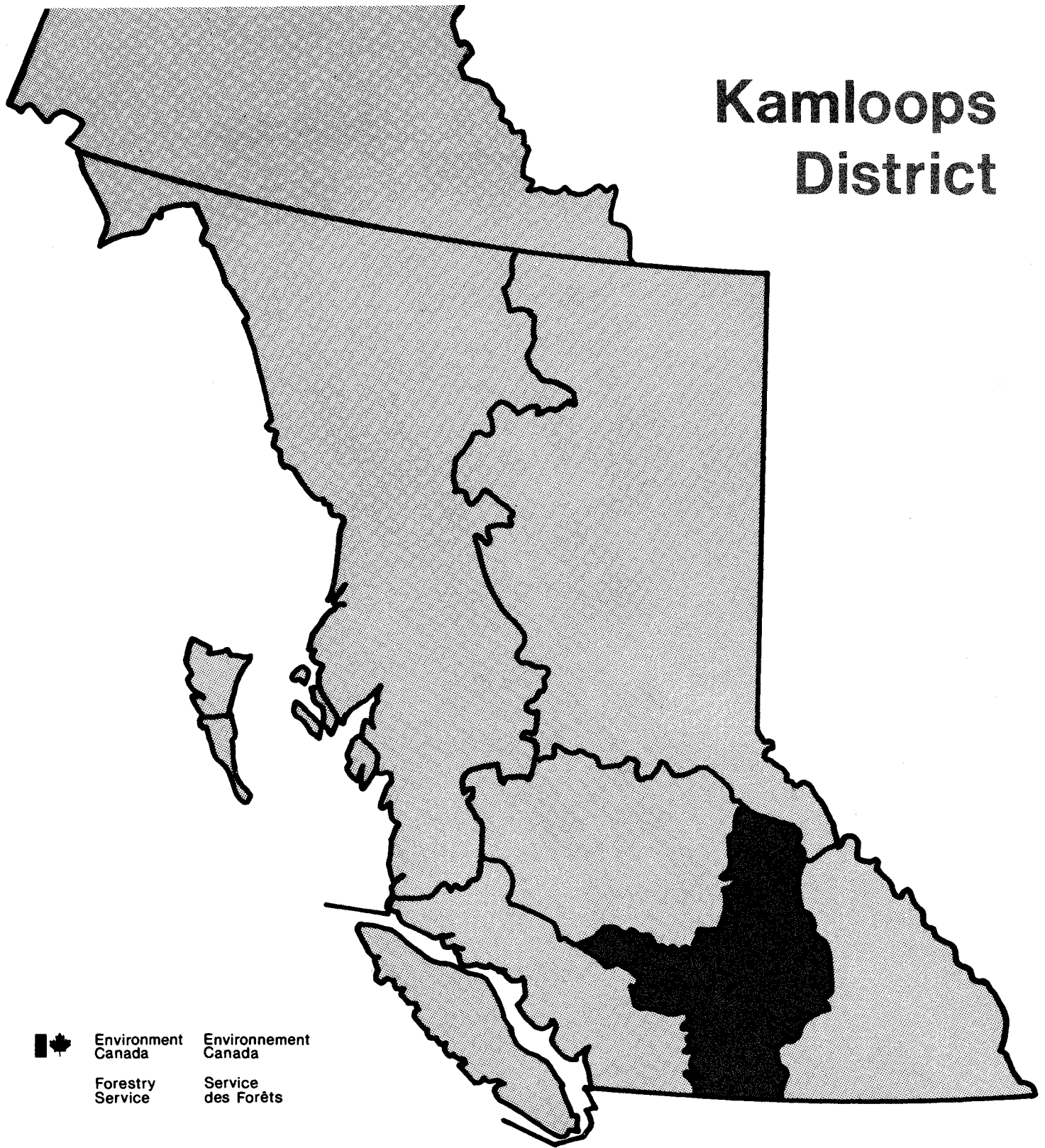


Kamloops District



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Forest Insect & Disease Conditions 1973

KAMLOOPS DISTRICT

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IMPORTANT NOTICE

Pests and damage at low levels and of minor consequence are not mentioned herein but the data are recorded and preserved in the form of Internal Reports. Such reports and those relative to other B. C. districts are available on request by contacting:

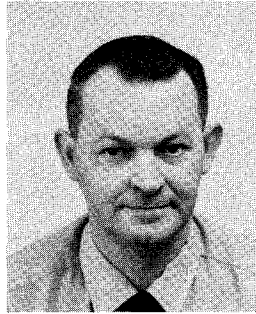
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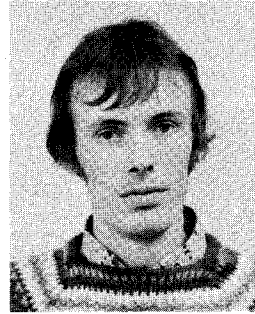
FOREST INSECT AND DISEASE CONDITIONS 1973

KAMLOOPS DISTRICT

by



Cliff Cottrell



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Survey Technicians

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INTRODUCTION

Bark beetles continued to account for most of the tree mortality in the Kamloops Forest District. Spruce beetles attacked large volumes of Engelmann spruce in high-elevation stands in the vicinity of Kelowna. Mountain pine beetle attacks increased in lodgepole pine stands in the Okanagan Valley, but declined in white pine stands in most areas with the major exception of the North Thompson Valley, and remained low throughout the District on ponderosa pine.

Defoliating insects caused more damage in 1973 than in 1972. Spruce budworm infestations on Douglas-fir continued to expand in the Bridge River area. The western false hemlock looper caused moderate to heavy defoliation of Douglas-fir trees at Salmon Arm and Enderby as well as in new areas near Kamloops, Chase and Lavington. Douglas-fir tussock moth infestations greatly increased in size in the North and Central Okanagan Valley. Western hemlock loopers caused moderate damage to western hemlock and western red cedar in the wet-belt areas of the District.

Most of the current disease problems were caused by climatic factors, notably drought damage to all coniferous tree species and winter drying of Douglas-fir and ponderosa pine in the Thompson River Valley.

SPRUCE BEETLE EPIDEMICS CONTINUE

Spruce beetles continue to devastate overmature Engelmann spruce in high-elevation stands in the Okanagan Valley. Infestations on Mt. Gottfriedsen and Whiterocks Mtn. are estimated at 1,500 acres each, and on Little White Mtn. 300 acres. About 90% of the spruce timber has been killed in these areas. Late in 1973, enough overwintering beetles were found in the Whiterocks Mtn. area to effectively destroy the remaining healthy trees above approximately 4,500 feet in elevation. To date, no attacks have been found in younger, more thrifty stands of spruce below the 4,500 foot level. However, this area should be closely watched in 1974 since the severe drought conditions that this area experienced throughout most of 1973 presumably have left the trees more susceptible to beetle attack.

Smaller infestations, totalling 200 acres, have recently developed in one of the few remaining large areas of overmature spruce from Mt. Chapperon to Bouleau Mtn.

Although infestations in the McGillivray Lake area have declined over the past several years, beetles have taken an annual toll of scattered trees in seed blocks.

BEETLE ATTACKS ON LODGEPOLE PINE INCREASING

MOUNTAIN PINE BEETLE attacks in lodgepole pine stands increased in the Okanagan Valley but declined along Cayoosh Creek (Table 1).

Table 1. Number of beetle-killed lodgepole pine trees as determined from aerial surveys, Kamloops Forest District

Location	Year of survey	
	1972	1973
S. fork Whiteman Cr ^{1/}	1,000	2,800
Terrace Cr ^{1/}	1,600	2,000
Mission Cr ^{1/}	250	500
Trout Cr	0	4,000
Cayoosh Cr	1,200	700
Totals	4,050	10,000

^{1/}Plus several thousand trees attacked in 1970-72 and logged in 1972-73.

The numbers of red-topped lodgepole pine more than doubled from 1972 to 1973 and are expected to further increase in 1974. At Trout Creek, approximately 20 miles west of Summerland, there were 4,000 red-tops in a 500-acre area. However, red-tops represented only 11% of the stand and an additional 50% of the trees were attacked in 1973. At Terrace Creek, on a cruise strip one mile outside of the main infestation area, 4% of the trees were attacked in 1972 and 15% in 1973.

Fewer red-topped western white pine trees were noted during aerial surveys in 1973 than in 1972. Infestations expanded in the North Thompson Valley and in Manning Park but declined in the Shuswap River drainage (Table 2).

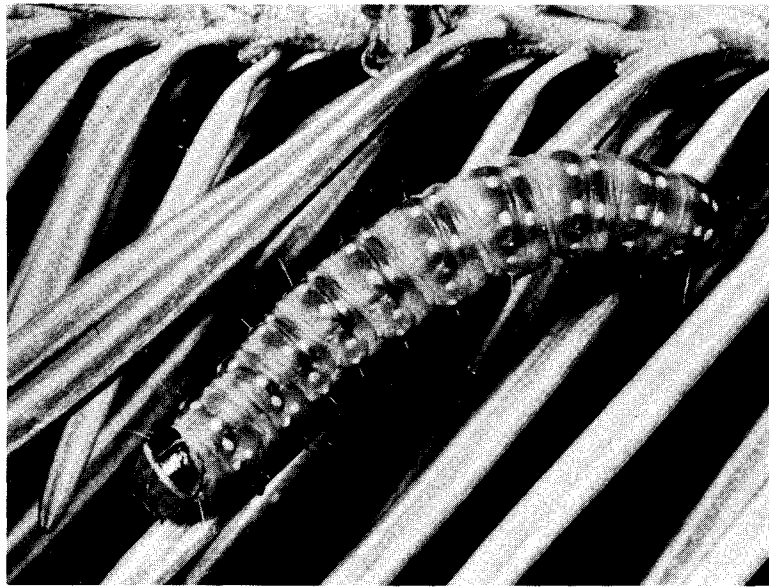
Table 2. Western white pine trees killed by mountain pine beetle, Kamloops Forest District

Location	Year of survey	
	1972	1973
Avola to Lempriere	2,400	4,500
Larch Hills	1,000	500
Tsuius Cr	1,200	600
Sugar L - Squaw Va	7,050	1,200
Manning Park	2,000	2,500
Totals	13,650	9,300

The number of beetle-killed ponderosa pine remained low. The largest infestation involved about 110 trees near Gun Lake.

DOUGLAS-FIR BEETLES attacked small numbers of standing Douglas-fir trees near Carpenter Lake, Brash Creek and in the Monte Hills area. Although Douglas-fir beetle populations have been small for several years, some increase is expected in 1974, as the long, hot summer in 1973 was favorable to brood development and presumably made the trees more susceptible to beetle attacks.

SIXTH YEAR
OF
SPRUCE BUDWORM
DEFOLIATION



Infestations of one-year-cycle WESTERN SPRUCE BUDWORM in Douglas-fir stands continued in the Anderson, Seton, Carpenter, Gun and Downton lakes area. An estimated 45,000 acres of Douglas-fir trees were defoliated in 1973 (Map 1), a slight increase from 1972. The heaviest defoliation occurred at Mission Pass, at the west end of Carpenter Lake and along the south side of Downton Lake. This is the sixth consecutive year of defoliation in the Bridge River Valley. Some understory trees have been killed and top-kill is evident in overstory trees, especially in Mission Pass.

South of Lytton, there were 900 acres of moderate and 700 acres of light defoliation of Douglas-fir trees along Kwoiek Creek compared with 200 acres of heavy defoliation in 1972.

The large numbers of egg masses in August indicate that the infestation will continue in 1974.

FALSE HEMLOCK LOOPER INFESTATIONS EXPAND

In 1972, WESTERN FALSE HEMLOCK LOOPERS caused light to heavy defoliation of semi-mature Douglas-fir trees on 3,200 acres in the vicinity of Salmon Arm and Enderby. To date, about 300 acres of the most heavily defoliated trees have died, mostly those on dry, rocky sites at Sunnybrae, Gleneden and White Lake.

Defoliation in the Salmon Arm area was less extensive in 1973, due in part to heavy egg parasitism and an experimental control program on 400 acres of forest using insect bacteria (*Bacillus thuringiensis*). Infestations near Enderby and Grindrod expanded and new outbreaks occurred near Vinsulla, north of Kamloops, in the vicinity of Chase and at Lavington. This increased the estimated area of defoliation to 4,900 acres (Table 3 and Map 1).

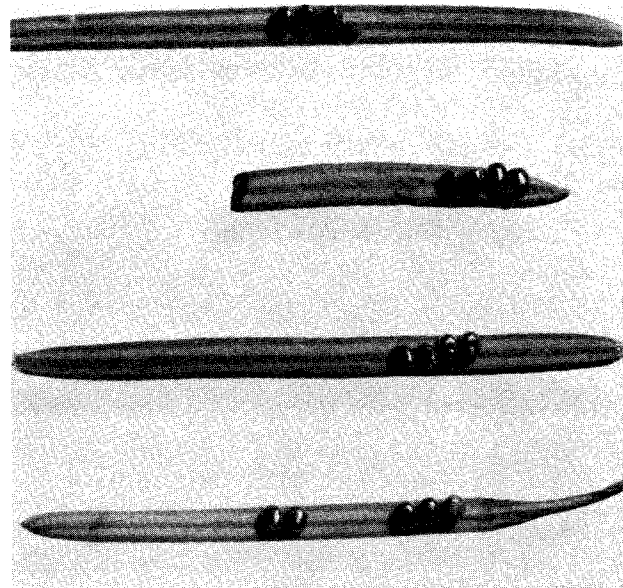


Table 3. Western false hemlock looper infestations,
Kamloops Forest District, 1973

Location	Acres of defoliated Douglas-fir	Defoliation intensity in 1973
Vinsulla	350	moderate-heavy ^{1/}
Niskinlith L	550	light-moderate
Chase (south)	200	light
Little Shuswap L	350	moderate
	200	heavy ^{2/}
Turtle Va	75	moderate
Sunnybrae	100	heavy
	300	light
Gleneden	100	heavy
	1,600	light-moderate
Canoe	200	moderate-heavy
Mara L	75	moderate
Grindrod	100	moderate-heavy
Enderby	300	moderate-heavy
Lavington	300	moderate-heavy
Coldstream	100	moderate-heavy
Total	4,900	

^{1/}Moderate-heavy = Top-killing and occasional tree mortality may occur.

^{2/}Heavy = Tree mortality may be expected.

In addition, moderate to large numbers of larvae, relatively free from disease or parasites, were found in other Douglas-fir stands throughout the Thompson, Shuswap and North Okanagan valleys. Predictions for 1974 are based on egg counts taken during September from within and beyond known infested stands (Table 4). The criterion adopted is that 25 or more eggs per 18-inch branch sample will result in moderate defoliation, whereas 50 or more eggs will cause heavy defoliation. It would appear that many of the current infestations will continue during 1974 and that defoliation will be apparent in new areas.

Table 4. Western false hemlock looper defoliation and egg density, Kamloops Forest District, 1973, and predicted 1974 defoliation

Location	Defoliation of Douglas-fir 1973	Avg no. eggs per 18-inch branch	Anticipated defoliation 1974
Jamieson Cr	moderate	1	light
Westside	moderate	9	light
Paul L	nil	0	nil
McGillivray L Rd	moderate	42	moderate
Niskonlith L	light	17	light
Chase (west)	light	74	heavy
Chase (south)	light	80	heavy
Little Shuswap L	moderate	41	moderate
Blind Bay	nil	0	nil
Carlin	light ^{1/}	8	light
Sunnybrae, mile 3	heavy	135	heavy
Sunnybrae, mile 4	light ^{1/}	12	light
Sunnybrae, mile 6	nil	8	light
Gleneden	heavy	37	moderate
Canoe	moderate-heavy	19	light
Canoe, McLeod Rd.	light ^{1/}	7	light
Mara L	moderate	4	light
Grindrod	moderate-heavy	54	moderate-heavy
Glenmary	moderate-heavy	42	moderate
Enderby	moderate-heavy	24	light-moderate
Enderby (west)	nil	5	light
Brash Cr	nil	5	light
Whiteman Cr	nil	7	light
Beau Park	nil	10	light
Six Mile Rd.	nil	0	nil
Glenemma	nil	3	light
Lavington	moderate-heavy	70	heavy

^{1/}Sprayed, June 1973, with *Bacillus thuringiensis* (B.t.).

TUSSOCK MOTH KILLING TREES

DOUGLAS-FIR TUSSOCK MOTH severely defoliated immature Douglas-fir and some ponderosa pine trees over approximately 5,100 acres (Table 5) in 1973 compared with 1,700 in 1972. Damage was confined to the Okanagan Valley with the exception of small outbreaks in mature Douglas-fir near Salmon Arm and Savona (Map 1).

The largest infestations occurred in the Kelowna - Winfield - Oyama areas comprising some 2,500 acres, of which about 1,000 acres of trees were killed. This rapid and extreme tree mortality is thought to have been partly caused by the exceptionally severe drought in 1973.

In the South Okanagan, the 1,000-acre infestation at Kilpoola Lake, west of Osoyoos, collapsed during the summer of 1973. As a result of past defoliation, 50 acres of trees were killed and 100 acres of Douglas-fir trees suffered top-kill. New infestations occurred near Okanagan Falls and Penticton of 200 and 100 acres, respectively.

By August, larval populations where infestations have persisted for two or three years were greatly reduced by a polyhedral virus disease. Although some defoliation may occur in these areas during the early feeding period in 1974, most infestations are expected to collapse during the summer as the virus disease spreads through the tussock moth populations. Small isolated outbreaks, such as those east of Vernon, Winfield and Rutland, may persist for another year.

Table 5. Douglas-fir tussock moth infestations,
Kamloops Forest District, 1973

Location	No. acres defoliated
Savona	5
Salmon Arm	15
Vernon	130
Oyama	750
Winfield	1,000
Glenmore (Kelowna)	1,000
Rutland	150
Okanagan Mission	500
Westbank	150
Summerland	50
Penticton	100
Kaleden	50
Okanagan Falls	200
Osoyoos	1,000
Total	5,100

Map 1 **Kamloops Forest District**

Areas within which Infestations
occurred in 1973

Spruce Budworm



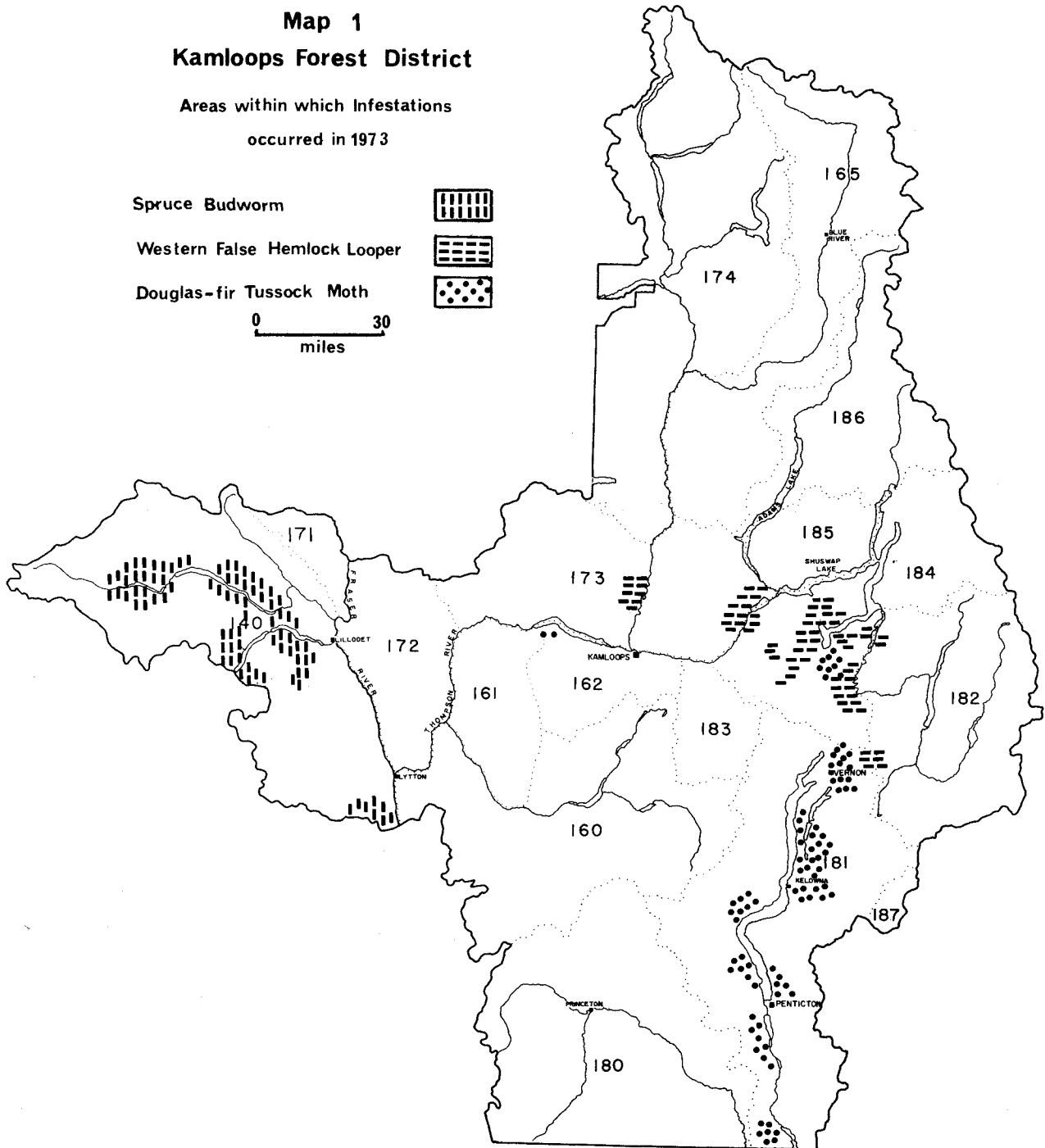
Western False Hemlock Looper



Douglas-fir Tussock Moth



0 30
miles



WESTERN HEMLOCK LOOPERS heavily defoliated western hemlock and western red cedar trees in two 300-acre areas along Tsuius Creek. Moderate defoliation occurred on the current year's growth of western hemlock from Avola to Lempriere in the North Thompson Valley and in the Perry River drainage. These areas border a severe outbreak in the Nelson Forest District. Larvae were common in small numbers on Douglas-fir throughout the Kamloops Forest District.

No disease and few parasites were noted in the loopers during the summer; populations are expected to be high in 1974.

FILAMENT BEARER larvae were commonly found in the wet-belt forests of the Kamloops Forest District in association with the western hemlock looper and likely caused some damage to western hemlock and western red cedar. However, where high populations of filament bearers occurred by themselves, such as at Noisy Creek near Mabel Lake, they heavily defoliated understory trees and ground cover plants but caused little damage to overstory trees.

During May and June, **LARCH BUDMOTH** larvae severely defoliated 1,200 acres of high-elevation mature western larch in the southern part of Silver Star Provincial Park. By mid-August, most trees had refoliated. Past infestations of this insect in the Kamloops Forest District occurred in 1966 but persisted for only a single year.

For the first time since 1966, **WESTERN BLACKHEADED BUDWORM** larvae caused noticeable foliage damage in the Kamloops Forest District. Approximately 100 acres of mature western hemlock trees in the Tsuius Creek Valley were moderately defoliated. Elsewhere in the District larvae were scarce.

The foliage of ponderosa pine was heavily infested by the **PINE NEEDLE SCALE**, *Phenacaspis pinifoliae*, in low elevation stands in Central and North Okanagan. Localized outbreaks of the **BLACK PINE**

NEEDLE SCALE, *Nuculaspis californica*, occurred on ponderosa pine in the vicinity of Penticton.

PINE BUTTERFLY larvae lightly defoliated mature ponderosa pine on the west side of Okanagan Lake from Peachland to Summerland for the second consecutive year. In 1973, pine trees near Duck Lake and along the north arm of Okanagan Lake were also lightly defoliated. Large numbers of butterflies fluttering around the crowns of trees in July indicated that further defoliation may occur in 1974.

BLACK ARMY CUTWORM defoliated Engelmann spruce and Douglas-fir seedlings planted near Redsands in the North Thompson Valley. About 200 acres of a logged-over area were burned in the fall of 1971 and planted in the spring of 1973. Severity of the burn eliminated many of the ground cover plants that are normally the food of cutworms, so that they were forced to feed on the conifer seedlings.

Late in May, 880 Scots pine planted on forest sites in the Okanagan Valley were examined for the presence of the EUROPEAN PINE SHOOT MOTH. Naturally-seeded lodgepole and ponderosa pine trees were checked when they occurred in or around Scots pine plantations. To date, no shoot moths have been found in native pines on forest sites, although infested exotic and native pines were found in earlier years in some residential gardens.

The DOUGLAS-FIR NEEDLE MIDGE severely damaged the foliage of immature Douglas-fir trees from Kelowna to Winfield, and near Okanagan Lake from O'Keefe to Whiteman Creek. Moderate infestations occurred southwest of Kamloops and in the vicinity of Falkland.

COOLEY SPRUCE GALL APHID infestations on Douglas-fir trees generally declined, causing only light damage.

OTHER NOTEWORTHY INSECTS

LARCH CASEBEARER, *Coleophora laricella*, populations on western larch remained at a low level in the southeastern part of the Okanagan Valley.

LARCH SAWFLIES, *Pristiphora erichsonii*, caused small pockets of defoliation of western larch near Vernon but were scarce elsewhere in the District.

FOREST TENT CATERPILLARS, *Malacosoma disstria*, defoliated several thousand acres of trembling aspen trees in the Mad River Valley.

DISEASE CONDITIONS

WHITE PINE BLISTER RUST is a perennial problem of western white pine in the wet-belt areas of the District. In the North Thompson Valley an estimated 1,700 recently-damaged trees were noted from Avola to Thunder River. Numerous damaged trees were also observed in the Raft River Valley, east of Vavenby, around Adams Lake, along the Upper Shuswap River and in Manning Park.

DROUGHT DAMAGE - All coniferous tree species in the southern part of the Kamloops Forest District sustained drought damage as a result of unusually light snow and rainfall coupled with high temperatures during July and August. Many trees that were defoliated by the Douglas-fir tussock moth and western false hemlock looper died after only one year's heavy defoliation, whereas it normally takes two to three years of feeding to cause tree mortality. Large areas of spruce, Douglas-fir and pine trees, regardless of elevation, that have been weakened by drought may be susceptible to bark beetle attack.

WINTER DRYING - For the second consecutive year, ponderosa pine between Spences Bridge and Ashcroft suffered light to moderate damage. Foliage discoloration appeared in a band between 1,500 and 2,500 feet elevation along the east side of the Thompson River. Douglas-fir was lightly affected.

Douglas-fir trees in a localized area along Cherry Creek, west of Kamloops, have been seriously damaged; as a result, some tree mortality is imminent.

Light to moderate foliage damage on ponderosa and lodgepole pines, western red cedar and Douglas-fir occurred near Shuswap Lake from Squilax to Celista.

CURRENT STATUS OF MAJOR PESTS IN B. C.

PEST	D I S T R I C T S					
	PRINCE GEORGE	PRINCE RUPERT	VANCOUVER	CARIBOO	KAMLOOPS	NELSON
Mountain Pine Beetle	light on Pw Canoe R	epidemic Hazelton area	patchy on Pw Fraser Canyon	light on Pl Cariboo L	outbreaks expanding	epidemics E and W Kootenays
Spruce Beetle	trace Monkman area	trace Stewart area	not found	trace Quesnel L	localized epidemics	light
Douglas-fir Beetle	light Canoe R	not found	trace Pemberton area	expanding Fraser R	light	light
Western Blackheaded Budworm	sporadic increase	new outbreaks	declined	moderate Wingdam	localized outbreaks	trace
Spruce Budworm	epidemic Liard R	light	epidemic Pemberton Fraser Cn	light Hendrix L	epidemic Lillooet area	trace
Douglas-fir Tussock Moth	absent	absent	declined	not found	localized epidemics	not found
Western Hemlock Looper	light	trace	light	not found	localized outbreaks	outbreaks Columbia R
False Hemlock Looper	absent	absent	light	not found	localized epidemics	trace
Black Army Cutworm	localized outbreaks	localized outbreaks	not found	not found	outbreak Blue R	outbreak Golden
Forest Tent Caterpillar	epidemic S & E of Pr. George	light	light	epidemic Quesnel - Horsefly	epidemic Raft R	epidemic Golden - Trail
Larch Casebearer	absent	absent	no host	no host	trace	declined
White Pine Blister Rust	light Canoe R	light	scattered light	light	frequent	common
Dwarf Mistletoe	southern areas on Pl	widespread on Hw, Pl	widespread on Hw	Cariboo - Chilcotin on Pl	Okanagan on F	widespread on Pl, Lw
Drought	not apparent	not apparent	localized	moderate	widespread severe	widespread moderate

Canadian Forestry Service
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BC-X-93 December, 1973