

# Emerald Ash Borer

## What is the Emerald Ash Borer?

The Emerald Ash Borer (EAB) is a non-native invasive beetle from Asia. It was first discovered in Michigan in 2002, and has since been spreading across the country killing millions of ash trees. EAB feeds on and kills all species of native ash trees, and is expected to cause close to 100% mortality of ash trees in the U.S.



Leah Bauer, USDA Northern Research Station, Bugwood.org.

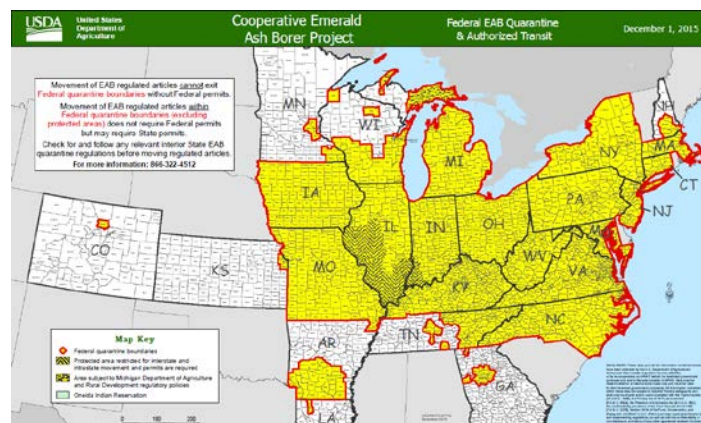
## Why does the Emerald Ash Borer matter?

There are several species of ash trees in Maryland and they play vital roles in the function of our environment. Ash trees support the biodiversity of our insects, birds, and other wildlife. They grow along our streams and rivers, helping to filter out chemicals and sediment and protect water quality. Ash trees are also found in many of our urban communities, providing shade and air quality benefits. Losing our ash could threaten the important benefits that these trees provide.

In addition to environmental threats, EAB also poses a threat to public safety. Infested trees become brittle and prone to snapping or shattering, which could be dangerous if ash trees are growing near homes, roads, parks, or utility wires. When ash trees become brittle, they may also require more expensive machinery for removal. If you have an infested ash tree that you are not going to chemically treat, have it removed sooner rather than later to avoid safety risks and higher costs.

## EAB in Maryland

EAB came to Maryland in 2003, first arriving in Prince George's County. It has since spread across most of the Western Shore and was found for the first time on Maryland's Eastern Shore in the summer of 2015. The entire state of Maryland is now under the federal EAB quarantine. Under the federal quarantine, ash products may be moved between the Eastern and Western Shore, and to other states within the quarantine boundary. Ash products may not be moved outside of the quarantine boundaries. Restrictions apply for moving ash products into some states, so check with each state if you are planning to move products across state lines.



Federal EAB quarantine area as of 12/1/15.

This quarantine regulates the following products:

- Ash nursery stock
- ANY species of hardwood firewood
- Ash woody debris or green lumber
- Ash wood chips greater than 1” in diameter in 2 dimensions

State	Requirements for moving firewood from MD
DE	USDA certificate
PA	USDA certificate
VA	None
WV	None

For more information on the status of EAB in Maryland, visit the [Maryland Department of Agriculture EAB webpage](#). For more information on the Federal EAB Quarantine, visit the [USDA APHIS website](#).

*Although the quarantine allows some movement of ash products, the best practice is to use wood products where you buy them. This will minimize the risk of moving EAB, and other potential pests, to un-infested areas.*

### **Signs and symptoms of EAB**

The following images are signs that a tree may be infested with EAB. However, there are many species of native pests, and other causes of damage that could lead to ash decline. If you suspect EAB, visit <http://extension.umd.edu/hgic>.



Crown Dieback



Epicormic sprouting



D-shaped exit holes



S-shaped galleries



Bark splitting



Woodpecker damage

Photos from Bugwood.org. Reading across: Dan Hermes, The Ohio State University; PA DCNR- Forestry; PA DCNR- Forestry; Kelly Oten- NC Forest Service; Michigan Department of Agriculture; Kenneth R. Law, USDA APHIS PPQ.

## **Responding to EAB**

### **1) Tree Inventory**

The first step in responding to any forest pest is to conduct a tree inventory along streets, in parks, or around private residences. A basic inventory should include:

- Location
- Species
- Size
- Condition, including signs of EAB damage
- Additional factors for removal or treatment, including proximity to structures, accessibility for removal, or particular aesthetic or cultural value

### **2) Management options**

Your tree inventory will help you choose the best management options for your trees, including:

#### **Treatment**

Chemical treatment is currently the only way to prevent mortality due to EAB. Treatment protects future ash seed sources and preserves the ecosystem benefits of our ash trees. Several chemicals and treatment methods are available to protect ash trees. Currently, the most effective chemical known for EAB is emamectin benzoate, which can be applied through stem injections. Costs often limit the number of trees chosen for treatment, so focusing on the following may help to maximize the benefits of treatment:

- Large trees
- Rare species of ash, including pumpkin and black ash
- Trees with cultural or aesthetic importance
- Trees with less than 30% crown dieback



Dave Cappaert, Michigan State University,  
Bugwood.org

#### **Removal**

Due to the safety hazards created by EAB, most ash trees that aren't treated will eventually need to be removed. Removing your trees promptly when they show signs of infestation will allow you to protect against safety hazards. It may also save you from more complicated and expensive removals. Candidate trees for removal include hazardous trees, ash trees that already show signs of decline due to EAB or other causes, and trees that could damage structures or wires. Ash removals may be done proactively (prior to showing signs of infestation) or reactively (following signs of infestation).

<b>Removal approach</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Proactive-</b> remove ash trees that do not yet show signs of infestation	<ul style="list-style-type: none"> <li>• Spread out removal costs</li> <li>• Begin replanting and recovery before widespread canopy loss</li> </ul>	<ul style="list-style-type: none"> <li>• Eliminate alternative management options</li> </ul>
<b>Reactive-</b> remove ash trees that show signs of infestation	<ul style="list-style-type: none"> <li>• Delay demands on budget</li> <li>• Other management options remain viable</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for large cost burden when trees die</li> <li>• Potential for dramatic canopy loss</li> </ul>

### **Replacement**

If you are removing your ash trees, it is important to replace them to maintain the vital benefits that our trees provide. Consider replacing your ash trees with a diversity of species to increase the resilience of our canopies to forest health threats. New ash trees should not be planted, due to the likelihood that they will die as they mature. Be sure to select the right tree for the right site, by considering soil type, moisture, and sunlight. Also consider the future size of the trees to avoid conflicts near wires or structures. Be sure to follow proper planting and maintenance procedures to ensure tree survival. For tips on planting and maintenance, visit <http://dnr2.maryland.gov/forests/Pages/treemendous/planting.aspx>.



### **Utilization**

When trees are removed, they are often cut up and taken to landfills. However, some trees that are removed could be turned into valued products such as lumber, mulch, crafted products, or firewood. These products could be generated and used locally or donated to parks, schools, or non-profit organizations. Trees could also be sold to area sawmills. Prior to removing ash trees, communities should consider needs for wood products in their area. Purchasing equipment such as a portable sawmill could enable communities to make better use of their removed trees to meet these needs.

### **3) EAB Response Plans**

Developing a Community EAB Response Plan will help communities to make timely and effective decisions regarding EAB. A basic EAB response plan should address:

- Treatment priorities, selected treatment methods, and cost estimates
- Removal priorities and cost estimates
- Replacement for removed trees

- Use or disposal of removed trees
- Monitoring for declining or hazardous trees, and the effectiveness of treatment activities
- Timeline for management activities
- Budget
- Identification of personnel, volunteer staff, or contracts for work
- Consideration of relevant ordinances
- Responsibilities for implementing all parts of the plan, including the management of trees on private property, public rights-of-way, and utility easements

#### 4) Biocontrol

The long-term alternative to treatment and removal of ash trees is biological control, or “biocontrol.” Biocontrol is a system that uses natural enemies of pests to control pest populations. There are several species of wasps that are natural enemies for EAB, parasitizing and killing the beetle at its egg and larval life stages. The USDA has approved the release of 4 of these wasps: *Oobius agrili*, *Tetrastichus planipennisi*, *Spathias agrili*, and *Spathius galinae*. The Maryland Department of Agriculture has released these wasps around the state, and *T. planipennisi* has been found to be reproducing and spreading from its release sites.

While most trees can tolerate low to moderate levels of boring insects, the density of EAB infestations overwhelms our ash trees. Biocontrols have the potential to reduce EAB populations and allow ash trees to survive. This will reduce the need to treat or remove our trees over time, and protect the ecological benefits that our ash trees provide.



*T. planipennisi*. David Cappaert, Michigan State University, Bugwood.org



*T. planipennisi*. Bill McNee, Wisconsin Dept. of Natural Resources, Bugwood.org

#### **For more information**

For more information and resources, including ash tree and EAB identification, treatments, tree replacement, and wood utilization, visit [emeraldashborer.info](http://emeraldashborer.info).

For information on ash tree identification, signs of infestation, and treatment and management options, download our Homeowner's Guide:

[http://dnr2.maryland.gov/forests/Documents/EmeraldAshBorer\\_HomeownersGuide.pdf](http://dnr2.maryland.gov/forests/Documents/EmeraldAshBorer_HomeownersGuide.pdf)

**For questions, contact:**

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