

## Western Pine Beetle (*Dendroctonus brevicomis*)

### Hosts

In Idaho, western pine beetle (WPB) only attacks and kills ponderosa pine. Older, declining trees and dense stands are most at risk. It is the most common bark beetle attacking large diameter ponderosa pine in Idaho.

### Distribution

Western pine beetle occurs throughout Idaho wherever ponderosa pine occurs.

### Life Cycle

Western pine beetle outbreaks usually start through an external disturbance that stresses the trees such as fire, drought or defoliation. Western pine beetle usually has two generations per year in northern Idaho. Beetles fly in May or June and the next generation emerges to infest new trees later in the summer. Western pine beetle mostly overwinters as larvae.

### Damage

Adult beetles (Figure 1) feed under the bark, excavating wandering egg galleries (Figure 2). Beetles introduce a blue stain fungus into the sapwood, which interferes with water transport and reduces the tree's defenses, improving larval survival. Sapwood decay fungi are often introduced as well. Unlike most bark beetles, WPB larvae do most of their feeding inside the bark, not in the phloem (Figure 6 reverse side).

The first indication of attack is reddish brown boring dust in the bark crevices or around the base of the tree during the spring and summer months. Pitch tubes can occur with this species (Figure 3), but blind attacks (no pitch tubes) are also common. Beneath the bark, winding galleries packed with frass are seen (Figure 2), but larvae are inside the bark. Woodpeckers often flake off the outer bark to feed on beetle larvae. Ponderosa pine with the bright orange inner bark showing is a positive indicator of WPB attacked trees (Figure 4). Western pine beetle outbreaks typically consist of a few trees or small groups and usually last a few years. This is in contrast to the mountain pine beetle, where outbreaks can occur over thousands of acres and last for many years.

### Recognition



**Figure 1.** Western pine beetle adult.



**Figure 2.** Wandering egg galleries of western pine beetle under bark.



**Figure 3.** Pitch tubes from western pine beetle on ponderosa pine



**Figure 4.** Woodpecker feeding typical of WPB infestations.



# Forest Pest Fact Sheet

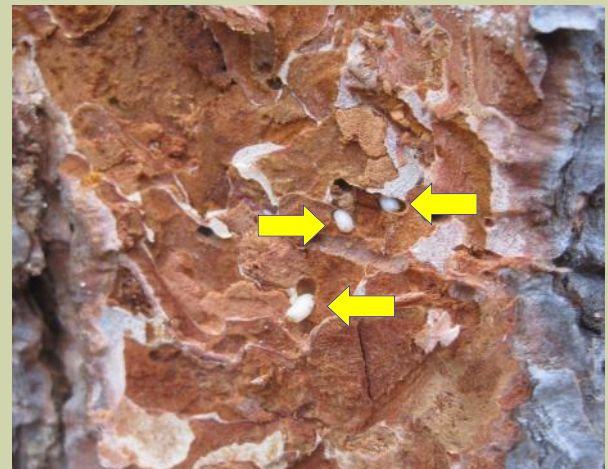
## Western Pine Beetle Management

**Predisposing Factors** Western pine beetle is most damaging to trees growing under stress. Drought or fire-scorched trees, and overstocked stands are most susceptible to attack. Western pine beetle also commonly attacks trees struck by lightning. Single storied stands with an average diameter over 10", and a basal area greater than 120 ft<sup>2</sup>/acre are especially at risk. Areas reforested using a close spacing (commonly 10 ft. X 10 ft.) can experience WPB mortality at smaller diameters if they are not precommercially thinned. For example, 8" diameter trees growing on a 10 foot spacing have a basal area of over 150 ft<sup>2</sup>/acre while 10" trees on the same spacing have a basal area of almost 240 ft<sup>2</sup>/acre.

**Thinning** Density management is the best way to prevent pine bark beetle problems. Thin so the residual stand has a basal area of less than 100 ft<sup>2</sup>/acre (Figure 5.). Remember that creating green pine slash during the winter or spring months can create conditions favorable for another bark beetle, the pine engraver (*Ips pini*). See IDL Forester Forum or fact sheet on pine engraver for details <https://www.idl.idaho.gov/forestry/insects-and-disease>. Thinning improves the vigor of the remaining trees by making more light, water and nutrients available. Thinned stands are less attractive to bark beetles and vigorous trees are better able to defend against bark beetle attack.

**Sanitation and Salvage** Thinning prevents many bark beetle issues, but some trees in a stand may still be attacked. Removing infested trees will reduce the number of beetles in a stand by removing the beetles before they can emerge to attack other trees. Trees with the bright orange inner bark exposed by woodpeckers (Figure 4.) in the winter or early spring usually contain live beetles. Check the bark with an ax to see if larvae or adults are feeding there (Figure 6.). Infested trees can be harvested, or felled and debarked. Bark that is removed should be disposed of offsite. Just removing the bark will not be effective because beetles will be inside the bark and may emerge and attack adjacent trees. Salvage after bark beetle outbreaks is time sensitive, the sooner the better. The presence of blue stain or decay in the sapwood will significantly reduce the value of the logs. Most mills will deduct when blue stain is present, and some will not accept stained wood.

Target Spacing for Western Pine Beetle Management (90 ft <sup>2</sup> / Acre)				
Tree Diameter	Ft <sup>2</sup> /Tree	Spacing	TPA @ Spacing	Ft <sup>2</sup> @ Spacing
8	0.35	13 X 13	256	89
10	0.55	16 X 16	169	93
12	0.79	18 X 20	120	94
14	1.07	22 X 22	89	95
16	1.4	26 X 26	64	90
18	1.77	30 X 30	48	85
20	2.18	32 X 32	42	92
22	2.64	36 X 36	33	88
24	3.14	40 X 40	27	85



**Figure 5.** Recommended spacing for various sized trees to obtain approximately 90 ft<sup>2</sup>/Acre.

**Figure 6.** Western pine beetle larvae inside bark of ponderosa pine. Picture was taken 11/2/2015.