

# Bark Beetles in California Conifers

## Are Your Trees Susceptible?



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Native bark beetles cause high levels of tree mortality in California. When, where, and the extent to which mortality occurs is primarily influenced by forest stand and drought conditions. A dramatic rise in the number of dead trees follows one to several years of inadequate precipitation. The more severe and prolonged the drought, the greater number of dead trees. Dense groups of trees are particularly susceptible to bark beetle attacks due to stress caused by competition for limited resources. Stressed trees equate to suitable host material for bark beetles and successful reproduction results in more beetles and higher levels of tree mortality.



TREES KILLED BY BARK BEETLES

Tree mortality caused by bark beetles can rise sharply in a short amount of time, similar to that observed in the southern part of the state in 2003. The primary reason for increases in tree mortality have been periods of severe and protracted drought combined with high tree densities. High levels of tree mortality will occur if forests are not altered to improve tree health and resilience.

The bark beetles causing widespread mortality in the forests and forested communities in California are all native. The principal species include: mountain pine beetle, fir engraver beetle, western pine beetle, Jeffrey pine beetle and pine engraver beetles.

### HOW CAN SOMETHING SO SMALL KILL SOMETHING SO BIG?

Individual bark beetles are not much larger than a piece of cooked rice. Not only are they small and difficult to see, their activity is often scattered and hardly noticeable.

Bark beetles survive in trees that are stressed, diseased, or injured; either by human activity or during storms or wildfires. Occasionally, small groups of standing trees may be killed but over the landscape they are often unnoticed.

Bark beetles can increase dramatically when sufficient food is available. Typically this is in the form of drought-stressed trees. High numbers of these small beetles (outbreak populations) attack trees *en mass*. Often many trees are killed over the landscape; likened to that of wildfire. In many years, more trees are killed by bark beetles than by fire!

In the battle between trees and tree-killing beetles the two principle interacting factors are tree vigor and beetle numbers. When beetle populations are low, healthy trees often produce enough resinous pitch to drown and “pitchout” the beetles that attempt to enter. When trees are stressed they may be unable to produce sufficient amounts of defensive pitch. When beetle populations are high, even an apparently healthy tree may not be able to produce enough pitch to ward off hundreds of attacks (a mass attack). In addition, many beetles carry fungi that further impair the tree’s defense system.



WIDESPREAD TREE MORTALITY NEAR IDYLLWILD, CA - 2003

#### PITCH TUBES



(SUCCESSFUL ATTACK)



(UNSUCCESSFUL ATTACK)

**Does this affect you? Look inside!**

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This publication was developed to educate the public regarding the principle tree-killing bark beetles in California. With this knowledge, you can make informed decisions concerning improving tree health on your private property and provide meaningful input about proposed actions on public lands.

Federal and State Forest Health Staff are available to assist you with additional information. Please see page 12 for a list of contacts and additional information sources.



Forest Service

Pacific Southwest Region