GEORGIA FORESTRY COMMISSION

Frequently Asked Questions about Emerald Ash Borer in Georgia

1. **What counties are quarantined for emerald ash borer (EAB) and why?**
   The following counties are proposed as quarantined areas: DeKalb and Fulton Counties.

   EAB was discovered in Georgia in July 2013 as part of the national detection survey funded by USDA-Animal and Plant Health Protection Service. Georgia is part of a nationwide trapping program to detect the presence of this forest pest. In 2013, more than 400 traps were placed throughout the state by GFC, GDA, UGA, and private contractors. These traps targeted areas with an increased risk of introduction, such as campgrounds and cargo centers. Traps were also placed in stands with a high ash component. Annual monitoring has occurred in Georgia since 2005.

2. **What is a quarantine and why is this necessary?**
   The emerald ash borer is a U.S. Department of Agriculture regulated pest because it poses significant threats to our forest ecosystems and steps are taken to minimize these impacts and halt the man-caused spread of infested wood. The state of Georgia (both Department of Agriculture and Forestry Commission) are equally concerned about this pest spreading unchecked.

   The quarantine establishes county-level regulations where the EAB has been found and uses the same protocols for wood movement that have been established by USDA for almost 10 years. Regulated articles can be moved within the quarantined counties, but can't be moved to outside the quarantine area unless specific rules are followed. These rules are in draft form now and will be available for public comment soon.

3. **What are regulated articles?**
   The following are regulated articles:
   a. The emerald ash borer in any life stage,
   b. Firewood of all hardwood (non-coniferous) species,
   c. Ash nursery stock,
   d. Green (non-heat treated) ash lumber,
   e. Other living, dead, cut, or fallen, material of the genus *Fraxinus*, including logs, stumps, roots, branches, and composted and un-composted chips.
   f. Any other article, product, or means of conveyance not listed above may be designated as a regulated article if an inspector determines that it presents a risk of spreading emerald ash

USDA APHIS

borer and notifies the person in possession of the article, product, or means of conveyance that it is subject to the restrictions of the regulations.

4. **What is the emerald ash borer?**
   The emerald ash borer is an insect that belongs to a group of metallic wood-boring beetles. Our native beetles normally serve to kill weakened trees, which is a part of the natural nutrient recycling process. However, emerald ash borers kill vigorously growing trees and weakened ash trees. It is not native to the United States and was first found near Detroit, Michigan in 2002. EAB is now found in 21 states and has already killed tens of millions of ash trees.

   In its native range (Asia), it attacks trees but does not kill them. However, here in North America, our ecosystem and our ash species are different. All of our native species of ash are known to be attacked and killed by this insect.

5. **What do emerald ash borers look like?**
   Adult beetles are bright metallic green in color with very short antennae. Adults are one-half inch long and one-eighth inch wide. Underneath the wing covers, their bodies are a metallic, purplish-red color. Larvae are creamy white in color and have flattened, segmented bodies. Older larvae grow up to an inch in length. More information can be found at: www.gainvasives.org/eab.

6. **How many ash trees are there in Georgia**? The Georgia Forestry Commission and U.S. Forest Service estimate that ash makes up 1% of our state's forests, one of Georgia's least prevalent species.

   Commercial timber – Georgia has 1.77 million acres of forest land with an ash component. On this acreage, the total stumpage value of ash in Georgia as of August 2013 exceeds $400 million.
   Urban trees - About 2.9 million ash trees are found in Georgia's urban and community forests and have a value of $725 million.

7. **How does the EAB kill a tree?**
   Adult beetles lay eggs on the bark of ash trees. When the eggs hatch, the larvae (immature beetles) bore tunnels into the bark and destroy the water and nutrient-conducting tissues under the bark; this effectively starves the (roots) of ash trees. The canopy of heavily infested trees will begin to die, usually near the top and progressing downward. Sometimes, infested ash trees produce epicormic ("water") sprouts on the trunk or branches below emerald ash borer activity. Adult feeding (removal of tissue along leaflet edges) can be seen on affected ash trees. The bark may crack directly over larval galleries. Adult beetles chew characteristic "D"-shaped exit holes as they leave former feeding sites below the bark. Woodpeckers often are found on infested ash tree trunks, feeding on larvae; this is most often noted during winter. Trees attacked by the emerald ash borer die within two to three years.

8. **What trees are affected?**
   All ash (members of the *Fraxinus* genus) are susceptible to attack and death from this insect. White ash and green ash are the most common ash species found in Georgia. White ash occurs in moist upland or lowland forests found in the mountains and piedmont and is a valuable timber tree used for furniture, veneer, interior finish, baseball bats, railroad ties, tool handles and fuel. Green ash is found throughout the state, mostly in lowland areas. Its wood is inferior to the white ash because it is more brittle and less resilient. However, it has some of the same uses as white ash. Carolina ash, pumpkin ash and blue ash are also found in Georgia but have a much lower occurrence. All species of North American ash are susceptible to EAB. Branches as small as one-inch in diameter to trunks exceeding two feet in diameter have been colonized by this beetle.

9. **Where did the emerald ash borer come from?**
   The beetle is native to parts of Asia, specifically China, Japan, Korea, and parts of eastern Russia. Although no one knows exactly how the insect entered our country, it most likely arrived in solid wood packing material that originated from Asia. This could include ash wood used for crating, pallets, or stabilizing cargo in ships.

10. **Where is the insect currently found in the U.S.?**
    The emerald ash borer was first found in the United States in June of 2002, near Detroit, Michigan. Since then, it has spread to 21 central and eastern states and part of eastern Canada. Georgia is currently the southern-most state in which the pest has been detected. Click the link below for the current distribution map: http://emeraldashborer.info/#sthash.TvjBHbDZ.dpbs.

11. **How does emerald ash borer spread to new areas?**
    EAB can spread naturally by flying to new host trees upon emergence, but this dispersal is limited to about 15 miles per year. Humans significantly accelerate the spread of this exotic insect by moving infested nursery stock, firewood and logs to un-infested areas. The movement of firewood is a known agent for spreading EAB long distances from their main infestation sites.

12. **What is the life cycle of the emerald ash borer?**
    Adults are present year-round, and feed on ash leaflets. Following mating, female beetles lay eggs (average 60 – 90 per female) in bark cracks. Tiny white larvae hatch from eggs within one week and then bore through the bark and into the tree's food-connective tissue. Larvae feed under ash tree bark from mid-summer through the next spring, producing "S"-shaped tunnels. Pupation occurs in spring and the new generation of adults emerges shortly thereafter. In Georgia some larvae take two years to develop.

13. **How can moving firewood and other wood products spread the insect?**
    Beetles bore into ash wood as very small larvae, leaving no visible entry points. Therefore, it is difficult to tell if wood is infested before the adult emerald ash borers emerge. Any beetles living in wood can emerge during transport or at the final destination and attack new trees in the new location. This is most readily done through the transportation of firewood and wood packing materials.

The primary focus now is to prevent further spread of this insect, especially as facilitated by humans. Don't move firewood or other unprocessed ash wood products out of areas where emerald ash borer has been detected or is suspected to be present. Use local firewood or wood that has been debarked, heat treated and inspected. A good rule of thumb is to burn firewood within the county where it was cut. For additional information about firewood movement please visit www.dontmovefirewood.org/.

14. **What does a tree infested with the emerald ash borer look like?**
Initially, the top of the crown begins to thin and partially die. Epicormic sprouting, or sprouting from the main stem of the tree, may occur. Woodpeckers like EAB larvae; heavy woodpecker damage on ash trees may be a sign of infestation. This damage causes the tree to look like it is losing patches of bark. In severe cases, the bark of the tree may split in places where the larvae are feeding.

Tangible evidence of the beetle can also be seen. Adults leave a one-eight inch D-shaped exit hole in the bark when they emerge in spring. This may be above eye level, so it is important not to discount a symptomatic tree if no exit holes are observed. If the bark is peeled back, the galleries where larvae have fed may also be observed; they are meandering and are usually filled with frass (sawdust and insect excrement). Larvae may also be visible underneath the bark. The cream-colored larvae have bell-shaped segments and can be up to one-and-a-quarter inches in length.

Will emerald ash borer kill all of the ash trees?
It is too early to tell, but many believe that mortality may be similar to what has been seen with hemlocks (affected by hemlock woolly adelgid) and American chestnuts (affected by chestnut blight). The emerald ash borer has already killed millions of ash trees in the United States and threatens to kill many more as its range expands. Research to manage the beetle is ongoing and currently the best management plan is to minimize its spread while seeking a permanent solution.

15. **Why are ash trees important?**
Ash wood is greatly valued for its strength and elasticity and is often used for baseball bats, bows, tool handles, and other products that require durability, strength, and resilience. Green ash is planted widely as a landscape tree in urban areas and is a valuable native component of wetland areas. Ash foliage and seeds are fed upon by numerous animals as well as butterfly and moth caterpillars.

Ash is typically found in low lying areas near or adjacent to streams and rivers. They stabilize the soil and prevent erosion as well as shade the waters to keep temperatures cool. Ash trees provide direct benefits to a variety of wildlife species. The seeds of ash trees are eaten by waterfowl, upland gamebirds, songbirds, and small mammals. White-tailed deer and beaver browse on the leaves and twigs of ash trees. Cavity-nesting birds such as woodpeckers, wood

ducks, and owls can be found in larger trees. Ash trees also serve as larval host plants for some species of butterflies, including the tiger swallowtail and Baltimore checkerspot.

16. **How long does it take for a tree to die?**
    Within two years of observing symptoms, most of the crown of the tree will be dead. Complete tree death typically occurs within five years, but may take as few as two to three years.

17. **Are there any natural enemies of the emerald ash borer?**
    Yes, scientists have observed parasitic wasps attacking the egg or larval stages of the emerald ash borer in its native land. Efforts are underway to determine if these wasps can be introduced to America to control these beetles. Unfortunately, this process is time-consuming and biological controls often take long periods to become established and even longer to determine how effective they may be at controlling a pest. A fungus (*Beauveria bassiana*) has also been tested as an adult beetle "natural insecticide; results have showed moderate success.

18. **How can I protect my ash tree?**
    At this time, spraying or injecting ash trees with an insecticide is not recommended. Minimizing known stressors (parking vehicles on the tree's root zone, construction projects, excessive pruning, and mechanical damage by string trimmers or lawnmowers) should be practiced for ash, as well as other tree species. Providing water during very dry periods (one inch of water applied evenly over the soil/lawn under the tree canopy twice a month) is encouraged.

    Insecticide options are available for those wishing to protect high-value ornamental trees, an option which is not recommended until the beetle is known to be present within 15 miles. Certain insecticides can be used for prevention or control of EAB. The insecticide is applied as a protective cover spray, soil treatment, stem injection or bark spray, depending on the type of insecticide used.

    If a tree is already infested and over half the crown is alive, insecticides may be used therapeutically to help trees recover. Recovery is slow and tree health improvement might not be noticeable for one to two years. Re-treatment must take place every one to two years.

19. **What can be done about this problem?**
    The USDA, Georgia Department of Agriculture and Georgia Forestry Commission have been working together to ensure that regulations minimally impact businesses,but at the same time will limit the likelihood emerald ash borer will be moved in ash nursery stock, or in logs, mulch, firewood, and other similar items.

    Currently, little can be done to protect or save trees from the EAB in a forest environment. The best option for most ash trees is to quickly detect the presence of EAB in new areas and destroy affected tree materials. Cut down dead and dying ash trees and chip, burn, or bury the wood on the site in accordance with all local regulations, to reduce the chance of other trees being attacked.

Insecticide options are available for those wishing to protect high-value ornamental trees, an option which is not recommended until the beetle is known to be present within 15 miles. If a tree is already infested and if over half the crown is alive, insecticides may be used therapeutically to help trees recover. Recovery is slow and improvement in tree health might not be noticeable for one to two years. Re-treatment must take place every one to two years.

Communities should identify their ash resource with a public tree inventory. Without a public tree inventory, it is difficult to evaluate how the EAB will affect your community.

20. **With emerald ash borer found in Georgia, should landowners harvest all of their valuable ash timber now?**
The natural spread of emerald ash borer is fairly slow. If someone is growing ash on their property, they should monitor th trees for signs and symptoms of emerald ash borer. As long as trees are healthy and growing, and not under imminent threat from the insect, they should continue to be managed according to a forest management plan. A quarantine of the area where the trees are found, however, could make it difficult or impossible to conduct a normal harvest and haul the logs to a non-quarantine area.

If ash trees are found to be infested, a salvage harvest should be considered. Emerald ash borer damage is primarily confined to the outer portions of the tree, so affected trees may still be valuable for lumber and other wood products if detected early and processed quickly.

For areas within a quarantine area, all parts of any ash tree harvested must remain within the quarantined area. That means harvested materials can only be left on site or transported to locations inside of the quarantined boundaries. This applies to both infested and healthy trees. Harvested ash wood can freely move from a non-quarantined area into the quarantine boundaries.

21. **What can be done with wood from trees killed by the emerald ash borer?**
Emerald Ash Borer has been discovered in Georgia, which triggers specific regulatory instructions inside the quarantined counties. Ash products harvested outside the quarantine counties can be cut and moved without restrictions. Ash products harvested inside the quarantine counties will be subject to restriction and the timber harvester must obtain a limited permit to move the ash product. If the product is found to be EAB infested, the product must be processed on site (see below) or used within the quarantine area.

Research has shown that infested wood chipped to a size of less than one-inch in two dimensions contained no larvae. Emerald Ash Borer larvae are successfully killed when heated to 140°F for three to seven hours, or 130°F for ten to fourteen hours, depending on the thickness of the lumber. Firewood of all hardwood (non-coniferous) species, will be regulated articles, and at no time are regulated articles permitted to be transported from an infested area to a non-infested area without a limited permit.

22. **What should I do if I observe a dying ash tree and suspect the emerald ash borer?**
In an urban environment - If your tree is healthy, there is no reason to cut it down. If it is dying or diseased, it may be best to hire a certified arborist to look at your tree and determine whether it has Emerald Ash Borer or other insect or disease problems.

In a timber management setting - If you think you have an EAB infestation, please contact your local Georgia Forestry Commission office (http://www.gatrees.org/ContactUs.cfm) or a consultant forester for assistance.

Additional information on the pest can be found at www.gainvasives.org/eab/ and for firewood movement at www.dontmovefirewood.org/.

DO NOT COLLECT AND TRANSPORT WOOD SAMPLES THAT MAY BE INFESTED!