



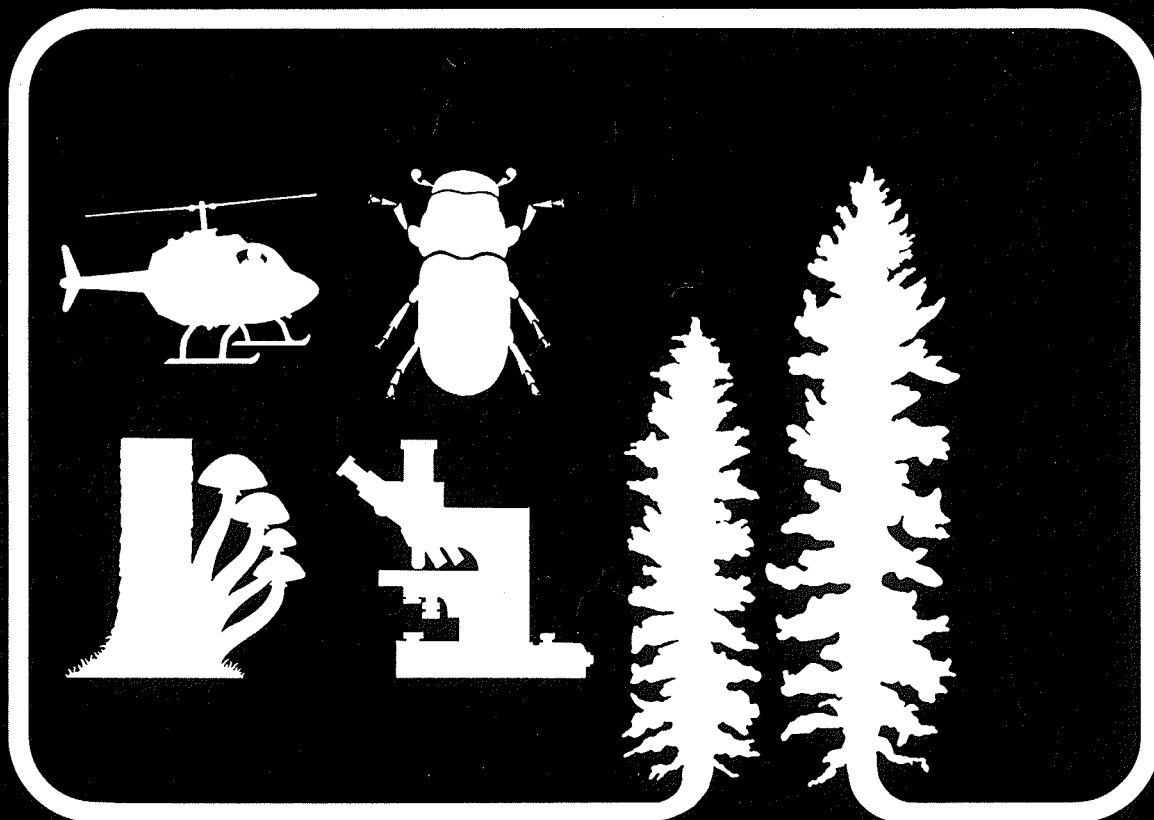
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Forest insect and disease conditions in Alberta, Saskatchewan, Manitoba, and the Northwest Territories in 1980 and predictions for 1981



Y. Hiratsuka, H.F. Cerezke, J. Petty, and G.N. Still

**FOREST INSECT AND DISEASE CONDITIONS IN ALBERTA, SASKATCHEWAN,
MANITOBA, AND THE NORTHWEST TERRITORIES IN 1980
AND PREDICTIONS FOR 1981**

Y. HIRATSUKA, H.F. CEREZKE, J. PETTY, and G.N. STILL

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ABSTRACT

No major or significant forest insect or disease problems developed in the prairie provinces and Northwest Territories in 1980. There was, however, a significantly increased area of infestation by the mountain pine beetle in the southern parts of Alberta and Saskatchewan. The total affected area is estimated to be 70 km², and the infestation is expected to increase in 1981.

Spruce budworm populations in Manitoba generally declined in 1980. No significant defoliation was detected in the Duck Mountain, Spruce Woods, and Birds Hill provincial parks areas and west of Lake Winnipegosis. Populations virtually collapsed in Riding Mountain National Park but remained approximately the same in the Belair Provincial Forest, along Highway 304 at Sandy River and the Wanipigow Lake area, and at Wekusko Lake. In the Northwest Territories, two small areas (less than 2 km² each) of spruce budworm infestations were observed in the Slave River area. It is predicted that in 1981 the damage in the region generally will be about the same as in 1980.

In Saskatchewan and Manitoba jack pine budworm populations almost totally collapsed in 1980. No significant defoliation is anticipated in 1981.

In Alberta in 1980, aspen defoliation by the forest tent caterpillar and associated aspen defoliators increased to cover 75 000 km², and a similar level of infestation is expected for 1981. In Saskatchewan, trembling aspen stands covering 128 000 km² were affected by moderate to severe forest tent caterpillar defoliation. A general population decline is indicated for 1981 in west-central Saskatchewan, but continued high populations are expected in the eastern and extreme western parts of the province. Forest tent caterpillar defoliation in Manitoba

RESUME

En 1980 les insectes ou les maladies n'ont suscité aucun problème sérieux ou important dans les provinces des Prairies et les Territoires du Nord-Ouest. Toutefois, l'aire d'infestation du Dendroctone du Pin ponderosa s'est considérablement accrue dans le sud de l'Alberta et de la Saskatchewan. On estime à 7000 ha la superficie totale ainsi affectée et l'on prévoit une aggravation de l'infestation en 1980.

Les populations de la Tordeuse des bourgeons de l'Épinette au Manitoba ont diminué en 1980. Aucune défoliation significative n'a été enregistrée dans les parcs provinciaux Duck Mountain, Spruce Woods et Birds Hill ainsi que dans les régions situées à l'ouest du lac Winnipegosis. Ces populations ont virtuellement fléchi dans le parc national du mont Riding mais sont demeurées à peu près constantes dans la forêt provinciale Belair, le long de l'autoroute 304 à la rivière Sandy et dans la région du lac Wanipigow ainsi qu'au lac Wekusko. Dans les Territoires du Nord-Ouest deux petites aires (moins de 200 ha chacune) d'infestation de la Tordeuse des bourgeons de l'Épinette ont été observées dans la région de la rivière des Esclaves. Il est prévu que, d'une manière générale, les dégâts de cet insecte dans la région seront en 1981 à peu près les mêmes qu'en 1980.

Dans la Saskatchewan et le Manitoba il y a eu chute totale des populations de la Tordeuse du Pin gris en 1980. Aucune défoliation significative n'y est prévue en 1981.

En Alberta en 1980 la défoliation du Tremble par la Livrée des forêts et d'autres défoliateurs inféodés à cette essence s'est accrue au point de couvrir une superficie de 75 000 ha et il est prévu qu'elle atteindra un niveau semblable en 1981. En Saskatchewan des peuplements de Peuplier faux-tremble couvrant une superficie de 128 000 ha ont

occurred in limited areas in the Turtle Mountain Provincial Park.

subi une défoliation modérée à grave. Une chute générale des populations de cet insecte est indiquée pour 1981 dans le centre-ouest, alors qu'elles se maintiendront à des niveaux élevés dans l'est et l'extrême-ouest de la province. La Livrée des forêts a causé une certaine défoliation dans des aires limitées au parc provincial Turtle Mountain.

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INTRODUCTION

This report summarizes forest insect and disease conditions in Alberta, Saskatchewan, Manitoba, and the Northwest Territories in 1980 and provides predictions of infestation levels of major insect pests for 1981. Surveys were conducted mainly by the staff of the Forest Insect and Disease Survey (FIDS) of the Northern Forest Research Centre, Canadian Forestry Service, with the cooperation of personnel from many federal, provincial, and municipal agencies.

The main responsibilities of the FIDS group are as follows:

1. Contribute to a national overview of important pest conditions in 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 1980-81 fiscal year was as follows:

H.F. (Herb) Cerezke, Entomologist
 J. (Jim) Emond, Senior Technician (Pest Extension Service)
 H. (Howy) Gates, Entomology Technician
 M. (Mike) Grandmaison, Insect/Disease Ranger
 Y. (Yasu) Hiratsuka, Mycologist, Head FIDS
 P.J. (Paul) Maruyama, Mycology Technician
 B.H. (Ben) Moody, Damage Appraisal Officer
 J. (Jack) Petty, Senior Technician (Field Surveys)
 D. (Dianne) Szlabey, Insect Taxonomy Technician
 G.N. (Gary) Still, Insect/Disease Ranger
 R.C. (Craig) Tidsbury, Insect/Disease Ranger
 H.R. (Dick) Wong, Insect Taxonomist

The following descriptions of pests are arranged more or less according to national and regional importance. Brief remarks on

other noteworthy insects, diseases, and conditions appear in the table on pages 10-13.

SPRUCE BUDWORM

Choristoneura fumiferana (Clemens)

There was a general reduction in spruce budworm infestations in all regions of Manitoba in 1980 (Fig. 1). No defoliation was observed in the western part of the province, including the Duck Mountain Provincial Park area, Spruce Woods Provincial Park and Forest, Birds Hill Provincial Park, and areas west of Lake Winnipegosis. These areas experienced some defoliation in previous years. In Riding Mountain National Park only light defoliation occurred along the south shore of Clear Lake and at a few other high-use sites, although high populations had been predicted for 1980. White spruce, severely defoliated from 1977 to 1979 in Riding Mountain National Park, showed remarkable recovery with prolific adventitious shoot development.

In the Interlake region, some 30 small infestations of moderate to severe defoliation were identified (Fig. 1). The largest occurred between Fisher Bay and Sturgeon Bay, but no estimates were made of defoliation areas. Predictions of moderate to severe defoliation for the Interlake region, which were based on egg-mass densities recorded in 1979, did not materialize. The decline in budworm populations is believed to be related to adverse spring weather conditions.

Areas of defoliation in southeastern Manitoba were somewhat less widespread than in 1979 in Whiteshell Provincial Park, the Belair Provincial Forest, and areas north along Highway 304 at Sandy River and Wani-pigow Lake; however, budworm decline in this region was not as noticeable as in the western part of the province.

Moderate to severe defoliation recurred in 1980 between Wekusko Lake and Grass River Provincial Park.

No areas of defoliation were recorded in Saskatchewan, but in Alberta moderate defoliation recurred along the river valley in the city of Edmonton.

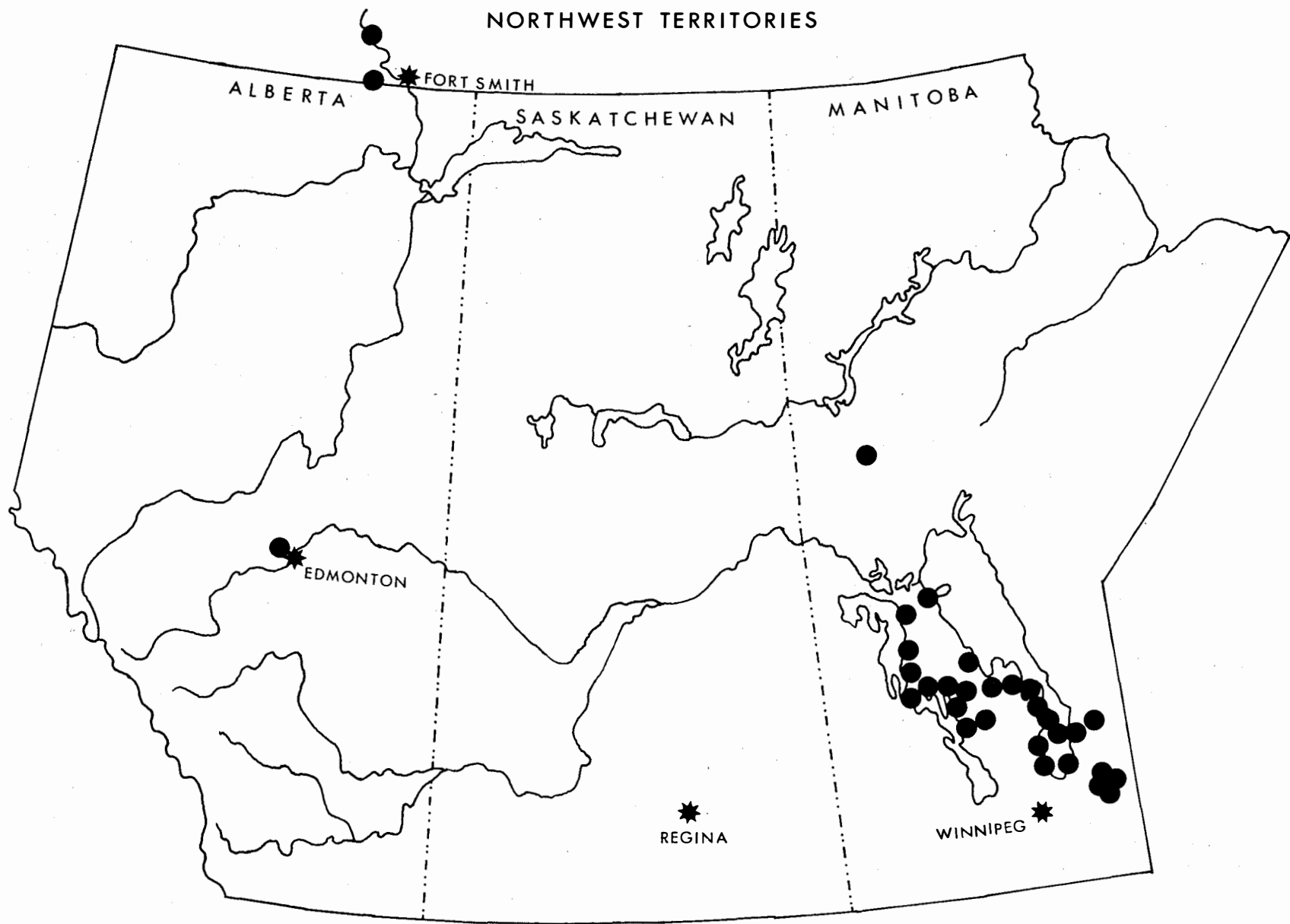


Figure 1. Areas of moderate to severe spruce budworm infestations in 1980, determined by aerial and ground surveys.

In the Northwest Territories two small infestations, each less than 2 km², occurred along the Little Buffalo River and between Hook Lake and the Slave River. Defoliation was light to moderate at both sites.

Egg-mass surveys were conducted in many of the Manitoba infestations in 1980. Predicted 1981 damage levels for Manitoba are mostly light to moderate (Table 1).

JACK PINE BUDWORM

Choristoneura pinus pinus Freeman

Epidemics of jack pine budworm in Saskatchewan and Manitoba collapsed in

1980. Adverse weather conditions together with poor bud growth and inhibited male flower production in jack pine stands have been suggested as important factors in the decline. The only noteworthy budworm infestation occurred in a pine plantation north of Senlac, Saskatchewan, where defoliation was generally only light to moderate.

A series of budworm outbreaks occurred in parts of southern Manitoba between 1970 and 1979, and drought conditions prevailed in the late 1970s. These and other factors such as winter injury placed considerable stress on pine stands during that period. Significant tree mortality and general stand decadence were observed during aerial

Table 1. Average spruce budworm egg-mass densities and predicted 1981 damage for Manitoba

Location	Egg masses per 10 m ² of foliage	1981 damage forecast
Interlake region		
Moosehorn	131	Moderate
Waterhen	25	Light
Gypsumville	108	Moderate
Lake St. George	176	Moderate
Jackhead Harbour	61	Light
Gimli	183	Moderate
Arborg	15	Light
Riverton	128	Moderate
Narcisse	5	Light
Arnes	46	Light
Fisher Branch	12	Light
Winnipeg Beach	9	Light
Southeastern Manitoba		
Whiteshell Provincial Park	122	Moderate
Hecla Island Provincial Park	194	Moderate
Grindstone Point Provincial Park	77	Light
Lac du Bonnet	154	Moderate
Belair Provincial Forest	62	Light
Wanipigow Lake	221	Severe
Silver Falls	6	Light
Northern Manitoba		
Wekusko Lake	160	Moderate
Riding Mountain National Park	51	Light

surveys in 1979 but generally were not as evident in 1980.

In Saskatchewan the recent major outbreaks (1976 to 1979) in the Nisbet and Torch River provincial forests caused some concern to various users of these forests and to adjacent property owners. Studies of the impact of budworm defoliation on tree growth in the Nisbet Provincial Forest indicated that a 20-30% incidence of top-kill had occurred in some areas by 1978; however, tree mortality that could be attributed to budworm defoliation was considered insignificant. Radial growth losses were particularly evident in the 1977 and 1978 increments. In the western part of the Nisbet Forest, tree growth suppression continued into the 1979 and 1980 increments, even though budworm populations collapsed there in 1978.

Egg surveys were conducted across southern Manitoba in order to monitor population levels and forecast the degree of defoliation that might occur in 1981. Results indicate that populations will generally remain endemic. Some light to moderate defoliation is forecast for Nopiming Provincial Park, north of Quesnel Lake, and northwest of Gypsumville.

No egg surveys were conducted in Saskatchewan in 1980; however, populations are not expected to increase significantly from current endemic levels.

ASPEN DEFOLIATORS

Primarily *Malacosoma disstria* Hübner,
Choristoneura conflictana (F. Walker), and
Operophtera bruceata (Hulst)

There was a significant increase in the extent of trembling aspen defoliation in Alberta and Saskatchewan in 1980 (Fig. 2). Specific surveys for the detection of defoliation were not conducted in the Northwest Territories in 1980; however, during aerial surveys for spruce budworm in the Slave River area, sizable patches of moderate to severe aspen defoliation were observed, probably due to *C. conflictana*, the large aspen tortrix. No major infestations have been reported in Manitoba since 1978.

The forest tent caterpillar, *M. disstria*, continued to be the major, overall aspen defoliator in Alberta and Saskatchewan. In Alberta, however, a significant part of the total infestation was by *C. conflictana* and/or *O. bruceata*, the Bruce spanworm. The early aspen leaf curler, *Pseudexentera oregonana* Walsingham, was commonly observed with these two species in both provinces and contributed significantly to the total defoliation in some areas. A green fruitworm, *Orthosia hibisci* Guenée, and the linden looper, *Erannis tiliaria* (Harris), were found in abundance at some locations in Alberta, particularly in the Lesser Slave Lake area.

In Alberta in 1980, trembling aspen stands were moderately to severely defoliated over an estimated total area of 75 000 km², an increase of about 11 000 km² over that reported in 1979. Roughly two-thirds of this area is in agricultural zones and includes widely scattered aspen bluffs, farm woodlots, and ornamental and shade trees in urban areas. The remainder lies in the commercial forest zones and in provincial and national parks.

Similar defoliation affected an estimated total area of 128 000 km² in Saskatchewan, more than double that reported in 1979. Roughly half of this was in agricultural and urban areas; the remainder is in commercial forests and provincial and national parks.

In Manitoba, moderate to severe defoliation occurred only in a few patches in the Turtle Mountain Provincial Forest, as in 1979.

Radial growth losses and tree mortality due to repeated defoliation alone have not been considered serious enough to warrant large-scale control programs in commercial forests in the region. Many of the inquiries received at the Northern Forest Research Centre concerned protection of ornamental and shade trees and shrubs, the nuisance aspect of insect invasions in urban and other public-use areas, and the maintenance of aesthetics in park and recreation areas. Considerable expenditure has been incurred for control programs against the forest tent caterpillar by various agencies. The one in Prince

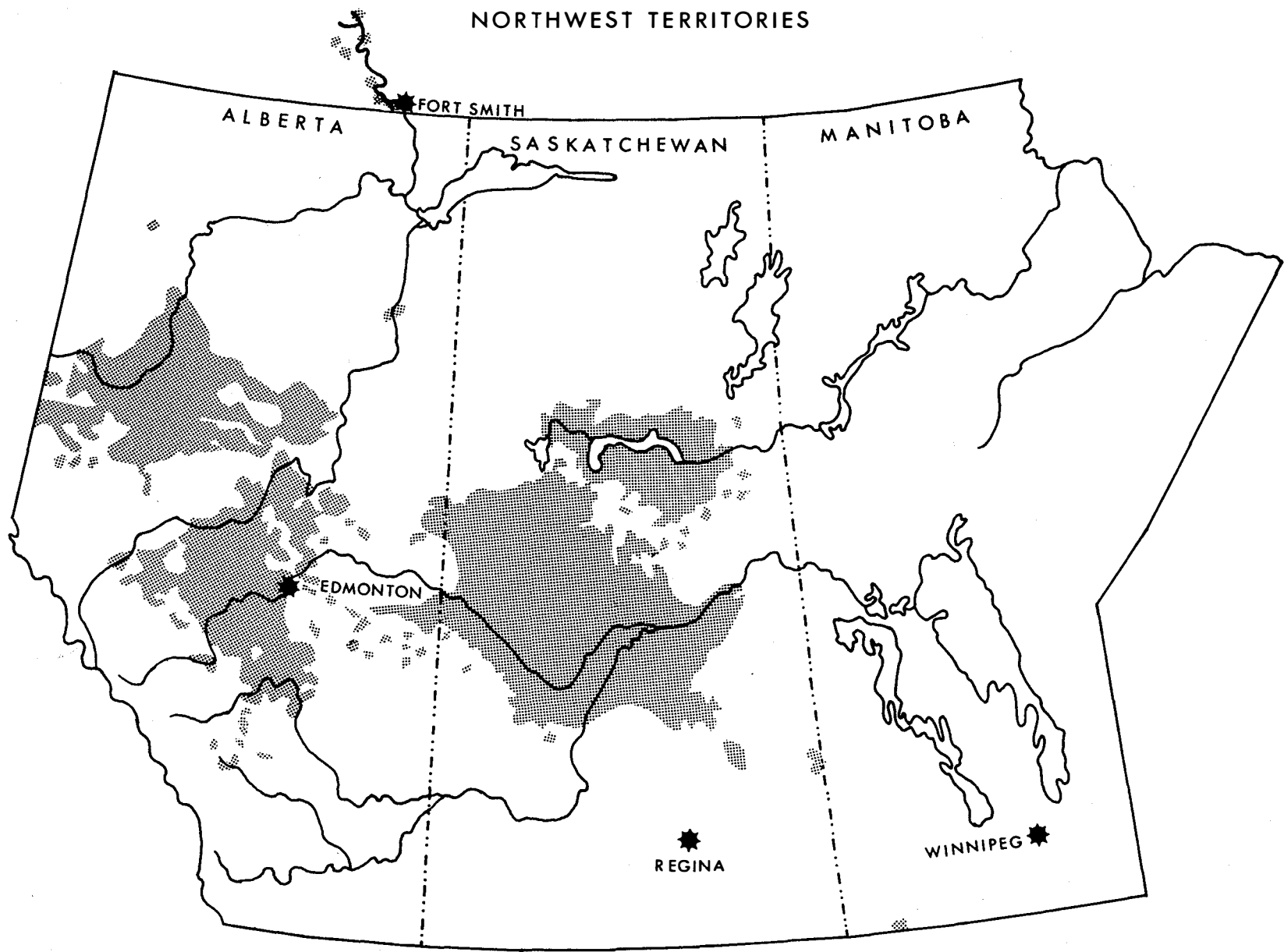


Figure 2. Areas of moderate to severe defoliation of trembling aspen by the forest tent caterpillar, large aspen tortrix, and Bruce spanworm in 1980, determined by aerial and ground surveys.

Albert, Saskatchewan, cost the city more than \$34,000 in 1980.

Forest tent caterpillar egg-band surveys were conducted across the infested areas in Alberta and Saskatchewan in order to derive defoliation forecasts for 1981. In Alberta, infestations may be similar in distribution and intensity to those experienced in 1980. In Saskatchewan, a general population decline is expected in the west-central part of the outbreak, but continued high populations are expected in the extreme western and eastern parts. Egg-band surveys conducted in the Turtle Mountain Provincial Park by the Manitoba Department of Mines, Natural Resources and Environment indicated that some moderate to severe defoliation may occur in the Adam Lake Campground area.

MOUNTAIN PINE BEETLE

Dendroctonus ponderosae Hopkins

Mountain pine beetle infestations that were reported in 1979 continued to expand and intensify in 1980 (Fig. 3). Major new infestations were found in Alberta in lodgepole pine stands in the Porcupine Hills and to the west along the lower escarpment of the Livingstone Range, indicating a northward spread of some 50 km. Since the start of the outbreak in about 1976, the total area of beetle-infested forests in Alberta and the Rocky Mountain national parks has grown to over 70 km², and over one million trees have been killed (Table 2). In areas south of Blairmore this represents 2.5 times the 1979 estimate.

In the Bow-Crow Forest, south of Blairmore, an estimated 65 km² are affected.

Table 2. Estimates of mountain pine beetle infestation areas and tree mortality in Alberta, Saskatchewan, and the Rocky Mountain national parks

Location	Area affected in 1979-80 (km ²)	Estimated tree mortality 1977-1980
Alberta provincial forest lands:		
Bow-Crow Forest	65.0	780 000
Pole Haven	0.8	20 000
Porcupine Hills-Livingstone Range	-	20 000
Indian Reserves in Alberta:		
Peigan and Blood	0.8	22 000
National parks:		
Waterton Lakes	10.9	295 000
Kootenay	-	200
Yoho	-	130
Provincial parks:		
Cypress Hills (Alberta)	-	3 500
Cypress Hills (Saskatchewan)	-	150
Alberta cities:		
Lethbridge	-	12
Medicine Hat	-	2

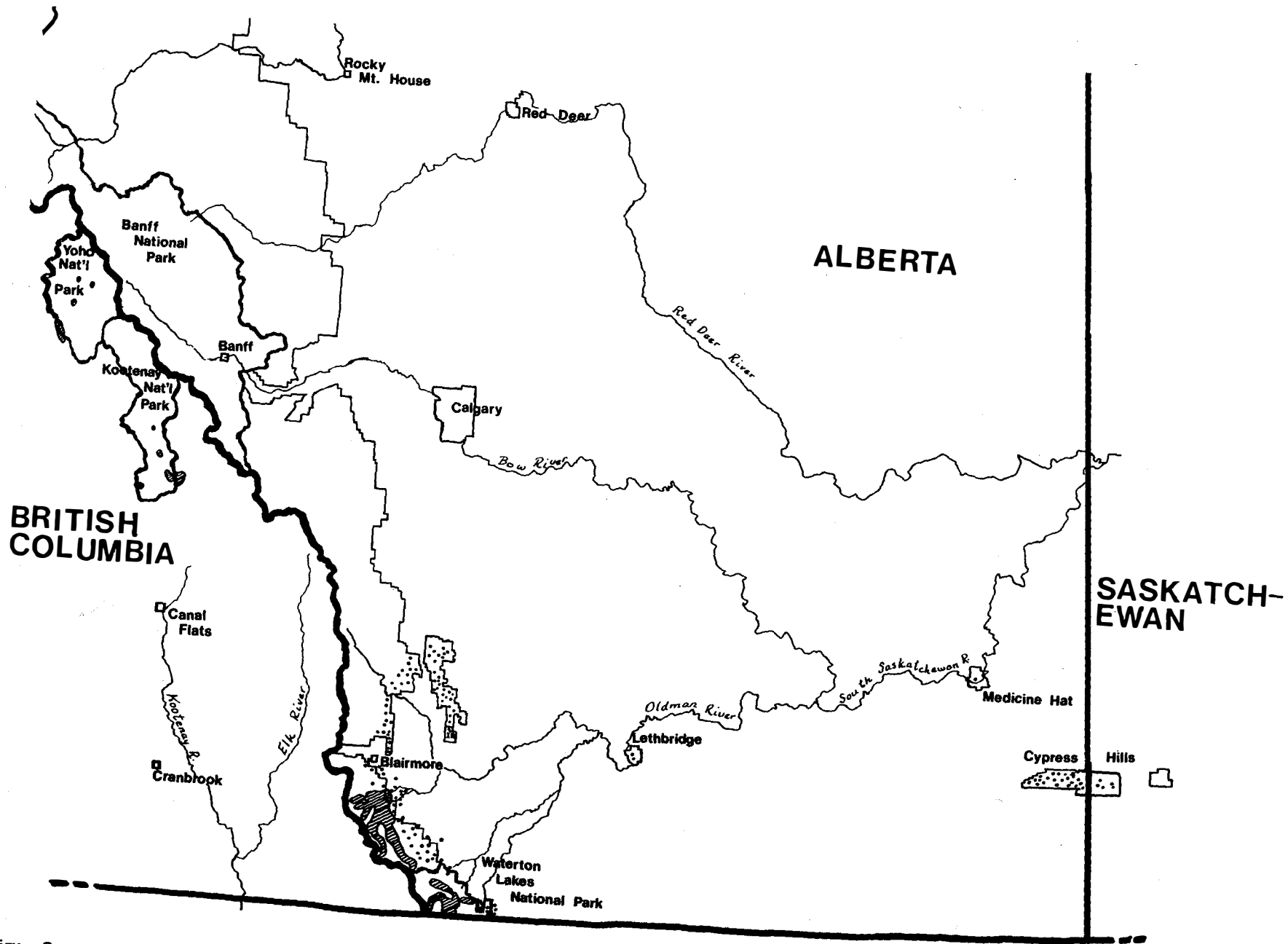


Figure 3. Areas of mountain pine beetle infestations in 1980.

The largest infestations are concentrated at lower elevations along the West and South Castle River valleys, near Beaver Mines Lake, and in areas along the Carbondale River valley. Ground cruises in two mature infested stands in 1980 indicated the cumulative mortality of the pine component was 67% and 89%, respectively, for the two locations. Along the West Castle River numerous infestations have developed in young lodgepole pine stands 35-40 years old. Salvage logging of heavily beetle-killed merchantable stands was commenced in late 1980.

Throughout the Bow-Crow Forest the main host tree species is lodgepole pine, but numerous infestations also include limber and whitebark pines, and a small Scots pine plantation near Beaver Mines was virtually wiped out.

In the area north of Blairmore numerous small infestations were detected in early 1980 throughout the Porcupine Hills, along the East Livingstone Range, on Whaleback Ridge, in the Thunder Mountain area, near Burmiss, and along the Crowsnest Pass. A control program of sanitation cuttings was launched by the Alberta Forest Service in April 1980 in these areas.

Numerous red-topped trees were observed on the Peigan Indian Reserve (located at the south end of the Porcupine Hills), on the Blood Indian Reserve, and in provincial forest (Pole Haven) areas extending east from Waterton Lakes National Park.

Mountain pine beetle infestations are now widespread throughout Waterton Lakes National Park, where over 10 km² of mature pine forests are estimated to be affected (Table 2). In Yoho National Park four infestations are known: near Emerald Lake, near Field, at the lower end of the Otterhead valley, and near Leancoil. In Kootenay National Park red-topped trees occur along the Kootenay River as far north as Pitts Creek and near Radium. No infestations were reported from either Banff or Jasper national parks.

In provincial parks, over 100 small infestations, varying from 1 to 16 trees per

infestation, have been mapped throughout Cypress Hills Provincial Park in Alberta. It is estimated that 3500 trees are infested. Infestations also occur in both the east and west blocks of the Cypress Hills in southwest Saskatchewan. Control programs (sanitation cuttings) were initiated by both provinces in 1980.

The eastward movement of mountain pine beetles from the main outbreak area has also resulted in mortality of urban-planted pine, primarily Scots pine, in Lethbridge and Medicine Hat, Alberta.

Increased areas of mountain pine beetle infestation are predicted for 1981.

DUTCH ELM DISEASE

Ceratocystis ulmi (Buisman) C. Moreau

Surveys conducted by the Manitoba Department of Mines, Natural Resources and Environment and Manitoba Agriculture indicated that Dutch elm disease continued to expand in range and intensity in southeastern Manitoba and along the Red River immediately south of Winnipeg. The disease was detected for the first time in Carman, Miami, and St. Malo. No infection was found at Minnedosa, north of Brandon, where the disease was first discovered in 1979. Brandon is still the western limit of the disease. A small number of the smaller European elm bark beetle, *Scolytus multistriatus* (Marshall), was found in Winnipeg in 1980, confirming its presence in Manitoba.

Surveys of elm bark beetles in Saskatchewan were conducted mainly by the staff of Saskatchewan Agriculture and the PFRA Tree Nursery using trap logs and sticky traps. Native elm bark beetles were collected in a few new locations such as Carnduff, Redvers, and Carlyle in 1980. Suspected wood specimens were cultured at the Saskatchewan Agriculture laboratory in Regina, but so far the Dutch elm disease organism has not been isolated in Saskatchewan.

No elm bark beetle or Dutch elm disease were detected in Alberta in 1980. Surveys were conducted by Alberta Agricul-

ture and the Canadian Forestry Service using trap logs and sticky traps.

WOOD BORERS

Fire hazard conditions were extreme in 1980, and large tracts of forest were burned in central and northern parts of all three prairie provinces. This resulted in a record number of inquiries from private industry and provincial personnel concerned about consequent wood-borer damage, primarily from the white-spotted sawyer beetle, *Monochamus scutellatus* (Say). This beetle invades freshly fire-killed timber, and its "worm holes" can result in up to a 30% loss in value due to downgrading of lumber products. Major burns involved mature white spruce and jack pine, two of the main hosts of this beetle. Several forest districts were affected, including the Peace River and Athabasca forests in Alberta and the Porcupine Hills on the Saskatchewan-Manitoba border.

A survey conducted in September 1980 in the Porcupine Hills Provincial Forest in Manitoba indicated low to moderate sawyer beetle infestation levels on about 30% of the trees sampled. These levels are sufficient to result in up to an 18% loss in value of lumber products if the trees are not salvaged before completion of larval development.

In addition to questions about wood-borer risk and salvage of fire-killed timber, the inquiries concerned protection of log decks against sawyer beetle attack, damage impact of the "worm holes" in whole logs used for building construction, and methods of direct control.

LODGEPOLE NEEDLE MINER

Coleotechnites starki (Freeman)

The lodgepole needle miner was first recorded in Banff National Park in 1942. Since then it has been common in Banff, Jasper, Kootenay, and Yoho national parks. Populations have fluctuated, and at times moderate to severe defoliation of lodgepole pine has occurred, although there has been no tree mortality. Continuous severe defoliation

reduces tree vigor, however, and this may cause trees to be more vulnerable to the mountain pine beetle.

During 1980, needle miner populations were again present in Kootenay National Park along the Vermilion River Valley between Marble Canyon and Hawk Creek. Defoliation was severe around Numa Creek, decreasing to light toward Marble Canyon and Hawk Creek. Many of the trees had only the 1980 and a portion of the 1979 needles remaining. Although needle miner populations were high in this area, some of the defoliation was caused by a needle cast (probably *Lophodermella concolor* (Dearn.) Darker). In Banff National Park low populations persisted along the road leading to the ski area on Mt. Norquay. Very low populations were present on the lower slopes of Cathedral Mountain in Yoho National Park.

SCLERODERRIS CANKER

Gremmeniella abietina (Lagerberg) Morelet

The North American race of this disease was found in two new locations in Jasper National Park, along Marmot Basin Road and on Maligne Pass Trail. These and a previously reported location near Maligne Lake are situated in subalpine lodgepole pine stands close to the timberline. Thus far the disease has not been found outside of the park in Alberta. Recently scleroderris canker was detected 100 km east of the Manitoba-Ontario border, and a detection survey is planned for the border area in 1981. A more virulent European race of this disease has been found in eastern United States and Canada.

DWARF MISTLETOE ON JACK PINE

Arceuthobium americanum Nuttall ex Engelmann

Dwarf mistletoe on jack pine occurs extensively throughout pine forests across the region. Host trees are often deformed and have reduced vigor and growth, and mortality may occur before tree maturity. Stands with heavy, long-term infection often have little or no commercial value for timber products.

Consequently, some eradication programs have been initiated by provincial governments. Manitoba is carrying out such a program in the Belair Provincial Forest, where clear-cut areas are being restocked with resistant pine species. Similar programs are being considered for other mistletoe areas in the province.

Extensive wildfires that occurred in the Athabasca Forest in Alberta in 1979 and 1980 destroyed large tracts of heavily mistletoe-infected jack pine forests. Because the burns are often discontinuous, however, this can result in remnant islands of live or partially burned infected trees, especially around burn peripheries. These provide loci for early reinfection and spread into adjacent pine regeneration. In cooperation with the Alberta Forest Service, aerial surveys were conducted in 1980 in northeastern Alberta to assess the extent and distribution of such residual stands.

LARCH SAWFLY

Pristiphora erichsonii (Hartig)

The larch sawfly was a major defoliator of larch throughout the prairie provinces

and Northwest Territories during the 1950s and early 1960s. In 1980, moderate to severe defoliation again occurred in the Northwest Territories between Little Buffalo Falls and Fort Smith and south into Wood Buffalo National Park as far as the Salt River. Other areas of similar defoliation occurred near Fort Resolution along the Little Buffalo River from Great Slave Lake to the Nyarling River in the Slave River delta and in patches along the Slave River south to Fort Fitzgerald. In the Marlboro-Obed area of west-central Alberta, defoliation was light to moderate, a decrease from 1979. The parasite *Olesicampe benefactor* Hinz was released in this area in 1975, and 90% recovery was made from the release site this past season.

In Manitoba populations were very low. Light infestations occurred on western larch along Settlers Road in Kootenay National Park in British Columbia.

OTHER NOTEWORTHY INSECTS, DISEASES, AND CONDITIONS

(listed alphabetically by scientific name)

Insect, disease, or condition	Location	Tree host	Remarks
Spruce gall aphids			
<i>Adelges cooleyi</i> (Gillette)	Region-wide	Spruce	Common on both mature and small ornamental plantings.
<i>Pineus similis</i> (Gillette)			
<i>Pineus pinifoliae</i> (Fitch)			
Pear sawfly			
<i>Caliroa cerasi</i> (Linnaeus)	Urban centers	Cotoneaster, mountain-ash, apple, plum	Common on ornamental trees and shrubs.
Larch casebearer			
<i>Coleophora laricella</i> Hübner	Manitoba	Larch	This insect caused light damage near Marchand and Sprague, Manitoba.

OTHER NOTEWORTHY INSECTS, DISEASES, AND CONDITIONS, *continued*

Insect, disease, or condition	Location	Tree host	Remarks
Comandra blister rust <i>Cronartium comandrae</i> Peck	Alberta	Pine	An estimated 1% of 2-0 bare-root seedlings at the Pine Ridge Tree Nursery in Alberta was found to be infected by this rust.
European spruce sawfly <i>Diprion heryniae</i> (Hartig)	Manitoba	Spruce	A light infestation was identified near Moose Lake, Manitoba.
Western gall rust <i>Endocronartium harknessii</i> (J.P. Moore) Y. Hiratsuka	Region-wide	Lodgepole pine, jack pine	This is one of the most important disease problems of man-made and man-assisted, young, hard pine forests. Extensive rodent damage of rust galls was noted at several foot-hill locations.
Fire blight <i>Erwinia amylovora</i> (Burrill) Winslow <i>et al.</i>	Major urban centers	Apple, cotoneaster, crab apple, hawthorn, mountain-ash, pear, etc.	A decrease in infestation over 1979 was recorded. It is very common and is the most important ornamental tree disease.
Birch leaf miners <i>Fenusa pusilla</i> (Lepeletier) <i>Heterarthrus nemoratus</i> (Fallen) <i>Profenusa thomsoni</i> (Konow)	Urban centers	Birch species	Incidence of leaf mining is high in most of the major urban centers.
Lilac leaf miner <i>Gracillaria syringella</i> (Fabricius)	Urban centers	Lilac	Common in major urban centers. There was a slight decrease over 1978 level of infestation.

OTHER NOTEWORTHY INSECTS, DISEASES, AND CONDITIONS, *continued*

Insect, disease, or condition	Location	Tree host	Remarks
Pine root collar weevil <i>Hylobius warreni</i> Wood	Foothills	Lodgepole pine	This is recognized as an important insect causing partial girdling injury and mortality in thinned and planted young pine stands. Levels of this insect, pitch nodule moths (<i>Petrova</i> spp.), and <i>Armillaria</i> root rot have increased several-fold since 1978 in mechanically thinned plots.
Web-maker <i>Nycteola frigidana</i> (Walker)	Manitoba	Willow	Light to moderate damage occurred in Whiteshell Provincial Park, Manitoba.
Spruce spider mite <i>Oligonychus ununguis</i> (Jacot)	Region-wide	Spruce, juniper, cedar	Very common and causes significant damage on ornamental trees and shrubs.
Yellow-headed spruce sawfly <i>Pikonema alaskensis</i> (Rohwer)	Manitoba	Spruce	Moderate to severe defoliation was recorded on several young white spruce along roadsides in Duck Mountain Provincial Park and near Goose, Bird, and Long lakes in Manitoba. There were generally low populations elsewhere throughout the region.
Terminal weevils <i>Pissodes terminalis</i> Hopping <i>Pissodes strobi</i> (Peck)	Alberta foothills	Spruce, pine	Common in thinned and planted stands.
Silver leaf <i>Stereum purpureum</i> (Persoon) Fries (≡ <i>Condrostereum</i> p.)	Urban centers	Mountain-ash, apple, cotoneaster, other species	Especially common on planted trees 15 years or older.

OTHER NOTEWORTHY INSECTS, DISEASES, AND CONDITIONS, continued

Insect, disease, or condition	Location	Tree host	Remarks
Chemical injury	Region-wide	Many species	Mortality of and injury to nontarget trees and shrubs by agricultural chemicals (herbicides and soil sterilants) are increasing each year, especially in urban centers.
Excessive needle discoloration	Region-wide	Spruce, pine	Higher than usual incidence of self-pruning type of needle discoloration and casting occurred across the region. The condition may have resulted from drought conditions in the spring of 1980 or fall of 1979.
Transplant injury	Region-wide	Many species	Many urban and nursery tree problems are attributable to improper planting practices and the poor quality of planting stock.
Winter drying and frost damage	Region-wide	Many species	The high incidence of winter drying and frost damage in 1980 may be attributed to low winter precipitation and adverse temperature fluctuations in the spring.

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