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ANNUAL DISTRICT REPORT
FOREST INSECT AND DISEASE SURVEY
BRITISH COLUMBIA, 1975
PART IV, KAMLOOPS FOREST DISTRICT

by

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PACIFIC FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
VICTORIA, BRITISH COLUMBIA
- FILE REPORT -

DEPARTMENT OF THE ENVIRONMENT

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INTRODUCTION

This report outlines the status of forest insect and disease conditions in the Kamloops Forest District for 1975, and attempts to forecast pest population trends.

Regular field work in the District began May 25 and ended August 22. Special surveys for Douglas-fir tussock moth, western false hemlock looper and mountain pine beetle population assessments were done from September 23 to October 3. Aerial surveys consisting of 20 flying hours, 12 of which were supplied by the British Columbia Forest Service, were done in July and August.

A total of 617 insect and disease collections were submitted to the Pacific Forest Research Centre in 1975. Map 1 shows collection localities and drainage divisions.

Numbers of larval defoliators in field collections remained at a high level; 86% of the beating collections contained larvae, the same as in 1973 and 1974.

Bark beetles accounted for most of the tree mortality in the Kamloops Forest District. Mountain pine beetles killed an increased number of lodgepole pine in the Okanagan Valley, and caused moderate to heavy losses of western white pine in the Shuswap, Adams and North Thompson valleys. The first major infestation in ponderosa pine since 1969 became apparent southwest of Merritt in 1975. The first spruce beetle outbreak in two years occurred north of Barriere. Douglas-fir beetle populations increased slightly but caused little tree mortality.

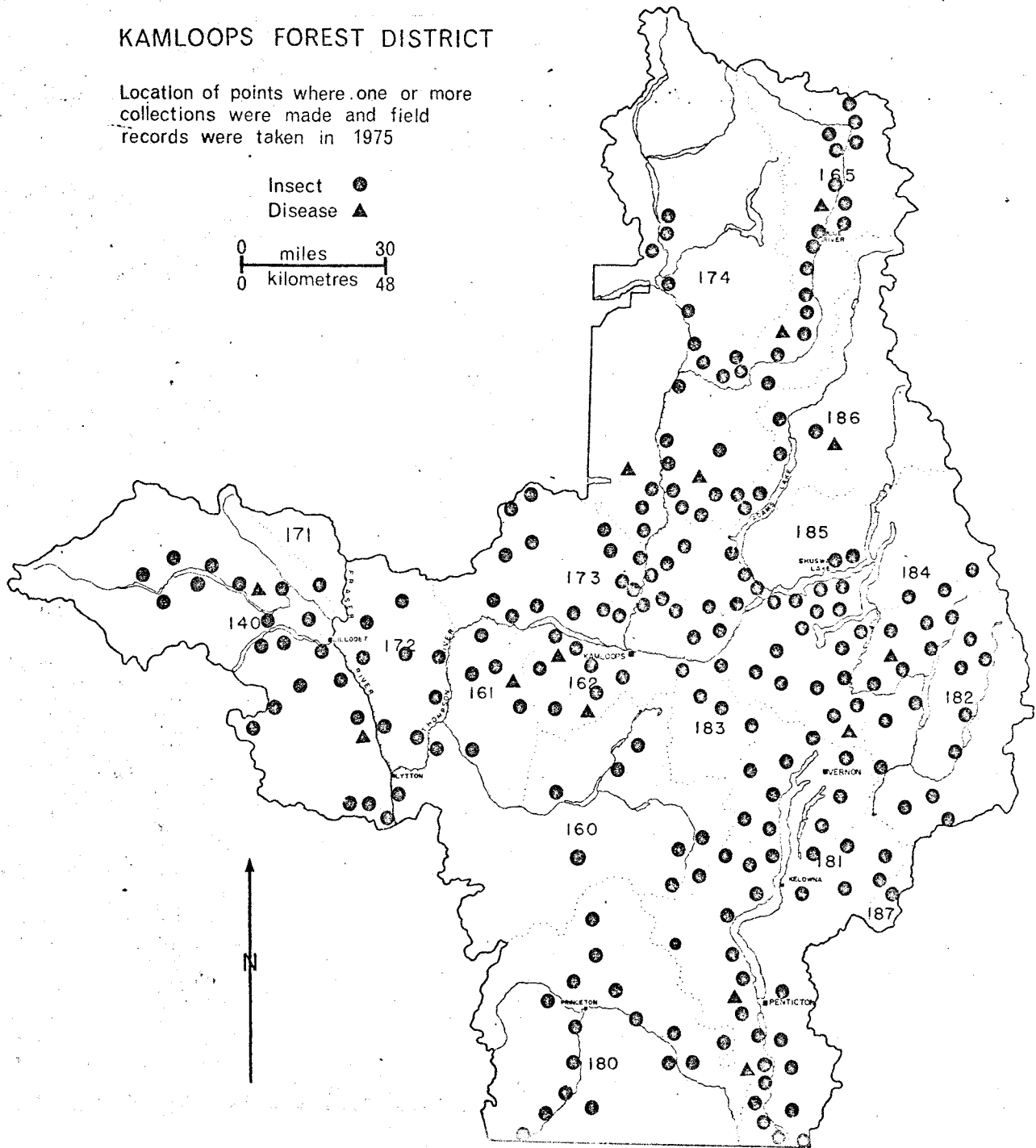
Western spruce budworm defoliation of Douglas-fir trees continued unabated in the western portion of the District, while infestations of Douglas-fir tussock moth and western false hemlock looper declined.

There were few spectacular disease problems noted in 1975 except some frost damage near Kamloops and the perennial incidence of white pine blister rust.

MAP 1

KAMLOOPS FOREST DISTRICT

Location of points where one or more collections were made and field records were taken in 1975



FOREST INSECT CONDITIONS

Currently Important Insects

Bark Beetles

Mountain pine beetle, *Dendroctonus ponderosae*

Mountain pine beetle infestations continued to expand to include more than 18,000 acres (Tables 1 and 2) of attacked lodgepole and western white pine stands. Several thousand additional acres have been logged to salvage beetle-killed trees. The most noteworthy increases were in lodgepole pine stands in the Okanagan Valley and in western white pine stands in the Adams, North Thompson and Shuswap river valleys and along Cayoosh Creek. The number of beetle-killed ponderosa pine remained low until 1974 and 1975, when several small outbreaks developed in the western portion of the District.

In the Okanagan Valley, beetle attacks in lodgepole pine stands have developed in six major areas. Infested acreages were estimated as follows: Whiteman Creek, 1,000; east of Ellison, 1,200; Mission Creek, 1,550; Lambly (Bear) Creek, 3,300; Trout Creek, 1,900 and Riddle Creek, 1,000. In addition, new, smaller infestations were noted near Oyama Lake, and along Power, Jack and Camp creeks. Elsewhere, new infestations occurred southwest of Keremeos in the Ashnola River Valley and near Murray Lake, southwest of Merritt.

Increased attacks occurred in western white pine stands in four major drainages; acreages involved are as follows: from Avola to Lempriere, 1,200; east of Gannett Lake, 600; North Barriere Lake, 500; Cayoosh Creek Valley, 2,000 and along the Yalakom River, 600.

The first major infestation of ponderosa pine since 1969 became apparent at Murray Lake in 1975. More than 100 acres of mature ponderosa pine were killed by the 1974-75 attack; and surrounding lodgepole pine trees were attacked in 1975. Infestations of 50 acres each occurred in ponderosa pine stands near Carpenter Lake and Hat Creek.

Table 1. Acreage of pine trees killed by the mountain pine beetle from 1973 to 1975, Kamloops Forest District

| Pine species | Est. no. of acres | | |
|---------------|-------------------|--------|--------|
| | 1973 | 1974 | 1975 |
| lodgepole | 1,900 | 5,000 | 10,750 |
| western white | 3,100 | 5,000 | 7,150 |
| ponderosa | 30 | 50 | 300 |
| Totals | 5,030 | 10,050 | 18,200 |

The successful 1975 attack produced a large population of beetles. Therefore in 1976 infestations are expected to expand where mature or over-mature trees are available in high hazard areas. (See page 11, "Management of Lodgepole Pine to Reduce Losses from the Mountain Pine Beetle", by L. Safranyik et al.).

Table 2. Acres of pine trees killed by mountain pine beetle, Kamloops Forest District, 1975

| Drainage | Location | Acres |
|-------------------|------------------|--------|
| LODGEPOLE PINE | | |
| Bridge R | Carpenter L | 400 |
| | | 400 |
| Coldwater R | Murray L | 50 |
| | | 50 |
| Okanagan, north | Whiteman Cr | 1,000 |
| | Oyama L | 50 |
| | | 1,050 |
| Okanagan, central | Vernon Cr | 550 |
| | Scotty Cr | 300 |
| | Black Knight Mtn | 350 |
| | Mission Cr | 700 |
| | Belgo Cr | 200 |
| | Joe Rich Cr | 50 |
| | Leech Cr | 100 |
| | Grouse Cr | 100 |
| | Bellevue Cr | 100 |
| | Klo Cr | 300 |
| | Terrace Cr | 1,000 |
| | Bald Range Cr | 500 |
| | Lean-to Cr | 1,000 |
| | Lambly Cr | 500 |
| | Lambly L | 300 |
| | Power Cr | 150 |
| | Jack Cr | 100 |
| | | 6,300 |
| Okanagan, south | Trout Cr | 1,000 |
| | Lost Chain Cr | 300 |
| | Bearpaw Cr | 100 |
| | Camp Cr | 200 |
| | Isintok Cr | 300 |
| | Riddle Cr | 1,000 |
| | | 2,900 |
| Similkameen R | Ashnola R | 50 |
| | | 50 |
| Total | | 10,750 |

Table 2 - Cont'd.

WESTERN WHITE PINE

| | | |
|------------------|--------------------|--------------|
| North Thompson R | Avola to Lempriere | 1,200 |
| | Raft R | 400 |
| | N. Barriere L | <u>1,000</u> |
| | | 2,600 |
| Adams R | Gannett L | 600 |
| | Burton Cr | 100 |
| | Tsikwustum Cr | <u>100</u> |
| | | 800 |
| Fraser R | Yalakom R | 600 |
| | Cayoosh Cr | <u>2,000</u> |
| | | 2,600 |
| Shuswap R | Mt. Ida | 150 |
| | Kingfisher Cr | 75 |
| | Hound Cr | 75 |
| | Upper Shuswap R | 200 |
| | Sugar L | 200 |
| | Squaw Va | 200 |
| | Vance Cr | <u>50</u> |
| | | 950 |
| Skagit R | Manning Park | <u>200</u> |
| | | 200 |

| | |
|-------|-------|
| Total | 7,150 |
|-------|-------|

PONDEROSA PINE

| | | |
|-------------|-------------|------------|
| Bridge R | Carpenter L | 100 |
| Thompson R | Hat Cr | 60 |
| Coldwater R | Murray L | 140 |
| Total | | <u>300</u> |

| | |
|-------------|--------|
| Grand Total | 18,200 |
|-------------|--------|

Spruce beetle, *Dendroctonus rufipennis*

One known infestation of spruce beetle occurred in Engelmann spruce at 5,000 feet (1,500 metres) elevation in the headwaters of Chu Chua and Birkby creeks, west of North Barriere Lake. Most of the trees on approximately 250 acres (100 ha) in the valley bottoms were attacked in 1974, and some trees were attacked in 1975 on the surrounding hillsides. However, since the majority of the beetle population has a 2-year life cycle at this elevation, additional attacks are expected in 1976 from the beetles overwintering at the base of the 1974-attacked trees. The infestation is believed to have built up in wind-thrown spruce in the fall of 1971 and spring of 1972 on the fringe of logged areas.

Douglas-fir beetle, *Dendroctonus pseudotsugae*

Douglas-fir beetle populations increased slightly in the Fraser and South Thompson River drainages and in the Okanagan Valley (Table 3). Since more beetle-infested logging slash was noted in 1975, attacks on standing trees are expected to increase in the next year or two. The last serious outbreak of Douglas-fir beetle in the Kamloops Forest District occurred in 1965.

Table 3. Number and location of beetle-killed Douglas-fir trees in the Kamloops Forest District, 1975

| Location | No. of trees |
|----------------------|--------------|
| Botanie Cr | 100 |
| Fountain Va | 300 |
| Siwhe Cr | 30 |
| Venables Cr | 30 |
| Deadman R | 50 |
| Ashcroft - Walhachin | 170 |
| Tranquille Cr | 125 |
| Lac Le Jeune Rd. | 50 |
| Monte L | 25 |
| Westwold | 25 |
| Falkland | 25 |
| Vernon Commonage | 50 |
| Turnbull Cr | 100 |
| Total | 1,080 |

Dryocoetes-Ceratocystis complex

Aerial surveys of high elevation spruce-balsam stands were somewhat restricted in 1975, however it is felt that the number of attacked alpine fir trees remained at a relatively low level. Five hundred red-topped trees were noted at North Barriere Lake, 500 near Eneas Lakes, 400 in each of the headwaters of Shorts and Terrace creeks.

Defoliators

Western spruce budworm, *Choristoneura occidentalis*

Infestations of western spruce budworm continued in western portions of the Kamloops Forest District, and expanded in Manning Park and in the Adams Lake area. Feeding damage was mostly confined to Douglas-fir trees, but Engelmann spruce, alpine fir and some western hemlock were also defoliated at Adams Lake.

Aerial surveys in August revealed 85,000 acres of Douglas-fir defoliation in the Anderson, Seton, Carpenter, Gun and Downton lakes areas, Cayoosh Creek and in tributary valleys of the Fraser River from Fountain south to Kwoiek Creek in the Fraser Canyon. Defoliation was heavy on 8,000 acres, moderate on 14,000 and light on 63,000 acres. This is the eighth consecutive year of defoliation in the Bridge River Valley. Heaviest feeding damage occurred near Kwoiek Lake, Jackass Mountain, Shalalth, Marshall Creek and Downton Lake.

Along Adams Lake and Adams River, infestations increased from 1,600 acres of light defoliation in 1974 to 9,500 acres of light to moderate defoliation in 1975. New infestations in Douglas-fir stands were found along both sides of Adams Lake north of Spapilem Creek, and near Momich Lake, Gollen Creek and Harbour Lakes. Moderate defoliation occurred at Robert and Burton creeks, where feeding first became evident in 1974.

In Manning Park the infestation expanded from 1,000 acres of light defoliation in 1974 to 7,000 acres in 1975. Defoliation of Douglas-fir and some amabilis fir is confined to the western boundary of the Park along Skaist River, where defoliation is moderate, and along the Skagit River where there is only light feeding.

Foliage discoloration became apparent by the end of June, at which time almost all of the 1975 growth had been consumed at lower elevations of many infestations. Larval populations within infestations were comparable to those found in previous years, although there was a slight increase in other Douglas-fir zones in the District.

Larval parasitism was low, ranging from 2 to 6%, and no evidence of virus or disease was found in mass collections of larvae submitted to the Insect Pathology Research Institute.

Egg populations were assessed in August, to determine the potential population for 1976. Predictions of 1976 damage are based on the criteria that 50 to 150 egg masses per 100 ft² of foliage could result in moderate defoliation, and more than 150 in heavy defoliation. Table 4 shows the results of the egg survey and defoliation estimates in 1974 and 1975.

Table 4. Comparison of density of spruce budworm egg masses and defoliation estimates for Douglas-fir trees, 1974 and 1975, Kamloops Forest District

| Location | Avg no. egg masses per 100 ft ² of foliage | | Estimated defoliation (%) | | Predicted defoliation for 1976* |
|--------------------------------------|---|------|---------------------------------|------|---------------------------------------|
| | 1974 | 1975 | 1974 | 1975 | |
| Gun L | 88 | 70 | 15 | 20 | M |
| Marshall Cr | 205 | 133 | 15 | 15 | M |
| Mission Pass | 220 | 479 | 25 | 30 | H |
| Fountain Valley | 193 | 172 | 10 | 15 | H |
| Cayoosh Cr | 83 | 92 | 20 | 20 | M |
| Botanie Cr | - | 273 | - | 20 | H |
| Kwoiek Cr | 234 | 164 | 30 | 35 | H |
| Adams L Rd., mi. 29 | - | 120 | - | 5 | M |
| Robert Cr | - | 92 | - | 20 | M |
| Harbour Lakes Rd., mi. 6 | - | 98 | - | 15 | M |
| Manning Park (west- ern boundary) | 117 | 213 | 10 | 10 | H |

* M - moderate; H - heavy.

Sectar traps were used for the third year as a means of assessing adult budworm populations. The traps, containing a sex attractant at the rate of 10 mg of Soolure, were set out at six locations in the District just prior to moth emergence in early July, and retrieved after the moth flight in August (Table 5).

Appraisal plots, established in 1973 at Kwoiek Creek and Mission Pass, to study the effects of defoliation over a period of years, were re-examined in August. At Mission Pass, where trees have sustained foliage loss for eight consecutive years, 20% of the Douglas-fir trees examined had from 1 to 15 feet of top stripping; and a few had top-kill. Damage was much more severe at Kwoiek Creek where, after four successive years of severe defoliation, 60% of the trees

had from 2 to 20 feet of top-kill; the remainder having from 5 to 25 feet of top strip. Several large mature trees in this area were also killed by Douglas-fir bark beetles.

Data from the assessment of egg populations, and flight trap information gathered from six locations in the District, indicate that populations in all areas now infested will continue at, or near the same intensity as in 1975, providing weather conditions are conducive to larval development and no unforeseen virus or disease appears.

The most severe defoliation in the District can be expected at Mission Pass, Fountain Valley, Botanie Creek, Kwoiek Creek, and along the western boundary of Manning Park. Although tree mortality to date is restricted to a few understory trees in several areas, another year of moderate to heavy defoliation in Kwoiek Creek and at Mission Pass will probably result in some tree mortality and increased top-kill.

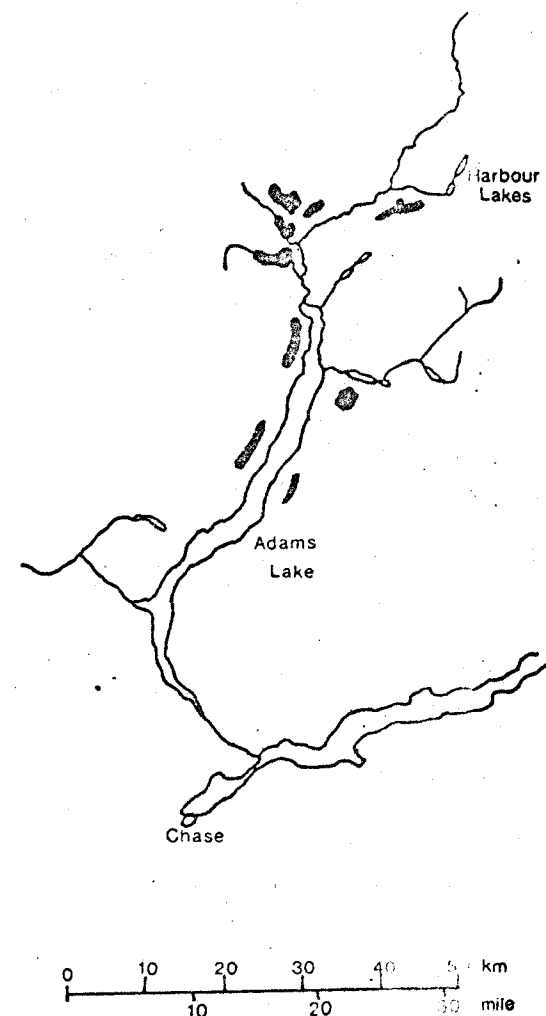
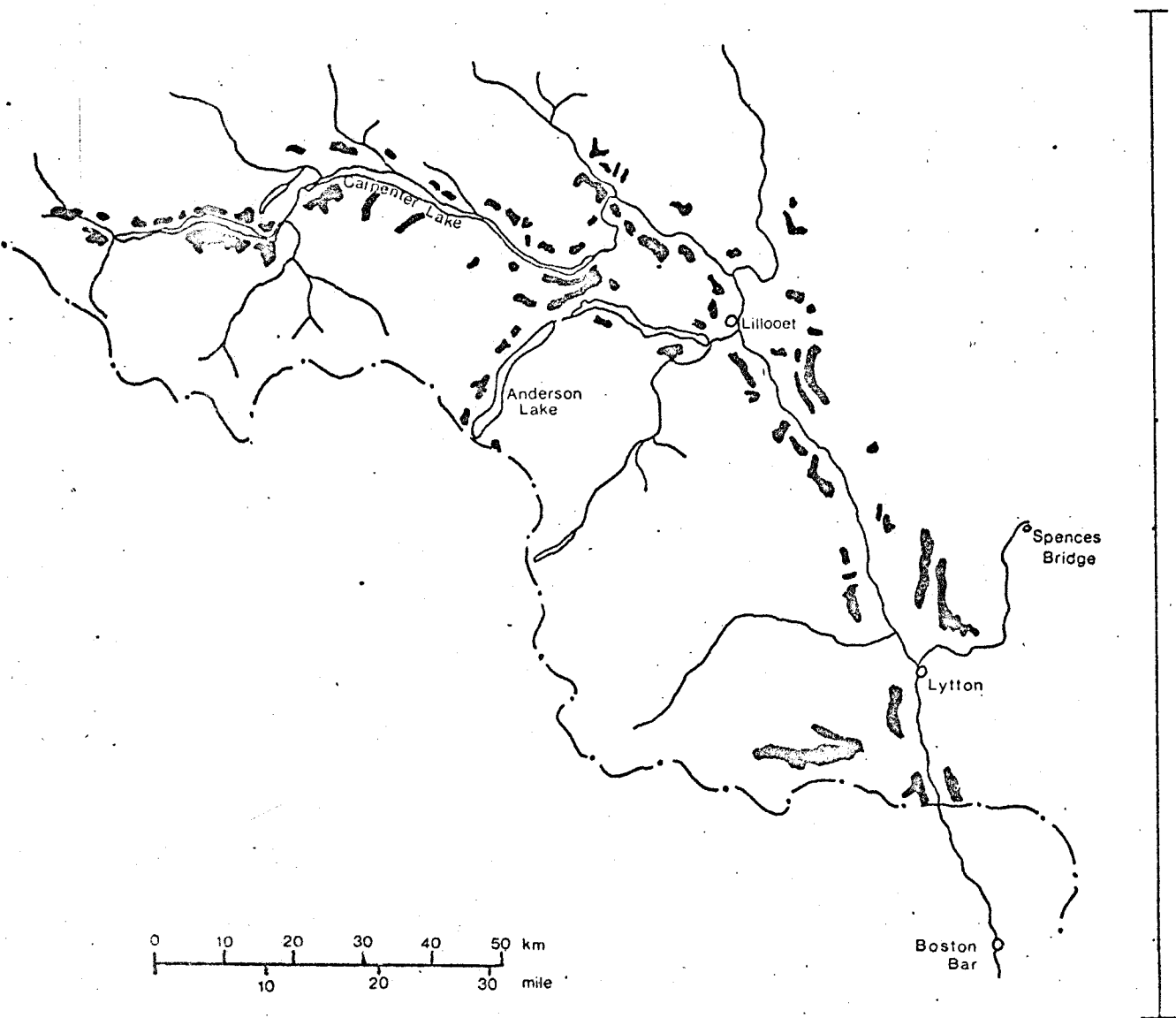
Table 5. Numbers of spruce budworm larvae in beating samples and moths caught in flight traps, Kamloops Forest District, 1975

| Location | Avg no. larvae in beating samples | | | Avg no. male moths per trap | | |
|------------------|--------------------------------------|------|------|--------------------------------|------|------|
| | 1973 | 1974 | 1975 | 1973 | 1974 | 1975 |
| Mission Pass | 20 | 163 | 115 | 18 | 19 | 24 |
| Botanie Cr | - | 205 | 460 | - | 65 | 31 |
| Dominic L Rd. | 0 | 1 | 14 | 12 | 27 | 16 |
| Lac Le Jeune Rd. | 0 | 0 | 0 | 5 | 45 | 16 |
| Enderby | 8 | 0 | 1 | 10 | 12 | 18 |
| Vernon | 0 | 3 | 1 | 8 | 20 | 24 |

WESTERN SPRUCE BUDWORM DEFOLIATION OF DOUGLAS-FIR

KAMLOOPS FOREST DISTRICT

1975



Douglas-fir tussock moth, *Orgyia pseudotsugata*

Douglas-fir tussock moth larvae severely defoliated immature Douglas-fir and ponderosa pine trees for the third year in the Kamloops area. Heavy defoliation resulting in considerable tree mortality, was recorded on 6,300 acres south of Kamloops Lake between Cherry Creek and Savona, and on 14,300 acres along both sides of the North Thompson Valley, from Westsyde to McLure.

Control operations conducted by the British Columbia Forest Service against this insect and the false hemlock looper were undertaken in June, and approximately 31,000 acres were sprayed with a bacteria, *Bacillus thuringiensis*, as the control agent. Unfortunately there was very little reduction in feeding damage this year, though many larvae died in the later stages of their development.

A nuclear polyhedral virus infecting some late instar larvae near Kamloops in 1974, appeared more widespread in 1975. This, together with direct control measures and larval parasitism, undoubtedly reduced populations, as counts of overwintering egg masses were much reduced from 1974.

Moderate to heavy defoliation may be expected in 1976 in fringe areas near Durand Creek, Cherry Creek, Rayleigh, Palmer-Forsythe road and on the south side of Jamieson Creek, where egg masses were numerous.

Infestations in the Okanagan Valley collapsed in 1975, although trees continued to die as a result of previous recent defoliation (Table 6).

Table 6. Douglas-fir tree mortality in plots of 50 trees each, defoliated by Douglas-fir tussock moth, 1973, 1974 and 1975

| Location | Avg defoliation (%) | | | Dead trees (%) | | |
|------------------|---------------------|------|------|----------------|------|------|
| | 1973 | 1974 | 1975 | 1973 | 1974 | 1975 |
| Heffley Cr | - | 86 | 85 | - | 0 | 30 |
| Jamieson Cr | - | 90 | 88 | - | 0 | 54 |
| Dairy Cr | - | 82 | - | - | 0 | - |
| S. of Kamloops L | - | 76 | 82 | - | 0 | 74 |
| Vernon Hill | 78 | 90 | 71 | 2 | 20 | 24 |
| Glenmore | 90 | 90 | 85 | 72 | 72 | 72 |
| McKinley Ldg. | 91 | 88 | 89 | 28 | 32 | 32 |
| Okanagan Mission | 64 | 55 | 39 | 0 | 0 | 6 |

Spruce spider mite, *Tetranychus ununguis*

Spruce spider mites attacked the 1974 and 1975 foliage of about 2,000 acres of immature Douglas-fir trees from Winfield to Kelowna. These trees had recently been partially defoliated by the Douglas-fir tussock moth, and the additional mite feeding will probably prevent the recovery of many of the trees.

Western false hemlock looper, *Nepytia freemani*

False hemlock looper infestations in Douglas-fir stands declined to 1,800 acres (720 ha) in 1975, from over 14,000 (5,600 ha) in 1974. Light to moderate defoliation occurred on 750 acres (300 ha) at Monte Lake and on 800 acres (320 ha) between Louis Creek and Barriere. At Barriere, defoliation was caused by the combined feeding of western false hemlock looper and western hemlock looper, *Lambdina fiscellaria lugubrosa*. Elsewhere small areas of light feeding were noted at Larkin, 100 acres (40 ha), Pritchard 50 acres (20 ha) and Lavington 100 acres (40 ha). High overwintering egg parasitism appeared to be the main cause of the population decline (Table 7). Throughout the District the number of larvae per positive collection was lower (Table 8).

Table 7. Average number of western false hemlock looper eggs per 18-inch branch indicating parasitism that occurred in the spring of 1975, Kamloops Forest District

| Location | Avg no. eggs per 18-inch branch fall 1974 | 1975 defoliation prediction | Avg no. eggs per 18-inch branch spring 1975 | 1975 defoliation |
|-----------------------|--|-----------------------------------|--|---------------------|
| Adams R | 56 | heavy | 14 | light |
| Chase, 1 mi. S.W. | 118 | heavy | 30 | light |
| Gleneden, 1 mi. N. | 51 | medium | 7 | light |
| Monte L, S. | 24 | medium | 5 | light |
| Grindrod, 1 mi. S.W. | 25 | medium | 6 | nil |
| Mt. Rose, N. | - | - | 11 | nil |
| Mt. Rose, S. | 39 | medium | 15 | nil |
| Deer Cr | 272 | heavy | 19 | light |
| Lavington, 1.6 mi. E. | 251 | heavy | 18 | medium |

Table 8. Three-year summary of western false hemlock looper collections by drainage division

| Drainage division* | No. samples taken during larval period | | | % samples containing larvae | | | Avg no. larvae per positive sample | | |
|--------------------|--|----|----|-----------------------------|----|----|------------------------------------|-----|----|
| | 73 | 74 | 75 | 73 | 74 | 75 | 73 | 74 | 75 |
| 173 | 59 | 23 | 23 | 17 | 50 | 47 | 41 | 44 | 28 |
| 174 | 5 | 8 | 9 | 0 | 38 | 22 | - | 143 | 5 |
| 181-184 | 61 | 49 | 48 | 74 | 61 | 58 | 63 | 68 | 35 |

* See map 1.

Moderate larval populations of false hemlock looper in Douglas-fir tussock moth, *Orgyia pseudotsugata*, infestations south of Kamloops Lake and north of Kamloops between Westsyde and McLure, were probably responsible for up to 20% of the defoliation which occurred in these areas.

Control operations in the Kamloops area against the looper and tussock moth appears to have had little effect in inhibiting feeding and preventing defoliation.

To predict 1976 larval populations, egg samples were taken early in October at 27 locations in and around infested areas (Table 9). Results of the survey indicate that the infestation has collapsed as counts of healthy eggs were low and parasitism high.

Table 9. Total number of western false hemlock looper eggs and healthy eggs, Kamloops Forest District, 1975

| Location | Total no. eggs per sample | % eggs parasitized | Avg no. healthy eggs per 18-inch branch |
|-----------------------|---------------------------------|--------------------------|---|
| Chinook Cove | 5 | 0 | <1 |
| Barriere | 60 | 42 | 4 |
| Exlou | 47 | 28 | 3 |
| Wild Horse Mtn | 2 | 100 | 0 |
| Beresford | 4 | 0 | <1 |
| Niskonlith L | 6 | 83 | <1 |
| Little Shuswap L, N. | 283 | 100 | 0 |
| Jacko L | 0 | - | 0 |
| Campbell Cr | 2 | 100 | 0 |
| Robbins Range | 18 | 28 | 1 |
| Monte L, S.W. | 53 | 64 | 2 |
| Monte L, N.E. | 54 | 44 | 3 |
| Monte L, S.E. | 13 | 54 | <1 |
| Duck Range | 4 | 0 | <1 |
| Duck Meadow | 9 | 11 | <1 |
| Pritchard, 1 mi. S.E. | 112 | 44 | 11 |
| Pinaus L | 14 | 78 | <1 |
| Mt. Rose, S. | 27 | 100 | 0 |
| Larkin | 82 | 43 | 8 |
| Harris Cr | 2 | 100 | 0 |
| Lavington, 1.6 mi. E. | 153 | 91 | 2 |
| Beau Park | 1 | 100 | 0 |
| Whiteman Cr | 9 | 100 | 0 |
| Emory Point | 8 | 50 | <1 |
| Princeton, 10 mi. E. | 0 | - | 0 |
| Bromley, 1.5 mi. E. | 0 | - | 0 |
| Bromley | 3 | 0 | <1 |

Trees that were heavily defoliated during the past several years continued to die, while trees lightly to moderately defoliated have begun to recover (Table 10).

Table 10. Douglas-fir tree mortality in plots of 50 trees each defoliated by western false hemlock looper, 1973, 1974 and 1975

| Location | Avg defoliation (%) | | | Dead trees (%) | | |
|------------------|---------------------|------|------|----------------|------|------|
| | 1973 | 1974 | 1975 | 1973 | 1974 | 1975 |
| Sunnybrae, mi. 6 | 96 | 97 | 88 | 64 | 68 | 76 |
| Sunnybrae, mi. 4 | 75 | 75 | 60 | 20 | 40 | 40 |
| Gleneden | 65 | 74 | 59 | 0 | 4 | 12 |
| Canoe | 71 | 53 | 37 | 6 | 6 | 10 |
| Enderby | 23 | 11 | 0 | 0 | 0 | 0 |
| Lavington | 29 | 74 | 60 | 0 | 0 | 14 |

Western hemlock looper, *Lambdina fiscellaria lugubrosa*

Western hemlock looper in association with the western false hemlock looper caused light defoliation of semi-mature Douglas-fir trees near Barriere. Elsewhere, larvae were common throughout the range of Douglas-fir in the District, but did little damage.

Populations of western hemlock looper, which were at near outbreak levels in cedar-hemlock stands in the North Thompson Valley north of Blue River and in the Shuswap River drainage in 1974, collapsed in 1975.

Black army cutworm, *Actebia fennica*

Black army cutworms were numerous in coniferous plantations in the "Eden Fire" (mid September, 1973) west of Salmon Arm. More than 25 larvae per square foot were found in 1/2-acre or 1-acre areas throughout a 600-acre area planted with Engelmann spruce and lodgepole pine seedlings in the spring of 1975. Fortunately there was sufficient broadleaved ground cover for the larvae to feed upon so that little damage was done to the seedlings.

Small numbers of black army cutworms were reported from Finn, Hellroar and Lempriere creeks in the North Thompson Valley, and from Scotch Creek north of Shuswap Lake.

Populations in 1976 may remain at a high level in the "Eden Fire" area, as pheromone traps attracted numerous moths indicating a low rate of parasitism. Of the four attractants used, BC-3 achieved the best results (Table 11).

Table 11. Number of male black army cutworm moths caught in four types of sex pheromone traps in the "Eden Fire", Kamloops Forest District, 1975

| Attractant ^{1/} | No. of traps | Total no. moths caught | Avg no. moths caught per trap |
|--------------------------|------------------|------------------------|-------------------------------|
| BC-1 | 14 ^{2/} | | >0.5 |
| BC-2 | 14 | 7 | 0.5 |
| BC-3 | 14 | 117 | 8.4 |
| BC-4 | 6 | 1 | >0.2 |
| BC-5 | 13 | 5 | >0.4 |

^{1/} BC-1 (Z)-7-Tetradecen-1-01 Acetate
 BC-2 (Z)-7-Hexadecen-1-01 Acetate
 BC-3 (Z)-7-Dodecen-1-01 Acetate
 BC-4 (Z)-9-Tetradecen-1-01 Acetate
 BC-5 2 female pupae per trap (failed to emerge)

^{2/} Most traps were knocked down and trampled by cattle.

Scale Insects

The black pineleaf scale, *Nuculaspis californica*, severely attacked all ages of ponderosa pine in the vicinity of Summerland, Trout Creek and Penticton. Numerous mature pine trees near Penticton, weakened by drought and scale attack, died in 1974 and 1975. In 1976, tree mortality is expected at Summerland. Light scale attacks were noted near Gallagher Lake, north of Oliver.

Pine needle scales (white), *Phenacaspis pinifoliae*, were abundant on ponderosa pine in and around Kamloops but populations declined in the Okanagan Valley.

Other Noteworthy Insects

Douglas-fir needle midges, *Contarinia* spp.
Cooley spruce gall aphid, *Adelges cooleyi*

Needle midges extensively damaged immature and semi-mature Douglas-fir trees for about 10 miles along the Similkameen River east of Princeton (near Bromley). Elsewhere in the District infestations were light.

Populations of spruce gall aphid were also light in 1975 (Table 12).

Table 12. Percentage of Douglas-fir needles infested by needle midges and aphids, Kamloops Forest District, 1975

| Location | % needles attacked by | |
|------------|-----------------------|----------------|
| | <i>Contarinia</i> | <i>Adelges</i> |
| Barriere | 0.4 | 1.0 |
| Heffley Cr | 0.7 | 1.1 |
| Cherry Cr | 0.1 | 1.0 |
| Monte Cr | 4.4 | 0.8 |
| Pinaus L | 6.6 | 9.1 |
| Harris Cr | 16.6 | 2.3 |
| Ashnola R | 12.2 | 6.9 |

Satin moth, *Stilpnotia salicis*

Satin moth larvae caused more damage in 1975 than since the last major outbreak in 1964. Several dozen large groves of trembling aspen trees were heavily defoliated near Merritt, Courtney Lake and Aspen Grove. Small groups of black cottonwood and aspen trees were defoliated at Carpenter, Nicola, Allison and Dry lakes. Two infested silver poplar trees at Avola may constitute a northern distribution record for this insect.

Gypsy moth, *Porthetria dispar*

No gypsy moths were collected in a survey to detect the possible spread of this insect into southwestern Canada. Pheromone traps to attract the moths were placed in several tourist accommodation sites at Osoyoos, Oliver and Summerland.

European pine shoot moth, *Rhyacionia buoliana*

In May, 1975 no shoot moth larvae or pupae were found in 812 Scots pine trees planted in forested sites. Naturally-seeded lodgepole and ponderosa pines were examined when they occurred near Scots pine plantations (Table 13).

Table 13. Examination of pine trees for the presence of European pine shoot moths, 1975

| Location | No. and species of pine | | |
|---------------|-------------------------|-----------|-----------|
| | Scots | lodgepole | ponderosa |
| Larkin | 19 | - | 50 |
| Glenmore (S.) | 22 | - | 50 |
| Glenmore (N.) | 43 | 1 | 6 |
| Joe Rich Cr | 128 | 50 | - |
| Westbank | 600 | 25 | - |
| Totals | 812 | 76 | 106 |

In June, 1975 pheromone traps were placed in six locations in an attempt to attract shoot moth adults (Table 14). At the Okanagan Regional College at Kelowna, one adult was caught. Trees on the College grounds had been heavily infested but most of the infested shoots had been removed.

Table 14. Number of pheromone traps and European pine shoot moths caught, Kamloops Forest District, 1975

| Location | No. traps | No. adults caught |
|----------------------------|-----------|-------------------|
| Hillside Nursery, Kamloops | 2 | 0 |
| Knapp's Nursery, Kamloops | 2 | 0 |
| Larkin | 3 | 0 |
| Vernon, BX Cr | 4 | 0 |
| Okanagan College | 3 | 1 |
| Joe Rich Cr | 3 | 0 |
| Totals | 17 | 1 |

Larch budmoth, *Zeiraphera improbana*

All infestations on western larch trees in the Silver Star Mountain and Vernon Hill areas declined.

Sequoia pitch moth, *Vespamina sequoiae*, caused localized ponderosa and lodgepole pine tree mortality in the vicinity of Salmon Arm.

Western winter moth, *Erannis vancouverensis*, larvae heavily defoliated Douglas maple, white birch, willow and alder trees along Skimikin and Corning creeks in the Shuswap Lake area.

Bruce spanworm, *Operophtera bruceata*

Endemic populations of spanworm were reported in fruit-tree orchards in the vicinity of Oliver and Osoyoos. J. Procter, Provincial Department of Agriculture, and D. McMullen, Agriculture Canada, state that the infestation was first noted four years ago and defoliation is less intense now. Some control measures have been taken using Diazinon.

Forest Disease Conditions

Frost Damage

Ponderosa pine trees at Dufferin Heights, Kamloops and Knutsford, were severely discolored due to unseasonable low temperatures during the spring of 1975. Some Douglas-fir trees at Knutsford were also damaged. Several mature ponderosa pines at Dufferin Heights died during the summer as a result of frost damage, soil disturbance and bark beetle attacks.

White pine blister rust, *Cronartium ribicola*

White pine blister rust, a perennial problem of western white pine, continued in the wet-belt areas of the District. The highest incidence of infection occurred in stands in the North Thompson Valley, around North Barriere and Adams lakes, Scotch Creek, the headwaters of tributaries of the Coldwater River and in Manning Park. The most concentrated damage was in approximately 2,000 acres (800 ha) in Scotch Creek.

A canker disease, *Cytospora kunzei*

This disease infected scattered young growth Douglas-fir trees in several thousand acres of selectively-cut stands northeast of Penticton. Branch and top-killing was common on individual and small groups of trees.

Globose gall rust, *Endocronartium harknessii*

Five lodgepole pine stands of 100 trees each were examined for the presence of globose gall rust at Lac Le Jeune, Mile 5 - Powder Lake Road, Barriere, North Barriere Lake Road and Greenstone Mountain. At Lac Le Jeune, 7% of the trees had stem or branch infections, but none were found at the other four locations.