

THE MOUNTAIN PINE BEETLE SITUATION IN CANADA 1981

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The mountain pine beetle continues to be the most damaging insect in western Canada in 1981. In British Columbia, mature lodgepole pine are by far the most commonly affected tree species, followed by western white pine, occasionally ponderosa pine and other pines, and rarely other species. The distribution of currently active infestations in western Canada and the northwestern United States is shown in Figure 1.

Lodgepole pine is distributed throughout British Columbia and adjacent Alberta. In British Columbia, it covers more than 14 million ha and by volume comprises 14% of the provincial inventory, although in some areas it is much higher, reaching 50% in the Cariboo Forest Region. Lodgepole pine is now the third ranking species, comprising about 19% of the annual provincial harvest. It has not, however, always been a commercially sought species, accounting for less than 5% of the harvest in the 1960s and only 2% in 1955. Not surprisingly, then, a large proportion of this species is mature and overmature; by area, more than half is greater than 80 years old and almost three-quarters is more than 60 years old. It is these trees that are most susceptible to attack.

Outbreaks have been recorded within British Columbia at irregular intervals since at least 1910. Particularly notable early infestations occurred in the Princeton, Okanagan Valley, and Lillooet Areas, and:

- From 1930, 36 vast areas were infested around Tatla Lake in central British Columbia.
- From 1930, 43 large infestations were in the Kootenay, Yoho, and Banff National Parks.
- From 1946, 65 infestations were around Babine Lake in northcentral British Columbia and in western white pine stands on Vancouver Island.

- From 1972, 77 virtually all mature pine on more than 20,000 ha were killed in the Kleena Kleene Valley in central British Columbia.

Infestations generally persisted within individual stands for eight or more years or until the pine component of the forest was depleted, especially the larger (more than 25 cm) trees. The current outbreaks started during the late 1960s and early 1970s. In 1974, a total of only 3 300 ha at 35 scattered locations were affected. This included stands in the Elk Creek and White River Valleys, and there were areas just below the international border in Montana. The infestations expanded and intensified rapidly, and by 1981, heavy mortality of mature pine trees occurred in more than 5 000 separate locations covering more than 220 000 ha in the interior of British Columbia (more than 540 000 acres). It was estimated that the 1979 attacks alone killed more than 14 million trees, with a gross volume of 7.7 million metres³. This represents more than 300 000 truckloads of logs. In Alberta, infestations encompassed more than 7 000 ha with 1.5 million recently killed trees.

Aerial surveys in 1981 showed red trees (that is, those killed in the past year) present over more than 160 000 ha in British Columbia. This is equal to the total area logged of all tree species in a year in the province. In individual forest regions, such as Cariboo and Nelson, the area with recent kill is 2½ to 3½ times the area of annual harvest. Not included in these estimates are the additional areas of more than 36 000 ha in the Kleena Kleene Area and 20 000 ha in the Flathead Area and the Elk Creek Stand, where most of the mature pine were already killed.

The cumulative loss to date and the potential loss—considering the extent and volume of the mature

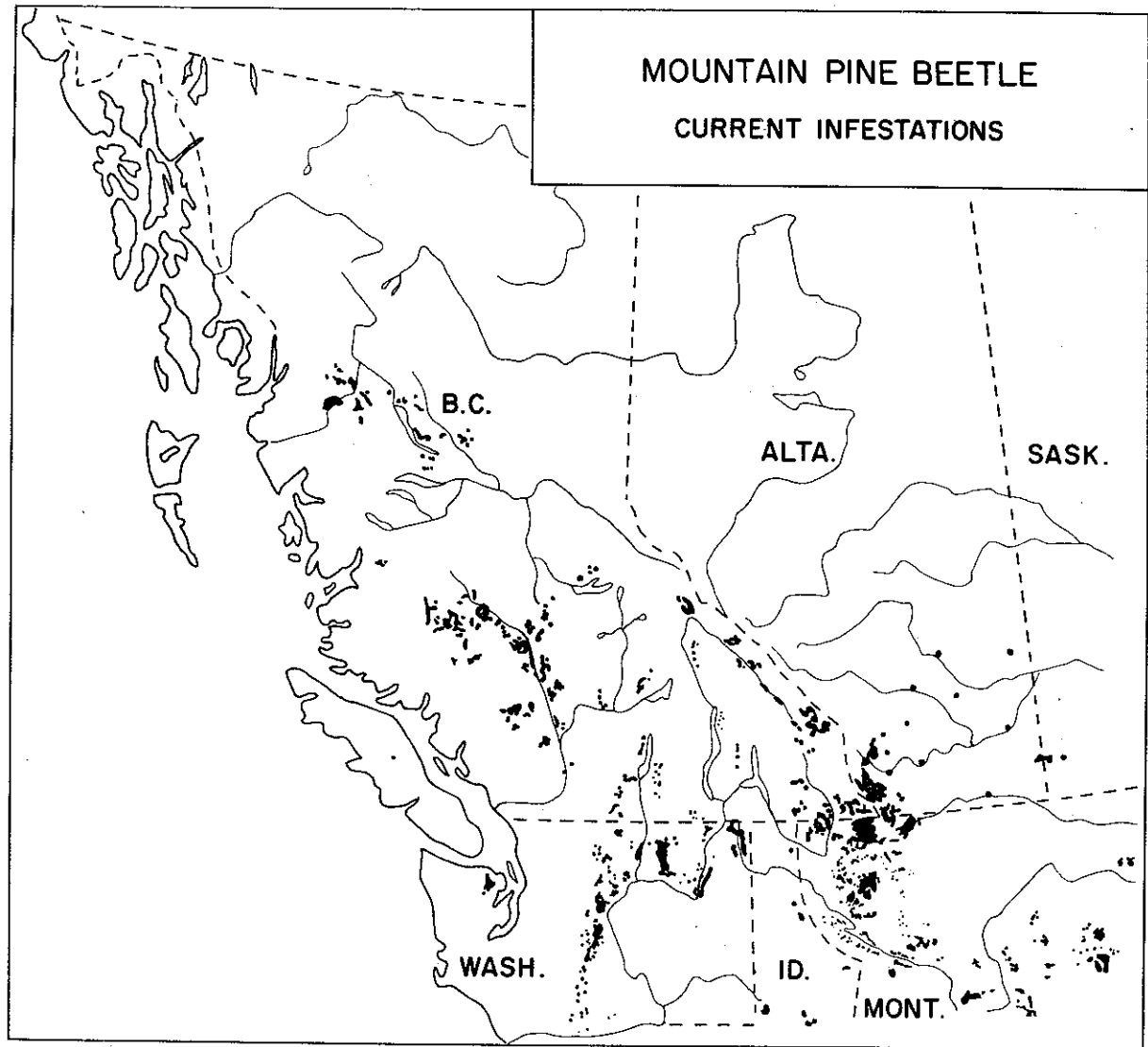


Figure 1

Distribution of
Mountain Pine Beetle Infestations
In Western North America
In 1981

susceptible stands—are many times greater. As two-thirds of the infestations mapped presently cover less than 20 ha each and another 17% were less than 50 ha, the potential for expansion is still considerable. Also, two-thirds of the area mapped was judged to be lightly or moderately infested, i.e., less than 30% of the susceptible host trees were recently attacked. Consequently, the potential is high for continued intensification of these attacks within many of these stands.

The majority of infested stands in Canada are on provincial Crown land, although major infestations occurred in the Akamina-Kishinina Park Reserve and the adjacent Waterton National Park, and the Cypress Hills Provincial Park and infestations are evident in the Kootenay, Glacier, and Yoho National Parks. In Kootenay National Park, infested trees were first observed in 1979 and currently more than 50 spot infestations and 2,000 recently killed trees are evident. This situation is similar to that during the 1930s following which up to 90% of the mature pine were killed in stands over 650 km² in the Kootenay and Banff National Parks by 1945.

In Alberta, a major infestation exists in the Waterton Lakes National Park and the adjacent southwestern corner of that province. Infested pine stands were scattered in the foothills from the United States border northward for approximately 120 km with outlying infestations in the Cypress Hills Provincial Park in both Alberta and Saskatchewan.

Extensive sanitation cuttings have been underway to constrain the beetle activity in these areas. In total, this has involved about 700 trees in the Cypress Hills and 42,000 trees in Alberta. The beetle has also been found in shelter belts and ornamental or street plantings at 35 locations in southern Alberta and in one tree at Maple Creek, Saskatchewan. Mostly, these were Scots pine in or near centres such as Lethbridge, Medicine Hat, Brooks, and Drumheller.

In considering the information just presented, it should be remembered that the maps and area or tree

estimates are based on newly faded trees, most of which were attacked the year preceding the annual aerial surveys. Recalling the biology of the tree and bark beetle interaction, foliage on trees attacked late in the summer of 1980 generally does not turn the characteristic bright red until July 1981. Recently killed trees that are still green or trees killed in earlier years are not reflected in the annual data. Results from ground cruises may more clearly indicate actual stand conditions. An overall average based on 48 stands cruised this year in British Columbia indicated that:

- 16% of the trees were red, having been attacked and killed in 1980.
- 22% of the trees were still green but fatally attacked this year, indicating a still expanding and increasing infestation.
- 19% of the trees had been killed from attacks prior to 1980.
- 3% of the trees were partially attacked and may survive, if only to be reattacked.
- 40% of the trees, usually smaller trees, were as yet unattacked.

However, the variation among stands is extreme. The percentage of currently attacked trees ranged from 0 to 72, and in some stands that had been infested for as few as four years, less than 10% of the trees were still alive.

In summary, the mountain pine beetle, a native pest, is currently epidemic in lodgepole pine and some white pine stands throughout central and southern British Columbia and adjacent portions of Alberta. Recent tree mortality is evident on more than 160 000 ha of forest land. Older, almost complete stand mortality, most of which is unsalvagable, covers more than 50 000 ha. Based on ratios of recent to current attacks, a doubling of tree mortality can be expected in 1982 in British Columbia (that is 1½ trees for every person in Canada).