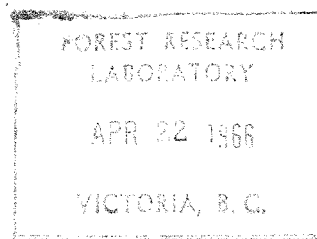


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**ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
MANITOBA AND SASKATCHEWAN**

1963

**INFORMATION REPORT
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
WINNIPEG, MANITOBA**

**CANADA
DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH**

April, 1964

Not for publication

ANNUAL DISTRICT REPORTS
FOREST INSECT AND DISEASE SURVEY
MANITOBA-SASKATCHEWAN REGION

1963

by

V. Hildahl, J. J. Lawrence, R. W. Hancox, B. B. McLeod,
A. E. Campbell, R. C. Tidsbury, L. L. McDowall,
M. C. Warachka, and K. L. Mortensen

FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

CANADA

DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

March, 1963

(This report may not be published in whole or in part without the written consent of the Director, Forest Entomology and Pathology Branch, Department of Forestry, Ottawa, Canada.)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

1963

by

V. Hildahl

**CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA**

March, 1964

1.1 INTRODUCTION

Excellent growing conditions prevailed throughout most of the Manitoba-Saskatchewan Region in 1963. Cool weather during May delayed foliage development from a week to ten days in most areas, but was followed by near-normal temperatures and abundant rainfall during June and July. The season ended with light precipitation and much above-average temperatures setting record frost-free periods in many localities and allowing the foliage to persist on deciduous tree species late into the fall.

There were some notable changes in the status of several major as well as minor insect and disease problems throughout the shelterbelt and forested sections. The larch sawfly was again the most widely distributed forest insect recorded at infestation levels, and marked population increases occurred in several areas, particularly throughout Riding Mountain National Park and in the extreme northwestern part of Manitoba. Infestations of the spruce budworm continued to decline in the Cypress Hills Provincial Forest, Riding Mountain National Park and on the north shore of Lake Winnipegosis, and remained essentially the same in the vicinity of Namew Lake on the Manitoba-Saskatchewan border and along the Churchill and Birch rivers. However, defoliation in these latter areas was less noticeable and uniform than in past years due to the excellent foliage and shoot growth on both white spruce and balsam fir. The balsam-fir sawfly was limited primarily to spruce-balsam fir stands in the forested areas where there were some notable changes in distribution and intensity. In general, populations declined in the northern parts of both provinces, and increased in southeastern Manitoba and in the Prince Albert and Meadow Lake districts of Saskatchewan. No change was recorded in the status of the jack-pine budworm in Saskatchewan, but larval populations were significantly higher in southern Manitoba, particularly in areas where jack pine produced a heavy pollen crop, and new infestations occurred in two locales of the Sandilands Forest Reserve. The localized infestation of pine tube moth west of Prince Albert, Saskatchewan persisted for the third consecutive year and damage ranged from moderate to severe. Larvae of the black-headed budworm were more common on spruce and balsam fir throughout both provinces, and a general increase in populations of the yellow-headed spruce sawfly resulted in moderate to severe defoliation of white spruce shelterbelts and woodlots in eastern Saskatchewan for the first time in several years. Relatively high populations of both the pine needle scale and spruce spider mite persisted on planted spruce in several localities. The forest tent caterpillar continued to defoliate trembling aspen and other deciduous hosts over extensive areas but there were marked changes in the infestation pattern; increased distribution in Saskatchewan was off-set by declines in central and eastern Manitoba resulting in a slight reduction in total area affected. The outbreak of the aspen leaf beetle, which was

generally confined to the Aspen Grove sections in 1962, increased three-fold expanding northward and eastward into the forested areas. Large numbers of adults during the early part of the season caused concern to Resort operators and private individuals, but correspondingly high larval populations did not develop in many areas and subsequent skeletonizing of aspen foliage was patchy. An outbreak of the birch skeletonizer caused moderate to severe damage to the foliage of white birch over an extensive area in northern Manitoba. Unusually high populations of the American aspen beetle caused complete defoliation of trembling aspen in parts of the Cypress Hills Provincial Forest, and severe infestations of the grey willow-leaf beetle were common throughout central and western Saskatchewan. Generally higher populations of the fall cankerworm were evident and several new infestations developed in shelterbelts and town plantings of Manitoba maple and white elm in the southern sections of the Region.

The most noteworthy disease condition was further deterioration of trembling aspen resulting from the severe drought of 1961. Damage has been particularly severe in prairie "bluffs" where the drought-weakened trees have been heavily attacked by a Cytospora canker. The first evidence of damage to the foliage of forest trees caused by sulphur dioxide fumes was recorded in the Thompson, Manitoba area since the smelter commenced operations, and fumes emanating from an oil refinery in the Metropolitan Winnipeg municipality of East St. Paul caused severe coloration of the foliage of deciduous trees, particularly bur oak, over a relatively small area. Malformation of Manitoba maple shoots and foliage resulting from the use of 2,4-D in weed control operations was common in agricultural areas of both provinces. Leaf blights of trembling aspen and balsam poplar increased notably and by late summer had caused severe coloration and early leaf fall in parts of western Manitoba. Severe reddening of the foliage of spruce caused by previous drought conditions occurred frequently in the forested areas throughout central Saskatchewan. However, damage was usually limited to small patches of less than five acres in each instance and there was no apparent tree mortality. The status of the white pine blister rust remained unchanged in southeastern Manitoba; branch flagging and dead-topped trees are common throughout stands of white pine in the area. Light to moderate infections of needle rust on black and white spruce were recorded in localized areas, but the incidence of fungi causing needle casts of conifers was generally low. Gall and spindle rusts of jack pine were widespread and infections varying in intensity were reported from all forest Districts.

Forest insect and disease conditions in both provinces during the season are presented in detail in the following District reports. Totals of 4066 forest insect and 286 disease collections were received by the Winnipeg and Saskatoon laboratories respectively. The number of collections by Survey districts and principle host trees are shown in Table 1.

TABLE 1

Forest Insect and Disease Collections from Principle Host Trees
Manitoba and Saskatchewan
1963

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.	17	-	1	1	2	1	42	7	20	-	87	1	11	-	15	-	15	3	26	7	117	2	353	22
Eastern Man.	33	-	26	1	19	3	62	3	16	-	136	2	16	-	48	-	1	2	3	-	151	11	511	22
Interlake Man.	28	-	15	-	6	1	18	3	15	-	69	3	14	-	21	-	3	-	1	-	78	1	268	8
Western Man.	53	13	15	6	14	4	18	10	14	2	111	11	45	8	8	2	11	3	9	4	125	13	423	76
Northern Man.	64	1	30	4	21	3	32	1	22	1	90	3	19	6	38	2	-	-	2	-	107	18	425	39
Southern Sask.	10	-	-	-	-	-	-	-	2	-	53	2	4	-	-	-	13	4	6	4	35	2	123	12
Hudson Bay, Sask.	43	2	13	-	12	2	21	4	31	-	177	8	21	-	27	1	12	4	16	-	68	2	441	23
Prince Albert, Sask.	42	1	23	2	2	-	97	-	37	-	117	6	21	-	11	1	5	2	-	-	94	7	449	19
Northern Sask.	30	1	35	3	5	-	38	1	32	-	29	4	18	-	38	-	1	1	-	-	84	11	310	21
Meadow Lake, Sask.	71	7	20	3	5	-	57	5	36	1	76	5	12	1	16	-	5	3	-	1	96	7	394	33
West-central Sask.	11	1	-	-	-	-	1	-	1	-	46	-	8	-	-	-	11	5	12	-	54	3	144	9
Totals	402	26	178	20	86	14	386	34	226	4	991	45	189	15	222	6	77	27	75	16	1009	77	3841	284

I = Insect Collections

D = Disease Collections

1.2 SUMMARY OF FIELD OPERATIONS

Surveys commenced in all Districts early in May and terminated about mid-October except where special studies were carried out. Despite a heavy field program and a shortage of two Rangers (Technicians, Forest Research) on the staff most of the work was completed as scheduled, and the number of collections was increased by 801.

1.2.1 District Assignments:- The resignation of L. W. Dashensky from the Ranger staff in late April, 1963 required that R. W. Hancox be transferred from the Hudson Bay District of Saskatchewan to the Eastern District of Manitoba; R. C. Tidsbury from the Southern District of Saskatchewan to the Hudson Bay District; and M. Warachka was transferred from the Survey Laboratory Staff to the Northern District of Saskatchewan. Consequently, the Southern District was left vacant, but essential surveys were carried out at intervals by V. Hildahl, Ranger Supervisor. R. C. Van Den Abeele was appointed to the field staff in late August to fill the vacancy created by the resignation of J. B. Martin the previous season, and assisted with surveys in the Prince Albert and Northern districts of Saskatchewan during the remainder of the field season. Additional appointments to the field staff in late December of 1963 were G. N. Still and C. L. Rentz. District assignments in 1963 are as follows:

Survey Sub-region	Forest District	Survey Code No.	Forest Research Technician (Ranger)
Southeastern	Southern District, Man.	00	* J.J. Lawrence
	Eastern District, Man.	01	R.W. Hancox
	Southern District, Sask.	11	Vacant (essential surveys by V. Hildahl)
Central	Northern District, Man.	02	* A.E. Campbell
	Western District, Man.	03	B.B. McLeod
	Hudson Bay District, Sask.	05	R.C. Tidsbury
Northwestern	Prince Albert District, Sask.	06	* L.L. McDowall
	Northern District, Sask.	08	M. Warachka
	Meadow Lake District, Sask.	07	K.L. Mortensen
	West-central District, Sask.	12	Vacant (surveys by L.L. McDowall and K.L. Mortensen)

* Regional Supervisor

1.2.2 Detection Surveys:- Greater emphasis placed on general collections of forest insects and diseases, particularly in permanent sampling areas and plots established throughout the Region, was aided in the northern sections by improved road systems and expanded aerial surveys. The Rangers travelled approximately 143,600 miles by road and 275 miles by boat. They also used about 165 hours of flying time of which 33 hours was provided by the Provincial Forestry branches of Manitoba and Saskatchewan, and their assistance and cooperation in this respect is gratefully acknowledged.

Aircraft travel is summarized by Province in Table 2, and the areas covered are shown on the accompanying map.

TABLE 2
Summary of Aircraft Travel
Manitoba and Saskatchewan
1963

Province	Type of flying	Type of aircraft	No. of hours	Approx. mileage	Approx. area surveyed (sq.mi.)*
Manitoba	Chartered	Piper Comm.	7.00	1,000	4,000
		Cessna 172	10.00	1,200	4,800
		Cessna 180	48.45	5,300	21,200
	Provincial Renewable Resources Br.	Beaver	25.20	2,560	10,240
Saskatchewan	Chartered	Cessna 140	8.25	825	3,300
		Cessna 172	10.00	1,150	4,600
		Cessna 180	48.25	5,280	21,120
	Provincial Forestry Branch	Super Cub	5.30	550	2,200
Totals			163.25	17,865	71,460

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

1.2.3 Survey Sub-projects:- Some adjustments were again necessary in the number and scope of Survey sub-projects owing to the staff shortage and changes in project plans. Accordingly, "Foliage Production of Tamarack Studies at Permanent Plots" and "Surveys for Spruce Stand Openings" were discontinued entirely in all Districts; the number of "Spruce Budworm Egg Population Sampling" plots was reduced from 96 in 1962 to 22 in 1963; "Boxelder Twig Borer Population Sampling" was discontinued at 12 of the original plots; and "Larval Sampling of the Fall Cankerworm" was continued in only 3 plots in the Southern District of Saskatchewan. "Larch Sawfly Studies in Permanent Plots" was continued, but "Cocoon Collecting for Parasite Recovery" (using

the larval drop-tray method) was reduced from two to one permanent plot per District. Because of the widespread nature of existing infestations, "Forest Tent Caterpillar Egg-Band Sampling" was continued at about the same level as in 1962.

Studies on the "Biology and Habits of a Pine Tube Moth, *Argyrotania tabulana* Free." by K. R. Elliott, were intensified in the Prince Albert District of Saskatchewan, and "Collecting Insects by the Use of an Insecticide" was expanded to the Eastern District of Manitoba and the Meadow Lake District of Saskatchewan.

Methods and techniques pertaining to continuing studies have been outlined in detail in previous reports. The time spent by individual Rangers on sub-projects during the current year is shown in Table 3.

TABLE 3
Days Spent on Survey Sub-projects
Manitoba-Saskatchewan Region
1963

Technician, Forest Research (Ranger)	Survey Sub-project by Number						
	1	2	3	4	5	6	7
V. Hildahl	2	-	2	2	1.5	-	-
J. J. Lawrence	10	6	-	2	-	-	-
R. W. Hancox	14	4	-	-	-	-	3.5
B. B. McLeod	11	5	4	-	-	-	3.5
A. E. Campbell	12	5	10	-	-	-	-
R. C. Tidsbury	9	4	5	-	-	-	-
L. L. McDowall	12	5	-	1	-	5	3.5
K. L. Mortensen	13	4	-	2	-	-	3.5
M. Warachka	-	2	-	-	-	2	-
R. Van Den Abeele	10	3	-	-	-	2	-

- | | |
|---|---|
| 1. Forest Tent Caterpillar Egg-Band Sampling | 5. Population Sampling of the Fall Cankerworm |
| 2. Larch Sawfly Studies at Permanent Plots | 6. Pine Tube Moth Studies |
| 3. Egg Population Sampling of the Spruce Budworm | 7. Insecticide Sampling |
| 4. Population Sampling of the Boxelder Twig Borer | |

1.2.4 Facilities and Equipment:- No major renovations or additions were made to existing Ranger field cottages. The exterior of the cottages located at Loon Lake and Hudson Bay, Saskatchewan were re-painted, and landscaping of the grounds was completed at The Pas, Manitoba. The 18-foot house trailer previously in use in the Western District of Manitoba was replaced with a new 33-foot trailer to provide adequate family accommodation in that area. Three new "compact" station-wagon vehicles were purchased as replacement of sedan deliveries for use by Rangers on field assignments.

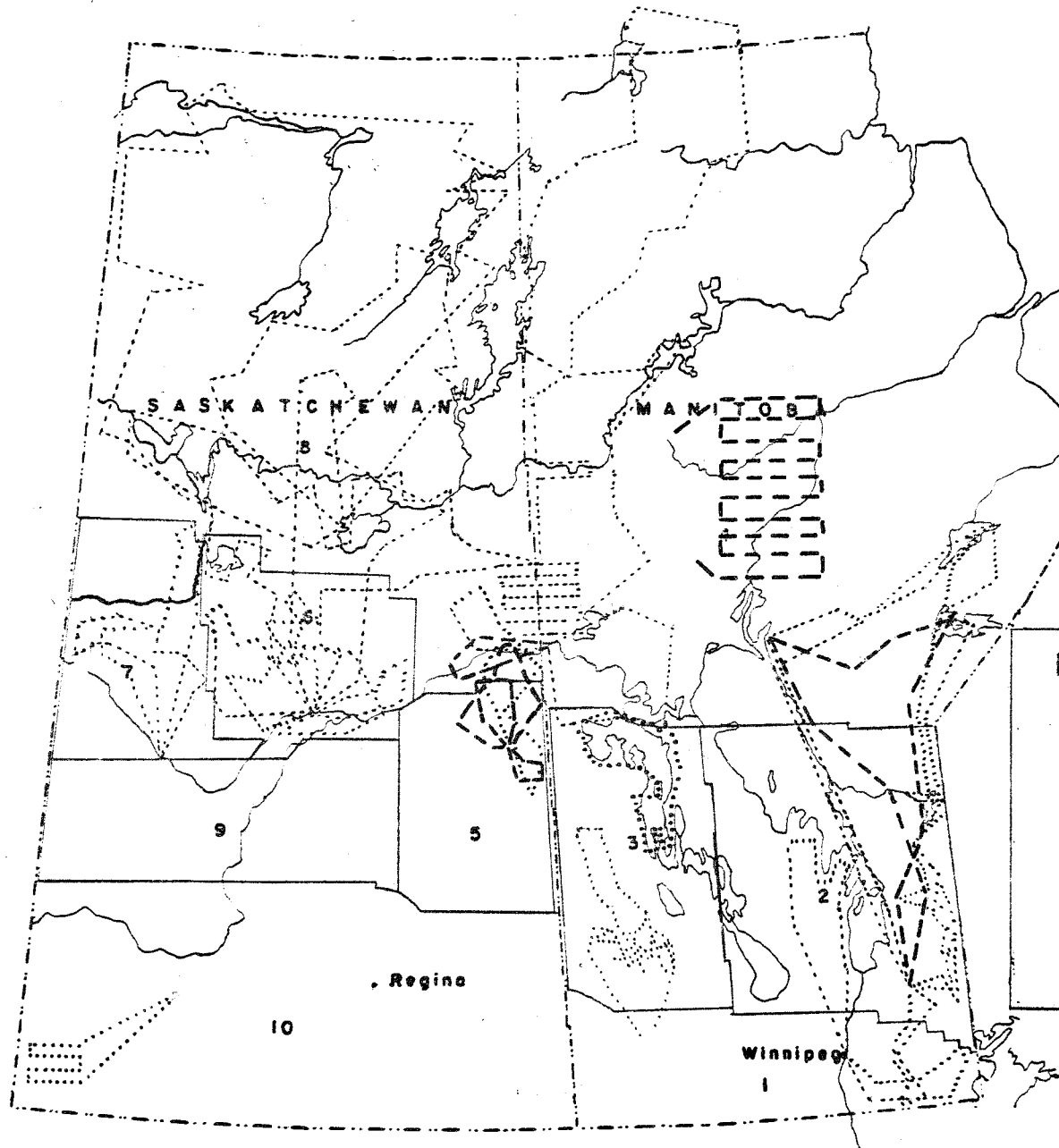
BIOLOGY RANGER DISTRICTS

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



**FOREST INSECT AND DISEASE
SURVEY**

AERIAL SURVEYS-1963

.....CHARTER

-----NON-CHARTER ÷ Provided
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Service.

Scale 120mi-1in.

2. ANNUAL DISTRICT REPORT
SOUTHERN DISTRICT OF MANITOBA
(including the Interlake Section)
1963

by

J. J. Lawrence and V. Hildahl

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March, 1964

2.1 INTRODUCTION

This report deals with forest insect and disease conditions throughout the Interlake Section and the western part of the Southern District of Manitoba extending from the Red River to the Saskatchewan border. Field surveys were carried out from about mid-May to October 5, and 464 insect and 37 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. In addition to general sampling and special collections, the following survey-projects were continued: forest tent caterpillar egg-band counts to forecast population and infestation trends; larch sawfly cocoon collecting using the larval-drop tray method to determine the incidence of parasites and disease; sequential sampling of larch sawfly eggs for population estimates; and larval sampling of the boxelder twig borer. Approximately 3 hours and 15 minutes of chartered flying were used for aerial reconnaissance of inaccessible areas in the Interlake section and to map infestations of the forest tent caterpillar, jack-pine budworm and larch sawfly. The cooperation and assistance received throughout the field season from personnel of the Renewable Resources Branch, Department of Natural Resources is gratefully acknowledged.

The cool, wet weather that prevailed during May and June favored good tree growth, but foliage and insect development was delayed about ten days in most areas. The season ended with light rainfall and much above average temperatures. The larch sawfly was again the most widely distributed forest insect occurring in outbreak numbers, but populations generally remained at the same level as in 1962. The jack-pine budworm infestation along the Gypsumville, Grand Rapids Highway expanded and increased in intensity, and the black-headed budworm was more common in all areas. Relatively high larval populations of the yellow-headed spruce sawfly caused noticeable defoliation of single or small groups of trees at widely scattered points, and the infestation of jack-pine shoot moth, (*Eucoma gloriola* Hein.) was more widespread. High populations of adults of the aspen leaf beetle were recorded throughout most of the District in late May and June. However, larval populations did not develop fully and skeletonizing of aspen foliage was patchy and less severe than expected. The status of the forest tent caterpillar remained unchanged with main infestations again limited to the Lake St. George area in the Interlake section. Populations of the aspen blotch miner were notably higher in many areas but resultant foliage damage was light. Several localized infestations of the fall cankerworm developed in parts of the District; defoliation was particularly severe along the Red River in Metropolitan Winnipeg and in field-row plantings in the Lyleton area.

The most important tree disease condition was continuing mortality of trembling aspen in prairie "bluffs" in southwestern Manitoba resulting from the extreme drought of 1961. Spraying with 2,4-D for weed control in field crops caused notable damage to the shoots and foliage of Manitoba maple and several other tree species in localized areas throughout the agricultural sections, and leaf blights of trembling aspen, balsam poplar and white elm caused some coloration and early leaf-fall in some parts of the District.

2.2 INSECT CONDITIONS

2.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):- As indicated in Fig. 1, infestations of the larch sawfly were again widespread throughout the District, but remained at about the same level as in 1962. Defoliation ranging from light to moderate (20-50 per cent) was recorded in scattered tamarack stands on Hecla Island, in the Washow Bay-Pine Dock-Hodgson areas, and north between Gypsumville and Grand Rapids. In the latter area, the infestation was confined mainly to tamarack reproduction. Only very light defoliation was noted in tamarack stands along the Assiniboine River south of Douglas in western Manitoba.

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 of tamarack for oviposition by adult sawflies.

Plot No.	Location	Infestation Ratings		
		No. of shoots examined	No. of shoots curled	Rating
101	Riverton	60	1	light
102	Gypsumville	50	0	light
104	Douglas	50	0	light

Larch sawfly cocoons were collected using the drop-tray method from the Riverton plot for larval dissection to determine the incidence of parasites. Subsequent results showed that the Tachinid fly, Bessa harveyi (T.T.) was the most abundant parasite, accounting for about 46 per cent of the parasitism. Less than one per cent of the larvae were parasitized by Mesoleius tenthredinis Morley.

2.2.2 Jack-pine Budworm, Choristoneura pinus Free:- The heavy pollen crop produced by jack pine favored a build-up of budworm populations between Miles 45 and 49 along the Gypsumville Highway in the Interlake Section. The infestation expanded and increased in intensity with moderate to severe defoliation (ranging from 25 to 75 per cent of the current growth) extending over about nine square miles as compared to less than one square mile in 1962. The older infestation north of Rosenberg remained unchanged with defoliation again ranging from only a trace to light throughout infested stands, and very low populations were recorded in jack-pine plantations in the Spruce Woods Forest Reserve.

2.2.3 Spruce Budworm, Choristoneura fumiferana (Clem.):- Populations of this budworm remained low, and defoliation of white spruce and balsam fir was negligible in areas where larvae were detected. Light infestation was recorded throughout the Spruce Woods Forest Reserve in southwestern Manitoba and at Mulvihill, Poplarfield, Arborg, Calder's Dock and Grand Rapids in the Interlake Section (Fig. 2).

2.2.4 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):-- Caused light to moderate defoliation of a few widely scattered open-growing white spruce at Lake St. George and on three ornamental spruce at Beaver Creek. Elsewhere populations were very low and defoliation negligible.

2.2.5 Pine Needle Scale, Phenacaspis pinifoliae (Fitch):-- Young scales were active by June 10 and relatively high populations were noted on the foliage of planted white and Colorado spruce at several locations. Light to moderate (and occasionally severe) infestations occurred in Assiniboine and Kildonan parks but were generally light elsewhere in Metropolitan Winnipeg, and moderate to heavy damage was recorded in spruce shelterbelts in the Somerset and Pilot Mound areas in west-central Manitoba. In addition, two small areas of light infestation were recorded on jack-pine in the Interlake section; one located seven miles north of the Fairford River on Highway No. 6 and the other at Mile 45 along the Sypsumville-Grand Rapids Highway.

2.2.6 Balsam-fir Sawfly Neodiprion abietis complex:-- Populations of this defoliator continued to decline in the Interlake section, and it was not recorded in southwestern Manitoba (Fig. 4). Larval collections were taken from white and black spruce near Riverton, Red Rose Tower, Arborg and Fairford, but resultant defoliation was very light in these areas.

2.2.7 A Shoot Moth on Jack Pine, Eucosma gloriola (Hein.):-- This shoot moth was more widespread than in 1962, but the incidence of damaged jack pine leaders remained relatively light in all areas. The infestations near Dawson Cabin and Woodridge in southeastern Manitoba coalesced and expanded to form an almost continuous infestation throughout young jack pine stands in the area extending from Piney and South Junction through Vassar, Sandilands and Marchand to East Braintree. The infestation previously reported in the Interlake section also increased in size and larval collections were taken as far as Mile 28 north of Gypsumville.

2.2.8 Spruce Spider Mite, Oligonychus ununguis (Jac.):-- Spider mites were common during the early part of the season and caused moderate to severe injury to ornamental Colorado and white spruce in residential and park areas throughout Metropolitan Winnipeg. Elsewhere, light infestations were recorded in the Carberry and Camp Hughes areas in southwestern Manitoba.

2.2.9 Forest Tent Caterpillar, Malacosoma disstria Hbn.:-- The forest tent caterpillar again caused serious defoliation of trembling aspen stands in several locales throughout the Interlake section but remained at endemic levels in southwestern Manitoba (Fig. 6). The old infestation

southwest of Jackfish Point in Lake Winnipeg continued at moderate to severe intensity and covered an area of about 70 square miles extending from Jackhead Lake south to Lake St. Andrew, west to Lake St. David, and north to Lake St. Patrick. A particularly localized severe infestation east of Fisher Bay completely stripped about 30 square miles of trembling aspen stands in townships 29 and 30, ranges 3 and 4, E.P.mer. In addition, isolated patches of severe defoliation occurred on the western half of Black Island, and two miles southwest of the mouth of the Jackhead River. Elsewhere in the Interlake section, only occasional larvae were taken from trembling aspen and defoliation was negligible.

Mass collections of late instar larvae and pupae of the forest tent caterpillar were taken in the Lake St. George infestation to determine the incidence of parasites. The results, based on mass rearings of sound living larvae and pupae only, showed that approximately 10 per cent of the larvae were parasitized by Achaetoneura frenchii Will., 5 per cent by Exorista mella Wlk., 2 per cent by Sarcophaga aldrichi Park., and one per cent by Leschenaultia exul Th. Fifty-two percent of the pupae were parasitized by S. aldrichi and 5 per cent by Itoplectis conquisitor (Say).

Egg-band surveys were carried out at predetermined sampling points throughout the infestation and adjacent areas to predict the extent and severity of defoliation in 1964. As indicated in the following table, egg-bands were present at 13 of the 19 locations sampled in the Interlake section. Based on the resultant counts it is expected that the infestation will continue in most areas where it occurred in 1963, but at reduced population levels.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Surveys
Interlake Section of Manitoba-1963

(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	Defol. forecast for 1964
Black Island (West End)	5.3	35.3	21.0	11.7	Moderate
Black Island (West End)	4.7	36.7	27.7	9.0	Moderate
Gimli (2 mi. south)	2.3	25.7	16.7	3.0	Light
Jackhead (1 mi. south)	3.3	33.3	23.3	9.0	Moderate
Cross Lake	3.0	23.0	15.7	0	Nil
Cross Lake	2.2	20.7	15.0	1.0	Light
Cross Lake	2.8	27.7	14.0	3.0	Light
Grand Rapids(3.5 mi. south)	3.0	34.0	17.0	1.3	Light
Grand Rapids(8.8 mi. south)	4.7	40.3	19.0	3.0	Light
Gypsumville	3.7	30.0	19.0	0	Nil
Lake St. George	4.0	36.0	25.3	109.3	Severe
Lake St. George	3.7	36.7	22.7	49.0	Severe
Arborg (5 mi. south)	3.0	24.7	16.3	0	Nil
Red Rose	2.8	29.3	18.0	2.0	Light
Hodgson (14 mi. east)	2.3	27.3	16.0	2.7	Light
Riverton	2.7	24.3	17.3	0	Nil
Riverton (21 mi. north)	3.7	36.0	22.7	0	Nil
Riverton (4 mi. north)	2.8	28.0	18.7	0	Nil
Caulders Dock (3 mi. south)	3.3	32.0	22.0	1.3	Light

2.2.10 Fall Cankerworm, Alsophila pometaria (Harr.):- Populations of this defoliator increased notably and several new infestations were reported in both urban and rural areas. Severe defoliation of Manitoba maple, white elm, green ash and basswood occurred in Kildonan Park and on Fraser's Point in the City of Winnipeg, and light to moderate infestations were common throughout the remainder of the Metropolitan area. Similar conditions were reported along the Red River Valley from Emerson north to Winnipeg, and west from Lockport and Selkirk to Warren.

The most extensive infestation occurred in Edwards Municipality (Lyleton) in southwestern Manitoba. Field plantings of Manitoba maple, white elm, green ash and Manchurian elm were almost completely stripped of foliage in sections 7 to 9, 17 to 29, and 30 to 36 in township 1, range 28, W.P.mer., and in sections 1 to 5 and 6 to 11 in township 2, range 28, W.P.mer. In addition, light defoliation occurred in other shelterbelt and field plantings up to two miles on the outside of the main infestation area, and moderate defoliation was recorded in a windbreak of white elm at Dalney, approximately ten miles to the east.

2.2.11 Boxelder Twig Borer, Proteoteras willingana Kft.:- Light populations of twig borers were recorded in practically all Manitoba shelterbelts examined. Larval counts at three permanent sampling points in southwestern Manitoba (which are shown in Table 2) showed a slight increase in numbers in some areas.

TABLE 2

Boxelder Twig Borer Population Counts
Southwestern Manitoba-1963
(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 Level					
				LOWER		MID		UPPER	
				No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Souris	25.0	19.0	11.0	359	10	411	9	359	8
Holland	25.0	20.0	12.0	322	8	318	8	338	6
Sidney	25.0	21.0	13.0	352	5	303	12	338	9

2.2.12 American Aspen Beetle, Gonioctena americana (Schaeff.):- Collections of this leaf eating beetle were taken at widely scattered points throughout both the Interlake section and southwestern Manitoba. The most notable damage occurred at Mile 80 along the Gypsumville-Grand Rapids Highway where relatively high beetle populations caused moderate

skeletonizing of the foliage of trembling aspen reproduction over a small isolated area. Patches of light skeletonizing were also recorded in the Lake St. George and Red Rose areas, and at the International Peace Gardens.

2.2.13 Aspen Leaf Beetle, Chrysomela crotchi Brown:- As indicated on the accompanying map (Fig. 7), this leaf eating beetle was widely distributed occurring in practically all trembling aspen (and occasionally balsam poplar) stands throughout southwestern Manitoba and the southern half of the Interlake section. Although large numbers of adult beetles were noted during late May and early June, correspondingly high larval populations did not materialize and resultant skeletonizing of foliage was generally patchy and less severe than expected. Aspen reproduction was usually the most heavily attacked but in localized areas, where beetle populations were particularly high, the foliage of mature trees was also skeletonized to some degree.

In the Interlake section, severe skeletonizing of the foliage of both trembling aspen and balsam poplar was continuous on the west side of Lake Winnipeg from Winnipeg Beach to just north of Riverton, on Black Island, and along the Washow Bay peninsula. Outside these areas, numerous isolated patches of severe damage occurred near Woodlands, Lake Francis, Mulvihill, Ashern, Arborg, 11 miles south of Lake St. George, and Rosenberg. In southwestern Manitoba, many patches of severe damage occurred in aspen stands from Ste. Agathe south to Emerson and in the vicinities of Elm Creek, Carman, Morden, Miami, Cypress River, Holland, Glenboro, Hartney, Melita and Pierson. Similar conditions were recorded in the Turtle Mountain Forest Reserve and in the Virden-Miniota-Elkhorn triangle, near Carberry, and between St. Francois Xavier and Poplar Point west of Winnipeg. Elsewhere in both districts, skeletonizing of foliage was general in all aspen stands and ranged from light to moderate.

2.2.14 Gray Willow-leaf Beetle, Galerucella decora Say:- Several collections of larvae of this beetle were taken from willow at widely scattered points in the area extending from the Red River west to the Manitoba-Saskatchewan border. However, only low populations prevailed and skeletonizing of foliage was very light. In the Interlake section, distribution was general throughout, and relatively high populations caused moderate damage to willow stands east of Ashern.

2.2.14 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Acleris variana</u> (Fern.) (Black-headed budworm)	wS, bS	Throughout Inter- lake section and at Morden.	Generally widespread in Interlake section, but populations were low (Fig. 5).

2.2.14 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Acrobasis betulella</u> Hulst. (Birch tube maker)	wB	Gypsumville area.	Widely scattered populations; light foliage damage (Fig. 8).
<u>Altica populi</u> Brown (A poplar flea beetle)	bPo, spAl	Interlake Section.	Widely scattered; light defoliation in localized areas.
<u>Anoplonyx canadensis</u> Hgt. (A sawfly)	spAl	Riverton.	One larval collection; no noticeable defoliation.
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Cross Lake, Lake St. George, Beaver Creek, Washow Bay and Gypsumville.	Common in localized areas but defoliation was negligible.
<u>Archips cerasivorana</u> (Fitch) (Ugly-nest caterpillar)	ecCh	Carberry, Rosenburg, Beaver Creek and Cross Lake.	Light infestations only.
<u>Arge pectoralis</u> (Leach) (Birch sawfly)	spAl	Hecla and Black islands.	Light defoliation recorded in both areas.
<u>Argyrotaenia tabulana</u> Free. (A pine tube moth)	jP	Back Island.	One collection only; populations very light.
<u>Bucculatrix canadensisella</u> Chamb. (Birch skeletonizer)	wB, spAl	Riverton, Washow Bay, Black and Hecla islands.	Most common along west shore of Lake Winnipeg, but all infestations light.
<u>Chermes lariciatus</u> (Patch) (Pineapple gall aphid)	wS	Camp Hughes area.	Very light infestation; damage negligible.
<u>Choristoneura conflictana</u> (Wlkr.) (Large aspen tortrix)	tA	Arborg, Gimli and Beaver Creek.	Light infestation in localized areas.
<u>Chrysomela knabi</u> Brown (A leaf beetle)	bPo	Interlake Section.	Widely scattered infestations; light defoliation in some areas.

2.2.14 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Curculio</u> sp. (A weevil)	wS,jP, tA,bPo	Southwestern Manitoba and Interlake section.	Light populations widely scattered throughout.
<u>Dichelonyx backii</u> Kirby (A leaf chafer)	bPo,tA, ecCh	Rosenburg and Grahamdale.	Light leaf chafing recorded in both areas.
<u>Dioryctria reniculella</u> (Grote) (Spruce coneworm)	wS	Morden.	Very low populations.
<u>Energia decolor</u> Wlk. (A noctuid)	tA	Gimli and Winnipeg Beach.	Very light populations, no noticeable defoliation.
<u>Epicauta</u> sp. (A blister beetle)	caragana	Southwestern Manitoba.	Infestations widespread; caused light to moderate defoliation in Glenbora and Lyleton areas.
<u>Erannis tiliaria</u> Harr. (Linden looper)	Ba,mM, wE,gAs	Southern and Western Manitoba.	Relatively high popu- lations in areas from Winnipeg to Emerson and Thornhill to Miami; caused light defoliation.
<u>Fenusa dohrnii</u> (Tisch.) (Alder leaf miner)	spAl	Interlake Section.	Moderate infestations on Black Island; light elsewhere.
<u>Hemichroa crocea</u> (Fourc.) (Striped alder sawfly)	wB, spAl	Riverton and Hecla and Black islands.	Moderate infestation on Black Island; light populations elsewhere.
<u>Hylurogopinus rufipes</u> (Eichh.) (Native elm bark beetle)	wE	Southern Manitoba.	Most common in native stands along rivers; populations slightly lower.
<u>Hyphantria cunea</u> (Drury) (Fall webworm)	wB,spAl, ecCh,W, Do	Interlake Section.	Most common in Washow Bay, Calder's Dock, Riverton and Black Island areas where it caused noticeable defoliation.

2.2.14 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Itame loricaria</u> Evers. (A looper)	tA	Southwestern Manitoba and Interlake Section.	Common throughout but only low populations.
<u>Lecanium coryli</u> L. (Lecaniine scale)	We, mM	Metro Winnipeg, Selkirk and Ste. Agathe.	Common on individual trees, but populations were relatively low and caused no noticeable damage.
<u>Lithocolletis salicifoliella</u> Cham. (Aspen blotch miner)	tA	Southwestern Manitoba and Interlake Section.	Widely scattered; infestations ranged from light to severe in localized areas.
<u>Malacosoma lutescens</u> (N. & D.) (Prairie tent caterpillar)	ecCh	Camp Hughes and Melbourne.	Moderate infestations in both areas.
<u>Nymphalis antiopa</u> L. (Spiny elm caterpillar)	W	Arborg, Riverton and Rosenburg areas.	Moderate defoliation of individual willow clumps.
<u>Petrova albicapitana</u> (Busck.) (Pitch nodule maker)	jP	Rosenburg and Gypsumville.	Only low populations recorded; caused no serious damage.
<u>Pikonema dimmockii</u> (Cress.) (Green-headed spruce sawfly)	bS, wS	Riverton-Washow Bay area.	Very low populations; usually associated with the yellow-headed spruce sawfly.
<u>Pissodes strobi</u> (Peck) (White-pine weevil)	wS	Camp Hughes and Shilo areas.	Low populations recorded throughout spruce plantations; usually on smaller trees.
<u>Pissodes terminalis</u> Hopk. (Lodgepole terminal weevil)	jP	Gypsumville-Grand Rapids area.	Infestation light; only an occasional terminal damaged.
<u>Rhyacionia</u> sp. (A pine shoot moth)	jP	Gypsumville-Grand Rapids area.	Common throughout the area; highest population recorded near Grand Rapids.
<u>Sciaphila duplex</u> Wshw. (Poplar leaf roller)	tA	Lockport-Rosenburg area.	Widespread but only low populations recorded; damage negligible.

2.2.14 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Semiothisa granitata</u> Gn. (A geometrid)	tL	Hecla Island.	Very low populations; no noticeable defoliation.
<u>Semiothisa sexmaculata</u> Pack. (A geometrid)	tL	Riverton and Hecla Island.	Low populations recorded; defoliation negligible.
<u>Tetralopha asperatella</u> (Clem.) (An aspen webworm)	tA	Riverton, Rosenburg, Hecla and Black islands.	Common in some localities but damage was negligible.
<u>Toumeyella numismaticum</u> (P. & M.) (Pine tortoise scale)	jP	Gypsumville.	Caused only light damage; the predator, <u>Hyperaspis congener</u> noted feeding on scales.
<u>Zale duplicata largera</u> Sm. (An owlet moth)	jP	Lake St. George.	Light infestation throughout localized area.

2.3 DISEASE CONDITIONS

2.3.1 Spruce Needle Rust, Chrysomyxa sp.: - This needle rust of black and white spruce was observed at several locations. Light infections (involving only occasional needles on individual trees) were noted in the Spruce Woods Forest Reserve and the Brandon area in southwestern Manitoba, and at Grand Rapids, Gypsumville, Calder's Dock, and on Hecla and Black islands in the Interlake section.

2.3.2 White Pine Blister Rust, Cronartium ribicola J. C. Fisher: - Planted eastern white pines on the Experimental Farm at Morden, Manitoba were examined for this blister rust, but they appeared to be free from infection. Similar examination of the alternate host, Ribes spp. throughout the area did not show any evidence of the disease during the current year.

2.3.3 Macrophoma Gall on Poplars, Macrophoma tumefaciens Shear: - Investigations to determine the distribution and incidence of this disease were continued mainly in areas where it had not been reported previously. In the Interlake section, light infections were observed on trembling aspen in the vicinity of Winnipeg Beach, Woodlands, and at the junction of the Gypsumville-Grand Rapids highways (Fig. 9).

2.3.4 Leaf and Twig Blight, Pollaccia radiosa (Lib.) Bald & Cif.:— This disease of aspen was reported from several localities. The highest incidence of infection occurred on the west end of Black Island in Lake Winnipeg where stands of aspen reproduction were moderately damaged. Elsewhere, light infection was noted 5 miles south of Gypsumville, and at Gretna, Swan Lake, Glenboro and in the Spruce Woods Forest Reserve.

2.3.5 Ink Spot of Aspen, Ciborinia bifrons (Sear.)Sear.:— Light infection of trembling aspen was common throughout the Spruce Woods Forest Reserve, and in isolated patches in the Riverton, Pine Dock, Hodgson, Lake St. George and Devil's Lake area. Only a few leaves were affected on individual trees at the locations where the disease was detected.

2.3.6 Industrial Fume Damage:— Fumes from an oil refinery in the Greater Winnipeg Municipality of East St. Paul caused considerable coloration of the foliage of several tree species over an area of about $2\frac{1}{2}$ square miles immediately north of the refinery. The affected area extended in a northeasterly direction across Henderson Highway (No. 9) to the Red River and north as far as Hoddinott Avenue. The foliage of bur oak was most seriously affected and damage ranged from 10 to 95 per cent of the leaves discolored on about 85 per cent of the trees. Lesser damage occurred (in descending order) on Manitoba maple, trembling aspen, green ash, balsam poplar, white elm, caragana, dogwood, chokecherry and Canada plum. Observations later in the season (about mid-August) indicated that the trees were recovering satisfactorily and very little permanent damage would result.

2.3.7 Hail Damage:— A localized hailstorm south of Fraserwood in early July caused heavy damage over an area of about $1\frac{1}{2}$ square miles. Approximately 25 per cent of the foliage was stripped-off trembling aspen, balsam poplar and green ash, and breakage of the leaders and branches was common.

2.3.8 Malformation of Manitoba Maple Shoots and Foliage:— Surveys were continued throughout the Interlake section and southwestern Manitoba to determine the severity of damage to Manitoba maple by the use of 2,4-D for weed-control in field crops. Of fourteen shelterbelts examined only three yielded typical symptoms of malformed shoots and leaves, and damage was confined to either a few isolated twigs or parts of the tree. Results of the survey are shown in the following table.

TABLE 3

Degree of Injury to Manitoba Maple Resulting from the Use
of 2,4-D for Weed-Control in Field Crops
Interlake Section and Southwestern Manitoba-1963

Location	Date Sampled	Degree of Injury	Remarks
Holland 30-7-11W.P.	July 30	Nil	No visible 2,4-D damage.
Ninette 13-5-11-W.P.	July 30	Nil	M. Maple in the shelterbelts have numerous dead tips.
Wawanesa 24-7-17-W.P.	July 30	Nil	Numerous dead tips, but no evidence of 2,4-D.
Waskada 4-2-26-W.P.	July 31	A few isolated twigs damaged.	Fall cankerworm feeding also no leaves left on damaged tips.
Lyleton 29-1-28-W.P.	July 31	Nil	A few curled tips. Severe fall cankerworm feeding.
Pierson 24-2-29-W.P.	July 31	A few isolated twigs damaged.	No curled leaves, but twigs curled on lower branches. Fall cankerworm feeding.
Linklater 22-6-28-W.P.	July 31	Nil	No 2,4-D damage noted.
Oak Lake 22-9-24-W.P.	July 31	Nil	No 2,4-D damage noted.
Souris 3-8-22-W.P.	July 31	Nil	No 2,4-D damage noted.
Pigeon Lake -12-2-W.P.		Part of both sides of the trees damaged.	This damage is not 2,4-D but shrub killer spraying by the power commission in this area.
Selkirk -13-5-E.P.	Aug. 9	Nil	No evidence of 2,4-D damage.
Gimli 13-19-3-E.P.	Aug. 9	Nil	No evidence of 2,4-D damage.

TABLE 3 (cont.)

Location	Date Sampled	Degree of Injury	Remarks
Woodlands 22-14-3-W.P.	July 23	Nil	No evidence of 2,4-D damage.
Eriksdale 6-22-5-W.P.	July 23	Nil	No evidence of 2,4-D damage.

2.3.9 Other Noteworthy Diseases

Organism & Disease	Host(s)	Locality	Remarks
<u>Dibotryon morbosum</u> (Schw.) Theiss & Syd (Black knot of cherry)	cCh	Interlake Section and Southwestern Manitoba.	Widely scattered infections range from light to moderate intensity.
<u>Fomes pinicola</u> (Schwartz) Cke. (Red belt fungus)	bF	Interlake Section.	Localized, light infections.
<u>Gnomonia ulmea</u> (Schw.) Thuem. (Elm leaf spot)	wE	Southwestern Manitoba.	Heavy infections along Assiniboine River from Winnipeg to Brandon caused conspicuous defol- iation.
<u>Gymnosporangium corniculans</u> Kern (Cedar rust)	Prostrate juniper	Morden Experi- mental Farm, Manitoba.	Light to moderate infection on several trees.
<u>Melampsorella</u> sp. (Yellow witches' broom)	bS	Interlake Section.	Light infection only.
<u>Peridermium harknessii</u> J. P. Moore (Globose gall rust)	jP	Miles 45 and 46 along Grand Rapids Highway and at Cross Lake.	Light infections occur on scattered trees.
Slime Flux	wE	Kildonan Park (Metro Winnipeg)	Occurred on several trees, but did not seriously affect their vigor.

3. ANNUAL DISTRICT REPORT

**EASTERN DISTRICT OF MANITOBA
(including the southeastern section of Manitoba)**

1963

by

R. W. Hancox

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1964

3.1 INTRODUCTION

Surveys to determine the distribution and intensity of forest insects and diseases were carried out in the Eastern District and the southeastern part of the Southern District from the Red River east to the Ontario boundary from May 13 to November 15. During this period 665 insect and 38 tree disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively. Approximately 37 hours and 35 minutes flying time were utilized for surveys and general sampling in the roadless areas east of Lake Winnipeg and northward from the Whiteshell Provincial Park to Gods Lake; of this, 27 hours and 35 minutes was chartered time and the remainder was supplied by the Manitoba Government Air Service by arrangement through the Renewable Resources Branch of the Department of Natural Resources.

Several special collections of insect material were made for use in research projects at the Winnipeg and other laboratories and a method of collecting insects by use of an insecticide was tried on an experimental basis. Sub-projects continued this season were: (1) forest tent caterpillar egg band surveys to forecast the severity of attack in 1964; (2) sequential sampling of larch sawfly egg populations; and (3) sampling of larch sawfly cocoons by the larval drop tray method for parasite and disease studies.

The co-operation received from personnel of the Manitoba Department of Mines & Natural Resources, and the Woods Department of the Manitoba Paper Company in carrying out this work is gratefully acknowledged.

Early spring weather was generally cool and wet, so that foliage development was retarded in most areas. However, near-normal weather conditions prevailed throughout the summer and the fall was generally dry with above normal temperatures. Larch sawfly populations generally remained at low levels but light to moderate defoliation occurred in the East Braintree area. Jack-pine budworm populations remained light in the Belair Forest Reserve despite a heavy pollen crop on jack pine, but they increased in the Sandilands Forest Reserve. The balsam-fir sawfly caused moderate to severe defoliation of spruce near Contour, Richer, Woodridge, Menisino and Piney. The forest tent caterpillar outbreak declined throughout most of the areas affected in 1962, but the infestation at Big Whiteshell Lake expanded to the southeast and one in Ontario expanded westward into Manitoba near Waugh. A marked increase in populations of the aspen leaf beetle was evident, particularly along the east side of Lake Winnipeg from Victoria Beach south to the Gull Lake area, and along No. 12 Highway from the Zhoda area to Steinbach and near Woodridge. Increased populations of the aspen blotch miner were recorded throughout the District. No new infections of tree diseases were recorded, and there was little change in the status of those previously reported in the District.

3.2 INSECT CONDITIONS

3.2.1 Larch Sawfly, Fristiphora erichsonii (Htg.):— Population levels in general remained low and very little serious defoliation occurred. (Fig. 1). However, light defoliation was recorded in tamarack stands north of Pine Falls and moderate defoliation occurred in occasional small open-growing tamarack near Pointe du Bois. Moderate defoliation also occurred on scattered tamarack in a mixed stand of black spruce and tamarack near East Braintree, extending about 2 miles along the Trans-Canada Highway and about 1 mile in width.

No defoliation was detected on aerial surveys of the area from Crowduck Lake in the Whiteshell Forest Reserve north to Gods Lake; one larval collection was made at Stevenson Lake.

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

Location	Plot No.	No. of shoots examined	No. of shoots curled	Infestation rating-1963
Pointe du Bois	109	50	0	light
Telford	102	60	1	light
Agassiz	110	50	0	light
Cat Lake	-	60	1	light
Sandilands F.R.	101	50	0	light
Piney	102	50	0	light
Sandilands F.R.	103	50	0	light
East Braintree	-	130	7	light

3.2.2 Jack-pine budworm, Choristoneura pinus Free:— Low populations were recorded in jack pine stands 2.8 miles west of Rennie, at Crowduck Lake, north of Belair, at Long Lake, Wallace Lake, and Aikens Lake. The infestation in the Belair Forest Reserve remained light, with small patches of very light defoliation occurring from 1 mile north of Stead to $4\frac{1}{2}$ miles north. Moderately high populations were recorded at Gem Lake, but defoliation was light.

A very heavy pollen crop produced by jack pine in the south-eastern part of Manitoba seemed to favor a build-up of populations. Moderate to severe defoliation (up to 75 percent) occurred at two locations: in an area about 3 miles wide between the Marchand Fire Tower and Sandilands in townships 4 and 5, rge. 9 E.P.mer., and in another area about $1\frac{1}{4}$ miles wide that extended south of Vassar for about $4\frac{1}{2}$ miles in townships 1 and 2, rge. 12, E.P.mer. Very low populations were recorded in jack pine stands near Menisino.

3.2.3 Balsam-fir Sawfly, Neodiprion abietis complex:- Populations were widely distributed throughout (Fig. 4). Light defoliation of balsam fir and of white and black spruce, was recorded in patches from Caddy Lake in the Whiteshell Forest Reserve north to Big Stone Lake, and at Otter Falls, Manigotogan, and near Hazel Creek. Similar patches occurred near the Marchand Headquarters in the Sandilands Forest Reserve and throughout the Northwest Angle Forest Reserve. Light defoliation also occurred on black spruce only at Dogskin, Family, and Elliot lakes and moderate defoliation occurred on balsam fir at Sasaginnigak Lake.

The most serious defoliation (up to 75 percent) occurred on black spruce at several locations in southeastern Manitoba. One of these was an area about $1\frac{1}{2}$ miles long and $\frac{1}{4}$ mile wide along the periphery of a large black spruce swamp west of the Contour Fire Tower in the S.E. $\frac{1}{4}$ of sec. 25, tp. 10, rge. 10, E.P.mer. A second one was located within some 30 square miles that extended along both sides of the Trans-Canada Highway from the western boundary of the Sandilands Forest Reserve eastward about 6 miles in townships 7 and 8, rge. 9, E.P.mer. A third affected most of the west half of sec. 28, tp. 1, rge. 12, E.P.mer. The fourth and fifth areas occurred west of Menisino; south of the Morden-Sprague highway, the former affected an area about $2\frac{1}{2}$ miles long and 1 mile wide, and north of the highway the latter affected an area about 3 miles long and 1 mile wide. The sixth and final one extended south from a point about 1 mile south of Woodridge for about $7\frac{1}{2}$ miles to No. 12 Highway in a 1 to $1\frac{1}{2}$ mile wide band mainly in townships 2 and 3, ranges 10 and 11, E.P.mer.

3.2.4 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.): - Populations remained low and defoliation ranged from a trace to light at widely scattered points. White spruce was lightly attacked at the Whiteshell River on the Central Whiteshell Road, Crowduck, Bird, Wallace, Manigotogan, Gem, Black, and Viking lakes, and black spruce at Sasaginnigak, Gunisao and Big Stone lakes. In most cases defoliation was confined to a few twigs per branch. Light to moderate defoliation occurred on an occasional small white spruce from the Pinawa Channel to Pointe du Bois, at Crowduck and Falcon lakes and along No. 4 Highway at the Manitoba-Ontario boundary and on black spruce immediately north of Pine Falls.

3.2.5 Black-headed Budworm, Acleris variana Fern:- This budworm was commonly found throughout, but little serious defoliation occurred (Fig. 5). Low populations occurred on white spruce at Caddy Lake, along the Central Whiteshell Road at the Whiteshell River, near Victoria Beach, and at Bird, Wallace, Long, Siderock, Gem, Sasaginnigak, Dogskin, Family, Moar, Weaver and Molson lakes; on black spruce north of Pine Falls, Wallace, Gem, Aikens, Sasaginnigak, Dogskin, Family, Black, Moar, Charron, Gods, Stevenson, Weaver and Gunisao lakes; and on balsam fir at Crowduck, Manigotogan, Moar, Molson, and Eardley lakes. Higher populations were recorded on white spruce at Eardley Lake, but only light defoliation occurred.

3.2.6 White-pine Weevil, Pissodes strobi (Peck):- Damaged jack pine leaders were observed at widely scattered points. The highest incidence of attack occurred $8\frac{1}{2}$ miles north of Pine Falls and near Wanipigow and Wallace lakes. Light damage was observed throughout the Agassiz Forest Reserve, at Caddy Lake, from Rennie to Darwin along No. 4 Highway, north of Pine Falls, west of Camp 24 on the Bear River Road, near Black River, Wanipigow Lake and Wallace Lake, in the Northwest Angle Forest Reserve, near Marchand Forestry Headquarters and at Birch Lake and Dawson Cabin.

Examination of a small red pine plantation at Wallace Lake showed that 3 of 25 trees (up to 1 inch in diameter) were infested. In a natural jack pine stand (trees up to 2 inch d.b.h.), 11 of 84 trees were infested. Forty trees were examined $8\frac{1}{2}$ miles north of Pine Falls and 15 of them were infested. The only occurrence on white spruce was recorded at Caddy Lake where one tree (2 inch d.b.h.) was attacked.

3.2.7 Pine Needle Scale, Phenacaspis pinifoliae (Fitch):- Light infestations occurred on jack pine near Beaconia in the Belair Forest Reserve, at Crowduck Lake in the Whiteshell Forest Reserve, and in the Agassiz Forest Reserve; on black spruce at Caddy Lake and $2\frac{1}{2}$ miles north of Pine Falls; and on white spruce near the Manitoba-Ontario boundary along No. 4 Highway and near Marchand in the Sandilands Forest Reserve.

3.2.8 Sawflies on Jack Pine, Neodiprion spp.:- These sawflies were again generally distributed and caused no widespread serious defoliation. The species occurring in order of abundance were: Neodiprion nanulus nanulus Schedl., Neodiprion pratti banksianae Roh., Neodiprion virginianus complex, and Neodiprion maurus Roh.

Low populations of N. nanulus nanulus occurred on jack pine throughout the Agassiz Forest Reserve, at Long, Siderock, Gem, Dogskin, Elliot and Gunisao lakes. N. pratti banksianae caused very light defoliation near Pine Falls, and at Charron and Viking lakes. One tree near Bird Lake was moderately defoliated. N. virginianus was recorded in low numbers in the Bird Lake and Pine Falls areas. Light to moderate feeding damage was evident on an occasional jack pine at Viking Lake. N. maurus caused very light defoliation of jack pine along the Bear River Road.

3.2.9 Forest Tent Caterpillar, Malacosoma disstria Hbn.:- Populations declined in 1963 and defoliation of trembling aspen (Fig. 6) occurred in patches rather than in extensive continuous areas as in 1962 (Fig. 6). This was due mainly to adverse spring weather with late frosts and high winds that retarded foliage growth and caused irregular leafing out of aspen and resultant starvation of newly emerged larvae in localized areas.

Patches of light defoliation occurred at Falcon, Caddy, White, Red Rock, and Brereton lakes in the Whiteshell Forest Reserve and from Rennie to Whitemouth, from Star Lake to the Manitoba-Ontario boundary, from Wallace Lake to Long and Beresford lakes, and at Sasaginnigak and Dogskin lakes.

Small patches (usually 5 acres or less) of moderate defoliation occurred from Big Whiteshell Lake to Lone Island Lake, along the north and west shore of Crowduck Lake, between Pointe du Bois and Bird Lake and southeastward to Eaglenest Lake, around Flintstone, Tooth and Moose lakes, along the north shore of Siderock Lake and north to Aikens Lake, between Night-owl and Horseshoe lakes in the Berens River system, and around Eardley, Wrong and Weaver lakes and from Lebrix Lake to Gunisao Lake.

Patches of moderate to severe defoliation were recorded at Big Whiteshell Lake, Green Lake and throughout a 2 mile by 1 mile extension of this infestation between Big Whiteshell Lake and Crowduck Lake, in the Pointe du Bois area from the southeast end of George Lake north to Shatford Lake, west almost to the boundary of the Whiteshell Forest Reserve and east to Forbes Lake and Lamprey Falls on the Winnipeg River, throughout the Bird Lake infestation which covered the area from immediately north of Eaglenest Lake at the Manitoba-Ontario boundary northwest to Bisse and Bernic Lakes to a point about 5 miles southeast of Maskwa Lake, east surrounding Bird Lake and northeast to Elbow and MacGregor lakes and south to Star Lake. Moderate to severe defoliation also occurred on the Bear River Road east of Camp 24, along the Sandy River east to Owl Lake and north to Manigotogan, along the north and east shores of Black Lake, at Happy, Manigotogan, Caribou, and Wanipigow lakes and along the Wanipigow River watersheds to Lake Winnipeg. Similar defoliation occurred in a narrow band surrounding Gem and Garner lakes, within a 3 by 1 mile area about 8 miles east of Bissett, and near Little Grand Rapids and along the east and southeast shores of Family Lake.

Traces of defoliation occurred on trembling aspen from East Braintree to the vicinity of Moose Lake in the southeastern part of Manitoba. The current infestation in Ontario extended westward and caused moderate to severe defoliation with a 5 x 2 mile area southwest of Waugh, and on the peninsula between Indian and Snowshoe bays.

An egg-band survey was carried out in the fall to determine the probable extent and intensity of infestation in 1964, and the results are shown in Table 1.

TABLE 1

Forest Tent Caterpillar Egg Band Survey Records - 1963
Eastern and Southern Districts 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 1964
Agassiz Forest Reserve	3.2	28.0	19.0	0	nil
Big Whiteshell Lake	3.5	39.3	20.3	32.7	severe
Big Whiteshell Lake	5.0	35.0	22.7	38.0	severe
Junction of Big Whiteshell Lake Rd. & Central Rd.	4.2	33.0	19.7	5.0	light
Red Rock Lake	4.5	33.0	23.7	2.0	light
Brereton Lake	3.7	28.0	16.7	1.7	light
Telford	3.5	29.7	16.0	1.3	light
Caddy Lake	3.7	33.7	18.7	1.3	light
Pointe du Bois	3.5	30.0	22.3	46.6	severe
Pointe du Bois	3.4	30.0	13.7	39.6	severe
Pointe du Bois	3.8	34.7	16.3	32.6	severe
Pointe du Bois	3.7	32.7	20.0	5.3	light
Pointe du Bois	4.2	34.7	19.7	0.6	light
Bird Lake	5.2	37.7	19.0	11.3	moderate
Bird Lake	6.2	45.7	20.3	25.6	severe
Bird Lake	5.5	37.0	22.0	49.0	severe
Bird Lake	4.0	35.0	20.7	31.0	severe
Bird Lake	4.7	34.3	20.3	16.3	severe
Bird Lake	4.8	34.7	20.3	36.0	severe
Bird Lake	4.2	30.3	18.3	2.3	light
Bird Lake	3.7	27.3	18.3	1.0	light
Cat Lake	5.3	41.7	21.0	7.3	moderate
Bear River Road	4.6	38.0	25.7	48.0	severe
Bear River Road	5.2	37.7	22.0	3.0	light
Manigotogan	3.2	27.3	14.0	1.3	light
Manigotogan	4.2	37.3	17.3	38.3	severe
Manigotogan	3.0	24.7	12.0	1.7	light
Manigotogan	4.5	31.3	16.3	1.3	light
Manigotogan	5.0	35.7	21.0	14.3	severe
Wanipigow Lake	3.8	29.0	16.0	18.7	severe
Caribou Lake	5.0	34.3	18.0	4.7	light
Caribou Lake	3.2	27.0	15.3	1.0	light
Wallace Lake	3.8	31.0	16.0	1.3	light
Wallace Lake	3.7	32.0	15.3	5.0	light
Wallace Lake	4.3	34.3	15.0	7.0	moderate
Long Lake	3.8	38.3	14.0	1.3	light
Crowduck Lake,	4.0	34.7	16.7	7.3	moderate
Black Lake	4.3	34.3	18.0	22.3	severe
Gem Lake	4.8	34.7	23.7	25.0	severe

TABLE 1 (cont.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg bands per tree	Defoliation forecast 1964
Manigotogan Lake	4.7	32.3	16.7	2.7	light
Siderock Lake	2.8	26.3	17.0	1.0	light
Aikens Lake	3.5	28.0	17.0	2.3	light
Sasaginnigak Lake	4.3	28.3	16.0	14.7	severe
Family Lake	3.0	24.3	17.0	11.7	severe
Moar Lake	4.8	30.7	20.7	1.3	light
Vita	3.5	28.0	19.0	0	nil
Menisino	3.2	28.7	18.3	0	nil
Piney	3.0	25.0	19.7	0	nil
Moose Lake	4.5	41.0	23.0	1.0	light
Caribou Fire Tower	3.5	28.6	16.0	1.3	light
Birch Lake	3.3	29.3	18.0	1.0	light
East Braintree	3.0	29.0	14.0	0.6	light
Manitoba-Ontario boundary at #1 highway	3.7	33.0	19.3	1.0	light
Falcon Lake	3.5	30.0	21.0	1.6	light
Falcon Lake	3.0	30.0	25.0	1.3	light
Falcon Lake	2.8	26.0	13.0	0.3	light
Falcon Lake	3.0	22.0	12.3	0.6	light

3.2.10 Aspen Leaf Beetle, Chrysomela crotchii Brown:- There was a significant increase in the adult populations of this leaf beetle early in the season, but subsequent larval populations were not as high as expected (Fig. 7). Light infestations with patches of moderate were recorded throughout the Whiteshell Forest Reserve and north to Sasaginnigak and Family lakes. Collections were taken as far north as Molson and Big Stone lakes in northern Manitoba, and throughout the Agassiz, Sandilands, and Northwest Angle Forest reserves.

Moderate defoliation with patches of severe occurred from Victoria Beach south to the Gull Lake area, along the Bear River Road, at Otter Falls, Falcon Lake, and along No. 15 Highway near Vivian. Severe skeletonizing was confined mainly to aspen reproduction up to 3" d.b.h.

In the southeastern part of Manitoba, moderate to severe defoliation was noted from the Zhoda-Vita area north and west to Steinbach and over an area of about 6 square miles north of Woodridge.

3.2.11 American Aspen Beetle, Gonioctena americana (Schaeffer):- Populations of this beetle remained at about the same level as last season. Light feeding was observed on trembling aspen in the Darwin area, near Dencross, at Lowlands, at Stead in the Belair Forest Reserve, and west of Pointe du Bois. Light to moderate defoliation of individual trees occurred near Black River, Wanipigow Lake, and Falcon Lake. In addition, it was observed feeding in conjunction with the aspen leaf beetle, C. crotchii at Gull Lake where defoliation by both species ranged from moderate to severe on smaller trees, and in the Agassiz Forest Reserve where the combined defoliation was light.

3.2.12 Large Aspen Tortrix, Choristoneura conflictana (Wlkr.): - The large aspen tortrix infestation at Island Lake in northern Manitoba subsided from moderate to severe in 1962 to patches of moderate defoliation in 1963. The infestation covered the peninsula between Cochrane and D'arris bays on Island Lake extending east to Bella Lake. Elsewhere, very low populations causing only traces of defoliation were recorded at Moar Lake.

3.2.13 Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.: - There was an increase in populations of this blotch miner and samples were collected from trembling aspen at 35 widely scattered points. Light infestations were recorded at Crowduck, Caribou, Manigotogan, Aikens, Sasaginnigak, Gem, Family, Moar, Elliot, Eardley, Weaver, and Gunisao lakes and near Stead in the Belair Forest Reserve. Light to moderate damage was noted at Caddy, Wallace, Siderock, and Viking lakes, near the junction of the Bird and Cat lakes Roads, along the Bear River Road, throughout the Agassiz Forest Reserve, along No. 15 Highway in the Vivian-Hazel Creek area, near Marchand in the Sandilands Forest Reserve, and throughout the Northwest Angle Forest Reserve. Moderate infestations covering several acres each were observed near Falcon Lake and $8\frac{1}{2}$ miles north of Pine Falls.

3.2.14 The Grey-willow Leaf Beetle, Galerucella decora Say:- There was a slight increase in populations in the vicinity of Wanipigow Lake, but elsewhere in the District the status of this insect remained much the same.

Very light infestations, with skeletonizing ranging from a trace to light occurred at Otter Falls, Caddy Lake, Falcon Lake, and in the Northwest Angle Forest Reserve. Light skeletonizing of willow foliage was observed at Family, Caribou and Bird lakes, in the Brightstone area, near Catfish Creek south of Pine Falls, south of Hadashville, and near Marchand in the Sandilands Forest Reserve. At Telford, along the Bear River Road, and at Eardley Lake an occasional willow clump was moderately defoliated.

Moderate to severe skeletonizing was recorded on the occasional willow clumps from Manigotogan area east to Wallace and south to Long Lake, and in the English Brook-Wanipigow Lake area.

3.2.15 Fall Webworm, Hyphantria cunea (Drury):- Populations of this webworm were slightly higher than in 1962 and caused moderate to severe defoliation of individual alder, green ash, elm, balsam poplar, birch, willow and chokecherry at scattered points in the eastern part of the District. Feeding was confined mainly to the smaller reproduction trees. The stink bug, Podisus modestus Dall., was observed feeding on larvae in the Moose Lake area.

White birch was moderately defoliated in the Agassiz Forest Reserve north of No. 4 Highway. Moderate to severe defoliation occurred on occasional alder clumps in the McMunn-East Braintree area and near White Lake in the Whiteshell Forest Reserve; on willow in the Birch Lake area; and on balsam poplar, green ash, elm, and chokecherry north of Moose Lake in the Northwest Angle Forest Reserve.

3.2.16 Western Tent Caterpillar, Malacosoma pluviale (Dyar):- Slightly higher populations of this tent caterpillar were found on chokecherry, pincherry, trembling aspen, birch and alder. Light to moderate feeding on chokecherry was noted at Big Whiteshell Lake, near the Whiteshell River along the Central Whiteshell Road and at Bird Lake, Crowduck Lake, and Gods Lake. Pincherry was light to moderately defoliated at Wallace and Long lakes. An occasional small trembling aspen was moderately defoliated just north of Caribou Lake, and young birch at Black Lake. Alder was lightly attacked near Bird Lake.

3.2.17 Yellow-necked Caterpillar, Datana ministra (Drury):- This caterpillar was collected from birch, bur oak, willow and elm. Light infestations were noted on birch at Crowduck Lake; on willow north of Pine Falls and at Dawson Cabin, and on elm in the Northwest Angle Forest Reserve. Moderate infestations were recorded on birch in the Falcon Lake-West Hawk Lake area; on willow at Black Lake; and on bur oak at the Whiteshell River along the Central Whiteshell Road, at the junction of No. 4 Highway and the Central Whiteshell Road, and $\frac{1}{2}$ mile south of St. Malo.

3.2.18 Birch Skeletonizer, Bucculatrix canadensisella Cham.:- This skeletonizer caused light damage to the foliage of birch at Otter Falls in the Whiteshell Forest Reserve and at Big Stone Lake in northern Manitoba. Higher populations were detected 9 miles north of Pine Falls, where light to moderate skeletonizing was observed on several trees (Fig. 8).

3.2.19 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Acrobasis betulella</u> Hulst. (Birch tube maker)	wB	Sasaginnigak Lake, Crow-duck Lake, and near Marchand.	Moderate on an occasional tree at Sasaginnigak Lake, otherwise light.
<u>Acrobasis rubrifiella</u> Pack. (Alder tube maker)	spAl	Caddy Lake, Bird Lake, and Sandilands Forest Reserve.	Highest populations in the Sandilands Forest Reserve, light elsewhere.
<u>Alsophila pometaria</u> (Harris) (Fall cankerworm)	wE, mM	$\frac{1}{2}$ mile north of Dencross.	Very low populations.
<u>Amorbia humerosana</u> Clem. (A leaf roller)	jP, tA	Throughout the District.	Low populations at all collection points.
<u>Anoplonyx canadensis</u> Hgtn. (A sawfly)	tL	Throughout the District.	Common in most tamarack stands.
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Throughout the District.	Common in all tamarack stands.
<u>Archips cerasivoranus</u> (Fitch) (Ugly nest caterpillar)	cCh	Sandilands and Agassiz Forest reserves.	Generally low populations but moderate to severe damage on trees attacked.
<u>Archips fervidana</u> (Clemens) (Oak webworm)	bO	North of Stead in the Belair Forest Reserve.	Very low populations caused only light damage.
<u>Arge pectoralis</u> (Leach) (Birch sawfly)	spAl	North of Pine Falls	Low populations.
<u>Badebecia urticana</u> Hbn. (A leaf roller)	W, tA, wB, spAl, bPo	Widely scattered points throughout the District.	Very light damage.
<u>Caliroa quercus-alba</u> (Cress.) (A sawfly)	bO	Marchand Forestry H.Q.	Light to moderate defoliation on one clump of small oak.
<u>Chermes lariciatus</u> (Patch) (Pineapple gall aphid)	wS, bS	Throughout the forested areas of the District.	Most common on white spruce. Low populations.

3.2.19 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Choristoneura fumiferana</u> (Clemens) (Spruce budworm)	wS, bF	Victoria Beach, Molson Lake and Eardley Lake.	Very low popula- tions; a trace of defoliation at Victoria Beach.
<u>Chrysomela knabi</u> Brown (A leaf beetle)	bPo	Sandilands Forest Reserve.	Light to moderate feeding over a small area near Marchand.
<u>Croesus latitarsus</u> Norton (Dusky birch sawfly)	spAl	$\frac{1}{2}$ mile north of Seddons Corner.	Light feeding on an occasional alder clump.
<u>Dichelonyx backi</u> Kirby (Green rose leaf chaffer)	tA	Wanipigow Lake and Otter Falls.	Low populations.
<u>Dichelonyx subvittata</u> Lec. (A leaf chaffer)	wE, bO, tA, pCh	Wanipigow Lake and Dencross.	Very low popula- tions at Wanipigow Lake. Higher popula- tions at Dencross. Damage light.
<u>Dimorphopteryx pinquis</u> (Nort.) (A sawfly)	wB, spAl, W	Bear River Road, north of Pine Falls, White- shell, Telford, and Stead.	Very light feeding damage on white birch.
<u>Disonycha quinquevittata</u> Say. (A leaf beetle)	W, pCh.	Telford and Stead.	Very low populations at Telford; highest populations at Stead, and very light defoliation.
<u>Enargia decolor</u> Wlkr. (A noctuid)	tA, W	Otter Falls, and in the Sandilands Forest Reserve.	Populations very low.
<u>Erannis tiliaria</u> (Harris) (Linden looper)	mM, Haw	$\frac{1}{2}$ mile north of Dencross.	Very low populations.
<u>Fenusa dohrnii</u> (Tischbein) (European alder leaf miner)	spAl	Throughout the District.	Light to moderate damage at widely scattered points.
<u>Hylurgopinus rufipes</u> (Eichhoff) (Native elm bark beetle)	wE	Roseau River at Dominion City.	Found in one tree only.
<u>Lambdina fiscellaria</u> <u>fiscellaria</u> Gn. (Hemlock looper)	bF, wS, tL, wB	North of Pine Falls, Family, Eardley and Weaver lakes.	Low populations; no defoliation evident.

3.2.19 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Lopidea dakota</u> , Knight (Caragana plant bug)	caragana	Kirkness and the junction of #4 and #11 highways.	Very low popu- lations at Kirkness; higher populations at the junction of #4 and #11 highways.
<u>Malacosoma americanum</u> (Fabricius) (Eastern tent caterpillar)	cCh	Lowlands, Libau, Beaconia, Nourse, and the Sandilands Forest Reserve.	Moderate to severe defoliation on the trees attacked.
<u>Malacosoma lutescens</u> (N.&D.) (Prairie tent caterpillar)	tA, cCh, pCh	Wanipigow Lake, Cat Lake, Caribou Lake, and the Sandilands Forest Reserve.	Moderate to severe damage on the trees attacked.
<u>Mordwilkoja vagabunda</u> (Walsh) (Poplar vagabond aphid)	tA	Whiteshell Forest Reserve, Dogskin, Family and Eardley lakes.	Light damage at all collection points.
<u>Nematus limbatus</u> Cress. (A sawfly)	W	North of Pine Falls and in the Sandilands Forest Reserve.	Moderate to severe defoliation on willow clumps attacked.
<u>Nymphalis antiopa</u> (Linn) (Spiny elm caterpillar)	wE, W	Pine Falls and Birch Lake.	An occasional small elm was moderately defoliated near Pine Falls. Willow was lightly attacked near Birch Lake.
<u>Orsodacne atra</u> Ahr. (A leaf beetle)	tA, W, pCh, bO, wB caragana	Throughout the District.	Very low popula- tions.
<u>Paleacrita vernata</u> (Peck) (Spring cankerworm)	tA	$\frac{1}{2}$ mile north of Dencross.	Very low populations
<u>Pandemis canadana</u> , Kft. (A leaf roller)	tA, W, spAl	Stead, Pointe du Bois, Hadashville and Sprague.	Low populations and very light damage.

3.2.19 Other Noteworthy Insects (cont.):-

<u>Insect</u>	<u>Host(s)</u>	<u>Locality</u>	<u>Remarks</u>
<u>Periclista albicollis</u> (Nort.) (A sawfly)	bO	Silver Falls, Lone Island Lake and Sandilands Forest Reserve.	Light feeding on bur oak at all collection points.
<u>Phytophaga rigidae</u> (Osten Sacken) (Willow cone gall midge)	W	Throughout the District.	Low populations at widely scattered points.
<u>Physokermes piceae</u> (Schrank) (Spruce bud scale)	bS, wS	Throughout the forested part of the District.	Most common on black spruce; low populations.
<u>Pikonema dimmockii</u> (Cresson) (Green-headed spruce sawfly)	wS, bS	Throughout the District.	Most common at Eardley Lake; light defoliation.
<u>Pseudexentera improbana oregonana</u> Wlsh. (A leaf roller)	tA, bO, W	Sandilands Forest Reserve.	Low populations and very light damage.
<u>Rhabdophaga strobiloides</u> (Walsh) (Beaked willow gall)	W	Throughout the District.	Common in most willow clumps in the District.
<u>Saperda obliqua</u> Say (A wood borer)	spA1	9½ miles north of Pine Falls.	First recorded collection of this insect at the Winnipeg Laboratory.
<u>Tetralopha asperatella</u> Clem. (A webworm)	tA bPo	Throughout the District.	Low populations.
<u>Tetralopha robustella</u> Zeller (Pine webworm)	jP	Sandilands Forest Reserve.	Light populations.
<u>Toumeyella numismaticum</u> (P. & McD.) (Pine tortoise scale)	jP	Belair and Sandilands Forest reserves.	Light infestation in Piney area.
<u>Trichiosoma triangulum</u> (A sawfly)	Kby. tA,W, spA1, wB, bF	Throughout the District.	No obvious damage.
<u>Zale duplicata largera</u> Sm. (An owlet moth)	jP	Throughout the District.	Low populations, common in most jack pine stands.

3.3 TREE DISEASE CONDITIONS

3.3.1 Western Gall Rust, Peridermium harknessii J. P. Moore:- This gall rust was common in jack pine stands near Richer, Marchand, Woodridge, Piney, Sprague, and Moose Lake in southern Manitoba. Infection was generally light with an occasional tree moderately attacked in the Moose Lake area where fruiting was common by May 30. Light infection also occurred along the Bear River Road, north of Pine Falls, at Aikens, Charron, and Weaver lakes, and throughout the Belair Forest Reserve. North of Stead in the Belair Forest Reserve 7 out of 20 trees examined were infected and fruiting galls were common by June 3.

Jack pine stands at Stevenson Lake in the northern District were lightly infected with severe infection on an occasional tree.

3.3.2 A Needle Rust on Spruce, Chrysomyxa sp.:- A light infection was recorded on the foliage of black spruce 9 miles north of Pine Falls, and a moderate to severe one at Pointe du Bois. The latter affected several acres and ranged from moderate to severe on reproduction to light on large trees.

3.3.3 White-pine Blister Rust, Cronartium ribicola, Fischer:- Little change was apparent in the status of this blister rust and flagging was common on white pine northeast of Moose Lake.

3.3.4 Dwarf Mistletoe of Black Spruce, Arceuthobium pusillum Peck:- Occasional brooming of black spruce was noted along the north shore of Brereton Lake and throughout the area north of Pine Falls to the O'Hanley River. Moderate to severe attack occurred in the Belair Forest Reserve north of Stead and east of Grand Beach. In southern Manitoba, infections occurred from Hadashville to Dawson Cabin, south of East Braintree in the Birch Lake area, and from Moose Lake to Sprague Lake in the Northwest Angle Forest Reserve.

3.3.5 Mistletoe of Jack Pine, Arceuthobium americanum, Nutt. ex Engelm:- There was no change in the areas previously affected by this misteltoe and no new ones were found. Severe infections occurred in jack pine stands near Belair and Victoria Beach. The misteltoe plants were examined for the parasite Wallrothiella arceuthobii but it was not found.

3.3.6 Mortality of Balsam fir:- An occasional dead balsam was noted in most stands throughout the District. Scattered, dead trees were recorded east of Great Falls and over a small area north of Aikens Lake where mortality ranged from 5 to 10 percent. Several islands in Sasaginnigak Lake showed tree mortality ranging from 15 to 20 percent and up to 35 percent on a small island in Eardley Lake. The exact cause of this condition is still not fully understood but it apparently is not due to insects or diseases.

3.3.7 A Rust, Cymnosporangium sp.:— Light infections occurred on the foliage of mountain ash at Crowduck Lake, north of Pine Falls and at Wallace Lake; on hawthorns north of Dencross; and on the foliage and fruit of Saskatoon serviceberry at Viking Lake, north of Pine Falls, and in the Belair, Whiteshell, Agassiz and Sandilands Forest reserves.

3.3.8 Galls on Poplars, Macrophoma tumefaciens Shear:— Light infections were noted on trembling aspen at Viking, Black, Manigotogan, Sasaginnigak, Brereton, and Big Whiteshell lakes, and on balsam poplar near Moose Lake and at Birch Point and on both balsam poplar and trembling aspen along the Whitemouth River. (Fig. 9).

3.3.9 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. Results of the survey are shown in the following table:

TABLE 2

2,4-D Injury to Manitoba Maple
Eastern District of Manitoba - 1963

Place Examined	Date Sampled	Degree of Injury	R marks
3 miles east of Whitemouth, sec. 29, tp. 11, rge. 12 E.P.mer.	June 19	None	No damage; no knowledge of spraying in this area.
Lac du Bonnet, sec. 18, tp. 15, rge. 11, E.P.mer.	July 17	Entire tree damaged.	Cause unknown.
Elma, sec. 29, tp. 10, rge. 12, E.P.mer.	June 20	Entire tree damaged.	Cause unknown.
Ile de Chene, sec. 30, tp. 8, rge. 4, E.P.mer.	June 21	Part of one side of tree damaged.	Spraying noted here June 17.
Dencross, sec. 6, tp. 15, rge. 8, E.P.mer.	July 22	Nil	No damaged foliage found.
Madashville, sec. 32, tp. 8, rge. 12, E.P.mer.	June 30	Nil	No damaged foliage found.
Beausejour, sec. 7, tp. 13, rge. 7, E.P.mer.	Aug. 12	Nil	No damaged foliage found.

3.3.10 Flooding by Beaver:- High beaver populations throughout the area from the Whiteshell Forest Reserve north to Family and Moar lakes caused extensive flooding of timber in localized areas. Trees were killed over areas ranging from 5 to 15 acres at numerous points.

3.3.11 Other Noteworthy Diseases

Disease Organism	Host(s)	Locality	Remarks
<u>Cronartium comandrae</u> Pk. (Comandra blister rust)	jP	Moose Lake area.	Light infection.
A Needle Rust	bF	Gem, Eardley and Crowduck lakes.	Very light infection at Gem Lake; light at Eardley Lake, and moderate to severe at Crowduck Lake.
<u>Lophodermium pinastri</u> (Schrad ex Fr.) (Pine needle cast)	jP	9½ miles north of Pine Falls.	Light attack over a small area.
A Needle Cast	bF	Sasaginnigak and Crowduck lakes.	Very light at Sasaginnigak Lake; moderate-severe at Crowduck Lake.
<u>Flammula alnicola</u> (Fr.) spruce Kummer (A yellow stringy butt rot of conifers)		Bird Lake.	No fruiting bodies of this disease found.
<u>Melampsora bigelowii</u> Thum. (A salix-larix rust)	W	Agassiz Forest Reserve.	Common, an occasional willow clump moderately infected.
<u>Gnomonia ulmea</u> (Schw.) Thum (Elm leaf spot)	wE	1 mile east of Marchand Forestry H.Q.	Moderate to severe infection on six trees (4" d.b.h.).
<u>Sclerotium ciborinia</u> (Ink spot on aspen)	tA	9 miles north of Pine Falls	Light to moderate infection over small area.
<u>Apiosporina collinsii</u> (Schw.) Hoehn. (Witches' broom on Saskatoon)	Saskatoon	Belair, Whiteshell, Agassiz, and Sandilands Forest reserves.	Common, light infections, mainly in shaded areas.
<u>Dibotryon morbosum</u> (Schw.) T. & S. (Black knot of cherry)	cCh, pCh	Throughout the District.	Common and widely scattered. Heavy infection in Belair Forest Reserve.

4. ANNUAL DISTRICT REPORT
SOUTHERN DISTRICT OF SASKATCHEWAN

1963

by

V. Hildahl

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FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March, 1964

4.1 INTRODUCTION

Almost ideal weather throughout most of the spring, summer and fall produced one of the best-growing and longest frost-free seasons on record in southern Saskatchewan. Foliage development on most tree species was delayed about a week by cool, wet weather during early May, but normal temperatures and above-average precipitation in June and July accelerated growth. The season ended with above-normal temperatures and generally light rainfall in all sections.

Owing to staff shortages during the current season, Forest Insect and Disease Survey investigations were greatly reduced in the District. Work consisted primarily of sampling and recording major pests, and of carrying out special studies considered essential to the overall Survey program. The latter included: (1) egg-mass and defoliation surveys of the spruce budworm; (2) egg-band sampling of the forest tent caterpillar; and (3) larval population sampling of the fall cankerworm and boxelder twig borer. Totals of 119 insect and 11 disease samples were submitted to the Forest Entomology Laboratory, Winnipeg and the Forest Pathology Laboratory, Saskatoon, respectively.

Although the number of major insect problems remained much the same, there were important changes in the status of some of them. The occurrence of large numbers of adults of the aspen leaf beetle in late May and early June caused considerable concern to Park Officials and private individuals, but resultant larval populations failed to develop fully and skeletonizing of aspen foliage was patchy and much less severe than expected. The continued decline of forest tent caterpillar infestations in the Cypress Hills Provincial Forest was partly off-set by a substantial increase in populations of the American poplar beetle resulting in almost complete defoliation of trembling aspen in localized areas of the Park Block. Boundaries of the localized outbreak of the spruce budworm in the Battle Creek Valley of the Cypress Hills remained unchanged, but larval populations were notably lower and caused only light to moderate defoliation of white spruce. Spider mites occurred commonly on planted white spruce throughout the District, but due to the cool, wet weather during the early part of the season, damage was less conspicuous. Several new local infestations of the fall cankerworm were recorded on shelterbelt and town plantings of Manitoba maple and white elm in the west-central part of the District, and the yellow-headed spruce sawfly was noticeably more abundant on ornamental white spruce throughout the eastern sections.

The most important tree disease condition was continuing mortality resulting from the extreme drought in 1961. Observations in August and September of this year indicated that mortality of trembling aspen had increased as much as 25 per cent in some prairie "bluffs" where previous damage had been particularly severe. Associated again with the drought-weakened and dying trees were new and widespread attacks of Cytospora canker. Spraying with 2,4-D for weed control in field crops caused considerable damage to the shoots and foliage of Manitoba maple and some other tree species in adjacent shelterbelts.

4.2 INSECT CONDITIONS

4.2.1 Spruce Budworm, Choristoneura fumiferana (Clem.):- This budworm continued to infest white spruce stands in the West Block of the Cypress Hills Provincial Forest, but it was not detected elsewhere (Fig. 2). Ground and aerial surveys indicated little change in the size of the infestations affecting some 200 acres in sections 2 and 11, tp. 8, rge. 30, W 3rd mer. and sec. 21, tp. 7, rge. 29, W. 3rd. mer. along the Battle Creek Valley but defoliation declined to light to moderate from moderate to severe in 1962. Elsewhere in the valley, populations were low and caused no noticeable defoliation. Egg-mass and defoliation surveys have been carried out since 1960 to follow the history of the outbreak. Results of these surveys, as shown in Table 1, indicate that the outbreak has been declining steadily since 1961 and it is expected to continue its decline in 1964.

TABLE 1

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

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

** Defoliation records to be taken July, 1964.

4.2.2 Spruce Coneworm, Dioryctria reniculella (Grote):- Recorded only in the West Block of the Cypress Hills Provincial Forest. Larvae occurred commonly on white spruce in association with the spruce budworm, but populations were relatively low and caused no serious defoliation.

4.2.3 Pine Needle Scale, Phenacaspis pinifoliae (Fitch):- Occurred on most shelterbelt and ornamental plantings of Colorado and white spruce examined west from the Manitoba-Saskatchewan boundary to Swift Current. The highest populations, ranging from light on some trees to moderate on others, were noted on spruce plantings on the Forestry Farm at Indian Head, in Wascana Park in Regina City and at Creelman, and in farm shelterbelts in the Weyburn, Indian Head, Moose Jaw and Swift Current areas.

4.2.4 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— There was a general increase in populations throughout the eastern sections and light to moderate defoliation of white spruce occurred on individual plantings at Kenossee Lake in Moose Mountain Provincial Park, in a small plantation at Creelman, and in shelterbelts at Kipling, Odessa, Glenavan, Grenfell and Indian Head.

Shelterbelt plantings from Regina west to the Alberta border and native stands of white spruce in the Cypress Hills Provincial Forest still remained relatively free from attack. The severe infestations previously reported at Govan and Southey north of Regina were substantially reduced by spraying.

4.2.5 Spruce Spider Mite, Oligonychus ununguis (Jacot):— Spider mites occurred commonly on practically all shelterbelt and ornamental plantings of Colorado and white spruce but damage was not particularly serious or extensive. Noticeable infestations, ranging from light on single trees to heavy on groups, were recorded in the cities of Regina, Moose Jaw and Swift Current, and on shelterbelts in the Creelman area.

4.2.6 Larch Sawfly, Pristiphora erichsonii (Htg.):— Planted Siberian larch at the Department of Natural Resources Field Headquarters in the West Block of the Cypress Hills Provincial Forest that had suffered previous damage by porcupines, were lightly defoliated by the sawfly. Observations elsewhere indicated only very light defoliation of larch on the Forest Nursery Station at Indian Head and in a privately-owned plantation of tamarack at Wolseley. In the latter area, many trees are dead as a result of prolonged drought-periods and competition from a dense growth of caragana and honeysuckle that has invaded the plantation.

4.2.7 Fall Cankerworm, Alsophila pometaria (Harr.):— Generally increased populations and several new, localized infestations of this important defoliator were recorded in shelterbelts and town plantings of Manitoba maple and white elm throughout the west-central part of the District. Particularly severe infestations causing almost complete stripping of the foliage was common in shelterbelts in the Maple Creek, Consul, Swift Current, Stewart Valley, Ernfold, Tuxford and Davidson areas. Larvae were also commonly found on boulevard and park trees in the cities of Regina and Moose Jaw. Light infestations were recorded in the Echo Lake Provincial Park in the Qu'Appelle River Valley, in the Trans-Canada Campsite at Besant, and on the Forest Nursery Station at Indian Head.

4.2.8 Aspen Leaf Beetle, Chrysomela crotchii Brown:— The occurrence of large numbers of adult beetles during late May and early June prompted numerous inquiries from Provincial Park Officials and private individuals. Sampling at that time indicated that populations were

generally distributed throughout the entire Aspen Grove Section and in "prairie bluffs" of trembling aspen in the eastern and central parts of the District. However, correspondingly high larval populations failed to develop and resultant skeletonizing of the foliage was less severe than expected. Damage was most severe on aspen reproduction, but where localized infestations were particularly heavy, the foliage in the entire crown of trees up to 4" D.B.H. was completely skeletonized.

The unusually high populations of adults caused light to moderate defoliation early in the season in the Esterhazy, Abernethy, Bulyea, Moosomin, Broadview, Odessa, McLean, Kipling, Froude, Weyburn and Moose Mountain Provincial Park areas. Larval feeding commenced in the latter part of June and by mid-August, patchy to almost continuous skeletonizing of the foliage extended over the entire area from Maryfield and the Moose Mountain Provincial Park, northwest through McLean and Bulyea and eastward to Ituna and Yorkton. In addition, localized moderate to severe infestations developed some distance to the west of the main area in the Trans-Canada Campsite near Besant, and at Elbow, Davidson and Chamberlain.

4.2.9 Forest Tent Caterpillar, Malacosoma disstria Hbn.: - Populations continued to decline in the trembling aspen stands in the Cypress Hills and none were found elsewhere in the District for the first time in several years. In the Cypress Hills Provincial Forest, the old infestation in the Park Block completely subsided and only two small patches of light to moderate defoliation remained in the East Block. One patch, located in sec. 9, tp. 9, rge. 24, W 3rd mer., covered approximately 150 acres and the other in sec. 3, tp. 9, rge. 25, W 3rd mer. was limited to about 30 acres.

As shown in Table 2, results of egg surveys carried out in the fall indicate that present low populations will continue to decline and cause no noticeable defoliation of trembling aspen in 1964.

TABLE 2

Results of Forest Tent Caterpillar Egg Sampling
Southern District of Saskatchewan - 1963

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

Sample Point No.	Location by Sec., Tp., Rge., and Mer.	Av. d.b.h. of trees (ins.)	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. No. of Egg-bands per tree	Defoliation forecast 1964
Park Block						
1	36-8-26-W3	3.6	24.0	11.4	0	Nil
2	25-8-27-W3	2.8	20.0	10.6	0	Nil
3	21-8-26-W3	3.0	25.6	12.4	0	Nil
East Block						
4	23-9-25-W3	3.0	21.0	15.0	0	Nil
5	25-9-25-W3	2.0	18.4	9.6	0	Nil
West Block						
6	36-7-29-W3	4.0	30.0	18.0	0	Nil
7	21-8-30-W3	3.0	27.4	18.4	0	Nil

4.2.10 Gray Willow Leaf Beetle, Galerucella decora (Say):- Infestations were widespread in the eastern and central sections of the District, and by mid-August severe skeletonizing of the foliage by both larvae and adults of this beetle was common in willow bluffs growing about sloughs in cultivated fields, on pasture lands, and along roadsides. The most extensive and continuous outbreak occurred within a triangular area extending from Caron west to Chaplin and South to Old Wives Lake, where exceptionally high populations completely skeletonized the foliage on all willows. Localized moderate to severe infestations also were recorded on white elm and green ash plantings in Rowan's Ravine Provincial Park along the east side of Last Mountain Lake, and on willow and ornamental hybrid poplars and Manitoba maples in the Trans-Canada Campsite near Besant.

4.2.11 American Aspen Beetle, Gonioctena americana (Schaeff.): - This leaf-eating beetle, which is usually most abundant during late May and June, increased significantly in trembling aspen stands throughout the Cypress Hills Provincial Forest, but it was not recorded elsewhere in the District. The most severe infestations were noted in the Park Block where unusually large numbers of both larvae and adults completely defoliated all aspen up to 5 inches d.b.h. in several small localized patches. Beetles were also numerous throughout aspen stands in the remainder of the Park Block and in the East and West blocks, but feeding was confined to aspen reproduction and defoliation was only light to moderate.

4.2.12 Boxelder Twig Borer, Proteoteras willingana (Kear.): - Larvae of this species bore into the current twigs of Manitoba maple resulting in notable pruning of the ends of the branches the following spring. Counts at permanent sampling points, which are shown in Table 3 showed a further general increase in the incidence of twig borers in shelter-belts in 1963.

TABLE 3

Boxelder Twig Borer Population Counts
Southern District of Saskatchewan - 1963

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

Location	Tree Data			No. of Twigs Examined and Twig Borer Populations by Crown Level					
	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. Crown Width (ft.)	LOWER		MID		UPPER	
				No. of Twigs	No. of Borers	No. of Twigs	No. of Borers	No. of Twigs	No. of Borers
Maple Creek	15.0	10.0	6.0	241	20	246	16	232	13
Swift Current	21.0	12.0	7.0	255	28	270	37	304	39
Findlater	23.0	14.0	8.0	286	22	317	20	294	11
Indian Head	24.0	16.0	8.0	372	27	378	27	344	21
Carlyle	25.0	17.0	9.0	432	22	408	26	342	19
Willowbrook	26.0	18.0	12.0	436	22	426	34	373	18
Moose Jaw	16.0	12.0	8.0	329	20	332	15	285	15

4.2.13 The Leaf Roller, Sciaphila duplex Wlshm.: - This leaf roller was noted in trembling aspen stands at widely separated points, but caused significant damage only in the vicinity of Moosomin where it had rolled up to 40 per cent of the leaves on most trees. Elsewhere in the District, light infestations persisted in the Park Block of the Cypress Hills Provincial Forest, on the Forest Nursery Station at Indian Head, in the Trans-Canada campsites at McLean and Broadview, throughout most of Ketepwa Provincial Park, and in the vicinity of Froude.

4.2.14 A Lecaniine Scale, Lecanium coryli L.: - A notable infestation of this scale occurred on several planted American elm on the Canada Department of Agriculture Experimental Farm at Indian Head. Although the outbreak was localized, it was particularly severe on some trees and as many as 90 scales were counted per lineal foot of branch.

4.2.15 Nuttall Blister Beetle, Lytta nuttalli Say: - Adult beetles occurred commonly in mid-season on shelterbelt and hedgerow plantings of caragana at several locations, but in all instances defoliation was light. The highest populations were observed in the Tuxford-Regina-Mortlach area, and around Grenfell and Swift Current.

4.2.16 Boxelder Bug, Leptocorus trivittatus Say: - This insect, which feeds on the leaves and seeds of Manitoba maple, was recorded only sporadically during the early part of the season and caused no discernable damage. However, during late September, large numbers of adults congregating on and about buildings caused considerable concern to property owners in the Maple Creek, Swift Current and Indian Head areas.

4.2.17 Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.): - A notable decline in both populations and distribution of this tent maker was evident in the central section of the District between Indian Head and Swift Current where particularly heavy infestations had persisted for several years. In 1963, the only significant infestation in this area occurred in the Trans-Canada Campsite near Besant where Saskatoon serviceberry was moderately defoliated.

4.2.18 Other Noteworthy Insects: -

Insect	Host(s)	Locality	Remarks
<u>Alitca populi</u> (A leaf beetle)	bPo	Trans-Canada Campsite at Broadview.	Adults common on most trees; no noticeable damage.

4.2.18 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Archips cerasivoranus</u> (Fitch) (Ugly-nest caterpillar)	ecCh	Trans-Canada Campsite at Besant.	Heavy infestation causing complete defoliation.
<u>Archips negundana</u> (A leaf roller)	mM	Trans-Canada Campsite at Besant.	Light damage to foliage of ornamental plantings.
<u>Calligrapha alni</u> (Schffr.) (A leaf beetle)	gAs, W	Trans-Canada Campsites at McLean and Besant, and Echo Lake Provincial Park.	Low adult populations common; damage negligible.
<u>Cecidomyia negundinis</u> (Boxelder gall fly)	mM	Forest Nursery Station, Indian Head.	Light to moderate damage.
<u>Choristoneura conflictana</u> (Wlk.) (Large aspen tortrix)	tA	Cypress Hills Provincial Forest.	Generally distributed but no noticeable damage.
<u>Chrysomela knabi</u> (A leaf beetle)	tA	Wapella.	Adults common but no conspicuous defoliation.
<u>Compselechia niveapulvella</u> (A leaf roller)	tA	Esterhazy.	About 30 per cent of leaves damaged in a 7 square mile area.
<u>Corythucha arcuata</u> Say (Oak lace bug)	ecCh	Trans-Canada Campsite at Besant.	Adults very abundant causing light to moderate defoliation.
<u>Dichelonyx backi</u> (Kirby) (Green rose chafer)	tA, bPo, caragana	Cypress Hills, Trans-Canada Campsite at Broadview, and Sanctuary.	Conspicuous damage in some areas.
<u>Erannis tiliaria</u> (Harr.) (Linden looper)	mM	Indian Head and Regina.	Usually associated with fall cankerworm; light to moderate defoliation on some trees.
<u>Eriosoma americanum</u> (Riley) (Woolly elm aphid)	wE	Wascana Park in Regina.	Localized infestation causing light to moderate damage.

4.2.18 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Itame loricaria</u> (A looper)	tA	Cypress Hills Provincial Forest, and Moosomin area.	Infestation light in both areas.
<u>Liocoris borealis</u> (A plant bug)	caragana	Moosomin.	Adults on all shelterbelts and hedges; damage light.
<u>Operophtera bruceata</u> (Hulst) (Bruce spanworm)	tA,mM, wE,ecCh	Echo Lake and Buffalo Pond Prov. parks, Cypress Hills Prov. Forest, and Indian Head.	Widespread, but light infestations in all areas.
<u>Orsodacne atra</u> (A leaf beetle)	tA, ecCh, Se	Echo Lake Prov. Park, Trans-Canada Campsite at McLean and Indian Head.	Adults common; no serious damage detected.
<u>Orthosia hibisci</u> (An owl moth)	tA	Esterhazy, Indian Head and Cypress Hills Prov. Forest.	Light infestations; no noticeable defoliation.
<u>Pseudexentra improbana oregonana</u> (A leaf roller)	tA	At Moosomin and in Trans-Canada Campsite near McLean.	Generally low populations but an occasional tree noticeably damaged.

4.3 DISEASE CONDITIONS

4.3.1 Larch-willow Rust, Melampsora bigelowii Thum:- This leaf rust (alternate stage on larch), occurred at widely scattered points in the central and eastern sections of the District. Infection was most common in the Trans-Canada Campsite west of McLean where the foliage on practically all willows was lightly damaged.

4.3.2 Drought Damage:- There were no new reports of drought damage to shelterbelt and ornamental trees in 1963 because of the abundant rainfall in most areas. However, further deterioration of trembling aspen was evident in areas where the extreme drought conditions of 1961 had caused particularly severe damage. Surveys carried out in

August and early September indicated an increase of as much as 25 per cent in tree mortality in many individual aspen "bluffs". Associated again with the current dead and dying trees was the weakly parasitic fungus, Cytospora chrysosperma (Pers.)Fr., which usually invades trees in their declining stages.

The area within which tree mortality has been most serious during the past two years extends from the Manitoba-Saskatchewan border westward to Estevan, Weyburn, Regina and Outlook, east through Kenaston, Strasbourg and Melville, and thence south to Whitewood and Carlyle.

4.3.3 Malformation of Manitoba Maple Shoots and Foliage:- Surveys were continued to determine the incidence and severity of this condition in relation to the use of 2,4-D for weed control in field crops. Twenty shelterbelts and field row plantings were examined at widely separated points and all yielded typical symptoms of malformed shoots and leaves. Damage ranged from a few shoots affected on individual trees to all the shoots and foliage on trees in entire shelterbelts, and was usually most severe on plantings adjacent to fields that had been sprayed by aircraft. Results of the survey are shown in the following table:

TABLE 4

Degree of Injury to Manitoba Maple Resulting from the Use
of 2,4-D for Weed-control in Field Crops
Southern District of Saskatchewan - 1963

Location	Date Sampled	Degree of Injury	Remarks
Stewart Valley, Sask. 30-19-14-W3	17-6-63	Part of both sides of the trees lightly to moderately damaged.	Field sprayed 200 yds. away.
Kyle, Sask. 30-36-5-W3	17-6-63	Entire tree severely damaged.	Adjacent field aerial sprayed.
Rosetown, Sask. 24-30-15-W3	17-6-63	All of one side of tree affected. Moderate to severe damage to leaf petioles.	Field sprayed 500 yds. away.
Saskatoon, Sask. 30-36-5-W3	17-6-63	Part of one side of trees affected; only light damage to leaf petioles.	Field sprayed 300 yds. away.

TABLE 4 (cont.)

Location	Date Sampled	Degree of Injury	Remarks
Ernfold, Sask. 27-17-8-W3	18-6-63	All of one side of trees affected. Damage moderate. Early symptoms of 2,4-D damage.	Adjacent field sprayed.
Wymark, Sask. 23-13-13-W3	18-6-63	A few isolated twigs affected. Light damage to leaf petioles.	Field sprayed 500 yards away.
Gull Lake, Sask. 18-13-19-W3	18-6-63	Part of both sides of the trees affected. Moderate damage to the leaves and leaf petioles.	Adjacent field aerial sprayed.
Mortlash, Sask. 30-17-1-W3	18-6-63	One side of all trees damaged.	Adjacent field sprayed.
Gravelbourg, Sask. 6-11-5-W3	19-6-63	Part of both sides of the trees affected. Moderate to severe damage to leaf petioles.	Adjacent field sprayed.
Indian Head, Sask. 24-18-13-W2	19-6-63	Part of one side of trees affected. symptoms - damage light.	Adjacent field Early sprayed.
Belle Plaine, Sask. 9-17-23-W2	17-7-63	Part of both sides of the trees affected. Moderate to severe damage.	Adjacent field aerial sprayed.
Yellow Grass, Sask. 18-10-16-W2	17-7-63	All of one side of trees affected. Moderate damage to entire stand.	Adjacent field aerial sprayed.
Fillmore, Sask. 7-11-11-W2	17-7-63	Part of both sides of the trees affected. Moderate to severe damage to stand.	Adjacent field sprayed.

TABLE 4 (cont.)

Location	Date Sampled	Degree of Injury	Remarks
Carlyle, Sask. 6-8-2-W2	17-7-63	Part of one side of trees affected. Light damage.	Field sprayed $\frac{1}{2}$ mile away.
Craven, Sask. 23-20-21-W2	18-7-63	All of one side of trees affected. Moderate damage.	Adjacent field sprayed.
Dysart, Sask. 15-23-15-W2	18-7-63	Entire tree affected. Severe damage to all trees.	Adjacent field aerial sprayed.
Duff, Sask. 16-22-8-W2	18-7-63	Part of both sides of the trees affected. Moderate to severe damage.	Adjacent field aerial sprayed.
Esterhazy, Sask. 31-20-1-W2	19-7-63	A few isolated twigs affected. Very light damage.	No spraying in immediate vicinity of shelterbelt.
Moosomin, Sask. 7-14-31-W.P.	19-7-63	Part of one side of trees affected. Light damage.	Adjacent field sprayed.

5. ANNUAL DISTRICT REPORT
WESTERN DISTRICT OF MANITOBA

1963

by

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FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March, 1964

5.1 INTRODUCTION

Field surveys were carried out from mid May to late October, and included ten hours of chartered flying time for mapping and detecting outbreaks; totals of 421 insect and 78 tree disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively. Adverse weather throughout the Duck and Riding Mountain areas early in the season retarded foliage growth and insect development by about two weeks, but normal spring weather prevailed throughout the remainder of the District.

These variable weather conditions contributed to the general break-up of the forest tent caterpillar outbreak that occurred in the Riding Mountain and Duck Mountain areas, and allowed the continuation of severe infestations in the Lake Winnipegosis sections. Infestations of the aspen leaf beetle shifted northward to include the Porcupine Mountain area where it severely skeletonized trembling aspen and balsam poplar that had refoliated after being almost completely stripped by the forest tent caterpillar. Declining populations of both the spruce budworm and balsam-fir sawfly were recorded in old infestation areas, but there was a general increase in numbers of larch sawfly throughout most of the District.

Leaf blights of trembling aspen and balsam poplar increased notably and by late summer had caused severe coloration and early leaf fall. Light infections of elm leaf spot were common throughout the southern sections. Other previously reported tree diseases remained either static or decreased in intensity.

Mass and special collections of insects, and samples of plant material were obtained for personnel at other laboratories. The writer acknowledges the excellent cooperation received from personnel of the National Parks Service and of the Renewable Resources Branch of the Manitoba Department of Natural Resources.

5.2 INSECT CONDITIONS

5.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):- As indicated in Fig.1, infestations increased in several areas. Defoliation of tamarack was moderate to severe along the east side of Lake Winnipegosis from Waterhen Lake north to Denbeigh Point and light to moderate in small patches throughout the Porcupine, Dawson Bay and Overflow areas. Tamarack was lightly infested throughout the Duck Mountain Forest Reserve except for scattered reproduction in the Blue Lakes section, which was moderately to severely defoliated. In Riding Mountain National Park, the infestation increased to cause moderate defoliation of small stands of tamarack in the Whitewater and Christy lakes areas and along the north shore of Whirlpool Lake, but it remained light along the south boundary.

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

Location and Plot Number	Number of Shoots Examined	Number of Curled Shoots	Infestation Rating for 1963
Norgate Road, R.M.N.P., #108	150	9	Light
Moon Lake, R.M.N.P., #114	60	1	Light
Central Road, R.M.N.P., #107	50	0	Light
Cowan, Man., #111	60	1	Light
Steepprock, Man., #104	60	1	Light

R.M.N.P. - Riding Mountain National Park

Larch sawfly cocoons were collected from 20 larval drop trays located in plot 108 at mile 14, Highway #19 in Riding Mountain National Park. These cocoons will be dissected to determine the incidence of disease and parasites.

5.2.2 Spruce Budworm, Choristoneura fumiferana (Clem):- As indicated in Fig.2, aerial and ground surveys failed to reveal any evidence of the old infestation along the east escarpment of Riding Mountain National Park, and declining populations caused only light defoliation of the new foliage of white spruce in the Elk Lake area (tp.20, rge.18, W. P. mer.). Also, the small infestations in the Overflow and Dawson Bay areas of Lake Winnipegosis declined and caused only light defoliation of the new foliage of white and black spruce and balsam fir. Several larvae were collected from black spruce in the Timberton area, but defoliation was very light.

5.2.3 Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.:- This sawfly caused light defoliation of the top two feet of black spruce along Highway #10 in the Steepprock area (tp. 44, rge. 25, W.P. mer.). A small white spruce shelterbelt, three miles west of the town of Dauphin, was 80 percent defoliated. Only occasional larvae were recorded throughout the remainder of the District.

5.2.4 White-pine Weevil, Pissodes strobi Peck.:- Light leader damage occurred in stands of young white and black spruce in Riding Mountain National Park, with the heaviest being in the Whitewater Lake, Whirlpool River and Rolling River areas. A very light infestation was also recorded on a few trees in the central part of the Duck Mountain Forest Reserve. Collections of infested white and black spruce leaders were taken from Riding Mountain National Park and forwarded to Dr. S. G. Smith of the Sault Ste. Marie Laboratory for further studies.

5.2.5 Spruce Needleworm, Dioryctria reniculella (Grote):- This needleworm was found in association with the spruce budworm on white spruce in the Overflow River area on the northwest shore of Lake Winnipegosis where it was approximately 25 percent of the total larval population. It was not found on either black spruce or balsam fir in the same area.

5.2.6 Balsam-fir Sawfly, Neodiprion abietis complex:- The infestation on Denbeigh Point on the east shore of Lake Winnipegosis declined from severe to moderate and affected only the old foliage of balsam fir. Approximately 100 acres of balsam fir were lightly to moderately defoliated in the Mossy Portage area (tp. 47, rge. 19, W.P. mer.). Numerous larval colonies were observed causing light defoliation of white spruce one mile west of Elk Lake in Riding Mountain National Park. These infestations are indicated in Fig. 4.

5.2.7 Forest Tent Caterpillar, Malacosoma disstria Hbn.:- The outbreak continued but some significant changes were recorded as indicated in Fig.6. The infestation in the Porcupine Mountain-Lake Winnipegosis area increased in severity to cause moderate to severe defoliation of nearly all broad-leaf tree species, and it spread southeastward to defoliate patches of trembling aspen at the north end of Pelican Lake, and along the west shore of Lake Winnipegosis from Fox Point to the junction of Highway #20 and the Pine River Road including Birch Island and Red Deer Point (tp. 33, rge. 18, W.P. mer.). Moderate to severe defoliation also occurred along the east side of the Lake from Meadow Portage north to Kanusk Lake, and small stands of trembling aspen between it and Cedar Lake were moderately defoliated. Farm shelterbelts and woodlots in the Swan Valley were again severely infested.

Unseasonal weather delayed larval development and probably contributed to the break up of the large infestation in the Duck Mountain area. Only patches of moderately to severely defoliated aspen were mapped along the east and northeastern slopes from Umatillo in the south to Renwer in the north and around Wellman, Glad, and Singoosh lakes and in the area bounded by Blue, Laurie, Childs and Grass Island lakes.

In Riding Mountain National Park, the old infestation virtually disappeared. Approximately 400 acres of trembling aspen along the Vermillion River Valley in townships 22 and 23, rge. 11, W.P. mer. were lightly defoliated with moderate defoliation occurring on occasional trees. Populations remained very low throughout the remainder of the Park, and in the agricultural areas to the south and east.

Mass collections of larvae and pupae (100 of each) were taken in the Steeprock Lake and Duck Mountain areas and reared in the Winnipeg Laboratory for recovery of parasites. The results indicate that parasitism by Diptera species increased notably in both areas and that by Hymenoptera species decreased. This indicates that the parasite complex is probably developing to the stage where it can become an effective factor in the control of the outbreak.

An extensive egg-band survey was conducted throughout the District in the fall to predict the extent and severity of infestations in 1964. The results as listed below indicate that the outbreak will continue in "patches" rather than in large continuous areas.

TABLE I

Forest Tent Caterpillar Egg-Band Survey
Western District of Manitoba - 1963

(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. Defol. egg- bands forecast for 1964
North Gate, R.M.N.P.	6.0	50.3	26.0	0.0 Nil
Moon Lake (3.3 mi. S.)	4.3	38.6	29.6	0.0 Nil
Jct. #10 hwy. - Audy L. Rd.	3.0	31.6	22.0	0.0 Nil
#10 hwy. - South Boundary	4.3	32.3	18.0	0.0 Nil
Golf Course, R.M.N.P.	4.0	24.3	17.6	0.0 Nil
Townsite, R.M.N.P.	3.0	30.0	10.0	0.0 Nil
Townsite, R.M.N.P.	6.6	50.0	26.6	0.0 Nil
Townsite, R.M.N.P.	4.0	21.6	16.3	0.0 Nil
Lenswood	3.6	21.6	13.6	24.0 Severe
Birch River	4.0	20.0	14.3	32.6 Severe
Novra (1 mi. N.)	4.0	28.0	24.6	15.0 Severe
Powell	6.3	43.3	21.6	8.0 Light
Parallel #53 & #10 hwy.	3.0	28.3	11.0	7.0 Moderate
Steeprock Road	3.6	30.0	16.0	8.6 Moderate
Mafeking (1 mi. S.)	3.0	29.3	18.3	0.6 Light
Bowsman (6 mi. N.)	3.6	28.3	22.0	68.6 Severe
Minnitonas (4½ mi. N.)	3.6	28.3	22.3	22.0 Severe
Laurie Lake	3.6	25.0	18.3	5.0 Light to moderate
Singoosh Lake	8.3	51.0	18.3	54.6 Severe
Winnipegosis (2.5 mi. S.)	4.0	34.0	19.3	2.3 Light
#20 hwy. & Pine River Rd.	3.6	26.6	17.6	7.0 Light
Camperville (1.5 mi. S.)	4.0	35.0	18.3	13.0 Severe
Renwer (3.5 mi. E.)	7.0	48.6	27.6	11.0 Severe
Cowan (4.2 mi. S.)	3.6	30.6	15.3	3.3 Light
Sclater (7 mi. S.)	3.0	29.0	22.3	10.6 Moderate to severe

TABLE I (cont.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. egg- bands	Defol. forecast for 1964
Pine River (4.6 mi. S.)	3.0	27.0	19.3	6.0	Moderate to severe
Swan River (2.5 mi. past)	4.3	39.0	15.0	8.3	Moderate
Ethelbert (9.2 mi. S.)	4.6	43.3	16.0	2.3	Light
Manipogo Park, Lake Man.	4.0	36.0	14.0	0.0	Nil
Skowman	3.3	30.0	17.0	5.0	Moderate
Basket Lake (5 mi. W)	4.0	15.6	13.0	0.3	Light

5.2.8 Aspen Leaf Beetle, Chrysomela crotchii Brown:- This leaf beetle continued to skeletonize the foliage of both reproduction and pole size of trembling aspen and balsam poplar throughout the District (Fig.7). Adult emergence reached a peak by June 16th and for a short time the beetles caused concern to resort operators when large numbers were collected along the beaches and lake shores. The first larval feeding was observed on June 27th and the last in early October.

Moderate to severe skeletonizing occurred within an 800 square mile area along the south, east and northeastern slopes of the Porcupine Mountain Forest Reserve. This damage was particularly significant because it occurred on the second crop of leaves that grew after the first had been completely removed by the forest tent caterpillar. Also the latter defoliation forced the adult beetles to lay many of their eggs on the trunks and branches of the trees, but good growing conditions allowed rapid refoliation that coincided with the hatching of the beetle eggs in early July.

The severe infestation previously reported in the Sclater area was reduced to small patches of skeletonizing in stands of aspen reproduction and saplings along the eastern slopes of the Duck Mountains and to woodlots in the agricultural area to the north and east.

In Riding Mountain National Park, skeletonizing was confined mainly to trembling aspen and balsam poplar reproduction growing in the right-of-ways that were originally cleared for relocation of Highway #10. Damage ranged from light to moderate except for severe that occurred in patches along Highway #10 near Clear Lake, and within some 400 acres west of Whitewater Lake.

Severe patches were also recorded along the Pine River road east to Lake Winnipegosis, at Ebb and Flow Lake at the south end of Lake Dauphin, and in the Erickson and Gladstone areas.

5.2.9 Striped Alder Sawfly, Hemichroa crocea (Fourcroy):- Larvae caused moderate to severe defoliation of speckled alder in the central part of the Duck Mountain Forest Reserve, but were not detected elsewhere. A mass collection of mature larvae was taken at Baldy Mountain and reared in the Winnipeg Laboratory for parasites. To date, only the Tachinid Bessa harveyi (Tnsd.) has been recovered but other parasite species are expected as the overwintering emergence period progresses.

5.2.10 Aspen Blotch Miner, Lithocolletis salicifoliella Chamb.:- This miner occurred commonly on trembling aspen reproduction, but caused only light damage. The highest concentrations were recorded at Moon Lake and along the Rolling River road in Riding Mountain National Park, at Otter Lake, Overflow River, Red Deer River, and in central portion of the Duck Mountain Forest Reserve.

5.2.11 European Alder Leaf Miner, Fenusa dohrmii Tischb.:- In Riding Mountain National Park, foliage damage by this leaf miner was severe on speckled alder in the Clear Lake area, moderate in the Moon Lake area, and light along the Norgate and Rolling River roads. Elsewhere in the District, damage was severe in the Baldy Mountain area of the Duck Mountain Forest Reserve, and light in a small area about twelve miles east of Pine River (tp.33,rge.21, W.P.mer.), throughout the Porcupine Mountain area, and northward to the Overflow River.

5.2.12 Prairie Tent Caterpillar, Malacosoma lutescens (N.&D.):-- Population declines were noted throughout the District in 1963. The most significant occurred in the Grandview and Alonsa areas where infestations were reduced from severe to light. Slight reductions occurred in the Lake Audy area of Riding Mountain National Park, where larval predation by the beetle, Calosoma poss. frigidum was observed. Observations also indicated that egg parasitism was low in the Grandview and Alonsa areas, and somewhat higher in the Audy Lake area. Rearings in the Winnipeg Laboratory have recovered two species of egg parasites to date, Tetrastichus malacosomae Grlt. and Telenomus sp.

5.2.13 Spiny Elm Caterpillar, Nymphalis antiopa (L.):-- American elm, willow and balsam poplar reproduction are the main hosts of this caterpillar and it was found in the Riding and Duck Mountain areas and near Hamiota. In the Riding Mountains, severe defoliation of willow and poplar was recorded along the Rolling River road, and numerous colonies were observed on ornamental elms in Wasagaming; in the Duck Mountains, light defoliation of shrubs and bushes occurred in the central part. Elsewhere in the District, populations were low, causing only scattered patches of light defoliation.

5.2.14 Bark Beetles and Wood Borers:- Various collections and observations were made as follows:-

Insect Species	Host(s)	Location(s)	Remarks
<u>Aegeria tibialis</u> (Harris) (A clear-wing moth)	tA, bPo, roots	Millwood and Sclater	Common on open grown reproduction
<u>Conopia bolteri</u> (Hy. Edwards) (A clear-wing moth)	W	McCreary, Kelwood, Birtle	Low populations
<u>Dendroctonus simplex</u> Lec. (Eastern larch beetle)	tL	Cowan	Severe infes- tation on dying trees
<u>Ips pini</u> Say (Pine engraver)	jP	Cowan	Infested scattered, dying trees
<u>Magdalis armicollis</u> (Say) (Red elm bark weevil)	wE	McCreary	A single collection
<u>Monochamus scutellatus</u> (Say) (White-spotted sawyer)	wS	All forested areas	Infested logs and wind thrown trees
<u>Oberea schaumii</u> Lec. (A poplar twig borer)	tA	Throughout District	Moderate infes- tations at Ethelbert, Mafeking and Millwood
<u>Saperda calcarata</u> Say (Poplar borer)	tA, bPo	Throughout District	Most common in farm woodlots, heavy in root collars at Sclater and Millwood
<u>Saperda moesta</u> Lec. (a poplar twig borer)	bPo	Throughout District	Caused some leader and branch mortality
<u>Saperda concolor</u> Lec. (A poplar borer)	W		Severe in field- shelter belts & thickets in agricultural area
<u>Saperda tridentata</u> (Olivier) (Elm borer)	wE	McCreary and Gladstone	Recovered from dead and dying trees
<u>Siricid</u> spp. (Horntails)	bF	Riding Mountain National Park	Collected from dying balsam along east escarpment

5.2.15 Other Noteworthy Insects:-

<u>Insect</u>	<u>Host(s)</u>	<u>Location(s)</u>	<u>Remarks</u>
<u>Acleris variana</u> Fern. (Black-headed budworm)	wS, bF	Riding Mountain National Park and Overflow River area	Low populations; very light defoliation
<u>Acrobasis betulella</u> Hulst. (Birch tube maker)	wB	Lake Winnipegosis & Pine River areas	Commonly collected; damage light
<u>Acrobasis rubrifasciella</u> Pack. (A leaf-roller)	spAl	Pine River area	Low populations; no defoliation
<u>Acronicta dactylina</u> Grt. (A dagger moth)	tA,W	Riding Mountain National Park and Porcupine Forest Reserve	Low populations at widely scattered points
<u>Acronicta impressa</u> Wlk. (A dagger moth)	W	Riding Mountain National Park	Collected in the Moon Lake area
<u>Altica populi</u> Brown (A poplar flea beetle)	spAl, bPo	Riding Mountain National Park, Cowan and Duck Mountain Forest Reserve	Severe defoliation in eastern section R.M.N.P.; light in the Duck Mtn. area
<u>Anoplonyx canadensis</u> Hgtn. (A sawfly)	tL	Riding Mountain National Park	Low populations; caused no defoliation
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Riding Mountain National Park, Duck Mountain Forest Reserve and Cowan areas	Low populations; no defoliation observed
<u>Cinera</u> spp. (Aphids)	tA, bPo,sW, jP,sB	Throughout District	Scattered populations infesting nearly all shrub and tree hosts
<u>Archips cerasi vorana</u> (Fitch.) (Ugly nest caterpillar)	cCh	Throughout District	Light infestations at scattered points
<u>Archips fervidana</u> (Clem.) (Oak webworm)	bO	Ebb and Flow area	Light localized infestation
<u>Choristoneura conflictana</u> (Wlk.) (Large aspen tortrix)	bPo	Overflow River area	Very low popula- tions; no noticeable damage

5.2.15 Other Noteworthy Insects:-(cont.)

Insect	Host(s)	Location(s)	Remarks
<u>Chrysomela knabi</u> Brown (A leaf beetle)	spAl, wB	Riding Mountain National Park and Valley River tower	Low populations; light skeletonizing of foliage
<u>Caliroa</u> sp. (A sawfly)	bO	Broken Pipe Lake	Light skeletonizing of foliage
<u>Corythucha arcuata</u> (Say) (Oak lace bug)	bO	Ebb and Flow and Broken Pipe Lake	High populations caused noticeable browning of foliage
<u>Croesus latitarsus</u> Nort. (Dusky birch sawfly)	wB	Riding Mountain National Park	Low populations; very little defoliation
<u>Dichelonyx backi</u> Kby. (Green rose chafer)	tA	Duck Mountain Forest Reserve	Found on aspen reproduction at Laurie Lake; light damage
<u>Eriophyes</u> sp. (A gall mite)	gAs	Camperville	Heavy infesta- tion in one tree
<u>Epicauta subglabra</u> (Fall.) (Caragana blister beetle)	Misc.	Porcupine Forest Reserve, Birtle	Several collec- tions from various host plants
<u>Itame loricaria</u> Evers. (A looper)	tA	Generally dis- tributed through- out District	Low populations, no noticeable defoliation
<u>Galerucella decora</u> Say (Gray willow-leaf beetle)	bPo, W, tA	Throughout District	Light popula- tions at locations
<u>Gonioctena americana</u> (Schaeff.) (American aspen beetle)	tA	Riding Mountain National Park and Duck Mountain Forest Reserve	Light defoliation of aspen repro- duction in the Minnitonas area
<u>Hylobius</u> sp. (A root weevil)	scP	Riding Mountain National Park	Light infestation in a plantation in the Whirlpool River area
<u>Halisidota maculata</u> (Harr.) (Spotted tussock moth)	spAl, bPo	Riding Mountain National Park, Overflow River	Low populations, no defoliation observed

5.2.15 Other Noteworthy Insects:-(cont.)

Insect	Host(s)	Location(s)	Remarks
<u>Lepyrus palustris</u> Scop. (A weevil)	W,tA, bPo, wS,Do	Throughout District	Adults only collected; no damage observed
<u>Lopidea dakota</u> Knight (Caragana plant bug)	W, bO caragana	Riding Mountain National Park, Swan River, Russell	Adults only collected
<u>Lytta nuttallii</u> Say (Nuttall blister beetle)	caragana Misc.	Noura, Roblin	Infestations local, foliage damage light
<u>Malacosoma pluviale</u> (Dyar) (Western tent caterpillar)	cCh	Overflow River	A single larval collection
<u>Nematus ventralis</u> Say (A sawfly)	W	Duck Mountain Forest Reserve	Caused moderate to severe defol. in localized areas
<u>Neodiprion nanulus nanulus</u> Schedl. (Red pine sawfly)	jP	Cowan	Very low populations
<u>Neodiprion pratti banksianae</u> Roh. (Jack-pine sawfly)	jP	Riding Mountain National Park	Low populations in Lake Ann area
<u>Nycteola cinereana</u> N. & D. (A defoliator)	bPo	Riding Mountain National Park, Dawson Bay, Pine River	Low populations; light to moderate defoliation of foliage on leaders
<u>Nycteola frigidana</u> Wlk. (A defoliator)	bPo	Duck Mountain Forest Reserve	Light damage
<u>Operophtera bruceata</u> (Hulst) (Bruce spanworm)	tA	Duck Mountain Forest Reserve	Very low populations
<u>Pissodes</u> sp. (A weevil)	jP	Novra	Larvae attacking the root collars of reproduction; infestation light
<u>Periclista albicollis</u> Nort. (A sawfly)	bO	Ebb and Flow, and McCreary areas.	Low populations; light defoliations

5.2.15 Other Noteworthy Insects:-(cont.)

Insect	Host(s)	Location(s)	Remarks
<u>Petrova albicapitana</u> (Busck) (Pitch nodule maker)	jP	Duck Mountain Forest Reserve	Low populations in plantations
<u>Phenacaspis pinifoliae</u> (Fitch.) (Pine needle scale)	wS, jP	Dauphin, Pine River and Overflow	Light in forested areas; severe infestations on shelterbelts at Dauphin & Pine River
<u>Physokermes piceae</u> (Schrank) (Spruce bud scale)	wS	Throughout District	Light infestations in all white spruce stands
<u>Phytophaga rigidae</u> (Osten Sacken) (Willow beaked-gall midge)	W	Throughout District	Low populations; scattered, light damage
<u>Pontania</u> sp. (A sawfly)	bPo	Throughout District	Light damage to the foliage of reproduction
<u>Proteoteras willingana</u> (Kearfott) (Boxelder twig borer)	mM	Birtle and Denbeigh Point	Low populations; damage light
<u>Pleroneura borealis</u> Felt. (Balsam shoot-boring sawfly)	bF	Duck Mountain Forest Reserve	Populations declined from 1962; only a trace noted
<u>Rhabdophaga strobiloides</u> (Walsh) (A gall insect)	W	Throughout District	Low, scattered populations
<u>Retinodiplosis resinicola</u> (O.S.) (A midge)	jP	McCreary	Moderate infesta- tions on open growing trees
<u>Semiothisa sexmaculata</u> Pack. (A looper)	tL	Riding Mountain National Park	Low populations found in all tamarack stands

5.3 TREE DISEASE CONDITIONS

5.3.1 White Pocket Rot, Polyporus tomentosus Fr. and P. tomentosus var. circinatus:- Observations were limited to collecting sporophores. In Riding Mountain National Park, P. tomentosus and P. tomentosus var. circinatus were collected at Edwards Lake and P. tomentosus only at Greyling Lake and Clear Lake. The roots of several white spruce examined at Elk, Moon and Cripple lakes were infected by this disease but no sporophores were found. Examination of white spruce at Laurie Lake in the Duck Mountain Forest Reserve produced negative results.

5.3.2 Mortality of Balsam Fir:- Aerial surveys of the District indicated a slight increase in the incidence of dead balsam fir. In addition to the mortality previously recorded on the east escarpment of the Riding Mountains, single or groups of trees, either dead or dying, were noted in the following locations: east shore of Red Deer Lake, north and east shores of Lake Winnipegosis, Red Deer Point on Lake Winnipegosis, Mafeking and Overflow River areas, eastern slopes of the Duck Mountains, Salt Point on Dawson Bay, north end of Pelican Lake, Birch Island, Lake Winnipegosis, west shore of Lake Winnipegosis, Duck Bay, Camperville area, and at Island Lake. Preliminary investigations have suggested that this condition is related to a complex of factors including adverse weather conditions.

5.3.3 Mortality of Tamarack:- Several small stands of dead tamarack were recorded along the east shore of Lake Winnipegosis from Denbeigh Point south to Inland Lake, on the east shore of Birch Island, and between Pelican Lake and Fox Point. A stand of tamarack two miles south of Cowan is now about 80 percent dead. The cause of mortality was not determined, but may be the effect of severe drought in 1961.

5.3.4 Mortality of White Birch:- Mortality of white birch occurred throughout most of the District. In 1963, dead and dying trees were recorded along the north and east shores of Lake Winnipegosis, on Birch Island and Red Deer Point, along the slopes of the Duck Mountains west of Sclater and Garland, and along the east and north escarpments of the Riding Mountains. Mortality usually occurred in small patches and was limited to single trees or small groups.

5.3.5 A Leaf Spot on Balsam Poplar, Septoria sp.:- Infections occurred on the foliage of balsam poplar throughout the District. The most severe discoloration accompanied by early leaf fall occurred in the area south and east of Birch River, in the Grandview and Baldy Mountain areas, Shergrove area, the Whitewater Lake area of Riding Mountain National Park, and the Rossburn-Birdtail area.

5.3.6 Spruce Mistletoe, Arceuthobium pusillum Pk.: - Light branch and tree mortality accompanied heavy infections on black spruce growing in "bogs" in the Steeprock-Mafeking area. Aerial surveys of the north shore of Dawson Bay between the Overflow River and Denbeigh Point revealed many pockets of very heavily broomed black spruce that had died. A stand of white spruce in tp. 48, rge. 25, W.P. mer., was heavily broomed and some dead trees were observed. A small pocket of heavily broomed black spruce was also recorded (tp. 34, rge. 18, W.P. mer.) on Red Deer Point in Lake Winnipegosis.

5.3.7 Macrophoma Gall on Poplars, Macrophoma tumefaciens Shear.: - Macrophoma galls in association with Cucurbitaria staphula were collected from both trembling aspen and balsam poplar. Samples were submitted from Proulx Lake, Waterhen River, and Alonsa.

5.3.8 Frost Damage: - Low temperatures and late snowfall caused light damage to the foliage of deciduous trees and shrubs in some areas. The most notable occurred on aspen and white birch on the south slopes of the Duck Mountains, and on aspen and chokecherry at Alonsa and Erickson.

5.3.9 Aspen Twig and Leaf Blight, Pollaccia sp.: - This blight lightly infected the leaders of trembling aspen reproduction in open areas at several points in the District. Samples and observations were made at Elk Lake and Whitewater Lake in Riding Mountain National Park and at Blue lakes and Singoosh Lake in the Duck Mountain Forest Reserve. No damage was observed in the Porcupine Forest Reserve area.

5.3.10 Poplar Ink Spot, Sclerotium sp.: - This disease occurred throughout the Riding Mountain National Park where the foliage of open-growing aspen reproduction was moderately infected at several locations. Damage was particularly noticeable one mile west of Elk Lake and in the Whitewater Lake area where moderate "shot hole" damage occurred. Light damage was recorded on reproduction along roadsides in the Deer Lake area.

5.3.11 Malformation of Manitoba Maple Shoots and Foliage:- Surveys were continued throughout the agricultural areas to detect damage caused by herbicides (2,4-D) to Manitoba maple and typical symptoms were found in all of the areas examined. The following is a summary of the areas examined and the severity of damage encountered.

TABLE 2

2,4-D Injury to Manitoba Maple
Western District of Manitoba - 1963

Location	Date	Degree of Injury	Remarks
Grandview 12-28-26 W.P.mer.	July 2	Part of one side of trees damaged.	All tree species in area affected.
Russell 12-21-29 W.P.mer	July 3	Part of one side of trees damaged.	Occurred only on Manitoba maple.
Assiniboine Valley west of Russell 11-21-20 W.P.mer.	July 3	All of one side of trees damaged.	Other tree species also affected.
Harrowby 29-20-29 W.P.mer.	July 3	Part of one side of trees damaged.	Manitoba maple shelterbelt.
Foxwarren 24-18-28 W.P.mer.	July 3	Part of both sides of the trees damaged.	Manitoba maple shelterbelt.
Foxwarren 11-18-28 W.P.mer.	July 3	Part of one side of trees damaged.	Manitoba maple shelterbelt.
Gladstone 29-14-11 W.P.mer.	July 4	Part of one side of trees damaged.	Manitoba maple shelterbelt.
Amaranth 35-18-12 W.P.mer.	July 4	Part of one side of trees damaged.	All tree species affected.
Shoal Lake 28-16-23 W.P.mer.	July 16	Part of one side of trees damaged.	Manitoba maple shelterbelt.
Hamiota 31-13-23 W.P.mer.	July 16	Entire tree damaged.	Manitoba maple shelterbelt.

5.3.12 Other Noteworthy Diseases:-

<u>Organism and Disease</u>	<u>Host(s)</u>	<u>Location(s)</u>	<u>Remarks</u>
<u>Camarosporium caraganae</u> (A stem disease)	caragana	Riding Mountain	Patchy mortality in field shelter-belt
<u>Chrysomyxa pirolata</u> Wint. (Spruce cone rust)	wS, bS	Riding Mountain National Park	The moderate infection of cones recorded in 1962 subsided and only a trace was found in 1963
<u>Coniophora puteana</u> (Schum. ex Fr. Karst.) (Brown cubical butt rot)	wS	Duck Mountain Forest Reserve	Single collection from wind thrown tree
<u>Cronartium ribicola</u> Fischer (White pine blister rust)	Black currant	Dropmore	A single collection in a nursery
<u>Fomes pini</u> (Thore ex. Pres.) Lloyd (Red ring rot)	wS	Riding Mountain National Park	Collected from the Greyling Lake area
<u>Gnomonia ulmea</u> (Schw.) Thum (Elm leaf spot)	wE	Gladstone	Foliage of shelter-belt and shade trees commonly infected
<u>Macrophoma</u> sp. (A needle cast)	bF	Duck Mountain Forest Reserve	Light infection in the Baldy Mountain area
<u>Marssonnia</u> sp. (A leaf spot)	tA	Riding Mountain National Park	Common, but light infection
<u>Melanspora bigelowii</u> Thum (Larch-willow rust)	W	Riding Mountain National Park	Common on clumps of willow bushes at Lake Katherine
<u>Peridermium harknessii</u> Moore (Western gall rust)	jP	Riding Mountain National Park, Duck Mountain Forest Reserve	Common in the central part of the forest reserve and along the Rolling River Road
<u>Polyporus volvatus</u> Pk. (A pouch fungus)	wS	Riding Mountain National Park	Occasionally found on standing dead trees
<u>Rhizoshaeria</u> sp. (A needle cast)	bF	Riding Mountain National Park	Collections taken from McKinnon Creek area

6. ANNUAL DISTRICT REPORT
NORTHERN DISTRICT OF MANITOBA

1963

by

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CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March, 1964

6.1 INTRODUCTION

Surveys of forest insects and diseases were conducted from May 15 to October 11; 408 insects and 48 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. Approximately 15,360 square miles of the District were covered by aerial surveys requiring 36 hours of flying time in chartered aircraft and 15 hours in Provincial Government aircraft. The assistance and co-operation received from the Renewable Resources Branch of the Department of Natural Resources and the Manitoba Government Air Service are gratefully acknowledged.

Weather from May 15 to early in June was generally cooler than normal, and recorded temperatures for this period ranged from a low of 26°F. to a high of 60°F. with freezing rain and snow usually accompanying the lower temperatures. Although this had some effect on larval development, especially the forest tent caterpillar, there was no evidence of any adverse effects on tree growth.

There was little change in the distribution of the forest tent caterpillar in 1963, but larval populations were much lower except in the Flin Flon and Bakers Narrows areas. High populations of the spruce budworm persisted through the Namew Lake infestation and along the Churchill River, but defoliation was less conspicuous than in 1962 due to excellent foliage and shoot growth. The birch skeletonizer caused severe skeletonizing of white birch foliage in stands along the Churchill River between Southern Indian Lake and the Manitoba and Saskatchewan boundary and in the vicinity of Flin Flon and Bakers Narrows. A marked increase in the larch sawfly populations occurred in tamarack stands in the northern section of the District.

Surveys of the Thompson Smoke Easement Area were conducted in early July and damage to the foliage of balsam poplar and white birch by sulphur dioxide fumes was confirmed at three points. This represents the first time that injury from fumes has been detected since the beginning of the Smelter operations in 1961.

The following sub-projects and special sampling methods were continued: (1) 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 for disease and parasite studies; (5) sequential sampling of larch sawfly eggs for population estimates; and (6) the occurrence of several species of rusts and their alternate hosts.

6.2 INSECT CONDITIONS

6.2.1 Spruce Budworm, Choristoneura fumiferana (Clem.):- Observations indicated that below normal temperatures during the latter part of May and early June had no adverse effect on the larval development of the spruce budworm, and high populations continued to persist in the Namew Lake infestation and in several smaller infestations on the Churchill River (Fig. 2). However, excellent foliage, shoot and leader growth on both spruce and balsam fir made defoliation less conspicuous. Elsewhere in the District, only an occasional larva was taken and defoliation was negligible.

Aerial surveys and observations covering approximately 3,136 square miles through the Namew Lake infestation, were conducted in early July. Predetermined flight lines were flown at eight mile intervals (Fig. 3) to determine the incidence of mortality of spruce and balsam fir caused by spruce budworm feeding. Infestation boundaries were also mapped and the only extension occurred in the Cranberry-Simonhouse lakes area where an additional five square miles of spruce-balsam fir stands were effected, representing the smallest annual increase since 1953.

Some host-tree mortality was observed in small patches of less than 5 acres on the north shores of Goose and Athapapuskow lakes and at the north end of Missi Island in Amisk Lake (the latter two areas were ground checked). The appearance and condition of spruce and balsam fir in these areas was similar to those in the Sturgeon-Wier and Saskoba Lake areas where host mortality has been recorded during the past several years.

Current defoliation of spruce and balsam fir along the Churchill River was less conspicuous than in 1962. However, scattered patches of pronounced reddening of foliage was evident in the immediate vicinity of Sisipuk Lake and on a small island in Kipahigan Lake about twenty miles to the south; the latter representing the first time that this insect has been detected at infestation level in this area.

The final results of the egg-mass sampling in the Namew Lake area are not yet available, but preliminary results indicate that the infestation will continue within the same areas and at about the same levels as in 1963.

6.2.2 Larch Sawfly, Pristiphora erichsonii (Htg.):- Aerial surveys with accompanying ground checks, revealed a marked increase in populations in the northern section of the District, where moderate to severe defoliation was recorded in the tamarack bogs occurring in two areas (Fig.2). One of the latter extended from Chipewyan Lake on the South Seal River north through Tadoule and Shethanie

lakes, and along the Wolverine River to Nejanilini and Baralzon lakes. The other extended from the south end of Nueltin Lake to Eganolf Lake and west along the North Seal River to Le Pensie Lake on the Cochrane River. North of this section along the Manitoba and Northwest Territories boundary defoliation was light.

Defoliation throughout the southern sections was light except for moderate in small stands of tamarack between Prospector and Root Lake and about fifteen miles south of Denare Beach in northern Saskatchewan. An occasional tree was also moderately defoliated east from The Pas to Cedar Lake.

Excellent foliage, shoot and leader growth was evident in all young stands of tamarack examined. Mass collections of cocoons were taken at two permanent plots to determine the incidence of parasites and disease, and egg population counts were continued in four plots. The results of the latter are summarized below:

Plot No.	Place	No. of shoots examined	No. of curled shoots	Infestation ratings - 1963
101	The Pas	60	1	light
102	Cranberry Portage	70	2	light
103	Amisk Lake	80	3	light
105	The Bog	50	0	light

6.2.3 Black-headed Budworm, Accleris variana (Fern.):— This insect was generally found in all spruce and balsam fir stands but caused only very light defoliation (Fig.5). Larvae were most abundant on white spruce at Witchai, Wintering, Cross and Sipiwek lakes.

6.2.4 Balsam-fir Sawfly, Neodiprion abietis complex:— Larval populations were much lower than in 1962 in the vicinity of Setting, Wintering and Cross lakes and only traces of defoliation occurred on old foliage of black and white spruce and balsam fir (Fig.4). Elsewhere only an occasional larva was taken, and in all instances defoliation was very light.

6.2.5 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— Light defoliation of open growing white spruce occurred in the Atikameg Lake and Orok areas, and very light populations causing no serious defoliation on white and black spruce as far north as Chipewyan Lake.

6.2.6 Green-headed Spruce Sawfly, Pikonema dimmockii (Cress.):— Usually associated with the yellow-headed spruce sawfly and occurring in small numbers in the areas mentioned in section 6.2.5.

6.2.7 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— Populations of this important defoliator of trembling aspen declined considerably. There was little notable change in distribution but defoliation was patchy, particularly in the Atikameg and Rocky lakes areas of Manitoba and at the south end of Amisk Lake in Saskatchewan (Fig.6). Observations indicated that below normal temperatures accompanied by snow, rain, and high northwest winds during the early part of the season had a deleterious effect on the newly emerged caterpillars.

Defoliation was light in the area from The Bog north to Westray and in the Pasquia River area, and moderate to severe in the vicinity of Youngs Point, The Pas, Radio Range and Orok. Patches of moderate to severe defoliation occurred in the Atikameg Lake and Prospector areas with an area (about twenty-five acres) of complete defoliation along the Carrot River road at the Manitoba and Saskatchewan boundary. Defoliation was light from Prospector north to approximately ten miles south of Cranberry Portage, severe north through Baker's Narrows, Paradise Lodge, Long Lake to Flin Flon, and then moderate to Kipahigan Lake. Small patches of moderate to severe defoliation were observed along the Churchill River from Pukatawagan through Highrock, Burntwood and Granville lakes. At Reed Lake defoliation was also moderate to severe, but it was light to moderate east through Tramping, Wekusko, Snow, Stull, Chisel and Osborne lakes. East of The Pas to Cedar and Moose lakes areas defoliation was generally moderate with an occasional patch of severe in the vicinity of Little Fish Lake.

Refoliation of trembling aspen was normal throughout the infestation but in some localized areas, the new foliage was skeletonized by the aspen leaf beetle. Diseased larvae of the forest tent caterpillar were taken at Radio Range, Root Lake and Baker's Narrows and sent to the Winnipeg laboratory for further studies. The parasitic fly, Sarcophaga aldrichi (Park.) occurred at various population levels through most of the infested areas, the highest being in the Radio Range and Simonhouse Lake areas. Adult moth flights, which were common in The Pas area in early July in 1962, were not observed this year.

Mass collections of late instar larvae and pupae were taken at The Pas and Rocky Lake areas to determine the incidence of parasites. The results, based on mass rearings of sound larvae and pupae only, are summarized on the following page:

<u>Area</u>	<u>Type of collection</u>	<u>No. of specimens</u>	<u>Percentage of parasitism by</u>	
			<u>Diptera sp.</u>	<u>Hymenoptera sp.</u>
The Pas	larvae	113	19.2	0.0
	pupae	100	51.0	0.0
Rocky Lake	larvae	110	14.3	0.0
	pupae	100	66.0	0.0
Paradise Lodge	larvae	111	14.4	0.0

Egg-band surveys were carried out at pre-determined sampling points throughout the infestation areas to predict the extent and severity of defoliation in 1964. Results, as shown below, indicate that the infestation will continue in most areas where it occurred in 1963, but at slightly reduced population levels.

TABLE I

Forest Tent Caterpillar Egg-band Sampling - 1963
Northern District of Manitoba
(based on examination of 3 co-dominant
trembling aspen at each sampling point)

Sample Point No.	Location	Summary of Egg-band Counts				
		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 1964
1	Pasquia River Road	3	28	16	7.0	moderate
2	Pasquia River Road	4	40	23	7.3	moderate
3	Westray	3	30	18	1.6	light
4	Atikameg Lake	4	30	24	16.3	severe
5	Atikameg Lake	4	33	22	30.3	severe
6	Atikameg Lake	3	29	17	24.0	severe
7	Rocky Lake	4	30	21	4.0	light
8	Rocky Lake	3	32	19	4.0	light
9	Root Lake	3	25	13	2.6	light
10	Reed Lake	4	29	16	20.6	severe
11	Osborne Lake	4	37	20	1.6	light
12	Snow Lake	3	32	25	6.6	moderate
13	Wekusko Lake	3	31	22	4.6	moderate
14	Little Fish Lake	4	37	30	29.6	severe
15	Prospector	2	27	18	15.3	severe
16	Simonhouse Lake	4	30	20	21.6	severe
17	Radio Range	3	29	20	10.6	severe
18	The Pas	4	39	23	28.0	severe
19	Flin Flon	3	29	20	35.6	severe
20	Cranberry	4	35	19	13.3	severe

6.2.8 Birch Skeletonizer, Bucculatrix canadensisella Chamb:-
A new outbreak of this insect caused moderate to severe skeletonizing of the foliage of white birch in young stands from the Manitoba and Saskatchewan boundary on the Churchill River east through Highrock and Granville lakes to the south end of Southern Indian Lake (Fig.8). The highest larval concentrations occurred in the Highrock Lake area, where discoloration of the foliage was most conspicuous and easily discernable from the air. Small localized infestations also occurred in the vicinity of Sisipuk Lake, Flin Flon, and Baker's Narrows.

6.2.9 Large Aspen Tortrix, Choristoneura conflictana (Wlk.):-
Populations remained low. Collections containing only single larva and/or pupae were taken from trembling aspen, willow and alder in the vicinity of Snow and Ospwagan lakes, and at the south end of Denare Beach in Saskatchewan.

6.2.10 Poplar Flea Beetle, Altica populi Brown:- Occurred on most alder examined between Westray and Sisipuk Lake. The highest concentrations of larvae and adults were noted on alder in the vicinity of Westray and Goose Lake, and between Wekusko and Snow Lake where skeletonizing of the foliage ranged from light to moderate. Small numbers of larvae and adults were also taken from white birch and willow at these locations.

6.2.11 Aspen Leaf Beetle, Chrysomela crotchi Brown:- Infestations were generally light and confined to the southern section of the District. Skeletonizing of aspen foliage was recorded in the vicinity of Flin Flon, Orok and Radio Range areas. Larvae and adults were occasionally collected from balsam poplar, alder and willow but no serious defoliation was recorded on these species.

6.2.12 American Aspen Beetle, Gonioctena americana Schaeffer:-
Larval feeding caused light defoliation of trembling aspen at The Pas, Orok, Radio Range and Root Lake. One adult was taken from black spruce at Chipewyan Lake in the northern section of the District.

6.2.13 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Acrobasis betulella</u> Hulst. (Birch tube maker)	wB	Orok and north to Baker's Narrows	Light defolia- tion (continuous or patches?)
<u>Agrilis anxius</u> Gory (Bronze birch borer)	wB	The Pas north to Flin Flon	Light population
<u>Amouronematus</u> sp. (A sawfly)	puW	Entire District	Most collections from the northern part of the District; light populations
<u>Anoplonyx canadensis</u> Hgtn. (A sawfly)	tL	Little Duck Lake	A trace of defoliation
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Westray	Light populations
<u>Arge pectoralis</u> (Leach) (Birch sawfly)	spAl	The Pas	Light populations
<u>Chrysomelid</u> sp. (A leaf beetle)	puW misc.	Sipiwesk and Patrick lakes	A few patches of light skeletonizing
<u>Dioryctria abietivorella</u> (D. & S.) (A coneworm)	bS	Lynn and Eyre lakes	Cones lightly infested
<u>Dioryctria reniculella</u> (Grote) (Spruce coneworm)	wS, bS	Southern section of the District	Light popula- tions; no defol- iation
<u>Fenusa dohrmii</u> (Tischbein) (European alder leaf miner)	spAl	Wekusko Lake and Barrington River	Foliage lightly infested
<u>Galerucella decora</u> (Say) (Gray willow-leaf beetle)	puW, bPo	Atikameg to Wintering Lake	Low populations
<u>Gracillarid</u> sp. (A blotch miner)	puW, bPo, wB	Entire District	Light feeding damage in localized areas
<u>Itame loricaria</u> Evers. (A looper)	tA puW	The Pas, Snow Lake and Cranberry Portage	No noticeable defoliation

6.2.13 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Lithocolletis salicifoliella</u> Chamb. (Aspen blotch miner)	tA	Westray, The Pas and north to Sisipuk Lake	Light infestations
<u>Malacosoma lutescens</u> (N. & D.) (Prairie tent caterpillar)	cCh	The Pas, Orok and Atikameg Lake	Light to moderate defoliation
<u>Malacosoma pluviale</u> (Dyar) (Western tent caterpillar)	puW, wB	Westray, The Pas, Flin Flon and Denare Beach	Light defoliation; most common on willow
<u>Neodiprion nanulus nanulus</u> Schedl. (Red-pine sawfly)	jP	The Pas, Orok and Egg, Patrick and Walker lakes	Light defoliation of individual trees
<u>Neodiprion pratti banksianae</u> (Roh.) (Jack-pine sawfly)	jP	Walker Lake	Light defoliation of individual trees
<u>Neodiprion virginiana</u> complex (Red-headed jack pine sawfly)	jP	Radio Range, Cranberry, Tramping and Amisk lakes	Low populations
<u>Nycteola frigidana</u> Wlk. (An owlet moth)	puW bPo	Northern section of the District	Common in the Paint Lake area
<u>Pontania</u> sp. (A sawfly)	tA, puW, bPo	Northern section of the District	Larvae common, caused light defoliation
<u>Rhyacionia busckana</u> Heinrich (A tip moth)	jP	Walker Lake	Light to moderate damage to current shoot growth of one tree
<u>Saperda concolor</u> Lec. (A long-horned wood borer)	puW, bPo	Entire District	Light twig damage in all areas
<u>Semiothisa granitata</u> Gn. (Green spruce looper)	wS, bS	The Pas and Sipiwek Lake	Low populations, no defoliation
<u>Semiothisa sexmaculata</u> Pack. (Green larch looper)	tL	Chipewyan, Delpé, Egg, Nueltin and Little Duck lakes	Low populations, no defoliation
<u>Tetralopha asperatella</u> (Clem.) (A webworm)	tA	Entire District	Larvae common, light feeding damage

6.3 TREE DISEASE CONDITIONS

6.3.1 Yellow Witches' Broom, Melampsorella coloradense:- New and old brooms occur commonly on white and black spruce throughout the District, but are most conspicuous on black spruce near Witchai Lake and between Highrock and Granville lakes in the northern section. Occasional dead trees supporting several brooms were observed throughout the latter area in 1963.

6.3.2 Spruce Needle Rust, Chrysomyxa sp.:- Only a trace of needle rust infection was observed on white and black spruce throughout the District. It was recorded on black spruce at Le Pensie Lake, north of Brochet for the first time.

6.3.3 Globose Gall Rust, Peridermium harknessii J. P. Moore:- Light infections occurred on young jack pine between Wekusko and Snow Lake and near Westray, but was not detected elsewhere in the District.

6.3.4 Larch Rust, Melampsora bigelowii Thum.:- This leaf rust of larch, which has its alternate stage on willow, is not considered serious. It occurred on most willow foliage examined throughout the District. Infection was light except in the Chipewyan and Little Duck lakes areas, and at several points along the Seal River where it ranged from moderate to severe.

6.3.5 Tar Spot, Rhytisma salicinum (Pers.) Fr.:- Tar spots occurred commonly on the foliage of willow throughout the District and at the north end of Nueltin Lake in the Northwest Territories. Infections were light and collections were taken in the vicinity of Snow Lake, Southern Indian Lake, Seal River, Lynn Lake, Windy River, and Root Lake

6.3.6 Other noteworthy diseases:-

Disease organism	Host	Locality	Remarks
<u>Arceuthobium americanum</u> Nutt. (Jack-pine mistletoe)	jP	Southern section of the District	Widely distributed, but no new occurrences recorded in 1963
<u>Arceuthobium pusillum</u> Peck. (Dwarf mistletoe of black spruce)	bS	The Bog, Westray, Prospector and Cranberry	No change in distribution from previous years

6.3.6 Other noteworthy diseases (cont.):-

<u>Disease organism</u>	<u>Host</u>	<u>Locality</u>	<u>Remarks</u>
<u>Coleosporium solidaginis</u> Thuem. (Pine needle rust)	jP	Root Lake	Light infection on several trees
<u>Macrophoma tumefaciens</u> Shear. (Galls on poplars)	bPo	Baker's Narrows	Light infection (Fig.9)

6.4 SUMMARY OF FOREST INSECTS AND DISEASES IN
THE THOMPSON SMOKE EASEMENT AREA, 1963

Surveys were continued for the fourth consecutive year in cooperation with the Renewable Resources Branch of the Department of Natural Resources to determine the status of forest insects and diseases throughout the Smoke Easement Area held by the International Nickel Company around Thompson. Approximately 7,488 square miles of forest stands were surveyed along pre-determined flight lines flown at twelve-mile intervals. In addition, ground checks were made at nineteen points of which ten were permanent sulphur dioxide sampling stations established by the Company.

The larch sawfly was noted in most tamarack stands, but defoliation was light except in the vicinity of Isbister Lake where it was moderate on a few trees. There was no evidence of spruce budworm feeding, but the black-headed budworm was present in small numbers throughout the area and caused light defoliation at Wintering and Sipiwesk lakes. A marked decline occurred in populations of the balsam-fir sawfly, and feeding damage was very light on the old foliage of balsam fir and spruce in old infestation areas at Setting, Wintering and Sipiwesk lakes. Some mortality of balsam fir is occurring in these areas, probably due to several consecutive years of severe defoliation. The forest tent caterpillar was less abundant, and the small isolated infestations recorded in 1962 were not as conspicuous from the air. However, moderate defoliation persisted in isolated stands adjacent to the Smoke Easement Area between Duck Lake and Wabowden, and at the south end of Threepoint Lake.

The first incidence of damage to forest stands caused by sulphur dioxide fumes from the mining smelter was recorded since the commencement of operations in 1961. Laboratory examinations of samples taken throughout the Smoke Easement Area indicated light damage to the foliage of balsam poplar at Isbister and Witchai lakes, and to white birch foliage at Natawahunan Lake. These locations are approximately 25, 35 and 20 miles northeast and east respectively of the smelter plant. There was no evidence of similar damage to the foliage of conifers in these or other areas. The status of all other forest diseases remained unchanged or decreased in severity.

Other forest insects and diseases that occurred commonly throughout the Smoke Easement Area but caused little significant defoliation or damage, are summarized in tables 2 and 3.

TABLE 2

Forest Insects - Thompson Smoke Easement Area.

Insect	Host(s)	Sampling Station No.	Remarks
<u>Aphid sp.</u> (Plant louse)	bPo, bF, spAl, wS, tA, jP	12,15,16,18, 19	Low popula- tions
<u>Chrysomelid sp.</u> (A leaf beetle)	puW Dogwood, Rose	5,8,10,12, 16,18,19	Light defoliation
<u>Gracillarid sp.</u> (A blotch miner)	bPo, spAl	8,15,17	Light leaf mining damage
<u>Nycteola frigidana Wlk.</u> (An owlet moth)	puW	5,8,9,10,15, 16,17,18	No noticeable defoliation
<u>Pikonema alaskensis (Roh.)</u> (Yellow-headed spruce sawfly)	wS, bS	16,19	Very light defoliation to individual trees
<u>Pikonema dimmockii (Cress.)</u> (Green-headed spruce sawfly)	wS	8,12,19	No noticeable defoliation
<u>Pontania sp.</u> (A sawfly)	puW, tA bPo	8,10,12,16, 18,19	Light defoliation

TABLE 3

Tree Diseases - Thompson Smoke Easement Area

Disease or organism	Host(s)	Sampling Station No.	Remarks
Needle Cast	bF, bS, tL	5,10,12	Infection light
<u>Phragmidium</u> sp. (A leaf rust)	rose	5,8,15	Light to moderate infection
<u>Polyporus betulinus</u> (Bull.) wB (Slash fungus) Fr.		5	Infection light
<u>Puccinia linkii</u> Klotzsch (Leaf rust)	highbush cranberry	8,19	Light to moderate infection
<u>Rhytisma salicinum</u> (Pers.) puW (Tar spot) Fr.		8,17	Common but infection light

Locations of the International Nickel Company's Sulphur Dioxide Sampling Stations by Numbers are as Follows:

- | | |
|--------------------------------|---------------------------------|
| No. 5 - Wintering Lake (North) | No. 15 - Harding Lake |
| No. 8 - Natawahunan Lake | No. 16 - Nelson House |
| No. 9 - Isbister Lake | No. 17 - Ospwagan Lake |
| No. 10 - Burntwood River | No. 18 - Paint Lake |
| No. 12 - Witchai Lake | No. 19 - Wintering Lake (South) |

7. ANNUAL DISTRICT REPORT
HUDSON BAY DISTRICT OF SASKATCHEWAN

1963

by

R. C. Tidsbury

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March 1964

7.1 INTRODUCTION

A cool, late spring caused retarded foliage development, particularly in that portion of the District lying north of Hudson Bay. However, near-normal weather conditions that favoured excellent growth of all tree species prevailed as the season progressed. Field work commenced in the District on May 13 and was terminated on October 30. Totals of 460 insect and 28 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively. Several special assignments and projects were carried out during the season; these included: (a) forest tent caterpillar egg-band surveys to forecast infestation intensity in 1964; (b) larch sawfly cocoon collecting, using the tray method, in one permanent tamarack plot for disease and parasite studies; (c) surveys to determine the distribution of damage caused to Manitoba maple in relation to the use of 2,4-D in weed control; (d) special collections of insect and disease material for personnel of the Winnipeg and other laboratories. Aerial surveys in the District involved approximately nine hours flying time; of these three hours and thirty minutes were by chartered aircraft and the remainder was supplied by the Saskatchewan Department of Natural Resources. Their assistance and cooperation throughout the season is gratefully acknowledged.

The numbers of major insects occurring in outbreak numbers remained the same but there were notable changes in the intensity and distribution of some. The latter was most noticeable in the case of the forest tent caterpillar whose populations decreased significantly near Carrot River and Otosquen, and north of Usherville and increased markedly in the area extending northwesterly from the junction of the Manitoba boundary and the Carrot River to Cumberland Lake. The spruce budworm infestations along the Birch River, at Belanger Lake and around Cumberland Lake continued but defoliation was less noticeable because of excellent foliage and shoot growth on both white spruce and balsam fir. Population levels of the larch sawfly and jack-pine sawflies remained about the same but those of the aspen leaf beetle and yellow-headed spruce sawfly increased. Forest disease conditions remained relatively unchanged. However, there was a slight increase in the number of infections of *Macrophoma* gall of poplars and globose gall-rusts of jack pine. The incidence of malformation of Manitoba maple shoots and foliage in relation to field spraying with 2,4-D remained unchanged, and a marked increase in mortality of trembling aspen, resulting from the severe drought of 1961, occurred in the Kelvington area.

7.2 INSECT CONDITIONS

7.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):- In general populations remained at low levels (Fig.1), and the growth of tamarack was excellent. Defoliation ranging from very light to light, occurred along the Armit road, near Peepaw Lake, Mistatim, Crooked River, Greenwater Lake Provincial Park, at the junction of the Barrier River and Highway No. 35, and in the Battle Heights and Squaw Rapids areas of the Northern District of Saskatchewan. Generally, light defoliation with a few moderate patches occurred in the vicinity of Hudson Bay, at the junction of the Roscoe River and the Armit road, near Saginas Lake, at Mile 14 on Highway No. 109, and near Peesane, Chelan, Carrot River, and throughout the Carrot River Provincial Forest. Defoliation, ranging from severe on tamarack reproduction to light on larger trees was recorded at the junction of Dagg Creek and Highway No. 9, Carrot River, Nipawin and Golburn. Areas within which some of the mature tamarack trees were heavily defoliated were located at Crooked River, Carrot River, and near the Whitefox fire tower.

Aerial surveys indicated scattered, moderate defoliation with an occasional tree showing heavy defoliation along the eastern slope of the Pasquia Hills, particularly northeast of Hudson Bay in tp.45, rge.3, W.2nd.mer.; along the Overflowing River in tp.47, rge.1, W.2nd.mer. and tp.48, rge.31, W.P.mer.; along the Pasquia River in townships 49 and 50, rge.30, W.P.mer.; and west of Turnberry in tp.51, rge.30, W.P.mer. Heavy defoliation was recorded northeast of Kennedy Lake in tp.53, rge.6, W.2nd.mer., and in several patches approximately two miles north of Goose Lake. Patches of heavy defoliation were also recorded north of North Rat Lake to Bog Lake and south to Potatoe Lake. In the Cumberland Lake area, moderate defoliation was mapped along the northwest corner of Belanger Lake.

Sequential sampling of larch sawfly egg populations, to determine population levels was continued in two permanent tamarack plots with the following results:

Plot No.	Location	No. of shoots examined	No. of shoots curled	Infestation rating-1963
101	Armit road	60	1	light
102	Peepaw Lake	70	1	light

Larch sawfly cocoons were collected along the Armit road using the larval drop-tray method, and will subsequently be dissected to determine the incidence of parasites and diseases.

7.2.2 Spruce Budworm, Choristoneura fumiferana (Clem.):- Populations remained unchanged throughout the District (Fig.2). A few larvae were collected near the Manitoba boundary and the Little Armit River and at Mile 70 on Highway No. 109, but defoliation was very light. There was no significant changes in the boundaries of the Birch River and Belanger Lake infestations, and current feeding on spruce and balsam fir was generally light and visible from the air in only an occasional patch, particularly in the spruce stand in tp.55, rge.3, W.2nd.mer. This was probably due to excellent foliage and shoot growth on white spruce in the area. Dead and dying spruce and balsam fir was observed in the Birch River infestation, affecting approximately 30 percent of the trees.

In the Cumberland Lake area, current defoliation of both balsam fir and white spruce ranged from light to moderate and ground checks indicated that populations had not declined from the 1962 levels. Current growth was also very good in this area.

7.2.3 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):- High populations of this sawfly caused moderate to severe defoliation of occasional trees in white spruce shelterbelts and ornamental plantings in the Bjorkdale, Somme, Mistatim, Peesane, Archerwill, Battle Heights, Golburn, Nipawin, Reserve, Armit, Ruby Lake, Swan Plain and Steen areas. In addition, light defoliation of ornamental white spruce was noted near Weeks. No defoliation was recorded elsewhere in the District.

7.2.4 Green-headed Spruce Sawfly, Pikonema dimmockii (Cress.):- The status of this sawfly remained unchanged and again caused no noticeable defoliation. It appeared in collections taken from white spruce in the Bertwell and Chemong areas, near Mile 13 fire tower off the Fir River road, and near the junction of Dagg Creek and Highway No. 9, and from black spruce near Veillardville.

7.2.5 Forest Tent Caterpillar, Malacosoma disstria Hbn.:- Populations of the forest tent caterpillar decreased considerably in three of the four infestations recorded in trembling aspen stands in 1962 (Fig.6). The infestation in the Pasquia Hills, which covered some 180 square miles last year, declined to very light, with only an occasional tree showing light to moderate defoliation in the western and northwest sections and along the Pasquia, Otosquen and Waskwei rivers. Similar reductions in defoliation occurred in the severe infestation previously located 22 miles southeast of Carrot River in tp.48, ranges 7 and 8, W.2nd.mer.

The boundaries of the infestation in the eastern part of the Porcupine Provincial Forest (between townships 37 and 43 and rge.1, east to the Manitoba boundary) remained approximately the same except for the southwest corner where it decreased to a two square mile patch south of the Parr Hill fire tower (tp.38,rge.1,W.2nd.mer.). The western boundaries of the infestation extended northward approximately halfway through townships 39 and 40, rge.1,W.2nd.mer. and thence northeast to the southern base of tp.44,rge.30,W.P.mer. Defoliation throughout this area was severe.

The moderate infestation that affected 25 to 30 acres south of Ushta fire tower, sec.22,tp.38,rge.5,W.2nd.mer. in 1962, decreased to very light. Elsewhere in the District, only traces of defoliation were recorded.

In the Cumberland, Belanger and Bog lakes area of the Northern District of Saskatchewan, patches of severe defoliation extended from the junction of the Manitoba boundary and Highway No. 109, west to approximately four miles west of Bog Lake and then north to Cumberland Lake.

Ground observations indicated numerous adults of the flesh-fly, Sarcophaga aldrichi Park. throughout all areas of heavy infestation. Mass collections of late instar larvae and pupae were taken near Otosquen and Parr Hill to determine the incidence of parasites and the results are shown in the following table:

Location	Type of collection	No. reared	No. of Dipterous parasites	No. of Hymenopterous parasites	Percentage effective parasitism by Dips.
Otosquen River	larvae	92	49	0	53.3
Otosquen River	pupae	94	93	0	98.9
Parr Hill	larvae	95	27	0	28.4
Parr Hill	pupae	62	52	0	83.9

Egg-band surveys were carried out at 39 locations to predict severity of infestations in 1964. The results are tabulated in Table 1.

TABLE 1

Summary of Forest Tent Caterpillar Egg Band Sampling - 1963
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 1964
Manitoba-Saskatchewan border at hwy.109	3.0	31.0	15.3	35.6	severe
2 mi.N. of Otosquen River	4.8	44.7	8.0	0.7	light
18.2 mi. N.E. of Bainbridge Lodge on hwy.109	3.5	35.6	28.0	7.3	moderate
Otosquen River	3.2	31.7	21.0	0.3	light
5.2 mi. N. of Bainbridge Lodge on hwy.109	3.8	40.0	10.7	3.7	light
Otosquen River	4.2	35.7	27.3	0.7	light
Waskwei River	4.5	45.3	9.7	1.7	light
1 mi.S. of Otosquen R.	3.0	31.7	21.0	2.0	light
11.5 mi.N. of Overflowing R.	3.2	32.3	21.7	0.0	Nil
2 mi. N. of Hudson Bay	3.2	29.3	22.3	0.0	Nil
5 mi.E. of Jct.#9 hwy. and Armit Road	3.2	32.3	21.0	2.7	light
6 mi.E. of the Erwood Corner on the Armit Road	3.8	34.7	20.7	0.0	Nil
1 mi.E. of Lussier Creek	3.5	28.0	19.3	3.3	light
1 mi.W. of Manitoba - Saskatchewan border on Armit Road	3.8	37.3	19.0	6.3	moderate
6 mi.N. of Reserve	3.7	34.3	20.0	0.0	Nil
Porcupine Provincial Forest south boundary off #9 hwy.	5.2	45.3	22.3	0.7	light
4 mi.N. of Lady Lake	9.7	28.3	16.7	0.0	Nil
11.4 mi.S.E. of Jct.#9 hwy. & Little Swan River Road	3.3	26.0	18.7	0.0	Nil
1.4 mi.S.E. of Saginas Lake	3.3	32.0	14.0	0.3	light
6.8 mi.S.E. of Parr Hill	3.3	36.3	19.3	1.7	light
1.4 mi.S. E. of Parr Hill	4.0	33.0	20.7	1.7	light
Parr Hill	6.0	42.0	18.0	21.7	severe
Parr Hill	4.5	35.7	17.3	20.3	severe
2.9 mi.S. of Porcupine Pro- vincial Forest south bound- ary off #9 hwy.	3.5	24.7	18.3	0.0	Nil
4.4 mi.W. of Prairie River	3.3	25.0	18.3	0.3	light
0.3 mi.S. of the Carrot R.	4.0	29.7	21.0	0.0	Nil
18.4 mi.E. and 5.5 mi.S. of Carrot River	4.2	31.0	25.0	0.0	Nil

TABLE 1 (cont.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg-bands per tree	Defoliation forecast 1964
4.4 mi.N. of Smoky Burn	3.8	31.3	23.3	0.0	Nil
5 mi. S.E. of Jct. Red Earth Rd. and the Fir R.Rd.	3.3	28.3	23.0	0.0	Nil
4.4 mi.S. of Runciman	3.8	33.0	20.3	0.0	Nil
4.2 mi.N.W. of Bjorkdale	3.2	29.0	22.0	0.7	light
Greenwater Lake Provincial Park	5.2	40.0	14.3	0.0	Nil
Greenwater Lake	3.5	20.7	13.0	0.0	Nil
Jct. Hwys. 49 and 35	3.2	24.7	19.0	0.0	Nil
Leslie	3.2	29.3	22.7	0.0	Nil
Good Spirit Provincial Park	3.2	27.3	18.7	0.0	Nil
Good Spirit Lake	3.3	25.3	18.0	0.0	Nil
0.5 mi.W. of Manitoba-Saskatchewan boundary off hwy. No. 57	5.2	52.0	12.0	0.0	Nil
Madge Lake	3.7	33.0	19.3	0.0	Nil

7.2.6 Aspen Leaf Beetle, Chrysomela crotchi Brown:- Populations of this leaf beetle increased throughout the District (Fig.7). Moderate to severe skeletonizing of reproduction trembling aspen foliage occurred at Yorkton, Canora, Buchanan, Theodore, Hudson Bay, Parr Hill Lake, Peepaw Lake, Duck Mountain Provincial Park, Okla, Carrot River, the Carrot River Provincial Forest, Battle Heights, Bannock, and in scattered areas along the Fir River and Armit roads and Highway No. 109.

Light skeletonizing was recorded at the junction of Dagg Creek and Highway No. 9, along the Armit and Fir River roads and Highway No. 109, at Erwood, Armit, Mistatim, Tisdale, Caragana, in the Greenwater Lake Provincial Park, at Rose Valley, Kelvington, Wadena, Kylemore, Canora, Good Spirit Lake Provincial Park, Verigin, Runnymede, Arran, Arabella, Swan Plain, Sturgis, at the Whitefox fire tower and in the Squaw Rapids area.

7.2.7 American Aspen Beetle, Gonioctena americana (Schaeffer):- Larval and adult populations caused moderate to severe defoliation of trembling aspen reproduction in the McBride Lake, Otosquen, Carrot River areas and the Carrot River Provincial Forest. The heaviest populations of adults were observed near the junction of the McBride Lake and Little Swan River roads. Light to moderate defoliation was recorded at Madge Lake, Endeavour, Tall Pines, Reserve and Hudson Bay, near the junction of the Roscoe River and the Armit road, the junction of the Barrier River and Highway No. 35 and in the Whitefox fire tower area.

7.2.8 Leaf Rollers on Trembling Aspen:- The incidence of leaf rollers remained light in trembling aspen stands, except in the Yorkton, Fonehill and Willowbrook area where light to moderate defoliation was caused by Pseudexentera improbana oregonana (Wlshm.) and Epinotia sp. The former also caused very light defoliation in the Sheho and Wroxton areas. Another one, Tortricid sp., was commonly found but caused no noticeable defoliation in the Greenbush and Armit areas and near the junction of Dagg Creek and Highway No. 9. This condition also applied to Sciaphila duplex (Wlshm.) in the Wroxton area.

7.2.9 A Webworm on Aspen, Tetralopha asperatella (Clem):- This webworm was common in areas where old cocoons of the forest tent caterpillar were numerous and where aphids had caused previous damage to trembling aspen leaves. Light infestations were recorded at Hudson Bay, Mile 10 on Highway No. 109, Otosquen, Armit and Parr Hill, and very light at Erwood, Overflowing River and Mile 17 on Highway No. 109, Reserve, Caragana, Greenwater Lake Provincial Park, Ketchen, Prairie River, Mistatim, Crooked River, Tisdale, Nipawin, Battle Heights and in the vicinity of the Whitefox fire tower and in the Squaw Rapids area.

7.2.10 Other Noteworthy Insects:-

Insect Species	Host(s)	Locality	Remarks
<u>Acleris variana</u> (Fern.) (Black-headed budworm, Fig.5)	wS,bF, tL	Usherville, Saginas Lake and Cumberland Lake.	Very light popu- lations, no defoliation.
<u>Acronicta dactylina</u> Grt. (A dagger moth)	bPo, spAl	Junction Roscoe River and Armit road, and in the Greenwater Lake Provincial Park.	Very light populations, no defoliation.
<u>Agrilus anxius</u> Gory (Bronze birch borer)	wB	Mile 50, Highway No. 109, McBride Lake area, Hudson Bay, Mistatim, Green- water Lake Provincial Park and Redearth Lake area.	Heavy populations attacking dead and dying trees.
<u>Altica populi</u> Brown (A poplar flea beetle)	bPo, wB, spAl, bS	Pasquia and Porcu- pine Provincial Forests, Greenwater Lake Provincial Park, and Cumberland Lake area.	Noticeable defol- iation at the junction of the Roscoe River and Armit road, and in the Cumberland Lake area.

7.2.10 Other Noteworthy Insects (cont.):-

Insect Species	Host(s)	Locality	Remarks
<u>Anoplonyx canadensis</u> Hgtn. tL (A sawfly)		Chemong, Hudson Bay, Saginas Lake, Crooked River and the Whitefox fire tower area.	A few larvae in collections; no noticeable defoliation.
<u>Anoplonyx luteipes</u> Cress. tL (A sawfly)		Throughout the District.	Common, but caused no noticeable defoliation.
<u>Aphrophora signoreti</u> Fitch (A spittle bug)	bF, wS,jP	Porcupine Provincial Forest, Greenwater Lake Provincial Park, Cumberland Lake and Whitefox fire tower areas.	Very low populations, no noticeable defoliation.
<u>Archips cerasivorana</u> (Fitch) (Ugly-nest caterpillar)	cCh	Along the Armit road, Peepaw and Ruby lakes, and the Whitefox fire tower area.	Defoliation confined to nests.
<u>Archips</u> sp. (A leaf roller)	W, caragana	At the junction of Dagg Creek and Hwy. No. 9, and in the Carrot River area.	Very light populations, no defoliation.
<u>Arge pectoralis</u> (Leach) (Birch sawfly)	wB	Junction of the Roscoe River and the Armit road.	Very light populations, no noticeable defoliation.
<u>Cerambycid</u> sp. (A long-horned wood borer)	bF	Mile 50 on Hwy. No. 109, and at Mistatim and Mikado.	Moderate to heavy populations in dead and dying balsam fir.
<u>Chalcoides</u> sp. (A leaf beetle)	tA, bPo	Leross, Tuffnell, and Carrot River.	No defoliation.
<u>Chermes cooleyi</u> Gillette (Cooley spruce gall aphid)	wS	Greenwater Lake Provincial Park, and Carrot River Provincial Forest.	Light populations.

7.2.10 Other Noteworthy Insects (cont.):-

<u>Insect Species</u>	<u>Host(s)</u>	<u>Locality</u>	<u>Remarks</u>
<u>Chermes lariciatus</u> Patch (A gall aphid)	wS	Pasquia and Porcupine Provincial Forests, Veillardville, Bannock, and in the Whitefox fire tower area.	Heavy defoliation near Veillardville, very light elsewhere.
<u>Chrysomela knabi</u> Brown (A leaf beetle)	bPo	Madge Lake and Usherville.	Very light skeletonizing.
<u>Cyphon variabilis</u> Thunb. (False flower beetle)	Caragana tA,tL	Chemong, Carrot River and Whitefox fire tower area.	No defoliation.
<u>Dicerca</u> sp. (A wood borer)	tA, bPo	Beaverdale, Greenwater Lake Provincial Park, Rama and Bannock.	Light infestation.
<u>Dichelonyx backii</u> (Kby.) (A leaf chaffer)	tA, wE,W, wS,spAl	Mile 28 on Hwy. No. 109, junction Roscoe River and the Armit road, Parr Hill Lake, Tall Pines, Endeavour, Swan Plain, Carrot River.	Light defoliation at Parr Hill Lake and Swan Plain. Elsewhere no noticeable defoliation.
<u>Dioryctria reniculella</u> (Grote) (Spruce coneworm)	bS	Mile 21 on the Fir River road and in the Cumberland Lake area.	No defoliation.
<u>Enargia decolor</u> Wlk. (A noctuid)	tA, wB	Willowbrook, Kelliher, Foam Lake, Crooked River, and Armit.	Very light defoliation at Foam Lake and Willowbrook.
<u>Eriosoma americanum</u> (Riley) (Woolly elm aphid)	wE	Beaverdale, Nipawin and Tisdale.	Very light defoliation.
<u>Fenusa dohrnii</u> (Tischb.) (European alder leaf miner)	spAl	Overflowing River off Hwy. No. 109, Armit and Saginas Lake area.	Light defoliation.

7.2.10 Other Noteworthy Insects (cont.):-

Insect Species	Host(s)	Locality	Remarks
<u>Galerucella decora</u> (Say) (Gray willow-leaf beetle)	tA	Leslie, Sheho, Tuffnell, Foam Lake and Cumber- land Lake area.	Moderate defoliation in the Cumberland Lake area; very light elsewhere.
<u>Gelechiid</u> sp. (A micro moth)	W,tA	Mile 28 on Hwy. No. 109, Otosquen, Hudson Bay, Armit and Parr Hill areas.	No defoliation.
<u>Ips</u> sp. (A bark beetle)	wS, jP	Pasquia Provincial Forest.	Heavy populations in dead trees.
<u>Itame loricaria</u> Evers. (A looper)	tA,bPo, W	Throughout the Aspen Grove Section.	No noticeable defoliation.
<u>Lepyrus palustris</u> Scop. (A weevil)	tA,W	Kelliher, Rose Valley, Crooked River, at the junction of the Roscoe River and Armit road.	No serious damage.
<u>Lithocolletis salicifoliella</u> Chamb. (Aspen blotch miner)	tA	Throughout Aspen Grove Section.	Increased populations from previous year.
<u>Lopidea dakota</u> Kngt. (A plant bug)	Caragana	Throughout the District.	Common on shelter-belts, but no noticeable defoliation noted.
<u>Malacosoma lutescens</u> (N.&D.) (Prairie tent caterpillar)	wild rose	Kamsack, Kessock, Lady Lake and Bertwell.	Severe defoliation confined to tents.
<u>Mordwilkoja vagabunda</u> Walsh (Poplar vagabond aphid)	tA	Yorkton, Arran, Canora, Reserve, Otosquen, Whitefox fire tower and Cumberland area.	Very light damage.
<u>Nematus</u> sp. (A sawfly)	W,tA, bPo	Yorkton, Tuffnell, Bankend, Bjorkdale, Dagg Creek off Hwy. No. 9, Mile 13 on the Fir River road, Chemong and Otosquen.	Light populations; no notable defoliation.

7.2.10 Other Noteworthy Insects (cont.):-

<u>Insect Species</u>	<u>Host(s)</u>	<u>Locality</u>	<u>Remarks</u>
<u>Neodiprion abietis</u> complex (Balsam-fir sawfly) (Fig.4)	WS	Pasquia Provincial Forest, Veillardville and Porcupine Provincial Forest.	Very light populations feeding in conjunction with spruce budworm and green-headed spruce sawfly. Caused no notable defoliation.
<u>Neodiprion nanulus</u> <u>nanulus</u> Schedl. (Red-pine sawfly)	jP	Chemong, along the Fir River road, at the junction of the Armit road and Hwy. No. 9 and the Whitefox fire tower area.	Very light to light defoliation.
<u>Nycteola cinereana</u> N.&D. (A phalaenid)	bPo	Chemong at the junction of the Roscoe River and the Armit road, and in the Whitefox fire tower area.	Heavy defoliation on reproduction in the Whitefox fire tower area; light defoliation at other two areas.
<u>Oberea schauvi</u> Lec. (Poplar twig borer)	tA	Mile 11 on Hwy. No. 109, Hudson Bay, Armit and Bertwell.	Very light damage of reproduction.
<u>Oligonychus ununguis</u> (Jacot) (Spruce spider mite)	bS	Junction of Dagg Creek and Hwy. No. 9.	Light populations.
<u>Orthosia hibisci</u> Gn. (A fruit worm)	tA, wE mM, W gAs, spAl	Canora, Beaverdale, Wroxton, Kamsack, and the Porcupine Provincial Forest.	No defoliation.
<u>Parorgyia plagiata</u> Wlk. (Gray spruce tussock moth)	wS, bF	Miles 38 and 48 on Hwy. No. 109 and at the junction of Dagg Creek, and Hwy. No. 9.	No defoliation.

7.2.10 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Petrova albicapitana</u> Busck. (Pitch nodule maker)	jP	Chemong, Hudson Bay, Nipawin, and the Whitefox fire tower area.	Very light damage.
<u>Physokermes piceae</u> Schr. (Spruce bud scale)	wS, bS	Pasquia and Porcupine Provincial forests.	Very light to light populations.
<u>Pissodes strobi</u> (Peck) (White-pine weevil)	wS	Hudson Bay, and at the junction of the Little Swan River road and Hwy. No. 9.	Very light infestation.
<u>Proteoteras willingana</u> (Kft.) (Boxelder twig borer)	mM	Mile 67 on Hwy. No. 109.	Very light infestation to the twigs.
<u>Semiothisa sexmaculata</u> Pack. (A looper)	tL	Northern, Pasquia and Porcupine Provincial forests.	No defoliation.
<u>Zale duplicata largera</u> Sm. (An owlet moth)	jP	Mile 13 on the Fir River road, and in the Whitefox fire tower area.	Very low populations.

7.3 DISEASE CONDITIONS

7.3.1 Globose Gall Rust, Peridermium harknessii J. P. Moore:- A heavy infection of this rust occurred in a small stand of jack pine (about twelve trees) in the town of Hudson Bay. A light attack, confined to scattered trees, also extended from the town limits to a point three miles south. Heavy infection on two trees with light on several other trees continued in the Greenbush River area. Light infection of a few trees was noted along Highway No. 9 near Chemong and in the Whitefox fire tower area.

7.3.2 Needle Casts on Balsam Fir:- Infection ranging from moderate on two trees to light on five trees occurred near the junction of the Roscoe River and the Armit road. A collection was also taken near the Otosquen River off Highway No. 109, but damage was light and confined to two branches on one tree. A light attack was recorded at Budd's Point in the Cumberland Lake area where a few branches were affected on one tree.

7.3.3 Needle Rust, Chrysomyxa sp.:- Infections ranging from light to severe occurred on white spruce along the Fir River road to Mile 13 fire tower. Light infections were recorded at Ruby Lake, at the junction of the Roscoe River and the Armit road and in the Greenwater Lake Provincial Park.

7.3.4 Macrophoma Galls, Macrophoma tumefaciens Shear.:- Collections of this gall were taken at scattered points in the forested area of the District (Fig.9). Infection was light and confined mainly to a few branches on two or three trembling aspen at each collection point at Hudson Bay, Armit, Parr Hill, Greenwater Lake Provincial Park, Smoky Burn and along the Carrot River near the Manitoba boundary. A light infection also occurred on one trembling aspen in the Cumberland Lake area of Northern Saskatchewan.

7.3.5 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 area of the District. The results of the survey are outlined in Table 2.

TABLE 2

2,4-D Injury to Manitoba Maple
Hudson Bay District - 1963

Place	Date	Degree of Injury	Remarks
Norquay	July 4	Light injury on part of one side of belt.	Grain field sprayed nearby.
Steen	" 5	Light injury on part of one side of belt.	Grain field sprayed nearby.
Stenen	" 15	A few isolated twigs damaged.	Grain field sprayed 500 yards away.

TABLE 2 (cont.)

Place	Date	Degree of Injury	Remarks
Hudson Bay	July 22	A few isolated twigs damaged on two roadway clumps.	Field spraying in area.
Carrot River	" 23	Light injury on part of both sides of belt.	Grain field 300 yards away probably sprayed.
Smoky Burn	" 24	A few isolated twigs damaged.	Grain field beside belt probably sprayed.
Whitefox	" 25	Majority of one side of belt lightly to moderately damaged.	No signs of spraying.
Crest	" 25	Light injury on part of one side of belt.	Grain field beside belt; no signs of spraying.
Nipawin	" 25	A few isolated twigs damaged on upper 1/3 of belt.	Grain field beside belt; probably sprayed.
Archerwill	" 25	A few isolated twigs very lightly damaged.	Grain field beside belt; no signs of spraying.
Wadena	" 26	A few isolated twigs damaged.	Field spraying beside belt.
Elfros	" 26	A few isolated twigs lightly damaged.	Field sprayed in area.
Buchanan	" 26	A few isolated twig tops lightly damaged.	No evidence of field spraying.
Sturgis	" 26	Light damage on part of one side of belt.	Field spraying in area.
Canora	" 26	Light to heavy on a few twigs at one end of belt.	Field spraying beside belt.
Kamsack	" 26	Light on a few isolated twigs at one end of belt.	No evidence of field spraying in immediate area.
Bankend	" 25	Part of one side of belt lightly damaged.	Field spraying in area.

7.3.6 Other Noteworthy Diseases:-

<u>Disease or organism</u>	<u>Host(s)</u>	<u>Locality</u>	<u>Remarks</u>
<u>Coleosporium solidaginis</u> (Schw.) Thum. (Rust)	Aster	Hudson Bay.	Infection heavy on a few plants. Alternate stage occurs on jack pine needles.
<u>Lophodermium</u> sp. (Needle cast)	bF	Junction of the Light infection Otosquen River and Hwy. No. 109.	
<u>Napicladium collinsii</u> (Frank) Sacc. (A fungus)	sSo	Hudson Bay.	Moderate infection on one clump.
<u>Pucciniastrum epilobii</u> Otth. (Rust)	Fireweed	Whitefox fire tower area.	Light infection on three plants. Alternate stage occurs on the needles of balsam fir.
<u>Thelephora fimbriata</u> Schw. (A "smothering" fungus)	wS	Bertwell.	Heavy infection on one seedling.
<u>Thelephoraceae</u> sp. (A slash fungus)	spAl	Erwood.	Moderate infection on one clump.

8. ANNUAL DISTRICT REPORT
PRINCE ALBERT DISTRICT OF SASKATCHEWAN

1963

by

L. L. McDowall

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March, 1964

8.1 INTRODUCTION

Favourable weather conditions, conducive to good growth prevailed during most of the field season. Surveys of forest insect and disease conditions were carried out between May 16 and October 19 and they included mapping of the major outbreaks (involving about 9 hours of chartered flying time), recording the distribution and abundance of minor insects and diseases, making special collections for personnel of the Winnipeg and other laboratories, and answering general inquiries regarding forest insect and disease damage. In addition, the following Survey sub-projects were continued: (a) forest tent caterpillar egg surveys; (b) larch sawfly population studies at permanent plots; (c) pine tube moth population studies; (d) insecticide sampling; (e) lodgepole terminal weevil population sampling; (f) population sampling of the boxelder twig borer; (g) 2,4-D damage surveys; and (h) surveys of aspen mortality resulting from drought injury. Totals of 454 insect and 19 disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively. The cooperation and assistance extended by the Saskatchewan Department of Natural Resources in carrying out this work is gratefully acknowledged.

The major insect pests in 1963 continued to be the forest tent caterpillar and the larch sawfly, and populations of the pine tube moth west of Prince Albert were somewhat reduced. Populations of the jack-pine budworm and jack-pine sawflies remained at fairly low levels but increased populations and distribution of the balsam-fir sawfly, willow-leaf beetle and aspen leaf beetle were recorded. Further deterioration of trembling aspen "bluffs" resulting from the extreme drought in 1961 was recorded throughout the southern portion of the District. Conspicuous reddening of spruce foliage was prevalent in the Big River-Dore Lake area.

8.2 FOREST INSECT CONDITIONS

8.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— Exceptionally high populations persisted in most tamarack stands through the southern section of the District, and although populations remained light in the northwest portion, defoliation increased from light to moderate in the Smoothstone-Emmeline lake area (Fig.1). Favourable weather conditions during July brought about a rapid emergence of the larvae and accelerated the feeding period. This resulted in larvae spinning-up cocoons by the last week of July.

Moderate to severe defoliation of tamarack was again recorded in the Home, Holbein and Red Rock blocks of the Nisbet Provincial Forest and to a lesser degree in the Steep Creek Block. The heaviest defoliation occurred in stands from Crutwell north to No. 3 highway.

Defoliation ranging from light to moderate with an occasional tree showing heavy feeding was noted in scattered stands from Shellbrook west to the District boundary. A large swamp, bordering No. 55 highway south of Canwood, suffered moderate to heavy defoliation. North to Dumble, Big River, Cowan, Dore and Smoothstone lakes, overall defoliation was light. A small stand just southeast of Emmeline Lake was moderately defoliated. Light to moderate defoliation was recorded from Cookson north and east to Mayview and Emma Lake with scattered patches of moderate extending north to Rebitt and Clearsand lakes. Light to moderate defoliation prevailed along the east side of Bittern Lake, the south shore of Candle Lake, and in the vicinity of Shipman and Snowden along No. 55 highway. Moderate to heavy defoliation was recorded in stands north of English cabin and east through the Fort a la Corne Provincial Forest to Nipawin.

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		Infestation ratings
		No. of shoots examined	No. of curled shoots	
102	Crutwell	60	23	severe
114	Red Rock Block	80	26	severe
112	Dumble	60	1	light

Larch sawfly cocoons were collected by the larval drop tray method from the Red Rock plot for examination and dissection. Results of larval dissections showed that the dipterous parasite Bessa harveyi was the most abundant, accounting for 36 percent of the parasitism.

8.2.2 Jack-pine Budworm, Choristoneura pinus Free.:- No appreciable change in the overall status of this species was noted and defoliation remained light at all collection points. Jack pine stands in the Home Block of the Nisbet Provincial Forest still supported the highest populations, although larvae were also common in the Red Rock Block and in the Fort a la Corne Provincial Forest between English cabin and the north boundary. The number of larvae per five-tree beating sample ranged from two to fourteen with the exception of a small area west of Prince Albert where slightly higher populations were encountered on open growing jack pine.

8.2.3 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— This sawfly was generally distributed throughout the District, but with the exception of three locations, only light defoliation was recorded. A moderate to heavy infestation flourished in a white spruce shelterbelt located on the Marchant Grove Church grounds north of Shellbrook. Light to moderate defoliation of several ornamental white spruce was recorded two miles south of Smeaton and a small windbreak half mile north of Northside. Generally light defoliation with some moderate was recorded at Christopher Lake and Mayview.

8.2.4 Balsam-fir Sawfly, Neodiprion abietis complex:— A slight increase in populations and a wider distribution of this insect was noted in 1963 (Fig.4). It was collected from both white and black spruce, but in all instances defoliation was very light and usually confined to branches in the lower crown. The most northerly collection was made in the Dore Lake section with the remainder being taken from the south-central portion of the District.

8.2.5 Pine Tortoise Scale, Toumeyella numismaticum (P. & M.):— A small, light infestation affecting jack pine regeneration in an area of about one acre was recorded in the Home Block of the Nisbet Provincial Forest. Elsewhere populations were very light and widely scattered.

8.2.6 Lodgepole Terminal Weevil, Pissodes terminalis Hopping:— This insect was still active in jack pine stands located southeast of Candle Lake. Although some extensions in the boundaries were noted the incidence of damaged leaders, which ranged from 20 to 30 percent throughout the area, was less than in 1962. Light damage to the leaders was also recorded in stands in the Big River Provincial Forest, Conwood Regional Park and in the Buckland plantation west of Prince Albert.

8.2.7 A Pine Tube Moth, Argyrotaenia tabulana Free:— Although populations of this species remained relatively high within the infestation area of approximately 20 square miles, some reduction in the number of larvae occurred in the most heavily infested stands located two and seven miles west of Prince Albert. After three years of continuous attack, sparse foliage production and reduced needle growth were conspicuous in the above mentioned areas. Field studies are still in progress and two host-tree mortality plots were established in 1963. Elsewhere throughout the Nisbet Provincial Forest and surrounding areas populations were generally light.

8.2.8 Sawflies on Jack Pine, Neodiprion spp.:— A number of special collections of these sawflies were taken from jack pine. The species occurring in order of abundance were: N. nanulus nanulus Schedl., N. virginiana complex, N. pratti banksianae Roh., and N. maurus Roh. The majority of collections were made in the Home Block of the Nisbet Provincial Forest. However, collections were also taken in the Red Rock Block, Fort a la Corne Provincial Forest, and at Round and Candle lakes. As in previous years, feeding was light and limited to one or two branches per tree of both mature and immature jack pine.

8.2.9 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— This caterpillar again defoliated large areas of trembling aspen and other deciduous hosts in the northern section of the Prince Albert District (Fig.6). Although foliage growth was slightly retarded by cool weather in some localities, no change in larval development was noted. Two natural control agents, a parasite fly, Sarcophaga aldrichi Park. and the fiery hunter, Calosoma frigidum Kby. were common in the Bodmin Hills infestation area.

Severe defoliation persisted in the Bodmin-Big River area with considerable extension southward in the extensive aspen stands that cover the Bodmin Hills. Severe defoliation was also recorded in the immediate vicinity, (approximately twenty square miles) surrounding the town of Big River. Northwest between Cowan and Delarande lakes to Taggart and Green lakes defoliation ranged from moderate to severe. North to Sled, Beaupre and Dore lakes defoliation was moderate with occasional patches of severe. Along the north, east and south shores of Smoothstone Lake, defoliation was also severe and it continued along the south shore of Anglin Lake with a slight southwestward extension. Moderate to heavy feeding occurred along the west and south shores of Bittern Lake and from light to moderate at the northwest tip of Candle Lake. With the exception of an occasional small patch of light defoliation, populations remained at low levels throughout the remainder of the District. Mass collections of egg bands were made and will be examined for effective parasitism and disease.

Mass collections of larvae and pupae were submitted to the Winnipeg Laboratory for rearing and parasite recovery; results are shown below:

Location	Type of collection	No. reared	No. of dipterous parasites	Percentage of effective parasitism
Bodmin Hills	larval	98	16	16.3
Bodmin Hills	pupal	142	65	45.7
Halkett Lake	larval	106	2	1.8
Halkett Lake	pupal	95	51	53.7

Egg band surveys were carried out during September and October to predict the severity of infestations in 1964; results are shown in Table 1.

TABLE 1

Summary of Forest Tent Caterpillar Egg-Band Sampling
Prince Albert District - 1963

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

Area No. and location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. of egg-bands per tree	Defoliation forecast for 1964
Bodmin Tower-1	3.0	24.3	15.0	20.0	severe
Bodmin Tower-2	3.0	26.3	15.3	7.6	moderate
Bodmin Tower-3	4.6	32.0	25.6	11.6	severe
Home Block-N.P.F.-4	3.0	22.0	12.0	1.3	light
Red Deer Hill-5	3.0	21.7	14.0	0.3	light
MacDowall-6	3.0	20.3	14.0	1.0	light
Prince Albert-7	3.0	19.7	12.3	0.7	light
Shellbrook-8	3.0	16.3	10.7	2.7	light
Pascal-9	3.0	23.0	18.6	3.6	light
Sturgeon Lake-10	3.0	24.0	18.6	3.3	light
Tweedsmuir-11	3.3	25.3	17.3	4.7	light
Christopher Lake-12	3.3	27.7	18.0	9.3	moderate
Candle Lake-13	3.3	20.0	12.7	0.3	light
Candle Lake-14	3.3	21.3	14.0	0.0	Nil
Candle Lake-15	3.7	22.7	18.3	8.7	moderate
Candle Lake-16	3.0	19.7	14.0	0.0	Nil
Shell Lake-17	3.3	27.0	17.7	1.7	light
Big River-18	3.0	25.0	17.6	53.7	severe
Big River-19	3.6	29.0	19.3	37.3	severe
No. 55 highway-20	3.3	28.3	16.0	15.0	severe
Sled Lake-21	3.0	26.7	20.3	11.0	severe
Green Lake-22	4.0	32.0	19.7	16.3	severe
Bittern Creek-23	4.0	36.0	16.0	15.6	severe
Dore Lake-24	5.0	31.3	14.5	12.3	severe

8.2.10 Aspen Leaf Beetle, *Chrysomela crotchi* Brown:- An overall increase in distribution and populations was recorded in the central and southern portions of the District (Fig.7). Patches of light to moderate defoliation occurred in aspen stands six miles south of Prince Albert and in the MacDowall, Duck Lake, Rosthern and Batoche areas. Light skeletonizing was recorded on scattered aspen from Prince Albert west to Shellbrook and Shell Lake. Small patches of aspen along the west and south shore of Candle Lake showed light to moderate skeletonizing. Collections were also made at Christie Lake, Cookson, Lilly Plains and Davies, but populations were light and only a trace of defoliation was noted.

8.2.11 Grey Willow-leaf Beetle, Galerucella decora (Say):- A substantial increase in populations as well as a more widespread distribution of this leaf skeletonizer was noted in 1963. Damage ranged from moderate to heavy in willow stands in the Big River, Dumble, Debden, Marchant Grove, Cookson, Christopher Lake and Mont Nebo areas. Elsewhere collections from willow contained only on occasional larva or adult beetle.

8.2.12 Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.):-- Populations of this insect were relatively high throughout the southern section of the District. Numerous tents were observed from MacDowall south to Duck Lake, and complete defoliation of eastern chokecherry was common in this area with some light feeding occurring on aspen reproduction. Heavy defoliation of chokecherry was also recorded from Prince Albert west to Shellbrook. Scattered tents causing defoliation ranging from light to moderate, were recorded along the airport road into the Red Rock Block of the Nisbet Provincial Forest and in the vicinity of Candle Lake. Both chokecherry and pincherry were attacked in these areas.

8.2.13 A Leaf Roller of Aspen, Compsolechia niveopulvella Chamb.:-- Several collections of this leaf roller were made in aspen stands in the MacDowall-Duck Lake area south of Prince Albert. Although curled leaves were common, the overall damage was light. Evidence of light damage (curled leaves) was also recorded north of Prince Albert along No. 2 highway, south of Candle Lake and in the vicinity of Mayview.

8.2.14 Poplar Gall Aphid, Mordwilkoja vagabunda Walsh:- Damage remained light through most of the District, but a light to moderate infestation was recorded in a small patch of aspen four miles west of Prince Albert. Additional collections were made at Candle Lake, Steep Creek, Kilwinning, Mont Nebo, Shellbrook and Davies.

8.2.15 European Alder Leaf Miner, Fenusa dohrnii (Tisch.):-- A light to moderate infestation of this leaf miner was recorded on speckled alder in the vicinity of English Cabin in the Fort a la Corne Provincial Forest. Elsewhere populations were low with a trace to light damage occurring in the Red Rock and Home blocks of the Nisbet Provincial Forest as well as at Christopher and Emma lakes.

8.2.16 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Anoplonyx canadensis</u> Hgtn. (A sawfly)	tL	Eastern section of District.	Light populations.
<u>Acleris variana</u> (Fern.) (Black-headed budworm)	wS	Red Rock and Home Nisbet Provincial Forest.	Low populations; no serious defoliation.
<u>Altica populi</u> Brown (Poplar flea beetle)	bPo spAl	Nisbet Provincial Forest and Candle Lake.	Populations light to moderate west of Prince Albert, otherwise very light and scattered.
<u>Archips cerasivoranus</u> (Fitch) (Ugly-nest caterpillar)	cCh	Prince Albert area.	Populations light and widely scattered west and south of Prince Albert.
<u>Amorbia humerosana</u> Clem. (A leaf roller)	jP	Nisbet and Fort a la Corne Provincial Forests.	Widely scattered but damage light.
<u>Choristoneura fumiferana</u> Clem. (Spruce budworm)	wS	Crutwell.	One collection containing two larvae; defol. very light.
<u>Chermes lariciatus</u> (Gill.) (A gall aphid)	wS	Nisbet Provincial Forest.	Very light and usually found on one tree only.
<u>Corythucha elegans</u> Drake (A lace bug)	W	Candle Lake and Christopher Lake.	Willow heavily infested along west shore of Candle Lake; light to moder- ate damage east of Christopher Lake.

8.2.16 Other Noteworthy Insects (cont.):-

<u>Insect</u>	<u>Host(s)</u>	<u>Locality</u>	<u>Remarks</u>
<u>Dichelonyx backi</u> (Kby.) (A leaf chafer)	tA, W	Prince Albert District.	Populations light, collected mainly in central section of District.
<u>Dioryctria reniculella</u> (Grote) (Spruce coneworm)	wS	Nisbet Provin- cial Forest.	Two small collec- tions; four and ten miles west of Prince Albert.
<u>Energia decolor</u> Wlk. (A noctuid)	tA	Bodmin and Big River.	Populations light in both locations.
<u>Eurytoma</u> sp. (A chalcid)	jP	Home Block of the Nisbet Provincial Forest.	Galls common on jack pine regeneration.
<u>Gonioctena americana</u> (Schffr.)	tA	Candle Lake area.	Light defoliation south of Candle Lake; populations elsewhere very light and widely scattered.
<u>Itame loricaria</u> Evers. (A looper)	tA, W	Nisbet Provin- cial Forest and Candle Lake.	Populations low; no serious defoliation.
<u>Lithocolletis salicifoliella</u> Chamb. (Aspen blotch miner)	tA	Throughout District.	Scattered light infestations.
<u>Petrova albicapitana</u> (Busk.) (Pitch nodule maker)	jP	Throughout District.	Low populations.
<u>Pikonema dimmockii</u> (Cress.) (Green-headed spruce sawfly)	wS, bS	Throughout Dis- trict.	Populations light and widely scattered; no noticeable defoliation.

8.2.16 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Semiothisa granitata</u> Gn. (Green spruce looper)	WS	Nisbet Provincial Forest.	Populations very light in Home Block.
<u>Semiothisa bicolorata</u> Fabr. jP (A geometrid)		Nisbet and Fort a la Corne Provincial forests.	Populations very light and widely scattered.
<u>Semiothisa sexmaculata</u> Pack. tL (A geometrid)		Throughout District.	Found in majority of tamarack stands but populations were light.
<u>Tetralopha asperatella</u> (Clem.) (A webworm on aspen)	tA	Throughout District.	Populations generally low; most common in the Macdowall, Bodmin and Big River areas.
<u>Zale duplicata largera</u> Sm. jP (An owlet moth)		Nisbet Provincial Forest.	High populations in Home Block, elsewhere light.

8.3 TREE DISEASE CONDITIONS

8.3.1 Macrophoma gall of Poplar, Macrophoma tumefaciens Shear.:
These galls occur on poplars at widely scattered points throughout the District, but there have been no serious or widespread infections (Fig.9). In 1963 they were most common on trembling aspen along the south boundary of Prince Albert National Park and on balsam poplar in the Dore Lake region.

8.3.2 Tar Spot on Willow, Rhytisma salicinum (Pers.):
Infections were widely distributed in the western portion of the District and usually on willow bordering tamarack and black spruce swamps. Damage ranging from light to moderate was recorded at the following locations: Canwood, Dumble, Mayview, Emma and Candle lakes.

8.3.3 A Canker on Trembling Aspen, Cytospora sp:- This canker was present in most aspen "bluffs" in the extreme south portion of the District, where it was usually found on trees weakened by prolonged periods of drought during the past two years. The highest incidence of infection occurred from Duck Lake south and east into the West-Central District.

8.3.4 Drought Injury of Aspen:- Special surveys to determine the amount of tree mortality occurring in aspen "bluffs" were again carried out. Results indicated a substantial increase in mortality in some locations, especially in the southern portion of the District. This condition has been attributed to the prolonged drought which had existed prior to 1963.

8.3.5 Malformation of Manitoba Maple Shoots and Foliage:- Surveys to determine the distribution and effects of 2,4-D damage on shelter-belts were carried out during mid summer. Results indicated that damage to Manitoba maple was widespread but light, and was most noticeable through the farming areas south of Prince Albert. Severe damage to trembling aspen and chokecherry attributed to spraying was recorded along power lines between Holbein and Shellbrook and also in the Spruce Home-Christopher Lake area. Results of the survey are shown in the following table:

TABLE 2
2,4-D Injury to Manitoba Maple
Prince Albert District of Saskatchewan - 1963

Location	Date sampled	Degree of Injury	Remarks
Shellbrook 7-49-3 W.3rd.mer.	July 19	Isolated twigs damaged.	Light field crop spraying; bluffs located along sidegrain field.
Kilwinning 34-47-15 W.3rd.mer.	July 19	Damage to parts of trees.	A few trees dying, but not from 2,4-D.

TABLE 2 (cont.)

Location	Date sampled	Degree of Injury	Remarks
Leask 35-46-6 W.3rd.mer.	July 19	Isolated twigs only.	Very little damage.
Wingard 6-46-3 W.3rd.mer.	July 19-	Nil.	Shelterbelt healthy.
Duck Lake 11-43-2 W.3rd.mer.	July 19	A few isolated twigs.	Slight damage.
MacDowall 9-46-1 W.3rd.mer.	July 19	Nil.	No fields.
Hagen 5-45-25 W.2nd.mer.	July 25	Isolated twigs only.	Damage very light.
Crystal Springs 18-44-24 W.2nd.mer.	July 25	Damage light to one side of trees.	Small shelterbelt mixed with caragana.
Melfort 26-44-18 W.2nd.mer.	July 31	Damage very light on one side of trees.	Some mortality due to drought.
Spalding 8-39-18 W.2nd.mer.	July 31	Nil.	No damage to scattered maple.
Annaheim 8-39-20 W.2nd.mer.	July 31	A few isolated twigs.	Very little field-crop spraying in 1963.
Humbolt 30-37-22 W.2nd.mer.	July 31	Parts of trees damaged on one side.	Large shelterbelt; growth good in patches.
Watson 21-36-19 W.2nd.mer.	July 31	Trees partially damaged on one side.	Small shelterbelt; some drought injury.
Lanigan 24-33-22 W.2nd.mer.	July 31	Damage confined along one side (light).	Some drought injury in remainder.

8.3.6 Spruce Needle Rust, Chrysomyxa sp.: - Scattered collections of this rust were made from both white and black spruce. Small localized infections occurred in the Red Rock Block of the Nisbet Provincial Forest, at Crutwell, in the Fort a la Corne Provincial Forest and at Candle and Christopher lakes. In all instances the infection was light and widely scattered.

8.3.7 Reddening of Spruce: - Severe reddening of spruce foliage was recorded at several points within the Prince Albert District. In the Big River Provincial Forest along the Caribou Trail, white spruce over a relatively wide area showed conspicuous coloration of the foliage where both mature and immature trees were affected. Patches of moderate to heavy reddening were observed along the Dore Lake Road and north of Big River along No. 55 highway. In these areas it was confined mainly to immature black spruce. No tree mortality was recorded in any of the above mentioned areas. This condition has been associated with periods of severe drought.

8.3.8 Other Noteworthy Diseases:-

Host(s)	Disease & Organism	Locality	Remarks
Saskatoon	<u>Apiosporina collinsii</u> Schw. (Witches Broom)	Western section of District.	Brooms common west of Prince Albert and in the Mount Nebo area.
Jack Pine	<u>Arceuthobium americanum</u> Nutt. (Mistletoe of jack pine)	Nisbet Pro- vincial Park.	Still prevalent throughout the Home, Holbein, Steep Creek and MacDowall Blocks.
Cherry	<u>Diobotryon morbosum</u>	Canwood, Debden, Cookson, Shellbrook and Shell Lake areas.	Common, but infections gen- erally light and caused no serious damage.
Willow	<u>Melampsora bigelowii</u> Thum. (A leaf rust)	Red Rock Block of the Nisbet Provincial Forest.	Light infection on scattered willow.

8.3.8 Other Noteworthy Diseases (co t.):-

Host(s)	Disease & Organism	Locality	Remarks
Trembling aspen	<u>Marssonina</u> sp. (A leaf spot)	Southeastern section of District	Infection light through south-eastern portion and extending into west-central District.
Trembling aspen	<u>Hypoxyton pruinatum</u> (Klotsche) Cke. (Canker on aspen)	Prince Albert District	Common in vicinity of Shell Lake, otherwise light and widely scattered.
Speckled alder	<u>Thelephora</u> sp. (A slash fungus)	Mayview	One collection only, light infection.
Willow	<u>Uncinula salicis</u> (Fr.) (Powdery mildew)	Cookson	Several willow clumps two miles south of Cookson showed heavy damage.

9. ANNUAL DISTRICT REPORT
NORTHERN DISTRICT OF SASKATCHEWAN

1963

by

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CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1964

9.1 INTRODUCTION

Surveys to determine the extent and distribution of forest insects and diseases were carried out in the Northern District of Saskatchewan from mid-May through mid-October. During this period, approximately 40 hours of flying time was used for aerial reconnaissance of inaccessible forested areas, sampling at northern lakes, and mapping infestations of the larch sawfly and forest tent caterpillar. Special studies and sampling carried out during the season included sequential sampling of larch sawfly egg populations in permanent plots and egg-band surveys to predict the severity and extent of forest tent caterpillar infestations in 1964. Totals of 337 insect and 24 disease samples were submitted to the Winnipeg and Saskatoon laboratories respectively.

Weather conditions were variable; temperatures ranged about 10 degrees below normal during the early part of the spring and were accompanied by above-average rainfall. However, as the season progressed, near-normal conditions allowed excellent foliage growth on all tree species.

The most outstanding forest insect was the forest tent caterpillar, which continued to cause severe defoliation to trembling aspen stands over extensive areas south of the Churchill River basin. The larch sawfly again occurred in practically all tamarack stands, but caused significant defoliation only in a few localized areas. Populations of the balsam-fir sawfly declined markedly in the old infestation areas along the Churchill River, but were still sufficiently high to cause moderate to severe damage to the old foliage of both spruce and balsam fir. Larvae of the black-headed budworm occurred in spruce-balsam stands as far north as Cree and Reindeer lakes, and populations of the aspen leaf beetle increased significantly in trembling aspen stands at several points between Otter Falls and Buffalo Narrows on the Churchill River.

There was little change in the distribution and status of important tree diseases throughout the District. Leaf and tar spots of willow and trembling aspen occurred commonly in localized areas, and light infections of spruce needle rust were reported in a number of locales.

9.2 INSECT CONDITIONS

9.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):- In general, defoliation of tamarack was light with little apparent change from the previous year (Fig. 1). Moderate defoliation was recorded at Mile 83 on the La Ronge Highway and in small stands at the west end of Lac La Ronge and along the Alberta-Saskatchewan border from

Lake Athabaska south to the Douglas River. Light defoliation generally prevailed throughout the remainder of the District, except at Charcoal and Franklin lakes and at Stoney Rapids where only traces were noted.

In Prince Albert National Park overall defoliation was moderate. Tamarack in a stand with black spruce along the west side of Namekus Lake showed moderate to severe defoliation. A narrow belt of moderate to heavy defoliation occurred along the north side of Waskesiu access road to the northeast boundary of the Park and to Skunk Creek. Light to moderate defoliation was recorded from Waskesiu to Crean and Kingsmere lakes, and moderate in the area from Mayview eastward about fifteen miles and thence north to East Trout and Meeyomoot lakes.

9.2.2 Balsam-fir Sawfly, Neodiprion abietis complex:- Populations declined markedly in the infestations previously recorded at Trade Lake and at Ile a la Crosse, but some reddening of the foliage of white spruce and balsam was still visible from the air (Fig. 4). Elsewhere, low populations were noted on these tree species at Buffalo Narrows, Careen Lake, Otter Rapids, Missinippi and Knee Lake. Black spruce was lightly defoliated at Peak and Peter Pond lakes.

9.2.3 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):- Low populations occurred in most black and white spruce stands in the District. Traces of defoliation were noted at Beauval, Buffalo Narrows and Ile a la Crosse. Occasional larvae were collected at Deschambault, Waterbury, Careen, Wapaweka, Lloyd, Johnson, Bigstone, Peak, McIntosh, and McTavish lakes and at Bear River on the Hanson Lake Road. The green-headed spruce sawfly, Pikonema dimmockii (Cress.) was usually found in association with the yellow-headed spruce sawfly at these locations, but caused no appreciable separate defoliation.

9.2.4 Spruce Budworm, Choristoneura fumiferana (Clem.):- Small numbers of larvae were recorded on black spruce at the junction of the Hanson Lake Road and the Sturgeon Wier River and at Jan and Trade lakes, but they caused no noticeable defoliation (Fig. 2).

9.2.5 Pine Tube Moth, Argyrotaenia tabulana Free.:- Light browning of the foliage of jack pine was evident from the air at Nameless Lake and light populations were also recorded at Molanosa and at McTavish, Keefe, La Ronge, and Peak lakes. A trace of damage was noted at Davey, Knee, Boundary, and Birdwatcher lakes.

9.2.6 Black-headed Budworm, Acleris variana (Fernald):- Low populations causing very light defoliation of black spruce were noted at many widely scattered points throughout the District (Fig. 5). Among these were Charcoal, Wapaweka, McTavish, Turnor, Lloyd, and

Deschambault lakes, and at Bittern Creek. Several collections were also taken in Prince Albert National Park, but no noticeable defoliation was recorded.

9.2.7 Neodiprion Sawflies on Jack Pine:- A large colony of N. virginiana complex completely defoliated a single young jack pine tree at McIntosh Lake, and additional collections were taken at McTavish and Tillabo lakes. N. nanulus nanulus Schedl. caused moderate defoliation of one pole-sized jack pine at Ballantyne River, and low populations occurred at points along the La Ronge Highway. Light infestations of N. pratti banksianae Roh., were noted at Beauval, Peak, and Black Birch lakes.

9.2.8 Forest Tent Caterpillar, Malacosoma disstria Hbn.:- Relatively high populations of this insect still persisted throughout Prince Albert National Park and Northern Saskatchewan to the Churchill River Basin, where overall defoliation ranged from moderate to severe (Fig. 6).

In Prince Albert National Park, moderate to severe defoliation again occurred at Halkett Lake although some reduction was noted along the south shore over previous years. South of Halkett Lake along the south boundary of the Park and in the general vicinity of Amyot Lake on the west boundary scattered patches of moderate to severe defoliation prevailed. Severe defoliation occurred along the Narrows Road and extended south to Shady, Namekus and Trappers lakes and east to Anglin Lake just outside the Park boundary. Patches of moderate to heavy defoliation were recorded from the junction of No. 2 highway and the Waskesiu town road to the east boundary. Defoliation of balsam poplar ranging from light to moderate was also noted in this area. North of Waskesiu in the vicinity of Kingsmere and Crean lakes, defoliation was moderate with an occasional small patch of severe. North of the Park to Lac La Ronge, defoliation ranged from moderate to severe with large areas of severe westward along the Churchill River to Pine River. Severe defoliation was also recorded at Otter Lake, light to moderate at McLennon Lake, moderate to severe at Trade, Manawan, Pelican, Mirand, Jan and Deschambault lakes.

The parasitic fly, Sarcophaga aldrichi Park., was abundant in most infestation areas and populations of the Ichneumon parasite, Theronia atalantae (Poda), were particularly high at Otter Falls. Foliage development was retarded about two weeks by low temperatures during the spring and some larvae had emerged and therefore starved before the buds opened. Refoliation of trembling aspen was good in all stands and completed by mid-July.

Egg surveys conducted throughout and adjacent to the infestation areas indicated that moderate to severe defoliation will continue in 1964. Sampling data is shown in tables 1 and 2.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Survey
Prince Albert National Park - 1963

(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	Defol. Fore- cast for 1964
Halkett Lake	4.0	30.0	19.7	12.0	severe
South Boundary Road	2.7	23.7	11.3	9.7	severe
" " "	3.0	25.3	17.0	5.3	moderate
" " "	3.0	28.0	15.3	1.7	light
" " "	3.3	24.0	17.0	11.7	severe
" " "	3.0	25.3	14.0	6.3	moderate
" " "	3.7	32.7	17.0	8.0	moderate
Waskesiu	3.0	21.7	14.3	16.3	severe
"	4.3	30.7	21.7	16.7	severe
"	4.0	30.7	21.0	12.0	severe
McAuley Lake	4.0	26.3	17.3	16.3	severe
Waskesiu	6.3	39.0	18.7	8.7	moderate
"	6.0	37.7	19.0	1.0	light
"	5.3	31.0	16.0	10.7	moderate
"	4.0	26.0	22.7	4.3	light
"	6.0	33.3	21.0	5.7	light
Narrows Road	4.7	29.3	19.3	16.3	severe
Namekus Lake	4.0	26.7	15.3	17.3	severe
South Boundary	4.3	35.3	18.7	12.3	severe

TABLE 2

Results of Forest Tent Caterpillar Egg-Band Survey
Northern District of Saskatchewan - 1963

(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	Defol. Fore- cast for 1964
Mile 69, Molanosa	3.3	25.3	10.7	15.7	severe
Mile 90, La Ronge Road	2.6	23.0	14.7	28.0	severe
Mile 99, La Ronge Road	3.0	29.3	13.3	29.7	severe
Mile 1, Churchill R. Rd.	3.0	25.7	12.7	24.0	severe
Mile 14, "	4.3	34.7	11.7	46.7	severe
Mile 7, "	3.0	26.7	10.3	24.3	severe
Mile 36, "	3.3	23.0	7.0	34.3	severe
Mile 98, Hanson Lk. Rd.	3.0	22.7	12.7	7.7	moderate
Mile 134, "	3.6	28.7	13.0	13.3	severe
Mile 152, "	3.7	34.0	15.0	2.7	light
Denare Beach	3.3	31.0	22.6	35.0	severe
" "	3.6	34.6	25.3	44.6	severe
Sturgeon Wier	3.3	31.3	21.6	4.0	light

9.2.9 Aspen Leaf Beetle, Chrysomela crotchi Brown :- Populations increased significantly and resulted in noticeable skeletonizing of the foliage of trembling aspen reproduction in several parts of the District. It was most abundant at Otter Falls and Sandfly Lake where it caused moderate skeletonizing of aspen foliage. Light infestations occurred at Deschambault and La Ronge lakes, at Buffalo Narrows and at the junction of the Bear River and Hanson Lake road. Very light populations were noted at Bittern Creek and Missinipi and throughout Prince Albert National Park.

9.2.10 Grey Willow Leaf Beetle, Galerucella decora Say:- This beetle caused light to moderate skeletonizing of willow foliage along Highway No. 2 from Waskesiu south to the Park Gate. The highest populations were around McAuley Lake where most willow clumps were skeletonized to some degree. Light skeletonizing also occurred at Molanosa, La Ronge, and Missinipi, and at Deschambault, Hannah, and Deception lakes.

9.2.11 A Webworm on Aspen, Tetralopha asperatella (Clem):- Light infestations of this webworm were fairly common in areas previously defoliated by the forest tent caterpillar. Low populations were recorded all along the Hanson Lake Road, and the north end of the La Ronge Highway, and occasional larvae were collected at Birch Point, Wollaston, Wapaweka, and McIntosh lakes, and at Otter Rapids.

9.2.12 Birch Skeletonizer, Bucculatrix canadensisella Cham.:- Occurred commonly on white birch and speckled alder throughout the District. Light populations were found on white birch at Deschambault Lake, Birch Point, Charcoal Lake, Bear River, Lillabo Lake and Turnor Lake and on alder at Deschambault and Deception lakes.

9.2.13 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Altica populi</u> Brown (Poplar flea beetle)	tA,Al	Bigstone, Jan, and Deschambault lakes. Also Skunk Creek.	Generally low populations.
<u>Amorbia humerosana</u> Clem. (A tortricid)	jP,bS, tL	Molanosa, La Ronge, Peak Lake and McTavish Lake.	Scattered low populations.
<u>Anoplonyx canadensis</u> Hgtn. (A sawfly)	tL	McAuley Lake, Mayview and Waskesiu.	Commonly found.

9.2.13 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Buffalo Narrows, Careen, La Ronge and Cumberland lakes.	Commonly found.
<u>Arge clavicornis</u> Fab. (A sawfly)	wB,W	La Ronge, Nevins, McTavish, McLennan, and Lillabo lakes.	Low populations.
<u>Arge pectoralis</u> (Leach) (Birch sawfly)	wB	Keefe, Bigstone, La Ronge, and Wapaweka lakes.	Light to moderate at Deception Lake; light elsewhere.
<u>Calligrapha alni</u> Schfr. (A leaf beetle)	Al	McLennan and McIntosh lakes.	Light infestations.
<u>Chermes cooleyi</u> Gillette (Cooley spruce gall aphid)	bS, wS	Buffalo Narrows and Careen Lake.	Commonly found.
<u>Dioryctria reniculella</u> (Spruce coneworm)	bS, wS	Trade, Harmah, Namew and Cumberland lakes.	Light infestations.
<u>Chermes lariciatus</u> (Patch) (Pineapple gall aphid)	wS	Waskesiu and Missinipi,	Low numbers only, no serious damage.
<u>Dichelonyx backii</u> Kby. (Green rose chafer)	tA,W, wB	Prince Albert Nat. Park, Spruce River, Bittern Creek, and Molanosa.	Adults numerous and caused light leaf chafing in all areas.
<u>Elasmostethus cruciatus</u> (Say) and <u>Meadorus lateralis</u> (Say) (Stink bugs)	wB, Al	Northern Saskatchewan District.	Heavy infestation at Birch Point on Reindeer Lake. Lightly scattered throughout remainder of District.
<u>Gonioctena americana</u> (Schfr.) (American aspen beetle)	tA	Molanosa, Bear River, Birch Creek, and Halkett Lake.	Light feeding on reproduction.
<u>Hylobius pinicola</u> (Couper) (A weevil)	jP	Charcoal, Daly, and Costigan lakes.	Low populations.
<u>Lepyronia quadrangularis</u> (Say) (A spittle bug)	Al,wB	Bigstone Lake	Heavy infestation in Mill Site.

9.2.13 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Lithocolletis salicifoliella</u> Cham. (Aspen blotch miner)	wB,tA	Prince Albert Nat. Park.	Light along No. 2 Highway north of the Park.
<u>Monochamus scutellatus</u> (Say) (White-spotted sawyer)	jP, bS	Otter Falls and at Buffalo Narrows.	Found in dead trees and logs.
<u>Nematus populi</u> (Marl.) (A sawfly)	bPo	McLennan Lake, and at Waterbury Lake.	Light to moderate infestations.
<u>Nematus ventralis</u> Say (A sawfly)	W	Prince Albert National Park.	Most common at McAuley Lake and Waskesiu.
<u>Petrova albicapitana</u> (Busch.) (Pitch nodule maker)	jP	Buffalo Narrows and Lloyd Lake.	Light infestations, no serious damage.
<u>Pissodes strobi</u> (Peck) (White-pine weevil)	bS	Waterbury Lake.	Light infestation.
<u>Phenacaspis pinifoliae</u> (Fitch) (Pine needle scale)	bS	Bigstone and Knee Lake.	Light infestations.
<u>Physokermes piceae</u> (Schr.) (Spruce bud scale)	bS	Bigstone and Knee Lake.	Light infestations.
<u>hratora americana</u> (Brown) <u>canadensis</u> (A leaf beetle)	W	Otter Falls, Buffalo Narrows, and Bull Moose Creek. Deception, Spalding, Bigstone, and Hatchet lakes.	Light skeletonizing of foliage.
<u>Pontania</u> sp. (A sawfly)	W,wB, bPb	La Ronge, Waskesiu, Keefe, McIntosh, and Deception Lakes. Also Bear River.	Galls very numerous on willow at some locations; light on other tree species.
<u>Schizura unicornis</u> (Smith) (Unicorn caterpillar)	wB	Deschambault and La Ronge.	Light infestations.
<u>Semiothisa granitata</u> Gn. (Green spruce looper)	Gn. bS, tL	Throughout District; and Prince Albert National Park.	Light populations.

9.2.13 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Semiothisa sexmaculata</u> tL Pack. (Green larch looper)		Throughout District.	Highest populations at Mayview, Waskesiu, and Bittem Creek.
<u>Trichiocampus irregularis</u> (Dyar) (A sawfly)	W	Throughout District.	Common, but populations light.
<u>Trichiosoma triangulum</u> W,Al (Kby.) (A birch sawfly)		Throughout District.	Common, but populations light.

9.3 DISEASE CONDITIONS

9.3.1 Spruce Needle Rust, Chrysomyxa sp.: - Light infections occurred on the foliage of black spruce at Costigan and Waterbury lakes, and near the townsite of Waskesiu in Prince Albert National Park.

9.3.2 Leaf Spot on Aspen, Marssonina sp.: - Light infections noted on the foliage of trembling aspen reproduction along the highway right-of-way in the vicinity of Skunk Creek, and at Deschambault and Bigstone lakes.

9.3.3 Leaf Rust on Willow, Melampsora bigelowii Thum: - Localized infections of this rust on the foliage of willow were found at several points in the District. Two species of willow were heavily infected at Bear River on the Hanson Lake Road, but in each case the rust was confined to about five large clumps. Light infections occurred at Bigstone and Deschambault lakes and a moderate infection was noted at Skunk Creek.

9.3.4 Tar Spot on Willow, Rytisma salicinum Pers. ex Fr.: - Light infections were noted along the shore of Lloyd Lake, at Bear River and Deschambault Lake, and at Waskesiu in Prince Albert National Park.

9.3.5 Reddening of Spruce: - Extensive coloration of white and black spruce in all age classes occurred along Highway No. 2 from Waskesiu north to Skunk Creek. Although in many instances the foliage in the entire crowns of affected trees was completely reddened, no tree mortality was noted. This condition was attributed to a complex of factors including prolonged periods of drought in past years, and unfavorable growing sites.

9.3.6 Other Noteworthy Diseases:-

Organism and Disease	Host(s)	Locality	Remarks
<u>Peridermium harknessii</u> J. P. Moore (Globose gall rust)	jP	Lloyd Lake.	A light infection on a few trees.
<u>Dibotryon morbosum</u> (Schw.) Theiss. & Syd. (Black knot of cherry)	Ch	Buffalo Narrows, and Waskesiu.	Infections usually light; no serious damage.
<u>Arceuthobium americanum</u> Nutt. (Dwarf Mistletoe of pine)	jP	Beauval, Reindeer Lake and western part of District.	Extensive brooming.
<u>Arceuthobium pusillum</u> Peck. (Eastern dwarf mistletoe)	bS	Molanosa.	Occasional brooming.
<u>Uncinula salicis</u> (Fr.) Wint. (Powdery mildew)	W	Throughout District.	Notably at Bear River, Deschambault Lake and at La Ronge.
Herbicide Damage	mM	Ile a la Crosse.	Caused by spraying with 2,4-D for weed control.

**10. ANNUAL DISTRICT REPORT
MEADOW LAKE DISTRICT OF SASKATCHEWAN**

1963

by

K. L. Mortensen

**CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA**

March, 1964

10.1 INTRODUCTION

The most noteworthy insect problem in the Meadow Lake District was the continuation of the forest tent caterpillar outbreak. The area affected remained much the same but populations were higher and migrating larvae caused considerable annoyance to residents and tourists during the latter part of June and early July. Severe skeletonization of willow foliage by the grey willow leaf beetle occurred throughout the southern half of the District during August. The jack-pine sawfly, Neodiprion maurus Roh. virtually disappeared after a small infestation last year near Chitek Lake. Little change was noted in the status of other major insects. Larch sawfly populations remained low and aspen webworms were again common in August and September, particularly where old forest tent caterpillar cocoons were abundant. Yellow-headed spruce sawfly populations remained low in most shelterbelts, but light to moderate populations occurred on scattered, open growing white and black spruce from Green Lake to Beauval.

Tree disease conditions changed little during the past year. Leaf blights on deciduous trees were less common and rust infections of conifers were sporadic. The jack pine globose gall and spindle rusts were widely scattered throughout most jack pine stands.

Surveys were carried out from mid May to late October and during this period totals of 374 insect and 33 tree disease samples were collected. Six hours of chartered flying time were used for aerial surveys.

10.2 INSECT CONDITIONS

10.2.1 Larch Sawfly, Pristiphora erichsonii (Htg.):- This sawfly was again present in all tamarack stands but defoliation was light with moderate to heavy on an occasional young tree (Fig. 1). Results of sequential sampling of larch sawfly egg populations conducted in permanent plots are shown below.

Plot No.	Location	Infestation Rating		
		No. of shoots counted	No. of shoots curled	Infestation rating 1963
102	Loon Lake	60	0	light
104	Pierceland	60	1	light
105	St. Cyr	70	2	light

Cocoons were collected for parasite studies from 20, two-foot square drop trays at the Loon Lake plot. The data obtained from laboratory examination of these cocoons are as follows:

Total No. cocoons examined	No. of healthy larvae	No. of larvae parasitized by dipterous parasites	No. of larvae parasitized by <u>Tritneptis klugii</u>	No. of cocoons destroyed by other causes
97	11	17	42	27

10.2.2 Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.:- Larvae were collected from most of the black and white spruce examined throughout the District. Populations continued to increase along the Buffalo Narrows road from Green Lake to Beauval and caused moderate to severe defoliation to open-growing black and white spruce; the defoliation appeared to be confined to the roadsides. Moderate defoliation of young white spruce occurred around the resort areas at Jumbo Beach, Little Fishing and Mustus lakes, and in a farm shelterbelt at Cater. Severe defoliation of a few young white spruce was recorded at the Turtle Lake Resort, north of Livelong, and in an old campsite at Perch Lake in the northern part of the District. Light infestations were recorded at Keeley Lake, Four Corners, Kimball and Chitek and Mistohay lakes.

10.2.3 Black-headed Budworm, Acleris variana (Fern.):- This defoliator of white and black spruce and balsam fir occurred more commonly than in 1962 (Fig. 5). It was found in association with the yellow-headed spruce sawfly along the Buffalo Narrows Road from Mile 21 to Mile 32. Collections were also made from widely scattered points including Waseca, Steeles' Narrows and Brightsand Lake but no noticeable defoliation was found.

10.2.4 Spruce Gall Aphid, Chermes lariciatus (Patch):- Galls on white and black spruce were again abundant and widespread. An occasional ornamental tree was heavily attacked and disfigured around the resort areas at Loon, Little Birch, Peck and Turtle lakes. Elsewhere damage was generally light.

10.2.5 Pitch Nodule Maker, Petrova albicapitana (Busck):- This insect was detected in nearly all of the jack pine stands examined. Damage was generally light, but a noticeable increase in numbers of new nodules was recorded in the study plot at Beacon Hill. Results of tallies conducted in October 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			Total No. of trees with old and new nodules - 1963
		1961	1962	1963	
144	25	10	8	18	54

Thus far no permanent damage has been recorded on any of the trees attacked.

10.2.6 Sawflies on Jack Pine, Noediprion spp.:-- There was a complete collapse of the small, localized infestation of Noediprion maurus Roh. reported last year in the Chitek Lake area. Elsewhere sawfly colonies were also less abundant, but a number of collections were made at widely scattered points. In all cases defoliation was confined to an occasional tree or individual branches. Collections of N. nanulus nanulus Schedl. were taken from jack pine at Pierceland, Rapid View, Mile 32 Buffalo Narrows Road, and Pierce, Waterhen, Flotten and Loon lakes. Collections of N. pratti banksianae Rohwer were made at St. Cyr, Loon Lake, Pierceland and N. maurus Roh. at Mile 32 Buffalo Narrows Road.

10.2.7 Forest Tent Caterpillar, Malacosoma disstria Hbn.:-- As indicated by the 1962 egg band survey, the outbreak of this defoliator continued with a noticeable general increase in the severity of defoliation (Fig. 6). The southern boundary of moderate to severe defoliation of trembling aspen, commences at a point on the Saskatchewan-Alberta border just north of the Lloydminster Ferry, runs northeasterly to Worthington Lake, sweeps southeasterly to the north end of Turtle Lake, and then eastward to Chitek Lake and across into the Prince Albert District. Practically all of the aspen stands in the District north of this line suffered moderate to severe defoliation. The infestation in the Capasin area coalesced with that in the Big River-Bodmin area of the Prince Albert District which began in 1960.

Foliage development of trembling aspen was somewhat retarded and in many cases forest tent caterpillar larvae emerged before food was available. However, very little mortality was observed at that time but mortality due to starvation was fairly widespread during the latter part of the feeding season, and larvae migrating in search of food caused considerable annoyance to residents and tourists throughout the infested area.

Mass collections of larvae and pupae were made at Cold Lake and Meadow Lake in connection with parasite studies. The following table summarizes the results of the laboratory rearings.

Location	Type of Collection	No. Reared	No. of Diptera Parasites	Percentage of Parasitism
Cold Lake	Larval	95	28	29
	Pupal	112	59	53
Meadow Lake	Larval	113	12	10
	Pupal	102	35	34

Egg band surveys conducted during the fall to predict population levels in 1964 suggested a decline, but extensive areas of severe defoliation will probably occur again throughout the District. The results of the egg band survey are shown in Table 1.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Survey
Meadow Lake District - 1963
(Based on examination of 3 co-dominant trembling aspen
at each sampling point)

Sta. No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown Depth	Av. No. Egg bands per tree	Forecast for 1964
1	Gold River	3.7	23.3	14.6	10.7	Severe
3	Pierce Lake	3.3	22.0	12.3	15.7	Severe
10	Big Bush	3.0	19.0	16.7	23.3	Severe
11	St. Walburg	3.3	18.3	13.3	3.7	Light
12	Little Birch Lake	3.3	20.3	14.6	15.0	Severe
13	Meadow Lake	3.8	24.3	18.6	19.7	Severe
15	Prince	3.0	21.6	15.6	0.3	Light
16	Loon Lake Beach	4.0	34.3	16.7	25.3	Severe
28	Flotten Lake	3.3	25.0	14.7	3.0	Light
30	Meadow Lake	3.0	22.6	17.6	26.3	Severe
32	Little Fishing Lake	3.3	23.0	19.3	5.7	Moderate
33	Green Lake	3.3	23.3	18.3	18.7	Severe
35	Waterhen R. & Hgy. 155	3.7	21.7	14.7	12.3	Severe
37-	Divide	3.3	26.3	15.3	26.7	Severe
38	Ministikiwan Lake	3.7	22.7	19.0	8.7	Moderate
41	Lloydminster	4.0	26.3	21.0	3.7	Light
43	Glaslyn	3.7	22.3	15.3	0.3	Light
44	Midnight Tower	3.3	22.7	16.7	3.3	Light
48	Goodwill	3.0	24.3	13.0	5.3	Moderate
49	Golden Ridge	3.3	22.6	16.6	23.7	Severe
53	Dorintosh	4.0	24.7	19.7	22.7	Severe
55	Canoe Lake Village	3.7	30.0	20.3	8.7	Moderate
59	Canoe Lake	3.0	23.3	16.3	8.3	Severe
61	Capasin	3.7	19.3	12.3	2.7	Light

TABLE 1 (cont.)

Sta. No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. Crown Depth	Av. No. Egg bands per tree	Forecast for 1964
62	Capasin	3.7	24.7	12.3	1.7	Light
65	Turtleford	3.3	21.3	15.7	0.3	Light
66	Cater	3.0	21.0	17.3	0.0	Nil
67	Spiritwood	3.3	18.3	12.0	10.3	Severe
68	Leoville	3.7	22.7	12.3	0.6	Light
69	Cochin	3.0	23.0	18.3	0.6	Light
77	Lloydminster	4.0	23.6	19.6	1.3	Light
A	St. Walburg	2.7	21.3	17.7	3.3	Light
B	Livelong	3.3	22.3	15.6	0.0	Nil
C	Paradise Hill	3.7	21.0	16.0	2.3	Light
D	Maidstone	3.3	22.3	17.6	1.3	Light
E	Greig Lake Resort	4.0	34.7	18.7	10.3	Severe

10.2.8 Grey Willow-leaf Beetle, Galerucella decora (Say):- There was a marked increase in abundance throughout the District. Severe skeletonizing of willow foliage occurred from the north end of Loon Lake, through the Bronson Provincial Forest, to St. Walburg, and in the agricultural area from St. Walburg to North Battleford. Large areas of severely skeletonized willow were observed in aerial survey in the North Battleford, Midnight Lake, Chitek Lake, Dore River and Durocher Lake areas. Other patches of almost complete skeletonizing were recorded at Pierceland, Peerless and Golden Ridge.

10.2.9 American Aspen Beetle, Gonioctena americana (Schffr.): - Adults and larvae were common throughout the central part of the District in June, but with the severe forest tent caterpillar infestation in the area it was difficult to attribute any degree of defoliation to these leaf beetles. Small pockets of light defoliation were recorded at Midnight Lake, Goose Lake, Glaslyn and along Highway No. 4 around Ducharme Creek and Divide.

10.2.10 Webworms on Poplar, Tetralopha asperatella (Clem.): - Webworms were again common on poplars during the fall. Populations were particularly heavy in areas where old forest tent caterpillar cocoons were abundant. Moderate to heavy defoliation occurred in small patches near Loon Lake, Waterhen Lake, Keeley Lake and Goodsoil.

10.2.11 Boxelder Twig Borer, Proteoteras willingana Kft.: - Light populations of twig borers occurred in most Manitoba maple shelterbelts examined. Counts were made on branches from five trees in shelterbelts at Goodwill, Loon Lake and Bolney. The data obtained from these population studies are shown in Table 2.

TABLE 2

Results of 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)

Location	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. Crown Width (ft.)	N o. of twigs examined and twig borer populations by crown level					
				LOWER		MID		UPPER	
				No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Loon Lake	18.4	16.2	15.0	248	5	317	20	262	14
Goodsoil	16.8	14.4	7.6	308	12	326	11	300	15
Bolney	22.0	18.0	11.6	443	31	436	22	309	18

10.2.12 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Argyrotaenia tabulana</u> Free. (A pine tube moth)	jP	Waterhen Lake.	Very light damage.
<u>Anoplonyx luteipes</u> (Cress.) (A sawfly)	tL	Throughout the District.	Commonly found but no noticeable defoliation.
<u>Archips cerasivoranus</u> Fitch (Ugly-nest tortrix)	tA, cCh	Horse Head P.O., Wapaweeke Beach and Brightsand Lake and Tea Creek.	Generally light infestations but small pocket of heavy at Tea Creek on the Leoville-Meetoos Rd.
<u>Altica populi</u> Brown (A poplar beetle)	tA, bPo	Bolney, Cleeves and Loon Lake.	Light feeding on balsam poplar during August.
<u>Aphrophora</u> spp. (Spittle bugs)	wS, jP, tL, bF	Throughout District.	Most abundant in Loon Lake and Divide areas. <u>A. permutata</u> Uhl. and <u>A. signoreti</u> Fitch were the species recorded.
<u>Choristoneura fumiferana</u> (Clem) (Spruce budworm)	wS	Peck Lake and Fort Pitt	Very light populations, no noticeable defoliation (Fig.2).

10.2.12 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Choristoneura pinus</u> Free. (Jack-pine budworm)	jP	Rapid View and Beacon Hill.	Very low populations.
<u>Campaea perlata</u> Gn. (A geometrid)	tA, wB, W, bPo	Central portion of District.	Low populations.
<u>Chrysomela crotchii</u> Brown (Aspen leaf beetle)	tA, W	Marshall and Canoe Lake.	Low populations; no skeletonizing.
<u>Eupithecia filmata</u> Pears. (A looper)	wS	Throughout the Meadow Lake District.	Low populations.
<u>Eupithecia luteata</u> Pack. (A looper)	tA, W	Throughout the southern half of Meadow Lake District.	Commonly found during May and June.
<u>Incisalia nippon clarki</u> jP Freem. (Jack-pine hairstreak)		Widely scattered throughout the District.	Populations declined; no defoliation recorded.
<u>Malacosoma lutescens</u> (N.&D.) (Prairie tent caterpillar)	cCh, rose	Blaine Lake, Ministikiwan Lake, Capasin and Fort Pitt.	Small pockets of moderate infestation at widely scattered points.
<u>Neodiprion abietis</u> (complex) wS (Harris) (Balsam-fir sawfly)		Widely scattered throughout the District.	No serious defoliation.
<u>Operophtera bruceata</u> (Hulst) tA, (Bruce's spanworm)	W	Peerless, Hafford, Belbutte, Pierceland, Goodsoil and Richard.	Low populations.
<u>Pikonema dimmockii</u> (Cress.) wS, (Green-headed spruce sawfly)	bs	Throughout District.	Populations generally low and usually associated with the yellow-headed spruce sawfly.
<u>Pissodes strobi</u> (Peck) (White-pine weevil)	wS, bs	Widely scattered throughout the District.	Damage generally light.

10.2.12 Other Noteworthy Insects (cont.):-

Insect	Host(s)	Locality	Remarks
<u>Pissodes terminalis</u> (Hopping) (Lodgepole terminal weevil)	jP	Meadow Lake and Mustus Lake.	Light populations.
<u>Phenacaspis pinifoliae</u> (Fitch) (Pine needle scale)	wS	Waseca and Marsden.	Light populations at Waseca; heavy in large farm shelterbelt at Marsden.
<u>Semiothisa bicolorata</u> F. (A looper)	jP	Widely scattered throughout the District.	Occasional larvae; no defoliation.
<u>Semiothisa granitata</u> Gn. (A looper)	wS, bF, tL	Widely scattered throughout the District.	Low populations; no defoliation.
<u>Semiothisa sexmaculata</u> Pack. (A looper)	tL	Found commonly throughout the District.	No appreciable defoliation.

10.3 DISEASE CONDITIONS

10.3.1 Macrophoma Galls on Poplar, Macrophoma tumefaciens Shear:- A light infection, confined to occasional trembling aspen trees, was recorded at Meadow Lake. Curcubitaria staphula was associated with the galls collected from this area. A few galls were also noted on large mature aspen at Pierceland. (Fig. 9).

10.3.2 A Salix-Larix Rust, Melampsora bigelowii Thum.:- A light infection occurred on the foliage of willow in a small area near the Divide Fire Tower. The alternate stage of this rust occurs on tamarack.

10.3.3 Globose Rust Gall, Peridermium harknessii J.P. Moore:- Light infections common throughout most jack pine stands in the District; collections taken from Worthington Lake, Jeanette Lake and Divide Fire Tower.

10.3.4 Spruce Needle Rust, Chrysomyxa sp.:- Heavy infection occurred in a small patch of mature white spruce on a farm woodlot near Loon Lake and a few white spruce were moderately attacked near the Divide Fire Tower.

10.3.5 Malformation of Manitoba Maple Shoots and Foliage:- Surveys were continued to determine the distribution of this condition in relation

to the use of 2,4-D in weed control in grain crops. Of five shelterbelts examined, all showed typical symptoms, but damage was light in all cases. Results of the survey are shown in Table 3.

TABLE 3
2,4-D Injury to Manitoba Maple
Meadow Lake District - 1963

Location	Date Sampled	Degree of Injury	Remarks
North Battleford 7-44-17-W3rd.mer.	June 18	A few isolated twigs damaged.	Shelterbelt 100 yds. from sprayed grain field.
Prince 18-46-15-W3rd mer.	June 18	A few isolated twigs damaged.	Shelterbelt adjacent to sprayed grain field.
Ile a la Crosse 8-05E-349	July 12	A few isolated twigs damaged.	No evidence of spraying in immediate vicinity.
Meadow Lake 34-59-17-W3rd.mer.	July 20	A few isolated twigs damaged.	Shelterbelt adjacent to sprayed field.
North Battleford 5-43-16-W3rd.mer.	Aug. 1	Part of both sides of trees damaged.	Boulevard in city, adjacent to spraying.

10.3.6 Other Noteworthy Diseases:-

Organism and Disease	Host(s)	Locality	Remarks
<u>Arceuthobium americanum</u> Nutt. (Eastern dwarf mistletoe)	jP	Throughout most jack pine stands.	Mistletoe plants infected with the hyperparasite, <u>Wallrothiella arceuthobii</u> (Pk.) at Jeanette Lake.
<u>Chrysomyxa arctostaphyli</u> Diet. (Yellow witches' broom)	bS	Scattered throughout the District.	Light infections; mostly small brooms.
<u>Ciborinia</u> sp. (An ink spot)	tA	Loon Lake.	Small patch of light infection.

10.3.6 Other Noteworthy Diseases: (cont.):-

Organism and Disease	Host(s)	Locality	Remarks
<u>Cronartium comandrae</u> Peck (Comandra blister rust)	jP	Meadow Lake, St. Cyr and Loon Lake.	Occasional light infection on jack pine. Heavy infec- tion on alternate host <u>comandra</u> sp. at Loon Lake.
<u>Flammula</u> sp. (A butt rot of conifers)	wS	Little Birch Lake.	Collection of mush- room resembling <u>F. alnicola</u>
<u>Fomes pinicola</u> (Swartz) Cke. (Brown crumbly rot)	tL wS	Whelan P.O. Loon Lake.	One collection from living tL. Common as a slash fungus.
<u>Fomes pini</u> (Brot. ex Fr.) Karst. (Red heart rot)	wS	Widely scattered throughout the District.	Common as a slash fungus.
<u>Fomes roseus</u> Fr. (Brown cubical rot)	wS	Goodsoil.	Found in wind- thrown slash at one location.
<u>Lenzites saepiaria</u> (Wulf.) Fr. (Brown cubical pocket rot)	wS	Throughout the District as far south as North Battleford.	Common slash fungus.
<u>Nectria galligena</u> Bres. (Nectria canker)	white elm	Spiritwood.	Light infection on dead elm branches in a shelterbelt.
<u>Polyporus tomentosus</u> Fr. (Root rot of conifers)	wS	Loon Lake.	Collections of sporophores.

11. ANNUAL DISTRICT REPORT
WEST-CENTRAL DISTRICT OF SASKATCHEWAN

1963

by

L. L. McDowall and K. L. Mortensen

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY LABORATORY
WINNIPEG, MANITOBA

March 1964

11.1 INTRODUCTION

Forest insect and disease conditions remained much as they have been in recent years and no major problems were recorded. The main defoliating insects were the fall cankerworm on Manitoba maple and the aspen leaf beetle on trembling aspen. The severe infestation of prairie tent caterpillar continued unabated in the Pike Lake Provincial Park area, while the grey willow leaf beetle severely skeletonized the foliage of willow in the Eagle Hills south of Battleford. The pine needle scale occurred at infestation levels on shelterbelt and ornamental plantings of white spruce at widely separated points. The most important disease condition continued to be dieback and mortality resulting from the severe drought of 1961.

Totals of 127 insect and 9 disease samples were made during the summer. Emphasis was again placed on sampling caragana, white elm, and Manitoba maple.

11.2 INSECT CONDITIONS

11.2.1 Spruce Budworm, Choristoneura fumiferana (Clem.):- The heavy infestation that had persisted since 1956 in a white spruce shelterbelt near Rosthern showed a marked decline, and only light feeding was recorded (Fig. 2). Laboratory rearings in 1962 showed 57 per cent larval parasitism. Populations were too low to make similar collections in 1963.

11.2.2 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):- Populations of this insect remained low in all spruce shelterbelts. Light defoliation was recorded at Floral, while an occasional larva was noted near Rose Valley and Ranger Lake.

11.2.3 Pine Needle Scale, Phenacaspis pinifoliae (Fitch):- Heavy infestations persisted on Colorado and white spruce plantings in park areas in the city of Saskatoon. A request for information on control was received from the owner of a spruce shelterbelt that was attacked at Marsden. A light infestation was recorded on white spruce in the cemetery at Watrous.

11.2.4 Forest Tent Caterpillar, Malacosoma disstria Hbn.:- Endemic populations continued throughout most of the eastern part of the District and the Pike Lake Provincial Park (Fig. 6). No defoliation was recorded, but larval collections were taken at Battleford, Borden, Pike Lake Park, Spalding, Dana and Watson. Egg band sampling was carried out in the fall to predict infestation levels for 1964. The results, shown in Table 1, indicate that there will be little change in populations.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Survey
West-Central Saskatchewan - 1963

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

Area No. Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. No. egg bands per tree	Defoliation forecast 1964
Pike Lake - 2	2.8	20.0	15.0	0	Nil
Pike Lake - 4	3.0	18.3	14.6	0	Nil
Pike Lake - 5	3.0	21.3	16.6	0	Nil
Battleford - 7	3.3	17.0	13.6	0	Nil
Red Pheasant - 9	3.0	22.0	16.6	0	Nil
Borden - 10	3.0	19.3	15.0	0	Nil
Reynaud - 11	3.0	26.6	16.6	0	Nil
Lepine - 12	3.0	27.0	16.0	0	Nil
Pleasant Dale - 13	3.0	27.0	17.3	0	Nil

11.2.5 Boxelder Twig Borer, Proteoteras willingana (Kft.):- This insect occurred in nearly all Manitoba maple shelterbelts, but no marked change in the intensity was recorded. Population studies were continued at Outlook, Floral and Domrémy and the results are summarized in Table 2.

TABLE 2

Results of Boxelder Twig Borer Population Counts
West-central District of Saskatchewan

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

Location	Tree Data			No. of twigs examined and twig borer populations by crown level					
	Av. ht. (ft.)	Av. crown depth (ft.)	Av. crown width (ft.)	LOWER		MID		UPPER	
				No. of twigs	No. of borers	No. of twigs	No. of borers	No. of twigs	No. of borers
Outlook	20.6	16.8	11.2	515	27	475	23	412	16
Floral	17.2	15.2	9.2	361	11	377	11	278	8
Domrémy	19.0	15.2	10.2	280	6	261	8	277	11

11.2.6 Prairie Tent Caterpillar, Malacosoma lutescens (N.&D.):- The infestation in the Pike Lake Park area was again severe and caused almost complete defoliation of eastern chokecherry, Saskatoon service-berry and wild rose. Patches of heavy defoliation were again recorded

in the Hoey-Wakaw-Crystal Springs area. Elsewhere, larval collections were taken at Saskatoon, Borden, Humbolt and Dana, but only light defoliation occurred.

11.2.7 Leaf Rollers of Aspen:- Compsolechia niveopulvella Chamb. was the most commonly occurring leaf roller and it caused light to moderate defoliation in aspen stands east of Saskatoon, south and west of Battleford and around Borden. Occasional larval collections were also taken of Pseudexentra improbana oregonana Wlsh., Epinotia solandriana Linn. and Choristoneura conflictana (Wlkr.) at widely scattered points, but defoliation was negligible.

11.2.8 Fall Cankerworm, Alsophila pometaria (Harris):- Increased larval populations and new local infestations were recorded in shelter-belt and town plantings of Manitoba maple and white elm throughout the central part of the District. Scattered shelterbelts in the vicinities of Vanscoy, Delisle, Tessier, Harris and Rosetown were severely defoliated and larvae were commonly found on boulevard trees in Saskatoon. Light to moderate defoliation was recorded in shelterbelts at Asquith, Juniata and Battleford.

11.2.9 Aspen Leaf Beetle, Chrysomela crotchii Brown:- There was a noticeable increase in the abundance of this insect, particularly in the central portion of the District (Fig. 7). Skeletonizing of the foliage of aspen reproduction was moderate to severe in the area from Meacham to Saskatoon and around Naicam, Demremy, Birch Hills and Fenton. Light feeding damage was recorded west of Saskatoon in the vicinities of Vanscoy, Harris and Borden.

11.2.10 A Lace Bug, Corythuca sp.:- Caused heavy damage to the foliage of Saskatoon serviceberry throughout most of the Pike Lake Provincial Park and in the hills southwest of Battleford. A small patch of heavily damaged willow occurred in the vicinity of Crystal Springs.

11.2.11 Grey Willow-leaf Beetle, Galerucella decora (Say):- Moderate to heavy skeletonizing of willow foliage occurred throughout the Eagle Hills south of Battleford and of scattered clumps of willow south as far as Biggar. Elsewhere occasional adults and larvae were found but populations were low and caused no visible damage.

11.2.12 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Altica populi</u> Brown (A poplar flea beetle)	bPo, W	Lizard Lake, Waldon and Resource.	Very light populations.
<u>Antheraea polyphemus</u> (Cramer) (A polyphemus moth)	sB, tA	Pike Lake Park and Battleford.	Very low populations.
<u>Amauronematus</u> sp. (A sawfly)	tA,W, bPo	Throughout District.	Commonly found; no visible defoliation.
<u>Acleris variana</u> (Fern.) (Black-headed budworm)	wS	St. Benidict.	Low populations (Fig. 5).
<u>Gampaea perlata</u> Gn. (A fringed looper)	tA	Pike Lake.	Occasionally found.
<u>Dichelonyx backii</u> Kby. (A leaf chafer)	tA,W, caragana	Domremy and Humbolt.	Moderate populations in the Domremy area.
<u>Enargia decolor</u> Wlk. (A noctuid)	tA,W, mM	Dafoe, Borden, Wel- don and Humbolt.	Occasional larvae.
<u>Gluphisia septentrionalis</u> Wlk. (A prominent)	tA	Biggar and Lizard Lake.	Occasional larvae.
<u>Itame loricaria</u> Evers. (A looper)	tA,W, bPo	Widely scattered throughout District.	No noticeable defoliation.
<u>Lopidea dakota</u> Knight (Caragana plant bug)	caragana	Borden, Pike Lake, Tessier, Biggar, Battleford and Melfort.	Commonly found; no visible damage.
<u>Orsodacne atra</u> Ahr. (A leaf beetle)	tA,W, caragana	Dana, Pike Lake, Richard, Wakaw and Melfort.	Adults only; no noticeable defoliation.
<u>Operophtera bruceata</u> (Hulst) (Bruce's spanworm)	tA,W, mM, caragana	Widely scattered throughout the District.	No serious defoliation recorded.
<u>Pristiphora erichsonii</u> (Htg.) (A larch sawfly)	sL	Ranger Lake.	Severe defoliation to one remaining tree in an old plantation (Fig. 1)
<u>Pikonema dimmockii</u> (Cress.) (Green-headed spruce sawfly)	wS	Rosthern and Ranger Lake.	Only an occasional larva.
<u>Schizura concinna</u> J.E.Smith (A red-humped caterpillar)	tA	Brancepeth.	Moderate defoliation of one tree.
<u>Tetralopha asperatella</u> (Clem.) (A webworm on aspen)	tA	Kinistino and St. Breux.	Very low populations.

11.3 TREE DISEASE CONDITIONS

11.3.1 Drought Injury:- Mortality of trembling aspen is still occurring in most "prairie bluffs" as a result of the 1961 drought. Associated with the dead and dying trees are attacks by wood boring insects and relatively heavy infections of Cytospora and Hypoxyylon cankers.

11.3.2 Gymnosporangium sp.:- A heavy infection of this rust, which has its alternate stage on juniper, occurred on Saskatoon serviceberry throughout the Pike Lake Provincial Park area and in the Eagle Hills south of Battleford.

11.3.3 Slash fungus, Lenzites saepiaria (Wulf)Fr.:- This organism was found attacking native white spruce along the North Saskatchewan River at Battleford. Hailstorms and prolonged droughts have caused considerable tree mortality in these stands.

11.3.4 Malformation of Manitoba 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 where spraying had been carried out in adjacent fields. All maple trees showed typical symptoms, but only light damage was recorded. Results of the survey are shown in Table 3.

TABLE 3

2,4-D Injury to Manitoba Maple
Meadow Lake District - 1963

Location	Date Sampled	Degree of Injury	Remarks
Battleford 10-44-17-W3	June 17	A few isolated twigs damaged.	Approx. 100 ft. from sprayed field.
Maymont 32-41-12-W3	June 18	A few isolated twigs damaged.	Adjacent to sprayed field.
Maymont 20-42-12-W3	June 18	A few isolated twigs damaged.	Adjacent to sprayed field.
Rosthern 4-43A-3-W3	June 25	A few isolated twigs damaged.	Adjacent to sprayed field.
Borden 19-39-8-W3	June 25	A few isolated twigs damaged.	One-half mile from sprayed field.

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

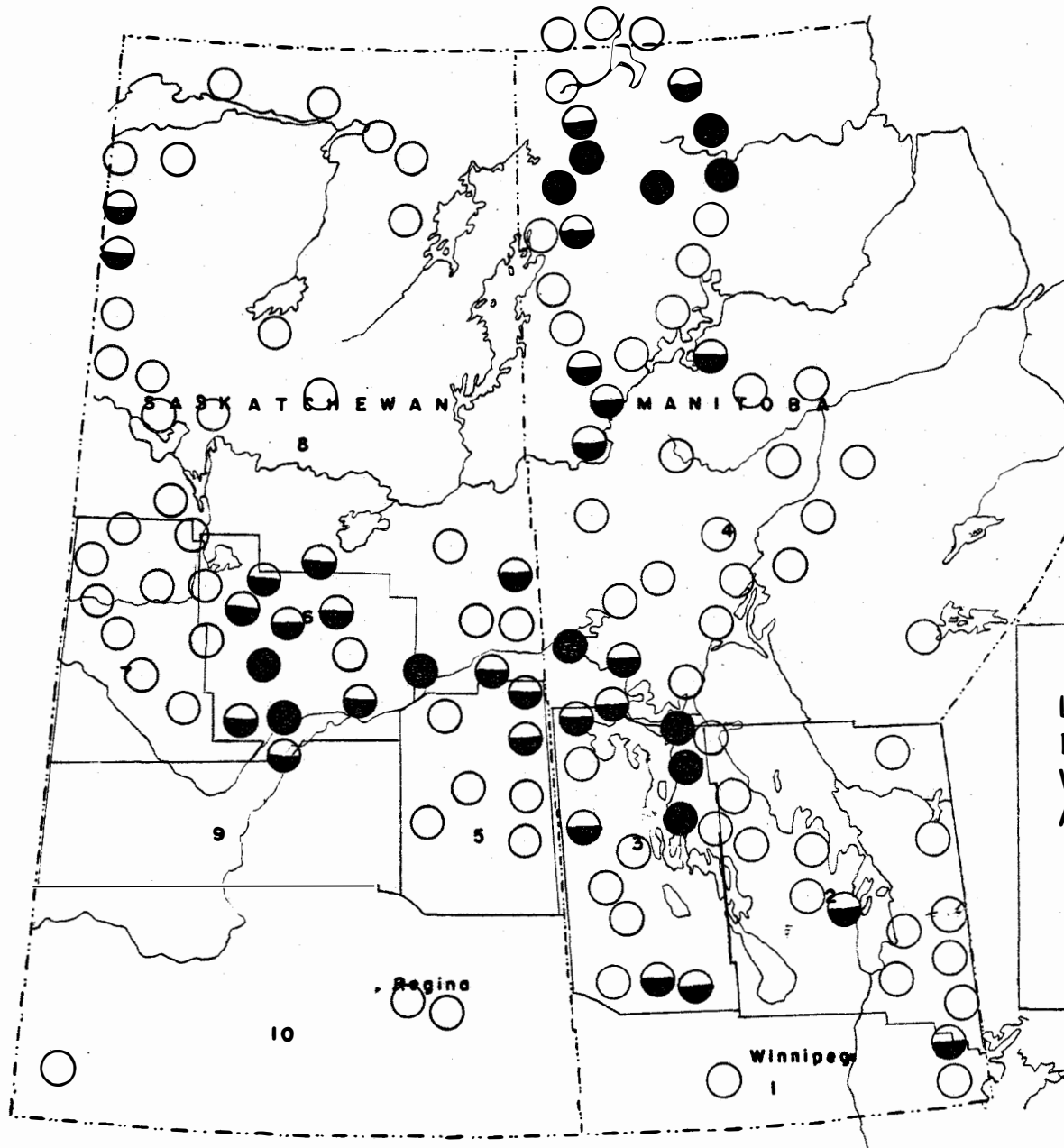
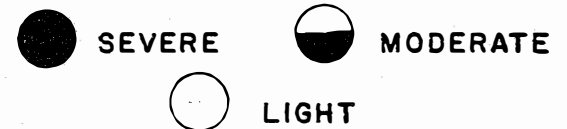


FIG. 1

**LOCATION OF POINTS WHERE
LARCH SAWFLY INFESTATIONS
WERE DETERMINED BY GROUND
AND AERIAL SURVEYS—1963**



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

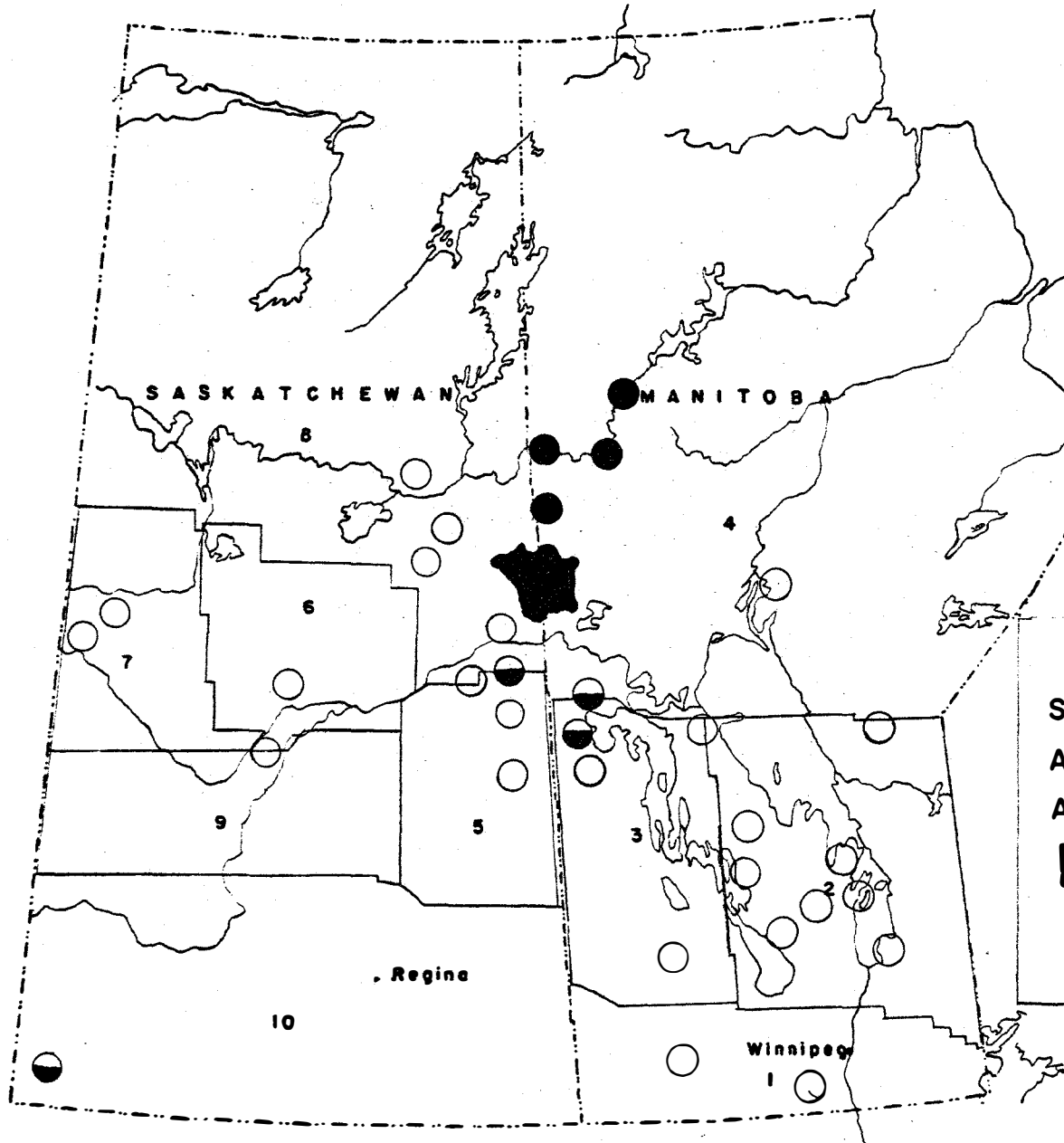
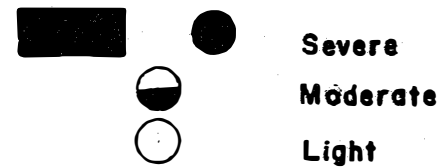
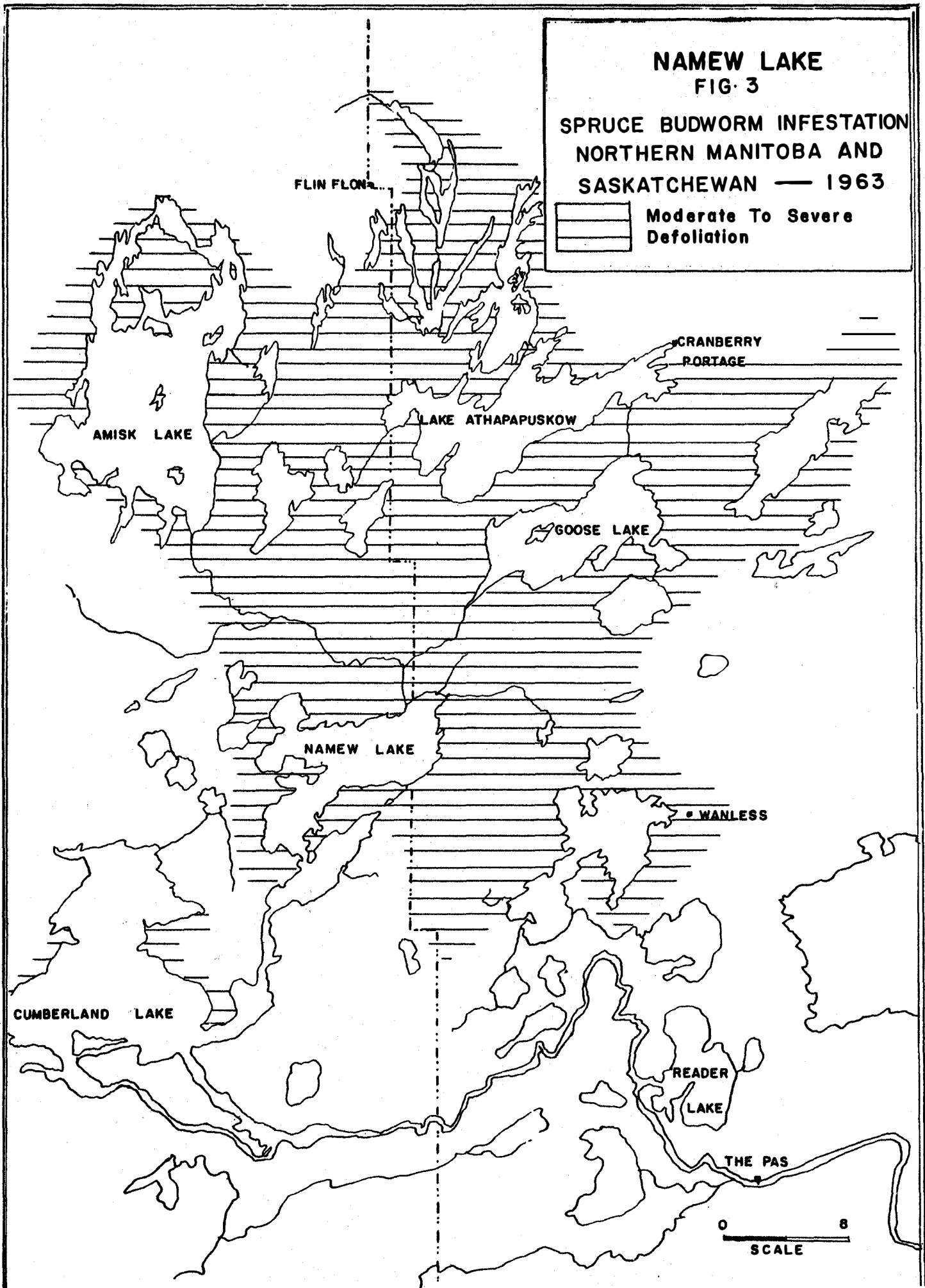


FIG. 2
SPRUCE BUDWORM INFESTATIONS
AS DETERMINED BY GROUND AND
AERIAL SURVEYS—1963.



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

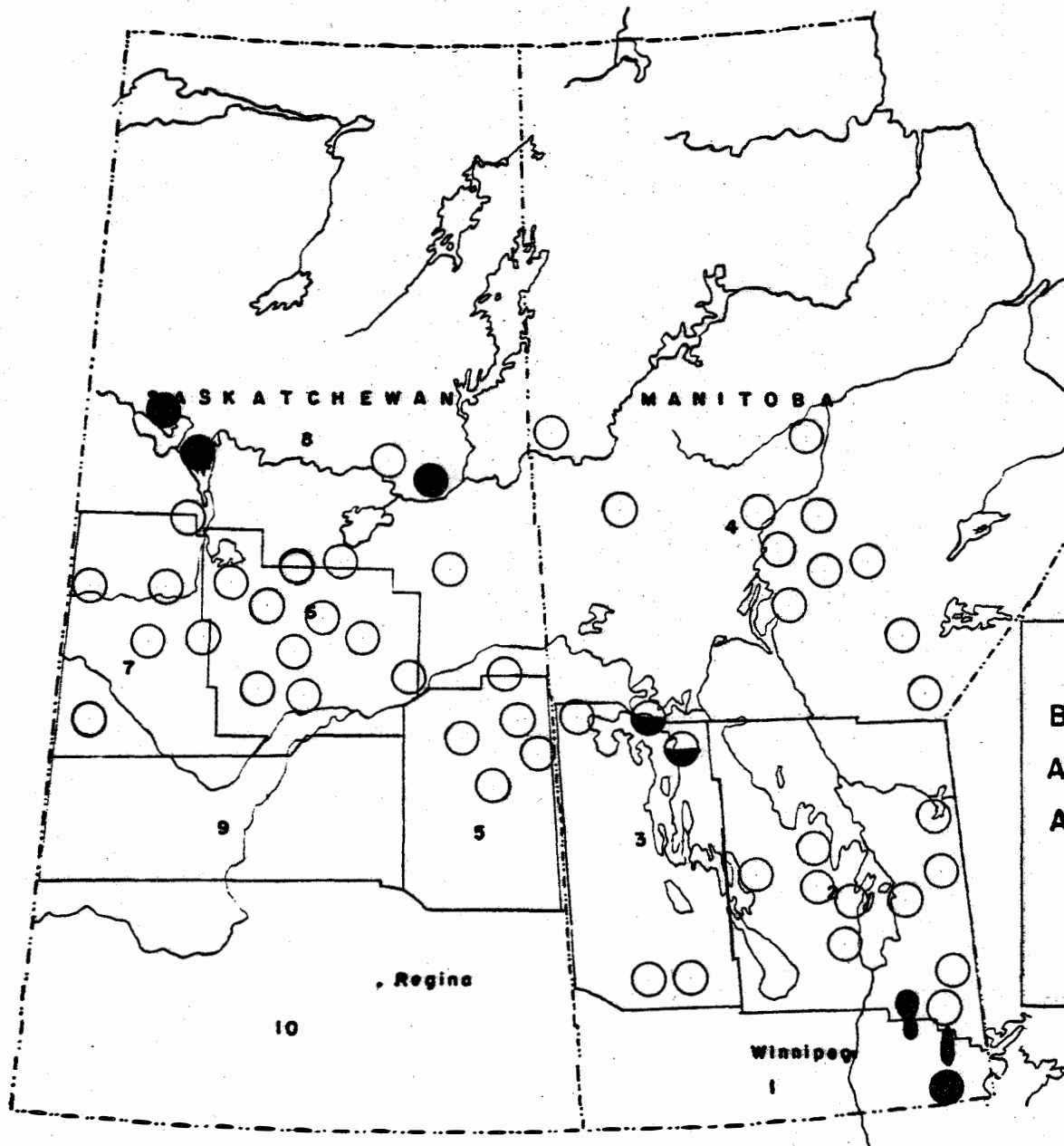


FIG. 4
BALSAM FIR SAWFLY INFESTATIONS
AS DETERMINED BY GROUND AND
AERIAL SURVEYS — 1963.

● SEVERE
◐ MODERATE
○ LIGHT

Scale 120mi-1in.

BIOLOGY RANGER DISTRICTS

MANITOBA
1-SOUTHERN DISTRICT
2-EASTERN DISTRICT
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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

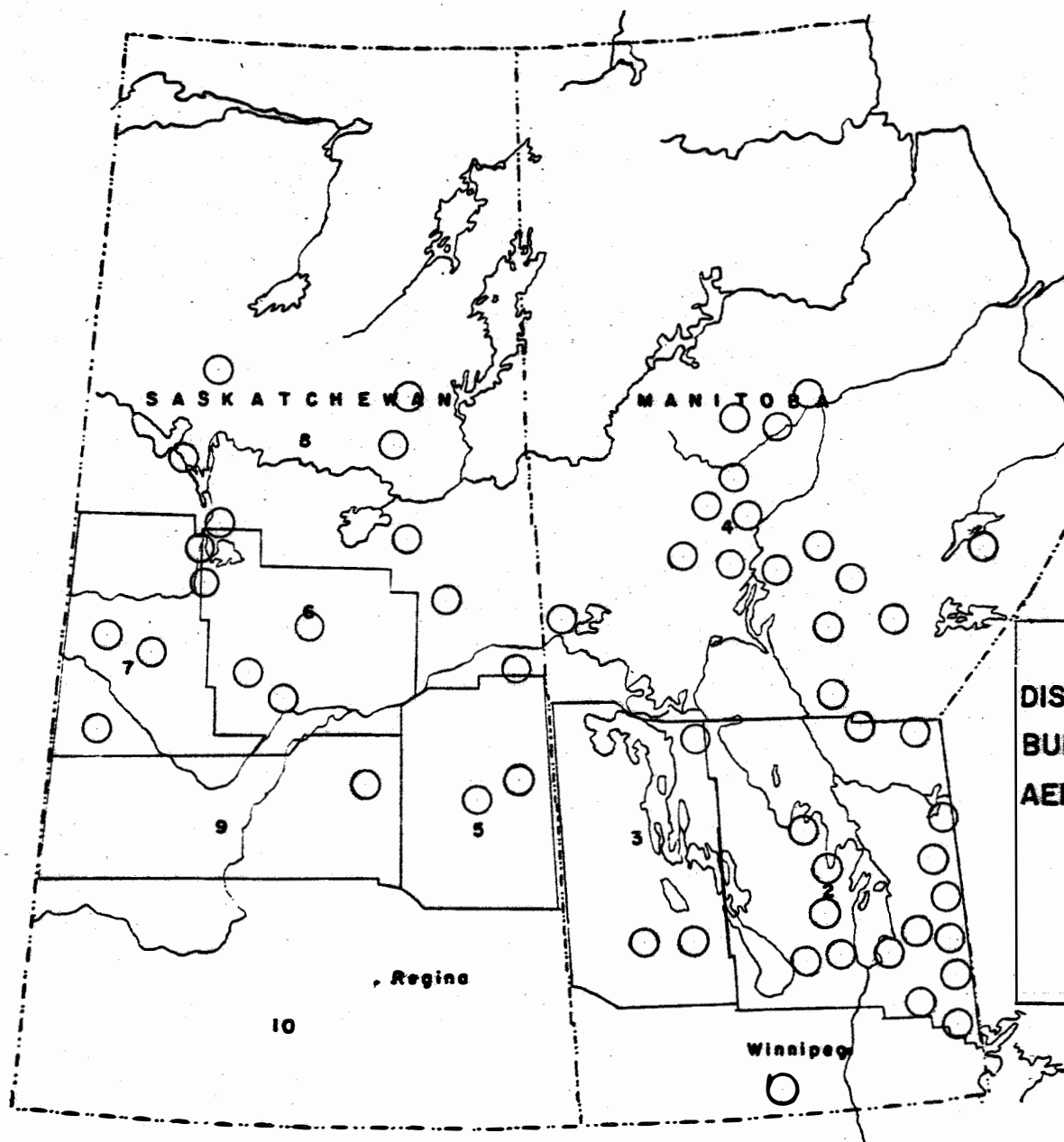


FIG. 5
DISTRIBUTION OF THE BLACK-HEADED
BUDWORM AS DETERMINED BY GROUND
AERIAL SURVEYS — 1963.

○ LIGHT INFESTATION

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

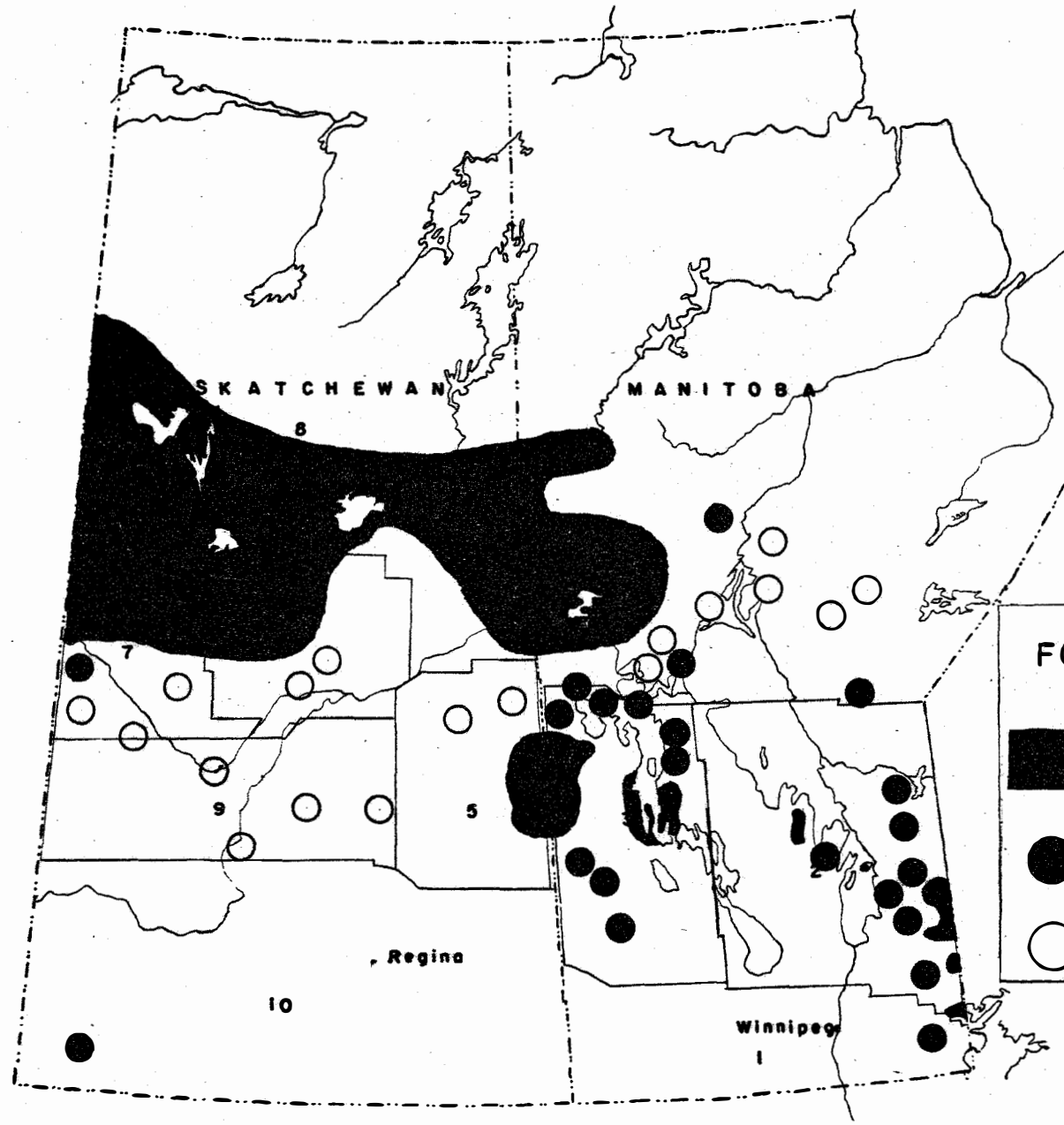





FIG. 6
FOREST TENT CATERPILLAR
1963

 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

- 1. SOUTHERN DISTRICT
- 2. EASTERN DISTRICT
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- 4. NORTHERN DISTRICT

SASKATCHEWAN

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- 6. PRINCE ALBERT DISTRICT
- 7. MEADOW LAKE DISTRICT
- 8. NORTHERN DISTRICT
- 9. WEST-CENTRAL DISTRICT
- 10. SOUTHERN DISTRICT

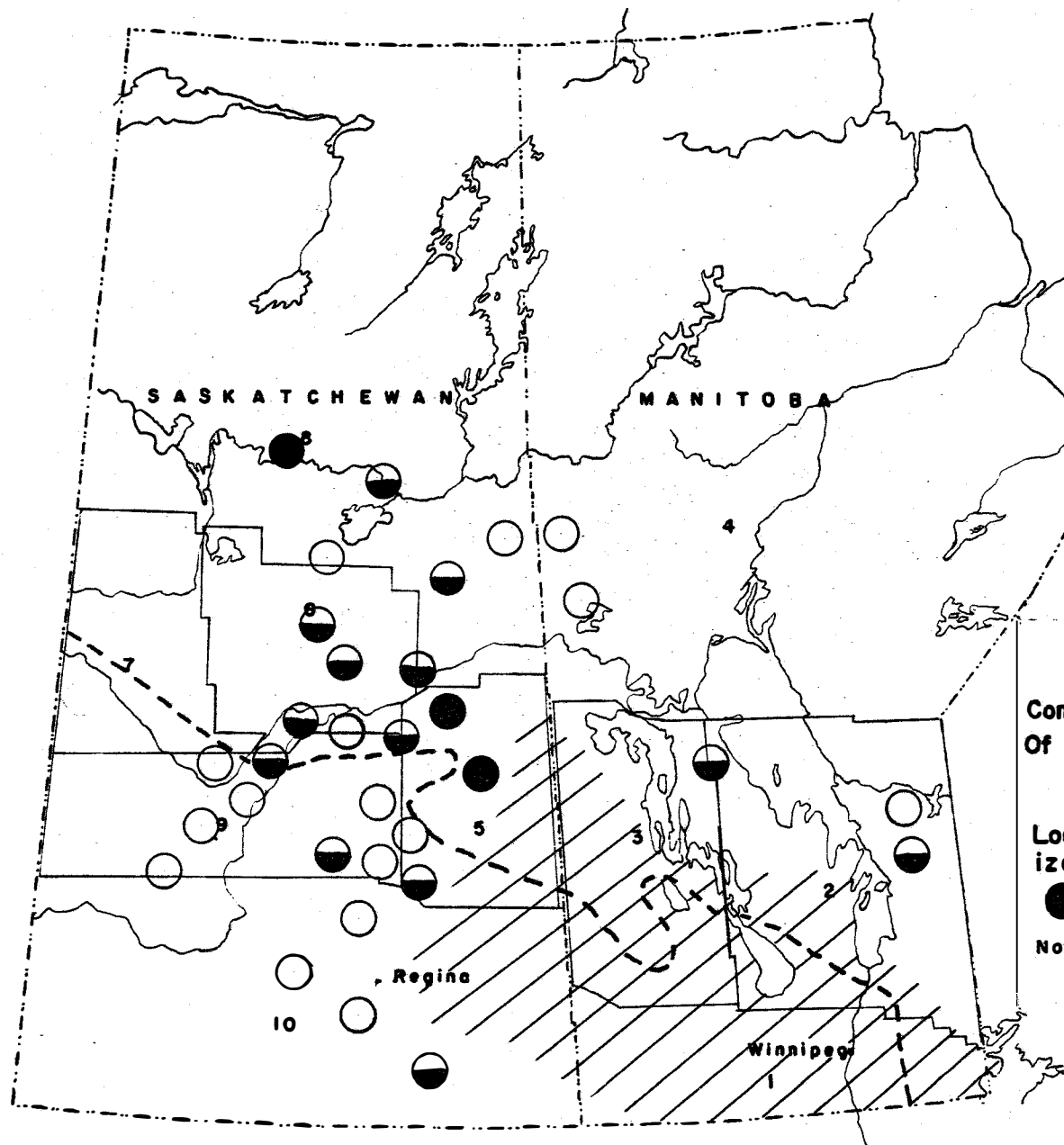


FIG. 7
ASPEN LEAF BEETLE—1963
 Continuous Area Within Which Skeletonizing
 Of Aspen Foliage Was Moderate To Severe:



Localized Areas Where Aspen Was Skeleton-
 ized To The Following Degrees:

● Severe ◐ Moderate ○ Light

Note: Grassland and Aspen Grove areas occur
 south of the dotted line; continuous
 forested areas north.

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
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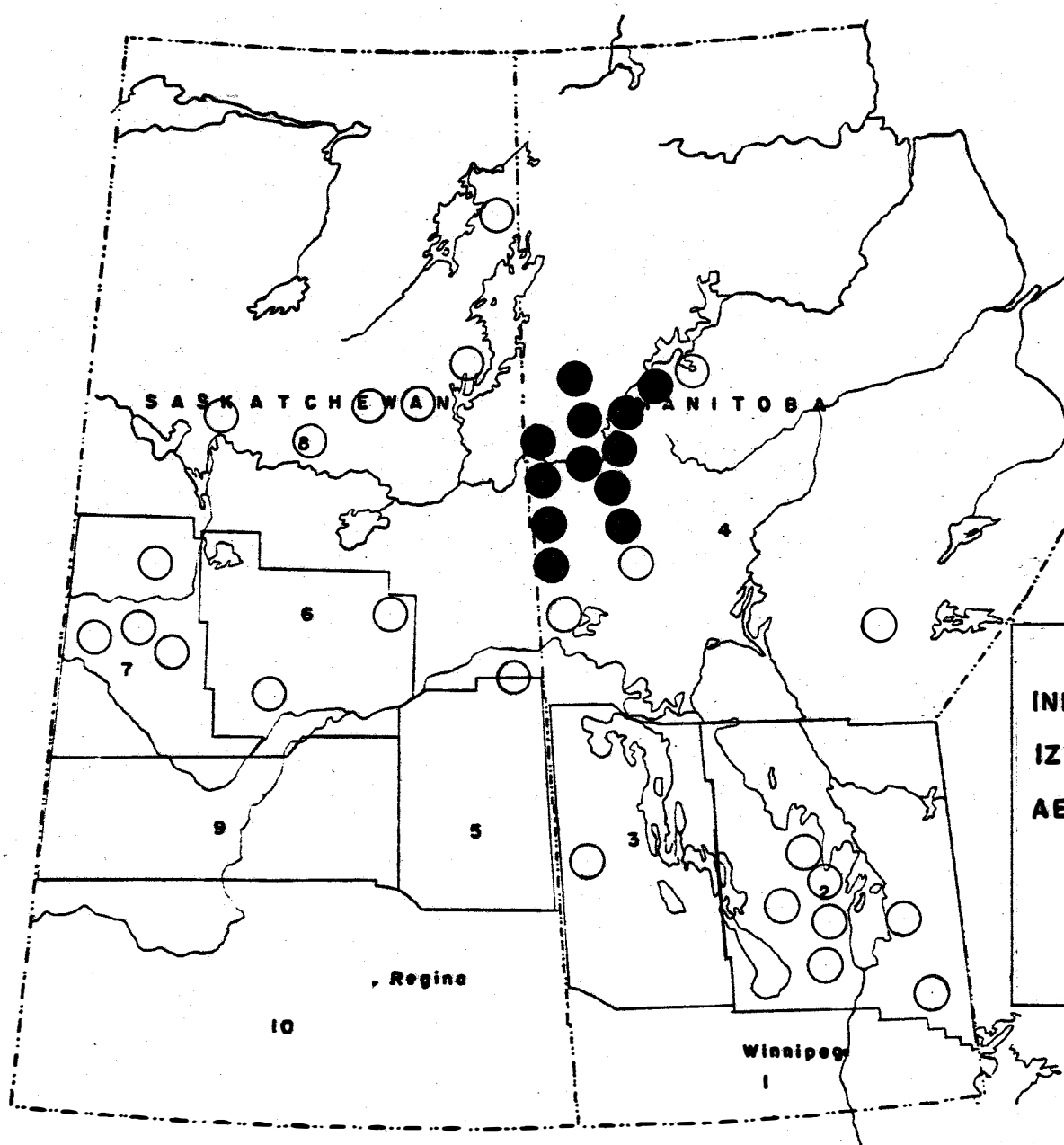


FIG. 8
INFESTATIONS OF THE BIRCH SKELETON-
IZER AS DETERMINED BY GROUND AND
AERIAL SURVEYS — 1963.

● HEAVY INFESTATION
○ LIGHT INFESTATION

Scale 120mi-1in.

115 -

BIOLOGY RANGER DISTRICTS

MANITOBA

- 1- SOUTHERN DISTRICT
- 2- EASTERN DISTRICT
- 3- WESTERN DISTRICT
- 4- NORTHERN DISTRICT

SASKATCHEWAN

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- 7- MEADOW LAKE DISTRICT
- 8- NORTHERN DISTRICT
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- 10- SOUTHERN DISTRICT

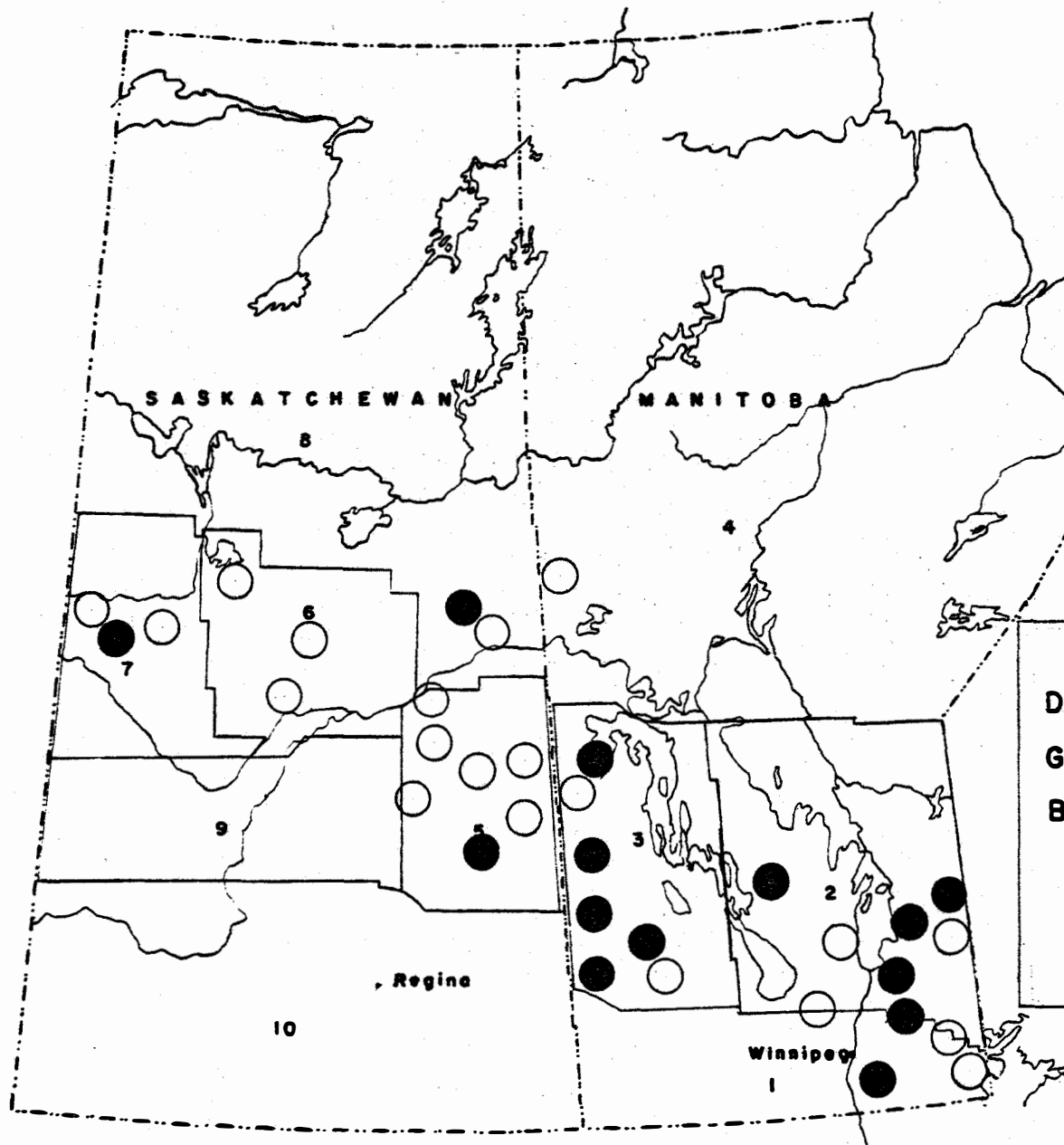


FIG. 9
DISTRIBUTION OF MACROPHOMA
GALLS ON POPLARS AS LOCATED
BY SURVEYS IN 1962 AND 1963.

● 1962 Sample Points
○ 1963 Sample Points

Scale 120mi-1in.

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