The Emerald Ash Borer

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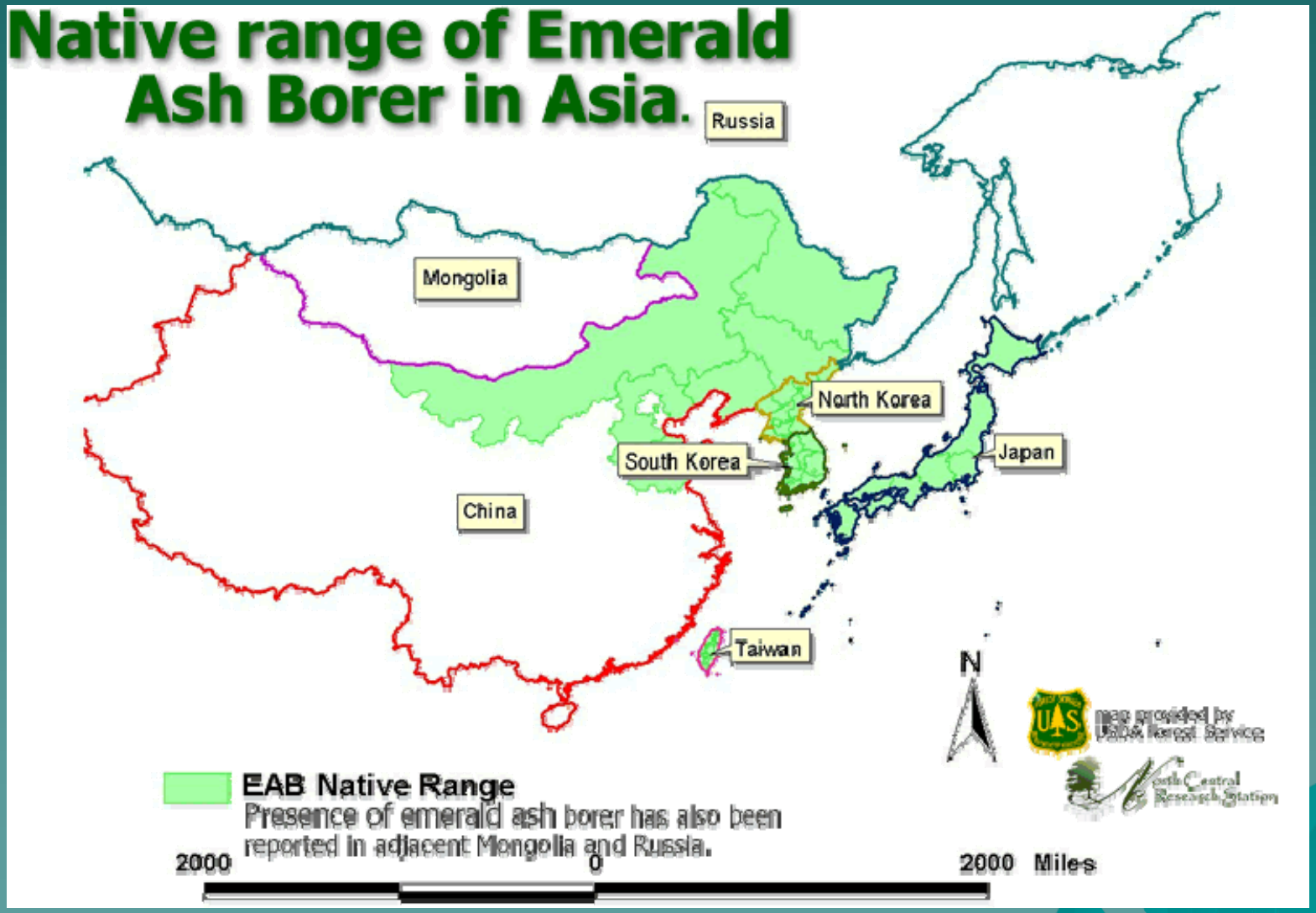
Emerald Ash Borer, *Agrilus planipennis*

- Family: Buprestidae, metallic wood boring beetles
- Genus: *Agrilus*, same genus as native two-lined chestnut borer and bronze birch borer. Characterized by flattened larvae and bullet-shaped, metallic looking adults

EAB Native Range



EAB History in North America

- First detected in Detroit, Ontario in 2002
- > 35 million ash trees killed in Michigan and surrounding states
- Since first detected, has spread to 9 additional states
- VA and MD have taken eradication measures in past
- Eradication measures unlikely to succeed in long run, eventual spread of EAB inevitable

EAB Biology and Life History

- Adult Emergence and mating May-July, live for about 1 month
- Eggs laid in bark crevices singly or in small clusters

EAB Biology and Life History

- 1st instar larvae chew through bark, feed on phloem and outer sapwood, summer into fall

EAB Biology and Life History

- Autumn – Pre-pupal larvae overwinter in shallow chambers excavated in outer sapwood or inner bark
- Spring- Pupation begins April-May

EAB Biology and Life History

- Adults can remain in pupal chamber 1-2 weeks prior to emergence
- Adults emerge through D-shaped emergence holes

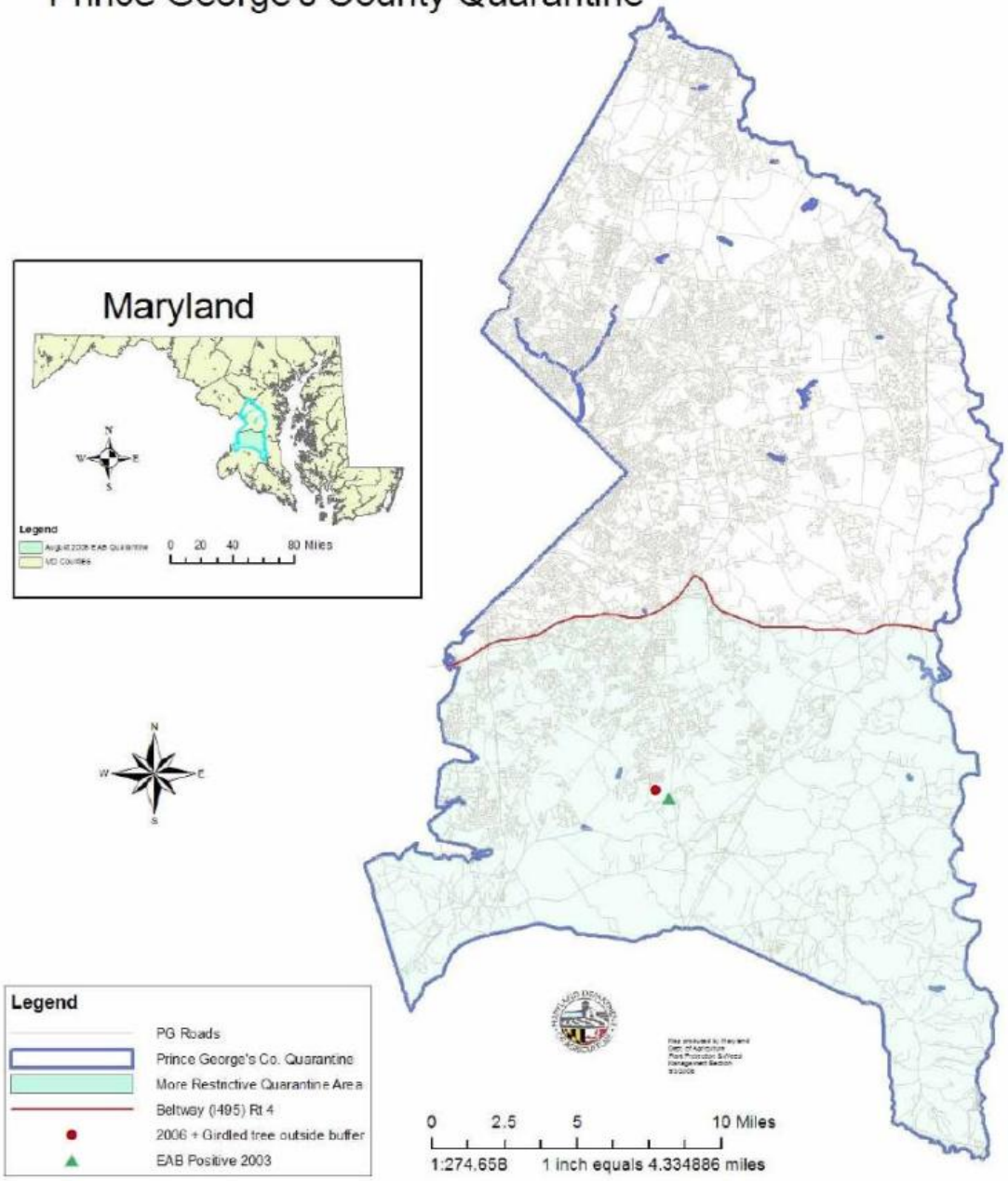
Other Signs of EAB

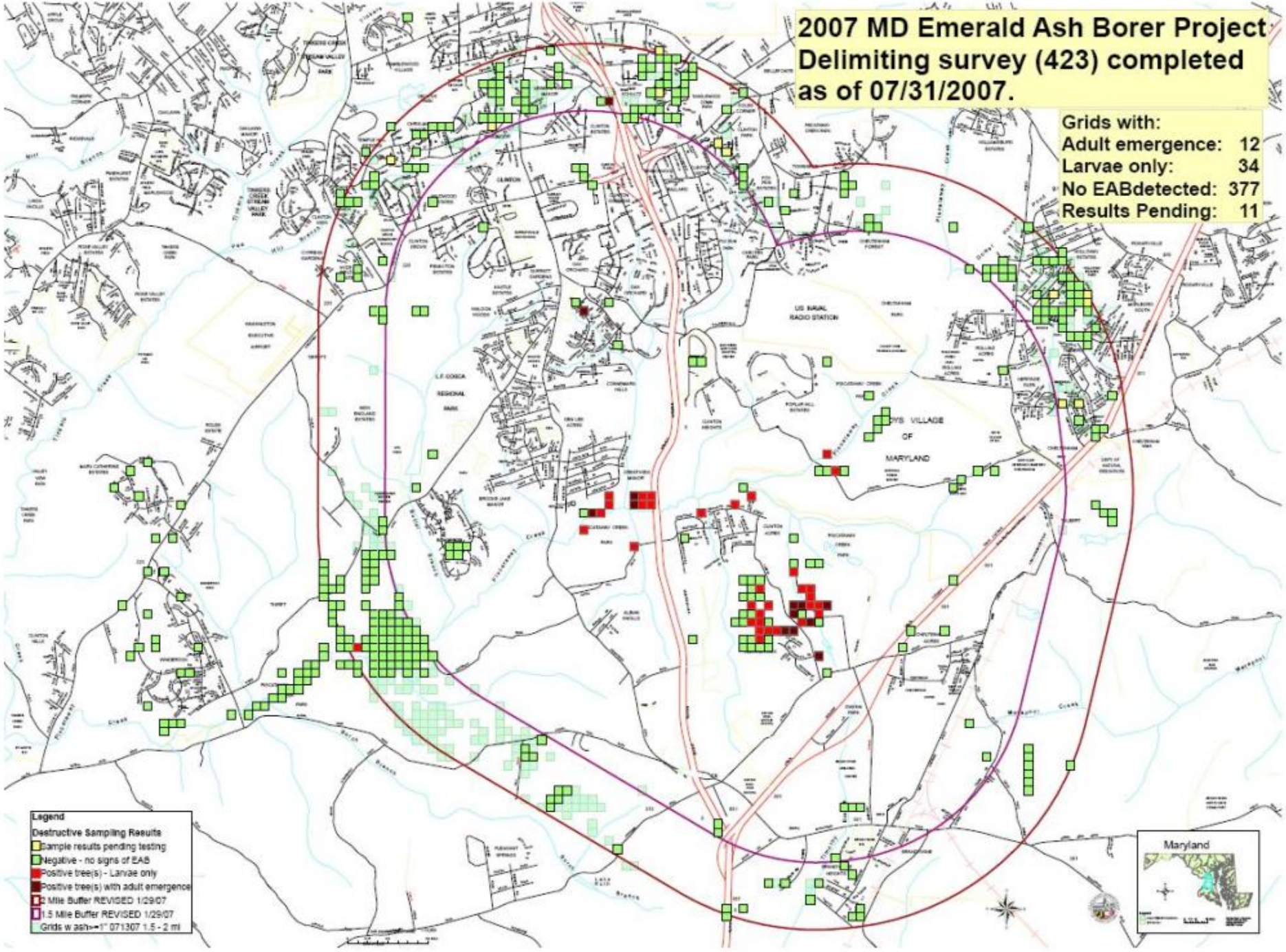
EAB in the Mid-Atlantic Region

- In 2003, EAB was discovered in Fairfax County, VA, and MD introduced from imported nursery stock from Michigan
- Eradication efforts by the Fairfax County Forest Pest Program and VDACS appeared to have been successful to date.
- Likewise, MDA efforts appeared successful until Aug 2006, when a new infestation was discovered in MD near the original eradication zone in Prince George's County
- In 2006, MDA conducted a second, massive eradication effort covering 15-20 sq miles and many personnel volunteering from other agencies and states

Stripping Trap Trees in Fairfax, VA

2006 Emerald Ash Borer Project
Prince George's County Quarantine



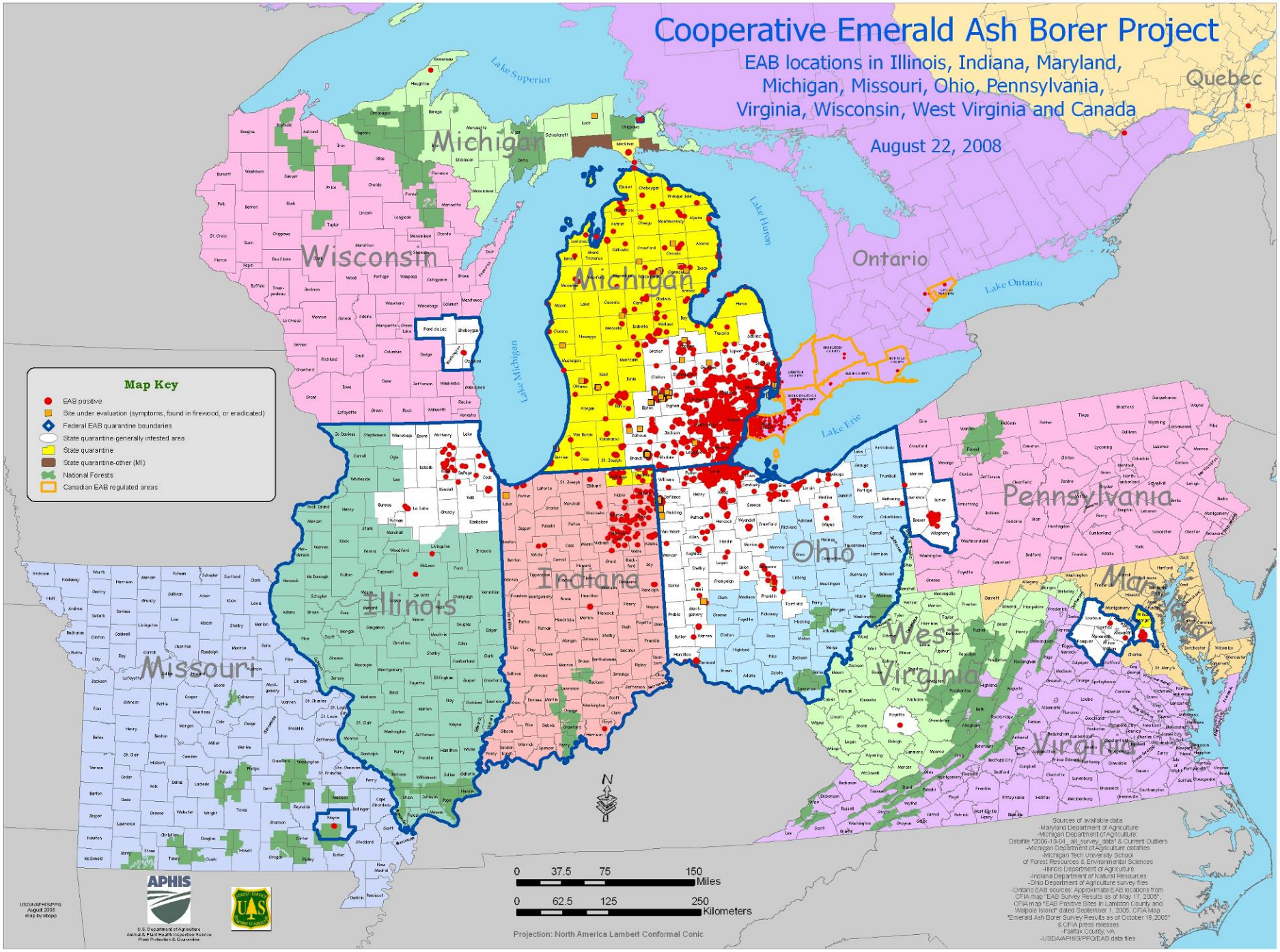

2007 MD Emerald Ash Borer Project
Delimiting survey (423) completed
as of 07/31/2007.
Grids with:
Adult emergence: 12
Larvae only: 34
No EABdetected: 377
Results Pending: 11
Legend
Destructive Sampling Results
Sample results pending testing
Negative - no signs of EAB
Positive tree(s) - Larvae only
Positive tree(s) with adult emergence
2 Mile Buffer REVISED 1/29/07
1.5 Mile Buffer REVISED 1/29/07
Grids w ash>=1" 071307 1.5 - 2 mi
Maryland

Photos by Debra Martin, VDACS

Cooperative Emerald Ash Borer Project

EAB locations in Illinois, Indiana, Maryland, Michigan, Missouri, Ohio, Pennsylvania, Virginia, Wisconsin, West Virginia and Canada

August 22, 2008



Interstate movement of firewood is probably the primary pathway of EAB range expansion

- Natural dispersal rate thought to be about ½ - 2 miles per year
- Range map closely tracks locations of major interstate corridors
- New infestations often associated with campgrounds
- VDACS surveys have found firewood sold in VA coming from the numerous states (including western states) and a few countries

DON'T MOVE FIREWOOD

Stop the Spread of Tree-Destroying Insects and Diseases

Leave Your Firewood at Home

Virginia's forests are threatened by non-native insects and diseases that can kill large numbers of trees. Three recently introduced insects – emerald ash borer, Asian longhorned beetle, and Sirex woodwasp – are wood-infesting species that can be transported long distances in firewood. Likewise, oak wilt and other diseases can be spread through firewood. The gypsy moth, already well established in much of Virginia, can be spread over great distances when it lays its eggs on firewood that is moved into non-infested areas. Once transported into new areas, these insects and diseases can become established and kill local trees. We must STOP THE SPREAD of these insects and diseases and protect our forests and trees.

How you can help:

- Use firewood from local sources.
- If you have moved firewood, burn all of it before leaving your campsite.
- Do not transport firewood across state lines or into campgrounds or parks.

For more information contact your local Virginia Cooperative Extension office (www.ext.vt.edu/offices) or Virginia Department of Forestry office (www.dof.virginia.gov/) or visit the following Web sites:

www.emeraldashborer.info

www.aphis.usda.gov/ppq/ep

www.fs.fed.us/r8/foresthealth/

Virginia Cooperative Extension

Virginia Department of Forestry

Forest Service U.S. Department of Agriculture

Virginia Department of Agriculture and Consumer Services

DCR Virginia Department of Conservation & Recreation

Virginia State University

Virginia Tech

2006 - Publication 426-106

The Early Detection Problem

- Early detection and delimitation very difficult
- Signs and symptoms do not appear for 1 or more years after attack
- By then, adults may have spread
- New detection tools are desperately needed
- Since no bait is available, our current detection program in Virginia involves mostly visual inspection of declining ash and use of panel trap trees baited with Manuca oil – these traps do not exhibit long range attraction or specificity to EAB

Prism traps are available, however they are not very effective for early detection or delineation

APHIS is funding widespread deployment of these traps in 2009

Prognosis for Virginia Ash Resource

- All *Fraxinus* species are vulnerable: white, green, pumpkin, black
- About 1.6% of VA forested volume is ash (250,000 acres)
- More diffuse resource may result in slower progression of EAB compared to Mid-West
- Urban, landscape trees and riparian zones have higher ash densities
- Urban areas will probably be hit the hardest and experience a more rapid progression of EAB infestation

Solutions Anyone?

- EAB will establish in VA, but there IS value in slowing it down
- VA State Parks and Federal Lands allowing firewood entry are at high risk for EAB establishment
- State and County level quarantines
- VA should require that all incoming firewood for sale contain a valid seal indicating it has been kiln-dried. Other states have this requirement.

Solutions Cont'd

- Urban forest resources should be inventoried carefully to assess potential impacts and plan hazard tree removal and replacement schedules
- Acceptable replacement species should be considered – Manchurian ash?
- Beware of the Asian Longhorned Beetle – Don't make the same mistake with maple
- Diversify the urban landscape as much as possible – don't plant entire landscapes & streetscapes with just one species
- Systemic insecticides such as Merit (imidacloprid) and Tree-äge (emamectin benzoate) and others being tested may be effective at protecting individual trees but will play no role in stopping infestations from spreading
- Biological control?