

Mediterranean Pine Engraver Spreading in Arizona

Forest Health Alert
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AZ Department of Forestry and Fire Management

Why Do We Care?

The non-native Mediterranean pine engraver beetle (MPE) (*Orthotomicus erosus*) (Figure 1) made its way to Arizona in 2018, likely through the movement of wood packing products from neighboring states. MPE are native to Europe, the Middle East, northern Africa, and China. Since being introduced into the US, they have spread quickly through warmer climate states.

MPE are tiny beetles, ranging from 3-3.5mm long, and are reddish-brown in color. MPE beetles generally attack distressed pine trees by boring holes in the bark and chewing on the layer just under the bark, called the phloem, where a tree transports sugars and water. The tunneling created by the beetles' chewing blocks the tree's ability to transport water and nutrients, effectively killing the tree.

Healthy pines have a natural defense against bark beetles; they secrete thick resin when beetles try to gain entry, pushing the beetles out and trapping them in sticky resin. However, stressed trees produce little to no resin and can become susceptible to MPE and other bark beetle attacks. In addition, even healthy trees may not be able to fend off MPE if beetle populations are abnormally high.



Figure 1: MPE are small, about 3mm in length, as shown in relation to a penny.

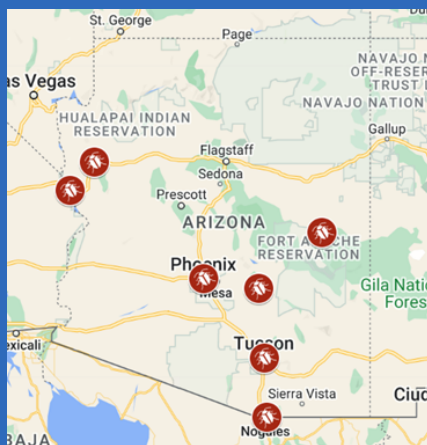


Figure 2: Map showing MPE monitoring locations across the state.

Arizona Monitoring Locations

The Arizona Department of Forestry and Fire Management, in collaboration with the USDA, has monitored for this insect pest with various trapping efforts and management projects. MPE was discovered in Tucson in May of 2021 through an expanded trapping program, and an Early Detection Rapid Response monitoring program identified the presence of MPE in Kingman, Topock, Pinetop-Lakeside, Superior, and Nogales in spring of 2023 (Figure 2).

Signs of Activity - What to Look For

The two most common external signs that an urban tree may be infested with MPE are yellowing or browning needles, especially at the top of the tree, and the presence of red boring dust on the bark or accumulated at the base of the tree. Less common signs in an urban setting can include pin-sized exit holes in the bark and resin oozing out of the holes in the bark; if water availability is minimal, the tree may not ooze resin.



Figure 3: Eldarica pine showing yellow needles at the top of the crown.



Figure 4: Pitch tubes and exit holes made by MPE in Aleppo pine.



Figure 5: Red boring dust as seen on pine bark.

What Else Could it Be?

Various other insects can cause trees to have similar signs and symptoms to an MPE infestation. Yellowing or orange-brown needles alone could be a sign that the tree needs more water. Other insects can also make holes in the bark of pine trees. The main difference is that non-MPE wood boring beetles are generally found on trees that are already dead. In addition, the holes they make are much bigger and are usually flat on one side rather than perfectly round, like those of MPE. Woodpeckers and other sapsuckers also make holes in bark, but they will be fairly large, roughly 1 cm in diameter or larger, and likely in rows or columns. MPE holes are pinhead-sized and spread randomly over the bark in a shot-hole-like appearance.



Figure 6: Non-MPE wood boring beetle holes, significantly larger and deeper than MPE. Photo Credit: Stanislaw Kinelski, bugwood.org

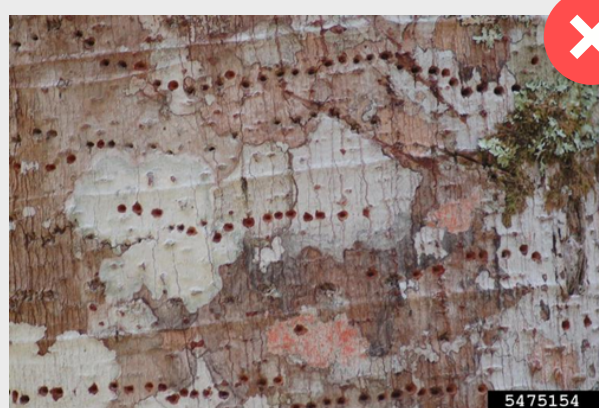


Figure 7: Woodpecker holes in tree bark showing a horizontal pattern. Photo Credit: Joy Viola, Northeastern University, Bugwood.org

What We're Doing

The Arizona Department of Forestry and Fire Management is working to better understand MPE and the best management practices for dealing with this pest through three ongoing projects:

Push-pull Assessment: This project is occurring in parks around Phoenix with the intention of reducing MPE populations in these localized areas. This strategy will test the ability of verbenone, a known bark beetle deterrent, to “push” MPE out of an area. Nearby, traps with lures will be placed to “pull” the MPE into that area. This project will help assess if verbenone has an effect on MPE. Future projects will look at other known deterrents, such as conophthorin and Ips dienol.



Figure 8: Photo of verbenone pouches placed on an Aleppo pine in hopes of deterring MPE

Host Tree Assessment: This project involves working with local contractors in Phoenix and Tucson to collect bark beetles from recently cut conifer trees. This assessment will help us to determine which bark beetle species, including MPE, are attacking Arizona’s ornamental conifers.

Bolt Assessment: Similar to the Host Tree Assessment, this project will be looking to see which native tree species are susceptible to an MPE attack. We will bait logs (bolts) with MPE lures to see if the beetles are able to bore into and reproduce in these trees. Knowing which native species are susceptible to MPE will help us predict their spread throughout the state.

What Can You Do?

Preventing an MPE infestation from starting is the best option.

Prevention involves keeping trees unstressed and healthy, so they are able to fight off the attack themselves. Water trees appropriately, plant trees in the correct location, and remove dead and dying trees.

Once an infestation has started, the best method to stop the infestation from spreading may be to have the tree removed.

This will remove beetles from the area before they spread to nearby trees. All infested green material should be removed from the site, chipped, buried or burned. A certified tree care professional will be able to help you determine the best course of action.

If you suspect that a pine may be infested with MPE beetles, please contact the Department of Forestry and Fire Management with specific tree location details to help us monitor where MPE is spreading. This information is invaluable in helping us stay ahead of the problem. We may also be able to cover a portion of the cost of removing the tree. Information or questions can be emailed to foresthealth@dffm.az.gov.

