging up to 80 per cent on aspen, 70 per cent on willow, and 60 per cent on white birch between 2 and 6-1/2 miles south of Thompson. Balsam poplar, jack pine, spruce, pincherry, Saskatoon and laborador tea also showed a trace of damage within small scattered patches.

6.3.12. HAIL AND WIND DAMAGE :- Aerial surveys in northern Manitoba indicated that severe hail storms in 1964 caused lesions resulting in branch mortality on jack pine and spruce. Conspicuous orange-coloured flagging on jack pine was noted. However, needles had dropped off the dead spruce branches and damage was not particularly noticeable from the air. Patches of hail damage, ranging in size from 10 to 40 square miles, were detected at the northeast end of Landing Lake, north west of Oxford Lake, from Knee Lake to Gods Lake, between Edmund and Sharpe lakes, and in the Joint, Laidlaw, Windy lakes area. High winds (from 65 to 80 m.p.h.) accompanied by hail stones from 1/2 to 1 inch in diameter were reported at Island Lake in late July, 1964, at at the east end of God's Lake in September 1964. On August 4, 1965, high winds blew down scattered aspen and spruce in a narrow strip along the south side of Reed Lake.

6.3.13 FROST DAMAGE :- Below average temperatures during May and early June resulted in light frost damage to foliage of several decidious trees. Aspen, willow and alder were lightly damaged by frost in patches throughout the southern section of the District. This damage caused irregular leafing of aspen with many clones having leaves much smaller and lighter in colour than normal.

6.3.14. OTHER NOTEWORTHY DISEASES: -

Disease and Organism	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Jack-pine mistletoe)	Pine, jack	Southern section of the District	No new occurrences recorded.
Arceuthobium pusillum Peck. (Dwarf mistletoe of black spruce)	Spruce, black	Southern section of the District	No change in occurrence or distribution.
Diatrype disciformis (Hoffm. ex Fr.) (A dieback)	Alder	Molson Lake	Occasional dead branches noted.
Diatrypella faracea (Fr.) Nits. (A dieback)	Alder	Big Sand Lake	Occasional branches infected on one clump.
Drepanopeziza populorum (Desm.) V Hohn (A leaf spot)	Aspen, trembling	Westray	20 per cent of foliage in 80 per cent of trees infected over a small area.
Favolus alveolaris (Dc. ex Fr.) Quel. (A decay)	Willow	Granville Lake	Light on an occasional clump.
Gymnosporangium nidus-avis Thaxt. (A rust)	Saskatoon	Radio Range and Reed Lake	30 per cent of leaves and fruit attacked at Radio Range; 10 per cent at Reed Lake.
Hysterium acuminatum Fries. (A needle cast)	Juniper	Radio Range	50 per cent of one clump infected.

6.3.14. OTHER NOTEWORTHY DISEASES (CONT'D)

Disease Organism	Host(s)	Locality	Remarks
Lophodermium filiforme Darker. (A needle cast)	Spruce, black	Northern Indian Lake	20 per cent of the needles on 70 per cent of trees infected in lower crown.
Lophodermium pinastri (Schrad. ex Fr.) Chev. (A needle rust)	Pine, jack	Sawbill Bay	Light infection on one tree.
Melampsora abieti-capraearum Tub. (A rust)	Willow	Amisk Lake	30 per cent of foliage on 30 per cent of willow clumps infected.
Melampsora medusae Thum. (Larch-aspen rust)	Aspen, trembling	Egg and Chisel lakes	Light infection on scattered trees.
Melampsora caryophyllacearum Schroet. (Yellow witches broom on balsam fir)	Fir, balsam	Wintering Lake	Very light infection on single trees.
Myxofusicoccum alni Jaap. (A dieback)	Alder	Chisel Lake	One clump only attacked.
A needle cast on balsam fir	Fir, balsam	Sipiwesk Lake	30 per cent of foliage on 50 per cent of trees infected.
A needle cast on white spruce	Spruce, white	Harding Lake	10 per cent of foliage on one tree infected.

6.3.14. OTHER NOTEWORTHY DISEASES (CONT'D)

Disease and Organism	Host(s)	Locality	Remarks
A needle cast on black spruce	Spruce, black	Natawahunan, God's and Edmund lakes	Light at Natawahunan and God's lakes; 70 per cent of foliage attacked on 10 per cent of trees at Edmund Lake.
Sarcotrochila balsameae (Davis) Korf. (Snow blight)	Fir, balsam	Island Lake	1st Manitoba record; infection light.
Schizophyllum commune Fr. (A decay)	Fir, balsam	Egg Lake	One tree infected; white feathery conks on stem.
Septoria musiva Pk. (A leaf spot)	Poplar, balsam	Radio Range, Prospector and Kiskitto Lake	Light infection.
Stereum hirsatum (Willd ex Fr.) S. F. Gray (A decay)	Birch, white	Amisk Lake	Found on one small dead tree.
Stereum purpureum Lloyd. (A decay)	Aspen, trembling	Reed Lake	Found on wind thrown tree.
Tympanis alnea (Persoon) Fries (A dieback)	Alder	Granville and Big Sand lakes	Light infection on an occasional alder clump.

6.4 SUMMARY OF FOREST INSECT AND TREE DISEASE CONDITIONS IN THE THOMPSON SMOKE EASEMENT AREA - 1965

This is the sixth annual survey report of forest insect and tree disease conditions in the smoke easement and adjacent areas held by the International Nickel Company around Thompson. A total of 18 hours and 35 minutes flying time was provided by the Manitoba Government Air Service. The survey was carried out from July 5 to 9, along 10 predetermined flight lines running east and west at about 12 mile intervals from between Harding and Assean lakes in the north to Cross and Walker lakes in the south. A total of 118 insect and 51 disease samples were collected in the vicinity of 10 sulphur dioxide testing stations and at 8 other sample points. The north-easterly portion of the Easement Area was not sampled due to large areas of burn.

Weather conditions during the survey were generally poor with numerous rain squalls. Water levels were high on most lakes. Insect activity was light and development was about two weeks later than usual at all sample points. Gall insects were common on deciduous trees, attacking both leaves and stems. A crystalline-like patch on the foliage of white birch and speckled alder caused by a sucking insect, possibly a mite, was common at many locations. Leaf hoppers were numerous on birch and alder. The spruce pineapple gall aphid was common on white and black spruce and damage ranged from moderate to severe at some locations.

Extensive hail damage, particularly to jack pine, was noted over a large area at the northeast end of Landing Lake. Yellow witches' broom on black spruce was common throughout the area surveyed with about one in seven trees attacked with from one to six brooms. Light sulphur dioxide fume damage was recorded at seven locations. Forest insects and diseases collected during this survey are listed in Tables 2 and 3.

TABLE 2

FOREST INSECT CONDITIONS
SMOKE EASEMENT AREA, THOMPSON, MANITOBA
1965

Insect	Host(s)	Location and Sampling Station No.	Remarks
Aceria parapopuli (Keifer) (Poplar bud-gall mite)	Aspen, trembling	Nelson River Patrick Lake	A trace to light damage.
Acleris variana (Fern.) (Black-headed budworm)	Spruce, white and black	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #19 (Wintering Lake(S)) SO_2 #12 (Witchai Lake) SO_2 # 9 (Isbister Lake) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake) SO_2 # 5 (Wintering Lake), Duck Lake, Cross Lake, Nelson River Cauchon Lake, Patrick, Cotton Lakes.	Damage light at SO_2 #18, SO_2 #5, Nelson River and Cross Lake with defoliation to 10 per cent: low populations and no visible damage at other collection points.

Insect	Host(s)	Location and Sampling Station No.	Remarks
Amauronematus sp. (A sawfly)	Willow Aspen, trembling	SO_2 #16 (Nelson House) SO_2 #12 (Witchai Lake) SO_2 # 9 (Isbister Lake) SO_2 # 5 (Wintering Lake) Duck, Patrick and Cotton lakes.	High populations at SO_2 #16, #12, #5, and at Duck Lake; a trace of defoliation recorded at all points.
Aphid spp. (A plant louse)	Alder	SO_2 #15 (Harding Lake) Nelson River, Cotton Lake	A white woolly aphid causing damage to 20 per cent of foliage at Nelson River; light at other points.
Arge clavicornis Fab. (A sawfly)	Alder	Sipiwesk Lake (S)	Low population, a trace of feeding damage.
Buccalatrix canadensisella Cham. (Birch leaf skeletonizer)	Birch, white Alder	Sipiwesk, Duck and Cotton lakes	Low adult populations at all collection points.
Cecidomyid sp. (A gall midge)	Spruce, black	SO_2 #10 (Burntwood River)	Needles infested, a trace of damage.
Chermes lariciatus (Patch) (Spruce pineapple gall aphid)	Spruce, white and black	SO_2 #15 (Harding Lake) SO_2 #10 (Burntwood River) SO_2 #19 (Wintering Lake) SO_2 #17 (Ospwagan Lake) SO_2 # 5 (Wintering Lake) Nelson River, Sipiwesk Lake and Duck Lake	Damage was 50 per cent at SO_2 #15, Nelson River and Sipiwesk; 30 per cent at Duck Lake; 10 per cent at SO_2 #10, #5; trace at SO_2 #17.
Choristoneura fumiferana (Clem.) (Spruce budworm)	Spruce, white	SO_2 #15 (Harding Lake)	20 per cent defoliation; a few trees attacked.
Chrysomelid sp. (A leaf beetle)	Birch, white Alder	SO_2 #9 (Isbister Lake) Cotton Lake	10 per cent defoliation on white birch at SO_2 #9 and on alder at Cotton Lake.
Chrysomela crotchi Brown (Aspen leaf beetle)	Birch, white	Cotton Lake	Larval feeding damage to foliage 10 per cent on 80 per cent of trees.

Insect	Host(s)	Location and Sampling Station No.	Remarks
Cicadellid sp. (A leaf hopper)	Birch, white Alder Willow Poplar, balsam	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #10 (Burntwood River) SO_2 #19 (Wintering Lake (S)) Nelson River, Patrick and Cross lakes.	Light to moderate populations; highest numbers along Burntwood River. Damage a trace to 10 per cent.
Cynipid sp. (A gall midge)	Aspen, trembling Rose	SO_2 #15 (Harding Lake) SO_2 # 8 (Natawahunan Lake) SO_2 # 9 (Isbister Lake) Nelson River, Patrick and Sipiwesk lakes	10 per cent of aspen damaged at SO_2 #9 and to wild rose along the Nelson River; light at other points.
Dimorphopteryx pinguis (Nort.) (A sawfly)	Birch, white	SO_2 #9 (Isbister Lake) SO_2 #12 (Witchai Lake) Sipiwesk Lake	Low populations; a trace of feeding damage.
Dioryctria reniculella (Grote) (Spruce cone worm)	Spruce, white and black	SO_2 #12 (Witchai Lake) Cross Lake	Very low populations; no visible damage.
Eriophyes sp. (A mite)	Birch, white Alder Willow Cherry, choke Aspen, trembling Cherry, pin	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #19 (Wintering Lake (S)) SO_2 #12 (Witchai Lake) SO_2 # 8 (Natawahunan Lake) SO_2 # 9 (Isbister Lake) SO_2 # 5 (Wintering Lake (N)) Sipiwesk, Duck and Cross lakes	Severe on willow at SO_2 #12; moderate on white birch at SO_2 #16, and #19; light to moderate at other collection points.
Eupithecia filimata (Pears.) (A looper)	Spruce, white and black Fir, balsam	SO_2 #18 (Paint Lake) Sipiwesk, Cross and Cotton lakes, Thicket Portage	Very low populations; no visible damage.
Eupithecia luteata Pack. (A looper)	Spruce, black	SO_2 #19 (Wintering Lake (S)) Landing Lake	Very low populations; no visible damage.
Gracillarid sp. (A blotch miner)	Birch, white	SO_2 #18 (Paint Lake)	Up to 10 per cent of foliage damaged or 80 per cent of the trees.
Griselda radicana Wlshm. (A leaf roller)	Fir, balsam Spruce	SO_2 #19 (Wintering Lake (S)) Sipiwesk Lake	Very low populations; no visible damage

Insect	Host(s)	Location and Sampling Station No.	Remarks
Hylobius pinicola (Couper) (The root collar weevil)	Spruce, black	Cross Lake	One adult only.
Idiocerus lachrymalis Fitch. (A leaf hopper)	Aspen, trembling	Nelson River and Prudhomme Lake	Low populations.
Idiocerus populi L. (A leaf hopper)	Aspen, trembling	Sipiwesk Lake	Low populations.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	Aspen, trembling	Nelson River and Prudhomme Lake	Leaves infested; damage a trace.
Lithophane amanda Sm. (An owlet moth)	Birch, white Alder	SO_2 #5 (Wintering Lake (N)) Cross and Cotton lakes	Very low populations; damage nil.
Macremphytus sp. (A sawfly)	Dogwood	SO_2 #8 (Natawahunan Lake)	20 per cent defoliation.
Malacosoma pluviale (Dyar) (Western tent caterpillar)	Birch, white Willow Ash, mountain	Cross Lake	10 per cent defoliation on white birch and mountain ash; wandering larvae on willow.
Neodiprion abietis complex (Balsam-fir sawfly)	Spruce, white	Thicket Portage	Low populations; no visible damage.
Orgyia antiqua (L.) (Rusty tussock moth)	Willow Alder Birch, white Aspen, trembling	Cauchon, Duck and Cross lakes	Very low populations.
Orsodacne atra Ahr. (A leaf beetle)	Aspen, trembling	SO_2 #18 (Paint Lake)	Damage nil.
Parorgyia plagiata (Wlk.) (Gray spruce tussock moth)	Fir, balsam	Sipiwesk Lake (S)	One larvae; damage nil.

Insect	Host(s)	Location and Sampling Station No.	Remarks
Pemphigus populi-transversus Riley (Poplar petiole gall)	Aspen, trembling Poplar, balsam	SO_2 #15 (Harding Lake) SO_2 #19 (Wintering Lake (S))	Light on bPo at SO_2 #15; 50 per cent damage on 50 per cent of aspen trees at SO_2 #19.
Phratora americana canadensis Brown (A leaf beetle)	Birch, white	SO_2 #8 (Natawahunan Lake)	One adult only.
Phyllocolpa sp. (A sawfly)	Poplar, balsam Aspen, trembling Willow	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #19 (Wintering Lake (S)) SO_2 #9 (Isbister Lake) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake) Thicket Portage, Nelson River, Sipiwesk and Duck lakes	Damage ranged from 50 per cent at Sipiwesk to 10 per cent at Duck Lake and SO_2 #17; other points light.
Phyllocnistis populiella Cham. (A blotch miner)	Poplar, balsam	SO_2 #15 (Harding Lake)	A trace of damage.
Pikonema alaskensis (Roh.) (Yellow-headed spruce sawfly)	Spruce, white and black	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbister Lake) SO_2 #17 (Ospwagan Lake) SO_2 #5 (Wintering Lake (N)) Cauchon and Sipiwesk lakes	Defoliation ranging from a trace to 10 per cent was recorded at all collection points.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white and black	SO_2 #19 (Wintering Lake (S)) SO_2 #12 (Witchai Lake) SO_2 #9 (Isbister Lake) SO_2 #17 (Ospwagan Lake) SO_2 #5 (Wintering Lake (N)) Cauchon and Duck lakes	25 per cent defoliation occurred at Cauchon Lake; a trace at all other points sampled.
Plagodis alcoolaria (Gn.) (A looper)	Birch, white Willow	Sipiwesk and Cotton lakes	Low populations; no visible damage.
Pristiphora sp. (A sawfly)	Willow	SO_2 #9 (Isbister Lake)	Very low populations; no visible damage.

Insect	Host(s)	Location and Sampling Station No.	Remarks
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	Willow	SO_2 #9 (Isbister Lake)	A trace of damage.
Syneta pilosa (Brown) (A leaf beetle)	Sp uce, black Fi , balsam	SO_2 #16 (Nelson House) SO_2 #19 (Wintering Lake (S) SO_2 #9 (Isbister Lake)	Very low populations at all points.
Tenthredinid sp. (A sawfly)	Poplar, balsam Birch, white Willow Aspen, trembling Alder Spruce, white Fir, balsam	SO_2 #16 (Nelson House) SO_2 #15 (Harding Lake) SO_2 #10 (Burntwood River) SO_2 #12 (Witchai Lake) SO_2 #17 (Ospwagan Lake) SO_2 # 5 (Wintering Lake (N) Nelson River, Cauchon, Patrick, Sipiwesk, Duck and Cotton lakes.	Light damage recorded at all collection points.
Tortricid sp. (A leaf roller)	Aspen, trembling Willow Birch, white	SO_2 #15 (Harding Lake) SO_2 #12 (Witchai Lake) SO_2 #9 (Isbister Lake) SO_2 #17 (Ospwagan Lake) Cross Lake	Light damage to foliage at all collection points.
Trichiosoma triangulum Kby. (A sawfly)	Aspen, trembling Birch, white	SO_2 #9 (Isbister Lake) Duck Lake	One larva collected at each point; no visible damage.
Zale duplicata largera Sm. (An owlet moth)	Pine, jack	Patrick Lake	Two larvae only; damage nil.

TABLE 3

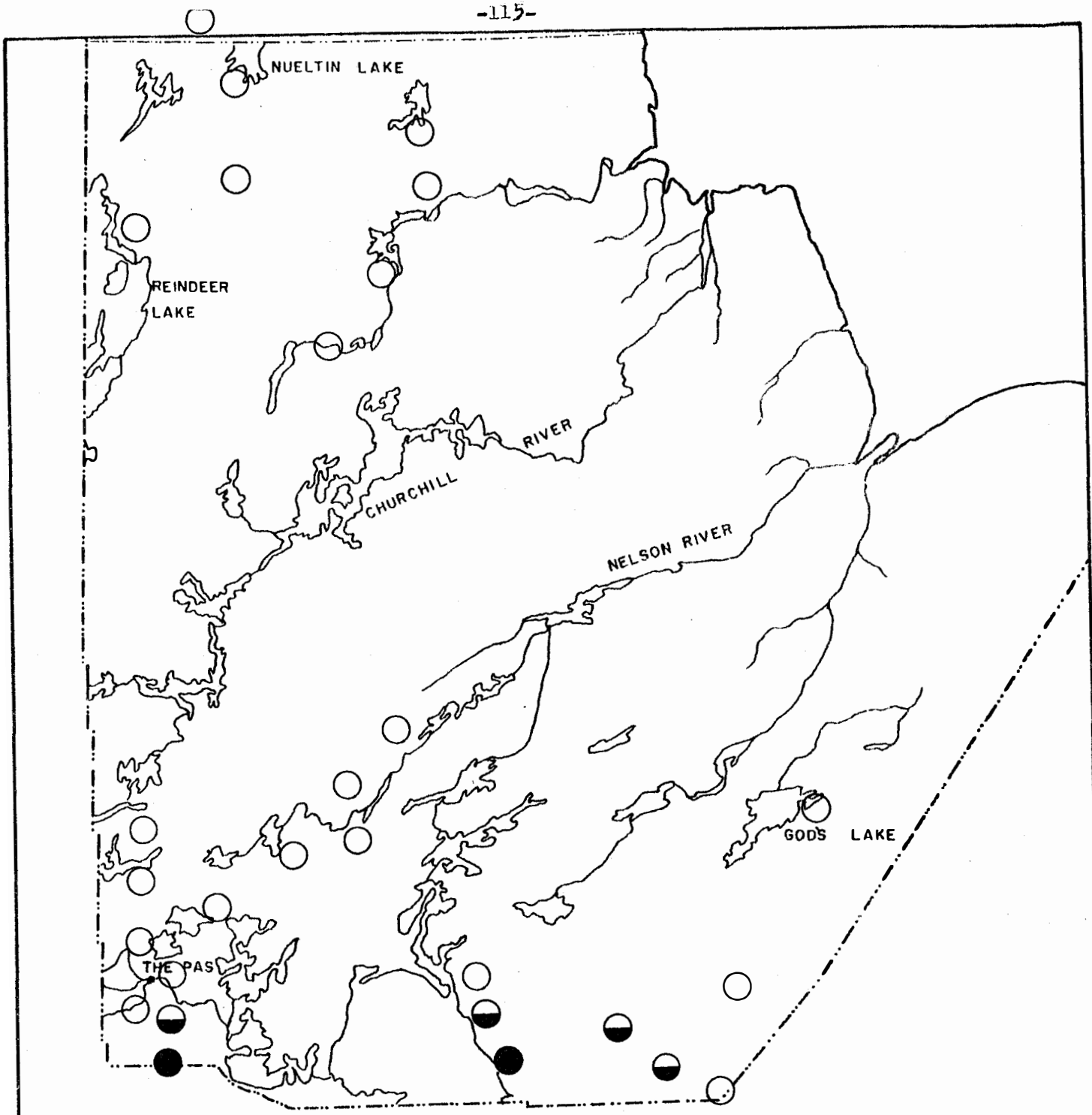
TREE DISEASE CONDITIONS
SMOKE EASEMENT AREA, THOMPSON, MANITOBA
1965

Disease or Organism	Host(s)	Location and Sampling Station No.	Remarks
Chrysomyxa ledicola (Peck) Lagerh. (A rust)	Ledum	SO_2 #8 (Natawahunan Lake) SO_2 #15 (Harding Lake)	Light damage at Station SO_2 #8 and 10 per cent of leaves infected at SO_2 #15.

Disease or Organism	Host(s)	Location and Sampling Station No.	Remarks
Chrysomyxa arctostaphyli Diet. (A rust brown)	Spruce, black	SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbister Lake)	3 per cent of trees attacked at SO_2 #8 and 10 per cent at SO_2 #9; common throughout the area.
Fomes fomentarius (L. ex Fr.) Kickx (A slash fungus)	Birch, white	SO_2 #15 (Harding Lake) SO_2 #12 (Witchai Lake)	Common on slash and standing dead trees.
Fomes igniarius (L. ex Fr.) Kickx (A slash fungus)	Aspen, trembling	SO_2 #17 (Ospwagan Lake)	Common
Fomes subroseus (Weir) Overh. (A slash fungus)	Spruce, black	SO_2 #12 (Witchai Lake)	Common
Gymnosporangium sp. (A rust)	Ash, mountain	Cross Lake (N)	20 per cent of foliage attacked.
Melampsorella caryophyllacearum Schroet. (Yellow witches' broom)	Fir, balsam	SO_2 #19 (Wintering Lake (S))	Light infection.
Needle casts	Fir, balsam Spruce, white and black	Sipiwesk Lake (S) SO_2 #15 (Harding Lake) SO_2 #8 (Natawahunan Lake)	30 per cent of needles on 50 per cent of the balsam fir attacked at Sipiwesk Lake; 10 per cent of foliage on one white spruce at SO_2 #15; light on black spruce at SO_2 #8 possibly in conjunction with fume damage.
A needle spot	Juniper	SO_2 #15 (Harding Lake)	A trace of damage.
Pollaccia elegans Serv. (A leaf and twig blight)	Poplar, balsam	SO_2 #15 (Harding Lake) Thicket Portage	40 per cent of foliage on 20 per cent of trees infected at SO_2 #15; light infection at Thicket Portage.

Disease or Organism	Host(s)	Location and Sampling Station No.	Remarks
Pollaccia radiosa (Lib.) Bald.&Cif. (A leaf and twig blight)	Aspen, trembling	SO_2 #17 (Ospwagan Lake) Cauchon Lake	80 per cent of foliage on 10 per cent of trees infected at SO_2 #17; 70 per cent on 40 per cent of trees at Cauchon Lake.
Polyporus spp. (Slash fungii)	Aspen, trembling Birch, white Spruce, black	SO_2 #10 (Burntwood River) SO_2 #9 (Isbister Lake) SO_2 #17 (Ospwagan Lake)	P. lirsutus common on trembling aspen at SO_2 #17; P. betulinus common on white birch at SO_2 #9; and P. abietinus common on black spruce at SO_2 #10.
Redding of balsam fir	Fir, balsam	SO_2 #19 (Wintering Lake)	Redding of balsam fir common around the south end of Wintering Lake.
Hail damage	Pine, jack Spruce, black	Landing Lake	30 per cent of jack pine branches showed damage on 90 per cent of trees, and 20 per cent of black spruce branches were damaged on 80 per cent of trees over several sq. miles at northeast end of Landing Lake.
Possible SO_2 fume damage	Spruce, black	SO_2 #10 (Burntwood River) SO_2 #8 (Natawahunan Lake)	10 per cent of old needles (3-5 years) attacked on 10 per cent of trees at SO_2 #10; light damage at SO_2 #8.
	Alder	SO_2 #8 (Natawahunan Lake)	10 per cent of foliage damaged on 50 per cent of trees.
	Birch, white	SO_2 #9 (Isbister Lake) SO_2 #10 (Burntwood River) Nelson River	Damage less than 10 per cent on a few trees at SO_2 #9 and on one tree at SO_2 #10. Damage very light on Nelson River

Disease or Organism	Host(s)	Location and Sampling Station No.	Remarks
Possible SO_2 fume damage (Cont'd)	Amelanchier	SO_2 #19 (Wintering Lake (S))	Damage to 10 per cent of foliage on 30 per cent of trees.
	Poplar, balsam	SO_2 #15 (Harding Lake)	Damage to 10 per cent of foliage on 30 per cent of the trees.
	Spruce, white	SO_2 #15 (Harding Lake)	Damage to 10 per cent of the needles on 50 per cent of the trees.
	Pine, jack Aspen, trembling	Thompson	SO fume damage for $2\frac{1}{2}$ to 3 miles immediately south of smelter (about one mile in width).



NORTHERN DISTRICT MANITOBA

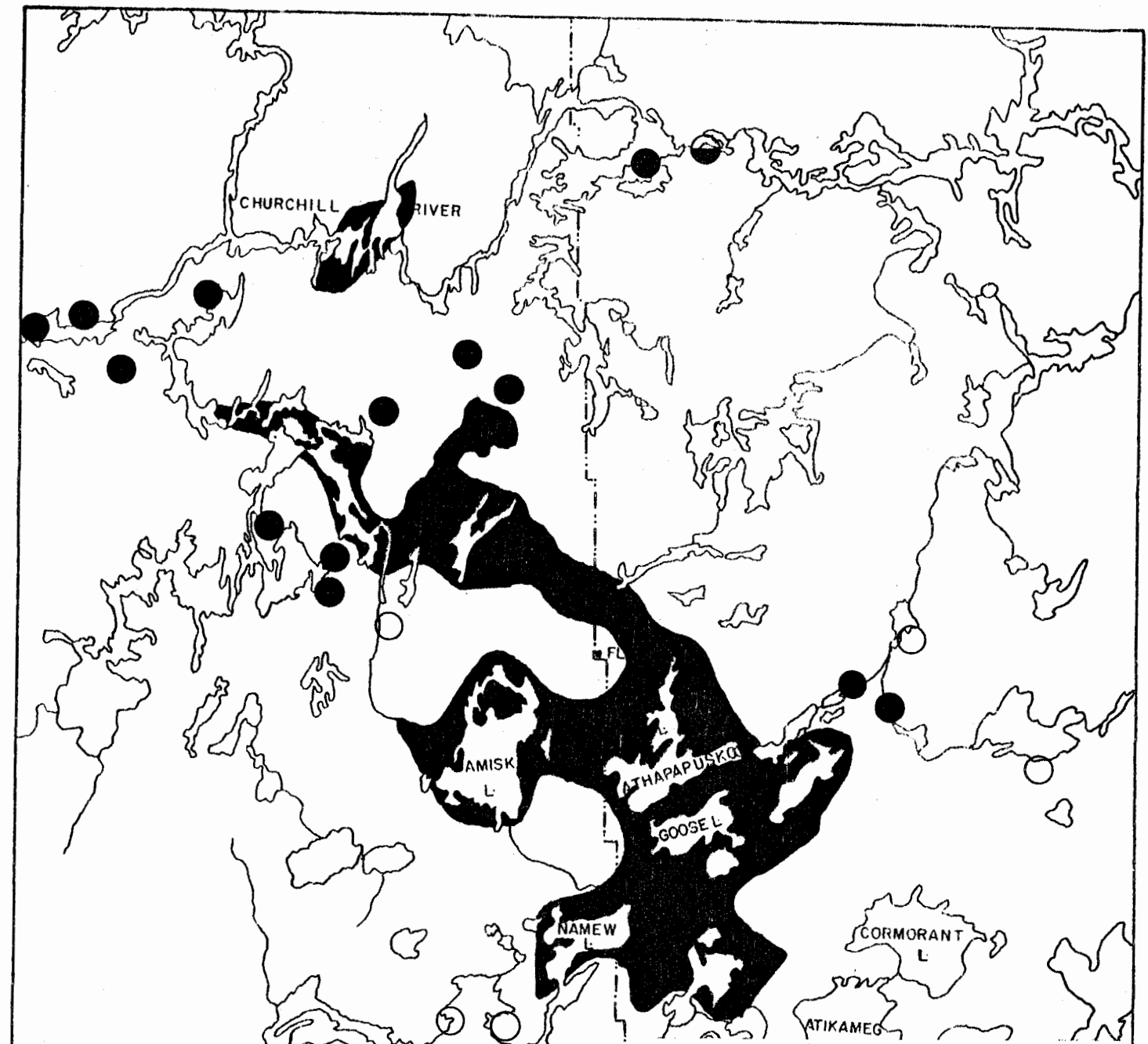
FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1965.

- Severe
- Moderate
- Light

SCALE 64 mile — 1 Inch

50 0 50



FIG·2

SPRUCE BUDWORM INFESTATION NORTHERN MANITOBA AND SASKATCHEWAN—1965·

Light

Moderate

Severe

Areas of continuous moderate to severe defoliation.

SCALE 1 inch — 20 Miles

20 0 20

7. ANNUAL DISTRICT REPORT

HUDSON BAY DISTRICT OF SASKATCHEWAN

1965

by

R. C. Tidsbury

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

7.1. INTRODUCTION

Cool, wet weather during the early part of the season caused retarded foliage development and frost damage throughout the District. Near-normal temperatures prevailed during July and August, but the fall season was again cool and wet. Field work commenced on May 17 and terminated on October 15. Totals of 457 insect and 62 disease collections were submitted to the Winnipeg laboratory. In addition to general collecting, survey sub-projects included: (a) forest tent caterpillar egg-band surveys to forecast infestation intensity in 1966; (b) collecting larch sawfly cocoons for disease and parasite studies; (c) small mammal population survey; and (d) special collections of insect and disease material for personnel of the Winnipeg and other laboratories. Aerial surveys supplied by the Saskatchewan Department of Natural Resources involved approximately six and one-half hours by fixed-wing aircraft, and two hours by helicopter. In addition, approximately three hours and ten minutes of charter flying time was used on aerial surveys. The assistance and co-operation received from Provincial Forestry personnel throughout the season is gratefully acknowledged.

Notable changes were recorded in the distribution of two forest insects; the forest tent caterpillar and aspen leaf beetle. Populations of the former in particular, collapsed throughout the District. There was also a significant decrease in populations of the aspen leaf beetle and the prairie tent caterpillar. The spruce budworm infestation along the Birch River and at Budd's Point on Cumberland Lake decreased to light, and no defoliation was recorded at Belanger Lake. Infestations of the yellow-headed spruce sawfly and larch sawfly remained about the same, but there was a slight decrease in populations of the gray willow-leaf beetle and the American aspen beetle.

Perennial forest diseases remained relatively unchanged. However, there was a very marked increase in annual diseases, such as leaf spots and needle rusts. This condition was probably due to above normal rainfall.

7.2. INSECT CONDITIONS

7.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Populations of this sawfly remained at the same levels as the previous year, except in the Erwood area where a slight increase in populations was recorded (Figure 1). Ground surveys indicated moderate to severe defoliation in a small area six miles south of Erwood in the Porcupine Provincial Forest. Localized patches of moderate defoliation were recorded in the Otosquen - Ceba area in the Pasquia Hills and in the Ruby Lake, Mistatim, Bjorkdale, Crooked River, Reserve, Usherville and Hudson Bay areas. Light defoliation was recorded near Chemong in the Pasquia Hills, in the Mile 13 fire tower area off the Fir River Road, throughout the Carrot River and Porcupine Provincial forests, in the Nipawin, Endeavour and Norquay areas, and in the Greenwater and Duck Mountain Provincial Parks.

Aerial surveys indicated moderate to severe defoliation extending from the eastern slopes of the Pasquia Hills to the Manitoba boundary, in the Elm and Wapisew lakes area, in the Birch River area south of Cut Beaver and Wapisew lakes, along the Carrot River in tp. 51, rge. 8, W. 2nd mer. northeast of Carrot River, and in the Whitefish Lake area of the Porcupine Provincial Forest.

Sequential sampling of larch sawfly egg populations was continued in two permanent tamarack plots, and the results are shown in the following table:

Plot No.	Location	No. of shoots examined	No. of shoots curled	Infestation rating - 1965
101	Armit	90	4	light
102	Peepaw Lake	80	1	light

A total of 795 cocoons were collected at the Armit plot. Subsequent examinations of the cocoons at the laboratory indicated

that 26 per cent were destroyed by small mammals; 2 by fall emergence of the parasitic fly, Bessa harveyi (T.T.); and 7 by diseases. Larval dissection indicated that 53 and 1 per cent were parasitized by Bessa harveyi (T.T.) and Mesoleius tenthredinis Morely respectively. (Cage No. 2 was damaged by an animal.)

7.2.2. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Populations remained unchanged throughout the District, except in the Birch River and Belanger Lake areas where light defoliation was recorded in the former and no defoliation in the latter area. A few larvae were collected at Mile 70 on Highway No. 109 in the Carrot River Provincial Forest, on shelterbelts near Foam Lake, in the Greenwater Provincial Park, and in the Erwood-Armit area of the Porcupine Provincial Forest. Defoliation in these areas was negligible to very light. A small patch of light defoliation was recorded at Budd's Point on Cumberland Lake. Ground checks in the Birch River area indicated normal foliage and shoot growth on spruce. Preliminary results of spruce budworm egg counts taken from white spruce at Pine Island on Cumberland Lake indicated that very low populations will continue in 1966.

7.2.3. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- This sawfly caused moderate to severe defoliation of occasional white spruce trees in shelterbelts and ornamental plantings in the Ruby Lake, Nipawin, Whitefox, Bjorkdale, Peesane, Hudson Bay and Rama areas (Figure 2). Also, severe defoliation of two black spruce reproduction was recorded at Bankside Lake in the Pasquia Hills. Light defoliation was recorded on white and black spruce at Arborfield, Chelan, Reserve, Insinger, Pelly, Kamsack and throughout Greenwater and Duck Mountain Provincial parks. Very light populations were recorded at scattered points throughout the remainder of the District.

7.2.4. FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- Populations of this serious defoliator of trembling aspen collapsed completely throughout the previous infestation areas. Aerial surveys and ground checks indicated no defoliation, and the only larval collection was from balsam poplar in the Good Spirit Provincial Park. The collapse was attributed to a combination of factors, including an abnormally wet, late spring accompanied by killing frosts which caused retarded foliage development, and to relatively high parasitism in areas where severe defoliation has persisted for several years.

Egg-band surveys were carried out at six locations to predict severity of infestations in 1966. The results, as tabulated in Table 1, indicate that populations will be practically nil.

TABLE 1.

Summary of Forest Tent Caterpillar Egg Band Sampling - 1965
Hudson Bay District of Saskatchewan.

(Based on the examination of 3 co-dominant trembling aspen at each sample point.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown depth (ft.)	Av.No.of egg-bands per tree	Defoliation forecast 1966
Greenwater Provincial Park	3	29	15	0.0	Nil
Manitoba-Saskatchewan border at Hwy.109	3	27	13	0.0	Nil
Duck Mountain Provincial Park (Madge Lake)	3	30	20	0.0	Nil
Good Spirit Provincial Park	3	30	22	0.0	Nil
Parr Hill (Porcupine Provincial Forest)	3	32	14	0.0	Nil
Saginas Lake (Porcupine Provincial Forest)	6	54	18	0.0	Nil

7.2.5. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Populations of this leaf beetle decreased considerably. Moderate to severe defoliation of scattered single trembling aspen reproduction occurred in Good Spirit Provincial Park, along the Fir River road, and at the junction of the

McBride Lake and Little Swan River roads. Very light defoliation of a few single trees was recorded in the Springside, Willowbrook, Yorkton, Wroxton areas and throughout the forested area of the District.

7.2.6. AMERICAN ASPEN BEETLE, Gonioctena americana (Schaeffer):- Populations of this leaf beetle decreased slightly, but were again found commonly in association with the aspen leaf beetle, C. crotchi. Moderate defoliation of a few trembling aspen reproduction was recorded in the Carrot River Provincial Forest and near Chemong in the Pasquia Hills. Light defoliation was observed in the Crooked River, Mistatim areas, along the Fir River road and in the McBride-Peepaw lakes areas of the Porcupine Provincial Forest.

7.2.7. GRAY WILLOW-LEAF BEETLE, Galerucella decora (Say):- A slight decrease in larval populations of this beetle occurred throughout the District, particularly in the agricultural area. Moderate to severe skeletonizing was recorded in the provincial forests and parks, in the Helldiver and Culdesac lakes area, along the Sipanok Channel south of the Birch River, along the Carrot River east of Carrot River, and in the Prairie River, Pasquia Hills, Leaf Lake, Veillardville, Hudson Bay, Carrot River, Crooked River, Nipawin and Whitefox fire tower areas. Elsewhere only light skeletonizing was recorded.

7.2.8. PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N.& D.):- A marked decline in populations of this species occurred throughout the agricultural areas. Light defoliation of chokecherry, the preferred host, wild rose and serviceberry was recorded at Carrot River, Canora, Mikado, in agricultural areas adjacant to the Good Spirit Provincial Park and the Porcupine Provincial Forest. The highest number of nests was observed in the Canora-Mikado area.

7.2.9. OTHER NOTEWORTHY INSECTS:-

Insect Species	Host(s)	Locality	Remarks
Acleris variana Fern. (Black-headed budworm)	Spruce, white and black	Pasquia Hills, Birch River, Porcupine and Carrot River Provincial forests, Duck Mountain Provincial Park, Hudson Bay, Wadena and Foam Lake	Light defoliation in the Birch River area; elsewhere light populations.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Acronicta dactylina Grt. (A dagger moth)	Alder, Willow, Birch, white	Pasquia Hills, Hudson Bay, Veillardville, Porcupine Provincial Forest and Duck Mountain Provincial Park	Very light populations; no defoliation.
Acronicta fragilis Gn. (A dagger moth)	Birch, white	Duck Mountain and Greenwater Provincial parks and Porcupine Provincial Forest	Very light populations; no defoliation.
Acronicta grisea Wlk. (A dagger moth)	Alder Willow Birch, white	Porcupine Provincial Forest, Veillardville and Hudson Bay	Very light defoliation in the Porcupine Provincial Forest; no defoliation elsewhere.
Acronicta innotata Gn. (A dagger moth)	Birch, white	Duck Mountain Provincial Park and the Porcupine Provincial Forest	Very light populations; no defoliation.
Alsophila pometaria (Harr.) (Fall cankerworm)	Maple, Manitoba	Foam Lake	Severe infestation in one shelterbelt.
Altica populi Brown (Poplar flea beetle)	Poplar, balsam	Duck Mountain and Good Spirit Provincial parks and Porcupine Provincial Forest	Very light populations; a trace of skeletonizing.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Anoplonyx canadensis Hgtn. (A sawfly)	Tamarack	Throughout the District	Common but caused no noticeable defoliation.
Anoplonyx luteipes (Cress.) (A sawfly)	Tamarack	Throughout the District.	Common but caused no noticeable defoliation.
Aphrophora signoreti Fitch (A spittle bug)	Caragana Fir, balsam Spruce, white and black Birch, white	Pasquia Hills, Hudson Bay and the Porcupine Provincial Forest	Low populations; no damage.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	Rose, wild Chokecherry, eastern	Pasquia Hills, Ruby Lake, Whitefox, Greenwater and Good Spirit Provincial parks and Porcupine Provincial Forest	Damage confined to nests.
Arge clavicornis (Fabricius) (Willow sawfly)	Birch, white Willow	Pasquia Hills and the Porcupine Provincial Forest	Very light defoliation on scattered single trees.
Arge pectoralis (Leach) (Birch sawfly)	Alder, Birch, white	Fir River road and the Porcupine Provincial Forest	Light defoliation confined to one or two branches on single trees.
Buccalatrix canadensisella Chambers (Birch skeletonizer)	Birch, white	Porcupine Provincial Forest and the Duck Mountain Provincial Park	Very light skeletonizing.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Campaea perlata Gn. (Fringed looper)	Willow Aspen, trembling Poplar, balsam Birch, white	Pasquia Hills, Porcupine Provincial Forest, Veillardville and Kamsack	Low populations; no defoliation.
Chermes lariciatus (Patch) (Pineapple gall aphid)	Spruce, white	Porcupine Provincial Forest, Pasquia Hills, Hudson Bay, Birch River, Veillardville, Nipawin, Carrot River Provincial Forest, Canora, Pelly, Duck Mountain and Good Spirit Provincial parks	Moderate damage in the Duck Mountain Provincial Park and the Carrot River Provincial Forest; elsewhere light damage.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Pelly	Light damage to a small patch of reproduction.
Choristoneura pinus Freeman (Jack-pine budworm)	Pine, jack	Whitefox fire tower area, Nipawin, Hudson Bay, Parr Hill Lake (Porcupine Provincial Forest)	Very light populations at Parr Hill Lake and Nipawin; light damage elsewhere.
Cimbex americana Leach (Elm sawfly)	Willow	Porcupine Provincial Forest	Very light populations in the Armit-Erwood area.
Dioryctria reniculella (Grate) (Spruce coneworm)	Spruce, white	Foam Lake	Very light populations in a single shelterbelt.
Eriosoma americanum Riley (Woollyelm aphid)	Elm, white	Along the Carrot River north of the Pasquia Hills, at Carrot River and Kamsack	Light damage on scattered individual trees.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Fenusa dohrnii Tischb. (European alder leaf miner)	Alder	Porcupine Provincial Forest, Veillardville, Greenwater and Duck Mountain Provincial parks	Moderate damage in the Porcupine Provincial Forest; light damage elsewhere.
Hemichroa crocea (Fourc.) (Striped alder sawfly)	Alder	Porcupine Provincial Forest	Light to moderate damage on single branches.
Itame loricaria Evers. (A looper)	Aspen, trembling	Porcupine Provincial Forest, Lady Lake, Hudson Bay and Swan Plain	Very light populations; no damage.
Lambdina fiscellaria fiscellaria (Guen.) (Hemlock looper)	Poplar, balsam Fir, balsam	Porcupine Provincial Forest and Duck Mountain Provincial Park	Very light populations; no damage.
Lithocolletis salicifoliella Chamb. (Aspen blotch miner)	Aspen, trembling Poplar, balsam	Throughout the District	Light damage on trembling aspen in the Porcupine Provincial Forest and Pasquia Hills; elsewhere very light damage.
Lopidea dakota Knight (Caragana plant bug)	Alder, Caragana	Hudson Bay, Carrot River, Carrot River Provincial Forest and Wadena	Moderate populations at Hudson Bay; light populations elsewhere.
Mordwilkoja vagabunda Walsh (Poplar vagabond aphid)	Aspen, trembling	Pasquia Hills, Porcupine Provincial Forest and Canora	Light damage.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Nematus limbatus (Cress.) (Willow sawfly)	Willow	Fir River road and the Porcupine Provincial Forest	Severe defoliation of individual branches on a few trees in the Porcupine Provincial Forest; light defoliation elsewhere.
Neodiprion abietis complex (Balsam-fir sawfly)	Spruce, black	Pasquia Hills, Fir River road and the Porcupine Provincial Forest	Very light populations; a trace of defoliation in the Porcupine Provincial Forest.
Neodiprion virginianus (Red-headed jack pine sawfly)	Pine, jack	Pasquia Hills	Very light defoliation.
Nepytia canosaria Wlk. (False hemlock looper)	Spruce, white Fir, balsam	Pasquia Hills and the Porcupine Provincial Forest	Very light populations; no noticeable damage.
Nymphalis antiopa (L.) (Mourning-cloak butterfly)	Willow Aspen, trembling	Duck Mountain Provincial Park and the Porcupine Provincial Forest	Severe defoliation of single branches.
Orsodacne atra Ahr. (A leaf beetle)	Aspen, trembling Poplar, balsam Chokecherry, eastern	Throughout the District	Light feeding at Mistatim and in the Porcupine Provincial Forest
Petrova albicapitana (Busck.) (Pitch nodule maker)	Pine, Jack	Armit, Hudson Bay and the Fir River road.	Light infestations.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	Spruce, white and black	Armit and Foam Lake	Severe in a shelterbelt at Foam Lake; light infestation on black spruce at Armit.
Phratora americana canadensis Brown (A leaf beetle)	Poplar, balsam Aspen, trembling	Veillardville, Mistatim and the Porcupine Provincial Forest	Light populations of adults; no noticeable defoliation.
Phyllocnistis populiella Cham. (Aspen leaf miner)	Aspen, trembling	Greenwater Provincial Park and Wroxton	Light infestation on reproduction.
Phytophaga rigidae (O.S.) (Cone willow gall fly)	Willow	Duck Mountain Provincial Park, Porcupine Provincial Forest and Margo	Light to moderate infestations.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white and black	Throughout the forested area of the District	Very light populations feeding in conjunction with the yellow-headed spruce sawfly.
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	Willow	Porcupine and Carrot River Provincial forests, Greenbush and Margo	Light to moderate infestations.
Semiothisa bicolorata Fahr. (A geometrid)	Pine, jack	Pasquia Hills, Hudson Bay, Fir River road and the Porcupine Provincial Forest	Very light larval populations; no defoliation.
Semiothisa sexmaculata Pack (Green larch looper)	Tamarack	Throughout the District	Moderate populations at Erwood, Madge Lake and in the Porcupine Provincial Forest; elsewhere light populations.

7.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect Species	Host(s)	Locality	Remarks
Tetralopha asperatella (Clem.) (A webworm on aspen)	Aspen, trembling Poplar, balsam	Pasquia Hills, Porcupine and Carrot River Provincial forests, Duck Mountain and Greenwater Provincial parks, Wroxton, Springside and Archerwill	Light damage.
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	Pine, jack	Hudson Bay and the Whitefox fire tower area	Light damage.

7.3 DISEASE CONDITIONS

7.3.1. **NEEDLE RUST**, Chrysomyxa ledicola Lagerh.:- A moderate infection of this rust was found on a small stand of young scattered black spruce in the Greenwater Lake Provincial Park. Light infections on small black spruce were recorded near Madge Lake, Erwood, Chelan and in the Carrot River Provincial Forest. Also, a few small black spruce trees were very lightly infected in the Armit and Crooked River areas.

7.3.2. OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Apiosporina collinsii (Schw.) Hoehn. (Apiosporina witches' broom)	Serviceberry	Duck Mountain Provincial Park and Greenbush.	Intensity light along the west side of the Duck Mountain Provincial Park. Moderate infection on one tree in the Greenbush area. No range extensions noted.

7.3.2. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Jack pine mistletoe)	Pine, jack	Whitefox area	A few trees severely infected in an old burned-over area. No range extensions noted.
Arceuthobium pusillum Pk. (Dwarf mistletoe)	Spruce, white and black	Hudson Bay and Pasquia Hills	Light infection on a few white spruce east of Hudson Bay, and on a few black spruce north of the Waskwei River in the Pasquia Hills.
Cenangium furfuraceum (Roth.) Sacc. (Small brown fruiting body)	Alder	Hudson Bay	Severe infection; common on dead and dying bushes.
Chrysomyxa arctostaphyli Diet. (A rust broom)	Spruce, black	Pasquia Hills and along the Fir River road	Previously recorded light infections 14 and 22 miles north of Hudson Bay, with 1 per cent crown affected; light infections on a few trees along the Fir River road.
Chrysomyxa ledi de Bary (Needle rust)	Spruce, black	16 miles north of Veillardville	A small area of light infections on young trees.
Cronartium comandrae Peck (Comandra rust of jack pine)	Pine, jack	Carrot River Provincial Forest	This rust was found in association with Peridermium harknessii J.P. Moore, on two trees. There was no evidence of branch mortality or discolouration.

7.3.2. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Diplodia tumefaciens (Shear.) Zalasky (Macrophoma galls)	Aspen, trembling	Peepaw Lake and Hudson Bay area	In the Hudson Bay area, two trees infected, 5 per cent of the branches with small galls; in the Peepaw Lake area, 2 per cent of the branches of one tree were infected. No branch mortality in both areas.
Drepanopeziza populorum (Desm.) v. Hohn. (Leaf spot)	Aspen, trembling	Wroxton and 10 miles south of Somme	Several small trees severely infected south of Somme; light infection recorded on a few small trees near Wroxton.
Linospora tetraspora G.E. Thompson (Leaf blight)	Poplar, balsam	Carrot River Provincial Forest and in the Greenwater Provincial Park	Light to moderate infection on several small trees throughout both collection areas.
Melampsora bigelowii Thuem. (Larch-willow rust)	Willow	Duck Mountain and Greenwater Provincial parks, Porcupine and Carrot River Provincial forests and near Chelan	Very light infection confined to a few leaves in the Madge Lake and Chelan areas; light infection confined to a few bushes elsewhere.
Peridermium harknessii J.P. Moore (Globose gall rust)	Pine, jack	Fir River fire tower area, 20 miles northeast of Whitefox, Carrot River Provincial Forest and the Hudson Bay area	A slight extension of light gall infection in all areas.

7.3.2. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Pollaccia radiosa (Lib.) Bald. & Cif. (Twig and leaf blight)	Aspen, trembling	Saginas Lake area (Porcupine Provincial Forest)	Light infection on upper crown of a few scattered saplings.
Polyporus adustus Willd. ex Fr. (A decay)	Spruce, white	Caragana area	Specimens infecting exposed root surface of one stump.
Puccinia caricis-shepherdiae J.J. Davis (Sedge rust)	Low buffalo berry	Parr Hill Lake (Porcupine Provincial Forest)	Light to moderate infection in a large spruce-jack pine stand.
Ramularia rosea (Fuckl.) Sacc. (Leaf spot)	Willow	Madge Lake area (Duck Mountain Provincial Park)	Very light infection on a few leaves.
Septoria musiva Pk. (Leaf spot)	Poplar, balsam	Duck Mountain and Greenwater Lake Provincial parks and the Porcupine and Carrot River Provincial forests	Light to moderate infections.
Taphrina pruni Tulasne (Plum pocket disease)	Plum	Danberry and Hudson Bay areas	Severe infection on one tree in the Hudson Bay area; moderate to severe infection on several trees in the Danberry area.

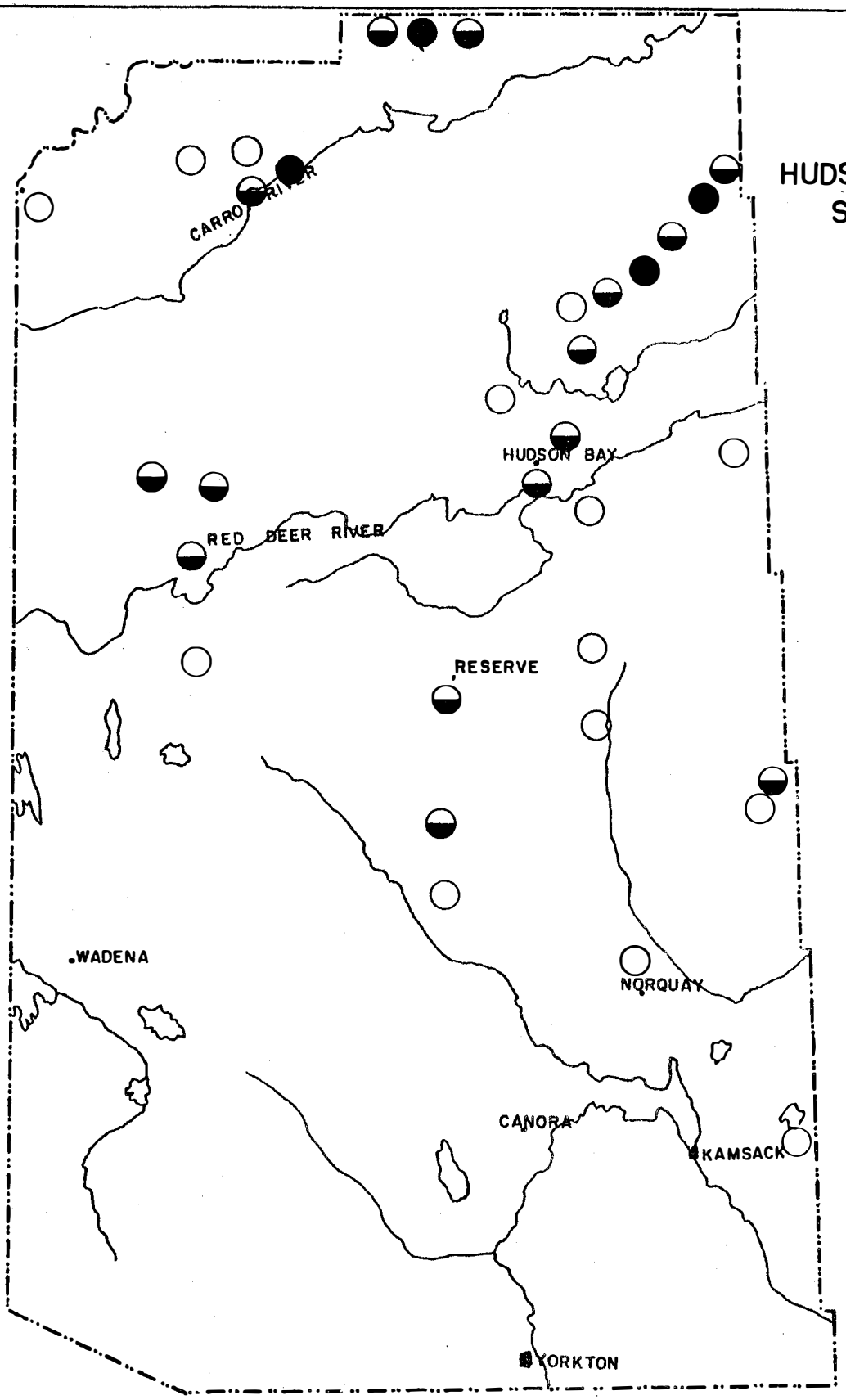


FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965.

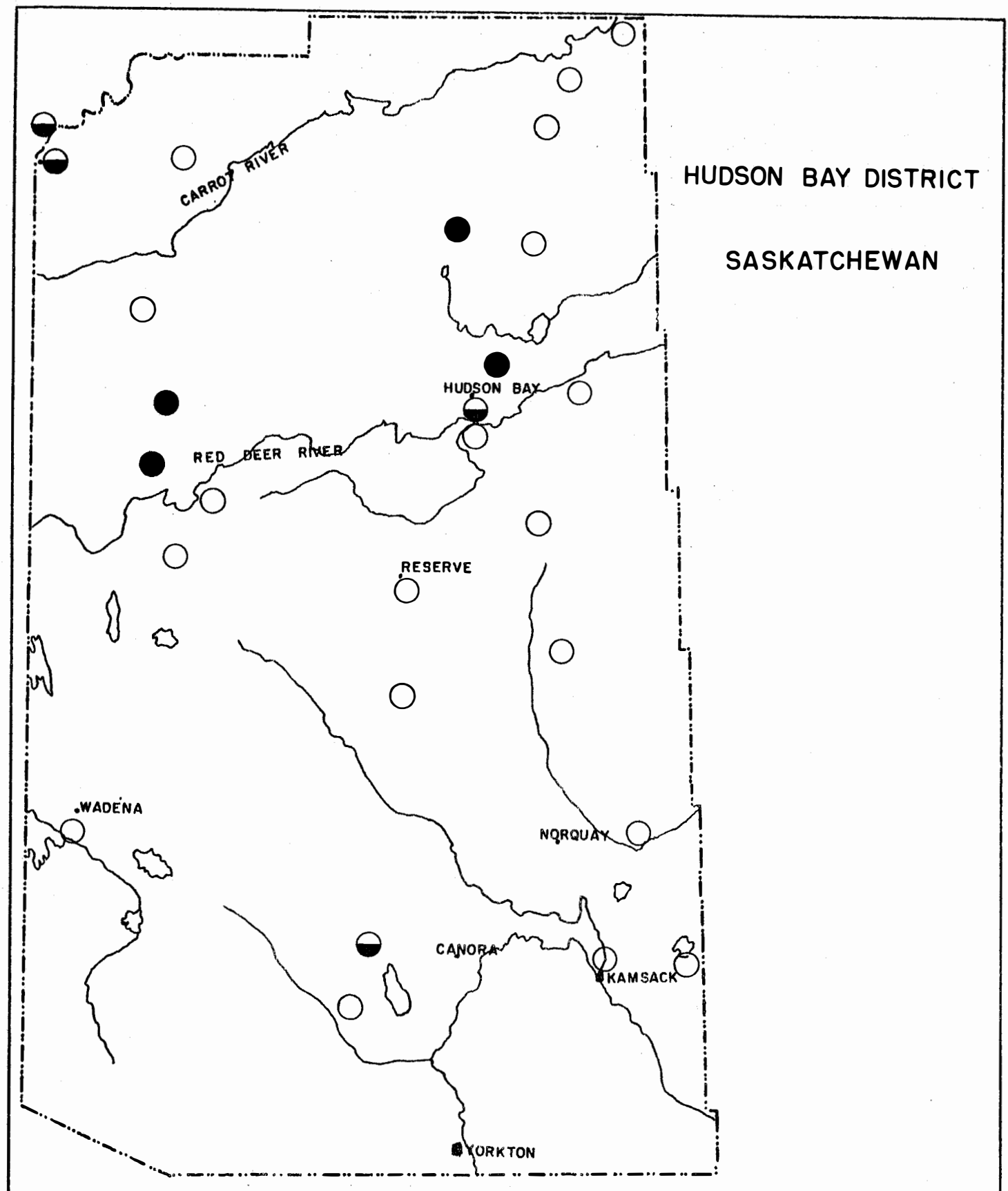


FIG. 2

YELLOW-HEADED SPRUCE SAWFLY

INFESTATIONS — 1965.

8. ANNUAL DISTRICT REPORT

PRINCE ALBERT DISTRICT OF SASKATCHEWAN

1965

by

B. B. McLeod

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

8.1 INTRODUCTION

Field surveys were carried out from early May to late October. In addition to road surveys, 23 hours of aerial reconnaissance were required to map several important forest pests. Totals of 404 insect and 266 tree disease samples were taken in the District. The co-operation and assistance received from the personnel of the Saskatchewan Department of Natural Resources is gratefully acknowledged.

Survey sub-projects carried out this year were: (1) sequential sampling of the larch sawfly egg populations; (2) special sampling of the forest tent caterpillar egg populations; (3) sampling for Saperda borers in poplar; (4) populations studies of small mammals; (5) biological control attempts against the larch sawfly in the Crutwell area. Mass collections of jack-pine budworm, yellow-headed spruce sawfly, aspen leaf beetle and prairie tent caterpillar were collected for parasite study. Special collections were also made of black knot of cherry, lodgepole terminal weevil infested jack pine leaders, and insect produced galls of willows and poplars for personnel of the Winnipeg and other laboratories.

Several important changes occurred in the status of some major insect species. The forest tent caterpillar outbreak completely collapsed and the jack-pine budworm infestations continued to increase in size and intensity. The larch sawfly remained much the same as in the previous year, and the pine tube moth remained at endemic population levels. A more intensive tree disease survey was conducted in the District with particular emphasis on jack-pine mistletoe, Hypoxylon canker, Diplodia galls, and Pollaccia blights.

8.2 INSECT CONDITIONS

8.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Moderate to severe defoliation was again prevalent in the southern areas of the District, while light infestations continued in the west, north and eastern sections.

Tamarack bogs throughout the Fort a la Corne Provincial Forest were severely defoliated, and patchy moderate to severe defoliation occurred in the Nisbet and Pines Provincial Forest reserves. Similar conditions also existed along the east and southeast sections of Prince Albert National Park and in a small bog on the south shore of White Gull Lake.

Light defoliation of tamarack occurred along No. 2 highway between Prince Albert National Park and Molanosa, along the Hanson Lake road north to township 65, range 15, W 2nd mer., along No. 55 highway in the

Canwood-Erinferry and Big Riger areas, throughout the Canwood Provincial Forest, and from Shellbrook west to Mont Nebo along No. 3 highway. Aerial surveys of the northeast section of the District revealed little or no defoliation in the East Trout, Meeyomoot, Little Bear and Big Sandy lakes area. This same condition prevailed throughout the north and western sections of Prince Albert National Park and that portion of the District lying north of the Park and west of Montreal Lake including the Sled, Doré, Clark, La Plonge, Emmeline and Swan lake areas.

Sequential sampling of egg populations was again carried out in four permanent plots and the infestation ratings, based on the utilization of current shoots for oviposition, are summarized in Table 1.

TABLE 1

Location and Plot Number		Number of shoots examined	Number of curled shoots	Infestation rating for 1965
Crutwell	# 102	80	26	Severe
Red Rock Block	# 114	110	5	Light
Erinferry	# 112	120	6	Light
Mayview	# 111	210	28	Moderate

The introduced parasite, Holocremnus sp. nr. nematorum was again released in the Crutwell bog, but its successful establishment has not been confirmed to date. Mass collections of mature larvae were made in the Red Rock block and Mayview areas and reared in special cages to the cocoon stage.

A total of 1,842 cocoons were collected from the Mayview and Red Rock plots. Subsequent examination showed 3 per cent were diseased, 0.5 per cent destroyed by the fall emergence of the parasite Bessa harveyi (T.T.), and 0.1 per cent by the parasite Tritneptis klugii (Ratz.). Dissection of 400 cocoons showed effective parasitism of 2.5 per cent by Mesoleius tenthredinis Morley and 12 per cent by B. harveyi (T.T.).

8.2.2. JACK-PINE BUDWORM, Choristoneura pinus Free.:- The jack-pine budworm outbreak continued to increase in size and intensity in 1965. The infestation covered all of the Nisbet Provincial Forest, the Canwood Provincial Forest, and the Pines Provincial Forest lying north of township 45. The infestation also expanded in the Fort a la Corne Provincial Forest to include all jack pine stands on both sides of the Saskatchewan River and in the Fort a la Corne and north end of the Cumberland Indian reserves. The pine plantations in the Elk House area suffered light to moderate defoliation.

A large stand of jack pine along the Hanson Lake road between townships 53 and 59, ranges 16 to 20, W 2nd mer., and encompassing most of the Nipawin Provincial Park was moderate to severely defoliated. A small infestation of some 16 square miles in townships 54 and 55, range 26, W 2nd mer. just south of Bittern Lake, and small, scattered patches of moderate to severe defoliations were mapped south of Candle Lake (tp.53-54, rge.22, W 2nd mer.), southeast of Birchbark Lake (tp. 52, rge. 22, W 2nd mer.) and just north along the C.P.R. right-of-way between the towns of Shipman and Snowden (tp.52, rge.19-20, W 2nd mer.). In all the above mentioned areas, except the Canwood Provincial Forest, defoliation ranged up to 100 per cent of the new foliage and as much as 50 per cent of the old foliage was destroyed on individual and small groups of trees.

Several collections of C. pinus were taken throughout Prince Albert National Park and in the Piprell-Sandy lakes area, but defoliation was very light. Mass collections of late instar larvae and pupae were made from three locations in the Nisbet and Fort a la Corne Provincial forests for parasite recovery; the results of these collections are summarized below.

Location	Type of collection	No. of specimens	Percentage parasitism by: Diptera sp.	Hymenoptera sp.
Crutwell	Larval	137	0.7	0.0
Red Rock Block	Larval	214	1.3	2.3
Fort a la Corne P.F.	Larval	152	0.9	0.6
Crutwell	Pupal	195	14.8	11.3
Red Rock Block	Pupal	201	7.9	21.4
Fort a la Corne P.F.	Pupal	181	6.6	11.5

8.2.3. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Although populations of this insect remained at low levels, collections were taken from numerous points throughout the District. The highest numbers were encountered along Poplar Creek in the Fort a la Corne Provincial Forest, but damage to white spruce was light. Other samples were taken from the following areas, but damage was negligible; Fort a la Corne Provincial Forest, Nisbet Provincial Forest, Prince Albert National Park, Emma Lake, Choiceland and Candle Lake.

8.2.4. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- This sawfly was widely scattered throughout the Prince Albert District, but damage was light except in one area. White spruce plantings (up to 10' high) in the Marchant Grove area (sec.21 and 31, tp. 50, rge. 3, W 3rd mer.) were severely defoliated. Mass collections of available larvae were taken from several old parasite release points as well as at Marchant Grove, and reared to determine if the introduced parasite Drino bohemica has become established.

Location	No. of specimens	Percentage parasitism by: *Diptera* sp.	*Hymenoptera* sp.
Shady Lake P.A.N.P.	79	0.0	0.0
Christopher Lake	93	4.3	0.0
Marchant Grove	165	5.4	0.0

8.2.5. FOREST TENT CATERPILLAR, *Malacosoma disstria* Hbn.:- The forest tent caterpillar outbreak collapsed in 1965 and only individual larvae or single colonies were collected from a few widely scattered points. Egg band surveys were conducted in September and October, and the results indicate endemic population levels in 1966. The results of this survey are summarized in Table 2.

TABLE 2

FOREST TENT CATERPILLAR EGG BAND SURVEY

PRINCE ALBERT DISTRICT OF SASKATCHEWAN - 1965

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no of egg-bands	Defoliation forecast for 1966
Waskesiu P.A.N.P.	3.0	26.6	15.0	0	Nil
Waskesiu P.A.N.P.	6.0	40.0	16.6	0	Nil
Shady Lake P.A.N.P.	3.0	26.3	13.3	0	Nil
Halkett Lake P.A.N.P.	3.3	24.0	14.3	0	Nil
Birch Creek	5.0	36.0	14.6	0	Nil
Bodmin Tower	6.3	46.0	20.0	0	Nil
Big River (18 mi.north)	5.6	35.6	25.0	0	Nil
Sled Lake	5.3	48.3	9.6	0	Nil
Doré Lake	6.6	60.0	11.6	0	Nil
Sharps Lake	4.0	28.3	10.3	0	Nil
Erinferry	3.0	23.3	12.0	0	Nil
Mont Nebo	3.0	25.6	15.6	0	Nil
Paddockwood	3.0	25.6	14.0	0	Nil
Nipawin Provincial Park	3.3	30.0	15.6	0	Nil

8.2.6. ASPEN LEAF BEETLE, *Chrysomela crotchi* Brown:- This leaf beetle caused patchy moderate to severe skeletonizing of the foliage of reproduction trembling aspen in the western portion of the Fort a la Corne Provincial Forest and light to moderate damage throughout the Pines and Nisbet Provincial

forests. Low populations and light damage were recorded along the Hanson Lake road and in Nipawin Provincial Park, the Big River-Sled Lake area, and in the Prince Albert National Park.

A predatious fly, tentatively identified as Surphus sp., caused up to 50 per cent predation to C. crotchi egg masses in the Fort a la Corne and Nisbet Provincial forests, thereby asserting some natural control of this beetle in these areas.

8.2.7. THE GREY-WILLOW LEAF BEETLE, Galerucella decora (Say):- This leaf skeletonizer was found commonly throughout the southern portions of the District. Severe damage to willow foliage occurred in the Pines and northwestern sections of the Fort a la Corne Provincial forests, and in the Red Rock Block of the Nisbet Provincial Forest. Patchy, light to moderate skeletonizing occurred in the remaining areas of the Nisbet and Fort a la Corne Provincial forests, and also along the south and east boundaries of the Prince Albert National Park.

8.2.8. PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- This tent-maker was recorded throughout the southern portions of the District in 1965, where infestations on chokecherry, rosebush and other miscellaneous shurbs were generally light except in three areas. Moderate concentrations of tents were observed in the Ordale (tp.49, rge.5, W 3rd mer.), Pines Provincial Forest (tp.45, rge.1, W 3rd mer.), and in the Nisbet Provincial Forest (tp.49, rge. 26, W 2nd mer.) areas.

Mass collections of mature larvae were taken from Christie Lake (sec. 22, tp.49, rge.26, W 2nd mer.) and collections of egg patches from Ordale and MacDowall (sec.27, tp.45, rge.1, W 3rd mer.). This material is being reared to determine the parasite complex of this species.

8.2.9. OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Aceria parapopuli (Keifer) (Poplar bud gall mite)	Aspen, trembling	Nisbet Provincial Forest, Erinferry and Nipawin Provincial Park	Common in these localities but damage recorded as light.
Acleris variana Fernald (Black-headed budworm)	Spruce, white and black	Throughout District	Low populations scattered through all spruce stands.
Acronicta dactylina Grt. (A dagger moth)	Willow	Ordale	Single collections; no attributable defoliation.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Adalia frigida Gn. (A lady beetle)	Caragana, Maple, Manitoba Spruce, white Pine, jack Willow	Nisbet Provincial Forest, Fort a la Corne Provincial Forest, Pines Provincial Forest, Skunk Creek and Smeaton	Adults common on many hosts; no damage.
Agrilus criddlei Frost (The wood borer)	Willow	Throughout District	Low populations causing some mortality to individual willow canes.
Altica populi Brown (A flea beetle)	Poplar, balsam Aspen, trembling	Big River, Mont Nebo and Prince Albert National Park	Light skeletonizing of foliage on reproduction trees.
Amorbia humerosana (Clem.) (A leaf roller)	Spruce, white	Nisbet Provincial Forest	Very low populations.
Anomogyna elimata Gn. (Camelian caterpillar)	Pine, jack	White Gull Creek and Piprell Lake	Very low populations; no attributable damage.
Anoplonyx luteipes Cress. (A sawfly)	Tamarack	All tamarack bogs in District	Larvae collected in all tL samples; no defoliation.
Aphid spp.	all tree species	Throughout District	Generally low populations; little or no damage.
Archippus albertus (McD.) (A leaf roller)	Spruce, white	Nipawin Provincial Park	Single collection; no damage.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	Cherry, choke	Nisbet Provincial Forest, Fort a la Corne Provincial Forest and Erinferry	Light infestations on open growing or roadside shrubs.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Campaea perlata Gn. (Fringed looper)	Poplar, balsam	Erinferry	Single collection; no defoliation.
Chermes cooleyii Gillette (Cooley spruce gall aphid)	Spruce, white	Big River and Smeaton	Single tree severely infested at Big River.
Chermes lariciatus Patch (The gall aphid)	Spruce, white and black	Throughout District	Severe on some reproduction in Erinferry area; light in remainder of District.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Mont Nebo	Single collection; no defoliation.
Chrysomela knabi Brown (A leaf beetle)	Alder	Skunk Creek	Light damage to alder thickets.
Cynipid spp. (A gall fly)	Aspen, trembling Rose	Big Sandy Lake, Polwarth, Fort a la Corne Provincial Forest	Infestations light in all areas.
Dendroctonus valens Lec. (Red turpentine beetle)	Pine, jack	Fort a la Corne Provincial Forest	Recently cut jack pine infested.
Dichelonyx backi Kby. (Green rose chafer)	Aspen, trembling	Big River	Adults only; infestation very light.
Dimorphopteryx pinguis (Nort.) (A sawfly)	Birch, white	Nisbet Provincial Forest	Low populations; light damage.
Epicnaptera americana (Harr.) (The lappet moth)	Willow	Fort a la Corne Provincial Forest	Single collection; no attributable defoliation.
Eupithecia luteata Pack. (A looper)	Tamarack	Crutwell	Single collection containing 2 larvae.
Gluphisia septentrionalis Wlkr. (A prominent)	Poplar, balsam	Mont Nebo	Single collection; very light feeding damage.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Gonioctena americana (Schaeff.) (American aspen beetle)	Aspen, trembling	Throughout District	Low populations and light damage in all areas; highest populations in the Fort a la Corne Provincial Forest.
Herculia thymetusalis Wlk. (Spruce needle worm)	Spruce, white	Prince Albert	Single collection; larvae infesting cones.
Hypagyrtis piniata Pack. (A looper)	Spruce, white	Prince Albert National Park	Low populations; no defoliation.
Ichthyura albosigma Fitch. (A prominent)	Aspen, trembling	Erinferry	Single collection; populations very light.
Janus abbreviatus (Say) (Willow shoot sawfly)	Willow	Paddockwood	Scattered, low populations in new willow growth.
Lambdina fiscellaria fiscellaria (Gn.) (Hemlock looper)	Pine, jack	Skunk Creek	Single collection; populations very low.
Lepyrus palustris Scop. (A weevil)	Willow, Poplar, balsam Aspen, trembling	Throughout District	Adults only in collections; no damage observed.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	Aspen, trembling	Fort a la Corne and Nisbet Provincial Forests	Low populations; very light damage.
Lithophane thaxeri Grt. (Owlet moth)	Tamarack	Nisbet Provincial Forest	Very low populations; no defoliation.
Lopidea dakota Knight (Caragana plant bug)	Caragana	MacDowall and Ordale	Adults common in caragana plantings but no noticeable defoliation observed.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Mordwilkoja vagabunda (Walsh) (Poplar vagabond aphid)	Aspen, trembling	Throughout District	Severe infestations on reproduction in Big River area; light elsewhere in District.
Mulsantina hudsonia C sy. (A lady beetle)	Spruce, white and black	Mont Nebo and Prince Albert National Park	Low populations of adults.
Neodiprion abietis complex (Balsam-fir sawfly)	Spruce, white	Prince Albert National Park and Nisbet Provincial Forest	Low populations; very light damage.
Neodiprion nanulus nanulus Schedl. (Red-pine sawfly)	Pine, jack	Prince Albert National Park	Single collection; trace of feeding on one tree.
Neodiprion virginianus complex (Red-headed jack-pine sawfly)	Pine, jack	Nisbet Provincial Forest	Low populations; very light damage.
Nycteola frigidana Wlk. (A webworm)	Willow	Skunk Creek	Single collection; no defoliation.
Nycteola cinereana N. & D. (A webworm)	Poplar, balsam	Erinferry	Very light damage to foliage of small trees.
Oberea schaumi Lec. (A poplar twig borer)	Aspen, trembling	Throughout District	Common on open growing regeneration.
Palthis angulalis Hbn. (Spruce harlequin)	Poplar, balsam	Mont Nebo	Single collection.
Pandemis canadana Kft. (A tortricid moth)	Poplar, balsam Aspen, trembling	Fort a la Corne Provincial Forest and Prince Albert National Park	Low populations; very light damage.
Parorygia plagiata Wlk. (Grey spruce tussock moth)	Spruce, white and black	Jay-Jay Lake, Prince Albert National Park and Skunk Creek	Low populations; no attributable defoliation.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Petrova albicapitana (Busck.) (Pitch nodule maker)	Pine, jack	Fort a la Corne Provincial Forest, Hanson Lake road	Low populations on reproduction and sapling size trees.
Physokermes piceae Schr. (Spruce bud scale)	Spruce, white	Candle Lake	No attributable damage.
Phyllocolpa sp. (A sawfly)	Poplar, balsam Aspen, trembling	Throughout District	Light damage by this leaf curling sawfly in all areas.
Phytophaga rigidae (O.S.) (Willow beaked-gall fly)	Willow	Throughout District	Lower populations; very light damage.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white	Nisbet Provincial Forest and Mont Nebo	Very low populations.
Pissodes strobi (Peck) (White-pine weevil)	Spruce, white and black	Nisbet Provincial Forest and Erinferry	Common on reproduction bS in the Crutwell area.
Pleroneura borealis Felt. (Balsam shoot-boring sawfly)	Fir, balsam	Big River	Light infestations 26 miles north of Big River.
Protitame virginalis Hlst. (A looper)	Aspen, trembling	Pines Provincial Forest and Mont Nebo	Populations remained at very low levels.
Protobormia porcellaria indicataria Wlk. (Dotted-line looper)	Tamarack	Fort a la Corne Provincial Forest	Single collection; no defoliation.
Pseudexentera improbana oregonana Wlshm. (A leaf roller)	Aspen, trembling	Mont Nebo	Single collection; no defoliation.
Rhabdophaga strobiloides (Walsh) (Willow cone gall midge)	Willow	Throughout District	Lower population levels; light damage.
Rheumaptera hastata Linn. (A looper)	Birch, white	Nisbet Provincial Forest	Low populations; no attributable defoliation observed.

8.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect species	Host(s)	Locality	Remarks
Saperda calcarata Say (The poplar borer)	Aspen, trembling	Throughout District	Common throughout District; populations and damage highest in the south.
Saperda concolor Lec. (Poplar-gall saperda)	Willow	Throughout District	Common in open growing willow thickets; some mortality to individual canes.
Saperda moesta Lec. (Poplar twig borer)	Poplar, balsam	Throughout District	Mainly on open growing reproduction; some mortality to stems and branches.
Saperda sp. (Poplar root saperda)	Poplar, balsam Aspen, trembling	Throughout District	Species attacking roots of host tree growing on poor sites; common in all areas.
Semiothisa sexmaculata Pack. (Green larch looper)	Tamarack	Nisbet Provincial Forest	Low populations.
Semiothisa signaria dispuncta Wlk. (A looper)	Spruce, white	Pines Provincial Forest, Nipawin Provincial Park and Skunk Creek	Populations remained at a low level; no defoliation recorded.
Syneta pilosa Brown (A leaf beetle)	All conifers	Throughout District	Adults only collected; no feeding damage observed.
Tetralopha asperatella (Clem.) (A webworm)	Poplar, balsam Aspen, trembling	Nisbet Provincial Forest	Low populations; very light damage.
Toumeyella numismaticum (P. & McD.) (Pine tortoise scale)	Pine, jack	Fort a la Corne Provincial Forest and Mont Nebo	Very light infestations on regeneration.

8.3 TREE DISEASE CONDITIONS

8.3.1. MISTLETOE OF JACK PINE, Arceuthobium americanum Nutt.:- Although A. americanum has been observed in many areas of the District, some pockets of infected jack pine have not been previously recorded. During the 1965 field season, a special effort was made to locate as many of these unrecorded infections as possible. The results are summarized below:

Location	Remarks
Hanson Lake road:	
Smeaton, 1/2 mile north of town	Small pocket of lightly broomed jack pine.
Mile 24-25	Small pocket of severely infected pine; branch and tree mortality present.
White Gull Creek crossing	Severe infection on south side of White Gull Creek.
Mile 33-34	Severe infection with tree mortality.
Mile 40-43	Severe infection with tree mortality.
Fishing Lakes turn off	Severe infection approximately one mile wide.
Baldy Lake	Small pockets of infected jack pine on west side of Hanson Lake road.
Mile 79-81	Small pockets of light infection.
Piprell Lake turn off	Small pockets of moderately infected pine for 2 miles west of Hanson Lake road.
Prince Albert National Park and No. 2 Highway north:	
Southeast corner of Prince Albert National Park	Small area of pole size jack pine moderately infected. Only known infection in P.A.N.P. to date.
Mile 54-55 (Molanosa)	Scattered mature pine infected.
Mile 63-65	Infection on overtopping pole size jack pine, light infection on regeneration.
Junction of Montreal River and Varley Creek (tp.64, rge.24, W 2nd mer.)	Small patch of severe brooming with branch and tree mortality.
Clark Lake (tp.63, rge.8, W 3rd mer.)	Small patches of severe brooming.
Montreal River Dam	Small patches of severe brooming.
Nipawin Provincial Park	Severe brooming and mortality along Tower ridge (Narrows Hills Tower).
Doré Lake (north shore)	Large areas of mistletoe infested jack pine, partially cut over.

Location	Remarks
Bittern Lake (tp.55-56, rge.25-26 W 2nd mer.)	Small patches of infected trees growing on sand ridges in area.
Canwood Provincial Forest	Small patches of severe brooming with branch and tree mortality.
Nisbet Provincial Forest	Scattered pockets of severe infection throughout reserve; very heavy in the Steep Creek block.
Fort a la Corne Provincial Forest	Scattered patches of severe brooming with tree mortality on both sides of Saskatchewan River.
East Trout Lake (Tp.61, rge.22)	Pockets of severe brooming along Bow River in Township 61.

Three of the above infections were classed as "outbreak areas", that is, areas larger than 1/4 section in which 30 per cent or more of the trees were infected. Ten trees were selected in two or more points within each of the outbreak areas by using the 2 tree bearing method and the infection data recorded. The results of these surveys are recorded in Table 3.

TABLE 3

Summary of 3 Outbreak Area Reports of Arceuthobium americanum Nutt.

Prince Albert District of Saskatchewan

1965

Location and Plot No.	Estimated % of jP in stand	Position in stand *		Age		Height		% infected	% mortality
		Dom.	Supp.	Dom.	Supp.	Dom.	Supp.		
Crutwell (06-1)	95%	60%	40%	49	30	40	20	90	40
Nipawin Prov. Park (06-2)	95%	85%	15%	48	29	31	18	50	20
Steep Creek (06-3)	95%	75%	25%	53	37	40	25	90	13

* Data in these columns refer only to jack pine in each particular stand.

8.3.2. WHITE POCKET ROT, Polyporus tomentosus Fr. and P. tomentosus var. circinatus:- Collections of P. tomentosus and P. tomentosus var. circinatus were taken from the roots of mature white spruce in a spruce-aspen stand 23 miles north of Big River. The infection was recorded as light in the area. White spruce along the east boundary of Prince Albert National Park were examined for sporophores, but were negative.

8.3.3. MACROPHOMA GALL ON POPLARS, Diplodia tumefaciens (Shear) Zalasky:- A small patch of severely infected trembling aspen was recorded in the Pines Provincial Forest, about 9 miles south of the Village of MacDowall (tp.44, rge.1, W 3rd mer.). Approximately 15 per cent of the infected trees were dead. The accompanying table lists the collections and degree of infections for the District in 1965.

Location	No. of trees examined	No. of trees infected
Pines Provincial Forest	42	42
Big River	5	1
Big River	5	3
Candle Lake	6	3
Christopher Lake	17	6
Birch Creek (Montreal Lake)	3	1

8.3.4. HYPOXYLON CANKER, Hypoxylon pruinatum (Klotsche) Cke.:- This canker of aspen is found throughout the District, but is collected more readily from aspen bluffs and woodlots in the southern part. The following lists the collection points and degree of infection.

Location	No. of trees examined	No. of trees infected
Trappers Lake, P.A.N.P.	50	2
Waskesiu, P.A.N.P.	20	3
Mayview, P.A.N.P.	10	2
Crutwell	20	1
Big River	13	7
Love	20	6
Erinferry	23	3
Christie Lake	20	3

8.3.5. A BARK FUNGUS, Caliciopsis calicioides (Ellis & Ev.) Fitzp.:- This fungus was collected from the heavy bark of living and occasionaly dead mature balsam poplar. Collections were made from many points in the District, and are listed below with the degree of infection.

Location	No. of trees sampled	No. of trees infected
Big Sandy Lake (Hanson Lake road)	5	5
Smeaton	3	2
Emma Lake	5	5
Skunk Creek	6	5
Montreal Lake	20	11
MacDowall	32	1
Marchant Grove	10	3
Wroxton	3	2
Ordale	15	3
Fort a la Corne Provincial Forest	12	10
Nisbet Provincial Forest	5	1
Big River (23 miles north)	25	25
Sled Lake	9	9
Doré Lake	9	7
Nipawin Provincial Park	3	1
Mont Nebo	15	1

8.3.6. OTHER NOTEWORTHY DISEASES:-

Disease and Organism	Host(s)	Locality	Remarks
Alternaria sp. (Circular leaf spot)	Poplar, northwest	Melfort	Infection light on planted saplings.
Apiosporina collinsii (Schw.) Hoehn (Witches' broom)	Saskatoon	Nisbet Provincial Forest, Mont Nebo and Big River	Small patches of heavy infection.
Ceratocystis fimbriata (Ell. & Halst.) Davidson (Target canker)	Aspen, trembling	Prince Albert National Park	Light infection in the Waskesiu area.

8.3.6. OTHER NOTEWORTHY DISEASES (CONT'D):-

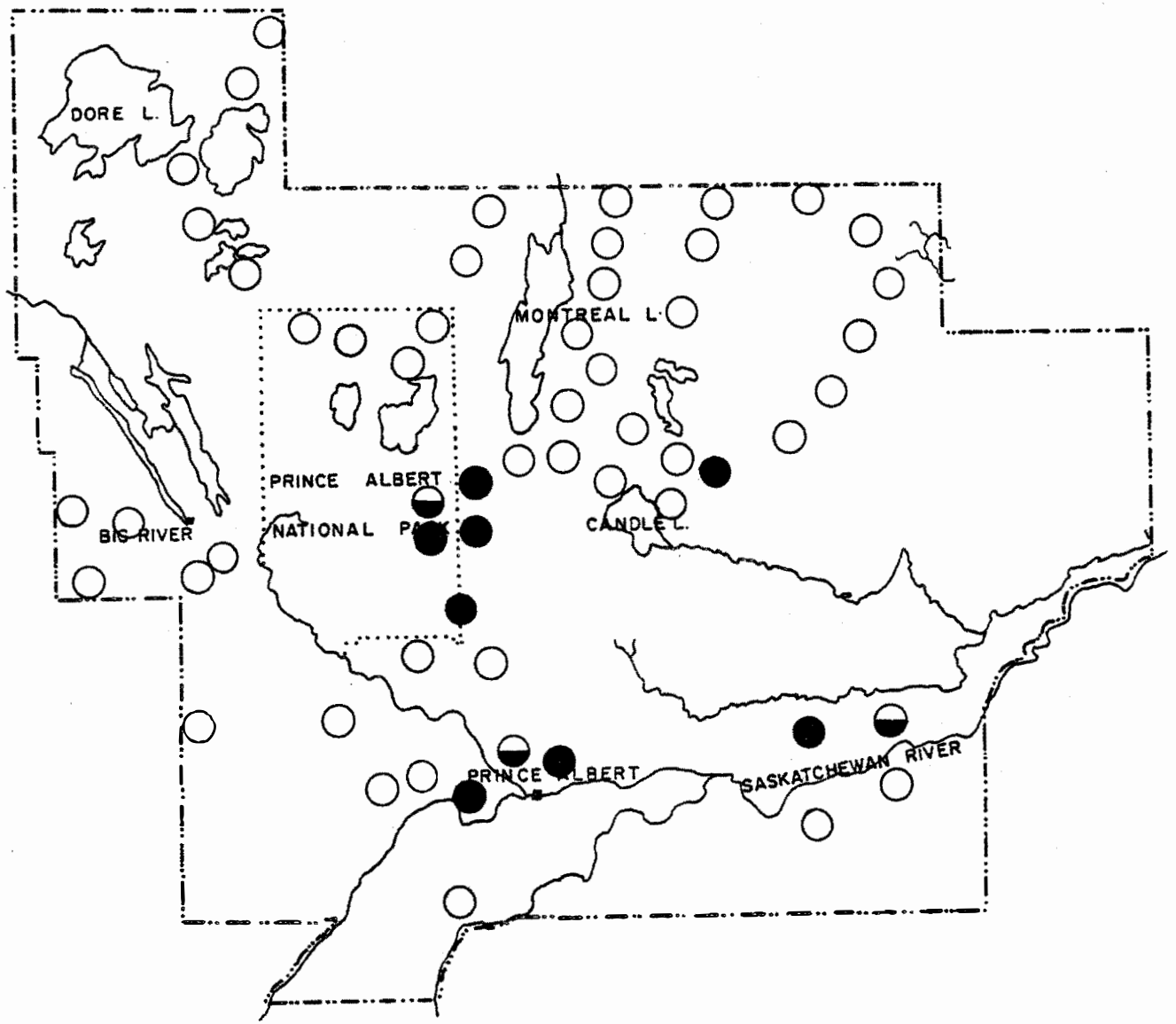
Disease and Organism	Host(s)	Locality	Remarks
Chrysomyxa arctostaphyli Diet. (Witches' broom)	Spruce, black	Fort a la Corne Provincial Forest, Nisbet Provincial Forest and Prince Albert National Park	Light infections in all black spruce bogs sampled; infection heavier in the northern parts of the District.
Chrysomyxa ledi de Bary (Needle rust)	Spruce, white and black	Montreal Lake and Prince Albert National Park	Very light infections.
Chrysomyxa ledicola Lagerh. (Needle rust)	Spruce, white and black	Nisbet Provincial Forest, Erinferry and Montreal Lake	Light to moderate infections on reproduction bS in the Erinferry area.
Chrysomyxa pirolata Wint. (Spruce cone rust)	Spruce, white	Prince Albert National Park	Light infection in the Shady Lake area.
Coccomyces hiemalis Higgins (Cherry shot hole)	Cherry, choke and pin	Throughout District	Moderate infections in all areas where recorded.
Cronartium comandrae Peck. (Comandra blister rust)	Pine, jack	Nisbet Provincial Forest, Erinferry and Big River	Light infections in all jack pine stands; noticeably heavier in Big River.
Cryptochaeta rufa (Fr.) Karst. (Slash fungus)	Aspen, trembling Poplar, balsam	Throughout District	Found on dead stems and branches.
Cryptosporiopsis cornina (Peck.) Petrak & Sydow (Dieback)	Dogwood	Big River	Common in most Dogwood thickets.
Fomes igniarius (L. ex Fr.) Gill. (White trunk rot)	Aspen, trembling	Throughout District	May be found in all stands, bluffs and woodlots.
Frost Damage	Aspen, trembling Fir, balsam	Nisbet Provincial Forest and Candle Lake	Approximately 20 per cent mortality to new shoots of bF in Candle Lake area.
Melampsorella caryophyllacearum Schroet. (Witches' broom)	Fir, balsam	Mirasty Lake	Rust brooms common in this area.

8.3.6. OTHER NOTEWORTHY DISEASES (CONT'D):-

Disease and Organism	Host(s)	Locality	Remarks
Melampsora medusae Thum. (Larch-aspen rust)	Aspen, trembling	Skunk Creek, Pines Provincial Forest and Fort a la Corne Provincial Forest	Infections generally light.
Melampsora bigelowii Thum. (Larch-willow rust)	Willow	Nisbet Provincial Forest, Pines Provincial Forest, Fort a la Corne Provincial Forest, Erinferry and Paddockwood	Scattered severe infections.
Peridermium stalactiforme Arth. and Kern. (Stalactiforme rust)	Pine, jack	Candle Lake	Common in this area.
Peridermium harknessii J.P. Moore (Western gall rust)	Pine, jack	Throughout District	This gall rust was found in all jack pine stands examined.
Pollaccia elegans Serv. (Poplar shoot blight)	Poplar, balsam	Nisbet Provincial Forest, Fort a la Corne Provincial Forest, and Montreal Lake area	Infection light on reproduction trees.
Pollaccia radiosa (Lib.) Bald. & Cif. (Aspen shoot blight)	Aspen, trembling	Throughout District	Common on reproduction in all areas.
Puccinia caricis var. grossulariata Arth. (A rust)	Gooseberry	Nisbet Provincial Forest	Light infection in Crutwell area.
Ramularia rosea (Fckl.) Sacc. (Leaf spot)	Willow	Nisbet Provincial Forest	Light infection of shaded willow foliage.
Rhytisma salicinum Pers. ex Fr. (Tar spot)	Willow	Throughout District	Light in all areas.

8.3.6. OTHER NOTEWORTHY DISEASES (CONT'D):-

Disease or Organism	Host(s)	Locality	Remarks
Septoria musiva Pk (Leaf spot)	Poplar, balsam	Throughout District	Severe infections to foliage of reproduction trees in the Waskesiu, Montreal Lake and Erinferry areas.
Uncinula salicis (DC. ex Merat) Wint. (Powdery mildew)	Willow, Aspen, trembling Poplar, balsam	Prince Albert National Park, Montreal Lake and Nisbet Provincial Forest	Heavy infection on shaded bPo foliage in Skunk Creek area. Light in other areas.
Valsa nivea (Hoffm.) Fr. (Dieback)	Aspen, trembling	Fort a la Corne Provincial Forest	Die-back common in this area.
Valsa kunzei Fr. var. piceae Waterman (Weeping canker)	Spruce, white	Montreal Lake	Single collection.



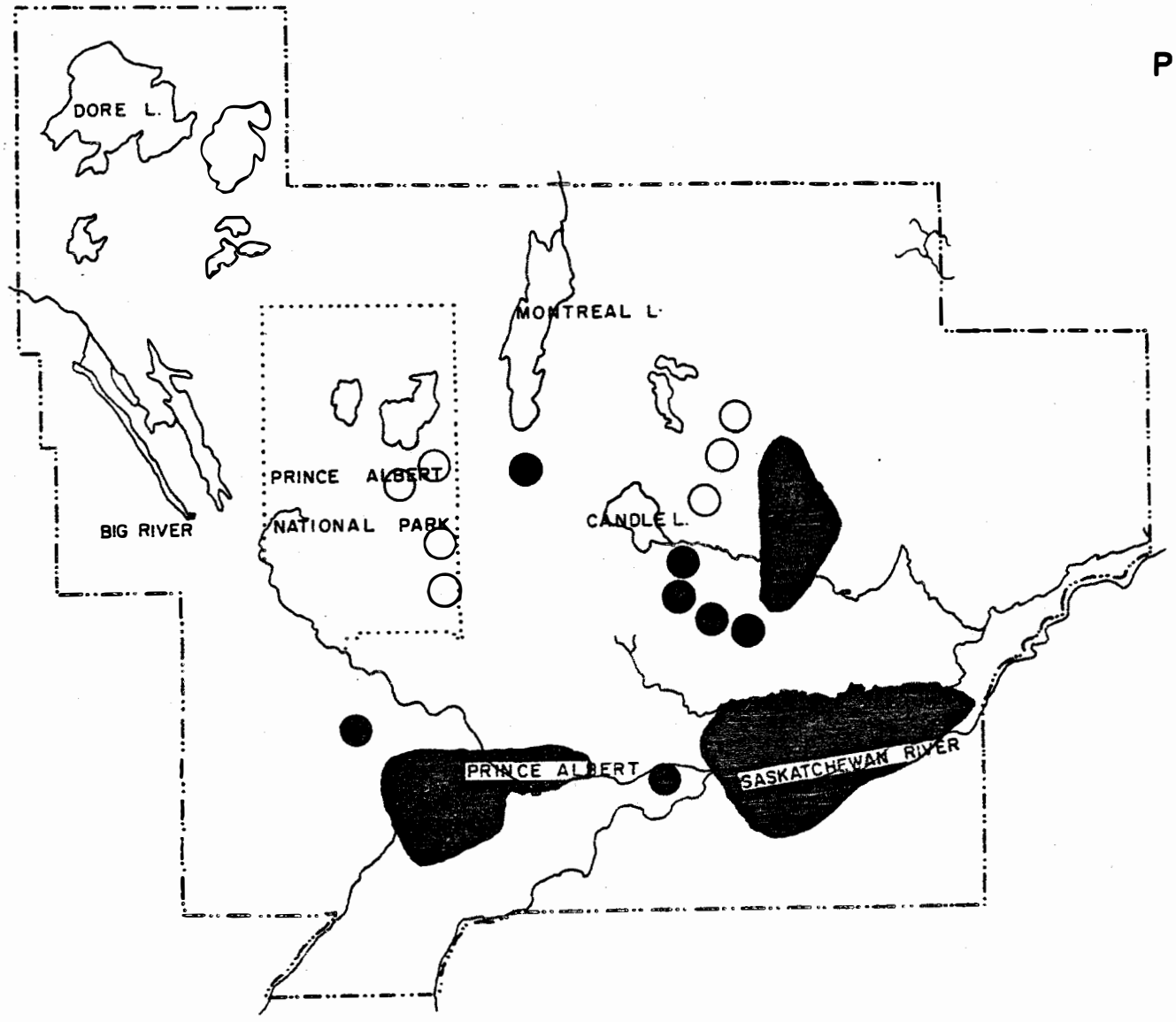
PRINCE ALBERT DISTRICT SASKATCHEWAN

FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1965.

- Severe
- Moderate
- Light

SCALE
0 30



PRINCE ALBERT DISTRICT
SASKATCHEWAN

FIG. 2

JACK PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS— 1965.

Areas of continuous moderate to severe defoliation

Light

SCALE
0 30

9. ANNUAL DISTRICT REPORT

NORTHERN DISTRICT OF SASKATCHEWAN

1965

by

R. D. Van Den Abeele

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

9.1 INTRODUCTION

Forest insect and disease surveys were carried out from May 12 to October 20. Mapping of insect outbreaks, general sampling, and reconnaissance of inaccessible areas were carried out using 33 hours of chartered flying and 19 hours with aircraft provided by the Department of Natural Resources. Totals of 318 insect and 220 disease collections were submitted to the Winnipeg laboratory. Survey sub-projects carried out were: (1) sequential sampling of larch sawfly egg populations; (2) special sampling of forest tent caterpillar egg populations; and (3) small mammal population studies. Mass collections of the balsam fir sawfly, western tent caterpillar and spruce budworm were made for parasite studies. A more intensive disease survey was carried out with special emphasis on the distribution of jack-pine mistletoe, yellow witches' broom of spruce and the leaf and twig blights of trembling aspen and balsam poplar.

I gratefully acknowledge the co-operation extended by personnel of the Saskatchewan Department of Natural Resources in supplying transportation, facilities and information in connection with the carrying out of these surveys.

9.2 INSECT CONDITIONS

9.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- This sawfly was recorded in most tamarack stands surveyed throughout the District, and along the Saskatchewan - N.W.T. boundary (Figure 1). Light defoliation occurred along the Churchill River system from Lac la Loche-Wasekamio lakes area eastward to the Amisk-Cumberland lakes area, and throughout the Reindeer, Wollaston and Cree lakes area. Light to moderate defoliation of scattered tamarack reproduction was recorded in the Uranium City-Fredette Lake area and light defoliation in the remaining sections of the northern part of the province. However, ground checks in several areas showed that oviposition in the new shoots was heavy with a successful hatch, but heavy larval mortality apparently occurred during the early feeding stages. These conditions were observed in an area extending from the Tazin River (just south of Hill Island Lake) east through Wigness, Wholdaia, Snowbird, Latimer and Kasba lakes.

Sequential sampling of larch sawfly egg populations was again carried out in permanent plot 101, (sec.1, tp.68, rge.23, W 2nd mer.) south of Lac La Ronge. Light infestations were recorded when only 2 of the 70 new shoots examined had been utilized by the sawflies for oviposition.

9.2.2. SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- As indicated in Figure 2, moderate to severe defoliation of white spruce, black spruce and balsam fir occurred in a 600 square mile area, running from Wood and Deschambault lakes eastward through the Mirond, Jan, Corneille, Attitti, Wildnest and Mari lakes to join the Namew-Amisk lakes infestation in the vicinity of Flin Flon. In addition, an area of some 70 square miles was heavily infested along the Churchill River in the Pita-Wintego lakes area, and spot infestations (of less than 10 square miles) were recorded at Manawan Lake, along the north-east shore of Sadler La e, at Trade and Keg lakes and on islands in the Lac la Ronge and Bernard lakes. Mass collections of spruce budworm larvae and pupae were made from the extreme western location at Bernard Lake, and reared for parasites. The results are listed below:

Type of Collection	No. of Specimens	% Parasitism by Hymenopterous spp.	% Parasitism by Dipterous spp.
Larvae	125	0	5.6
Pupae	94	9.5	4.2

High numbers of egg masses were recorded at Trade, Mirond, Jan, Attitti and Wildnest lakes, indicating that the infestation will continue at about the same levels in 1966.

9.2.3. JACK-PINE BUDWORM, Choristoneura pinus Free.:- Populations increased to outbreak levels in two locations (Figure 3). Approximately 300 square miles of jack pine south of the Churchill River and west and south of Pinehouse Lake was heavily infested. Moderate to severe defoliation of the new foliage was mapped throughout the infested areas and considerable back-feeding on the old foliage was observed in the Senyk Lake and Smoothstone River areas. Also, a small stand of jack pine about three miles east of Brownell Lake (tp.69, rg.11, W 2nd mer.) was moderately defoliated. In addition, a single tree at the junction of the Nemeiben River and Churchill River road was 50 per cent defoliated, and several larvae were taken at Reindeer La e, but no defoliation was observed.

9.2.4. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- This sawfly was collected at widely scattered points in the District. Black spruce on an island in Nettell Lake in the northwest corner of the Province was heavily damaged; approximately 100 per cent of the new and 60 per cent of the old foliage was destroyed, particularly on some reproduction and smaller trees. It is believed that this infestation has been active for several years, as about 40 per cent of the trees were dead and 75 per cent of the remainder had dead tops.

Elsewhere, collections were taken from white spruce at Latimer Lake in the N.W.T. where damage was light, and low larval populations were recorded at Wollaston, Upper Foster and Wasekamio lakes, in the Lac La Ronge area, at the Ballantyne River along the Hanson Lake Road, and in the Buffalo Narrows area.

9.2.5. BALSAM-FIR SAWFLY, Neodiprion abietis complex:- The outbreak in north-central Saskatchewan continued. Moderate to severe defoliation occurred on white and black spruce, and balsam fir growing on islands in Trade, Otter, Besnard, Sandfly, Nistowiak and Nemeiben lakes. Light defoliation occurred at Drinking and Devil lakes along the Churchill River, and at McIntosh Lake.

9.2.6. BLACK HEADED BUDWORM, Acleris variana (Fernald):- Larvae were collected from many widely scattered points throughout the District. Up to 70 per cent of the new foliage of black spruce was destroyed on several islands in Sandfly Lake and the top three feet of black spruce on islands in Lac La Ronge were heavily infested. Low populations and light defoliation of both white and black spruce was recorded in the Bigstone, Besnard, McIntosh and Nistowiak lakes area, and on black spruce in the Wollaston-Reindeer lake area, and at Wilson Lake northeast of Uranium City.

9.2.7. AMERICAN ASPEN BEETLE, Gonioctena americana (Schff.):- This leaf beetle was widely scattered throughout the District. Moderate damage to foliage of trembling aspen reproduction occurred along the Hanson Lake Road in the vicinity of the Ballantyne River. Light damage was recorded at MacKenzie Creek south of La Ronge, along the Montreal River between Bigstone Lake and Lac La Ronge, and along the Churchill River Road north of La Ronge. Elsewhere, beetle populations were low and damage negligible.

9.2.8. A BLOTCH MINER, Gracillard sp.:- A moderate to severe infestation was detected in the Lake Athabasca area. Severe mining of willow foliage occurred in and around Uranium City and west to the Alberta boundary, and northeast to Wilson Lake. On the south side of Lake Athabasca, moderate to severe damage occurred along the Williams River, to Carswell Lake, and along the Douglas River to Brander Lake. Mining was severe in the MacKenzie Creek area south of Lac La Ronge, and light at McLennan Lake and near Buffalo Narrows.

9.2.9. GREY WILLOW-LEAF BEETLE, Galerucella decora Say:- Populations remained at about 1964 levels. Light skeletonization of willow foliage occurred at Lac La Ronge, Bigstone, Potatoe, Knee, Amisk, Deschambault and Wollaston lakes.

9.2.10. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- A significant decrease in populations of this leaf beetle was observed in the old infestation at Sandfly Lake, where only light skeletonizing occurred on

scattered trembling aspen reproduction. Elsewhere, light skeletonizing occurred at Knee, Nistowiak, La Ronge, Mirond, Besnard and Deschambault lakes. Light damage was also detected on aspen reproduction along the Hanson Lake Road at the Ballantyne River, and along the Montreal River between Lac La Ronge and Bigstone Lake.

9.2.11. FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- Surveys revealed the almost total collapse of the forest tent caterpillar outbreak in the District. Collections containing single larvae were taken at Buffalo Narrows and along the Churchill River Road north of Lac La Ronge, but defoliation was negligible. Egg-band counts at 8 locations in the District indicated continued low population levels in 1966. The results of this survey are summarized in Table 1.

TABLE 1.

Results of Forest Tent Caterpillar Egg-Band Survey

Northern Saskatchewan - 1965

(Based on examination of 3 co-dominant trees at each sampling point.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands per tree	Forecast for 1966
Mile 16 Churchill River Road	3.6	32.3	11.0	0	Nil
Mile 90 Lac La Ronge Highway	7.3	48.3	12.3	0	Nil
Mile 98 Hanson Lake Road	4.5	36.0	11.3	0	Nil
Mile 134 Hanson Lake Road	3.8	30.0	11.3	0	Nil
Mile 152 Hanson Lake Road and Deschambault Lake	4.2	32.3	10.0	0	Nil
Mile 180 Junction Hanson and Jan Lake roads	3.6	29.6	10.6	0	Nil
Mile 190 Hanson Lake Road and Sturgeon-Wier River	4.2	29.6	10.0	0	Nil
Mile 62 Junction Buffalo Narrows and Beauval roads	4.0	32.0	19.6	0	Nil

9.2.12. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acrobasis betulella Hulst. (Birch tube maker)	Birch, white	Buffalo Narrows	No serious damage.
Archippus packardianus Fern. (A leaf roller)	Spruce, black	Amisk Lake	Light populations.
Adoxus obscurus Linn. (Western grape rootworm)	Willow Aspen, trembling Birch, white	Deschambault Lake, Pine Creek, Mac-Kenzie Creek	Low populations.
Altica populi Brown (Flea beetle)	Poplar, balsam	Ballantyne River	Low populations.
Arge clavicornis (Fabricius) (Willow sawfly)	Willow Birch, white	McLennan and Deception lakes, Lac La Loche	Low populations.
Agrilus anxius Gory (Bronze birch borer)	Birch, white	Junction of Jan and Hanson Lake roads	Twigs lightly infested; common in localized areas.
Aceria parapopuli (Keifer) (Poplar bud gall-mite)	Aspen, trembling	Deschambault Lake	Twigs lightly infested.
Archippus albertus McD. (The leaf roller)	Spruce, black and white	Otter and Wilson lakes	Low populations.
Aegeria prob. tibialis (Harr.) (A clearwing moth)	Aspen, trembling	Martin Lake	High populations in localized patches of willow and aspen reproduction
Anoplonyx luteipes Cress. (A sawfly)	Tamarack	Tazin River and Snowbird Lake in the N.W.T.	Traces of defoliation.
Amoplonyx canadensis Hgtn. (A sawfly)	Tamarack	Jan and Deschambault lakes	Traces of defoliation.

9.2.12. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Bucculatrix canadensisella Chambers (Birch skeletonizer)	Birch, white	Isle-a-la-Crosse	Leaves lightly infested.
Campaea perlata G.N. (A looper)	Aspen, trembling Alder	MacKenzie Creek, Pine Creek	Low populations.
Chrysomela knabi Brown (A leaf beetle)	Birch, white Alder	Pine Creek	Low populations.
Chermes lariciatus Patch. (A gall aphid)	Spruce, white and black	Knee, Besnard, Otter and Reindeer lakes, Ballantyne River at Hanson Lake Road	Low populations.
Chermes cooleyi Gillette (Cooley spruce gall aphid)	Spruce, white	Lac La Loche	Trace of browning on branch tips.
Dioryctria reniculella (Grote.) (Spruce coneworm)	Spruce, white	Belcher, Trade and Deschambault lakes	Trace of damage.
Eupithecia luteata Packard (A looper)	Spruce, black Tamarack	Wilson, Keller and Jan lakes	Trace of damage.
Feralia jocosa (Gn.) (Green striped spruce caterpillar)	Spruce, black	McIntosh Lake	Defoliation negligible.
Haploa confusa Lyman (A woolly-bear)	Willow	Potatoe Lake	No noticeable damage.
Hylobius pinicola Couper (A pine root collar weevil)	Pine, jack Tamarack Spruce, black	Wollaston, Nettel and Deschambault lakes and Tazin River (N.W.T.)	Low adult populations.
Janus abbreviatus (Say) (The willow shoot sawfly)	Willow	MacKenzie Creek	Moderate damage to several willow thickets.

9.2.12. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Lithophane amanda Sm. (An owlet moth)	Birch, white	Snake Lake and Bigstone Creek	Very low populations.
Lexis bicolor Grt. (The smoky moth)	Pine, jack	Waterbury Lake	No noticeable damage.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	Aspen, trembling	Mirond and Martin lakes, Ballantyne River at the Hanson Lake Road	Very light infestations.
Lepyrus palustris Scop. (A weevil)	Willow	Williams River in Lake Athabaska area	Low populations.
Mordwilkoja vagabunda (Walsh) (Poplar vagabond gall aphid)	Aspen, trembling	Sandfly and Mirond lakes, Bigstone Creek	Trace of damage.
Magdalis gentilis Lec. (A weevil)	Pine, jack	Waterbury Lake	Trace of damage.
Malacosoma pluviale (Dyar) (Western tent caterpillar)	Willow	McIntosh Lake	Infestation in localized areas.
Monochamus scutellatus Say. (White-spotted sawyer)	Birch, white	Waterbury Lake	Low adult populations.
Nematus limbatus (Cress.) (Willow sawfly)	Willow	Isle-a-la-Crosse	Very light populations.
Nematus unicolor (Marl.) (The sawfly)	Birch, white	Waskamio Lake	Populations low.
Neodiprion virginianus complex (Red-headed jack-pine sawfly)	Pine, jack	Nemeiben River at the Churchill River Road.	Light to moderate defoliation on two trees only.

9.2.12. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Oberea schaumi Lec. (A poplar twig borer)	Aspen, trembling	Ballantyne River at the Hanson Lake Road	Light damage.
Orsodacne atra Ahr. (An aspen leaf beetle)	Spruce, white Tamarack	Churchill River at Churchill River Road and Deschambault Lake	Light damage.
Pissodes strobi (Peck) (White-pine weevil)	Spruce, white Pine, jack	Buffalo Narrows and Pine Creek	Light damage to leaders only.
Prisitphora siskiyouensis Marl. (The sawfly)	Birch, white	Jan Lake	No serious damage.
Petrova albicapitana (Busck) (Pitch nodule maker)	Pine, jack	Deschambault and Cree lakes, Williams River south of Lake Athabaska	Only a few nodules recorded at each location.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white	Lac La Ronge	Low populations.
Phytophaga rigidae O.S. (The beaked willow gall fly)	Willow	Widely scattered throughout all of District.	Low populations; light damage.
Phratora americana canadensis Brown (The leaf beetle)	Willow	Ballantyne River at the Hanson Lake Road	No noticeable damage.
Rhabdophaga strobiloides (Walsh) (The willow cone gall midge)	Willow	Widely scattered throughout all the District	Heavy woodpecker predation was noted. Only light damage.
Saperda concolor Lec. (Poplar-gall saperda)	Willow Aspen, trembling	Throughout the District	Light populations except for severe twig infestations at Martin Lake on aspen regeneration.

9.2.12. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Syneta pilosa Brown (A leaf beetle)	Fir, balsam Tamarack Spruce, white and black	Tazin River (N.W.T.) Bigstone Creek, Devil Lake, Deschambault Lake and Ballantyne River at the Hanson Lake Road	Low populations.
Saperda moesta Lec. (Poplar-twig borer)	Poplar, balsam	Ballantyne River at Hanson Lake Road, Lac La Ronge and Reindeer River	Heavy woodpecker predation of borer populations noted. Light damage to host trees.
Saperda calcarata Say (The poplar borer)	Aspen, trembling Poplar, white	Deschambault Lake and Mile 10 Churchill River Road	Light stem damage.
Saperda sp. (A root saperda)	Poplar, balsam	Rabbit and Bigstone Creeks and at Mile 10 Churchill River Road	Light damage to regeneration.
Tetralopha asperatella (Clem.) (An aspen webworm)	Aspen, trembling Poplar, balsam	Reindeer River and Nemeiben River at the Churchill River Road	Light populations.
Trichocampus irregularis (Dyar) (The sawfly)	Willow	Wholdaia Lake (N.W.T.)	Light damage.

9.3 DISEASE CONDITIONS

9.3.1. A MISTLETOE OF JACK PINE, Arceuthobium americanum Nutt.:- Patches of infected jack pine were recorded from many locations throughout the District. Aerial surveys north of Lake Athabaska and along the N.W.T. boundary failed to extend the known northern distribution. Patches of severely broomed jack pine were recorded at the following points: south shore of Lake Athabaska, Williams River, Douglas River, Carswell Lake, Brander Lake, Churchill River at Knee Lake, Pinehouse and Sandy lakes, Pelican Narrows area; at Manawan, Wood, Deschambault, Pelican and Mirond lakes; on islands in Lac La Ronge area, along south and east shores of Wapawekka Lake extending south into the Wapawekka Hills; and along the south shore of

Swan Lake, south shore of Emmeline Lake, and the Montreal River.

9.3.2. YELLOW WITCHES' BROOM OF SPRUCE, Chrysomyxa arctostaphyli Diet.:- Brooming was observed on black spruce in all parts of the District, with the heaviest infections usually occurring in the northern areas. Light infections were recorded along the Tazin River and at Wigness, Snowbird and Wholdaia, Athabasca, Upper Foster, Senyk, Reindeer, La Ronge, Potatoe and Deschambault lakes.

9.3.3. LEAF AND TWIG BLIGHT OF POPLAR, Pollaccia radiosa (Lib.) Bald. & Cif.:- This blight infected reproduction trembling aspen throughout much of the District and southern portions of the District of MacKenzie northwest of Uranium City. The following table lists the collection points with the degree of infection:

Location	No. of trees examined	No. of trees infected
Buffalo Narrows	20	16
Isle a la Grosse	2	1
Wasekamio Lake	20	18
Lac La Loche	15	3
Lac La Plonge	25	3
Upper Foster Lake	5	1
Keller Lake	5	2
McIntosh Lake	5	2
McLennon Lake	15	3
Lac La Ronge	15	7
Devil Lake	15	3
Trade Lake	2	1
Mirond Lake	30	14
Corneille Lake	10	6
Deschambault Lake	25	23
Jan Lake	20	16
Ballantyne River, Hanson Lake Road	10	7
Sturgeon Weir River, Hanson Lake Road	6	6
Bear River, Hanson Lake Road	10	5
Pine Creek, Lac La Ronge Road	10	2
Nemeiben River, Churchill River Road	15	15
Reindeer River (Island)	15	6
Reindeer Lake	15	3
Uranium City	20	5
Tazin River, Northwest Territories	5	1

9.3.4. WESTERN GALL RUST, Peridermium harknessii J.P. Moore:- Light infections of this gall rust were noted on jack pine in the following areas: Rabbit and MacKenzie creeks along the La Ronge Highway, at the Ballantyne River on the Hanson Lake Road, and at Otter, Waterbury, Jan and Upper Foster lakes.

9.3.5. A BARK FUNGUS, Caliciopsis calicioides (Ellis and Ev.) Fitzp.:- This fungus, which occurs on the bark of mature balsam poplar, was widely distributed throughout the southern portion of the District. Samples were taken along the Hanson Lake road at Creighton, and at the Ballantyne River and the Sturgeon Weir crossings, and at Lac La Ronge, Bigstone, Otter, Potatoe, Jan, and Wasekamio lakes.

9.3.6. TAR SPOT, Rhytisma salicinum Pers. ex Fr.:- Moderate to severe infections of this tar spot were recorded on willow foliage at Wholdaia Lake in the N.W.T., and at Martin Lake, Uranium City and in the Portage La Loche areas. Light infections occurred along the Nemeiben River, Montreal River, MacKenzie Creek, and in the Wasekamio Lake areas. Rhytisma sp. severily infected the foliage of a Ledum sp. at Wholdaia Lake in the N.W.T.

9.3.7. NEEDLE RUST, Chrysomyxa ledicola Lagerh.:- Moderate to severe infections of this needle rust were found on the foliage of white spruce in the Lake Athabasca area, and at Latimer Lake in the N.W.T. The foliage of black spruce was only lightly infected in the same locations. Light infections were also recorded at Brander Lake, Besnard Lake and in the Buffalo Narrows area.

9.3.8. SPRUCE PARTRIDGE DAMAGE:- During the winter and early spring, spruce partridge caused light to moderate defoliation to the upper crowns of pole size jack pine along the Lac La Ronge Highway north of mile 65.

9.3.9. STORM DAMAGE:- About 75 per cent of the trees covering 4 square miles in the Potatoe Lake-Rabbit Creek area were heavily damaged by a severe wind and hail storm. Many of the trees were either uprooted or broken off and the hail caused up to 90 per cent defoliation of the remaining stand.

9.3.10. OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Apiosporina collinsii (Schw.) Hoehn. (Leaf blight)	Saskatoon	Jan, Otter and Pita lakes	Small patches of light infection.

9.3.10. OTHER NOTEWORTHY DISEASES (CONT'D):-

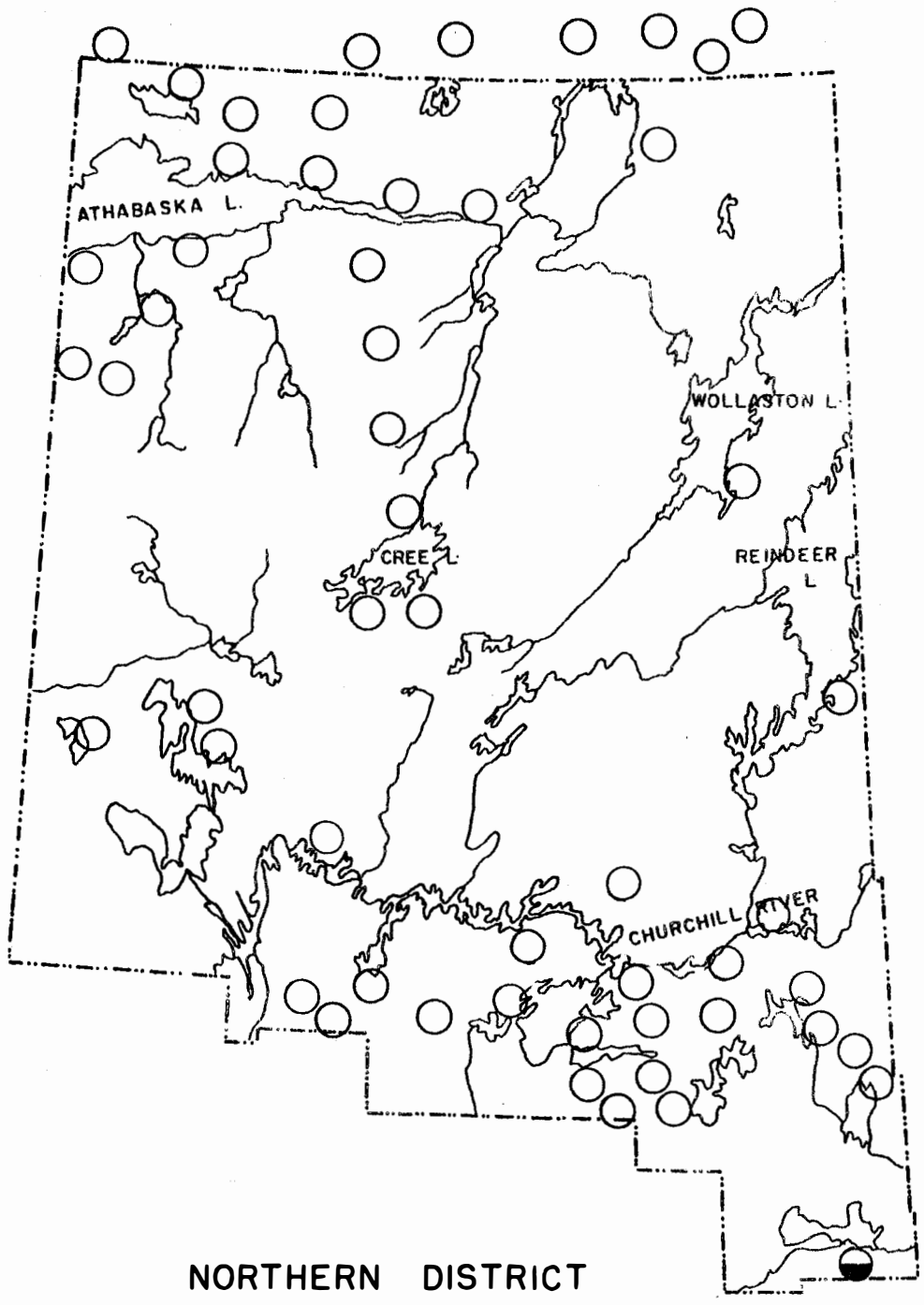
Organism and Disease	Host(s)	Locality	Remarks
Chrysomyxa pirolata Wint. (Cone rust)	Spruce, white	Nistowiak Lake	Light infection.
Cronartium comandrae Pk. (Comandra rust)	Pine, jack	Churchill River Road at the Churchill River	Caused no noticeable damage.
Cytospora chrysosperma (Pers.) Fr. (Cytospora canker)	Aspen, trembling	Deschambault, Mirond and Jan lakes	Light infection but common.
Cytospora suffusa (Fr.) Tul. (Dieback)	Alder	Brander Lake	Light infection found on twigs.
Coccomyces hiemalis Higgins (Cherry shot hole)	Cherry, pin and choke	Lac La Ronge, Deception and Otter lakes, along the Mac-Kenzie Creek.	Common on reproduction but infection was recorded as light.
Chrysomyxa ledi de Bary (Needle rust)	Spruce, white and black	Lac La Loche, Lac la Plonge, Wasekamio Lake, Buffalo Narrows	Trees only lightly infected.
Dibotryon morbosum (Schw.) Theiss & Syd. (Black knot of cherry)	Cherry, pin and choke	Lac La Ronge and MacKenzie Creek	Found in localized scattered patches; galls infested with insects.
Daedalea unicolor (Bull.) Fr. (Slash fungus)	Birch, white	MacKenzie Creek	Light infection only.
Drepanopeziza populorum (Desm.) Hohn. (Leaf spot)	Aspen, trembling	Tazin River, N.W.T.	Light infection.
Fomes ignarius (L. ex Fr.) Kickx (White trunk rot)	Aspen, trembling	Deschambault, Sandfly, Pita, Mirond, Wild-nest lakes, Reindeer River	Found on dead stems. Light infections common.

9.3.10. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Fomes fomentarius (L. ex Fr.) Kick. (White mottled rot)	Birch, white	Pine Creek, Otter, Upper Foster and McLennon lakes.	Dead white birch stems lightly infected.
Fomes robustus Karst (Slash fungus)	Birch, white	Mile 10, Churchill River Road	Light infection on dead trees only.
Fomes pinicola (Sw. ex Fr.) Cke (Brown cubical rot)	Fir, balsam	Besnard Lake	Light infection recorded.
Hypodermella ampla (J.J. Davis) Dearn. (Needle spot)	Pine, jack	Churchill River Road at the Churchill River	Very light damage.
Hypoxylon pruinatum (Klotsche) Cke. (Hypoxylon canker)	Aspen, trembling	Jan Lake	Light; only small numbers of cankers collected.
Lenzites saepiaria (Wulf.) ex Fr. (Brown cubical pocket rot)	Pine, jack	Mile 10 Churchill River Road	Light infection on dead trees.
Lophodermium pinastri (Schrad. ex Fr.) Chev. (Needle cast)	Pine, jack	Brander Lake, Tazin River (N.W.T.), and Deception Lake	Light to moderate infection on foliage.
Macrophoma tumefaciens Shear. (Macrophoma gall of poplars)	Aspen, trembling	Lac La Ronge	Light damage only.
Melampsora bigelowii Thum. (Larch-willow rust)	Willow	Fredette and Jan lakes	Light infections, but common. A parasite occurred on this rust.
Nectria cinnabarina (Tode ex Fr.) Fr. (Coral spot)	Willow	Bigstone Creek at the La Ronge Highway	Light infection.
Polyporus abietinus Dicks. ex Fr. (Pitted saprot)	Spruce, white	Nemeiben River at the Churchill River Road	Found lightly affecting slash.

9.3.10. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Polyporus pargamenus Fr. (White pocket rot)	Aspen, trembling	Knee Lake	Light infection recorded.
Polyporus betulinus (Bull.) Fr. (Slash decay fungus)	Birch, white	McLennon Lake	Light infection on dead mature trees.
Pollaccia elegans Serv. (Shoot blight and leaf spot)	Poplar, balsam	Lac La Ronge and Reindeer River	Light infection; common on regeneration.
Ramularia rosea Fckl. (Leaf spot)	Willow	Bigstone Creek	Light infection.
Septoria betulicola Pk. (Leaf spot)	Birch, white	Wagnes Lake (N.W.T.)	Light infection only.
Septoria alnifolia El.. & Ev. (Leaf spot)	Alder	Brander Lake	Light to moderate infection.
Septoria musiva Pk. (Leaf spot)	Poplar, balsam	Jan and Waskamio lakes, Pine Creek	Light damage occurred at all points.
Septoria salicicola (Fr.) Sacc. (Leaf spot)	Willow	Martin Lake	Light infection.
Sclerophoma pithyophila (Cda) Hohn. (Needle blight)	Pine, jack	Brander Lake	Moderate reddening of foliage.
Uncinula salicis (DC. ex Merat) Wint. (Powdery mildew)	Willow	Throughout District	Common, but only light infections.



NORTHERN DISTRICT
SASKATCHEWAN

FIG. I

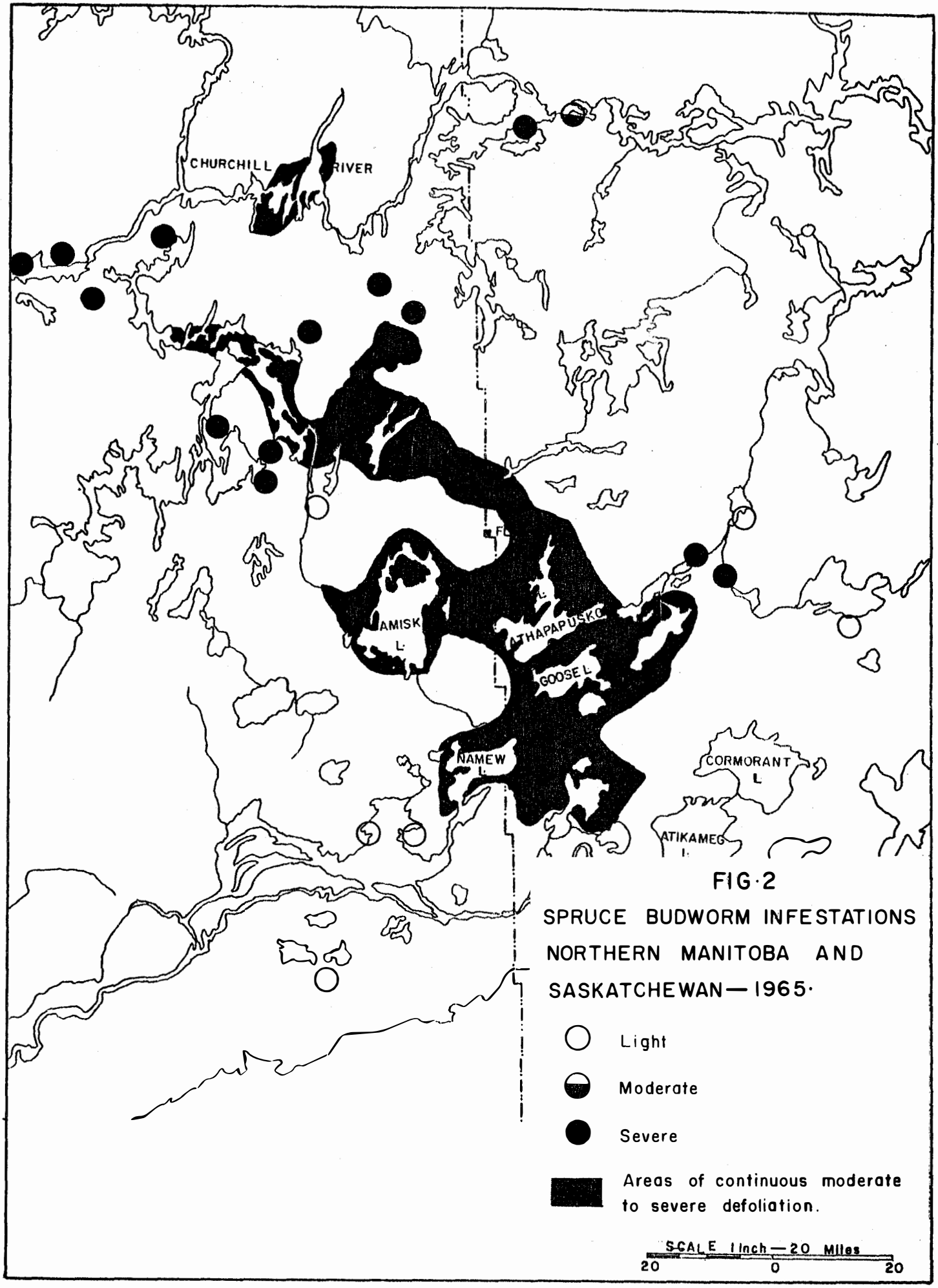
LARCH SAWFLY — 1965

LOCATION OF POINTS WHERE INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS.

○ Light ◒ Moderate ● Severe

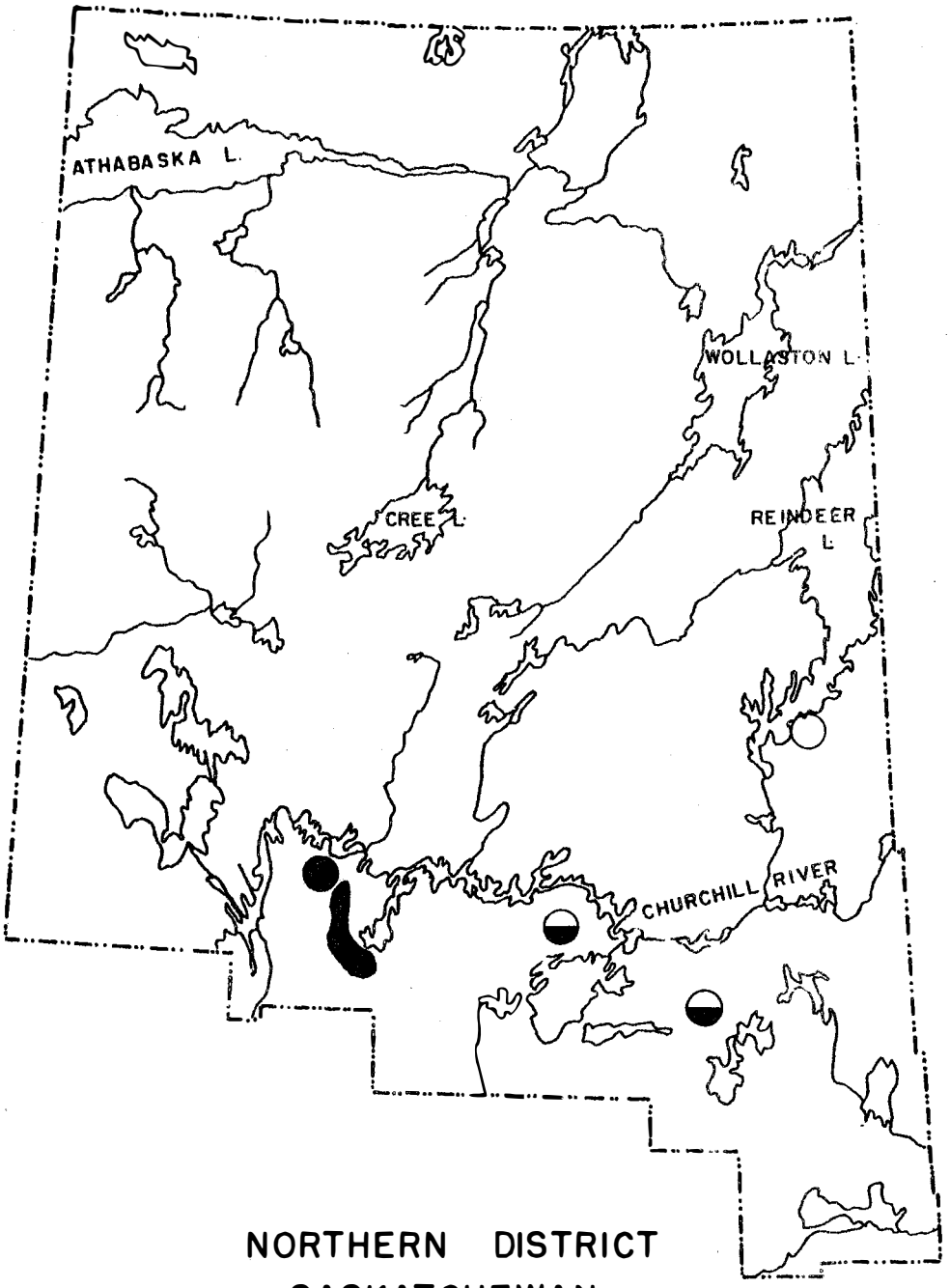
SCALE 64 miles—1 inch

50 0 50



FIG·2

SPRUCE BUDWORM INFESTATIONS NORTHERN MANITOBA AND SASKATCHEWAN — 1965·



NORTHERN DISTRICT
SASKATCHEWAN

FIG. 3

JACK-PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965.

○ Light ◒ Moderate ● Severe

SCALE 64 miles–1 inch

50 0 50

10. ANNUAL DISTRICT REPORT

MEADOW LAKE DISTRICT OF SASKATCHEWAN

1965

by

C. L. Rentz

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

10.1 INTRODUCTION

Surveys were carried out from mid-May to mid-October, and totals of 217 insect and 84 disease collections were made. Eight hours of chartered and three hours and fifty minutes of flying time provided by the Saskatchewan Department of Natural Resources were utilized in recording intensity and distribution of important insects and diseases in the District.

In addition to regular insect and disease surveys, special emphasis was placed on surveys of bark beetles, wood borers, leaf eating beetles, insect diseases and insect galls. Survey sub-projects carried out during the season were: (1) population sampling of the boxelder twig borer; (2) forest tent caterpillar egg population studies; (3) sequential sampling of larch sawfly egg populations; (4) larch sawfly population studies at permanent plots; (5) sampling for Saperda borers in poplar; and (6) population studies of small mammals. Mass collections of forest tent caterpillar, aspen leaf beetle, and the prairie tent caterpillar were collected for parasite studies. Special collections of black-knot of cherry and of insect galls were made for personnel of the Winnipeg laboratory.

The most important change in insect conditions was the complete collapse of the forest tent caterpillar infestation which had previously defoliated most of the continuous trembling aspen stands in the District. Little change was noted in the status of other major insects. Larch sawfly populations remained at low levels and the yellow-headed spruce sawfly caused only very light defoliation to single trees and ornamental plantings. Leaf blights on deciduous trees were common, while rust infections on coniferous trees were sporadic. Globose gall and spindle rusts were widely scattered throughout most jack pine stands.

The co-operation and assistance received from provincial forestry officials and private co-operators, is gratefully acknowledged.

10.2 INSECT CONDITIONS

10.2.1. LARCH SAWFLY, Pristiphora erichsonii (Htg.):- This sawfly was present in all tamarack bogs, but defoliation was light and only individual branches were attacked. Results of sequential sampling of larch sawfly egg populations conducted at three permanent sampling plots are shown below:

RESULTS OF SEQUENTIAL SAMPLING
OF LARCH SAWFLY EGG POPULATIONS
MEADOW LAKE DISTRICT - 1965

Plot No.	Location	Infestation Rating		
		No. of shoots counted	No. of shoots curled	Infestation rating 1965
102	Loon Lake	50	0	light
104	Pierceland	60	1	light
105	St. Cyr	50	0	light

(Infestation ratings: L = up to 35% defoliation)

A total of 477 cocoons were collected at the Loon Lake plot for parasite studies. Examination of the cocoons indicated that 7.33 per cent were destroyed by fall emergence of Bessa harveyi (T.T.) and .42 per cent by disease organisms. A representative number of larvae dissected showed that effective parasitism was 33 per cent by B. harveyi larvae and 13.5 per cent by Mesoleuis tenthredinis Morley. In addition, 6 per cent of the larvae were diseased, .5 per cent destroyed by undetermined causes, and 15.5 per cent of the larvae contained encapsulated M. tenthredinis eggs.

10.2.2. YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis Roh.:- This defoliator caused very little damage during the current season. Larvae were collected throughout the District, but populations were very low. The highest larval populations were recorded at Loon Lake, where one planted white spruce tree was 70 per cent defoliated. However, nearby trees yielded only single larvae and defoliation was not discernable.

10.2.3. ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Collections of this leaf beetle were taken in the Spiritwood, Mildred, Corn-Beef-Creek, Jeanotte Lake, Pierceland and Golden Ridge areas. Low populations caused only light skeletonizing of trembling aspen foliage in all areas mentioned.

10.2.4. AMERICAN ASPEN BEETLE, Gonioctena americana (Schffr.):- This aspen defoliator was common throughout the District. Populations, however, were low

and damage was restricted to single trees or, in a few instances, to small patches of light defoliation.

10.2.5. PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- Highest populations of this tentmaker were recorded from Fort Pitt south through Lloydminster to Marsden. In some instances 100 per cent of the chokecherry was affected. In the Witchekan, Battlefords Provincial Park and Loon Lake areas, damage was restricted to single clumps of rose and chokecherry bushes.

10.2.6. FOREST TENT CATERPILLAR, Malacosoma disstria (Hbn.):- Infestations of this defoliator of trembling aspen collapsed during the past season. The eggs appeared to hatch successfully, but the majority of the larvae died while in the first instar. Only eleven larval collections were recorded throughout the District; the highest populations occurring in the Spiritwood area where a trace of defoliation was recorded. Single scattered larvae were collected in the Loon Lake, Golden Ridge and Rapid View areas, but damage was negligible.

Egg-band surveys conducted during the fall indicate continued low population levels for 1966. The results of these surveys are shown in Table 1.

TABLE 1

Results of Forest Tent Caterpillar Egg-band Survey

Meadow Lake District - 1965

(Based on the examination of 3 co-dominant trembling aspen at each sampling point.)

Station No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown Depth	Av. No. Egg-bands per tree	Defoliation forecast for 1966
1	Ministikiwan Lake	2.6	24.7	16.3	0	Nil
2	Rapid View	3.0	29.3	19.7	0	Nil
3	Cold Lake	3.6	25.0	19.7	0	Nil
4	Mildred	2.8	22.0	17.6	0	Nil
5	Spiritwood	3.7	28.0	21.3	0	Nil
6	Belbutte	2.7	22.2	14.0	0	Nil
7	Kelley Lake	3.7	30.0	19.0	0	Nil
8	Flotten Lake	3.4	23.0	18.0	0	Nil
10	Green Lake	3.3	27.3	19.3	0	Nil
11	Golden Ridge	3.0	21.0	17.0	0	Nil

10.2.7. POPLAR VAGABOND APHID, Mordwilkoja vagabunda Walsh:- This gall aphid caused considerable curling of foliage of trembling aspen trees throughout the District. Although in some instances 80 per cent of the foliage on individual trees was affected, infestations generally ranged from light to moderate.

10.2.8. BOXELDER TWIG BORER, Proteoteras willingana Kft.:- Light populations of this twig borer occurred in most Manitoba maple shelterbelts examined. Counts were made on branches from five trees in shelterbelts at Goodsoil, Bolney and Loon Lake. The data obtained from these populations studies is shown in Table 2.

TABLE 2

Results of Boxelder Twig Borer Population Counts
Meadow Lake District of Saskatchewan

1965

(Based on examination of four branches 36 inches long from each crown level on 5 trees at each sample point.)

	Tree Date			No. of twigs examined and twig borer populations by crown levels					
				Lower		Mid		Upper	
Location	Av. ht. (ft.)	Av. crown depth (ft.)	Av. crown width (ft.)	No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Goodsoil	21.2	18.0	12.4	372	11	437	14	501	10
Bolney	22.6	17.8	11.2	395	13	414	13	378	12
Loon Lake	20.0	17.4	11.6	388	18	378	16	361	14

10.2.9. OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Aceria parapopuli (Kiefer) (Poplar bud gall mite)	Aspen, trembling	Spiritwood and Meadow Lake	Very light infestations at Spiritwood; moderate to heavy in a small patch at Meadow Lake.
Acleris variana (Fern) (Black-headed budworm)	Spruce, black and white	Goodsoil and Corn-beef Creek	Very light in both locations; damage negligible.
Acrobasis betuella Hulst. (Birch tube maker)	Birch, white	Loon Lake	Very light.
Acronicta dactylina Grt. (A dagger moth)	Willow, Aspen, trembling	Loon River, Meadow Lake and Loon Lake	Low populations; no noticeable defoliation.
Agrilus criddlei Frost (Flat-headed wood borer)	Willow	Spiritwood, Baupame, Golden Ridge, Edwards Lake and Pierceland	Light infestations; galls rare.
Anoplonyx luteipes (Cress.) (A sawfly)	Tamarack	Northern portion of the District.	Very low populations; no hoticeable defoliation.
Archips cerasivoranus Fitch. (Ugly-nest tortrix)	Chokecherry, eastern	Meota, Loon Lake and Lloydminster	Populations low; only single scattered tents observed.
Chermes cooleyi Gillette (Cooley spruce gall aphid)	Spruce, white	Goodsoil	Light damage on several trees.

10.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Chermes lariciatus (Patch) (Spruce pineapple gall aphid)	Spruce, black and white	Throughout the District	Occurred commonly but galls were not numerous.
Choristoneura fumiferana (Clem.) (Spruce budworm)	Tamarack, Spruce, white and black	Meetoos and Chitek Lake	Very low populations; no noticeable defoliation.
Choristoneura pinus Free. (Jack-pine budworm)	Pine, jack	Chitek Lake	Low populations; no noticeable defoliation.
Choristoneura rosaceana Harr. (Oblique-banded leaf roller)	Willow	Loon Lake area	Light damage to scattered willow clumps.
Dichelonyx backi Kby. (A leaf chafer)	Tamarack	Chitek Lake	Very light infestation.
Dimorphoteryx pinquis (Nort.) (A sawfly)	Birch, white	Loon Lake	Very low populations.
Epinota solandriana Linn. (A leaf roller)	Aspen, trembling	Steele's Narrows	Low populations.
Eupithecia luteata Packard (A looper)	Tamarack	Chitek Lake	Light infestations.
Fenusa dohrnii Tischb. (European alder leaf miner)	Alder	Loon Lake	Low populations causing light damage to leaves.
Feralia jocosa Gn. (Green-stripped spruce caterpillar)	Pine, jack Spruce, white	Edwards Lake and Jumbo Beach	No noticeable defoliation.

10.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Galerucella decora (Say) (Grey willow leaf beetle)	Willow, Caragana, Pine, jack Aspen, trembling	Goodsoil, Green Lake, Loon Lake, Battlefords Provincial Park and Corn-Beef Creek	Low populations caused a trace of defoliation to willow.
Halisidota maculata (Harr.) (Spotted tussock moth)	Willow and Poplar, balsam	Loon Lake and Meadow Lake.	Common, but no serious defoliation.
Hemichroa crocea (Fourcroy) (Striped alder sawfly)	Alder	Loon Lake	Light damage to several trees.
Lepyrus palustris Scop. (A weevil)	Tamarack, Alder, Willow and Aspen, trembling	Throughout District	Very common, but no noticeable damage.
Lithocolletis salicifoliella Chamb. (Aspen blotch miner)	Aspen, trembling	Loon Lake and St. Walberg	Very light damage.
Nematus limbatus Cress. (A sawfly)	Willow	Loon Lake area	Very low populations.
Nycteola cinereana N. & D. (An owlet moth)	Poplar, balsam	Corn-Beef Creek	Very light, no noticeable damage.
Oberea schaumi Lee (Round-headed woodborer)	Aspen, trembling and Poplar, balsam	Fort Pitt and Chitek Lake	Light damage to stems of young trees.
Orsodacne atra Ahr. (A leaf beetle)	Aspen, trembling	Green Lake and Loon Lake	Only adults collected; very light populations.

10.2.9. OTHER NOTEWORTHY INSECTS (CONT'D):-

Insect	Host(s)	Locality	Remarks
Petrova albicapitana (Busch.) (Pitch nodule maker)	Pine, jack	Throughout the District	Common in all stands examined.
Phylloconistis populiella Cham. (A leaf miner)	Aspen, trembling	Loon Lake and Golden Ridge	Very light infestations.
Phytophaga rigidae (O. & S.) (Beaked willow-gall fly)	Willow	Battlefords Provincial Park and Pierceland	Light populations in both areas.
Pissodes strobi (Peck) (White-pine weevil)	Spruce, white and Pine, jack	Meetoos, Pierceland and Loon River	Most common on white spruce regeneration.
Pseudexentera oregonana Wlshn. (A leaf roller)	Aspen, trembling	Lloydminster area	Light damage.
Rhabdophaga strobiloides (Walsh) (Willow cone-gall midge)	Willow	Pierceland, Edwards Lake, Meota and Battlefords Provincial Park	Light infestations.
Saperda calcarata Say (The poplar borer)	Aspen, trembling	Loon Lake, Pierceland and Golden Ridge	Usually light damage; occasional tree moderately attacked.
Saperda concolor Lec. (A poplar-gall Saperda)	Willow	Loon River and Loon Lake	Common, but damage light.
Saperda moesta Lec. (A poplar-twig borer)	Poplar, balsam	Leoville, Midnight Lake, Edwards Lake, Golden Ridge and Loon Lake	Moderate infestations in most areas; usually young trees attacked.

10.2.9. OTHER NOTEWORTHY INSECTS (CONT'D)

Insect	Host(s)	Locality	Remarks
Sciaphila duplex Wlshn. (A leaf roller)	Aspen, trembling	Lloydminster, Spiritwood and Baupame	Very light damage.
Semiothisa sexmaculata (Pack.) (Green larch looper)	Tamarack	Chitek Lake	Very low populations.
Syneta pilosa Brown (A leaf beetle)	Spruce, white	Green Lake	Very low populations.
Syngrapha alias Ottol (A semi looper)	Pine, jack	Golden Ridge	No damage noted.
Tetralopha asperatella (Clem.) (An aspen webworm)	Aspen, trembling and Birch, white	Throughout the District	Low populations but occurred commonly.
Trichiosoma triangulum Kby. (A sawfly)	Aspen, trembling and Willow	Pierce Lake and Pierceland	Very light infestations.
Xyelid sp. (A sawfly)	Pine, jack	Golden Ridge area and Edwards Lake	Low populations on regeneration.
Zenobia pleonectusa manitobae Stand (An owlet moth)	Aspen, trembling	Spiritwood	Low populations.
Zeiraphera fortunana Kft. (A spruce bud moth)	Spruce, white	Goodsoil	Light damage.

10.3 TREE DISEASE CONDITIONS

10.3.1. DWARF MISTLETOE, Arceuthobium americanum Nutt.:- This parasitic plant occurs in almost all jack pine stands in the District. In older stands up to 80 per cent of the trees are attacked, and in some instances mortality is quite noticeable. In young, vigorous stands only an occasional broom may be noted, and no mortality has been recorded to date.

10.3.2. HYPOXYLON CANKER, Hypoxylon pruinatum (Klotsche) Cke:- This canker of trembling aspen occurs commonly in the District. Although damage is usually restricted to single trees, a two acre patch was noted in the Rapid View area within which all trees were affected. In 1965, collections were taken at Meadow Lake, Green Lake, Flotten Lake, St. Walberg, Golden Ridge, Rapid View, and along the Beaver River south of Goodsoil.

10.3.3. MACROPHOMA GALL ON POPLARS, Diplodia tumefaciens (Shear) Zalasky:- Light infections, confined to occasional aspen trees, were noted at many points in the District. All trees within an area of about two acres near Loon Lake were heavily attacked and some mortality was occurring in smaller trees.

10.3.4. OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Apiosporinia collinsii (Schw.) Hoehn (Witches broom on Saskatoon)	Saskatoon	Jeanotte Lake, Pierceland and Loon Lake	Light damage to foliage.
Caliciopsis calicioides (Ellis & Evi.) Fitzp. (A bark fungus)	Poplar, balsam	Throughout the District	Infects large, overmature trees; damage light.
Chrysomyxa arctostaphyli Diet. (Yellow witches' broom)	Spruce, black	Throughout the District	Brooms small and occur sporadically.
Chrysomyxa ledicola Lagerh. (Spruce needle rust)	Spruce, black	Pierceland, Loon Lake, Flotten Lake and Ministikwan Lake	Light infections.
Chrysomyxa pirolata Wint. (Spruce cone rust)	Spruce, white	Ministikwan Lake and Loon Lake	Light infections.

10.3.4. OTHER NOTEWORTHY DISEASES (CONT'D):-

Organism and Disease	Host(s)	Locality	Remarks
Ciborinia whetzelii (Sear.) (An ink spot)	Aspen, trembling	Neeb and St. Walberg	Heavy infections in small patches.
Coccomyces hiemalia Higgins (Cherry shot-hole)	Cherry, pin	Loon River and Loon Lake	Causing discolouration and early leaf fall.
Cronartium comandrae Peck. (Comandra blister rust)	Pine, jack	Pierceland, Goodsoil, Golden Ridge and Steele's Narrows	Damage restricted to single scattered branches on occasional trees.
Cytospora chrysosperma (Pers.) Fr. (Cytospora canker)	Aspen, trembling	Golden Ridge and Meadow Lake	Light damage common.
Drepanopeziza populorum (Desm.) Hohn. (A leaf spot)	Aspen, trembling	Spiritwood, St. Walberg, Flotten Lake, Loon Lake and Pierceland	Very common; some small patches of noticeable damage.
Fomes igniarius (L. ex Fr.) Kickx (White trunk rot)	Aspen, trembling	Loon Lake	Very light infection.
Lenzites saepiaria (Wulf) Fr. (A slash fungus)	Spruce, white	Loon Lake	On living tree that had been windthrown.
Linospora tetraspora Thompson (A leaf blight)	Poplar, balsam	Pierceland	A small patch of young trees affected.
Melampsora bigelowii Thum. (A Salix-Larix rust)	Willow	Pierceland, Cold Lake, Ministikwan Lake and Loon River	Heavy in Pierceland and Loon River areas; light elsewhere.
Melampsora medusae Thum. (Larch-Aspen rust)	Aspen, trembling	Pierceland	Light infection in an aspen bluff.

10.3.4. OTHER NOTEWORTHY DISEASES (CONT'D)

Organism and Disease	Host(s)	Locality	Remarks
Nectria cinnabarina (Tode ex Fr.) Fr. (A coral spot)	Maple, Manitoba	Goodsoil	Very light infection on twigs.
Peridermium harknessii J.P. Moore (Globose gall rust)	Pine, jack	Corn-Beef Creek, Edwards Lake and Golden Ridge	Very light infection.
Phragmidium speciosum (Fr.) Cke (A rust on rose)	Rose	Throughout the District	Common
Poliaccia radiosa (Lib.) Bald. & Cif. (Leaf and twig blight)	Aspen, trembling	Throughout the District	Most severe on regeneration.
Polyporus tomentosus Fr. (White pocket rot)	Spruce, white	Loon Lake area	Only four collections of sporophores were found in the District.
Puccinia caricis var. grossulariata Arth. (A rust)	Gooseberry	Loon Lake	50 per cent of leaves on four bushes attacked.
Rhytisma salicinum (Pers.) Fr. (Tar spot)	Willow	Loon Lake	Light infection.
Septoria musiva Pk. (Leaf spot)	Poplar, balsam	Throughout the District	Discolouration of leaves common; light damage.
Stigmina megundinis (Berk. & Curt.) M.B. Ellis (A dieback)	Maple, Manitoba	Goodsoil	Very light infection on branches and twigs.
Uncinula salicis (D.C. ex Morat) Wint. (Powdery mildew)	Poplar, balsam	Loon Lake	Light infection on leaves.

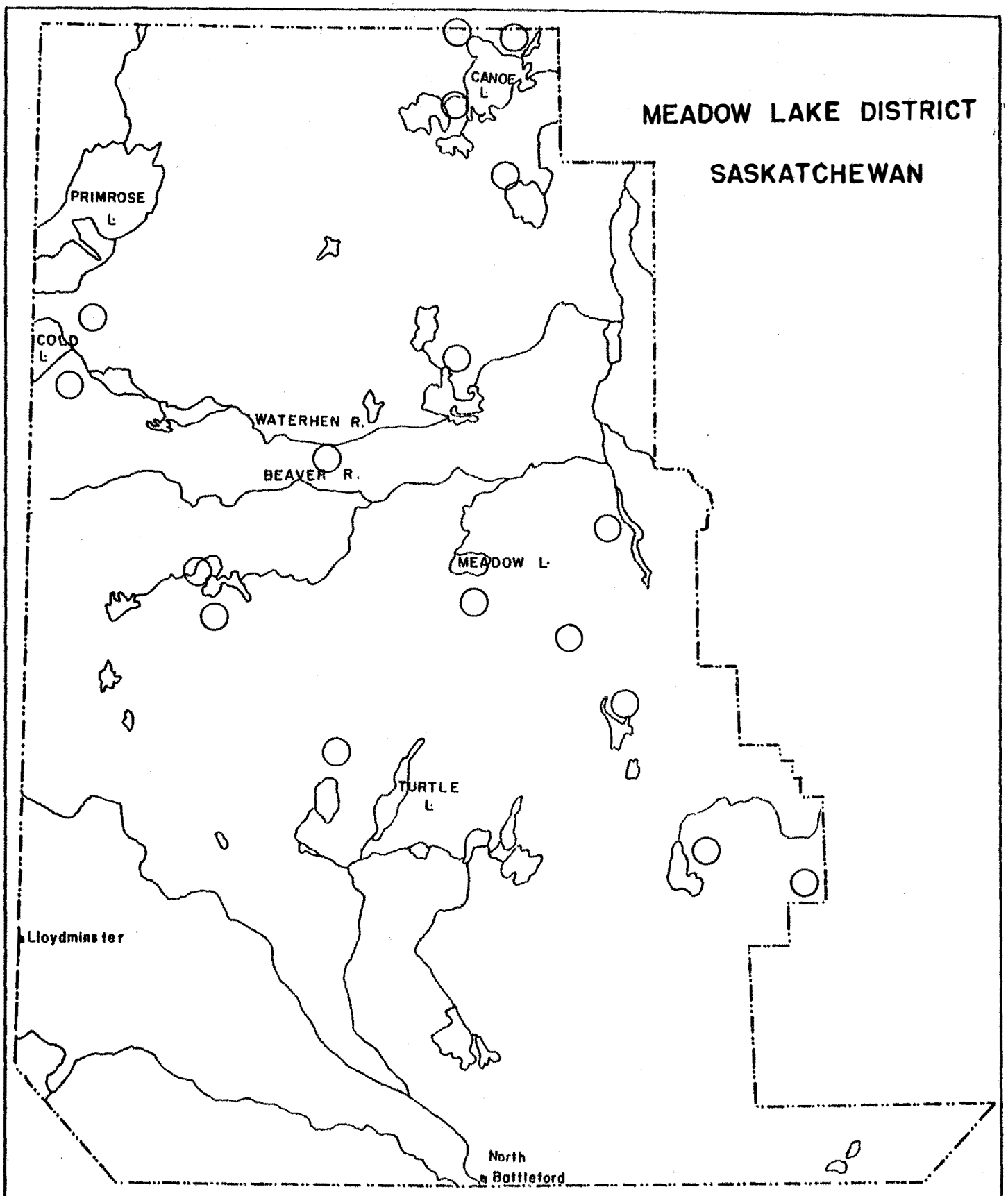


FIG. 1

LARCH SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1965.

● SEVERE ◒ MODERATE ○ LIGHT

11. ANNUAL DISTRICT REPORT

WEST-CENTRAL DISTRICT OF SASKATCHEWAN

1965

by

B. B. McLeod and C. L. Rentz

CANADA DEPARTMENT OF FORESTRY

FOREST INSECT AND DISEASE SURVEY

WINNIPEG, MANITOBA

March, 1966

11.1 INTRODUCTION

Forest insect and disease surveys were carried out periodically during the season and totals of 191 insect and 71 disease samples were taken. Survey sub-projects carried out were: (1) population counts of the boxelder twig borer; (2) mass collections of prairie tent caterpillar larvae; (3) mass collections of fall cankerworm larvae; (4) mass collection of insects inhabiting black-knot of cherry; and (5) special surveys of elm in shelterbelts for the native elm bark beetle. In association with the latter, four hours and 55 minutes of aerial time were used to conduct a survey along the North and South Saskatchewan rivers to determine the distribution of elm stands.

The most notable change in the status of major insects was the general decline of the fall cankerworm outbreak in the western section of the District.

The spruce budworm, yellow-headed spruce sawfly and gray willow leaf beetle remained at low population levels.

Hypoxylon canker of trembling aspen and die-back diseases of Manitoba maple continue to be the most conspicuous disease problems. Aspen stands, which suffered heavy mortality in the 1961 drought, are showing some recovery with new sucker growth ringing many of the dead bluffs. Herbicide damage was notable mainly in the southeastern part of the District.

11.2 INSECT CONDITIONS

11.2.1 FALL CANKERWORM, Alsophila pometaria (Harr.):- Populations declined except in the southeastern section of the District. Numerous Manitoba maple shelterbelts in the Watson area suffered defoliation ranging up to 100 per cent. A mass collection of mature larvae from this area indicated parasitism of only 2 per cent. Surveys in the area bounded by highways 3, 6, 14, 5 and 2 revealed low populations and light damage, and this applied also in the Rosthern, Outlook, Milden, Battleford and Perdue areas.

11.2.2 BOXELDER TWIG BORER, Proteoteras willingana (Kft.):- Light infestations of this twig borer were recorded on Manitoba maple at Saskatoon, Delisle, Vanscoy, Outlook, Englefield, Birch Hills, Resource, Naicam and Domremy. Population studies were continued with the results shown in Table 1.

TABLE 1

BOXELDER TWIG BORER POPULATION COUNTS

WEST-CENTRAL DISTRICT OF SASKATCHEWAN

(Based on examination of four 36" branches from three crown levels of five trees at each sample point.)

Location	Tree Data			No. of twigs examined and twig borer populations by crown level					
				Lower		Mid		Upper	
	Av. ht. (ft.)	Av. crown depth (ft.)	Av. crown width (ft.)	No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Outlook	20.4	16.6	11.8	412	14	497	10	403	16
Saskatoon	20.0	17.4	11.6	554	3	460	10	579	13
Domremy	22.8	17.2	17.0	1068	13	994	16	1131	26

11.2.3 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Populations were scattered throughout eastern and central portions of the District. Patchy, moderate to severe skeletonizing of the foliage of trembling aspen reproduction was recorded in the Haultain-Dundurn areas, and in the community pastures between Donavon and the South Saskatchewan River. Light feeding damage occurred between Waldheim and Rosthern, and along Highway No. 14 between Lanigan and Viscount. Small patches of light damage occurred in the Dana, Broderick and Wynyard areas. Adults were collected in the St. Brieux, Melfort, Domremy and Elston areas, but the damage was not serious.

11.2.4 NATIVE ELM BARK BEETLE, Hylurgopinus rufipes (Eichh.) The occurrence of the native elm bark beetle in high numbers at Outlook, Saskatchewan prompted an intensive survey to be carried out to determine its distribution in the area. Planted and native elm throughout some 1,400 square miles were examined. Positive results were obtained from native elm along the Saskatchewan River near Outlook and from planted elm in an abandoned shelterbelt near Milden (sec.26, tp.29, rge.12, W 3rd mer.). Surveys elsewhere in the District proved negative.

11.2.5 GRAY WILLOW-LEAF BEETLE, Galerucella decora (Say):- Adults were common throughout the District early in the season and light skeletonizing of the foliage of trembling aspen reproduction occurred in the Middle Lake area. However, expected high larval populations did not develop, and only light damage to willow occurred at Drake, Watrous, Wynyard, St. Louis, Wakaw, Muenster, Domremy and Biggar.

11.2.6 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- Populations of this tent-maker generally declined, but moderate concentrations of tents were again present in the Pike Lake area south of

Saskatoon, and at a point 12 miles south of Battleford. Light infestations were recorded at Outlook, Donavon, Vanscoy, Rosthern and Dana.

A mass collection of larvae was taken from the Pike Lake area and when reared to the adult stage showed effective parasitism of 6.5 per cent.

11.2.7 SPRUCE BUDWORM, Choristoneura fumiferana Clem.:- Low populations prevailed in many spruce shelterbelts throughout the District. The previously reported infestation south of Rosthern remained at a low level with less than 10 per cent of the new foliage destroyed. A mass collection of 70 larvae from this area showed a parasitism of 11 per cent. Low populations and very light feeding damage to shelterbelt plantings were recorded at Resource, on the Melfort Experimental Farm, and at Asquith.

11.2.8 OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Aceria parapopuli (Keifer) (Poplar bud gall mite)	Aspen, trembling	Resource and Dafoe	Light damage.
Acleris variana Fern. (Black-headed budworm)	Spruce, white	Resource, Ethelton and Melfort	Low populations in shelterbelts.
Acronicta americana (Harris) (American dagger moth)	Ash, green	Dundurn	Single collection; no defoliation.
Acronicta fragilis Gn. (A dagger moth)	Willow	Laura	Single collection; no defoliation.
Adalia frigida Gn. (A lady beetle)	Willow Caragana Spruce, white Maple, Manitoba	Watrous, Dana, Domremy, Melfort, Brancepath, Rosthern and Englefield.	Adult populations low in all areas; traces of feeding damage on willow.
Agrilus criddlei Frost (A wood borer)	Willow	Rosthern, North Battleford and St. Louis	Low populations.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	Cherry, choke	Outlook	Light infestations along the South Saskatchewan River.

11.2.8 OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Biston cognitaria (Guenée) (Pepper-and-salt moth)	Maple, Manitoba Caragana Elm, white	Colonsay, Hanley, Dundurn, Melfort and Brancepath	Low populations causing very light damage.
Brachyrhinus ovatus (Linnaeus) (Strawberry root weevil)	Spruce, white	Drake	Single specimen; no damage.
Badebecia urticana Hbn. (A leaf roller)	Willow Aspen, trembling	St. Louis, Cudworth and Wakaw	Very low populations.
Caligrapha alni (Schffr.) (A leaf beetle)	Willow	Drake	Single collection of adults; very light feeding on single willow thicket.
Campaea perlata Gn. (The fringed looper)	Willow Maple, Manitoba	Cudworth and Quill Lake	Only single larva in collections; no defoliation observed.
Chermes lariciatus Patch (A gall aphid)	Spruce, white	Ethelton	Very light infestation on white spruce plantings.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	Aspen, trembling	Cudworth	Low population levels; very light defoliation.
Compsolechia niveopulvella Chamb. (A leaf roller)	Aspen, trembling	St. Louis, Daphne, Dana, Watrous and Muenster	Low populations; feeding damage light in all areas.
Erannis tiliaria (Harn.) (Linden looper)	Elm, white	Perdue	Low populations on shelterbelts in the Perdue-Biggar areas.
Enargia decolor Wlk. (A noctuid)	Aspen, trembling	St. Louis, Watrous, and Middle Lake	All collections contained single larva; no noticeable damage.
Epinotia solandriana Linn. (A leaf roller)	Aspen, trembling	Muenster	Single collection; no damage observed.

11.2.8 OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Eupsilia tristigmata Grt. (An owlet moth)	Maple, Manitoba	Quill Lake	Low populations.
Gracilaria negundella Chambers (Boxelder leaf roller)	Maple, Manitoba	Birch Hills and Perdue	Widely scattered low populations with very light defoliation.
Halisodota maculata (Harr.) (Spotted tussock moth)	Caragana Maple, Manitoba	Dundurn, Melfort, Domremy and Birch Hills	Low populations in farm shelterbelts.
Hyperetis amicaria (H.-S.) (A looper)	Willow	Dana	Populations very low.
Itame loricaria Evers. (A looper)	Willow Cherry, choke Aspen, trembling	Outlook, Richard, Drake, Lanigan, Dana, Watrous and Englefield	Widely scattered low population; defoliation very light in all areas.
Lecanium corni Bouché (European fruit lecanium)	Maple, Manitoba	Birch Hills and Domremy	Light infestations in shelterbelts.
Leptocoris trivittatus (Say.) (Boxelder bug)	Maple, Manitoba	Hanley	Low populations.
Lepyrus palustris Scop. (A weevil)	Willow	Richard	Single adult collection.
Lopidea dakota Knight (Caragana plant bug)	Caragana	Brancepath and Melfort	Common in shelterbelts.
Melanolophia canadaria Gn. (A looper)	Caragana Maple, Manitoba	Hanley, Dundurn, Brancepath, Clavet, Colonsay and Melfort	Low populations in all areas.
Mordwilkoja vagabunda (Walsh) (Poplar vagabond aphid)	Aspen, trembling	Muenster, Lipsett and Delisle	Light infestations on reproduction.
Operophtera bruceata (Hulst.) (Bruce spanworm)	Willow Cherry, choke Aspen, trembling Poplar, balsam	Throughout eastern section of District	Low populations in all areas; very light feeding damage.

11.2.8 OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Orthosia hibisci Gn. (A fruit worm)	Willow Ash, green	Muenster and Rosthern	Very low populations.
Orsodacne atra Ahr. (A leaf beetle)	Aspen, trembling	Lanigan, Daphne, Cudworth, St. Louis and Englefield	Adults only in collections; no visible defoliation.
Oberea schaumi Lec. (The poplar twig borer)	Aspen, trembling	Domremy, Wakaw, Lanigan and Cudworth	Light infestations in reproduction.
Pandemis canadana Kft. (A tortricid moth)	Aspen, trembling	Watrous	Low populations.
Pareophora minuta (MacGillivary) (Ash sawfly)	Ash, green	Rosthern	Approximately 10 per cent defoliation in one shelterbelt.
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	Spruce, white	Domremy, Rosthern, and Asquith	Light infestations in all areas.
Phyllocolpa sp. (A sawfly)	Aspen, trembling	Elstow and Dana	Low populations; light leaf curling.
Phytophaga rigidae (O.S.) (Willow beaked-gall fly)	Willow	Rosthern, Waldheim, Richard, Drake, Lac Vert, Cudworth and Dafoe	Common in areas mentioned.
Pikonema alaskensis (Roh.) (Yellow-headed spruce sawfly)	Spruce, white	Domremy, Muenster, Meskanaw, Melfort, Elstow and Ethleton	About 20 per cent defoliation at Ethleton; light all other locations.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	Spruce, white	Ethleton	Single collection.
Protoboarmia porcelania indicataria Wlk. (Dotted line looper)	Spruce, white	Lanigan	No visible damage.

11.2.8 OTHER NOTEWORTHY INSECTS:-

Insect species	Host(s)	Locality	Remarks
Protitame virginalis Hlst. (A looper)	Aspen, trembling	Hanley	Very low populations.
Raphia frater Grt. (An owlet moth)	Cherry, pin	Clavet	Single collection; no defoliation.
Rhabdophaga strobiloides (Walsh) (Willow cone gall midge)	Willow	Rosthern, Waldheim, Drake, Richard, Lac Vert, Dana, Cudworth and Dafoe	Common in all areas.
Saperda calcarata Say. (The poplar borer)	Aspen, trembling	Throughout District	Common in aspen woodlots and bluffs.
Saperda concolor Lec. (The poplar-gall saperda)	Willow	Wolverine, Rosthern, Waldheim, Richards, Drake, St.Gregor, Spalding, Dafoe, Donavon and Broderick	Common in most areas; some wind breakage at Rosthern and Wolverine.
Sphinx chersis (Hubner) (The great ash sphinx)	Ash, green Elm, white	Milden and Pike Lake	Causing light defoliation to shade trees in Milden area.
Tetralopha asperatella (Clem.) (The webworm)	Aspen, trembling	Donavon and Hanley	Low populations.

11.3 TREE DISEASE CONDITIONS

11.3.1 HYPOXYLON CANKER OF ASPEN, Hypoxylon pruinatum (Klotsche) Cke:- This disease of trembling aspen occurrs throughout the District. Farm woodlots and natural stands or bluffs in the eastern section of the District were examined for this canker, and the results are listed below:

Location	No. of trees examined	No. of trees with cankers
Waldheim	150	3
St. Louis	20	1
Daphne	15	3
Englefield	10	1
Muenster	30	6

Location	No. of trees examined	No. of trees with cankers
St. Brieux	12	1
Elstow	12	1

11.3.2 MACROPHOMA GALL ON POPLARS, Diplodia tumefaciens (Shear) Zalasky:- D. tumefaciens galls were recorded at several locations in the District. A small patch of aspen near the Town of Donavon was severely infected. Light infections were found at Daphne, St. Louis and Waldheim.

11.3.3 FROST DAMAGE:- Late spring frosts (the last on June 9) caused varying degrees of damage to new growth throughout most of the District. Heavy frost damage to foliage of shrubs and reproduction trees occurred in the Burr, Biggar and Red Pheasant areas. Trees in the Silver Park area were about 35 per cent damaged and light damage to foliage was recorded in the Melfort, Delmay and Waldeim areas.

11.3.4 DIE-BACK OF MANITOBA MAPLE:- Examination of Manitoba maple in the District revealed a considerable amount of shoot and twig die-back. Samples were taken from shelterbelts in the Saskatoon, Domremy and Birch Hills areas. In addition to damage caused by field sprays, the following fungi were identified:

Sphaeropsis albescens Ell. & Ev.
Phoma fumosa Ell. & Ev.
Pleurostromella acerina Petrack
Epicoccum nigrum Link
Diplodia atrata (Desm.) Sacc.
Tubercularia vulgaris Tode ex Fr.
Alternaria sp.
Cytospora sp.
Cyptosporiopsis sp.
Cytospora annulata Ell. & Ev.
Stigmina negundinis (Berk. & Curt.) M. B. Ellis

11.3.5 STEM CANKERS OF CARAGANA:- Stem cankers were common in caragana shelterbelts in the Birch Hills and Melfort areas. Samples revealed the presence of three fungi causing light damage. They were: Camarosporium caraganae Karst., Cucurbitaria caraganae Karst., and Tubercularia vulgare Tode. ex Fr.

11.3.6 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Caliciopsis calicioides (Ell. & Ev.) Fitzp. (A bark fungus)	Poplar, balsam	Battleford and Silver Park	Common on mature trees with heavy bark.

11.3.6 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Ceratocystis fimbriata (Ell. & Halst.) Davidson (Target canker)	Aspen, trembling	Swanson and Dafoe	About 25 per cent trees near Dafoe infected.
Coccomyces hiemalis Higgins (Shot hole of Cherry)	Cherry, choke	Outlook	Light infections along the South Saskatchewan River.
Cytospora ambiens Sacc.	Elm	Rosthern and Milden	Light infections.
Cytospora chrysosperma (Pers.) Fr. (A canker)	Aspen, trembling	Kinley, Humboldt, Domremy, Haultain and Dafoe	Infection heaviest in the Humboldt area.
Dibotryon morbosum (Schw.) Theiss. & Syd. (Black knot of cherry)	Cherry, choke	Wakaw, Dana, Melfort and Muenster	Infections scattered; severe in localized areas.
Drepanopeziza populorum (Desm.) V. Hohn (A leaf spot)	Aspen, trembling	Elstow and Dafoe	Light.
Fomes ignarius (L. ex Fr.) Gill. (White trunk rot)	Aspen, trembling	Haultain and Muenster	Common in most woodlots.
Gymnosporangium biseptatum Ell. Bull. and Gymnosporangium nidus-avis Thaxt. (Rusts on Saskatoon)	Saskatoon	Saskatchewan River Valley	Severe infection along river from Outlook to Batouche and from Laird to Langham.
Podosphaera oxyacanthae var. tridactyla (Wallr.) Salmon	Cherry, choke	Donavon	Light infections in area.
Pollaccia radiosa (Lib.) Bald. & Cif. (Aspen shoot blight)	Aspen, trembling	Melfort	Light infection 4 miles south of town.

11.3.6 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Pollaccia sp. (A shoot blight)	Cottonwood	Laura	Light infection of sucker growth at base of mature trees.
Septoria caraganae (Jacq.) Died. (A leaf spot)	Caragana	Melfort and Birch Hills	Severe infections at both locations.
Septoria musiva Pk. (Leaf spot)	Poplar, northwest	Melfort	Light infections to sapling size plantings.
Uncinula salicis (DC. ex Merat) Wint. (Powdery mildew)	Willow	Dana	Light infection of shaded foliage.

INDEX TO INSECT SPECIES

INDEX TO TREE DISEASES