

Invasive tree pest updates: borers threatening our community forest are moving closer

Tree experts and enthusiasts recently attended a day-long conference about the invasive pests attacking oak trees and other species in California. These insects and the disease they carry pose a significant threat to our community forest.

See our previous column here: https://www.davisenterprise.com/features/don-shor-new-pest-threatens-our-urban-forest/article_40771ef4-82df-48c4-babf-f1ce9e964f5e.html

It was officially called the FD-ISHB Preparedness Workshop. FD-ISHB stands for Fusarium Dieback - Invasive Shot Hole Borer. There are three insect species, all called ambrosia beetles, spreading fusarium disease which they farm within the tree in a symbiotic relationship. The insect uses the fungal colonies as a food source. The fungus kills the tree.

These borers fly from tree to tree, establishing colonies in the cambium (water and nutrient conducting tissue). The insect itself can cause some branch dieback in many species of trees. In species known as reproductive hosts, the fusarium fungus grows and blocks the cambium, leading to major branch dieback, overall decline of the tree, and death.

Invasive Shot Hole Borers have spread from Southern California up into the Bay Area.

Speakers also reviewed the spread of the similar Mediterranean Oak Borer, which is present around Clear Lake, north into Mendocino County, east into Yolo County, spreading rapidly in Sacramento County, and further east into El Dorado County.

Meanwhile, Emerald Ash Borer (EAB), which arrived in the eastern US 25 years ago and has killed hundreds of thousands of ash trees there, is expanding its presence in Oregon. Five counties in the northern Willamette Valley are quarantined for the pest, but it continues to spread. There are still a lot of ash trees downtown and in some older neighborhoods, especially in east Davis, vulnerable to EAB.

Where did they come from?

ISHB came from southeast Asia, Emerald ash borer from northern Asia. Mediterranean oak borer is self-evident in the name. Most likely they all arrived on imported wood.

Invasive Shot Hole Borer

The host range for this pest and disease is extensive, including important crops such as avocados, most of our native tree species in the Valley (Valley oak, Western sycamore, stream willow, Fremont cottonwood), and other street tree species such as London plane tree. London plane tree is one of our most common shade trees in Davis.

With at least 3 to 5 generations per year, the pest has the potential to increase rapidly within 1 - 2 years after it arrives in an area.

ISHB has since killed thousands of trees since it was detected in Southern California in 2003. In the Tijuana River valley, it's estimated that 200,000 native willows have been killed. Invasive

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castor beans are seeding in and encroaching on the whole area, crowding out native plants. Ironically, the borer also attacks the castor beans, but they still have time in their life cycle to flower and set seed.

In 2023 it was detected in San Jose and has now been found in hundreds of trees. There are streets with London plane tree as the sole street tree where they are all infested. This illustrates the importance of tree species diversity in urban tree plantings.

Another species of ambrosia beetle with the same life cycle was discovered in the Felton area near Santa Cruz in 2024. This one is decimating native box elders (*Acer negundo*) and sycamores and will also attack the related hybrid plane trees.

What to do?

Management strategies focus on early detection, using traps for aggressive monitoring at the outset of the infestation, then making treatment or removal decisions. This requires lots of boots on the ground, some funding, and a little training.

Surveying is being rapidly expanded and management protocols are being established.

"Trees with 150 or fewer entry holes are considered low to moderately infested. Trees with 150 or more entry holes are severely infested. Low to moderately infested trees are treatable. For severely infested trees, removal is the only effective treatment option to protect surrounding trees."¹

In a nutshell, when this pest arrives and gets established in a region, the options are to use a mix of pesticides, and to remove the most-infected trees.

Amplifier trees are a big concern. This is the term for heavily infested trees that are dying. The beetles, which have 3 to 5 generations per year (more in warmer regions), do a mass flight when the tree dies. This leads to rapid infestation nearby. One to two years after the pest arrives you can have huge numbers. As one researcher said, "a single female can start a whole population."

How likely is it to be a problem in our area?

Very.

One researcher stated, "it is highly likely to arrive and spread in the Sacramento region because of the host composition and microclimate."

Our warmer temperatures lead to more pest lifecycle generations, and we have a lot of the types of trees they like here.

¹ <https://www.sanjoseca.gov/your-government/departments-offices/transportation/landscaping/trees/invasive-shot-hole-borers>

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Davis downtown and Central Park are heavily planted with London plane trees and some older Valley oaks. Infestation and dieback from ISHB and MOB will likely begin within a decade. All cities in the Valley will face increasing costs of tree management, and increased need for new tree plantings, over the next decade.

How to manage it?

An Integrated Pest Management (IPM) strategy gives much better results than preventative insecticide applications.

The Disneyland Resort in Anaheim is a case in point, with over 16,000 trees of 681 species or cultivars. The resort chose to inject ALL of their trees with systemic insecticide. This created wounds and led to cankers, weakened the trees, and didn't prevent spread of the pest. Adopting the IPM practice of early detection, active monitoring, and pruning and removal as needed, allowed a 95% reduction in pesticide usage.

Research is underway and experts are collaborating to develop strategies for management which can forestall significant tree losses. In the long run, cities are going to need to plan for increasing costs, community resistance to pesticide usage and tree removals, and implement tree plantings of appropriate species to replace the losses.

This pest is moved primarily by people. *Don't move firewood!*

UCANR, the outstanding information resource managed by UC, provides the best current research and updates: <https://ucanr.edu/site/invasive-shothole-borers>.

Mediterranean red oak borer

ISHB is an imminent threat to shade trees in the Sacramento Valley. Unfortunately, another tree pest has already arrived.

The Mediterranean oak borer was confirmed in Calistoga in Napa County in 2016. It is very likely that it arrived in oak wood staves used for wine barrels. As of summer 2025, it had spread into the Sacramento Valley and was killing oaks in Natomas, in Sacramento.

"MOB infestations have since spread to nearby Lake and Sacramento counties. Blue oak (*Q. douglasii*) is also a known host. In California, a single attack was found in a severely distressed California black oak (*Q. kelloggii*) and another attack in fire-damaged Oregon white oak. California officials found that MOB is already established and too widespread to be eradicated from central California."²

Infested trees are cut and either burned or chipped on site. Chips and wood should not be moved from the site.

<https://www.oregon.gov/odf/Documents/forestbenefits/fact-sheet-mediterranean-oak-borer.pdf>

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Treatment with systemic insecticides and fungicides is being tested but hasn't shown good efficacy.

Our Valley oak (*Quercus lobata*) is the primary host of Mediterranean oak borer, less commonly the blue oak (*Q. douglasii*). As one researcher said, "they really love the big Valley oak." There is a preference for larger trees, 8"+ in diameter. Infestation is from the top down, weakening branches, with 5 to 10 years from infestation to "full wilt" and death of the tree. This is a major threat to our historic native oaks.

Taking action.

- Monitoring is the key. Find and remove the amplifier trees.
- An emerging tree pest group is meeting quarterly. Plans are underway for a Coordinated Response Committee statewide. There's a need to streamline permits and fees and reduce delays in removing infested trees.
- A rapid test for presence of the disease(s) is under development.
- Choose trees carefully. Certain species are highly preferred hosts for ISHB, specifically box elder (*Acer negundo*), Western sycamore (*Platanus racemosa*) and London plane (*Platanus x acerifolia*). Valley oak is a highly preferred host for MOB.
- Don't move wood. Beetles can emerge from cut wood for months.
- Don't move chips in infested regions. Not an issue here yet, but this will require monitoring of 'chip drop' programs in years to come.

What does this mean for us?

Don't move firewood.

People spread these borers initially by moving wood. Going fishing at Clear Lake, or camping on the coast? Mediterranean oak borer is established in many places there. Don't bring back any firewood! Don't even take it to your next campsite.

Report sightings.

Keep an eye on large, old oaks.

"If the tree canopy is thinning and browning, starting at the ends of a limb traveling towards the trunk, there might be signs of MOB. You may see a section of the tree brown and dying while the rest is green and healthy."

If you see these symptoms on an older oak, especially Valley oak, here's a link to use for reporting it: <https://survey123.arcgis.com/share/392d1eb48f49467996db5e995df17868>

Keep informed.

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Cities are going to have to make some tough decisions as these pests spread. Use of pesticides to protect high-value trees may be controversial. Even more controversial will be removal of large, old trees.

"Don't panic!" said one of the slides at the presentation.

Really? Seems to me that a little bit of panic might be appropriate! Just please panic prudently and follow the updates.

The combined impact of these pests that are on their way will affect hundreds if not thousands of trees in Davis. Our downtown and older neighborhoods are especially in peril.

We need to be planting more trees now to mitigate these future tree losses.

And **don't move firewood!**

Resources:

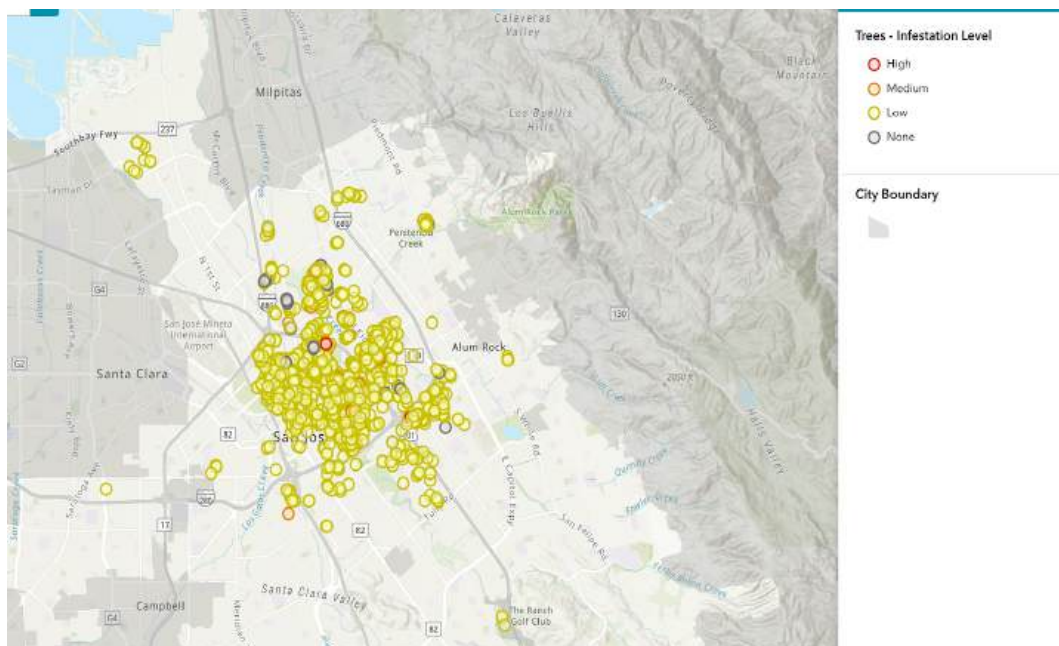
ISHB info: <https://ucanr.edu/site/invasive-shothole-borers>

Risk map of ISHB: <https://ucanr.edu/site/invasive-shothole-borers/statewide-ishb-fd-risk-map>

Key personnel:

Dr. Shannon Lynch, UC Davis, forest pathologist

Dr. Beatriz Nobua-Behrmann, UC Cooperative Extension (benobua@ucanr.edu).



Here is a rather sobering map of the spread of Invasive Shot Hole Borer in San Jose in just three years.

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Map shown is from 2026; the borer was confirmed in downtown San Jose in 2023.



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Entry and exit holes, and the nearby staining, is especially visible on our London plane trees and our native Western sycamore.

Photo courtesy of Monica Dimson, Ph.D., UCCE, UCANR.



ISHB galleries in a dead sycamore tree. Photo courtesy of Beatriz Nobua-Behrmann, Ph.D.
Urban Forestry and Natural Resources Advisor, UCANR

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Tiny entry hole of the Invasive Shot Hole Borer. Staining on the trunk is the most visible symptom of infestation.

Photo courtesy of Monica Dimson, Ph.D., UCCE, UCANR.

If you see symptoms, learn more and report your find: <https://ucanr.edu/site/invasive-shothole-borers/diagnosis>

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Mediterranean oak borer damage to the canopy of a mature oak. Photo courtesy of Sheri Smith, US Forest Service