



# Forest Health Note

## Hosts:

Douglas-fir, true fir, western larch, spruce, and western hemlock.

## Importance:

Flatheaded fir borers commonly breed in felled trees or those weakened by fire, defoliation, drought, or other types of disturbance. Trees infested are usually pole size or larger. Beetles can infest the entire tree or attacks can be confined to the upper crown and result in topkill. Flatheaded fir borers are considered less aggressive in their attacks on living trees than bark beetles.

This beetle is particularly aggressive in southwest Oregon where it attacks Douglas-fir growing on the edge of stands or scattered patches of trees on dry sites (Figure 1). In eastern Oregon, the flatheaded fir borer is also one of the few insects that attacks and kills western larch.

Photo: Rob Flowers, ODF



Figure 1: Douglas-fir mortality from flatheaded fir borer attacks in southwest Oregon.

## Flatheaded Fir Borer (*Melanophila drummondii*)

### Look For:

Detection of flatheaded fir borer attacks prior to the yellowing of the tree's crown is difficult. Unlike bark beetles, there are no external indicators of attack such as boring dust or pitch streams on the bark. For this reason, infestations are rarely diagnosed before the damage has already occurred. However, it is sometimes possible to identify infested green trees during the fall and winter months from the patches of bark removed by woodpeckers searching for beetle larvae. By the time the infested tree's foliage turns red, usually in the late spring or early summer in the year after attack, beetles have already left the tree.

The only way to confirm a beetle attack is to remove a piece of bark and look for its distinctive gallery pattern (Figure 2). Larvae construct wide, winding galleries that increase in width as larvae grow. Galleries are filled with a brown dust packed in concentric lines (Figure 3). The removal of bark from the tree's lower bole does not guarantee detection of a flatheaded

borer attack, since sometimes attacks are confined to the upper crown.

### Biology:

Although called a borer, the larvae of this large beetle feed and develop in the phloem/cambium interface, much like bark beetle larvae, and never bore into the tree's sapwood. The life cycle of the flatheaded fir borer normally requires one year. Adults emerge in the spring and feed on



Photo: Dave Overhulser, ODF

Figure 2: Bark removed to show flatheaded fir borer galleries.



Photo: Dave Powell, USDA FS, Bugwood

Figure 3: Flatheaded fir borer larvae have an enlarged head and distinct body segments. Galleries are extremely flat and packed with layers of sawdust like pellets.

conifer needles before flying to a suitable host tree. Adult beetles can sometimes be seen resting on tree bark exposed to direct sunlight (Figure 4). Eggs are laid in bark crevices and upon hatching, larvae immediately bore into the inner bark. Larvae feed in the inner bark without boring into the sapwood. Late in the summer or early fall, larvae construct pupal cells in the outer bark. Winter is spent in the outer bark and adult beetles emerge the following spring.



Photo: Dave Overhulser, ODF

Figure 4: Adult beetles have a metallic bronze or black body color. Yellow spots of varying size are sometimes present.

### **Control:**

#### Silvicultural

Procedures to maintain stand vigor, such as sanitation cuttings and thinning, are thought to be helpful in reducing tree susceptibility to flatheaded borers. On harsh sites in southwest Oregon, regenerating or favoring pine during thinning rather than Douglas-fir will reduce future flatheaded borer problems.

Avoid practices detrimental to trees including backfilling over roots, soil compaction in the root zone, and road cuts through well-established stands.

Flatheaded fir borer commonly attack damaged Douglas-fir. Trees with more than 50% of the crown or 25% of the cambium damaged by fire has a high probability of attack and should be removed to prevent a build-up of borer populations.

For further information about the Oregon Department of Forestry's Forest Health Program,

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