

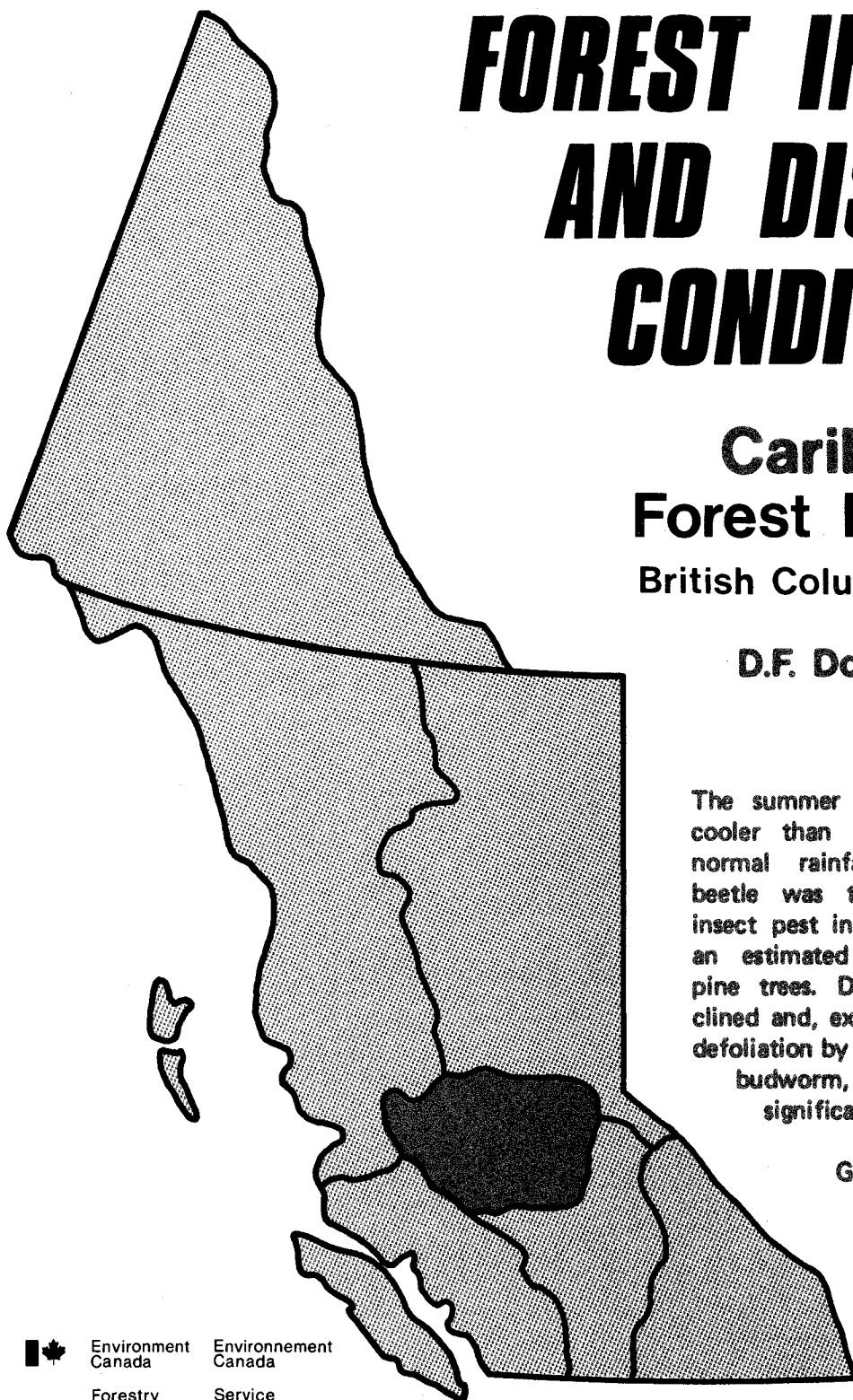
FOREST INSECT AND DISEASE CONDITIONS

Cariboo Forest District British Columbia, 1975

D.F. Doidge

The summer of 1975 was much cooler than average with above normal rainfall. Mountain pine beetle was the most important insect pest in the District, killing an estimated 140,000 lodgepole pine trees. Douglas-fir beetle declined and, except for some minor defoliation by two-year-cycle spruce budworm, there were no other significant insect problems.

Globose gall rust, stem rusts, and dwarf mistletoe were the most prominent diseases.

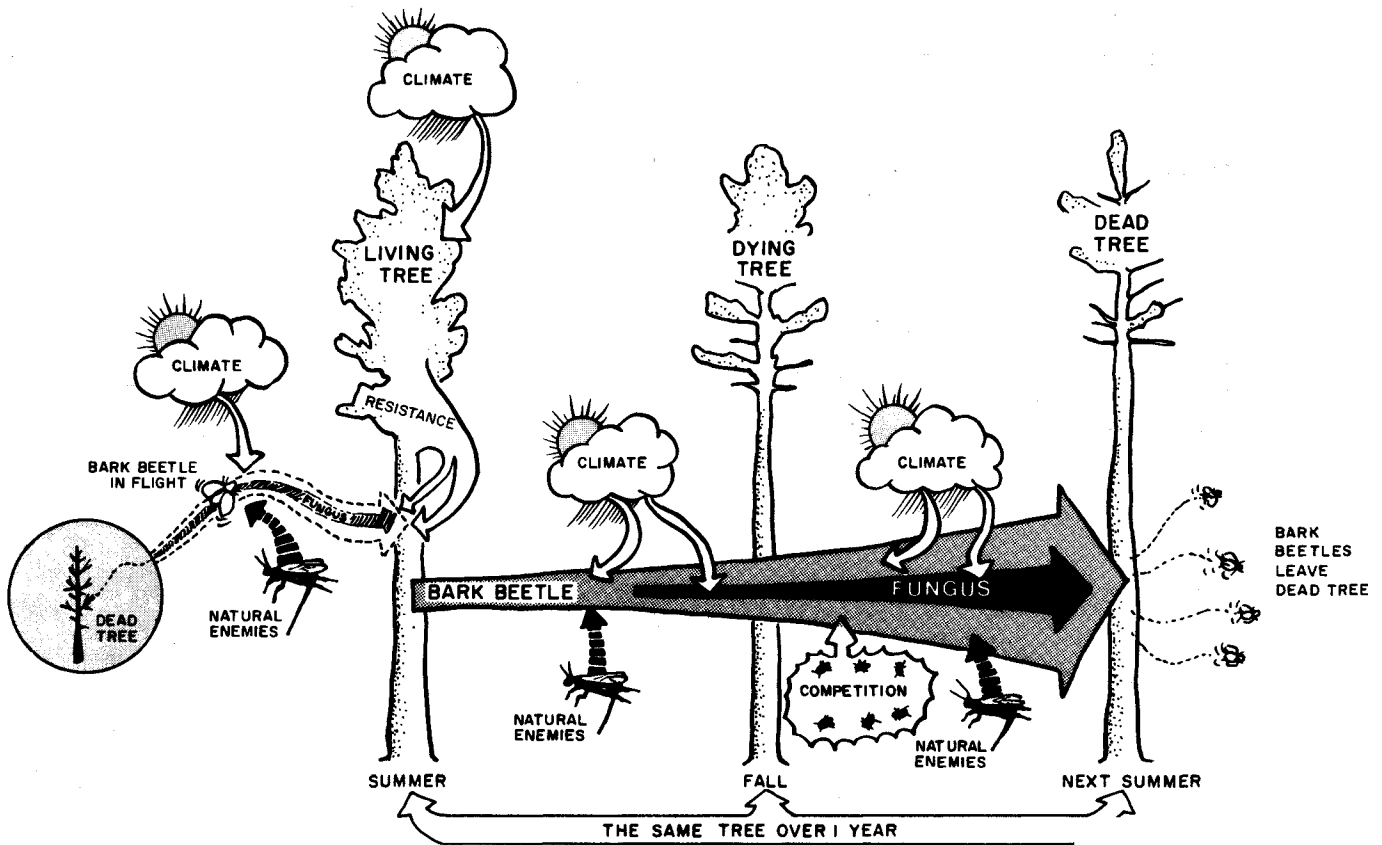


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LOGEPOLE PINE MORTALITY FROM

mountain pine beetle, *Dendroctonus ponderosae*, attack is a major problem in the Cariboo District because the majority of the lodgepole pine is in the climatically moderate or high beetle hazard area, and a large portion exceeds the susceptible age of 80 years and size of 8 inches diameter.

Significant increases in populations became apparent in 1970. In 1972 infestations developed along the Klinaklini River, and in 1973, around the north end of Cariboo Lake. In 1974, infestations occurred at Bull and Bald mountains, at the south end of Cariboo Lake, around Tye Lake and the mouth of Little River, and in scattered patches east of Williams Lake. In 1975, infestations expanded and there was a 6-fold increase in the number of lodgepole pines killed by beetles, from 21,000 dead (red-top) trees in 1974 to 140,000 on 37,000 acres (14,900 ha) in 1975 (Table 1).

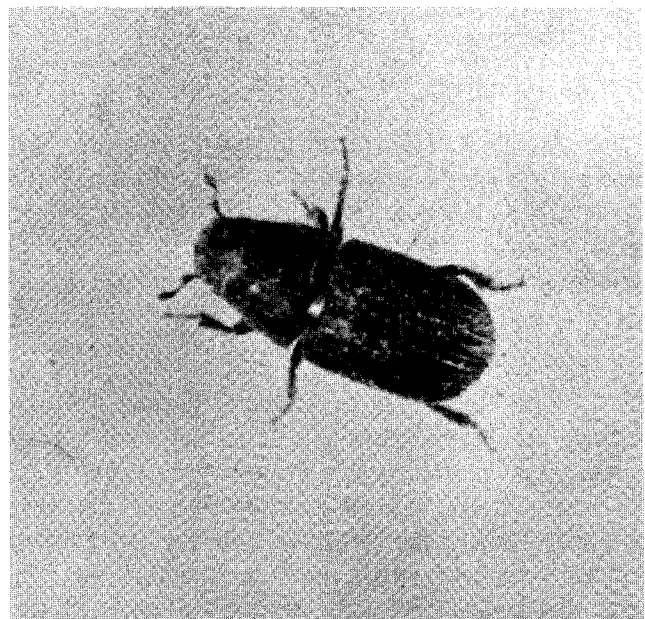


Table 1. Major infestations of mountain pine beetle in the Cariboo District, August, 1975

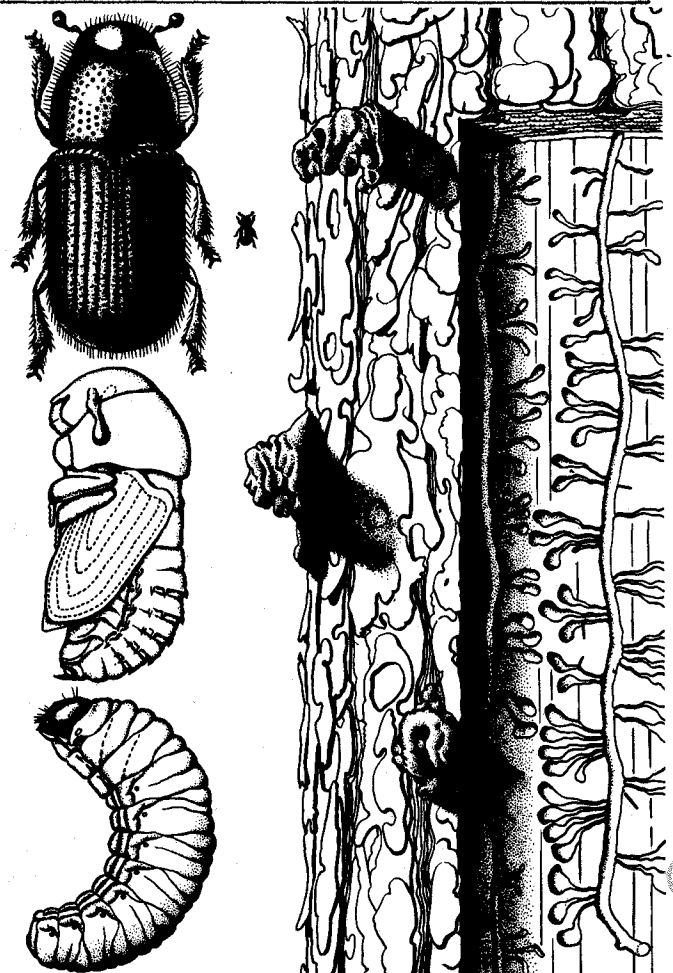
Locality	No. red-tops*	Locality	No. red-tops*
West Chilcotin		Tyee Lake	
Klinaklini R	64,000	Tyee L	6,700
Koni L	3,500		
Clearwater	3,200		
Dean R	2,500	Cariboo Lake	
One Eye L	1,300	Cariboo L	3,700
		Little R	1,500
		Ditch Cr	1,000
East Chilcotin		Dog Creek - Jesmond	
Bald Mtn	14,400	Jesmond	2,600
Grinder Cr	1,200	Canoe Cr	1,800
Till L	1,000	Kostering Cr	1,300
Drummond L	950	Dog Cr	1,200
Farwell Cr	900		
Williams Lake			
Bull Mtn	13,400		
Hawks Cr	1,200		

* Trees killed in the previous one or two years.

Additional areas with from 100 to 600 red-topped lodgepole pine were scattered throughout the District.

During 1975, most of the susceptible stands were flown and infestations were sketch mapped (see map). Vertical aerial photographs were taken and ground cruises were conducted at Bull-Bald mountain, Becher's Prairie, and Tyee Lake.

The extremely large outbreak along the Klinaklini River, inaccessible except by helicopter, precluded fall surveys. Photos taken in August, however, show that the infestation is moving up the valley and into the tributary valleys. An abundance of host material exists in these valleys as well as on the plateau in One Eye Lake - Tatla Lake areas, hence the outbreak is expected to continue.

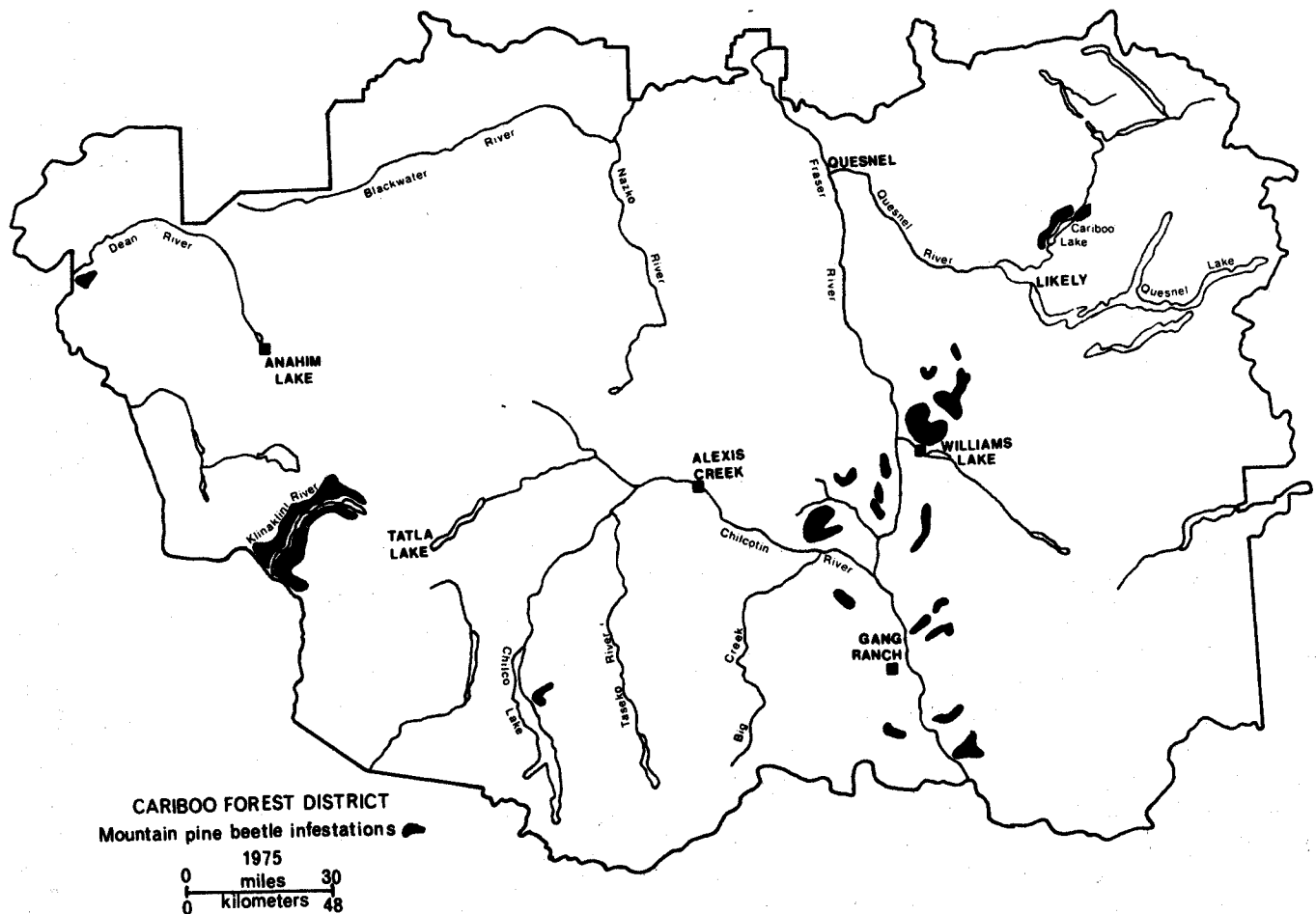


In 1975, 16 to 24% of the lodgepole pine stems on the four 80-chain cruise strips were attacked (Table 2). Combined with the 1974 attack, these stands have lost 29 to 52% of their pine. Overwintering

populations were high in all areas and there is potential for further tree mortality as the residual trees are of susceptible age and size.

Table 2. Status of lodgepole pine trees on cruise strips, Cariboo Forest District, 1975

Location	% of trees			
	Healthy	Green, attacked 1975	Red, attacked 1974	Grey, attacked prior to 1974
Bald Mountain	55	22	16	7
Bull Mountain	70	24	5	1
Tyee L	48	23	22	7
Becher's Prairie	67	16	16	1

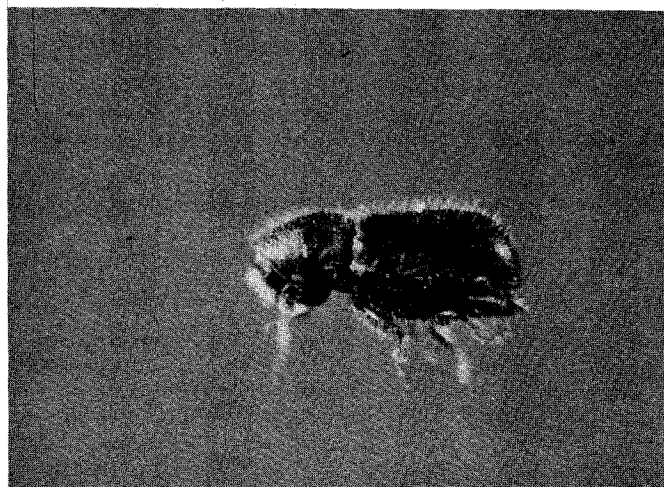


THE NUMBERS OF DOUGLAS-FIR TREES killed by Douglas-fir beetle, *Dendroctonus pseudotsugae*, in the District declined for the first time in five years. During 1973, subnormal summer temperatures and below normal precipitation may have slowed beetle development and prevented a large percentage of the brood from reaching the adult stage by the fall of 1973. This resulted in a less concentrated attack in 1974 and a reduction in tree mortality in 1975.

There were 4,700 dead (red-topped) Douglas-fir in 1975, compared with 7,500 in 1974. The main concentrations of dead trees were: Hawks Creek Valley (800), San Jose River - Jones Creek area south-east of Williams Lake (600), Meldrum Creek - Buckskin Lake (600), Chimney - Felker lakes (500), Williams Lake River (400), across the Fraser River from Macalister (400), Lee's Corner - Anahim Reserve (300), Dog Creek - China Gulch (300), Gaspard Creek - Churn Lake (300), north end Chilko Lake (200), and McLeese Lake (100). Additional patches of from 10 to 50 red-tops were scattered throughout the District.

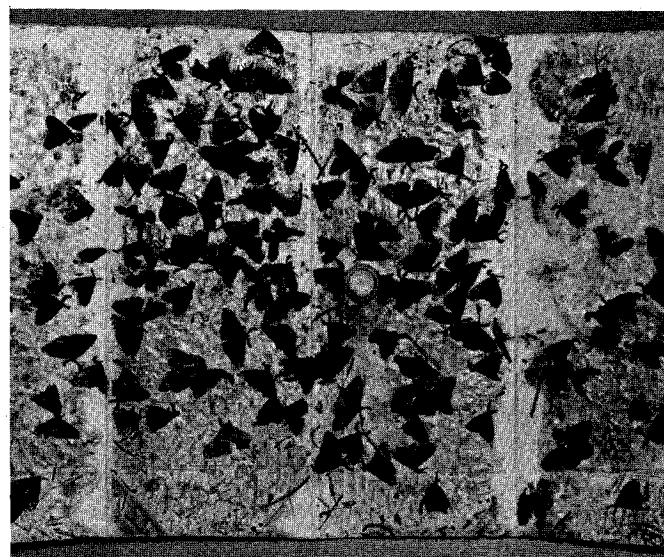
Populations of Douglas-fir beetle will probably remain about the same in 1976.

MORTALITY OF ALPINE FIR CAUSED BY the western balsam bark beetle, *Dryocoetes-Ceratocystis* complex, in high elevation stands in the interior wet belt of the Cariboo District continued at a low level, with 1,250 dead (red-topped) alpine fir recorded in 1975 compared with 1,100 in 1974. The bark beetle carries a lesion-causing fungus which destroys the cambium, hence even light attacks can cause tree mortality. Specific counts and areas observed were: Moffat Lakes (400 dead trees), Molybdenite Creek (300), Tisdall Lake (200), Hen Ingram Lake (200), Swift River (100), and Spanish Lake (50).



Tree mortality will probably continue at about the same level in 1976.

DOUGLAS-FIR TUSSOCK MOTH, *Orgyia pseudotsugata*, killed Douglas-fir trees on several thousand acres south of Clinton in 1948. No larvae have been collected in the District since that time. However, because of extensive infestations in the Kamloops - Savona area, traps containing a sex attractant were set at 20-Mile House in August. An average of 75 adult male moths were trapped. Female tussock moths are wingless. Since it is not known how far males will fly or are blown by wind, the presence of the adults indicates only that the area should be checked closely in 1976.



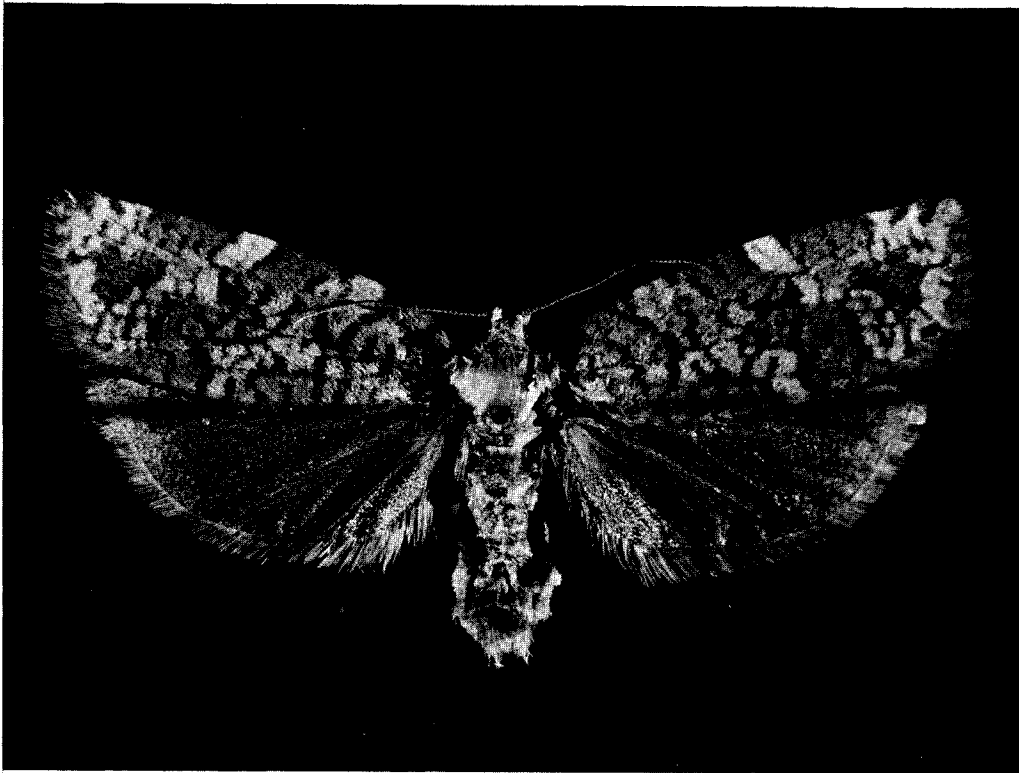
DEFOLIATION OF ALPINE FIR AND Englemann spruce by two-year-cycle spruce budworm, *Choristoneura biennis*, occurred along the upper Horsefly River and the MacKay River drainage although 1975 was an "odd" year when larvae fed only a short time before hibernating until the next year. Normally, feeding in the "odd" year is light, but in 1975 the larval population was high enough to cause severe defoliation of understory alpine fir, and light to moderate defoliation of overstory alpine fir and Englemann spruce. Some open growing small trees (5' - 10') were 100% defoliated and understory alpine fir lost 20 to 80% of the new growth and most suffered some top stripping.

Insect traps, baited with a sex attractant, were

set near Umiti Creek, Wells, Barkerville and Hendrix Creek to determine if significant number of budworm were off cycle, i.e. flying in the "odd" year instead of the "even" year. Male adults were trapped in all areas, averaging 60 at each, with a high of 112 at Hendrix Creek.

Two-year-cycle spruce budworm seldom causes mortality of native trees. However, in 1976 some mortality of understory trees and some top-kill may be expected.

All areas where defoliation occurred in 1974 will be defoliated again in 1976, namely, the Bosk - McNeil lakes area, MacKay and Horsefly rivers, Little River, Cunningham Creek, and the Bowron Lake circle.



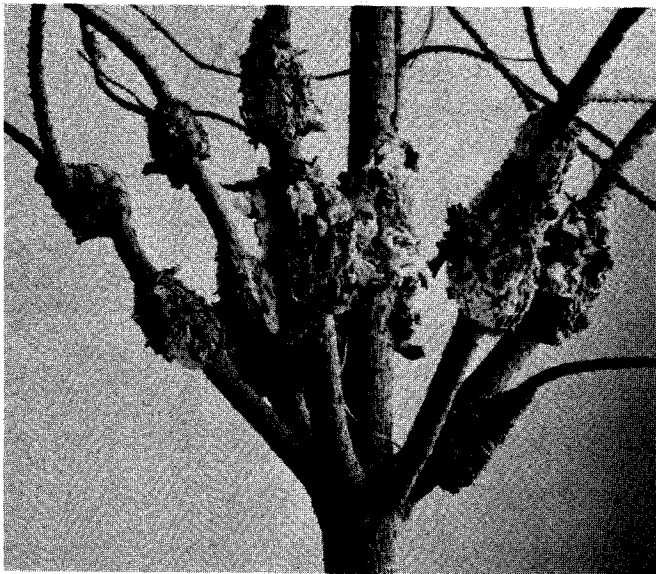
WESTERN SPRUCE BUDWORM, *Choristoneura occidentalis*, lightly defoliated Douglas-fir in small patches on Becher's Prairie near Riske Creek, and at Kelly Lake near Clinton. These were

the only areas where damage was noticeable, although 44% of the beating collections contained larvae.

A continuing low population is predicted for 1976.

COOLEY SPRUCE GALL APHID, *Adelges cooleyi*, a sucking insect, attacks Douglas-fir and spruce trees. As this insect is a pest of Christmas-tree-sized Douglas-fir, five permanent plots were established to monitor the population. The number of needles infested at the plots decreased from an average of 80% in 1974 to 12% in 1975. Only a few new galls were noted on spruce.

GLOBOSE GALL RUST, *Endocronartium harknessii*, is the most common, most conspicuous and often the most destructive rust of lodgepole pine in western Canada. Irregularly round or pear-shaped galls on stems or branches are the most conspicuous symptoms. The galls are woody and perennial, growing larger and producing spores each year until they have girdled and killed the affected branch or stem. It is a short cycle rust; i.e. it completes its life cycle on pine alone, without alternate hosts, and when the host dies, the rust dies too.

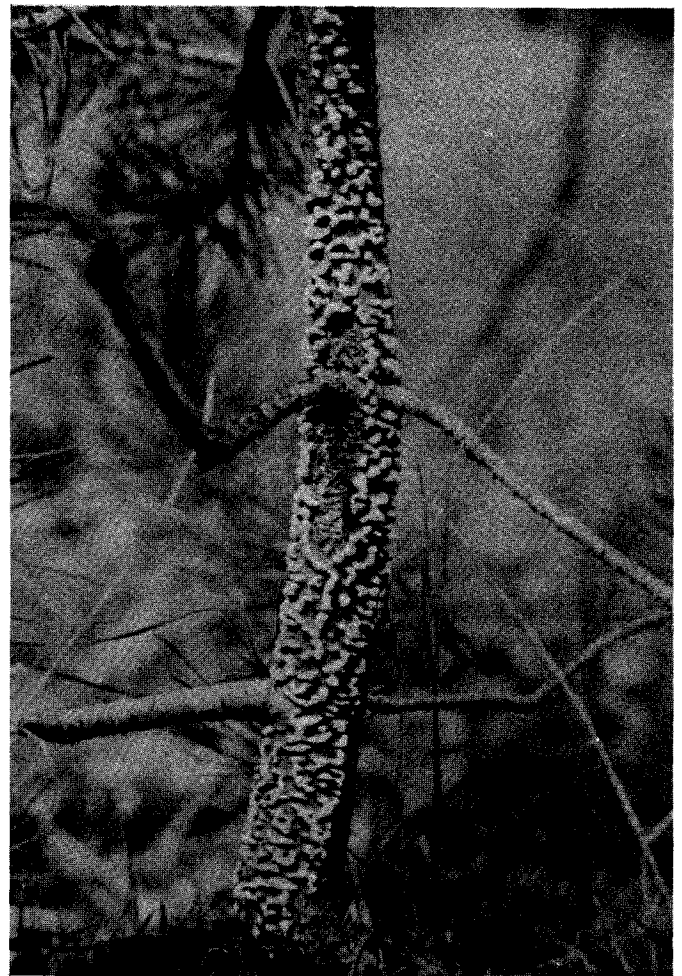


In 1975, the Cariboo - Chilcotin areas were surveyed to determine the extent and intensity of this rust. In each of 24 plots, 100 randomly selected pines were examined for branch or stem galls. Globose gall rust was found in 21 of the plots; an average of 40% of the trees were infected with a high of 99% at Wingdam. Stem galls, which can cause tree mortality by girdling, occurred on 14% of the trees, with a maximum of 45% at North Bonaparte.

Globose gall rust could be an important pest in plantations, especially if trees are planted near infected residuals.

CANKERS CAUSED BY *Atropellis piniphila* were found on lodgepole pine in 11 of 24 stands in which 100 random trees were examined. A high of 25% of the trees were infected at Wingdam. The cankers cause deformation of the tree trunk and sapwood staining, which degrades them as sawlogs and pulpwood. Tree mortality, while not uncommon in infected trees, is of little consequence in the thickly stocked stands where it occurs.

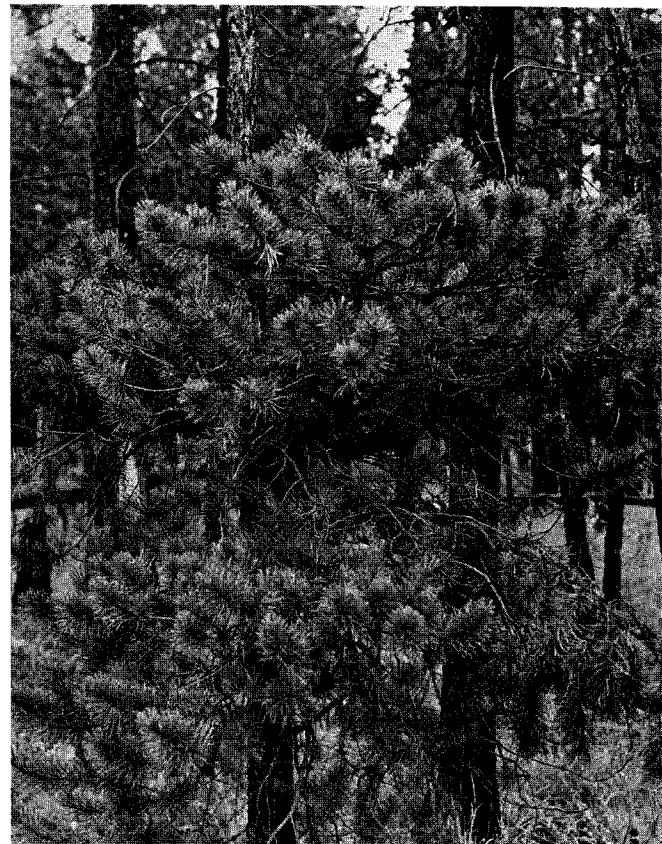
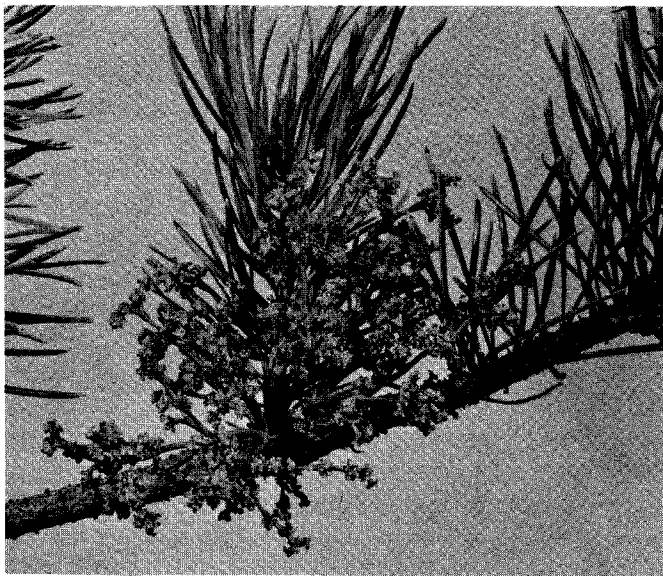
STALACTIFORM RUST, *Cronartium coleosporioides*, often prevalent in lodgepole pine reproduction, also infects larger stems. In 1975, 9 of 24 stands examined were infected. At Mount Begbie, 25% of the lodgepole pine were infected



and near Exeter 22% had stem cankers. Branch and tree mortality results from girdling, although on larger stems, growth loss and deformity is the principal result of infection.

The disease alternates between pines and Indian paintbrush, the secondary host. However, once a tree is infected the disease is perennial until the infected portion dies.

DWARF MISTLETOE, *Arceuthobium americanum*, is the most important parasite of lodgepole pine in the District. It survives only on living hosts, seriously retarding and distorting their growth. In 1975, 100 random lodgepole pine trees were examined at each of 24 locations. An average of 40% of the trees were infected at 16 locations with a high of 88% at mile 14 Nazko road.



General guidelines for control of the pest are available and should be practised where feasible: Dwarf Mistletoes in British Columbia and Recommendations for their Control, by J.A. Baranyay and R.B. Smith, BC-X-72.

STATUS OF FOREST PESTS IN PACIFIC REGION 1975

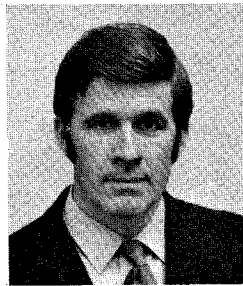
PEST	DISTRICTS						
	PRINCE RUPERT	PRINCE GEORGE	VANCOUVER	CARIBOO	KAMLOOPS	NELSON	YUKON
MOUNTAIN PINE BEETLE	epidemic Kitwanga to Burns Lake	light attacks Stuart-Takla Lakes	severe tree mortality along Klinaklini R	epidemic, Cariboo L Tyee L, Bull Mtn Bald Mtn Klinaklini R	epidemic in Okanagan Va	epidemic, Elk Cr-White R, Blackwater Ridge,	not found
SPRUCE BEETLE	low populations	low populations	not common	low populations in wind-throw	localized infestation at Birk Cr	low populations	not found
DOUGLAS-FIR BEETLE	not found	low populations	scattered light attacks	patches red-tops Williams Lake to Dog Creek along Fraser R	increase scattered light attacks	increased attacks Columbia and Kettle R Valleys	no host
SPRUCE BUDWORM ONE-YEAR-CYCLE	low populations near Bell-Irving R Trace at Kitimat	epidemic Liard R area	epidemic in Lillooet, Fraser and Sumallo R Valleys	light defoliation Becher's Prairie	epidemic Lillooet, Adams L Manning Pk	low populations	trace
SPRUCE BUDWORM TWO-YEAR-CYCLE	low populations	low populations	not found	high populations MacKay River, Bowron circle	not found	epidemic at McMurdo and Bobbie Burns Cr., Spillimacheen R	not found
DOUGLAS-FIR TUSSOCK MOTH	not found	not found	not found	adults in traps only, no larvae collected in beatings	infestations N and W of Kamloops	low populations near Cascade	no host
FALSE HEMLOCK LOOPER	not found	not found	not found	not found	decrease, due to parasitism and pesticide	infestations at Columbia and Windermere Lakes	not found
BLACK ARMY CUTWORM	low populations	not found	not found	not found	localized infestation, little seedling damage	epidemic at Beaverfoot R and Symond Cr	not found
WESTERN BLACK-HEADED BUDWORM	decreased population, Q.C.I. and mainland	decreased population	low populations	low populations	low populations	low populations Upper Arrow Lake	low populations

FOREST DISTRICT RANGER ASSIGNMENTS 1976

Canadian Forestry Service
Pacific Forest Research Centre
506 West Burnside Road
Victoria, B.C.

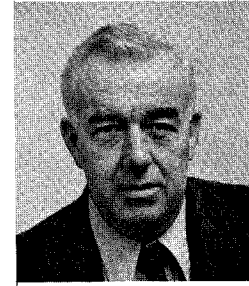
BC-X-137 January 1976

VANCOUVER



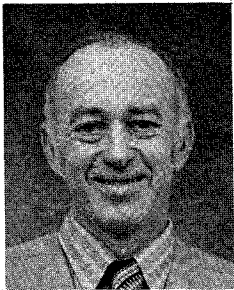
Ernie Morris

KAMLOOPS

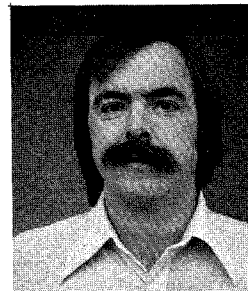


Dick Andrews

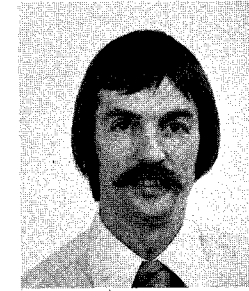
CARIBOO



Stan Allen



Colin Wood



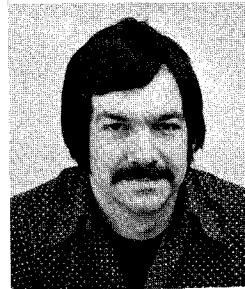
Jack Monts

PRINCE GEORGE & YUKON TERRITORY



Roly Wood

PRINCE RUPERT

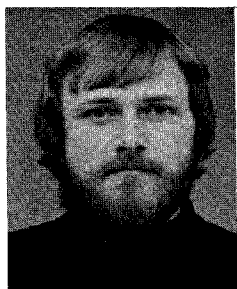


Don Doidge

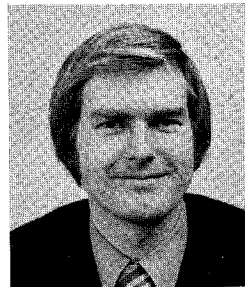
NELSON



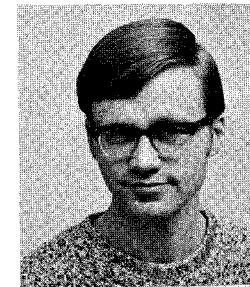
Cliff Cottrell



Leo Unger



Peter Koot



Bob Erickson