

**FOREST INSECT AND DISEASE CONDITIONS IN ALBERTA, SASKATCHEWAN,
MANITOBA, AND THE NORTHWEST TERRITORIES IN 1979
AND PREDICTIONS FOR 1980**

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**INFORMATION REPORT NOR-X-225
APRIL 1980**

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ENVIRONMENT CANADA
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EDMONTON, ALBERTA, CANADA
T6H 3S5**

Hiratsuka, Y., H.F. Cerezke, and J. Petty. 1980. Forest insect and disease conditions in Alberta, Saskatchewan, Manitoba, and the Northwest Territories in 1979 and predictions for 1980. Environ. Can., Can. For. Serv., North. For. Res. Cent. Edmonton, Alberta. Inf. Rep. NOR-X-225.

ABSTRACT

No major new forest insect or disease problems developed in 1979 in the three Prairie Provinces and the Northwest Territories.

An estimated 520 000 ha of spruce and spruce-fir forests in southern Manitoba were defoliated by the spruce budworm. There were significant increased areas of infestation in Riding Mountain National Park and adjacent forested areas, including the Duck Mountain Provincial Forest.

In Saskatchewan, notable infestations of jack pine budworm recurred in the Nisbet and Torch River provincial forests and are expected to continue at a similar level in 1980. In Manitoba, the total area of jack pine forest moderately to severely defoliated by jack pine budworm in 1979 increased significantly from 1978. Most of this occurred in the southeastern part of Manitoba. A significant decrease is forecast for 1980.

The area of aspen defoliation in Alberta by the forest tent caterpillar and some other aspen defoliators was similar to that reported in 1978, and no population decline is predicted for 1980. In Saskatchewan, the area of severe outbreak of forest tent caterpillar increased markedly and now encompasses 6 800 000 ha. The main areas of infestation were in central and southern Saskatchewan, and this is expected to continue in 1980.

Infestations of the mountain pine beetle expanded significantly in 1979 over 1978. Red-topped trees now extend throughout the Crowsnest Forest from Blairmore south through Waterton Lakes National Park to the U.S. border. Several infestations were also found in Kootenay and Yoho national parks and in the Cypress Hills Provincial Park; the latter is a significant eastward extension

RESUME

Les trois provinces des Prairies et les Territoires du Nord-Ouest n'ont connu en 1979 aucun nouveau problème sérieux à cause des insectes et des maladies. On a évalué à 520 000 ha les forêts d'Épinette et d'Épinette-Sapin défoliées par la Tordeuse dans le sud du Manitoba. Il y a eu une extension sensible des régions d'infestation dans le parc national de Riding Mountain et les régions forestières adjacentes, y compris les forêts du parc provincial de Duck Mountain.

En Saskatchewan, des infestations remarquables de la Tordeuse du Pin gris ont récidivé dans les forêts provinciales Nisbet et Torch River et l'on prévoit qu'elles se poursuivront à un niveau semblable en 1980. Au Manitoba, la superficie totale de forêts de Pin gris modérément à sérieusement défoliées par la Tordeuse du Pin gris en 1979 a augmenté légèrement par rapport à 1978. Cela s'est produit surtout dans la partie sud-est du Manitoba. Une diminution significative est prévue pour 1980.

L'aire de défoliation du Tremble en Alberta par la Livrée des forêts et quelques autres défoliateurs du Tremble a été semblable à celle de 1978 et aucun déclin des populations n'est prévu pour 1980. En Saskatchewan, l'aire d'infestation grave de la Livrée des forêts s'est sensiblement étendue et elle atteint maintenant 6 800 000 ha. Les principales aires d'infestation se situaient dans le centre et le sud de la province et l'on s'attend à la même chose en 1980.

Les infestations du Dendroctone du Pin ponderosa se sont significativement étendues de 1978 à 1979. Des arbres à cimes rougies sont maintenant répandus dans toute la forêt Crowsnest, de Blairmore sud, en passant par le parc national de Waterton Lakes jusqu'à la frontière des E.U. Plusieurs infestations ont aussi eu lieu dans les parcs nation-

of the mountain pine beetle range in Alberta. Further intensification and spread of infestations are expected in 1980.

aux Kootenay et Yoho et dans le parc provincial de Cypress Hills, ce dernier constitue une extension significative vers l'est de l'aire de dispersion du Dendroctone du Pin ponderosa en Alberta. On prévoit une intensification et une dispersion des infestations en 1980.

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INTRODUCTION

The Forest Insect and Disease Survey Unit (FIDS) at the Northern Forest Research Centre is an important element of the Forestry Extension group (Head, H.J. (Harry) Johnson) and has the following responsibilities in Alberta, Saskatchewan, Manitoba, and the Northwest Territories:

1. Contribute to a national overview of important pest conditions of the region and their implications;
2. Map and evaluate important forest pest infestations in the region;
3. Provide advisory services concerning forest insect and disease problems;
4. Conduct plant quarantine related activities;
5. Conduct specific surveys of unresolved or potential problems; and
6. Provide an ornamental and shade tree pest extension service.

Staff of the Forest Insect and Disease Survey for the 1979-80 fiscal year were as follows:

H.F. (Herb) Cerezke, Entomologist
 J. (Jim) Emond, Senior Technician (Pest Extension Service)
 H. (Howy) Gates, Entomology Technician
 Y. (Yasu) Hiratsuka, Mycologist, Head FIDS
 P.J. (Paul) Maruyama, Mycology Technician
 J.C.E. (John) Melvin, Insect Taxonomy Technician
 J. (Jack) Petty, Senior Technician (Field Surveys)
 G.N. (Gary) Still, Insect/Disease Ranger
 R.C. (Craig) Tidsbury, Insect/Disease Ranger
 H.R. (Dick) Wong, Insect Taxonomist

In addition, E. (Ted) Evans worked with Yasu Hiratsuka for three months on contract to conduct a survey of pine stem rusts at Pine Ridge Forest Tree Nursery with the funds made available by the Alberta Forest Service, and D. (Diane) Szlabey was employed in January to assist Dick Wong on a temporary basis.

This report includes a summary of pest conditions in the Prairie Provinces during 1979 and provides predictions of damage levels by major pests for 1980.

SPRUCE BUDWORM

Choristoneura fumiferana (Clemens)

An estimated 520 000 ha of spruce and spruce-fir forests in Manitoba were defoliated by the spruce budworm in 1979 (Fig. 1). Most of the infestations occurred in the lower third of the province, extending from the Whiteshell Provincial Forest through the Interlake region to the south end of the Duck Mountain area and Riding Mountain National Park. Approximate areas of defoliation within this zone were: Whiteshell area—40 000 ha; east side of Lake Winnipeg—4000 ha; Interlake region—320 000 ha; Birch Island and Lake Winnipegosis area—9500 ha; Duck Mountain—5000 ha; and Riding Mountain National Park—142 000 ha. Other smaller infestations occurred in the Spruce Woods Provincial Forest, Birds Hill Provincial Park, and in northern Manitoba at Wekusko Lake.

Almost 40% of the outbreak areas were in forests of prime value; the remainder were in the agricultural zone and less valuable stands. A large portion of the defoliated forest in the Interlake region occurred in small scattered stands such as farm woodlots, many of which have now sustained several years of repeated defoliation. Some stands in this region are declining, and tree mortality attributed to repeated defoliations and drought is also evident.

Egg mass surveys conducted in several locations in the Interlake and eastern regions indicate continuation of the outbreak in 1980 at a similar intensity as in 1979. Average egg mass densities per 10 m² of foliage and predicted damage levels for 1980 are summarized in Table 1.

In Riding Mountain National Park, a cooperative study with Parks Canada was undertaken to evaluate the condition of trees and forest in several selected high-use areas such as campgrounds, the golf course, and cottage areas and at other points of high visual interest. Trees in these areas had been

PRAIRIES REGION

FOREST INSECT AND DISEASE SURVEY 1979

areas and points where
SPRUCE BUDWORM INFESTATIONS
were determined by aerial
and ground surveys
MODERATE TO SEVERE

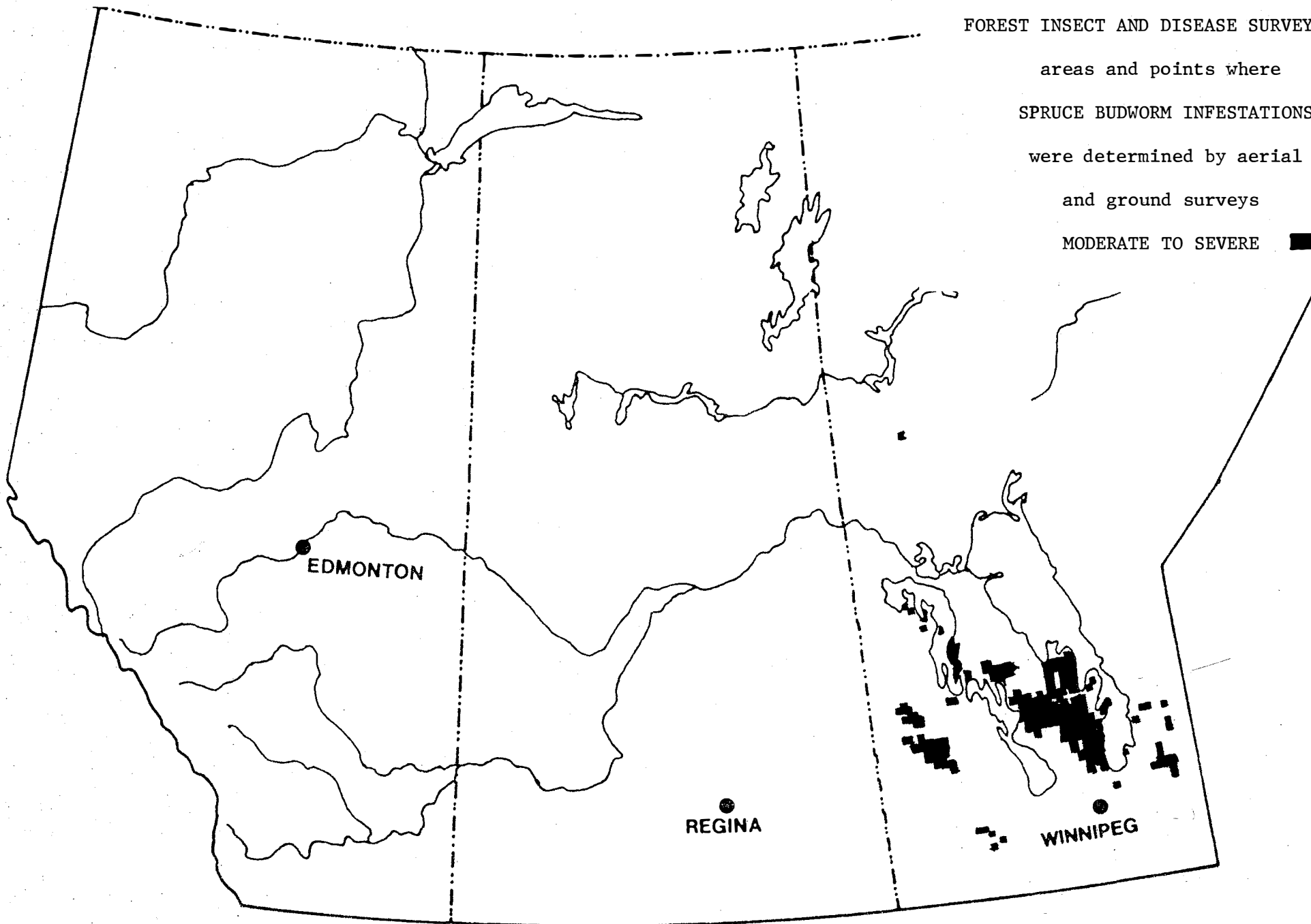


Figure 1. Areas of moderate to severe spruce budworm infestations.

Table 1. Average spruce budworm egg mass densities and 1980 predicted damage for Manitoba

Location	Egg masses per 10 m ²	1980 damage forecast
Interlake and eastern region		
Manigotogan	109	Moderate
Lac du Bonnet	254	Severe
Riverton	59	Moderate
Hodgson	543	Severe
Mantagao Lake	321	Severe
Arnes	56	Moderate
Grahamdale	311	Severe
Agricultural areas (10 locations)	158	Moderate
Birds Hill Prov. Park	870	Severe
Hecla Island Prov. Park	560	Severe
Grindstone Point Prov. Park	170	Moderate
Whiteshell Prov. Park	200	Severe
Riding Mountain National Park	1082	Severe

severely defoliated by the budworm for the second or third consecutive year. The results of this study are being reported elsewhere.

Populations of the spruce budworm were low in other regions of the Prairie Provinces and the Northwest Territories. A light infestation was noted a few kilometres south of Bertwell, Saskatchewan, and similarly, small light infestations were observed in the Athabasca Forest near Fort McMurray, Alberta, and near Little Buffalo Falls, Northwest Territories. Light to moderate defoliation occurred at one or two locations along the river valley in the city of Edmonton.

JACK PINE BUDWORM

Choristoneura pinus pinus Freeman

The total estimated area of jack pine forest in Manitoba that was moderately to severely defoliated by jack pine budworm in 1979 was 500 000 ha, an increase over that reported in 1978 (Fig. 2). Most of this (about 470 000 ha) occurred in the southern corner of the province from north of the Wanipigow River south into Whiteshell Provincial Park.

This was the second year of heavy defoliation for much of the area.

Other areas of moderate to severe defoliation occurred in the Bélair Provincial Forest and Grand Beach Provincial Park (about 7000 ha); near Libau (less than 1000 ha); at scattered locations in the Agassiz Provincial Forest (about 5000 ha); in the northern portion of the Sandilands Provincial Forest (3000 ha); on the east side of Lake St. Martin (12 000 ha), and north and west of Gypsumville (9000 ha). Other infestations of undetermined size occurred near Grand Rapids, east of Hodgson, and in pine plantations of the Spruce Woods Provincial Forest.

In Saskatchewan, notable jack pine budworm infestations recurred in the Nisbet and Torch River provincial forests (Fig. 2). There was generally light to moderate defoliation in both areas, although a few small locations west of Prince Albert sustained heavier defoliation. Considerable top-kill and some tree mortality has occurred in the Nisbet Forest, primarily as a result of annual defoliations since 1977.

FOREST INSECT AND DISEASE SURVEY 1979

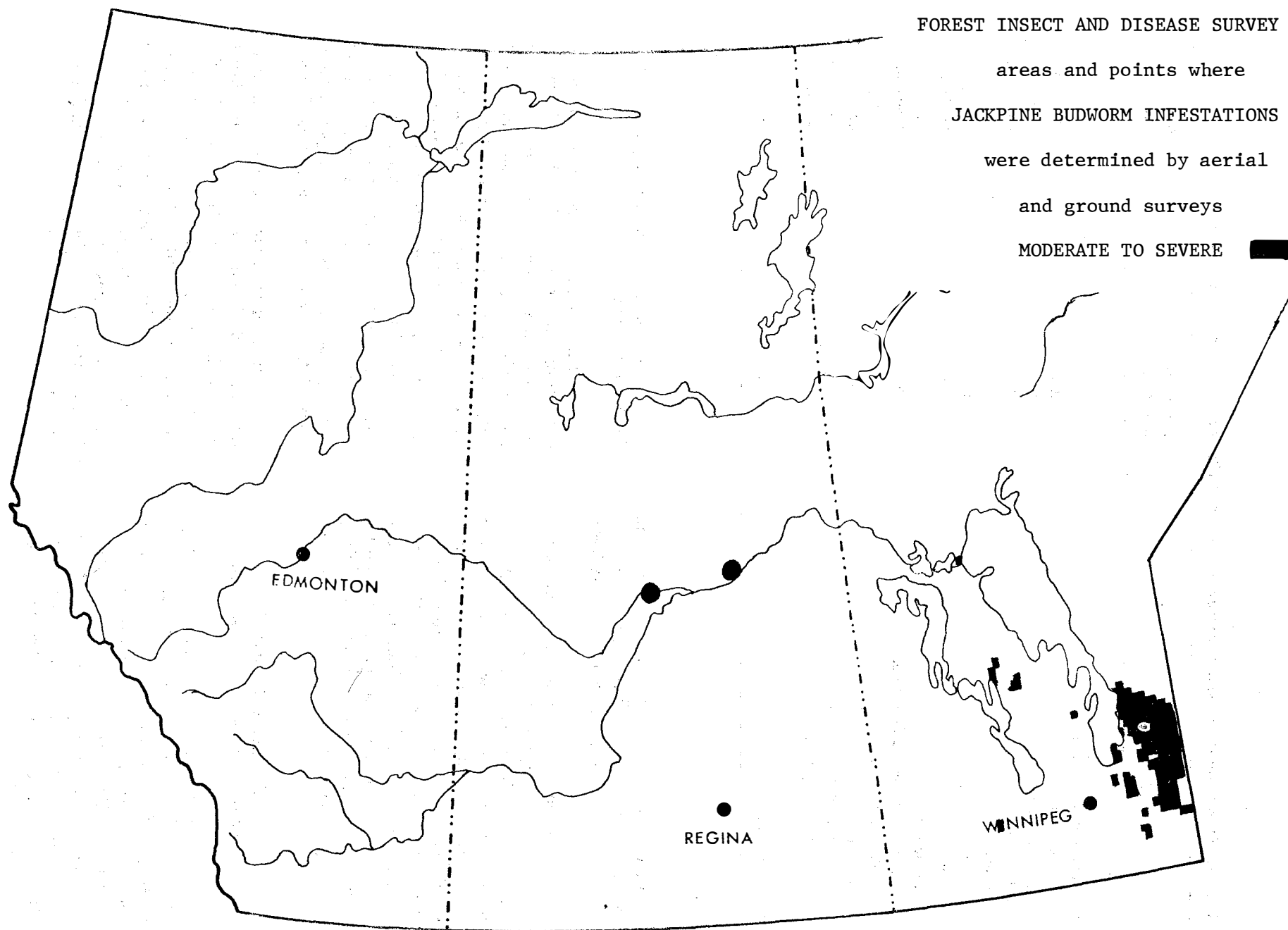


Figure 2. Areas of moderate to severe jack pine budworm infestations.

Surveys of jack pine budworm egg masses were conducted at selected locations in both provinces to forecast expected defoliation levels in 1980. Table 2 summarizes the results. Infestation levels in the Nisbet and Torch River forests are expected to be much the same as in 1979, while a general decrease is forecast for several locations in Manitoba.

ASPEN DEFOLIATORS

Aerial surveys were the principal means used to record defoliation of aspen throughout central Alberta and Saskatchewan (Fig. 3), hence the causal organism(s) was not always determined. Where possible, ground observations were made to identify the cause of damage. Indications from 1978 surveys that aspen defoliators would not be a problem in Manitoba in 1979 prompted a curtailment of surveys specifically for these insects. This decision appeared to be justified, since only one report of moderate to severe defoliation was recorded, namely in Turtle Mountain Provincial Park.

The forest tent caterpillar (*Malacosoma disstria* Hübner) was the primary pest in most of the area. Although the large aspen tortrix (*Choristoneura conflictana* (F. Walker)), Bruce spanworm (*Operophtera bruceata* (Hulst)), and aspen leaf roller (*Pseudexentera oregonana* (Walsingham)) were associated with the forest tent caterpillar in many areas, they were also the primary cause of defoliation in a number of locations.

The areas of defoliation in Alberta were similar to those reported in 1978. Two extensive and a number of smaller outbreaks were identified in central Alberta. The larger outbreaks occurred north and south of the Swan Hills, where 2 900 000 and 2 400 000 ha, respectively, were defoliated. The northern outbreak extended from the Swan Hills, Calling Lake, and Sunset House north and west to Hotchkiss and Clear Hills to the British Columbia border. The southern outbreak occurred within the zone bounded by Fort Assiniboine, Whitecourt, Edson, Rocky Mountain House, Lacombe, Busby, and back to Fort Assiniboine. Smaller infestations of 150 000 to 300 000 ha were recorded north-east of Peerless Lake, near Valleyview, in the

Saddle Hills, and south of Grande Prairie. Numerous other small, localized infestations were scattered between the large outbreaks, throughout central Alberta and west of Calgary.

Bruce spanworm was the dominant species in the Saddle Hills, south of Grande Prairie, in the Obed-Hinton area, and west of Calgary. The aspen leaf roller was dominant southeast of Edmonton. The forest tent caterpillar caused most of the defoliation in the area south of the Swan Hills and in the southern part of the area north of the Swan Hills, giving way to the large aspen tortrix in the northern part.

Low populations of the forest tent caterpillar were recorded in Lethbridge and Calgary and in aspen bluffs in eastern Alberta.

In Saskatchewan, the outbreak of the forest tent caterpillar increased markedly. The most extensive infestation, which in 1978 was centered west and south of Prince Albert National Park in the Delaronde-Green-Witcheakan-Paddling lakes area, expanded to encompass 5 200 000 ha. Moderate to severe defoliation was recorded throughout the southern half of Prince Albert National Park, east and south to Meath Park, Kinistino, Middle Lake, and Delisle, northwest to Jackfish, Turtle, and Loon lakes and Meadow Lake Provincial Park, and north as far as Keeley Lake, La Plonge, and Emmeline Lake. Populations were very high in Prince Albert and Saskatoon. Another area of 1 100 000 ha moderately to severely defoliated was west of Lac la Ronge Provincial Park to Pinehouse, Knee, and Cup lakes and north to Otter, McTavish, and Thompson lakes. Smaller outbreaks occurred south of Lac la Loche, between Primrose Lake and Meadow Lake Provincial Park, in the Beaver Hills south of Sheho, and near Wroxton.

Egg band surveys in Saskatoon and Prince Albert and surrounding areas indicate a recurrence of the forest tent caterpillar in 1980 similar to 1979. Egg band counts in Cypress Hills Provincial Park indicate a declining population.

The large aspen tortrix was responsible for severe defoliation in the southern

FOREST INSECT AND DISEASE SURVEY 1979

areas and points where

DEFOLIATION OF TREMBLING ASPEN BY

FOREST TENT CATERPILLAR

LARGE ASPEN TORTRIX

BRUCE SPANWORM

were determined by aerial

and ground surveys

MODERATE TO SEVERE

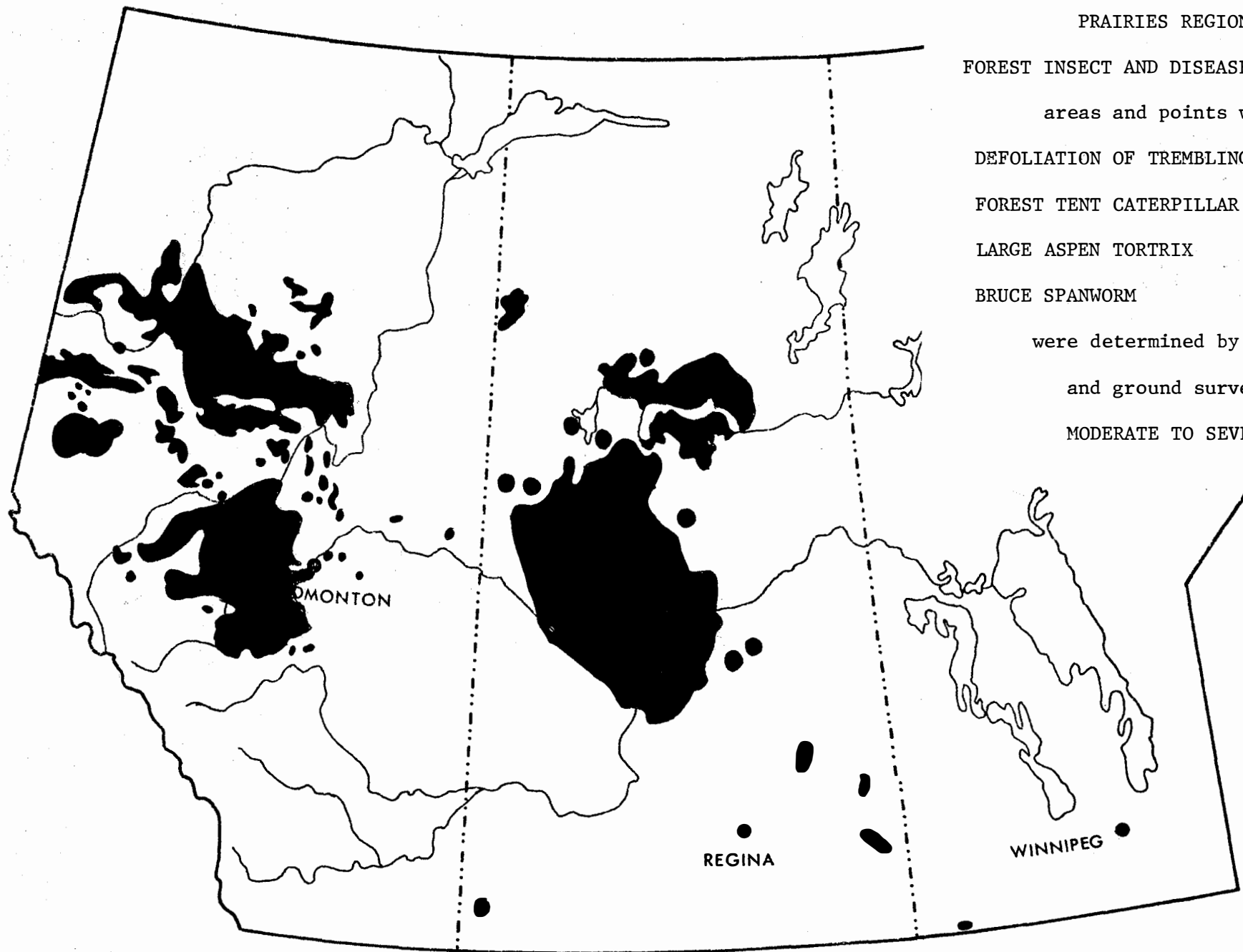


Figure 3. Areas of moderate to severe defoliation of trembling aspen by forest tent caterpillar, large aspen tortrix, and Bruce spanworm.

Table 2. Results of 1979 jack pine budworm egg mass surveys in Manitoba and Saskatchewan and 1980 forecast

Location	Egg masses per 10 m ² of foliage	1980 forecast
MANITOBA		
Bissett	17	Light
Manigotogan	26	Light
Lac du Bonnet	7	Light
Bélair Prov. Forest	43	Light
Hodgson	27	Light
Lee Lake	146	Moderate-Severe
Gypsumville	44	Light
SASKATCHEWAN		
Nisbet Prov. Forest	66	Moderate
Torch River Prov. Forest	62	Moderate

part of the Beaver Hills and between White-wood and Moosomin.

MOUNTAIN PINE BEETLE

Dendroctonus ponderosae Hopkins

The number of red-topped trees increased significantly in 1979 over that recorded in 1978. Infestations now occur throughout the southern part of the Crowsnest Forest, Kootenay, Yoho, and Waterton Lakes national parks and in pine stands along the eastern border of Waterton Lakes Park (Fig. 4). The discovery of five trees infested with mountain pine beetle in Cypress Hills Provincial Park constitutes a new record and an extension of its range in Alberta.

In the Crowsnest Forest, beetle-attacked trees were most numerous in mature stands of lodgepole pine along the drainages of the West Castle and South Castle rivers, around Beaver Mines Lake, on the lower slopes of Syncline Mountain, and along Gardiner Creek. Fewer attacked trees were sighted in the Lynx Creek campground area and along the south-facing slopes of the Blairmore Range, Carbondale Hill, and Mount

Backus. Infestations were also present along Mill and Gladstone creeks and in the valleys of tributaries draining to the Waterton River. The area east of Waterton Lakes National Park, known as Makowan Butte, had numerous small patches of beetle-killed trees. On the west side of Blairmore, five infested trees were recorded, which appears to be the most northern extension of current outbreak.

Based upon numbers of new attacked trees in 1979, the outbreak is expected to expand considerably in 1980.

Mountain pine beetle infestations in Waterton Lakes National Park were extensive throughout the park. Most beetle-killed trees occur above the Waterton Park townsite, along both sides of Waterton Lake, and in the valleys at the west side of the park. In Kootenay National Park, groups of dead trees were seen along the lower end of the Kootenay valley from Pitts Creek south to the park boundary. Light infestations in Yoho National Park occur near Leancoil, along the Otterhead River near its confluence with the Kicking Horse River, and on the lower slopes of Mount Burgess across the valley from Field.

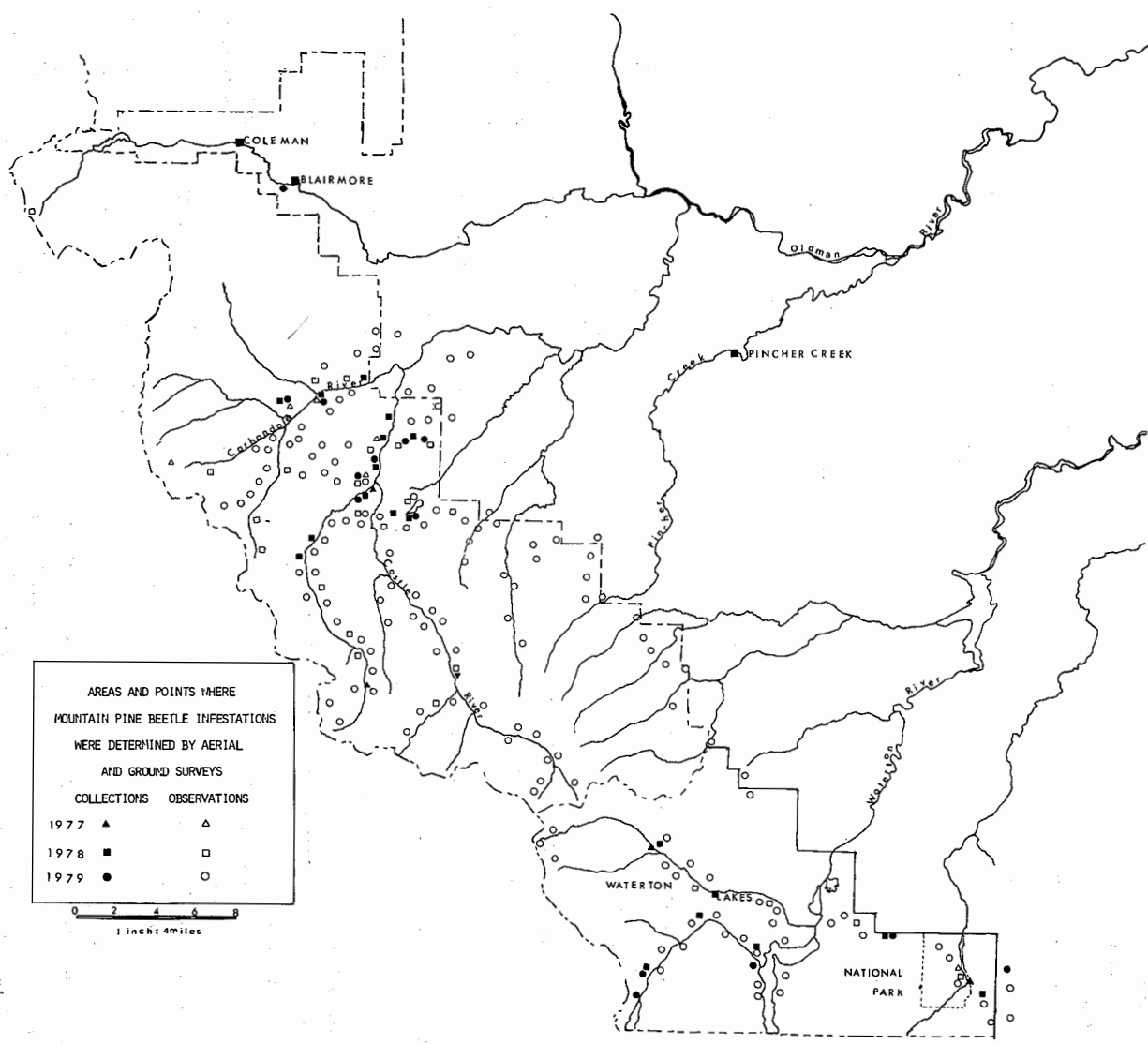


Figure 4. Areas of mountain pine beetle infestations.

SPRUCE CONE INSECTS AND RUST DISEASE

White spruce cones received from two locations in the Grande Prairie Forest district were examined for seed and cone insects and the spruce cone rust, *Chrysomyxa pirolata* Winter. In 300 cones examined from each location, eight different insect species were associated with the cones. The incidence of damaged cones was relatively low due to the heavy cone crops and was 20.7% and 10.3%, respectively, for the two locations. The most damaging species were the spiral cone borer, *Hylemya anthracina* Czerny, which attacked 11.3% and 3.7% of the cones, and the spruce seed moth, *Laspeyresia youngana* (Kearfott), which damaged 2.7% and 0.7% of the cones. Estimated seed losses due to all insects were 5-6% and 1-2% for the two locations.

A mid-July sample of 200 cones from each location indicated 23.5% and 5.5% of cones severely infected by *C. pirolata*. Seed losses from this rust are unknown but likely were higher than that due to insects in 1979.

DUTCH ELM DISEASE

Ceratocystis ulmi (Buisman) C. Moreau

According to surveys conducted by the Manitoba Department of Agriculture and Manitoba Department of Mines, Natural Resources and Environment, Dutch elm disease continued to extend its range in southern Manitoba in 1979. New detected areas of infestation occurred near the town of St. Adolphe, in the town of Ste. Anne, and near St. Eustache, west of Winnipeg. The most significant extension of the disease was a single infected tree at Minnedosa, northwest of Winnipeg. The location is 55 km from the nearest previously infested area at Brandon.

Surveys in Saskatchewan were conducted mainly by the staff of Saskatchewan Agriculture and the PFRA Tree Nursery in most of the major urban centers and farm shelterbelts, but so far the disease has not been detected. Native elm bark beetles were collected in a few new locations in Saskatchewan.

No elm bark beetle or Dutch elm disease were detected in Alberta in 1979. This province has designated both the native and smaller European elm bark beetles and the disease organism as pests under The Agriculture Pest Act of Alberta.

PINE STEM RUSTS IN TREE NURSERIES

Pine stem rusts, especially the autoecious western gall rust (*Endocronartium harknessii* (J.P. Moore) Y. Hiratsuka), are considered to be important in bare-root seedling production in nurseries that are surrounded by native hard pines.

In one bed in the Pineland Tree Nursery, Hadashville, Manitoba, about 3% of 2-0 seedlings were found to be infected with the western gall rust. Sanitary action to eliminate jack pine trees next to the bed has been recommended.

A survey of 2-0 lodgepole pine seedlings was conducted at the Pine Ridge Tree Nursery, Smoky Lake, Alberta. Of more than 6000 seedlings examined, 67 (1.13%) were infected with comandra blister rust (*Cronartium comandrae* Peck), and only 2 (0.03%) were found to be infected with western gall rust. This level of infection is acceptable, and most of the infected seedlings can be culled during sorting. Further examination of lifted stock for pine stem rusts and a survey of alternate hosts of comandra blister rust in and around the nursery is planned for 1980.

WOODBORERS

Concern about woodborers and their damage varies from year to year and most often is associated with salvage of fire-killed timber. Large forest fires that occurred near Montreal Lake and in Nipawin Provincial Park, Saskatchewan, in the spring of 1977 created ideal breeding conditions for the white-spotted sawyer beetle, (*Monochamus scutellatus* (Say)). Extensive grading due to worm holes was evident in spruce and jack pine sawlogs in 1978 and 1979. Losses were also reported in salvaged rail and fence post material.

A stand of merchantable white spruce that sustained scorching around the lower stems and root bases is being monitored to relate the degree of injury to time of death and subsequent risk of woodborer damage. A final survey will be made in 1980.

Other woodborer species confirmed in the region included the poplar borer (*Saperda calcarata* Say) in aspen in shelterbelt and campground sites and the carpenterworm (*Prinoxystus robiniae* (Peck)) in American elm, green ash, and poplar shade trees.

NEEDLE MINER

Coleotechnites starki (Freeman)

High populations of lodgepole needle miner in Alberta caused notable discoloration and needle drop of lodgepole pine along the Vermilion River valley between the Paint Pots and Floe Creek in Kootenay National Park. In the Bow River valley in Banff National Park, populations have persisted for many years and caused moderate discoloration on the lower slopes of Mount Norquay. Low populations were also present around Two Jack Lake and on the lower slopes of Mount Eisenhower and Protection Mountain.

SCLERODERRIS CANKER

Gremmeniella abietina (Lagerberg) Morelet

The only known distribution of this disease in the region is in Alberta in an area in Jasper National Park near Maligne Lake, where it was first reported in 1974. The disease mainly has been found sporadically on small suppressed trees distributed over an area of 1800 ha. Isolates of the fungus from Alberta have been examined by Dr. C.E. Dorworth of the Great Lakes Forest Research Centre, Sault Ste. Marie, and were found to

be serologically related to the common North American race rather than to the virulent European race recently found in Quebec, Newfoundland, New York, and Vermont.

DWARF MISTLETOE IN JACK PINE

Arceuthobium americanum Nuttall ex Engelmann

Aerial surveys were conducted jointly with the Alberta Forest Service over some 1 900 000 ha of forests in northeastern Alberta to map areas of jack pine with heavy brooming caused by dwarf mistletoe. The area surveyed extends north from the Clearwater River to Lake Athabasca and between the Athabasca River and the Alberta-Saskatchewan border. Flight lines were flown approximately every 10 km at an altitude of 240 to 460 m above ground. Brooming was sighted as far south as Township 91 and increased in frequency northward to Lake Athabasca, occurring almost continuously north of Township 102. A similar survey conducted in 1978 indicated brooming was also extensive and severe on the west side of the Athabasca River near Lake Claire. Ground observations at several locations indicate heavily infected stands are in various stages of decadence and stand succession and are characterized by multiple stem deformities.

LARCH SAWFLY

Pristiphora ericksonii (Hartig)

Light to severe defoliation by the larch sawfly occurred in tamarack stands in the Marlboro-Obed area in west central Alberta and along the highway between Fort Smith and Little Buffalo Falls in the Northwest Territories. Very low populations were present along the Miette Road in Jasper National Park.

OTHER NOTEWORTHY INSECTS AND DISEASES

Insects or diseases	Location	Hosts	Remarks
Spruce gall aphids <i>Adelges cooleyi</i> (Gillette) <i>Pineus similis</i> (Gillette) <i>Pineus pinifoliae</i> (Fitch)	All areas	Spruce	Common on both mature and small ornamental plantings.
Pear sawfly <i>Caliroa cerasi</i> (Linnaeus)	Urban centers	Cotoneaster Mountain-ash Apple	Often found on ornamental trees and shrubs.
Chemical injury	All areas	All species	Caused by misuse and abuse of agricultural chemicals (herbicides, soil sterilants, etc.). An increasing problem in urban centers.
<i>Cladosporium gallicola</i> Sutton	Central Alberta	Western gall rust on lodgepole pine and jack pine	Recognized for the first time as an aggressive hyper-parasite. Tsuneda and Hiratsuka, Can. J. Plant Pathol. 1:31-36, 1979.
Western gall rust <i>Endocronartium harknessii</i> (J.P. Moore) Y. Hiratsuka	All areas	Lodgepole pine Jack pine	Recognized as the most important disease problem in man-made and man-assisted hard pine forests. Fairly common on small native ornamentals.
Fire blight <i>Erwinia amylovora</i> (Burrill) Winslow <i>et al.</i>	Major urban centers	Apple Cotoneaster Crab apple Hawthorn Mountain-ash Pear, etc.	Very common and the most important ornamental tree disease in urban and rural centers. The Province of Alberta designated the disease a "pest" under The Agriculture Pest Act.

OTHER NOTEWORTHY INSECTS AND DISEASES, continued

Insects or diseases	Location	Hosts	Remarks
Birch leaf miners <i>Fenusa pusilla</i> (Lepeletier) <i>Heterarthrus nemoratus</i> (Fallen) <i>Profenusa thomsoni</i> (Konow)	Urban centers	Birch spp.	High population of birch leaf miners in most of the major urban centers.
Lilac leaf miner <i>Gracillaria syringella</i> (Fabricius)	Urban centers	Lilac	Common in major urban centers. A slight decrease over that reported in 1978.
Spruce spider mite <i>Oligonychus ununguis</i> (Jacot)		Spruce Juniper Cedar	Very common and causes significant damage on ornamental trees and shrubs.
White pine weevil <i>Pissodes terminalis</i> Hopping	Foothills	Spruce Pine	Common in thinned or planted stands.
<i>Scytalidium uredinicola</i> Kuhlman <i>et al.</i>	Central Alberta	Western gall rust on lodgepole pine	Found for the first time in Canada. An active hyperparasite of western gall rust. Hiratsuka <i>et al.</i> Plant Dis. Rep. 63:512-513, 1979.
Silver leaf <i>Stereum purpureum</i> (Persoon) Fries (≡ <i>Condrostereum p.</i>)	Urban centers	Mountain-ash Apple Cotoneaster Misc. spp.	A noticeable increase of infections in all urban areas of the province.
Two-spotted spider mite <i>Tetranychus urticae</i> Koch	Urban centers	Elder Misc. spp.	Commonly found on elder in late August and early September.

OTHER NOTEWORTHY INSECTS AND DISEASES, continued

Insects or diseases	Location	Hosts	Remarks
Transplant injury	All areas	All species	A significant problem of newly planted trees in nurseries and urban areas. Improper planting practice and poor quality planting stock are the main cause.
Winter drying and frost damage	Across the region	All species	Above average incidence of the damage in 1979 can be attributed to low winter precipitation and adverse temperature fluctuations in the spring.

ACKNOWLEDGMENTS

We would like to acknowledge the assistance and cooperation of many individuals from the following agencies:

- Alberta Forest Service
- Alberta Agriculture
- City of Edmonton
- Department of Northern Saskatchewan
- Saskatchewan Department of Tourism and Renewable Resources

- Saskatchewan Agriculture
- City of Prince Albert
- City of Saskatoon
- Manitoba Department of Mines, Natural Resources and Environment
- Manitoba Agriculture

Also, aircraft time was provided by the Alberta Forest Service, Manitoba Department of Mines, Natural Resources and Environment, Parks Canada, and Department of Northern Saskatchewan.