

# WESTERN BALSAM BARK BEETLE

## *Dryocoetes confusus*



### Introduction

The western balsam bark beetle (WBBB) (Figure 1) is a native pest of true firs in the western United States.

This species is found from British Columbia, south to Arizona and New Mexico, following the distribution of its primary host, subalpine fir. Occasionally, grand fir is attacked. Like all bark beetles, WBBB bores into the bark and feeds on the phloem, which can cause girdling and tree death. Wind-thrown trees, logging slash, and weakened trees are often colonized by low populations, and beetles can build up to levels where healthier trees are attacked.



Figure 1. *Western balsam bark beetle adult.*  
Photo by B. Oakes, USFS,  
[www.forestryimages.org](http://www.forestryimages.org).

Trees already weakened by other agents (such as drought, root disease, or old age) are especially susceptible. Western balsam bark beetles frequently attack trees in groups.

### Biology

Western balsam bark beetle usually takes two years to complete its life cycle, though it may only take one year under favorable weather conditions. The male initiates the attack on the tree and makes a nuptial chamber under the bark. After attracting several females, egg galleries are produced that radiate out from the chamber, often in a star-shaped pattern (Figure 2).



Figure 2. *Western balsam bark beetle gallery.*  
Photo by S. Tunnock, USFS,  
[www.forestryimages.org](http://www.forestryimages.org).

Eggs are laid along the edge of the galleries and hatching larvae mine perpendicular to the main egg gallery feeding in the phloem. Larvae become dormant with the approach of winter and cold weather. Larvae resume feeding in the spring, pupate, and then pass the second winter as callow or immature adults. Mature adults begin their first flights in early June and continue through September. Like most bark beetle species, WBBB carry spores of a sapwood-staining fungus that disrupts water transport in the tree, which coupled with the larval feeding, kills the tree.

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## Insect Recognition

**W**estern balsam bark beetles are approximately 4 mm long, dark brown, and are covered with short reddish brown hairs. Females have a dense patch of hair on the front of their heads, between the eyes (Figure 3).

Larvae look like typical bark beetles, with legless



Figure 3. *Western balsam bark beetle adults, females on left. Note dense patch of hairs on front of the head of the beetle on left. Photo by USFS, R2 archive, [www.forestryimages.org](http://www.forestryimages.org).*

bodies and dark-brown heads (Figure 4). The star-shaped gallery pattern of this species is distinctive and is not confused with other bark beetles attacking subalpine fir.

## Damage

**E**vidence of infestation may be hard to determine because the beetles usually attack trees above eye level. Entrance holes are small and pitch tubes (such as those associated with mountain pine beetle) are not formed. Boring dust can accumulate in bark crevices and around the base of the tree and is usually visible in late summer.

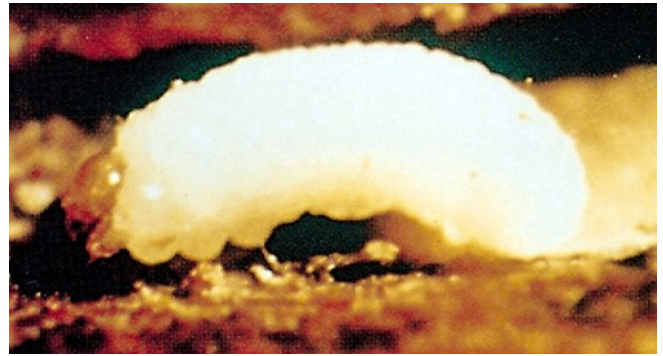


Figure 4. *Western balsam bark beetle larva. Photo by British Columbia Ministry of Forests.*



Figure 5. *Pitch streaming down the bole of attacked subalpine fir. Photo courtesy of USDA Forest Service, Region 1.*

Resin may stream down the bark from the entrance holes (Figure 5), often indicating an unsuccessful attack.



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Successfully attacked trees turn from green to red over the course of a year, and red needles are usually retained on the tree for more than one year (Figure 6).



Figure 6. Red foliage of subalpine fir killed by western balsam bark beetle. Photo by Scott Tunnock, USFS, [www.forestryimages.org](http://www.forestryimages.org).

## Management

Western balsam bark beetle usually builds its populations in wind-thrown trees and logging slash. Salvaging downed trees and proper slash disposal will help to minimize potential problems. However, application of these management techniques is not always feasible because subalpine fir stands are often located in remote, high elevation, or sensitive areas. Aggregation

pheromones (tree baits) are available for this species and can be used to concentrate beetles in an area scheduled for harvest. Infested trees are then removed from the stand during harvest. Consult with a forest entomologist before using pheromones.

## Useful Links

[Forest and Insect Disease Leaflet](#)

[USFS Region 1 Field Guide](#)

[USFS Region 1 Management Guide](#)

## References

Kegley, S. 2006. Western balsam bark beetle ecology and management. *In*: Forest insect and disease identification and management. USDA Forest Service, Northern Region.

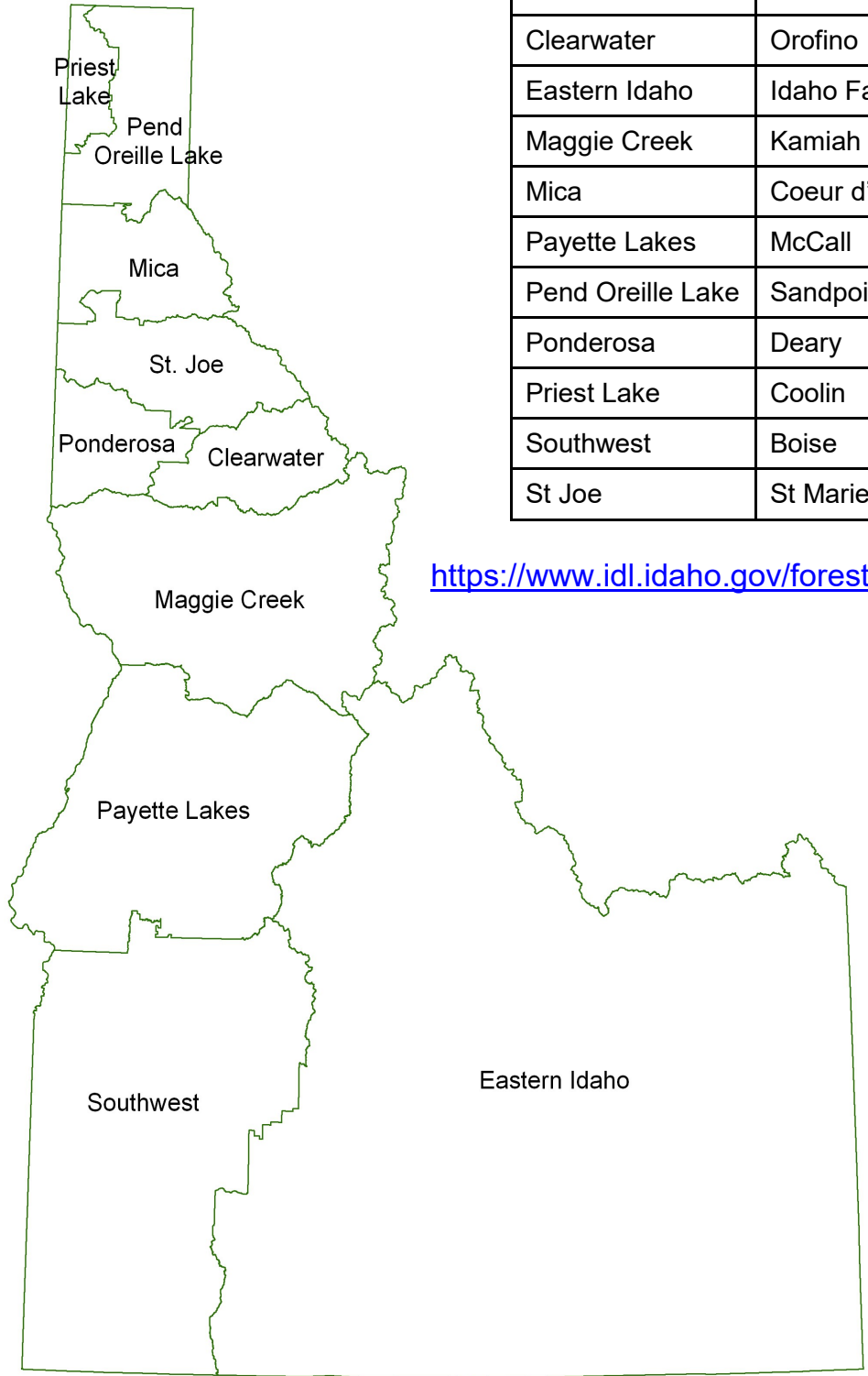
Stock, A.J., J.H. Borden and T.L Pratt. 1994. Containment and concentration of infestations of the western balsam bark beetle, *Dryocoetes confusus* (Coleoptera:Scolytidae) using the aggregation pheromone exobrevicomin. *Can. J. For. Res.* 24:483-492.

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