
Emerald Ash Borer Risks and Responses in Maryland

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What is EAB?

- Invasive beetle from Asia
- Girdles and kills ash trees by feeding on cambium
- Discovered in Michigan in 2002
- Discovered in Prince George's County in 2003



PA DCNR-Forestry Archive, Bugwood.org



Leah Bauer, USDA Northern Research Station, Bugwood.org

Signs and symptoms



Crown dieback



Epicormic sprouts



D-shaped exit holes



Serpentine galleries



Bark splitting



Woodpecker damage

EAB Effects

- Mortality within 2-3 years of symptoms
- Nearly 100% mortality unless treated
 - Some lingering ash in the Lake States
 - White ash shows some resistance
- Rapid deterioration of tree
 - Ash snap

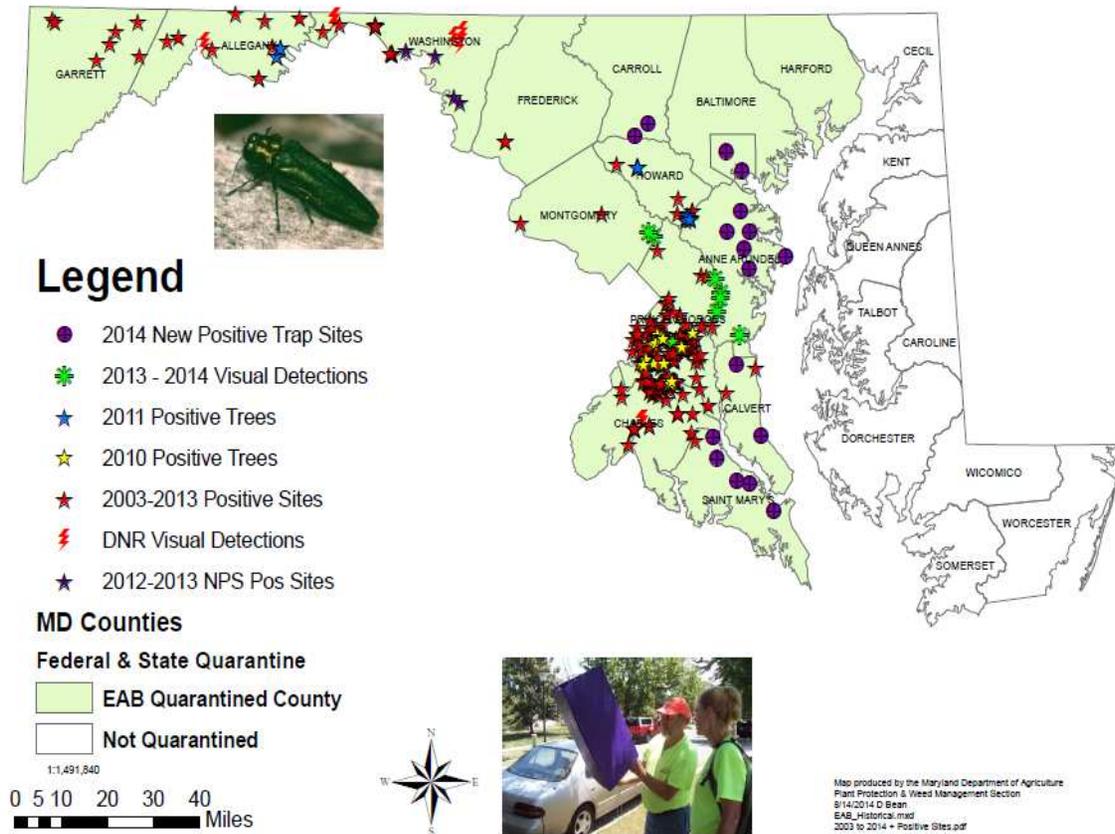


EAB Killed Ash Tree - Ash Snap

Amy Stone, The Ohio State University, bygl.osu.edu

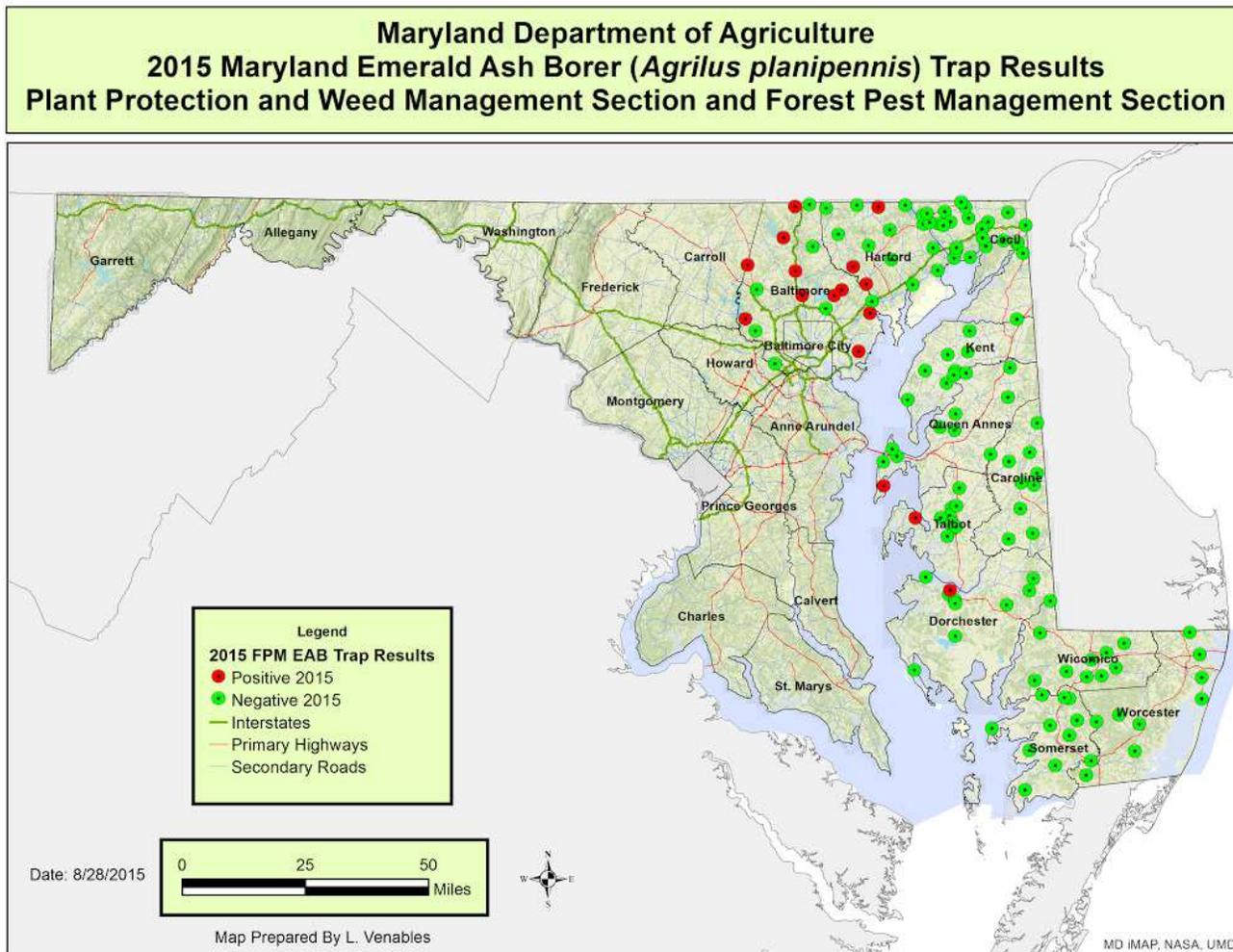
EAB Distribution in Maryland, 2014

Maryland Emerald Ash Borer Project 2003 to 2014 Positive Sites



Maps: MD Dept. of Agriculture

EAB Distribution, 2015



Regulated articles

- Ash nursery stock
 - Hardwood firewood
 - Ash woody debris or green lumber
 - Ash wood chips > 1" in 2 dimensions
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Scope of the problem

- 5 Million ash trees in MD
- Average of 2% of total volume
- Pockets of dense cover

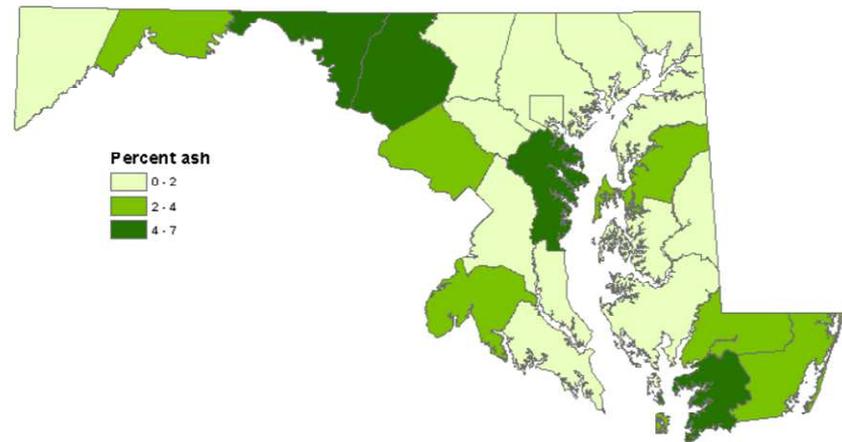


Figure 8. – Ash trees as a percentage of total live volume on forest land by county in Maryland.

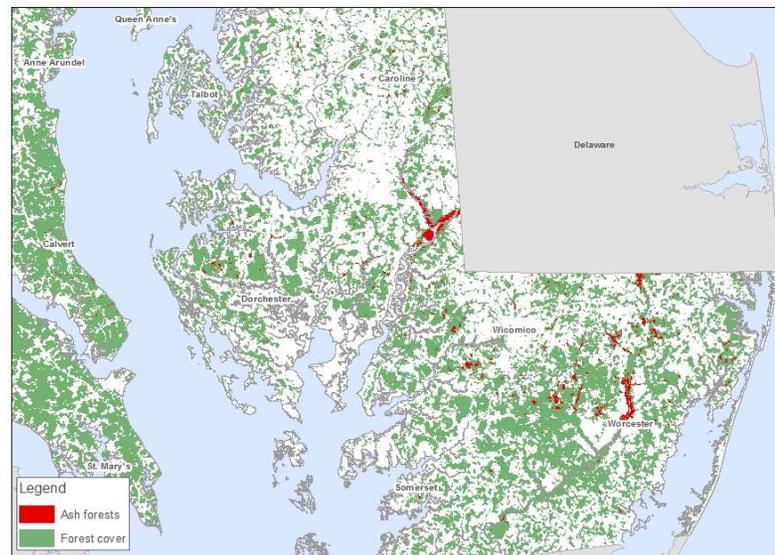
USDA-USFS Northern Research Station, *Maryland's Forest Resources*, 2012

Ash species in MD

- White and green ash common across MD
 - Green ash especially common in lowlands and on the coastal plain
 - Rare species
 - Black ash- swamps in Western MD
 - Pumpkin ash- wet areas on Eastern Shore and Southern MD
 - Carolina ash- small pockets on the lower Eastern Shore
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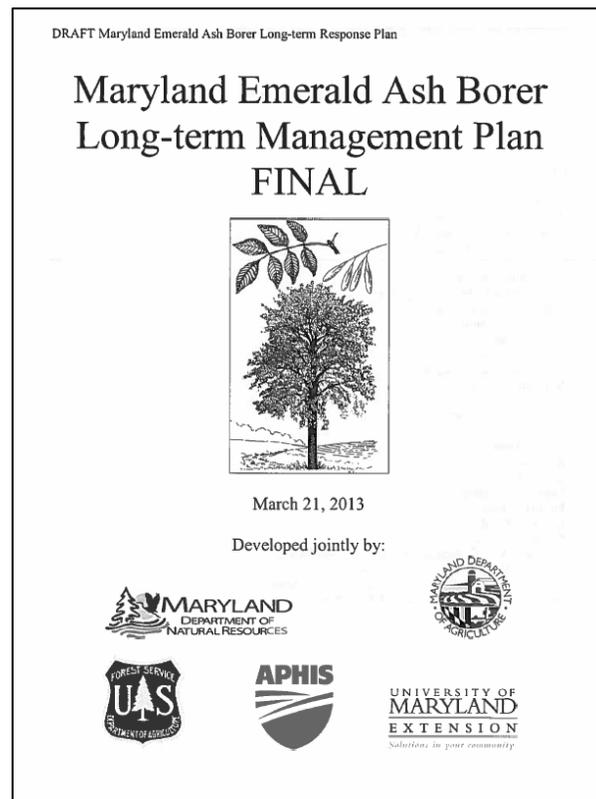
Water quality

- Ash grows along streams and wetlands
- Stands with 50-100% cover on the Eastern Shore
- Good areas to consider replanting, biocontrol, or treatment where possible



Long Term EAB Plan

- Identifies street trees as a high-risk resource in Maryland



Community Livability

- Common landscaping species on lawns and streets
- Shade and air quality benefits
- \$289 in annual benefits for a 10” dbh tree



Tyler Wakefield, MFS

Wood Products

- Harvest 300,000 cubic feet of ash per year in MD
- Useful for lumber and other products, including baseball bats



Illinoisurbanwood.org

Response elements

- Community response planning
 - Outreach and information
 - Treatment, removal, and replacement
 - Protected lands planning
 - Biocontrol
 - Wood utilization
 - Seed collection
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Community Response Plans

- Tree inventory
- Priority areas for management
- Cost-effective responses
 - Treatment priorities and needs
 - Removal priorities
 - Replacement
- Utilization
- Outreach
- Responsibilities



Tyler Wakefield, MFS

Tree Inventory

- Species
- Size
- Location
- Condition
- Special value
 - Historical
 - Cultural
 - Aesthetic



Urban Tree Inventories

Community	No. Ash
Allegheny Fairgrounds	78
Arnold	250
Catonsville	779
Cockeysville	33
Crofton	222
Cumberland***	74
Baltimore City	3334
Baltimore City Zoo	99
Hagerstown	363
Jug Bay	81
La Plata	380
Millersville	15
Odenton	259
Parole	187
Severn	0
Severna Park	188
Waldorf	138
Westminster	46
Total	6526

Outreach

- Outreach with partners
- Workshops
- Press releases
- Signs and flyers
- Webinars



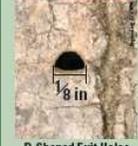
Homeowner information

Saving your Ash Trees from the Emerald Ash Borer Beetle:
A Homeowner's Guide
The Emerald Ash Borer

The Problem: The Emerald Ash Borer attacks and kills all ash tree species native to North America

<p>Emerald Ash Borer</p>  <p>Emerald Ash Borer Adults are about 1/2 inch long. They are bright metallic green with purple abdominal segments under the wing covers.</p>	<p>Unprotected Ash Tree</p> 	<p>Cut Down Dead Trees</p> 
<p>[Ash trees not protected with insecticides typically die 4-6 years after initial infestation.]</p>		

Signs and Symptoms of EAB Infestations

 <p>D-Shaped Exit Holes</p>	 <p>Galleries</p>	 <p>Dieback</p>	 <p>Bark Splitting</p>	 <p>Woodpecker Activity</p>
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REPORT INFESTED TREES: 1-800-342-2507

For more EAB Identification Tips and its Look-a-Likes, visit: <http://mda.maryland.gov/plants-pests/Documents/e-2939.pdf>
Cover Photo: Green Ash, Fraxinus pennsylvanica/William Jacobs, Colorado State University, Bugwood.org



MARYLAND
DEPARTMENT OF
NATURAL RESOURCES
Martin O'Malley, Governor • Joseph P. Gill, Secretary



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Silvicultural Guidance

Preparing for EAB: Decision Chart for Ash in Woodlots

Goals of EAB Forest Management

- Retain at least 70sq ft of BA/acre of non-ash species
- Increase forest resiliency by increasing tree species diversity
- Ensure that desirable species regenerate
- Control invasives.
- Maintain water quality/riparian buffer



Perform Inventory of Property to Determine # and size of Ash trees

Stand 60-100% Ash or Stand Containing Ash Dominated Pockets

Stand 10-60% Ash

Stand < 10% Ash

Harvest Feasible:

Control invasives. Utilize ash trees with aggressive harvest (Clearcut or Seed Tree). Retain non-ash species during seed tree harvest, and keep a few ash individuals as a seed source.

Harvest not Feasible:

Control invasives. Underplant with seedlings if natural regen. is not present. Reduce ash BA, and promote non-ash species.

Ash along Streams or in Wetlands

Ash Over 50' from Stream or Wetland

No Action Necessary

Optional: Girdle ash for wildlife habitat, underplanting where feasible (gap greater than 60' with no natural regeneration). Maintain riparian buffer.

Option:

Maintain Riparian Buffer. Possibly underplant with native wet-site species to minimize erosion and potential water quality impacts.

Option:

Consider selective harvest if stand and site conditions are appropriate. Maintain a minimum 60sqft/ac.

Prescription:

Reduce ash basal area to no more than 10% of residual stand. Ensure that invasive species are controlled and desirable species will regenerate.

Option:

Timber Harvest or TSI (if feasible) targeting larger diameter ash first. Goal is to utilize and obtain the most value for ash in the stand. Leave a few large individuals/acre as a seed source.*

Option:

Girdle ash trees to create wildlife habitat, targeting a mix of canopy classes. Make sure to take some dominant and co-dominant trees.* (3-6 snags/acre recommended)

* Based on a phloem Reduction Strategy, which attempts to limit EAB population growth by eliminating EAB habitat and food (eg: more ash phloem creates more EAB)

Things to Keep in Mind

- Do not completely eliminate ash trees from the stand. Goal is to maintain species diversity and ash species benefits. Keep a minimum of a few individuals/acre, and no more than 10% of BA.
- EAB does little to affect potential timber value in ash trees.
- Remember to obey EAB quarantine, and stay up-to-date on quarantine regulations.
- Sell locally or debark to slow the spread.

Treatment

- Trees with <30% dieback
 - Large trees
 - Rare species
 - Trees of importance
 - Within 10-15 miles of known infestation

 - 50/50 cost share for treatment in communities around the state
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Trunk Injections

- Emamectin benzoate (Tree-Age)
 - Effective for 2+ years
 - Nearly 100% mortality to EAB
 - Conducted by licensed pesticide applicator
- Costly (\$8-17 per diameter inch)
- Can be conducted on most sites
- Treat in early spring



Tyler Wakefield, MFS



Removals

- Safety hazards
- Salvage/pre-salvage harvests
- Remove infested trees early to avoid safety hazards and higher costs



Tyler Wakefield, MFS

Replacement

- Diversify tree species
- Replant or underplant
- Silvicultural practices



Protected Lands Planning

- Treatment and removal
 - Manage safety risk in developed areas
 - Preserve rare species and specimen trees
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- Initial focus on Central MD
 - Moving to Eastern Shore next year
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Wood Utilization

- High volume of trees to be removed
- Efficiently dispose of debris
- Retain value of removed trees
- Possible outlets
 - Habitat for humanity
 - Fuel assistance programs
 - School woodworking programs



Dan Hermes, Ohio State University, Bugwood.org

Biocontrol

Parasitic Wasps

- *Tetrastichus planipennis*
 - Larval Parasitoid
- *Oobius agrili*
 - Egg Parasitoid
- *Spathius agrili*
 - Larval Parasitoid
- *Spathius galinae*
 - Larval Parasitoid



Biocontrol efforts in Maryland

- Maryland Department of Agriculture has released:
 - 38,000 *tetrastichus*
 - 529 *spathius*
 - 14,000 *oobius*
- *Tetrastichus* is successfully reproducing and spreading
- Useful as a long term strategy
- Not currently adequate to combat EAB



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

Seed Collection

- Wildlife and Heritage and National Seed Bank
- Preserve genetic diversity
- Include sample of rare species in Maryland



Keith Kanoti, Maine Forest Service, Bugwood.org

Future of ash trees in MD

- Long term prognosis unclear
 - Short term: treatment, removal, and replacement
 - Long term: pursue biocontrols and study “lingering ash”
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Contact Information

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