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

1961

by

V. Hildahl, L.L. McDowall, B.B. McLeod, M.R. Pratt, G.T. Lalor,  
J.J. Lawrence, A.E. Campbell, R.W. Hancox, J.A. Drouin,  
K.L. Mortensen, and J.B. Martin

INTERIM REPORT 1962-2  
FOREST ENTOMOLOGY LABORATORY  
WINNIPEG, MANITOBA

CANADA  
DEPARTMENT OF FORESTRY  
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

April, 1962

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March 1962

(This report may not be published in whole or in part without the written consent of the Director, Forest Entomology and Pathology Branch, Department of Forestry, Ottawa, Canada.)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

by

V. Hildahl

### 1.1 INTRODUCTION

The year 1961 was the driest on record in Manitoba and Saskatchewan since the mid 1930's. The abnormally dry fall of 1960 was followed by a mild winter with light snowfall resulting in very little spring run-off. Drought conditions persisted after spring break-up with many points recording about one-third normal precipitation from April through September. Sloughs dried out in the Aspen Grove and Prairie sections early in the season and water levels of lakes and rivers throughout the forested areas dropped to almost record lows. The severe drought caused extensive damage to ornamental and shelterbelt plantings, and to native reproduction. The latter was particularly noticeable in jack pine on light, sandy soils. It also increased the incidence and severity of fires in the forested sections; Manitoba experiencing the longest and most destructive fire season on record.

The abnormal weather was accompanied by notable changes in insect and disease conditions. In agricultural areas, a number of crop pests, particularly grasshoppers, increased in abundance and damage. The hot dry weather favored early development and high populations of the spruce spider mite, Oligonychus ununguis (Jacot) on shelterbelt and ornamental plantings of white spruce. On the other hand, the persistently above normal temperatures were probably responsible for a reduction in populations of the pine needle scale, Phenacaspis pinifoliae (Fitch). Populations of the fall cankerworm, Alsophila pometaria (Harris) on Manitoba maple and elm shelterbelts, declined in the western part of Saskatchewan but increased notably in the central part. The boxelder bug, Leptocoris trivittatus (Say) found on Manitoba maple and the blister beetle, Lytta nuttallii Say on caragana were also more abundant.

No immediate effects were noted in terms of forest insects. The spruce budworm, Choristoneura fumiferana (Clem.) increased in extent and continued to cause moderate to severe defoliation of white spruce and balsam fir in the vicinity of Namew Lake on the Manitoba-Saskatchewan boundary, along the east escarpment of Riding Mountain National Park in central Manitoba, and in the West Block of the Cypress Hills Provincial Forest in southwestern Saskatchewan. The larch sawfly, Pristiphora erichsonii (Htg.) was again the most widely distributed forest insect recorded in outbreak proportions. Populations continued at very high levels in tamarack stands in the southern part of the Prince Albert District of Saskatchewan and increased in parts of the Western District of Manitoba. Notably lighter attack was recorded in the northern sections of both Provinces, where the reduction in populations was probably attributable to poor foliage and shoot production following several years of severe defoliation. The predicted general outbreak of the forest

tent caterpillar, Malacosoma disstria Hbn. developed in 1961. The 1960 infestations increased in size and numerous new infestations were recorded in aspen stands throughout the Aspen Grove Section and northward as far as the Churchill River basin. The old infestation in the Park Block of the Cypress Hills Provincial Forest was notably lighter and a further abatement of attack is predicted for 1962. The balsam-fir sawfly, Neodiprion abietis (Harris), outbreak continued for the second consecutive year in balsam fir and spruce stands. A general reduction in severity of attack was accompanied by an increase in the size of the areas affected, particularly in the Interlake section of Manitoba. Infestations of the jack-pine budworm, Choristoneura pinus Free. declined from severe to light in the Belair Forest Reserve at the southeastern end of Lake Winnipeg, but moderate to severe defoliation within approximately 20 square miles still persisted north of Arborg in the Interlake section. Larvae were more abundant in jack-pine stands in the Nisbet Provincial Forest of Saskatchewan but populations were still low and no serious defoliation was recorded. The distribution and abundance of the yellow-headed spruce sawfly, Pikonema alaskensis (Roh.) increased slightly in both provinces, but no widespread infestations were reported in either white or black spruce stands. A tube-making Tortricid, Argyrotaenia sp. occurred in outbreak numbers for the first time, causing moderate to severe defoliation of jack pine within some 2,000 acres of the Nisbet Provincial Forest of Saskatchewan.

Although the severe drought conditions caused some damage to the foliage of both coniferous and deciduous trees in many areas, leaf diseases were less conspicuous than in 1961. Leaf blights, twig blights and tar spots such as Melanconium sp., Marssonina sp., Napicladium tremuloidae, Ciborina bifrons and Rhytisma salicinum, which occur on the foliage of balsam poplar, trembling aspen and willow, were generally widespread in most districts, but infections were light and limited to small patches. The spruce needle rust, Chrysomyxa sp. occurred commonly on black and white spruce in a number of districts, but caused little noticeable coloration. Hypoxylon canker infection, Hypoxylon pruinaum continued throughout the range of trembling aspen in both provinces, but there was no notable change in abundance. Old attacks have resulted in some top-and branch-killing in many stands on marginal sites. No new occurrences were recorded of the jack-pine and black spruce mistletoes, Arceuthobium americanum and A. pusillum. Current infections of the former are causing severe damage to jack pine stands in the Stead-Belair area of Manitoba and in the Prince Albert and Lake Athabasca sections of Saskatchewan. A butt and root rot of white spruce caused by Polyporus tomentosus was reported from seven additional areas. These records extend the known northern distribution of this fungus to Buckingham Lake in Manitoba and Bar and Hatchet lakes in Saskatchewan. Another butt and root decay of conifers caused by Flammula alnicola was taken at two sample points; one along the Bird River in eastern Manitoba and the other at McBride Lake south of Hudson Bay in Saskatchewan. In both instances infection was light.

During the season, 3,794 insect and 248 disease collections were submitted to the Winnipeg and Saskatoon laboratories respectively by the Forest Research Technicians (Rangers). The number of collections by Survey Districts and host trees is shown in Table 1.

TABLE 1

Forest Insect and Disease Collections from Principal Host Trees  
Manitoba and Saskatchewan  
1961

Forest District	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.	35	0	24	1	16	0	95	5	26	0	44	3	21	0	5	0	3	2	3	1	84	1	356	13
Eastern Man.	24	4	23	0	33	0	55	6	23	0	121	11	29	2	19	3	7	1	8	2	124	15	466	44
Interlake Man.	48	0	15	0	30	1	12	2	20	0	86	5	9	0	18	2	4	0	0	0	76	4	318	14
Western Man.	84	9	23	0	7	3	22	2	30	1	116	3	15	2	8	0	2	2	8	1	45	8	360	31
Northern Man.	53	8	23	3	15	1	46	0	18	0	61	2	6	0	28	0	0	0	1	0	40	0	291	14
Hudson Bay Sask.	66	8	30	1	7	1	25	6	44	0	162	6	16	0	14	0	1	0	0	0	56	3	421	25
Prince Albert Sask.	43	3	9	0	4	2	96	22	35	0	158	11	31	2	13	0	5	0	1	0	84	6	479	46
Northern Sask.	25	5	24	2	8	1	21	2	29	0	124	5	6	0	13	0	0	1	0	0	60	2	310	18
Meadow Lake Sask.	54	9	9	1	3	0	50	0	41	0	140	4	6	0	10	0	6	0	1	0	22	1	342	15
West-Central Sask.	17	0	1	0	0	0	1	0	2	0	49	2	5	0	0	0	12	3	8	2	32	3	127	10
Southern Sask.	18	3	0	0	0	0	0	0	9	0	151	5	30	0	0	0	30	2	3	2	83	6	324	18
Totals	467	49	181	8	123	9	423	45	277	1	1212	57	174	6	128	5	70	11	33	8	706	49	3794	248

I = Insect Collections      D = Disease Collections



## 1.2 FIELD OPERATIONS

1.2.1 District Assignments:- No changes were made in Ranger (Forest Research Technician) Districts in 1961. As before, Rangers were assigned individual districts within the Survey Regions as follows:

Survey Region	Forest District	Survey No.	Forest Research Technician (Ranger)
Southeastern	Southern Dist., Man.	00	*L. L. McDowall
	Eastern Dist., Man.	01	B. B. McLeod
	Interlake Section, Man.	01	G. T. Lalor
	Southern Dist., Sask.	11	M. R. Pratt
Central	Western Dist., Man.	03	*J. J. Lawrence
	Northern Dist., Man.	02	A. E. Campbell
	Hudson Bay Dist., Sask.	05	R. W. Hancox
Northwestern	Prince Albert Dist., Sask.	06	*J. A. Drouin
	Northern Dist., Sask.	08	J. B. Martin
	Meadow Lake Dist., Sask.	07	K. L. Mortensen
	West-Central Dist., Sask.	12	K. L. Mortensen and J. B. Martin

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\* Regional Supervisor

1.2.2 Transportation Equipment: - Two new sedan delivery vehicles were obtained as replacements for the units previously assigned to the Eastern District of Manitoba and the Hudson Bay District of Saskatchewan.

1.2.3 Detection Surveys:- Broader coverage of the various Districts has been possible in recent years as new roads have opened and as aerial surveys in remote areas have been extended. However, this has required longer hours and longer field seasons by the staff. In 1961 field operations commenced on May 5 and were terminated generally by mid-October except in Districts where special sampling studies were being conducted. In carrying out the necessary detection surveys and the appraisal and extension work required, the Rangers covered approximately 141,752 miles by road, 13,775 miles by aircraft, and 400 miles by boat.

Due to the extreme fire hazard throughout the season, the Provincial Forest Services were unable to provide the same aerial travel for surveys of inaccessible areas as in former years. Severe smoke conditions also hindered surveys by charter aircraft and in some areas greatly reduced their effectiveness. Thus, insect infestations and disease outbreaks were mapped with less accuracy, particularly in the northern sections where survey coverage is entirely dependent on aircraft travel.

Aircraft travel is summarized below, and the areas covered are shown on the accompanying map.

Province	Type of Flying	Aircraft Type	No. of hours	Approx. mileage	Approx. area * surveyed (sq. mi.)
Manitoba	Chartered	Cessna 170	7.00	850	3,400
		Cessna 180	50.00	5,000	20,000
		Cessna 175	14.00	1,750	7,000
	Provincial Air Service	-	-	-	-
Saskatchewan	Chartered	Cessna 180	25.00	2,500	10,000
		Cessna 170	14.00	1,700	6,800
		Cessna 175	5.00	625	2,500
		Stinson	11.00	1,100	4,400
	Provincial Air Service	Cessna 140	2.30	250	1,000
Totals			128.30	13,775	55,100

Based on observations of approximately 2 miles each side of flight line.

1.2.4 Survey Sub-Projects:- The major sub-projects being carried out in co-operation with Survey and other Officers are outlined below, and the time spent by individual Rangers is summarized in Table 2. Methods and procedures used are described in detail in a Field Work Manual.

Phenological Surveys: This study was initiated in 1956 to determine whether distinct phenological zones occur in the two provinces. Base-line stations were established in the Whiteshell Forest Reserve in Manitoba and at Prince Albert in Saskatchewan. Survey stations were established at pre-selected points, well distributed throughout the various forest districts. Only white spruce was studied in 1961 and the phenology of the tree was based on the rate of terminal shoot elongation. One dominant lateral terminal about five feet above ground level on each of five trees at each sample point were selected for measurement. At base-line stations, measurements commenced about May 10 and were taken twice weekly until growth had terminated. At Survey stations, two measurements were taken; one when growth was between 25 and 50 per cent and the last when growth was complete. This program will be discontinued in 1962.

Spruce Budworm Egg Population Sampling: White spruce is the major host tree in most of the current spruce budworm infestation areas in Manitoba and Saskatchewan, and a sequential sampling method is desirable for predicting population intensity and subsequent defoliation. Branch sampling was carried out at 53 sample areas. At each sample point, two branches (18 inches long) were removed from the mid-crown of 5 sample trees. The foliage was critically examined and the number of spruce budworm egg masses recorded. Sample trees were marked for subsequent defoliation estimates.

Forest Tent Caterpillar Egg Population Sampling: Most sampling methods in use for sampling egg populations of this species require the destruction of the host tree. As a sequential or other suitable method using branch samples is required. The sampling technique of felling trees for egg counts was modified in 1961 to include removing by extension pruners two 18 inch branches from the mid-crown of each tree and recording egg populations thereon. Sampling was conducted at 146 points in Manitoba and 254 in Saskatchewan.

Larch Sawfly Studies in Permanent Plots: Data is required annually on: population trends in representative tamarack stands, degree of defoliation of the host trees, and natural control factors such as parasites and diseases. Studies involve plot tallies for tree mortality estimates, sequential sampling of egg populations for determination of population level, defoliation estimates, water level measurements and subsequent effect of flooding on trees, and dissections of larch sawfly cocoons for parasite and disease appraisals. Studies are currently being conducted at 16 plots in Manitoba and 17 plots in Saskatchewan.

Larval Population Sampling of the Fall Cankerworm: A reliable sampling method is required for estimating defoliation and subsequent damage to Manitoba maple shelterbelts and ornamental plantings throughout the prairie sections of the two provinces. Larval counts have been taken annually at sampling areas established in 1956 in southwestern Saskatchewan. Sampling is carried out during the 4th and 5th instars. Four branches (18 inches long) are removed from each of 5 sample trees at three crown levels. The number of leaf clusters and the number of larvae are recorded for each sample. The average number of larvae per infested leaf cluster will be used as an index for defining infestation classes.

Population Sampling of the Boxelder Twig Borer: Studies have been in progress since 1956 and are designed primarily to follow annual population trends of the boxelder twig borer on Manitoba maple. Sampling is conducted at 33 plots in four of the Districts in the Prairie and Aspen Grove sections of the two provinces. One branch (36 inches long) from each of the cardinal points at three crown levels are removed and examined. The total number of twigs and number infested on five trees are recorded and used as a population index.

Survey of Spruce Stand Openings: Studies were initiated in 1958 in collaboration with Dr. R. Whitney of the Forest Pathology Laboratory, Saskatoon, Saskatchewan. The primary objects of the survey are to: (1) locate stands in which white and black spruce is a major component and where the disease, Poly-porus tomentosus occurs; and (2) to determine the incidence of the disease in such stands and its association to Hylobius root weevil attack. A one-acre

strip (usually 20 chains long and 1/2 chain wide) is cruised for mortality of spruce at each sampling area. Only dominant and co-dominant trees are recorded. The root systems of five living and five dead trees in each plot are examined for incidence of P. tomentosus and Hylobius root weevil damage.

Survey for Flammula alnicola decay: Studies were commenced in 1960 in association with Dr. B. Denyer, Forest Pathology Laboratory, Saskatoon, Saskatchewan to obtain information on the distribution and incidence of this decay in coniferous forest stands of Manitoba and Saskatchewan. Areas recently cut-over were selected for examination. The surfaces of 25 coniferous stumps were examined at each sampling area, and the number infected with the disease organism, F. alnicola was recorded. Specimens from infected sample trees were forwarded to the Saskatoon Laboratory for identification and further study. This program will be discontinued in 1962.

TABLE 2

Days Spent on Survey Sub-projects by  
Forest Research Technicians (Rangers)  
Manitoba and Saskatchewan  
1961

Forest Research Technicians (Rangers)	Survey Sub-Project by Number								Total
	1	2	3	4	5	6	7	8	
L. L. McDowall	3	6	-	5	3	4	-	1	22
B. B. McLeod	4	14	-	8	5	-	2	2	35
G. T. Lalor	4	3	-	10	3	-	-	3	23
M. R. Pratt	5	14	5	1	14	5	1	1	46
J. J. Lawrence	5	17	-	7	15	-	-	2	46
A. E. Campbell	4	11	-	9	17	-	2	3	46
R. W. Hancox	6	17	-	9	15	-	-	1	48
J. A. Drouin	5	11	-	6	-	2	5	1	30
J. B. Martin	5	7	-	7	-	3	4	3	29
K. L. Mortensen	6	17	-	6	-	5	2	3	39

- |   |   |
|---|---|
| 1. Phenological Survey of White Spruce        | 5. Egg Population Sampling of the Spruce Budworm  |
| 2. Forest Tent Caterpillar Egg Surveys        | 6. Population Sampling of the Boxelder Twig Borer |
| 3. Population Sampling of the Fall Cankerworm | 7. Surveys for Spruce Stand Openings              |
| 4. Larch Sawfly Studies at Permanent Plots    | 8. Surveys for <u>Flammula alnicola</u> Decay     |

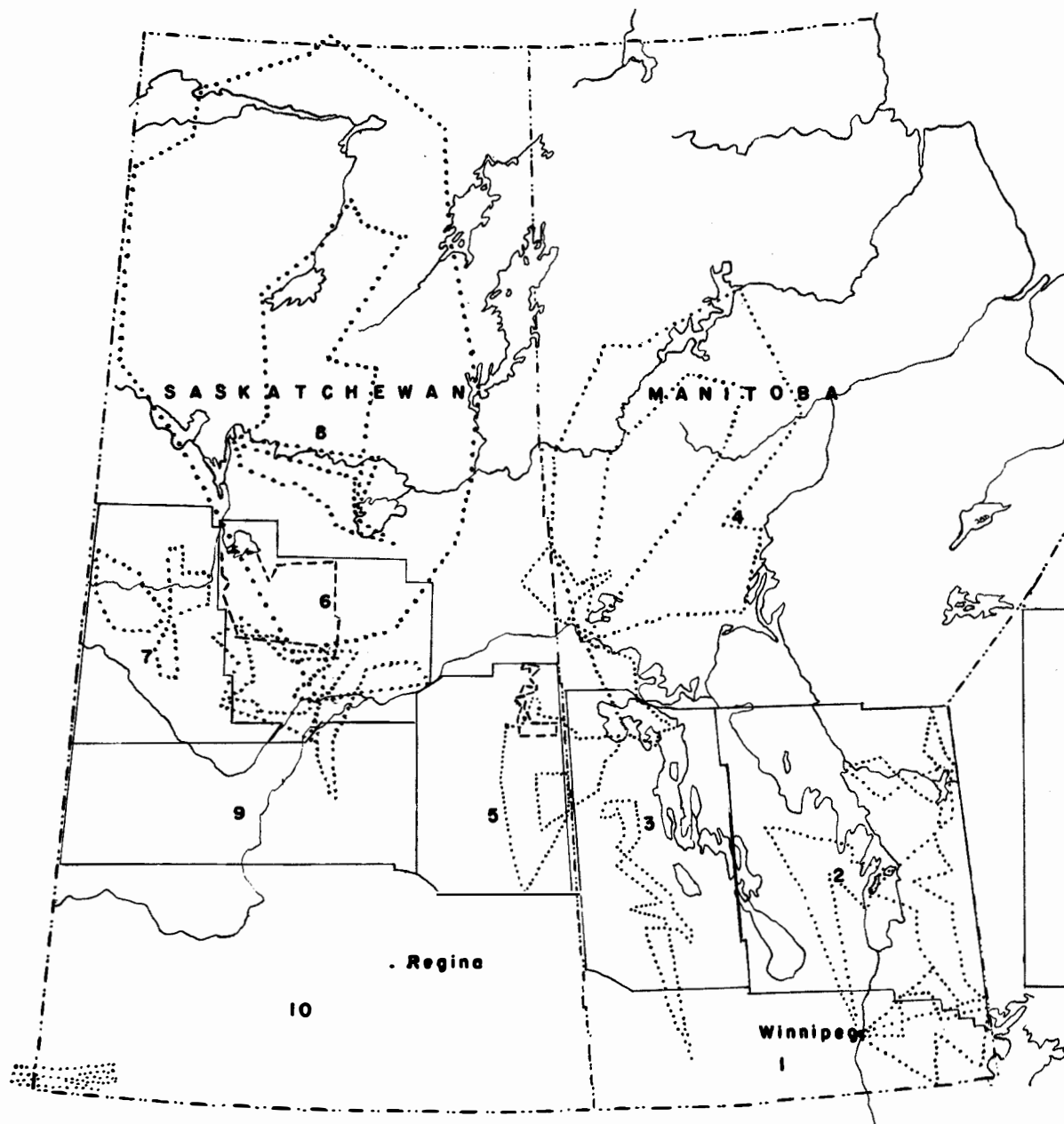
# DISTRICTS

## 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



**Scale 120mi-1in.**

2. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT OF MANITOBA

1961

by

L. L. McDowall

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

## 2.1 INTRODUCTION

Forest insect and tree disease surveys were conducted in the Southern District of Manitoba from early May until the latter part of October, 1961. Special emphasis was placed on the distribution and abundance of the larch sawfly, jack-pine budworm, spruce budworm, forest tent caterpillar, balsam-fir sawfly, Neodiprion sawflies on pines and a tip moth, Rhyacionia sp. on jack pine. A total of 356 insect and 13 tree disease collections were made in 1961.

## 2.2 REVIEW OF FOREST INSECTS AND TREE DISEASES

A relatively high increase in populations and a wider distribution of the following insects was recorded: balsam-fir sawfly, jack-pine sawfly, red-pine sawfly and red-headed jack-pine sawfly. Populations of the larch sawfly, jack-pine budworm and spruce budworm remained about the same. A tip moth, Rhyacionia sp. was still present in jack pine stands over a small area in south-eastern Manitoba. Virtually no change occurred in the distribution and status of tree diseases throughout the district. Several reports of mortality occurring in elm and Manitoba maple shelterbelts were investigated and samples were submitted to the Saskatoon Laboratory for further study and identification.

## 2.3 INSECT CONDITIONS

2.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— An over-all decline in populations was recorded. Defoliation, ranging from trace to light, occurred in patches over a widely scattered area (Fig. 1). Extremely hot, dry weather prevailed during the summer season and tamarack swamps, flooded in former years, were completely dry. With the exception of two or three stands, where it was below, shoot production and needle growth appeared about normal. Patches of light defoliation were recorded from Hadashville south to the Whitemouth River and east to McMunn, East Braintree, Falcon Lake, and Waugh on Lake of the Woods. South along the Manitoba-Ontario boundary to Harrison Creek, Birch Point, Moose Lake and Sprague, defoliation was very light. Tamarack stands west of Sprague to South Junction, Piney, Menisino and north throughout the Sandilands Forest Reserve showed only traces of defoliation. Light, scattered defoliation was recorded north of the Trans-Canada Highway bounded by Richer and Hadashville in the south and Elma and Hazel in the north. Only a trace of defoliation occurred in the stands nine miles south of Douglas in the western part of the District where springs keep the sites relatively wet.

Sequential sampling of egg populations was conducted in four permanent plots. The results, together with the number of curled shoots and infestation ratings for 1961 are shown below.

Plot No.	Place	Total Shoots Examined	No. of Curled Shoots	Rating 1961
101	Sandilands F.R.	70	2	L.
102	Piney	70	3	L.

Plot No.	Place	Total Shoots examined	No. of curled shoots	Rating 1961
103	Sandilands F.R.	70	2	L.
104	Camp Shilo	60	1	L.

Mass collections of larch sawfly cocoons were taken from three permanent plots using the drop-tray collection method. The cocoons were dissected at the Laboratory to determine the degree of parasitism and predation. Results of the dissections indicated that only the Tachinid, Bessa harveyi (Tsnd.) was present and occurred in two plots; no parasitism was recorded in a collection taken from the Spruce Woods Forest Reserve. In two plots in southeastern Manitoba, parasitism was 23 and 41 per cent.

2.3.2 Jack-pine Budworm, Choristoneura pinus Free:- There was no appreciable change in the status of this species. A number of scattered collections were taken in the southern portion of the Sandilands Forest Reserve between Menisino and five miles east of Piney. Collections were also taken from stands of jack pine six miles northwest of Sprague and in the area adjacent to Moose Lake. In all instances low populations prevailed and the number of larvae ranged from two to thirteen per five tree beating sample. Open growing trees appeared to be the preferred host.

Five collections were made from pine plantations in the Spruce Woods Forest Reserve where the number of larvae ranged from three to six per five tree beating sample; a slight increase over 1960. Flowering on both Scots pine and jack pine was generally heavy.

2.3.3 Spruce Budworm, Choristoneura fumiferana (Clem.): - Very low populations were recorded at all collection points in southwestern Manitoba. The number of larvae in a five tree beating sample ranged from two to ten and only a slight trace of defoliation was visible. Collections from white spruce were made in the following areas: four miles north of Glenboro, one mile north of the Assiniboine River along No. 34 Highway, three miles southwest of Carberry, and at several widely scattered points in the Spruce Woods Forest Reserve.

2.3.4 Balsam-fir Sawfly, Neodiprion abietis (Complex): - An increase in the population and distribution of this insect was recorded at several points in southeastern Manitoba (Fig. 7). Larval collections were taken from three tree species: black spruce, balsam fir and white spruce. Increased activity was mainly noted on black spruce. Continuous hot, dry weather during June appeared to be a major factor in the rapid development of this sawfly. It also favored early foliage flushing of black spruce which is normally later than other conifers. Consequently, feeding on black spruce was virtually complete by the end of June.



Black spruce stands in the vicinity of Woodridge, Menisino, Piney, South Junction, Sprague and Middlebro showed early browning and feeding on the old foliage was common in these areas. This condition also prevailed in the Hadashville, McMunn and East Braintree sections. Feeding on balsam fir was prolonged into July and the heaviest damage occurred from East Braintree east to the Manitoba-Ontario boundary. Over-all defoliation in the aforementioned area ranged between twenty and thirty per cent. Balsam fir stands north of Sprague to Moose Lake and northwest to Birch Lake were only lightly infested and a slight decline in populations was recorded.

Defoliation of white spruce throughout the area was classed as light and no increase in intensity was noted.

2.3.5 Sawflies on Pines, Neodiprion spp.:— Surveys carried out in 1961 for Neodiprion sawflies attacking pines indicated that an increase in the distribution and abundance had occurred. Larval collections from jack pine were confined mainly to young open growing trees, whereas with red pine, only mature trees were attacked. Although larger colonies were present on red pine, feeding on the old foliage appeared less as a result of the longer and heavier needle production than on jack pine. Three species of sawflies were collected and in order of their abundance are: N. nanulus nanulus Schedl., N. maurus Roh., N. pratti banksianae Roh. . The heaviest populations were recorded on jack pine along the west boundary of the Sandilands Forest Reserve from Marchand Headquarters north to the old Dawson Trail. Feeding on the old foliage was estimated at between twenty and thirty per cent of the affected branches and was restricted to one or two trees at each location and not more than four lower crown branches on each tree. Several large colonies were collected from red pine at Moose Lake and in stands east of Piney. In all instances defoliation was light and confined to the old foliage of the lower branches. Elsewhere throughout southeastern Manitoba collections were widely scattered and defoliation was very light. Two large collections, one of N. nanulus nanulus and the other of N. pratti banksianae were taken from a jack pine plantation in the Spruce Woods Forest Reserve. The colonies were collected from a single branch and only slight feeding had occurred. With the exception of N. maurus, which was found solely on jack pine, the other species were collected from both red pine and jack pine.

2.3.6 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— High populations still persist over a wide area in southeastern Manitoba. Shelterbelt and ornamental plantings of white spruce in particular are showing the effects of consistent defoliation. Over-all defoliation was classed as moderate in both shelterbelts and native stands with an occasional tree falling into the heavy category at the following places: Falcon Lake, East Braintree, McMunn, Prawda, Hadashville, Elma and Piney. Larvae were collected from both white and black spruce in native stands, but defoliation was more conspicuous on white spruce.

2.3.7 American Poplar Beetle, Conioctena americana (Schffr.): - Varying degrees of defoliation of aspen occurred over a wide area. The heaviest was recorded in the northern portion of the Sandiland Forest Reserve where a number of trees in several small aspen bluffs suffered between twenty-five and seventy-five per cent defoliation. Although it was generally light in the southwestern part of the District, a number of single trees south of Camp Hughes in the Spruce Woods Forest Reserve showed moderate defoliation. Elsewhere it was classed as very light and patchy.

2.3.8 Gray Willow-leaf Beetle, Galerucella decora (Say): - High populations of this beetle were again recorded at several points. Skeletonizing of willow foliage was severe in the Richer, Spruce Siding and Hadashville areas; moderate to heavy south of East Braintree to the Dawson Trail and west to the Whitemouth River, and in the Sundown, Vita, Piney, and South Junction areas; light to moderate in the area between Carberry and Douglas and south of Boissevain into the Turtle Mountain Forest Reserve; and along Highway No. 2 between Souris and Highway No. 10, and north of Holland along Highway No. 34 to Austin and Gladstone.

2.3.9 Forest Tent Caterpillar, Malacosoma disstria Hbn.: - Larvae were collected for the first time in several years at four widely scattered points. However, only small numbers were present and light defoliation was recorded only in the vicinity of Falcon Lake. Collections were also made at Menisino, Moose Lake, and East Braintree.

In order to predict infestation levels for 1962, an egg-band survey was conducted at seven points throughout the southeastern portion of the District. Results of the survey, as summarized in the following table, indicated that abundance of the forest tent caterpillar will remain at very low levels.

TABLE 3

Summary of Forest Tent Caterpillar Egg-Band Sampling - 1961  
Southern District of Manitoba

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

Sample point no.	Location by sec., tp., rge., and mer.	Summary of Egg-band Counts				Defoliation forecast 1962
		Av. d.b.h. of trees (ins.)	Av. Ht. of trees (ft.)	Av. Crown Depth (ft.)	Av. No. of egg-band per tree	
1	sec. 24, tp. 2, rge. 7, E.P. mer.	3.3	28	25	0	Nil
2	sec. 4, tp. 2, rge. 10, E.P. mer.	3.3	18	16	0	Nil

TABLE 3 (cont'd.)

Sample point no.	Location by sec., tp., rge. and mer.	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 band per tree	Defoliation forecast 1962
3	sec. 4, tp. 2, rge. 11, E.P. mer.	3.1	20	17	0	Nil
4	sec. 26, tp. 1, rge. 12, E.P. mer.	4.0	24	20	0	Nil
5	sec. 6, tp. 3, rge. 16, E.P. mer.	4.3	35	30	0	Nil
6	sec. 21, tp. 7, rge. 14, E.P. mer.	4.3	34	28	0	Nil
7	sec. 19, tp. 8, rge. 16, E.P. mer.	4.3	38	29	0.3	Nil-light

2.3.10 Aspen Leaf Beetle, Chrysomela crotchii Brown:- Both adults and larvae of this species were common at a number of points. Relatively high populations were recorded on trembling aspen in the Camp Hughes area and south of Brandon Junction in the Spruce Woods Forest Reserve. Light defoliation to both aspen and speckled alder occurred in the vicinity of Max Lake and the International Peace Gardens in the Turtle Mountain Forest Reserve. Populations were considerably lower in the Oak Lake and Pipestone areas.

In the north end of the Sandilands Forest Reserve and south of Hadashville along the Dawson Ridge, aspen suffered light to moderate defoliation. Several larval collections were also taken from dogwood in the Sandilands Forest Reserve, but no defoliation was noted.

2.3.11 Webworm on Aspen, Tetralopha asperatella (Clem.): - Populations remained relatively light in all areas examined. Light webbing was recorded on trembling aspen from Moose Lake south to Sprague, west to Piney and north through the Sandilands Forest Reserve. Aspen stands south of the Trans-Canada Highway between East Braintree and Hadashville were lightly infested. In the western portion of the District, in the vicinity of Melbourne, Carberry and Sidney, damage was very light.

2.3.12 Fall Webworm, Hyphantria cunea (Drury):- A marked decrease in populations occurred but a number of mass collections were again taken for recovery of the parasite Compsilura concinnata. Larvae were widely scattered and taken from white birch, chokecherry, dogwood and balsam poplar at the following points: East Braintree, Marchand, Piney, Sprague and in the area between Moose Lake and Sprague Lake. No collections were taken from the western part of the District.

2.3.13 White-pine Weevil, Pissodes strobi (Peck.):- Leader damage was light in all locations where observations and collections were made. Curled leaders appeared to be more prevalent in the southeast corner of Manitoba and were confined to jack pine regeneration and young plantations. Random counts of twenty-five trees in several areas showed that approximately eight per cent of the leaders were damaged. Widely scattered damage was also observed on white spruce in the Spruce Woods Forest Reserve.

2.3.14 A Pine Tip Moth, Rhyacionia spp.:- Surveys to determine distribution and intensity of pine tip moths were continued in southeastern Manitoba. Two mass collections of infested tips were made in July for dissection and microscopic examination. Distribution remained much the same as in 1960 when the species was first detected, and is still confined to the southern portion of the Sandilands Forest Reserve. Larval examination suggests that there are two species involved, Rhyacionia frustrana (Comst) and Rhyacionia busckana (Heinr). Studies on these tip moths will be continued in 1962 to determine distribution and life history.

2.3.15 Boxelder Twig Borer, Proteoteras willingana (Kft.):- Population counts conducted in Manitoba maple shelterbelts showed that only light infestations existed. This study was carried out at eight sample stations already established at various locations in southwestern Manitoba. Five trees were selected in each area and the number of twig borers were counted on four branch samples taken at each of three crown levels. The results of this study are shown in Table 4.

TABLE 4

Results of Boxelder Twig Borer Sampling Based  
on 12 Branch Samples from each of 5 Trees at each Location

Location	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. Crown Width (ft.)	No. of Twigs Examined and Twig Borer Populations by Crown Class					
				Lower		Middle		Upper	
				No. twigs	No. borers	No. twigs	No. borers	No. twigs	No. borers
Poplar Point sec. 11, tp. 12, rge. 5, W.P. m.	19	12	9	215	1	239	8	254	4

TABLE 4 (cont'd.)

Location	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. Crown Width (ft.)	No. of Twigs Examined and Twig Borer Populations by Crown Class					
				Lower		Middle		Upper	
				No. twigs	No. borers	No. twigs	No. borers	No. twigs	No. borers
Sidney sec. 6, tp. 11, rge. 12, W.P. m.	20	15	10	335	8	353	8	401	10
Camp Hughes sec. 33, tp. 10, rge. 16, W.P. m.	19	14	11	319	7	335	7	347	18
Holland sec. 21, tp. 8, rge. 11, W.P. m.	15	10	6	232	1	272	2	329	2
Wawanesa sec. 24, tp. 7, rge. 17, W.P. m.	17	13	7	290	11	322	12	260	7
Ninette sec. 22, tp. 5, rge. 17, W.P. m.	20	14	6	241	4	228	3	263	4
Souris sec. 3, tp. 8, rge. 22, W.P. m.	21	16	13	459	6	451	10	438	13
Turtle Mountain sec. 27, tp. 1, rge. 20, W.P. m.	16	11	8	319	8	342	9	394	11

## 2.3.16 Other Noteworthy Insects:-

Insect	Host(s)	No. of Collections	Remarks
<u>Accleris variana</u> (Black-headed budworm)	WS	3	Populations very light in Spruce Woods Forest Reserve
<u>Acrobasis betulella</u> (Birch tube maker)	sB	4	Limited to area in north portion of Sandilands F.R.

## 2.3.16 Other Noteworthy Insects: (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Anoplonyx canadensis</u> (a sawfly)	tL	6	Populations light in all areas where collected in southeastern Manitoba. General in most tamarack stands
<u>Anoplonyx luteipes</u> (a sawfly)	tL	5	Widely scattered over Southern District. Average of 2 larvae per collection
<u>Archips fervidanus</u> (oak webworm)	bO	4	Common in the Melbourne-Carberry section
<u>Cecidomyia reeksi</u> (a gall midge)	jP	2	Damage light; found in southeastern Manitoba
<u>Malacosoma lutescens</u> (Prairie tent caterpillar)	cCh	12	Generally distributed throughout southern Manitoba
<u>Monoctenus melliceps</u> (a sawfly)	eC	6	Found only in the Sandilands F.R.; populations light
<u>Nymphalis antiopa</u> (Spiny elm caterpillar)	W	2	Very low population recorded in southeastern Manitoba
<u>Nycteola frigidana</u> (an owlet moth)	W, tA	7	Distribution limited to small area in vicinity of Moose Lake
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	3	Number of nodules ranged from two to three per tree; widely scattered in southeastern Manitoba
<u>Pikonema dimmockii</u> (Green-headed spruce sawfly)	ws, bs	7	Populations lighter than in 1960. Average 0.4 larvae per collection; distribution general
<u>Semiothisa sexmaculata</u> (a geometer)	tL	10	Generally found in most larch stands examined in southeastern Manitoba. Average of 6 larvae per collection
<u>Toumeyella numismaticum</u> (Pine tortoise scale)	jP	5	Not quite as heavy as in previous years but still found in several areas in southeastern Manitoba.

## 2.4 Tree Disease Conditions

2.4.1 Vaccinium Rust, Pucciniastrum goeppertianum:- The only recorded infection was in balsam-fir three miles east of Dawson Cabin in the Sandilands Forest Reserve as in 1960.

2.4.2 Shoestring Root Rot, Armillaria mellea:- A light infection of this disease was recorded in a small area of red pine reproduction six miles southeast of Piney. Examinations showed that the root systems of four out of ten plants were infected.

2.4.3 Yellow Witches' Broom, Melampsorella cerastii:- Surveys to determine the distribution and intensity of this disease were continued in balsam-fir stands north of Moose Lake. There was no notable increase in the number of brooms recorded and the boundaries of the infection remained essentially the same. It is confined to a small area between Moose and Sprague Lakes.

2.4.4 Mistletoe on Black Spruce, Arceuthobium pusillum:- This mistletoe is common in most black spruce stands in the northern portion of the Sandilands Forest Reserve and east of Hadashville to Falcon Lake. Light scattered infections also occur in the South Junction-Sprague area.

2.4.5 Spindle Rust of Pine, Cronartium comandrae:- This disease was recorded on native jack pine at several widely scattered points in southeastern Manitoba. In most instances, only one or two trees were affected and branch killing was classed as light. Considerable damage to the stems and branches was recorded in a number of Scots pine plantations in the Spruce Woods Forest Reserve.

2.4.6 Die-Back of Manitoba Maple:- Symptoms of this die-back were observed in a number of shelterbelts throughout southwestern Manitoba in 1961. Critical examinations revealed that Manitoba maple trees were dying from the top down. A conspicuous pink stain in the heartwood, caused by the fungus Fusarium negundi, was present in all of the dead wood examined but absent in the living wood of affected trees. Ash growing in the immediate vicinity was not affected.

2.4.7 Needle Rust on Jack pine, Coleosporium asterum:- This rust was commonly found over a small area in the southeast corner of the Sandilands Forest Reserve. In all instances, only young open growing trees were attacked.

2.4.8 Black Knot of Cherry, Dibotryon morbosum:- This disease was common throughout with the heaviest concentrations occurring in the northern and central parts of the Sandilands Forest Reserve.

## 2.4.9 Other Noteworthy Diseases:-

Host	Organism	Locality	Remarks
White pine	<u>Cronartium ribicola</u>	Moose Lake	Still prevalent on white pine
Balsam fir	<u>Polyporus abietinus</u>	Sprague Lake	Light infection only
Trembling aspen	<u>Fomes igniarius</u>	Entire District	Light infection in most stands
Willow	<u>Rhytisma salicinum</u>	Southeastern Manitoba	Light to moderate infection scattered throughout
Balsam poplar	<u>Septoria musiva</u>	Entire District	Leaf spot general, but infection light
Black spruce	<u>Chrysomyxa</u> sp.	Southeastern Manitoba	Covered a wide area, but infection light
Trembling aspen	<u>Hypoxyton pruinaum</u>	Entire District	Light infection recorded in most stands



3. ANNUAL DISTRICT REPORT

EASTERN DISTRICT OF MANITOBA

1961

by

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CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

### 3.1 INTRODUCTION

Forest insect and disease surveys in the Eastern District of Manitoba were carried out between May 15th and November 1st. Survey sub-projects continued in 1961 were: spruce budworm mortality plots; Polyporus tomentosus and Flammula alnicola disease surveys; forest tent caterpillar egg-band survey, and Hylobius root weevil surveys. Twenty-two hours of aerial surveys covering the remote areas of the district were carried out. A total of 466 insect and 44 tree disease samples were taken. The writer acknowledges with thanks the co-operation received from personnel of the Manitoba Forest Service, and the Woods Department of the Manitoba Paper Company.

### 3.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

Forest tent caterpillar populations continued to increase, causing severe defoliation to trembling aspen stands throughout the District. The balsam-fir sawfly outbreak remained at a high level at several locations. The jack-pine budworm infestation in the Belair Forest Reserve declined to light. The light spruce budworm infestation at Crowduck Lake also declined and only a few larvae were found.

Tree disease surveys were continued with the initial recovery of Flammula alnicola in the Eastern District. Polyporus tomentosus surveys were conducted in the northern portion of the District and positive samples were collected.

### 3.3 INSECT CONDITIONS

3.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— Low populations were general throughout most of the District. Defoliation of tamarack was light to moderate in two small bogs just south of the Sand River near the settlement of Manigotogan, in small patches in the Packman Lake area, and in a stand about seven miles west of the junction of the Mukutawa and Nanawan rivers in the northern part of the District.

Sequential sampling of larch sawfly egg populations were continued in three permanent plots. The infestation rating at each plot, based on the utilization of the current shoots for oviposition, is listed below.

Location and Plot No.	<u>Infestation ratings</u>		Infestation rating, 1961
	No. shoots examined	No. shoots curled	
Pointe du Bois, Plot 101	70	2	Light
Agassiz, Plot 110	50	1	Light
Telford, Plot 102	50	1	Light

Larval drop trays were again used to collect cocoons at two permanent plots. These cocoons were dissected and examined for the presence of parasites and disease. Cocoons were relatively scarce on both plots due to low host populations. However, results of the dissections indicated that the Tachinid, Bessa harveyi (Tnd.) and the Chalcid, Tritneptis klugii (Ratz.) were the only parasites present. Parasitism by the former species was 23 and 43 per cent on the two plots. Parasitism by T. klugii was comparatively lighter and averaged only 5 and 3 per cent respectively.

3.3.2 Forest Tent Caterpillar, Malacosoma disstria Hbn.: - The number of infestations east of Lake Winnipeg increased. In the Whiteshell Forest Reserve, severe defoliation of trembling aspen occurred in small pockets between Molloy and Lone Island lakes, along the northwest shore of Crowduck Lake, and on the shores and islands of Saddle and Echo lakes, and within an area of some 6,000 acres along the Winnipeg River between Lamprey and Slave Falls in the Pointe du Bois area. Between the Whiteshell and Manigotogan-Bissett areas, complete defoliation occurred within an area of some 5,000 acres in the Bird-Booster lakes area. Severe defoliation occurred in pockets at Elbow, Cole, Shoe, Black, Flintstone, Garner, Rainey, Big Clearwater and Rice lakes; within large stands on the north shore of Gem Lake and at the east end of Long Lake; within an area of some 2,000 acres between Wallace and Siderock lakes; and within an area bounded by Caribou, Manigotogan, Happy lakes, Manigotogan River and Long Lake. Between the Manigotogan-Bissett area and the Berens River system, complete defoliation occurred on islands in Aikens and Sasaginnigak lakes but not on the shores. Severe defoliation occurred in patches around Dogskin, Hutch and White-eye lakes and northward to include the islands and shores of White Owl, Family and Moar lakes, and at the junction of the Berens and Etomami rivers. Defoliation was light at the Berens River settlement. North of the Berens River, severe defoliation occurred in patches on the northwest shores of Eardley Lake, and along the Belanger River.

In the autumn of 1960 egg-band survey was conducted at numerous points throughout the district and a forecast made for 1961. Results obtained from this survey are shown below.

Place	Forecast for 1961	Defoliation in 1961
Manigotogan Lake	Severe	Severe
Siderock Lake	Severe	Severe
Aikens Lake	Nil	Nil
Sasaginnigak Lake	Light	Nil
Family Lake	Moderate	Severe
Crowduck Lake	Light	Light
Lone Island Lake	Light	Light
Brereton Lake	Light	Light
Wallace Lake	Moderate	Severe
West Hawk Lake	Nil	Light
Caribou Lake	Severe	Severe

In early July a mass collection of pupae from the Wallace Lake outbreak was taken and reared for parasite recovery. The results are listed below:

No. of pupae collected	No. of pupae parasitized by:		No. of pupae surviving
	<u>Diptera</u> sp.	<u>Glypta</u> sp.	
226	19	5	202

During the months of September and October an egg-band survey was conducted throughout the district to estimate the extent and severity of defoliation expected in 1962. The results are listed in Table 1.

TABLE 1

Results of Forest Tent Caterpillar Egg-band Sampling  
Eastern District of Manitoba - 1961

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

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg-bands per tree	Defoliation forecast for 1962
Pointe du Bois #1	3.3	39.6	19.3	25	Severe
Pointe du Bois #2	4.0	37.0	20.3	18	Severe
Pointe du Bois #3	4.0	35.0	18.6	17	Severe
Pointe du Bois #4	4.3	38.3	21.0	24	Severe
Pointe du Bois #5	3.6	32.6	17.3	1	Light
Pointe du Bois #6	3.0	30.0	16.3	3	Light
Pointe du Bois #7	4.3	30.0	24.3	0	Nil
Caddy Lake	4.3	42.3	33.0	0	Nil
Brereton Lake	4.6	36.6	17.0	0	Nil
Telford	5.3	43.3	27.0	0	Nil
Red Rock Lake	4.0	38.3	20.3	0	Nil
Black Lake	5.0	36.0	18.0	44	Severe
Gem Lake	5.6	42.3	26.0	21	Severe
Managotagan Lake	4.0	29.0	15.0	6	Moderate
Siderock Lake	5.0	36.6	19.0	99	Severe
Aikens Lake	6.0	31.0	21.3	18	Severe
Sasaginnigak Lake	4.3	33.0	21.6	38	Severe
Dogskin Lake	4.6	43.3	21.6	9	Moderate
Family Lake	6.3	29.3	15.0	20	Severe
Moar Lake	5.3	39.3	19.0	22	Severe
Bird Lake #1	5.0	37.6	23.0	25	Severe
Bird Lake #2	5.0	35.0	20.0	24	Severe
Bird Lake #3	5.0	48.6	31.3	39	Severe
Bird Lake #4	4.0	36.6	19.6	44	Severe
Bird Lake #5	5.0	45.0	20.0	48	Severe

TABLE 1 (cont'd.)

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands per tree	Defoliation forecast for 1962
Bird Lake #6	10.0	76.0	23.3	42	Severe
Bird Lake #7	4.0	35.0	20.6	3	Light
Bird Lake #8	4.0	35.0	13.3	0	Nil
Crowduck Lake	6.5	50.0	20.0	41	Severe
Long Lake #1	8.0	47.0	16.3	61	Severe
Long Lake #2	3.0	35.0	20.0	5	Moderate
Long Lake #3	4.3	35.0	16.0	2	Light
Bear River #1	5.0	35.3	15.3	3	Light
Bear River #2	5.0	30.0	13.6	13	Moderate
Bear River #3	4.0	28.3	10.6	0	Nil
Agassiz #1	5.0	43.3	26.0	0	Nil
Agassiz #2	5.3	46.6	23.3	0	Nil
Agassiz #3	4.6	30.0	16.6	0	Nil
Caribou #1	4.3	31.6	16.6	22	Severe
Caribou #2	5.0	35.6	17.0	26	Severe
Caribou #3	3.0	30.0	14.0	6	Moderate
Caribou #4	3.0	35.0	15.6	.3	Light
Caribou #5	2.3	23.3	9.6	.3	Light
Wallace #1	3.0	21.6	9.6	44	Severe
Wallace #2	4.3	18.0	10.3	7	Moderate
Wallace #3	4.3	21.6	9.3	10	Severe
Wallace #4	5.0	33.3	14.3	6	Moderate
Wallace #5	4.0	35.0	18.6	3	Light
Wallace #6	4.0	30.0	14.0	4	Light
Wallace #7	3.0	26.6	13.6	1	Light
Wallace #8	3.0	25.0	10.3	1	Light
Wallace #9	3.0	27.0	18.0	1	Light
Wallace #10	3.0	30.0	17.0	0	Nil

3.3.3 Balsam-fir Sawfly, Neodiprion abietis complex:- A number of balsam fir and white and black spruce stands suffered defoliation of the old foliage in varying degrees throughout the District as illustrated in Figure 7.

Defoliation was severe on balsam fir in the Fort Alexander-Victoria Beach and Beaconsia areas; light to moderate on balsam fir and black spruce in the Caddy Lake-West Hawk Lake area; and light on all three species in the Pointe du Bois, Cat Lake, Bird Lake, Lac du Bonnet and Manigotagan-Bissett areas, and in the northern portion of the district where samples were taken at Shoe, Flintstone, Siderock, Aikens, Sasaginnigak and Family lakes. Adult emergence was general in the southern area by July 25th.

3.3.4 Jack-pine Budworm, Choristoneura pinus Free.: - The infestation in the Belair Forest Reserve decreased substantially. Small pockets of light defoliation occurred in the Stead, Belair Station and Grand Beach areas. A fire north of Stead in the spring destroyed the jack pine in an area that suffered moderate defoliation in 1960.

3.3.5 Wood Borers and Bark Beetles: - A survey in stands of burned over timber was conducted for the presence of wood-feeding insects. All tree species examined contained high populations of bark beetles and wood borers. Trees were sampled at the four foot level where a one foot section was cut from the trunk. The sample block was peeled and split, and the specimens collected were sent to the Winnipeg Laboratory for identification. The insects recorded were for the most part in the larval stage and are shown in the following synopsis:

Insect Species	Specimens recovered (x) from:			
	Balsam fir	Black spruce	Jack pine	Tamarack
Wood borers and bark beetles:				
<u>Cerambycidae</u>	x	x	-	x
<u>Buprestidae</u>	-	x	-	x
<u>Scolytidae</u>	x	x	-	x
<u>Ips</u> sp.	-	-	-	x
<u>Monoctonus</u> sp.	-	-	x	-
<u>Urocerus</u> sp.	x	-	-	-
Others:				
<u>Aradus</u> sp.	-	x	-	-
<u>Ilateridae</u>	-	-	-	x
Predators and parasites:				
<u>Cleridae</u>	x	-	-	-
<u>Cucujidae</u> sp.	-	-	x	-
<u>Ichneumonidae</u>	x	x	-	x
<u>Chalcidae</u>	-	x	-	-

A high proportion of the Buprestid larvae were parasitized by a small Ichneumonid parasite. Small Cerambycid larvae also suffered high parasitism by the same parasite and by a Chalcid. However, no parasitism was observed in larvae that had entered the sapwood.

A survey of native and ornamental elms was conducted in six areas throughout the southern portion of the District for the occurrence and distribution of a bark beetle vector of the Dutch-elm disease. Larvae of a Scolytid were collected but further identification must await the emergence of adults from overwintering material.

Studies of wood borers and associated insects infesting the roots and root collars of balsam poplar were continued (See Fig. 8 and Fig. 9). To date, Cerambycid, Buprestid, Aegerid, Cossid and Diptera species have been collected. Also, three plots about 35 feet square were established in reproduction in disturbed areas (such as burrow pits), to determine the incidence of Saperda spp. The reproduction was about 4 feet in height, 9 years of age, and 0.5 inches in diameter at 6 inches above ground level, and about 8 per cent of the stems were dead. Some 17 per cent of the root systems were infested and they contained an average of 1.4 larvae each.

Numerous clumps of speckled alder were examined for the presence of wood borers and larvae of a Cerambycid and adults of a Saperda sp. were collected.

3.3.6 Spruce Budworm, Choristoneura fumiferana (Clem.):— Populations remained low. Larval collections were made at Crow Duck and Eaglenest lakes, Victoria Beach, Pinawa and Beausejour but there was no obvious defoliation. The infestation at Red Sucker Lake was not visited in 1961, due to the prolonged fire season.

Tree mortality continued in spruce-balsam stands defoliated during the 1955-58 outbreak. Strip cruises were carried out in the Wallace Lake and Winnipeg River areas and the results are summarized in Table 2.

TABLE 2

Mortality of White Spruce and Balsam Fir at Four Locations  
Eastern District of Manitoba

(based on one acre cruise strip tallies)

Location	Year tallied	Tree species and DBH (ins.)	No. of trees		Basal area (sq. ft.)		Per cent basal area dead
			Living	Dead	Living	Dead	
Eaglenest Lake #1	1961	bF up to 3"	333	0	3.808	0	0
		bF over 3"	32	4	7.692	.866	10
		wS up to 3"	5	0	.164	0	0
		wS over 3"	15	1	10.742	.087	.8
Eaglenest Lake #2	1961	bF up to 3"	64	0	.800	0	0
		bF over 3"	38	10	9.044	2.032	18
		wS up to 3"	5	0	.025	0	0
		wS over 3"	9	0	7.116	0	0
Wallace Lake #1	1961	bF up to 3"	89	80	2.149	1.122	34
		bF over 3"	6	21	.931	3.152	77
		wS up to 3"	5	0	.025	0	0
		wS over 3"	0	0	0	0	0

TABLE 2 (cont'd.)

Location	Year tallied	Tree species and DBH (ins.)	No. of trees		Basal area (sq. ft.)		Per cent basal area dead
			Living	Dead	Living	Dead	
Wallace Lake #2	1961	bF up to 3"	144	118	2.632	3.215	55
		bF over 3"	10	15	1.356	3.024	69
		wS up to 3"	1	0	.005	0	0
		wS over 3"	2	1	1.156	.267	19
Winnipeg River #1	1961	bF up to 3"	16	15	.284	.573	67
		bF over 3"	54	55	13.601	13.552	49
		wS up to 3"	1	0	.005	0	0
		wS over 3"	0	0	0	0	0
Winnipeg River #2	1961	bF up to 3"	13	5	.221	.137	38
		bF over 3"	32	14	6.896	2.848	29
		wS up to 3"	0	0	0	0	0
		wS over 3"	0	0	0	0	0

3.3.7 A Sawfly on Jack Pine, Xyelid sp.:— A small infestation of this gall-forming sawfly was found in the new shoots of jack pine reproduction along the Bear River Road (sec. 6, tp. 20, rge. 13, E.P. mer.). The attack was relatively light with a population count ranging from 3 to 6 galls per tree. This constitutes the first Survey record of this species in Manitoba.

3.3.8 A Root Weevil, Hylobius sp.:— Two areas were surveyed for the incidence of Hylobius root weevil damage and infection of roots by the white pocket rot, Polyporus tomentosus. The areas are located in the northern portion of the District and lie along the junction of the Nelson River and the Northern coniferous zones. The results of the 1961 Hylobius survey are summarized in Table 3.

TABLE 3

Summary of Hylobius sp. Damage in Two Study Areas  
Eastern Manitoba - 1961

Location	Av. d.b.h. (ins.)		Av. ht. (ft.)		Damage index		Percentage of roots diseased on trees		Percentage of diseased roots with insect damage	
	L	D	L	D	L	D	L	D	L	D
Eardley Lake	10.2	9.0	81.0	68.0	2.3	3.3	15.3	85.0	60.0	30.0
Weaver Lake	11.4	10.4	80.0	76.0	3.9	2.7	35.2	100.0	100.0	22.5



3.3.9 Insects Infesting the Tops of Black Spruce:- Examination of black spruce revealed an increase of insect activity in club-topped trees along the Bernic Lake road. Light damage to both the new foliage and current cone crop was recorded. However, the accumulated damage to the old cones and foliage was classed as heavy. Insect species recovered from these tops were:

<u>Herculia thymetusalis</u>	<u>Archippus albertus</u>
<u>Epizeuxis americalis</u>	<u>Dioryctria abietivorella</u>
<u>Drymus unus</u>	<u>Psallus piceicola</u>
<u>Cyphon variabilis</u>	<u>Polia sp.</u>
<u>Geometrid sp.</u>	<u>Chalcid sp.</u>
<u>Gelechiid sp.</u>	<u>Hemerobiid sp.</u>
<u>Aphid spp.</u>	

### 3.3.10 Other Noteworthy Insects:-

<u>Insect</u>	<u>Host(s)</u>	<u>No. of Collections</u>	<u>Remarks</u>
<u>Acleris variana</u> (Black-headed budworm)	WS	4	Very low populations throughout the District.
<u>Acrobasis betulella</u> (Birch tube-maker)	WaB, WB	6	Low populations along the Bear River and in the Whiteshell Forest Reserve.
<u>Acrobasis rubrifasciella</u> (Alder tube maker)	spAl	3	Low populations along the Bear River and in the Whiteshell Forest Reserve.
<u>Anoplonyx luteipes</u> (a sawfly)	tL	7	Fairly high populations in the Managotagan-Bissett areas.
<u>Archips cerasivorana</u> (Ugly-nest caterpillar)	cCh	18	Common in the Stead-Belair and Agassiz areas.
Aphid spp.	JP, tA, bPo, WB, SpAl, bS, W	44	Special collections for G. A. Bradley .
<u>Badebecia urticana</u> (a leaf roller)	cCh, pCh, spAl, tA	6	Low populations in the Whiteshell Forest Reserve.
<u>Cecidomyia reeksi</u> (a gall midge)	JP	5	Common in the Agassiz and Bear River areas.
<u>Choristoneura conflictana</u> (large aspen tortrix)	tA	2	At very low population levels throughout the District.

## 5.3.10 Other Noteworthy Insects:- (cont'd.)

<u>Insect</u>	<u>Host(s)</u>	<u>No. of Collections</u>	<u>Remarks</u>
<u>Datana ministria</u> (Yellow-necked caterpillar)	bO	5	Common throughout the southern Agassiz.
<u>Dioryctria abietivorella</u> (a coneworm)	jP	3	Low populations in the Belair and Agassiz Forest Reserves.
<u>Dioryctria</u> sp. (a coneworm)	jP	4	Low populations in the Belair and Agassiz Forest Reserves.
<u>Epinotia solandriana</u> (a skeletonizer)	tA	2	Very low populations and no defoliation in the Selkirk area.
<u>Galerucella decora</u> (Gray willow leaf beetle)	W	12	A small severe infestation seven miles west of Bissett; light throughout remainder of District.
<u>Gonioctena americana</u> (American aspen beetle)	tA	7	Light defoliation in Southern Whiteshell; moderate defoliation in central Agassiz.
<u>Hyperaspis congener</u> (a lady beetle)	jP	2	Very low populations throughout the District.
<u>Lambdina fiscellaria</u> <u>fiscellaria</u> (Hemlock looper)	bF	5	Common in balsam fir stands - no defoliation.
<u>Lecanium corni</u> (European fruit lecanium)	mM	1	Single collection from Pinawa.
<u>Lecanium</u> poss. <u>quercifex</u> (a scale insect)	mM, bO, tA, spAl, hazelnut	9	Very common on most shrubs throughout the southern part of the District.
<u>Lithocolletis</u> <u>salicifoliella</u> (a blotch miner)	tA	5	Low populations in the Whiteshell area and northern part of Agassiz Forest Reserve.

## 3.3.10 Other Noteworthy Insects:- (cont'd.)

<u>Insect</u>	<u>Host(s)</u>	<u>No. of Collections</u>	<u>Remarks</u>
<u>Malacosoma americanum</u> (Eastern tent caterpillar)	cCh	7	Tents commonly found in the agriculture areas.
<u>Malacosoma lutescens</u> (Prairie tent caterpillar)	pCh	7	Tents commonly found in the Belair Forest Reserve and Bissett areas.
<u>Malacosoma pluviale</u> (Western tent caterpillar)	cCh, W, wB, tA spAl, Misc.	15	Forested area of the District, damage confined to host shrubs.
<u>Mordwilkoja vagabunda</u> (Poplar vagabond aphid)	tA	3	Low populations on aspen reproduction.
<u>Neodiprion virginianus</u> (complex) (Red-headed jack-pine sawfly)	jP	1	One colony found in Belair Forest Reserve.
<u>Neodiprion nanulus</u> <u>nanulus</u> (Red-pine sawfly)	jP	2	Very low populations throughout the District.
<u>Nycteola frigidana</u> (a Notodontid)	bPo, W, gAs	4	Low population levels, causing no damage.
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	7	Commonly found in the Agassiz and Belair Forest Reserve.
<u>Periclista albicollis</u> (a sawfly)	bO	2	Rennie infestation subsided; only light defoliation in southern Whiteshell recorded.
<u>Phenacaspis piniroliae</u> (Pine needle scale)	jP, wS	5	Single scattered collections found in the Belair and Agassiz Forest Reserves and Pointe du Bois areas.
<u>Pikonema alaskensis</u> (Yellow-headed spruce sawfly)	wS	5	Roadside white spruce reproduction in the Caddy Lake-West Hawk Lake area light to moderately defoliated.

## 3.3.10 Other Noteworthy Insects:- (cont'd.)

<u>Insect</u>	<u>Host(s)</u>	<u>No. of Collections</u>	<u>Remarks</u>
<u>Pissodes strobi</u> (White-pine weevil)	JP	4	Scattered samples taken from the Whiteshell area .
<u>Pissodes poss. terminalis</u> (a weevil)	JP	1	Single collection taken along Pointe du Bois Road.
<u>Phytophaga rigidae</u> (Willow beaked gall midge)	W	3	Common throughout the Agassiz Forest Reserve.
<u>Proteoteras willingana</u> (Boxelder twig borer)	mM	6	Found in all shelterbelts and woodlots in the agriculture areas.
<u>Schizura concinna</u> (Red-humped caterpillar)	W	5	Found severely defoliating roadside willows in the southern Agassiz.
<u>Semiothisa spp.</u> (Geometers)	tL	11	Occasionally collected from tamarack; populations levels low in all areas.
<u>Sciaphila duplex</u> (a skeletonizer)	tA	2	Low populations recorded in the Selkirk and Rennie areas.
<u>Tetralopha asperatella</u> (a webworm)	tA	10	Population levels highest in areas previously infested by the forest tent caterpillar.
<u>Tetralopha robustella</u> (a webworm)	JP	5	Small, light infestation at Jessica Lake; damage confined to branches of host tree.
<u>Toumeyella numismaticum</u> (Pine tortoise scale)	JP	12	Numerous collections from jack pine regeneration in the Belair and Agassiz Forest Reserves and Pointe du Bois area.
<u>Zelleria haimbachi</u> (a leaf roller)	JP	3	Very low population levels in all areas.

### 3.4 TREE DISEASE CONDITIONS

3.4.1 White Pocket Rot, Polyporus tomentosus:- A special survey of this rot was carried out in mature white spruce stands on islands in Weaver and Eardley lakes. The root systems of five trees at each location were examined and the results indicated that the rot was present in two root samples at Weaver Lake and in four at Eardley Lake. Armillaria mellea was present at both locations to a moderate degree.

3.4.2 Root and Butt decay of Conifers, Flammula alnicola:- Stands of white spruce and balsam fir cut during the winter of 1960-61 (selective cut) were examined to determine the incidence of the butt and root decay, Flammula alnicola. Samples were taken from ten stumps at each of two locations and forwarded to the Pathology Laboratory at Saskatoon for identification. The results showed that F. alnicola was present in one stump out of 300 examined in the vicinity of Bird Lake and was absent at Manigotagan; the other location sampled.

3.4.3 Root Decay of White Spruce:- A survey of standing dead white spruce in the Bird River area of the Manitoba Paper Co. limits was made to determine the cause of this extensive mortality. The root systems of twelve trees were examined for the presence of diseases and the results are shown in table 4.

TABLE 4

Results of Survey for Root Decays, Bird River - 1961

Tree No.	Decay type	Fungus isolated	Decay caused by
1	White pocket	Penicillium	<u>Fomes pini</u> or <u>Polyporus tomentosus</u>
2	Yellow pocket	<u>P. tomentosus</u>	<u>P. tomentosus</u>
3	Yellow pocket	<u>P. tomentosus</u>	<u>P. tomentosus</u>
4	Yellow stringy	Penicillium	<u>Armillaria mellea</u>
5	Yellow stringy	<u>A. mellea</u>	<u>A. mellea</u>
6	White pocket	<u>P. tomentosus</u>	<u>P. tomentosus</u>
7	Yellow stringy	Hyphomycete	<u>A. mellea</u>
8	Brown stain	<u>A. mellea</u>	<u>A. mellea</u>
9	no decay	none	
10	no decay	none	
11	Red stain	<u>F. pini</u>	<u>F. pini</u>
12	Grey stain	basidiomycete	Unknown

3.4.4 Aspen Branch Galls, Macrophoma tumefaciens:- This disease was found throughout the District. Light infestations were recorded at the following points: Bear River, Crowduck Lake, Shoe Lake, Bird River, Bird Lake and Pointe du Bois.

3.4.5 Spray Damage:- A special survey was conducted in the Pinawa area to collect foliage damaged by 2-4-D sprays along the power line right-of-way. The spray damaged foliage was collected, pressed and sent to the Forest Pathology Laboratory in Saskatoon. Samples were obtained from trembling aspen, balsam poplar, white birch, white elm, green ash, chokecherry, highbush cranberry, Manitoba maple and willow.

3.4.6 Other Noteworthy Diseases:-

Host	Organism	Locality	Remarks
Jack pine	Globose gall rust	Stead (Belair F.R.) Agassiz F.R.	Common
Jack pine	<u>Coleosporium asterum</u>	Stead (Belair F.R.)	Common
Jack pine	<u>Coleosporium asterum</u>	Agassiz F.R.	Single collection
Jack pine	<u>Peridermium harnessii</u>	Leaf Lake	Numerous galls
Balsam fir	<u>Peridermium coloradense</u>	Pine Falls	Common in area
Saskatoon	<u>Gymnosporangium</u> rust on berries	Belair Victoria Beach	Heavy damage to berry crop in area
Mountain ash	<u>Pleurotus</u> ( <u>sapidus?</u> )	Pinawa	Single collection
Mountain ash	<u>Gymnosporangium</u> rust	Wallace Lake	Single collection
White birch	Cubical rot (die back)	Agassiz F.R.	Common in area
Balsam poplar	<u>Septoria</u> leaf spot	Pointe du Bois Bird Lake	Common in low areas

4. ANNUAL DISTRICT REPORT

SOUTHERN DISTRICT OF SASKATCHEWAN

1961

by

M. R. H. Pratt

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

#### 4.1 INTRODUCTION

Forest Insect and Disease survey was carried out in the Southern District of Saskatchewan from May 17 through September, 1961. During that period, a total of 323 insect and 18 tree disease collections were taken from shelterbelts, plantations, ornamental plantings and native stands. In addition, several mass collections of the spruce budworm, forest tent caterpillar and stink bugs were taken for special studies. Population studies of the fall cankerworm and boxelder twig borer were continued and egg sampling of the spruce budworm and forest tent caterpillar was intensified in infestation areas.

#### 4.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

Severe drought and above normal temperatures prevailed throughout southern Saskatchewan during the summer. These conditions tended to lower the water table in most areas which caused short leader and twig growth, and premature coloration of the foliage of both native and planted trees.

A noticeable decline in populations of leaf rollers or trembling aspen, (Epinotia nisella criddleana and Pseudexentera improbana oregonana) was probably due to the continuous hot, dry weather. Spruce budworm populations remained high in the West Block of the Cypress Hills Provincial Forest, and an occasional larva was collected from ornamental plantings and shelterbelts of white spruce elsewhere in the District. The forest tent caterpillar infestation in trembling aspen stands throughout the Cypress Hills continued as the most serious problem. Occasional larval samples of this species were also taken at several other points.

No serious outbreaks of tree diseases were noted. The continuous hot, dry weather caused considerable yellowing of deciduous tree foliage in most stands. Surveys for the incidence of white pocket rot, Flammula alnicola were carried out in recently logged-over white spruce stands in the West Block of the Cypress Hills Provincial Forest, but only light infection was noted.

#### 4.3 INSECT CONDITIONS

4.3.1 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— The severe infestation which severely defoliated trembling aspen stands in the East and Park blocks of the Cypress Hills Provincial Forest during the past five years, decreased somewhat in intensity and area. (See Fig. 3). In the Park Block, moderate to severe defoliation was confined mainly to a few small, isolated patches of trembling aspen, usually no more than four or five acres in area. In the East Block, patches of moderate to severe defoliation extended along the north slopes and valleys of the Cypress Hills for a distance of 17 miles. An



occasional larva was taken in the West Block of the Provincial Forest, but no noticeable defoliation was recorded. Elsewhere in the District, a widespread distribution was noted but populations remained low and caused no conspicuous defoliation. Collections of larvae were taken at Indian Head, Qu'Appelle, Avonhurst, Vibank, Moose Jaw, and in the Swift Current-Duncairn area.

To follow the infestation pattern and predict the severity of defoliation by the forest tent caterpillar in succeeding years, egg-band surveys have been carried out in the Cypress Hills Provincial Forest since 1958. Sampling conducted in the fall of 1961 indicated that defoliation in 1962 will likely occur in small patches only and a further recession of larval populations will be evident. Adverse weather during the period of early larval development could also substantially reduce populations and subsequent defoliation. The following table lists the locations of the points sampled in 1961, the average number of egg-bands per tree, and the severity of defoliation likely to occur at these points in 1962.

TABLE 1

Summary of Forest Tent Caterpillar Egg-Band Sampling - 1961  
Cypress Hills Provincial Forest

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

Sample Point No.	Location by sec., tp., rge., and mer.	Summary of Egg-band Counts					Defol. forecast 1962
		Av. d.b.h. of trees (ins.)	Av. Ht. of trees (ft.)	Av. Crown Depth (ft.)	Av. No. of egg-band per tree		
Park Block:							
1	21-8-26-W3	3.8	28	19	33	severe	
2	20-8-26-W3	4.3	26	20	18	severe	
3	25-8-27-W3	4.0	23	19	20	severe	
4	25-8-27-W3	3.1	18	9	13	severe	
5	19-8-26-W3	4.4	24	15	20	severe	
6	24-8-27-W3	5.1	27	17	12	moderate	
7	19-8-27-W3	4.0	25	16	0	nil-light	
East Block:							
1	27-9-25-W3	3.1	19	14	25	severe	
2	20-9-25-W3	4.1	23	16	18	severe	
3	21-9-25-W3	3.6	19	14	8	moderate	
4	36-10-25-W3	3.6	19	14	37	severe	
5	25-9-25-W3	3.3	20	15	19	severe	
6	19-9-23-W3	4.1	25	22	15	severe	
7	36-9-24-W3	4.6	31	20	14	severe	
West Block:							
1	36-7-29-W3	3.4	29	17	0	nil	
2	33-7-29-W3	2.8	18	13	0	nil	
3	2-8-30-W3	3.0	20	9	0	nil	
4	11-8-30-W3	3.0	21	13	0	nil	

Mass collections of larvae and pupae have been taken in the Cypress Hills area during the past three seasons and reared at the Laboratory to determine the incidence of parasitism. The results as shown in the following synopsis, indicate a notable increase in both larval and pupal parasitism.

	Per Cent Parasitism		
	1959	1960	1961
Larval Parasitism:	3	13	36
Pupal Parasitism:	5	30	67

4.3.2 Spruce Budworm, Choristoneura fumiferana (Clem.): - The infestation, which covered approximately 100 acres of white spruce along the Battle Creek Valley in the West Block of the Cypress Hills Provincial Forest last year, increased in size and moderate to severe defoliation occurred in patches within some 600 acres (Fig. 5). In addition, light larval populations were recorded throughout the remainder of the white spruce stands in the valley from the Alberta border east to the Battle Creek Ranger Station. Aerial surveys, supplemented by ground checks, also showed patches of light defoliation in the valleys and on the northern slopes along the Nine-mile Creek in the southern section of the West Block. No evidence of budworm was found in the eastern side of this Block or in the Park Block. Elsewhere in the district, only an occasional larva was taken from white spruce shelterbelts and ornamental plantings.

A mass collection of 200 larvae was taken during the last week of June from the infestation area in the Battle Creek Valley. Subsequent rearing at the Winnipeg Laboratory indicated that 21 per cent were parasitized, mainly by Madremyia saundersii and Phryxe pecocensis.

Egg-mass sampling, initiated in 1960, was intensified throughout the Battle Creek Valley, and the results are shown in Table 2.

TABLE 2

Results of Spruce Budworm Egg-Mass Sampling on White Spruce  
Cypress Hills Provincial Forest - West Block  
1961

(based on examination of two 18 inch branch tips  
from each of five full crowned co-dominant trees)

Sample Point No.	Location by sec., tp., rge. and mer.	Summary of Egg-mass Sampling		
		Total area of foliage	No. of egg-masses	No. of egg masses/ 100 sq. ft. foliage
1	11-8-30-W3	16.8	22	131
2	11-8-30-W3	14.6	14	96

TABLE 2 (cont'd.): -

Sample Point No.	Location by sec., tp., rge. and mer.	Summary of Egg-mass Sampling		
		Total area of foliage	No. of egg-masses	No. of egg masses/ 100 sq. ft. foliage
3	11-8-30-W3	17.9	3	17
4	2-8-30-W3	20.5	8	39
5	10-8-30-W3	20.5	7	34
6	10-8-30-W3	17.4	6	34
7	10-8-30-W3	20.9	4	19
8	10-8-30-W3	20.0	13	65
9	1-8-30-W3	17.5	7	40
10	2-8-30-W3	17.1	5	29
11	2-8-30-W3	16.9	10	59
12	11-8-30-W3	19.1	16	83
13	2-8-30-W3	18.4	15	82
14	2-8-30-W3	17.8	14	79
15	31-7-29-W3	16.2	0	0
16	36-7-30-W3	14.9	0	0
17	31-7-29-W3	15.1	3	20

The above, compared with the 1960 data, indicates that the infestation will probably increase in both intensity and size in 1962.

4.3.3 Fall Cankerworm, Alsophila pometaria (Harr.): - Infestations continued to cause defoliation of Manitoba maple, ash, and American elm shelterbelts and ornamental plantings in the Regina-Swift Current-Maple Creek area, but declined in other areas. In the Maple Creek area, larval populations have been high for the past four years, but only light defoliation occurred in 1961. Populations were also lower in the Swift Current-Beverley, Stewart Valley, Cantuar and Ernfold areas, but increased in shelterbelts in the Baildon, Crestwynd, Corrine, Moreland and Ceylon areas south of Regina and Moose Jaw with resultant moderate defoliation. Elsewhere, only light populations were noted. An occasional larva was taken from Manitoba maple, ash and American elm plantings in the Wolseley, Grenfell, Moose Mountain and Estevan areas.

The results of counts on Manitoba maple, carried out in five shelterbelts since 1958, supported the above observations, and it was noted that continuous severe defoliation in past years has caused considerable branch mortality at all crown levels and the trees are generally in poor condition.

4.3.4 Boxelder Twig Borer, Proteoteras willingana (Kft.): - This borer caused conspicuous damage to the new growth of Manitoba maple in shelterbelts across southern Saskatchewan. Due to the hot, dry weather, fewer and shorter twigs were produced and this resulted in a somewhat higher percentage of infestation in most stands. This condition was particularly evident at seven representative sample points in the district where population counts have been taken each year since 1956.

4.3.5 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.): - Light populations of the yellow-headed spruce sawfly occurred on white spruce shelterbelt and ornamental plantings at Kenosee Lake, Moosomin and around Indian Head in the eastern part of the District. Spruce plantings from Regina west to the Alberta boundary and native white spruce stands in the Cypress Hills Provincial Forest were relatively free of attack.

4.3.6 Spruce Spider Mite, Oligonychus ununguis (Jac.): - A noticeable increase in the abundance of the spruce spider mite occurred on ornamental and shelterbelt plantings of white spruce throughout most of the District. The above normal temperatures and drought conditions that prevailed appeared to favor spider mite development. By mid-June all stages of the insect were present and dense webbing and browning of the needles were conspicuous. The most severe damage was noted in white spruce plantings in the area from Regina east to the Manitoba border. Attack was generally more severe on white spruce growing on poor soils or left in a neglected condition. Colorado spruce appeared less susceptible to spider mite attack. Only light populations were noted on native white spruce in the Cypress Hills Provincial Forest.

4.3.7 Pine Needle Scale, Phenacaspis pinifoliae (Fitch.): - Infestations of the pine needle scale remained much the same. Light to moderate infestation, generally affecting only a few trees at each location, was widely distributed on ornamental plantings and shelterbelts of white spruce throughout the eastern part of the District. The heaviest scale concentrations occurred on white spruce shelterbelts in the vicinity of Lemberg, Creelman, Grenfell, Wolseley and Indian Head.

4.3.8 Larch Sawfly, Pristiphora erichsonii (Htg.): - Larch sawfly populations have all but disappeared in tamarack and larch plantations at Wolseley and Indian Head. A combination of abnormal weather conditions, animal grazing and competition from lower shrubs and grass has resulted in loss of vigor and rapid deterioration of the tamarack plantation at Wolseley where numerous dying and dead trees are now evident. Repeated applications of insecticides over the past three years have reduced larch sawfly populations to practically nil in the plantations at the Indian Head Forest Nursery Station. Light infestation continued on a few planted tamarack near the Battle Creek Ranger Station in the Cypress Hills Provincial Forest.

4.3.9 Spiny Elm Caterpillar, Nymphalis antiopa (L.): - During late June and early July, light larval populations of the spiny elm caterpillar were noted on roadside willows and small trembling aspen trees in the Moose Mountain, Touchwood Hills and Wymark areas. Although populations are apparently increasing, they were relatively low and little defoliation resulted.

4.3.10 The Leaf Beetle, Altica populi Brown: - Large numbers of adults and larvae severely skeletonized balsam poplar over the southeastern part of the District. Feeding damage was most conspicuous on small trees in the Moose Mountain, Carlyle, Manor, Alameda and Redvers areas.

4.3.11 Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.): - This species was widely distributed, but caused only light defoliation. Collections were taken from wild rose and chokecherry in the Cypress Hills Provincial Forest, in the vicinity of Swift Current, Moose Jaw, Minton, Qu'Appelle and in the Moose Mountain Provincial Park.

4.3.12 American Aspen Beetle, Gonioctena americana (Schffr.): - Light infestations, mainly on small trembling aspen trees, occurred throughout the Cypress Hills Provincial Forest. Only an occasional colony of feeding beetles was noted on aspen in the eastern half of the District.

4.3.13 Nuttall Blister Beetle, Lytta nuttallii Say.: - An increase in numbers of the blister beetle, L. nuttallii occurred this year throughout the central portion of the District. High concentrations of adults fed on the new shoots of caragana causing moderate defoliation in town hedges and field-row plantings in the areas east from Regina to Wolseley and south from Qu'Appelle to Ceylon.

4.3.14 Leaf Rollers of Aspen: - A noticeable decline in populations of the leaf rollers, Epinotia nisella criddleana and Psuedexentera improbana oregonana, which commonly occur on trembling aspen, was evident throughout the Aspen Grove Section and only very light damage occurred. Balsam poplar, cottonwoods and hybrid poplars used for shelterbelt plantings were free from leaf roller attack.

4.3.15 Bruce Spanworm, Operophtera bruceata (Hulst): - Light populations were noted on native trembling aspen and in Manitoba maple shelterbelts throughout most of the District. During June, one or two larvae were taken in most five tree beating samples from the above tree species.

4.3.16 The Boxelder Bug, Leptocoris trivittatus (Say): - During August, large numbers of nymphs and adults were noted on the leaves and seed-clusters of Manitoba maple throughout the District, but very little damage was done to the seed crop. In September, the adults tended to congregate around buildings when in search of overwintering niches.

#### 4.3.17 Other Noteworthy Insects: -

Insect Species	Host(s)	No. of Collections	Remarks
<u>Archips cerasivoranus</u> (Ugly nest caterpillar)	Chokecherry Saskatoon	2	A few nests found in Cypress Hills Provincial Forest and eastern half of the District

## 4.3.17 Other Noteworthy Insects:- (Cont'd.)

Insect Species	Host(s)	No. of Collections	Remarks
<u>Banasa dimidiata</u> (a stinkbug)	Trembling aspen Willow	5	Found in plantations; no appreciable damage
<u>Biston cognataria</u> (Pepper-and-salt moth)	Trembling aspen Willow	13	Common throughout the District
<u>Choristoneura conflictana</u> (Large aspen tortrix)	Trembling aspen	5	Found in stands from Regina east to Manitoba boundary
<u>Chrysomela crotchii</u>	Trembling aspen	14	A light infestation ex- tended from Mortlach east to the Manitoba boundary; confined to trees from one to three inches.
<u>Dicerca</u> sp. (a flatheaded borer)	Trembling aspen	7	Adults found on aspen stands throughout District
<u>Epicauta fabricii</u> (Ash-gray blister beetle)	Caragana	3	Light to moderate de- foliation near Ceylon
<u>Galerucella decora</u> (Gray willow leaf beetle)	Willow	3	Light infestation in Cypress Hills Provincial Forest; occasionally found elsewhere in Dis- trict
<u>Mordwilkoja vagabunda</u> (Poplar vagabond aphid)	Trembling aspen	8	Found on small aspen trees in eastern half of District; damage light
<u>Tetralopha asperatella</u> (a webworm)	Trembling aspen	2	Found throughout aspen stands in eastern half of the District
<u>Trichiosoma triangulum</u> (a sawfly)	Willow	17	Common in eastern portion of District

#### 4.4 TREE DISEASE CONDITIONS

4.4.1 Root and Butt Decay of Conifers, Flammula alnicola:- A survey to detect the occurrence of this decay in recently cut white spruce stumps was carried out in the West Block of Cypress Hills Provincial Forest. Sixty-five stumps were examined but none showed evidence of infection.

4.4.2 White Pocket Rot Polyporus tomentosus:- A survey for the occurrence of this pocket rot was carried out in the Cypress Hills West Block on the root systems of five dead trees. Of a total of 35 decayed roots, 3 were infected with P. tomentosus and an additional 2 with Armillaria mellea.

4.4.3 2-4-D Injury of Broad-leaved Trees:- Samples of typical 2-4-D injury to broad-leaved trees in shelterbelt and ornamental plantings were taken during August and forwarded to the Forest Pathology Laboratory at Saskatoon. Damage was mainly confined to ash, Manchurian elm, caragana and Manitoba maple. It was frequently encountered in agricultural areas where aerial and ground spraying programs were carried out earlier in the summer.

4.4.4 Deterioration of Aspen Foliage in the Cypress Hills:- During July and August the foliage in many small aspen stands throughout the Cypress Hills and surrounding area began to wilt, dry out, and turn brown. There was no apparent insect damage or disease infection, and it was probably caused by abnormally high temperatures and drought conditions that prevailed during the spring and summer.

#### 4.4.5 Other Noteworthy Diseases:-

Host	Organism	Locality	Remarks
Trembling Aspen	<u>Radulum casearium</u>	Moose Mountain	Found on overmature, windthrown trees
Chokecherry	<u>Dibotryon morbosum</u>	Throughout District	Infections generally light - usually only a few branches infected
White Spruce	<u>Peridermium coloradense</u>	Cypress Hills	Yellow witches' broom. Infection light and only occasional specimens taken
Trembling Aspen	<u>Polyporus adustus</u>	Moose Mountain	Slash fungus - infection light. Generally does not cause serious damage.
Trembling Aspen	<u>Fomes applanatus</u>	Cypress Hills	Samples were taken from dead wood, but the fungus also causes heart rot of living trees.

5. ANNUAL DISTRICT REPORT

INTERLAKE DISTRICT OF MANITOBA

1961

by

G. T. Lalor

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962



## 5.1 INTRODUCTION

Forest insect and disease surveys were made in the Interlake Section from May 15 to October 20. During that period a total of 318 insect and 20 disease samples were taken. Sub-projects such as larch sawfly plots, Polyporus tomentosus and Hylobius plots were continued. Special collections of forest insect and disease material were made for personnel of the Winnipeg Laboratory and forest tent caterpillar egg-band surveys were conducted throughout the area.

## 5.2 REVIEW OF FOREST INSECT AND DISEASE CONDITIONS

The status of several species of forest insects changed in 1961. The balsam-fir sawfly infestation, previously confined to Hecla Island and the Washow Bay Peninsula, spread to encompass an area of approximately 3,600 square miles. Sharp increases in the extent and intensity of larch sawfly infestations occurred throughout the northern portion of the District. Samples of the forest tent caterpillar were taken at several points, indicating a rise in populations of this species. Although there was an apparent rise in populations of the spruce budworm on Hecla Island, little change was noted in the size of previous infestations.

## 5.3 INSECT CONDITIONS

5.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— There were some changes in the status of this insect (See Fig. 1). Light defoliation, not exceeding 15 per cent occurred in tamarack along No. 8 Highway between Hnaua and a point 15 miles north of Riverton. At Washow Bay, in an area encompassing 100 square miles, defoliation ranged from 10 to 95 per cent; the heaviest occurred in sec. 31, tp. 24, rge. 5, E.P. mer. and in sections 31 and 32, tp. 25, rge. 3, W.P. mer. Between Washow Bay and Pine Dock defoliation generally ranged from 10 to 30 per cent, but pockets of defoliation up to 90 per cent occurred in sections 23 and 24, tp. 30, rge. 5, E.P. mer. From Calder's Dock to Pine Dock defoliation did not exceed 15 per cent, but it was 30 per cent at Fisher Bay. At other points, including Vidir and Hodgson, defoliation was about 10 per cent. Scattered clumps of tamarack growing on grazing land between Hodgson and Ashern were approximately 10 per cent defoliated. Between Ashern and Gypsumville, defoliation was from 10 to 15 per cent. At Gypsumville, nil to 50 per cent defoliation occurred. Along the Grand Rapids road from Gypsumville to a point 25 miles north, defoliation in undamaged stands ranged from 10 to 20 per cent, but most of the tamarack stands in this area were destroyed or severely damaged by forest fires. In a few widely scattered stands between mile 25 and mile 73, defoliation ranged from 10 to 40 per cent.

Larval drop trays were again used to collect cocoons at Plot 101, Washow Bay, and two hundred of them were dissected in the laboratory. The dissections showed that parasitism by Bessa harveyi increased to over 50 per cent. Slight increases also occurred in the number parasitized by Mesoleius tenthredinis and Tritneptis kluzii.

Sequential sampling of larch sawfly egg populations was continued at three locations in two permanent plots and the infestation rating of each, based on the utilization of current shoots for oviposition, is shown below:

Location and Plot Number	Infestation ratings		
	No. of shoots examined	No. of shoots utilized	Infestation rating 1961
Washow Bay Plot #101	120	22	Moderate
Washow Bay Plot #101	350	40	Moderate
Gypsumville Plot #102	50	0	Nil-Light

5.3.2 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— Populations increased but serious defoliation did not occur. Collections of one or two larvae per five-tree beating sample were made at Beaver Creek, Hecla Island and Arborg. The heaviest populations were encountered at Grand Rapids and Cross Lake in the Northern District of Manitoba where four to five per sample were taken from trembling aspen, white birch, dogwood, willow and alder. On June 21, a short aerial survey of the infestation was conducted and occasional pockets of very light defoliation were observed.

During October, an egg survey to determine the probable extent and severity of infestations in 1962 was conducted, and the results are shown in Table 1.

TABLE 1

Forest Tent Caterpillar Egg-Band Sampling  
Interlake Section of Manitoba - 1961

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

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands	Forecast for 1962
Ashern	3.4	25.3	14.7	0	Nil
3.4 miles west of Hodgson	3.3	30.7	20.0	0	Nil

TABLE 1 cont'd.

Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands	Forecast for 1962
Gimli	3.6	31.0	22.3	1.3	Light
Mile 58, No. 6					
Highway	3.0	20.0	15.3	.6	Light
Cross Lake	2.0	20.2	16.5	7.0	Severe
Cross Lake	2.0	21.3	15.2	2.0	Light
Cross Lake	3.0	26.2	9.7	.3	Light
Grand Rapids	4.0	29.7	19.4	2.0	Light
Grand Rapids	2.0	22.8	15.3	0	Nil
Gypsumville	3.0	28.0	10.8	0	Nil
Eriksdale	3.0	18.8	13.2	0	Nil
Poplarfield	2.0	21.5	16.0	0	Nil
Silver	3.0	30.2	21.2	.3	Light
Calder's Dock	4.0	40.3	22.7	.3	Light
Riverton	2.0	15.5	12.8	0	Nil
Inwood	3.0	30.2	16.1	0	Nil
Woodlands	3.0	29.2	18.5	0	Nil

5.3.3 Balsam-fir Sawfly, Neodiprion abietis complex:- A notable change in the status of this insect occurred in 1961. The infestation which was confined to the Washow Bay Peninsula and Hecla Island in 1960 spread to encompass an area of approximately 3,600 square miles. Throughout the area, defoliation varied according to the tree species and density of the stands. The heaviest damage to the old foliage of conifers occurred in stands of open growing, native white spruce trees. On native black spruce and on shaded white spruce, damage very rarely exceeded the moderate level.

Severe defoliation of balsam fir, moderate defoliation of black spruce and light defoliation of white spruce occurred on Hecla Island and on the Washow Bay Peninsula. This condition extended north to a point 7 miles south of Pine Dock where defoliation of balsam fir decreased to moderate and defoliation of black and white spruce was negligible. Five miles south of Pine Dock, damage to all tree species was light. At Pine Dock only an occasional larva was present. Between Hodgson and Ashern and north along No. 6 Highway to Fairford where the forest stands are composed mainly of trembling aspen and scattered clumps of white spruce, the latter species supported very light populations of balsam-fir sawfly. Between the Fairford River and Gypsumville, populations were light with the exception of one point where several open-growing white spruce trees were severely defoliated. At Gypsumville, defoliation of black and white spruce was very light while defoliation of balsam fir was generally moderate with small patches of severe.

In the agricultural areas north of Arborg, between Riverton and Hodgson, a complex of balsam-fir sawfly and yellow-headed spruce sawfly, Pikonema alaskensis Roh. was present on most white spruce shelterbelts. Damage to the old foliage ranged from light to severe, and at two points in the vicinity of Sylvan was estimated at 50 to 75 per cent. Severe damage occurred on shade trees surrounding the Indian Hospital at Dallas.

5.3.4 Spruce Budworm, Choristoneura fumiferana (Clem.): - The first samples of this species were taken from white spruce and balsam fir on May 30 when migration from the hibernacula to the buds was in progress. By July 5 pupation had commenced but most larvae were in the sixth instar. There was no apparent change in the boundaries of previously infested areas in the eastern and north-eastern portions of Hecla Island, and in a very small area at Calder's Dock. At the latter, defoliation was generally moderate with an occasional white spruce tree severely defoliated, and aerial surveys conducted during the month of June showed that defoliation on Hecla Island was generally light with an occasional patch of moderate. At Beaver Creek, an occasional larva was present on white spruce. Larval collections were also made at Fisher Branch Tower, Cross Lake, and fifty miles north of Gypsumville along No. 6 Highway.

5.3.5 Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.: - This sawfly was present on white spruce, balsam fir and black spruce at most points in the Section, but severe defoliation was confined to white spruce shelterbelts and open growing native trees. Light defoliation of the current foliage of black and white spruce was recorded at Hecla Island, the Washow Bay Peninsula and as far north as Pine Dock. Moderate to severe defoliation of white spruce shelterbelts occurred at points in the Sylvan and Ledwyn areas. Between Hodgson and Dallas, defoliation of shade trees was severe. Along the east shoreline of Lake Manitoba between Ashern and Fairford very light defoliation occurred on native white spruce. North of Fairford to Gypsumville, defoliation was generally light with severe defoliation occurring in a stand of open-growing white spruce trees.

5.3.6 Jack-pine Budworm, Choristoneura pinus Free.: - No change in the status of this species was apparent in 1961. A light to moderate infestation encompassed approximately 18 square miles around Rosenberg Tower. The heaviest damage occurred on mature trees growing in the immediate vicinity of the tower.

5.3.7 Green-headed Spruce Sawfly, Pikonema dimmockii (Cress.): - Very light defoliation of black and white spruce occurred at Hodgson, Red Rose, Lake St. George and in the area between Hnaua and Beaver Creek.

5.3.8 The Long-horned Wood Borer, Oberea schaumii Lec.: - A severe infestation occurred in the Deer Horn, Lundar, Eriksdale, Ashern and Fairford areas. Trembling aspen up to one inch in diameter and from three to eight feet in height were

the most seriously affected. Results of counts made of 100 trees at each of the above-mentioned areas showed that 25 to 50 per cent contained larvae.

5.3.9 Spotless Fall Webworm, Hyphantria cunea (Drury):- This species attacked alder and white birch throughout the eastern part of the Section. During August, mass collections of late instar larvae were taken at Washow Bay, Beaver Creek, Red Rose and Lake St. George. The larvae contained in those collections were reared for parasite recovery and the following Hymenoptera were recovered: Apan-  
teles hyphantriae Riley and Hyposoter pilosulus (Prov.)

5.3.10 A Root Weevil, Hylobius sp.: - An area near Red Rose was again surveyed for Hylobius damage to the root systems of black spruce in conjunction with the Polyporus tomentosus disease survey. The results are shown in Table 2.

TABLE 2

Summary of Hylobius sp. Damage Assessment

Location	Av. d.b.h. (ins.)		Av. ht. (ft.)		Percentage of roots diseased on trees		Percentage of diseased roots with insect damage	
	Living	Dead	Living	Dead	Living	Dead	Living	Dead
Red Rose	6.8	5.4	53	32	3.6	55.0	100	54

## 5.3.11 Other Noteworthy Insects:-

Insect	Host(s)	No. of Collections	Remarks
<u>Acleris variana</u> (Black-headed budworm)	wS, bS	5	Very light populations at Lake St. George, Narcisse, Sylvan, Beaver Creek and Hnausa.
<u>Anoplonyx luteipes</u> (a sawfly)	tL, bS	4	Noticeable rise in populations at Riverton.
<u>Archips cerasivoranus</u> (Ugly nest caterpillar)	cCh	6	Common throughout the Section.
<u>Badebecia urticana</u> (a leaf roller)	tA	3	Very light at Hnausa, Hecla and Rosenberg.

## 5.3.11 Other Noteworthy Insects:- (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Campaea perlata</u> (a geometer)	W, tA, wB	4	Found at widely separated points.
<u>Cecidomyia negundinis</u> ( a gall midge)	mM	1	Very severely damaged a shelterbelt at Ponemah.
<u>Choristoneura rosaceana</u> (a leaf roller)	W	2	Very light at Clarkleigh.
<u>Chrysomela crotchii</u> (Aspen leaf beetle)	tA	7	Small patches of light to severe throughout the Section.
<u>Dichelonyx backi</u> (Green rosechafer)	W, wB	3	Common in the Grand Rapids area.
<u>Dioryctria reniculella</u> (Spruce coneworm)	wS	3	Very light at Moosehorn, Grand Rapids, and Calder's Dock.
<u>Enargia decolor</u> (a Noctuid)	tA	4	Occasional larva at Hecla, Hodgson and Hnausa.
<u>Epinotia solandriana</u> (a skeletonizer)	tA	1	Very light at Hodgson.
<u>Gallerucella decora</u> (Gray willow leaf beetle)	W, wB	2	Very light at Beaver Creek and Riverton.
<u>Gonioctena americana</u> (American aspen beetle)	tA	2	Scattered colonies at Fairfield and Riverton.
<u>Itame loricaria</u> (a spanworm)	tA, W	6	Common throughout the Section.
<u>Orthosia hibisci</u> (a fruitworm)	tA, bPo, wB	4	Found at scattered points throughout the Section.
<u>Pandemis canadana</u> (a leaf roller)	wB	5	Found at widely separated points.
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	2	Occasional nodules at Lake St. George and Cross Lake.
<u>Physokermes piceae</u> (Spruce bud scale)	wS, bS	4	Light at Lake St. George and Riverton.

## 5.4 TREE DISEASE CONDITIONS

5.4.1 Damage by Brush-killing Chemicals:- Roadside spraying operations conducted along a sixty mile stretch of No. 6 Highway between Ashern and Gypsumville caused conspicuous damage to adjacent forests. The damage extended as far as fifty yards from the highway and caused darkening and wilting of deciduous foliage. On coniferous species of which tamarack was the most severely affected, the chemical caused a curling and reddening of the leaders and lateral branches. On other conifers such as black and white spruce the damage was less conspicuous.

## 5.4.2 Other Noteworthy Diseases:-

Host	Organism	Locality	Remarks
Saskatoon	<u>Apiosporina</u>	Narcisse	Common on Saskatoon growing in shade.
Jack pine	<u>Cronartium</u>	Rosenberg	Very light infection.
Jack pine	<u>Arceuthobium americanum</u>	Throughout area	Additional infections noted at Grand Rapids and Cross Lake areas.
Conifers	<u>Chrysomyxa</u> sp.	Throughout area	Very light infections.
Chokecherry	<u>Dibotryon morbosum</u>	Throughout area	Most common throughout the southern portion.
Trembling aspen	<u>Hypoxyylon pruinatum</u>	Throughout area	Most common in stands on grazing lands.

6. ANNUAL DISTRICT REPORT

WESTERN DISTRICT OF MANITOBA

1961

by

J. J. Lawrence

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962



## 6.1 INTRODUCTION

Hot, dry weather from early spring to September created ideal forest fire conditions throughout the District and one of the worst fire seasons in history was recorded. Large acreages of young and mature timber stands were destroyed, particularly in the central part of the Duck Mountain Forest Reserve, in the section north and east of Cowan, and around Gunn Lake in the Riding Mountain National Park. Water levels in lakes and rivers were also affected appreciably by the prolonged drought and almost new lows were recorded.

Approximately six hours of flying time were used on aerial surveys to determine the distribution and intensity of infestations of the forest tent caterpillar, spruce budworm, large aspen tortrix and other important forest insects and diseases.

Several survey sub-projects were continued in conjunction with general forest insect and disease observations throughout the District as: (1) spruce budworm egg sampling in balsam-fir stands; (2) forest tent caterpillar egg-band sampling on trembling aspen; (3) phenological measurements of white spruce; (4) foliage production, defoliation estimates and water level measurements in tamarack stands; (5) sequential sampling of egg populations and cocoon collections of the larch sawfly for parasite studies; and (6) a survey to determine the distribution of the butt and root rot of conifers caused by Flammula alnicola. Sampling in connection with the first three was intensified in 1961.

The excellent assistance and co-operation received from the Provincial Forest Service, Federal Parks Service and other Government agencies continued throughout the season and is hereby gratefully acknowledged.

## 6.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

Some marked changes were noted in the status of various forest insects and tree diseases. Populations of the larch sawfly showed a general increase, due in part to the prolonged drought which favored improved foliage and shoot growth of tamarack in most stands. The spruce budworm infestation in the Riding Mountain National Park was more widespread and the forest tent caterpillar infestations increased in areas affected in 1960 and several new ones occurred. Infestations of large aspen tortrix which have persisted for several years, terminated with only a trace of defoliation recorded. Adults of the leaf beetles, Chrysomela spp. caused light defoliation of trembling aspen and balsam poplar throughout most of the District, but the numbers of larvae present were low.

A survey to determine the incidence of a root and butt rot caused by Flammula alnicola was carried out in two stands of recently cut-over white spruce with negative results. The leaf blights, Melanconium sp. and Septoria musiva, the twig blight, Napicladium tremulae, and an ink spot, Ciborina bifrons, commonly found on trembling aspen and balsam poplar were not recorded in 1961, probably due to the prolonged dry weather. The heaviest infection of the spruce needle rust on black and white spruce caused by the fungus, Chrysomyxa sp. was noted in Riding Mountain National Park; only a trace being recorded elsewhere in the District.

### 6.3 INSECT CONDITIONS

6.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— Populations of the larch sawfly were generally higher this season. (See Fig. 1). The most noticeable increase in numbers was in the southern part of the District where excellent foliage and shoot growth produced almost ideal conditions for larch sawfly development.

From Minnedosa north to Riding Mountain National Park and west from Onanole through Crawford Park and Horod to Seech, defoliation was light to moderate. Tamarack stands in this area are widely separated and stand composition is mainly black and white spruce interspersed with tamarack.

In Riding Mountain National Park, moderate to severe defoliation occurred from Clear Lake north to Moon Lake, West from Clear Lake to Gunn Lake, and east from Clear Lake along the Norgate Road. At Mile 14 along the Norgate Road severe defoliation was confined to the upper half of the crowns, while the lower portions were only lightly attacked.

Northeast from Dauphin through Ste. Rose, Toutes Aides and Meadow Portage, moderate to severe defoliation was confined to tamarack up to 2 inches d.b.h., while more mature trees were lightly attacked. Defoliation was light in the Winnipegosis-Duck Bay area and west to Cowan, except for a small area of moderate defoliation 12 miles east of Pine River.

From Grandview north to Baldy Mountain, Singoosh, Blue and Wellman lakes, defoliation was light with an occasional tree showing moderate. Along the west boundary of the Duck Mountain Forest Reserve, from Boggy Creek south to Bield, one small stand of tamarack in sec. 7, tp. 29, rge. 27, W.P. mer. was moderately defoliated. Throughout the remainder of the area only light defoliation was encountered. From Cowan north through Swan River, Birch River, Mafeking to the Overflowing River, defoliation was moderate. This same condition persisted in the area from Dawson Bay west to Red Deer Lake.

Mortality of tamarack was evident in a stand 3 miles south of Cowan along No. 10 Highway (sec. 10, tp. 35, rge. 23, W.P. mer.). The stand covers approximately seven acres, of which 65 per cent is dead or dying. Several dead trees were severely infested with bark beetles, Scolytid sp. and of five dying trees examined, only one was very lightly infested with these beetles. Normally this stand is very wet but due to the dry, hot summer, it was exceptionally dry.

Sequential sampling of egg populations of the larch sawfly was carried out in four permanent sample plots. Infestation ratings, based on the utilization of current shoots for oviposition by adult sawflies are shown below:

Location and Plot No.	No. shoots examined	No. curled shoots	Infestation rating 1961
Riding Mountain N. P. 107	290	34	Moderate
Riding Mountain N. P. 108	30	16	Severe
Cowan 111	50	0	Light
Riding Mountain N. P. 114	130	41	Severe

Larch sawfly cocoons were again collected by means of larval drop trays from plots in Riding Mountain National Park and at Cowan for use in parasite studies. Based on the dissection of 200 cocoons, parasitism by Bessa harveyi was moderate, and by Mesoleius tenthredinis, very light.

6.3.2 Large Aspen Tortrix, Choristoneura conflictana (Wlk.): - Infestations in Riding Mountain National Park and the Duck Mountain Forest Reserve, which have persisted for several years, terminated this season. Larval counts ranged from 1 to 6 per collection at sample points throughout the District, and little or no serious defoliation was noted.

6.3.3 Spruce Budworm, Choristoneura fumiferana (Clem.): - Larvae were widely scattered throughout the District and the highest populations were again recorded west of McCreary along Scott Creek and north and east of Clear Lake along No. 10 Highway in Riding Mountain National Park, and to a small area along the west boundary of the Duck Mountain Forest Reserve. The infestation west of McCreary extended north and west to include an additional 2 square miles; thus making a total of 12 square miles of severely defoliated balsam fir and scattered white spruce. The infestation northeast of Clear Lake, bounded on the east by Whirlpool Lake, on the north by Elk Lake and west by No. 10 Highway extended northward for approximately 6 miles. However, defoliation was so light that it could not be detected from the air, but ground checks revealed that the upper crowns of occasional white spruce were lightly defoliated. In the Duck Mountain Forest Reserve near Bield (sec. 19, tp. 26, rge. 26, W.P. mer.), a small (2 acre) stand of white spruce was lightly defoliated. Elsewhere in the District, only an occasional larva was found.

Spruce budworm egg sampling, carried out in the infestation west of McCreary, indicated that it will continue in 1962 at approximately the same level of intensity.

6.3.4 Forest Tent Caterpillar, Malacosoma disstria (Hbn.): - Distribution was general and three new infestations were recorded: (1) in the Duck Mountain Forest Reserve, (2) at Mareking, and (3) along the Steep Rock River off Point Wilkins on Lake Winnipegosis (See Fig. 2).

The infestation in Riding Mountain National Park remained at the light to moderate level but it extended westward to include the eastern half of tp. 23, rge. 23, W.P. mer. to bring the total area affected to 90 square miles. A small patch (1 acre) of light to moderate defoliation was recorded 7 miles northwest of Onanole (sec. 29, tp. 19, rge. 19, W.P. mer.).

In the Duck Mountain Forest Reserve some 250 square miles of trembling aspen were severely defoliated. The infestation extended north from Garland through the NW 1/4 of tp. 31, rge. 23; the west halves of tps. 32 and 33, rge. 23; the east halves of tps. 32 and 33, rge. 24; all of tps. 34 and 35, rges. 24 and 25; and the east half of tp. 34, rge. 26, W.P. mer. Stands in this area are composed mainly of trembling aspen with a few scattered white spruce, black spruce,

balsam poplar and white birch. Between Bellisite and Mafeking in tp. 42, rge. 26, W.P. mer., west of No. 10 Highway an area of some 15 square miles was severely defoliated. A similar infestation covering about 5 square miles occurred inland from Point Wilkins on Dawson Bay.

Egg-band surveys were carried out where appreciable numbers of larvae were found earlier in the season, and the results are shown in Table 1.

TABLE 1

Summary of Forest Tent Caterpillar Egg-Band Sampling  
Western District of Manitoba - 1961

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

Location Sample Pt. No.	Av. d.b.h. (ins.)	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. No. of Egg- bands	Defoliation Forecast for 1962
Mafeking #1	3	26	19	3	Light
" #2	4	35	21	22	Severe
" #3	3	30	20	3	Light
" #4A	3	32	16	9	Severe
" #4B	4	37	27	12	Severe
" #4C	5	43	25	6	Light
" #5	4	31	25	21	Severe
" #6	4	36	22	3	Light
" #7	3	32	24	38	Severe
" #8	3	32	18	12	Severe
" #9	3	25	20	2	Light
" #10	3	29	20	6	Moderate
" #11	2	19	16	.3	Light
Lake Audy #12A	6	36	23	76	Severe
" " #12B	5	43	27	40	Severe
" " #12C	6	38	23	9	Moderate
" " #12D	5	37	23	7	Light
" " #12E	7	40	25	6	Light
" " #13	5	35	22	7	Light
" " #14	6	39	21	3	Light
" " #15	7	40	22	.3	Light
" " #16	4	38	25	.6	Light
Moon Lake #17	4	36	22	.3	Light
Katherine Lake #18	4	37	19	.6	Light
Onanole #19	4	29	15	.3	Light
" #20	3	34	19	.3	Light
Ste. Rose #21	2	20	15	0	Nil
Shergrove #22	4	21	14	0	Nil
" #23	4	38	18	.3	Light

TABLE 1 (cont'd.)

Location Sample Pt. No.	Av. d.b.h. (ins.)	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. No. of Egg- bands	Defoliation Forecast for 1962
Wellman Lake #24	7	51	24	24	Severe
" " #25A	6	44	20	61	Severe
" " #25B	6	43	20	75	Severe
" " #25C	7	46	21	138	Severe
" " #26	4	32	24	30	Severe
" " #27	2	32	19	8	Severe
Clear Lake #28	3	22	16	.3	Light
" " #29	3	29	20	2	Light
" " #30	4	30	19	.3	Light
" " #31	3	28	21	0	Nil
" " #32	4	31	19	.3	Light

6.3.5 Balsam-fir Sawfly, Neodiprion abietis (complex):- Moderate defoliation occurred again in a white spruce shelterbelt 1/2 mile east of Strathclair, but to date there is no indication of tree mortality. A few open growing native white spruce suffered severe defoliation one mile north of Camperville (sec. 18, tp. 35, rge. 19, W.P. mer.), where a population build-up has been evident during the past three years. Elsewhere in the District larvae were taken from most spruce stands examined but defoliation was very light.

6.3.6 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh):- Collections were taken from most of the black and white spruce stands examined. Moderate to severe defoliation was recorded on a few ornamental white spruce at the junction of the Audy Lake Road and No. 10 Highway. Northward to Moon Lake, an occasional native young white spruce was moderately defoliated. A small stand of black spruce reproduction was moderately defoliated 10 miles north of Meadow Portage. Little or no defoliation was recorded on a white spruce shelterbelt at Newdale where it had been severe.

6.3.7 Spiny Elm Caterpillar, Nymphalis antiopa L.:- Populations increased but noticeable defoliation was confined to small patches at widely scattered intervals. In Riding Mountain National Park, collections were taken from willow 8 miles east of Clear Lake (sec. 33, tp. 19, rge. 18, W.P. mer.), and along the Rolling River Road (sec. 14, tp. 19, rge. 17, W.P. mer.), where defoliation was moderate. Balsam poplar was lightly defoliated and at both, larval parasitism ranged up to 90 per cent. Severe defoliation of willow occurred in sec. 34, tp. 19, rge. 23, W.P. mer., and of trembling aspen 8 miles west of Benito.

## 6.3.8 Other Noteworthy Insects:-

Insect	Host(s)	No. of Collections	Remarks
<u>Acleris variana</u> (Black-headed budworm)	wS, bS	16	Common throughout District. Defoliation light.
<u>Acrobasis betulella</u> (Birch tube maker)	waB	3	Common in R.M.N.P. and east of Pine River.
<u>Anoplonyx luteipes</u> (a sawfly)	tL	4	Low populations in all tamarack stands examined in District.
<u>Archips cerasivoranus</u> (Ugly-nest caterpillar)	cCh	3	Light webbing noted in the Benito area; moderate infestation between Audy Lake and White Water Lake; light from No. 10 Highway to Audy Lake; small area of moderate webbing along north shore of Clear Lake.
<u>Archips fervidanus</u> (Oak webworm)	bO	1	Light webbing noted 7 miles west of McCreary.
<u>Argyresthia laricella</u> (Larch shoot moth)	tL	1	Common 4 miles north of Audy Lake in R.M.N.P. - damage light.
<u>Choristoneura pinus</u> (Jack-pine budworm)	jP	1	Collection taken along Rolling Road in R.M.N.P. - no defoliation.
<u>Dioryctria reniculella</u> (Spruce coneworm)	wS	10	Confined to R.M.N.P. area; populations very low.
<u>Epinotia solandriana</u> (a skeletonizer)	tA	3	Very light throughout entire District.
<u>Gonioctena americana</u> (American poplar beetle)	tA	6	2 small areas of moderate defoliation near Garland; light throughout the remainder of the District.
<u>Lithocolletis salicifoliella</u> (Aspen blotch miner)	bPo	1	Rare - one collection on bPo only.

## 6.3.8 Other Noteworthy Insects:- (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Malacosoma lutescens</u> (Prairie tent caterpillar)	cCh	5	A small area of moderate defoliation near Audy Lake, light in remainder of R.M.N.P. Light in the D.M.F.R.
<u>Neodiprion maurus</u> (a pine sawfly)	jP	1	Occurred 12 miles E. of Pine River - very light.
<u>Neodiprion nanulus nanulus</u> (Red-pine sawfly)	jP	3	Very light populations in R.M.N.P.
<u>Neuroterus</u> sp. (a gall wasp)	bO	1	Moderate infestation 7 miles west of McCreary, covering fairly large area.
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	1	Very light infestation in R.M.N.P.
<u>Phenacaspis pinifoliae</u> (Pine needle scale)	wS	2	Very common on ornamental wS in the townsite of Wasagamung. Scattered throughout the remainder of R.M.N.P.
<u>Physokermes piceae</u> (Spruce bud scale)	wS	6	Light infestation in the R.M.N.P. and D.M.F.R. areas.
<u>Pissodes strobi</u> (White-pine weevil)	wS, bS	4	2% of white spruce stand infested 3 miles East of Clear Lake; 10% of black spruce infested along the Rolling River Rd.; 5% of leaders of white spruce infested 8 miles NW of Audy Lake.
<u>Semiothisa sexmaculata</u> (a geometer)	tL	6	Common in all tamarack stands examined, defoliation light.
<u>Tetralopha asperatella</u> (a webworm)	tA	1	Very light 12 mi. E. of Pine River.

#### 6.4 TREE DISEASE CONDITIONS

6.4.1 Root and Butt Decay of Conifers, Flammula alnicola:- A special survey of two recently cut-over areas of white spruce was made in June to determine the incidence of this root and butt decay of conifers. Twenty-five stumps were examined at each location with negative results.

6.4.2 A Rust on Jack Pine, Coleosporium asterum:- Two widely separated occurrences of this rust were recorded on jack pine; one along the Rolling River Road in Riding Mountain National Park and the other 1/2 mile north of Cowan. The infection was light at both locations.

6.4.3 The Slash Fungus, Radulum casearium:- One collection of R. casearium was taken from dead trembling aspen west of McCreary, sec. 4, tp. 21, rge. 16, W.P. mer. in Riding Mountain National Park. The collection was of interest because the disease had not been collected at this location before.

6.4.4 Spruce Needle Rust, Chrysomyxa sp.: - The intensity of needle rust on spruce has declined during the past two years. It was common along the Norgate Road in Riding Mountain National Park in 1960, but only a trace was recorded this season. Light infections of this rust were also recorded 2 miles north of Audy Lake, and north of Meadow Portage along the Waterhen River.

6.4.5 A Die-back of Balsam Fir:- There has been an increase in mortality of balsam fir during the past four or five years in Riding Mountain National Park. The cause has not been determined, therefore it will be referred to as "a die-back of balsam fir".

The following symptoms appear progressively throughout the crowns of the affected trees: (1) the foliage of one or more branches in the crown turns red and the branch dies, (2) the foliage over a portion of the crown turns red and these branches die, (3) the foliage in the entire crown turns red and the tree dies. Whether the first symptoms will eventually spread throughout the entire crown and cause mortality of the tree is not known. In all cases the dead or red needles remain on the branch for a number of years. Examinations of the root systems of dead trees has indicated a light infection by Armillaria mellea but no other symptoms.

Areas where this condition has been recorded in Riding Mountain National Park are: in the townsite of Wasagaming; 5 miles west of McCreary in the Park (which covers a fairly large area); and north of Wasagaming along No. 10 Highway. No definite age group, height class or density of the stand is involved and the number of dead trees range from a single tree in a large area to three or four in small areas.

6.4.6 Red Ring Rot, Fomes Pini:- This decay is common in windthrown spruce throughout Riding Mountain National Park.



7. ANNUAL DISTRICT REPORT

NORTHERN DISTRICT OF MANITOBA

1961

by

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CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

## 7.1 INTRODUCTION

Field surveys of forest insects and diseases in the Northern District of Manitoba were conducted from May 13 to October 6. In addition to general surveys, special collections of insect material were made for parasite and disease studies at the Winnipeg and other laboratories; special studies relating to the effect of spruce budworm defoliation on white spruce stands in the Namew Lake area were continued; and special tree disease surveys for the occurrence and distribution of Polyporus tomentosus and Flammula alnicola were continued in white and black spruce stands.

Aerial surveys required 24 hours of flying time and surveys by boat involved approximately 75 miles. Totals of three hundred and fifty-five insect and twenty-three tree disease collections were made.

The assistance and co-operation received from the Manitoba Forest Service and private co-operators during the season is gratefully acknowledged.

## 7.2 REVIEW OF INSECTS AND TREE DISEASES

The Namew Lake infestation of the spruce budworm continued, and the current growth of spruce and balsam fir was, in most cases, killed in the early bud stage. This condition was attributed in part to the hot and dry weather prevailing during the early part of the season that accelerated larval development. A marked increase in the abundance and distribution of the forest tent caterpillar occurred in many parts of the District. The distribution of the larch sawfly remained unchanged, but the balsam-fir sawfly continued to increase in distribution and intensity. Several species of Neodiprion sawflies were common on jack pine throughout the District, and a complex of insect species caused light to moderate defoliation of club-topped black spruce in one area.

There was no change in the status of the more common tree diseases throughout the District. Special surveys were conducted to determine the incidence of the root and butt rots, Polyporus tomentosus and Flammula alnicola in white and black spruce stands.

## 7.3 INSECT CONDITIONS

7.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— Aerial and ground surveys indicated some degree of defoliation in most of the tamarack stands examined. (See Fig. 1). The highest larval concentrations occurred in a small stand in the vicinity of Prospector, where complete stripping of foliage occurred for the second consecutive year. Light to moderate defoliation was recorded in scattered tamarack stands from Cranberry Portage to Flin Flon and southwest to Amisk Lake in Northern Saskatchewan. Similar conditions existed between The Pas and the

Overflowing River, where defoliation was most conspicuous near Westray. Defoliation was generally light in tamarack stands north and east from The Pas to Sipwisk, Cross, Setting and Wintering lakes, but it was moderate in occasional small patches. Tamarack stands between Thompson and Lynn and Granville lakes were lightly defoliated. Elsewhere this sawfly was present on most tamarack examined, but it was causing only very light defoliation.

Egg population counts of the larch sawfly were continued in four permanent sampling plots and the results, based on the number of current shoots utilized for oviposition by adult sawflies, are shown below.

Plot No.	Place	Infestation ratings - 1961	
		Total shoot Examined	No. of Curled Shoots
101	The Pas	60	1
102	Cranberry Portage	110	19
103	Amisk Lake, Sask.	90	4
104	The Bog	60	1

Mass collections of cocoons were taken by the larval drop-tray method in permanent plots near The Pas and Cranberry Portage. Based on the dissection of three hundred and thirty-six larch sawfly cocoons in the Laboratory, parasitism by Bessa harveyi was moderate, and by Mesoleius tenthredinis and Tritneptis klugii, very light.

7.3.2 Spruce Budworm, Choristoneura fumiferana (Clem.):— There was little change in the abundance and distribution of the spruce budworm in 1961. The large infestation in the Namew Lake area along the Manitoba-Saskatchewan border showed further extensions in the vicinity of Embury, Simonhouse and Rocky lakes (See Fig. 6). Much of the current growth of white spruce and balsam fir in the area was killed during early bud development. Hot and dry weather during the early part of the season may have been responsible for the somewhat accelerated larval development. Defoliation of current growth ranged from 90 to 100 per cent throughout most of the infested area. Low populations were evident in spruce and balsam-fir stands at Snow, Cross, Setting and Wintering lakes, and a trace of feeding occurred on white spruce between Wekusko and Snow Lake. In the northern section of the Western District of Manitoba, aerial observations of spruce and balsam-fir stands along the north shore of Dawson Bay indicated that the spruce budworm may be present at infestation levels. Reddening of spruce and balsam fir tops was conspicuous at Denbeigh Point, but no ground checks were made to confirm the aerial observations. An occasional larvae was also taken from white spruce in the Porcupine Forest Reserve, west of Mareking.

Egg-mass surveys were intensified and sampling was carried out at twenty-six points throughout the Namew Lake infestation area in stands showing varying degrees of defoliation. The results indicate that the infestation will probably continue at approximately the same level of intensity. However, the latter could be lower if hot weather after oviposition had any adverse effect on the eggs and resultant larvae.

One acre strip-cruises were carried out in two areas to assess the mortality of white spruce and balsam fir after nine years of moderate to severe defoliation. All living and dead trees were recorded and the results are shown in Table 1.

TABLE 1

Mortality of Balsam Fir and White Spruce at Two Locations  
in the Namew Lake Infestation Area - 1961

(based on 1 acre tallies)

Location	No. of years Moderate to Se- vere Defoliation	Tree species and d.b.h. (ins.)	No. of trees Living	Dead	Basal area sq. ft.	Percentage of basal area dead
Sturgeon Wier, Sask. 7-036-329	9	WS up to 3"	44	312	12.239	86
		WS over 3"	245	106	88.293	13
		bF up to 3"	2	4	.196	72
		bF over 3"	2	7	2.292	51
Chocolate Lake, Man. 7-036-329	9	WS up to 3"	118	62	6.234	30
		WS over 3"	195	28	44.987	7
		bF up to 3"	67	13	1.798	18
		bF over 3"	12	8	4.080	22

7.3.3 Forest Tent Caterpillar, Malacosoma disstria Hbn.: - Current infestations caused moderate to severe defoliation in extensive stands of trembling aspen in many parts of the District. The most severe infestations occurred in the vicinity of Amisk and Archibald lakes in Saskatchewan and Leaf, Simonhouse, Reed, Cormorant, Cross, Moose and Atikameg lakes in Northern Manitoba (See Fig. 2). Trembling aspen stands in the immediate vicinity of Wanless also suffered severe defoliation. Refoliation of trembling aspen foliage after complete stripping was generally absent in most of the severe infestation areas.

Egg-band surveys were conducted in most of the infested areas to forecast population trends and defoliation in 1962. The results are shown in Table 2.

TABLE 2

Results of Forest Tent Caterpillar Egg-Band Sampling - 1961  
Northern District of Manitoba

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

Sample Point No.	Location by grid	Summary of Egg-band Counts				Defoliation Forecast 1962
		Av. d.b.h. of trees (ins.)	Av. Ht. of trees (ft.)	Av. Crown depth (ft.)	Av. No. of egg bands per tree	
BAKERS NARROWS						
NM-6	7-038-336	6.3	37	15	5	light
THE PAS						
NM-7	7-041-321	3.6	23	19	38	severe
NM-8	7-041-321	2.6	23	15	31	severe
NM-9	7-041-321	4.3	30	19	54	severe
NM-10	7-041-321	3.1	26	18	56	severe
NM-11	7-041-319	3.6	26	19	7	moderate
NM-12	7-039-319	1.3	24	20	10	severe
NM-13	7-040-322	3.0	18	14	5	moderate
NM-14	7-042-323	4.3	29	22	74	severe
ATIKAMEG LAKE						
NM-15	7-043-324	3.6	29	16	88	severe
NM-16	7-043-324	2.6	23	16	43	severe
NM-17	7-043-324	4.3	23	15	40	severe
NM-18	7-043-324	2.3	20	15	7	severe
NM-19	7-042-324	2.6	24	17	5	moderate
ROOT LAKE						
NM-20	7-040-326	4.0	28	20	11	severe
WANLESS						
NM-21	7-040-327	4.3	32	17	36	severe
NM-22	7-040-327	3.0	24	17	37	severe
NM-23	7-040-327	3.0	28	21	24	severe
NM-24	7-040-327	3.0	26	21	2	light
NM-25	7-040-328	4.6	35	18	4	light
NM-26	7-040-330	3.6	35	19	6	moderate

TABLE 2 (cont'd.)

Sample Point No.	Location by grid	Summary of Egg-band Counts				Defoliation Forecast 1962
		Av. d.b.h. of trees (ins.)	Av. Ht. of trees (ft.)	Av. Crown depth (ft.)	Av. No. of egg bands per tree	
REED LAKE						
NM-27	7-049-334	4.0	28	15	43	severe
NM-28	7-049-334	5.0	38	17	53	severe
NM-29	7-049-334	4.0	40	21	30	severe
NM-30	7-049-334	4.3	32	16	13	severe
NM-31	7-049-334	4.0	36	13	8	moderate
CRANBERRY PORTAGE						
NM-32	7-040-334	4.0	28	18	6	moderate

7.3.4 Balsam-fir Sawfly, Neodiprion abietis (Harr.):— Several small (under 100 acres) but severe infestations in spruce and balsam stands along the shores and islands of Cross, Setting and Wintering lakes continued with some extension of boundaries, (See Fig. 7), but there was no indication of tree mortality. Along the Nelson River south of Cross Lake, light to moderate defoliation occurred in small patches of balsam fir and spruce, and increased numbers of larvae were evident in young balsam-fir stands along the south shore of Atikameg Lake. Elsewhere in the District only an occasional larva was taken. Mass collections of cocoons were made to determine the incidence of parasitism and disease but the results are not yet available.

7.3.5 Neodiprion Sawflies on Jack Pine:— Several species were taken from jack pine and except for moderate to severe defoliation of individual young jack pine at Rocky Lake, defoliation was light and usually confined to one or two branches per tree. The most common species were Neodiprion maurus and Neodiprion virginiana.

7.3.6 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— This sawfly caused moderate to severe defoliation to individual open growing young white spruce in the vicinity of Orok. It was also commonly associated with a complex of insect species causing light to moderate defoliation to black spruce tops between The Pas and Root Lake. Elsewhere, populations on white and black spruce were very low.

7.3.7 A Root Weevil, Hylobius sp.:— Surveys of this root insect were continued in two white spruce stands in conjunction with a survey of a white pocket rot, Polyporus tomentosus. At each study area, the root systems of five living and five dead white spruce trees were appraised and the data are recorded in Table 3.

TABLE 3

Summary of Hylobius sp. Damage

Location	Av. d.b.h. (ins.)		Av. ht. (ft.)		Av. damage index		Percentage of roots diseased on trees		Percentage of diseased roots with insect damage	
	Living dead		Living dead		Living dead		Living	dead	Living	dead
Setting Lake	7	6	45	39	0	1.9	0	100	0	17
Bucking- ham Lake	7	6	45	44	1.2	0	29	21	12	0

7.3.8 Insects Attacking Black Spruce Tops:- A complex of insects, causing varying degrees of defoliation, was present in most of the black spruce tops examined. Although generally light, the most conspicuous defoliation occurred between The Pas and Root Lake and in an occasional top along the Snow Lake road. The insect species most commonly collected, in order of relative abundance, were: Herculia thymetusalis, Dioryctria abietivorella, Pikonema alaskensis, and Archippus albertus.

7.3.9 Bark Beetles Attacking Dead Tamarack:- Scolytid sp. Several collections of these beetles were taken from dead and dying tamarack at various locations throughout the District but were most abundant north of Root Lake and in the immediate vicinity of Cranberry Portage.

#### 7.3.10 Other Noteworthy Insects:-

Insect	Host(s)	Locality	Remarks
<u>Acrobasis betulella</u> (Birch tube maker)	wB	The Pas-Flin Flon	Present on most birch examined; light defoliation.
<u>Arge pectoralis</u> (Birch sawfly)	wB	The Pas, Highrock, Paint and Rocky Lake	Light defoliation, usually confined to one or two branches.
<u>Agrilus anxius</u> (Bronze birch borer)	wB	The Pas-Cranberry Portage-Snow Lake	Present on most birch with dead or dying tops.
<u>Dioryctria abietella</u> (Spruce needle worm)	jP	Atikameg Lake	Occurred in small stand of young jack pine; light damage to current shoot growth.

## 7.3.10 Other Noteworthy Insects:- (cont'd.)

Insect	Host(s)	Locality	Remarks
<u>Dioryctria reniculella</u> (Spruce coneworm)	wS bF	Nome Lake, Bakers Narrows, Amisk Lake	Commonly found associated with the spruce budworm.
<u>Choristoneura pinus</u> (Jack-pine budworm)	jP	The Pas	Occurred in small numbers on jack pine; no noticeable defoliation.
<u>Hemichroa crocea</u> (Striped alder sawfly)	aL	Gauer Lake	Caused light-moderate de- foliating to alder along the south shore of the lake.
<u>Hyphantria cunea</u> (Fall webworm)	aL, wB	Pasquia and Carrot River Road areas	Nests common in these areas; defoliation con- fined to a few branches on affected trees.
<u>Semiothisa granitata</u> (a geometer)	SW, bF bS, IT	Entire District	Common but no noticeable defoliation.

7.4 TREE DISEASE CONDITIONS

7.4.1 White Pocket Rot, Polyporus tomentosus:- Special surveys for the occurrence and distribution of this rot were confined to the northern clay belt in the vicinity of Setting and Buckingham Lakes. The root systems of five dead white spruce were examined at each point and although it was present at both locations, the level of infection was very low.

7.4.2 Root and Butt Decay of Conifers, Flammula alnicola:- Special surveys were continued in white spruce stands in the Porcupine Mountain Forest Reserve, at Bakers Narrows, and at Simonhouse Lake that were cut during the winter of 1960-61.

Twenty-five stumps were examined at each location but the disease was not found.

7.4.3 Tree Disease Surveys in Thompson Smoke-Easement Area:- Several SO<sub>2</sub> (sulphur dioxide) study plots, established by the International Nickel Company throughout the smoke-easement area in 1960 were again visited to determine whether injury had occurred during the first smelter operations. No discoloration of the foliage or other damage that could be attributed to SO<sub>2</sub> was found, but the disease organisms listed below occurred in the vicinity of the study plots.



Disease organism	Plot where occurred	Tree sp. affected	Remarks
<u>Peridermium coloradense</u>	12, 8, 18, 19	bS	Common on bS. Most abundant at plots 12 and 19.
Spherical rust galls	12, 18, 19, 8	JP	Occasional dead branch on JP.
<u>Macrophoma</u> sp.	12, 19	bF	Infection generally light.

Note: A needle rust Chrysomyxa sp. which commonly occurred on white and black spruce in 1960, was absent in 1961.

7.4.4 Slash Fungus, Radulum casearium: - Two specimens were taken from windthrown trembling aspen in the vicinity of Wanless and fifteen miles south of Flin Flon. In each instance only one tree was affected.

7.4.5 Mistletoe on Jack Pine, Arceuthobium americanum: - There was no evidence of new occurrence of this mistletoe in jack pine. As in previous years, special attention was paid to jack pine stands in remote areas covered during aerial surveys.

7.4.6 Dwarf Mistletoe on Black Spruce, Arceuthobium pusillum: - No new occurrences of this mistletoe were recorded. As a note of interest, there was unusually long current shoot growth on mistletoe brooms examined between The Bog and Westray; this growth condition was not observed in other infected stands.

#### 7.4.7 Other Noteworthy Diseases: -

Host	Organism	Locality	Remarks
Jack pine and White spruce	<u>Armillaria mellea</u>	Throughout the District	Common on windthrown wS and JP
Trembling Aspen	<u>Hypoxyton pruinaum</u>	Generally distributed throughout the District	Damage confined to occasional tree in most stands examined.
White spruce	<u>Coniophora puteana</u>	Amisk Lake. One location only	One specimen from wind-fallen W. spruce. Causes root and butt rot.
Trembling Aspen	<u>Fomes ignarius</u>	Throughout District	Common on Aspen

8. ANNUAL DISTRICT REPORT

HUDSON BAY DISTRICT OF SASKATCHEWAN

1961

by

R. W. Hancox

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

## 8.1 INTRODUCTION

Surveys were carried out to determine the status and distribution of forest insects and tree diseases in the Hudson Bay District of Saskatchewan from May 10 to early November in 1961.

The Saskatchewan Department of Natural Resources provided approximately two hours of flying time for mapping forest tent caterpillar infestations on the east slopes of the Pasquia Hills. Approximately six hours of chartered flying time were utilized for defoliation surveys in the Porcupine Provincial Forest and the Pasquia Hills.

A total of 421 insect samples and 25 tree disease samples were submitted to the Winnipeg and Saskatoon laboratories, respectively. Special Survey sub-projects included: (1) distribution of larval drop trays in two permanent tamarack plots for larch sawfly parasite studies; (2) sequential sampling of larch sawfly eggs for population estimates; (3) forest tent caterpillar egg-band surveys; (4) collections of aphids for G. Bradley of the Winnipeg Laboratory; (5) phenological measurements of white spruce; and (6) a distribution survey of the butt rot, Flammula alnicola.

Several weeks were spent on spruce budworm egg-mass and forest tent caterpillar egg-band surveys in the Northern and Western districts of Manitoba.

The assistance and co-operation received from personnel of the Saskatchewan Department of Natural Resources is gratefully acknowledged.

## 8.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

A number of insect species completed their development earlier than usual this season as a result of hot, and very dry, weather that persisted from May through August. The most noteworthy changes in the status of forest insects in the Hudson Bay District in 1961 were: (1) an increase in forest tent caterpillar populations along the east slopes of the Pasquia Hills near the Otosquen River; (2) a further decline of the large aspen tortrix infestation in the Porcupine Provincial Forest south of Reserve; (3) an increase in yellow-headed spruce sawfly populations in shelterbelts in the west-central portion of the District; (4) a slight increase in the number of spruce budworms east of Hudson Bay in the vicinity of the Roscoe River; (5) an increase in Neodiprion sawfly populations on jack pine along the Armit Road and in the vicinity of the Whitefox fire tower; (6) an increase in spiny elm caterpillar populations in the Pasquia Hills; and (7) an increase in birch sawfly populations throughout the Porcupine Provincial Forest, and north of the 13 mile fire tower in the Pasquia Hills where moderate defoliation occurred on alder.

Further survey of the spruce budworm infestation along the Birch River was not possible this season. The extreme forest fire situation would not allow the release of the helicopter usually provided by the Saskatchewan Department of Natural Resources.

The root and butt decay, Flammula alnicola was detected in only one of 25 white spruce stumps examined east of McBride Lake in the Porcupine Provincial Forest. Spruce needle rust, Chrysomyxa sp. was very light throughout the District. Rabbits caused extensive damage during the winter of 1960-61 to trembling aspen, jack pine and tamarack reproduction at widely scattered points.

### 8.3 INSECT CONDITIONS

8.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— No noteworthy changes in the status of this sawfly were detected, and populations were generally light throughout.

East from Hudson Bay to the Manitoba boundary and south through the Porcupine Provincial Forest, defoliation ranged from a trace to light on mature trees, with pockets of light to moderate on immature trees near Saginas Lake. Along the south and east slopes of the Pasquia Hills, defoliation was light on mature trees and moderate on occasional open-growing trees.

A trace of defoliation was recorded at Madge Lake in the Duck Mountain Provincial Park and in the Greenwater Lake Provincial Park and adjacent area.

Shoot production and needle growth were good in young tamarack stands and poor in mature stands. Sequential sampling \* of the larch sawfly was continued in two permanent plots with the following results:

Plot No.	Place	Infestation Rating		1961
		No. of shoots Examined	No. of shoots Curled	
101	Armit Rd.	50	0	light
102	Peepaw Lake	50	0	light

Parasite and disease studies were continued in two other permanent plots and for this, twenty larval drop trays were set out in each during July. After larval drop was complete the moss was collected from the trays and forwarded to the Winnipeg Laboratory. During the winter, the cocoons were removed from

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\*IVES W.G.H. and PRENTICE R.M. 1958. Sequential sampling technique for surveys of the larch sawfly. Can. Ent. 90: 331-338.

the trays and forwarded to the Winnipeg Laboratory. During the winter, the cocoons were removed from the moss and dissected. Results of the dissections indicated that three main parasites of the larch sawfly were present. The Tachinid, Bessa harveyi (Tsnd.) was the most prevalent and caused 50 and 53 per cent parasitism in the two areas examined. Effective parasitism by the Ichneumonid, Mesoleius tenthredinis Morley was negligible, being absent in one plot and less than one per cent in the other. The Chalcid, Tritneptis klugii (Ratz.) was more abundant than in former years and caused about 4 per cent parasitism in both plots.

8.3.2 Forest Tent Caterpillar, Malacosoma disstria, Hbn.:— Populations of this caterpillar increased in most trembling aspen stands throughout the District in 1961. Larval collections were made from Canora west to Wadena and Foam Lake, from Greenwater Provincial Park west to Archerwill, north to Tisdale and Carrot River and east to Prairie River, from the Madge Lake-Kamsack area north to Swan Plains, from Hudson Bay east to Erwood and Smoky Ridge, and along the east slopes of the Pasquia Hills in the vicinity of the Otosquen and Waskwei rivers. An occasional larva was also taken along the Flin Flon Highway north of the Saskatchewan River.

Light defoliation was recorded at all points except Madge Lake and along the east slopes of the Pasquia Hills. At Madge Lake, occasional small patches of moderate defoliation occurred in a mature stand on the south shore. Severe defoliation occurred within a 6 X 9 mile area south of the Otosquen River, and within a 1 X 2 1/2 mile area along the Waskwei River west of The Pas Highway.

Egg-band surveys were conducted near the Otosquen River, at Madge Lake, Bjorkdale, Buchanan, Wadena and Foam Lake. The results are shown in Table 3 and they indicate that defoliation will be severe at the Otosquen River and light at all other points in 1962.

TABLE 3

Summary of Forest Tent Caterpillar Egg Band Sampling - 1961  
Hudson Bay District of Saskatchewan  
(based on the examination of 3 co-dominant trembling aspen at each sample point)

Location and Area No.	Av. d.b.h. (ins.)	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. No. of Egg Bands per tree	Defoliation Forecast for 1962
Otosquen 1-A	5"	36'	22'	108	Severe
Otosquen 1-B	4.6"	38'	20'	32	Severe
Otosquen 1-C	4"	34'	21'	46	Severe
Otosquen 1-D	3.3"	33'	18'	76	Severe

TABLE 3 (cont'd.)

Location and Area No.	Av. d.b.h. (ins.)	Av. Ht. (ft.)	Av. Crown Depth (ft.)	Av. No. of Egg Bands per tree	Defoliation Forecast for 1962
Otosquen 2	3.6"	28'	19'	20	Severe
Otosquen 3	5"	45'	21'	6.3	Light
Otosquen 4	3.6"	32'	24'	0	Nil
Otosquen 5	7"	39'	19'	4.3	Light
Otosquen 6	3"	31'	25'	.6	Light
Bjorkdale 7	3.3"	28'	21'	1.6	Light
Buchanan 8	3.6"	25'	16'	1.0	Light
Buchanan 9	3"	25'	17'	2.3	Light
Wadena 10	3.3"	27'	13'	.3	Light
Wadena 11	3.6"	26'	14'	0	Nil
Foam Lake 12	3.6"	24'	19'	0	Nil
Foam Lake 13	2.6"	25'	21'	0	Nil
Buchanan 14	2.3"	21'	17'	0	Nil
Buchanan 15	3.6"	25'	20'	1	Light
Madge Lake 16	5.6"	46'	20'	2.3	Light
Madge Lake 17	3.3"	28'	22'	1.6	Light
Madge Lake 18	4"	35'	21'	.6	Light

8.3.3 Spruce budworm, Choristoneura fumiferana (Clem.):— There was a slight increase in the activity of this insect in white spruce and balsam fir stands east of Hudson Bay in the vicinity of the Roscoe River. Larval collections were also made on the east slopes of the Pasquia Hills at the Waskewei River, near Dagg Creek in the Porcupine Provincial Forest, and on a white spruce shelterbelt near Norquay. However, defoliation was very light and populations remained generally low.

The infestation along the Birch River in tp. 54, ranges 4 and 5, W 2nd mer., which covered some 16 square miles in 1960, could not be surveyed in 1961 because of a curtailment in air travel due to the extreme forest fire situation.

8.3.4 Large Aspen Tortrix, Choristoneura conflictana (Wlk.):— A further decline in populations of this insect was noted and the resultant defoliation of trembling aspen was negligible. Very light populations were recorded south of Reserve in the Porcupine Provincial Forest. A single larva was collected at each of the following collection points: Veillardville, Carrot River, Hazel Dell, Lintlaw, Rama, Wadena, Foam Lake, and Ituna. Two larvae were taken near Caragana.

8.3.5 Balsam-fir Sawfly, Neodiprion abietis (Harr.):— Populations of this sawfly increased in native stands of white spruce and balsam fir at widely scattered points but were negligible in spruce shelterbelts throughout the District. Larvae were collected at Bertwell, Dagg Creek, Roscoe River, Chelan, Mistatim and at Madge Lake, but in general, populations were low and defoliation was very light.

8.3.6 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— A notable increase in populations was noted on white spruce shelterbelts throughout the west-central portion of the District. Moderate defoliation occurred mainly on mature white spruce from Archerwill to Tisdale, east to Peesane, and south to Ketchen. Moderate defoliation also occurred on immature white spruce shelterbelts at Ruby Lake, and near Reserve and Peesane.

Larvae were commonly found throughout the remainder of the District in both shelterbelt and native spruce stands, but defoliation was light. Light populations of the green-headed spruce sawfly, Pikonema dimmockii (Cress.) were also noted in conjunction with the yellow-headed spruce sawfly at most collection points.

8.3.7 Sawflies on Jack Pine, Neodiprion sp.:— A slight general increase in this Neodiprion complex was noted. Most pronounced were increased populations of Neodiprion nanulus nanulus along the Flin Flon Highway near the Whitefox fire tower, and south and east of Hudson Bay. In all instances defoliation remained very light.

8.3.8 Leaf Beetles on Poplars:— Nine species were collected from various poplars at scattered points throughout the District in 1961. In order of abundance these were: the American Aspen Beetle, Gonioctena americana; the Aspen Leaf Beetle, Chrysomela crotchii; Orsodacne atra; Chrysomela knabi; Chalcoides sp.; Phratora americana canadensis; Altica populi; the Western Grape Rootworm, Adoxus obscurus; and Calligrapha elegans. In general, they caused light defoliation of various poplars throughout the agricultural areas, and from McBride Lake to Reserve in the Porcupine Provincial Forest but the first two were the most important. Defoliation of trembling aspen by Gonioctena americana was light in the Porcupine Provincial Forest, at Peepaw and Parr Hill Lakes, from Usherville to Reserve, and in the Northern Provincial Forest near the Otosquen and Greenbush rivers, and severe in a small pocket of reproduction near the Whitefox fire tower on the Flin Flon Highway. In association with Chrysomela crotchii, it caused light to moderate defoliation along the Armit Road between Peepaw and Parr Hill Lakes in the Porcupine Provincial Forest, in the Greenwater Lake Provincial Park and near Wallwort. Both of these species in association with Phratora americana canadensis caused moderate defoliation of trembling aspen reproduction near Madge Lake in the Duck Mountain Provincial Park.

8.3.9 The Gray Willow Leaf Beetle, Galerucella decora (Say.):— Populations of this beetle increased slightly and collections were made at widely separated points. Light populations occurred throughout the agricultural areas, near Veillardville and Chemong, at Mountain Cabin in the Northern Provincial Forest, from Parr Hill Lake to McBride Lake in the Porcupine Provincial Forest, and in Greenwater Lake Provincial Park. Occasional willow clumps south-west of Clemenceau and at McBride Lake showed light to moderate skeletonization.

8.3.10 Leaf Rollers on Trembling Aspen:- Defoliation by leaf rollers was light to moderate in aspen groves throughout the agricultural area and very light in the Northern Provincial Forest, in the Porcupine Provincial Forest and along the Armit road. The following species were common: an undetermined Tortricid, Pseudexentera improba, oregonana, Pandemis canadana, Acleris sp. and Epinotia solandriana.

8.3.11 The White-pine Weevil, Pissodes strobi, Peck:- Light damage to the leaders of black and white spruce was noted at widely scattered points in stands of black spruce reproduction near Akosane and the Barrier River.

White spruce reproduction was examined near Bertwell where 5 per cent of the leaders were attacked and near Parr Hill Lake where 20 per cent were attacked. Very light leader damage to white spruce occurred along the Armit road south of Roscoe.

8.3.12 The Birch Sawfly, Arge pectoralis (Leach.): - There was an increase in the incidence of this insect in the Hudson Bay District in 1961. Moderate defoliation occurred on alder north of the 13 mile fire tower in the Pasquia Hills. Light defoliation was recorded near Saginas Lake and north of Usherville in the Porcupine Provincial Forest. Populations, however, remained at a very low level. A very light population was recorded on white birch at Madge Lake.

A sawfly, Arge clavicornis was noted feeding in conjunction with Arge pectoralis north of Usherville and near Saginas Lake. Light defoliation of alder by A. clavicornis also occurred near Swan Plains.

8.3.13 The Spiny Elm Caterpillar, Nymphalis antiopa, (L):- Occasional clumps of willow were severely defoliated by this caterpillar for a distance of about five miles along the Fir River road north of the 13 mile fire tower. The occasional small balsam poplar was also lightly defoliated over the same area as above. Elsewhere in the District, the spiny elm caterpillar was not found.

8.3.14 The Prairie Tent Caterpillar, Malacosoma lutescens, (N. & D.): - M. lutescens was taken at two collection points in the Hudson Bay District. A small patch of severe defoliation was recorded on chokecherry reproduction near Buchanan. Moderate to severe defoliation occurred on chokecherry reproduction over a small area west of the Whitefox fire tower on the Flin Flon Highway.



## 8.3.15 Other Noteworthy Insects:-

Insect Species	Host(s)	No. of Collections	Remarks
<u>Acantholyda</u> sp. (a false webworm)	jP, wS	4	Light populations at widely separated points
<u>Acleris variana</u> (Black-headed budworm)	wS, bF	5	Very light populations at widely scattered points
<u>Anoplonyx luteipes</u> (a sawfly)	tL	26	Common in all tamarack stands in the District
Aphid sp.	tA, tL, wS, W, jP, bPo, waB	16	Common throughout the District
<u>Archips cerasivoranus</u> (Ugly-nest caterpillar)	cCH	2	Notable decrease throughout the District
<u>Bucculatrix canadensisella</u> (Birch skeletonizer)	wB, saB	3	Light skeletonization of white birch foliage at Madge Lake and on white and swamp birch at Dagg Creek
<u>Campaea perlata</u> (a geometer)	tA	12	Light on aspen in agricultural areas
<u>Chermes cooleyi</u> (Cooley spruce gall aphid)	wS	2	Light on shelterbelts south of Hudson Bay and near Sturgis
<u>Chermes lariciatus</u> (a gall aphid)	wS, bS	6	Light at widely separated points in the District
<u>Choristoneura pinus</u> (Jack-pine budworm)	jP	2	Light populations near Whitefox fire tower, very light along Armit Road
<u>Corythucha</u> sp. (a lace bug)	Hazelnut, tA, W	8	Light to moderate skeletonization of willow foliage along the Armit Road and in Porcupine Provincial Forest
<u>Dioryctria abietivorella</u> (a coneworm)	jP	2	Light in jack pine stands along the Flin Flon Highway

## 8.3.15 Other Noteworthy Insects:- (cont'd)

Insect Species	Host(s)	No. of Collections	Remarks
<u>Dioryctria reniculella</u> (Spruce coneworm)	jP	1	Very light near Parr Hill Lake
<u>Fenusa dohrnii</u> (European alder leaf-miner)	Alder	17	Light to moderate attack on most alder examined
<u>Itame loricaria</u> (a spanworm)	tA, W	50	Common on trembling aspen throughout the District
<u>Mordwilkoja vagabunda</u> (Poplar vagabond aphid)	tA	4	Common on aspen in agricultural areas
<u>Orthosia hibisci</u> (a fruitworm)	tA, wS	13	Light in most t. aspen stands
<u>Pemphigus populitransversus</u> (Poplar twig gall aphid)	tA, bPo	8	Light populations in Porcupine Provincial Forest
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	4	Light attack in most jack pine stands
<u>Phenacaspis pinifoliae</u> (Pine needle scale)	jP	1	Very light on jack pine near Whitefox fire tower
<u>Phyllocnistis</u> sp. (a leaf miner)	tA	3	Light near Parr Hill, Dagg Creek, and Madge Lake
<u>Physokermes piceae</u> (Spruce bud scale)	wS, bS	17	Light attack on spruce throughout forested area
<u>Proteoteras willingana</u> (Boxelder twig borer)	mM	1	Light populations south of Hudson Bay
Scolytid sp. (a bark beetle)	jP, wS, bF, tL	8	Collections made along Armit Road, at Brainbridge, Greenwater Lake and Greenbush River
<u>Semiothisa sexmaculata</u> (a geometer)	tL	23	Light populations in most tamarack stands
<u>Tetralopha asperatella</u> (a webworm)	tA, bPo, W	11	Light populations on aspen groves throughout agricultural areas
<u>Toumeyella numismaticum</u> (Pine tortoise scale)	jP	2	Light in jack pine stands along Armit Road

#### 8.4 TREE DISEASE CONDITIONS

8.4.1 Root and Butt Decay of Conifers, Flammula alnicola:- A special survey of this disease was carried out east of McBride Lake in the Porcupine Provincial Forest (Grid 7-029-298) in an area of some four acres that had been clear-cut during the winter of 1960-61. Twenty-five white spruce stumps averaging 18" in diameter were examined, and although heart-rot was present in seven of them, only one was infested with F. alnicola.

8.4.2 Spruce Needle Rust, Chrysomyxa sp.: - A light infection was recorded on white spruce in the Porcupine Provincial Forest north of Usherville where one of six trees examined was infected. In the Northern Provincial Forest, infection was light, occurring only on the odd needle.

8.4.3 Rust on Jack pine, Coleosporium asterum:- This rust caused light damage to jack pine foliage near Parr Hill Lake in the Porcupine Provincial Forest, along the Armit Road and north and east of Whitefox. Infection of alternate hosts was not found.

8.4.4 Apiosporina collinsii (causing witches' broom on Saskatoon service berry):- Infection was severe on occasional trees in Greenwater Provincial Park, moderate at one point west of Bertwell, and light west of the Greenbush River in the Northern Provincial Forest. It was noted that the trees most severely attacked were usually growing in shaded situations.

8.4.5 Spruce Mistletoe, Arceuthobium pusillum:- No change was noted in the areas infected. Pockets of light infection remain in black spruce north of the Waskwei River on the east slope of the Pasquia Hills (tp. 51, rge. 1, W 2nd mer.), and in white spruce near the Roscoe River on the Armit Road (tp. 44, rge. 31, W.P. mer.). Mistletoe plants from both areas were examined for disease and none was found.

8.4.6 Jack pine Mistletoe, Arceuthobium americanum:- A stand of jack pine north and east of Whitefox (tp. 53, rge. 12, W 2nd mer.), which has been infected with mistletoe for several years, was greatly reduced by fire. Mistletoe plants were examined for the fungus disease Wallrothiella arceuthobii but it was not found.

8.4.7 Rabbit Damage:- Extensive damage to small trees by rabbits occurred at widely scattered points. Small trembling aspen were completely girdled throughout the Porcupine Provincial Forest, and trembling aspen and jack pine reproduction along the Armit Road was extensively damaged. Small tamarack in an area south of Crooked River and small jack pine in a stand five miles northwest of Bjorkdale were killed.

8.4.8 Hail Damage:- A hail storm in early August caused from 45 to 50 per cent defoliation of trembling aspen and balsam poplar within an area two miles wide and several miles long, north of Swan Plains.

8.4.9 Other Noteworthy Diseases:-

Host	Locality	Disease Organism	Remarks
Trembling aspen	Throughout the aspen groves of the Hudson Bay District	<u>Hypoxyylon pruinatum</u>	Common, but only light to moderate infection
Jack pine	Armit Road and Parr Hill Lake	<u>Cronartium comandrae</u>	Light to moderate on occasional trees
Jack pine	North of Veillardville, near Greenbush River and along Armit Road	Spherical gall rust	Light to moderate on occasional trees
Jack pine	Along Fir River Road	Needle Cast	Very light

8.4.10 Tree Diseases Not Recorded in 1961:- Diseases of trembling aspen such as leaf blight, Marssonina sp., leaf spot, Melanconium sp., twig blight, Napicladium tremuloidea and ink spot, Ciborina bifrons, and those of willow such as powdery mildew, Uncinula salicis, and tar spot, Rhytisma salicinum were prevalent in 1960 but did not appear in 1961.

9. ANNUAL DISTRICT REPORT

PRINCE ALBERT DISTRICT OF SASKATCHEWAN

1961

by

J. A. Drouin

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

## 9.1 INTRODUCTION

Surveys of forest insects and tree diseases were carried out in the Prince Albert District from May to September inclusive. These consisted of assessing and mapping infestations, recording damage and distribution of major and minor insects and tree diseases. Survey sub-projects of a long term nature, i.e. phenological measurements, Polyporus tomentosus disease and Hylobius sp. plots, Saperda sp. mortality plots in trembling aspen and balsam poplar, and Xyelid sp. and Eurytoma sp. studies were continued. A project on Pissodes sp. on jack pine in conjunction with the Sault Ste. Marie Laboratory was expanded. Also, a survey to determine incidence of a root and butt decay of softwoods, Flammula alnicola, was continued. A total of 479 insect and 46 disease collections were submitted to the Winnipeg and Saskatoon Laboratories. Aerial surveys of inaccessible areas were again carried out by charter aircraft and co-operative arrangements with the Saskatchewan Department of Natural Resources. The assistance extended by Provincial personnel in this and other aspects of the work is gratefully acknowledged.

## 9.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

Some changes occurred in the status of the major insect species in 1961 which may be attributed in part to the current severe drought conditions that have been unequalled since the early 1930's. Populations of the larch sawfly continued to cause severe defoliation of tamarack in the southern portions of the District and light in the northern portions. There was a further increase in distribution and abundance of the forest tent caterpillar. The large aspen tortrix infestation showed a further decline and was limited to small, scattered pockets. Slight increases in populations were recorded for the jack-pine budworm and yellow-headed spruce sawfly. Low populations of the spruce budworm, sawflies on jack pine, a complex of insect species on black spruce and the black-headed budworm were again recorded over much of the District. Drought conditions caused extensive mortality of jack pine reproduction throughout the Nisbet Provincial Forest.

## 9.3 INSECT CONDITIONS

9.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— This sawfly continued to cause severe defoliation of tamarack in the southern portions of the District and light in the northern portions (see Fig. 1). As a result of relatively cool temperatures early in the season followed by relatively high temperatures with little or no precipitation until early fall, initial development was delayed approximately 12 days and later development was very rapid. Feeding was complete by the end of July and larvae were not observed after August 8.

Severe defoliation was recorded throughout the Home, Holbein, Canwood, Red Rock, Steep Creek and MacDowall blocks of the Nisbet Provincial Forest and moderate to heavy patches extended westward to Shell Lake. North of Canwood and Sturgeon Lake to the southern boundary of Prince Albert National Park, west to the Big River Provincial Forest and throughout the Green, Dore, Sled lakes areas defoliation remained very light. In the eastern sections, moderate to severe defoliation extended from Whitestar through the Fort a la Corne Provincial Forest to Nipawin, and in patches north of Highway 55 to the Torch River and into the Nipawin Provincial Forest, and in the Sturgeon, Emma and Christopher lakes area.

Foliage production records at three permanent sample plots were again recorded, and although foliage production was good in the southern areas of the District, some reduction in shoot and needle length was recorded. The infestations at these plots were rated according to the current utilization of shoots for oviposition and the results are shown below.

Plot No.	Location	Infestation Ratings		
		No. of shoots examined	No. of shoots curled	1961 infestation
102	Crutwell	20	19	Severe
114	Red Rock Blk.	30	20	Severe
112	Dumble	60	1	Light

Larch sawfly cocoons were collected by the larval-drop tray method at the Crutwell and Red Rock Block plots for examination and dissection at the Laboratory. Examination of the material showed considerable mortality during cocooning due possibly to severe drought conditions. Result of cocoon dissections indicated that the dipterous parasite, Bessa harveyi, continued to decrease at Crutwell while an increase of 17 per cent was recorded in the Red Rock Block. The chalcid parasite, Tritneptis klugii, showed an increase in abundance at both plots and caused considerable mortality of overwintering sawfly larvae.

An interesting observation was made in the Crutwell area. Severe defoliation of tamarack for several years caused a decline in foliage production which reduced the number of shoots available for oviposition. As a result, the sawfly began ovipositing in white spruce shoots, and to a lesser extent in black spruce. This generally took place on the underside of the softer, slower growing laterals and to some degree on the branch terminals and as shown in Fig. 13 the shoots developed the characteristic curled tip. However, very little feeding took place and it was assumed that the young larvae were unable to survive on the coarser needles.

9.3.2 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— An extensive increase in populations of this species on trembling aspen and other associated hosts was again recorded in 1961 (see Fig. 2). The severe infestation in the Bodmin Hills area continued, extending north to the Big River townsite and south towards Bodmin,

covering approximately nine square miles. Scattered patches of moderate to severe defoliation also occurred 18 miles north of Big River along the east side of Cowan Lake and extending north to the Cowan River dam area. Extensive areas of severe defoliation occurred at the south end of Smoothstone, Dore, Sled and Mirasty lakes and extending west towards the Beaver River. Another severe infestation, encompassing eighteen square miles, was recorded in the hills near Capasin. In this area light defoliation extended west to the townsite of Capasin and east from the slopes of the hills to Pascal. High larval populations were recorded in the following areas: Christopher Lake, Emma Lake, Angling Lake, Shell Lake, Victoire, Ormaux, Debden and Eldred. Throughout the remainder of the District larvae were very common in most of the trembling aspen stands examined.

Cool, unseasonal weather delayed larval emergence. This was first recorded at Bodmin on May 25 when trembling aspen foliage was clear of the bud scales. Newly laid egg-bands were first noted in severe infestation areas on June 30. In the old, severe infestation in the Bodmin Hills populations of the pupal parasite, Sarcophaga aldrichi Park. were very common. Ground beetles were also abundant in this area. Egg-band sampling was intensified to predict further infestation extensions in 1962 and the results are shown in Table 1. Populations of the forest tent caterpillar will probably cause moderate to severe defoliation in the Bodmin-Big River and Cowan Lake areas, around Sled, Dore, Smoothstone and Mirasty lakes, and in the Capasin, Morneau and Ormaux area. Patches of moderate defoliation may occur in the Cameo and Shell Lake, Christopher and Emma lakes areas. Light defoliation can be expected throughout the remainder of the District.

TABLE 1

Summary of Forest Tent Caterpillar Egg-Band Sampling  
Prince Albert District - 1961

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

Area no. and location	Av. d.b.h. (ins.)	Av. height (ft.)	Av. crown depth (ft.)	Av. no. of egg-bands per tree	Forecast for 1962
Capasin A-1	4.3	32	25	81.0	Severe
Capasin A-2	4.3	46	37	62.0	Severe
Morneau A-3	3.0	23	17	54.0	Severe
Morneau A-4	4.0	32	24	17.6	Severe
Bodmin Tower A-5	3.0	23	13	14.3	Severe
" " A-6	2.6	33	13	11.3	Severe
" " A-7	3.0	23	17	24.6	Severe
" " A-8	3.1	29	20	13.0	Severe
" " A-9	3.1	24	20	11.6	Severe
Bodmin A-10	5.0	46	24	18.6	Severe
Bodmin Hill A-11	3.1	29	22	26.0	Severe
Ladder Road A-12	3.1	29	25	21.3	Severe
" " A-13	4.0	30	25	25.6	Severe
" " A-14	2.3	18	17	4.6	Severe



TABLE 1 (cont'd.)

Area no. and location	Av. d.b.h.	Av. height	Av. crown depth	Av. no. of egg-bands per tree	Forecast for 1962
Morneau A-15	3.0	22	18	0.6	Light
Morneau A-16	3.0	22	17	1.0	Light
Puscal A-17	3.0	20	19	0.0	Light
Ormaux A-18	3.0	18	16	0.0	Light
Ladder Lake A-19	3.0	25	20	0.6	Light
" " A-20	5.0	49	44	0.6	Light
" " A-21	2.0	19	15	0.0	Light
Bodmin A-22	3.0	23	21	1.3	Light
Erinferry A-23	3.0	27	25	1.0	Light
Delden A-24	4.0	29	25	0.0	Light
Christie Lake A-25	4.0	24	18	0.3	Light
Ordale A-26	4.0	39	32	1.3	Light
Ordale A-27	2.0	17	13	0.3	Light
Mont Nebo A-28	2.0	18	16	0.3	Light
Shell Lake A-29	3.0	21	18	0.3	Light
Dore Lake A-30	4.0	38	31	15.6	Severe
" " A-31	4.0	43	29	12.6	Severe
" " A-32	3.0	36	26	2.0	Moderate to Severe
Michel Point A-33	4.0	44	33	9.6	Severe
Beaupre Lake A-34	3.0	33	26	5.6	Severe
Sled Lake A-35	3.0	23	20	3.6	Severe
Dore Road A-36	3.0	23	19	4.3	Severe
Dore Road 55, A-37	3.0	26	22	4.6	Severe
Highway 55 A-38	4.0	33	29	7.0	Severe
Highway 55 A-39	3.0	31	27	11.3	Severe
Highway 55 A-40	4.0	38	33	10.6	Severe
Big River A-41	3.0	20	17	9.6	Severe
" " A-42	3.0	17	16	4.6	Severe
" " A-43	3.0	18	15	12.3	Severe
Cowan Dam A-44	3.0	21	19	6.6	Severe
Green Lake A-46	3.0	27	23	3.0	Severe
Cameo A-47	3.0	21	18	1.6	Moderate to Severe
MacDowall A-48	3.0	19	15	0.0	Light
Red Deer Hills A-49	3.0	21	16	0.0	Nil to Light
Duck Lake A-50	3.0	21	16	0.0	Nil to Light
Home Block A-51	3.0	22	19	0.0	Nil to Light
Tweedsmuir A-52	2.0	23	15	0.3	Nil to Light
Christopher Lake A-53	3.0	27	14	2.3	Moderate

TABLE 1 (cont'd.)

Area no. and location			Av. d.b.h.	Av. height	Av. crown depth	Av. no. of egg-bands per tree	Forecast for 1962
Prince Albert National Park							
Halkett Lake	4		4.3	34	16	29.6	Severe
"	"	5	4.3	34	14	31.3	Severe
"	"	6	2.3	24	12	19.0	Severe
"	"	7	4.9	29	13	22.3	Severe
"	"	8	3.0	23	10	26.3	Severe
"	"	9	4.6	34	15	40.3	Severe
"	"	10	3.3	32	17	1.6	Light
"	"	11	3.3	30	13	0.6	Light
"	"	12	3.6	39	21	0.0	Nil to Light
"	"	13	4.0	35	16	3.0	Light
"	"	14	2.6	30	15	0.3	Light
"	"	17	4.0	32	15	0.0	Nil to Light
Buffalo Park	18		3.3	24	17	15.6	Severe
Buffalo Park	19		3.6	29	15	4.3	Light
Mayview	20		4.6	34	20	0.0	Nil to Light
Waskesiu	43		4.0	33	18	0.3	Nil to Light
"	44		4.6	34	18	0.0	Nil
"	45		5.3	39	14	0.0	Nil
"	46		5.0	36	12	0.0	Nil
"	47		3.0	27	11	0.0	Nil
"	48		3.6	34	26	0.0	Nil
"	49		3.6	35	8	0.0	Nil
"	50		4.0	33	21	0.0	Nil
"	51		3.0	28	12	0.0	Nil
"	52		4.0	35	17	0.0	Nil
"	53		5.0	40	25	0.0	Nil
"	54		4.0	35	18	0.0	Nil
"	55		4.0	38	22	0.0	Nil
"	56		4.0	34	22	0.0	Nil
"	57		6.6	43	16	0.0	Nil
Narrows	58		6.0	39	15	0.0	Nil
"	59		6.0	43	21	0.0	Nil
"	60		5.0	35	12	0.0	Nil
"	61		6.0	41	17	0.0	Nil
"	62		6.0	38	12	0.0	Nil
"	63		5.0	34	11	0.0	Nil
"	64		5.6	41	14	0.0	Nil
"	65		4.0	33	11	0.0	Nil

9.3.3 Large Aspen Tortrix, Choristoneura conflictana (Wlk.): - The large aspen tortrix and leaf roller infestation in trembling aspen south of Prince Albert showed a further decline (see Fig. 4). Although patches of moderate to severe defoliation were common throughout the Aspen Grove Section, the main body of the infestation was still located in the Red Deer Hills-Duck Lake area on the north side of the South Saskatchewan River. Somewhat smaller and scattered patches of moderate to severe defoliation were recorded south of Shellbrook, in the Crutwell area, at Round Lake, along the Shell River, at Christopher Lake, and north of Shell Lake.

A complex of other leaf rollers has been found in increasing frequency with the large aspen tortrix and now comprise most of the larval population in these infestation areas. High populations of this complex were also recorded in the forest tent caterpillar infestation areas at Bodmin and north of Big River. Throughout the remainder of the District, larvae were common in most of the trembling aspen stands examined.

9.3.4 Jack-pine Budworm, Choristoneura pinus Free.: - A general increase in the abundance and distribution was observed in most jack-pine stands examined. Larval collections were confined mainly to the MacDowall, Steep Creek, Home and Canwood Blocks of the Nisbet Provincial Forest. In all cases defoliation was negligible.

9.3.5 A Pine Tube Maker, Argyrotaenia prob. tabulana Free.: - The first recorded infestation of this insect in the Prairie Provinces occurred in 1961. The infestation, affecting some 8,000 acres of jack pine, developed one-half mile north of Prince Albert and extended west for seven miles into the Home Block of the Nisbet Provincial Forest. This area supports almost pure stands of jack pine interspersed with trembling aspen, birch, scattered black and white spruce growing on generally flat and sandy soils. The main pockets of infestation were centered two miles west of Prince Albert and six miles west extending south to north from the Canadian National Railway line to the top of township 49. Two smaller pockets of light defoliation were recorded immediately north of the Prince Albert townsite and on the west side of the Shell River.

9.3.6 Yellow-headed Spruce Sawfly, Pikonema alaskensis Roh.: - Populations increased in 1961 and defoliation was most noticeable in the southern portion of the District on shelterbelts, shade trees and open growing or fringe native white spruce. Severe defoliation of a white spruce shelterbelt consisting of 80 trees was observed at Marchant Grove. Scattered moderate defoliation was also recorded in the Duck Lake and MacDowall Block areas on open growing white spruce. Occasional light defoliation was recorded at Christopher Lake, Holbein, Christie Lake and in the Forest Gate area.

9.3.7 A Leaf Beetle on Balsam Poplar, Altica populi Brown.: - This leaf beetle continued to cause light to moderate skeletonizing of the foliage in balsam poplar

stands. Distribution increased north of the Saskatchewan River extending to Big River and Dore Lake.

9.3.8 Galls Occurring on Current Shoots of Jack Pine:- Field studies in the Prince Albert area from 1956 to 1961 revealed the presence of galls on the current shoots of reproduction jack pine. These were most evident on trees under six feet in height and were usually found on the lower two-thirds of the crown. Dissections and rearings indicated that the galls were inhabited by a Chalcid species similar to a newly described one, Eurytoma calycis, which was found during concurrent studies in northwestern Ontario. However, the galls were larger and the shoots did not bend as the season progressed. They reached an average size of 13 mm by 6 mm by late summer and contained an average of five larvae. The attacked shoots usually died as a result of the injury.

Galls similar to those occupied by E. calycis have also been found, containing undetermined larvae resembling the sawfly family Xyelidae.

9.3.9 The Poplar Borer, Saperda calcarata Say:- The poplar borer and associated species of carpenter moths and flat-headed borers continued to cause light to medium mortality in trembling aspen stands in the District. Mortality and rate of spread studies caused directly or indirectly by the poplar borer were continued on a plot established in 1958, four miles west of Prince Albert. Plot tallies were summarized from 1958 to 1960 in last year's report. Table 2 shows the 1961 data.

TABLE 2

Tally of Dead and Living Trembling Aspen in a Six Grid Plot  
with Records on the Occurrence of Saperda sp. and Disease  
in 1961

Grid No.	No. of Trees	d.b.h.		No. of Living Trees Showing Damage by			No. of Dead Trees Showing Damage by			Accumulative No. of Dead Trees
		Av.	Range	<u>Saperda</u>	<u>Hypoxylon</u>	<u>Fomes</u>	<u>Saperda</u>	<u>Hypoxylon</u>	<u>Fomes</u>	
1	10	4.7	4.0- 5.5	7	2	0	2	2	0	2
2	4	2.7	2.1- 4.4	1	0	0	0	2	0	3
3	8	4.9	3.5- 6.0	7	0	0	0	0	0	1
4	24	4.8	2.5- 6.0	21	2	1	0	0	0	4
5	17	4.9	3.6- 6.0	12	4	0	2	4	0	5
6	9	4.7	2.7- 5.5	6	3	0	1	1	0	3

### 9.3.10 A Round-Headed Root Collar Borer on Poplars, Saperda sp.:-

Surveys for a poplar borer, Saperda sp. were continued in 1961. This species occurred in trembling aspen and balsam poplar growing on poor soils. Trees infested by borers were readily identified by the bulbous, gnarled appearance of the root collar. Examination in most cases reveal scars, emergence holes, feeding damage and large amounts of frass and sawdust around the base of the tree. Both Cerambycid and Buprestid larvae contribute to this damage but the latter are considered secondary. Some light mortality has been recorded in the study plots established. Heavy mining damage and resultant decay in addition to girdling beneath the bark, renders the tree susceptible to wind breakage (Fig. 9). Study plots in the Prince Albert, Christopher Lake areas indicates gallery damage extends both above, and to a lesser extent, below ground. Adult emergences occur at or slightly above ground level, with occasional emergences just below ground level (Fig. 8).

### 9.3.11 A Weevil Attacking Leaders of Jack Pine, Pissodes poss. terminalis:-

Surveys on the occurrence of Pissodes sp. on the leaders of jack pine from 1956 to 1961 indicate a fairly widespread distribution in Saskatchewan. This species, similar in appearance and damage to Pissodes strobi Peck. found on white and black spruce, showed certain biological differences in the adult and the type of damage. It was active in jack pine stands from the northern limits of the Aspen Grove Section in Saskatchewan to the Churchill River watershed. The most active infestations were reported in old burns and cut-over areas supporting dense stands of jack pine reproduction in the Prince Albert area. The larvae, usually two to three, bore upwards in the new leader from the region of the first whorl, following a relatively straight path and pupate inside or below the apical bud (Fig. 12). Dead or dying leaders, either bent or curling are readily observed in the latter stages of attack (Fig. 10). Heavy damage through wind breakage of the leader occurs at the point where the larvae penetrates from the cambium to the pith to pupate (Fig. 11). Mortality of the leader always follows attack by Pissodes sp. and continued attacks cause staggling.

### 9.3.12 Other Noteworthy Insects:-

Insect	Host(s)	No. of Collections	Remarks
<u>Acleris variana</u> (Black-headed budworm)	WS	4	Occasional at scattered points.
Aphid spp.	tA, tL, bPo		Common - light damage.
<u>Archippus albertus</u> (a leaf roller)	bS	4	Continued light populations.
<u>Cecidomyia reeksii</u> (a gall midge)	jP	3	Occasional, low populations.

## 9.3.12 Other Noteworthy Insects:- (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Choristoneura fumiferana</u> (Spruce budworm)	wS	1	Single collection only.
<u>Chrysomela crotchii</u> (Aspen leaf beetle)	tA, W	8	Increase in populations; common and widely scattered.
<u>Dioryctria abietivorella</u> (a coneworm)	bS, jP	10	Associated with insect complex in bS-larvae also found feeding on <u>Pissodes</u> sp. pupae.
<u>Epizeuxis americalis</u> (an owlet moth)	bS	4	Common-low populations.
<u>Fenusa dohrnii</u> (European alder leaf miner)	spAl	5	Heavy leaf damage at Crutwell, Dore Lake and Christie Lake.
<u>Herculia thymetusalis</u> (a Pyralid moth)	bS	5	Light increase in populations and damage.
<u>Malacosoma lutescens</u> (Prairie tent caterpillar)	cCh, wB	19	Increase - heavy populations at Duck Lake, Nisbet P.F., Shellbrook.
<u>Neodiprion abietis</u> (Balsam-fir sawfly)	wS	3	Few larvae noted but widely scattered.
<u>Neodiprion maurus</u> (a pine sawfly)	jP	3	Light - found at Sled Lake and Pinkney Lake.
<u>Neodiprion virginiana</u> complex (Red-headed jack-pine sawfly)	jP	11	Continued low populations throughout District.
<u>Nymphalis antiopa</u> (Spiny elm caterpillar)	W, tA	11	Light increase - widely scattered.
<u>Oberea schaumii</u> (a stem-boring beetle)	tA	10	Light damage on trembling aspen reproduction.
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	26	Increase in 1961 of second year nodules - common throughout District.

## 9.3.12 Other Noteworthy Insects:- (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Pikonema dimmockii</u> (Green-headed spruce sawfly)	wS	11	Low populations, wide distribution.
<u>Pissodes strobi</u> (White-pine weevil)	wS, bS jP	14	Widely scattered, damage light.
<u>Schizura concinna</u> (Red-humped caterpillar)	tA, wB	8	Confined to Nisbet P.F.
<u>Tetralopha asperatella</u> (a webworm)	tA, wB	15	Common, light damage in all areas.
<u>Gonioctena americana</u> (American aspen beetle)	tA	12	General increase in 1961, caused light defoliation at Duck Lake, Bodmin.

9.4 TREE DISEASE CONDITIONS

9.4.1 Root and Butt Decay, Flammula alnicola:- Field surveys to determine occurrence and distribution of F. alnicola decay were continued in 1961. Two cut-over stands, at Emma Lake and at Whitestar, were examined with negative results. Survey methods were modified in 1961 and involved the selection of 25 recently cut stumps for examination. No collections of F. alnicola mushrooms were made in late fall due to the drought conditions and to consistently above-normal temperatures during the season.

9.4.2 Blister Rusts on Jack Pine:- A special survey for the pycnial and aecial stages of blister rusts on jack pine was conducted during May in the Prince Albert area. Scattered collections of blister rust, characterized by globose or spindle shaped galls, were made in the jack pine stands of the Nisbet Provincial Forest. Some mortality was caused in jack pine reproduction and pole growth; the spindle or globose swellings increase in diameter and length, eventually girdling the stem or branch.

9.4.3 Drought Conditions on Jack Pine Reproduction:- Most of the prairie region experienced a drought unequalled in severity since the 1930's. Precipitation in Saskatchewan during the growing season was 62 per cent of the long term average.

The amount varied considerably by area, and some received much less than the percentage indicated. In addition, temperatures tended to be consistently above normal. These conditions caused extensive mortality of jack pine reproduction throughout the Nisbet Provincial Forest where the stands are on well drained, dry, sandy soil. Light mortality of jack pine reproduction was also recorded in the Ft. a la Corne Provincial Forest and in the sand hills east of Canwood. The severe drought condition was also assumed to be responsible in part for light to medium mortality of scrub trembling aspen commonly found in these areas.

9.4.4 Rust on Conifers:- Rust infection of white and black spruce remained at very low levels in 1961. Occasional collections of a leaf rust on jack pine, Coleosporium asterum were made at widely scattered points.

9.4.5 Armillaria Root Rot, Armillaria mellea:- This root rot of jack pine remained prevalent throughout stands in the Nisbet Provincial Forest, Big River and Candle Lake areas. Light, scattered tree mortality was recorded in these areas as well as in the Fort a la Corne Provincial Forest.

9.4.6 Herbicide and Weed-Spray Damage:- A survey was conducted in 1961 to detect damage to tree species in farm shelterbelts by 2-4-D spraying. Due to drought conditions, spraying of field crops with 2-4-D was substantially reduced and, as a result no serious damage was observed throughout the agricultural areas of the District.

9.4.7 Other Noteworthy Diseases:-

Host	Organisms	Locality	Remarks
Willow	<u>Melampsora bigelowii</u>	Dore Lake and Christopher Lake	Common - widely scattered.
Trembling aspen	Leaf spot	Beaupre Lake	Common - widely scattered.
Balsam fir	<u>Pullularia pullulans</u> die-back	Cowan Lake	Single collection.
Pincherry	<u>Dibotryon morbosum</u>	Bodmin and Holbein	Very common
Trembling aspen	<u>Armillaria mellea</u>	Nisbet P.F.	Very common on poor sites.
Balsam poplar	<u>Stereum rufum</u>	Red Rock Blk.	Occasional only.
Jack pine	<u>Wallrothiella</u> on mistletoe	Home Blk.	Common.
Rose (Wild)	<u>Phragmidium</u> rust	Dore Lake	Very common.



10. ANNUAL DISTRICT REPORT  
NORTHERN DISTRICT OF SASKATCHEWAN

1961

by

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FOREST ENTOMOLOGY LABORATORY  
WINNIPEG, MANITOBA

March, 1962

## 10.1 INTRODUCTION

In the northern District of Saskatchewan, surveys of forest insects and diseases were conducted from May 8 to September 28, 1961. Travel was accomplished mainly by truck, but chartered aircraft and flying arranged through the co-operation of the Saskatchewan Department of Natural Resources were used to cover remote areas. The assistance extended by personnel of the Saskatchewan Department of Natural Resources in this and other assignments is gratefully acknowledged.

Aerial survey was again used to extend the range of the disease, Polyporus tomentosus, and to carry out other insect and disease surveys in the far northern portion of Saskatchewan. A total of 250 insect samples and 16 tree disease samples were collected.

## 10.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

Some changes were noted in the pattern of the larch sawfly outbreak. Tamarack stands south of the Churchill River basin suffered greater damage than those to the north but shoot and needle growth of tamarack was generally poor. The forest tent caterpillar again caused severe defoliation in scattered patches of trembling aspen. Large aspen tortrix populations declined and caused very little defoliation but the yellow-headed spruce sawfly continued to cause severe defoliation of white and black spruce at widely scattered points.

The leaf blight, Marssonina sp. which caused coloration of leaves of trembling aspen over a wide range of northern Saskatchewan in 1960, decreased to negligible. A needle rust of spruce, Chrysomyxa sp., also declined. The white pocket rot, Polyporus tomentosus was found in sawn lumber at Deschambault Lake.

## 10.3 INSECT CONDITIONS

10.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— The distribution and degree of infestation are shown in Figure 1. Defoliation of tamarack in Prince Albert National Park was severe at Mayview, Spruce River, three miles north of Sandy Lake, the Narrows, and the Waskesiu River. From the Park boundary north to the Churchill River, defoliation was light at Molanosa and Ile-a-la-Crosse, light to moderate in scattered patches at Deschambault Lake, Bigstone Lake and Rabbit Creek, and moderate at Skunk Creek, Pine Creek and Waden Bay. North of the Churchill River defoliation was light at check points at Buffalo Narrows, La Loche, Clearwater River, Bulyea River and Hatchet, Williams and Reindeer lakes. Severe drought conditions caused poor foliage growth in areas with low soil moisture levels which was particularly noticeable in tamarack stands in the area north of the Churchill River.

Sequential sampling to determine infestation levels on the basis of the number of current shoots utilized for oviposition was continued in three permanent plots. The results are listed below.

Location and Plot Number	No. of Shoots Examined	No. of Curled Shoots	Infestation Rating - 1961
Mayview 111A	60	1	Light
Waskesiu 116	70	2	Light
Rabbit Creek 101A	90	4	Light

Twenty larval drop trays were used in the plots at Mayview and Waskesiu to collect cocoons which were subsequently dissected to determine the incidence of predation, parasitism and disease in the host insect. The results indicated that the number of cocoons increased by approximately 20 per cent at Mayview and 10 per cent at Waskesiu. Small mammal predation was high as a result of damage to the trays and protective screenings by animals such as elk browsing in the areas. The fall emergence of the Diptera, Bessa harveyi, increased to approximately 30 per cent at Mayview and 50 per cent at Waskesiu. A large increase was also noted in the number of diseased and dead larvae.

10.3.2 Large Aspen Tortrix, Choristoneura conflictana (Wlk.):— Populations of this leaf roller were markedly reduced. Although larvae were commonly found on trembling aspen throughout the District, severe defoliation was confined to small patches near and west of Waskesiu, and in the southeast corner of Prince Albert National Park. However, this defoliation was attributable only in part to C. conflictana and mainly to the following species: Pseudexentera improbana oregonana, Epinotia solandriana, Pandemis canadana and a Tortricid. (See Fig. 4).

10.3.3 The Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.):— Populations of this spruce sawfly increased in Prince Albert National Park. They remained very light and scattered in the remainder of the District with the exception of patches of severe defoliation on a number of islands of lakes in the northern part of the Province.

In the Park, defoliation was severe in a small patch of white spruce at Scenic View and another at Namukus Lake, and light in patches one mile north of Scenic View, and one mile north of the Waskesiu River on the shore of Lake Waskesiu. North of the Park, light populations were found at scattered locations to Lac la Ronge and Deschambault Lake. Severe defoliation occurred on two small islands in Rene Lake on the Alberta boundary, two islands in Phelps Lake, and islands and points of Selwyn Lake in the Northwest Territories.

10.3.4 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— Severe defoliation of trembling aspen occurred in widely scattered stands from the Prince Albert National Park north to the Churchill River. The largest areas of defoliation were recorded in the vicinity of Lake Ile-a-la-Crosse (Fig. 2).

In Prince Albert National Park, the area of severe defoliation near Halkett Lake and Bell Hill Tower expanded to the west, south and east so that a total area of 0.7 square miles is now affected. The pockets of severe defoliation at Amyot and Moonlight lakes subsided, but that west of Montreal Lake expanded to cover some 15 square miles with an additional 40 square miles of moderate defoliation. North of the Park, defoliation was light north of La Ronge, moderate in patches at Sucker River, Waden Bay and Otter Lake, and severe in numerous small patches from La Ronge northwest to Ile-a-la-Crosse. No other defoliation was evident, but larval collections were made at Bittern Creek, Bigstone Lake, English Bay and along the Uranium City road to the vicinity of Otter Falls or 44 miles north of La Ronge, and in Prince Albert National Park along the south boundary for 14 miles west of the Buffalo Paddock and from the South Gate to Waskesiu. As a note of interest, a predator of the forest tent caterpillar, the fiery hunter, Calosoma frigidum, was quite common in the severely defoliated area near Halkett Lake.

An egg-band survey was conducted in September to determine the probable intensity of infestation in 1962 at various locations throughout the District and the results are listed in Table 1.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Survey  
Northern Saskatchewan - 1961

(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 1962
N1 Sandy Lake	5	44	31	41.0	Severe
N2 Knee Lake	4	38	25	60.0	Severe
N3 Dipper Lake	4	34	22	45.0	Severe
N21 Deschambault Lake	4	32	14	1.3	Light
N22 Deschambault Lake	4	36	17	1.3	Light
N23 Deschambault Lake	2	29	14	0	Nil
N24 Deschambault Lake	3	32	12	0	Nil
N25 Deschambault Lake	3	29	10	0	Nil
N26 Sucker Creek	3	31	17	66.0	Severe
N27 Sucker Creek	3	35	22	15.0	Severe
N28 Sucker Creek	4	33	16	19.0	Severe

TABLE 1 (cont'd.)

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 1962
N29 Sucker Creek	5	48	13	0	Nil
N30 Sucker Creek	5	38	21	0	Nil
N31 Churchill River Road	5	34	14	1.0	Light
N32 Churchill River Road	4	36	20	0	Nil
N33 Churchill River Road	4	37	21	0.7	Light
N34 Churchill River Road	5	41	18	0.3	Light
N35 Churchill River Road	3	29	15	0	Nil
N36 Churchill River Road	5	33	15	0.7	Light
N37 La Ronge Highway	3	34	15	0	Nil
N38 Ile-a-la-Crosse	3	22	15	5	Moderate
N39 Ile-a-la-Crosse	2	19	9	2	Light
N40 Ile-a-la-Crosse	4	25	15	17	Severe
N41 Ile-a-la-Crosse	7	49	22	36	Severe
N42 Ile-a-la-Crosse	6	57	23	44	Severe
N43 Ile-a-la-Crosse	7	48	22	49	Severe
N44 Sturgeon W. River	4	37	23	68	Severe
N45 Sturgeon W. River	4	34	24	28	Severe
N46 Sturgeon W. River	3	29	22	14	Severe
N47 Sturgeon W. River	4	32	23	2.0	Light
N48 Sturgeon W. River	3	27	21	4.0	Light

10.3.5 American Aspen Beetle, Gonioctena americana (Schaeff.):— Populations were sampled over the entire range of trembling aspen, (i.e. mainly from the Prince Albert National Park to the Churchill River), but the only defoliation was light and it was found in scattered patches throughout Prince Albert National Park, and near La Ronge and Ile-a-la-Crosse.

10.3.6 A Root Weevil, Hylobius sp.:— A special survey of damage by this insect and a white pocket rot, Polyporus tomentosus, was continued by examining the roots of five living and five dead white spruce in sample plots. The results are tabulated below.

Location	Av. d.b.h. (ins.)		Av. ht. (ft.)		Percentage Diseased Roots	Percentage Diseased Roots with Insect Damage
	Living	Dead	Living	Dead		
Deschambault Lake	11	11	57	61	46.5	17.0
Dipper Lake	8	10	52	66	42.0	17.2
Uranium City Road	13	10	67	66	35.8	0.0

10.3.7 Balsam-fir Sawfly, Neodiprion abietis Harr.: - Small areas of defoliation were recorded along the Churchill River basin (See Fig. 7). Along the shores of Dipper Lake, balsam fir growing under white spruce was severely defoliated. Light infestations were found on young white spruce at Snake (Pinehouse) and Besnard lakes. These infestations could not be detected from the air so accurate mapping was not possible.

10.3.8 Black Spruce Complex: - Club-topped black spruce were sampled at Sled, Paull, Close and Weitzel lakes. Feeding was light at all locations and not significantly different from previous damage. The species of insects present in the samples in order of their numerical abundance were: Herculia thymetusalis, Dioryctria abietivorella, Archippus albertus, Gelechiid sp., and Hylobius pinicola.

10.3.9 Other Noteworthy Insects: -

Insect	Host(s)	No. of Collections	Remarks
<u>Altica populi</u> (a poplar flea beetle)	bPo	2	Lighter than in 1960. Found only in Prince Albert National Park.
<u>Anoplonyx luteipes</u> (a sawfly)	tL	9	No defoliation; found on tamarack as far north as Selwyn Lake, N.W.T.
<u>Aphid</u> sp.	tA, W, bPo	19	Fewer than last year, but not uncommon on hardwood sp.
<u>Archips cerasivoranus</u> (Ugly-nest caterpillar)	W, cCh	3	Fairly common from Molanosa south.
A Gracillariid (a leaf miner)	W	6	Main area of attack same as last year; within 25 mile radius of La Ronge.
<u>Hemichroa crocea</u> (Striped alder sawfly)	spAl	2	Light populations on alder at Deschambault and Waskesiu lakes.
<u>Malacosoma pluviale</u> (Western tent caterpillar)	tA	5	Lightly scattered on small trees north of La Ronge.
<u>Mordwilkoja vagabunda</u> (Poplar vagabond aphid)	tA	5	Light near ZN Lake, near La Ronge, and in Prince Albert National Park.

## 10.3.9 Other Noteworthy Insects :- (cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Neodiprion maurus</u> (a pine sawfly)	jP	5	On a few branches only near Molanosa and La Ronge. Less abundant than last year.
<u>Nymphalis antiopa</u> (Spiny elm caterpillar)	tA, W	4	Very light - widely scattered south of the Churchill River.
<u>Oberea schaumii</u> (a stem-boring beetle)	tA	5	Scattered occurrences near La Ronge and in Prince Albert National Park. Light populations.
<u>Petrova albicapitana</u> (Pitch nodule maker)	jP	6	Lightly scattered on young jack pine from Prince Albert National Park to Rene Lake.
<u>Pissodes strobi</u> (White pine weevil) and <u>Pissodes poss. terminalis</u> (a pine weevil)	wS, bS  jP	2  6	A few found near La Ronge and Montreal Lake.
<u>Semiothisa sexmaculata</u> (a geometer)	tL	8	Caused no visible defoliation. Widely scattered.
<u>Tetralopha asperatella</u> (a webworm)	tA	9	Light - usually secondary attack. Spread over entire area south of the Churchill River.

10.4 TREE DISEASE CONDITIONS

10.4.1 Jack-pine Mistletoe, Arceuthobium americanum:- No change was observed in the status of this disease in 1961. Large areas of severe infection occur from Ile-a-la-Crosse north to Lake Athabaska and between Hanson, Big Sandy and Candle lakes. Heavy tree mortality and subsequent stand openings were noted in the latter area.

10.4.2 The White Pocket Rot, Polyporus tomentosus:- The survey for incidence of this pocket rot was continued with emphasis on northern distribution. Three new plots were established and the root systems of five dead white spruce were

examined at each. The disease was not found at Mile 33 on the Uranium City Road or at Dipper Lake, but it was present in light intensity at Ballantyne Bay. The disease, Armellaria mellea was present at all three locations.

10.4.3 Globose Rust Galls:- Collections of globose rust galls on jack pine made to determine the date of spore ripening in various areas. The galls were common on jack pine in all areas examined and the spore ripening dates were recorded as follows:

Waskesiu, Prince Albert National Park	May 31
Nipawin Provincial Forest	June 7
Whitegull Lake	June 8

10.4.4 Herbicide and Weed-Spray Damage:- A survey to determine the effect of herbicide spraying on deciduous trees in woodlots and shelterbelts was carried out. Due to drought conditions, the use of 2-4-D as a weed control in agricultural crops was curtailed to some extent resulting in only occasional, scattered damage. Foliage samples showing 2-4-D damage were forwarded to the Saskatoon Pathology Laboratory for further study.

#### 10.4.5 Other Noteworthy Diseases:-

Host	Disease	Location	Remarks
Alder	Leaf blight (not yet diagnosed)	Candle Lake	Few trees - light.
Trembling Aspen	<u>Hypoxylon</u> canker	Prince Albert National Park	Ubiquitous.
Trembling Aspen	Powdery mildew		Scattered occurrences.
Willow	<u>Melampsora bigelowii</u>	L. Athabaska	Scarce - no alternate host found.
Trembling Aspen	<u>Melanconium</u> leaf blight	Skunk Creek	Occasional infected tree.
Pincherry	<u>Dibotryon morbosum</u>	Skunk Creek	Common throughout District as far north as Churchill River.
Black spruce	<u>Chrysomyxa</u> rust	North of Sled Lake	Widespread but light.
Black spruce	<u>Peridermium coloradense</u>	Eynard Lake, N.W.T.	Severe attack.



11. ANNUAL DISTRICT REPORT

MEADOW LAKE DISTRICT OF SASKATCHEWAN

1961

by

K. L. Mortensen

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY LABORATORY

WINNIPEG, MANITOBA

March, 1962

### 11.1 INTRODUCTION

Forest insect and disease surveys were conducted in the Meadow Lake District from early May to October 15. During this period 342 insect collections were submitted to the Forest Entomology Laboratory, Winnipeg and 21 disease samples to the Forest Pathology Laboratory, Saskatoon.

Five hours of chartered flying time were used to map forest tent caterpillar and larch sawfly infestations.

The co-operation received from the Saskatchewan Department of Natural Resources and other private co-operators is gratefully acknowledged.

### 11.2 REVIEW OF FOREST INSECT AND DISEASE CONDITIONS

The most noteworthy insect development was a marked increase in abundance of the forest tent caterpillar; defoliation of trembling aspen by leaf rollers was generally lighter; small pockets of moderate jack pine leader damage caused by Pissodes spp.; and Dioryctria abietivorella (Grote) causing jack pine shoot damage in a few areas.

In addition to general surveys, special collections of stink bugs were made during September, and a number of special projects including phenological measurements, tamarack plot tallies and water level measurements were carried out. Also, surveys for the occurrence of the diseases, Flammula alnicola and Polyporus tomentosus were continued.

### 11.3 INSECT CONDITIONS

11.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.):— Quantitative sampling at five sampling points indicated a slight decline in activity, and low populations were common throughout most tamarack stands. See (Fig. 1). In the Goodsoil area, moderate defoliation occurred in a few small swamps and occasional small fringe trees were severely defoliated. In Meadow Lake Provincial Forest and in extensive stands north of the Beaver River from Green Lake to Waterhen Lake, aerial surveys indicated that defoliation was very light.

Infestation ratings, based on the utilization of current shoots for oviposition by the female larch sawfly, were carried out at the five permanent tamarack plots. The results are shown in the following table.

Plot No.	Location	Infestation ratings		
		Total shoots counted	Total shoots curled	Infestation ratings
101	Meadow Lake P.F.	70	2	Light

11.3.1 Larch Sawfly, Pristiphora erichsonii (Htg.): - (cont'd.)

Plot No.	Location	Infestation ratings		
		Total shoots counted	Total shoots curled	Infestation ratings
102	Loon Lake Resort	80	1	Light
103	Loon Lake	60	1	Light
104	Pierceland	120	5	Light
105	St. Cyr	50	0	Light

Foliage production records were also taken at the above plots in June. Shoot growth remained poor in plots located near Pierceland, Loon Lake and in the Meadow Lake Provincial Forest, but it was very good in younger trees at St. Cyr and Loon Lake Resort. Water level measurements at plots 103 and 104 indicated that they were falling.

Parasite studies were also continued in plots 102 and 104. Cocoons were collected in 20 drop trays at each plot and dissected in the Laboratory. Although populations were low, parasitism by the Diptera, Bessa harveyi was high, and that by the Hymenoptera, Mesoleius tenthredinis was low.

11.3.2 Forest Tent Caterpillar, Malacosoma disstria (Hbn.): - Both distribution and intensity increased throughout the District (See Fig. 2). The main infestation around Cold Lake expanded in all directions. Severe defoliation extended northward to at least the boundary of the Department of National Defence Air Weapons range, and south and east to Lac Des Isles and Ministikiwan Lake. Patches of moderate to heavy defoliation occurred around Goodsoil, south of the Beaver River on No. 26 Highway and around the shores of Loon Lake. Aspen stands south of the Bronson Provincial Forest were free of defoliation with the exception of a small, moderate infestation within the Lloydminster city limits. Isolated small patches of heavy defoliation occurred in the immediate vicinity of the Canoe Lake village, near the Dorintosh Department of Natural Resources Headquarters, and in the Capasin-Leoville area. Elsewhere in the District, larvae were commonly found.

Deciduous trees and shrubs in the severely infested areas were completely defoliated by June 10, and had re-foliated by July 1. Larvae were an annoyance to the public in the centres of Lloydminster and Cold Lake, and at public campsites at Ministikiwan and Pierce lakes, and Lac Des Isles.

Extensive egg-band surveys were conducted in September and October to predict defoliation for 1962, and the results are shown in Table 1.

TABLE 1

Results of Forest Tent Caterpillar Egg-Band Survey  
Meadow Lake District - 1961

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

Sta. No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth	Av. no. egg-bands per tree	Forecast for 1962
01	Cold Lake	3	23	17	32	Severe
02	Cold River	3	23	18	21	Severe
03	Pierce Lake	3	23	17	42	Severe
04	Pierceland	3	27	21	32	Severe
05	Meadow Lake	4	22	14	59	Severe
06	Beacon Hill	2	19	15	17	Severe
07	Peerless	3	28	12	16	Severe
08	Beaver River No. 26 Hwy.	3	22	18	21	Severe
09	Loon River No. 26 Hwy.	4	28	22	25	Severe
10	Big Bush	3	18	14	13	Severe
11	St. Walburg	3	24	15	2	Light
12	Birch Lake	3	23	17	13	Severe
13	Meadow Lake Game Preserve	4	40	30	3	Light
14	St. Cyr	3	26	19	3	Light
15	Prince	4	28	24	1	Light
16	Loon Lake Beach	4	32	18	7	Mod.
17	Steele's Narrows	3	19	15	4	Light
18	South Makwa	4	26	20	11	Severe
19	South Makwa	3	25	18	3	Light
20	Mudie Lake	3	20	15	75	Severe
21	Pierceland	3	25	20	41	Severe
22	Pierceland	3	23	16	19	Severe
23	Ministikiwan Lake	2	15	10	3	Light
24	Ministikiwan Lake	3	20	13	3	Light
25	Meadow Lake	3	21	17	4	Light
26	Barne's Crossing	3	25	18	6	Mod.
27	Waterhen River	3	18	13	1	Light
28	Flotten Lake	3	21	13	11	Severe
29	Salt Creek Tower	4	35	20	2	Light
30	Meadow Lake	3	17	13	7	Mod.
31	Peck Lake	3	13	10	4	Light
32	Little Fishing Lake	3	22	18	1	Light
33	Green Lake	2	18	14	2	Light
34	Cowan River Bridge	4	28	18	0	Nil
35	Buffalo Narrows Road, Mi. 25	3	28	17	1	Light
36	Grand Rapids	3	22	17	1	Light
37	Divide	4	36	27	6	Mod.

TABLE 1 (Cont'd.)

Sta. No.	Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth	Av. no. egg-bands per tree	Forecast for 1962
38	Ministikiwan Lake	2	22	18	34	Severe
39	Ministikiwan Lake	4	23	19	33	Severe
40	Cold Lake	3	21	17	35	Severe
41	Lloydminster	3	16	12	5	Mod.
42	Halfway Station	4	49	38	0.3	Light
43	Glaslyn	3	25	18	0.3	Light
44	Midnight Tower	3	25	20	0	Nil
45	Martineau River	3	23	18	10	Severe
46	Beaver River	3	23	18	44	Severe
47	Peerless	3	22	17	10	Severe
48	Lac Des Isles	4	25	20	22	Severe
49	Golden Ridge	3	18	15	6	Mod.
50	Rapid View	3	20	15	2	Light
51	Rapid View	3	24	20	2	Light
52	Dorintosh	3	24	16	9	Severe
53	Dorintosh	3	23	14	18	Severe
54	Dorintosh	3	23	17	14	Severe
55	Canoe Lake Village	4	35	18	33	Severe
56	Canoe Lake Village	4	34	22	14	Severe
57	Canoe Lake Village	4	33	22	17	Severe
58	Canoe Lake Village	4	28	13	6	Mod.
59	Canoe Lake Village	3	25	16	2	Light
60	Capasin	3	26	18	34	Severe
61	Capasin	3	27	23	2	Light
62	Capasin	4	26	22	2	Light
63	Leoville	4	27	22	0	Nil
64	Leoville	4	27	25	1	Light
65	Turtleford	3	23	19	0	Nil
66	Cater	3	21	17	0	Nil
67	Spiritwood	4	22	17	0	Nil
68	Big River No. 22 Hwy.	3	21	17	0	Nil
69	Cochin	3	23	19	0.3	Light
70	Keeley Lake	5	33	17	2	Light
71	Beauval	3	26	15	2	Light
72	Lloydminster	3	15	12	2	Light
73	Lloydminster	3	23	16	0.6	Light
74	Lloydminster	3	20	15	0.3	Light
75	Lloydminster	3	17	12	0.6	Light
76	Lloydminster	3	17	12	1	Light
77	Aberfeldy	3	16	13	0.6	Light

11.3.3 Defoliators of Trembling Aspen:- Various species of leaf rollers and leaf beetles occurred commonly in nearly all trembling aspen stands during May and June. In order of abundance these were: the leaf rollers, Pseudexentera improbana oregonana and Compsolechia niveopulvella, and the leaf beetle, Gonioctena americana. Defoliation of trembling aspen by the above species was less conspicuous than in 1960 (see Fig. 4). Serious defoliation did not recur around Maidstone and Lashburn, but small pockets of moderate defoliation occurred at Fort Pitt, Barthel, Loon Lake, Bolney and Green Lake. The leaf beetle, G. americana caused moderate defoliation of small trembling aspen trees in the vicinity of Bournemouth and Meetoos. The predacious beetle, Calosoma frigidum was generally found in abundance throughout the leaf roller infestations.

Populations of the large aspen tortrix, Choristoneura conflictana remained low. Collections containing a few larvae were taken at Green Lake, Pierceland, Barthel and Bournemouth.

11.3.4 Boxelder Twig Borer, Proteoteras willingana (Krt.): - No significant change was noted in the status of this insect, but population studies were continued at Goodsoil, Onion Lake, Bolney, Loon Lake and Edam. Populations remained low and very little twig damage was observed in the study areas or in other Manitoba maple shelterbelts.

11.3.5 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.): - Larvae were common in nearly all spruce stands sampled from the last of June to mid August. Defoliation was generally light with noticeable feeding confined to open growing trees. Small ornamental white spruce suffered moderate defoliation in public campsites at Jumbo Beach, Greig Lake and Mustus Lake. Moderate defoliation occurred in white spruce shelterbelts at Pierceland and Cater and in small, isolated white spruce growing along the abandoned railroad grade in the Bronson Provincial Forest. Heavy defoliation occurred in a few ornamental trees at Golden Ridge, Blue Bell and Beauval. The most noticeable rise in populations was recorded along the Buffalo Narrows Road from approximately mile 10 to mile 30, where scattered, open growing white and black spruce suffered light to moderate defoliation.

11.3.6 Weevil Leader Damage, Pissodes spp.: - Damage to the leaders of white and black spruce by the weevil, Pissodes strobi was somewhat less widespread. Scattered trees were attacked along No. 4 Highway from Meadow Lake to Glaslyn, north of Goodsoil along the Beaver River and along the Buffalo Narrows Road in the vicinity of Grand Rapids. Collections from jack pine were taken in the vicinity of St. Walburg, Sundance Tower, and the Martineau River bridge.

Light damage to the leaders of jack pine by Pissodes (poss.) terminalis was observed near Barne's Crossing and at Meadow Lake.

11.3.7 A Snout Moth, Dioryctria abietivorella (Grote):- Damage by this shoot borer of jack pine was conspicuous in the District in 1961. The larvae appear to bore into the shoot at the flowers causing the shoot to curl and dry out. Most noticeable damage was observed in the Meadow Lake Provincial Park near Kimball Lake and Peitahigan Lake. Damaged shoots were also observed in jack pine stands around Loon Lake and St. Cyr.

11.3.8 Pitch Nodule Maker, Petrova albicapitana (Busck):- Populations remained high in young jack pine near Beacon Hill and moderate elsewhere throughout the District.

11.3.9 Sawflies on Jack Pine, Neodiprion spp.:- Special collections of jack-pine sawflies were continued. The results are listed in the following table and they indicate that populations increased.

Sawfly Species	Location	No. of Colonies Collected
<u>Neodiprion pratti banksianae</u>	Loon Lake, Bronson P.F. St. Cyr and Meadow Lake P.F.	4
<u>Neodiprion maurus</u>	Loon Lake, Grand Rapids, St. Walburg, Goodsoil and Leoville	5
<u>Neodiprion nanulus nanulus</u>	Golden Ridge, Brightsand Lake and Halfway Station	4
<u>Neodiprion</u> sp.	St. Cyr	1

#### 11.3.10 Other Noteworthy Insects:-

Insect	Host(s)	No. of Collections	Remarks
<u>Acleris variana</u> (Black-headed budworm)	WS	7	Occasional larvae, wide distribution.
<u>Amauronematus</u> sp. (a sawfly)	W, tA	13	Widely distributed.
<u>Anoplonyx luteipes</u> (a sawfly)	tL	22	Common throughout all tamarack stands.

## 11.3.10 Other Noteworthy Insects:- (Cont'd.)

Insect	Host(s)	No. of Collections	Remarks
Aphid spp.	jP, tA, bPo	6	Special collections for Dr. G. Bradley.
<u>Archips cerasivoranus</u> (Ugly nest caterpillar)	cCh	2	Heavy infestation over 1/2 mile of roadside at Cabana.
<u>Campaea perlata</u> (a geometer)	W, tA	14	Decreased slightly.
<u>Chermes</u> sp. (an aphid)	wS, bS	21	Galls disfigured a few wS ornamentals at Chitek Lake Resort.
<u>Choristoneura pinus</u> (Jack-pine budworm)	jP	1	Very light infestation over small area west of Barthel.
<u>Chrysomela crotchii</u> (Aspen leaf beetle)	tA	3	Found at widely scattered points.
<u>Chrysomela knabi</u> (a leaf beetle)	tA	3	Occasional low populations.
<u>Fenusa dohrni</u> (European alder leaf miner)	Al	2	Moderate infestation over small areas at Loon Lake and Cowan River.
<u>Galerucella decora</u> (Gray willow leaf beetle)	W	5	Low populations, widely scattered.
<u>Itame loricaria</u> (a spanworm)	tA, W	27	Very common throughout the District.
<u>Malacosoma pluviale</u> (Western tent caterpillar)	W	1	Found only at Mile 41, Buffalo Narrows Road.
<u>Neodiprion abietis</u> (Balsam-fir sawfly)	wS	4	Slight increase in numbers of larvae at collection points.
<u>Nymphalis antiopa</u> (Spiny elm caterpillar)	tA	2	More common than in 1960.
<u>Oligonychus ununguis</u> (Spruce spider mite)	wS	4	Light infestation at Lloydminster.



## 11.3.10 Other Noteworthy Insects:- (Cont'd.)

Insect	Host(s)	No. of Collections	Remarks
<u>Operophtera bruceata</u> (Bruce spanworm)	W, tA	19	Lightly scattered throughout the District.
<u>Orthosia hibisci</u> (a fruitworm)	W, tA	12	Low populations, widely scattered.
<u>Phyllocnistis</u> sp. (a leaf miner)	tA	2	Occasionally found in more northern parts of District.
<u>Semiothisa sexmaculata</u> (a geometer)	tL, wS, jP	20	Common throughout the District.
<u>Tetralopha asperatella</u> (a webworm)	tA	3	Occasionally found.

11.4 TREE DISEASE CONDITIONS

11.4.1 White Pocket Rot, Polyporus tomentosus:- Special surveys were continued in 1-acre plots in mixed stands of white spruce and trembling aspen at Cold Lake and Canoe Lake. The roots of five dead white spruce at each plot were examined and the results indicated that the rot was absent at Cold Lake and present in only one root sample at Canoe Lake. However, Armellaria mellea was present at both locations to a moderate degree.

11.4.2 Root and Butt Decay, Flammula alnicola:- Two recently cut-over white spruce sites were examined, one at Flotten Lake and the other 12 miles north of Green Lake. Some 100 stumps were examined at the former and 50 at the latter but infection by F. alnicola was absent.

11.4.3 Coloration of Aspen Foliage:- Small pockets of trembling aspen began to show coloration of foliage during the latter part of July. Because of the hot, dry summer it was difficult to attribute this condition to factors other than drought. Such conditions were particularly noticeable in pockets of approximately one-acre each near Paradise Hill, east of Meadow Lake and at Jackfish Lake.

## 11.4.4 Other Noteworthy Diseases:-

Host	Organism	Locality	Remarks
Trembling aspen	<u>Radulum casearium</u>	Meadow Lake	Found occasionally
White spruce	<u>Fomes pini</u>	Meadow Lake	Found occasionally
White spruce	<u>Coniophora puteana</u>	Flotten Lake	Found occasionally
Jack pine	<u>Arceuthobium americanum</u>	Throughout District	Common
Trembling aspen	<u>Fomes igniarius</u>	Throughout District	Common
White birch	<u>Fomes romentarius</u>	Throughout District	Common
Trembling aspen	<u>Hypoxylon pruinaum</u>	Throughout District	Common
Black spruce	<u>Melampsorella cerastii</u>	Throughout District	Common

12. ANNUAL DISTRICT REPORT  
WEST-CENTRAL DISTRICT OF SASKATCHEWAN

1961

by

J. B. Martin and K. L. Mortensen

CANADA DEPARTMENT OF FORESTRY  
FOREST ENTOMOLOGY LABORATORY  
WINNIPEG, MANITOBA

March, 1962

## 12.1 INTRODUCTION

Surveys to determine the abundance and distribution of forest insects and diseases were carried out from May to October in the West-Central District of Saskatchewan. A total of 127 insect and 10 disease collections were made. Insect samples were sent to the Winnipeg Laboratory and tree disease specimens to the Saskatoon Laboratory.

Phenological measurements were confined to white spruce and were obtained at Scott, Saskatoon, Lanigan and Melfort as in former years, and at Biggar, Viscount and Gronlid for the first time.

Population studies of the boxelder twig borer were continued at Macklin, Outlook, Millerdale, Vanscoy, Floral, Radisson, Ethelton, Watrous and Domremy.

## 12.2 REVIEW OF FOREST INSECT AND TREE DISEASE CONDITIONS

The most noteworthy insect development was the severe infestation of prairie tent caterpillar throughout the Pike Lake Provincial Park. The ugly-nest caterpillar was also abundant in this region as well as on sub-marginal land in the Harris-Vanscoy locale. Leaf roller populations declined and were at low levels. Other insect conditions remained much the same as in 1960.

Tree disease conditions remained static. The dryness of the season did not favour the development of the leaf blights commonly found in the West-Central District.

## 12.3 INSECT CONDITIONS

12.3.1 Forest Tent Caterpillar, Malacosoma disstria Hbn.:— A slight increase in the number of larvae was noted but no appreciable amount of defoliation occurred (Fig. 2). Collections from trembling aspen were made at Lepine, Pleasantdale, Tiger Hills, Reynaud, Kinistino, Battleford, Rockhaven and Pike Lake.

Egg band surveys were continued but negative results were obtained at all of the points examined. The location of the sampling points and other related data are shown in Table 1.

TABLE 1

Results of Forest Tent Caterpillar  
Egg-Band Sampling - 1961

West-Central District of Saskatchewan

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

Area Number and Location	Av. d.b.h. (ins.)	Av. ht. (ft.)	Av. crown depth (ft.)	Av. no. of egg bands per tree	Forecast 1962
1 Pike Lake	3	21	16	0	Nil
2 Pike Lake	3	23	18	0	Nil
3 Pike Lake	3	21	18	0	Nil
4 Pike Lake	2	20	15	0	Nil
5 Pike Lake	3	20	16	0	Nil
6 Pike Lake	3	21	16	0	Nil
7 Battleford	2	16	12	0	Nil
8 Ibstone	3	19	15	0	Nil
9 Red Pheasant	3	21	17	0	Nil
10 Borden	3	21	17	0	Nil
11 Maymont	2	20	17	0	Nil
38 Reynaud	3	26	13	0	Nil
39 Lepine	2	28	14	0	Nil
40 Pleasantdale	4	35	15	0	Nil
41 Tiger Hills	2	28	13	0	Nil
42 Fenton	3	32	15	0	Nil

12.3.2 Prairie Tent Caterpillar, Malacosoma lutescens (N. & D.):— Populations of this insect increased at numerous locations. A severe infestation persisted for the second year in the Pike Lake Provincial Park; rose and chokecherry shrubs were practically defoliated by June 15 when larvae were observed feeding on small, isolated trembling aspen trees. Smaller and less severe infestations were recorded at Harris, Biggar, Meskanaw, Humbolt and Birch Hills. Chokecherry bushes were heavily defoliated along approximately one-half mile of roadside near Hoey. In the town park at Rosetown, many of the ornamental shrubs were completely defoliated.

12.3.3 Boxelder Twig Borer Proteoteras willingana (Kft.):— The distribution of this borer remained much the same. Light populations, causing light damage to Manitoba maple in shelterbelts, again occurred over the entire area. In addition to those from permanent plots, samples were taken near Pleasantdale, Bay Trail, Plunkett, Fulda and Viscount.

Population studies were continued at permanent plots as indicated in Table 2. The results show that there was no significant change in the infestation level in 1961.

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	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
Macklin	22	17	13	285	2	321	0	222	2
Vanscoy	22	19	11	253	4	259	5	222	6
Millerdale	16	12	9	366	3	359	4	339	3
Outlook	25	19	10	233	1	219	1	160	2
Floral	18	14	9	257	9	282	16	241	12
Radisson	12	8	8	236	4	219	2	189	4
Watrous	20	14	13	623	0	635	1	603	0
Domremy	25	18	20	510	5	545	7	514	15

12.3.4 Ugly-nest Caterpillar, Archips cerasivoranus (Fitch):— Infestations were noted in association with the prairie tent caterpillar in the Harris-Vanscoy area and in Pike Lake Provincial Park. A small pocket of heavy infestation on roadside shrubs was also recorded near the Petrofka ferry, and a few nests were found around Battleford, Lepine and Hoey.

12.3.5 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.): - Larvae of this sawfly occurred in a number of white spruce shelterbelts across the northern part of the District. Defoliation generally ranged from nil to light but severe defoliation of individual shelterbelts was recorded at Enns and Reynaud. Larval collections were also taken in spruce samples at Melfort, Kinistino, St. Gregor, Scott, Blaine Lake, Rosthern, Hafford and on the Keppel Game Preserve. Larvae in association with those of the green-headed spruce sawfly, Pikonema dimmockii were found at Rosthern, the Keppel Game Preserve, Melfort and Kinistino.

12.3.6 Spiny Elm Caterpillar, Nymphalis antiopa L.: - Colonies were again widely scattered throughout the District. Population levels appeared to be about the same but increased defoliation was observed on elm trees along No. 4 Highway immediately south of Battleford. Collections were also made at Biggar, Saskatoon and Lepine.

12.3.7 Spruce Spider Mite, Oligonychus ununguis (Jac.): - The hot, dry summer favoured development of infestations throughout the West-Central District. Damage by this insect is not always immediately visible, but it apparently contributed to the poor condition of white spruce in a number of shelterbelts. Ornamental spruce at Radisson and Saskatoon were affected in this manner, while moderate infestations were recorded at Biggar, Rockhaven, Rosthern, St. Gregor and Enns. A light infestation was observed on ornamental larch at the Scott Experimental Farm.

12.3.8 Spruce Budworm, Choristoneura fumiferana (Clem): - A moderate to severe infestation occurred in a white spruce shelterbelt near Rosthern where approximately 50 mature white spruce showed up to 50 per cent defoliation of the current growth. This abandoned shelterbelt was examined on June 30 when the budworm moths were very abundant. No other collections of budworm were made in the West-Central District.

#### 12.3.9 Other Noteworthy Insects: -

Insect Species	Host(s)	No. of Coll.	Remarks
<u>Alsophila pometaria</u> (Fall cankerworm)	Elm, mM	2	Light infestations at Wynyard and Battleford
Aphid spp.	W, tA	6	Collected for Dr. Bradley, Winnipeg Laboratory
<u>Acleris variana</u> (Black-headed budworm)	wS	1	Keppel Game Preserve Not widespread, very light

## 12.3.9 Other Noteworthy Insects (cont'd.): -

Insect Species	Host(s)	No. of Coll.	Remarks
<u>Altica populi</u> (A flea beetle)	bPo	3	Light populations at St. Gregor, Reynaud and Resource
<u>Chrysomela crotchii</u> (Aspen leaf beetle)	tA	2	Light infestations around Saskatoon and Biggar
<u>Compsolechia niveopulvella</u> (A leaf roller)	tA	4	Lightly scattered in northeastern section of the District
<u>Dioryctria reniculella</u> (Spruce coneworm)	wS	1	Occasional larvae in a shelter-belt at Rosthern
<u>Disonycha quinquevittata</u> (A leaf beetle)	W	2	Mainly on willow at Battleford and Pike Lake
<u>Erannis tiliaria</u> (Linden looper)	Rose	2	Found in association with M. lutescens at Rosetown and Saskatoon
<u>Eriosoma americanum</u> (Woolly elm aphid)	wE	2	Moderate infestations at Battleford and Cutknife
<u>Itame loricaria</u> (A spanworm)	tA, W	13	Light populations scattered throughout the District
<u>Mordwilkoja vagabunda</u> (Poplar vagabond aphid)	tA	1	Small pocket of severe infestation near Ethelton
<u>Neodiprion abietis</u> (Balsam-fir sawfly)	wS	1	A few larvae in one shelterbelt at Rosthern.
<u>Oberea schaumii</u> (A wood borer)	tA	3	A few of these wood borers found at various locations in District
<u>Phenacaspis pinifoliae</u> (Pine needle scale)	wS, LP	2	Moderate infestation at Rockhaven
<u>Pristiphora erichsonii</u> (Larch sawfly)	tL	2	Moderate infestations on the few larch trees at Scott Experimental Farm on Keppel Game Preserve
<u>Tetralopha asperatella</u> (A webworm)	tA	2	Occasional larvae found at Hoey and Lanigan



#### 12.4 TREE DISEASE CONDITIONS

12.4.1 Drought Conditions:- Drought conditions with high temperatures prevailed over most of the prairie sections in 1961. As a result, the foliage of deciduous trees appeared to dry out much earlier, and premature coloration of leaves was particularly noticeable on shelterbelts of Manitoba maple. Although the amount of permanent damage could not be ascertained, it appears that some branch mortality will be evident in 1962.

12.4.2 Hypoxylon Canker of Aspen, Hypoxylon pruinaum:- These cankers are common throughout the Aspen Grove Section of the West-Central District but no change in intensity or distribution was observed in woodlots and shelterbelts.

12.4.3 Black Knot on Cherry, Dibotryon morbosum:- This disease was again abundant throughout the Pike Lake Provincial Park, Yellow Creek, Resource and Melfort areas. Heavy attacks of many years standing were also recorded at Hoey and Domremy. At Pike Lake, large clumps of chokecherry supported up to 20 knots and some branch mortality has occurred.

12.4.4 Aspen Leaf Blight, Marssonina sp.: - This leaf blight was particularly common in 1960 but it was not found in 1961. Its absence was thought to be due to high temperatures and severe drought conditions.

12.4.5 Herbicide and Weed-Spray Damage:- A survey to determine the effect of herbicide spraying on deciduous trees in woodlots and shelterbelts was conducted throughout the District. Due to drought conditions, the use of 2-4-D was curtailed to some extent and therefore only occasional and scattered damage occurred. Samples were forwarded to the Forest Pathology Laboratory in Saskatoon for further study.

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# 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

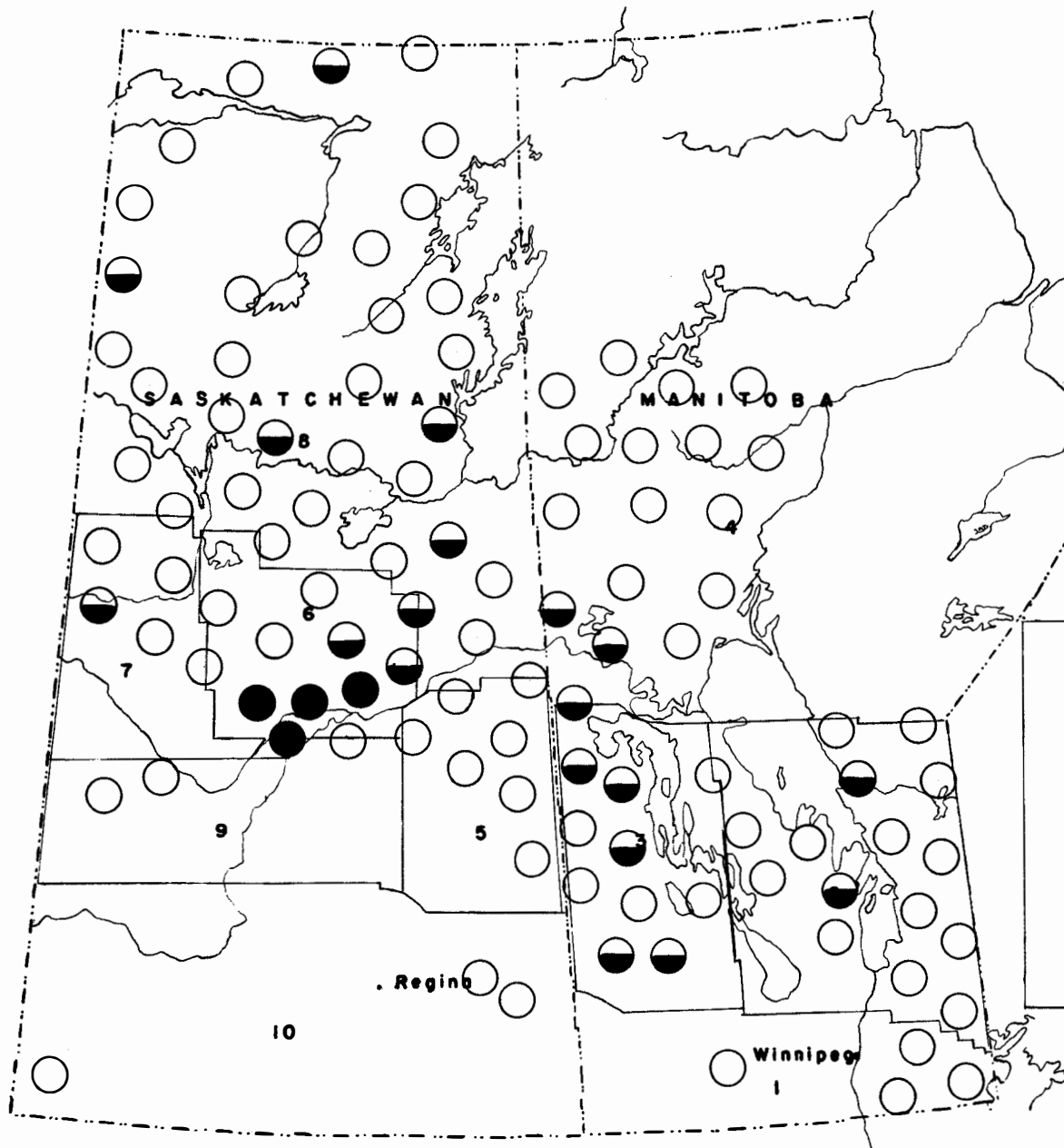


FIG. 1  
LARCH SAWFLY INFESTATIONS  
1961  
AS DETERMINED BY GROUND  
AND AERIAL SURVEYS

- Severe
- ◐ Moderate
- Light

Scale 120mi-1in.

# 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

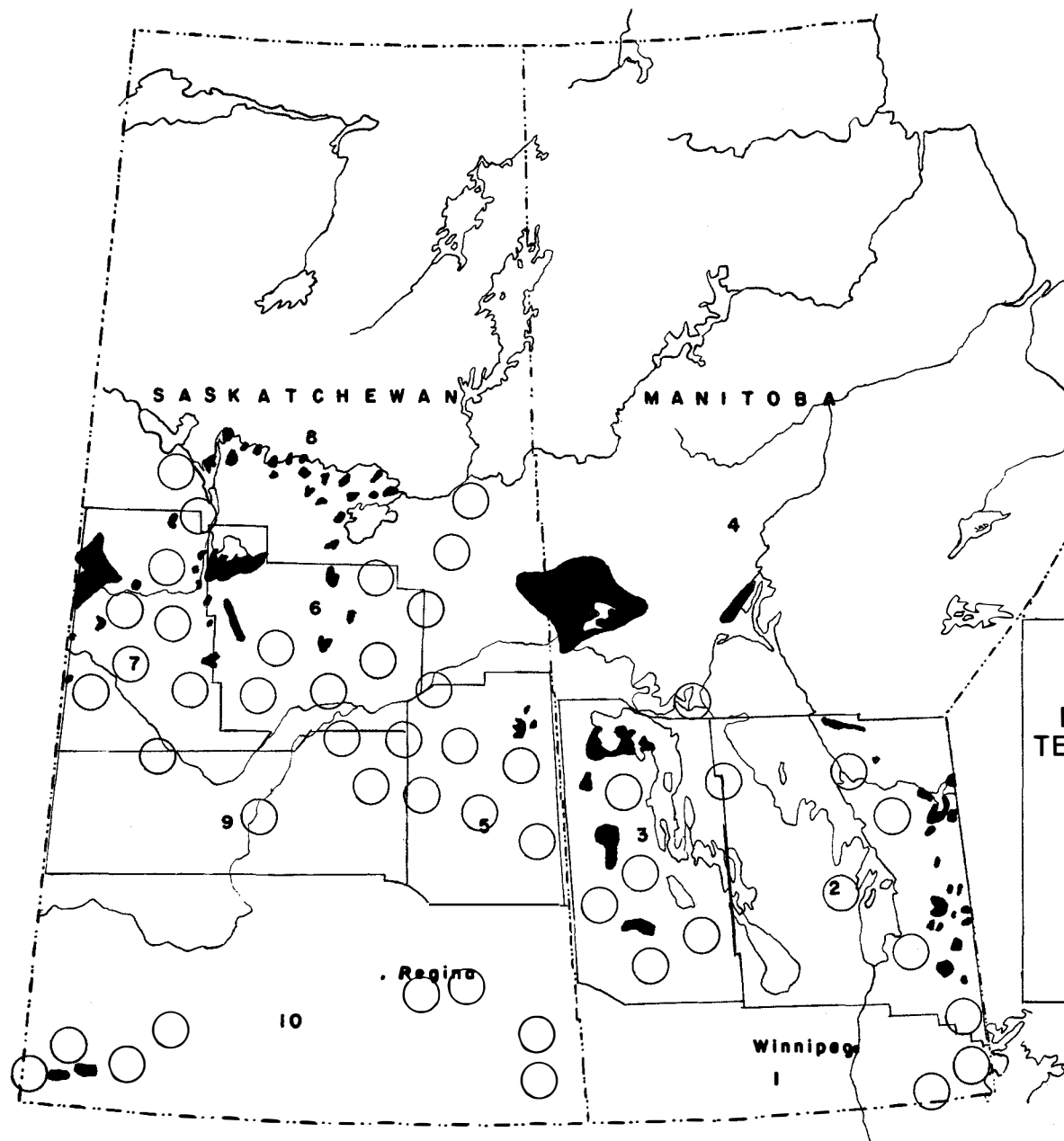


FIG. 2  
DEFOLIATION OF ASPEN BY THE FOREST  
TENT CATERPILLAR AT COLLECTION POINTS  
IN 1961

AS DETERMINED BY GROUND  
AND AERIAL SURVEYS

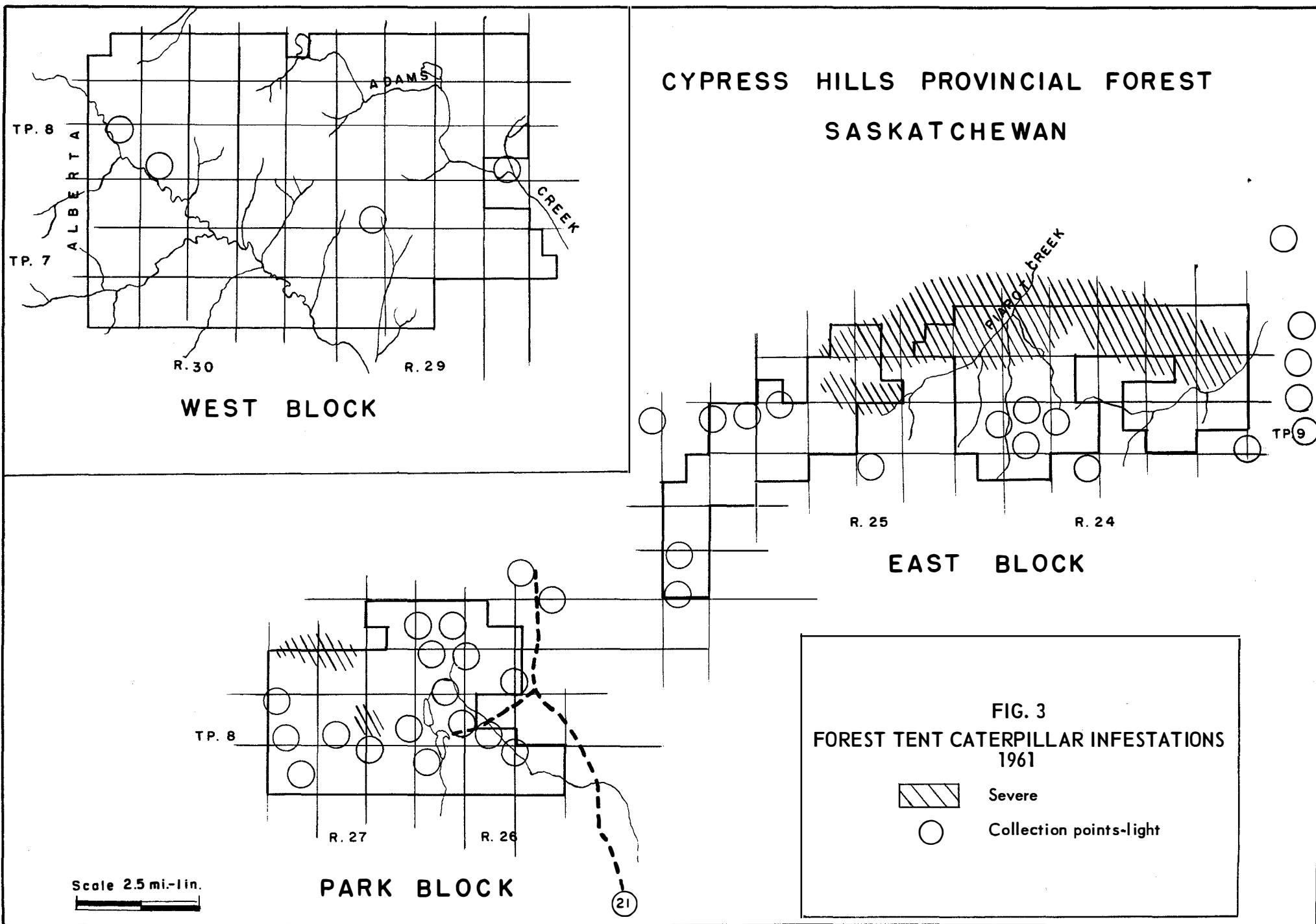


Moderate to severe



Light

Scale 120mi-1in.



# DISTRICTS

## MANITOBA

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

## SASKATCHEWAN

- 5· HUDSON BAY DISTRICT
- 6· PRINCE ALBERT DISTRICT
- 7· MEADOWLAKE DISTRICT
- 8· NORTHERN DISTRICT
- 9· WEST-CENTRAL DISTRICT
- 10· SOUTHERN DISTRICT

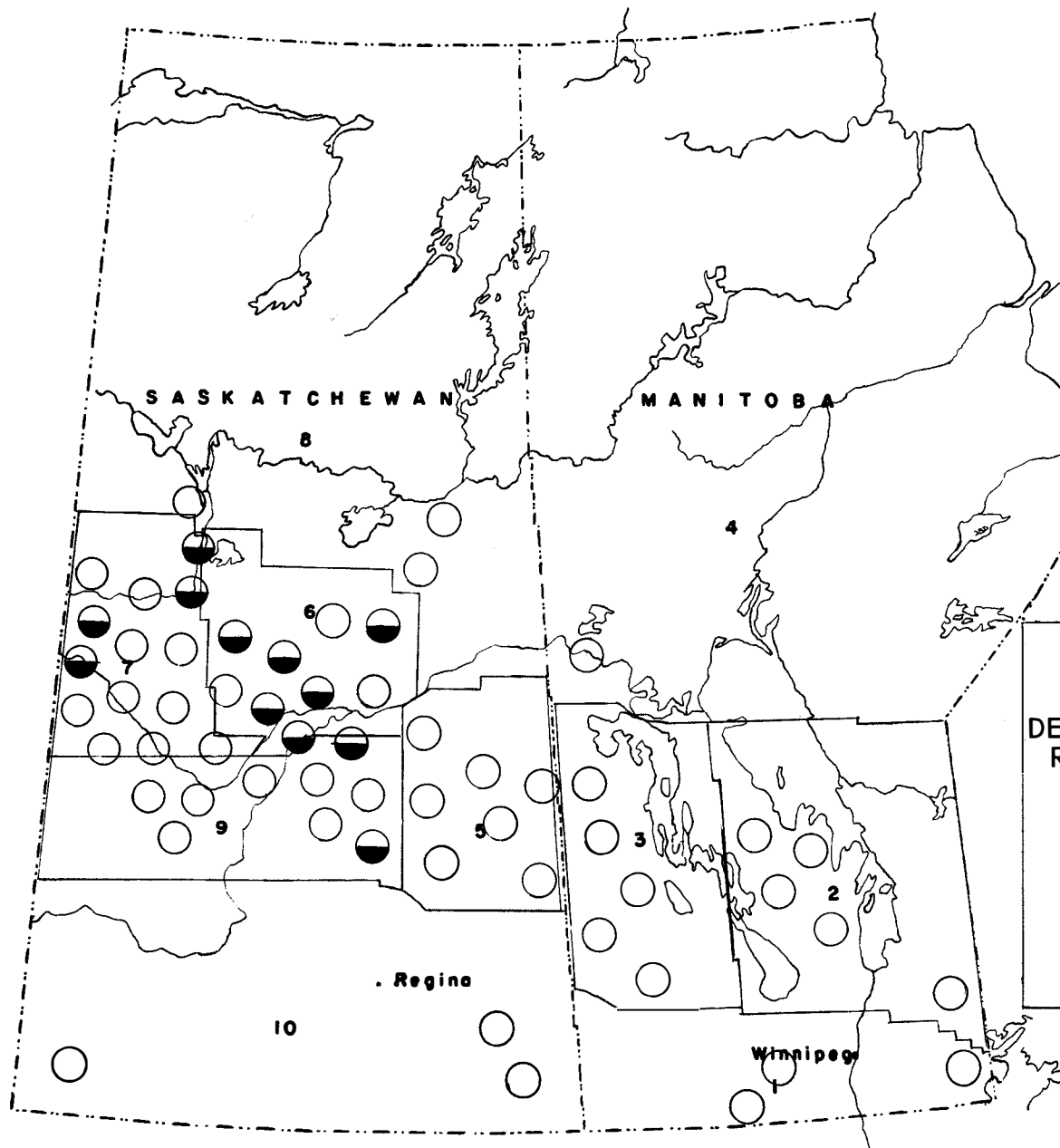


FIG. 4  
DEFOLIATION OF TREMBLING ASPEN BY LEAF  
ROLLERS AND SPECIES OF OLETHREUTIDS  
1961  
AS DETERMINED BY GROUND  
AND AERIAL SURVEYS

- Severe
- ◐ Moderate
- Light

Scale 120mi-1in.

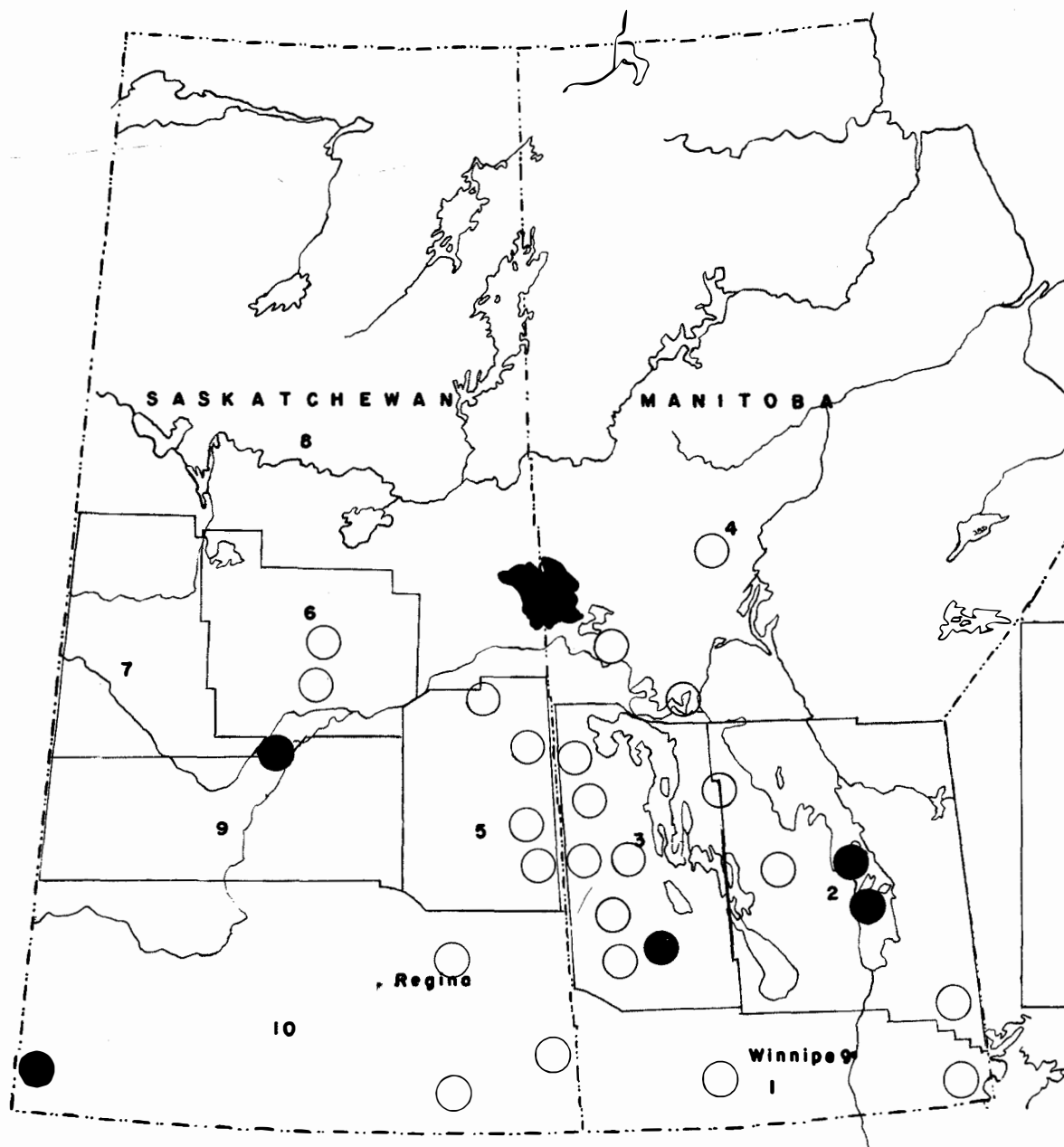
# DISTRICTS

## 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. 5**  
**SPRUCE BUDWORM INFESTATIONS**  
**1961**  
**AS DETERMINED BY GROUND**  
**AND AERIAL SURVEYS**

- Moderate - Severe
- Light

**Scale 120mi-1in.**

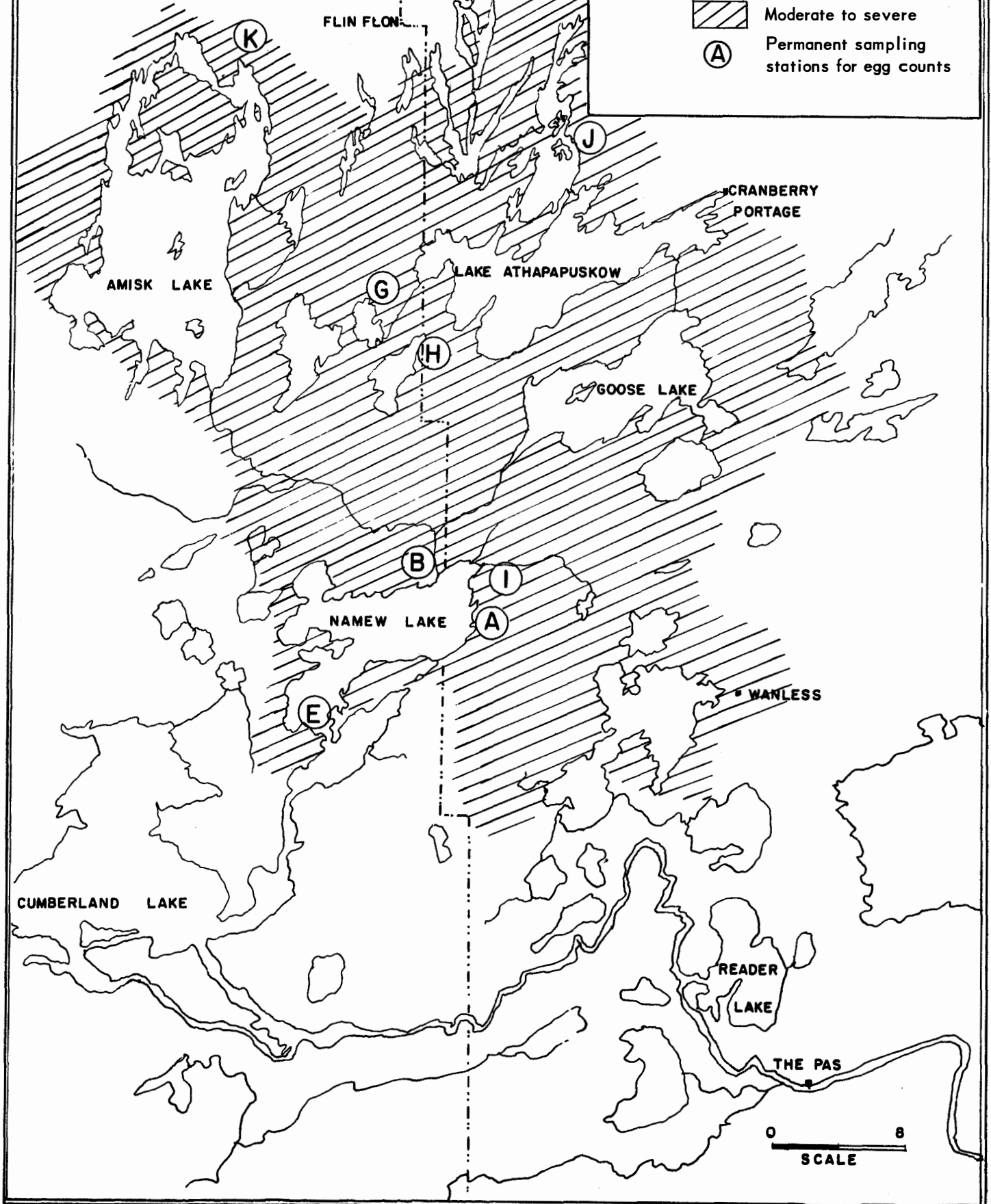
FIG. 6  
SPRUCE BUDWORM INFESTATION IN  
NORTHERN MANITOBA  
AND SASKATCHEWAN  
1961



Moderate to severe



Permanent sampling  
stations for egg counts



# 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

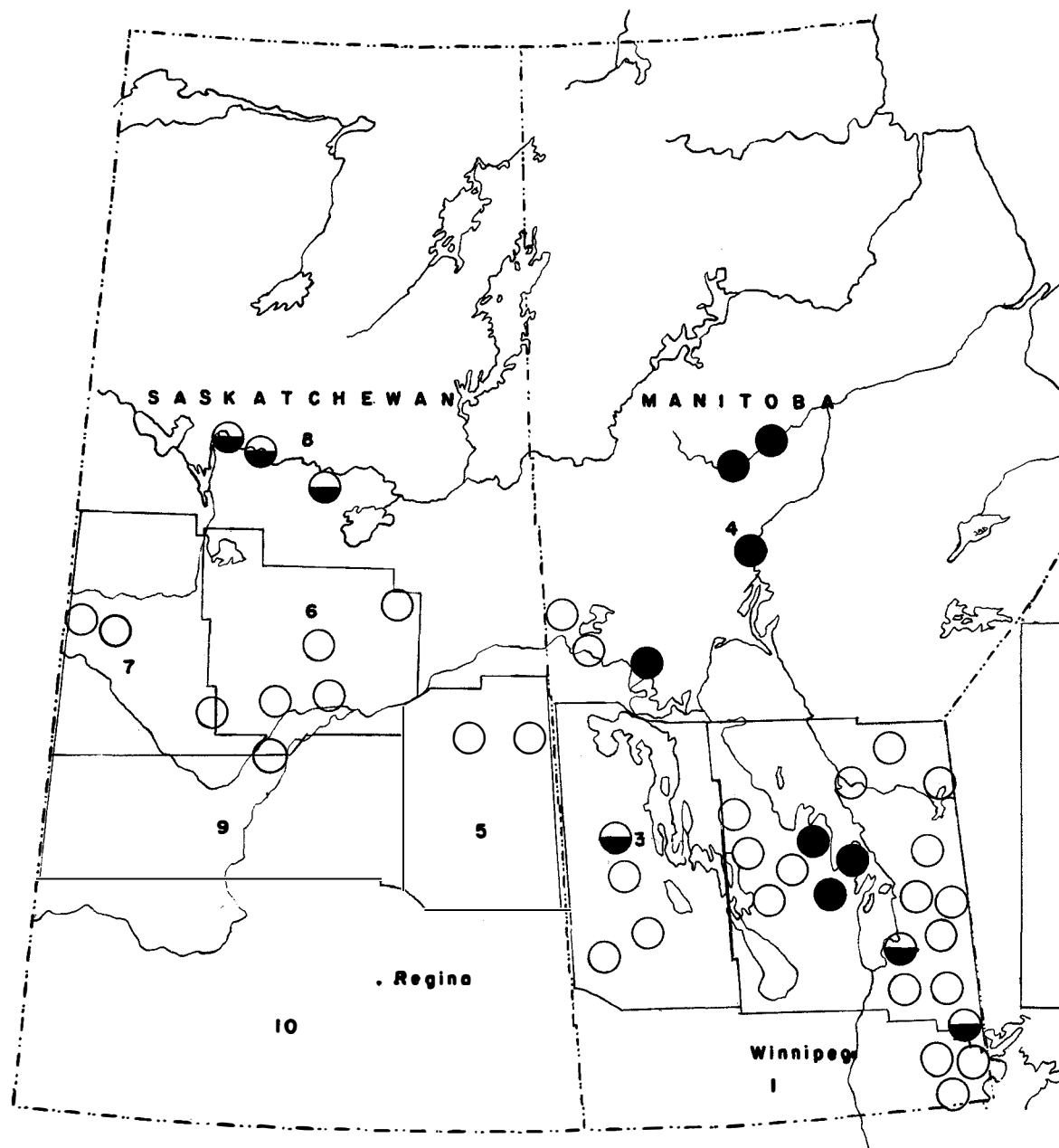


FIG. 7  
BALSAM FIR SAWFLY INFESTATIONS

1961  
AS DETERMINED BY GROUND  
AND AERIAL SURVEYS

- Severe
- ◐ Moderate
- Light

Scale 120mi-1in.



FIG. 8: Emergence holes below ground level on balsam poplar root collar attacked by borers. White line indicates ground level.

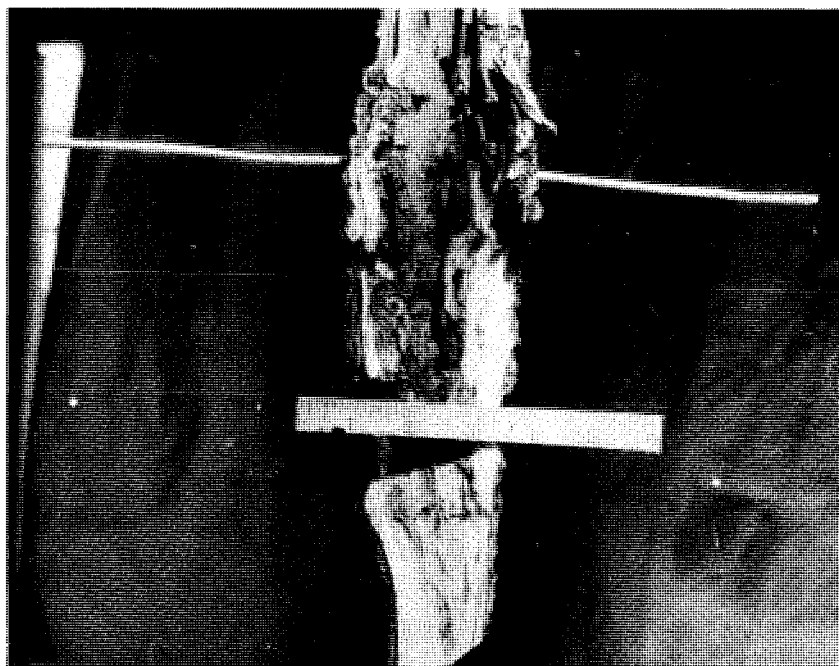


FIG. 9: Section of balsam poplar root collar showing interior damage by a wood borer, *Saperda* sp. White line indicates ground level.





FIG. 10: Jack-pine leader damage in latter stages of attack by a weevil, *Pissodes* sp.



FIG. 11: Jack-pine leader damage by a weevil, *Pissodes* sp. Leader break occurs where larva penetrates into heartwood.



FIG. 12: Ultimate larval instar of *Pissodes* sp. in the bud of Jack-pine leader.



FIG. 13: Oviposition by the Larch Sawfly on current shoots of white spruce.