



# Western Pine Beetle

*Dendroctonus brevicomis*



## HOSTS: PONDEROSA PINE

Only known to occur west of the Continental Divide; larger trees (>20 inches diameter at breast height) are preferred.

## DAMAGE: MORTALITY

Western pine beetle feeds under the bark on phloem, the vascular tissue that transports water and sugars throughout the tree. Beetles introduce blue stain fungi. Together, the beetles and fungi girdle the tree.

## Ecology

Western pine beetle (WPB) is a native bark beetle that infests ponderosa pine. At low population levels, WPB attacks and kills trees weakened by drought, fire, mechanical injuries, or disease. Trees are often killed in groups or clumps. When healthy trees are attacked, the tree will attempt to “pitch out” the beetle using resin defenses. However, drought stress negatively impacts tree defenses. Outbreaks are significantly influenced by drought as well as forest conditions; high-density, over-mature host stands are most susceptible. At high population levels (outbreak conditions), WPB can cause between 60-90% mortality in ponderosa. Natural enemies—such as woodpeckers and predatory beetles—help regulate low-density populations but rarely stop outbreaks once they begin. Ultimately, the beetle plays a significant ecological role as a disturbance agent, reshaping ponderosa pine ecosystems in ways that influence succession, nutrient cycling, and long-term forest resilience.

## Identification

- Creamy orange pitch tubes up the main bole of tree (versus red turpentine beetle which is only the first 6 feet). Not always present, especially when tree is drought-stressed.
- Orange-red boring dust accumulating in bark crevices
- Circuitous galleries etched into inner bark
- Presence of brown adult beetles that are approximately the size of a grain of cooked rice, or presence of small white larvae (less than ¼ inch)
- Bark flaked off tree by woodpeckers feeding on beetles
- Small exit holes on outside of bark
- Crowns of infested trees may be green. Trees often turn red after beetles have left the tree.

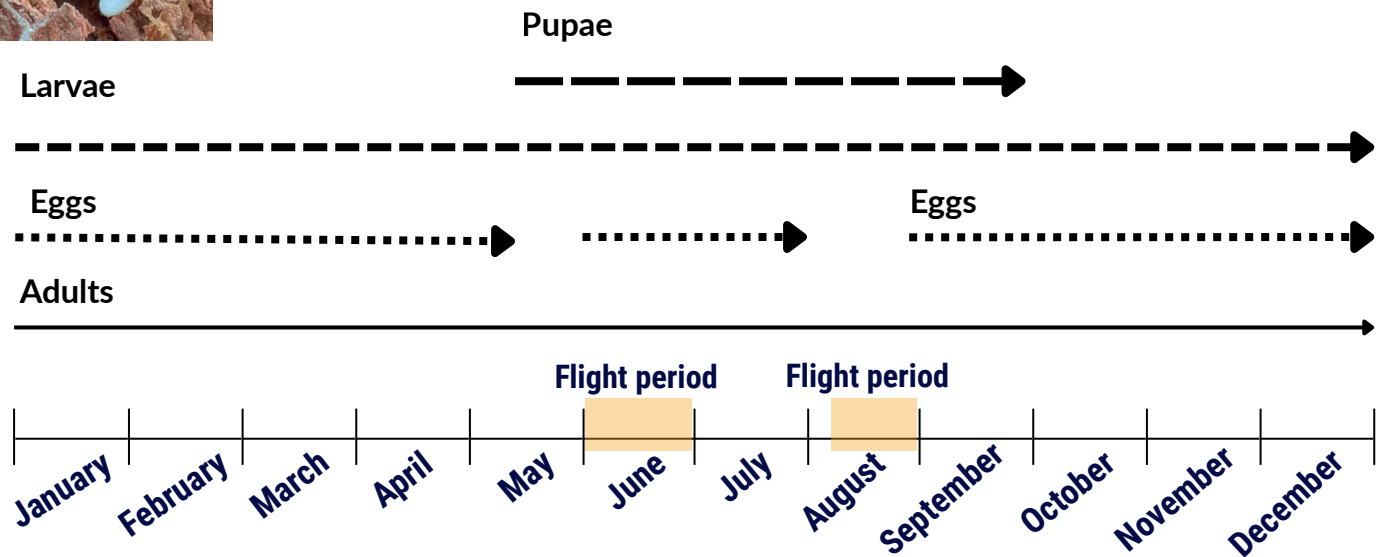


WPB galleries

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## Life Cycle

Western pine beetle can produce two generations per year in Montana, although development is temperature-dependent, so warmer locations in the species' range may see up to four generations of beetles per year. Adults attack trees in June and late August. Females initiate attack, releasing aggregation pheromones to attract more WPB. When a host tree is "full", both male and female beetles release anti-aggregation pheromones to prevent overcrowding the host. Eggs hatch into larvae that initially feed in inner bark but then migrate toward outer bark before pupating. Mature adults then emerge from the host and begin another generation. Due to having two generations/year, life cycles overlap.



## Management

- Thin stands to reduce competition and promote individual tree vigor. Trees "pitch out" beetles so adequate moisture is important for successful defense.
- Identify and remove beetle-infested trees. Trees may appear healthy but closer inspection will reveal pitch tubes and boring dust in bark crevices.
- Avoid soil compaction in stands with mature ponderosa pine.
- Remove or destroy infested material. Bark beetles will continue to develop in logs and firewood and, if left on site, can emerge the following summer to attack nearby trees.