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ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
MANITOBA AND SASKATCHEWAN
1964

INFORMATION REPORT
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
WINNIPEG, MANITOBA

CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
March, 1965

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ANNUAL DISTRICT REPORTS

FOREST INSECT AND DISEASE SURVEY

MANITOBA AND SASKATCHEWAN

1964

by

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

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

WINNIPEG, MANITOBA

March 1965

(This report may not be published in whole or in part without the written consent of the Director, Forest Entomology and Pathology Branch, Department of Forestry, Ottawa, Canada.)

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1. SUMMARY OF FOREST INSECT AND DISEASE CONDITIONS, AND FIELD OPERATIONS OF THE SURVEY MANITOBA-SASKATCHEWAN REGION 1964

by

V. Hildahl

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

1.1 INTRODUCTION

The 1964 growing season commenced with a warm dry period that was interrupted by killing frosts. This was followed by cool dry weather that finally gave way to near-normal conditions during mid-season. Temperatures ranged about 4 degrees below the long-time average in August and September resulting in one of the shortest growing seasons on record. For example, in the Winnipeg area the frost-free season lasted only 92 compared to last year's record 157 days; the last spring frost occurred on June 10 and the first fall frost came September 11 making the growing season 23 days shorter than usual. These abnormal weather conditions, particularly during the early part of the season, retarded foliage growth and insect development, and led to serious fires that caused widespread destruction of timber in many forested areas.

The most notable changes in forest insect conditions were large reductions in areas affected by the forest tent caterpillar and aspen leaf beetle, and the collapse of the pine tube moth infestation that has persisted for several years near Prince Albert, Saskatchewan. These were however, partially offset by significant increases in infestations of the jack-pine and black-headed budworms, the yellow-headed spruce sawfly, the fall cankerworm, the pine needle scale, and the spruce spider mite. The larch sawfly was again widely distributed and larval populations increased markedly in some areas. Populations of the spruce budworm were lower in all previously reported localized infestation areas and in the western part of the Namew Lake infestation. Defoliation by the balsam-fir sawfly generally declined in Manitoba but remained about the same in Saskatchewan, although there were some changes in areas affected.

Late spring frosts caused serious damage to the foliage of coniferous and broad-leaved trees and shrubs over extensive areas in the southern sections of the Region. Damage to forest trees caused by industrial fumes emanating from the mining smelter at Thompson, Manitoba increased but did not reach serious proportions. The incidence of Hypoxylon canker of aspen was notably higher in areas where aspen "bluffs" were weakened by recent droughts. White pine blister rust was found on a Swiss stone pine tree at a nursery near Dropmore, Manitoba extending the range of the pathogen some 300 miles westward from previous recorded infections. Light infections of needle rusts and needle casts of coniferous trees, and leaf spots of deciduous trees were common throughout most of the Region but caused little notable damage.

Forest insect and disease conditions in both provinces during the 1964 season are presented in detail in the following reports. Totals of 5323 insect and 527 disease collections were submitted to the laboratory by the Rangers. The number of collections by Survey districts and principal host trees are shown in Table 1.

TABLE 1

Forest Insect and Disease Collections from Principal Host Trees
Manitoba and Saskatchewan
1964

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.	65	1	21	4	8	0	104	11	16	0	156	2	5	1	34	0	38	0	55	0	178	12	680	31
Eastern Man.	50	4	42	10	30	3	82	22	65	1	199	24	30	2	67	4	5	2	11	1	238	9	819	82
Interlake Man.	68	2	27	2	19	2	45	14	38	0	148	14	23	3	42	1	17	1	13	0	231	7	671	46
Western Man.	41	13	20	3	12	2	26	6	26	0	150	36	56	12	14	0	14	7	12	5	222	14	593	98
Northern Man.	67	9	55	11	25	1	31	4	26	1	104	11	37	8	57	11	0	0	0	0	114	43	516	99
Southern Man.	18	4	2	0	0	0	2	0	7	0	39	5	4	0	5	0	18	3	11	0	83	6	189	18
Hudson Bay, Saskatchewan	59	2	32	1	16	2	19	3	34	0	162	9	43	2	31	1	10	8	25	0	134	5	565	33
Prince Albert, Saskatchewan	63	2	33	0	3	0	58	15	43	0	145	10	19	0	22	1	2	2	0	0	117	5	505	35
Northern Sask.	35	1	35	7	11	0	28	5	34	1	54	2	2	0	42	8	0	0	1	0	62	5	304	29
Meadow Lake, Saskatchewan	64	9	10	3	3	1	37	8	31	0	112	9	8	2	10	3	3	1	1	0	76	15	355	51
West-central Saskatchewan	15	0	0	0	0	0	0	0	0	0	36	4	0	0	0	0	16	1	4	0	55	0	126	5
TOTALS	545	47	277	41	127	11	432	88	320	3	1305	126	227	30	324	29	123	25	133	6	1510	121	5323	527

I = Insect Collections

D = Disease Collections

1.2 SUMMARY OF FIELD OPERATIONS

Surveys commenced in all Districts in early May and were terminated about mid-October. Despite the inexperience of some field personnel, the season's objectives were largely met and the numbers of forest insect and disease collections submitted were increased by 1637 and 225 respectively.

1.2.1 DISTRICT ASSIGNMENTS:- The appointments of C.L. Rentz and G.N. Still to the Survey field staff in late December 1963 required some adjustments in District assignments and responsibilities. C. Rentz was assigned to field duties in the Southern District and G. Still to the Interlake section of Manitoba, thus leaving J. Lawrence free to devote most of his time to personal supervision of their field work programs. The Southern District of Saskatchewan was left vacant but essential surveys were carried out jointly by V. Hildahl, Ranger Supervisor and G.N. Still.

District assignments and divisional responsibilities were as follows:

SOUTHEASTERN SURVEY DIVISION

Supervisor - J.J. Lawrence

District 00	Southern Manitoba	C.L. Rentz
District 01	Eastern Manitoba	R.W. Hancox
--	Interlake Section (Man.)	G.N. Still
District 11	Southern Saskatchewan	Vacant (surveys by V. Hildahl & G.N. Still).

CENTRAL SURVEY DIVISION

Supervisor - A.E. Campbell

District 02	Northern Manitoba	A.E. Campbell
District 03	Western Manitoba	B.B. McLeod
District 05	Hudson Bay, Saskatchewan	R.C. Tidsbury

NORTHWESTERN SURVEY DIVISION

Supervisor - L.L. McDowall

District 07	Northern Saskatchewan	R. Van den Abeele
District 08	Meadow Lake, Saskatchewan	K.L. Mortensen
District 09	Prince Albert, Sask.	L.L. McDowall
District 12	West-Central Saskatchewan	Vacant (surveys jointly by L.L. McDowall and K.L. Mortensen).

1.2.2. FIELD FACILITIES AND EQUIPMENT:- No major renovations or additions were made to Ranger field accommodations during the current season. The interior of the cottage at Loon Lake was refinished, and the water system at Hudson Bay was relocated in the storage shed. Further improvements were also made on the grounds at the Hudson Bay cottage preparatory to landscaping, and cement sidewalks were added at the Prince Albert cottage. Two new compact station wagon vehicles were purchased as replacements of sedan deliveries for use by Rangers on field assignments.

1.2.3. DETECTION SURVEYS AND SUB-PROJECTS:- Emphasis was again placed on general collections in all forest districts to determine the distribution and abundance of forest insects and diseases. In carrying out the necessary detection surveys and special projects the Rangers travelled approximately 135,000 miles by road and 500 miles by boat. In addition, 168 hours of flying time were utilized for mapping major insect and disease outbreaks, and for reconnaissance of inaccessible areas. Of this time, 32 hours were provided by the Provincial Forestry branches of Manitoba and Saskatchewan; their assistance and co-operation in this respect are gratefully acknowledged.

Aircraft travel by Province is summarized in Table 2, and aerial survey routes are shown on the accompanying map. (Fig. 1).

Survey sub-projects continued during the current season included: forest tent caterpillar egg-band sampling to predict population trends; spruce budworm egg population and defoliation studies; larval sampling of the fall cankerworm; and box-elder twig borer population studies. Methods and techniques pertaining to these continuing studies were outlined in detail in previous reports. Larch sawfly studies were expanded to determine the rate of spread of the parasite, Holocremnus sp. nr. nematorum, which was released near Pine Falls in 1961, near Riverton, Manitoba in 1962 and 1963, and near Crutwell, Saskatchewan in 1964. Studies on the biology and life history of the pine tube moth were correspondingly reduced because of population declines during the past two years in the Prince Albert, Saskatchewan area. The time spent by individual Rangers on the above studies is summarized in Table 3.

TABLE 2

Summary of Aircraft Travel
Manitoba and Saskatchewan
1964

Province	Type of flying	Type of aircraft	No. of hours	Approx. Mileage	Approx. area surveyed (sq. mi.)*
Manitoba	Chartered	Cessna 180	64:20	6,400	25,600
		Cessna 172	7:00	875	3,500
	Provincial Forestry Branch	Beaver	24:10	2,400	9,600
Saskatchewan	Chartered	Cessna 180	40:30	4,100	16,400
		Cessna 182	5:40	750	3,000
		Cessna 172	8:00	1,000	4,000
		Cessna 140	10:00	1,000	4,000
	Provincial Forestry Branch	Cessna 180	3:00	300	1,200
		Super Cub	5:20	525	2,100
TOTALS			168:00	17,350	69,400

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

1.3 IMPORTANT FOREST INSECTS AND DISEASES

1.3.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- This serious defoliator of tamarack was the most widely distributed forest insect occurring in outbreak numbers in the Manitoba-Saskatchewan Region, and higher larval populations were recorded in some areas (Fig. 2). In Manitoba, moderate to severe defoliation continued along the eastern and northern shores of Lake Winnipegosis and Lake Winnipeg, between Goose Lake and Cranberry Portage, and in the Tadoule, Nejanilini, Neultin, Egenolf and Brochet lakes areas. Light to moderate defolitation occurred in the central part of Riding Mountain National Park, north of Riverton in the Interlake section, and between East Braintree and Falcon Lake. In Saskatchewan, defoliation was generally lighter throughout the central part of the Hudson Bay District but moderate to severe infestations persisted along the Overflowing and Birch Rivers, in the Nisbet Provincial Forest and Prince Albert National Park, and east to Candle, Whiteswan and East Trout lakes. Although larvae were found at all collection points in the Northern and Meadow Lake districts defoliation was only light to moderate. Planted larch was lightly defoliated on the Forest Nursery Station at Indian Head and in plantations at Wolseley and in the Cypress Hills Provincial Forest.

TABLE 3

Days Spent on Survey Sub-projects
Manitoba-Saskatchewan Region
1964

Ranger	Survey Sub-project by Number*					
	1	2	3	4	5	6
V. Hildahl	-	1	2	1.5	1.5	1.5
J.J. Lawrence	7	5	-	2	-	-
R.W. Hancox	9	4	-	-	-	-
G.N. Still	4	3	2	-	-	-
C.L. Rentz	5	4	-	2	-	-
A.E. Campbell	9	5	8	-	-	-
B.B. McLeod	8	5	5	-	-	-
R.C. Tidsbury	6	4	5	-	-	-
L.L. McDowall	7	5	-	1	-	4
K.L. Mortensen	8	4	-	2	-	-
R. Van den Abeele	8	3	-	-	-	2

*1. Forest Tent Caterpillar Egg-band Sampling.
2. Larch Sawfly Studies
3. Population Sampling of the Spruce Budworm
4. Population Sampling for the Box-elder Twig Borer.
5. Larval Sampling of the Fall Cankerworm.
6. Pine Tube Moth Studies

1.3.2 BALSAM-FIR SAWFLY, Neodiprion abietis complex:- Populations of this sawfly generally declined in Manitoba and remained the same or increased slightly in Saskatchewan (Fig. 3). The large infestations reported in 1963 on black and white spruce in the Richer and Sundown areas of southeastern Manitoba were reduced to two small patches at the former location and to about 3 square miles at the latter. The old infestation in spruce-balsam stands on Denbeigh Point in Lake Winnipegosis subsided, and only light defoliation was reported elsewhere in the Province. In Saskatchewan, larval populations were noticeably higher in the Porcupine Provincial Forest, Greenwater Lake Provincial Park, and the Prince Albert and Meadow Lake districts but defoliation remained light. In the Northern District, localized light to moderate infestations were noted at Mountain, McIntosh, Wasekamio, Corneille, and Knee Lakes and at Ile à la Crosse and Buffalo Narrows.

1.3.3 SPRUCE BUDWORM, Choristoneura fumiferana Clem.:- Spruce budworm populations were high throughout most of the previously reported infestation areas and two new localized patches were recorded (Fig. 4). Moderate to severe defoliation of spruce-balsam stands continued in the Namew Lake area (on the Manitoba-Saskatchewan boundary north of The Pas). However, despite a 50 square mile extension eastward to Iskwasum Lake, the area of infestation decreased from 1,030 in 1963 to about 910 square miles. This was the first decrease recorded since the outbreak was discovered in 1952 and resulted from population declines over about 170 square miles in the oldest part. Ground and aerial surveys have established that notable tree killing has occurred, and if budworm populations continue at their

present levels further deterioration of the stands may be expected. Tallies taken in 1963 indicated that tree mortality ranged as high as 56 per cent of the white spruce and 79 per cent of the balsam fir (including all diameter classes) in localized areas.

Elsewhere, the isolated infestations reported along the Churchill River system and at Kipahigan Lake in Manitoba continued at the moderate to severe levels, and new ones were detected on an island in Kississing Lake and on Black Birch Island in Lake Winnipegosis. Only small patches of light to moderate infestation remained along the Birch River south of Cumberland Lake and in the Battle Creek Valley of the Cypress Hills Provincial Forest in Saskatchewan. No defoliation was evident in the infestation areas previously reported in Riding Mountain National Park and around Dawson Bay in Manitoba, and at Belanger and Cumberland Lakes and in a shelterbelt near Rosthern in Saskatchewan.

1.3.4 BLACK-HEADED BUDWORM, Acleris variana (Fern.):- The incidence of this budworm has increased notably during the past three years, and in 1964 relatively high larval populations were common on white spruce, balsam fir and black spruce in all forest districts of the Region. Patches of light to occasionally moderate defoliation occurred throughout the range of the host trees as far north as Island, Harding and Southern Indian Lakes in Manitoba and the Churchill River Basin in Saskatchewan (Fig. 5).

1.3.5 JACK-PINE BUDWORM, Choristoneura pinus Free.:- A marked increase in populations of the jack-pine budworm was an important feature of the season. As indicated on the accompanying map (Fig. 6), the most significant increases occurred north of Gypsumville in Manitoba where the area of moderate to severe defoliation expanded from about 9 to 600 square miles. Infestations in the Sandilands and Belair Forest Reserves also enlarged; the former from 6 to 25 square miles and the latter from a small patch to 7 square miles. In addition, moderate to severe defoliation occurred in patches throughout jack-pine stands north of Rosenburg in the Interlake section.

In Saskatchewan, infestations expanded to affect most of the Nisbet Provincial Forest. Moderate to severe defoliation was almost continuous in the MacDowall and Holbein blocks, and patchy in the Home, Red Rock and Steep Creek blocks. Similar conditions prevailed in the area between Elk House and English Cabin in the Fort à la Corne Provincial Forest.

1.3.6 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- A marked reduction was evident in the outbreak of this tent caterpillar; moderate to severe defoliation of trembling aspen extending over only about 15,000 square miles compared to 61,000 square miles in 1963 (Fig. 7). This notable decline was probably due in part to adverse weather during the early stages of larval development, and to greatly increased numbers of the parasitic fly, Sarcophaga aldrichi Park., and of the predaceous beetle, Calosoma frigidum Kirby.

In Saskatchewan, the largest remaining area of continuous moderate to severe defoliation extended east from the Alberta border through the central part of the Meadow Lake District to Prince Albert National Park (where a slight southward extension was noted) and north to La Ronge and the Churchill River. Elsewhere, localized patches of

moderate to severe defoliation persisted in the Sled, Dore, Beaupre and Pierce lakes areas, and in the Parr Hill area of the Porcupine Provincial Forest. In Manitoba, the most extensive infestations occurred along the Ontario border. Defoliation was almost continuous over approximately 800 square miles extending from Shoal Lake northward through the eastern part of the Whiteshell Provincial Park to the Manigotagan River. The severe infestation between Lakes St. George and St. Andrew continued with slight north and south extensions, and patches of moderate to severe defoliation were recorded from the Duck Mountain and Porcupine Forest reserves north to the Baker's Narrows - Flin Flon area.

1.3.7 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Alsophila pometaria (Harr.) (Fall canker-worm)	Maple, Manitoba Elm, white Ash, green Basswood	Southern sections of Manitoba and Saskatchewan	Particularly heavy infestations throughout Metropolitan Winnipeg and in the Lyleton area of Manitoba, and in the Kenaston, Outlook, Swift Current, and Maple Creek areas of Saskatchewan.
Bucculatrix canadensisella Cham. (Birch skeletonizer)	Birch, white	Manitoba and Saskatchewan	Moderate to severe defoliation continued in northwestern Manitoba, and new infestations developed in the Oxford-Island-God's lakes area. Elsewhere only light defoliation (Fig. 8).
Chrysomela crotchi Brown (Aspen leaf beetle)	Aspen, trembling	Southern and central sections of Manitoba and Saskatchewan.	The extensive outbreak that affected some 73,700 square miles in 1963 collapsed; moderate to severe defoliation restricted to localized patches (Fig. 9).
Oligonychus ununguis (Jac.) (Spruce spider mite)	Spruce, white Fir, balsam	Southern sections of Manitoba and Saskatchewan	Dry weather during the early part of the season favored increased populations. Light to severe infestations common on ornamental and shelterbelt plantings. Balsam fir severely infested at Buffalo Narrows, Saskatchewan.

1.3.7 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Phenacaspis pinifoliae (Fitch)	Spruce, white and Colorado Pine, jack and lodgepole	Southern and central sections of Manitoba and Saskatchewan	Populations increased noticeably in some areas but caused no serious damage; most abundant on shelterbelt and shade tree plantings.

1.4 IMPORTANT TREE DISEASES

1.4.1 INDUSTRIAL FUME DAMAGE:- A higher incidence of foliage discoloration due to sulphur dioxide fumes in the Smoke Easement area around Thompson, Manitoba was evident in 1964 after being detected for the first time in 1963. Tree species affected were trembling aspen, balsam poplar, white birch, willow, alder, serviceberry, highbush cranberry and black and white spruce. Damage was most noticeable at Ospwagan, Paint, Wintering, Nutawahunan and Witchai lakes, but it remained relatively light and could be detected by ground examination only. These locations occur within a radius of 35 miles extending in an arc from southwest to northeast of Thompson.

1.4.2 FROST INJURY:- Frosts occurring during late May and early June caused notable damage to the foliage of bur oak, and green ash; in many localized areas the young leaves were completely destroyed. Conifers were also affected but generally to a lesser extent; damage ranging from a few frost-killed shoots on scattered trees to almost complete destruction of the new shoots of balsam fir and white spruce over large areas. No tree mortality was recorded and refoliation occurred by late June through all of the affected areas.

1.4.3 WHITE PINE BLISTER RUST, Cronartium ribicola J.C. Fisher:-

A new infection of this blister rust was reported on Swiss stone pine (Pinus cembra L.) in a nursery near Dropmore in western Manitoba, extending the known range of the disease in this Region some 300 miles westward. Elsewhere, infections previously reported in the vicinity of Moose Lake and south of Falcon Lake in southeastern Manitoba continued at about the same level as in 1963.

1.4.4 SPRUCE NEEDLE RUSTS, Chrysomyxa spp.:- The status of the spruce needle rusts, Chrysomyxa ledi de Barry and Chrysomyxa ledicola Lagerh., generally remained unchanged. The intensity of the outbreaks in the Bird and Cat lakes areas and on Hecla Island in the Interlake section of Manitoba increased to moderate. In

addition, a severe outbreak on black spruce was recorded at Cantura Lake in northwestern Saskatchewan.

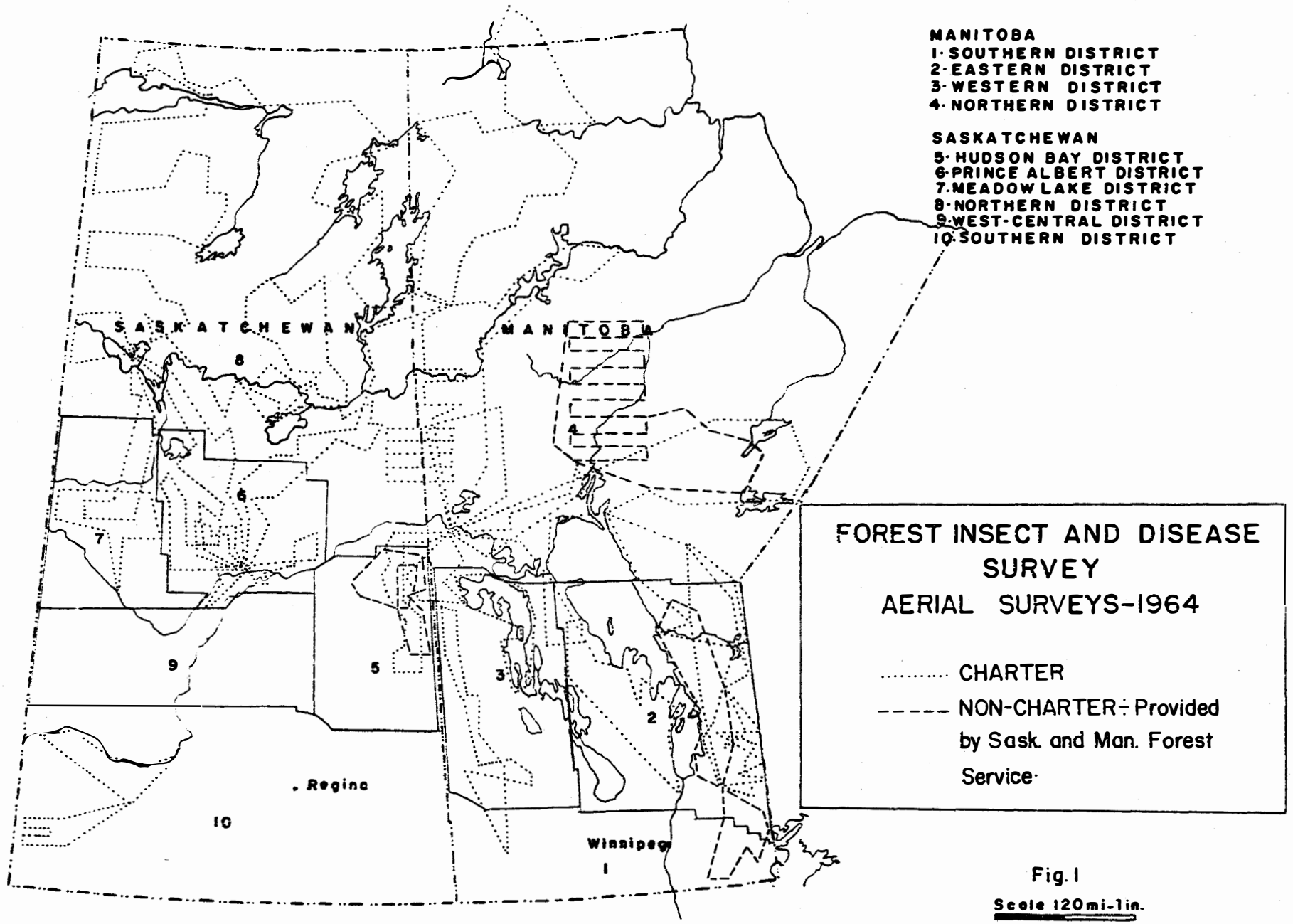
A light infection of Chrysomyxa weirii Jacks affecting white spruce occurred near Squaw Rapids in Saskatchewan.

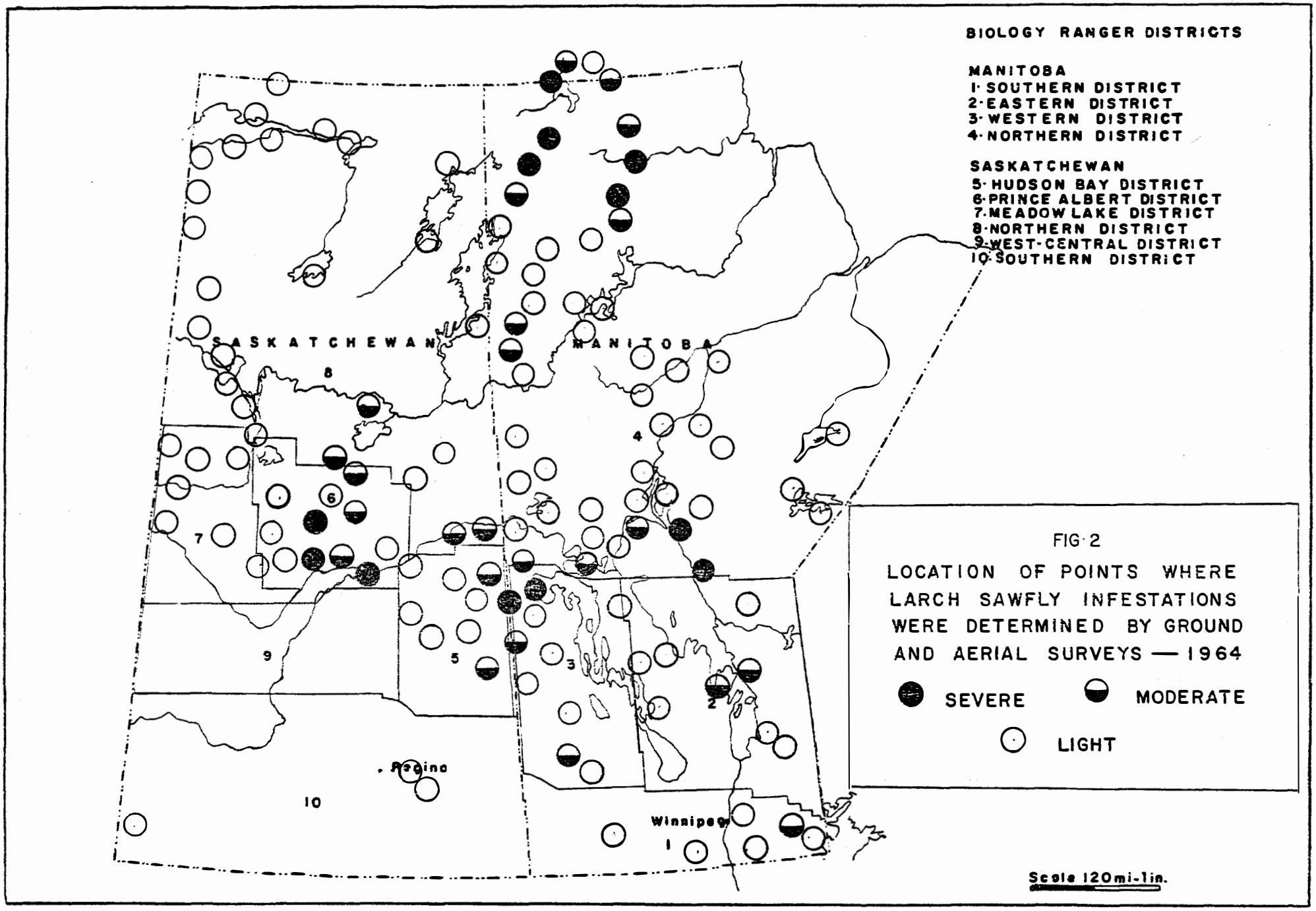
1.4.5 OTHER NOTEWORTHY DISEASES:-

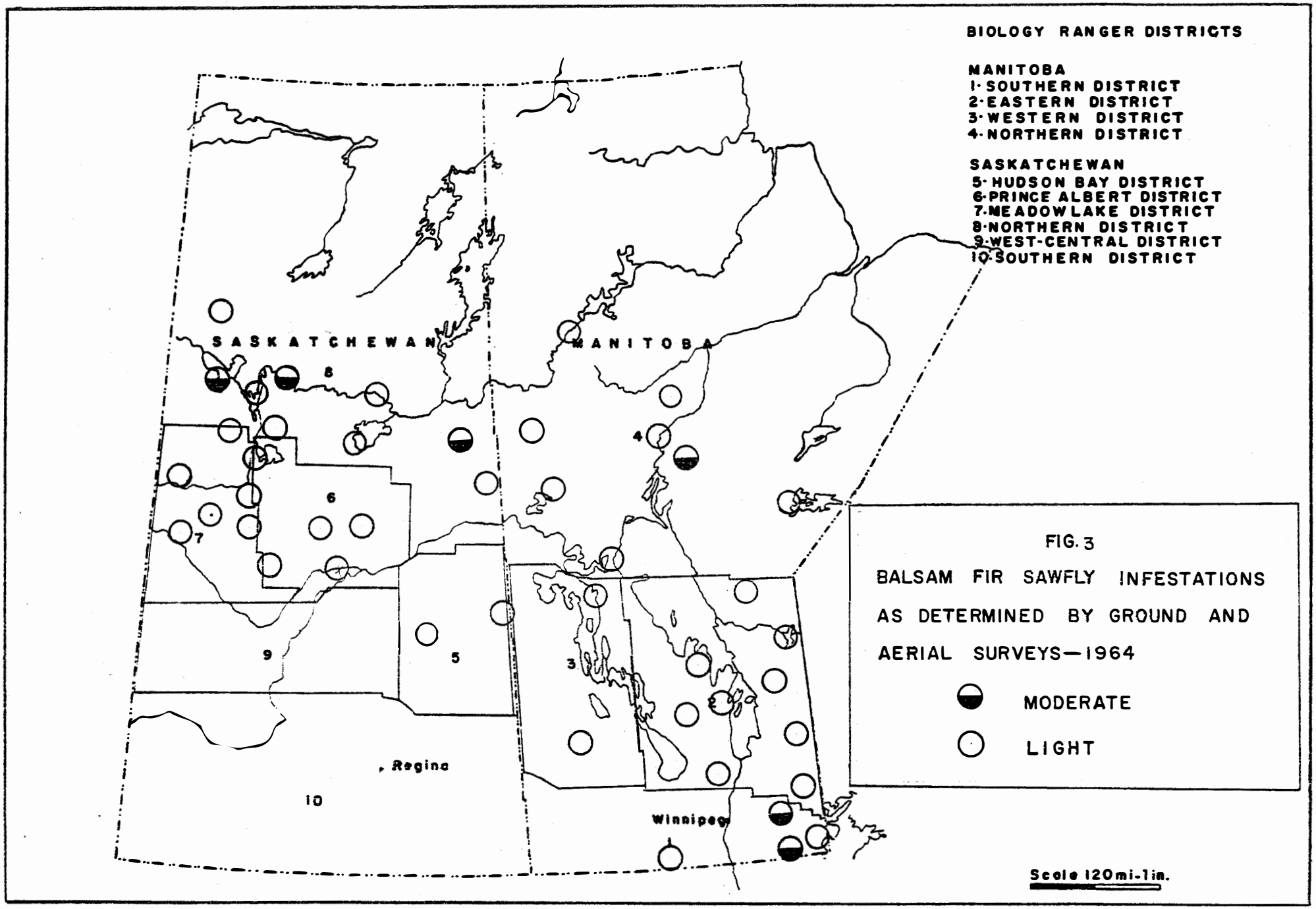
Organism and Disease	Host(s)	Locality	Remarks
Ceratocystis fimbriata (Ell. & Halst.) Dav. (Target canker)	Aspen, trembling	Manitoba and Saskatchewan	Moderate to severe damage in localized areas of northern Saskatchewan; light elsewhere.
Chrysomyxa arctostaphyli Diet. (Yellow witches' broom)	Spruce, black and white	Manitoba and Saskatchewan	Light to moderate damage in localized areas, particularly in the Porcupine Provincial Forest and at Snare Lake in Saskatchewan.
Chrysomyxa pirolata Wint. (Cone rust)	Spruce, white	Buffalo Narrows, Saskatchewan	Light infection restricted to small area.
Lophodermium pinastri (Schrad. ex Fr.) Chev. (Needle cast)	Pine, jack	Piney, Manitoba	Light damage to plantation stock.
Macrophoma tumefaciens Shear (Macrophoma gall)	Aspen, trembling Poplar, balsam	Manitoba and Saskatchewan	Common throughout the range of aspen and poplar; infections generally light.

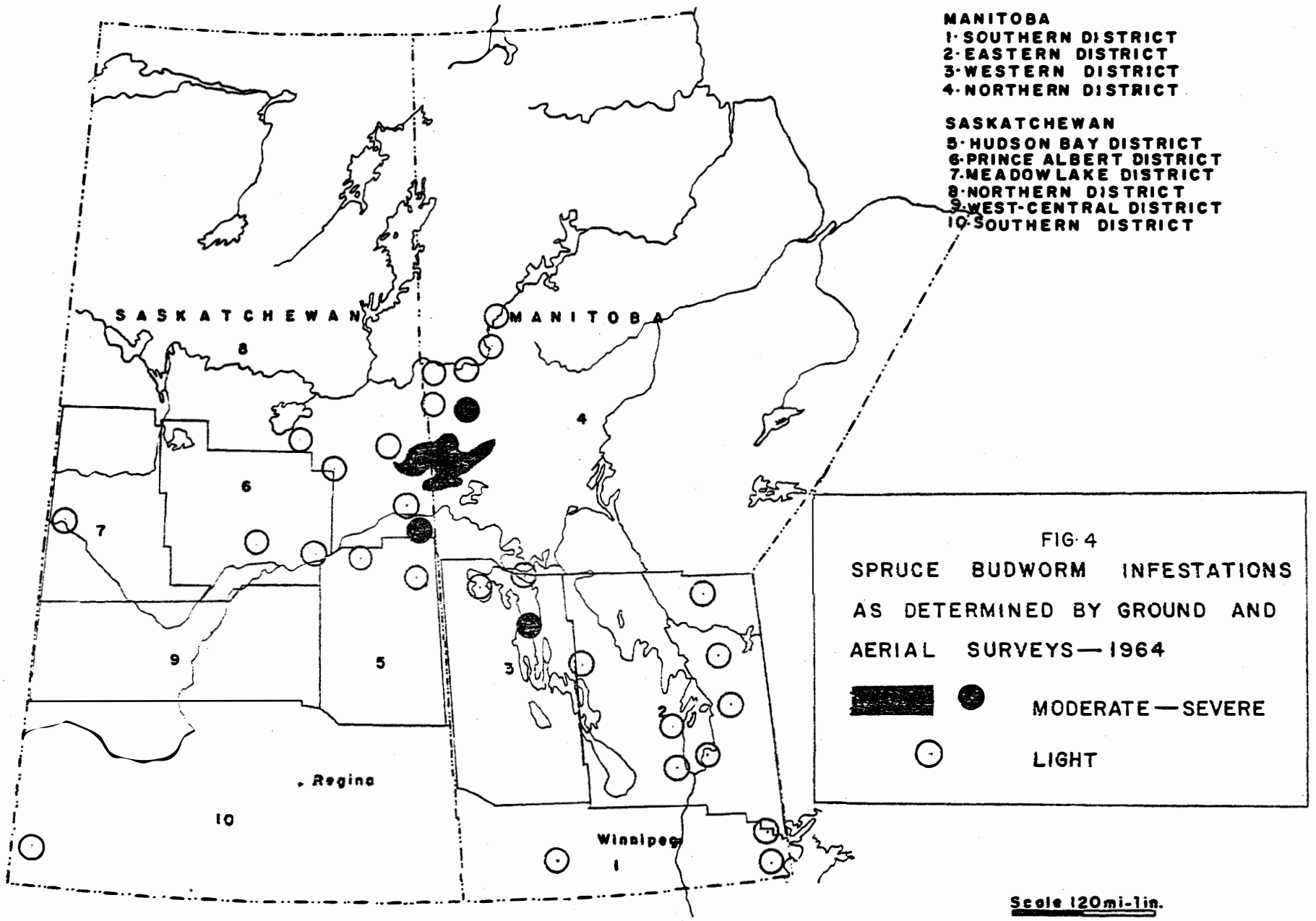
1.4.5 OTHER NOTEWORTHY DISEASES (Cont'd):-

Organism and Disease	Host(s)	Locality	Remarks
Pollaccia spp. (Leaf and twig blight)	Aspen, trembling Poplar, balsam and hybrids	Manitoba and Saskatchewan	Moderate to severe damage in several areas. P. radiosa (Lib.) Bald. & Cif. on aspen; P. elegans Serv. on balsam and hybrid poplars.
Septoria musiva Pk. (Leaf spot)	Poplar, balsam	Western Manitoba	Widespread infections; damage to foliage resulted in early leaf-drop in several localities.


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
AERIAL SURVEYS-1964
CHARTER
NON-CHARTER-Provided by Sask. and Man. Forest Service.
Fig. 1
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
FIG·2
LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS — 1964
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
Regina
Winnipeg
FIG. 3
BALSAM FIR SAWFLY INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1964
MODERATE
LIGHT
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
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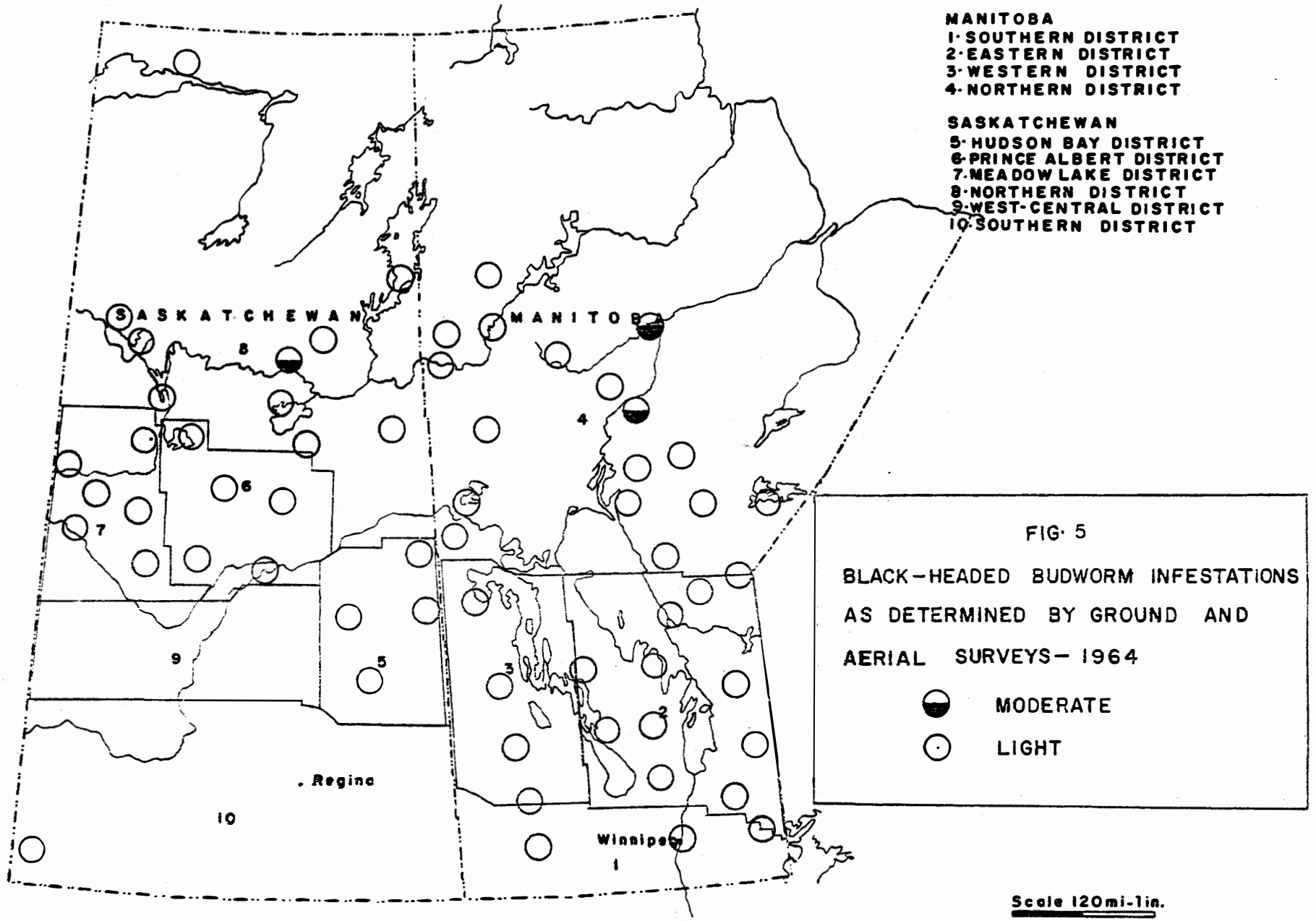
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FIG-4
SPRUCE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS—1964
MODERATE—SEVERE
LIGHT
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
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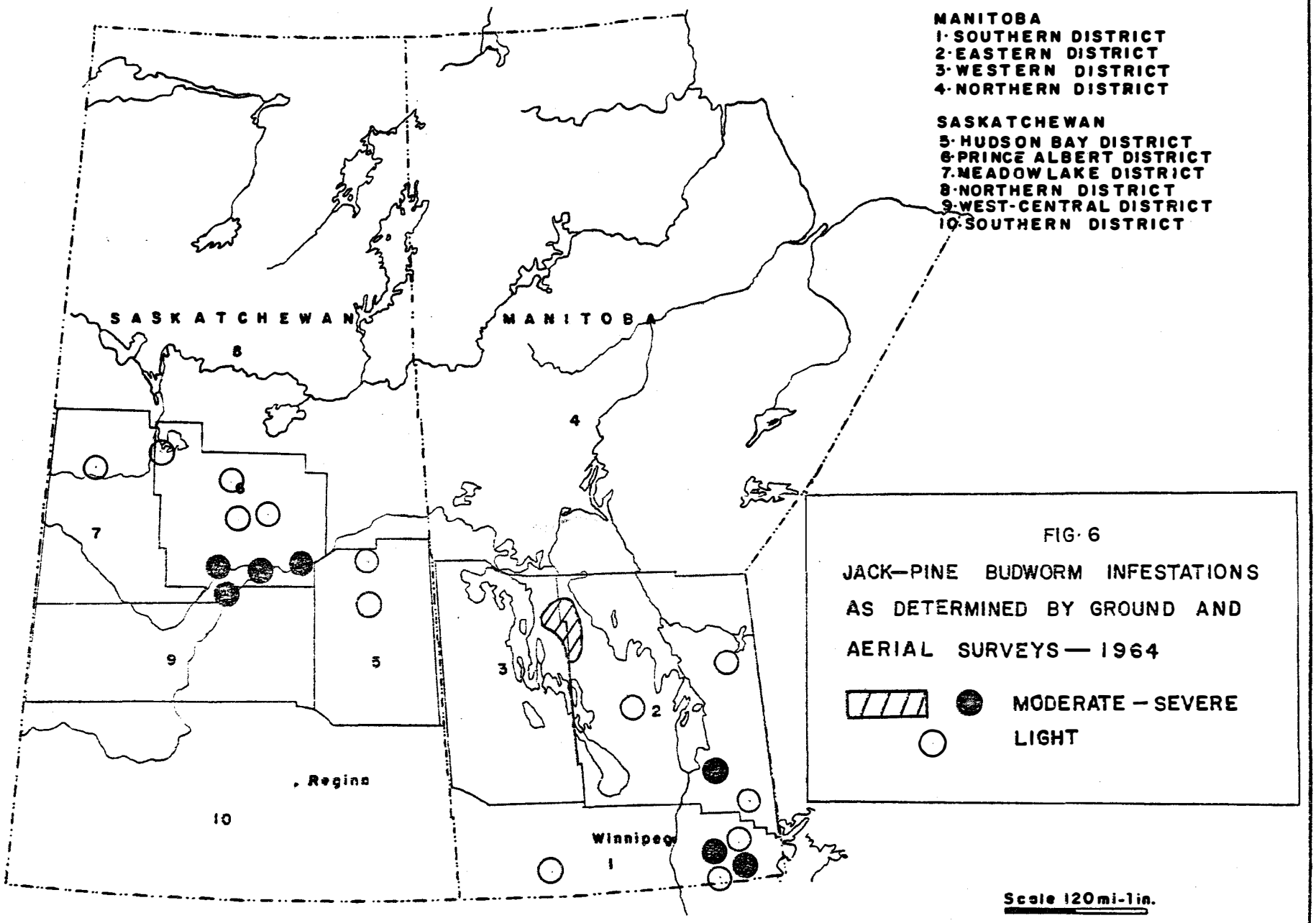
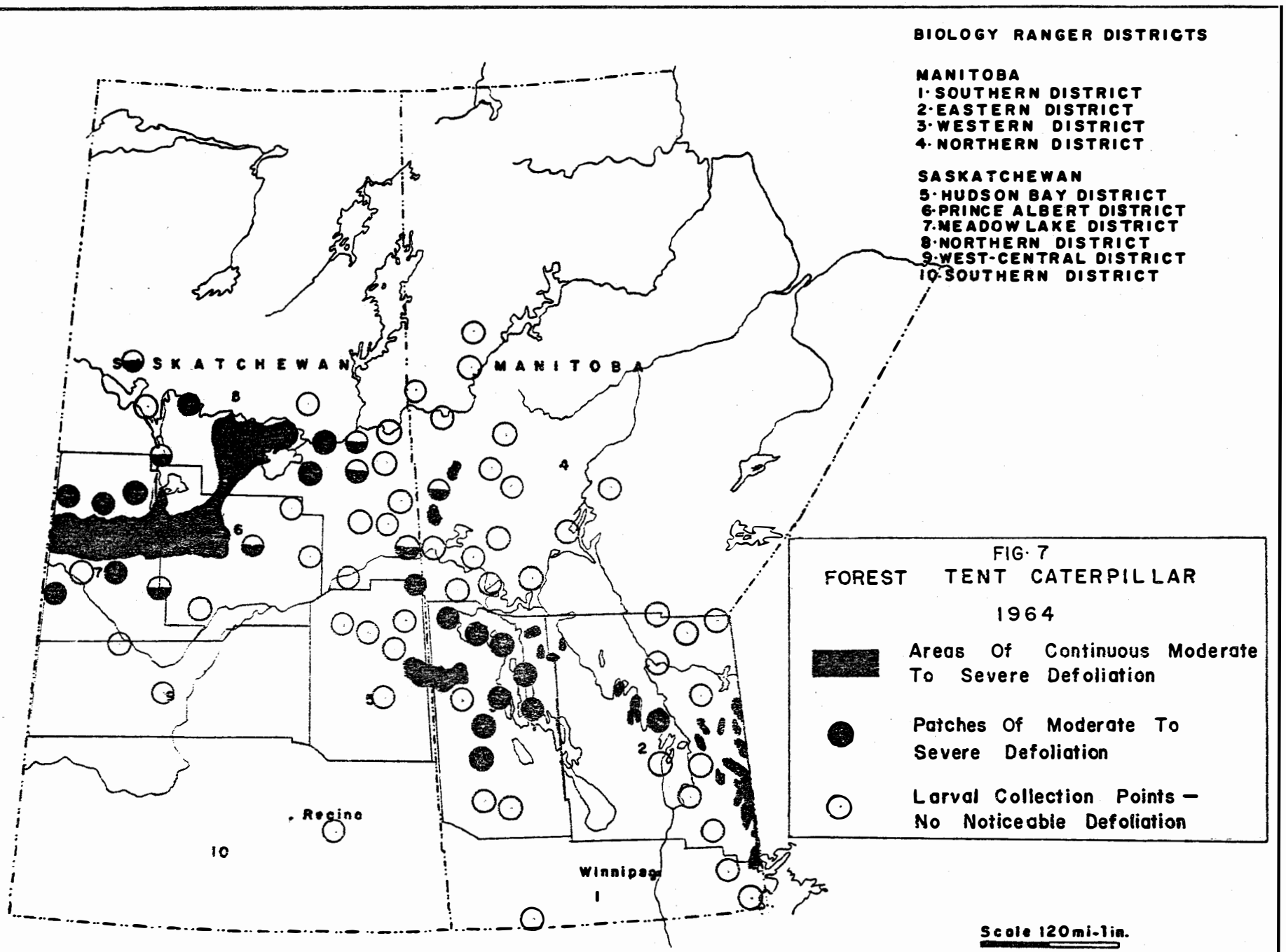
2-EASTERN DISTRICT
3-WESTERN DISTRICT
4-NORTHERN DISTRICT
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
7-MEADOW LAKE DISTRICT
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FIG. 5
BLACK-HEADED BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS- 1964
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
Regina
Winnipeg
FIG. 6
JACK—PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1964
MODERATE — SEVERE
LIGHT
Scale 120 mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
1·SOUTHERN DISTRICT
2·EASTERN DISTRICT
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SASKATCHEWAN
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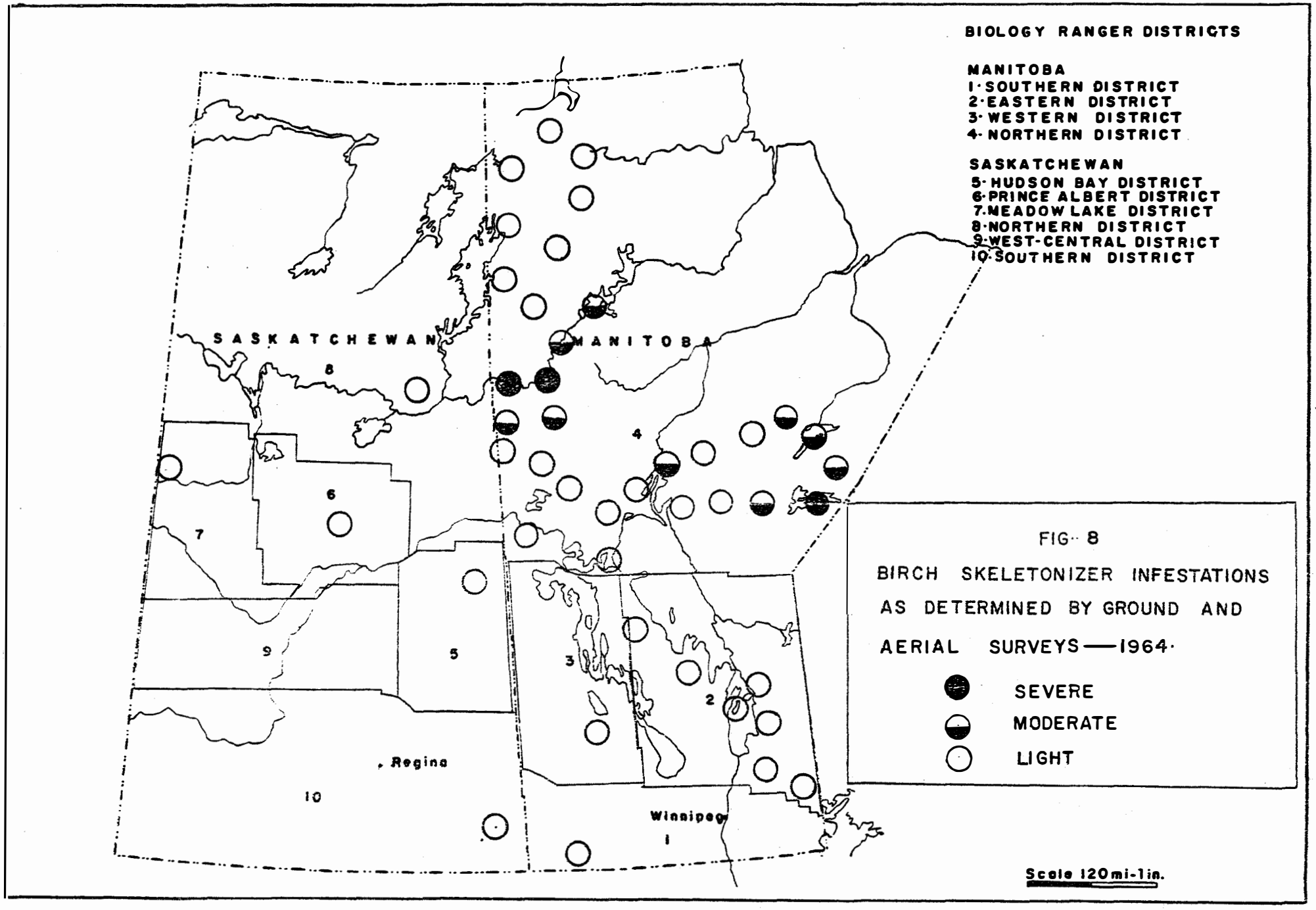
7·MEADOW LAKE DISTRICT
8·NORTHERN DISTRICT
9·WEST-CENTRAL DISTRICT
10·SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FIG· 7
FOREST TENT CATERPILLAR
1964
Areas Of Continuous Moderate To Severe Defoliation
Patches Of Moderate To Severe Defoliation
Larval Collection Points — No Noticeable Defoliation
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
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3-WESTERN DISTRICT
4-NORTHERN DISTRICT
SASKATCHEWAN
5-HUDSON BAY DISTRICT
6-PRINCE ALBERT DISTRICT
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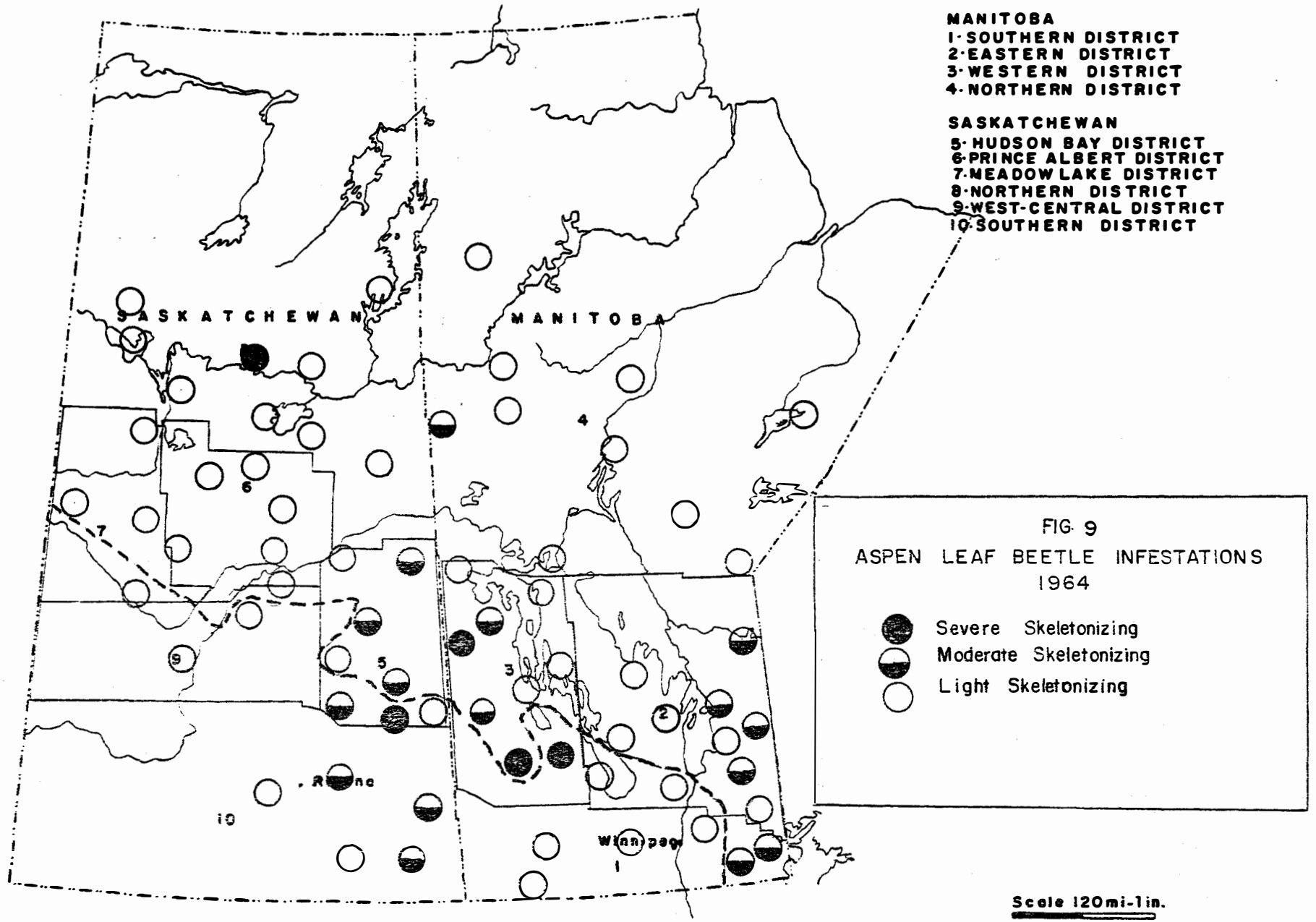
8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
FIG. 8
BIRCH SKELETONIZER INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS — 1964.
SEVERE
MODERATE
LIGHT
Scale 120mi-1in.


BIOLOGY RANGER DISTRICTS
MANITOBA
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8-NORTHERN DISTRICT
9-WEST-CENTRAL DISTRICT
10-SOUTHERN DISTRICT
SASKATCHEWAN
MANITOBA
Winnipeg
FIG. 9
ASPEN LEAF BEETLE INFESTATIONS
1964
Severe Skeletonizing
Moderate Skeletonizing
Light Skeletonizing
Scale 120mi-1in.

2. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT OF MANITOBA

1964

by

C. L. Rentz

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

2.1 INTRODUCTION

Surveys to determine the distribution and intensity of forest insects and diseases were carried out in the Southern District of Manitoba from the latter part of May to the middle of October. During this period, 608 insect and 25 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. Several special collections of insect material were made for use in research projects at Winnipeg and other laboratories. Survey projects continued this season were: (1) forest tent caterpillar egg-band surveys; (2) sequential sampling of larch sawfly egg populations; (3) collecting larch sawfly cocoons, using the larval drop tray method for parasite and disease studies; and (4) larval sampling of the boxelder twig borer.

Approximately 2 hours and 55 minutes of flying time was supplied by the Manitoba Department of Mines and Natural Resources for aerial reconnaissance of inaccessible areas to map infestations of the forest tent caterpillar, jack-pine budworm, and the balsam-fir sawfly. The co-operation and assistance received from personnel of the Department is gratefully acknowledged.

Cold, dry weather in the latter part of May and early June retarded foliage growth and insect development from one to two weeks in most areas. Above average rainfall was recorded during July and August in the Sprague, Middlebro, Vassar area, but in the other areas west to the Red River, rainfall was heavy throughout the season, resulting in considerable flooding of lowland areas.

Larch sawfly populations generally remained at low levels, but moderate to severe defoliation occurred along the Trans Canada Highway in the East Braintree-Falcon Lake area. Jack-pine budworm populations increased throughout the Sandilands and Spruce Woods Forest reserves. Infestations of the balsam-fir sawfly declined notably as most of the larvae died during the early feeding stages from unknown causes. Populations of the aspen leaf beetle declined in most areas, and the incidence of forest tent caterpillar remained at very low levels except in the extreme eastern part of the District. A shoot moth caused light damage to the terminal and leader growth of jack pine regeneration, particularly in the Sandilands Forest Reserve. No new outbreaks of tree diseases were noted and there was little change in those previously reported. The range of the white pine blister rust was extended about 30 miles northward to include white pine stands in the vicinity of Waugh on Lake-of-the-Woods. Unusually high winds and an early snowfall (September 26-27) caused some damage to conifers in the Hadashville and East Braintree areas.

2.2 INSECT CONDITIONS

2.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Higher populations of this insect were evident in tamarack stands throughout southern Manitoba. The most noticeable increase occurred in the East Braintree-Falcon Lake area where defoliation of tamarack was moderate to severe in most of the stands examined. In the remainder of the Sandilands Forest Reserve and in the Sprague, Middlebro and Moose Lake areas defoliation was very light. In the Douglas area along the Assiniboine River, populations showed a slight increase but defoliation remained very light (Fig. 1).

Foliage production and shoot growth on host trees were excellent with the exception of some stands in the extreme southeastern portion of the District where flooding due to excessive rainfall occurred in early summer.

Sequential sampling of egg populations was carried out in plot No. 102 at Piney. The results, based on the examination of 50 current shoots, showed that none had been used for oviposition by adult sawflies and therefore indicated that defoliation would remain very light. This method is based on infestation classes of: light = less than 25% defoliation, moderate = from 26 to 65%, and severe = over 65%.

A total of 35 cocoons were collected in plot No. 102 at Piney to determine the incidence of parasites and disease. Three per cent of the cocoons were destroyed by fall emergence of Bessa harveyi (T.T.) and three per cent by disease. Subsequent dissections indicated that effective parasitism of larch sawfly larvae was 17 per cent by B. harveyi and none by Mesoleius tenthredinis Morley.

2.2.2 JACK-PINE BUDWORM, Choristoneura pinus Free.:- The status of this insect changed notably during the current year. The two infestations previously reported in the Sandilands Forest Reserve expanded. Defoliation was also noticeably heavier with almost complete stripping of the new foliage within the affected areas (Fig. 2). The boundary of the infestation near Sandilands extended eastward to include most of secs. 19, 30, 31, and 32, tp. 4, rge. 10, E. P. mer., thence northerly through secs. 5 and 8, tp. 5, rge. 10, E. P. mer., northwesterly through secs. 24 and 26, tp. 5, rge. 9, E. P. mer., thence southerly through secs. 22, 15, 10, and 3, tp. 5, rge. 9, E. P. mer. and secs. 33 and 28, tp. 4, rge. 9, E. P. mer. to the town of Sandilands, and easterly through secs. 22, 23, and 24, tp. 4,

rge. 9, E. P. mer. The infestation at Vasser extended approximately 1/2 to 1 mile around the circumference of the 1963 infestation boundaries, and covered most of secs. 11, 13 and 14, all of secs. 23 to 26, 35 and 36, tp. 1, rge. 12, E. P. mer., parts of secs. 1 and 2, tp. 2, rge. 12, E. P. mer. and the eastern portions of secs. 19, 30, and 31, tp. 1, rge. 13, E. P. mer. Very light larval populations were also recorded throughout the range of jack pine in the remainder of the eastern section of the District. In the Spruce Woods Forest Reserve, populations increased in all plantations of jack, Scots, red, and lodgepole pines. The highest larval populations occurred in a plantation north of the Shilo main gate, but defoliation remained light. In the Camp Hughes area defoliation was light on all species of pine.

2.2.3 BALSAM-FIR SAWFLY, Neodiprion abietis complex:- This sawfly again caused moderate to severe defoliation of black spruce in the Richer and Menisino areas, but only in isolated patches rather than in relatively large continuous areas. Larval mortality was very high in all areas, but the cause was not determined. The Richer infestation was reduced to two small patches of moderate to severe defoliation; one in sec. 6, tp. 9, rge. 10, E. P. mer. and the other in sec. 24, tp. 7, rge. 9, E. P. mer. In the Menisino area, moderate to severe defoliation was recorded in two locations; one in a narrow band running through secs. 3, 4, 8, and the S. E. corner of sec. 17, tp. 2, rge. 10, E. P. mer., and the other in sec. 32, most of sec. 33 and the southwest quarter of sec. 34, tp. 1, rge. 10, E. P. mer. Elsewhere in the District, only low populations occurred and defoliation was very light.

2.2.4 A SHOOT MOTH ON JACK PINE, Eucosma gloriola Heinrich:- This shoot moth was recorded at five locations but was most abundant in the Woodridge and Dawson Cabin areas. In the Badger and Menisino areas, only single scattered leaders of jack pine were affected. In sec. 18, tp. 5, rge. 11, E. P. mer., about 20 per cent of the leaders were affected in a small stand of jack pine regeneration. Only trees less than 10 feet in height were attacked with the highest populations occurring on five and six foot trees.

2.2.5 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh):- Populations of this sawfly remained low and resultant defoliation ranged from a trace to light at most points. The heaviest infestations occurred near Hadashville where several black spruce were lightly defoliated and in the Dawson Cabin, East Braintree, and Waugh areas where white spruce, black spruce and balsam fir showed traces of feeding damage.

2.2.6 PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- This insect occurred in varying degrees of intensity throughout the District. Light to moderate infestations were recorded in the Killarney, Virden and Boissevain areas on ornamental white spruce, and all planted species of pine in plantations near Shilo and Marchand. Elsewhere, including the Metropolitan Winnipeg area, infestations were light, with an occasional tree moderately infested.

2.2.7 THE SPRUCE SPIDER MITE, Oligonychus ununguis (Jacob):- This spider mite caused considerable browning of white spruce foliage in many localities. The highest populations were noted at Winnipeg, Boissevain and Virden where moderate to severe infestations occurred on ornamental spruces. In the Killarney, Treherne, Morden, Gretna, Winkler, Niverville, and East Braintree areas, browning of foliage was very light on scattered trees. In the Falcon Lake townsite, a moderate infestation was reported on a few scattered open-growing white spruce trees.

2.2.8 BLACK-HEADED BUDWORM, Acleris variana Fern:- Larvae of this budworm were commonly found in the Sandilands, North-West Angle, and in the Spruce Woods Forest Reserves, but caused very little noticeable defoliation. It was most abundant on white spruce but also occurred on black spruce and balsam fir in some areas.

2.2.9 FOREST TENT CATERPILLAR, Malacosoma disstria (Hbn.):- Defoliation was again confined to trembling aspen stands in the southeast section of the District. The infestation southwest of Waugh, in secs. 12, 13, 24, and 25, tp. 7, rge. 16, E. P. mer. and secs. 7, 18, and 19, tp. 7, rge. 17, E. P. mer. continued at the moderate to severe levels, and in the vicinity of Shoal Lake, particularly severe defoliation extended in a strip about one mile wide northeast from Waugh along Indian Bay to the Ontario border, on the peninsula between Indian Bay and Snowshoe Bay, and in a narrow band along the south shore of the latter. In addition, traces of defoliation occurred throughout the area from Falcon Lake west to East Braintree and south to Moose Lake. One pupae was collected from aspen at the International Peace Gardens in the Turtle Mountains.

An egg-band survey was carried out in the accessible sections of the District during the latter part of the season to determine the probable extent and intensity of the forest tent caterpillar infestations in 1965. The results, as shown in Table 1, indicate that moderate infestations are likely to occur in the East Braintree - Falcon Lake area, but will remain light

elsewhere. No observations were made at or in the vicinity of Waugh, due to the inaccessibility of the infestations.

Special surveys were carried out in Metropolitan Winnipeg to determine the incidence of egg-bands following fairly heavy moth flights into the area about mid July. Subsequent sampling (Table 2) indicated that egg deposition was widespread but generally low. However, if current populations develop in 1965, some light defoliation of various broad-leaved trees throughout the urban area may be expected.

TABLE 1

Forest Tent Caterpillar Egg-band Sampling - 1964
Southern District of Manitoba

(based on examination of 3 co-dominant trembling aspen at each sample point)

Location	Summary of egg-band counts				
	Av.d.b.h. of trees (ins.)	Av.ht. of trees (ft.)	Av. crown depth (ft.)	Av.No. egg bands per tree	Defoliation forecast 1965
Southern Manitoba					
Aubigny	2.3	20.7	11.3	0.7	light
St. Malo	3.4	25.3	14.3	0.0	nil
Dominion City	2.5	23.0	17.0	0.0	nil
Vita	2.1	23.0	13.3	0.0	nil
Menisino	2.7	23.3	15.0	0.0	nil
Woodridge	2.3	24.3	13.3	0.0	nil
La Broquerie	2.7	26.3	17.3	0.0	nil
Falcon Lake	4.1	28.0	15.0	6.3	moderate
East Braintree	3.7	27.0	16.0	2.3	light
Caribou Fire Tower	3.1	25.0	14.3	0.3	light
Moose Lake	3.6	36.0	17.0	0.7	light
Sprague	3.7	31.3	17.7	0.7	light
Whitemouth Lake	3.0	25.7	15.3	0.0	nil
St. Annes	3.4	24.3	13.3	1.0	light
Pigeon Lake	2.8	23.0	16.3	0.7	light
Elm Creek	3.3	20.0	15.0	2.7	light
Ninette	3.2	21.7	13.3	0.0	nil
Brandon	3.0	24.7	18.7	0.0	nil
MacGregor	3.5	30.7	18.7	0.7	light

TABLE 2

Forest Tent Caterpillar Egg-band Sampling - 1964
Metropolitan Winnipeg Area

(based on 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. egg-bands per tree	Defoliation forecast 1965
Crescent Park	2.7	18.7	13.0	0.0	nil
Crescent Park	2.7	20.0	11.7	0.3	light
Middlechurch	1.8	18.0	15.0	0.3	light
Middlechurch	3.3	20.1	15.7	0.0	nil
East St. Paul	3.2	23.0	18.7	1.0	light
East St. Paul	3.2	26.7	23.0	1.7	light
St. James	3.8	30.7	17.0	1.7	light
St. James	1.5	15.3	12.0	1.0	light
Assiniboine Park	2.3	18.7	15.0	0.7	light
Assiniboine Park	3.8	30.0	22.0	0.7	light
Charleswood	2.5	21.7	16.7	0.0	nil
Charleswood	3.3	28.3	25.7	0.0	nil
Fort Garry	2.7	25.3	19.3	1.7	light
Fort Garry	3.5	30.7	20.0	0.3	light
St. Vital	2.7	24.0	16.7	0.0	nil
St. Vital	3.7	29.3	22.3	0.0	nil
St. Vital	3.5	24.3	18.3	0.0	nil

2.2.10 ASPEN LEAF BEETLE, Chrysomela crotchi (Brown):- This skeletonizer of trembling aspen foliage was recorded at many locations. Fairly high populations caused light to moderate damage in the Tolstoi, Ridgeville, Steinbach, Niverville and St. Malo areas. In the remainder of the District, light skeletonizing was limited to scattered patches of aspen regeneration.

2.2.11 LEAF ROLLERS ON TREMBLING ASPEN, Tortricid spp.:- There was a noticeable increase in the abundance of leaf rollers on trembling aspen in the south central portion of the Spruce Woods Forest Reserve, where several patches of moderate to severe defoliation were noted. Elsewhere, populations were very low and damage negligible. The species of leaf rollers, occurring in order of abundance were: Pandemis canadana Kft., Pseudexentra oregonana Wlk., Sciaphila duplex Wlshm., Epinotia sp., Archips sp., Babebecia urticana Hbn., Choristoneura rosaceana Harr., Gracillaria negundella Cham., and Archippus packardianes Fern.

2.2.12 BOXELDER TWIG BORER, Proteoteras willingana (Kft.):- Light infestations of this borer were recorded in most Manitoba maple shelterbelts. Population counts were made at three permanent sampling points where four branches at each of three crown levels were removed from five trees and examined for incidence of attack. Sample data as shown in Table 3 indicate that infestations remained at endemic levels.

TABLE 3

Boxelder Twig Borer Population Counts
Southwestern Manitoba - 1964

(based on examination of four branches 36 inches long from each crown level of five trees at each sample point)

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	24.6	20.6	14.8	412	19	410	8	474	9
Sidney	20.4	15.0	12.6	433	8	541	8	398	8
Souris	23.0	16.6	15.2	456	6	403	3	418	9

2.2.13 FALL WEBWORM, Hyphantria cunea (Drury):- Populations of this webworm were slightly higher than in 1963 and caused noticeable defoliation of willow, alder, balsam poplar, birch, and chokecherry at widely scattered points. Moderate to severe infestations were recorded in the Vita, Lonesand, Sundown, Menisino, Sprague, Birch Point, East Braintree and Dawson Cabin areas. Single, scattered tents were recorded throughout the Spruce Woods Forest Reserve, and in the International Peace Gardens in the Turtle Mountain Forest Reserve.

2.2.14 AMERICAN ASPEN BEETLE, Gonioctena americana (Schffr.):- This leaf beetle was most common in the southeastern portion of the District. Light to moderate defoliation of trembling aspen reproduction was recorded in the Richer, East Braintree, Whitemouth Lake and Marchand areas. Elsewhere, populations were very low and defoliation was practically nil. In most instances, this insect was found feeding in conjunction with the aspen leaf beetle.

2.2.15 FALL CANKERWORM, Alsophila pometaria (Harr.):- Populations of this cankerworm occurred commonly and usually in association with those of the linden looper, Erannis tiliaria (Harr.) and the spring cankerworm, Paleacrita vernata (Peck). Therefore, it was difficult to assess the amount of defoliation caused by individual species. White elm, Manitoba maple, and basswood were the preferred hosts but other deciduous trees and shrubs were also attacked. Larvae of all species were collected throughout the Metropolitan Winnipeg area but moderate to severe defoliation was generally restricted to areas along the Red and Assiniboine Rivers. Elsewhere, severe defoliation occurred to white elm and Manitoba maple in a small park at Emerson, and to shelterbelt plantings within an approximate 45 square-mile area near Lyleton in tps. 1 and 2, rge. 28, W. P. mer. Within the latter area defoliation of Manitoba maple, Chinese elm, and white elm plantings was severe, and of green ash, cottonwood and caragana, light to moderate. Most of the plantings were aerial sprayed with D. D. T. during late May but most of the defoliation was complete and many of the larvae had dropped to the ground to pupate. Therefore moderate to severe infestations will likely recur in 1965 in some sections of the area.

2.2.16 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acrobasis betulella Hlst. (A birch tube maker)	wB	Sandilands Forest Reserve.	Very low populations; no noticeable damage.
Acronicta Spp. (Dagger moths)	All tree species	Throughout District.	No appreciable damage; species occurring in order of abundance were: A. funeralis Gn., A. innotata Gn., A. lepusculina Gn., A. dactylina Grt., A. americanaum Harr., A. leporina Linn., and A. impressa Wlkr.
Altica populi Brown (A flea beetle)	Al, tA	Sandilands Forest Reserve.	Found in association with Chrysomela knabi Brown; no serious skeletonizing.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Sandilands Forest Reserve.	No appreciable defoliation.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	cCh	Throughout District.	Infestations light and scattered.

2.2.16 OTHER NOTEWORTHY INSECTS:- (Cont'd.)

Insect	Host(s)	Locality	Remarks
Arge pectoralis (Leach) (Birch sawfly)	wB	East Braintree, Moose Lake, and Dawson Cabin.	Very low populations.
Argyrotaenia tabulana Free. (A pine tube maker)	jP	Dawson Cabin and Spruce Woods Forest Reserve.	Low populations; no appreciable damage.
Bucculatrix canadensisella (Cham.) (Birch skeletonizer)	wB	Turtle Mountain Forest Reserve.	Low populations; very little skeletonizing.
Cecidomyia negundinis Gill. (Boxelder gall fly)	mM	Winnipeg south to Emerson along Red River.	Low populations; no appreciable damage to twigs and leaves.
Choristoneura fumiferana (Clem.) (Spruce budworm)	wS bF	Sprague, East Braintree, Spruce Woods Forest Reserve.	One to four larvae per 5 tree beating sample; light defoliation.
Chrysomela knabi Brown (A leaf beetle)	tA Al	Marchand, Woodridge, Carrick, and Badger	Low populations; very light defoliation.
Corythucha arcuata Say. (Oak lace bug)	bO	Turtle Mountain Forest Reserve	Light discoloration of foliage.
Dioryctria abietivorella Grt. (A snout moth)	jP	Piney area.	No noticeable damage.
Dioryctria reniculella (Grote) (Spruce cone worm)	wS	Spruce Woods Forest Reserve.	Very light damage.

2.2.16 OTHER NOTEWORTHY INSECTS:- (Cont'd.)

Insect	Host(s)	Locality	Remarks
Enargia decolor Wlk. (A noctuid)	tA	Marchand and Spruce Woods Forest Reserve.	Very light defoliation.
Epicauta Spp. (A blister beetle)	Caragana and Wild pea	Throughout District.	Very light defoliation at Melbourne, Goodlands, and East Braintree.
Eriosoma americanum Riley (Woolly elm aphid)	wE	Throughout District.	Damage generally light with an occasional tree moderately attacked.
Feralia jocosa Gn. (Green-striped spruce caterpillar)	jP	Southeastern portion of the District.	No appreciable defoliation.
Galerucella decora (Say) (Grey willow leaf beetle)	W	Badger, Carrick and East Braintree.	Low populations in scattered willow clumps.
Halisidota maculata H rr. (Spotted tussock moth)	tA W	Sandilands Forest Reserve.	No widespread defoliation.
Hylurgopinus rufipes (Eichh.) (Elm bark beetle)	wE	Pigeon Lake and St. Lazare.	Very light damage; feeding galleries common on dead wood.
Itame loricaria Evers. (A Geometrid)	tA bO	Throughout District.	Common but only very light defoliation.
Lambdina fiscellaria fiscellaria (Guenee) (Hemlock looper)	bF	East Braintree.	Very low populations.
Lithocolletis salicifoliella Chamb. (Aspen blotch miner)	tA	Sandilands Forest Reserve.	Light, scattered infestations.
Lopidea dakota Knight (Caragana plant bug)	Caragana	Western portion of District.	Commonly found; no widespread defoliation.

2.2.16 OTHER NOTEWORTHY INSECTS:- (Cont'd.)

Insect	Host(s)	Locality	Remarks
Meroptera pravella Grt. (A pyralid moth)	tA	South-central portion of District.	Very low populations.
Monoctenus melliceps (Cress.) (A sawfly)	eC	Dawson Cabin and East Braintree.	Light feeding on foliage; only a few single colonies.
Mordwilkoja vagabunda Walsh. (Poplar vagabond aphid)	tA	Marchand and Griswold.	Very light damage.
Nematus limbatus Cress. (A sawfly)	W	Waugh, East Braintree and Dawson Cabin.	Light defoliation on single clumps.
Nematus populi (Marl.) (A sawfly)	tA bPo	St. Agathe and East Braintree.	Light defoliation on a few single trees. Confined to regeneration.
Nematus unicolor (Marl.) (A sawfly)	wB	Marchand, Woodridge, and Moose Lake.	Low populations; no appreciable defoliation.
Neodiprion mauris Roh. (A sawfly)	jP	Dawson Cabin area.	Very low populations; light defoliation.
Neodiprion nanulus nanulus Schedl. (A sawfly)	jP	Sandilands Forest Reserve.	Low populations; very little defoliation.
Neodiprion sp. (A sawfly)	rP	Whitemouth Lake and Moose Lake.	About 10 acres of red pine reproduction infested at Whitemouth Lake, and only a single tree at Moose Lake.
Neoborus amoenus (Reut.) (Ash plant bug)	bAs	Dominion City	Some trees in a small area moderately attacked; generally populations light.

2.2.16 OTHER NOTEWORTHY INSECTS:- (Cont'd.)

Insect	Host(s)	Locality	Remarks
Nepytia canosaria Wlk. (False hemlock looper)	scP bS bF	Spruce Woods and Sandilands Forest reserves.	No appreciable damage.
Nymphalis antiopa Linn. (Mourning cloak butterfly)	tA W wE	Throughout District.	Light populations; skeletonizing restricted to individual trees and bushes.
Operophtera bruceata Hlst. (Bruce spanworm)	tA	Pierson.	Very low populations.
Orthosia hibisci Gn. (An owlet moth)	tA wB mM	Throughout District.	Low populations; no noticeable defoliation.
Parorgyia plagiata (Wlk.) (Grey spruce tussock moth)	jP	Dawson Cabin Area.	No widespread defoliation.
Petrova albicapitana (Busck.) (Pitch nodule maker)	jP	Spruce Woods and Sandilands Forest reserves.	Very low populations.
Phratora americana canadensis Brown (A leaf beetle)	tA	Eastern portion of District.	Light defoliation of young aspen in scattered patches.
Physokermes piceae (Shrank) (Spruce bud scale)	wS	Virden, Sprague, Dawson Cabin.	Very light infestations.
Pissodes strobi (Peck) (White-pine weevil)	jP lP	Throughout District.	Caused light leader damage in most areas where detected.
Rhyacionia frustrana (Com.) (A pine tip moth)	jP	Dawson Cabin.	Very low populations.
Semiothisa bicolorata F. (A geometrid)	jP	Southeastern portion of District.	Very low populations.

2.2.16 OTHER NOTEWORTHY INSECTS:- (Concl.)

Insect	Host(s)	Locality	Remarks
Semiothisa sexmaculata Pack. (A geometrid)	tL	Southeastern portion of District.	Very light defoliation.
Syneta pilosa Brown (A leaf beetle)	bF wS	Whitemouth Lake Road.	Very low populations; no noticeable defoliation.
Tetralopha asperatella (Clem.) (A webworm on aspen)	tA	Throughout District.	Low populations; da age light throughout.
Tetralopha robustella (Zeller) (Pine webworm)	jP	Sandilands Forest Reserve and Moose Lake.	Low populations; no appreciable damage.
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	jP	Sandilands Forest Reserve and Sprague.	Light to moderate infestation on single scattered trees.
Xylomyges dolosa Grt. (An owlet moth)	tA	Western portion of District.	Very low populations; no defoliation.
Zale duplicata largera Sm. (An owlet moth)	jP	East of the Red River.	Low numbers; causing no appreciable defoliation.
Zeiraphera fortunana Kft. (A spruce bud moth)	bF wS	Sprague and Winnipeg.	Very low populations.

2.3 TREE DISEASE CONDITIONS

2.3.1 WHITE PINE BLISTER RUST, Cronartium ribicola J. C. Fisher:- This blister rust was recorded at Moose Lake, in the North West Angle Forest Reserve, and at Waugh, on Lake of the Woods during the current season. The disease has persisted for several years and most of the white pine trees are now infected. Damage in older white pine stands is apparent in the form of dead branches and tops as well as the occasional dead tree. Some mortality of white pine reproduction has

occurred in a small mixed stand of jack, red, and white pines, aspen and white birch immediately south of Moose Lake; its extent is indicated in the following table which lists the data obtained by examining all white pine under 16 feet in height in three random 1/10 acre plots:

Plot No.	No. of wP under 16 ft. in height	No. of trees with main stem infection only	No. of trees with branch infection only	No. of trees dead from infection
1	12	4	0	4
2	36	6	2	3
3	33	3	0	0

2.3.2 GLOBOSE GALL RUST, Peridermium harknessii Moore:- This rust was prevalent in the Sandilands and North-West Angle Forest reserves, but infections were confined to single or small groups of jack pine trees. Damage to date has been negligible; only occasional branches are dead or dying.

2.3.3 SPRUCE NEEDLE RUSTS, Chrysomyxa spp.:- Light infections of these needle rusts were detected on white spruce in the Spruce Woods Forest Reserve, on black spruce in the Sandilands Forest Reserve, on blue spruce at East Braintree, and on a single Colorado spruce at Steinbach.

2.3.4 WIND AND SNOW DAMAGE:- High wind and an unusually early snowfall (night of September 26-27) caused light to moderate damage to forest trees in the eastern portion of the District. Uprooted and broken trees were quite evident in the Hadashville-East Braintree area and south to the North-West Angle Forest Reserve. Conifers suffered most of the damage, but limbs were also broken from many of the larger trembling aspen trees.

2.3.5 BARK SCALING OF PINE:- This condition is characterized by the flaking-off of the outer bark, leaving the inner bark exposed. It was common on mature and overmature red and jack pine trees throughout the Sandilands Forest Reserve, but was most conspicuous at the following locations: about 3 miles southeast of Piney, at Dawson Cabin, Woodridge, Marchand, East Braintree, Hadashville, Whitemouth Lake and north west of Sundown.

2.3.6 FROST DAMAGE:- Late spring frosts (early June) caused damage to the foliage of bur oak and green ash over extensive

areas. Although many of the dry leaves persisted on the trees throughout the season, refoliation was fairly rapid and the trees suffered no permanent damage. Areas of severe damage were noted at numerous locations from Winnipeg west to the Saskatchewan border and in the Sandilands and North West Angle Forest reserves in the eastern section of the District. Light damage was recorded in the Emerson-Dominion City area, and at widely scattered points along the Red River between Emerson and Winnipeg.

2.3.7. OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Lenzites saepiaria (Wulf) Fr. (A slash fungus)	jP	Dawson Cabin	Common slash fungus; caused no appreciable damage.
Lophodermium pinastri Chev. (A needle cast fungi)	jP	Piney	Light infection of approximately 12 trees in a plantation.
Puccinia peridermiospora (E. & T.) Arth. (Ash rust)	gAs	St. Agathe	Light infection; one tree only affected.

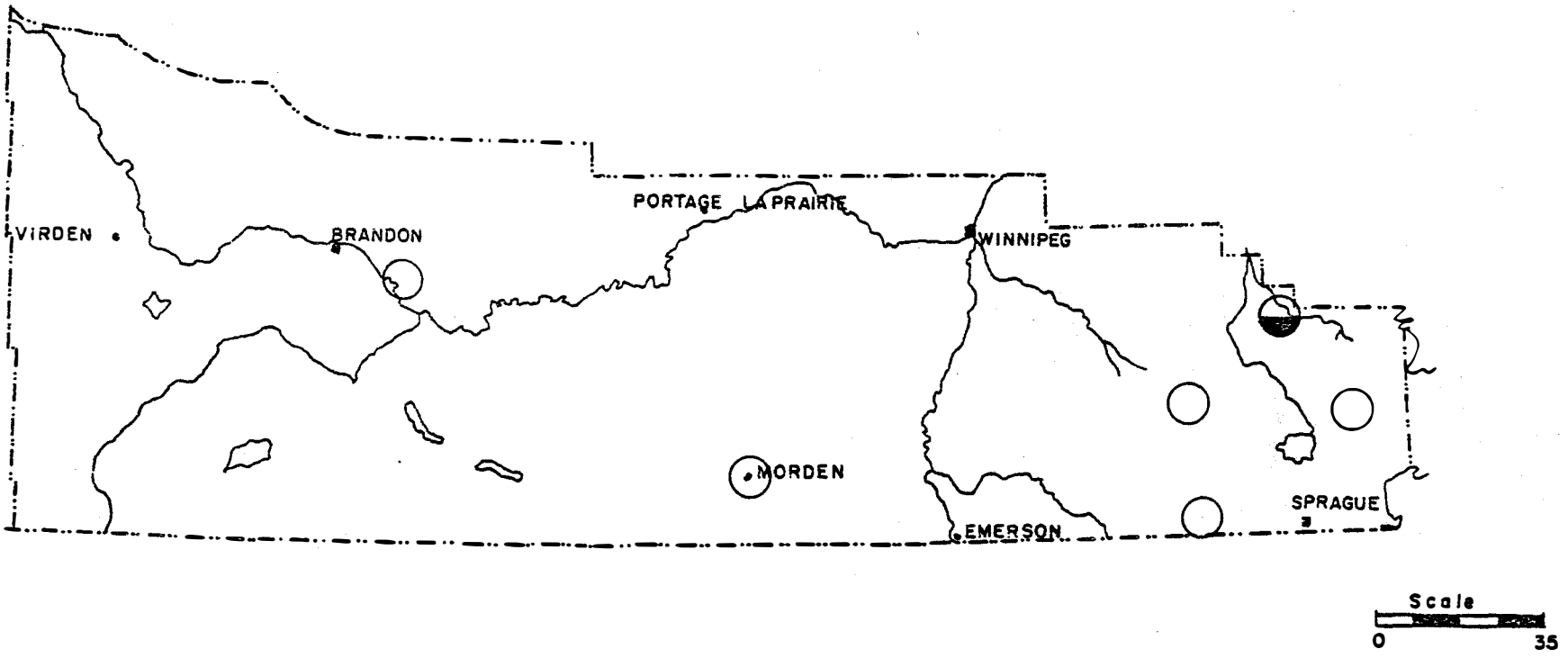
SOUTHERN DISTRICT
MANITOBA

LOCATION OF POINTS WHERE
LARCH SAWFLY INFESTATIONS
WERE DETERMINED BY GROUND
AND AERIAL SURVEYS - 1964.

Moderate

Light

Fig. 1



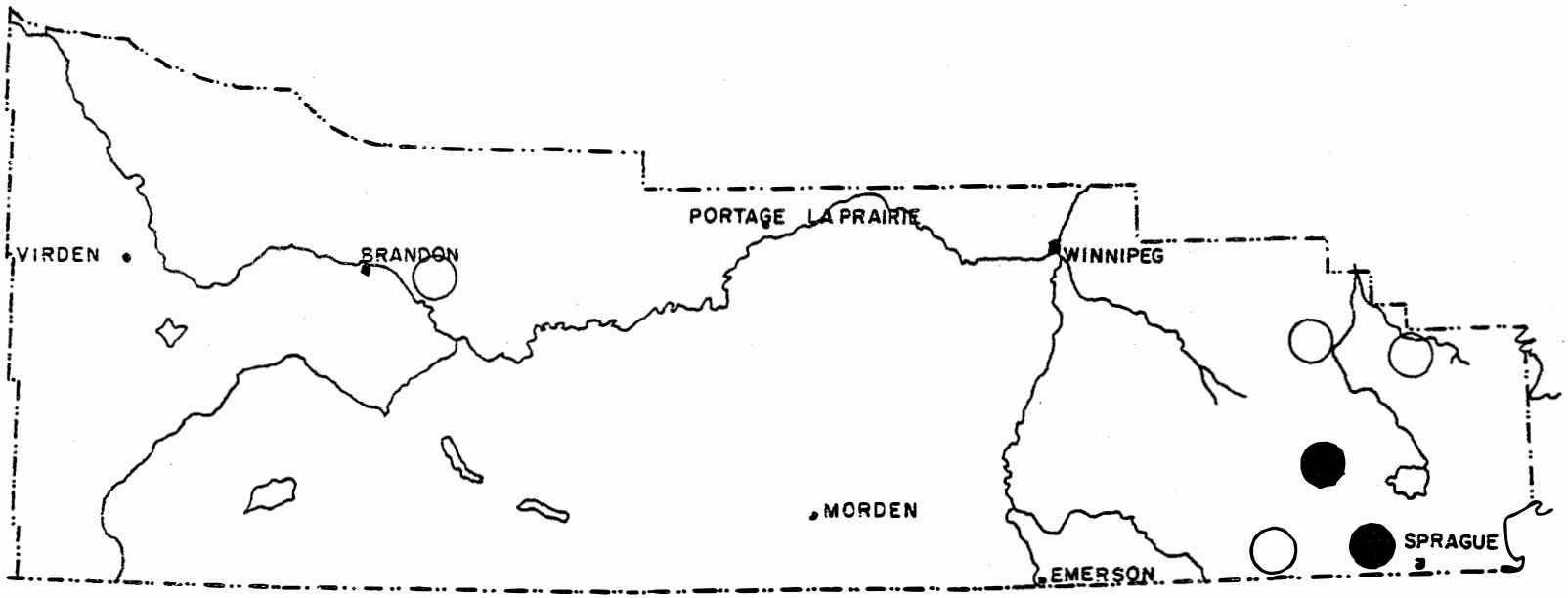
SOUTHERN DISTRICT
MANITOBA

JACK PINE BUDWORM INFESTATIONS AS DETERMINED
BY GROUND AND AERIAL SURVEYS IN 1964.

● Moderate to Severe Defoliation

○ Light Defoliation

Fig. 2



3. ANNUAL DISTRICT REPORT

EASTERN DISTRICT OF MANITOBA

1964

by

R. W. Hancox

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

3.1 INTRODUCTION

Surveys were conducted from May 14 to October 15 to determine the distribution and intensity of forest insects and diseases in the Eastern District of Manitoba. Totals of 757 insect and 82 disease samples were submitted to the Winnipeg Laboratory. Approximately 27 hours flying time was utilized for surveys of the inaccessible sections of the District extending from the Whiteshell Forest Reserve north to Norway House; of this 5 hours were supplied by the Manitoba Government Air Service through the Department of Mines and Natural Resources.

Mass collections of larvae and pupae of the forest tent caterpillar, jack-pine budworm, western tent caterpillar and yellow-headed spruce sawfly were collected and submitted for parasite and disease studies. Larch sawfly cocoons for parasite and disease studies were collected on a reduced basis this season and six special cages were established at three points in the vicinity of Pine Falls for recovery of the recently released parasite, Holocremnus sp. Aphids were again collected for Dr. Bradley and forest tent caterpillar egg band surveys were carried out over a wider area to forecast infestation trends in 1965.

The co-operation received from personnel of the Manitoba Department of Mines and Natural Resources and the Woods Department of the Manitoba Paper Company is gratefully acknowledged.

Weather conditions were warm and dry in early May. Several killing frosts occurred from mid-May through the first week in June retarding foliage production and insect development and the remainder of June was cool and dry. July weather was near normal but above average rainfall was received in August. September and October were generally warm and dry.

There were further extensions in most of the forest tent caterpillar infestation areas but these were mainly by pockets of moderate to severe defoliation. Jack-pine budworm populations increased markedly in the Belair Forest Reserve north of Stead. Populations of the western tent caterpillar, the American aspen beetle, the birch tube maker, the pine needle scale, and the black-headed budworm all showed increases throughout the District, and the spiny elm caterpillar increased north of Beausejour and in the Pine Falls area. Larch sawfly, yellow-headed spruce sawfly and balsam-fir sawfly populations remained at low levels but there were slight decreases in those of the aspen leaf beetle, the aspen blotch miner and the spotless fall webworm and a marked decrease in those of the yellow-necked caterpillar. Very light populations of a pine tube moth, Argyrotaenia tabulana, were detected at Sasaginnigak Lake.

The status of most tree diseases changed very little this season. Killing frosts occurring during late May and early June damaged the foliage of bur oak, ash and balsam fir. There was a slight increase in the occurrence of the spruce needle rust, Chrysomyxa sp. on black spruce. Surveys indicated that white-pine blister rust has infected white pine in the Falcon and Barren lakes area of the Whiteshell Forest Reserve. High winds severely damaged forest stands over several acres at Darwin and at Cat and Bird lakes.

3.2 INSECT CONDITIONS

3.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Populations remained low throughout the District (Fig. 1). Light defoliation of tamarack occurred in the Agassiz Forest Reserve, at Pointe du Bois, Telford, Lake Brereton, Otter Falls, and from Pine Falls to the O'Hanley River. Moderate to severe defoliation was noted on the occasional branch in most stands. On aerial surveys moderate defoliation was observed in scattered stands of tamarack along the Poplar River watershed from Lake Winnipeg to Weaver Lake.

Sequential sampling of larch sawfly egg populations was continued at three permanent plots with the following results:

Location	Plot No.	No. of shoots examined	No. of shoots curled	Infestation rating - 1964
Pointe du Bois	109	50	0	light
Telford	102	50	0	light
Agassiz	110	60	1	light

A total of 120 cocoons were collected in plot 109 at Pointe du Bois to determine the incidence of parasites and disease. About ten per cent of the cocoons were destroyed by fall emergence of Bessa harveyi (T.T.) and 2 per cent by disease. Subsequent dissections indicated that effective parasitism of the larch sawfly larvae was 25 per cent by B. harveyi and 6 per cent by Mesolieus tenthredinis Morley.

3.2.2 JACK-PINE BUDWORM, Choristoneura pinus Free.:- Larval development of the jack-pine budworm was retarded about two weeks by adverse weather conditions. The low populations, which had persisted in the Belair Forest Reserve in the past few years, increased markedly and moderate to severe defoliation occurred over 7 square miles in tp. 17, rge. 8, E. P. mer. north of Stead. This sudden increase in

populations appeared to be associated with the heavy pollen crop on jack pine that occurred for the second year in succession. Elsewhere, very low populations were recorded 2.8 miles west of Rennie along No. 4 highway, and at Black and Viking lakes in the northern part of the District.

3.2.3 BALSAM-FIR SAWFLY, Neodiprion abietis complex:- The amount of damage caused by this sawfly was light throughout the District. The highest populations occurred on black spruce west of Elma, near Telford and at Family Lake; on white spruce near Hazel Creek, Black, Dogskin and Siderock lakes; and on balsam fir at Sasaginnigak, Eardley and Falcon lakes. Moderate defoliation was generally confined to a few branches per tree. Light defoliation occurred on white spruce at Long, Betula, White and Caddy lakes, on black spruce at Caddy Lake and on black spruce and tamarack at Lake Brereton. Defoliation ranging from a trace to light was recorded on white spruce at Crowduck Lake and along No. 4 highway near the Manitoba-Ontario border and on balsam fir at Siderock and Gem lakes.

3.2.4 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Low populations on black and white spruce were widely distributed throughout the District. Highest larval numbers were recorded on white spruce at Falcon Lake, from West Hawk Lake to the Manitoba-Ontario border along No. 4 highway, near Hazel Creek and at White and Siderock lakes; on black and white spruce at Sasaginnigak lake, and on black spruce at Moar Lake where moderate defoliation of occasional branches was recorded on small open growing trees up to 2½ inches d.b.h. Defoliation ranging from a trace to light occurred on white spruce at Caddy, Betula, Crowduck, Bird, Long, Manigotogan, Dogskin, Harrop and Gem lakes, near Pine Ridge and north of Pine Falls, and on black spruce at Caddy, Brereton, Bird, Wallace, Aikens, Viking and Family lakes, north of Pine Falls, at Pointe du Bois and in the Belair Forest Reserve.

3.2.5 BLACK-HEADED BUDWORM, Acleris variana Fern:- There was a slight increase in larval numbers of this budworm, but damage remained light. Collections were widely distributed and the highest populations were found on black spruce at Sasaginnigak, Harrop and Weaver lakes. Low populations occurred on white spruce at Falcon, Crowduck, Bird, Gem, Black, Manigotogan, Moar, Eardley, Family, Betula, White, Caddy, Sasaginnigak and Harrop lakes, at Berens River, Pine Ridge, Otter Falls and near Hazel Creek on No. 15 highway, on black spruce at Eardley, Red Willow, Family, Bird, Aikens and Viking lakes, at Otter Falls and north of Pine Falls and on balsam fir at Siderock, Sasaginnigak, Eardley, Aikens and Harrop lakes. In all instances, defoliation ranged from a trace to light.

3.2.6 PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- There was an increase in the occurrence of this scale on white spruce in 1964. Two white spruce (4 inch d.b.h.) were moderately to severely attacked near Pine Ridge, one 5 inch d.b.h. tree was moderately infested at Sasaginnigak Lake. Similar infestations occurred on a few trees at Victoria Beach and in a hedge of planted white spruce in the town of Pine Falls. White spruce at Otter Falls and from West Hawk Lake to the Manitoba-Ontario border was lightly infested, as was black spruce at Caddy Lake. Jack pine was lightly attacked in the Agassiz Forest Reserve. In the Belair Forest Reserve, infestation was generally light with moderate attack on the occasional small jack pine.

3.2.7 SAWFLIES ON JACK PINE, Neodiprion spp.:- These sawflies occurred in jack pine stands at widely scattered points where defoliation was light and generally confined to a few branches on single trees. The species appeared in collections in the following order of abundance: Neodiprion virginianus complex, Neodiprion pratti banksianae Roh., Neodiprion maurus Roh., and Neodiprion nanulus nanulus Schedl.

N. virginianus complex caused light defoliation on jack pine at Sasaginnigak, Garner, Dogskin and Bird lakes and north of Pine Falls. N. pratti banksianae occurred in low numbers at Manigotogan Lake. N. maurus was noted feeding singley in low numbers at the Whiteshell River and along the Central Road in the Whiteshall Provincial Park. Damage by N. nanulus nanulus was very light at Siderock Lake.

3.2.8 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- Infestations increased in size in 1964 with the extensions consisting of pockets of patchy defoliation ranging from moderate to severe (Fig. 2). The infestation at Pointe du Bois coalesced with the one at Bird Lake and only a narrow band now separates it from the Whiteshell Lake infestation. Defoliation of trembling aspen occurred mainly east of a line extending northwestward from the northeast corner of West Hawk Lake to Nora Lake, along the Whiteshell River to Lone Island, Meditation, Horseshoe and Sailing lakes to the vicinity of Forbes Lake, then westward across the Winnipeg River at a point 2 miles north of Slave Falls, then north to a point about 3/4 of a mile outside the Whiteshell Forest Reserve on the Pointe du Bois - Lac du Bonnet Road, then north and east to Keys and Shafford lakes, northwest to Bird River P.O. and northeast to Springer Lake, then south to the vicinity of Bird Lake Road and then again northeast to encompass MacGregor Lake on the Ontario border. This infestation also extended eastward into Ontario. The largest patches of moderate to severe defoliation within the above described area occurred at Big Whiteshell Lake, encompassing Green Lake north to Turtle Lake and east to Crowduck Lake, south around Little Whiteshell to the southeast corner of Lone Island Lake and throughout the area north of a line from

a point on the Winnipeg River 2 miles north of Slave Falls through George Lake to Forbes Lake, Burton and Johnston lakes to Eaglenest Lake.

Very patchy moderate to severe defoliation occurred around Black, Flintstone and Garner lakes, around the southeast half of Gem Lake, and along the Manigotogan River watershed to Caribou and Turtle lakes.

The area of severe defoliation at Wanipigow Lake increased markedly. It extended southward in three large fingers from the Bissett Road for about 1½ to 2 miles, westward along the Wanipigow River for about 1½ miles and northward for about 3 miles along Beaver Creek with a patch to the east of the creek covering about 3 square miles.

Six square miles of severe defoliation was mapped immediately north of the Sandy River on both sides of the Pine Falls to Manigotogan Road. Eight miles east of Bissett, a patch of severe defoliation about ½ mile wide extended northward across the Wanipigow River for about 5 miles. A patch of severe defoliation occurred on the Bear River Road 6 miles north of Maskwa Lake covering an area of about 2 square miles. Very small patches also occurred along the east side of Obukowin Lake and south of Dogskin Lake between Clayton and Rundle lakes near the Ontario border.

Elsewhere light defoliation was recorded at the following points: Falcon Lake, Telford, White Lake, Betula Lake, Pinawa, Rennie-Whitemouth area, Agassiz and Belair Forest reserves, Hole River, Beresford, Siderock, Sasaginnigak, Family, Red Willow, Charron, Viking, Harrop, Weaver and Shallow lakes and at Berens River.

An egg-band survey was carried out in the fall to determine the probable extent and intensity of infestation in 1965, and the results are shown in Table 1.

TABLE 1

Forest Tent Caterpillar Egg Band Survey Records - 1964
Eastern District of Manitoba

(Based on the 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 1965
Crowduck Lake	4.6	37.6	16.6	38.0	severe
Black Lake	4.6	35.3	18.3	16.3	severe

TABLE 1 (con't.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg bands per tree	Defoliation forecast 1965
Gem Lake	4.0	28.6	18.0	40.6	severe
Manigotogan Lake	6.6	47.3	14.6	15.0	moderate
Siderock Lake	3.6	34.6	22.3	13.6	severe
Aikens Lake	3.0	27.0	12.3	9.6	severe
Sasaginnigak Lake	3.3	25.3	12.6	3.0	light
Dogskin Lake	3.3	30.0	13.6	3.0	light
Family Lake	3.2	28.6	14.3	3.6	light
Moar Lake	4.3	30.6	17.3	0.3	light
Man.-Ont. border at #4 hwy.	3.5	24.6	14.0	12.0	severe
Telford	3.2	26.0	18.6	4.3	light
Jct. #4 hwy. & Central Whiteshell road	3.0	30.0	19.3	3.0	light
Lake Brereton	3.0	30.3	19.0	2.6	light
Red Rock Lake	3.8	32.6	20.6	4.6	light
Jct. of Whiteshell Lake & Central Whiteshell road	3.2	29.3	18.6	4.6	moderate
Big Whiteshell Lake	4.5	40.6	24.6	64.6	severe
Caddy Lake	2.8	27.3	14.0	8.3	severe
Betula Lake	2.5	24.3	18.3	2.3	light
Nutimik Lake	2.3	25.6	17.3	2.3	light
Otter Falls	2.3	24.3	16.6	2.0	light
Seven Sisters Falls	3.8	30.6	17.3	1.0	light
Pointe du Bois #1.	4.0	32.3	17.6	44.6	severe
Pointe du Bois #2.	3.8	34.3	17.0	16.0	severe
Pointe du Bois #3.	3.3	28.3	16.0	6.6	moderate
Pointe du Bois #4.	3.2	27.6	18.0	3.3	light
Pointe du Bois #5.	2.2	22.0	17.6	0.3	light
Pinawa #1.	2.3	22.6	16.6	1.0	light
Great Falls	2.2	21.0	15.0	0.6	light
Bird Lake #1.	4.3	33.6	17.3	29.0	severe
Bird Lake #2.	5.2	41.3	23.6	24.3	severe
Bird Lake #3.	6.3	57.6	22.6	46.0	severe
Bird Lake #4.	3.3	29.3	20.0	17.6	severe
Bird River #1.	2.8	31.0	18.0	8.6	severe
Bird River #2.	2.8	26.0	18.0	3.3	light
Cat Lake	5.0	37.6	18.3	25.0	severe
Bear River Rd. #1.	3.8	34.0	21.3	3.0	light
Bear River Rd. #2.	4.3	31.6	18.0	26.3	severe
Bear River Rd. #3.	3.2	25.0	17.3	2.0	light
Pine Falls #1.	2.7	22.3	16.3	1.0	light
Pine Falls #2.	4.0	32.3	16.6	3.0	light
Black River	4.0	39.0	17.6	1.7	light

TABLE 1 (concl.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg bands per tree	Defoliation forecast 1965
Sandy River	4.0	36.3	21.0	7.6	moderate
Manigotogan	3.2	23.6	14.3	3.2	light
Hole River	4.6	34.0	16.3	1.6	light
English Brook	3.8	30.3	17.6	1.6	light
Wanipigow Lake	5.0	50.6	24.0	18.0	severe
Caribou Lake	4.5	36.6	21.3	9.0	moderate
Bissett #1.	3.3	24.6	13.3	1.0	light
Bissett #2.	4.2	30.6	18.3	5.6	light
Bissett #3.	3.5	28.0	19.3	3.6	light
Wallace Lake	2.5	21.0	18.6	3.6	light
Long Lake	3.5	33.0	15.3	3.6	light
Beresford Lake	3.8	31.0	21.3	32.3	severe
Belair Forest Reserve	2.8	25.3	20.3	5.3	moderate
Victoria Beach	2.5	22.3	15.0	2.6	light
Grand Beach	3.5	29.6	16.6	0.3	light
Libau	2.6	23.6	16.6	2.0	light
East Selkirk	3.8	24.0	16.6	0.6	light
Beausejour	2.5	25.6	12.3	1.0	light
Agassiz Forest Reserve #1.	2.7	28.6	18.0	1.3	light
Agassiz Forest Reserve #2.	3.2	35.3	19.3	1.3	light
Whitemouth	2.8	26.0	13.6	1.3	light
Rennie	3.2	29.0	15.0	1.6	light
Anola	3.5	28.3	17.6	0.0	nil
Vivian	4.5	32.0	21.6	2.6	light
Contour	4.7	37.3	21.3	1.0	light
Falcon Lake #1.	3.5	36.0	20.0	13.3	severe
Falcon Lake #2.	4.2	30.3	17.0	11.3	severe
Falcon Lake #3.	4.2	33.6	20.6	37.3	severe
Falcon Lake #4.	4.0	41.3	20.0	14.3	severe

3.2.9 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- There was a decrease in populations of this leaf beetle and moderate to severe skeletonizing was generally patchy in most aspen stands and confined to trees up to 3 inches D.B.H. with only a trace to light feeding on larger trees. Adult populations were relatively high during the early part of the season; egg clusters were found about July 10, and larval feeding was generally in progress by July 14, and continued to mid-September. Highest populations occurred in the Victoria and Grand Beach areas with large numbers of beetles being washed up on the beach in early June. However, subsequent skeletonizing of aspen foliage in the area was generally light with patchy moderate feeding damage on

small aspen trees. Moderate to severe skeletonizing of the foliage of small aspen trees up to 2½ inches D.B.H. occurred at Caddy, Jessica, Nutimik, Crowduck, Bird, Black, Gem, Beresford, Manigotogan, Wanipigow, Caribou, Siderock, Wallace, Aikens, Dogskin, and Family lakes, at Pointe du Bois, Otter Falls, Telford, near Belair, Grand Beach, north of Pine Falls, at Manigotogan, and throughout the northern part of the Agassiz Forest Reserve.

3.2.10 AMERICAN ASPEN BEETLE, Gonioctena americana (Schaeffer):- Populations of this leaf beetle increased and in most areas they were associated with those of the aspen leaf beetle. Light to moderate feeding on trembling aspen foliage occurred 11 miles west of Pointe du Bois, in the Brightstone area, at Julius, south of Manigotogan, near Telford, and at Caribou Lake. Light feeding damage was observed at Falcon, Caddy, Gull and Aikens lakes, at Pointe du Bois, west of Rennie, in the Agassiz and Belair Forest reserves, near Scanterbury and at the O'Hanley and Hole rivers.

3.2.11 THE GRAY WILLOW LEAF BEETLE, Galerucella decora Say:- There was little change in the status of this beetle. Moderate numbers of adults were recorded along the Bear River Road, at English Brook and Long Lake. Moderately high numbers of larvae were noted at Sasaginnigak Lake. Light skeletonizing of willow foliage occurred at all collection points. Low populations were recorded at Caddy, West Hawk, Crowduck, Wanipigow, Viking, Black, Moar and Elliot lakes, at Otter Falls, near Brightstone, Telford, north of Pine Falls and in the Agassiz Forest Reserve.

3.2.12 ASPEN BLOTCH MINER, Lithocolletis salicifoliella Chamb.:- There was a decrease in the occurrence of this blotch miner in aspen stands; collections were taken at only 15 widely scattered points compared to 35 in 1963. Moderate to severe infestations were observed on the foliage of reproduction trembling aspen over a small area along the Milner Ridge Road in the Agassiz Forest Reserve and in a similar small patch on the west shore of Shallow Lake. In addition light foliage damage occurred at Crowduck, Weaver, Moar and Elliot lakes, at Otter Falls, throughout the Belair Forest Reserve, north of Pine Falls and at Manigotogan.

3.2.13 THE BIRCH TUBE MAKER, Acrobasis betulella Hulst.:- Populations of this tube maker increased in 1964. Moderate to severe foliage damage occurred on young open growing white birch in a small area at Wallace Lake; moderate on several clumps of birch along the shore of Aikens Lake; and light to moderate at Moar Lake. Lower populations and light foliage damage occurred at Falcon, Beresford, Caddy, Crowduck, Black, Sasaginnigak, Eardley, Gunisao and Harrop lakes, in the Agassiz and Belair Forest reserves, at Scanterbury and near the O'Hanley River.

3.2.14 THE MOURNING-CLOAK BUTTERFLY, Nymphalis antiopa Linn.:- The larva of this insect is commonly called the spiny elm caterpillar and it caused moderate to severe defoliation of many willow clumps from the northeastern part of the Belair Forest Reserve eastward to Fort Alexander, from Pine Falls north to the O'Hanley River, and along roadsides north of Beausejour and at Falcon Lake. Planted white elm was moderately defoliated near the Hydro-dam at Powerview. Light defoliation occurred on willow at Harrop Lake and on Manitoba maple at Dencross. Very low populations were observed in the Caddy Lake area.

3.2.15 THE BIRCH SAWFLY, Arge pectoralis (Leach):- There was a slight increase in numbers of larvae of this sawfly, but defoliation was confined mainly to alder clumps growing along lake shores. Defoliation of alder was severe at Gem Lake and moderate at Garner and Elliot lakes and light feeding damage occurred at Shallow and Crowduck lakes.

3.2.16 THE STRIPED ALDER SAWFLY, Hemichroa crocea Fourc.:- Moderate infestation of this sawfly occurred on an occasional alder clump at Aikens and Sasaginnigak lakes. Light defoliation was noted at Crowduck, Manigotogan, Siderock, and Eardley lakes, north of Pine Falls, and near Big Creek in the Whiteshell Provincial Park. Feeding occurred mainly during the last two weeks in August.

3.2.17 A SAWFLY, Periclista albicollis (Nort.):- This sawfly caused light defoliation of bur oak at widely scattered points in the District throughout the early part of June. Highest populations were observed at Lone Island Lake, Pinawa Channel near the new townsite, Falcon Lake and in the Agassiz Forest Reserve. Lower populations were noted near Scanterbury, at Wanipigow Lake and in the Belair Forest Reserve.

3.2.18 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- There was a slight increase in larval numbers of this caterpillar. Chokecherry appeared to be the preferred host and was moderately to severely defoliated along No. 4 Highway 10 miles west of Rennie, and at Dencross, and Gull, Barren, and Lone Island lakes. Pincherry was moderately attacked near Jessica Lake. Defoliation ranging from light to severe occurred also in small areas of trembling aspen, willow, white birch, swamp birch, dogwood and gooseberry throughout the Whiteshell Forest Reserve, at Cat Lake, near Brokenhead and west of Pointe du Bois.

3.2.19 WESTERN TENT CATERPILLAR, Malacosoma pluviale (Dyar):- There was a notable increase in populations of this tent maker, particularly in the Manigotogan-Bissett area. Pincherry, chokecherry, willow and birch were moderately to severely attacked in small patches throughout the Whiteshell Forest Reserve, in the Bird-Cat lakes area, along the Bear River Road, from Manigotogan to Bissett, and in the Caribou, Long and Beresford lakes area.

3.2.20 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acleris hastiana Linn. (A leaf roller)	W	North of Pine Falls.	Low populations.
Acleris logiana Linn. (A leaf roller)	wB spAl	Harrop & Eardley lakes, Pine Falls.	Low populations; light damage.
Acrobasis rubrifasciella Pack. (Alder tube maker)	spAl	O'Hanley River, Bear River Road, Crowduck, Caddy, Manigotogan lakes, Berens River, Pine Falls, Belair.	Moderate to severe on occasional clumps. Light to moderate damage at all points.
Agrilus anxius Gory. (Bronze birch borer)	wB	Otter Falls.	Very low populations.
Altica populi Brown (Poplar flea beetle)	tA bPo	Otter Falls, Harrop Lake.	Very light damage.
Alsophila pometaria (Harr.) (Fall cankerworm)	bO wE mM	Agassiz Forest Reserve, Dencross, East Selkirk.	Low populations; light defoliation.
Amorbia humerosana Clem. (A needle tier)	bS	Caddy Lake.	Very low populations.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Throughout the District.	Common in most tamarack stands.
Aphids	All	Throughout the District.	Found in greater numbers this season.

3.2.20 OTHER NOTEWORTHY INSECTS (con't.):-

Insect	Host(s)	Locality	Remarks
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	ecCh	Agassiz and Belair forest reserves Pine Ridge, White Lake, Bird River, Vivian.	Populations unchanged from last season. Moderate to severe in small areas in the Belair and Agassiz forest reserves.
Arge clavicornis Fab. (A willow sawfly)	W wB spAl	Sasaginnigak, and Black lakes, Belair Forest Reserve.	Populations very low at all points sampled.
Argyrotaenia tabulana Free. (A pine tube moth)	jP	Sasaginnigak Lake.	Very light on one tree only.
Badebecia urticana Hbn. (A leaf roller)	W spAl tA Se caragana	Throughout the District.	Low populations and light feeding.
Bucculatrix canadensisella Cham. (Birch skeletonizer)	wB	Crowduck and Caddy lakes, north of Pine Falls and in the Belair Forest Reserve.	Heaviest populations north of Pine Falls and caused moderate damage; light at other points.
Calligrapha sp. (A leaf beetle)	spAl wB	Falcon, Beresford, Red Willow, Elliot, and Eardley lakes, and in the Belair Forest Reserve.	Highest populations on alder at Elliot Lake, and on birch at Falcon Lake. Light feeding at all points.
Cecidomya balsamicola Lintner (Balsam gall midge)	bF	Family, Harrop and Siderock lakes.	Needles lightly infested.
Chermes lariciatus (Patch.) (Pineapple gall aphid)	bS wS	Otter Falls, Aikens, Caddy and West Hawk lakes.	Very low population.
Choristoneura fumiferana (Clem.) (Spruce budworm)	wS bF	Victoria Beach, Hazel Creek, Manigotogan and Eardley lakes.	Low populations on white spruce at Victoria Beach and Hazel Creek and on balsam fir at the other points; a trace of defoliation.

3.2.20 OTHER NOTEWORTHY INSECTS (con't.):-

Insect	Host(s)	Locality	Remarks
Choristoneura rosaceana Harr. (Oblique-banded leaf roller)	W wB	Wanipigow, West Hawk and Family lakes.	Highest populations at West Hawk Lake. Very light damage to foliage.
Croesus latitarus Norton (Dusky birch sawfly)	wB spAl	Betula and White lakes.	Populations very low; light feeding damage.
Datana ministra (Drury) (Yellow-necked caterpillar)	wB	Eardley Lake.	Moderate to severe defoliation on six ½" d.b.h. trees. Elsewhere, a marked decrease.
Dimorphopteryx pinquis (Nort) (A sawfly)	wB	Elliot, Eardley, Black and Caddy lakes, O'Hanley River.	Light to moderate at several widely separated points.
Enargia decolor Wlk. (A noctuid)	tA	Victoria Beach, Libau, Telford and English Brook.	Populations decreased; no defoliation evident.
Epicauta fabricii (LeConte) (Ash gray blister beetle)	Caragana	Red Rock, Big Whiteshell and Falcon lakes.	Light defoliation of caragana at Falcon Lake; severe on wild pea at other points.
Epinotia solandriana Linn. (A leaf roller)	tA bPo	Otter Falls, Brightstone.	Populations very low.
Epizeuxis americalis Gn. (An owlet moth)	wS bS jP	Whiteshell Forest Reserve, Eardley, Dogskin and Gem lakes.	No evidence of feeding damage; low populations.
Erannis tiliaria (Harr.) (Linden looper)	bO mM	Dencross and Belair Forest Reserve.	Very low populations.
Eriophyes sp. (A mite)	gAs wB, W tA	Throughout the District.	Leaves lightly infested at widely scattered points.
Eriosoma americanum Riley (Woolly elm aphid)	wE	Dencross	Light infestation on one tree only.

3.2.20 OTHER NOTEWORTHY INSECTS (Con't.):-

Insect	Host(s)	Locality	Remarks
Eucosma gloriola Heinrich (A shoot moth)	jP	Wallace Lake, Pine Falls, Rennie.	Light at all points.
Eupithecia filimata Pears. (A looper)	wS bS bF	Throughout the District.	Highest populations at Caddy Lake; no evidence of feeding damage.
Fenusa dohrnii (Tischbein) (European alder leaf miner)	spAl	Harrop Lake, north of Pine Falls and the Belair Forest Reserve.	A slight increase in populations; light foliage damage at all collection points.
Feralia jocosa Gn. (Green-striped spruce caterpillar)	wS bS bF jP	Widely scattered points in the District.	Very low population.
Galerucella cavicollis Lec. (A leaf beetle)	pCh	Family Lake.	Adults numerous; light defoliation.
Gracillarid sp. (A blotch miner)	bO W wB tA bPo	Throughout the District.	Foliage lightly infested at all collection points.
Griselda radicana Wlshm. (A leaf roller)	wS	West Hawk, Bird, Manigotogan and Family lakes.	Populations very low.
Halisidota maculata (Harr.) (Spotted tussock moth)	spAl W bO	Throughout the District.	Light defoliation; highest populations on alder at Eardley Lake.
Hylobius pinicola (Couper) (A root collar weevil)	bS bF	Otter Falls, Fort Alexander, Dogskin, and Elliot lakes.	Low populations.
Hylurgopinus rufipes (Eichhoff.) (Native elm bark beetle)	wE	Traverse Bay, Bear River Road, Seven Sisters Falls.	Larvae, pupae and adults found at all collection points.

3.2.20 OTHER NOTEWORTHY INSECTS (Con't):-

Insect	Host(s)	Locality	Remarks
Hyphantria cunea (Drury) (Spotless fall webworm)	spAl W gAs wE ecCh pCh	Agassiz Forest Reserve, Pine Falls, Otter Falls, Falcon and Manigotogan lakes, and the Belair Forest Reserve.	A slight decrease in populations; light to moderate defoliation on the occasional bush.
Incisalia niphon clarki Freem. (Jack-pine hairstreak)	jP	Most jack pine stands throughout the District	Low populations.
Itame loricaria Evers. (A looper)	tA W	Throughout the District.	Low populations and very light defoliation.
Lambdina fiscillaria fiscillaria Gn. (Hemlock looper)	bF wB	Sasaginnigak and Harrop lakes.	No defoliation evident.
Lithophane amanda Sm. (An owlet moth)	wB tA spAl	Throughout the District.	Appeared in 17 collections: light defoliation at all points.
Macremphytus varianus (Nort.) (A sawfly)	aDo	North of Pine Falls and near Big Creek in the Whiteshell.	Light defoliation at both points.
Malacosoma americanum (Fab.) (Eastern tent caterpillar)	ecCh tA	Belair and Agassiz Forest reserves, Catfish Creek, East Selkirk and Scanterbury.	Severe defoliation of an occasional choke-cherry bush; light on aspen near Scanterbury.
Nematus limbatus Cress. (A sawfly)	W	Throughout the District.	Light feeding damage at all collection points.
Nycteola frigidana Wlk. (An owlet moth)	W wB	Throughout the District.	Highest populations noted at Siderock Lake; light in other areas.
Oberi schaumi Lec. (A poplar twig borer)	tA	Siderock Lake.	Very low populations.

3.2.20 OTHER NOTEWORTHY INSECTS (Con't.):-

Insect	Host(s)	Locality	Remarks
Oligonychus ununguis (Jacot) (Spruce spider mite)	wS	Victoria Beach.	Light to moderate on a few 6" d.b.h. trees.
Operophtera bruceata (Hulst.) (Bruce spanworm)	W tA gAs	Throughout the District.	Populations very low.
Orsodacne atra Ahr. (A leaf beetle)	bPo tA W aDo	Widely scattered points in the District.	Light defoliation.
Orthosia hibisci Gn. (A fruit-worm)	tA wB W spAl	Throughout the District.	Low populations; no evidence of defoliation.
Paleacrita vernata (Peck.) (Spring cankerworm)	wE mM	Dencross and East Selkirk.	Associated with the fall canke rworm; light defoliation.
Pandemis canadana Kft. (A leaf roller)	W tA wB	Throughout the District.	Low populations.
Parorgyia plagiata Wlk. (Grey spruce tussock moth)	wS bS bF jP	Throughout the forested areas of the District.	Highest populations at Manigotogan Lake, but no feeding damage noted.
Parorgyia vagans B. & McD. (A tussock moth)	W tA wB bPo	Whiteshell Forest Reserve, Wallace and Moar lakes.	Very low populations.
Petrova albicapitana Busck. (Pitch nodule maker)	jP	West of Pine Falls, east of Pointe du Bois, and at Gunisao Lake.	Populations low; only an occasional nodule found.
Phratora americana canadensis Brown (A leaf beetle)	W bPo tA	At widely scattered points.	Adults feeding in low numbers from mid-June to mid-July.

3.2.20 OTHER NOTEWORTHY INSECTS (Con't.):-

Insect	Host(s)	Locality	Remarks
Phyllocnistis populiella Cham. (A leaf miner)	tA bPo	Agassiz Forest Reserve, Caddy, West Hawk and Sasaginnigak lakes.	Leaves lightly infested at all points.
Physokermes piceae (Schrank) (Spruce bud scale)	wS bS	Throughout the forested areas.	Low populations.
Pikonema dimmockii (Cresson) (Green-headed spruce sawfly)	wS bS	Throughout the District.	Highest populations at Siderock Lake with light defoliation on an occasional branch; light feeding at all other collection points.
Pissodes strobi (Peck) (White-pine weevil)	jP rP bS	Pointe du Bois, Agassiz Forest Reserve, Bird and Caddy lakes.	Dead leaders on occasional trees.
Pissodes terminalis Hopping (Lodge pole terminal weevil)	jP	6 miles east of Rennie.	Twigs lightly infested.
Pristiphora sycophanta Walsh. (A sawfly)	W	North of Pine Falls and in the Belair Forest Reserve.	Low populations and light defoliation.
Proteoteras willingana (Kearfott) (Boxelder twig borer)	mM gAs	Dencross and Lone Island Lake.	Very low populations.
Protoboarmia porcelaria Gn. (Dotted line looper)	wS bS bF jP	Throughout the District.	Common in the forested areas.
Pseudexentera improbana oregonana Wlshm. (A leaf roller)	tA	Pinawa Road 2 miles north of Seven Sisters Falls.	Light foliage damage.
Saperda calcarata Say (A poplar borer)	tA	Otter Falls	Light infestation.

3.2.20 OTHER NOTEWORTHY INSECTS (Concl.):-

Insect	Host(s)	Locality	Remarks
Saperda concolor Lec. (A long-horned wood borer)	tA W	Bird Lake and Bissett.	Low populations; an occasional tree infested.
Sciaphila duplex Wlshm. (A poplar leaf roller)	tA	Throughout the Agassiz Forest Reserve, Caddy Lake and Brightstone.	Very light damage to aspen foliage.
Semiothisa bicolorata Fafr. (A looper)	jP	Bird River.	Very low populations.
Semiothisa granitata Gn. (A looper)	bF bS	Throughout the District.	Most common on black spruce.
Semiothisa sexmaculata Pack (A looper)	tL	Throughout the District.	Common in all tamarack stands.
Toumeyella numismaticum (Pettit & McDaniel) (Pine tortoise scale)	jP	Belair Forest Reserve, Telford.	Moderate to severe infestation on an occasional small tree.
Trichiosoma triangulum Kby. (A sawfly)	wB W spAl	Throughout the District.	Light infestation at widely scattered points.
Tetralopha asperatella Clem. (A webworm)	tA bO W wB	Throughout the District.	Moderate populations on an occasional aspen tree at Harrop and Crowduck lakes.
Tetralopha robustella Zeller. (Pine webworm)	jP	Crowduck and Betula lakes, Agassiz Forest Reserve, McArthur Falls and Rennie.	Low populations, only an occasional tree attacked.
Vasates quadripedes (Shimer) (Maple bladder-gall mite)	M	Lac du Bonnet.	Moderate to severe infestation on a few planted maple.
Zale duplicata largera Sm. (An owlet moth)	jP	Throughout the District.	Common in most jack pine stands.

3.3 TREE DISEASE CONDITIONS

3.3.1 WESTERN GALL RUST, Peridermium harknessii J. P. Moore:- The status of this globose gall rust remained unchanged. Moderate to severe infection occurred on several jack pine trees 5 miles south of Cat Lake and in the Belair Forest Reserve 4 miles north of Stead. Light to moderate infections were recorded at Caddy, Big Whiteshell, Long and Caribou lakes, along the Bear River Road, in the Agassiz Forest Reserve and at Bird, Crowduck, Beresford, Siderock, and Gunisao lakes. These infections resulted in branch mortality on occasional trees.

3.3.2 SPRUCE NEEDLE RUST, Chrysomyxa spp.:- There was a slight increase in the occurrence of this rust in 1964. Black spruce was more heavily attacked than white spruce. White spruce was lightly to moderately infected over a small area in the Agassiz Forest Reserve, and at Falcon and Garner lakes. Black spruce was moderately to severely infected in the Cat Lake-Bird Lake area, east of Pointe du Bois, in the Agassiz Forest Reserve, 9 miles north of Pine Falls, at Fort Alexander, and at Wallace Lake. Light infection occurred in black spruce stands at Bird River, Manigotogan, Wallace Lake, Fort Alexander, Telford, Falcon Lake and Garner Lake.

3.3.3 A NEEDLE RUST ON JACK PINE, Coleosporium asterum (Diet.) Syd.:- Moderate to severe rust infections occurred on several 1" d.b.h. jack pine along the Manitoba-Ontario border at No. 4 Highway and 2" d.b.h. trees at Caddy Lake. An occasional branch on larger trees was very lightly attacked. Light infection was noted scattered throughout jack pine stands along the Bear River Road.

3.3.4 REDDENING OF JACK PINE FOLIAGE:- Reddening of the foliage of jack pine occurred at several points in the District. The area most severely affected was 9½ miles west of Pointe du Bois along the Lac du Bonnet to Pointe du Bois road and involved about 1 square mile. Jack pine reproduction over a few acres within this area showed 40 percent of the ½ to 1 inch d.b.h. trees completely red and about 20 percent with from ¼ to ½ of their foliage red. About 1 acre of jack pine ½ mile west of Pointe du Bois was also severely affected. Aerial survey indicated reddening was general throughout the area from Lac du Bois to Keys Lake. This reddening of jack pine foliage also occurred along the south shore of Dorothy Lake and just north of Nutimik Lake, in the Falcon-West Hawk lakes area, at Crowduck and Gem lakes. Degree of reddening ranged from entire trees to the occasional branch on about 10 percent of the jack pine. Cause of this condition has not been determined, no adverse insect or disease conditions were evident. Possible drought and/or physiological conditions were responsible.

The outer bark of mature jack pine along the east side of Lake Brereton and west of Wallace Lake was noted peeling off causing the stems to look quite light in color. This peeling was moderate on an occasional tree and light on most. Cause of this condition is unknown.

3.3.5 WHITE-PINE BLISTER RUST, Cronartium ribicola Fischer:- Flagging was evident on most white pine in the area along the north shore of Falcon Lake, near Barren Lake and along the east side of Barren Lake. Samples submitted indicated possible infection by the white-pine blister rust, but squirrel damage was so extensive that positive identification was impossible. Flagging also occurred on scattered white pine along the south shore of Falcon Lake. Flagging typical of white-pine blister rust was also encountered along the south-east part of West Hawk Lake late in the season, but further surveys are required throughout this area to positively establish the presence of this disease.

3.3.6 MACROPHOMA GALL OF POPLARS, Macrophoma tumefaciens Shear:- Surveys to determine the distribution of Macrophoma gall on poplars were continued and trembling aspen was found lightly infected at the following points: Betula, Crowduck, Bird, Wallace, Wanipigow and Moar lakes, Seven Sisters Falls, Pine Falls, along the Bear River Road and at Hole River. Light infection continued on trembling aspen at Manigotogan and Viking lakes.

3.3.7 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- A survey to determine the distribution and severity of 2,4-D damage to Manitoba maple was continued. Field crop spraying throughout the Eastern District was reduced this season due to sub-normal spring weather conditions. Results of the survey are shown in the following table:

TABLE 2

2,4-D Injury to Manitoba Maple
Eastern District of Manitoba - 1964

Place Examined	Date Sampled	Degree of Injury	Remarks
2 miles south of East Selkirk, sec. 17, tp. 13, rge. 5 E. P. mer.	June 8	Part of both sides of the tree damaged.	Possible spray damage.
5.1 miles west of Beausejour, sec. 7, tp. 13, rge. 7, E. P. mer.	July 6	Nil	No damaged foliage found.

TABLE 2 (concl.)

Place Examined	Date Sampled	Degree of Injury	Remarks
3 miles east of Whitemouth sec. 29, tp. 11, rge. 12, E. P. mer.	July 6	Nil	No damaged foliage found.
2 miles south of Ladywood, sec. 1, tp. 14, rge. 7, E. P. mer.	Aug. 11	Nil	No damaged foliage found.
½ mile north of Dencross, sec. 6, tp. 15, rge. 8, E. P. mer.	Aug. 11	Nil	No damaged foliage found.

3.3.8 A LEAF SPOT ON BIRCH:- Foliage of white birch was severely infected with an unknown leaf spot at Otter Falls, Lake Brereton and at Wallace Lake. Light infection was noted at several points throughout the Whiteshell Forest Reserve and near Pine Falls.

Swamp birch was severely attacked by an unknown leaf blight in the Point du Bois area.

3.3.9 A LEAF SPOT ON ASPEN:- A leaf spot on the petioles of trembling aspen leaves occurred throughout stands at Hole River, Bird Lake, the Agassiz Forest Reserve, near Whitemouth and Rennie and along the Pinawa Channel. Infection was severe on occasional trees and light on most trees.

3.3.10 FROST DAMAGE:- Killing frosts occurred in Eastern Manitoba for seven consecutive nights from May 25 to June 1 and for the following two weeks foliage damage was very conspicuous, particularly in the southern sections of the District. Bur oak, ash and balsam fir were the species hardest hit. Degree of damage ranged from light to severe at widely scattered points and only trees near large bodies of water or under heavy canopies were spared. Manitoba maple, elm, birch, alder, trembling aspen and spruce were less severely hit and damage generally ranged from a trace to moderate, however the occasional maple and elm were severely damaged. Most trees recovered rapidly and refoliation was good. Caragana blossoms were lightly damaged in the Kirkness area, as was serviceberry in the Belair Forest Reserve. The new shoots of tamarack were lightly damaged in the Pine Falls and Caddy Lake areas. Frost was less severe in the Manigotogan-Bissett areas and north than in the southern part of the District.

3.3.11 WIND DAMAGE:- Wind damage to forest stands occurred at three locations. Near Darwin, an area of from 15 to 20 acres of aspen mixed with balsam poplar, spruce and jack pine was completely flattened. Severe damage also occurred over about 5 acres in a mixed stand of balsam poplar, spruce and balsam fir 2 miles west of Bird Lake on the Bird River and over a similar stand of 8 to 10 acres 5 miles south of Cat Lake.

3.3.12 OTHER NOTEWORTHY DISEASES:-

Disease and Organism	Host(s)	Locality	Remarks
Coleosporium asterum (Diet) Syd. (A pine needle rust)	jP	Manitoba-Ontario border on #4 highway.	Moderate to severe infection on several small trees.
Cytospora chrysosperma (Pers.) Fr. (Cytospora canker)	tA	Aikens Lake.	Moderate infection on several small partially dead trembling aspen.
Dibotryon morbosum (Schw.) Theiss. & Syd. (Black knot of cherry)	ecCh pCh	Throughout the District.	Heavy infection on chokecherry at Victoria Beach and in the Belair Forest Reserve and on pincherry at Beresford Lake.
Fomes igniarius (L.) Gill. (A canker of aspen)	tA	Bear River Road.	Light on one tree.
Fomes pinicola (Swartz) Cke. (Red belt fungus)	wS	Eardley Lake, Pine Falls.	Common on living trees at Eardley Lake, and on slash at Pine Falls.
Hypodermella sp. (A needle cast)	bF	Eardley Lake.	Light infection on several trees on a small island.
Hypoxylon pruinatum (Klotsche) Cke. (Hypoxylon canker)	tA	Sasaginnigak Lake, Pointe du Bois and East Selkirk.	Light infection on scattered trees.
Lenzites saepiaria (Wulf) Fr. (A slash fungus)	wS	9 miles north of Pine Falls.	Common on windthrown trees.

3.3.12 OTHER NOTEWORTHY DISEASES (concl.):-

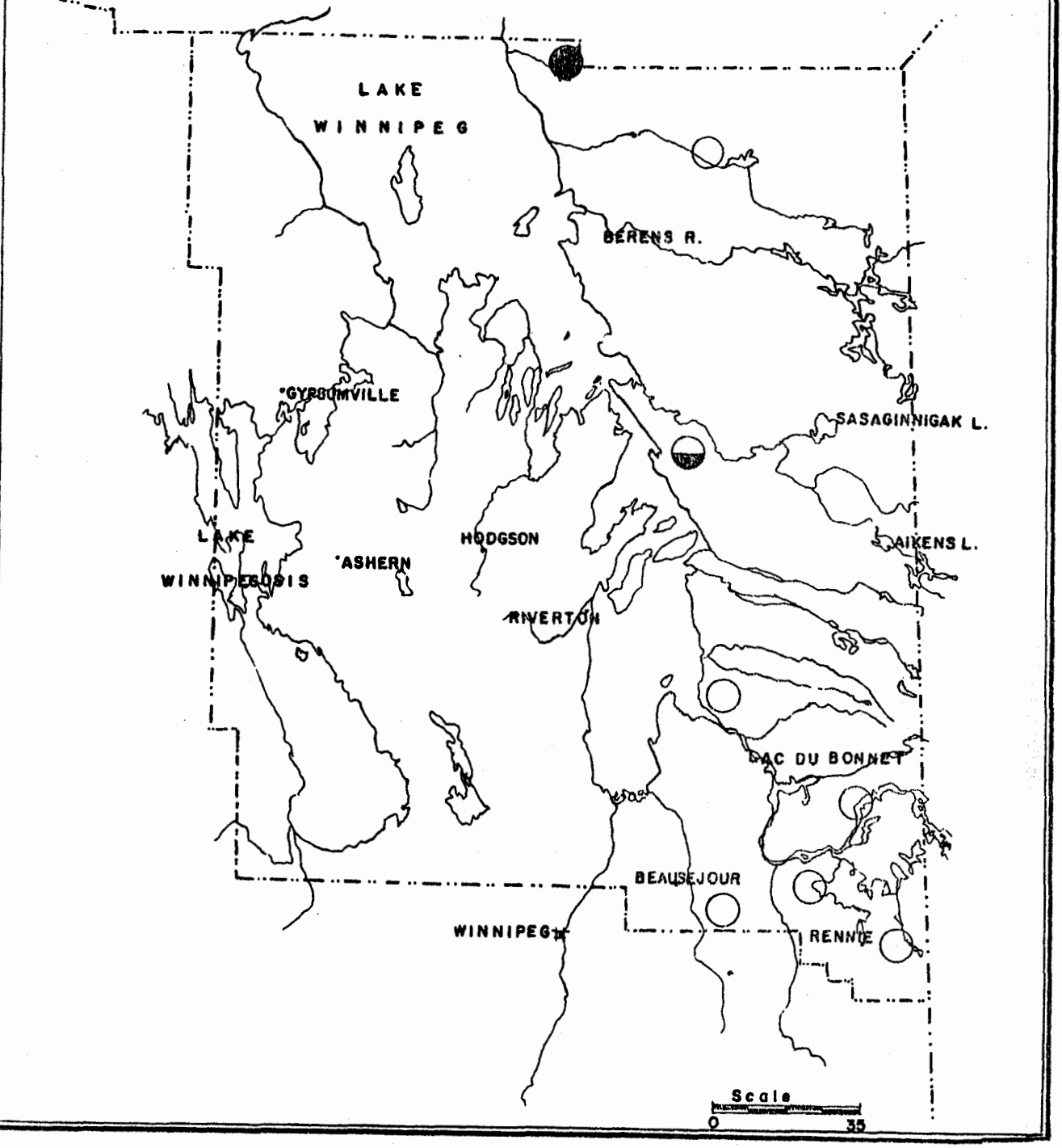
Disease and Organism	Host(s)	Locality	Remarks
Linospora tetraspora Thomp. (A leaf blight of balsam poplar)	bPo	Wallace and Long lakes.	Foliage of 2" d.b.h. and smaller trees severely infected over small areas.
Marssonina sp. (A leaf and twig blight)	tA	Moar Lake.	Infection light on several branches on 3 trees; mainly in lower crowns.
Melampsora sp. (A needle rust)	tL	Betula Lake.	Light on the occasional branches.
Needle cast on balsam fir	bF	Sasaginnigak and Harrop lakes.	Light infection. Macrophoma sp. present on needles at Sasaginnigak Lake.
Peridermium stalactiforme A. & K. (Stalactiforme rust)	jP	Agassiz Forest Reserve and near Belair.	Light attack on one tree at each collection point.
Rhytisma salicinum Pers. ex Fr. (Tar spot on willow)	W	Dogskin Lake.	Light to moderate infection of most willow clumps.
Stereum sp. (A slash fungus)	mM	Traverse Bay.	Common on windthrown maple.

EASTERN DISTRICT MANITOBA

LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Severe ◒ Moderate ○ Light

Fig. 1



EASTERN DISTRICT

MANITOBA

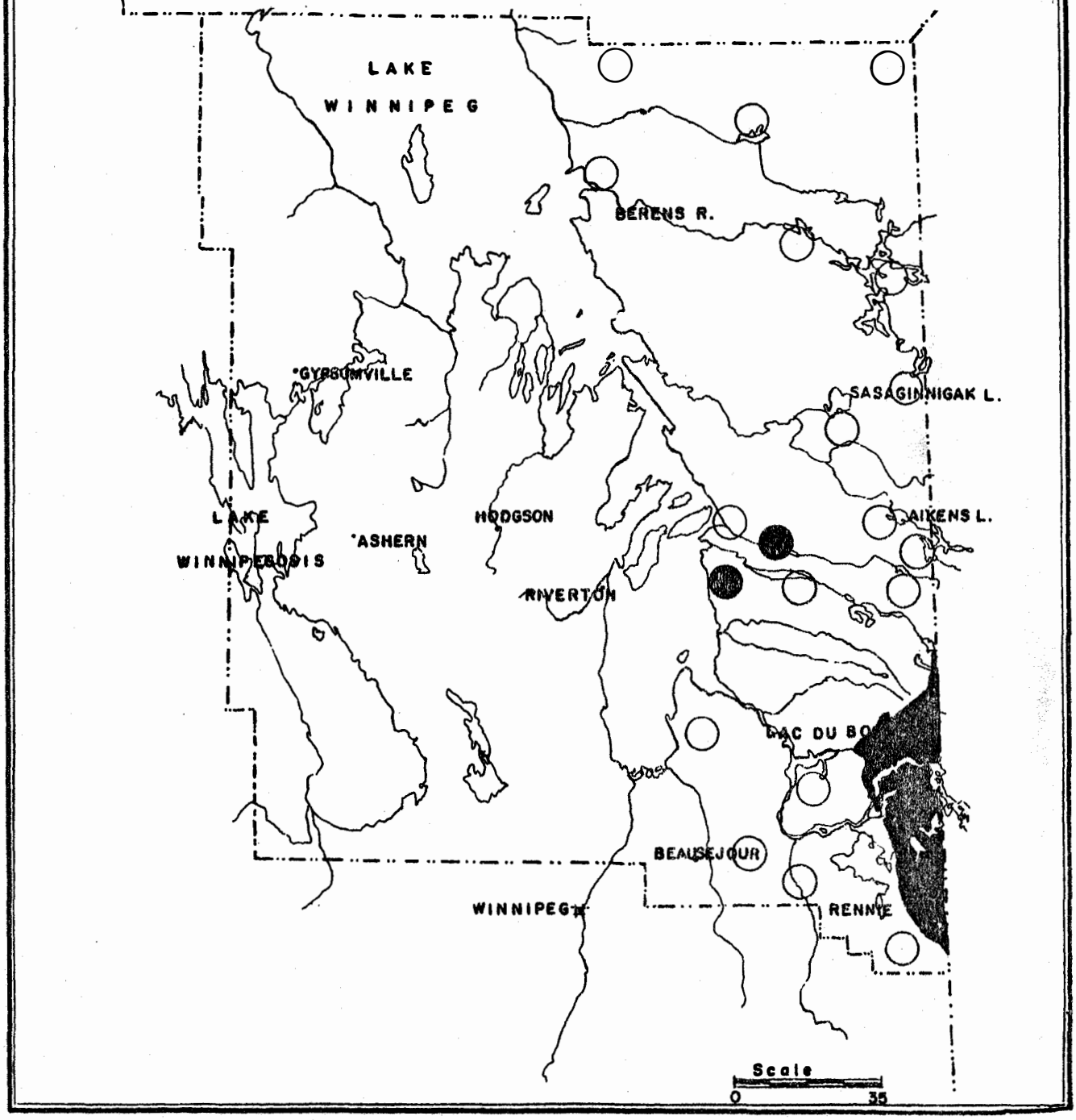
FOREST TENT CATERPILLAR INFESTATIONS
1964

Areas of Continuous Moderate to Severe Defoliation.

Patches of Moderate to Severe Defoliation.

Larval Collection Points - No Noticeable Defoliation.

Fig. 2



4. ANNUAL REPORT

INTERLAKE SECTION
OF THE EASTERN DISTRICT OF MANITOBA

1964

by

G. N. Still

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

4.1 INTRODUCTION

This report deals with forest insect and disease conditions throughout the Interlake section of Manitoba. Surveys were carried out from mid-May to early October and 671 insect and 46 disease collections were submitted. In addition to general sampling and special collections, the following survey projects were carried out: forest tent caterpillar egg band counts to forecast population and infestation trends; larch sawfly cocoon collections using the larval-drop tray method to determine the incidence of parasites and diseases; special collections and rearings to determine the dispersal of the parasite Holocremnus sp. nr. nemoratum from central release points; and sequential sampling of larch sawfly eggs for estimates of population density.

Six hours and 25 minutes of chartered flying were used for aerial reconnaissance of inaccessible areas and mapping infestations of the forest tent caterpillar, jack-pine budworm, and larch sawfly. The co-operation and assistance received from personnel of the Renewable Resources Branch, Department of Mines and Natural Resources is gratefully acknowledged.

The larch sawfly was the most widely distributed forest insect and defoliation of tamarack increased slightly in some areas. The jack-pine budworm infestations north of Gypsumville and in the Rosenberg area increased notably. There was an increase in the forest tent caterpillar infestation in the Lake St. George area, and populations of the aspen leaf beetle remained widespread but decreased in intensity in some areas. The spring and fall cankerworms caused moderate to severe defoliation of elm and Manitoba maple in the Selkirk area and in patches along the Red River.

Late spring frosts caused considerable damage to the foliage of trees, particularly that of bur oak, ash, spruce, and balsam fir. The use of 2,4-D for weed control in field crops caused scattered light damage to shelterbelts in agricultural areas. Light infections of Macrophoma gall of poplars were widely distributed throughout the district and a fairly extensive infection of jack pine by gall rusts occurred in the Grand Rapids area.

4.2 INSECT CONDITIONS

4.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- There were slight increases in populations and distribution of this sawfly in 1964 (Fig. 1). Also, the larvae developed faster than usual and by mid-August most of them had dropped to the ground and spun cocoons.

Small patches of moderate to severe defoliation of tamarack occurred along the east and north shores of Anderson Lake (tp. 36, rge. 6, W.P. mer.), along the Warpath River (tp. 37, rges. 7-8, W.P. mer.), along the south and west shores of Sisib Lake, on the boundary of tps. 33 and 34, rge. 11, W.P. mer., and at the south ends of Kawinaw and Katimik Lakes. In the Washow Bay area from the junction of the Hodgson and Pine Dock roads northward approximately eight miles and westward approximately eight miles and on Hecla Island, defoliation was light to moderate. Elsewhere in the District only occasional scattered tamarack were lightly defoliated.

Sequential sampling of egg populations in the permanent plot at Riverton produced negative results because none of the fifty current shoots of tamarack examined were utilized.

A total of 461 cocoons were collected at the Riverton plot using the drop-tray method and were subsequently examined to determine the incidence of parasites and disease. Examination of the cocoons indicated that 9 per cent had been destroyed by fall emergence of Bessa harveyi (T.T.) and 2 per cent by disease organisms. A representative number dissected indicated that effective parasitism of the larvae within the cocoons was 23 per cent by B. harveyi and 2 per cent by Mesoleius tenthredinis Morley.

4.2.2 JACK-PINE BUDWORM, Choristoneura pinus Free:- The infestations in the Rosenberg area, and between Gypsumville and Grand Rapids, expanded and increased in severity. The largest infestation, within which defoliation was moderate to severe, covered approximately 265 square miles in tps. 35 to 39, rges. 10 to 13, W.P. mer. (Fig. 2). Stands of jack pine in this area are not continuous but consist of clumps of trees within an old burn. Patches of moderate to severe defoliation also occurred within: approximately two square miles in tp. 33, rge. 10, W.P. mer.; five square miles in tp. 34, rge. 10, W.P. mer.; 20 square miles in tps. 35 and 36, rges. 9 and 10, W.P. mer.; and 15 square miles in the Devils Lake area.

Notable increases also occurred north of Rosenberg (in the vicinity of the fire tower) where defoliation was generally light to moderate but severe on occasional trees throughout about 18 square miles of jack-pine stands.

4.2.3 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Larvae were common in spruce stands throughout the Interlake Section. Moderate to severe defoliation of young planted spruce was recorded at the Beaver Creek Ranger Station, but part of it was caused by the balsam fir sawfly, Neodiprion abietis. Light to moderate defoliation of occasional spruce reproduction occurred in the Gypsumville area, 14 miles east of Hodgson, and in the Lake St. George area. Elsewhere, defoliation was negligible or very light and scattered.

4.2.4 BALSAM FIR SAWFLY, Neodiprion abietis complex:- Populations increased and light to moderate defoliation of individual white and black spruce occurred between Washow Bay and Beaver Creek, and in the Lake St. George area. Light defoliation of scattered spruce was also recorded at Hodgson, Mantagao Lake, Pine Dock, Malonton, six miles west of Poplarfield, and at Grand Rapids.

4.2.5 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Although collections were taken at eight scattered locations throughout the District, populations remained low and defoliation of balsam fir and spruce ranged from only a trace to light. Collection points were St. Clements, Sandy Hook, Riverton, Beaver Creek, Arborg, Chatfield, Gypsumville and Easterville.

4.2.6 PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- Light to moderate infestations were recorded on jack pine in the Broad Valley area, and seven miles north of Fairford; on native spruce at Fisher Branch, 25 miles north of Gypsumville, Poplarfield, and Whiteway Point; and on planted spruce at St. Clements.

4.2.7 SAWFLIES ON JACK PINE, Neodiprion spp.:- Collections of Neodiprion sawflies were taken at more widely separated points than in 1963. Colonies of N. virginianus complex caused light defoliation to scattered individual jack pine trees 14 miles east of Hodgson, on Black Island, in the Ketimik Lake area, at Calders Dock, and in the vicinity of the mouth of the Rice River. N. maurus Roh. was recorded nine miles south of the Lake St. George fire tower where one tree was lightly defoliated.

4.2.8 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- The infestation in the Lake St. George area increased and now extends north from Goldeye Lake in the south through tps. 30 to 33, rge. 1 E.P. mer. It is bordered on the west by Lake St. Patrick and on the east by the Jackhead River and Lake Winnipeg (Fig. 3). Defoliation was generally severe with patches of moderate at the extreme north and south ends of the area.

The infestation on Black Island decreased considerably from last year and only scattered patches of severe defoliation remained.

Moderate to severe defoliation also occurred between Pickerel, Soul and Sissib Lakes, and in patches on the neck of land between Washow Bay and Fisher Bay, and southwest of Wicked Point.

Occasional larvae were collected at scattered points elsewhere in the section, but defoliation was generally very light to nil.

Egg band surveys were carried out at predetermined sampling points to predict the extent and severity of defoliation in 1965 and the results are shown in the following table.

TABLE 1

Forest Tent Caterpillar Egg-Band Surveys
Interlake Section of Manitoba-1964

(based on examination of 3 co-dominant trembling aspen at each sampling point)

Location	Av. d.b.h. of trees (ins.)	Av. ht. of trees (ft.)	Av. crown depth (ft.)	Av. No. of egg-bands per tree	Defoliation forecast for 1965
Gimli	2.0	22	14	1.7	Light
Jackhead Harbor	3.5	32	18	10.0	Severe
Grand Rapids	3.8	34	18	1.7	Light
Grand Rapids	3.3	34	18	2.7	Light
Gypsumville	3.3	30	16	1.3	Light
Lake St. George	2.9	36	18	14.3	Severe
Lake St. George	5.7	40	25	69.3	Severe
Arborg	6.0	30	15	0.3	Light
Dallas	2.8	23	16	1.0	Light
Hodgson	3.7	26	19	1.3	Light
Riverton	2.3	22	14	5.3	Moderate
Beaver Creek	1.4	20	13	4.3	Severe
Riverton	1.6	21	14	1.7	Light
Calders Dock	2.2	27	19	5.7	Severe
Grosse Isle	2.5	19	15	0	Nil
St. Laurent	3.2	27	18	0	Nil
Eriksdale	3.3	24	20	0	Nil
Devils Lake	2.8	26	16	0	Nil
Moosehorn	2.5	23	16	0.3	Light
Ashern	2.4	19	14	0	Nil
Poplarfield	2.2	23	15	0	Nil
Inwood	2.3	19	11	0	Nil
Winnipeg Beach	2.7	25	16	1.0	Light
Whiteway Point	2.4	29	14	0.7	Light
Hecla Island	3.3	21	14	6.0	Moderate
Lake St. George	3.8	27	13	5.3	Moderate
Lake St. George	4.2	35	21	15.7	Severe

4.2.9 SPRING AND FALL CANKERWORMS, Paleacrita vernata (Peck) and Alsophila pometaria (Harris):- High populations of the spring cankerworm associated with the fall cankerworm caused severe defoliation of white elm and light to moderate defoliation of Manitoba maple, ash and willow in Selkirk Park. In addition, patches of moderate to severe defoliation occurred along the Red River and light defoliation was noted at Pigeon Lake. Elsewhere, collections of fall cankerworms were taken from elm, maple, ash, oak, chokecherry, and cottonwood at scattered locations throughout the southern section of the District as far north as Steeprock where light defoliation was common on elm.

4.2.10 FALL WEBWORM, Hyphantria cunea (Drury):- The highest populations of this webworm occurred west of Lake Winnipeg between Washow Bay and Whiteway Point, in the vicinity of Lake St. George, and on Hecla and Black islands where light to moderate, and occasionally severe, webbing and defoliation of individual trees was common. Most deciduous tree species were attacked but willow and white birch reproduction appeared to be the preferred hosts.

Occasional patches of light webbing and defoliation of individual trees occurred on white elm and Manitoba maple between Selkirk and Lockport, and on widely scattered willow clumps between Moosehorn and Devils Lake.

4.2.11 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- Tents were common at widely scattered points on Saskatoon, rose, and chokecherry. Defoliation was light to moderate, and occasionally severe on individual trees or shrubs eight to 10 miles west of Hodgson, near Eriksdale, south of Camper, and in the Inwood area.

4.2.12 MOURNING-CLOAK BUTTERFLY, Nymphalis antiopa L.:- Light to severe defoliation of scattered, individual willow clumps occurred between Washow Bay and Beaver Creek and on Hecla Island. Light to moderate defoliation of willow and occasionally of white birch and balsam poplar trees was also noted in the Rosenberg and Lake St. George areas.

4.2.13 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Although this leaf skeletonizer was again very common on trembling aspen and, to a lesser degree, on balsam poplar throughout the Section, most infestations were generally light and resultant damage to foliage was not as serious as in 1963. However, patches of light to moderate skeletonizing of poplar reproduction were commonly found at widely scattered locations.

4.2.14 A FLEA BEETLE, Altica populi Brown:- Moderate to severe skeletonizing of alder foliage occurred in patches between miles 20 and 26 of the Calders Dock Road north of Riverton. Patches of light leaf skeletonizing of alder, balsam poplar (most extensive on reproduction), and occasionally trembling aspen were common from Washow Bay north to Pine Dock, six miles west of Arborg, eight miles west of Poplarfield, and south of Grand Rapids.

4.2.15 BIRCH TUBE-MAKER, Acrobasis betulella Hulst.:- This tube-maker caused light to moderate damage to the foliage of birch, (particularly reproduction), in the Lake St. George area, from Washow Bay to Pine Dock and Calders Dock, and on Hecla and Black islands. Other collections were taken between Gypsumville and Fairford but damage was very light and occurred only on individual trees at scattered locations.

4.2.16 LEAF ROLLERS ON TREMBLING ASPEN:- Although leaf rollers caused only light leaf damage, they were common throughout the District. Fourteen different species were collected; the most common, in order of abundance, were: Tortricid sp., Sciaphila duplex Wlshm., Pandemis canadana Kft., Acleris sp., Epinotia sp., Badebecia urticana Hbn., Acleris logiana Linn., Choristoneura rosaceana Harr., and Pseudexentera oregonana Wlshm.

4.2.17 OTHER NOTEWORTHY INSECTS:-

Insect Species	Host(s)	Locality	Remarks
Acleris variana Fern. (Black-headed budworm)	wS bS bF	Interlake Section.	Common throughout; highest populations and light defoliation at Camp Morton, Hodgson, Lake Mantagao, Gypsumville and Pine Dock.
Acrobasis rubrifasciella Pack. (Alder tube-maker)	Al	Pine Dock, Washow Bay to Beaver Creek.	Light to moderate damage to occasional alder in the Pine Dock area. Scattered light damage between Washow Bay and Beaver Creek.
Acronicta Spp. (Dagger moths)	W wB tA Al	Between Washow Bay and Whiteway Point and Fairford and Grand Rapids.	A. americana Harr., A. dactylina Grt., A. fragilis Gn., A. grisea Wlk., A. innotata Gn., A. leporina Linn., A. lepusculina Gn. and A. quadrata Grt. were all common in an area between Washow Bay and Whiteway Point and on Hecla, Black and Punk Islands

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
(con't)			
Acronicta Spp.			but populations were low and defoliation negligible. A. dactylina Grt. and A. fragilis Gn. were collected between Fairford and Grand Rapids but there was no appreciable damage.
Actias luna (Linn.) (Luna moth)	W tA wB	Calders Dock, Hecla, Black and Punk islands, Grand Rapids.	No appreciable damage.
Adelges lariciatus (Patch) (Pineapple gall aphid)	wS bS	Interlake Section.	Light gall infestations in scattered areas.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Interlake Section.	Common on tamarack; no appreciable defoliation.
Archips cerasivoranus (Fitch.) (Ugly-nest caterpillar)	cCh	Northern part of Interlake Section.	Scattered nests; light to moderate defoliation of individual chokecherry was common as far south as Lundar, Chatfield and Riverton.
Archips fervidana Clem. (Oak ugly-nest caterpillar)	bO	Gunton, Netley, Ashern, Rosenberg and Hodgson.	Nests most common on bur oak reproduction. Occasional light to moderate defoliation of scattered individual trees.
Arge pectoralis (Leach) (Birch sawfly)	wB Al	Hecla, Black and Punk islands, Washow Bay and Katimik Lake.	Very light, localized defoliation.
Argyrotaenia tabulana Free. (A pine tube moth)	jP	Grand Rapids.	Very light damage to individual trees four miles south of Grand Rapids.

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
Bucculatrix canadensisella Chambers (Birch skeletonizer)	wB	West of Lake Winnipeg, from Washow Bay to Lake St. George. On Hecla, Black and Punk islands.	Scattered light sleketonizing common.
Cecidomyia balsamicola Lintner (Balsam gall midge)	bF	Jackfish Point and Whiteway Point.	Very light infested needles of scattered balsam fir in both areas.
Chermes cooleyi Gillette (Cooley spruce gall aphid)	wS	Fisher Branch, Moosehorn, and Katimik Lake.	Light infestations on scattered trees.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	tA	Malonton.	Light, localized defoliation.
Cimbex americana Leach (Elm sawfly)	W wB Al	Between Washow Bay and Pine Dock, on Hecla Island and at Teulon.	Six collections taken; defoliation light and scattered.
Datana ministra (Drury) (Yellow-necked caterpillar)	wB Haw Se	Calders Dock, and Inwood.	Occasional moderate to severe defoliation of hawthorn and saskatoon four to seven miles east of Inwood. Very light defoliation of white birch reproduction at Calders Dock.
Enargia decolor Wlk. (An owlet moth)	tA	Interlake Section.	Larvae common but defoliation not noticeable.
Eriosoma americanum (Riley) (Woolly elm aphid)	wE	Interlake Section.	Common; caused light to moderate malformation of leaves.
Erranis tiliaria Harr. (Linden looper)	wE mM gAs	High Bluff-Pigeon Lake-Poplar Point areas and at Steeprock.	Very light defoliation.

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
Eupithecia luteata Packard (Fir needle inch worm)	wS bS bF tL	West of Lake Winnipeg, between Washow Bay and Lake St. George, at Fairford and Gypsumville.	Seven collections taken at scattered locations; no appreciable defoliation.
Eupithecia ravicostalatica Pack. (A looper)	W	Stonewall, Lake Francis, Eriksdale and Ashern.	Low populations and no appreciable defoliation.
Fenusa dohrnii (Tisch.) (European alder leaf miner)	Al	Beaver Creek, Black Island.	Light leaf infestations.
Feralia jocosa Gn. (Green-striped spruce caterpillar)	S	Washow Bay, Poplarfield, Fraserwood, and at Mouth of Rice River.	No appreciable defoliation.
Galerucella decora (Say.) (Gray willow leaf beetle)	W tA	Hecla Island and at Mouth of Rice River.	Very light skeletonizing of foliage in localized areas.
Gonioctena americana (Schffr.) (American aspen beetle)	tA	Interlake Section.	Highest populations occurred at Hilbre and Hodgson; light, scattered defoliation common elsewhere.
Halisidota maculata Harr. (Spotted tussock moth)	Most broad-leaved trees.	Interlake Section.	Common, with highest populations occurring in the Beaver Creek area. No appreciable defoliation.
Hemichroa crocea (Fourc.) (Striped alder sawfly)	Al wB	Black Island.	Scattered patches of light defoliation on individual white birch.
Homoglaea hercina Morr. (An owlet moth)	tA	Interlake Section.	Low populations very common; no appreciable defoliation.

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
Itame loricaria Evers. (A looper)	tA	Interlake Section.	Low populations very common; no appreciable defoliation.
Lambdina fiscellaria fiscellaria (Guen.) (Hemlock looper)	S bF	Washow Bay area and on Hecla, Black and Punk Islands.	No noticeable defoliation.
Lepyrus palustris Scop. (A weevil)	W	Rosenberg, Moosehorn, and Poplarfield.	Very light infestations; no measurable damage.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	tA	Interlake Section.	Light leaf mining common.
Macremphytus varianus (Nort.) (A sawfly)	Do	Grand Rapids, Hecla Island, and Washow Bay to Calders Dock.	Light to moderate defoliation of dogwood on Hecla Island; light defoliation elsewhere.
Magdalis gentilis Lec. (A weevil)	jP wS	Interlake Section.	Low populations common.
Malacosoma americanum (F.) (Eastern tent caterpillar)	cCh	Lower Fort Garry.	A few tents; light defoliation of individual chokecherry.
Malacosoma pluviale (Dyar.) (Western tent caterpillar)	Rose, wB, cCh	From Moosehorn to Fairford and in the Calders Dock area.	Sparsely scattered tents causing light to moderate defoliation of individual trees.
Meroptera pravella Grt. (A snout moth)	tA	Interlake Section.	Low populations; no noticeable defoliation.
Monochamus scutellatus (Say.) (White-spotted sawyer)	wS	Katimik Lake.	Very light infestation.
Nematus limbatus (Cress.) (A sawfly)	bPo W	Arborg, St. Laurent, and Washow Bay.	Light defoliation of scattered individual trees.

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
Nematus unicolor (A sawfly)	wB	West of Lake Winnipeg from Gimli to Calders Dock.	Highest populations at Gimli; defoliation of scattered individual trees was light.
Nemoria mimosaria Gn. (A looper)	W wB Do	Interlake Section.	Low populations common; no noticeable defoliation.
Nycteola cinereana N. & D. (A phalaenid)	tA bPo	Arborg, Gimli, and Hecla Island.	Light defoliation of scattered individual black poplar in the vicinity of Arborg; no noticeable defoliation elsewhere.
Nycteola frigidana Wlk. (An owlet moth)	bPo W	Interlake Section.	Low populations common at scattered locations; no noticeable defoliation.
Operophtera bruceata (Hulst.) (Bruce spanworm)	tA bO cCh	Southern section of District as far north as Ashern, Arborg and Winnipeg Beach.	Low populations common; no appreciable defoliation.
Orthosia hibisci Gn. (Fruit worm)	tA	Interlake Section.	Common but no appreciable defoliation.
Palthis angulalis Hbn. (Spruce harlequin)	bO S	Interlake Section	Collections taken at six locations; no noticeable defoliation.
Petrova albicapitana (Busck.) (Pitch nodule maker)	jP	Grand Rapids and Hodgson.	Light infestations of scattered, individual trees.
Plagodis alcoolaria Gn. (A looper)	Most deciduous trees	Interlake Section.	Collections taken at six locations; no noticeable defoliation.
Phylloctnistis populiella Cham. (A leaf miner)	tA	Jackfish Pt., Rosenberg & Chatfield.	Leaves lightly infested in isolated areas.

4.2.17 OTHER NOTEWORTHY INSECTS (con't):-

Insect Species	Host(s)	Locality	Remarks
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	wS bS	Interlake Section.	Infestations common; defoliation very light and scattered.
Pissodes terminalis Hopk. (Lodgepole terminal weevil)	jP	Eleven miles north of Gypsumville.	Light tip damage of jack pine.
Prochoerodes transversata Dru. (A looper)	All broad-leaved trees & shrubs	Interlake Section.	Collections taken at six locations; no appreciable defoliation.
Proteoteras willingana Kft. (Boxelder twig borer)	mM	Interlake Section.	Light damage to twigs and shoots common.
Protitame virginalis Hlst. (A looper)	tA bPo wB	Interlake Section.	Low populations common; no appreciable defoliation.
Raphia frater Grt. (An owlet moth)	tA bPo W	Between Washow Bay and Calders Dock, and at Poplarfield.	Common but defoliation negligible.
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	W	Interlake Section.	Common; most numerous in the Hodgson and Arborg areas.
Semiothisa spp. (Loopers)	wS bS tL	Interlake Section.	S. sexmaculata Pack. was collected at 11 locations; very light scattered defoliation. S. granitata Gn. collected in the Washow Bay area, Chatfield, Fairford and Gypsumville; no appreciable defoliation.
Tetralopha asperatella (Clem.) (An aspen webworm)	tA bPo wB bO	Interlake Section.	Commonly found; light, and occasional light to moderate leaf webbing.

4.2.17 OTHER NOTEWORTHY INSECTS (concl.):-

Insect Species	Host(s)	Locality	Remarks
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	jP	Arborg and between Fairford and Grand Rapids.	Light infestations on occasional reproduction at scattered locations.
Trichiosoma triangulum Kby. (A sawfly)	wB W	Interlake Section.	Low populations common; no appreciable defoliation.
Xylomyges dolosa Grt. (An owlet moth)	tA	Interlake Section.	Collections taken at six locations; no noticeable defoliation.
Zeiraphera fortuana Kft. (Spruce bud moth)	wS	Interlake Section.	Low populations common; no noticeable defoliation.

4.3 TREE DISEASE CONDITIONS

4.3.1 FROST DAMAGE:- Late spring frosts caused considerable damage to the foliage of forest and ornamental trees, particularly bur oak, green ash, white spruce and balsam fir. The leaves of most oaks were severely damaged; only those in scattered areas in the southern part of the section and near lakes and rivers escaped injury. Acorn production was retarded but trees refoliated well. Similar injury occurred on ash but it was not as extensive, perhaps due to later foliage development. In addition, the buds of spruce and balsam fir were moderately to severely damaged on trees at scattered locations.

4.3.2 GLOBOSE GALL RUST, Peridermium harknessii J.P. Moore:- The largest infection of this disease of jack pine occurred in the Grand Rapids area where numerous galls were noted on many scattered, dead trees. A severe infection was also noted killing one tree on the northeast end of Black Island while lightly infected trees were observed throughout the remainder of the island. Elsewhere, collections were taken at five locations between Gypsumville and Grand Rapids, 11½ miles east of Hodgson, near the Red Rose fire tower and at the Rosenberg fire tower. Occasional dead branches bearing galls were noted at all locations.

4.3.3 COMANDRA BLISTER RUST, Cronartium comandrae Peck:- Light infections of this spindle shaped rust gall on jack pine were recorded three miles south of Mantagao Lake, in the vicinity of the Rosenberg fire tower, and approximately fifteen miles north of Arborg. Occasional dead branches, bearing galls, were evident at each location.

4.3.4 SPRUCE NEEDLE RUSTS, Chrysomyxa spp.:- These needle rusts were recorded on both black and white spruce at several locations. Light to moderate infections of individual black spruce were noted on Hecla Island and light infections occurred at Easterville and in the Pine Dock and Washow Bay areas.

4.3.5 MACROPHOMA GALL ON POPLARS, Macrophoma tumefaciens Shear.:- Observations indicated that this disease is widely distributed throughout the Interlake District. Collections were taken at ten locations between Gimli in the south and seven miles north of the Fairford River Bridge on Number six Highway. Occasionally, heavily infected trees were killed near the Beaver Creek fire tower and in the Hilbre area, and dead branches bearing galls were noted at all collection points. Other representative collection points were six miles west of Arborg, one mile south of Moosehorn, $2\frac{1}{2}$ miles south of Hilbre, $1\frac{1}{2}$ miles north of Red Rose fire tower and at Whiteway Point.

4.3.6 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- Surveys were continued to determine the severity of damage to Manitoba maple by the use of 2,4-D for weed control in field crops. Results indicated that damage was only light and scattered in the agricultural areas of the district. The results of the survey are shown in Table 2.

TABLE 2

2,4-D Injury to Manitoba Maple
Interlake District - 1964

Location	Date Sampled	Degree of Injury	Remarks
Cloverdale tp. 13, rge. 4 E.p.mer.	July 31	Very light twig and leaf damage to both sides of trees.	Shelterbelt; no evidence of spraying.
Saint Clements River Lot 8	July 31	Light damage to twigs and leaves on both sides of trees.	No evidence of spraying in immediate vicinity.

TABLE 2 (concl.)

Location	Date Sampled	Degree of Injury	Remarks
Grahamdale 15-28-08-W.p.mer.	Aug. 13	Very light twig and leaf damage on both sides of trees.	Shelterbelt near town; no evidence of spraying.
Ashern 23-25-07 W.p.mer.	Aug. 13	Very light twig and leaf damage on both sides of trees.	Shelterbelt; no evidence of spraying.
Eriksdale 4-01-06 W.p.mer.	Aug. 13	Very light twig and leaf damage to both sides of trees.	Shelterbelt; no evidence of spraying.
Inwood 2-18-01 W.p.mer.	Aug. 13	Very light twig and leaf damage on both sides of trees.	Boulevard in town; no evidence of spraying.

4.3.7 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Mistletoe of jack pine)	jP	Devils Lake-Grand Rapids areas.	Largest area of infection near Grand Rapids; some mortality of jack pine. Light infection in the Devils Lake area.
Ciborinia sp. (Ink spot)	tA	Gimli-Ashern.	Scattered patches of light infection.
Coleosporium asterum (Diet) Syd. (A needle rust)	jP	Red Rose fire tower.	Very light infection.
Fomes igniarius (L.) Gill. (Canker of aspen)	tA	Red Rose fire tower.	Very light infection.
Gymnosporangium sp. (A leaf rust)	saskatoon	Poplarfield, Grand Rapids.	Scattered reproduction moderately to severely infected.

4.3.7 OTHER NOTEWORTHY DISEASES (concl.):-

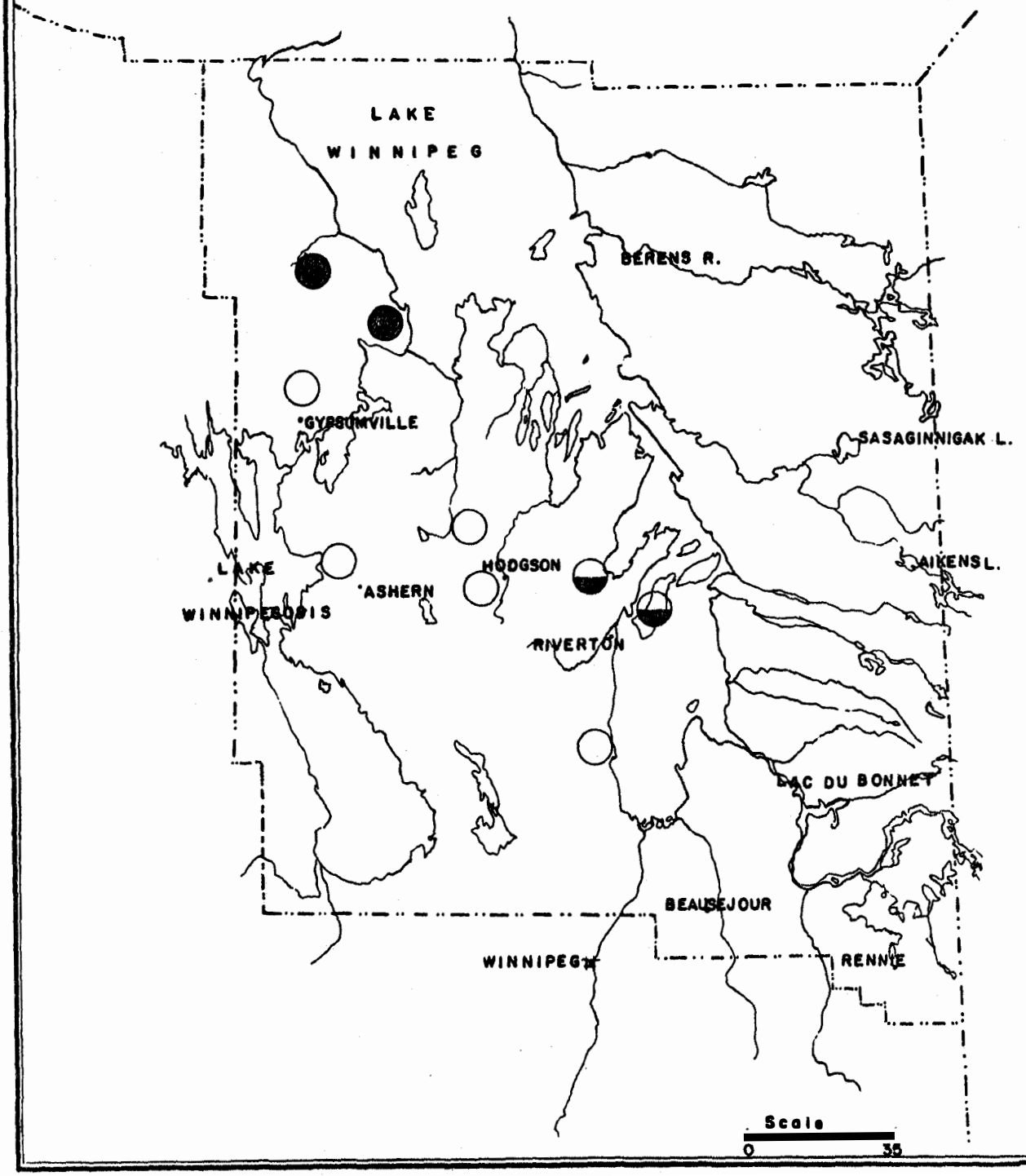
Organism and Disease	Host(s)	Locality	Remarks
Melampsora sp. (A leaf rust)	Willow	Four miles south of Ashern.	Light to moderate infection on leaves of occasional willow clump.
Monilinia fructicola (Wint.) Honey (Brown rot of plum)	Plum	Saint Clements.	Fruit moderately to severely infected in scattered patches.
Uredinopsis or Milesia sp. (Needle rust of balsam fir)	bF	Jackfish Point.	40 to 50 percent of the needles infected on some trees.
Poria obliqua (A wood destroying fungus)	wB	Red Rose fire tower.	Sterile conks found on one dead tree.

INTERLAKE DISTRICT
MANITOBA

LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Severe ◒ Moderate ○ Light

Fig. 1



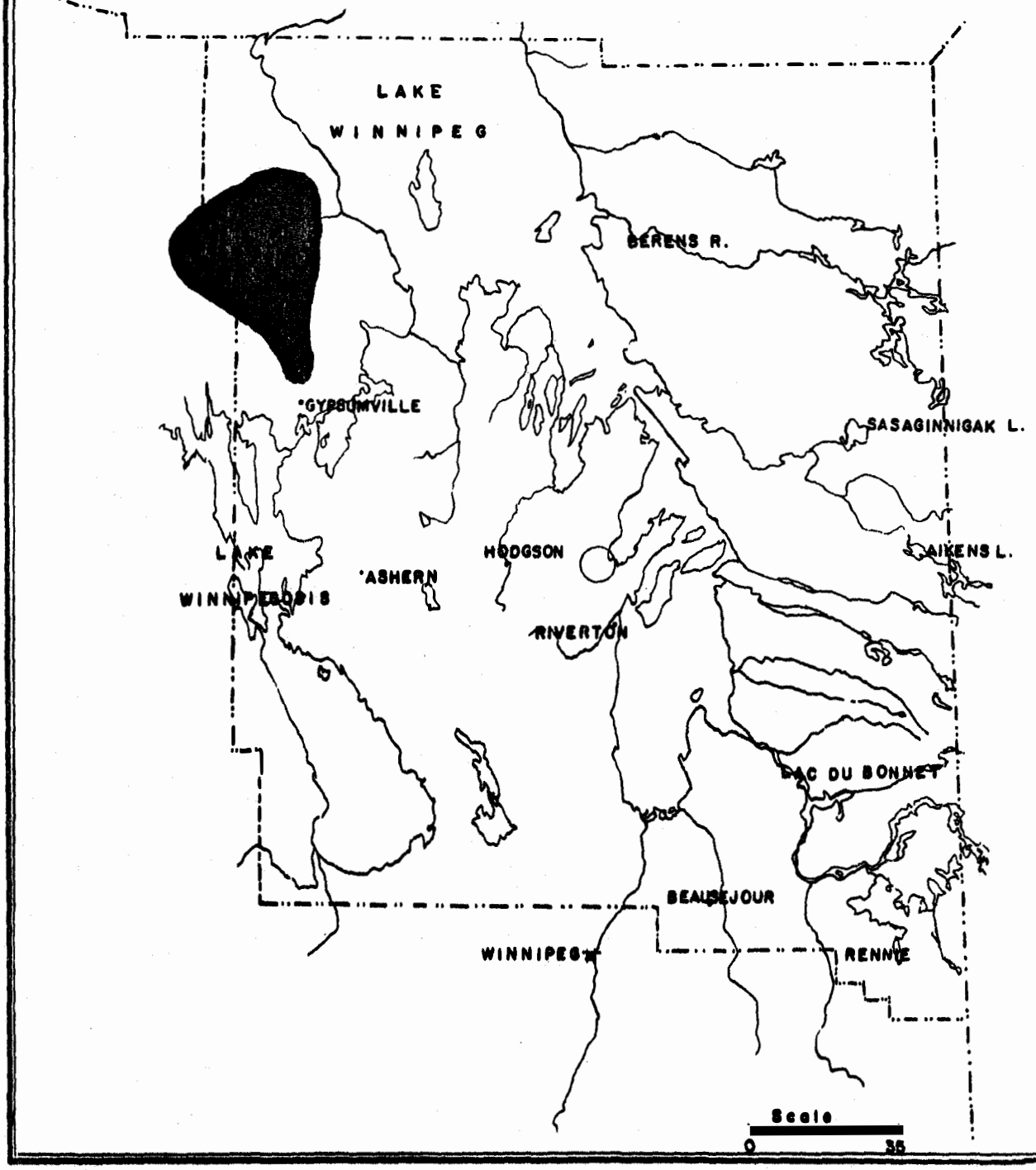
INTERLAKE DISTRICT
MANTOBA

JACK PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Moderate to Severe Defoliation

○ Light Defoliation.

Fig. 2



INTERLAKE DISTRICT
MANITOBA

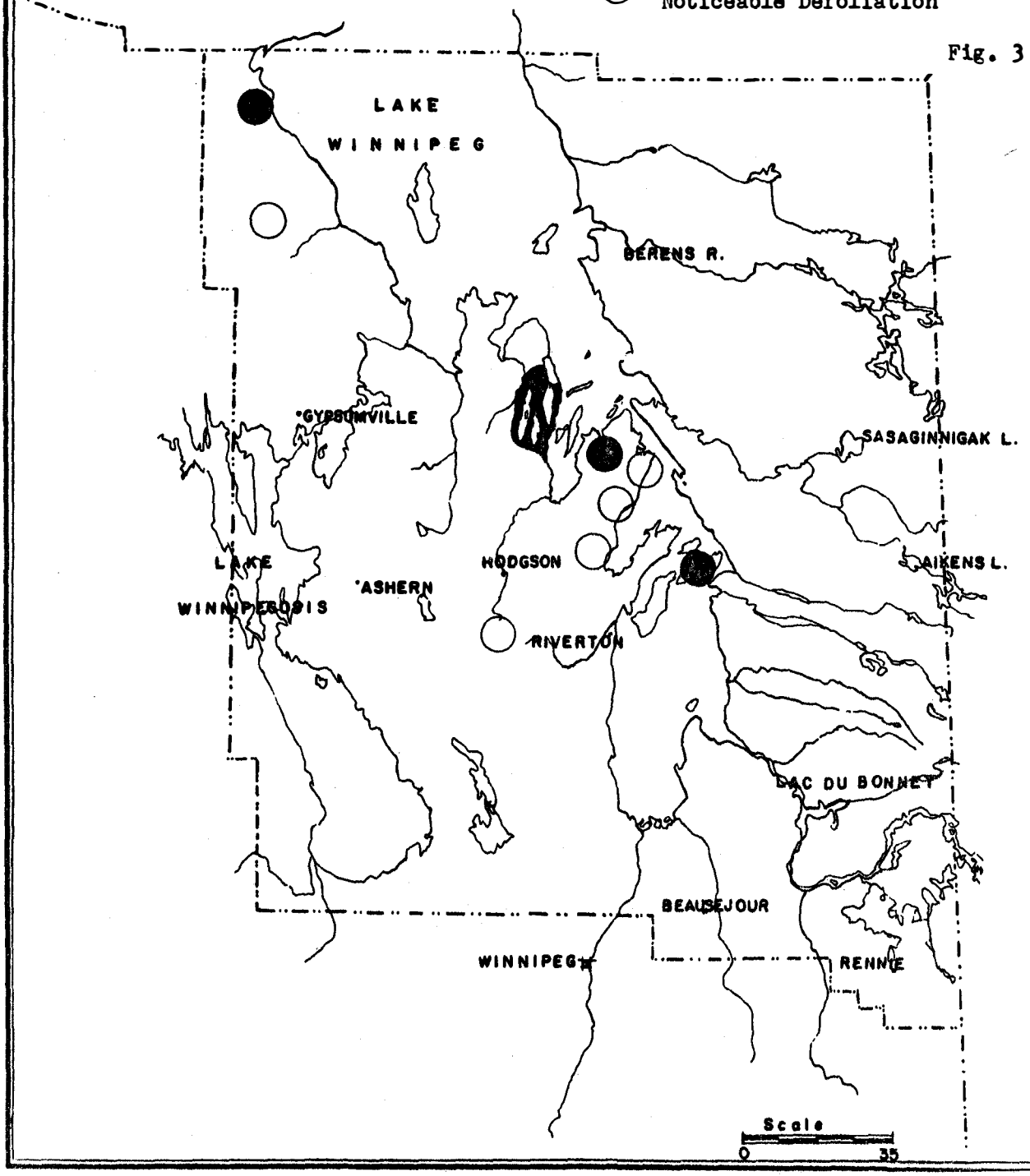
FOREST TENT CATERPILLAR INFESTATIONS
1964

Areas of Continuous Moderate to Severe Defoliation.

Patches of Moderate to Severe Defoliation.

Larval Collection Points - No Noticeable Defoliation

Fig. 3



5. ANNUAL DISTRICT REPORT

WESTERN DISTRICT OF MANITOBA

1964

by

B. B. McLeod

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

5.1 INTRODUCTION

Field surveys to determine the status of forest insects and diseases were carried out from May 11 to October 27, and 583 insect and 96 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. A total of 10 hours flying time was used to map insect and disease outbreaks in the District.

The main highlights were the continuation of the larch sawfly outbreak, the break-up of the forest tent caterpillar infestation in the Lake Winnipegosis region, and the decline of the severe infestation of spruce budworm on Birch Island. Tree disease conditions remained much the same. Leaf blights on balsam poplar foliage declined generally and reddening of balsam fir foliage was again noticeable from the air in some areas. White pine blister rust was recorded for the first time in the District when a single infected Swiss stone pine was found near Dropmore, Manitoba.

Continuing survey sub-projects included: forest tent caterpillar egg-band surveys; larch sawfly cocoon collecting for studies of natural control agents; sequential sampling of larch sawfly eggs for population estimates; and egg population sampling of the spruce budworm. In addition, several special collections of insect and disease material was made for personnel at the Winnipeg and other laboratories.

The writer acknowledges the excellent co-operation received from personnel of the National Parks Service and of the Manitoba Department of Mines and Natural Resources.

5.2 INSECT CONDITIONS

5.2.1 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.).- There were some changes in the status of the spruce budworm in 1964. The new foliage of white spruce growing in the north, east and southern sections of Birch Island in Lake Winnipegosis was severely defoliated. In addition, white spruce stands adjacent to the severe infestations were light to moderately defoliated. A further decline was evident in the Dawson Bay outbreak and only light defoliation to the tops of a few white spruce was recorded.

Aerial surveys of the east escarpment and Elk and Clear lakes area of Riding Mountain National Park failed to detect any recurrence of the spruce budworm infestations that caused moderate to severe defoliation of white spruce and balsam fir in 1960.

5.2.2 LARCH SAWFLY, Pristiphora erichsonii Htg.- As indicated in Fig. 1, populations of the larch sawfly increased in intensity in the northern portion of the District and remained relatively unchanged in southern areas. Defoliation of tamarack ranged from moderate to severe in the vicinity of the 53rd parallel, moderate along the Overflow River and in the southern section of the Porcupine Forest Reserve, and light along the Steeprock River road.

Light defoliation was recorded throughout the Duck Mountain Forest Reserve and in scattered tamarack stands east of Pine River and along the Waterhen River. Scattered reproduction in these areas was moderately to severely defoliated.

In Riding Mountain National Park, several small patches of moderate to severe defoliation occurred at Whirlpool, Jackfish, and Hyde lakes, but all other areas in and adjacent to the Park were only lightly infested.

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

	Number of shoots examined	Number of curled shoots	Infestation Rating 1964
Norgate Road, R.M.N.P. #108	70	2	Light
Moon Lake, R.M.N.P. #114	110	5	Light
Central Road, R.M.N.P. #107	50	0	Light
Cowen, Manitoba #111	70	2	Light
Steeprock, Manitoba #104	110	5	Light

Note: These ratings are based on infestation classes of: light = up to 35% defoliation; moderate = 36-65%; and severe = over 65%.

A total of 134 cocoons were collected in plot 108 in Riding Mountain National Park to determine the incidences of parasites and disease. Approximately 4 per cent of the cocoons were destroyed by fall emergence of Bessa harveyi (T.T.) and 31 per cent by disease. Subsequent dissections indicated that effective parasitism of the larch sawfly larvae was 26 per cent by B. harveyi and 36 per cent by Mesoleius tenthredinis Morley.

5.2.3 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.).- Infestations of this sawfly caused severe defoliation of the tops of black spruce growing in bogs from the Steeprock area north to the Overflow River, and in "The Bog" area north of the 53rd parallel of

latitude. A white spruce shelterbelt three miles west of Dauphin was lightly to moderately defoliated, and similar defoliation occurred in natural growing white spruce in the Clear Lake area of Riding Mountain National Park.

5.2.4 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.- This caterpillar continued to defoliate trembling aspen in the northern portion of the District but some significant changes were recorded in the infestation (Fig. 2).

Severe defoliation occurred along the south and southeast slopes of the Porcupine Mountains from Whitefish Lake on the Manitoba-Saskatchewan boundary eastward to Birch River and northward to Novra, but from the latter point northward through the Bellsite Mafeking area and westward to the Saskatchewan boundary defoliation was light. In the central part of the Porcupine Mountains patchy moderate to severe defoliation occurred around Armit Lake.

The large infestation in the Lake Winnipegosis area broke up into many small isolated patches. The area from the Bell River north through Salt Point, Point Wilkens to the mouth of the Red Deer River and the "Bluff" was again moderately to severely defoliated, and small patches of similar defoliation occurred at the mouth of the Shoal River, along the east shore of Dawson Bay to Whiteaves Point, at Pelican Bay and along the west shore of Lake Winnipegosis south to township 40 including Birch Island. The infestation along the east side of the lake declined noticeably and small patches of moderate to severe defoliation were mapped at McAulay Harbor, Inland Lake, Pim Lake and in the Meskanau, Mistatim, Pickeral and Blend lakes area. The localized infestation between Pickeral Lake and Denbeigh Point subsided completely.

In the Segemace Bay area on Lake Winnipegosis, a strip of severe defoliation occurred from Camperville (Figs. 3 and 4) south to the junction of Highway No. 20 and the Pine River road, and a similar strip was mapped along the Waterhen River in the vicinity of the Waterhen tower and ferry.

The Duck Mountain infestation continued with numerous scattered patches of moderate to severe defoliation occurring along the eastern slopes between townships 29 to 32, rge. 23, W. P. mer. Additional small patches were mapped in areas adjacent to Jack, George, Ralph, Fred, Blue and Child's lakes. Farm shelterbelts and aspen bluffs north and west of Swan River were again moderately to severely defoliated as was a strip of broad-leaved trees along the Woody River in township 39, rge. 25, W. P. mer.

Aerial and ground surveys of Riding Mountain National Park confirmed the collapse of the infestation in the Vermilion River area along the northern slopes of the mountain, and only scattered larval collections were taken in areas adjacent to the Park.

Mass collections of larvae and pupae were taken in the Steeprock and Camperville areas and reared in the Winnipeg Laboratory for the recovery of parasites. The results are shown below.

Location	No. of specimens reared	Parasites Recovered	
		Diptera Sp.	Hymenoptera Sp.
Steeprock	99 larvae	10	0
Camperville	116 larvae	13	0
Steeprock	106 pupae	61	2
Camperville	98 pupae	75	1

An intensive egg-band survey was conducted throughout the District to predict the severity and extent of infestations in 1965. A tabular summary follows.

TABLE I

Forest Tent Caterpillar Egg-Band Survey
Riding Mountain National Park and Western District of Manitoba - 1964

(based on 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. egg-bands	Defoliation forecast 1965
Western District					
Whitefish Lake (1 mi.E.)	3.1	36.3	21.6	14.6	Severe
Whitefish Lake (12 mi. S.E.)	2.0	19.3	12.3	12.0	Severe
Whitefish Lake (5 mi.E.)	9.0	63.3	28.3	40.3	Severe
Bowsman (6 mi. N.)	6.0	58.3	17.0	20.3	Severe
Birch River (8.7 mi.N.)	3.6	33.3	23.3	17.6	Severe
Mafeking (4.5 mi. S.)	4.0	36.6	20.0	6.6	Moderate
Steeprock road	5.0	40.0	21.6	7.6	Moderate
Westgate (Man.-Sask. boundary)	3.0	35.0	21.3	0.3	Light
Powell (1 mi. S.)	3.3	26.6	16.3	4.3	Light-Mod.

TABLE I (Cont'd.)

Location	Av.d.b.h. (ins.)	Av. ht. (ft.)	Av.crown depth (ft.)	Av. No. egg-bands	Defoliation forecast for 1965
Parallel #53 & #10 Hwy.	3.3	31.6	20.0	0.0	Nil
Overflow River (.5 mi. S.)	4.0	30.0	21.6	8.0	Moderate
Minnitonas (5 mi. S.)	6.0	40.0	17.0	6.1	Light
Wellman Lake, D.M.F.R. (2 mi. S.)	9.0	65.0	20.6	8.3	Light
Singoosh Lake, D.M.F.R. (5 mi. E.)	4.0	25.0	18.6	21.6	Severe
San Clara (3 mi. N.)	3.0	19.3	11.3	1.3	Light
Laurie Lake, D.M.F.R.	3.0	24.3	15.0	0.0	Nil
Grandview Tower, D.M.F.R. (1 mi. N.)	3.0	20.6	16.0	0.0	Nil
Sknowman	3.0	30.3	23.3	2.0	Light
Waterhen River Tower	3.0	29.3	20.6	10.3	Severe
Meadow Lands (3 mi. W.)	3.0	25.0	18.6	1.3	Light
Erickson (2 mi. N.)	3.0	25.0	17.6	0.0	Nil
Minnedosa Valley & #10 Hwy.	3.1	27.6	18.3	0.0	Nil
Rapid City (5 mi. E.)	3.0	22.6	12.6	0.0	Nil
Dauphin (7.4 mi. W.)	3.1	25.0	13.0	0.0	Nil
Shortdale (4.5 mi. E.)	3.0	19.0	10.0	0.0	Nil
Ethelbert (3 mi. S.)	3.0	20.0	13.6	0.0	Nil
Cowan (5 mi. S. W.)	3.6	36.0	20.3	0.0	Nil
Camperville (1.5 mi. W.)	9.1	45.0	20.6	44.6	Severe
Jct. Pine River Rd. & #20 Hwy.	5.3	46.3	23.6	2.6	Light
Millwood (1.6 mi. E.)	3.0	21.6	10.0	0.0	Nil
Rossburn (8 mi. S.)	3.0	28.0	21.6	0.0	Nil
Jct. #50 Hwy. & #4 Hwy.	3.0	25.0	17.0	0.0	Nil
Silver Ridge (.5 mi. S.)	3.0	33.3	24.3	0.0	Nil
Bernie (1.5 mi. W.)	2.3	21.6	17.0	0.0	Nil
Riding Mountain National Park					
Townsite, R.M.N.P. (1.5 mi. E.)	4.0	30.6	24.6	0.0	Nil
Townsite, R.M.N.P.	6.0	40.0	30.0	0.0	Nil
Townsite, R.M.N.P.	6.0	45.0	33.3	0.0	Nil
Townsite, R.M.N.P.	8.0	50.0	35.0	0.0	Nil
Golf Course, R.M.N.P.	3.0	25.0	15.0	0.0	Nil
Crawford Park Jct. (4 mi. N. W.)	3.0	20.0	14.0	0.0	Nil
North Gate, R.M.N.P.	4.0	35.0	20.6	0.0	Nil
Audy Lake Rd. & #10 Hwy., R.M.N.P.	3.6	33.3	21.6	0.0	Nil

5.2.5 ASPEN LEAF BEETLE, Chrysomela crotchi Brown.- Adult beetles were active by May 28 and light defoliation of trembling aspen was observed shortly thereafter. Egg laying activity reached a peak by July 10 and resultant larval populations caused noticeable skeletonizing of the foliage of reproduction in many areas.

The large infestation in the vicinity of the Porcupine Mountains broke up. However, many scattered isolated patches of moderately to severely skeletonized trembling aspen and balsam poplar reproduction up to 3" d.b.h. occurred along the lower southern slopes of the mountains from Whitefish Lake on the Manitoba-Saskatchewan boundary eastward to the Birch River area.

Elsewhere in the District, feeding damage was generally light except at Gunn Lake, Waterhen River, McCreary and in the central Duck Mountains where light to moderate skeletonizing was encountered.

Mass collections of adults and larvae were taken in the spring and summer respectively to obtain information on the parasite complex of the aspen leaf beetle. As indicated below, relatively few parasites were recorded.

Type of collection	No. of specimens	Number of Parasites	
		Diptera	Hymenoptera
Spring adults	217	0	0
Mature larvae	112	8	0

5.2.6 AMERICAN ASPEN BEETLE, Gonioctena americana (Schaef.).- A small, severe infestation was recorded on aspen reproduction near the forest nursery in Riding Mountain National Park. Although defoliation was recorded as 100 per cent, the affected trees refoliated immediately following the attack. Elsewhere, adult beetles caused moderate damage to aspen foliage at Gunn Lake in the Park and west of Singoosh Lake in the central part of the Duck Mountain Forest Reserve. Light damage also occurred in the Sclater, Minnitonas, Baden and Mafeking areas.

5.2.7 THE FLEA BEETLE, Altica populi Brown.- Adult beetles were active in the field by May 14 but egg laying activity was not general until a month later. Severe skeletonizing of alder, aspen, balsam poplar and willow foliage was recorded in the Greyling-Moon lakes areas of Riding Mountain National Park. Elsewhere in the Park, patches of damage, ranging from light to severe, were noted along the Rolling River road, along the north shore of Clear Lake, and in the Whitewater Lake area.

5.2.8 FALL CANKERWORM, Alsophila pometaria (Harr.).- Increased activity by this cankerworm resulted in light to moderate defoliation of Manitoba maple and elm, and severe defoliation of chokecherry along the Swan River in the vicinity of Lenswood. Manitoba maple shelterbelts and woodlots were lightly defoliated in the Neepawa and Gladstone areas.

Associated with infestations of the fall cankerworm were lesser populations of the basswood looper, Erannis tiliaria (Harr.) and the spring cankerworm, Paleacrita vernata (Peck).

5.2.9 UGLY-NEST CATERPILLAR, Archips cerasivoranus (Fitch).- High populations caused severe damage to chokecherry along roadsides two miles south of Ethelbert (sec. 20, tp. 29, rge. 21, W.P.mer.). Observations in this area indicated that parasitism of the larvae ran as high as 50 per cent in individual nests.

Light infestations were recorded throughout Riding Mountain National Park and in the Brokenpipe Lake, Cowan, and Westage areas.

5.2.10 STRIPED ALDER SAWFLY, Hemichroa crocea (Fourc.).- The infestations previously reported in the central part of the Duck Mountain Provincial Park expanded with severe defoliation of speckled alder occurring at Wellman, Dragline, Blue and Singoosh lakes and in the Baldy Mountain area. In Riding Mountain National Park, severe defoliation was recorded along Edwards Creek between Highway No. 10 and Edwards Lake and in the Moon Lake area.

5.2.11 MOURNING-CLOAK BUTTERFLY, Nymphalis antiopa (L.).- Increased populations caused moderate to severe defoliation of trembling aspen, white elm, balsam poplar and willow in localized areas of Riding Mountain National Park and the Duck Mountain Forest Reserve. Light infestations were also recorded at Oakburn and Strathclair, and in the Overflow River area.

5.2.12 ALDER LEAF MINER, Fenusa dohrnii Tischb.- Severe infestations of this leaf miner were recorded throughout the Cowan, Camperville and Pine River areas. Light to moderate infestations occurred in the Porcupine Mountain and Overflow River areas and in the Duck Mountain Forest Reserve. In Riding Mountain National Park, alder was moderately to severely infested along the Rolling River road and in the Moon Lake area, and lightly infested at Clear and Whitewater lakes.

5.2.13 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.).- Populations of this tent caterpillar continued to decline but light infestations were still recorded at many locations from Amaranth northward to the Swan River Valley. The Audy Lake and Alonsa infestations were also reduced to light.

A mass collection of 243 mature larvae reared at the laboratory yielded 5 hymenoptera and 2 diptera parasites.

5.2.14 ASPEN BLOTCH MINER, Lithocolletis salicifoliella Chamb.- High populations (up to seven per leaf) occurred on balsam poplar foliage in Wasagaming in Riding Mountain National Park. Associated with this infestation were light populations of a hymenoptera parasite. Severe infestations on trembling aspen reproduction were recorded along the Rolling River road. In addition, light infestations were recorded in the Whitewater, Gunn and Elk lakes areas of Riding Mountain National Park, and at Pine River, Dropmore, Overflow River and in the Duck Mountains.

5.2.15 WOODBORERS.- Numerous collections and observations were made throughout the season as follows:

Insect species	Host(s)	Location(s)	Remarks
Aegeria tibialis (Harr.) (A clear wing moth)	tA, bPo, roots	Millwood, Sclater.	High populations in Millwood area.
Synanthedon bolteri (Hy. Edwards) (A clear wing moth)	W	Throughout District.	Found in association with Saperda concolor.
Magdalis armicollis (Say) (Red elm bark weevil)	wE	Riding Mountain National Park.	Found in association with Saperda tridentata
Monochamus scutellatus (Say) (White-spotted sawyer)	wS	All forested areas.	Collected from windthrown trees.
Saperda prob. adspersa Lec. (A wood borer)	tA, bPo, roots	Throughout District.	High populations at Millwood and Sclater.
Saperda calcarata Say (Poplar borer)	tA	Throughout District.	Mainly in woodlots and prairie "bluffs".
Saperda concolor Lec. (A round-headed borer)	W, tA	Throughout District.	Heavy in some areas.

5.2.15

Insect species	Host(s)	Location(s)	Remarks
Saperda moesta Lec. (A poplar-twig borer)	bPo	Throughout District.	Caused light twig and leader mortality.
Saperda mutica Say (A round-head borer)	W	Kelwood, Rossburn.	Occasionally taken from willow thickets.
Saperda tridentata Oliv. (Elm borer)	wE	Throughout District.	Taken from dying elm.
Oberea schaumi Lec. (Poplar twig borer)	tA	Throughout District.	Lightly infested reproduction in all areas.

5.2.16 OTHER NOTEWORTHY INSECTS.-

Insect	Host(s)	Location(s)	Remarks
Acleris variana (Fern.) (Black-headed budworm)	wS, bS	Riding Mountain National Park, Neepawa, and Steeprock, Pine River.	Low populations; caused very light defoliation only.
Acrobasis betulella Hlst. (Birch tube maker)	wB	Denbeigh Point and Lake Winnipegosis.	Low populations; light damage to reproduction.
Acrobasis rubrifasciella Pack. (A leaf roller)	spAl	McCreary.	Single collection; populations low.
Argyrotaenia tabulana Free. (A pine tube moth)	jP	Cowan.	Single collection; very low populations.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Riding Mountain National Park, Waterhen River, Overflow River and Duck Mountain Forest Reserve.	Low populations and only light defoliation in all areas.

5.2.16 OTHER NOTEWORTHY INSECTS.- (Cont'd.)

Insect	Host(s)	Location(s)	Remarks
Aphidae spp. (Aphids)	tA, bPo, jP, tL, wS, bF, spAl, bO, bS, W, mM, lP, Haw, Se	Throughout District.	Scattered populations; 53 collections taken for Dr. G. Bradley, Winnipeg Laboratory.
Badebecia urticara Hbn. (The leaf roller)	cCh	Riding Mountain National Park.	A single collection made in late May.
Bucculatrix canadensisella (Birch skeletonizer)	wB, waB	Riding Mountain National Park.	Very low populations.
Calligrapha alni Schffr. (The leaf beetle)	W	Strathclair.	Single collection of adults; light defoliation.
Campaea perlata Gn. (The fringed looper)	cCh, tA, W, wB	Overflow River, Steeprock, and Porcupine Forest Reserve.	Low populations; very light defoliation.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	tA	Erickson.	Very low populations; no measureable defoliation.
Cynipid spp. (Gall flies)	tA, bPo, W, bO	Throughout District.	Commonly collected but no serious damage.
Chrysomela knabi Brown (The leaf beetle)	W, bPo	Riding Mountain National Park, Duck Mountain Forest Reserve.	Scattered populations; light damage.
Datana ministra (Drury) (Yellow-necked caterpillar)	W	McCreary.	Severe on roadside willow thickets.
Hyphantria cunea (Drury) (Fall webworm)	mM, spAl, bPo, W, cCh	Porcupine Forest Reserve, Overflow, and at The Bog.	Increased populations but infestation still very light.

5.2.16 OTHER NOTEWORTHY INSECTS.- (Cont'd)

Insect	Host(s)	Location(s)	Remarks
Itame loricaria Evers. (The looper)	tA, W	Erickson, Strathclair, Laurier, Overflow and Steeprock.	Generally distributed throughout the District; no noticeable defoliation.
Lambdina fiscellaria (Guen.) (Hemlock looper)	tL	Riding Mountain National Park.	Very low populations in the District.
Lepyrus palustris Scop. (A weevil)	tA, W, bPo	Riding Mountain National Park, Duck Mountain Forest Reserve, Pine River and Overflow River.	Adult weevils collected over a wide area; no damage observed.
Meroptera pravella Grt. (The snout moth)	tA	Birch River	Very low populations; no damage observed.
Macremphytus varianus (Nort.) (The sawfly)	Siberian dogwood	Riding Mountain National Park.	Light to moderate defoliation of plantings.
Mordwilkoja vagabunda (Walsh) (Poplar vagabond aphid)	tA	Riding Mountain National Park and Steeprock.	Light damage to reproduction.
Nematus limbatus (Cress.) (Willow sawfly)	W	Riding Mountain National Park, Duck Mountain Forest Reserve and Overflow River.	Light defoliation of willow thickets.
Neodiprion abietis complex (Balsam-fir sawfly)	bF, wS	Denbeigh Point and Riding Mountain National Park.	Low population levels throughout the District.
Neurotoma inconspicua (Nort.) (The plum web-spinning sawfly)	pCh	Riding Mountain and Zoria.	Light to moderate damage to shrubs in the Zoria area.
Nycteola cinereana N. & D. (The owlet moth)	bPo	Throughout District.	Commonly collected in all areas.

5.2.16 OTHER NOTEWORTHY INSECTS.- (Cont'd.)

Insect	Host(s)	Location(s)	Remarks
Pamphilus prob. infuscatus Middlekauf (A false webworm)	tA	Riding Mountain National Park.	Low populations.
Oligonychus ununguis (Jacobi) (Spruce spider mite)	wS	Dauphin	Light on boulevard shade trees.
Pandemis canadana Kft. (A tortricid)	tA	Erickson.	Very low populations; no defoliation.
Petrova albicapitana Busck (Pitch nodule maker)	jP	Cowan.	Current infestation very light.
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	wS, jP	Cowan, Pine River, Dauphin, and Powell.	Severe on several open growing wS at Powell.
Phyllocolpa sp. (A sawfly)	bPo, tA, W	Throughout District.	Common in collections; preferred host was balsam poplar.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	ws, bs	Overflow River, and Riding Mountain National Park.	Low populations; no noticeable damage.
Pissodes strobi (Peck) (White-pine weevil)	wS, bS	Riding Mountain National Park.	Light infestations.
Proteoteras willingana Kft. (Boxelder twig borer)	mM	Riding Mountain National Park, Gladstone, Millwood, Kelwood, and Dawson Bay.	Light damage recorded at all points sampled.
Phytophaga rigidae (O. S.) (The beaked willowgall fly)	W	Throughout District.	Commonly collected but infestations remain light.
Rhabdophaga strobiloides (Walsh) (The willow cone gall midge)	W	Throughout District.	Light infestations on several species of willow.

5.2.16 OTHER NOTEWORTHY INSECTS.- (Concl.)

Insect	Host(s)	Location(s)	Remarks
Schizura concinna (A. & S.) (Red-humped caterpillar)	W	McCreary.	Severe defoliation of roadside willow thickets.
Semiothisa sexmaculata Pack. (A looper)	tL	Throughout District.	Present in most tL stands; no noticeable defoliation.
Tetralopha asperatella (Clem.) (An aspen webworm)	tA, W, bPo	Throughout District.	Populations highest in areas where old M. disstria cocoons were plentiful.
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	jP	Cowan and Birch River.	Low populations confined to a few trees.

5.3 DISEASE CONDITIONS

5.3.1 FROST DAMAGE.- Late spring frosts affected the foliage and seed crops of several tree species throughout the District. The new growth of white spruce was severely damaged throughout Riding Mountain National Park and in the Waterhen River area and that of black spruce to a lesser degree. The early foliage and acorn crop of bur oak was completely destroyed but the trees refoliated quickly and by mid-season appeared normal. Green ash foliage was also heavily damaged and the seed crop adversely affected; refoliation was much slower than on oak and the trees remained in low vigor for most of the season. The foliage of Manitoba maple generally escaped damage but the seed crop was affected in some areas; near Eden almost complete destruction of the 1964 seed crop was evident.

5.3.2 MORTALITY OF BALSAM FIR.- Aerial surveys of the District indicated a general increase in the incidence of mortality or "reddening" of balsam fir. In Riding Mountain National Park, mortality of balsam fir increased along the east escarpment and along several streams flowing into the Vermilion River, but remained light in the Moon-Edwards lakes area.

No substantial increase in balsam fir mortality was recorded in the Duck Mountains. The area affected remained much the same as in 1963, mainly along the east slopes from about Shanty Lake northward to about Sclater. However, a marked increase in the incidence of mortality occurred in the Dawson Bay area of Lake Winnipegosis, particularly on Salt Point (tp. 44, rge. 24, W. P. mer.), Whiteaves Point (tp. 44, rge. 22, W. P. mer.), and in the Cameron Bay (tp. 46, rge. 21, W. P. mer.) and Pelican Bay areas (tp. 44, rge. 19, W. P. mer.) where dead trees were commonly found. Similar conditions were mapped in the McAulay Harbor-Wade Point area (tp. 37 and 38, rge. 17, W. P. mer.) and Denbeigh Point on the east shore of Lake Winnipegosis.

5.3.3 MORTALITY OF WHITE SPRUCE AND JACK PINE.- During aerial surveys of the Birdtail Creek valley area of Riding Mountain National Park (tp. 23, rge. 25, W. P. mer.) many dead open growing white spruce were observed. The trees were located on both low and well drained sites and scattered through an apparently healthy stand of young white spruce.

Similar surveys of the area lying south of Inland Lake (tp. 37, rge. 16, W. P. mer.) revealed widespread mortality of jack pine reproduction. The cause of the mortality in both cases could not be determined from the air.

5.3.4 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE.- Surveys were continued to determine the incidence of damage to shelterbelts and woodlots from herbicide spraying of field crops and right of ways. Damage ranged from the malformation of a few leaves and shoots to the mortality of fringe areas of shelterbelts. The results of this survey are shown in the following table.

TABLE 2

2, 4-D Injury to Manitoba Maple
Western District of Manitoba - 1964

Location	Date	Degree of Injury	Remarks
Ochre River 8-24-17 W. P. mer.	July 29	A few isolated twigs damaged.	Aspen and willow spp. also affected.
St. Rose du Lac 7-24-15 W. P. mer.	July 29	A few isolated twigs damaged.	Only roadside willow thickets affected here.
Laurier 18-22-15 W. P. mer.	July 29	Part of one side of trees damaged.	Mostly reproduction Manitoba maple.
McCreary 31-20-15 W. P. mer.	July 29	A few isolated twigs damaged.	Only Manitoba maple affected.

TABLE 2 (Concl.)

Location	Date	Degree of Injury	Remarks
Swan River 24-36-27 W. P. mer.	July 31	A few isolated twigs damaged.	Manitoba maple, aspen and willow affected.
Brokenpipe Lake 33-26-21 W. P. mer.	July 31	A few isolated twigs damaged.	Aspen and willow only affected.
Grandview to Roblin along highway No. 5	Aug. 10	Entire tree damaged.	Some mortality due to spraying power-line right-of-way.
Roblin 9-25-28 W. P. mer.	Aug. 11	A few isolated twigs damaged.	
Cracknell 3-22-28 W. P. mer.	Aug. 11	Entire tree damaged.	Powerline spray drift into farm woodlot, fringe dead.
Dropmore to Russell along highway No. 83	Aug. 11	Entire tree damaged.	Fringe of woodlots dead from years of spraying.
Shoal Lake 14-17-23 W. P. mer.	Aug. 11	A few isolated twigs damaged.	Manitoba maple only affected.
Winnipegosis, along highway No. 20	Aug. 13	Entire tree damaged.	Powerline spraying killing fringe of woodlots.
Mountain Road between highways 5 and 10	Aug. 14	Entire tree damaged.	Powerline spraying killing all tree species.

5.3.5 OTHER NOTEWORTHY DISEASES.-

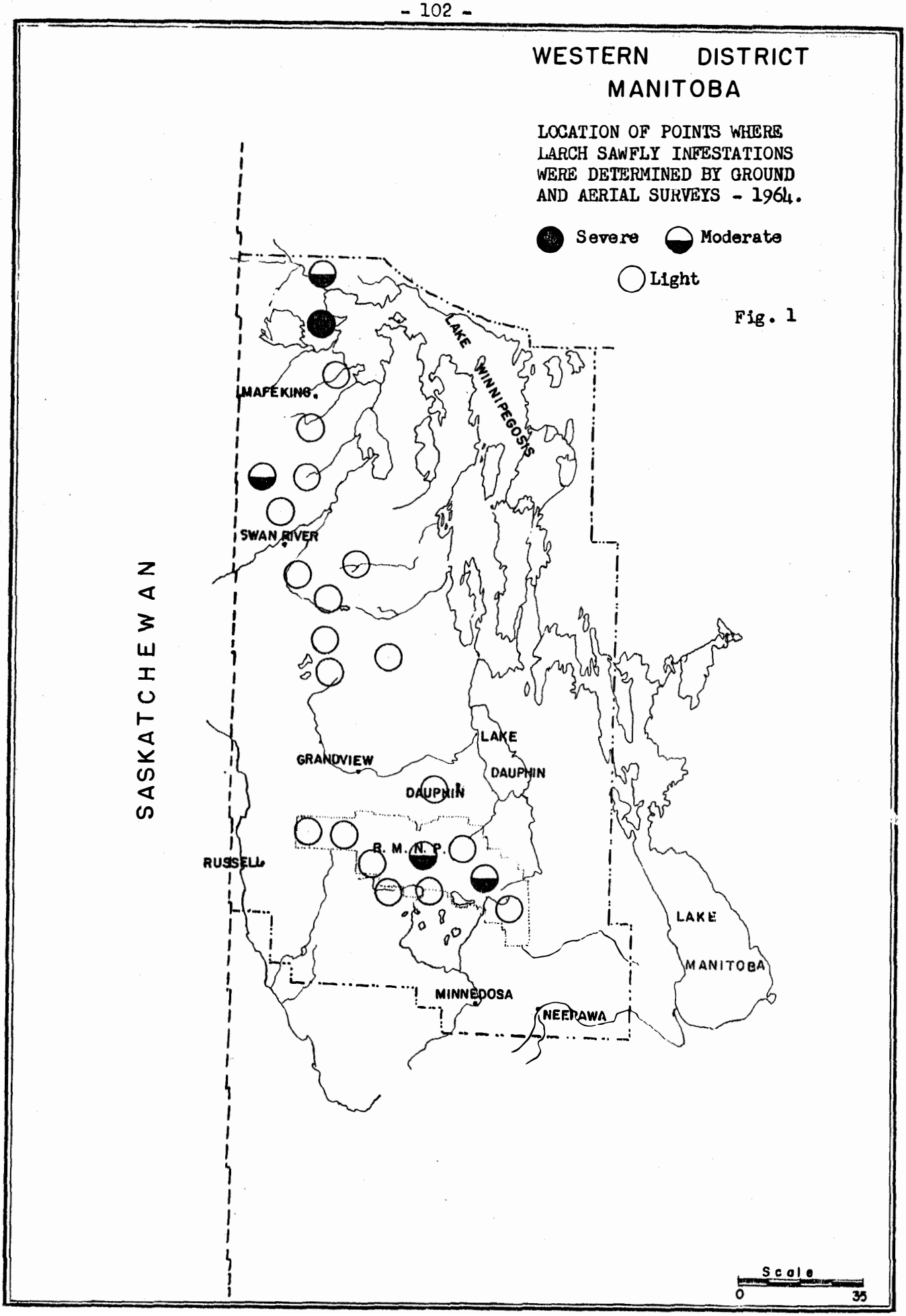
Organism and Disease	Host(s)	Location(s)	Remarks
Chrysomyxa sp. (Spruce needle rust)	wS, bS	Elk Lake	Infection light.
Coleosporium sp. (A needle rust)	jP	Cowan	Infection very light.

5.3.5 OTHER NOTEWORTHY DISEASES.-

Organism and Disease	Host(s)	Location(s)	Remarks
Cryptomyces maximus (Fr.) Rehm (A blight)	W	Minnedosa.	Common in woodlot willow thickets.
Cronartium comandrae Peck (Comandra blister rust)	jP	Duck Mountain Forest Reserve.	Infection light throughout plantations.
Fomes applanatus Pers. (White mottled rot)	wE	Baden.	Common on windthrown trees.
Fomes igniarius (L.) Gill (White trunk rot)	tA	Pine River.	Common in woodlots.
Fomes pinicola (Swartz) Cke. (Brown cubicle rot)	bS	Moon Lake.	Common on dead standing immature pole trees.
Fusicladium saliciperdum (All. & Tub.) Lind. (Willow blight)	W	Whirlpool Lake.	Infection confined to several willow thickets.
Hail damage	All species	Pine River.	Light to moderate foliage and bark damage in small area.
Marssonia sp. (A leaf spot)	tA	Russell, and Waterhen River.	Common but light at Russell; moderate on reproduction along Waterhen River.
Melampsorella caryophyllacearum Schroet. (Yellow witches' broom)	bF	Denbeigh Point.	Infection light in area.
Melampsorella sp. (A rust broom)	nS	Dropmore.	Infection very light on planted trees.
Mycosphaerella sp. (A leaf blight)	gAs	Riding Mountain National Park	Light infection along the north slopes.
Polyporus volvatus Pk. (A pouch fungus)	wS	Child's Lake, and Clear Lake.	Found on standing dead trees.
Peridermium harknessii Moore (Western gall rust)	jP	Powell, Duck Mountain Forest Reserve.	Light infection.

5.3.5 OTHER NOTEWORTHY DISEASES.-

Organism and Disease	Host(s)	Location(s)	Remarks
Peridermium coloradense (Diet.) Arth. & Kern (Broom rust of spruce)	bS	Pine River	Identified as P. coloradense now called Chrysomyxa arctostaphyli; light in area.
Pollaccia elegans Serv. (Leaf and Twig Blight)	bPo	Riding Mountain National Park.	Infection light.
Pollaccia radiosa (Lib.) Bald. & Cif. (Leaf and twig blight)	tA	Riding Mountain National Park, Duck Mountain Forest Reserve, and Powell.	Infection heavy in Duck Mountains; common in all other areas. Reproduction only affected.
Puccinia caricis (Schum.) Schroet. (A rust)	Wild gooseberry	Whitewater Lake.	Aecia commonly observed on underside of wild gooseberry foliage.
Rhytisma salicinum (Pres.) Fr. (Tar spot)	W	Riding Mountain National Park.	Infection very light.
Septoria sp. (A leaf spot)	bPo	Duck Mountain Forest Reserve, Riding Mountain National Park, and Pine River.	Infection much lighter than in 1963.
Septoria sp. (A leaf blight)	tA	Millwood.	Moderate infection on reproduction.
Target spot canker	tA	Minnedosa.	Infection causing stem and branch mortality in woodlot.
Uncinula salicis (Fr.) Wint. (Powdery mildew)	W	Riding Mountain National Park.	Infection light.


WESTERN DISTRICT
MANITOBA
LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS - 1964.
Severe
Moderate
Light
Fig. 1
SASKATCHEWAN
LAKE WINNIPEGOSIS
MAFEKING
SWAN RIVER
GRANDVIEW
LAKE DAUPHIN
DAUPHIN
R. M. N. P.
RUSSELL
LAKE MANITOBA
MINNEDOSA
NEEPAWA
Scale
0
35

WESTERN DISTRICT
MANITOBA

FOREST TENT CATERPILLAR INFESTATIONS
1964

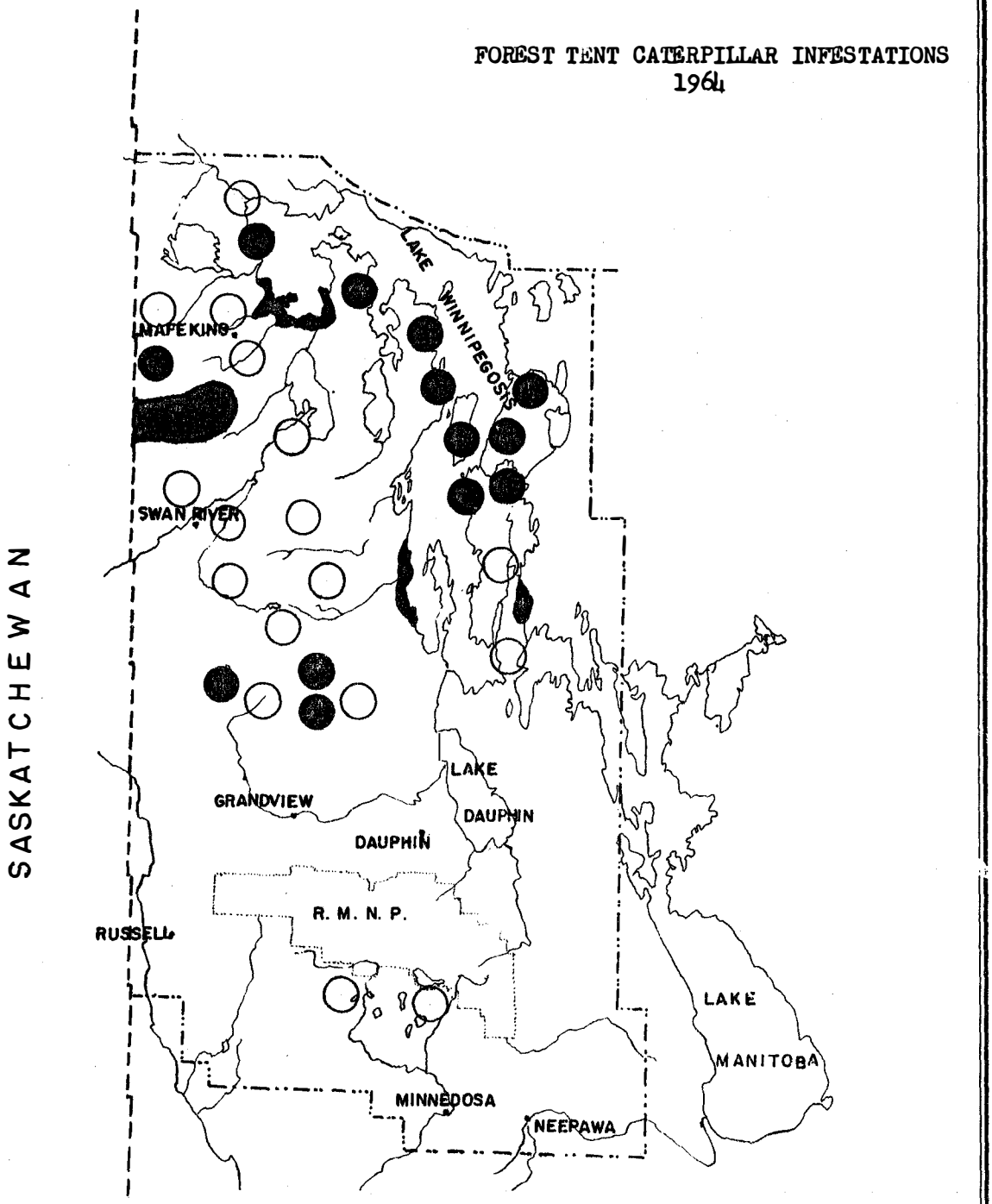


Fig. 2

Fig. 3
Severe defoliation of trembling aspen by Malacosoma disstria Hbn.
Camperville, Manitoba.
June 1964
Photo by B. McLeod

Fig. 4
Malacosoma disstria Hbn. cocoons on aspen and chokecherry shrubs.
Camperville, Manitoba.
June 1964
Photo by B. McLeod

6. ANNUAL DISTRICT REPORT

NORTHERN DISTRICT OF MANITOBA

1964

by

A. E. Campbell

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

6.1 INTRODUCTION

Surveys of forest insect and disease conditions in the Northern District of Manitoba and the Amisk and Cumberland lakes sections of the Northern District of Saskatchewan were conducted from May 12 to October 9, and 560 insect and 105 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. Approximately 23,480 square miles of the District were surveyed by air utilizing 44 hours and 30 minutes of charter flying time and 16 hours provided by the Manitoba Government Air Service. Travel by boat involved about 150 miles. The assistance and co-operation received from personnel of the Renewable Resources Branch of the Department of Natural Resources and the Manitoba Government Air Service are gratefully acknowledged.

From mid-May to early June weather conditions were generally cold with overnight frosts but were near-normal from mid-June to late July. Heavy rains and high winds in August through September to early October caused flooding conditions in many bogs in the southern section of the District. The adverse weather, particularly in the early part of the season, probably contributed to the marked decline in the forest tent caterpillar populations, but appeared to have little or no effect on the spruce budworm outbreak in the Namew Lake area. However, the first reduction in the size of the infestation area since it commenced about 1951 was recorded in 1964. High larval populations of the birch skeletonizer again caused noticeable feeding damage to birch stands in the northern part of the District, and several new infestations were detected in the eastern section. For the second year, moderate to severe defoliation of tamarack by the larch sawfly was recorded in the northern section but infestations remained light in the southern sections. Leaf beetles, leaf skeletonizers and leaf miners occurred commonly but feeding damage was generally light.

There were no indications of any serious or unusual conditions caused by disease organisms. Willow at Molson Lake was moderately infested by a tar spot but damage was light, and Puccinia rusts were commonly found on several hosts throughout the District. Surveys of the Thompson Smoke Easement Area revealed that fume damage to forest trees occurred at three additional locations for a total of five in two years.

The following sub-projects and special sampling methods were continued: (1) tree mortality appraisals to determine the effect of spruce budworm defoliation on white spruce and balsam fir;

(2) egg population sampling of the spruce budworm on white spruce and balsam fir; (3) forest tent caterpillar egg band counts to forecast population trends; (4) larch sawfly cocoon collecting using the drop-tray method; (5) sequential sampling of larch sawfly egg populations; and (6) the distribution of jack pine stem rusts and their alternate hosts.

6.2 INSECT CONDITIONS

6.2.1 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Generally favorable weather conditions during the larval feeding period favoured the continuation of high populations in most of the spruce-balsam stands in the Namew Lake infestation area along the Manitoba-Saskatchewan boundary south of Flin Flon. The most significant changes involved a reduction of approximately 170 square miles in the oldest part of the area and a new eastward extension of about fifty square miles (Fig. 1). These changes caused a net reduction from a total of 1,030 square miles in 1963 to about 895 in 1964. The area where the decline occurred extends from Namew Lake north and east to Saskoba and Mariche lakes and then west to the mouth of the Sturgeon Wier River on Amisk Lake. The extension extended from the eastern end of Simonhouse Lake to the west end of Iskwasum Lake on the Grass River. In 1964, the highest larval concentrations were observed in the vicinity of Flin Flon, Big Island Lake, North Star Road, Paradise Lodge, Atik, Cranberry Portage and at Nesso, Payuk, Mistik, Egg, Goose, Rocky and Simonhouse lakes, and at the west end of Iskwasum Lake on the Grass River where moderate defoliation was recorded.

The small, isolated infestations along the Churchill River between Sisipuk, Granville and South Indian Lakes and at Kipahigan Lake declined to very light and could not be detected from the air. However, a new area where moderate to severe defoliation occurred was detected on a small island on the east side of Kississing Lake about 35 miles northeast of Flin Flon. Evidence of old feeding damage in this area indicated that the infestation had been active for at least three years.

Aerial surveys were carried out in 1963 and 1964 to determine the incidence of tree mortality in the outbreak area. Predetermined flight lines were flown at eight mile intervals at an altitude of about 600 feet covering an area of 3,136 square miles. Three areas were selected and plot cruises were conducted at twenty 1/10 acre plots. All the living and dead trees were recorded and these summaries are shown in Table 1.

The results of an egg-mass survey in the Namew Lake infestation area indicated that the infestation will continue at about the same level in 1965.

TABLE 1

Mortality of Balsam Fir and White Spruce at Three Locations in the Namew Lake Infestation Area - 1964

(based on examination of 20 1/10 acre plots)

Location	Tree species and d.b.h. (ins.)	No. of trees		Total basal area sq. ft.	Basal area dead	Percentage of basal area dead
		Living	Dead			
Missi Island	wS up to 3"	0	0	0	0	0
Amisk Lake,	wS over 3"	49	1	46.948	0.442	0.9
Sask.	bF up to 3"	330	150	9.364	3.772	40.3
	bF over 3"	260	70	61.551	13.374	21.7
North Star	wS up to 3"	71	11	1.605	0.221	13.8
Road	wS over 3"	78	2	22.236	0.174	0.8
Bakers	bF up to 3"	383	146	5.275	1.385	26.3
Narrows,	bF over 3"	47	7	6.438	0.751	11.7
Man.						
Athapapuskow	wS up to 3"	87	4	2.147	0.108	5.0
Lake, Man.	wS over 3"	92	8	18.939	1.196	6.3
	bF up to 3"	150	8	2.215	0.216	9.8
	bF over 3"	11	4	3.273	1.601	48.9

6.2.2 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Surveys in the northern and eastern sections of the District indicated little or no change in the status of this sawfly (Fig. 2). High larval populations continued to cause moderate to severe defoliation of tamarack from Chipewayn Lake north along the South Seal River to Tadoule, Shethanie, Nejanilini and Baralzon lakes on the Wolverine River. Localized patches of moderate defoliation extended about forty miles into the Northwest Territories from the Manitoba boundary and west to Smith Bay on Nueltin Lake. Moderate to severe defoliation was observed south through Nueltin Narrows to Eganolf Lake and west along the North Seal River to Le Pensie Lake on the Cochrane River about 40 miles north of Brochet. Localized patches of moderate defoliation were also observed in the vicinity of Russell Lake. In the southern section, occasional patches of moderate defoliation occurred at the north end of Lake Winnipeg, Clear Bay on

Cedar Lake, between Cranberry Portage and Goose Lake, Prospector and Root Lake, and in the Bog about fifty miles south of The Pas. Occasional trees were moderately defoliated south of Denare Beach on Amisk Lake.

Water levels were below normal in the early part of the season in most tamarack bogs throughout the southern section of the District, but heavy rainfall from the latter part of July to early October caused flooding in most of them. However, there was no evidence of adverse effects on growth due to high water levels. Egg population counts were continued in four plots and the results are tabulated below.

Plot No.		No. of shoots examined	No. of cu shoots	Infestation ratings 1964
101	The Pas	60	0	light
102	Cranberry Portage	60	0	light
103	Amisk Lake	60	0	light
105	The Bog	60	3	light

Note: light = up to 35% defoliation;
moderate = 36-65%; and severe = over 66%

A total of 349 larch sawfly cocoons were collected from two permanent plots to determine the incidence of parasites and disease. Subsequent dissections of 240 of them indicated that effective parasitism was 51 per cent by Bessa harveyi (T. T.) and 4 per cent by Mesoleius tenthredinis Morley. Disease organisms accounted for 7 per cent mortality.

6.2.3 BLACK-HEADED BUDWORM, Acleris variana (Fern.):- This budworm occurred on white and black spruce and balsam fir at varying population levels throughout the entire District. Forty-eight collections (averaging 3.4 larvae per collection) were taken from June 12 to August 13. It was usually found in small numbers in association with the spruce budworm, or with a complex of insects attacking the "club-tops" of black spruce, and occasionally on yellow witches' broom of white spruce. The amount of feeding damage caused to the club tops and witches' brooms was difficult to determine. However it caused light defoliation of the current growth in the upper crowns of white and black spruce at Reed, Cross, Duck, Walker, Whiterabbit and Island lakes, Norway House, and at Mile 48 on the Snow Lake Road.

Other larval collecting points were: Orok, Radio Range, Pasquia River, Young's Point and Simonhouse, Rocky, Couchon, Oxford, Granville, Barrington and Paskwachi lakes.

6.2.4 BALSAM-FIR SAWFLY, Neodiprion abietis complex:- Except for small patches of light defoliation of spruce and balsam fir at Sipiwesk and Amisk lakes, the outbreak of this insect continued to decline and only traces of defoliation were recorded on the old foliage of spruce and balsam fir in areas previously infested at Setting, Wintering and Cross lakes. Other collection points were Island, Duck, Granville and Kississing lakes but defoliation at these points was negligible.

6.2.5 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Generally low larval populations were present on most spruce sampled through the southern part of the District, at God's and Island lakes in the northeastern section, and at Sipiwesk and Granville lakes in the central section. Small numbers of larvae, usually associated with a complex of insects that caused light feeding damage to the occasional black spruce top, was noted between Root Lake and Prospector, and "The Bog" area south of The Pas. Several collections, containing a few larvae, were also taken from white and black spruce at Reed, Rocky, Cross, Walker, Duck, Couchon, Molson, Oxford, God's, Snow and Granville lakes but they caused no visible defoliation.

6.2.6 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- There was a pronounced decrease in distribution of this serious defoliator of trembling aspen throughout most of the District (Fig. 3). Observations indicated that a combination of cold wet weather retarded foliage development, and parasites and disease were contributing factors. Only two areas of moderate to severe defoliation totalling about 45 square miles remained and these were located between Big Island Lake and Channing, and at Elbow Lake about 40 miles east of Flin Flon; this is in sharp contrast with approximately 10,000 square miles infested in 1963. Elsewhere, light defoliation of individual trembling aspen trees occurred near Reed, Morton, Moore, Williams, Kishitto and Little Fish lakes, and small numbers of larvae and pupae were collected at Orok, Prospector, Carrot River Valley Road, Radio Range and at Wekusko, Snow and Atikameg lakes. Collections of pupae were taken at Walker, Cross, Barrington, Granville and Amisk lakes; defoliation in these areas was negligible. Refoliation of trembling aspen was fair throughout the current infestation areas. However, in localized areas between Channing and

Big Island Lake, the stands were reinfested later by the aspen leaf beetle, which caused moderate skeletonizing of the new foliage. The parasitic fly, Sarcophaga aldrichi (Park.) occurred in fairly large numbers through the old infestation areas, being most abundant at Big Island Lake between Bakers Narrows and Flin Flon. Mass collections of late instar larvae and pupae of the forest tent caterpillar were taken at Big Island Lake and Channing to determine the incidence of parasites. The results, based on mass rearings of sound larvae and pupae at the laboratory were as follows:

Area	Type of collection	Number of specimens	Percentage of parasitism by Dipterous species	Percentage of parasitism by Hymenopterous species
Big Island Lake	larvae	82	20.6	0.0
	pupae	113	75.2	0.0
Channing	larvae	99	43.0	0.0
	pupae	97	83.5	0.0

Egg band surveys were carried out at pre-determined sampling points throughout the old infestation and surrounding areas to predict the extent and severity of defoliation in 1965. Results as shown in the following table indicate that the decline will continue except in the Big Island and Elbow lakes and Channing infestations; these will likely continue at about the same levels as in 1964.

Table 1

Forest Tent Caterpillar Egg-band Sampling - 1964
Northern District of Manitoba

(based on examination of 3 co-dominant trembling aspen at each sampling point)

Location	Summary of egg-band counts				
	Av.d.b.h. of trees (ins.)	Av.ht. of trees (ft.)	Av. crown depth (ft.)	Av. no. egg bands per tree	Defoliation forecast 1965
Pasquia River Rd.	3	26	17	0.0	nil
Pasquia River Rd.	2	25	17	1.0	light
Westray	3	29	19	1.0	light
Simonhouse Lake	3	31	20	6.0	moderate
Cranberry Portage	2	29	18	0.3	light
Cranberry Portage	3	33	23	0.3	light

Table 1 (concl.)

Location	Summary of egg-band counts				
	Av.d.b.h. of trees (ins.)	Av.ht. of trees (ft.)	Av. crown depth (ft.)	Av. no. egg bands per tree	Defoliation forecast 1965
Big Island Lake	3	29	21	3.6	moderate
Big Island Lake	3	29	20	4.0	light
Big Island Lake	5	37	30	11.3	moderate
Big Island Lake	3	32	20	6.3	moderate
Big Island Lake	3	31	23	7.3	moderate
Big Island Lake	3	30	20	3.3	light
Baker's Narrows	2	25	19	0.6	light
Mistik Creek	3	30	19	0.0	nil
Flin Flon	2	32	24	13.0	severe
Big Island Lake	3	33	25	11.3	severe
Big Island Lake	2	28	19	3.0	light
Snow Lake	3	35	24	4.3	light
Rocky Lake	3	34	24	1.3	light
Atikameg Lake	3	32	21	2.3	light
Reed Lake	4	33	22	6.0	light
Moose Lake	7	49	27	13.0	moderate
Williams Lake	3	22	15	6.0	moderate
Kishitto Lake	7	45	24	4.0	light
Cross Lake	2	27	19	1.6	light
Little Fish Lake	4	36	24	9.0	moderate
Morton Lake	2	25	17	8.0	severe
Elbow Lake	3	33	19	30.6	severe
Burntwood Lake	6	45	21	1.3	light

6.2.7 BIRCH LEAF SKELETONIZER, Bucculatrix canadensisella Chamb.: There was no change in the distribution of this skeletonizer in the northern section of the District (Fig. 4); high larval populations continued to cause moderate to severe skeletonizing of young birch stands at Burntwood, Highrock, Granville and Sisipuk lakes along the Churchill River watershed, and along the Manitoba-Saskatchewan boundary between Sisipuk and Kipahigan lakes. However, a new infestation was recorded in the area extending from Norway House to Molson, Stevenson, Island, Red Sucker, God's and Oxford lakes. Within this area, skeletonizing of white birch foliage ranged from light to moderate, with the heaviest infestations occurring at Island and Red Sucker lakes.

Surveys indicated that skeletonizing was generally more severe along rivers and lake shores and on islands, but occasional patches of moderate skeletonizing also occurred some distance inland, particularly in the area between Brochet and Lynn Lake and south of Flin Flon.

6.2.8 POPLAR FLEA BEETLE, Altica populi Brown:- There was no change in the status of this flea beetle, and low populations were again confined to the southern sections of the District. Light skeletonizing of alder foliage occurred in the vicinity of Athapapuskow, Reed, Snow, Sisipuk, Egg and Amisk lakes, at Flin Flon and Cranberry Portage. Adults and larvae were also taken occasionally from balsam poplar, but defoliation was negligible.

6.2.9 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- In 1963 low populations of this leaf beetle were confined to the southern part of the District. Surveys carried out in 1964 indicated a slight increase in numbers and a more widespread distribution extending northeastward to God's and Molson lakes areas and northward to Granville and Eyrie lakes. Light to moderate skeletonizing of the foliage on individual young trembling aspen occurred in the vicinity of Orok, Radio Range, Prospector and Westray, and at Egg, Root, Goose, Simonhouse and Big Island lakes. The highest concentrations of adults and larvae were observed in the latter area, where they caused moderate feeding damage to the new foliage of trembling aspen following severe defoliation by the forest tent caterpillar. Limited numbers of adults and larvae were also taken from alder, willow and balsam poplar, and feeding damage on these species was very light.

6.2.10 AN ASPEN WEBWORM, Tetralopha asperatella (Clem.):- Nests of this webworm were commonly found on trembling aspen and balsam poplar. They were most abundant at God's and Tadoule lakes where light feeding damage was usually confined to one or two branches. Light larval populations were also observed at Root Lake and Westray in the southern section, but defoliation was very light.

6.2.11 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acantholyda Sp. (False webworm)	wS	Amisk and Sipiwesk lakes.	Light populations.
Acrobasis betulella Hulst. (Birch tube maker)	wB	Orok, Big Island and Amisk lakes.	Light defoliation in vicinity of Orok. Populations low in other areas.
Acronicta Spp. (Dagger moths)	wB, bPo, puW, spAL	Molson, Snow, Egg, Simonhouse, Granville and Eganolf lakes.	A. dactylina, A. grisea and A. innotata were most common. A. fragilis and A. leporina occurred in small numbers at Simonhouse and Snow Lake. Caused no visible defoliation.
Agrilus anxius Gory (Bronze birch borer)	wB	Snow, Wekusko, Goose lakes and Cranberry Portage.	Light to moderate infestation in small patches of white birch
Arge clavicornis (Fab.) (Willow sawfly)	wB, spAL	Egg, Molson, Simonhouse and Le Pensie lakes.	Caused a trace of defoliation at Molson and Le Pensie lakes.
Arge pectoralis (Leach) (Birch Sawfly)	spAL	Molson Lake and Norway House.	Caused light to moderate defoliation of alder clumps along shore lines.
Amauronematus Sp. (A Sawfly)	puW	Island, Big Sand, Barrington, Molson, Nueltin, Walker and God's lakes.	Most common in the northern section of the District, but caused no visible defoliation.
Anoplonyx spp. (Sawflies on tamarack)	tL	The Pas, Cranberry Portage and Root Lake.	A. lutipes common but caused no visible defoliation. A single collection of A. canadensis was taken at The Pas.
Aphidae spp. (Plant lice)	bPo, tA, puW, Misc.	Atikameg, Egg, Cross, Walker, Duck, God's, Root, Wekusko, Simonhouse, and Amisk lakes.	Cinara sp. most common. Caused light damage to a few leaves or needles.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	cCh	Prospector and Root Lake.	Light defoliation.
Argyrotaenia tabulana Free. (A pine tube moth)	jP	Atikameg Lake.	Light populations; no visible damage.
Charmes cooleyi Gill. (Cooley spruce gall aphid)	wS	Reed and God's lakes.	Infestation light on single tree.
Charmes lariciatus Patch. (Spruce-pine apple gall aphid)	wS, bS	Orok, Paskwachi River and Rocky, Walker, Cross, and Snow lakes.	Infestation generally light; galls most common in the Walker Lake and Paskwachi River areas.
Choristoneura pinus Free. (Jack-pine budworm)	jP	Orok	Light populations caused no noticeable defoliation.
Chrysomela knabi Brown (A leaf beetle)	puW, bPo, spAL	Northern Section, and Amisk Lake.	Light feeding damage on patches of willow and alder.
Chrysomelid Sp. (A leaf beetle)	Misc.	Athapapuskow, Walker, Sipiwesk and Red Sucker lakes.	Light to moderate skeletonizing occurred to miscellaneous plants in these areas, elsewhere in the District populations are low.
Dioryctria reniculella (Grote) (Spruce cone worm)	wS	Snow, Simonhouse, Egg, Highrock, and Amisk lakes, at Mistik Creek and Cranberry Portage	Light populations, usually associated with C. fumiferana causing no visible defoliation.
Epicnaptera americana (Harr.) (A lappet moth)		Barrington, and Big Island lakes and Pasquia River Road.	Light populations. Causing no noticeable defoliation.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Epizeuxis americalis (Guen.) (An owlet moth)	bS, bF, wS	Atikameg, Snow, and Island lakes.	Larvae occurred in small numbers in black spruce tops and on black spruce mistletoe brooms; caused light defoliation.
Galerucella decora Say (Gray-Willow leaf beetle)	puW, tA	Westray, The Pas, at Egg and Amisk lakes.	Light skeletonizing in the vicinity of Westray.
Gonioctena americana (Schaef.) (American aspen beetle)	tA	Orok and Prospector.	A trace of feeding damage caused by adults. Light populations.
Gracillarid Sp. (A blotch miner)	puW, tA, wB	The Pas, Paskwachi River and Eyrie, Sisipuk, Egg, Goose, Cross, Walker and Island lakes.	Widely distributed; caused a trace of damage.
Halisidota maculata (Harr.) (Spotted tussock moth)	puW, spAL, bPo, wB	Sipiwesk, Snow, Barrington, Sisipuk, Stevenson, Red Sucker, Egg and Simonhouse lakes.	Larvae most abundant at Barrington Lake where they caused light defoliation of alder clumps along shore lin
Hemichroa crocea (Foure.) (Striped alder sawfly)	spAL, puW	Barrington, Island and Red Sucker lakes.	Light defoliation of alder at Island Lake.
Herculia thymetusalis Wlk. (A pyralid moth)	bS, wS	Atikameg, Snow, and Cross lakes.	Occurred in small numbers on club-topped black spruce and on yellow witches' brooms on white spruce.
Hyphantria cunea (Drury) (Fall webworm)	puW	Westray.	Light feeding damage on several willow clumps.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	tA	Orok, Cranberry Portage, Duck, Egg, Walker, Root, Snow, and Simonhouse lakes.	Light populations.
Macremphytus varianus (Nort.) (A sawfly)	Do	Norway House, Granville and Red Sucker lakes.	Light defoliation.
Malacosoma spp. (Tent caterpillars)	cCh, wB, puW, bPo	Grass, Sturgeon rivers. Elbow, Rocky, Egg, Cross, Walker and Amisk lakes.	M. pluviale (Dyar) was the most common and occurred in most areas; M. lutescens (N. & D.) occurred in three areas only. Light feeding usually confined to one or two branches of the host tree.
Monochamus spp. (Sawyer beetles)	jP bS	Simonhouse and Couchon lakes.	Light populations. M. scutellatus Say. most common and caused light damage.
Nematus limbatus (Cress.) (Willow sawfly)	puW, tA	Simonhouse, Reed, and Barrington lakes.	Caused light defoliation of willow clumps along lake shores.
Nymphalis antiopa (L.) (Spiny elm caterpillar)	puW tA	Snow lake.	Light defoliation of young trembling aspen.
Neodiprion spp. (Jack-pine sawflies)	jP	Couchon, Wekusko, and Amisk lakes.	N. virginianus complex was most abundant and caused light to moderate defoliation to young jack pine at Amisk Lake. N. pratti banksianae, N. maurus and N. nanulus nanulus found occasionally.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Notolophus antiqua (L.) (Rusty tussock moth)	puW, wB, bPo, Do	Walker, Cross, Oxford, God's, Island and Granville lakes.	Common in all areas but caused no noticeable defoliation.
Nycteola cinereana N. & D. (An owlet moth)	bPo, wB	Cross, Island and Root lakes.	Low populations; light defoliation of birch at Island Lake.
Nyctiola frigidana Wlk. (An owlet moth)	puW	Cross, Walker and Oxford lakes.	Occurred mostly in the northern section of the District; caused no noticeable defoliation.
Oberea schaumi Lec. (Poplar twig borer)	tA	Norway House.	Low populations.
Parorgyia plagiata (Wlk.) (Grey spruce tussock moth)	wS, bF	Root, Rocky, Snow, Molson and Oxford lakes.	Common in these areas, but caused no noticeable defoliation.
Pemphigus populi-transversus Riley (Poplar twig gall aphid)	bPo	Cross and Sisipuk lakes.	Galls common in these areas.
Phenacaspis pinifoliae (Fitch) (Pine-needle scale)	bS	Cross Lake.	The only occurrence in the District; very light damage.
Phratora americana canadensis (A leaf beetle)	tA, wB, puW	Egg and Oxford lakes.	Light defoliation.
Pikonema dimmockii (Cress.) (Green-headed spruce sawfly)	wS, bS, bF	Snow, Rocky, Walker, Cross, Sipiwesk, Couchon, Molson, Oxford, and God's lakes, and The Pas.	Common throughout most of the District, but caused no noticeable defoliation. Usually found in association with P. alaskensis and A. variana.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Pissodes strobi Peck. (White-pine weevil)	jP, wS	Athapapuskow and Le Pensie lakes.	Low populations.
Pontania sp. (A sawfly)	puW, tA	Entire District.	Common but caused no noticeable damage.
Phyllocolpa sp. (A sawfly)	puW, tA, bPo, wB	Cross, Walker, Duck, Couchon, Oxford, God's, Molson, Root, Snow and Tadoule lakes, and Westray.	Light to moderate defoliation of balsam poplar at God's and Island lakes.
Physokermes piceae Schr. (Spruce bud scale)	wS	Tadoule Lake.	Light infestation.
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	puW tA	Snow, Molson, Eganolf and Sisipuk lakes.	Light infestation in all areas.
Saperda calcarata Say. (The poplar borer)	tA	Atikameg and Cross lakes.	Low populations; light twig damage.
Saperda concolor Lec. (The poplar-gall saperda)	puW	Walker, Cross, Duck, God's, Molson, Wekusko lakes, Norway House and Amisk Lake in N. Saskatchewan.	Common in most willow stands.
Saperda moesta Lec. (The poplar-twig borer)	bPo	Cross, Duck, God's, Norway House and Amisk Lake.	Light infestation; infested twigs common.
Scolytid Sp. (Bark beetles)	wS jP	Atikameg and Root lakes.	Low populations.
Semiothisa bicolorata F. (A looper)	jP	Orok.	Low populations; no noticeable defoliation.

6.2.11 OTHER NOTEWORTHY INSECTS:- (Concl.)

Insect	Host(s)	Locality	Remarks
Semiothisa granitata Gn. (A looper)	wS, bF, tL	Root and Egg lakes.	Low populations; no noticeable defoliation.
Semiothisa sexmaculata Pack. (Green larch looper)	tL	Throughout range of tamarack.	Low populations; no noticeable defoliation.
Tenthredinid Sp. (A sawfly)	wB, spAL, tA, puW	Molson, Oxford, Snow, Tadoule, Granville and Simonhouse lakes.	Larvae common but caused no noticeable feeding damage.
Tortricid sp. (A leaf roller)	puW, tA, wS, wB, tL	Entire District.	Light feeding damage in the vicinity of Root and Couchon lakes.
Toumeyella numismaticum (Pettit and McD.) (Pine tortoise scale)	jP	Orok and Rocky Lake.	Light infestation.
Trichiosoma triangulum Kby. (A sawfly)	tA, bPo, puW	Walker, Oxford, Snow lakes and Cranberry Portage.	Low populations; a trace of defoliation.

6.3 TREE DISEASE CONDITIONS

6.3.1 SPRUCE NEEDLE RUST, Chrysomyxa ledicola Lagerh.:- Confined to the northern and northeastern sections of the District where very light infections were recorded on all age classes of white and black spruce. Collections were taken at Granville, Lynn, God's and Kamuchawie lakes and along the Paskwachi River about forty miles south of Brochet.

6.3.2 TAR SPOT, Rhytisma salicinum (Pers.) Fr.:- There was no apparent change in the incidence and distribution of this disease. Tar spots occurred commonly on willow foliage at God's, Oxford and Lynn lakes, and caused moderate damage along the lake shores at Molson Lake.

6.3.3. FUME DAMAGE:- Noticeable browning of the foliage of coniferous and deciduous trees caused by sulphur dioxide fumes occurred over an area of approximately six square miles immediately west and south of the mining smelter at Flin Flon. Foliage discoloration was most conspicuous on white birch, trembling aspen and tamarack. Refer also to the separate summary of forest insect and tree disease conditions in the Thompson Smoke Easement Area - 1964.

6.3.4 OTHER NOTEWORTHY DISEASES:-

Disease organisms	Host	Locality	Remarks
Arceuthobium americanum Nutt. (Jack-pine mistletoe)	jack pine	Southern Section of the District.	Infection remained static; no new occurrences recorded.
Arceuthobium pusillum Peck. (Dwarf mistletoe of black spruce)	black spruce	Southern Section of the District.	No change in distribution.
Fomes pinicola (Swartz) ex Fr. cke. (Brown cubical rot)	white spruce	Atikameg Lake.	Light infection of two trees.
Fomes fomentarius (L. ex Fr.) Kickx (White mottled rot)	white birch	Molson Lake.	Light infection on one tree.
Cronartium comandrae Pk. (Comandra blister rust)	jack pine	Root and Rocky lakes.	Light infection on several trees.
Gymnosporangium sp. (A leaf rust)	saskatoon and mountain ash	Root Lake and Norway House.	Infections common but light; caused no serious damage.

6.3.4 OTHER NOTEWORTHY DISEASES:- (Concl.)

Disease organism	Host	Locality	Remarks
Erwinia amylovora (Burr.) Winslow (Fire blight)	mountain ash	Cross Lake and Norway House.	Infection and damage light in these areas.
Melampsora bigelowii Thuem. (Larch-willow rust)	willow	Sisipuk and God's lakes.	Infections light; alternates on larch.
Polyporus betulinus (Bull.) Fr. (The birch conk)	white birch	God's Lake.	Infection very light; one conk taken from wind-thrown tree.
Uncinula salicis (Fr.) Wint. (Powdery mildew)	willow	Molson Lake and Guy Hill.	Common but caused no noticeable damage to foliage.

6.4 SUMMARY OF FOREST INSECT AND TREE DISEASE CONDITIONS IN THE THOMPSON SMOKE EASEMENT AREA - 1964

This is the fifth survey report depicting forest insect and disease conditions in the Smoke Easement and adjacent areas held by the International Nickel Company around Thompson. Surveys with an aircraft provided by the Manitoba Government Air Service were carried out along pre-determined flight lines at twelve mile intervals and involved sixteen hours of flying time covering approximately 7,488 square miles. Totals of one hundred and fifty insect and sixty disease collections were taken at ten of the Company's SO_2 sample stations and from eight other points within and near the Smoke Easement Area.

The larch sawfly was present in small numbers in most tamarack stands, but caused only traces of defoliation except in the vicinity of Blank Lake along the Birchtree River, and between Nelson House and Harding Lake where it was light on several trees. The black-headed budworm increased slightly in numbers and caused light defoliation of white and black spruce and balsam fir at Cross, Duck, Whiterabbit, Wintering and Paint lakes and in the vicinity of Nelson House. Larval populations of the balsam-fir sawfly continued to decrease and caused only a trace to light feeding damage to the old foliage of spruce and balsam fir at Cross, Sipiwesk, Duck and Isbester lakes. Jack-pine sawflies, Neodiprion nanulus nanulus and N. pratti

banksiana caused light defoliation at Cauchon Lake. Populations of the yellow-headed and green-headed spruce sawflies remained about the same; a trace of feeding damage occurred on most spruce examined. There was no evidence of spruce budworm or forest tent caterpillar feeding.

Light to moderate infections of Macrophoma gall of trembling aspen occurred along the shores of Cross Lake. A spruce needle rust, Chrysomyxa sp. occurred commonly on white spruce, black spruce and on labrador tea. Light infections of a rust, Phragmidium sp. occurred on rose bushes at Isbester and Harding lakes and Norway House. The Hydro Electric Dam on the Nelson River caused considerable flooding of forest trees along the shore lines of Duck, Cross and Sipiwesk lakes, and on the Nelson River below the dam.

For the second consecutive year light damage caused by sulphur dioxide fumes from the mining smelter at Thompson was recorded on forest trees. The affected areas range from 15 to 35 miles to the south and east and northeasterly directions. The damage was not visible from the air and careful ground observations were required to detect discoloration of foliage. Based on laboratory examinations, fume damage was evident on the foliage of balsam poplar, white birch, dogwood, trembling aspen, high-bush cranberry and white spruce at Natawahunan, Witchai, Ospwagan, Paint and Wintering lakes. In 1963 fume injury on balsam poplar and white birch was detected for the first time at the two former lakes. Other forest insects and diseases that occurred commonly throughout the Smoke Easement Area but caused little or no defoliation are listed in tables 2 and 3.

Table 2

Insect	Host(s)	Location & Sampling Station No.	Remarks
Agrilus anxius Gory. (Bronze birch borer)	white birch	SO_2 #18 (Paint Lake)	Common; caused only light damage.
Aphid spp. (Plant lice)	trembling aspen, dogwood, balsam poplar and willow	SO_2 #5 (Wintering Lake) SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbester Lake) SO_2 #12 (Witchai Lake) Cross, Walker, and Duck lakes.	Common but caused no visible damage.

Table 2 (Cont'd)

Insect	Host(s)	Location & Sampling Station No.	Remarks
Acronicta spp. (Dagger moth)	balsam poplar and willow	SO_2 #10 (Burntwood River) SO_2 #15 (Harding Lake) SO_2 #17 (Ospwagan Lake)	Low populations; A. grisea occurred at Harding and Ospwagan lakes, and A. lepurina at Burntwood River.
Amauronematus sp. (A sawfly)	willow and balsam poplar	SO_2 #15 (Harding Lake) SO_2 #16 (Nelson House) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake)	Larvae common but caused only a trace of feeding damage.
Chrysomela crotchi Brown (Aspen leaf beetle)	trembling aspen and balsam poplar	SO_2 #8 (Natawahunan Lake) SO_2 #10 (Burntwood River) SO_2 #16 (Nelson House) Cross, and Cauchon lakes	Caused light defoliation at Natawahunan Lake and Burntwood River; only a trace elsewhere.
Chrysomela knabi Brown (A leaf beetle)	alder, willow and balsam poplar	SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbester Lake) SO_2 #19 (Wintering Lake)	Low populations; only light feeding da age.
Chermes laricatus (Patch) (Spruce pine-apple gall aphid)	white spruce and black spruce	SO_2 #10 (Burntwood River) SO_2 #12 (Witchai Lake) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake)	Common but infestation light.
Epicnaptera americana (Harr.) (A lappet moth)	willow, white birch and alder	SO_2 #12 (Witchai Lake) SO_2 #15 (Harding Lake) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake)	Populations low; caused no noticeable defoliation.

Table 2 (Cont'd)

Insect	Host(s)	Location & Sampling Station No.	Remarks
Eriophyes sp. (A mite)	willow and saskatoon	SO_2 #15 (Harding Lake) SO_2 #17 (Ospwagan Lake) and Duck Lake	Leaves lightly infested; no noticeable damage.
Galerucella decora (Say.) (Gray willow leaf beetle)	willow	SO_2 #16 (Nelson House) SO_2 #19 (Wintering Lake)	Light foliage skeletonizing.
Gracillarid sp. (A blotch miner)	willow and white birch	SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake)	Larvae common; leaves lightly infested.
Hemichroa crocea (Foure.) (Striped alder sawfly)	alder	SO_2 #15 (Harding Lake)	Caused light defoliation of alder along lake shore; populations low elsewhere in the area.
Malacosoma pluviale (Dyar) (Western tent caterpillar)	willow and white birch	Cross and Walker lakes	Several old tents; no current defoliation observed.
Meroptera pravella Grt. (A snout moth)	balsam poplar	SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbester Lake) SO_2 #16 (Nelson House) and Walker Lake	Larvae common but caused no discernable defoliation.
Nematus limbatus (Cress.) (Willow sawfly)	willow	SO_2 #15 (Harding Lake)	Caused light defoliation of willow clumps along lake shore.

Table 2 (Cont'd)

Insect	Host(s)	Location & Sampling Station No.	Remarks
Notolophus antiqua (L.) (Rusty tussock moth)	balsam poplar, willow, alder and white birch	SO_2 #5 (Wintering Lake) SO_2 #9 (Isbester Lake) SO_2 #10 (Burntwood River) SO_2 #15 (Harding Lake) SO_2 #17 (Ospwagan Lake) SO_2 #18 (Paint Lake) SO_2 #19 (Wintering Lake) Cross and Walker lakes	Larvae common at all points but caused no noticeable feeding damage.
Nycteola frigidana Wlk. (An owlet moth)	willow	SO_2 #10 (Burntwood River) SO_2 #15 (Harding Lake) SO_2 #16 (Nelson House) SO_2 #18 (Paint Lake) Cross and Walker lakes	Larvae common; caused light defoliation.
Phyllocolpa sp.	trembling aspen, balsam poplar and willow	SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbester Lake) SO_2 #12 (Witchai Lake) SO_2 #16 (Nelson House) SO_2 #17 (Ospwagan Lake) SO_2 #19 (Wintering Lake) Cross, Walker, Duck and Cauchon lakes	Caused light defoliation on balsam poplar at Witchai and Wintering Lake; larvae common in other areas but caused no noticeable defoliation.
Phratora americana canadensis Brown (A leaf beetle)	willow	SO_2 #17 (Ospwagan Lake) SO_2 #19 (Wintering Lake)	Light to moderate skeletonizing of foliage.
Rhabdophaga strobiloides (Walsh) (Beaked-willow gall)	willow	SO_2 #8 (Natawahunan Lake) SO_2 #15 (Harding Lake) SO_2 #18 (Paint Lake) and Sipiwesk Lake	Light infestation of galls; no change from 1963.

Table 2 (Concl.)

Insect	Host(s)	Location & Sampling Station No.	Remarks
Saperda concolor Lec. (The poplar gall saperda)	willow and trembling aspen	SO_2 #8 (Natawahunan Lake) SO_2 #12 (Witchai Lake) SO_2 #16 (Nelson House) SO_2 #18 (Paint Lake) Walker, Cross and Duck lakes	Twigs lightly infested at most points except at Walker Lake where moderate infestation was recorded.
Saperda moesta Lec. (The poplar twig borer)	balsam poplar	SO_2 #8 (Natawahunan Lake) SO_2 #9 (Isbester Lake) Cross and Duck lakes	Moderate infestation at Duck Lake; light twig damage elsewhere.
Tenthredinid sp. (A sawfly)	white birch, and alder	SO_2 #9 (Isbester Lake) SO_2 #12 (Witchai Lake) SO_2 #17 (Ospwagan Lake) SO_2 #19 (Wintering Lake) Walker and Cauchon lakes	Larvae common, but caused no noticeable defoliation.

Table 3

Tree Diseases - Thompson Smoke Easement Area

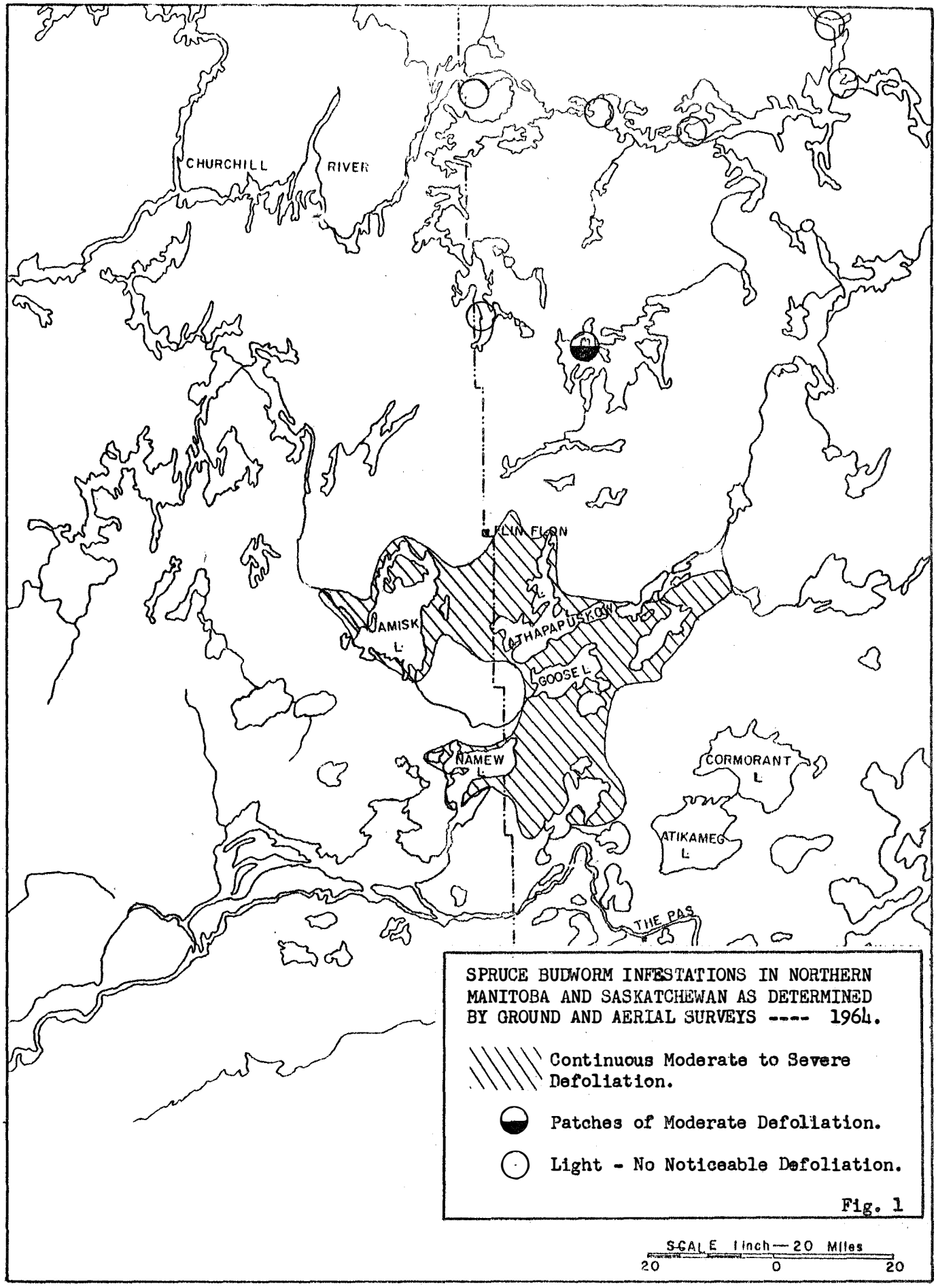
Disease or Organism	Host(s)	Locations & Sampling Station No.	Remarks
Fomes pinicola (Swartz) Cke. (Brown cubical rot)	black spruce and white spruce	SO_2 #10 (Burntwood River) Walker, Duck and Sipiwesk lakes	Light infection.
Fomes igniarius (L. ex Fr.) Kichx (White trunk rot)	trembling aspen	Sipiwesk Lake	Taken from a windthrown tree; light infection.

Table 3 (Cont'd)

Disease or Organism	Host(s)	Locations & Sampling Station No.	Remarks
Fomes fomentarius (L. ex Fr.) Kichx (White mottled rot)	white birch	Walker Lake	One immature conk taken from windthrown tree; infection very light.
Gymnosporangium rust (A leaf rust)	mountain ash	Cross Lake	Orange colored spots on foliage; infection light.
Melampsorella caryophyllacearum Schoret. (Yellow witches broom)	balsam fir	SO_2 #19 (Wintering Lake)	Infection light.
Phragmidium rust (A leaf rust)	rose	SO_2 #9 (Isbester Lake) SO_2 #15 (Harding Lake) SO_2 #16 (Nelson House)	Light infection.
Polyporus pargamenus Fr. (Slash decay)	trembling aspen	Sipiwesk Lake	Infection light on dead trees.
Pollaccia radiosa (Lib.) (Aspen shoot blight)	trembling aspen	SO_2 #5 (Wintering Lake) SO_2 #16 (Nelson House)	Infection light; no change in distribution.
Uncinula salicis (Fr.) Wint. (Powdery mildew)	balsam poplar	SO_2 #17 (Ospwagan Lake) and Sipiwesk Lake	Light infection on most balsam poplar at these points.
Puccinia caricis (Schum.) Schroet. (A leaf rust)	wild red currant	Sipiwesk Lake	Light infection on foliage.
Puccinia linkii Klotzseh (A leaf rust)	high bush cranberry	Sipiwesk Lake	Light infection on foliage. No trace at Natawahunan and Wintering lakes where light infection occurred in 1963.

Table 3 (Concl.)

Disease or Organism	Host(s)	Locations & Sampling Station No.	Remarks
Puccinia porphyrogenita Curt. (A leaf rust)	bunchberry	SO_2 #17 (Ospwagan Lake)	Small dark brown spots on underside of leaves; infection light.
Taphrina alni-incanae (Catkin Hypertrophy of alder)	alder	SO_2 #9 (Isbester Lake)	Leaves dark red in color; light infection.



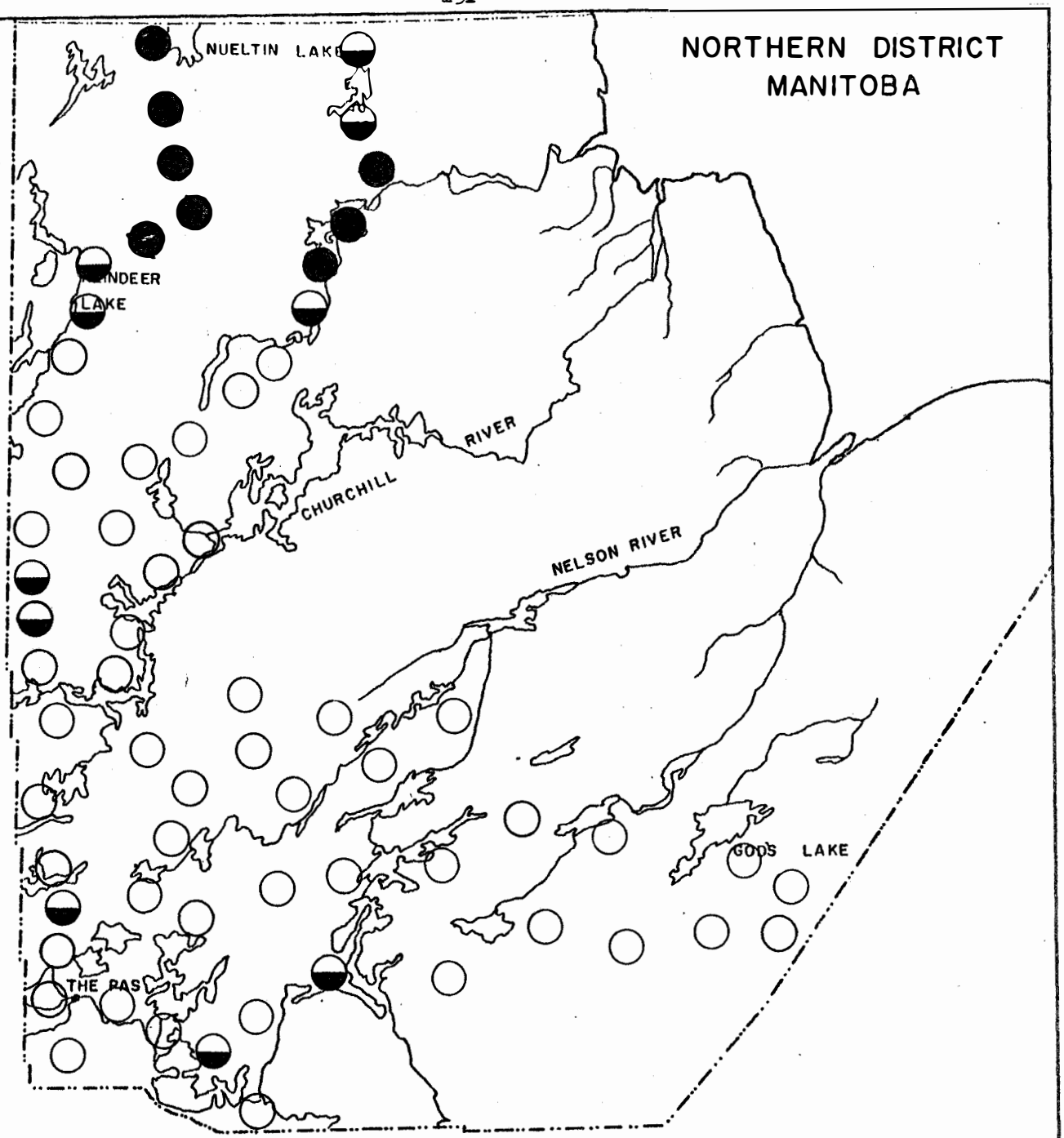
SPRUCE BUDWORM INFESTATIONS IN NORTHERN MANITOBA AND SASKATCHEWAN AS DETERMINED BY GROUND AND AERIAL SURVEYS ---- 1964.

Continuous Moderate to Severe Defoliation.

Patches of Moderate Defoliation.

Light - No Noticeable Defoliation.

Fig. 1



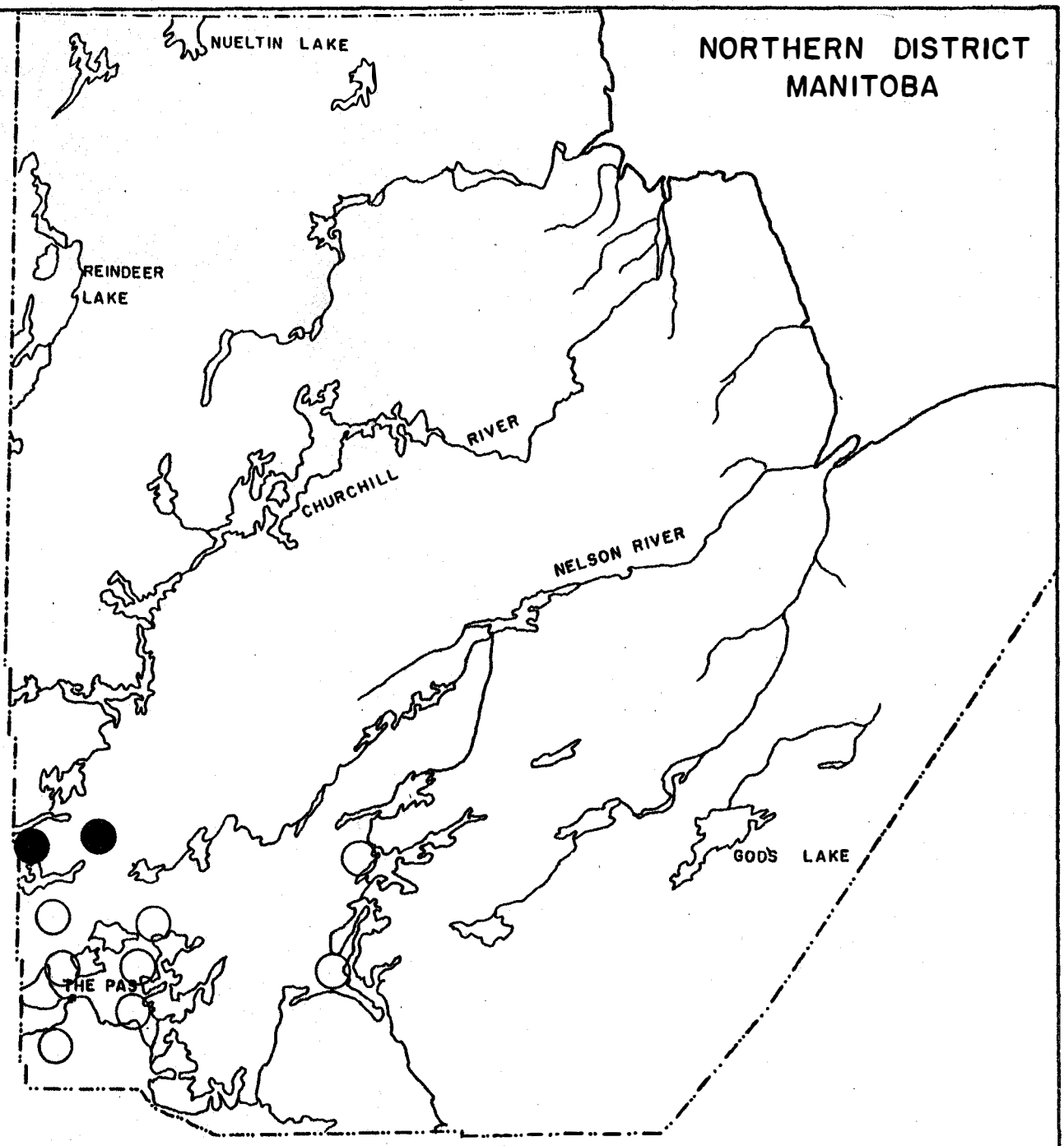
LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Severe ◒ Moderate ○ Light

Fig. 2

SCALE 64 mile — 1 inch

50 0 50



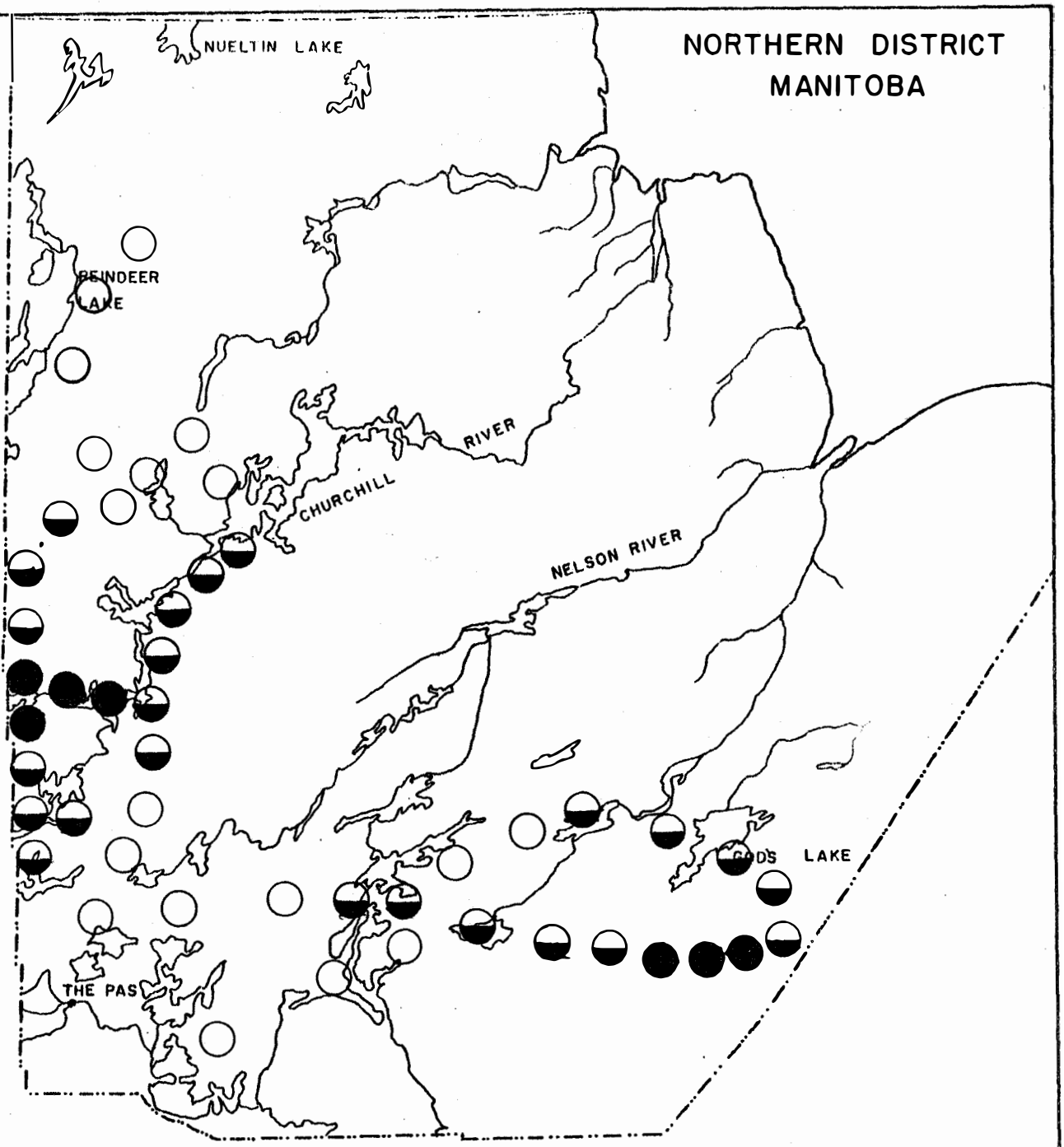
FOREST TENT CATERPILLAR INFESTATIONS
1964

● Patches of Moderate to Severe Defoliation.

○ Larval Collection Points - No Noticeable Defoliation.

Fig. 3

SCALE 64 mile — 1 inch
50 0 50



INFESTATIONS OF THE BIRCH SKELETONIZER AS DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964

- Severe
- Moderate
- Light

Fig. 4

SCALE 64 mile — 1 inch

50 0 50

7. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT OF SASKATCHEWAN

1964

by

V. Hildahl

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March 1965

7.1 INTRODUCTION

The 1964 growing season commenced with a short warm, dry period that was interrupted by killing frosts (as late as early June). This was followed by cool weather with abundant rainfall in most areas. Survey work in the District consisted primarily of sampling and recording major pests, and of carrying out essential studies; the latter including spruce budworm egg-mass population counts and defoliation estimates, and population sampling of the fall cankerworm and boxelder twig borer.

The number of important insect and disease problems remained about the same as in 1963, but there were notable changes in the status of some of them. Populations of the spruce budworm, pine needle scale, aspen leaf beetle, American aspen beetle, and gray willow-leaf beetle were noticeably lower, and the forest tent caterpillar infestation collapsed. The dry weather during the early part of the season favored slightly higher populations of the spruce spider mite and fall cankerworm. The severe frosts during late May and early June destroyed much of the early leaf growth on many trees, and field-crop spraying with 2,4-D resulted in conspicuous damage to Manitoba maple, particularly in areas where applied by aircraft.

7.2 INSECT CONDITIONS

7.2.1 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- A further decline in populations of this budworm was evident in white spruce stands in the Battle Creek Valley of the Cypress Hills Provincial Forest. The infestation was restricted to sections 2 and 11, tp.8, rge.30, W3rd mer., and ground and aerial surveys indicated that defoliation did not exceed 15 per cent. No collections were taken elsewhere in the District but, as in the past two years, sampling was limited to a few areas only.

Egg-mass and defoliation surveys were initiated in 1960 to follow the history of the outbreak in the Cypress Hills; the results of these surveys to date are shown in Table 1.

7.2.2 PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- Although this needle scale was widely distributed, it caused no serious damage in 1964. Light to moderate infestations were recorded on white and Colorado spruce in park areas and boulevard plantings in Regina, Moose Jaw, Yorkton, and on the Forest Nursery Station and in the town of Indian Head. In addition, similar infestations were reported in farm shelterbelts around Creelman, Indian Head and Moose Jaw.

Light infestations also commonly occurred on native lodgepole pine in the Park Block of the Cypress Hills Provincial Forest.

TABLE 1

Results of Egg-mass and Defoliation Surveys of the Spruce Budworm in the Cypress Hills of Saskatchewan, 1960-1964

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

** Defoliation estimates to be taken July 1965.

7.2.3 SPRUCE SPIDER MITE, Oligonychus ununguis (Jac.):- Dry weather during the early part of the season favored higher populations of this mite. Notable infestations, varying in intensity from light to severe on individual trees, were recorded in the Creelman, Indian Head, Moose Jaw, Swift Current and Maple Creek areas. Particularly high mite populations on ornamental plantings in Regina and Moose Jaw were substantially reduced with chemical sprays, and resultant damage to spruce was negligible.

7.2.4 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):-

This defoliator of white spruce occurred throughout the District. However, populations remained at about the same level as in 1963 and no widespread damage was recorded. Planted white spruce in farm shelterbelts near Indian Head was moderately defoliated, and light infestations were noted in the Estevan, Moose Mountains, Creelman, Weyburn and Regina areas. Most owners in these areas are familiar with the insect and usually apply direct controls. A light infestation occurred on native white spruce in the West Block of Cypress Hills Provincial Forest.

Light populations of the green-headed spruce sawfly, Pikonema dimmockii (Cress.), were noted feeding in association with the yellow-headed spruce sawfly in the Cypress Hills Provincial Forest and Moose Mountain Provincial Park.

7.2.5 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Planted Siberian and European larches at the Department of Natural Resources field headquarters in the West Block of the Cypress Hills Provincial Forest and on the Forest Nursery Station at

Indian Head were moderately defoliated by this sawfly. Elsewhere, similar infestations persisted in a plantation of tamarack near Wolseley.

7.2.6 FALL CANKERWORM, Alsophila pometaria (Harr.):- High larval populations continued in shelterbelt and town plantings of Manitoba maple, white elm, and green ash at several points throughout the central and southwestern sections of the District, and new infestations developed in the Estevan-Weyburn area in the southeastern section. Scattered shelterbelts in the Kenaston, Outlook, Ernfold, Swift Current, Maple Creek, Stewart Valley, and Consul areas were moderately to severely defoliated. Particularly heavy infestations in isolated shelterbelts in the Weyburn-Estevan area caused complete stripping of the foliage on many trees.

Infestations on boulevard and park trees in the cities of Regina and Moose Jaw, and in the Tuxford area were significantly reduced with chemical sprays.

7.2.7 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- The infestations of the forest tent caterpillar that persisted for several years in the Cypress Hills Provincial Forest collapsed. Observations at the 1963 egg-band sampling stations and at other points failed to reveal any defoliation. One collection of the insect was taken at McLean, but it did not occur at any other location where trembling aspen was sampled.

7.2.8 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- There was a notable decline in populations of this beetle in trembling aspen stands throughout the eastern sections of the District, and the large continuous areas of moderate to severe infestation recorded in 1963 were reduced to widely scattered patches of moderate. Isolated infestations, ranging from light to moderate, occurred in the Moose Mountain Provincial Park, near Moosomin, and in the Trans-Canada Campsite at McLean.

Elsewhere, adults and larvae were commonly found in trembling aspen bluffs as far north as Yorkton and west to the Trans-Canada Campsite near Besant, but in all instances skeletonizing of foliage was negligible.

7.2.9 AMERICAN ASPEN BEETLE, Gonioctina americana (Schaeff.):- Populations were generally lower than in 1963 in the Cypress Hills Provincial Forest. Foliage skeletonizing ranged from light to moderate on trembling aspen reproduction and very light on mature trees in the Park Block. Similar infestations were recorded in the West Block where 10 to 15 per cent of the foliage was damaged on young aspen trees up to 1 inch d.b.h.

7.2.10 POPLAR BUD GALL MITE, Aceria parapopuli (Keif.):- The poplar bud gall mite has become a serious pest of planted poplars in recent years throughout southwestern Saskatchewan. Particularly severe damage to hybrid poplars and cottonwoods has occurred at Mortlach, Swift Current, Maple Creek, and in the Clearwater Lake Summer Resort near Kyle.

7.2.11 BOXELDER TWIG BORER, Proteoteras willingana (Kear.):-

The larvae of this insect bore into the current twigs of Manitoba maple resulting in conspicuous dying back of the branch tips. Infestations were again widespread and light to moderate damage was recorded in shelterbelts near Goodeve, Moose Jaw, Weyburn, Oungre, Lang and Carlyle. Counts taken at permanent sampling stations indicated a slightly higher incidence of twig borers in most areas in 1964.

TABLE 2

Boxelder Twig Borer Population Counts
Southern District of Saskatchewan
1964

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
Maple Creek	15.6	7.8	6.2	236	21	236	18	230	15
Swift Current	20.6	12.2	7.4	243	30	274	43	305	37
Findlater	23.0	13.8	8.0	265	29	312	26	281	14
Indian Head	25.4	17.2	8.4	408	39	390	32	362	25
Carlyle	26.2	18.2	10.2	340	30	408	33	345	28
Willowbrook	26.2	18.6	12.4	316	24	373	37	262	21
Moose Jaw	17.0	12.8	7.6	304	20	247	20	252	21

7.2.12 LEAF HOPPERS, Idiocerus spp.:- Leaf hoppers were widespread but occurred most commonly in the western section of the District. Infestations of Idiocerus populi L., varying from light to heavy intensity, were recorded on trembling aspen and balsam poplar throughout most of the Cypress Hills Provincial Forest, and in the Fleming, Grenfell and Moose Mountain Provincial Park areas. Light infestations of Idiocerus lachrymalis Fitch were limited to trembling aspen stands in the East and West blocks of the Cypress Hills Provincial Forest.

7.2.13 GRAY WILLOW-LEAF BEETLE, Galerucella decora Say:- Infestations generally persisted throughout the central section of the District, but populations were noticeably lower and resultant damage was not as severe as in 1963. Moderate to severe skeletonizing of willow foliage was conspicuous in the Caron-Chaplin-Old Wives Lake triangle, and localized light to moderate infestations occurred near Broadview and in the Trans-Canada Campsite at Besant. Elsewhere populations remained at low levels.

7.2.14 DAGGER MOTHS, Acronicta spp.:- Although widely scattered, populations were low and caused no noticeable damage. A. dactylina was reported on willow near Stoughton and Creelman; A. innotata Gn., A. grisea Wlk., and A. quadrata Grt. on trembling aspen and white birch in the Moose Mountain Provincial Park.

7.2.15 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acleris variana (Fern.) (Black-headed budworm)	Spruce, white	West Block, Cypress Hills Provincial Forest	Light populations; no noticeable defoliation.
Agrilus populi Fisher (A wood-borer)	Aspen, trembling	Fleming, Indian Head and Willow-brook.	Light damage.
Aphids	Aspen, trembling Poplars, hybrid Caragana	Throughout District	Numerous in many localized areas; damage generally light.
Archips cerasivoranus Fitch (Ugly-nest caterpillar)	Cherry, choke	Moosomin, Caron, Moose Mt. Prov. Park and Trans-Canada Campsite at Besant.	Populations increased; moderate to severe defoliation in localized areas.
Archips rosaceanus (Harr.) (Oblique-banded leaf roller)	Caragana	Gull Lake	Light infestation.
Anoplonyx luteipes (Cress.) (A sawfly)	Larch, Siberian	Indian Head	Low populations; no defoliation.
Biston cognataria (Gue.) (Pepper-and-salt moth)	Willow and caragana	Moosomin, Grenfell and Indian Head	Light infestations; no noticeable damage
Bucculatrix canadensisella Cham. (Birch skeletonizer)	Birch, white	Moose Mountain Provincial Park	Light damage to foliage.

7.2.15 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Calligrapha alni (Schffr.) (A leaf beetle)	Willow	Besant, Indian Head, Creelman, Broadview and Duff	Light infestations; no noticeable da age to foliage.
Chermes cooleyi Gill. (Cooley spruce gall aphid)	Spruce, white	Indian Head and West Block of Cypress Hills Prov. For.	Light infestations.
Dicerca sp. (A wood borer)	Aspen, trembling	Throughout District	Widespread; no serious damage.
Eriosoma americanum Riley (Woolly elm aphid)	Elm, white	Throughout District	High populations in localized areas; light to moderate foliage damage.
Lecanium coryli L. (A lecaniine scale)	Elm, white	Indian Head	High populations on individual trees on Canada Department of Agriculture Experimental Farm.
Leptocorus trivittatus (Say) (Boxelder bug)	Maple, Manitoba Ash, green	Throughout District	Large numbers of adults noted in localized areas.
Lepyrus palustris Scop. (A weevil)	Aspen, trembling Willow	Cypress Hills Provincial Forest, Grenfell, and Indian Head.	Adults frequently collected; no damage detected.
Lopidea dakota Knight (Caragana plant bug)	Caragana Maple,	Throughout District	Numerous in localized areas; no serious damage.
Macrosiphum caraganae (Chol.) (Caragana aphid)	Caragana	Throughout District	Occurred most commonly in southwestern part of District.
Malacosoma lutescens (N.& D.) (Prairie tent caterpillar)	Cherry, choke	Lebret and Trans-Canada Campsite at Besant.	Infestations widespread; light to moderate defoliation of individual shrubs.

7.2.15 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Melanolophia canadaria (Guen.) (A looper)	Maple, Manitoba Elm, white Ash, green Willow	Cypress Hills Prov. Park, Carlyle, Goodeve and Indian Head	Widely scattered light infestations; no damage detected.
Nymphalis antiopa (Linn.) (Mourning-cloak butterfly)	Elm, Manchurian Willow	McLean, Besant and Moosomin	Widespread infestations, severe defoliation of individual trees.
Pandemis canadana (Kft.) (A tortricid moth)	Caragana	Wolseley	Light damage
Pemphigus populitransversus Riley (Poplar petiole gall aphid)	Cottonwood	Weyburn, Fort Qu'Appelle, Indian Head, Moose Jaw and Stewart Valley	Commonly collected; moderate to severe damage in localized areas.
Phyllocolpa sp. (A sawfly)	Cottonwood and hybrid poplars	Swift Current and Moose Jaw	Light infestations.
Phyllocnistis populiella (Cham.) (A leaf miner)	Aspen, trembling Poplar, balsam	West Block of Cypress Hills Provincial Forest.	Light infestations.
Recurvaria spp. (Needle miners)	Pine, lodgepole Spruce, white	Cypress Hills Provincial Forest	Light infestations.
Rhabdophaga strobiloides (Walsh) (Beaked willow gall)	Willow	Throughout District	Light to moderate infestations in most stands.
Sciaphila duplex Wlshm. (A leaf roller)	Aspen, trembling	Moose Mountain Prov. Park, Stoughton and Broadview.	Light infestations.
Semiothisa sexmaculata Pack. (A looper)	Larch, European Tamarack	Indian Head	Light infestations; no defoliation detected.

7.2.15 OTHER NOTEWORTHY INSECTS:- (Cont'd)

Insect	Host(s)	Locality	Remarks
Tetralopha asperatella (Clem.) (An aspen web-worm)	Aspen, trembling	Moosomin and Duff	Scattered light infestations.
Trichiosoma triangulum Kby. (A sawfly)	Aspen, trembling Willow	Goodeve and Moose Mountain Prov. Park	Light infestations.

7.3 DISEASE CONDITIONS

7.3.1 FROST DAMAGE:- Heavy frosts in late May and early June caused conspicuous damage to the foliage of most tree species during the early growing period throughout the southeastern part of the District. The most severe damage occurred to green ash and in many shelterbelts the young leaves were completely destroyed. Manitoba maple, white elm, bur oak and trembling aspen were affected also but to a lesser extent, and notable shoot-killing occurred on white spruce in some areas. No tree mortality was reported and most trees had refoliated by late June.

7.3.2 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- Injury to the new shoots and foliage of Manitoba maple caused by field spraying with 2,4-D for weed control was common in farm shelterbelts. Eight shelterbelts were examined at widely scattered points and all yielded typical symptoms; damage ranging from a few shoots affected to almost all the foliage on some trees in the shelterbelts, and was usually most severe on plantings adjacent to fields that had been sprayed by aircraft. Results of the survey are shown in Table 3.

TABLE 3

Degree of Injury to Manitoba Maple from the Use of 2,4-D for Weed Control in Field Crops Southern District of Saskatchewan - 1964

Location	Date Examined	Degree of Injury	Remarks
Moosomin 30-13-30-W.P.	21 - 7 - 64	Both sides of trees da aged.	Road spraying in immediate vicinity; damage to young trees.
Broadview 27-16-4-W2	22 - 7 - 64	Both sides of trees damaged.	Field sprayed 500 yds. from shelterbelt; mainly young trees affected.
Goodeve 2-24-9-W2	22 - 7 - 64	Both sides of trees damaged.	Field sprayed immediately adjacent to shelterbelt.
Indian Head 3-20-13-W2	23 - 7 - 64	Entire trees da aged.	Aerial spraying within 200 yds. of shelterbelt.
Moose Jaw 2 -17-26-W2	23 - 7 - 64	Entire trees damaged.	Aerial spraying within 500 yds. of shelterbelt.
Weyburn 5-9-14-W2	24 - 7 - 64	Both sides of trees damaged.	Field spraying immediately adjacent to shelterbelt.
Oungre 27-2-14-W2	24 - 7 - 64	Both sides of trees damaged.	Aerial spraying adjacent to shelterbelt.
Carlyle 31-5-2-W2	24 - 7 - 64	Both sides of trees da aged.	Field spraying 100 yds. from shelterbelt.

7.3.3 OTHER NOTEWORTHY DISEASES:-

Organism & Disease	Host(s)	Locality	Remarks
Melampsora bigelowii Thuem. (Larch-willow rust)	Willow	Throughout District	Noticeable infections in West Block of Cypress Hills Prov. For. and in Moose Mountain Prov. Park.

7.3.3 OTHER NOTEWORTHY DISEASES:- (Cont'd)

Organism & Disease	Host(s)	Locality	Remarks
Uncinula salicis (Fr.) Wint. (Powdery mildew)	Cherry, choke	Moosomin	A few young trees moderately infected.
Cytospera chrysosperma (Pers.) Fr. (A canker)	Aspen, trembling	Eastern section of District	Commonly found on drought-weakened and dead trees.
Dibotryon morbosum (Schw.) T. & S. (Black-knot of cherry)	Cherry, choke	Moosomin and Qu'Appelle Valley	Light infections.
Apiosporina collinsii (Schw.) Von H. (Witches' brooms)	Serviceberry	Cypress Hills Prov. Park	Light scattered infections; no serious damage.
Gloeosporium sp. (Twig blight and leaf spot)	Elm, Manchurian	Indian Head, Forest Nursery St.	Common, caused some twig killing on a few trees.
Pollaccia radiosa (Lib.) Bald. & Cif. (Leaf and twig blight)	Aspen, trembling	West Block, Cypress Hills Provincial Forest.	Heavy localized infections confined to reproduction.
Hypoxylon pruinatum (Klot.) Cke. (Hypoxylon canker)	Aspen, trembling	Trans-Canada campsites at McLean and Moosomin, Moose Mountain Prov. Park and Creelman.	Light to moderate infection of dying and dead trees.
Needle Cast	Spruce, white	West Block, Cypress Hills Provincial Forest.	Common in localized areas; no serious damage detected.

8. ANNUAL DISTRICT REPORT

HUDSON BAY DISTRICT OF SASKATCHEWAN

1964

by

R. C. Tidsbury

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

8.1 INTRODUCTION

Cool, dry weather during the early part of the season, which caused retarded foliage development, was followed by near-normal conditions during July, and cool, wet ones thereafter. Field work was commenced on May 19 and terminated on October 6. Totals of 605 insect and 34 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. In addition to general collecting, survey sub-projects included: (a) forest tent caterpillar egg-band surveys to forecast infestation intensity in 1965; (b) collecting larch sawfly cocoons, using the drop-tray method, in one permanent tamarack plot for disease and parasite studies; (c) surveys to determine the amount of damage caused to Manitoba maple by the use of 2,4-D in weed control; and (d) special collections of insect and disease material for personnel of the Winnipeg and other laboratories. Aerial surveys involved approximately ten hours flying time of which four hours and thirty minutes was supplied by charter aircraft and the remainder by the Saskatchewan Department of Natural Resources. The assistance and co-operation provided by Provincial Forestry personnel throughout the season is gratefully acknowledged.

Some changes were recorded in the distribution of a number of forest insects. Forest tent caterpillar populations decreased in the eastern part of the Porcupine Provincial Forest and in the Cumberland, Belanger and Bog lakes areas. The spruce budworm infestation along the Birch River decreased and those at Cumberland and Belanger lakes practically disappeared. Infestations of the larch sawfly and yellow-headed spruce sawfly remained about the same, but there was a significant decrease in populations of the aspen leaf beetle and the American aspen beetle. Marked increases were evident in populations of the gray willow-leaf beetle and of the prairie tent caterpillar.

Forest disease conditions remained relatively unchanged but there were slight increases in the incidence of Macrophoma gall of poplars and of gall rusts on jack pine. Conditions in the agricultural areas also remained relatively unchanged, particularly in regard to the malformation of Manitoba maple shoots and foliage in relation to field spraying with 2,4-D.

8.2 INSECT CONDITIONS

8.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Populations of this sawfly remained at low levels (Fig. 1). Generally light defoliation, with moderate on scattered reproduction, occurred at Pelly, Bjorkdale, along the Ridge road and in the Parr Hill Lake area of the Porcupine Provincial Forest, in the Duck Mountain Provincial Park, and Carrot River Provincial Forest. Elsewhere, light defoliation was recorded in localized areas in the Greenwater Provincial Park, the Pasquia Hills, and at Erwood, Veillardville, Mistatim, Crooked River and Chelan.

Aerial surveys indicated defoliation ranging from moderate to severe on occasional trees along the Overflowing River and east of Leaf Lake in tp. 47, rge. 1, W. 2nd. mer. and west of Elm Lake in tp. 55, rge. 31, W.P. mer. Moderate to severe defoliation was observed in localized areas between the Birch River and Sipanok Channel in tp. 53 and 54, rge. 5, W. 2nd. mer.

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 - 1964
101	Armit	142	10	light
102	Peepaw Lake	60	0	light

A total of 529 cocoons were collected at the Armit plot using the larval drop-tray method. Subsequent examination of the cocoons at the laboratory indicated that 37 per cent were destroyed by small mammals; 8 by fall emergence of the parasitic fly, Bessa harveyi, (T.T.); and 7 by diseases. Larval dissections indicated that 53 and 1 per cent were parasitized by Bessa harveyi (T.T.) and Mesoleius tenthredinis Morley respectively.

8.2.2 SPRUCE BUDWORM, Choristoneura fumiferana (Clem.):- Aerial surveys and ground checks in the infestation areas at Cumberland and Belanger lakes and along the Birch River indicated marked decreases in populations. Current defoliation was light except for a small patch of moderate south of Wapisew Lake in the latter area. Elsewhere, only occasional larvae were taken from spruce and balsam fir and defoliation was negligible. Observations indicated that there was no marked increase in host-tree mortality. Preliminary results of spruce budworm egg counts taken from white spruce at Pine Island and Budd's Point on the Cumberland Lake indicated that budworm populations will continue to decline in these areas in 1965.

8.2.3 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- Infestations of this sawfly remained unchanged, and were usually accompanied by lesser ones of the green-headed spruce sawfly, Pikonema dimmockii (Cress.). Defoliation of white spruce shelterbelts and ornamental plantings was moderate to severe in the Armit, Ruby Lake, Steen, Peesane and Rama areas and light at Hudson Bay, Reserve, Weeks and Mistatim. Light defoliation was also recorded on white and black spruce throughout most of the forested area of the District.

8.2.4 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- Aerial surveys and ground checks indicated a marked decline in populations of this serious defoliator of trembling aspen in all but two of the original infestation areas. Current defoliation, ranging from moderate to severe, involved an area of approximately 360 square miles in the Porcupine Provincial Forest (a decrease from 540 in 1963), and a small localized area of not more than 25 acres at the Manitoba-Saskatchewan boundary along Highway No. 109. (Fig. 2) However, light to moderate defoliation of individual trees was observed throughout areas previously defoliated at Carrot River, Ushta, Otosquen, Pasquia Hills, Cumberland and Belanger lakes.

Elsewhere, occasional larva was taken from trembling aspen near Hudson Bay, Bertwell, Weeks, Chelan, Crooked River, Tisdale, the Whitefox fire tower area, Carrot River, Prairie River, Canora and Arran but defoliation was negligible.

By mid July refoliation of affected stands was generally complete. The parasitic fly, Sarcophaga aldrichi Park. was common throughout all infestation areas.

Mass collections of late instar larvae and pupae were taken near Parr Hill and at the Manitoba-Saskatchewan boundary on Highway No. 109 to determine the incidence of parasites. The results are summarized below:

Location	Type of collection	No. reared	No. of Dipterous parasites	No. of Hymenopterous parasites	Percentage effective parasitism
Parr Hill	Larvae	104	9	0	8.6
Parr Hill	Pupae	112	69	0	61.6
Jct. Man. boundary & Hwy. 109	Larvae	76	5	0	6.6
Jct. Man. boundary & Hwy. 109	Pupae	94	68	0	72.3

Egg-band surveys were carried out at 41 locations to predict the severity of infestations in 1965. The results, as tabulated in Table 1, indicate that populations will continue to decline.

TABLE 1

Summary of Forest Tent Caterpillar Egg Band Sampling - 1964
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 1965
Manitoba-Saskatchewan border at hwy. 109	3	28	14	9.0	severe
7.8 mi. north of Bainbridge Lodge on hwy. 109	4	31	17	0.7	light
2.3 mi. north of Otosquen River	6	49	13	1.3	light
Otosquen River	4	36	19	1.0	light
10.8 mi. north of Hudson Bay on hwy. 109	3	35	20	1.3	light
4.5 mi. east of junction Ruby Lake road and hwy. 109	3	28	20	2.0	light
4.3 mi. west of Prairie River	3	26	19	1.3	light
6 mi. N.E. of Jct. hwy. 35 and hwy. 55	4	34	14	0.3	light
2 mi. west of Roscoe River	3	29	19	0.3	light
0.8 mi. east of Lussier Creek	3	27	19	2.0	light
3 mi. east of jct. Ridge road and Armit road off Ridge road	3	28	19	5.7	moderate
28.2 mi. east of hwy. 9 on Ridge road; 10.5 mi. s. and 1.3 mi. w. on tower road	4	37	11	4.3	light
0.2 mi. south of Bjorkdale	3	25	17	0.0	nil
0.5 mi. s.e. of hwy. 9 and Little Swan River road	4	34	21	2.3	light
Jct. McBride Lake road and Little Swan River road	3	28	20	2.3	light
Jct. Parr Hill Lake road and Little Swan River road	3	28	16	2.0	light
9 mi. s. of Jct. Parr Hill Lake road and Little Swan River road	5	46	13	2.0	light
Parr Hill	5	42	17	54.7	severe
Parr Hill (1.6 mi. south)	4	30	19	19.0	moderate

TABLE 1 (concl.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg bands per tree	Defoliation forecast 1965
2.3 mi. s. of Porcupine Provincial Forest boundary on hwy. 8	4	30	19	0.3	light
3.9 mi. s. of jct. McBride Lake road and hwy. 9 off hwy. 9	4	36	19	0.0	nil
17 mi. south of Reserve	5	42	12	3.0	light
Lady Lake	3	28	18	1.0	light
3.2 mi. n. of jct. hwy. 9 and hwy. 49 off hwy. 9	3	27	11	0.0	nil
0.7 mi. s. of jct. Manitoba boundary and hwy. 49	4	31	18	0.7	light
0.9 mi. s. of Assiniboine River off hwy. 8	3	21	16	1.3	light
5.5 mi. n. of jct. 8 and 10 hwys.	3	24	19	0.0	nil
11.6 mi. w. of jct. 8 and 10 hwys.	3	26	18	0.0	nil
Matheson's lumber yard-Yorkton	3	20	19	0.0	nil
Yorkton (west end)	3	22	17	0.0	nil
Canora (Pool elevators)	3	21	16	0.7	light
Jct. hwy. 9 and hwy. 5	3	29	16	0.3	light
Good Spirit Provincial Park	3	25	18	1.7	light
Good Spirit Provincial Park	3	27	21	0.0	nil
Good Spirit Provincial Park	4	30	24	1.7	light
Jct. Manitoba boundary and hwy. 57	3	30	21	0.3	light
Duck Mountain Provincial Park (Ministik Beach)	3	26	20	0.0	nil
Duck Mountain Provincial Park (Jubilee Subdivision)	3	28	19	0.0	nil
Duck Mountain Provincial Park (West boundary at hwy. 57)	4	33	22	0.0	nil
Greenwater Provincial Park	4	39	9	0.0	nil
Greenwater Provincial Park	4	33	12	0.0	nil

8.2.5 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Populations of this leaf beetle decreased throughout the District and only small, scattered patches of moderate to severe skeletonizing of trembling aspen reproduction occurred throughout the Porcupine Provincial Forest, Goodspirit Provincial Park, Pasquia Hills, and in the Yorkton and Jasmin areas. Elsewhere, light skeletonizing was recorded at Hudson Bay, Prairie River, Tisdale, Carrot River Provincial Forest, near the Whitefox fire tower, Bankend, Leross, Beaverdale, in the Goodspirit Provincial Park, Wroxton, Arran, in the Duck Mountain Provincial Park, Canora, Foam Lake, Elfros, Wadena, Lintlaw, Stenen, Buchanan, Rose Valley, Archerwill, Bjorkdale, Chelan, Porcupine Plain and at scattered locations in the Porcupine Provincial Forest.

8.2.6 AMERICAN ASPEN BEETLE, Gonioctena americana (Schaeffer):- An accurate estimate of the extent of defoliation caused by this leaf beetle could not be made as this species was commonly found in association with the aspen leaf beetle, C. crotchi. However, light populations were recorded on trembling aspen reproduction throughout all of the forested areas and in the agricultural areas around Weeks, Crooked River, Porcupine Plain, Archerwill and Ketchen.

8.2.7 GRAY WILLOW-LEAF BEETLE, Galerucella decora (Say):- A marked increase in larval populations of this leaf beetle occurred throughout the District, and moderate to severe skeletonizing of willow foliage was recorded in the agricultural areas at Wroxton, Bankend, Sheho, Ketchen, Okla, Caragana, Weeks and throughout the Porcupine Provincial Forest. In the latter area, the most pronounced feeding damage extended along the Little Swan River road from Highway No. 9 to the junction of the Peepaw Lake road. Moderate to severe skeletonizing also occurred at Mile 63 on Highway No. 109 and in the southeast corner of the Greenwater Lake Provincial Park and in nearby agricultural areas. Patches of severe skeletonizing were also detected at Leaf Lake in tp. 47, rge. 1, W. 2nd. mer. and along the Birch River in tp. 54, rge. 5, W. 2nd. mer.

8.2.8 POPLAR FLEA BEETLE, Altica populi Brown:- Adults and larvae caused light skeletonizing of balsam poplar foliage at Wadena, Arran and widely scattered points in the Porcupine Provincial Forest and the Goodspirit, Greenwater Lake and Duck Mountain Provincial parks. Light skeletonizing of alder was recorded at Armit Lake and in the Duck Mountain Provincial Park.

8.2.9 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- Increased defoliation of chokecherry, the preferred host, serviceberry, wild rose, and willow occurred throughout the agricultural sections of the District. Severe defoliation confined to the tents was observed

at Hudson Bay, Whitefox fire tower, Crooked River, Greenwater Lake Provincial Park, Buchanan, Invermay, Leslie, Leross, Goodspirit Provincial Park, Wroxton, Duck Mountain Provincial Park, Pelly, Canora and Endeavour. The highest number of nests was observed in the Carrot River area and in the Peepaw and Parr Hill lakes areas of the Porcupine Provincial Forest.

8.2.10 LEAF ROLLERS:- The incidence of a leaf roller, Tortricid sp. remained light on trembling aspen, willow and white birch, except in the Greenbush and Pasquia Hills area where it caused light damage to eastern chokecherry and balsam poplar. Pandemis canadana Kft., was present in small numbers but caused no noticeable defoliation of balsam poplar, willow and trembling aspen in the Carrot River area, in the Pasquia Hills and at Tall Pines and Leross. Babebecia urticana Hbn. and Pseudexentera improbana oregonana (Wlshm.) occurred on trembling aspen and willow at Yorkton, Steen, Wroxton, Leross, Invermay and in the Porcupine Provincial Forest, but caused no appreciable defoliation.

8.2.11 BARK BEETLES:- Heavy infestations of a bark beetle, Ips. sp. occurred in dead white spruce, jack pine and balsam fir at Steen, Bertwell, Carrot River, Squaw Rapids, Whitefox fire tower area, the Porcupine Provincial Forest and Pasquia Hills. Moderate to severe feeding damage by a Scolytid species was recorded on white spruce, black spruce and jack pine at Erwood, Bertwell, the Pasquia Hills, the Porcupine Provincial Forest, the Duck Mountain Provincial Park and at the junction of the Saskatchewan River and Sipanok Channel. One adult was also recorded on white elm along Highway No. 109 near the Manitoba boundary.

8.2.12 WOOD BORERS:- Several species of wood borers were commonly found throughout the District. A light infestation of the poplar twig borer, Oberea schaumi Lec., was recorded on trembling aspen reproduction at Archerwill and Carrot River. An unidentified Cerambycid or long-horned wood borer was commonly found on jack pine and white and black spruce in the Duck Mountain Provincial Park, Porcupine Provincial Forest and Pasquia Hills. A Saperda sp. was recorded on balsam poplar in the Carrot River Provincial Forest. The bronze birch borer, Agrilus anxius Gory, was very common in dead and dying white birch throughout the District. Light to moderate infestations of a Buprestid species occurred on jack pine, white spruce and white elm in the Pasquia Hills and the Porcupine Provincial Forest. Adults of the flat-headed wood borer, Dicerca sp., were common on trembling aspen throughout the forested area of the District.

8.2.13 OTHER NOTEWORTHY INSECTS:-

Insect Species	Host(s)	Locality	Remarks
Acleris variana Fern. (Black-headed budworm)	wS bS bF coS	Mile 72 Highway No. 109, Veillardville, Porcupine Provincial Forest, Greenwater Provincial Park and Rama.	Light defoliation in the Armit Lake area of the Porcupine Provincial Forest; elsewhere very light populations.
Acronicta dactylina Grt. (A dagger moth)	Al wB tA W	Duck Mountain Provincial Park, Porcupine Provincial Forest, Pasquia Hills and Veillardville.	Very light populations; no defoliation.
Acronicta fragilis Gn. (A dagger moth)	W wB	Porcupine Provincial Forest and Veillardville.	Very light populations; no defoliation.
Acronicta grisea Wlk. (A dagger moth)	Al W	Pasquia Hills, Porcupine Provincial Forest and Greenwater Provincial Park.	Very light defoliation in the Pasquia Hills; no defoliation elsewhere.
Acronicta innotata Gn. (A dagger moth)	wB	Duck Mountain Provincial Park and Veillardville.	Very light defoliation at Duck Mountain Provincial Park; no defoliation elsew ere.
Anoplonyx canadensis Hgtn. (A sawfly)	tL	Throughout the District.	Common, but caused no noticeable defoliation.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Throughout the District.	Occurred in larger numbers than A. canadensis Hgtn., but no noticeable defoliation.
Aphrophora signoreti Fitch (A spittle bug)	wB wS tL	Pasquia Hills, Duck Mountain Provincial Park and Porcupine Provincial Forest.	Low populations causing no damage.

8.2.13 OTHER NOTEWORTHY INSECTS (con't.):-

Insect Species	Host(s)	Locality	Remarks
Archips cerasivoranus (Fitch.) (Ugly-nest caterpillar)	cCh	Porcupine Provincial Forest and the Whitefox fire tower area.	Damage confined to nests.
Arge pectoralis (Leach) (Birch sawfly)	wB	Duck Mountain Provincial Park.	Light defoliation confined to one or two branches on a tree.
Bucculatrix canadensisella Chambers (Birch skeletonizer)	wB spAl	Pasquia Hills and the Carrot River Provincial Forest.	Very light skeletonizing of white birch in the Pasquia Hills. Light skeletonizing of speckled alder in the Carrot River Provincial Forest.
Calligrapha alni Schffr. (A leaf beetle)	W	Sheho and Wroxton.	Very light populations of adults; no noticeable defoliation.
Campaea perlata Gn. (A geometrid)	spAl tA	Good Spirit Provincial Park, Saskatoon Duck Mountain Provincial Park, Greenwater Provincial Park, and the Porcupine Provincial Forest.	Low populations causing no defoliation.
Chermes cooleyi Gillette (Cooley spruce gall aphid)	wS	Greenwater Provincial Park, Weeks, Veillardville, Duck Mountain Provincial Park, Porcupine Provincial Forest and Belanger Lake.	Moderate infestations at Veillardville; light elsewhere.
Chermes lariciatus (Patch) (Pineapple gall aphid)	wS bS	Duck Mountain Provincial Park, Porcupine Provincial Forest, Veillardville, Pasquia Hills, and Mile 73 - Highway No. 109.	Light attack.

8.2.13 OTHER NOTEWORTHY INSECTS (con't.):-

Insect Species	Host(s)	Locality	Remarks
Choristoneura pinus Freeman (Jack-pine budworm)	jP	Carrot River Provincial Forest and Veillardville.	Very light populations; no noticeable defoliation.
Chrysomela knabi Brown (A leaf beetle)	bPo W wB spAl	Porcupine Provincial Forest and Veillardville.	Light defoliation of speckled alder in the Armit Lake area of the Porcupine Provincial Forest; no noticeable defoliation elsewhere.
Cimbex americana americana Leach (A sawfly)	spAl tA	Porcupine Provincial Forest and Veillardville.	No noticeable defoliation.
Dichelonyx backi Kby. (Green rose chafer)	tA bPo W wS	Pasquia Hills, Porcupine Provincial Forest and Veillardville.	No noticeable defoliation.
Eriosoma americanum Riley (Woolly elm aphid)	wE	Along the Carrot River north of the Pasquia Hills, Squaw Rapids, Carrot River, Preeceville, Kamsack, Buchanan, Leslie and Insinger.	Moderate damage at Leslie; light damage elsewhere.
Eupithecia filmata Pears. (A looper)	wS bS	Belanger Lake, Veillardville and Porcupine Provincial Forest.	Very light populations; no damage.
Fenusa dohrnii Tischb. (European alder leaf miner)	spAl	Duck Mountain Provincial Park, Greenwater Provincial Park, Porcupine Provincial Forest Pasquia Hills and Veillardville.	Moderate damage in the Porcupine Provincial Forest, light damage elsewhere.

8.2.13 OTHER NOTEWORTHY INSECTS (con't.):-

Insect Species	Host(s)	Locality	Remarks
Hylobius pinicola Couper (Root collar weevil)	bF tL	Porcupine Provincial Forest and Crooked River.	Adults present; no appreciable damage.
Hyphantria cunea (Drury) (Spotless fall webworm)	wB spAl	Porcupine Provincial Forest.	Light to heavy populations on individual branches of widely scattered trees.
Itame loricaria Evers. (A looper)	tA W bPo	Jasmin, Yorkton, Duck Mountain Provincial Park, Arran, Lady Lake, Squaw Rapids and Whitefox fire tower area.	Light populations; no noticeable defoliation.
Lepyrus palustris Scop. (A weevil)	W tA bPo	Pasquia Hills, Porcupine Provincial Forest, Good Spirit Provincial Park, Carrot River Provincial Forest, Bankend, Wroxton, Ketchen, Yorkton, Invermay and Chelan.	Light populations of adults; no noticeable defoliation.
Lithocolletis salicifoliella Chamb. (Aspen blotch miner)	tA bPo	Porcupine Provincial Forest, Duck Mountain Provincial Park, Good Spirit Provincial Park and Veillardville, and Greenwater Provincial Park.	Light damage.
Lopidea dakota Knight (Caragana plant bug)	C mM Al W wE	Hudson Bay, Carrot River, Wadena, Rama, Kelvington, Sheho and Insinger.	Moderate populations at Wadena; light populations elsewhere; no noticeable damage.

8.2.13 OTHER NOTEWORTHY INSECTS (con't.):-

Insect Species	Host(s)	Locality	Remarks
Magdalis gentilis Lec. (A weevil)	tA jP wS	Chelan, Veillardville and Mile 74 - Highway No. 109.	Very light populations of adults.
Malacosoma pluviale (Dyar) (Western tent caterpillar)	W Rosebush	Mile 76 and 78 - Highway No. 109.	Severe defoliation confined to tents in localized areas.
Mordwilkoja vagabunda Walsh (Poplar vagabond aphid)	tA	Porcupine Provincial Forest, Greenwater Provincial Park, Leross and Carrot River.	Light damage.
Nematus limbatus (Cress.) (Willow sawfly)	W	Porcupine Provincial Forest and the Duck Mountain and Greenwater Provincial parks.	Severe defoliation on individual branches of a few trees in the Porcupine Provincial Forest; light defoliation elsewhere.
Neodiprion abietis Complex (Balsam-fir sawfly)	bF wS	Porcupine Provincial Forest and Greenwater Provincial Park.	Light defoliation at Armit Lake in the Porcupine Provincial Forest; a trace of defoliation in the Greenwater Provincial Park.
Neodiprion nanulus nanulus Schedl. (Red-pine sawfly)	jP	Whitefox fire tower area.	Populations increased on scattered reproduction; caused light to moderate defoliation.
Nepytia canosaria Wlk. (False hemlock looper)	wS bS	Porcupine Provincial Forest.	Light populations; no defoliation.
Nycteola cinereana N. & D. (An owlet moth)	bPo	Porcupine and the Carrot River Provincial forests; Duck Mountain Provincial Park and in the Pasquia Hills.	Light populations; no defoliation.

8.2.13 OTHER NOTEWORTHY INSECTS (con't.):-

Insect Species	Host(s)	Locality	Remarks
Nycteola frigidana Wlk. (An owlet moth)	W	Porcupine Provincial Forest, Pasquia Hills and the Carrot River Provincial Forest.	Light populations; no noticeable defoliation.
Nymphalis antiopa (L.) (Spiny elm caterpillar)	W tA	Porcupine Provincial Forest, Greenwater Provincial Park, Pasquia Hills, Duck Mountain Provincial Park, Preeceville, Porcupine Plain and the Whitefox fire tower area.	Severe defoliation of individual clumps and trees.
Operophtera bruceata (Hulst.) (Bruce spanworm)	tA Saskatoon	Yorkton, Beaverdale, Wroxton, Lady Lake and Chelan.	Light populations; no noticeable defoliation.
Orthosia hibisci Gn. (A fruit worm)	tA W wE	Duck Mountain Provincial Park, Arran, Stenen, and Mile 69 - Highway No. 109.	Light populations; no defoliation.
Orsodacne atra Ahr. (A leaf beetle)	tA bPo W Saskatoon	Throughout the District.	Light feeding at Yorkton, Beaverdale and Wadena.
Petrova albicapitana (Busck.) (Pitch nodule maker)	jP	Whitefox fire tower area and Veillardville.	Light infestation.
Phenacaspis pinifoliae (Fitch) (Pine needle scale)	wS	Duck Mountain Provincial Park and Tuffnell.	Moderate to severe infestation on a few trees in a shelterbelt at Tuffnell; light in the Madge Lake area of the Duck Mountain Provincial Park.

8.2.13 OTHER NOTEWORTHY INSECTS (Concl.)

Insect Species	Host(s)	Locality	Remarks
Phratora americana canadensis Brown (A leaf beetle)	tA W bPo	Duck Mountain Provincial Park and the Porcupine and Carrot River Provincial forests and at Carrot River.	Light populations of adults; no noticeable defoliation.
Phyllocnistis populiella Cham. (Aspen leaf miner)	tA bPo	Duck Mountain and Greenwater Provincial parks; Porcupine and Carrot River Provincial forests.	Light infestation.
Proteoteras willingana Kft. (Boxelder twig borer)	mM	Wadena.	Very light damage on one ornamental.
Semiothisa granitata Gn. (A geometrid)	tL bS bF wS	Porcupine Provincial Forest, Pasquia Hills and the Greenwater Provincial Park.	Very light larval populations; no defoliation.
Semiothisa sexmaculata Pack. (Green larch looper)	tL	Throughout the District.	Moderate populations at Bjorkdale, Chelan and the Porcupine Provincial Forest; elsewhere light populations.
Syneta pilosa Brown (A leaf beetle)	wB wS bS mM	Duck Mountain Provincial Park, Porcupine Provincial Forest, Veillardville and Squaw Rapids.	Light adult populations; no noticeable defoliation.
Tetralopha asperatella (Clem.) (A webworm on aspen)	tA bPo W	Porcupine and the Carrot River Provincial forests and at Arran.	Light damage.
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	jP	Pasquia Hills and Hudson Bay.	Light damage.

8.3 DISEASE CONDITIONS

8.3.1 GLOBOSE GALL RUST, Peridermium harknessii J. P. Moore:- The old infection sixteen miles north of Veillardville increased to severe on a few jack pine and light on several others nearby. In addition, a light to moderate infection occurred on a few trees near the Manitoba boundary along the Ridge road.

8.3.2 NEEDLE CASTS ON BALSAM FIR:- A light infection occurred on a few trees in the Parr Hill Lake area and a severe infection on one reproduction and lighter on several trees nearby, occurred in the Armit Lake area of the Porcupine Provincial Forest.

8.3.3 MACROPHOMA GALLS, Macrophoma tumefaciens Shear:- Light infections of this gall, confined mainly to a few branches on two or three trembling aspen, were recorded at scattered points in the District. Collections were made at Greenbush, Porcupine Plain, Mile 60 on Highway No. 109, at Peepaw Lake along the Ridge road and at the junction of the Little Swan River road and Highway No. 9 in the Porcupine Provincial Forest. A light infection also occurred on balsam poplar at Carrot River and at the Manitoba boundary on the Ridge road.

8.3.4 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- Surveys were continued to determine the severity and distribution of 2,4-D spray damage to Manitoba maple shelterbelts in relation to its use in weed control operations throughout the agricultural sections of the District. The results of the survey are tabulated in Table 2.

TABLE 2

2,4-D Injury to Manitoba Maple
Hudson Bay District - 1964

Place	Date	Degree of Injury	Remarks
Carrot River	July 14	Light injury on a few branch tips at one end of belt.	Field spraying in area.
Margo	July 16	Light injury on a few isolated twigs on two ornamental trees in town.	No signs of spraying.
Canora	July 16	Light injury to scattered branch tips.	Field spraying in area.

TABLE 2 (con't.)

Place	Date	Degree of Injury	Remarks
Canora	July 30	Severe injury on lower half of three trees in belt. belt. Moderate to light damage on same side on rest of belt. Light injury to scattered branches on other side of belt.	Field spraying beside
Kamsack	July 30	Severe injury on lower half of one side of a few trees. Light injury on other side of belt.	Field spraying beside belt.
Theodore	July 31	60% of one side and 40% of other side of belt lightly damaged.	Field spraying 100 yards away.
Leslie	July 31	Light damage on a few branch tips.	Field spraying in area.
Jasmin	July 31	Light damage to scattered branch tips on both sides of belt.	Field spraying in area.
Yorkton	July 31	Scattered twigs on two trees lightly injured.	Field sprayed in area.
Tuffnell	July 31	Light to moderate injury on one side of belt.	Field sprayed beside belt.
Leross	July 31	Light injury on a few isolated branch tips.	Grain field beside belt; no evidence of spraying.
Arran	Aug. 4	A few isolated twigs lightly injured on two ornamental trees.	Field spraying 300 yards away.
Sturgis	Aug. 4	Light injury on a few branches on one side and end of belt.	Field sprayed beside belt.

TABLE 2 (concl.)

Place	Date	Degree of Injury	Remarks
Nut Mountain	Aug. 5	Light injury on one end of belt.	Field spraying in area.
Caragana	Aug. 5	Very light injury on one end of belt.	Field spraying in area.
Hudson Bay	Aug. 5	Light injury on 60% of one side of belt.	Field sprayed 100 yards away.

8.3.5 MORTALITY OF BALSAM-FIRM AND WHITE BIRCH:- Mortality of balsam-fir, characterized by gradual to complete reddening of the foliage, was widely scattered throughout the forested area of the District. The highest mortality, as determined by ground and aerial survey, was noted in tps. 52 and 53, rge. 1, W. 2nd. mer. of the Pasquia Hills. Lighter mortality, that is areas of at least a half dozen dead or dying trees, was recorded along Highway No. 109 in the Pasquia Hills, east of Elm Lake in tp. 55, rge. 30, W.P. mer., in the Birch River area south of Cut Beaver and Wapisew lakes, south of Binnis Lakes in tps. 50 and 52, rge. 4, W. 2nd. mer., at Budds Point in the Cumberland Lake area and near Overflow Lake in tp. 48, rge. 4, W. 2nd. mer. In the Porcupine Provincial Forest, a few dead balsam fir were noted in tp. 42, rges. 1 and 2, W. 2nd. mer., in the Parr Hill area and near Whitefish and Armit lakes. Light mortality was also recorded in the Duck Mountain Provincial Park, and at Mistatim and Prairie River. Elsewhere, dead individual trees were observed in widely scattered areas.

The apparent dying-back of white birch was heaviest between Whitepoplar Creek and Bainbridge River in the Pasquia Hills and throughout the southwestern section of the Duck Mountain Provincial Park. Light mortality, involving only a few trees, was recorded throughout Greenwater Lake Provincial Park, the Porcupine Provincial Forest, the Prairie River area, and east of Leaf Lake in tp. 47, rge. 1, W.2nd. mer.

8.3.6 OTHER NOTEWORTHY DISEASES:-

Disease or organism	Host(s)	Locality	Remarks
Apiosporina collinsii (Schw.) Hoehn. (Witches' broom of Saskatoon)	Service-berry	Duck Mountain Provincial Park and Porcupine Provincial Forest.	Light infection at scattered locations; moderate to heavy infections west of Madge Lake.

9. ANNUAL DISTRICT REPORT

PRINCE ALBERT DISTRICT OF SASKATCHEWAN

1964

by

L. L. McDowall

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

9.1 INTRODUCTION

This report deals with forest insect and disease conditions in the Prince Albert District during the 1964 season. Surveys were carried out from May 13 to October 5 and included approximately ten hours of chartered flying time to map major outbreaks in inaccessible areas. In addition to general sampling and special collections to determine the distribution and abundance of minor insects and diseases, the following survey sub projects were carried out: larch sawfly studies at permanent plots, which included sequential sampling, water level measurements, defoliation estimates and cocoon collecting; forest tent caterpillar egg band counts to predict infestation trends in 1965; lodgepole terminal weevil population sampling; population sampling of the boxelder twig borer; releases of the larch sawfly parasite, Holocremnus sp. near nemoratum, and subsequent studies to determine establishment and rate of dispersal; 2,4-D spray injury to Manitoba maple; and surveys for stem rusts on jack pine. A total of 412 insect and 27 disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively. The writer gratefully acknowledges the excellent co-operation extended by personnel of the Saskatchewan Department of Natural Resources.

Near-normal temperatures accompanied by dry weather during the first half of the season probably helped increase populations of some insect species. Insects of major concern in 1964 were the forest tent caterpillar, larch sawfly and jack-pine budworm. Highlights of the season were the virtual collapse of the pine tube moth outbreak west of Prince Albert and the resurgence of populations of the jack-pine budworm in the Nisbet and Fort a la Corne Provincial forests. Populations of the yellow-headed spruce sawfly and jack-pine sawflies remained much the same, but an increase in populations and distribution of the balsam-fir sawfly, willow-leaf beetle, spiny elm caterpillar and the flea beetle on balsam poplar was recorded. With the exception of several new light infections of stem rusts on jack pine, there was no appreciable change in the status of the more common tree diseases that had been previously reported in the District.

9.2 FOREST INSECT CONDITIONS

9.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- With the exception of population declines in two areas, there was little change in the status of this defoliator of tamarack (Fig. 1). For the most part, near-average temperatures prevailed during the larval feeding period, allowing normal insect development and foliage production.

Defoliation declined from heavy to moderate in the Red Rock Block of the Nisbet Provincial Forest and from moderate to light in

scattered tamarack between Mont Nebo and Mildred in the western portion of the District. Moderate to heavy defoliation continued in the Crutwell area thirteen miles west of Prince Albert, and ranged from light to moderate in the Steep Creek and MacDowall blocks of the Nisbet Provincial Forest. Tamarack stands five miles south of Canwood were moderately defoliated, and north to Big River, Dore and Smoothstone lakes light defoliation prevailed.

Small patches of light were also recorded at Cookson, Christopher and Candle lakes. North of Candle Lake to Whiteswan, East Trout and Meeymoot lakes defoliation was patchy and ranged from moderate to heavy. Defoliation was light along #55 highway between Foxford and Snowden and north into the Nipawin Provincial Park.

Moderate to heavy defoliation was again recorded in tamarack stands in the northern half of the Fort a la Corne Provincial Forest.

Results of sequential sampling of egg populations carried out in three permanent plots are shown below. The infestation ratings for each plot are based on the utilization of current shoots for oviposition by adult sawflies.

Plot No.	Location	Infestation Ratings: No. of shoots examined	No. of curled shoots	Rating
102	Crutwell	60	22	severe
114	Red Rock Block	80	20	mod-severe
112	Dumble	70	2	light

Note: light = up to 35% defoliation; moderate = 36-65%; and severe = over 65%

A combined total of 1138 cocoons were collected from the Crutwell and Red Rock plots and were subsequently examined and dissected to determine the number destroyed by disease organisms and parasites. Twenty-one percent of the cocoons were destroyed by fall emergence of Bessa harveyi (T.T.), 0.3 percent by Tritneptis klugii (Ratz.) and 18 percent by disease organisms. Larval dissections indicated effective parasitism was 56 percent by B. harveyi and 7 percent by Mesoleius tenthredinis Morley.

9.2.2 A PINE TUBE MOTH, Argyrotaenia tabulana Free:- The severe infestation, which persisted for the past three years in jack pine stands west of Prince Albert virtually disappeared. Only an occasional larva was collected and mined needles were practically nonexistent.

Exceptionally short needle growth and sparse foliage production was common throughout the stands. Continuous moderate to severe attacks during the three years have caused considerable tree mortality and top killing especially in stands of light density and in open exposures along the edges.

9.2.3 LODGEPOLE TERMINAL WEEVIL, Pissodes terminalis Hopk.:- No significant change in the status of this species was recorded in 1964. It was prevalent in jack pine stands east of Candle Lake and leader damage still ranged between twenty and thirty percent. Very light damage continued in the Canwood Regional Park and in pine plantations at Buckland west of Prince Albert.

9.2.4 JACK-PINE BUDWORM, Choristoneura pinus Free.:- Larval populations of this budworm have been increasing since 1962 and in 1964 reached infestation levels in several localized areas (Fig. 2). This resurgence was probably aided by suitable weather conditions that allowed high staminate flower production and heavy pollen crops in most jack pine stands.

Aerial and ground surveys showed that the most extensive defoliation occurred in the MacDowall and Holbein blocks of the Nisbet Provincial Forest and in the western half of the Fort a la Corne Provincial Forest (Fig. 2). Severe defoliation with occasional patches of light to moderate was recorded throughout some 65 square miles within the MacDowall Block south of Prince Albert and conspicuous browning of the foliage was evident over approximately 27 square miles in the Holbein Block including the Crutwell area. In addition defoliation was light to moderate in patches throughout the Home Block, the Red Rock Block and the northern half of the Steep Creek Block. Almost continuous moderate to severe defoliation affected approximately 176 square miles within the boundaries of the Fort a la Corne Provincial Forest from Elk House on the west boundary east to English Cabin.

9.2.5 SAWFLIES ON JACK PINE, Neodiprion spp.:- Although a slight increase was recorded in populations and distribution of N. nanulus nanulus Schedl., defoliation was light at all sample points and the majority of collections were again taken in the Nisbet Provincial Forest. However, an increase in the number of defoliated branches per tree was recorded in the Prince Albert Regional Headquarters area and, whereas in 1963, usually not more than four or five branches showed signs of back feeding, in some instances it ranged from five to ten in 1964. Collections were also made at Candle Lake, Smeaton and in the Nipawin and Fort a la Corne Provincial forests. Two collections of N. virginianus complex, were made but only a trace of defoliation was noted. Larvae were collected from both mature and jack pine reproduction.

9.2.6 SAWFLIES ON SPRUCE, Pikonema sp.:- The yellow-headed spruce sawfly, P. alaskensis (Roh.) was consistently collected from both white and black spruce through the southern and central portions of the District. Populations were generally low and defoliation light except at Marchant Grove where a white spruce shelterbelt on church property was moderately to heavily defoliated and at Cookson where light to moderate defoliation was recorded on several white spruce. Other collection points were Mont Nebo, Mayview, Crutwell, Snowden, Sturgeon, Christopher and Candle lakes. The green-headed spruce sawfly, P. dimmockii (Cress.) was usually found in association with the yellow-headed spruce sawfly, although populations were lower and very little defoliation was attributed to this species.

9.2.7 BALSAM FIR SAWFLY, Neodiprion abietis complex:- This species was collected from both white and black spruce, and although populations remained light a slightly wider distribution was recorded. Very light defoliation of white spruce occurred in the Parkside, Kilwinning, MacDowall and Duck Lake areas. The most notable defoliation occurred west of Prince Albert and at Mayview but it was confined to a few branches in the lower crowns of scattered white spruce.

9.2.8 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.- This defoliator was prevalent throughout trembling aspen stands over most of the west central portion of the District (Fig. 3). However, there was a noticeable decline in the infestation in the Sled, Beaupre, Smoothstone and Dore lakes section. High numbers of the parasitic fly, Sarcophaga aldrichi Park., were present throughout the infestation areas. Populations of the poplar gall aphid, Mordwilkoja vagabunda Walsh., were higher also than usual in some areas but there was no evidence that they influenced the tent caterpillar populations in anyway.

Severe defoliation was recorded in the Bodmin-Ladder Lake-Big River area where a slight southward extension of the boundary was noted. From Bodmin south to Keg Lake on the west side of #55 highway and then west to Capasin in the Thickwood Hills defoliation ranged from moderate to severe. Continuous severe defoliation was mapped from Big River north for approximately 20 miles along both sides of Cowan Lake and encompassing the area formed by Black, Egg and Delaronde lakes. North of the Cowan River Dam to Sled, Beaupre, Smoothstone and Dore lakes, light to moderate defoliation occurred in scattered patches. Several small isolated patches of moderate defoliation were recorded from Dumble south to Eldred and Ormeaux all south of the original outbreak area. East of #55 highway, from Winter Lake eastward into Prince Albert National Park, defoliation ranged from moderate to severe. Similar conditions continued in the vicinity of Angling Lake and extended southward for one and a half miles. Small isolated

patches of moderate to severe defoliation were recorded along the north shore of Emma Lake, between Christopher and Oscar lakes, on the west shore of Candle Lake from Clearsand Creek south for about four miles and at Bittern, White Gull and Whiteswan lakes. Elsewhere over the southern portion of the District, populations were very low and only an occasional larva was collected.

Mass collections of larvae and pupae were submitted to the Winnipeg Laboratory for rearing and parasite recovery. The results are listed below.

Location	Type of collection	No. reared	No. of dipterous parasites	Percentage of effective parasitism
Bodmin Hills	larval	117	52	44
Bodmin Hills	pupal	102	78	76
Halkett Lake	larval	122	3	2
Halkett Lake	pupal	72	57	79

Egg band surveys for predicting the spread and intensity of infestations in 1965 were conducted during September and October and the results are shown in Table 1.

TABLE 1

Forest Tent Caterpillar Egg-Band Sampling
Prince Albert District - 1964

(based on 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 for 1965
Bodmin Hills	3.3	30.0	17.0	13.0	severe
Big River	3.3	28.0	16.6	21.0	severe
Big River	4.0	33.7	17.0	29.6	severe
Dore Lake Rd. Junct.	3.3	26.3	14.3	11.3	severe
Sled Lake	3.3	27.3	17.6	24.6	severe
Erinferry	3.0	24.0	14.6	6.6	moderate
Eldred	3.0	24.0	13.3	6.6	moderate
Canwood	3.0	25.0	13.3	3.3	light
Canwood	3.0	21.3	11.6	0.0	nil
Prince Albert	3.0	20.7	15.0	1.3	light
Home Block-N.P.F.	3.0	19.6	8.6	0.6	light
Shellbrook	3.0	18.6	14.0	1.3	light
Ordale	3.0	24.6	14.0	1.6	light

TABLE 1 (concl.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg-bands per tree	Defoliation forecast for 1965
Shell Lake	3.0	23.3	13.6	3.0	light
Mildred	3.3	25.3	12.6	3.3	light
Spiritwood	3.0	25.0	12.6	6.6	moderate
Holbein	3.0	21.3	9.3	0.0	nil
Red Deer Hill	3.0	22.6	14.0	0.0	nil
MacDowall	3.0	24.0	14.3	0.0	nil
Candle Lake	3.0	22.3	13.6	0.0	nil
Candle Lake	3.3	32.3	13.0	0.6	light
Candle Lake	3.3	26.6	15.6	0.0	nil
Clearsand Creek	3.0	22.3	14.3	11.3	severe
Sturgeon Lake	3.3	25.0	16.0	4.0	light
Christopher Lake	3.6	28.3	13.0	3.6	light
Emma Lake	3.3	29.6	15.3	13.3	severe
Angling Lake	3.3	22.0	11.3	14.6	severe
Angling Lake	3.0	28.0	17.0	7.3	moderate
Spruce Home	3.0	25.0	18.0	2.3	light
Nipawin P.P.	3.0	29.0	18.3	1.0	light
Parkside	3.0	19.3	13.3	1.3	light
Leask	3.0	20.0	15.0	0.0	nil
Duck Lake	3.0	25.3	15.6	0.0	nil

9.2.9 AMERICAN ASPEN BEETLE, Gonioctena americana (Schaef.):- Populations of this leaf beetle were generally light, with the exceptions of the following areas, where light to moderate defoliation was recorded: MacDowall, Christopher and Candle lakes and near English Cabin in the Fort a la Corne Provincial Forest. The collections were mainly from young aspen in stands of light density.

9.2.10 MOURNING CLOAK BUTTERFLY, Nymphalis antiopa (L.):- A marked increase in populations and distribution of the species was recorded in 1964 and collections were taken from willow, trembling aspen and balsam poplar at widely scattered points. Defoliation was light to moderate at Christopher Lake, Buckland, Crutwell and Mont Nebo. Light defoliation occurred at Holbein, MacDowall, Candle, Sturgeon and Duck lakes.

9.2.11 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- This tent maker was common throughout the southern portion of the District. An increase in the number of tents was recorded within a two mile radius of Prince Albert and at one point forty-six tents were counted along a quarter of a mile of roadway. Heavy concentrations of tents were noted also in the vicinity of Buckland, Holbein, MacDowall, Duck Lake, St. Louis and Spruce Home. Although chokecherry was the preferred host, it often attacked rosebush, pincherry and small aspen.

9.2.12 RED-HUMPED CATERPILLAR, Schizura concinna (T.E. Smith):- Although populations of this species were relatively high at all collection points, only light defoliation was recorded. Collections were taken from willow at Duck Lake, Dumble, Bodmin, Big River and the junction of No. 55 highway and Dore Lake road.

9.2.13 A LEAF BEETLE, Altica populi Brown:- A sharp increase in populations and a wider distribution of this species was recorded in 1964. The highest populations occurred north of Prince Albert where the foliage of balsam poplar in stands between Henribourg and Snowden along No. 55 highway suffered moderate to severe skeletonizing. Similar damage was also recorded to balsam poplar reproduction just south of Candle Lake, and small patches of light skeletonizing were noted at MacDowall, Crutwell, Shellbrook, Spruce Home, Northside, Christopher and Sturgeon lakes.

9.2.14 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Although larvae and adults of this beetle were common throughout the District, skeletonizing of aspen was generally very light except in the area from MacDowall through to Duck Lake where it was light to moderate.

9.2.15 GREY WILLOW-LEAF BEETLE, Galerucella decora Say:- This leaf beetle was widespread throughout the District. Severe skeletonizing of willow foliage was recorded at Candle Lake, Snowden, Smeaton, Meath Park, Spruce Home, Christopher Lake, Tweedsmuir, Mayview, Shellbrook, Ordale and Mont Nebo. Light to moderate skeletonizing was noted on scattered willow between Duck Lake and MacDowall and in the Home and Steep Creek blocks of the Nisbet Provincial Forest.

9.2.16 AN ASPEN WEBWORM, Tetralopha asperatella (Clem.):- This webworm was widely distributed with the heaviest populations occurring in areas previously infested by the forest tent caterpillar. Light to moderate webbing of both aspen and balsam poplar foliage was recorded at Eldred, Bodmin, Big River and north to the Cowan River Dam. Webbed leaves were also common in the Christopher, Angling and Candle lakes areas.

9.2.17 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Acleris variana (Fern.) (Black-headed budworm)	wS bS	Central and southern sections of District.	Populations were light throughout; light defoliation of scattered white spruce west of Prince Albert.
Amauronematus sp. (A sawfly)	W	Central portion of District.	Commonly found, but no serious defoliation.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Prince Albert District.	Found in all stands examined, but populations very low.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	cCh	Entire District.	Heaviest concentrations of nests at MacDowall, Duck Lake, and in the Home and Red Rock blocks of the Nisbet Provincial Forest.
Bucculatrix canadensisella Chamb. (Birch skeletonizer)	wB	Central portion of District.	Widely scattered; skeletonizing very light fourteen miles west of Prince Albert.
Chermes lariciatus (Patch) (Spruce gall aphid)	wS	Scattered throughout District	Highest incidence of galls recorded two miles south of Candle Lake and five miles west of Prince Albert; affecting several trees at each location.
Choristoneura fumiferana (Clem.) (Spruce budworm)	wS	Parkside, Shipman, Fort a la Corne Provincial Forest, Home and Red Rock blocks of Nisbet Provincial Forest.	Low populations; not more than two larvae per five tree beating sample.

9.2.17 OTHER NOTEWORTHY INSECTS (Cont.):-

Insect	Host(s)	Locality	Remarks
Cimbex americana Leach. (Elm sawfly)	W	Shellbrook.	Single collections; no defoliation.
Corythucha elegans Drake. (A lace bug)	W	Candle Lake.	Moderate to heavy isolated infestation along west and south shores of lake.
Dichelonyx backi (Kby.) (Green rose chafer)	tA	Tweedsmuir.	Small, light infestation mainly on regeneration.
Feralia jocosa Gn. (Green-striped spruce caterpillar)	wS bS	Dumble, Cookson, Candle Lake and Nipawin Provincial Forest.	Populations light; no defoliation.
Halisodota maculata Harr. (Spotted tussock moth)	tA W	Mayview, Smeaton, Shipman, Candle and Christopher lakes.	Low populations; no defoliation.
Lepyrus palustris Scop. (A weevil)	W	Shipman, Dumble, and Fort a la Corne Provincial Forest.	Light scattered populations.
Lithocolletis salicifoliella Chamb. (Aspen blotch miner)	tA	Fort a la Corne Provincial Forest, Home and Red Rock blocks of Nisbet Provincial Forest.	Widely scattered; infestations very light.
Lopidea dakota Kngt. (Caragana plant bug)	Caragana	Prince Albert, Ordale and Lilly Plains.	Not causing any damage, but common in these areas.
Mordwilkoja vagabunda Walsh. (Poplar vagabond aphid)	tA	Entire District.	Widely distributed; most prevalent in forest tent caterpillar outbreak areas at Bodmin, Big River, and Angling Lake.

9.2.17 OTHER NOTEWORTHY INSECTS (Cont.):-

Insect	Host(s)	Locality	Remarks
Nematus populi (Marl.) (A sawfly)	tA	Crutwell, Holbein and MacDowall.	Defoliation light, restricted to single trees, averaging three feet in height.
Nematus limbatus (Cress.) (Willow sawfly)	W	Sturgeon and Candle lakes.	Defoliation very light, confined to single willow bushes.
Neurotoma inconspicua (Nort.) (Plum web-spinning sawfly)	pCh	Mont Nebo and Mayview.	Populations relatively high along roadsides, but only light defoliation recorded.
Nycteola cinereana N. & D. (An owlet moth)	bPo	Mayview, MacDowall and Candle Lake.	Webbed leaves common on regeneration.
Operophtera bruceata (Hulst.) (Bruce spanworm)	tA	MacDowall.	Single collection four miles south of MacDowall.
Pseudexentera improbana oregonana Wlshm. (A leaf roller)	tA	Southern portion of District.	Light scattered populations; no serious defoliation.
Pissodes strobi Peck. (White-pine weevil)	jP bS	Home Block of Nisbet Provincial Forest.	Leader damage very light and widely scattered.
Rhyacionia spp. (A shoot moth)	jP	Home and Red Rock blocks of Nisbet Provincial Forest.	Common on pine regeneration but damage generally light.
Semiothisa sexmaculata Pack. (A looper)	tL	Entire District	Heaviest populations occurred in the Crutwell and Mayview areas; no discernable defoliation.

9.2.17 OTHER NOTEWORTHY INSECTS (Concl.):-

Insect	Host(s)	Locality	Remarks
Toumeyella numismaticum (P. & M.) (Pine tortoise scale)	jP	Home Block of Nisbet Provincial Forest.	A small, light infestation of approximately one acre still present west of Prince Albert.
Zale duplicata largera Sm. (An owlet moth)	jP	Nisbet Provincial Forest.	Populations light, considerably lower than 1963.

9.3 TREE DISEASE CONDITIONS

9.3.1 STALACTIFORME RUST, Peridermium stalactiforme Arth. & Kern:- Three areas newly infected by this stem rust were recorded in 1964. The first, located in sec. 13, tp. 55, rge. 22, W2nd mer. at Candle Lake showed that over-all infection was light and covered approximately one half acre. Some light branch mortality was recorded on several scattered trees within this area. Other infections noted occurred on jack pine along the south end of White Gull Lake and in the Nisbet Provincial Forest, eight miles west of Prince Albert. In the latter, only one or two branches of two trees were infected.

9.3.2 GLOBOSE GALL RUST, Peridermium harknessii (Moore.):- This rust was collected at Big River, Candle Lake, and the Red Rock Block of the Nisbet Provincial Forest. In general, infection was light and confined to one or two branches on single trees.

9.3.3 MACROPHOMA GALL OF POPLARS, Macrophoma tumefaciens Shear.:- Collections of this gall were made from trembling aspen at Dumble, Eldred and along the Candle Lake Road six miles north of No. 55 highway. Damage was light and usually occurred on only one tree at any one location. It was also recorded along the south boundary of Prince Albert National Park, on scattered trembling aspen between MacDowall and Duck Lake, and on balsam poplar along the south shore of Dore Lake.

9.3.4 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- A survey to determine the distribution and effects of field spraying with 2,4-D on Manitoba maple shelterbelts was continued in 1964, and in general, damage was very light. The results of the survey are shown in the following table:

TABLE 2

2,4-D Injury to Manitoba Maple
Prince Albert District of Saskatchewan - 1964

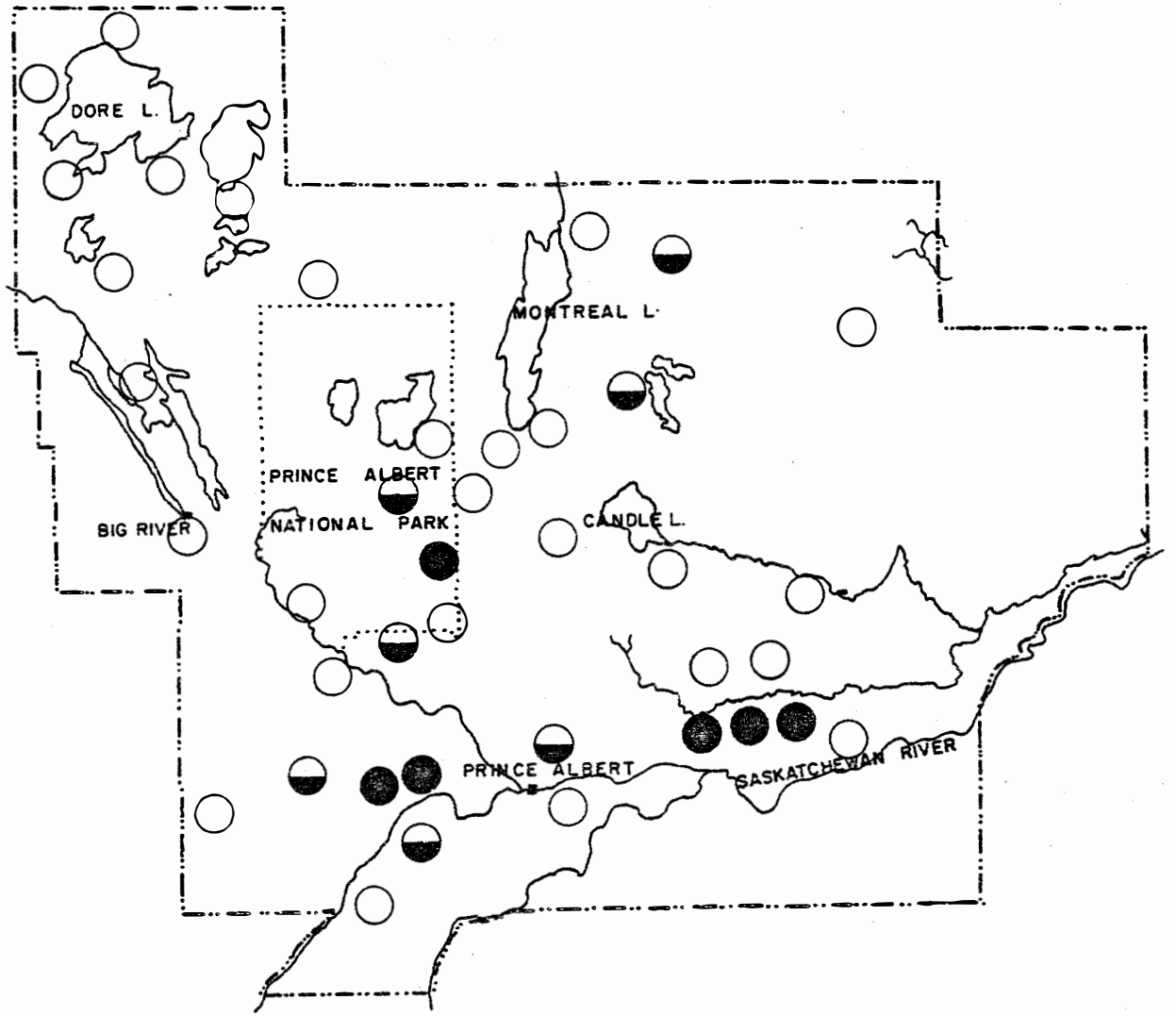
Location	Date sampled	Degree of Injury	Remarks
Shellbrook 8-49-3 W.3rd.mer.	July 25	A few isolated twigs.	Damage slight, very little spraying in area.
Parkside 6-48-4 W.3rd.mer.	July 25	Isolated twigs.	Damage very light and scattered.
Marcelin 22-45-6 W.3rd.mer.	July 25	Isolated twigs.	Some drought injury; 2,4-D injury very light.
Wakaw 30-42-26 W.2nd.mer.	July 25	Nil.	Little or no field crop spraying in area.
Cudworth 34-40-26 W.2nd.mer.	July 25	Isolated twigs and part of one side of trees.	Several trees showed symptoms of 2,4-D injury.
Spalding 12-39-18 W.2nd.mer.	July 25	Isolated twigs.	Very light, scattered damage.
Resource 20-43-18 W.2nd.mer.	July 25	Nil.	Some drought injury, otherwise no damage.
Weldon 5-46-22 W.2nd.mer.	July 25	Isolated twigs.	Shelterbelt reasonably healthy.

9.3.5. OTHER NOTEWORTHY DISEASES:-

Organism & Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Mistletoe of jack pine)	Jack pine	Nisbet Provincial Forest.	Prevalent throughout; brooming common.

9.3.5 OTHER NOTEWORTHY DISEASES (Concl.):-

Organism & Disease	Host(s)	Locality	Remarks
Apiosporina collinsii Schw. (Witches' Broom)	Saskatoon	Central and southern portion of district.	Light infection 5 miles west and 7 miles south of Prince Albert.
Corticium effuscatum Cooke & Ellice (A slash fungus)	Alder	Eight miles west of Prince Albert.	Several clumps of alder lightly infected.
Dibotryon morbosum (Schw.) (Black Knot of Cherry)	Cherry	Prince Albert District.	New area of infection 4 miles south of MacDowall, otherwise light and widely scattered.
Fomes igniarius (L.) Gill. (Canker of aspen)	Trembling Aspen	Big River and Dumble.	Numerous conks on single trees in both areas.
Fomes pini (Brot. ex Fr.) Karst (Red ring rot)	Jack pine	Home Block of Nisbet Provincial Forest.	Causing heart rot in jack pine of low vigor west of Prince Albert.
Hypoxylon pruinatum (Klotsche) Cke. (Hypoxylon canker)	Trembling Aspen	Mont Nebo.	Small clump of aspen lightly infected.
Polyporus pargamenus (Fr.) (A decay)	Trembling Aspen	Mont Nebo.	Infection light.
Uncinula salicis (DC. ex Merat) Wint (Powdery mildew)	Willow	Dumble, Cookson, Mayview.	Light at all locations; found on willow growing in or alongside tamarack swamps.



PRINCE ALBERT DISTRICT
SASKATCHEWAN

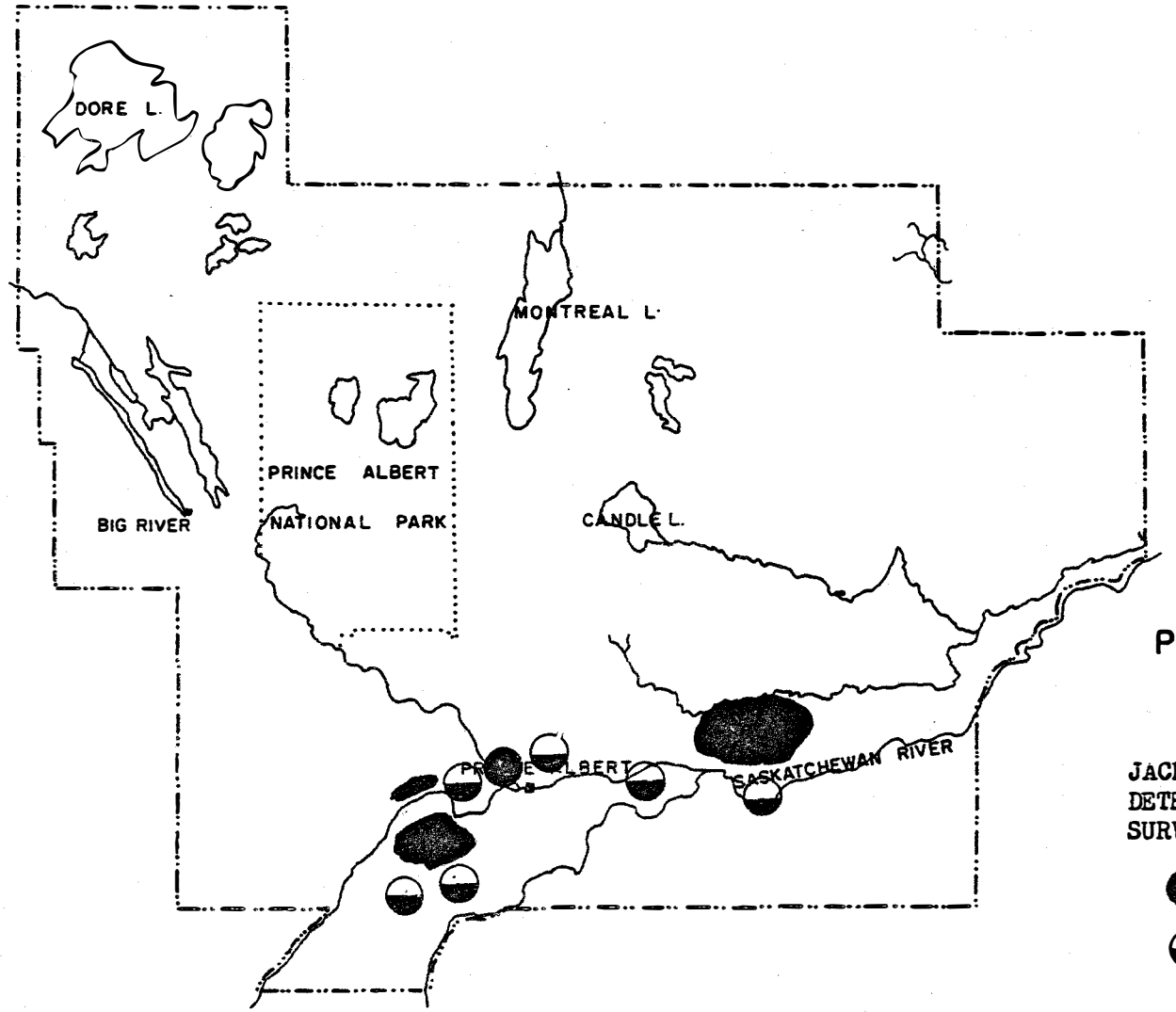
LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Severe ◒ Moderate

○ Light

Fig. 1

SCALE
0 30



PRINCE ALBERT DISTRICT
SASKATCHEWAN

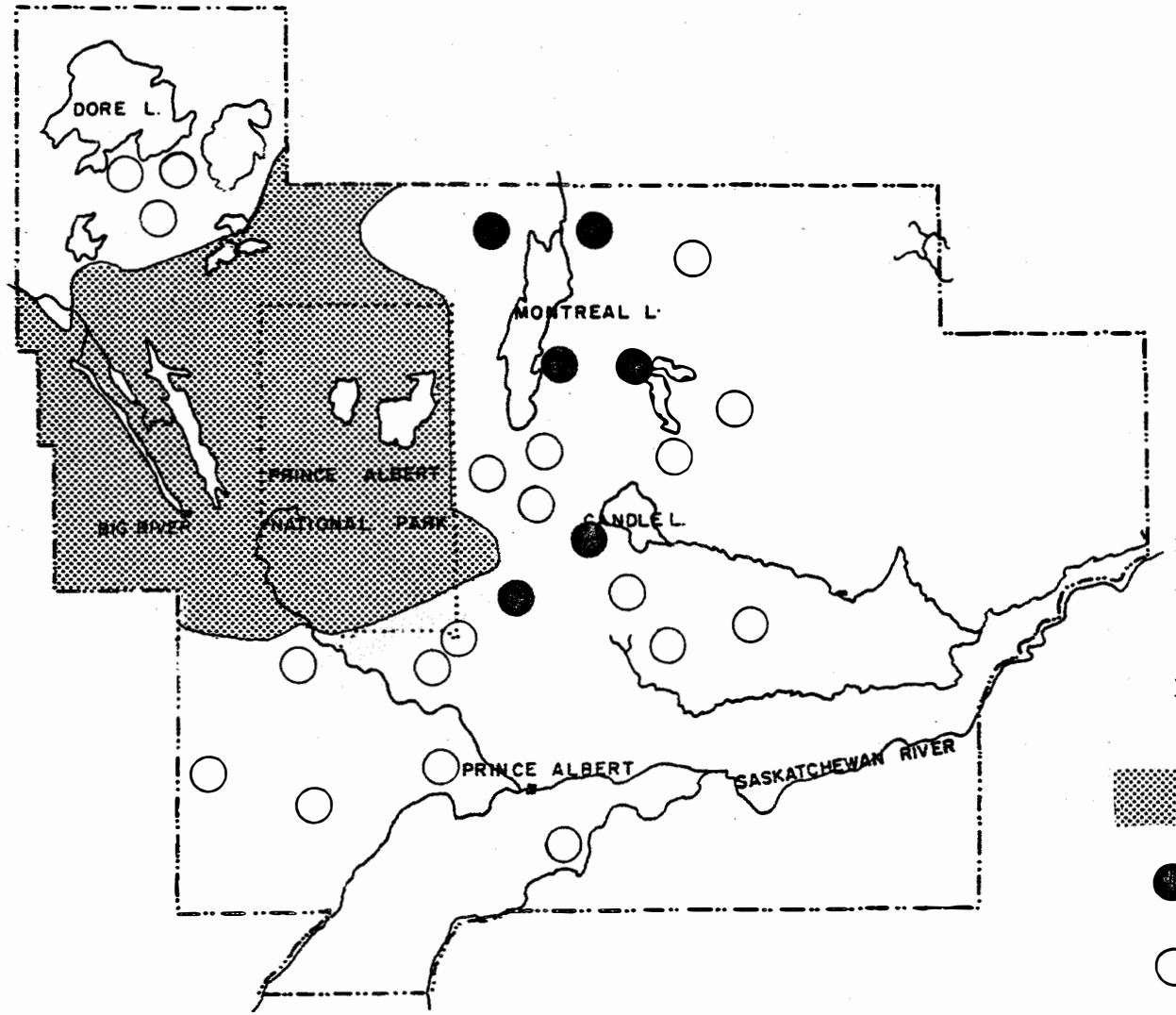
JACK PINE BUDWORM INFESTATIONS AS DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

Severe Defoliation

Light to Moderate Defoliation

Fig. 2

SCALE
0 30



PRINCE ALBERT DISTRICT
SASKATCHEWAN

FOREST TENT CATERPILLAR INFESTATIONS
1964

Areas of Continuous Moderate to Severe Defoliation.

Patches of Moderate to Severe Defoliation.

Larval Collection Points - No Noticeable Defoliation

Fig. 3

SCALE
0 30

10. ANNUAL DISTRICT REPORT

NORTHERN DISTRICT OF SASKATCHEWAN

1964

by

R. D. Van Den Abeele

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

10.1 INTRODUCTION

Weather conditions were generally dry and warm during the first half of the season, and wet and cool during the second half. Surveys of forest insect and disease conditions were conducted from May to October. The accessible parts of the Northern District were covered by motor vehicle, and the inaccessible parts by utilizing 38 1/2 hours of charter aircraft time. During the latter, major insect and disease outbreaks were mapped and general sampling of all host tree species was conducted at numerous northern lakes. Totals of 416 insect and 25 disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively. Special studies during the current season included larch sawfly egg population sampling in permanent plots and egg-band surveys of the forest tent caterpillar to predict the severity and extent of infestations in 1965.

Infestations of the forest tent caterpillar decreased notably in some areas in 1964. However severe defoliation continued from Lac La Ronge north to the Churchill River. The larch sawfly was present in practically all tamarack stands, but caused serious defoliation only in Prince Albert National Park, and the aspen leaf beetle was found throughout the south-central portion of the District. The balsam-fir sawfly outbreak remained much the same and caused light to moderate defoliation of spruce along the Churchill River. Collections of black-headed budworm larvae were made at widely scattered points but only traces of defoliation were noted. The gray willow leaf beetle caused light to moderate skeletonizing of willow foliage along Highway No. 2 from Waskesiu south to the Park Gate, and light populations of an aspen webworm were fairly common in areas previously defoliated by the forest tent caterpillar.

There was virtually no change in the status of the more common tree diseases. A globose gall rust on jack pine was recorded at Skunk Creek and Ballantyne River, and light infections of spruce needle rust were recorded at Cantura, Cree and Lloyd lakes.

10.2 INSECT CONDITIONS

10.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- This sawfly caused a trace to light defoliation of tamarack at Reindeer, Wollaston, Hanna, Ena, Lloyd, Agar, Frobisher, Nokomis, Cantura, Cree, Fredette, and Deception lakes, at Stony Rapids, along the south shore of Lake Athabaska, and along the Saskatchewan-Alberta border. Occasional patches of light to moderate defoliation were recorded at Skunk, Pine, and Bigstone creeks, Potato Lake, Nemeiben River, and Otter Falls. Similar conditions were noted along the Lac La Ronge and Churchill River highways, and the Ballantyne River, at Big Sandy,

Deschambault, and Jan lakes, and along the Hanson Lake and Buffalo Narrows roads (Fig. 1). In Prince Albert National Park, moderate to heavy defoliation occurred in scattered tamarack stands from Kinowa Lake north to McAuley and Waskesiu lakes.

Results of sequential sampling of egg populations carried out in two permanent plots are shown below. The infestation ratings for each plot are based on the utilization of current shoots for oviposition by adult sawflies.

Plot No.	Location	Infestation Ratings		
		No. of shoots examined	No. of curled shoots	Infestation ratings
111-A	Mayview	100	15	Moderate
101-A	Lac la Ronge	80	5	Light

Note: light = up to 35% defoliation; moderate = 36-65%; and severe = over 65%.

A total of 1,052 cocoons were collected at the Mayview plot using the drop tray method. Examination of the cocoons indicated that 13 per cent were destroyed by fall emergence of Bessa harveyi (T. T.) and 4 per cent by disease organisms. A representative number of larvae dissected showed that effective parasitism was 26 per cent by B. harveyi and 2 per cent by Mesoleius tenthredinis Morley.

10.2.2 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- This sawfly was collected from most of the black and white spruce trees sampled. In Prince Albert National Park, light defoliation was recorded around Lake Waskesiu, Hanging Heart Lake, and Waskesiu Narrows and light to moderate at Shady and Halkett lakes. In the northern sections of the District, it was light at Mountain, Knee, Wasekamio, and Corneille lakes, and at La Loche and Buffalo Narrows. The green-headed spruce sawfly, Pikonema dimmockii (Cress) was usually found on the same host trees but did not cause any appreciable defoliation.

10.2.3 BALSAM-FIR SAWFLY, Neodiprion abietis complex:- Although populations were relatively light throughout the District, a slight increase in distribution and abundance was recorded. Traces of de-

foliation occurred in the vicinity of Mountain, McIntosh, and Potato lakes, Bigstone and Pine creeks, and at Ile a la Crosse. Defoliation ranging from a trace to light was recorded on white spruce at Buffalo Narrows, Knee and Corneille lakes. Very low larval populations occurred throughout Prince Albert National Park and no defoliation was evident.

10.2.4 SAWFLIES ON JACK PINE, Neodiprion spp.:- Sawflies were common on jack pine at several locations. N. virginianus complex was taken at Nemeiben River, McTavish and McIntosh lakes in the Northern District, and N. nanulus nanulus Schedl. at Halkett Lake, Lake Waskesiu, and along the east boundary of Prince Albert National Park where it caused light to moderate defoliation of occasional branches.

10.2.5 BLACK-HEADED BUDWORM, Acleris variana (Fern.):- This budworm was widespread and occurred in most spruce-balsam fir stands, but caused no noticeable defoliation. Light infestations were recorded at Wapawekka, Rainbow, McLennan, Deception, Reindeer, and Nevins lakes in the northern sections of the District; at Skunk, MacKenzie, Pine, and Bigstone creeks, along the Nemeiben and Churchill rivers, at Big Sandy Lake, in the south central sections of Prince Albert National Park, and at Beauval, Buffalo Narrows, La Loche, and Ile a la Crosse.

10.2.6 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.: Aerial surveys conducted along the Churchill River basin showed that light to moderate defoliation of trembling aspen was continuous from Dipper Lake east to Lac La Ronge with patches of moderate to severe at Knee, Snake, Bernard, and Nemeiben lakes (Fig. 2). A strip of severe defoliation extended from Lac La Ronge north to Otter Falls. From Otter Falls east along the Churchill River to Wintego Lake, defoliation ranged from light to moderate. Southward to Pelican Narrows, Mirond, Corneille, and Jan lakes, only small scattered patches of light defoliation were recorded. The infestation at Hanson and Deschambault lakes almost disappeared, and little or no defoliation was apparent. From Montreal Lake north to Lac La Ronge only light to moderate defoliation was noted in the upper crown of trembling aspen. A small patch of light defoliation was recorded at mile 68 on the Buffalo Narrows Road and moderate between Turnor and Frobisher lakes. In Prince Albert National Park, moderate to heavy defoliation was again recorded in the old infestation at Halkett Lake, but the infestation was not as continuous as in previous years indicating that it may be declining. However, north of Halkett Lake to Kinowa, Tripps Beach, Trappers, Namekus, and Shady lakes defoliation was severe, and moderate to severe along the south shore of Lake Waskesiu and north to Hanging Heart, Crean, and Kingsmere lakes. Patches of

moderate defoliation still persisted in the western portion of the Park. In all cases, refoliation of trembling aspen was completed by the end of July.

Adults of the parasitic fly, Sarcophaga aldrichi Park., were very abundant in most infestation areas, especially in Prince Albert National Park.

Egg surveys were conducted throughout and adjacent to the main infestation areas to predict the severity of the outbreak in 1965. Sampling data, as shown in tables 1 and 2 indicate that defoliation will likely continue at about the same levels in Prince Albert National Park, but a further decline is expected to occur throughout most of the infestation areas in the Northern District.

TABLE 1

Summary of Forest Tent Caterpillar Egg-Band Sampling
Northern Saskatchewan - 1964

(based on examination of 3 co-dominant trembling aspen at each sampling point)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. egg bands per tree	Defoliation forecast for 1965
Mile 18 La Ronge Highway	3.0	26.6	16.0	2.0	Light
Mile 42 La Ronge Highway	3.1	26.3	13.3	0.6	Light
Mile 69 La Ronge Highway	3.8	33.0	16.0	4.0	Light
Mile 90 La Ronge Highway	3.6	37.6	20.3	4.3	Light
Mile 99 La Ronge Highway	3.0	25.6	14.3	4.6	Light
Mile 1 Churchill River Road	3.5	32.6	15.3	8.0	Moderate
Mile 9 Churchill River Road	3.8	33.6	14.3	5.6	Moderate
Mile 16 Churchill River Rd.	4.2	33.6	15.3	8.0	Moderate
Mile 25 Churchill River Rd.	3.8	34.0	10.6	12.3	Severe
Mile 36 Churchill River Rd.	3.5	31.6	13.0	9.6	Severe
Mile 53 Churchill River Rd.	3.5	37.6	16.0	16.3	Severe
Mile 98 Hanson Lake Road	4.0	25.6	16.6	4.3	Light
Denare Beach	3.3	33.3	23.3	0.0	Nil
Sturgeon Wier River	3.3	31.3	22.0	0.0	Nil

TABLE 2

Summary of Forest Tent Caterpillar Egg-Band Sampling
Prince Albert National Park - 1964

(based on examination of 3 co-dominant trembling aspen at each sampling point)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. egg bands per tree	Defoliation forecast for 1965
South Boundary Road	3.5	31.0	14.0	10.0	Severe
South Boundary Road	3.0	26.0	14.0	6.3	Moderate
South Boundary Road	3.6	27.6	14.3	14.6	Severe
South Boundary Road	3.0	26.6	16.3	3.3	Light
Halkett Lake	3.5	32.3	16.0	17.3	Severe
Halkett Lake	5.0	36.6	20.3	27.0	Severe
Namekus Lake	4.3	32.3	18.6	15.3	Severe
Junction to Waskesiu	3.6	31.3	10.3	5.0	Moderate
Waskesiu River	3.6	32.0	13.6	10.3	Severe
Waskesiu	3.0	20.0	14.3	8.3	Severe
Waskesiu	5.0	31.6	15.6	8.0	Moderate
Narrows Road	3.6	28.6	21.0	17.6	Severe
Narrows Road (South Bay)	5.0	27.6	19.0	18.0	Severe
First Narrows	5.0	31.6	18.3	19.6	Severe
MacAuley Lake	4.0	34.3	14.0	10.6	Severe
King's mere Drive	6.0	32.6	15.3	4.0	Light
Hanging Heart Lake	5.0	27.0	18.0	9.0	Moderate

10.2.7 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- Severe skeletonizing of aspen over an area of approximately ten square miles was recorded at Sandfly Lake west of Lac La Ronge. In addition, small scattered aspen were lightly damaged at Wapawekka, Corneille, Chachukew, McIntosh, Reindeer, Frobisher, Jan, Deschambault and Lac La Ronge lakes; along the Lac La Ronge Highway at Pine, MacKenzie and Bigstone creeks.

Very light beetle populations were recorded throughout Prince Albert National Park, along the Hanson Lake Road at the Ballantyne River, at Big Sandy Lake and Lac La Plonge, Ile a la Crosse and Buffalo Narrows.

10.2.8 GRAY WILLOW LEAF BEETLE, Galerucella decora (Say):- Patches of moderate to severe skeletonizing of willow were recorded at Tripps Beach, McAuley, Halkett, Hanging Heart and Kinowa lakes, and along the east boundary to Bittern Creek in Prince Albert National Park. In addition, light damage was recorded at the Nemeiben River, Montreal and Potato lakes, Skunk, Pine, and Bigstone creeks.

10.2.9 BIRCH SKELETONIZER, Bucculatrix canadensisella Cham.:- Populations remained very light; collections were taken from white birch and alder at Nokomis, Reindeer, McLennan, Deception, and Foster lakes but little or no damage was recorded.

10.2.10 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Waskesiu and Rainbow lakes, Churchill River, and Buffalo Narrows.	No noticeable defoliation.
Arge clavicornis Fab. (A sawfly)	wB W	Northern Saskatchewan.	Traces of defoliation.
Anoplonyx canadensis Hgtn. (A sawfly)	tL	Northern Saskatchewan District.	No defoliation noted.
Acronicta grisea Sm. (A dagger moth)	W	Throughout District and Prince Albert National Park.	Light and scattered populations.
Arge pectoralis (Leach) (Birch sawfly)	wB Al	Churchill River Basin, MacKenzie Creek, McLennan, Keg, and McIntosh lakes.	Very light defoliation.
Altica populi Brown (A flea beetle)	W Al	Potato Lake, Stony Rapids, McIntosh Lake, and Prince Albert National Park.	Feeding damage light.

10.2.10 OTHER NOTEWORTHY INSECTS:- (Cont'd.)

Insect	Host(s)	Locality	Remarks
Choristoneura pinus Free (Jack-pine budworm)	jP	Prince Albert National Park.	Low populations; no defoliation.
Cimbex americana Leach. (Elm sawfly)	Al, W, wB	Potato and Cree lakes.	No noticeable defoliation.
Choristoneura fumiferana (Clem.) (Spruce budworm)	wS	Corneille, Big Sandy, and Wapawekka lakes.	Very light populations; no noticeable defoliation.
Feralia jocosa Gn. (Green-striped spruce caterpillar)	wS, bS	Wasekamio, Montreal, Corneille lakes, and Skunk Creek and Prince Albert National Park.	Light populations.
Gonioctena americana (Schaef) (American aspen beetle)	tA	Skunk Creek and Prince Albert National Park.	Populations light to moderate in areas where detected.
Geometrid sp. (A looper)	W	Northern District of Saskatchewan.	Very light populations.
Halisidota maculata (Harr.) (Spotted tussock moth)	Al, W	Widely scattered in Northern Saskatchewan.	Light feeding damage.
Lepyrus palustris Scop. (A weevil)	W	Skunk and MacKenzie creeks, Nevins and Reindeer lakes.	No damage detected.
Lithocolletis salicifoliella Cham. (Aspen blotch miner)	tA	Jan Lake.	Light infestation.
Nematus unicolor (Marl.) (A sawfly)	wB	Northern Saskatchewan and Waskesiu Narrows.	Widely scattered; light defoliation.

10.2.10 OTHER NOTEWORTHY INSECTS:- (Concl.)

Insect	Host(s)	Locality	Remarks
Nycteola frigidana Wlk. (An owlet moth)	W	Waterbury, Corneille, MacAuley, Potato and Mountain lakes, Pine Creek, and Nemeiben River.	Low populations.
Petrova albicapitana (Busck.) (Pitch nodule maker)	jP	Stony Rapids, Reindeer, Crean, and Cree lakes, Buffalo Narrows, Lac la Plonge.	Low populations; widely scattered.
Schizura concinna J. E. Smith (Red-humped caterpillar)	tA	MacAuley Lake.	Defoliation very light.
Semiothisa granitata Gn. (A looper)	wS, bS	Throughout District and Prince Albert National Park.	Light populations.
Semiothisa sexmaculata Pack (A looper)	tL	Scattered over all District and Prince Albert National Park.	Light populations at all points.
Syneta pilosa Brown (A leaf beetle)	wS	Prince Albert National Park, Montreal Lake, MacKenzie Creek, and Waden Bay.	Very light and collected only in the adult stage.
Tetralopha asperatella (Clem) (An aspen webworm)	tA	Throughout District and Prince Albert National Park.	Common in areas previously defoliated by forest tent caterpillar.
Tortricid sp. (A leaf roller)	wB	Northern Saskatchewan District.	Caused very light damage.
Tenthredinid sp. (A sawfly)	W Al	Throughout Northern Saskatchewan.	No defoliation.

10.3 DISEASE CONDITIONS

10.3.1 SPRUCE NEEDLE RUST, Chrysomyxa sp.:- Light infections of this needle rust were recorded on black spruce at Cantura, Cree, and Lloyd lakes in the Northern District of Saskatchewan.

10.3.2 GLOBOSE GALL RUST, Peridermium harknessii J. P. Moore:- Light infections of this gall rust occurred on jack pine at Skunk Creek on the Lac La Ronge Highway, and at the junction of the Ballantyne River and the Hanson Lake Road.

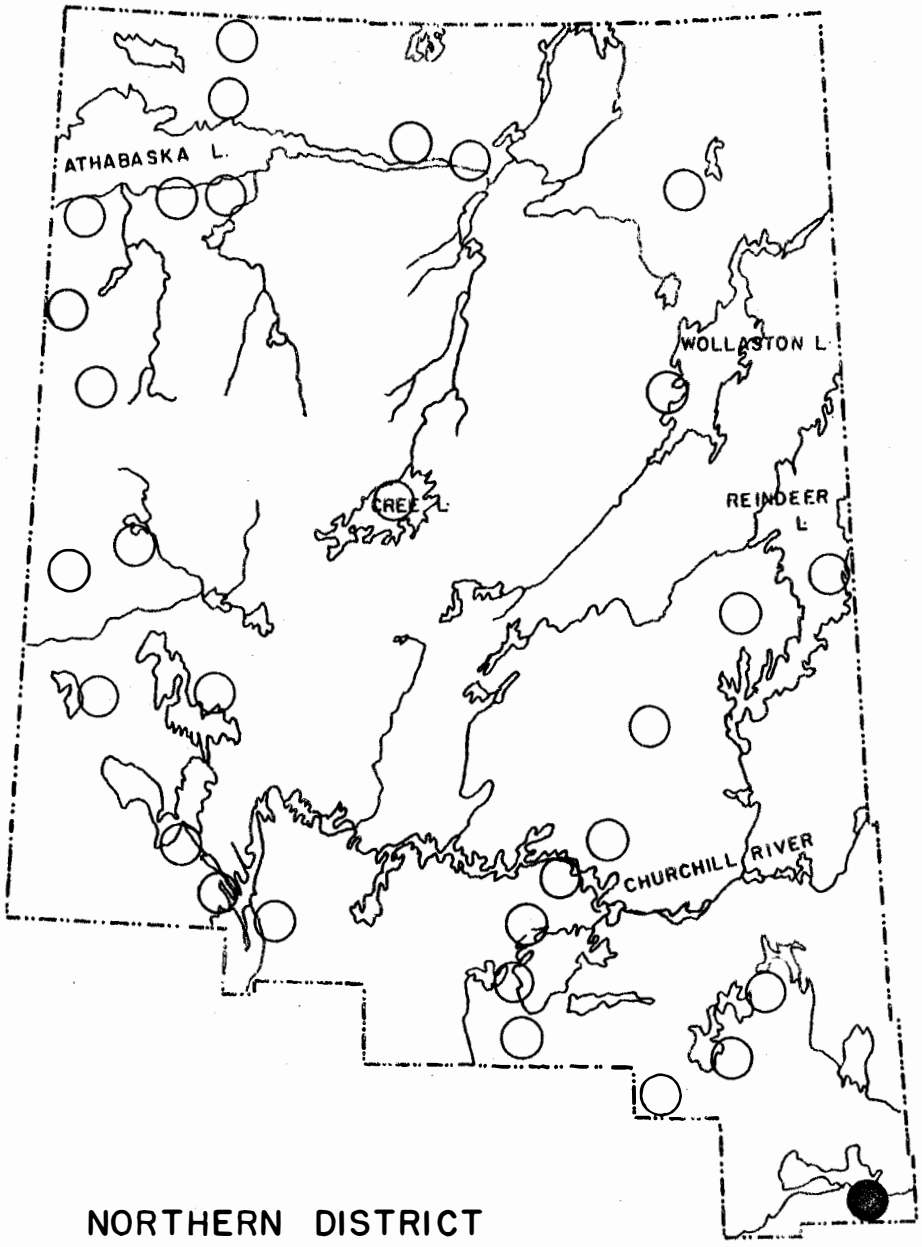
10.3.3 REDDENING OF SPRUCE:- Extensive discoloration of white and black spruce in all age classes was recorded along Highway No. 2 from Waskesiu north to Skunk Creek. On many trees, the foliage was completely reddened but no tree mortality was noted. This condition is probably associated with prolonged periods of drought, particularly on dry sites.

10.3.4 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Dwarf mistletoe)	jP	Cree Lake.	Brooming of jack pine common.
Chrysomyxa arctostaphyli Diet. (Yellow witches' broom)	bS	Snare Lake.	Brooming light throughout stand.
Chrysomyxa pirolata Wint. (Spruce cone rust)	wS	Buffalo Narrows.	Very light infection.
Peridermium stalactiforme A. & K. (Stalactiforme rust)	jP	La Loche.	Rust gall spindle type; light infection.
Fomes fomentarius (L. ex Fr.) Kickx (The tinder fungus)	wB	Corneille Lake.	Conks collected from lower part of main stem on dead trees.
Fomes pinicola (Sw. ex Fr.) Cke. (A brown crumbly rot)	wB	Prince Albert National Park, and Jan Lake Resort.	Light infection; a common invader of stumps and dead trees.

10.3.4 OTHER NOTEWORTHY DISEASES:- (Concl.)

Organism and Disease	Host(s)	Locality	Remarks
Lenzites saepiaria (Wulf.)Fr. (Brown cubical pocket rot)	bS	Deschambault and Big Sandy lakes.	Common slash fungus; no noticeable damage.
Polyporus betulinus (Bull.) (Slash decay fungus)	wB	McTavish and McLennan lakes.	Hand picked off dead trees. Light infection.
Polyporus pargamenus Fr. (White pocket rot)	Al	Nevins Lake.	Causing a white rot of broad leaved trees; only light infection.
Polyporus hirsutus Wulf. ex Fr. (The hairy conk)	wB	Frobisher Lake.	Causes a sap rot of dead hardwoods; no serious damage.
Stereum sp. (Slash fungus)	Al	Wapawekka and Reindeer lakes.	Infections light and scattered along lake shores.
Wallrothiella arceuthobii (Pk.)P (A parasitic fungus)		Ile a la Crosse.	Occurred on mistletoe plants in damp environments.



NORTHERN DISTRICT
SASKATCHEWAN

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

1964

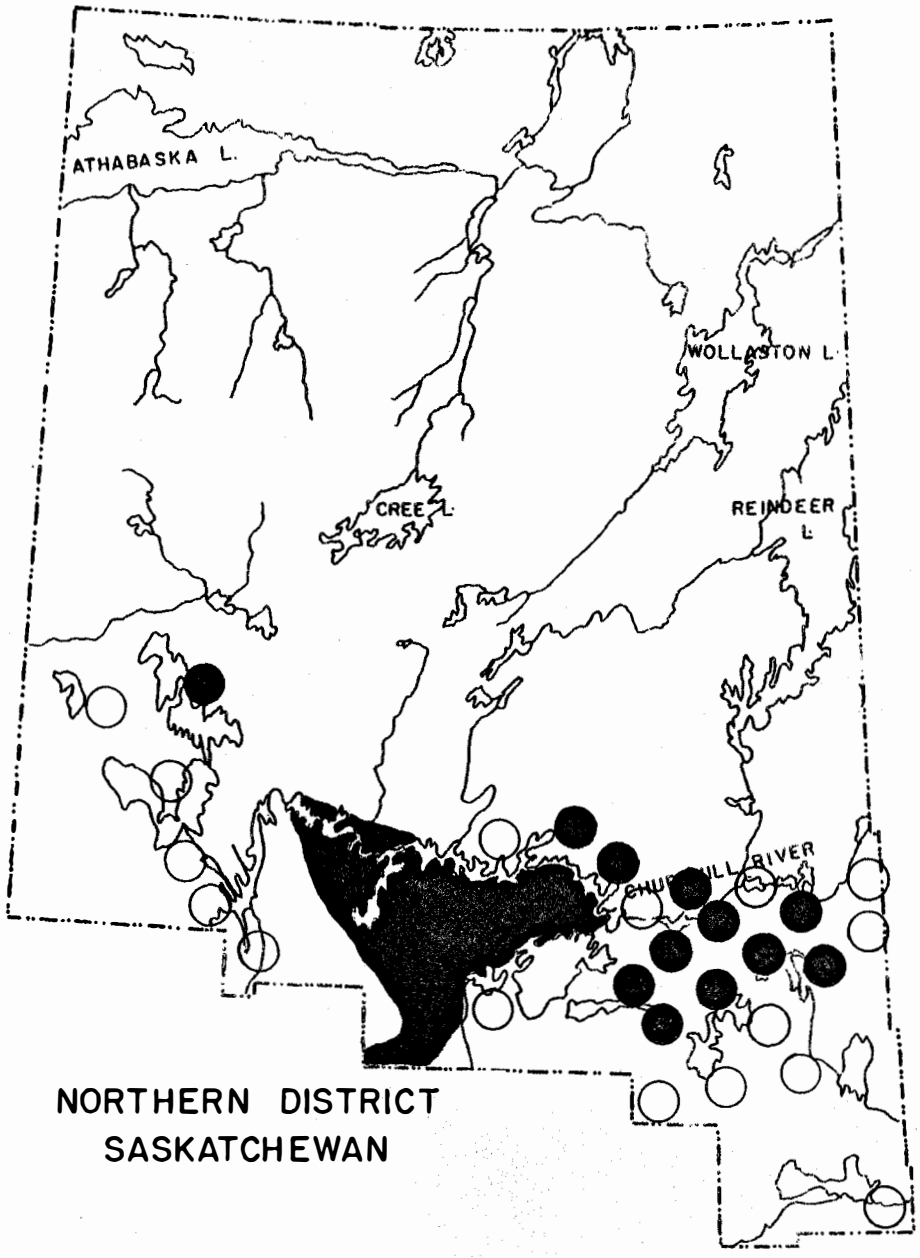
● Severe Defoliation

○ Light Defoliation

Fig. 1

SCALE 64 miles-1 inch

50 0 50



FOREST TENT CATERPILLAR INFESTATIONS
1964

Areas of Continuous Moderate to Severe Defoliation.

Patches of Moderate to Severe Defoliation.

Larval Collection Points - No Noticeable Defoliation.

Fig. 2

SCALE 64 miles--1 inch

50 0 50

11. ANNUAL DISTRICT REPORT

MEADOW LAKE DISTRICT OF SASKATCHEWAN

1964

by

K. L. Mortensen

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

11.1 INTRODUCTION

Surveys were carried out from mid-May to mid-October and totals of 349 insect and 49 disease collections were taken. Eight hours of chartered flying time were used for recording and mapping infestations of the forest tent caterpillar. The outstanding insect condition was the continuation of the forest tent caterpillar outbreak, but there were notable changes in the boundaries due to an almost complete collapse of the infestation north of the Meadow Lake Provincial Park and southward extensions to the Bronson and Meadow Lake Provincial forests. Larch sawfly populations remained light, but those of the balsam-fir sawfly, yellow-headed spruce sawfly, and black-headed budworm increased. The gray willow-leaf beetle infestation decreased in size and was confined mainly to the central portion of the District. Leaf rollers caused moderate damage to the foliage of trembling aspen growing on pasture lands north-west of Battleford, and the vagabond gall aphid was unusually abundant in stands previously defoliated by the forest tent caterpillar.

No serious damage by tree diseases was recorded during the season. Root rots and butt decays were common but showed little change from the previous year. Leaf blights and needle rust infections were unusually low. The yellow witches-broom occurred commonly in black spruce stands and infections of globose rust galls, spindle rusts, and dwarf mistletoe were widely distributed throughout jack pine stands.

11.2 INSECT CONDITIONS

11.2.1 LARCH SAWFLY, Pristiphora erichsonii (Htg.):- Larvae of this sawfly were collected in nearly all tamarack stands examined, but defoliation generally remained very light (Fig. 1). However, moderate to heavy defoliation occurred to small isolated trees at Goodsoil, Big Bush, Lac Des Iles, and Chitek Lake. Results of sequential sampling of egg populations, based on the utilization of current shoots by adult sawflies for oviposition, in permanent plots are shown below:

		Infestation Rating		
Plot No.	Location	No. of shoots Examined	No. of shoots curled	Infestation rating 1964
102	Loon Lake	50	0	light
104	Pierceland	50	0	light
105	St. Cyr	60	0	light

A total of 138 cocoons were collected from the Loon Lake plot and subsequently examined and dissected t o determine the number destroyed by small mammals, disease organisms and parasites. Forty-eight percent was destroyed by small mammals, 4.3 percent by fall emergence of Bessa harveyi (Tnsd.), and 5 percent by disease organisms. Larval dissections indicated effective parasitism was 13 percent by B. harveyi and 8 percent by Mesoleius tenthredinis Morley. Less than one percent of the cocoons were parasitized by Tritneptis klugii (Ratz.)

11.2.2 SAWFLIES ON SPRUCE:- The yellow-headed spruce sawfly, Pikonema alaskensis Roh. increased in abundance, and larvae were common in most white and black spruce samples taken from mid-June to mid-August (Fig. 2). Severe defoliation occurred in white spruce shelterbelts at Leoville, Turtleford, Mervin and Meadow Lake and of small ornamental white spruce around the public camp grounds at Mustus, Loon and Flotten lakes. In addition, isolated black spruce were heavily defoliated at widely scattered points along the Buffalo Narrows Road from Green Lake to Beauval and nine miles west of Peerless. Light defoliation to white spruce was recorded at Waseca, Cater, and Little Birch, Mudie, Kimball, Perch and Little Fishing lakes. The green-headed spruce sawfly, Pikonema dimmockii (Cress.) occurred in association with the yellow-headed spruce sawfly in native spruce stands throughout the District, but populations remained very low.

11.2.3 BLACK-HEADED BUDWORM, Acleris variana (Fern.):- Larval populations of this budworm continued to increase and, in conjunction with the yellow-headed spruce sawfly, caused moderate defoliation of white and black spruce along the Buffalo Narrows Road from Green Lake to Beauval. It also caused very light defoliation of white spruce at Flotten Lake and of black spruce at Macallum Lake. Elsewhere, larvae were commonly found in native spruce, but defoliation was negligible.

11.2.4 SPRUCE GALL APHID, Chermes lariciatus (Patch):- This pest again caused unsightly galls on ornamental white spruce around public beaches at Pierce, Cold, and Jeanette lakes. Isolated roadside trees were also heavily attacked at Divide and Macallum Lake. Light infestations were recorded at Peerless, Northern Pine, Golden Ridge and Perch Lake.

11.2.5 PITCH NODULE MAKER, Petrova albicapitana (Busck.):- Light infestations of this nodule-maker continued throughout most jack pine stands, but populations were generally low. A tally of the study plot at Beacon Hill indicated a decline from 1963, and five years of records indicate no serious injury by the attacks. The data are shown in the following table.

No. of JP on plot in 1960	No. of JP with nodules in 1960	No. of trees with new attack in 1961	1962	1963	1964	Total No. of trees with old and new nodules - 1964
144	25	10	8	18	5	59

11.2.6 SAWFLIES ON JACK-PINE, Neodiprion spp.:- Jack-pine sawflies were more common in the District than in 1963, but caused no serious defoliation. The most abundant species was N. nanulus nanulus Schedl. and it was collected at Radiance, Grand Rapids, Halfway Creek and Loon, Perch, Flotten, and Green lakes. N. maurus Roh. was collected at Pierceland, Chitek Lake, Golden Ridge, and Green Lake, N. pratti banksianae Rohwer at Steeles' Narrows, and N. virginianus Complex at Golden Ridge.

11.2.7 BALSAM-FIR SAWFLY, Neodiprion abietis Complex:- There was a general increase in the abundance and distribution of this sawfly. Populations were generally low, but in association with the yellow-headed spruce sawfly caused light defoliation at Flotten Lake and at mile 32 on the Buffalo Narrows Road.

11.2.8 FOREST TENT CATERPILLAR, Malacosma disstria Hbn.:- The current outbreak of this defoliator, which began in 1959, almost completely collapsed in the northern half of the District, but continued in the central portion and extended southward.

Severe defoliation of trembling aspen extended across the District in a band about 50 miles wide (Fig. 3) with the Beaver River as the approximate northern boundary. The southern boundary extended from Onion Lake near the Alberta border eastward along the southern boundaries of the Bronson and Meadow Lake Provincial forests to Turtle Lake, thence through Helene Lake and along the Big River into the Prince Albert District. South of the main infestation patches of moderate to heavy defoliation were recorded at Sandy Beach north of Lloydminster, around Midnight Lake, and on the south shores of Birch and Witchekan lakes. Larvae were collected at many other widely scattered points throughout the remainder of the southern part of the District, but no defoliation was noted. In the northern part of the District numerous patches of moderate to heavy defoliation occurred between the Beaver and Waterhen rivers. North of the latter, larvae and pupae were common along the roadsides to Canoe Lake and Beauval, but caused only very light patches of defoliation.

Egg band surveys conducted during the fall to predict degree of defoliation in 1965 indicated the infestation may continue and spread further southward, but further declines are expected in the older northern sections. The results of the egg band survey are shown in Table 1.

TABLE 1

Forest Tent Caterpillar Egg-Band Survey
Meadow Lake District - 1964

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

Stn. No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown depth	Av. No. Egg Bands per tree	Forecast for 1965
1	Cold Lake	3.3	25.7	14.3	0.7	Light
3	Pierce Lake	3.7	25.7	16.3	11.0	Severe
10	Big Bush	3.1	22.0	15.0	26.3	Severe
11	St. Walburg	3.1	23.7	15.7	3.7	Light
12	Lt. Birch Lake	2.7	20.7	15.7	15.7	Severe
13	Meadow Lake	2.8	24.0	17.0	26.0	Severe
15	Prince	3.0	19.7	14.3	2.0	Light
16	Loon Lake Beach	4.0	35.0	16.0	24.3	Severe
28	Flotten Lake	4.0	29.7	20.0	2.7	Light
30	Meadow Lake	4.0	29.7	18.0	61.0	Severe
32	Lt. Fishing Lake	3.3	27.7	18.3	17.0	Severe
33	Green Lake	3.0	28.0	21.3	3.7	Light
37	Divide	3.5	28.0	17.0	19.7	Severe
38	Ministikiwan Lake	2.7	19.7	15.3	6.0	Moderate
41	Lloydminster	3.5	21.3	14.3	6.0	Moderate
43	Glaslyn	3.5	20.7	15.3	0.3	Light
44	Midnight Lake	3.7	28.7	21.7	16.3	Severe
48	Goodsoil	3.1	26.3	15.3	8.0	Moderate
49	Golden Ridge	2.7	20.0	15.3	9.3	Severe
53	Dorintosh	3.5	27.0	17.0	17.0	Severe
65	Turtleford	3.3	20.3	15.3	2.0	Light
66	Cater	2.8	21.0	16.3	0.3	Light
67	Spiritwood	2.8	18.7	11.7	20.7	Severe
68	Leoville	4.3	25.3	16.7	18.0	Severe
69	Battleford's Park	3.0	19.0	14.0	1.3	Light
77	Lloydminster	2.8	17.0	12.8	4.0	Light
80	Richard	3.5	20.7	16.7	1.0	Light
81	Hafford	3.5	20.7	14.7	1.0	Light
83	Chitek Lake Resort	4.1	25.7	15.7	14.0	Severe
84	Meeting Lake	3.3	21.7	13.7	2.7	Light
85	Bapaume	2.7	14.0	12.6	6.0	Moderate
A	St. Walburg	2.5	21.3	16.0	4.3	Moderate
B	Livelong	3.3	22.3	15.7	3.0	Light
C	Paradise Hill	2.8	20.7	15.7	1.0	Light
D	Maidstone	3.5	22.7	14.3	2.0	Light
E	Greig Lake	2.7	26.7	14.0	8.7	Severe

11.2.9 GRAY WILLOW-LEAF BEETLE, Galerucella decora (Say):- Heavy skeletonizing of willow occurred throughout the central part of the District in an area bounded by Ministikwan, Loon, Meadow and Chitek lakes, Glaslyn and St. Walburg. There was a marked decline in populations from St. Walburg to North Battleford and in the Dore-Durocher lakes area.

11.2.10 AMERICAN ASPEN BEETLE, Gonioctena americana (Schffr.):- Adults and larvae of this beetle were collected at widely scattered points throughout the southern half of the District. Small patches of light to moderate defoliation were recorded near the Divide fire tower, the south end of Turtle Lake, Cold Lake and Goodsoil. Elsewhere only a trace of feeding damage was evident.

11.2.11 AN ASPEN WEBWORM, Tetralopha asperatella (Clem.):- Infestations of this webworm declined in intensity and light defoliation was recorded only at Green Lake and Loon Lake. As in former years, larvae were most abundant in areas previously infested by the forest tent caterpillar where they commonly inhabited empty caterpillar cocoons.

11.2.12 BOXELDER TWIG BORER, Proteoteras willingana Kft.:- All Manitoba maples examined showed evidence of light infestations of the boxelder twig borer. Counts were made on branches from five trees in shelterbelts at Goodsoil, Loon Lake and Bolney as shown in Table 2.

TABLE 2

Boxelder Twig Borer Population Counts
Meadow Lake District of Saskatchewan

(based on examination of four 36" branches from each crown level of 5 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
Loon Lake	20.0	17.4	11.6	345	22	355	26	305	20
Goodsoil	23.0	18.0	12.4	336	27	322	23	309	23
Bolney	22.5	17.8	11.2	441	27	460	28	377	19

11.2.13 ASPEN LEAF BEETLE, Chrysomela crotchi Brown:- An increase was noted in the abundance and distribution of this leaf beetle. Light feeding by adults was observed near the mouth of the Cold River and at Glaslyn, while small trembling aspen were lightly skeletonized by the larvae at Chitek Lake.

11.2.14 POPLAR VAGABOND APHID, Mordwilkoja vagabunda (Walsh): Damage to aspen foliage by this gall former was conspicuous throughout much of the Meadow Lake District. By the latter part of May, about 50 percent of the foliage on aspen trees was affected in small woodlots at Meadow Lake and Dorintosh. Moderate infestations were also recorded along No. 55 highway from Goodsoil to Golden Ridge, at Lac Des Iles and Ministikwan Lake.

11.2.15 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Arge pectoralis (Leach) (Birch sawfly)	Al	Loon Lake, St. Cyr and Green Lake.	Light defoliation.
Anoplonyx luteipes (Cress.) (A sawfly)	tL	Throughout the mixed-wood stands of the District.	Commonly found, but no noticeable defoliation.
Aceria parapopuli (Kiefer) (Poplar bud gall-mite)	tA	Throughout the District.	Widely scattered; common on an occasional tree.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	cCh	Tea Creek and Fort Pitt.	Small patches of heavy infestation.
Choristoneura pinus Free. (Jack-pine budworm)	jP	Goodsoil and Keeley Lake.	Very low populations; no appreciable defoliation.
Choristoneura conflictana (Wlk.) (Large aspen tortrix)	tA	Bolney, Maidstone, North Battleford and Fort Pitt.	Very low populations; no appreciable defoliation.
Choristoneura fumiferana (Clem) (Spruce budworm)	wS	Fort Pitt.	Very low populations; no discernable defoliation.

11.2.15 OTHER NOTEWORTHY INSECTS (concl.):-

Insect	Host(s)	Locality	Remarks
Feralia jocosa Gn. (Green-striped spruce caterpillar)	wS jP tL	Throughout the District.	Widely scattered; single larva in each collection.
Fenusa dohrnii Tischb. (European alder leaf miner)	Al	Throughout the District.	Widely scattered; low populations.
Hemichroa crocea (Fourc.) (Striped alder sawfly)	Al	St. Cyr and Loon Lake.	Low populations only.
Itame loricaria Evers. (A looper)	tA	Southern part of the District.	Widely scattered populations; no defoliation.
Malacosoma lutescens (N. & D.) (Prairie tent caterpillar)	cCh Rose	Southern part of the District.	Widely scattered; heavy infestations at Onion Lake and Maidstone, and in Bronson Provincial Forest.
Operophtera bruceata (Hulst) (Bruce spanworm)	tA	Across southern half of the District.	Widely scattered populations; no defoliation.
Pseudexentera poss. oregonana Wlshm. (A leaf roller)	tA	Paynton-Battleford area.	Patches of moderate leaf rolling.
Pissodes strobi (Peck) (White-pine weevil)	wS jP	Loon Lake.	Very low populations.
Semiothisa sexmaculata Pack. (A looper)	tL	Entire District.	Widely distributed, no noticeable defoliation.

11.3 DISEASE CONDITIONS

11.3.1 MACROPHOMA GALL OF POPLARS, Macrophoma tumefaciens Shear:- Investigations to determine the distribution and incidence of this disease were continued in areas where it had not been reported previously. New collection points were recorded in 1964 at Green Lake and Greig Lake where light infections were confined to occasional trembling aspen trees.

11.3.2 GLOBOSE RUST GALL, Peridermium harknessii J.P. Moore:- New distribution records of this jack pine rust gall were made at Green, Flotten and Canoe lakes and Goodsoil. Some branch mortality was observed on one small jack pine at Goodsoil, but elsewhere only light infections were recorded.

11.3.3 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- Below normal rainfall during the spring resulted in reduced field crop spraying for weed control in the Meadow Lake District. Thus damage to trees by 2-4-D was lower than 1963. Light damage was recorded in Manitoba maple shelterbelts at only Lloydminster and Waseca, as shown in Table 3.

TABLE 3

2-4-D Injury to Manitoba Maple
Meadow Lake District, Saskatchewan
1964

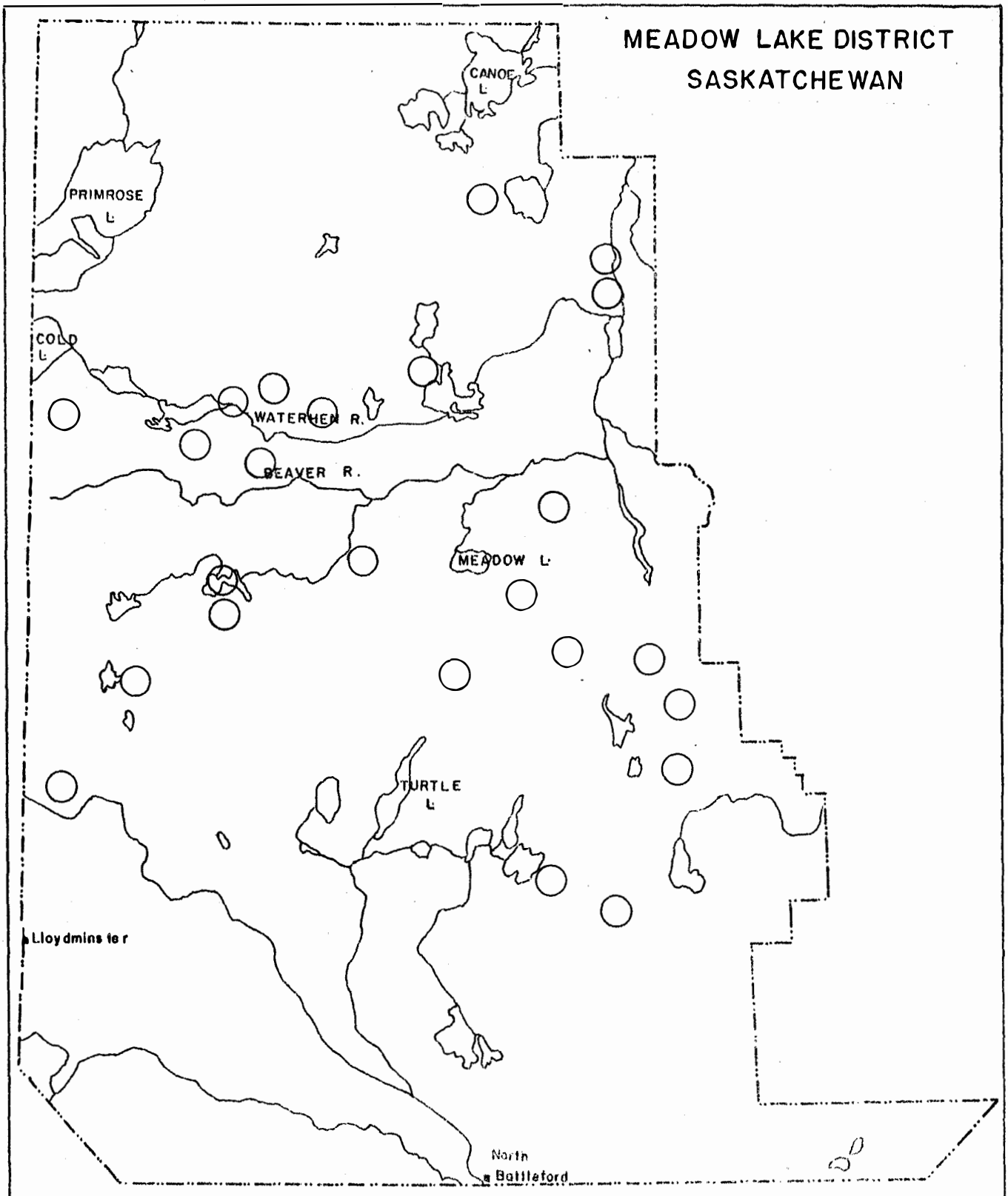
Location	Date sampled	Degree of Injury	Remarks
Lloydminster 1-51-28-W3	July 20	Light	Shelterbelt adjacent to sprayed field.
Waseca	July 20	Light	Shelterbelt adjacent to sprayed field.

11.3.4 OTHER NOTEWORTHY DISEASES:-

Organism and Disease	Host(s)	Locality	Remarks
Arceuthobium americanum Nutt. (Eastern dwarf mistletoe)	jP	Throughout most jack pine stands in the District.	Mistletoe plants infected with the hyperparasite, Wallrothiella arceuthobii (Pk.) at Jeanette Lake, and Ile a la Crosse.
Chrysomyxa arctostaphyli Diet (Yellow witches' broom)	bS	Throughout the District.	Widely scattered; common on bS at Golden Ridge and Pierceland.
Cronartium comandrae Peck (Comandra blister rust)	jP	Throughout the District.	Light infections. Heavy infections on alternate host, comandra sp. at Matheson and Flotten lakes.

11.3.4 OTHER NOTEWORTHY DISEASES (concl.):-

Organism and Disease	Host(s)	Locality	Remarks
Crystochaete rufa (Fr.) Karst (A slash fungus)	tA bPo	Loon, Green and Pierce lakes.	Light infections on slash and dying trees.
Dibotryon morbosum (Schw) Theiss. and Syd. (Black knot of cherry)	cCh	Southern part of the District.	Widely scattered; heavy infection on pincherry at Ministikwan Lake.
Fomes pinicola (Swartz) Cke. (Brown crumbly rot)	wS tA bPo	Turtle, Meadow Waterhen and Green lakes.	Common as a slash fungus.
Fomes pini (Brot. ex Fr.) (Red heart rot)	wS jP	Meadow, Greig, Green lakes, and Divide.	Light infection on living jP at Divide; elsewhere it occurred as a slash fungus.
Fomes ignairius var. laerigatus Pers. (False tinder fungus)	Poplar	Greig Lake.	A slash fungus; light infection.
Fomes subroseus (Weir) Overh. (Brown cubical pocket rot)	wS	Greig Lake and Divide.	A slash fungus; light infection.
Lenzites saepiaria (Wulf.) Fr. (Brown cubical pocket rot)	wS	Turtle Lake and Meadow Lake.	A slash fungus; light infection.
Polyporus tomentosus Fr. (Root rot of conifers)	wS	Loon Lake and Divide.	Occasional sporophore found.
Radulum casearium (Morgan) Lloyd. (Yellow stringy rot)	tA	Loon Lake and Greig Lake.	Collections from dead wood; light infection.



LOCATION OF POINTS WHERE LARCH SAWFLY INFESTATIONS WERE DETERMINED BY GROUND AND AERIAL SURVEYS IN 1964.

● Severe ◒ Moderate ○ Light

Fig. 1

Scale 20 miles — 1 inch

20 0 20

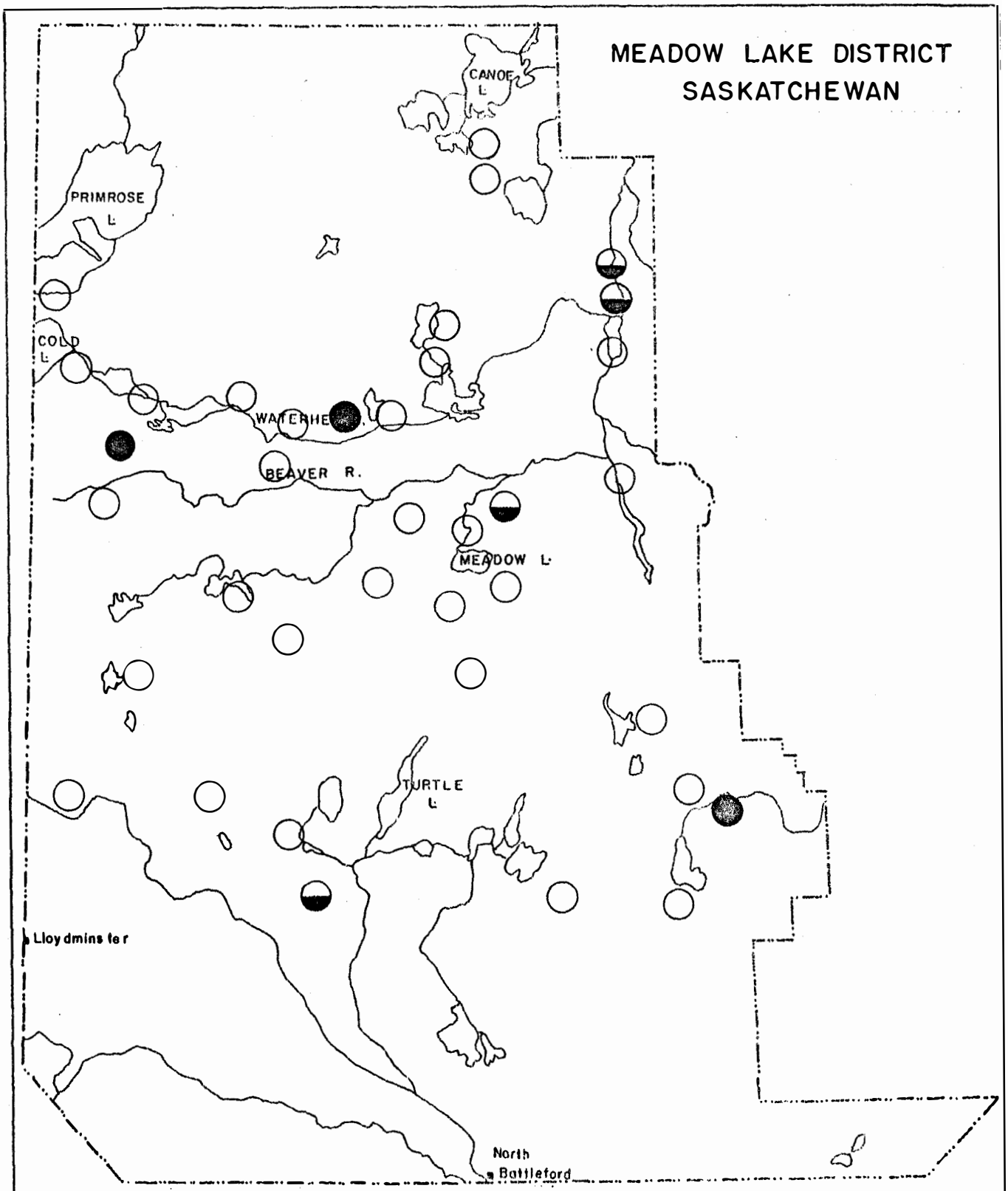

MEADOW LAKE DISTRICT
SASKATCHEWAN
CANOE L.
PRIMROSE L.
COLD L.
WATERHEN L.
BEAVER R.
MEADOW L.
TURTLE L.
Lloydminster
North Battleford
YELLOW-HEADED SPRUCE SAWFLY INFESTATIONS
1964
Severe
Moderate
Light
Scale 20 miles — 1 inch
20 0 20

Fig. 2

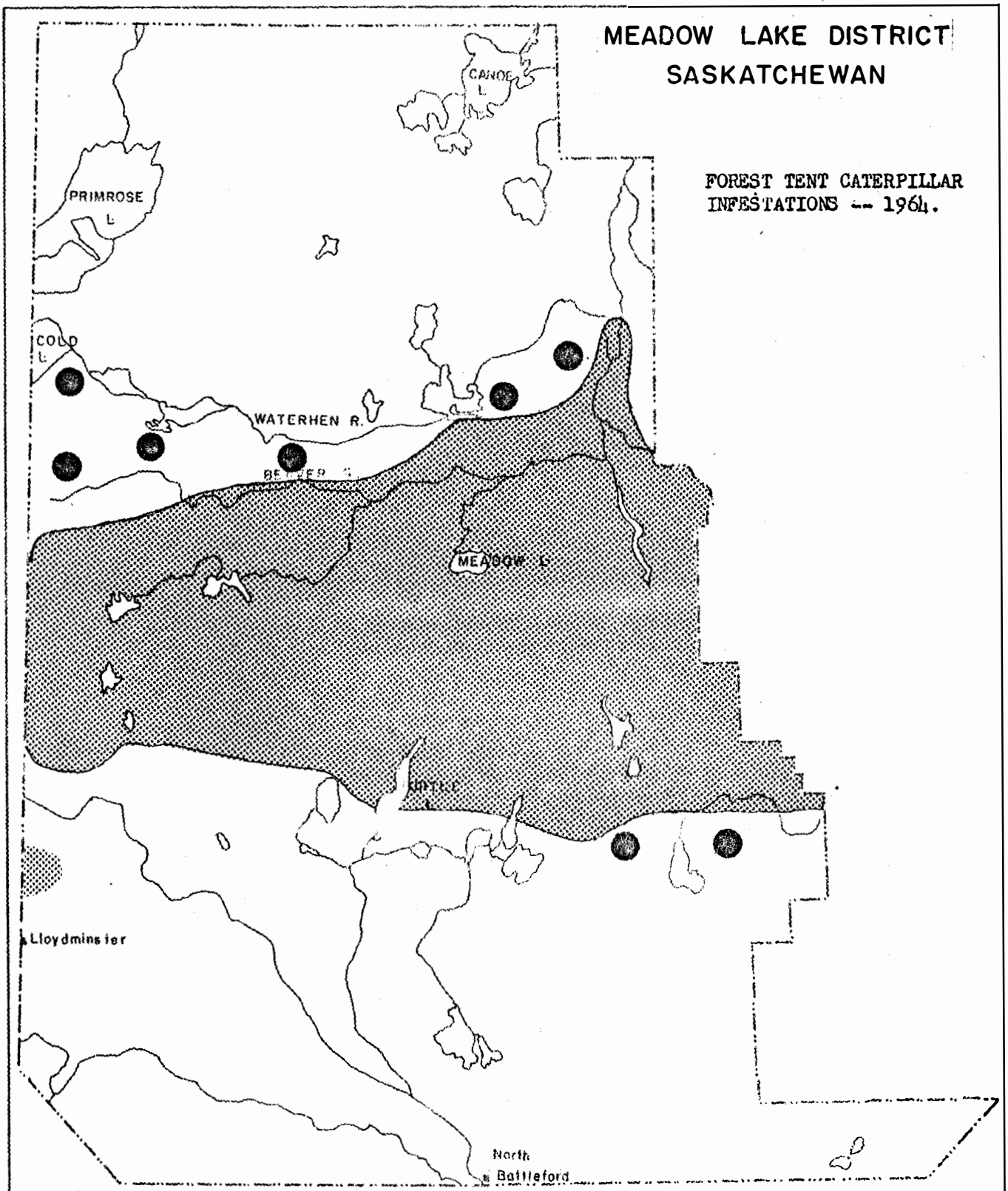

MEADOW LAKE DISTRICT
SASKATCHEWAN
FOREST TENT CATERPILLAR
INFESTATIONS -- 1964.
CANOE L.
PRIMROSE L.
COLD L.
WATERHEN R.
MEADOW L.
Lloydminster
North Battleford
Areas of Continuous Moderate to Severe Defoliation.
Patches of Moderate to Severe Defoliation.
Larval Collection Points - No Noticeable Defoliation.
Scale 20 miles — 1 inch
20 0 20

Fig. 3

12. ANNUAL DISTRICT REPORT

WEST-CENTRAL DISTRICT OF SASKATCHEWAN

1964

by

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CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1965

12.1 INTRODUCTION

Forest insect and disease surveys were conducted periodically in the District throughout the summer, and totals of 125 insect and 5 disease samples were taken. Survey sub projects included: (1) mass collections of prairie tent caterpillar larvae and eggs; (2) mass collections of fall cankerworm larvae; (3) mass collections of insects inhabiting black-knot of cherry; (4) population counts of the boxelder twig borer; and (5) caragana sampling.

The major insect pest during the current season was the fall cankerworm which caused defoliation to many deciduous shelterbelts throughout the central part of the District. The pine needle scale was severe on white spruce in parks and on boulevards in Saskatoon. The prairie tent and ugly-nest caterpillars continued to infest open-growing trees and shrubs on pasture lands and along roadsides, and declines were noted in populations of the gray willow-leaf beetle and the aspen leaf beetle. The yellow-headed spruce sawfly was widely scattered, but populations were generally low.

The most important tree diseases were hypoxylon canker in aspen bluffs, black-knot of cherry and herbicide damage to Manitoba maple. The incidence of hypoxylon cankers increased in the Battleford-Saskatoon area, probably as a result of the aspen trees being weakened by past drought periods, and moderate infections of black-knot of cherry persisted in localized areas. Herbicide damage was less conspicuous as crop spraying was reduced in many areas.

12.2 INSECT CONDITIONS

12.2.1 YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.):- A slight increase in the abundance of this sawfly was recorded at a number of widely scattered points. White spruce trees in a cemetery at Floral were heavily defoliated. Light defoliation of planted white spruce occurred in the Wilkie cemetery, on several farms near Rosthern, and at Osler and Biggar, and of Colorado spruce in a schoolyard near Cloan.

12.2.2 PINE NEEDLE SCALE, Phenacaspis pinifoliae (Fitch):- Heavy infestations persisted in the parks and on boulevards in Saskatoon causing deterioration of some older spruce trees. Moderately high populations were found on an occasional white spruce in a shelterbelt near Rosthern. Intensive beating samples failed to reveal any of the usual Coccinelid predators.

12.2.3 SPRUCE SPIDER MITE, Oligonychus ununguis (Jacot):- Light infestations of this mite were found on white spruce on the Dominion Experimental Farm at Scott and in an abandoned shelterbelt at Wolfe. Moderate damage was noted on one white spruce tree in the Wilkie cemetery.

12.2.4 FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.:- Endemic populations continued throughout most of the central and eastern part of the District. Larval collections were taken at Pronqua, Battleford and Grandora. Egg band sampling was carried out in the fall to predict infestation levels for 1965 and the results, as shown in Table 1, indicate a slight increase in populations.

TABLE 1

Forest Tent Caterpillar Egg-Band Survey
West-central Saskatchewan - 1964

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

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. egg bands per tree	Defoliation forecast 1965
Pike Lake	2.7	21.0	16.3	0	Nil
Pike Lake	3.3	22.7	17.7	0	Nil
Pike Lake	3.0	17.3	13.7	0	Nil
Battleford	3.3	20.7	15.7	0	Nil
Red Pheasant	3.7	22.0	18.7	0	Nil
Borden	2.7	16.7	14.0	0.3	Light
Saskatoon	3.3	28.0	17.7	0	Nil
Saskatoon	2.7	20.3	17.3	0	Nil
Grandora	3.3	16.7	14.0	0.3	Light
Radisson	2.7	18.7	14.0	0	Nil
Brancepath	3.0	20.0	15.0	0.7	Light
Crystal Springs	3.0	23.3	13.0	0.7	Light

12.2.5 LEAF ROLLERS ON ASPEN: Leaf rollers were again common on trembling aspen growing on pasture lands west of Saskatoon and throughout the Eagle Hills south of Battleford. The most widely distributed species was Pseudexentra oregonana Wlshm.; it caused moderate damage to the foliage of aspens at Borden, Vanscoy and Grandora, and light at Birch Hills, Dana, Rosthern, Kenaston, Pike Lake Provincial Park, Biggar and Cutknife. Very low populations of the large aspen tortrix, Choristoneura conflictana (Wlkr.) were recorded at Vanscoy, Biggar and Grandora.

12.2.6 FALL CANKERWORM, Alsophila pometaria (Harris):- Larvae of this cankerworm occurred in most deciduous shelterbelts examined in the south-central part of the District (Fig. 1). Moderate to heavy defoliation occurred at Grandora, Conquest and Springwater. Light defoliation was recorded in shelterbelts at Donavon, Kenaston, Broderick, Biggar, Battleford and Delisle; in town parks at Rosetown and Outlook; on the Forest Nursery Station at Sutherland and in the Pike Lake Provincial Park.

12.2.7 GRAY WILLOW-LEAF BEETLE, Galerucella decora (Say):- Adult populations were widely scattered throughout the District and were moderately heavy in the Biggar to Battleford area. However, correspondingly high larval populations failed to develop and therefore no appreciable amount of skeletonizing of willow foliage was observed.

12.2.8 BOXELDER TWIG BORER, Proteoteras willingana (Kft.):- Light infestations were recorded on Manitoba maple at Saskatoon, Springwater, Donavon, Delisle, Conquest, Kenaston, Outlook and Domremy. Population studies were continued at Outlook, Saskatoon and Domremy and the results are summarized in Table 2.

TABLE 2

Boxelder Twig Borer Population Counts
West-central District of Saskatchewan

(based on examination of four branches 36 inches long from each crown level of 5 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
Outlook	20.4	16.6	11.8	449	40	513	41	397	27
Saskatoon	16.0	14.0	7.4	257	3	235	3	237	5
Domremy	21.8	11.2	9.4	153	13	171	15	140	8

12.2.9 PRAIRIE TENT CATERPILLAR, Malacosoma lutescens (N. & D.):- Tents of this caterpillar were commonly found and heavy concentrations were recorded on the Crystal Beach Game Preserve near Harris, along the South Saskatchewan River near Borden, south of Battleford, and around Grandora. High populations were again recorded in the Pike Lake Provincial Park, but defoliation of chokecherry, rose and serviceberry shrubs was less severe than in the past 3 years. Light

to moderate infestations were recorded at Biggar, Broderick, Wakaw, Birch Hills and Domremy.

Of 100 larvae collected from Pike Lake Park and reared only 2 per cent were effectively parasitized by dipterous parasites.

12.2.10 OTHER NOTEWORTHY INSECTS:-

Insect	Host(s)	Locality	Remarks
Aceria parapopuli (Kiefer) (Poplar bud gall-mite)	tA	Red Pheasant.	Light damage scattered through the stand.
Archips cerasivoranus (Fitch) (Ugly-nest caterpillar)	cCh	Throughout the district.	Heavy on the Crystal Springs Game Preserve; light elsewhere.
Chrysomela crotchi Brown (Aspen leaf beetle)	tA	Harris, Kinistino, Melfort, Grandora, Hagen, and Cudworth.	Very light skeletonizing.
Cecidomyia negundinis Gill. (A midge)	mM	South-central part of the District.	Widely scattered; damage light.
Enargia decolor Wlk. (A noctuid)	tA	Saskatoon, Vanscoy, Pike Lake, and Pronqua.	Low populations.
Gonioctena americana (Schaef.) (American aspen beetle)	tA	Wakaw, Weldon, Meskanaw, Battleford, Red Pheasant and Biggar.	Very light defoliation.
Itame loricaria Evers. (A looper)	tA	Battleford, Saskatoon, Kenaston, Pike Lake, Asquith, and Red Pheasant.	No noticeable defoliation.
Lopidea dakota Knight (Caragana plant bug)	Caragana	Throughout the district.	Widely scattered; no noticeable damage.

12.2.10 OTHER NOTEWORTHY INSECTS:- (Concl.)

Insect	Host(s)	Locality	Remarks
Operophtera bruceata (Hulst) (Bruce spanworm)	tA W	Throughout District.	No serious defoliation recorded.
Pristiphora erichsonii (Htg.) (Larch sawfly)	sL	Scott.	Oviposition damage to new shoots common.
Zaraea americana Cress. (A sawfly)	Honeysuckle	Wilkie.	Moderate defoliation to an occasional shrub.

12.3 DISEASE CONDITIONS

12.3.1 HYPOXYLON CANKER, Hypoxylon pruinatum (Klotsche) Cke.:- Heavy infections were recorded in trembling aspen stands at Saskatoon and Battleford, and light ones occurred throughout the remainder of the District.

12.3.2 MACROPHOMA GALL ON POPLARS, Macrophoma tumefaciens Shear.:- A light infection of this disease was recorded for the first time on trembling aspen at Battleford.

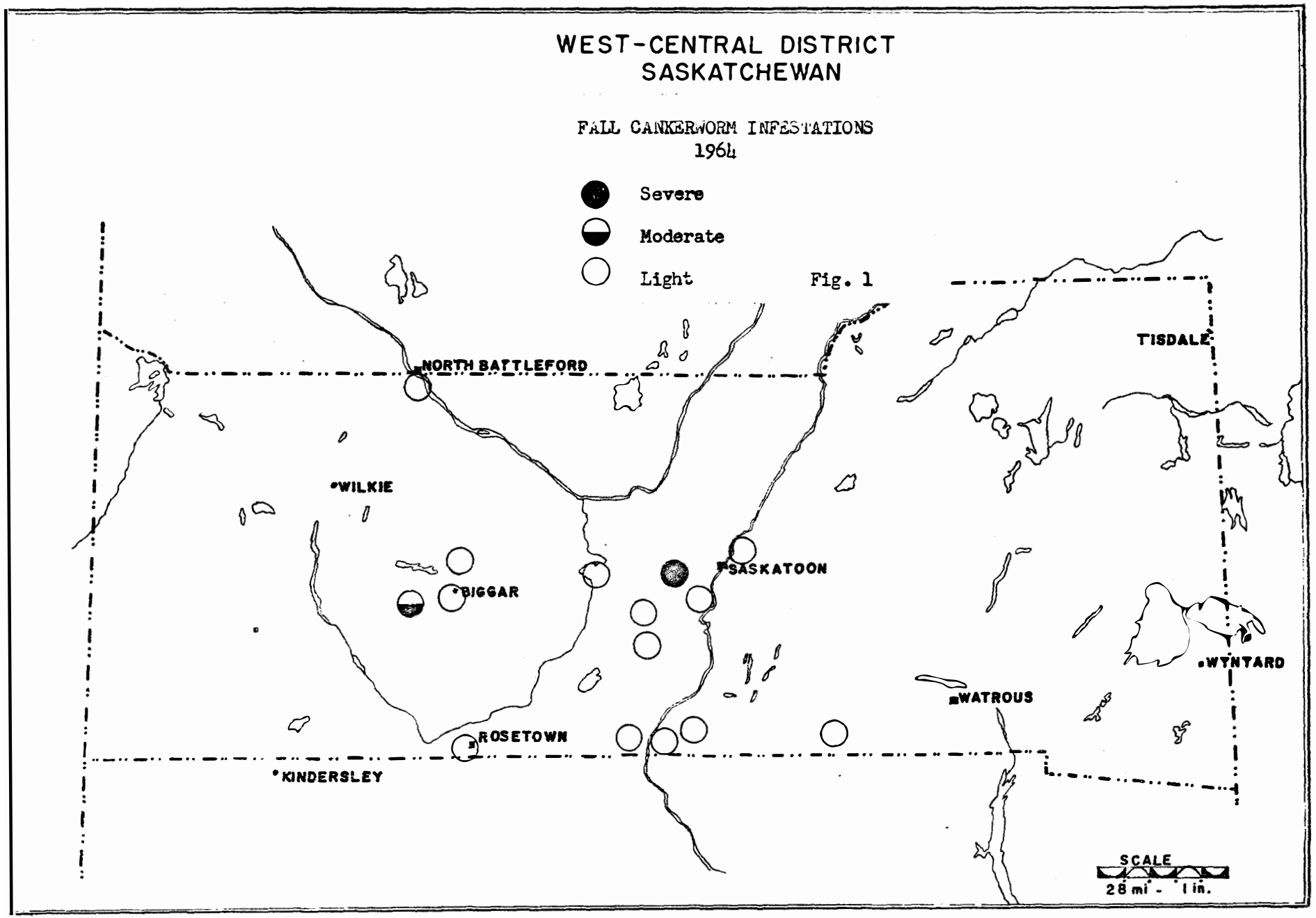
12.3.3 A SLASH FUNGUS, Cryptochaeta rufa (Fr.) Karst:- Fruiting bodies were common on dead branches throughout trembling aspen stands south of Battleford.

12.3.4 BLACK KNOT OF CHERRY, Dibotryon morbosum (Schw.) T. & S.:- Moderate infections were recorded on chokecherry in the Pike Lake Provincial Park, while light infections were observed along the North Saskatchewan River near Battleford.

12.3.5 MALFORMATION OF MANITOBA MAPLE SHOOTS AND FOLIAGE:- Observations were continued to determine the effects of field crop spraying with 2, 4-D on Manitoba maple shelterbelts. Reports were made on shelterbelts adjacent to sprayed crops at Osler and Rosthern and only very light damage was recorded as shown in the following table.

2, 4-D Injury to Manitoba Maple
West-central District - 1964

Location	Date sampled	Degree of injury	Remarks
Osler 30-39-4-W3	July 22	Light	Shelterbelt adjacent to sprayed grain field
Rosthern 4-43A-3-W3	July 22	Light	Shelterbelt adjacent to sprayed grain field


WEST-CENTRAL DISTRICT
SASKATCHEWAN
FALL CANKERWORM INFESTATIONS
1964
Severe
Moderate
Light
Fig. 1
NORTH BATTLEFORD
TISDALE
WILKIE
BIGGAR
SASKATOON
WYNYARD
WATROUS
ROSETOWN
KINDERSLEY
SCALE
28 mi - 1 in.

INDEX TO INSECT SPECIES

INDEX TO TREE DISEASES