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NEWSLETTER

Newton's land trust working to preserve open space since 1961

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Emerald Ash Borer Detected in Newton

By Julia Malakie, Member Urban Tree Commission and president of the Newton Tree Conservancy

Ash Tree at Underwood School

Emerald Ash Borer

D-shaped Exit Hole

What is Emerald Ash Borer?

Emerald Ash Borer (EAB), Latin name *Agrilus planipennis*, is a small, metallic green beetle of the family Buprestidae (also known as "jewel beetles" because they are shiny). EAB feed on ash leaves, but the real damage is done by EAB larvae, which kill ash trees (genus *Fraxinus*) by burrowing under the bark, thereby disrupting the tree's circulatory system for water and nutrients.

It is native to northeastern Asia, where it is a minor pest, kept in check by several species of native Asian wasps. In North America, it's an exotic, invasive, species. **Since EAB was first detected near Detroit in 2002, it's been spreading outward across the U.S. and Canada and has caused the death or removal of over 100 million ash trees.** Depending on underlying tree condition, EAB may kill a tree in anywhere from two to seven years.

Its impact has been so great in much of the Midwest that researcher Geoffrey Donovan used the 'natural experiment' of rapidly declining urban tree canopy to study the association between trees and human health. His well-publicized study compared deaths from lower respiratory disease and cardiovascular disease (for which poor air quality and stress are risk factors) between 1990 and 2007 in EAB-affected and unaffected areas. He found that EAB was associated with 21,000 additional human deaths.

Like the more well-known (at least in Massachusetts) — but so-far-contained — invasive Asian Longhorned Beetle (ALB), EAB likely arrived in North America on wooden shipping materials in the mid-1990s. It spreads by flying from one tree to another, but its rapid spread before first being detected is most likely due to movement of firewood. And despite the "Don't Move Firewood" public education campaign to slow the spread of ALB, EAB, and other invasive tree pests, firewood and vehicles with hitchhiking beetles probably still are a vector of spread.

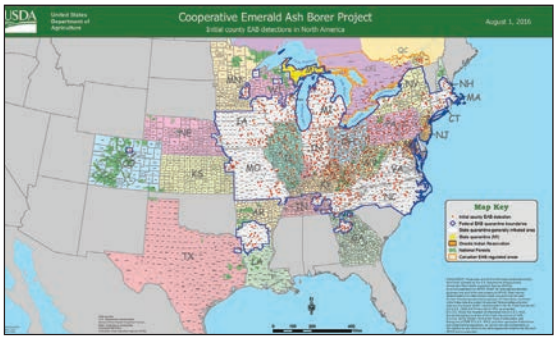
EAB in Massachusetts

It was inevitable that EAB would arrive in Massachusetts. It was uncertain how soon, but when it became clear in the late 2000s that EAB was spreading faster and wider than initially anticipated, demand for ash trees essentially dropped to zero. By 2010,

Continued on page 2

…Emerald Ash Borer Detected in Newton continued from page 1

Newton's Director of Urban Forestry Marc Welch had stopped planting ash trees.



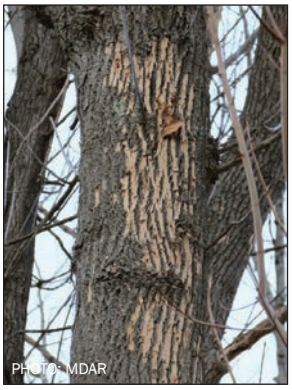
Map of Initial County Detections

EAB was first detected in Massachusetts in August 2012, in Dalton, Berkshire County, not long after it was found east of the Hudson River in New York. It was found in North Andover, on town-owned open space, in the fall of 2013, when someone noticed signs of damage on ash trees. One EAB turned up in a trap at the Arnold Arboretum in July 2014. It was found in Worcester in 2015 by the Department of Conservation and Recreation during monitoring for ALB. And it's always been assumed that it's in many more places than have yet been found.

How are EAB infestations detected?

Probably the earliest sign of EAB in an ash tree is dieback in the upper canopy, although not every dying ash tree has EAB. (Epicormic shoots — suckers and water sprouts below the dead canopy also are symptoms, but also not unique to EAB-infested trees.)

A more reliable indicator is unusually high woodpecker activity on an ash; that's what led to EAB detection in Concord, N.H., in 2013. Woodpeckers pecking for EAB larvae and pupa can also cause the outer layer of bark to flake off, creating a "blonding" effect on the tree trunk.



Blonding on an Ash Tree

Definitive signs of EAB are the S-shaped serpentine "galleries" (tunnels left by feeding larvae), which are revealed when bark is stripped off, and D-shaped exit holes left by emerging beetles.

But by the time D-shaped exit holes are visible from ground level, a tree is likely in very bad shape since infestations tend to move from the top down.

Methods of early detection of EAB arrival in a new area include: 1) the use of traps (purple or green) usually with a pheromone or other lure; 2) "trap trees" intentionally girdled so the scent of the cut will attract the beetle, and 3) Wasp Watchers, a program to monitor colonies of the *Cerceris fumipennis* wasp, a native, non-stinging, ground-nesting wasp which hunts Buprestid beetles generally, and will find EAB if it's nearby. The first EAB in Connecticut were found at a Wasp Watchers' site.

Finding EAB in Newton: Wasp Watchers works, and so does looking at trees!

Since 2012, I've been a volunteer Wasp Watcher for the Massachusetts Department of Agricultural Resources (MDAR), monitoring Cerceris wasp colonies as well as looking for new colonies between late June and mid-August, when the wasps are active.

Cerceris colonies are typically found in hard-packed, sandy soil, in full sun but within a couple of hundred yards of trees where the female wasps will hunt Buprestid beetles, paralyze them, and bring them back to their nests to become food for growing wasp larvae. It's "Wild Kingdom" in miniature. Baseball field base paths are a common location. Monitoring colonies means collecting dead Buprestid "discards" — beetles inexplicably dropped by the wasps, and, when possible, netting any wasps returning with prey, releasing them after they drop their prey.

A colony I'd found in the summer of 2015, in the Dog Park at Hunnewell Playground in Newton Corner, was rather small but seemed promising. There were discards (some thrifty colonies don't seem to throw any beetles away); it was near a highway (all it takes is one EAB flying off a truck); and there were several ash trees along the Turnpike side of the fence.

Still, it was rather startling on my very first visit in late June this year to find an intact EAB discard. That was followed by four more EAB discards, some a bit bedraggled, over a three-week period. (This represents 38% of the total of 13 beetles collected at the site this season, but maybe they're just easy for the Cerceris to spot!) MDAR searches of the park and neighborhood did not turn up an infested tree, and the best guess is that the source is in an inaccessible woodsy area along the Turnpike.

One infestation in Newton would be reason enough to assume EAB could be anywhere in the city. But it turns out that EAB had already killed an ash tree in Newtonville! Early in August, while doing a "windshield survey" — driving every street in the city to find unreported "dead or risk trees," Forestry Director Marc Welch spotted a dead young ash tree (about 5" diameter) on the Washington Park island. He got out to take a closer look and found D-shaped exit holes. This tree has already been removed and chipped, which destroys any remaining beetles in it.

What happens next?

Unlike with ALB, where infested and at-risk trees must be destroyed to prevent further spread, the EAB horse is already out of the barn. And individual healthy trees can be protected with early insecticide treatment. Cities and towns across the Midwest have been facing the dilemma of removal versus treatment for years, often with ash trees being a significant percentage, on the order of 25%, of their city trees. Many have chosen to treat their most valuable or prominent ash trees while removing the rest in phases to spread out both the cost of removals and the visual impact.

In Massachusetts, for better or worse, our dominant street tree species is Norway maple, not ash. Locally, both Somerville and Cambridge are already treating a majority of their ash trees. Cambridge began in 2014, treating 750 trees every other year (375 each year) while removing and replacing 100+ trees in poor condition. Cambridge chose TreeAzin insecticide because it's a neem oil extract listed as acceptable by the Organic Materials Review Institute. Similarly, Somerville, whose approximately 900 ash trees represent 7% of public trees, also began treating good-to-fair condition ash with TreeAzin. They will monitor borderline trees and plan to remove and replace 100+ poor and dying ash.

In contrast, Watertown's tree warden hasn't found any of their 60 public ash trees worth trying to save, given their budget limitations, and the inefficiency of treating scattered trees. Similarly, Brookline, with 3-4% ash trees, began monitoring for EAB with traps in 2015, but does not plan to treat any trees. This is due to already existing ash tree health issues, and concern about the risk to pets of inadequately supervised tree trunk injections.

Here in Newton, we probably have about 900 city ash trees (about 4% of our 21,000 or so street trees), with about 300-400 being 4" diameter or less, according to Marc Welch. He feels that limited city funds are better spent on replacing ash with new trees of other species. One possible exception is a very large 43" diameter ash at Underwood School playground, which could be treated, subject to approval by the IPM Committee and probably also the School Committee, since it is on school grounds.

What can residents do?

For residents with ash trees on their property, it's time to start paying closer attention for signs of EAB. If you have a healthy ash tree, in a good location, that you want to keep, you may want to consider beginning treatment before any signs of infestation appear. Mass NRC has a decision-making guide here: http://bit.ly/2bbAiEx. Untreated ash will need to be removed sooner rather than later since dead ash become brittle and hazardous more quickly than other species.

The website emeraldashborer.info has information on all aspects of the EAB problem and efforts to combat it, including a report on the effectiveness of different insecticide options.

Ash leaves and bark

All residents can keep an eye on city ash trees in their neighborhoods. Ash trees can be easily identified by their opposite branching (as opposed to alternate branching) and their compound leaves, usually with five to seven leaflets. Mature ash tree bark is quite similar to that of Norway maples, but twigs are thicker. Newton Tree Conservancy directors hope to complete at least a partial ash tree inventory and mapping this fall, to get a better picture of the condition of Newton's ash tree population, and to identify individual or clusters of ash that might be worth saving.

While it may not make financial sense for the city to treat its ash trees, it's my personal hope that individuals or groups will be permitted to adopt trees they care about for purposes of treatment. Otherwise, this entire genus could become as rare in Newton as the American chestnut is.

Is there a long-term solution?

The USDA began researching biological controls shortly after the initial EAB detection in 2002. Three different species of parasitoids (tiny stingless wasps) were identified to be natural enemies of EAB in its native range. After determining that they would not pose a significant risk to native-American insect species, the USDA began releases of these parasitoids in 2007, beginning with Michigan and then in other EAB-infested states. The hope is that while they may not eradicate EAB, they will help bring it under control.

Looking to a future when it's safe to plant ash trees again, a large-scale seed banking effort is underway to collect large quantities of ash tree seeds from across their geographical range in order to preserve the genetic diversity and repopulate. ■