FOREST HEALTH NOTE

March 2002

Flatheaded Fir Borer

(Melanophila drummondi)

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. In eastern Oregon, the flatheaded fir borer is also one of the few insects that attacks and kills western larch.

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

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

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 (Figure 1).

The only way to confirm a beetle attack is to remove a piece of bark and look for its distinctive gallery pattern (Figures 2 & 3). Larvae construct wide, winding galleries that increase in width

Figure 3: Flatheaded fir borer larvae are 1-inch or more in length with an enlarged head and distinct body segments. Galleries made by this beetle are extremely flat and packed with layers of sawdust like pellets.

as larvae grow. Galleries are filled with a brown dust packed in concentric lines. 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 (Figure 4).

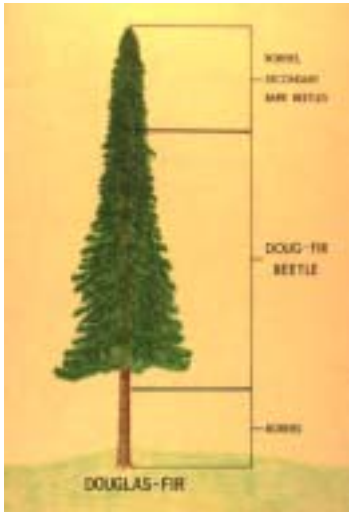

Figure 4: Distribution of borers and bark beetles infesting a mature Douglas-fir tree. Flatheaded fir borers are typically found in the lower bole and upper crown of Douglas-fir, but occasionally infest the entire tree.

Life Cycle

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 conifer needles before flying to a suitable host tree. Adult beetles can sometimes be seen resting on tree bark exposed to direct sunlight (Figure 5). 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.

Management

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.

Figure 5: Adult beetles are approximately ¾-inches long, with a metallic bronze or black body color. Yellow spots of varying size are sometimes present on the beetle's back.

Disturbance of trees during land clearing or construction of home sites can increase the likelihood of flatheaded borer and bark beetle attack. Practices detrimental to trees include backfilling over roots, soil compaction in the root zone, and road cuts through well-established stands.

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

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