ANNUAL DISTRICT REPORT

SOUTHWEST DISTRICT

ALBERTA 1968

by

G. J. Smith

FOREST RESEARCH LABORATORY

CALGARY ALBERTA

FORESTRY BRANCH

DEPARTMENT OF FISHERIES AND FORESTRY

February, 1969

INTRODUCTION

Forest insect damage was widespread and severe in the Southwest District in 1968. Populations of the spruce bark beetle increased along the mountains in southwestern Alberta and subsequently attacked a large volume of living mature spruce: this was the most damaging insect in the District and was the cause of major concern. The lodgepole needle miner caused severe stand discoloration and needle loss along the Bow River Valley in Banff National Park. Populations of aspen defoliators, namely forest tent caterpillar, large aspen tortrix and Bruce spanworm, increased considerably along the outer foothills between Pigeon Lake and the Porcupine Hills.

The fluctuating forest foliage diseases, namely needle casts, needle rusts, leaf blights and climatic damage, caused considerable stand discoloration and foliage loss. The systemic diseases, namely root and butt rots, canker diseases, blister rusts, gall rusts and dwarf mistletoe continued to cause growth loss, deformity and tree mortality.

INSECT CONDITIONS

Black-headed Budworm, Acleris variana (Fern.)

Larvae of this budworm caused light defoliation and bud damage to spruce in the mountain valleys and along the foothills. Damage was observed in the following areas; along the upper North Saskatchewan River, Deer Creek, Red Lodge Provincial Park, Bragg Creek Provincial Park, Marmot Creek Basin, Dutch Creek, the Livingstone River, Lynx Creek, Beauvais Lake Provincial Park, along the Simpson River in Kootenay National Park, and near Leanchoil in Yoho National Park.

Large Aspen Tortrix, Choristoneura conflictana (Wlk.)

In 1968, defoliation by this insect occurred in the aspen belt of the foothills from the Red Deer River to the United States Border. This represented a much wider distribution than in 1967 when it was only present from Tod Creek south to United States Border.

Patches of moderate to severe defoliation were observed from the Bottrel-Calgary area southward through the Sarcee Reserve, Priddis, Millarville, Turner Valley, Royalties, Chain Lakes, Porcupine Hills, Tod Creek, Lees Lake, Beaver Mines and Fish Lake to Twin Butte. In the outbreak along the Red Deer River, patches of moderate to severe defoliation were observed near Elkton, Bergen Sundre, James River Bridge, Garrington and 13 miles west of Innisfail. Patches of light defoliation were observed throughout the above areas and also southward through the oldest part of the outbreak from Twin Butte through Waterton Lakes National Park to the United States Border. (see map, page 30).

From observations of the 1968 moth flight, it appeared that populations in 1969 south of the Crowsnest Pass would continue to decrease; from the Porcupine Hills northward to the Red Deer River an increase is expected.

Spruce Budworms, Choristoneura biennis Freeman, Choristoneura fumiferana (Clem.)

The two-year cycle budworm, C. biennis, caused light defoliation to Engelmann spruce in the Numa Creek area and along the Vermilion River between Numa Creek and Floe Creek in Kootenay National Park. Larvae were present but defoliation was negligible near the mouth of the Simpson River, at Vermilion Crossing and in the Paint Pots area of Kootenay National Park, along the Kicking Horse River in Yoho National Park, in the Saskatchewan Crossing area of Banff National Park and along Thompson Creek in the Clearwater Forest.

A one-year cycle budworm, possibly C. fumiferana, but still in doubt due to a color variation of the larvae, was found in southwestern Alberta. This species severely defoliated the understory white spruce and lightly defoliated the overstory spruce in Beauvais Lake Provincial Park. Some feeding on Douglas fir and lodgepole pine was also noted in this area. Light defoliation of Engelmann spruce was noted near the headwaters of the South Castle River and around Cameron Lake in Waterton Lakes National Park.

Larvae, positively identified as C. fumiferana, caused light defoliation and bud damage to white spruce in Red Lodge Provincial Park.

Lodgepole Needle Miner, Coleotechnites starki Freeman

The larvae of this species caused extensive damage to the foliage of lodgepole pine and subsequent stand discoloration in Banff National Park during 1968.

Severe damage was evident on the north and south slopes of the Bow Valley from the Mt. Eisenhower-Boom Lake area eastward to the Mt. Corey-Massive Mtn. area. Smaller patches of severe damage were observed on the south slopes of Mt. Edith, Mt. Norquay, Stony Squaw Mtn. and on the west slopes of Mt. Inglismaldie and Mt. Girouard.

Mountain Pine Beetle, Dendroctonus ponderosae Hopk.

In 1968, there were no known infestations of this bark beetle within the District but encroachment in areas bordering Kootenay National Park was investigated and reported as a caution to those concerned.

During an aerial survey severe infestations of this beetle in lodgepole pine were observed approximately 2 miles west of the Park Boundary in the Luxor Pass area and 12 miles southeast of the Park along the Palliser River.

Spruce Bark Beetle, Dendroctonus obesus (Mann.)

In southwestern Alberta, populations of this beetle have gradually increased in recent years and have caused considerable tree mortality in mature and overmature stands of Engelmann spruce. From surveys between 1957 and 1967 it was known that these beetles were attacking a few living trees each year, a situation usually considered normal in old stands. In 1968 a significant increase in the number of attacked living trees was noted.

During an aerial survey of the Crowsnest Forest, tree mortality caused by bark beetles was observed in the following locations: along upper South Hidden Creek, Dutch Creek, North Racehorse Creek, First Creek, Smith Creek, Window Lake Road, South Racehorse Creek, Glacier Creek, North York Creek, South York Creek, Lynx Creek, Goat Creek, Byron Creek, North Lost Creek, the upper Carbondale River, MacDonald Creek, Gardiner Creek, Gravenstafel Creek, the West Castle River from the headwaters to Castle Ranger Station, Scarpe Creek, Jutland Creek, Font Creek, the upper South Castle River, Gladstone Creek and along Heath and Beaver creeks in the Porcupine Hills (see map, page 31).

In Waterton Lakes National Park, infestations were observed along Lost Lakes Trail, Twin Lakes Trail, Bauerman Brook Valley, the north slopes of Mt. Bauerman, Lost Mtn., Anderson Peak and along the east and west sides of Cameron Lake. Several other areas in the Park in which overmature spruce stands occur will be examined in 1969.

A damage appraisal survey was carried out in the Crowsnest Forest during the fall of 1968 to determine the percentage volume per acre of merchantable timber affected by bark beetles. Cruise strips set up in 25 locations between the south boundary of the Crowsnest Forest and Dutch Creek revealed that 44 per cent of the merchantable volume per acre of the timber cruised had been affected. The most beetle activity and tree mortality occurred in the upper West and South Castle river basins and along upper North Racehorse Creek where the affected merchantable volume per acre averaged 54 percent; along one cruise line it was 96 percent. Elsewhere in the Crowsnest Forest beetle damage was usually patchy and confined to large diameter trees along streams. The preference by the beetles for trees growing along streams was evident when no attacks were found on five of the cruise strips along slopes above streams.

Forest Tent Caterpillar, Malacosoma disstria Hbn.

In 1968, aspen defoliation by this insect extended southward from

that reported in 1967 to a line approximately along Highway 11 from Sylvan Lake west to the Rocky Mountain House area.

In the oldest part of the outbreak, extending northward from the Pigeon Lake - Buck Lake area to the North Saskatchewan River, defoliation was generally light but scattered patches of moderate to severe damage occurred in the Breton-Warburg, Genesee-Telfordville areas and along the south side of the North Saskatchewan River between Huggett and Edmonton.

Almost continuous severe defoliation was noted within an approximate parallelogram shaped area formed by a line from Medicine Lake northeast to Falun, north to Wizard Lake, southwest to Pendryl and south to Medicine Lake. This outline encompassed an area of approximately 500 square miles. An additional 60 square miles of severe defoliation extended in a neck southward from the Hoadley-Muskeg Creek area to near Leedale.

South of the line from Medicine Lake to Falun, scattered patches of moderate to severe defoliation were noted on the hills southeast of Faraway Pasture, north of Carlos, around Willesden Green and on the Medicine Lodge Hills west of Bentley. Patchy light to moderate defoliation extended from Medicine Lake south to the Rocky Mountain House area and southeast to the Sylvan Lake area. Similar defoliation was observed from Falun to the Rimbey-Gull Lake area.

Elsewhere in the District, larvae were found from the outbreak area south to Calgary, west to the upper Baptiste River and upper Prairie Creek and southeast to the Lacombe-Red Deer area. A small isolated outbreak was noted one mile east of James River Bridge (see map, page 32).

Bruce Spanworm, Operophtera bruceata (Hulst)

Populations of this aspen defoliating insect increased in 1968 along the foothills west of Calgary from the Jumping Pound-Exshaw area north to the Red Deer River. Larvae of this species were often found intermixed with those of the large aspen tortrix.

Patches of moderate to severe defoliation were observed along Highland Ridge west of Bergen,3 miles northwest of Cremona, west of Big Prairie, 3 miles south of Water Valley, near the head of Grande Valley Creek. along both sides of the Bow Valley between Mitford and Seebe, throughout the Stony Indian Reserve and south to Jumping Pound Creek. Similar defoliation was noted north of the Stony Reserve from Kangienos Lake northward through the Ghost Ranger Station area to Meadow Creek and along the Trans Canada Highway one mile inside the East Gate of Banff National Park (see map, page 30).

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

Larvae of this sawfly severely defoliated spruce shelterbelts in

the following locations; north of the Calgary Airport, west of Bowness along the Trans Canada Highway, in the Bowden-Innisfail area and west to Garrington, along Highway 11 from Sylvan Lake west to Rocky Mountain House, 4 miles east of Gilby, near the north end of Sylvan Lake, 8 miles southwest of Bentley and between Mulhurst and Calmar.

Larch Bud Moth, Zeiraphera diniana Gn.

Larvae of this insect severely defoliated approximately 50 acres of alpine larch near the treeline on the upper slopes of the south tributary of Marmot Creek. Light defoliation was observed in the Snow Ridge area and in Highwood Pass.

DISEASE CONDITIONS

Dwarf Mistletoe, Arceuthobium americanum Nutt. ex Engelm.

This parasitic plant caused mortality in severely infected lodgepole pine stands on the slopes along Cataract and Wilkinson creeks in the Bow River Forest. In five infected patches, which totalled several hundred acres, approximately 75 percent of the trees had stem infections and mortality averaged from 40 to 50 percent.

Tree mortality was low until 1968, thus it appeared that the extremely dry summer in 1967 contributed to the mortality rate of the trees predisposed by dwarf mistletoe.

Shoestring Root Rot, Armillaria mellea (Vahl. ex Fr.) Quél.

This root rot was the cause of mortality of young lodgepole pine in Waterton Lakes, Kootenay and Banff national parks, Deer Creek Basin, south of Burnstick Lake and near Strachan. Infected and dying Douglas fir were noted in the Kootenay Valley and Radium area of Kootenay National Park and along Beaver Creek in the Porcupine Hills.

A gradual spread and intensification of this root rot in aspen was noted in the Crimson Lake Provincial Park camping area.

Poplar Ink Spot, Ciborinia whetzelii (Seaver) Seaver

This organism caused patchy discoloration to aspen foliage near Paine Lake, along the South Castle and Carbondale rivers, York and Allison creeks and along the Trunk Road near Vicary Creek, Livingstone River, Cataract and Lineham creeks.

White Pine Blister Rust, Cronartium ribicola J.C. Fischer

During aerial surveys of the District, stands of whitebark and limber pine severely damaged by this rust were observed in Waterton Lakes National Park, the Crowsnest Forest, the southern portion of the Bow River Forest and east of these forest boundaries between Pincher Creek and the Highwood River. Most of the damage observed was in the form of dead tops and branches. During a ground survey it was noted that some trees had been killed by cankers that girdled the main stem below the crown.

In some areas patches of whitebark pine were observed in which approximately 25 percent of the trees were dead. Further examinations will be carried out in 1969 to determine if blister rust was the cause of this mortality.

Stalactiforme Rust, Peridermium stalactiforme Arth. & Kern

This rust caused considerable mortality in young dense stands of lodgepole pine in the Waterfowl Lakes and Saskatchewan Crossing areas of Banff National Park and in Marmot Creek Basin.

In the Marmot Creek area the infected trees were scattered through the stands and the disease was merely a thinning agent. In the Saskatchewan Crossing area, patches of sapling sized trees were observed in which most of the stems were infected or had been previously killed.

Red Flagging of Cedar

This condition was prevalent along Sinclair Canyon and the headquarters area of Kootenay National Park and along the Kicking Horse Valley in Yoho National Park.

The "red flagging" resulted from the dying of branch terminals and the subsequent reddening of the foliage. The cause of this was not definitely determined but it appeared to be a natural process in which non-functional foliage on the lower crown is periodically cast.

A needle blight fungus, Didymascella thujina (Durand) Maise, was found in the affected areas but was not believed the primary causal agent. The relationship between this organism and "red flagging" will be further investigated in 1969.

Dying Douglas Fir

Patches of dead and dying mature Douglas fir were observed along

the Kootenay River near the south boundary of Kootenay National Park. The only visible agent found was the decay fungus Fomes pinicola (Sw. ex Fr.) Cke. which was fruiting prolifically on the affected trees. As this fungus is considered a secondary agent, the primary cause of the tree mortality was not known and further investigations will be carried out in 1969.

Animal Damage

Along the Kootenay River in Kootenay National Park, numerous lodgepole pine trees have been killed by bear damage over the past 2 years. In this type of damage the animals debark the lower 3 to 4 feet of the tree boles by vertical clawing. Usually the debarking was continuous around the circumference and the trees died. The attacked trees were observed singly throughout the stands, but occasionally a group of several trees were debarked. This type of damage has been reported previously in the State of Oregon, U.S.A.

Climatic Damage

This type of damage to conifers, commonly called "red belt", was observed along the slopes of mountain valleys from Marble Mountain in the Clearwater Forest south to the United States Border.

Severe damage was observed in the following areas: on Mt. Inglismaldie and Mt. Girouard in Banff National Park, along the west sides of the Fairholm, Fisher, and Livingstone ranges and along the east sides of the Flathead and Clark ranges.

Most of the damage was observed near or surrounding clearings on mountain sides, rather than in a typical "belt" along heavily forested slopes. The damaged stands will be examined in 1969 to determine if any tree mortality occurred.

OTHER NOTEWORTHY INSECTS AND DISEASES, 1968

Causal Agent	Host	Remarks
Insect		
Clearwing moth, Aegeriidae	Lp. pine	Larvae caused severe butt girdling and mortality to young lodgepole pine in the Red-Streak Camp Ground area in K.N.P.

Other Noteworthy Insects and Diseases, 1968 cont'd.

Causal Agent	Host	Remarks
Defoliator of balsam poplar, Brachylomia populi Stkr.	B. poplar	Infestations found along the Bow Valley in B.N.P. and along the Highwood River.
Cone insects, Lepidoptera	E. spruce	Caused cone damage in Deer and Marmot Creek Watersheds and on the east slope of Hailstone Butte.
Budworm, Choristoneura lambertiana Bsk.	Limber pine	Severe infestations noted along the foothills between Maycroft and Waterton.
Leaf beetle, Chrysomela aeneicollis Schffr.	Willow	Caused patches of moderate to severe defoliation along the upper Red Deer River, in Snow Pass, near Waterfowl Lakes, the N. Saskatchewan River between Sask. Crossing and Sunwapta Pass and along Smith-Dorrien Creek.
Lodgepole pine beetle, Dendroctonus murrayanae Hopk.	Lp. pine	Light infestations in living trees at Eisenhower Field Station, on Mt. Heffner, along the Kootenay, Carbondale and West Castle rivers.
Rose chafers, Dichelonyx backi Kby. Dichelonyx fulgida Lec.	D. fir	Numerous adults found feeding on opening buds along Settlers Road in K.N.P.
American aspen beetle, Gonioctena americana (Schaeff.)	T. aspen	Caused scattered patches of defoliation 3 miles east of Clearwater Ranger Station, along Old Fort Creek west of Morley and Beaver Creek in the Porcupine Hills.
Bark beetle, Ips amiskwiensis G. Hopp.	E. spruce	Severe infestation in avalanche killed spruce along the north shore of Emerald Lake Y.N.P.

Other Noteworthy Insects and Diseases, 1968 cont'd

Causal Agent	Host	Remarks
Balsam-fir sawfly, Neodiprion abietis (Harr.)	W. spruce	Caused light to moderate defoliation in Red Lodge and Mameo Beach provindial parks and along the Red Deer River west of Innisfail.
Sawfly, Neodiprion sp.	Lp. pine	Numerous larval colonies found on planted pine near Hespero and in native pine along the West Kootenay Fire Road K.N.P.
Poplar twig borer, Oberea schaumi Lec.	T. aspen	Infestations noted in saplings 10 miles south of Leedale, 5 miles southeast of Burmis.
Pine needle scale, Phenacaspis pinifoliae (Fitch)	Lp. pine	Severely infested trees noted in the Crowsnest Pass area and Redstreak Campground K.N.P.
Poplar serpentine miner, Phylloconistis populiella (Cham.)	T. aspen	Caused severe stand discoloration in mountain valleys in the National parks and along the east slopes in southwestern Alberta.
Poplar borer, Saperda calcarata Say	T. aspen	Severe infestation in mature aspen on the Stony Indian Reserve.
Ambrosia beetle, Trypodentron lineatum (Oliv.)	E. spruce Lp. pine	Population buildup in the Crowsnest Forest in stumps, logging slash and decked logs.
Budworm, Zeiraphera fortunana Kft.	E. spruce W. spruce	Caused severe bud damage in a shelterbelt 5 miles southwest of Innisfail and light damage in native stands along Deer Creek, in the Bow River Forest, near the mouth of the Simpson River, K.N.P., and Leanchoil area Y.N.P.

Other Noteworthy Insects and Diseases, 1968 cont'd.

Causal Agent	Host	Remarks
Disease		
Needle cast, *Bifusella linearis* (Pk.) Hoehn.	Whitebark pine	Found along MacDonald Creek in the Crowsnest Forest. New host record for the region.
Spruce cone rust, *Chrysomyxa pirolata* Wint.	E. spruce W. spruce	Severe damage between Brown Creek and the Brazeau River, along McCue, Deer and Marmot Creeks and to cones gathered by the A.F.S. in the Crowsnest Forest.
Spruce needle rust, *Chrysomyxa weirii* Jacks.	E. spruce W. spruce	Present throughout the coniferous forests. Occasional small patches or individual trees were severely affected.
Black rib of willow, *Ciborinia foliicola* (Cash & Davidson) Whet.	Willow	Perfect stage found along South Castle River. New herbarium record.
Pine needle rust, *Coleosporium asterum* (Diet.) Syd.	Lp. pine	Light damage noted along the Kootenay River, Spray and Kananaskis Valleys.
Canker, *Cucurbidothis pithyophila* (Fr.) Petr.	Limber pine	Found in upper Saskatchewan River area on living trees. New regional record.
Cucurbitaria staphula Dearn. ex R. N. Arnold & R. C. Russell	B. poplar	Common on poplar east of Drayton Valley. New regional record.
Pine needle cast, *Davisomycella ampla* (J. J. Davis) Darker	Lp. pine	Severely infected patches in the Chungo Creek - Blackstone River area. Light elsewhere.
Tip blight, *Delphinella abietis* (Rostr.) E. Muell.	A. fir	Common in Paint Pots area of K.N.P. New regional record.

Other Noteworthy Insects and Diseases, 1968 cont'd.

Causal Agent	Host	Remarks
Pine needle cast, *Elytroderma deformans* (Weir) Darker	Lp. pine	Severe infection persisted in the same areas as reported in 1967.
Leaf spot, *Fabraea maculata* Atk.	Mtn. ash	Found along Upper West Castle River. New regional record.
Pine needle cast, *Gloeocoryneum cinereum* (Dearn.) Weindlmayr	Lp. pine	Caused severe stand discoloration along the North Ram River, the head of Rough Creek and the Spray River. Common in K.N.P.
Needle rust, *Gymnosporangium gaeumanni* Zogg	Juniper	Collected along the Bow Valley in B.N.P. First collection from North America.
Needle blight, *Isthmiella quadrispora* Ziller	A. fir	Found in the Paint Pots area of K.N.P. and along Bauerman Brook in W.L.N.P. New regional record.
Leaf blight of balsam poplar, *Linospora tetraspora* Thompson	B. poplar	Caused light stand discoloration in the Rocky Mountain House-Strachan area.
Needle cast, *Lirula macrospora* (Hartig) Darker	E. spruce	Common along Smith - Dorrien Creek. Severe along the Cascade River B.N.P.
Pine needle cast, *Lophodermella concolor* (Dearn.) Darker	Lp. pine	Caused severe stand discoloration in Chungo Creek - Blackstone River area, along the Red Deer River west of Sundre, the Bow and Cascade River valleys B.N.P. Vermilion Crossing and Redstreak Campground areas K.N.P., Spray Lakes and Kananaskis Valley areas of the Bow River Forest.

Other Noteworthy Insects and Diseases, 1968 cont'd

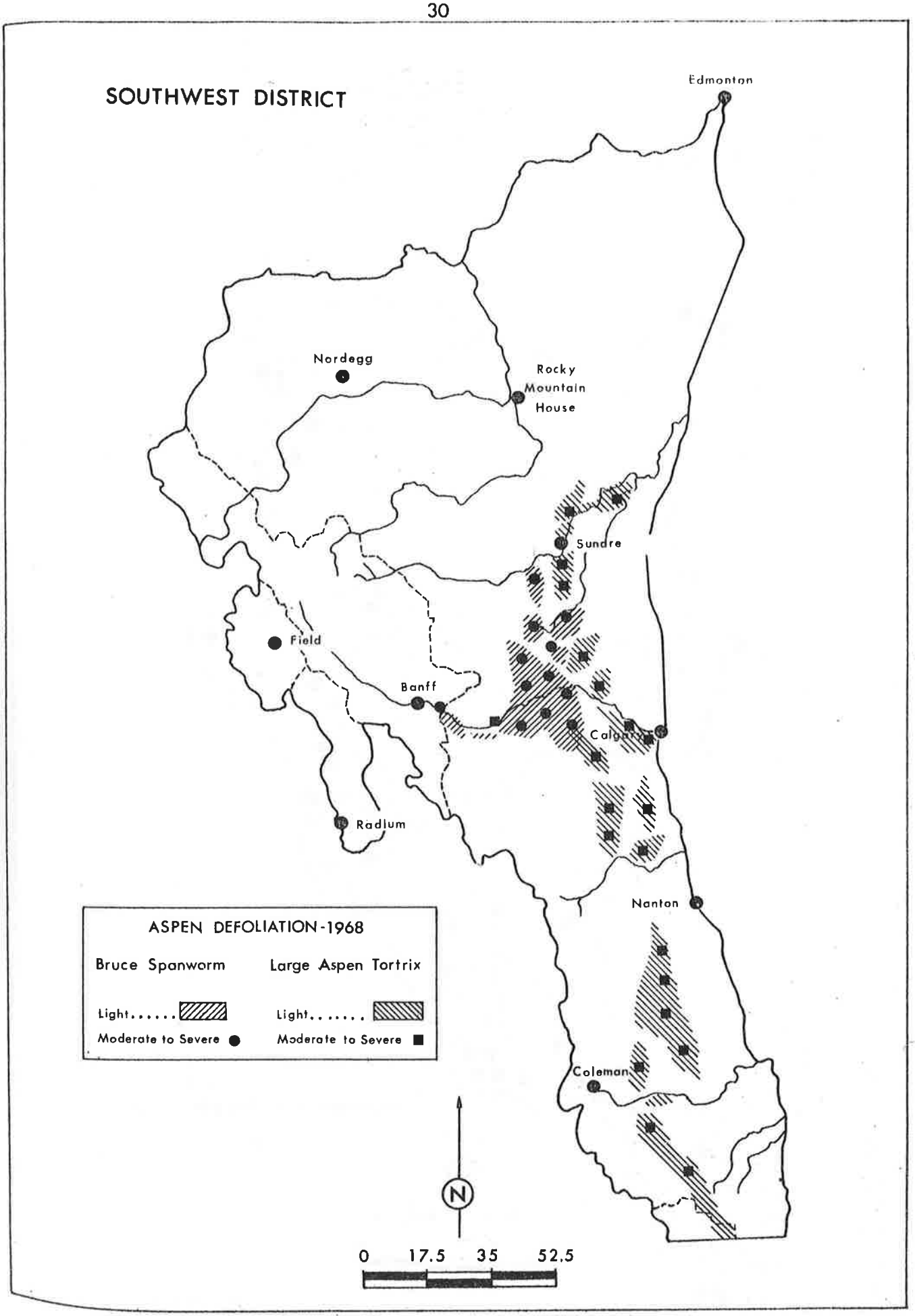
Causal Agent	Host	Remarks
Pine needle cast, *Lophodermella montivaga* Petr.	Lp. pine	Caused severe discoloration and needle loss in the Waterfowl Lakes area B.N.P.
Larch needle cast, *Lophodermium laricinum* Duby	Western larch	Found along Settlers Road K.N.P. New herbarium host record.
Pine needle cast, *Lophodermium pinastri* (Schrad. ex Hook.) Chev.	Lp. pine	Caused severe stand discoloration and needle loss north of Kootenay Crossing Warden Station.
Spruce needle cast, *Lophomerum darkeri* Ouellette	W. spruce	Caused severe needle loss 40 miles southeast of Nordegg.
Poplar leaf spot, *Marssonina tremuloidis* (Ell. & Ev.) Kleb.	T. aspen	Caused severe stand discoloration in the Willow Creek area, the Porcupine Hills, along the Trunk Road between Dutch Creek and the Oldman River, along the Crowsnest River and in the Paine Lake area.
Red root and butt rot, *Polyporus tomentosis* Fr.	E. spruce	Incidence increased in overmature stands in upper West Castle River area.
Douglas fir needle cast, *Rhabdocline pseudotsugae* Syd.	D. fir	Small patches of severely infected D. fir found in the National Parks and southern Foothills.
Needle fungus, *Rhizothyrium abietis* Naum.	A. fir	Found 36 miles northwest of Rocky Mountain House, Marble Canyon K.N.P., Lake Louise B.N.P. and in W.L.N.P. New regional record.

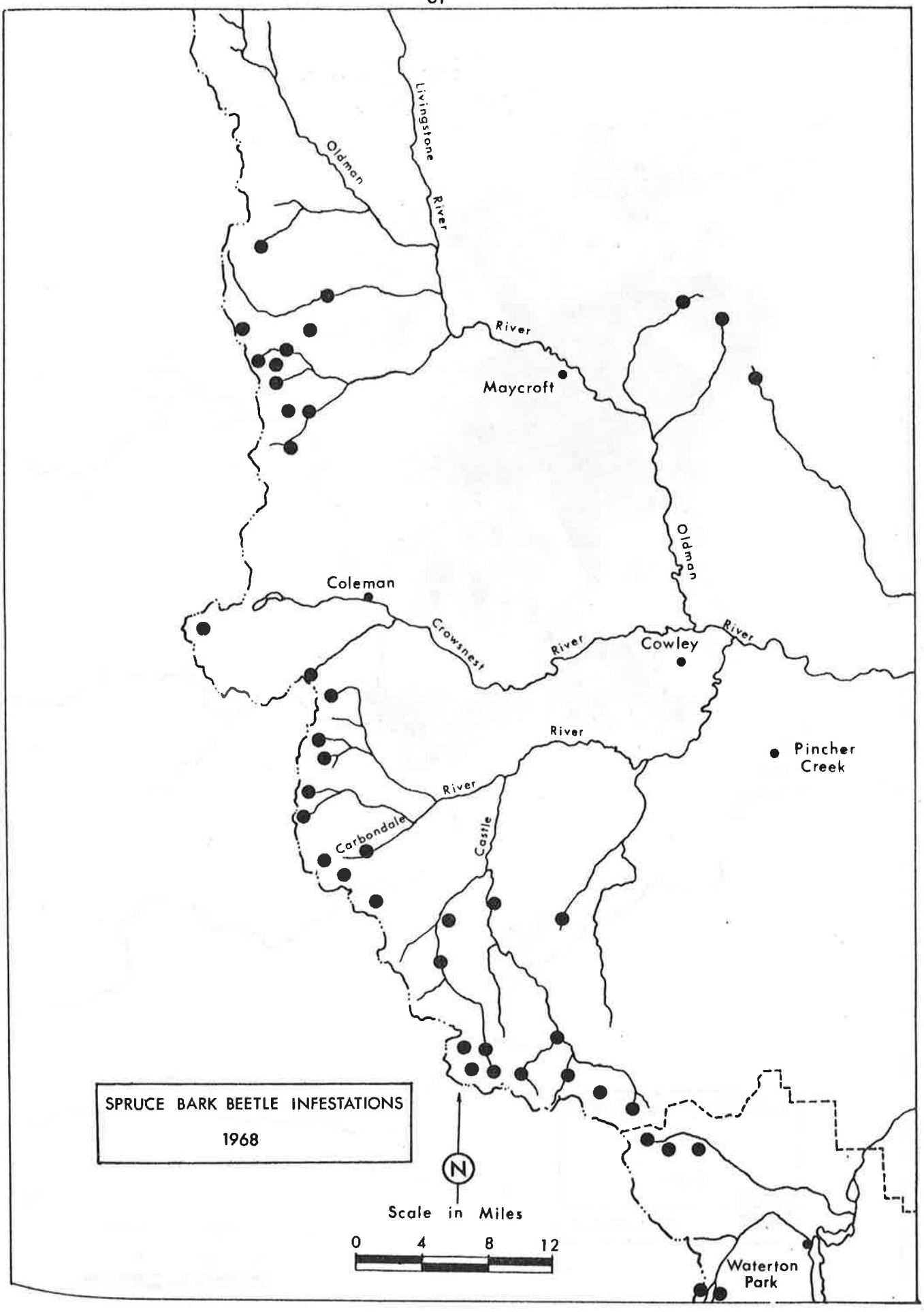
Other Noteworthy Insects and Diseases, 1968 cont'd.

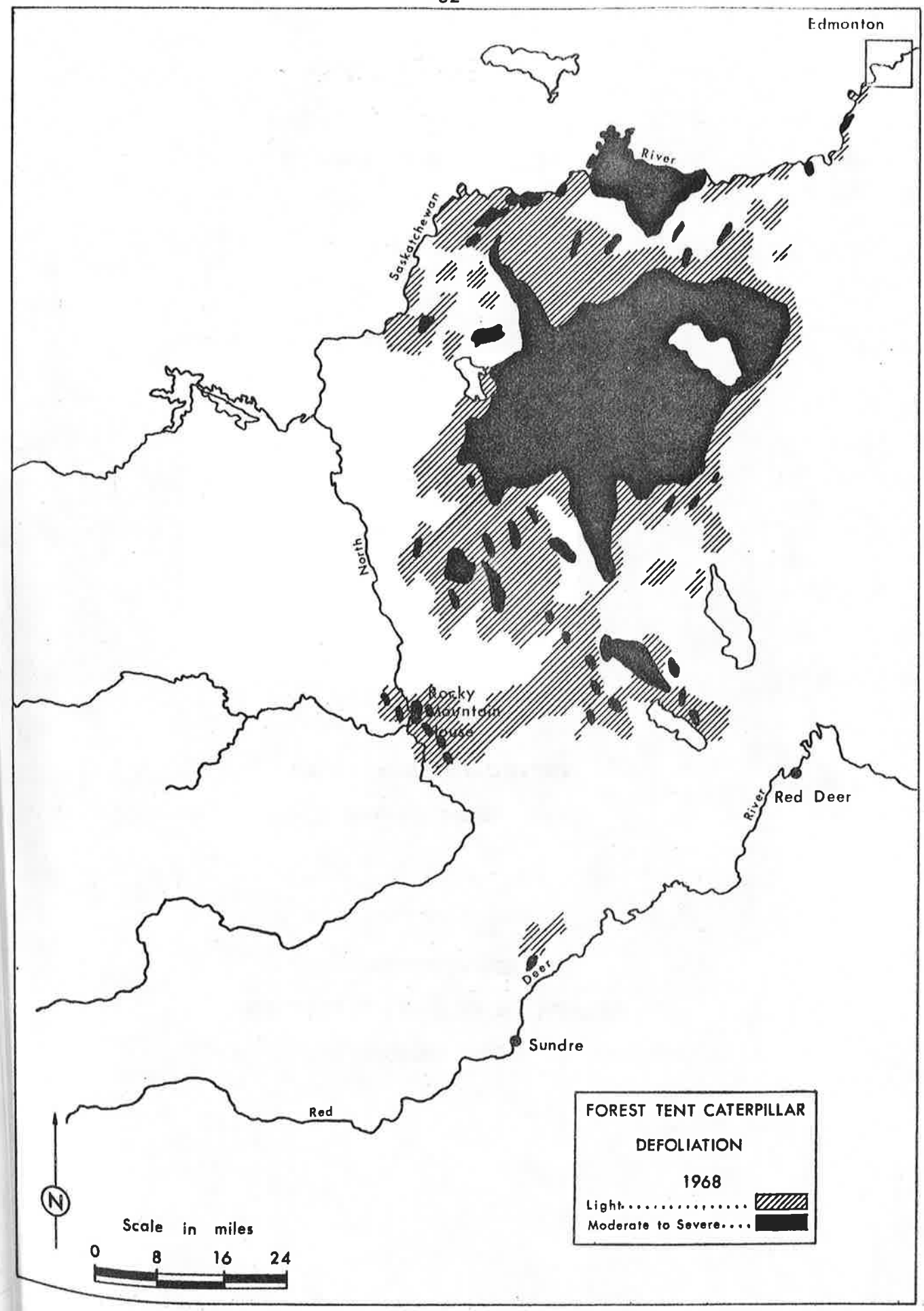
Causal Agent	Host	Remarks
Leaf spot, Septogloeum rhopaloideum Dearn. & Bisby	T. aspen	Caused severe stand discoloration near the Porcupine Ranger Station and along Sharples Creek in the Porcupine Hills.
Needle fungus, Seynesiella juniperi (Desm.) Arn.	Rocky Mtn. juniper	Common in the Radium area K.N.P. New herbarium host record.

SUMMARY OF INSECT AND DISEASE COLLECTIONS BY HOSTS

Host Coniferous	Collections Insect	Collections Disease	Host Deciduous	Collections Insect	Collections Disease
White spruce	17	29	Trembling aspen	27	10
Engelmann spruce	16	7	Balsam poplar	2	3
Black spruce	0	0	Willow	6	5
Lodgepole pine	13	31			
Whitebark pine	2	12			
Limber pine	2	2			
Alpine fir	1	11			
Douglas fir	1	8			
Western larch	1	2			
Alpine larch	1	1			
Cedar	0	1			
	54	104		35	18
Insect collections from miscellaneous hosts				5	
Disease collections from miscellaneous hosts				30	
GRAND TOTAL				246	


SOUTHWEST DISTRICT
Edmonton
Nordegg
Rocky Mountain House
Sundre
Field
Banff
Calgary
Radium
Nanton
Coleman
ASPEN DEFOLIATION-1968
Bruce Spanworm
Light.....
Moderate to Severe
Large Aspen Tortrix
Light.....
Moderate to Severe
N
0 17.5 35 52.5


Livingstone River
Oldman River
River
Maycroft
Oldman River
Coleman
Crowsnest River
River
Cowley
River
River
Pincher Creek
River
Carbondale
Castle
SPRUCE BARK BEETLE INFESTATIONS
1968
N
Scale in Miles
0 4 8 12
Waterton Park


Edmonton
River
Saskatchewan
North
Rocky
Mountain
House
River
Red Deer
Deer
Sundre
Red
FOREST TENT CATERPILLAR
DEFOLIATION
1968
Light
Moderate to Severe
N
Scale in miles
0 8 16 24