

2008 Emerald Ash Borer Monitoring

Research Project Summary

January 2009

Background:

The emerald ash borer (*Agrilus planipennis*), is an exotic beetle that is native to Asia (Figures 1 and 2). The first time it was discovered in North America was in Michigan in 2002. As of the fall of 2008, it has been discovered in Quebec, Michigan, Illinois, Indiana, Ohio, Wisconsin, Missouri, Pennsylvania, Maryland, Virginia, and West Virginia.

In North America, the emerald ash borer feeds exclusively on ash trees. The adults do little to no direct damage since they feed only on the leaves. However, the female lays her eggs under the bark of the ash tree where they hatch and develop into larvae which feed on the tree's inner bark. As the larvae feed they leave behind tunnels that disrupt the flow of nutrients within the tree. The tree soon dies because it can't obtain the nutrients that it needs to survive. Since its discovery in the U.S., over 50 million ash trees have been killed by emerald ash borers.

Ash trees are important both economically and ecologically. From an economic standpoint, ash trees are often used in landscaping projects, and ash lumber is used for baseball bats, furniture, and construction projects. Ecologically, ashes are canopy trees that provide valuable habitat for plants and animals. Their seeds are also an important source of food for wildlife. Mammoth Cave National Park has three species of ash trees – white ash (*Fraxinus americana*), blue ash (*Fraxinus quadrangulata*), and green ash (*Fraxinus pennsylvanica*). The emerald ash borer attacks all three species, and scientists currently don't know how to control or stop emerald ash borers once they become established.

The Question: Are emerald ash borers in Mammoth Cave National Park?

Various state and federal agencies across the country are surveying public lands to monitor the spread of emerald ash borers. Mammoth Cave National Park joined those monitoring activities in 2008.

The Project:

In late May 2008, park staff hung 18 big, sticky, purple boxes in ash trees at 13 different locations throughout the park (Figure 3). (The boxes were purple because in 2003 the USDA Animal and Plant Health



Figure 1: Adult emerald ash borer. Photograph courtesy of David Cappaert, Michigan State University, Bugwood.org



Figure 2: Adult emerald ash borer sitting on a penny for scale. Photograph courtesy of Howard Russell, Michigan State University, Bugwood.org

Inspection Service conducted an experiment which showed that emerald ash borers are attracted to purple.) Scientists believe that the rapid spread of the emerald ash borer is due to people moving firewood that contains the beetle larvae. Therefore, the boxes were located around the campgrounds, picnic areas, Visitor Center, parking lots, and other similar places that are heavily visited by people.

Each box was baited with a special lure that is attractive to emerald ash borers. Although the lure was attractive to emerald ash borers, it wasn't strong enough to attract them to the park. Only emerald ash borers that were already in that specific area of the park would be attracted to the lure. If present, any nearby emerald ash borers would be drawn to the boxes where they would become stuck. In early August, the boxes were removed from the trees and examined for emerald ash borers.

Results:

No emerald ash borers were found on any of the traps. This suggests that the emerald ash borer may not have found its way to Mammoth Cave National Park. However, with the emerald ash borer occurring in every state surrounding Kentucky, except for Tennessee, it is important to continue monitoring efforts. In future years, the big, purple boxes may once again decorate some of the park's ash trees as part of those monitoring efforts.

You Can Help:

In 2008, Missouri discovered its first occurrence of emerald ash borers. They were found at a popular campground. This pattern has repeated itself over and over again since the emerald ash borer was accidentally introduced into this country. Emerald ash borer larvae are often unintentionally transported in firewood that campers bring from home. Based on that, many states now have restrictions on moving firewood. It is hoped that by restricting the movement of firewood, the accidental spread of emerald ash borers to new parts of the country will be slowed. To help prevent the spread of the emerald ash borer to Mammoth Cave National Park or other parts of the country, don't move firewood more than 50 miles from where it was cut.



Figure 3: Park staff and volunteers install an emerald ash borer trap. Inset shows a close up of the trap. The white parchment paper on the sides protects the sticky glue of the trap and is removed before the trap is installed. The white bag inside the trap is where the lure is located.

The Mammoth Cave International Center for Science and Learning is a partnership between Mammoth Cave National Park and Western Kentucky University. We are a member of a national network of research learning centers based within the National Parks.

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- Support science-informed decision making.
- Communicate the relevance of and provide access to knowledge gained through scientific research.
- Promote science literacy and resource stewardship.