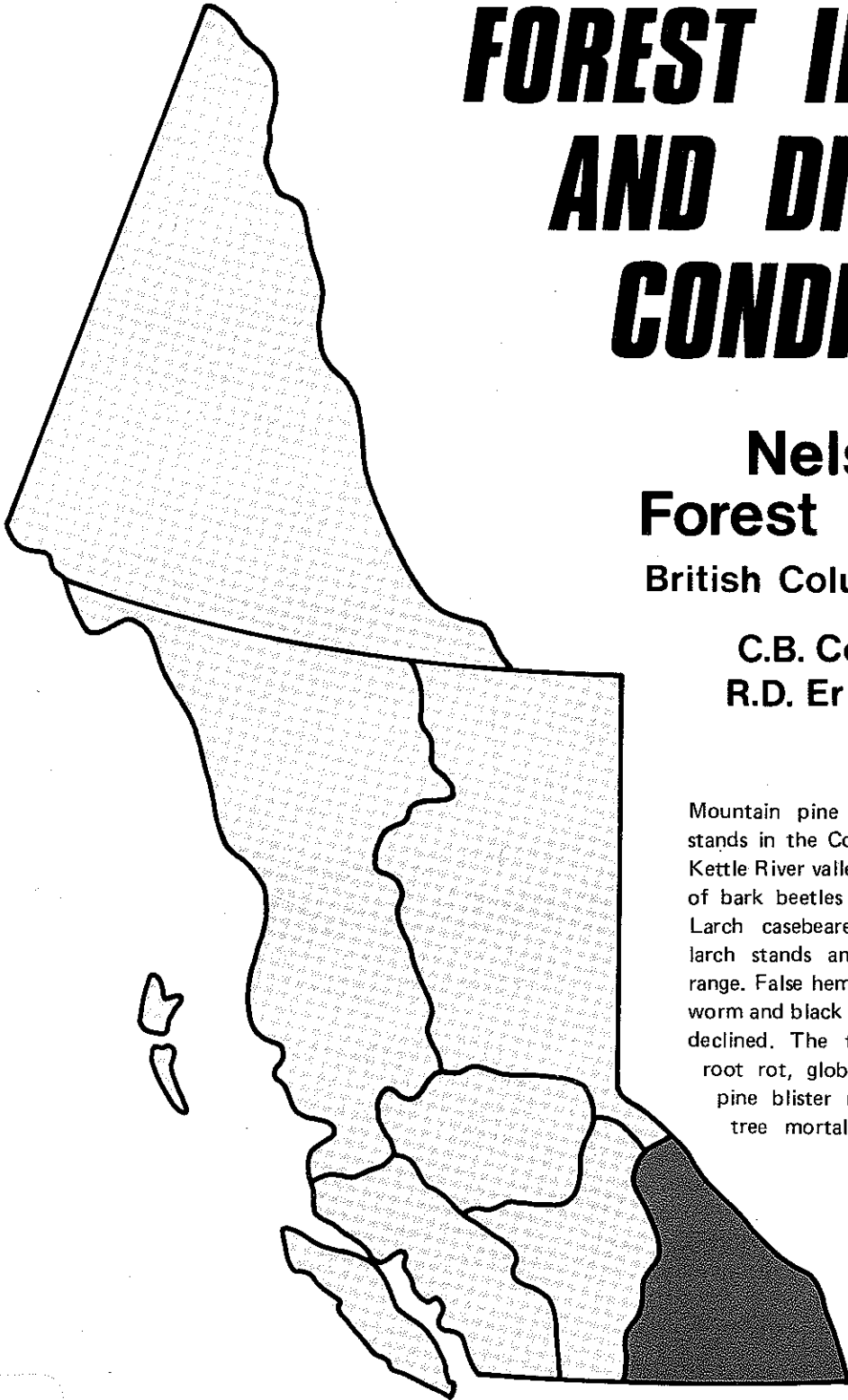


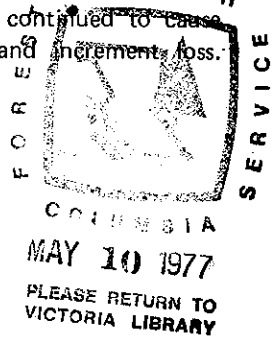
FOREST INSECT AND DISEASE CONDITIONS

**Nelson
Forest District
British Columbia, 1976**

**C.B. Cottrell
R.D. Erickson**

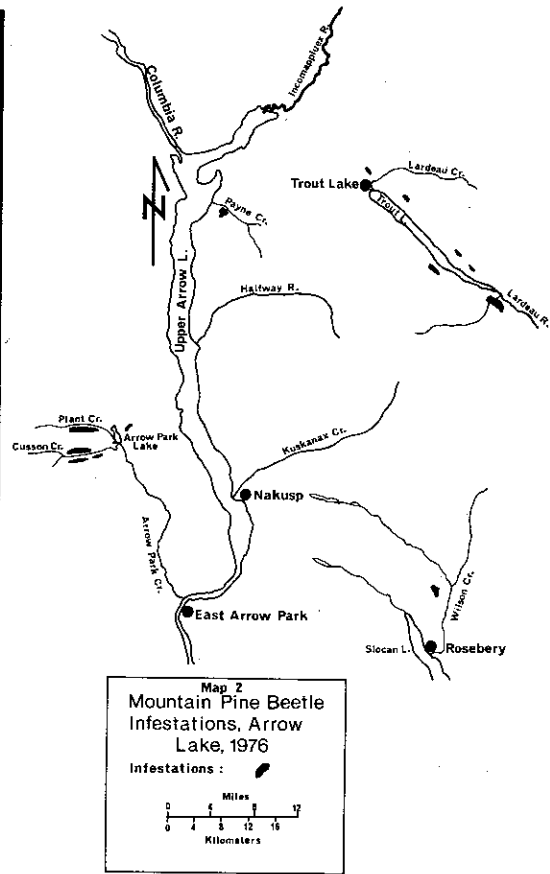
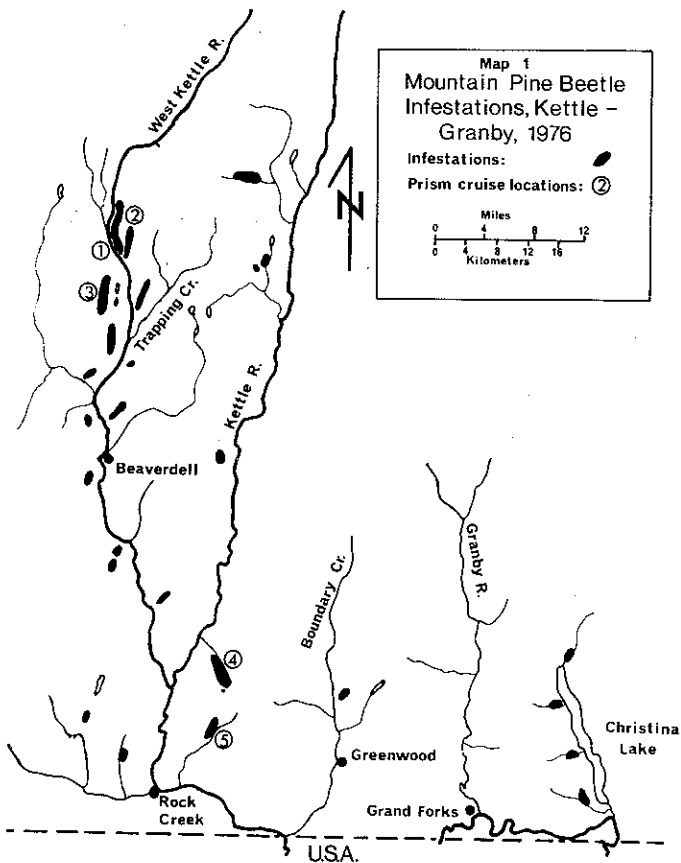


Mountain pine beetles devastated pine stands in the Columbia, White and West Kettle River valleys, whereas other species of bark beetles remained at low levels. Larch casebearer moderately damaged larch stands and further expanded its range. False hemlock looper, spruce budworm and black army cutworm outbreaks declined. The tree diseases, Armillaria root rot, globose gall rust and white pine blister rust continued to cause tree mortality and increment loss.



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THE MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae*, continued to kill large numbers of lodgepole and western white pine trees, although there was a temporary decline in the intensity of attack in 1976.

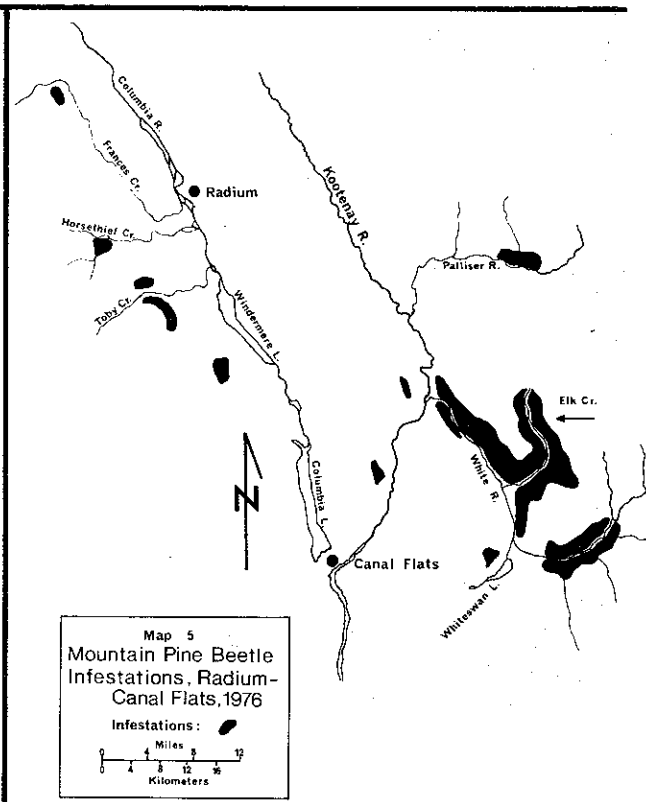
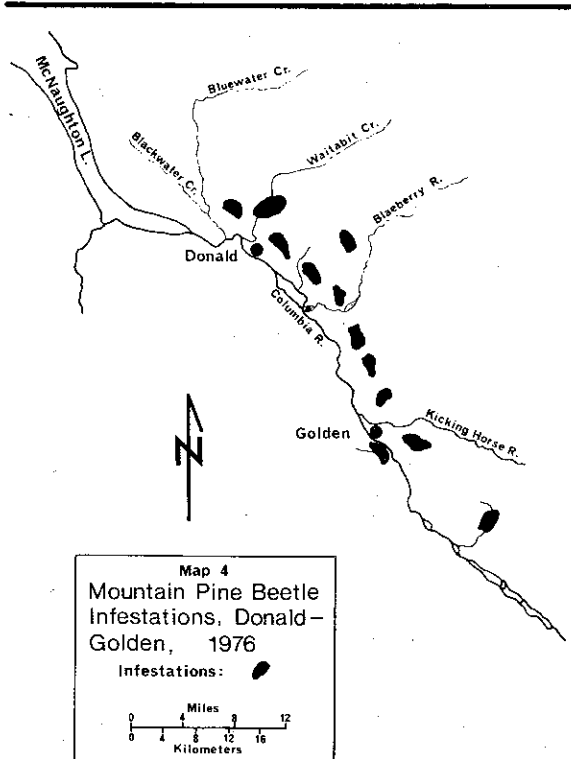
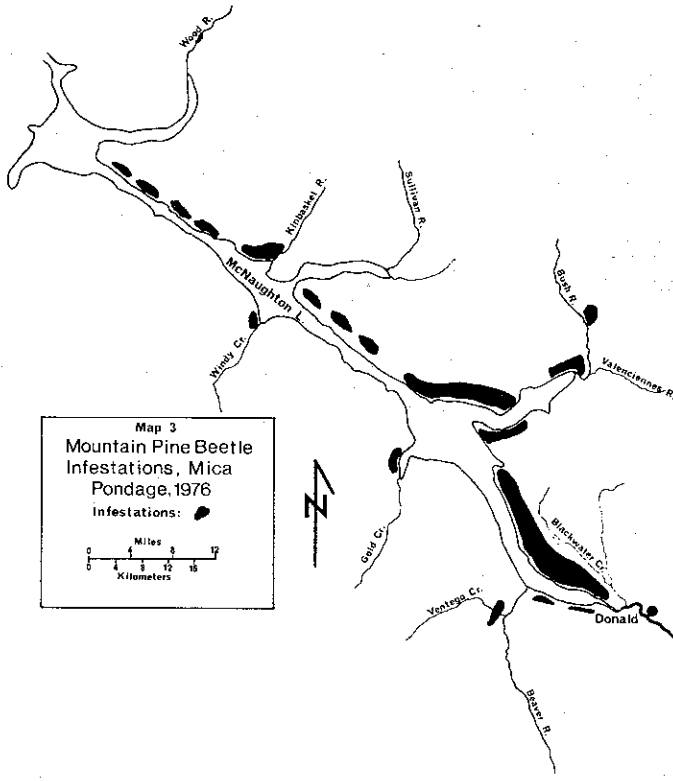
The number of red-topped lodgepole pine estimated in 1976 increased to 81,000 from the 73,000 recorded in 1975. Despite the large populations in 1976, a cool, wet summer delayed development and beetle emergence. The late emergence is likely to reduce the survival of 1976 broods, with a corresponding reduction in tree mortality for 1977 and subsequent fall attack. Nevertheless, because of the large quantities of overmature susceptible lodgepole pine, the long-term trend forecast is for increased beetle populations resulting in extensive tree mortality.

In the larger infestations in the East Kootenay, such as in the White River drainage and along the Columbia River north of Golden, beetle flights were late and many of the attacking beetles were drowned in copious pitch flows.

In the West Kootenay, beetle attacks were more successful as eggs and larvae were found in the fall. Infestations in this area are expected to continue at about the same level in 1977.

More than 11,000 red-topped western white pine trees were observed, mostly in the Columbia River Valley north of Kinbasket.

Maps one to five show the locations of major mountain pine beetle infestations.

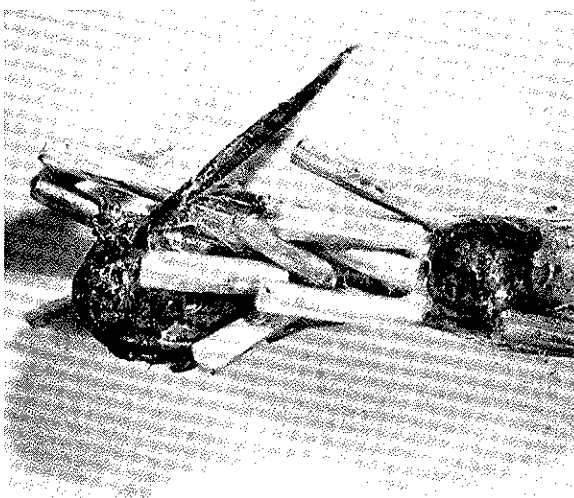


A SMALL INFESTATION OF SPRUCE BEETLE, Dendroctonus rufipennis, occurred at the headwaters of Cultus Creek on the southwest side of Kootenay Lake. Two 2 ha (5-acre) pockets of Engelmann spruce had been attacked in 1974. Most infested trees were removed from the area just prior to the 1976 beetle flight, but some beetles escaped from several exposed log decks early in May during a period of warm weather. A few attacks occurred on standing trees and stumps. Spruce beetles have not been reported in the Nelson Forest District for the past few years.

THE NUMBER OF TREES KILLED BY DOUGLAS-FIR BEETLE, Dendroctonus pseudotsugae, remained at a low level. Small groups, totalling about 50 dead Douglas-fir trees, were noted in the Lussier River Valley and near Whiteswan Lake. Attacks in standing trees declined in the Grand Forks - Christina Lake area.

LARCH CASEBEARER, Coleophora laricella, defoliation of western larch was generally light throughout the District, with some heavy defoliation in small, localized areas at Creston, Crawford Bay and from Blewett to Thrums. The range of the casebearer has extended notably to Sparwood and Argenta, although damage was negligible at these locations.

Assessment of overwintering larval populations



Larch casebearer on twig of western larch.

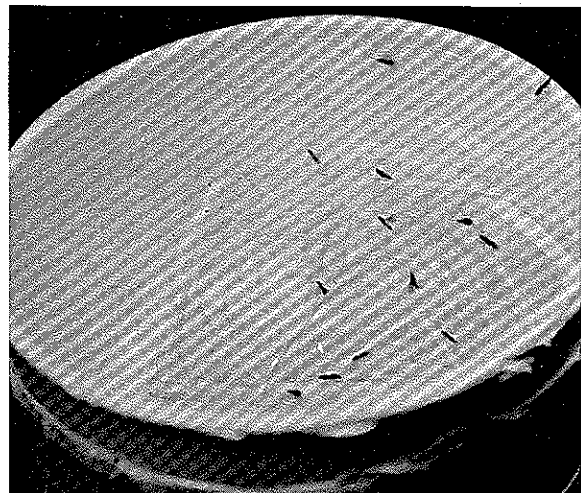
indicates that only light defoliation will occur in 1977 in most areas, except for moderate to heavy defoliation in the vicinity of Creston.

Release of exotic parasites (Agathis pumila and Diadegma laricella) against the casebearer in the Kootenays was continued by the Canadian Forestry Service in 1976.

THE WESTERN BALSAM BARK BEETLE, Dryocoetes confusus, IN ASSOCIATION WITH THE FUNGUS, Ceratocystis dryocoetidis, continued to kill high elevation alpine fir trees. An estimated 8,000 red-topped alpine fir were noted during aerial surveys. The largest concentrations occurred in the Spillimacheen River and Dewar Creek valleys.

THE FIRST OUTBREAK OF LARCH SAWFLY, Pristiphora erichsonii, since 1967, occurred near Sparwood. During the summer, larvae lightly defoliated about 4 ha (10 acres) of immature and mature western larch trees. There were relatively few overwintering cocoons in the duff beneath infested trees. However, 90% of the cocoons were undamaged and, unless predation by rodents is exceptional, increased sawfly infestations near Sparwood are predicted for 1977.

Since 1930, the first record of occurrence in British Columbia, the larch sawfly has been epi-



Larch casebearer parasites being released.



mic during two periods, from 1942 to 1945 and from 1965 to 1967. The latter epidemic resulted in moderate to severe defoliation of approximately 145 700 ha (360 thousand acres) of western larch in the Nelson Forest District. In both instances, the outbreaks appeared first in the Fernie - Sparwood area.

THE SPRUCE BUDWORM, currently in the McMurdo Creek Valley, appears to be the 2-year-cycle budworm, *Choristoneura biennis*, in that it feeds on spruce and alpine fir and has a 2-year life cycle. It differs, however, in that the larvae mature with subsequent heavy defoliation in the odd-numbered years, in contrast to the normal pattern elsewhere in the Province of larvae maturing during even-numbered years. For example, these budworm matured in 1975 at McMurdo Creek and caused

severe defoliation on 810 ha (2,000 acres). In 1976, this population consisted of immature larvae which entered hibernation in September, causing damage only to about 25% of the current foliage over an estimated 200 ha (500 acres). These larvae will mature in 1977 and more conspicuous defoliation can be expected.

INFESTATIONS OF WESTERN FALSE HEMLOCK LOOPER, *Nepytia freemani*, in the Windermere Valley collapsed, presumably as a result of a virus infection that appeared in 1975. These outbreaks on Douglas-fir were of short duration and caused no tree mortality. By the summer of 1976, most trees had fully recovered and previous defoliation was barely discernible.



Western spruce budworm moth trap.

Populations of the **WESTERN SPRUCE BUDWORM**, *Choristoneura occidentalis*, were generally low in Douglas-fir and western hemlock stands, except for a small area of light defoliation west of Revelstoke. This is an extension of a large infestation in the Kamloops Forest District.

FOREST TENT CATERpillARS, *Malacosoma disstria*, severely defoliated several thousand acres of mature trembling aspen on Moberly Bench north of Golden. Other deciduous species such as black cottonwood, western white birch, willow and understory plants were also damaged. Lesser numbers of the **WESTERN TENT CATERpillar**, *Malacosoma californicum pluviale*, occurred in association with the forest tent caterpillar at Moberly, and were a pest in residential areas of Golden and surrounding communities.

Forest tent caterpillars also defoliated about 405 ha (1,000 acres) of mature black cottonwood east of Fort Steele near the junction of the Wildhorse and Kootenay rivers.

The infestation on Moberly Bench is expected to decline, since numerous larvae died from virus disease and many pupae were parasitized. The Fort Steele infestation appears more healthy, with little

evidence of disease or parasites, and is expected to persist in 1977.

DOUGLAS-FIR NEEDLE MIDGE, *Contarinia* sp., infestations increased significantly in Douglas-fir Christmas-tree cutting areas of the Windermere Valley. These attacks, plus the damage caused by the **COOLEY SPRUCE GALL APHID**, *Adelges cooleyi*, made many trees unsuitable for commercial marketing. In the vicinity of Invermere and Radium, up to 45% of the foliage was destroyed by midges, plus 10 to 20% by aphids.

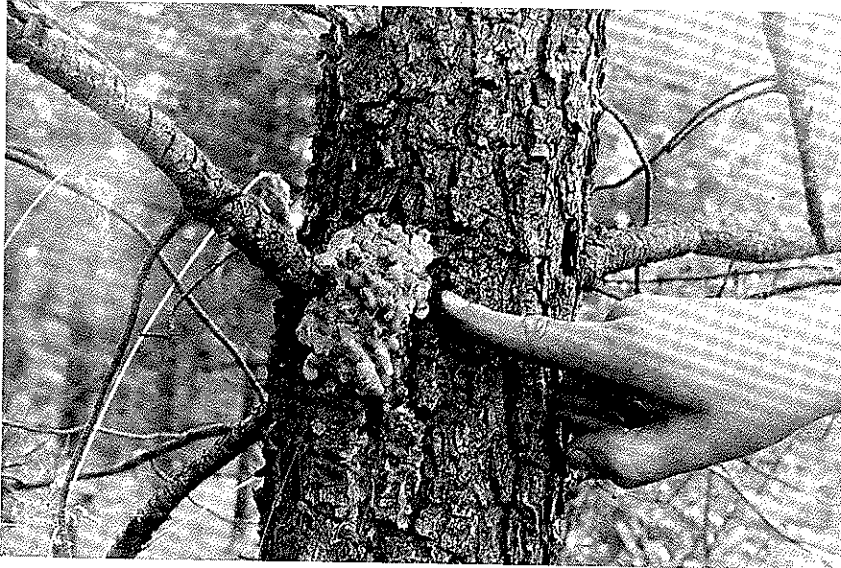
In the Kootenay River Valley near Canal Flats, where midge attacks averaged only 5%, aphid damage accounted for up to 35% of the foliage loss.

LEAF BEETLES, *Dichelonyx* spp., destroyed from 50 to 90% of the Douglas-fir foliage produced in 1976 in many of the Christmas-tree cutting permit areas in the Windermere Valley. Defoliation was heaviest in dense stands in the vicinity of Skookumchuck, Canal Flats and Fairmont. Damage was less severe in the open-growing stands on Christmas-tree farms.

This species also caused light defoliation of immature Douglas-fir, lodgepole and ponderosa pine trees in the Cranbrook and Elko districts.

PINE NEEDLE SCALE, *Phenacaspis pinifoliae*, was severe on Christmas-tree-size and mature Douglas-fir along the west side of Windermere Lake, and light on lodgepole and ponderosa pine in most of the East Kootenay area. In the West Kootenay, light attacks occurred on immature lodgepole and ponderosa pine near Beaverdell and Midway. **BLACK PINELEAF SCALE**, *Nuculaspis californica*, was not noted.

THE SEQUOIA PITCH MOTH, *Vespa mima sequoiae*, is commonly found attacking ponderosa and lodgepole pine trees in the Kootenay and upper Columbia River valleys. A small number of attacked trees are windthrown annually as a result of larval girdling at the bases of trees. Of a more serious nature, however, is the increased risk of extensive fires in grassland areas where the pitch moth is prevalent.



Sequoia pitch moth resin mass on ponderosa pine.

Often a grass fire may only scorch tree trunks but not ignite the tree crowns, but with numerous large masses of pitch caused by the pitch moth, a fire may be sustained long enough to ignite tree trunks and crowns, allowing the fire to spread from crown to crown.

A **LEAF BLOTCH MINER**, *Lyonetia* sp., caused severe browning of western white birch

foliage in the West Kootenay along the Kaslo River and from Kaslo to Trout Lake. In the East Kootenay, infestations were extensive in the Columbia River Valley from Donald to Spillimacheen, along the Kicking Horse River and the Beaver River, extending several miles into Glacier National Park.

ALL KNOWN INFESTATIONS OF BLACK ARMY CUTWORM, *Actebia fennica*, collapsed.

Larvae were not found in forest plantations and only a few adult male moths were caught in pheromone traps. In a recent burn area along the Blaeberry River, traps contained an average of three moths and an average of only one in the Beaverfoot River Valley.

THE ONLY EUROPEAN PINE SHOOT MOTH, Rhyacionia buoliana, found in the Nelson Forest District was at the Hugh Keenlyside Dam Viewpoint at Robson. Ten infested Mugho pine tips were discovered and burned in June. No adults were found in pheromone traps placed in a nearby Austrian pine plantation or in an adjacent native ponderosa pine stand. No shoot moths were found at Creston where infested trees had been imported in 1974 and subsequently destroyed.

A SMALL INFESTATION OF BLACK-HEADED BUDWORM, Acleris gloverana, on western hemlock on Saddle Mountain, west of Nakusp, subsided in 1976.

MODERATE NUMBERS OF PINE BUTTERFLY, Neophasia menapia, were observed hovering around the crowns of Douglas-fir, ponderosa and lodgepole pine trees near Castlegar, Robson and Brilliant and in an extensive area between Kitchener, Yahk and Kingsgate. There was no noticeable defoliation in 1976.

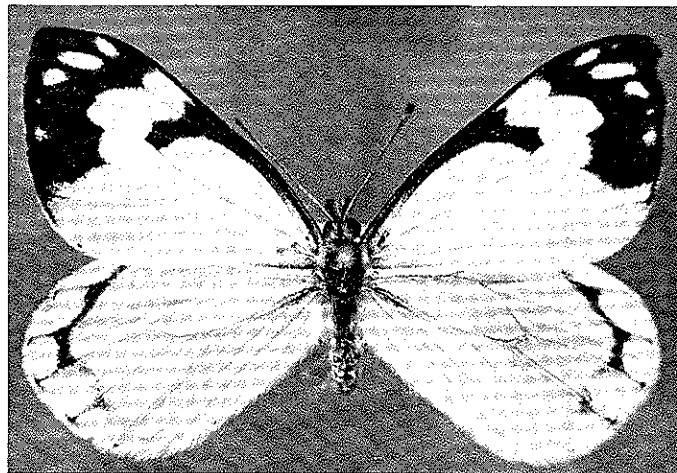
PINE NEEDLE SHEATHMINER, Zelleria haimbachi, infestations in lodgepole pine stands in the Skookumchuk - Canal Flats area collapsed.

LARCH BUDMOTH, Zeiraphera improbana, larvae were scarce in 1976. The infestation near Inonoaklin Crossing in the Monashees has subsided.

WHITE PINE BLISTER RUST, Cronartium ribicola, killed or top-killed mature western white pine trees along the Columbia River north of Golden. The largest concentrations observed this year were along Cummins River (400 trees) and Succour Creek (300 trees). Most infested trees occurred in small pockets or scattered over large acreages.

At Meadow Creek, north of Kootenay Lake, up to 80% of the crowns of 250 white pine were reddened.

BLACK STAIN ROOT DISEASE, Verticillium cladiella wagnerii, caused mortality of lodgepole pine in at least five areas in the Nelson Forest District. Samples were collected near Matthews and Arlington lakes, and at Jolly, Ptarmigan and Hellroarer creeks. Douglas-fir trees were killed in the Kettle River Recreational area. It is the first time the disease has been recognized in British Columbia, although it has been known in the United States for several years.



Pine butterfly adult.

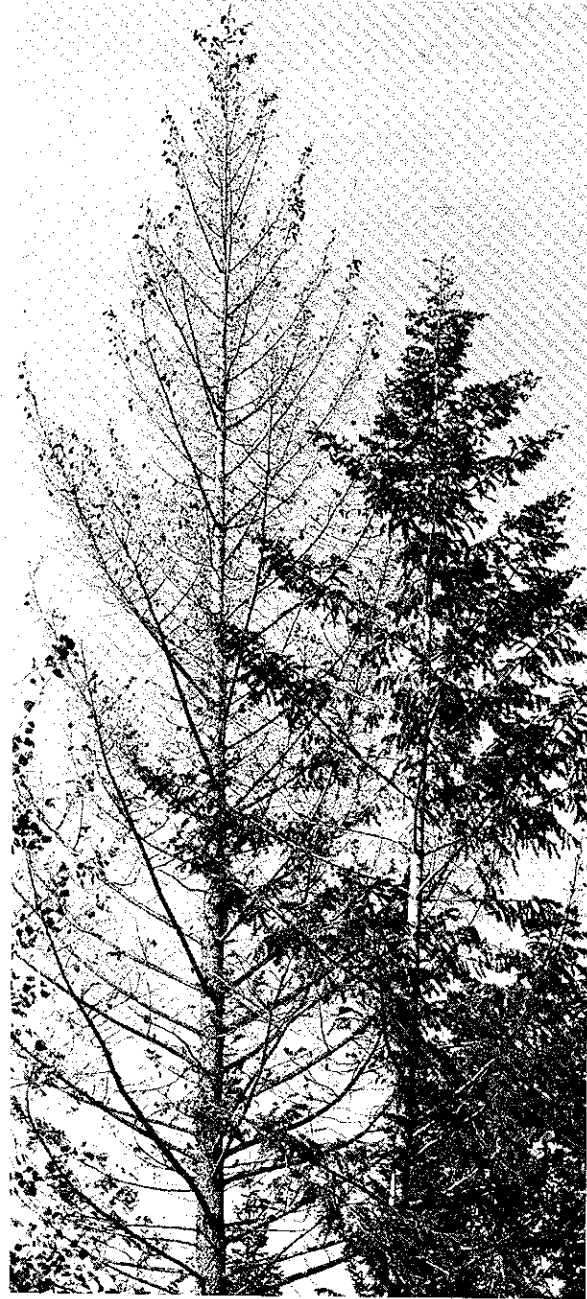
ARMILLARIA ROOT ROT, Armillaria mellea, continues to cause annual mortality of Douglas-fir trees in the Columbia, Pend-d'Oreille, Kettle River valleys and in pockets along Slocan and Upper Arrow lakes. Groups of 3 to 25 dead and dying trees were particularly common near Fairmont, Windermere and Invermere. Thin crowns, distress cones and chlorotic to bright-red foliage over the entire tree (on right in photo) are typical of trees killed by root rot. White mycelial fans under the bark at the root crown and heavy resin flows are additional symptoms.

GLOBOSE GALL RUST, Endocronartium harknessii, infections resulted in extensive lodgepole pine seedling mortality in the Kootenay and White River valleys. Galls on overstory trees provided the source of the infection. Branch flagging was common throughout the Nelson Forest District.

A LEAF BLOTCH OF TREMBLING ASPEN, Marssonina populi, caused conspicuous browning of aspen foliage in the vicinity of Elko and Fernie, particularly in the Bull and Elk River valleys.

SCLERODERRIS CANKER OF PINE, Gremmeniella abietina, was found on shaded branches of young lodgepole pine near Nancy Greene Lake west of Rossland. The fungus was previously collected on ponderosa pine at Canal Flats. Little damage has occurred to date in British Columbia, but the fungus has been a serious problem in eastern North America.

DOTHISTROMA BLIGHT OF PINE, Scirrhia pini, moderately reddened the foliage of lodgepole pine in many areas of the West Kootenay, particularly in the upper Kettle and Little Slocan River valleys, at Ladybird Creek near Castlegar, and south of Nelson near Hall.



Tree on left killed by root rot, Armillaria mellea.

STATUS OF FOREST PESTS IN PACIFIC REGION 1976

PEST	DISTRICTS							
	PRINCE RUPERT	PRINCE GEORGE	VANCOUVER	CARIBOO	KAMLOOPS	NELSON	YUKON	
MOUNTAIN PINE BEETLE	infestations, Cedarvale to Babine L	small infestations, Stuart L area	extensive infestation, Kinaklini R	infestations in central and western regions	widespread infestations on lodgepole and white pine	scattered infestations	not found	
SPRUCE BEETLE	small infestations, Smithers Landing, Otter L	low populations	not found	low populations	infestations, Yalakom PSYU	small infestation, Kootenay L	low population, Haines Jct to Watson Lake	
DOUGLAS-FIR BEETLE	not found	low populations	light attacks, Fraser Canyon - Pemberton - Vancouver Island	low populations	attacks on tussock moth-defoliated trees	low populations	no host	
WESTERN SPRUCE BUDWORM (1-YEAR-CYCLE)	trace	low populations	extensive infestations, Fraser Canyon - Pemberton areas	low populations	extensive infestations, Lillooet - Adams and Shuswap lakes	moderate populations, Revelstoke	trace	
SPRUCE BUDWORM (2-YEAR-CYCLE)	low populations, Bell-Irving R	defoliation, Holmes R	not found	infestations, Horsefly to Bowron L	infestation, Lempriere Cr	low populations	not found	
WESTERN BLACKHEADED BUDWORM	light infestation, Bell-Irving R	low populations	low populations	low populations	infestation, Blue R	low populations	trace	
FOREST TENT CATERPILLAR	low populations	severe defoliation, McBride area	not found	not found	infestation north of Barriere	infestations, Golden and Fort Steele	not found	
CONIFER SAWFLIES <i>Neodiprion</i> spp.	infestations, islands south of Prince Rupert	infestations east of Prince George	low populations	low to moderate populations	infestations, Vavenby to Avola	moderate populations, Beaton	trace	
CONE RUSTS	common on white and Sitka spruce	common on white spruce	not found	light infection	not found	not found	not found	

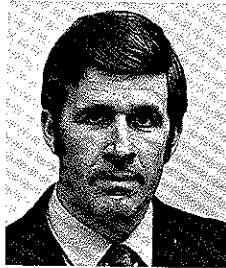
Forest District Ranger Assignments - 1977

CARIBOO

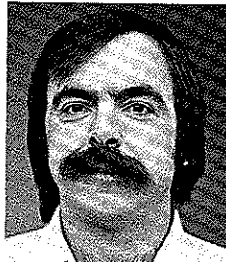


Stan Allen

VANCOUVER



Ernie Morris

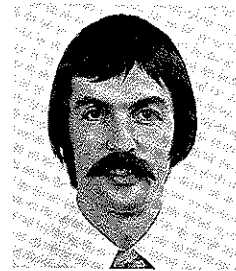


Colin Wood

KAMLOOPS



Dick Andrews

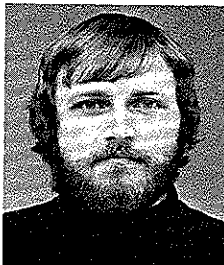


Jack Monts

PRINCE GEORGE & YUKON TERRITORY



Roly Wood



Leo Unger

PRINCE RUPERT



NELSON



Cliff Cottrell



Bob Erickson