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**Mighty oaks succumbing to tiny invasive beetle need public's help**



*See end of release for high-resolution version.*

University of California scientists are calling on the public to help stem the spread of the goldspotted oak borer, a small invasive beetle that has already killed 20,000 San Diego-area coast live oak, black oak and canyon live oak trees. The key to preventing the pest's spread to additional Southern, Central and Northern California woodlands, the scientists believe, is not moving beetle-infested oak firewood from one place to another.

Firewood hauled from GSOB's native turf -- in southern Arizona, Mexico or Guatemala -- most likely carried the pest to Southern California, where it was first detected in 2006. For millennia, the vast, dry Mojave Desert protected California from a GSOB invasion. But, the desert is no match for a pickup truck piled with logs.

"In January, I was in an area heavily infested with the oak borer," said UC Riverside entomologist Mark Hoddle, director of the UC Riverside Center for Invasive Species. "People are cutting down the dead trees. You can drive along the road and there are big piles of oak firewood for sale -- \$100 a truckload. I'm sure there are GSOB hibernating in the wood and the beetles will hatch out in the spring."

In its dormant stage -- as pupae -- GSOB hides under tree bark, where it is difficult to detect. Inadvertent introduction of GSOB to more of the state's treasured oak woodlands by campers, firewood sales people or other travelers will dramatically increase the number of oaks that succumb before scientists can get the pest under control.

It is the pest's larval stage that harms oak trees. GSOB larvae feed in the layer below the bark known as the cambium. Larval feeding destroys the cambium's vascular system, which carries water and nutrients through the tree. The tree starves and dies.

GSOB's damage, however, is not confined to the oak trees themselves. Oak trees are vital to foothill ecosystems. Certain animals rely entirely on the oaks for shelter and food.

"Woodpeckers store nuts in the trees, there is a species of ants that only live in oak trees," Hoddle said. "You end up with an ecosystem cascade when the oaks start dying because everything that evolved to rely on oaks is imperiled."

The oaks are also valued for their esthetic appeal. In many cases, their beautiful, broad canopies are the only trees providing shade on grassy foothills. Many are centuries old.

"We have been interacting with very concerned homeowners who have these fantastic oak trees that are dying," Hoddle said. "Recent aerial photography suggests that many more trees are infested with GSOB."

UC Cooperative Extension natural resources specialist Doug McCreary, who works among the oaks at the UC Sierra Foothill Research and Extension Center in Browns Valley, said many people have a visceral connection with oaks in

California.

"Their death can cause heartbreak and a tremendous sense of loss," McCreary said.

UC scientists are working closely with federal and state agencies to raise awareness about the goldspotted oak borer, and identify and introduce a natural enemy that will permanently suppress the pest. Because of the size of oak trees, the pest's protection in oak bark and cracks, and the scope of oak woodlands, control with pesticides is ineffective and impractical.

"We can't eradicate goldspotted oak borer, we realize that," Hoddle said. "But we believe we'll be able to reduce the populations of the beetle with natural enemies so they can no longer kill trees."

In its native environment, goldspotted oak borer populations are kept in check by parasitic wasps. In fact, Hoddle said, before GSOB was introduced in California, only about 50 of the attractive, shiny black and gold-flecked insects were known in beetle collections. Now that the pest is flourishing in an environment with no natural enemies, thousands of beetles have been found.

"Since the California invasion, the number of collected beetles has increased exponentially," Hoddle said.

In order to track down the best enemy for oak borers in California, UC Riverside scientists are studying the insect's genetic fingerprint. They hope to find out where the California GSOB came from by identifying relatives in the native habitat.

"We have been sampling borer populations in Arizona and have plans with the U.S. Forest Service to go to Mexico and Guatemala to get more beetles," Hoddle said. "We will compare the genetic fingerprint for the beetle we have in California and hope to pinpoint the area of origin for the California population. The beetles we have looked at so far from collection sites in Arizona do not appear to be closely related to the beetles in California."

Once UC scientists figure out where the California GSOB came from, they will be better able to find the best natural enemies to attack the strain of beetle killing oaks in Southern California. Hoddle estimates it will take scientists at least two years to identify, run safety tests in quarantine, raise and release GSOB's natural enemies in California.

The state's oak woodlands are absorbing this blow on the heels of other threats to their longtime sustainability. The oaks are already burdened by a continuing drought, encroaching development and farming, wildfires, firewood harvesting and Sudden Oak Death, a disease caused by a pathogen most likely introduced to the state in nursery plants more than 10 years ago.

The UC Riverside Center for Invasive Species offers the following tips for helping keep goldspotted oak borer from spreading to infested trees or to other parts of the state:

- Do not transport oak firewood into or out of campgrounds or parks
- Chip infested oak wood to 1-inch pieces
- Cover stored oak firewood with 6 mm, UV-stabilize, durable plastic tarps in the spring. Secure all the edges of the tarp to the ground to prevent beetles from escaping
- Season oak firewood. Remove the bark and place the wood in direct sunlight

The UC Riverside Center for Invasive Species has a Web site with information and photos of GSOB and damage caused by the pest: [http://cisr.ucr.edu/goldspotted\\_oak\\_borer.html](http://cisr.ucr.edu/goldspotted_oak_borer.html)

In addition, a two-page Pest Note on goldspotted oak borer, with 14 color photos, may be downloaded at <http://groups.ucanr.org/GSOB/files/70958.pdf>.

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