



Adult mountain pine beetle,
Dendroctonus ponderosae
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Mountain Pine Beetle - Banff

The mountain pine beetle (MPB) is a naturally occurring insect of the Rocky Mountain ecosystem. These small cylindrical insects attack and kill mature trees by boring through the bark and mining the phloem – the layer between the bark and wood of the tree. When conditions are favourable, populations of MPB can increase and large numbers of trees can be infected, killing large areas of mature lodgepole pine. This natural process is important to the forest ecosystem because, as a natural disturbance, it sets the stage for forest regeneration.

Life Cycle of Mountain Pine Beetle

MPB normally have a one-year life cycle. In late summer, the adults, who are about 5 mm (1/4”) long, leave the infected trees in which they have developed. They then seek out and colonize living, green trees, as well as search for mates.

The beetles tunnel into the tree and lay eggs in vertical galleries under the bark. After the eggs hatch, the grub-like larvae spend the winter feeding under the bark. Larvae pupate in the spring and emerge as adults from July to September.

A key part of this cycle is the transmission of blue-stain fungi from the beetle to the tree. The spores of these fungi are brought into the tree by adults during colonization.

Fungi grow within the tree and, together with bark beetle feeding, weaken it. This mutual network of beetle galleries and blue stain fungi disrupts the movement of water within the tree and rapidly kills it. The fungi give a blue-grey appearance to the sapwood.

What to Look For:

- red needles on the crowns of trees.
- eggs or larvae under the bark, or their galleries under the bark.
- “pitch tubes” – bubbles of resin on the trunk where beetles tunnel into the bark.
- “sawdust” at the base of a tree or in bark crevices.
- woodpecker activity, such as holes in the trunk and bark chips on the ground.



Pitch tube caused by MPB
© Canadian Forest Service

What Is the History of MPB in the Mountain Parks?

The MPB is present in all mountain national parks, but has only reached epidemic levels in Kootenay, Yoho and Waterton. In the 1940s, there was a major MPB outbreak in Kootenay National Park. 65,000 ha of pine forest were affected. A minor outbreak in Banff National Park affected 4000 ha. In the 1970s,

a major MPB epidemic moved from the US Rocky Mountains into southeastern BC and southwestern Alberta, including Waterton Lakes National Park. Through the 1980s, the beetles moved through Kootenay National Park. A small outbreak occurred in southern Banff National Park in the early 1980s.





In 1997, the annual insect and disease survey found that the beetles had dispersed across the Continental Divide into the Brewster Creek, Healy Creek and Bryant Creek drainages of Banff National Park. Since then, the beetle population has grown and migrated eastward into the warmer, drier forests of the Bow Valley, including areas outside Banff National Park.

What We Are Doing About MPB:
Parks Canada's policy provides the following direction to Banff National Park:

1. Native insects and diseases are natural ecological processes that should be allowed to proceed without interference if possible.
2. Where insects or disease pose a serious threat to provincial lands, intervention may occur, provided that it is effective and does not damage the park ecosystem.

To achieve both of these objectives, Banff National Park has established two different areas where different strategies are applied:



Long term management zone:

Prescribed fire are lit to reduce the extend extent of of MPB habitat, thus preventing a large build-up of the beetle population.



Short term management zone:

Beetle colonized are burned by prescribed fire, cut and removed, or cut and burned to slow the growth growth of the beetle population. Pheromone baiting is used to concentrate beetle colonization to known areas.



Pheromone Bait
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For futher information please call the Banff Fire Communication Specialist at 762-1417

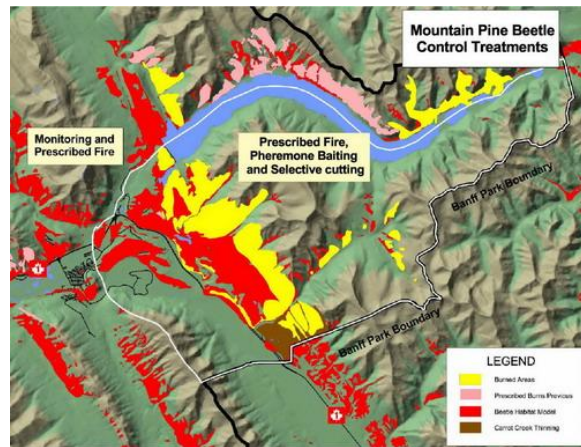
2008 Update

Short term management zone:

- 8,100 colonized trees have been removed by cut and burn or by mechanical removal since 2002
- 4420 ha. of attacked and susceptible forest were burned in 2003
- The number of green attacked trees is 315; these will be burned over winter.

Current situation

- In both management zones, the beetle is in a two-year life cycle (it takes longer for it to mature and fly out to colonize new trees).
- An interagency prescribed burn near Mt Nester near the Spray Reservoir is planned for 2008 to remove mountain pine beetle habitat and reduce beetle populations.



Summary

MPB is a dynamic ecological process that has both large-scale ecological benefits within the park and the potential for large-scale economic impacts on industrial forests. As such, it requires an adaptive management approach that integrates the objectives of many land managers and interest groups.

