

# EMERALD ASH BORER:

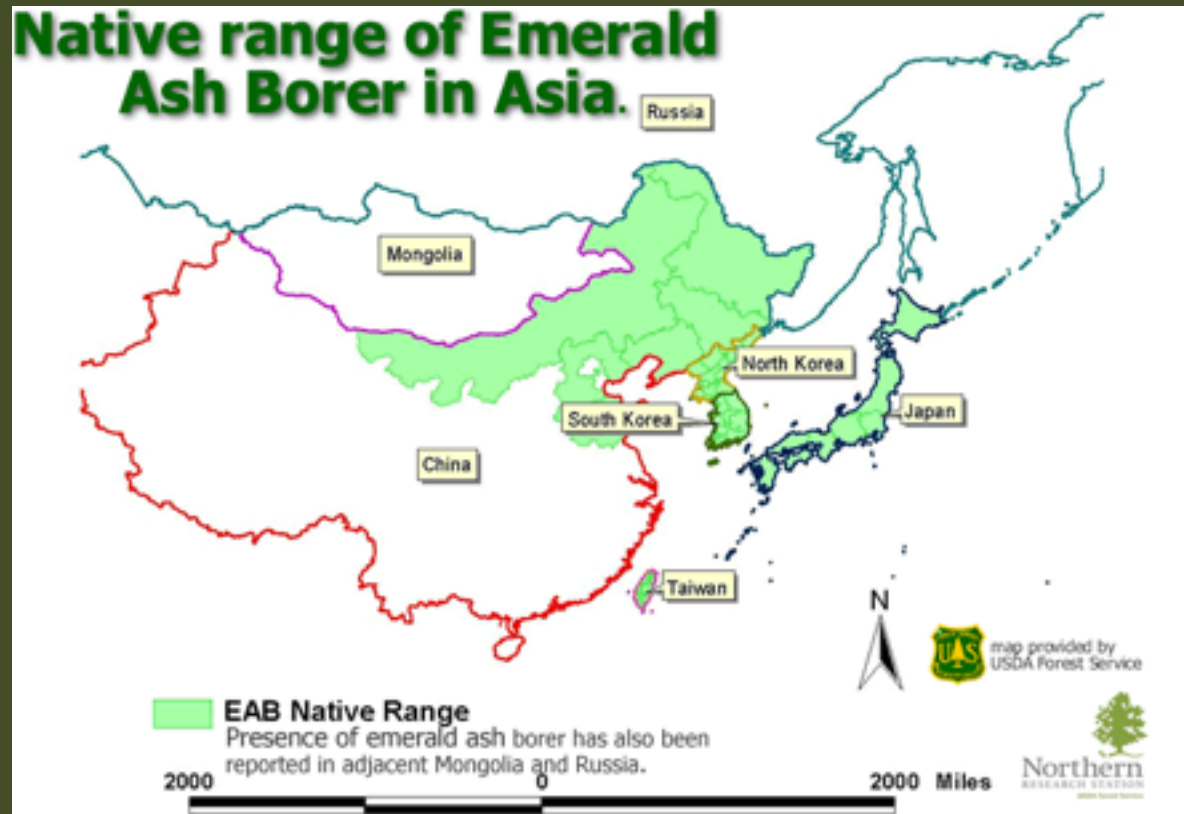
## Preparing for the Green Menace



Javier Marin  
Forest Pest Outreach Coordinator  
Mass Dept. of Agricultural Resources

# What is Emerald Ash Borer (EAB)

- An invasive wood-boring beetle (*Agrilus planipennis*)
- Native to Asia: China, Japan, Korea, Russia



# First Emerald Ash Borer Detection

- Considered to be the most destructive and fastest spreading pest in North America
- Tens of millions of ash trees have been killed in southeastern Michigan alone
- Has cost billions in damages



Ash trees killed by EAB



# How did it get to the United States?

- Thought to have been introduced in the 1990s in solid wood packing material such as pallets and crates



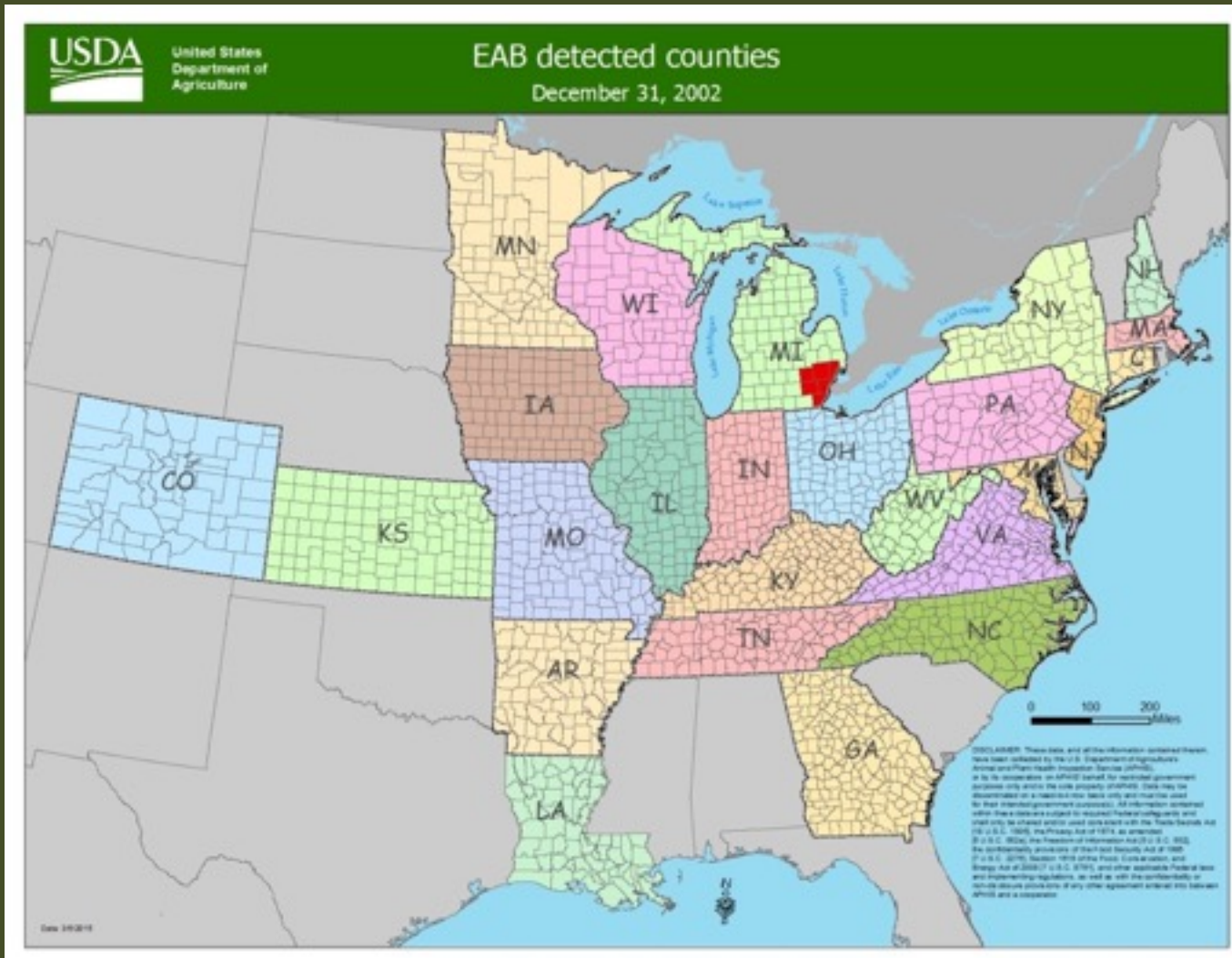


# Where is EAB today?

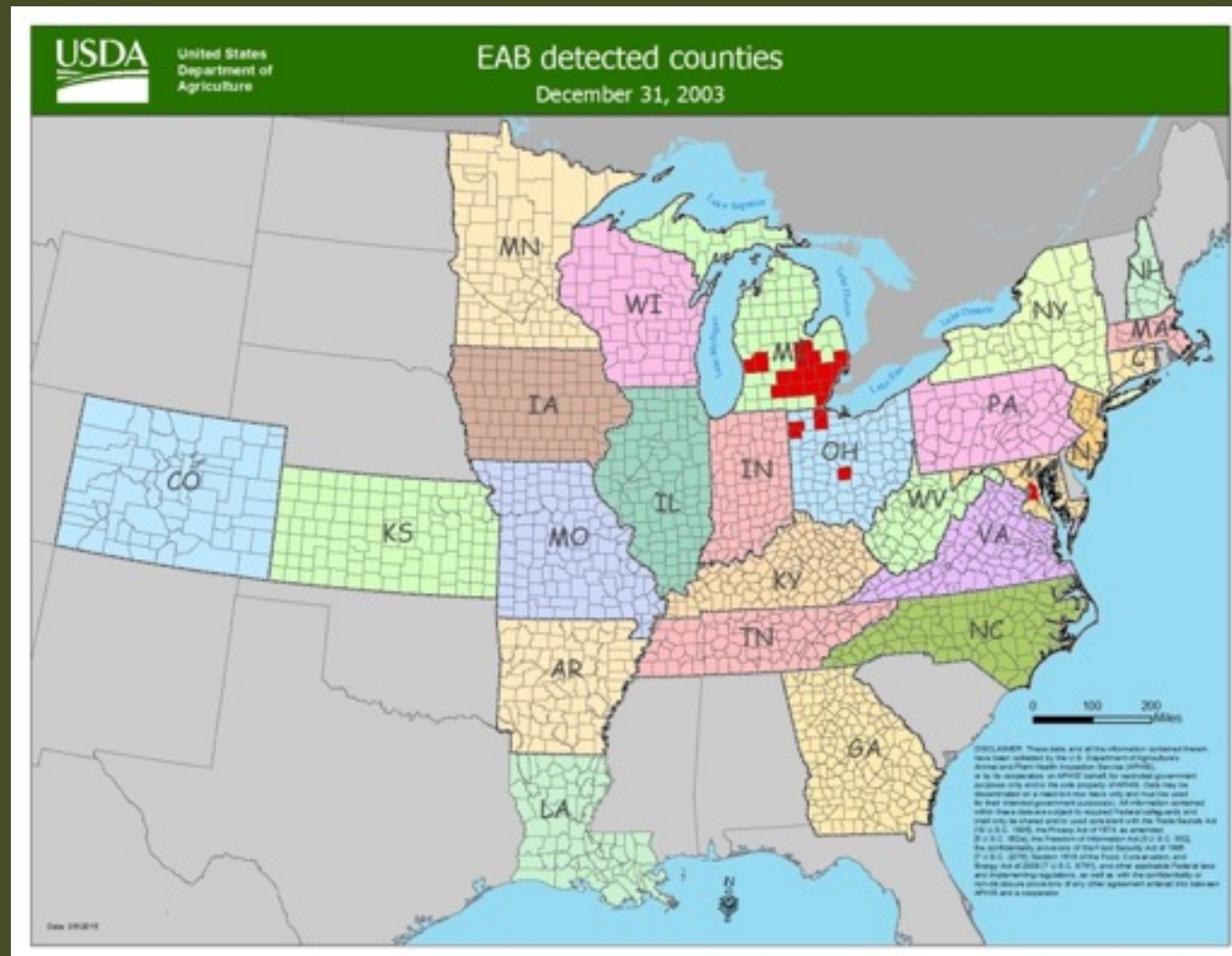
- Has now been detected in 31 States and two Canadian Provinces
- EAB spreads naturally through flight
  - Infestation front moves a few miles per year
- It also spreads through human-assisted movement
  - Movement of firewood and other wood products!



# The Spread of EAB

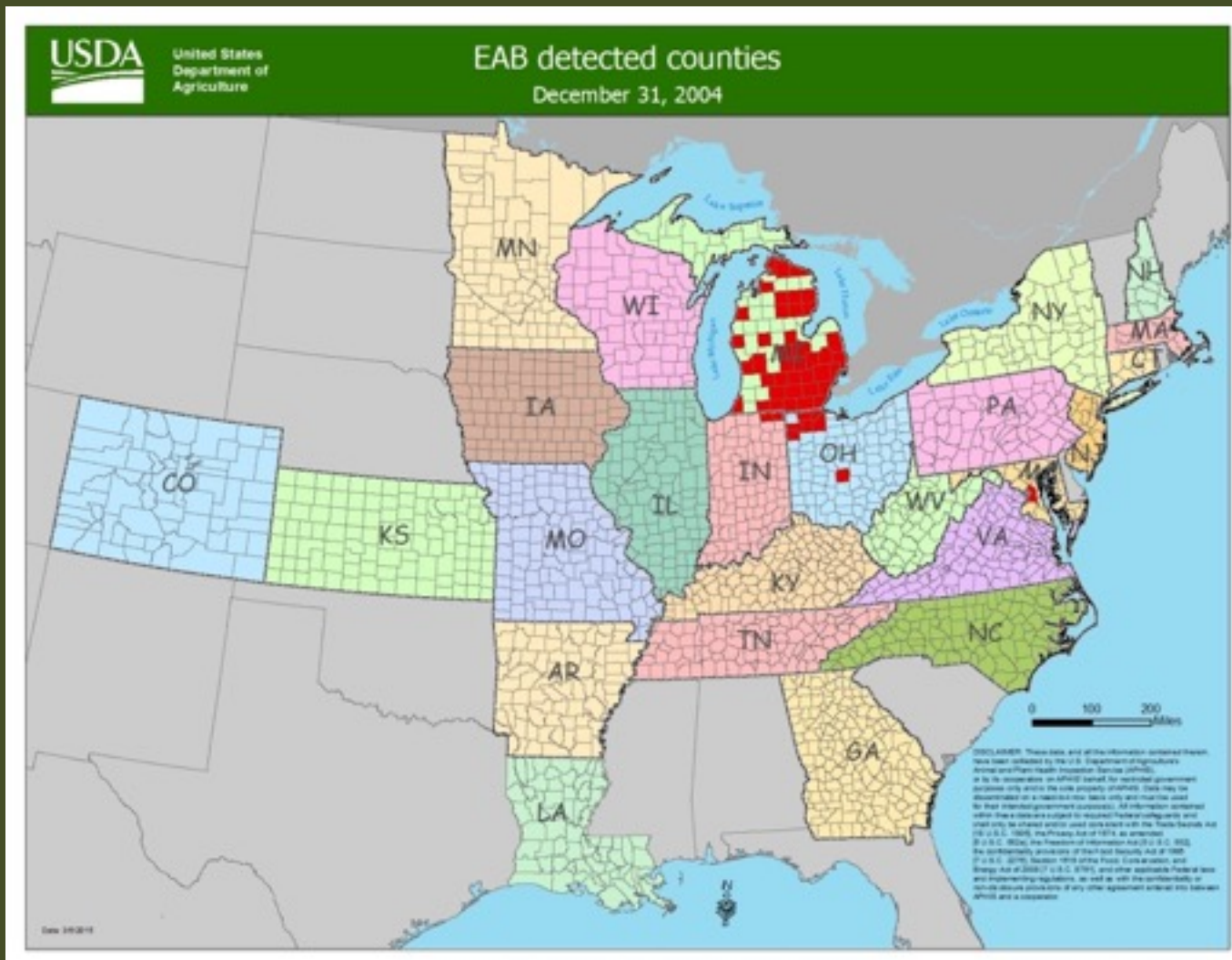


# The Spread of EAB

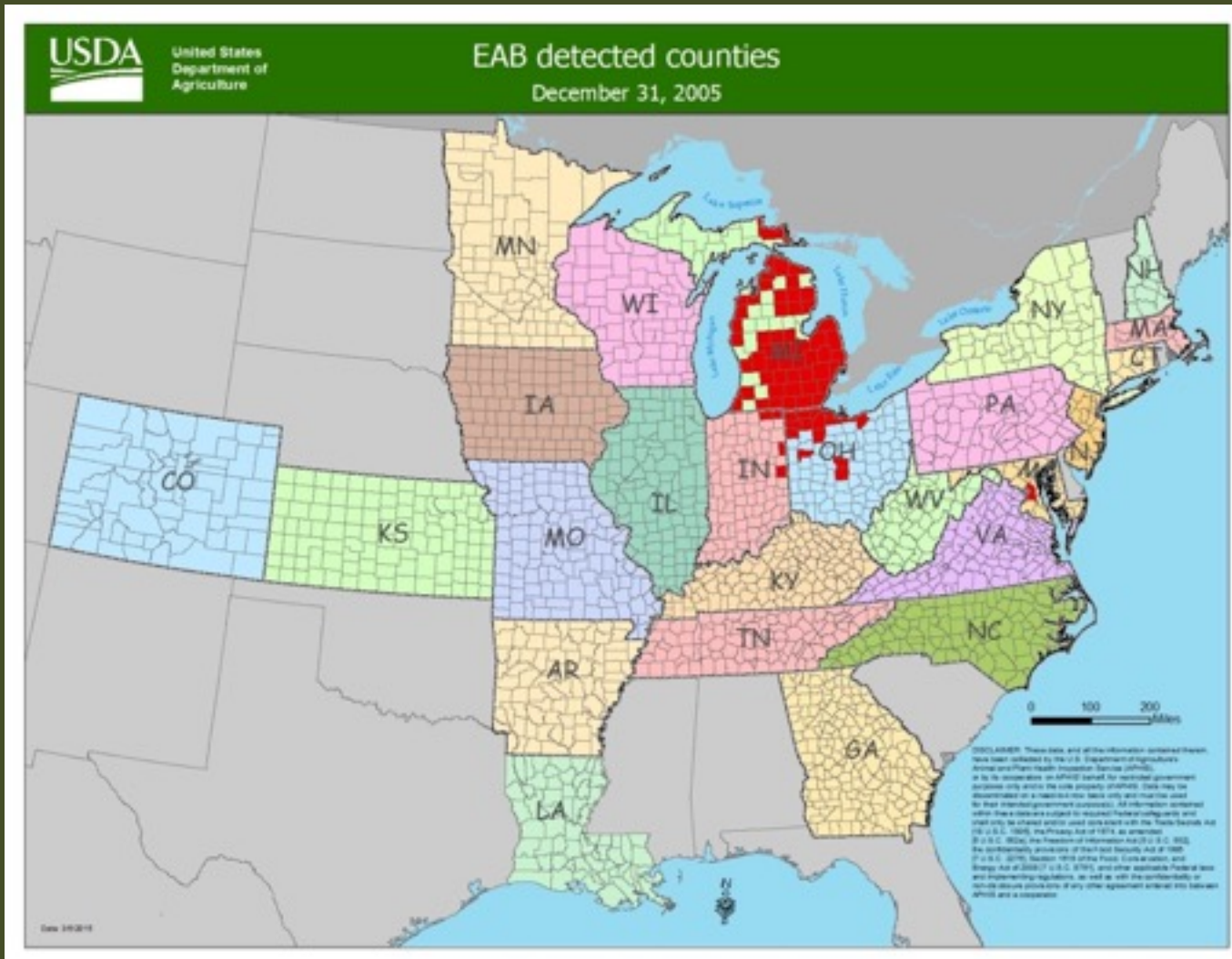




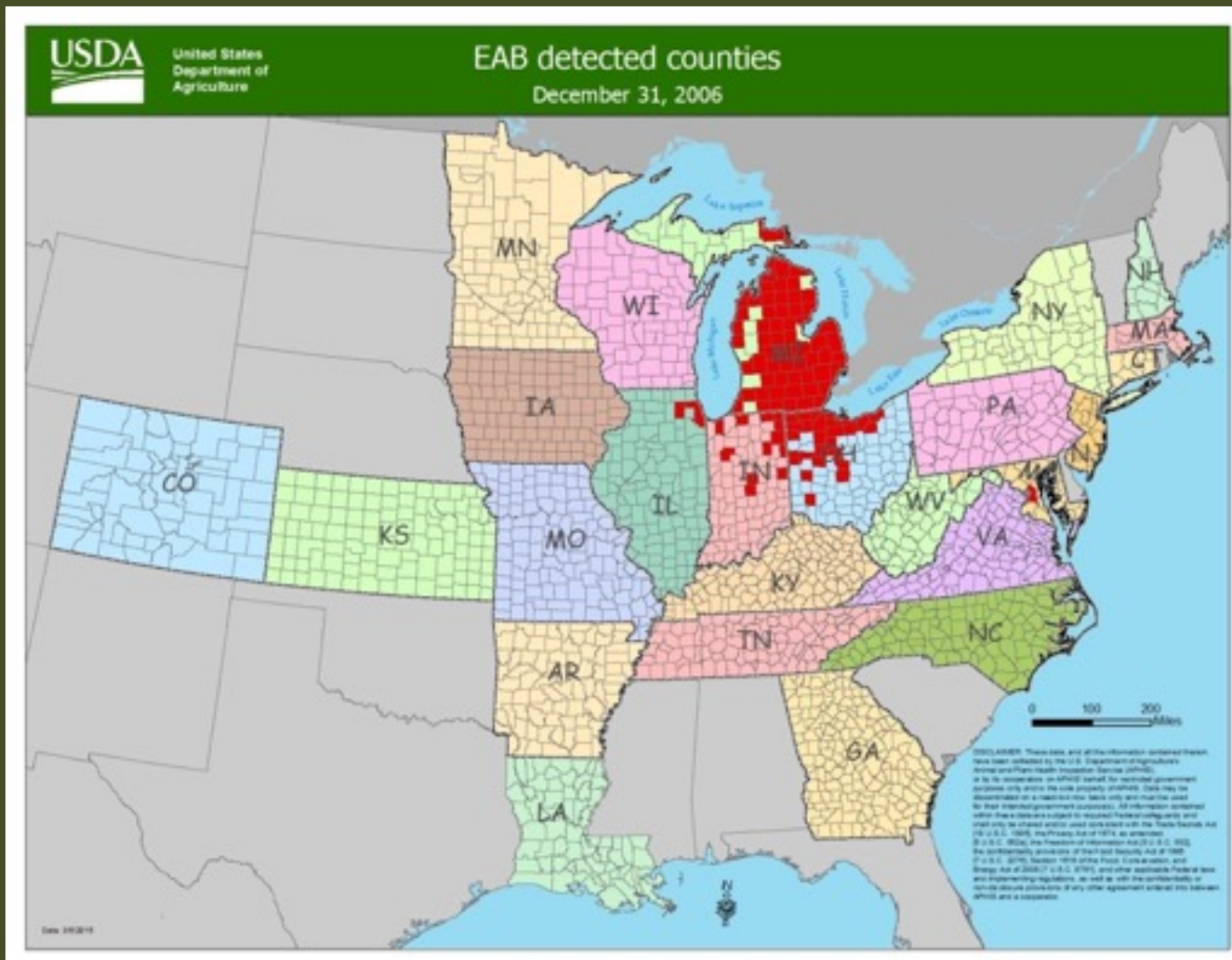
# The Spread of EAB



# The Spread of EAB

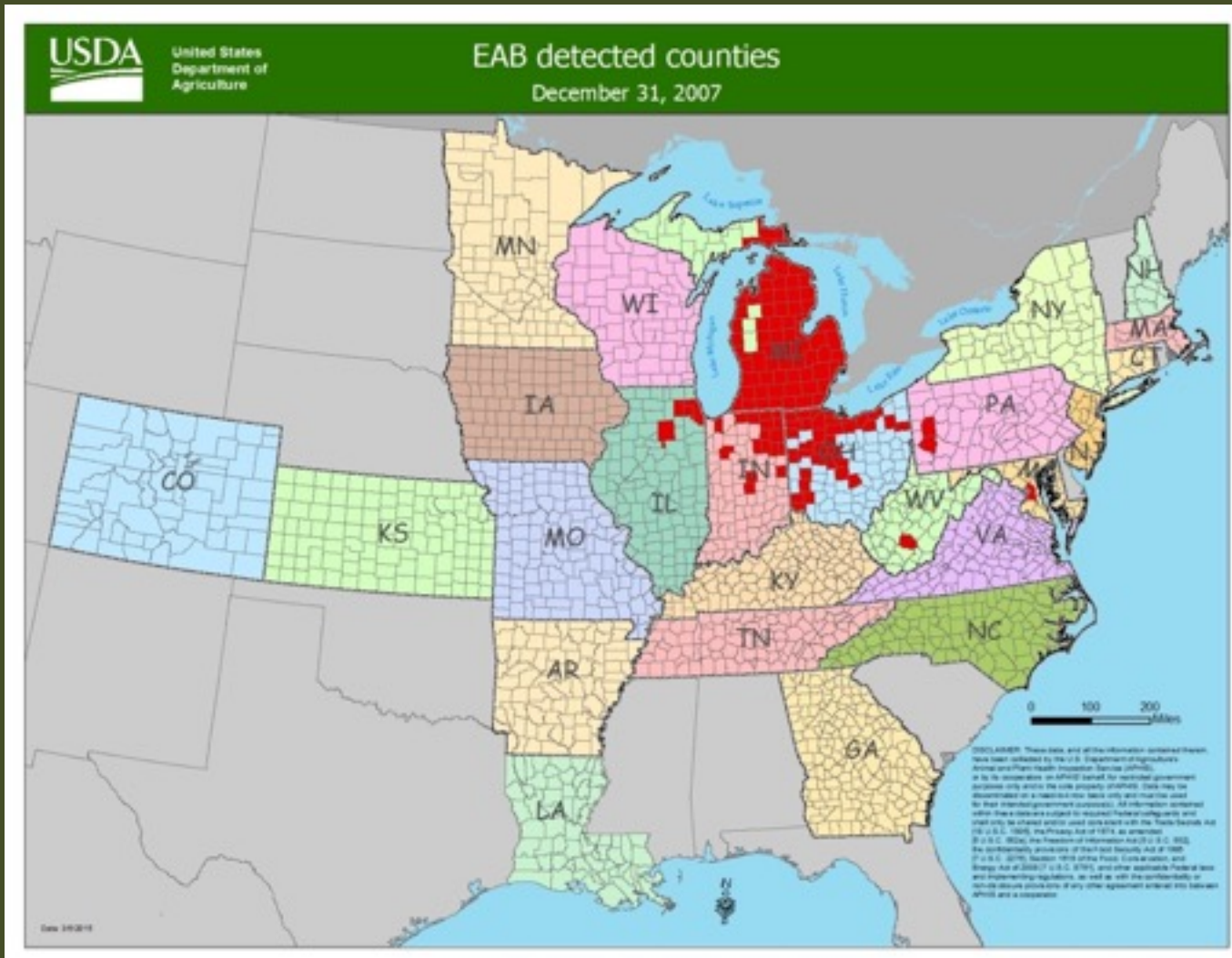


# The Spread of EAB

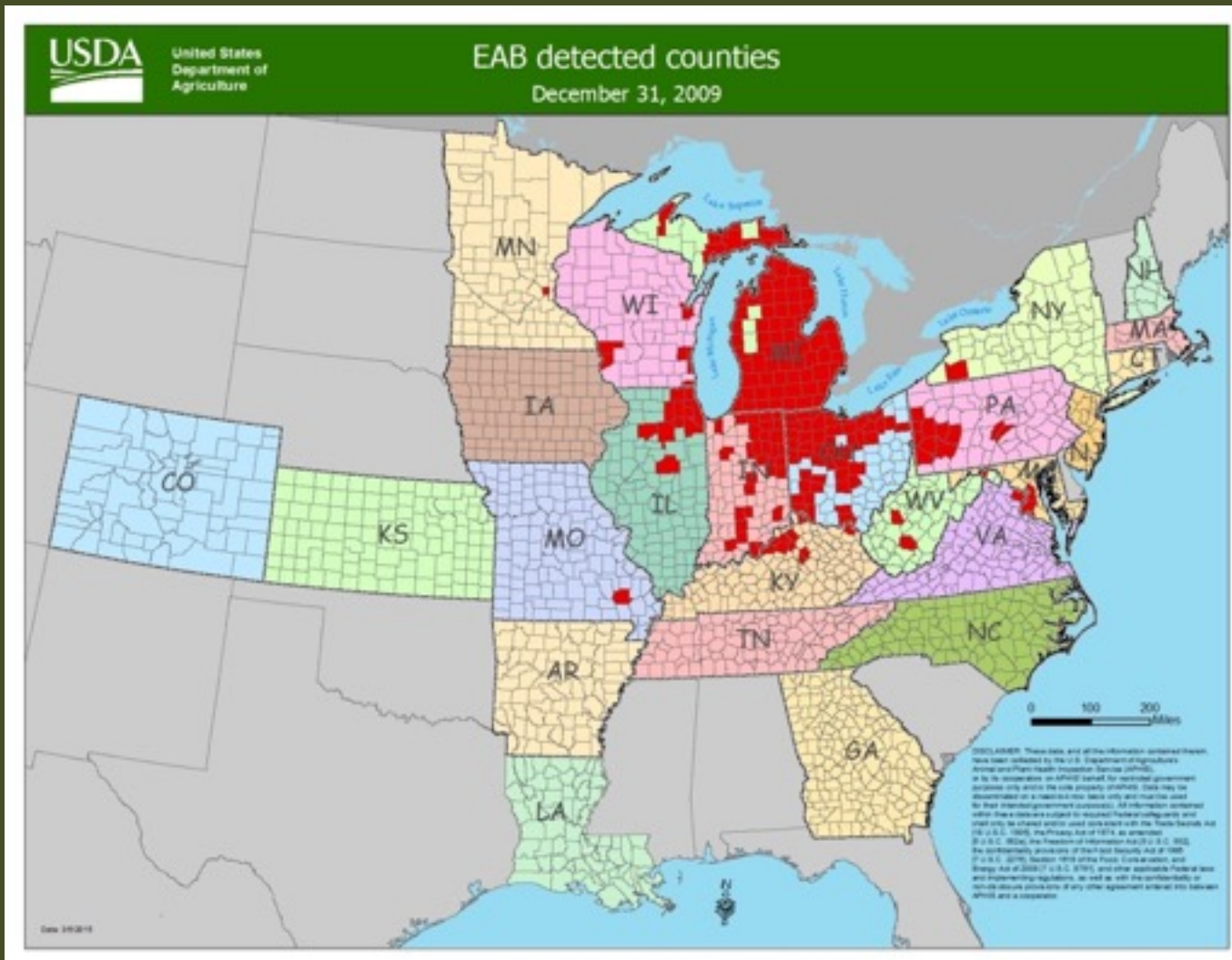




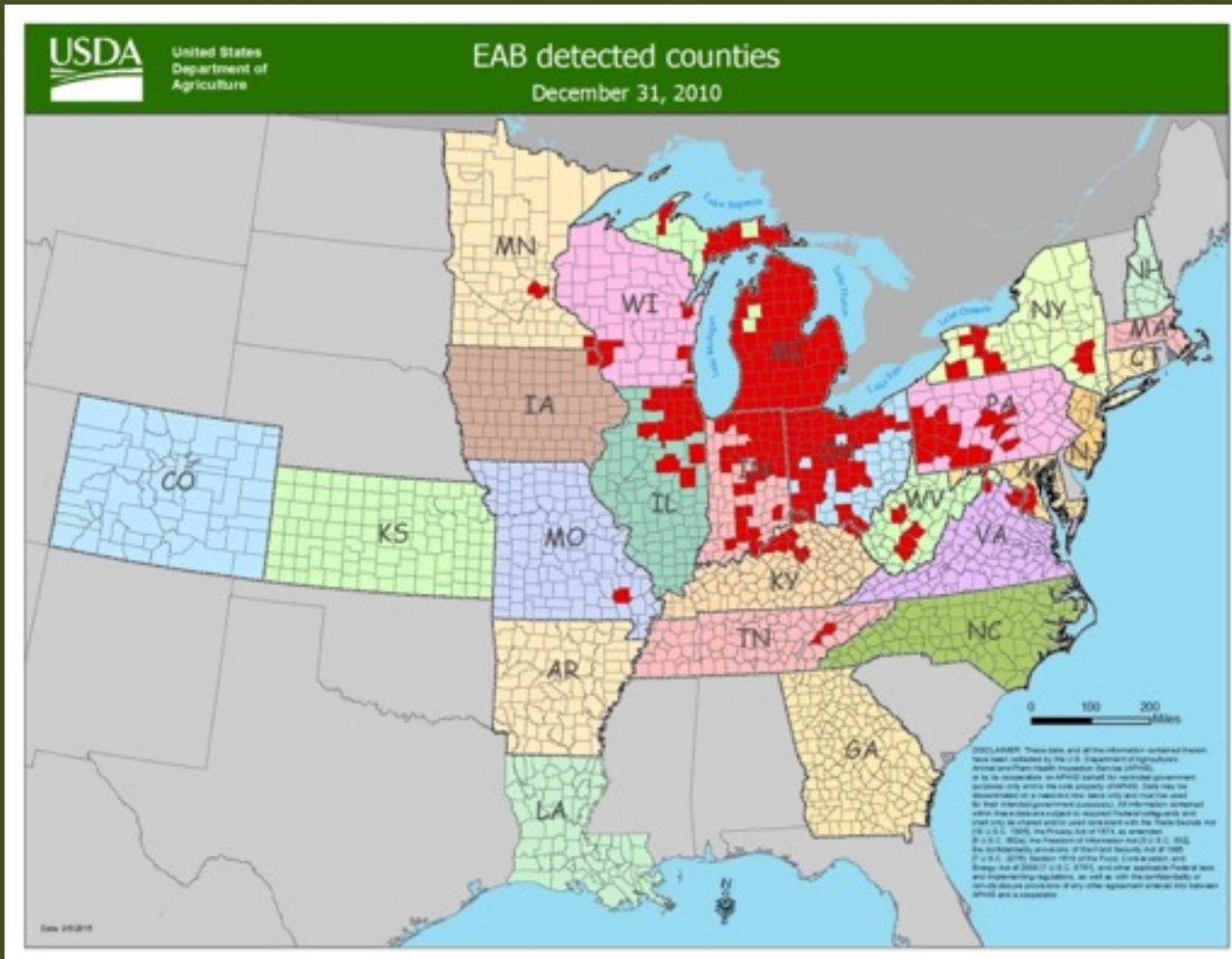
# The Spread of EAB



# The Spread of EAB

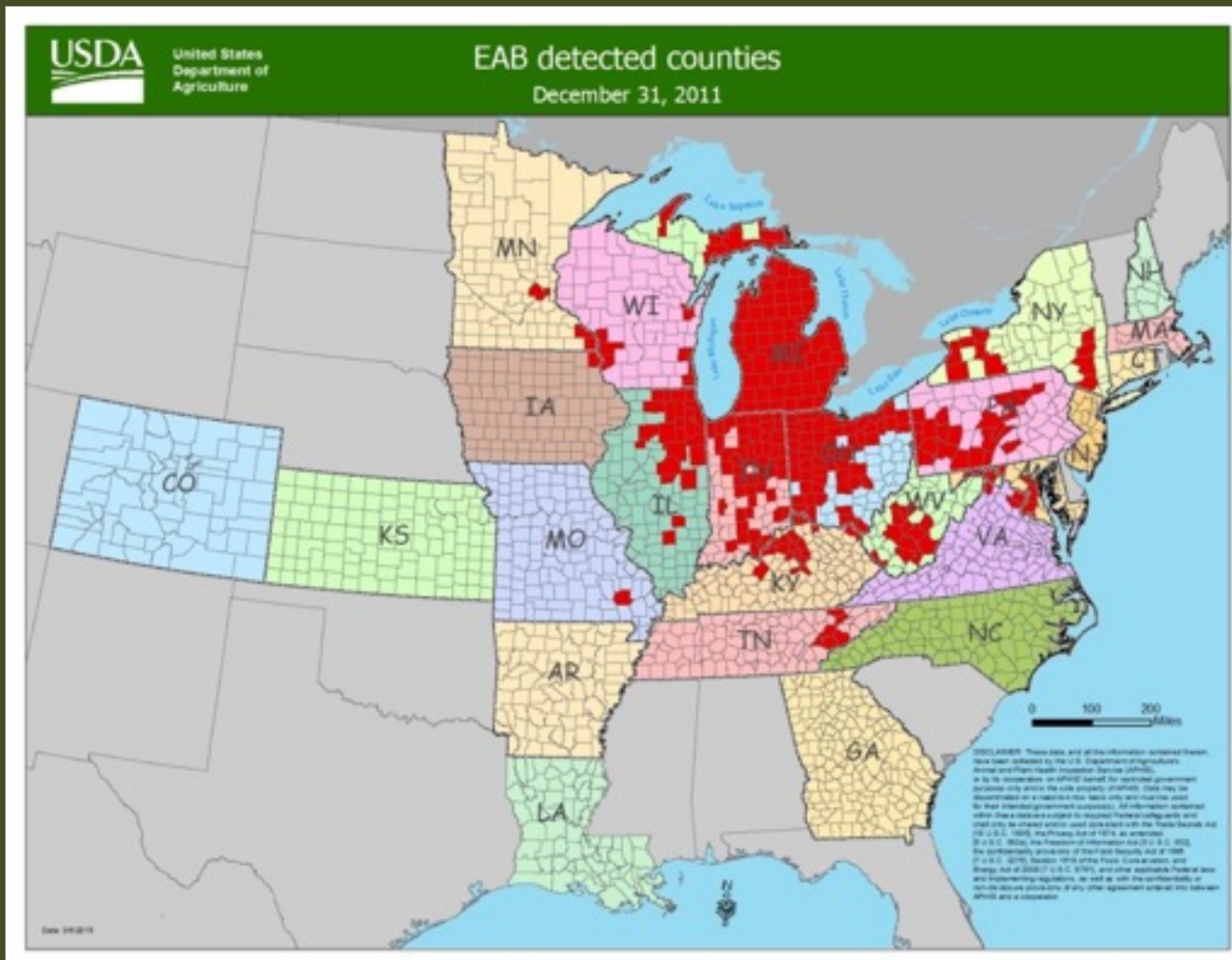


# The Spread of EAB

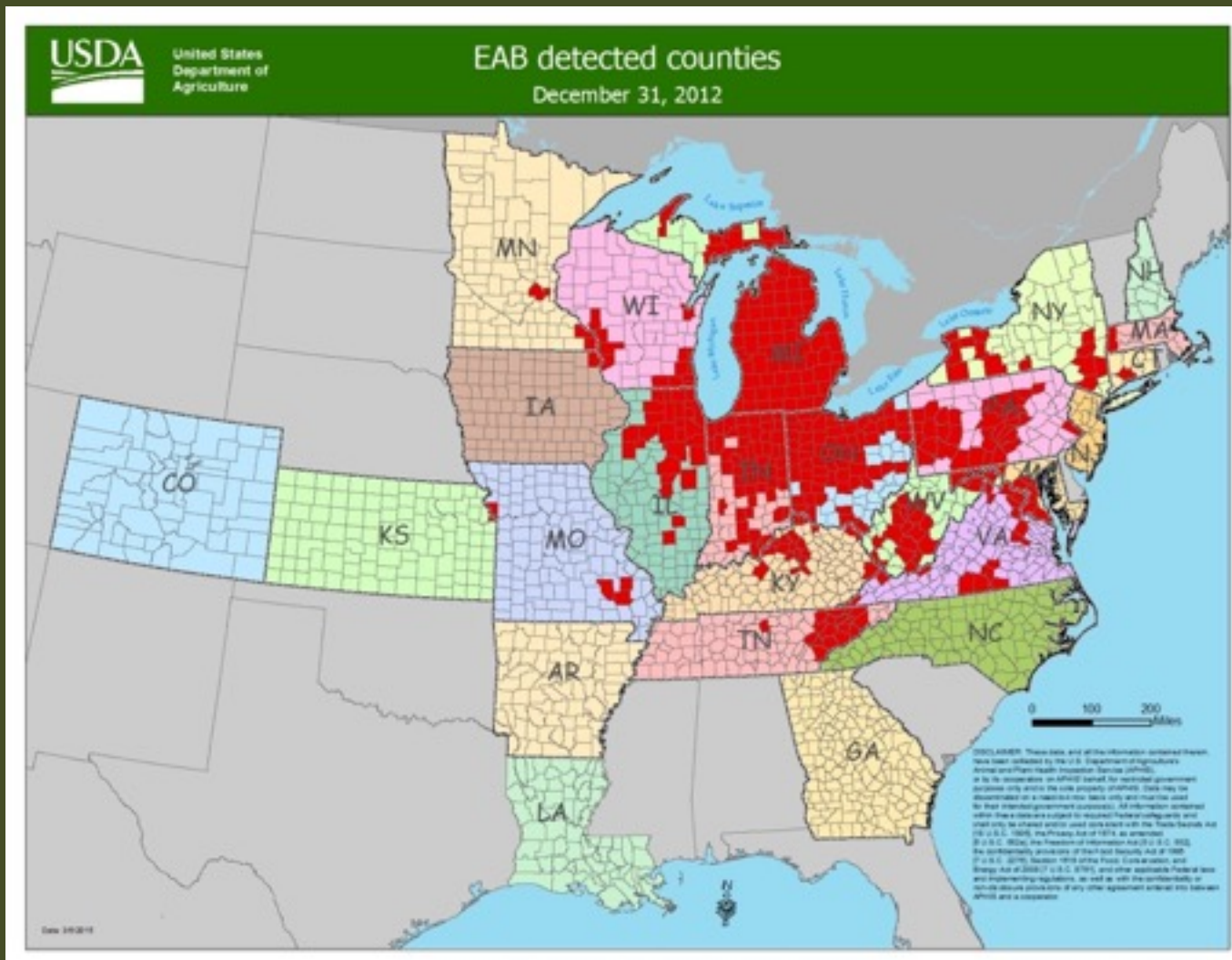




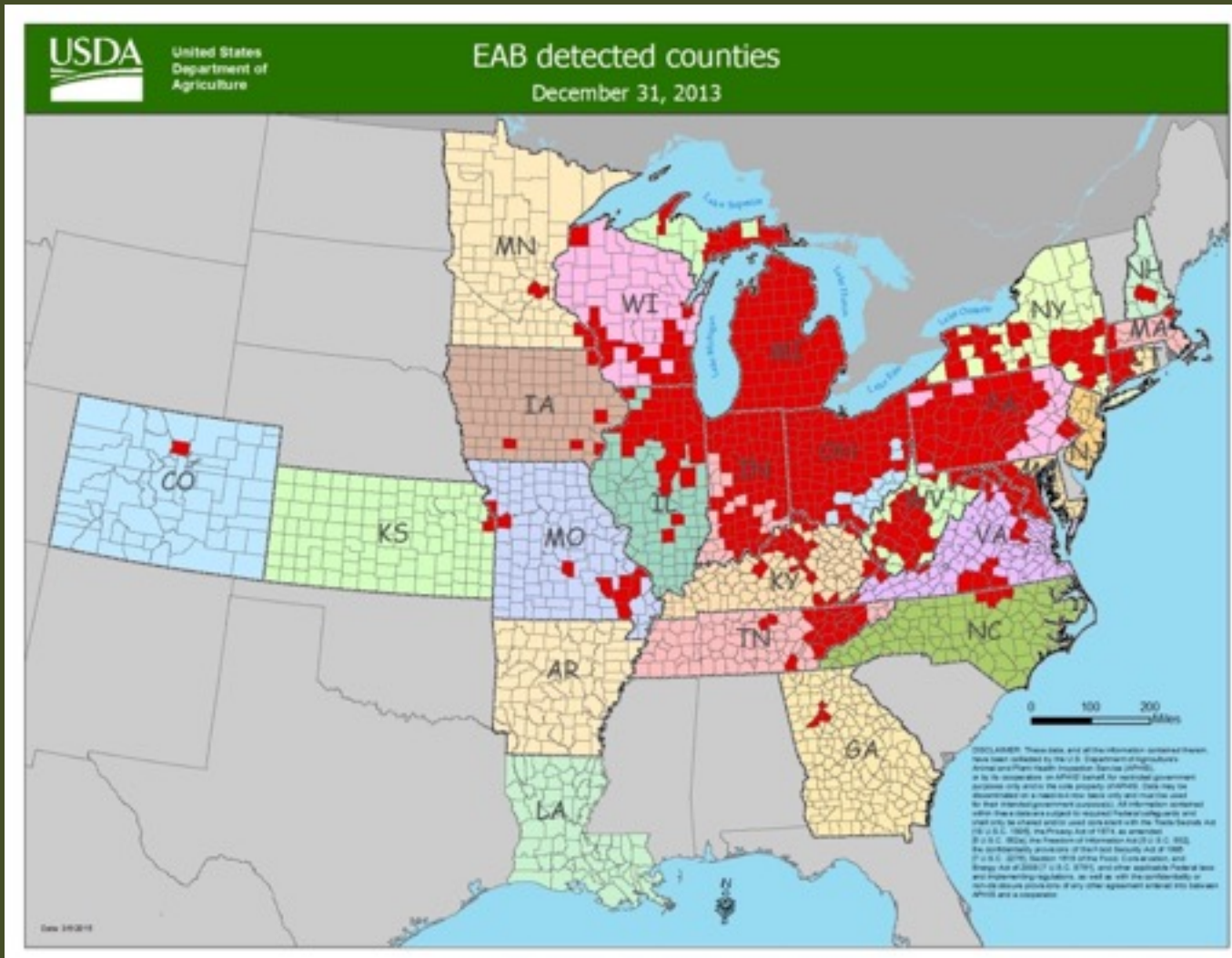
# The Spread of EAB



# The Spread of EAB

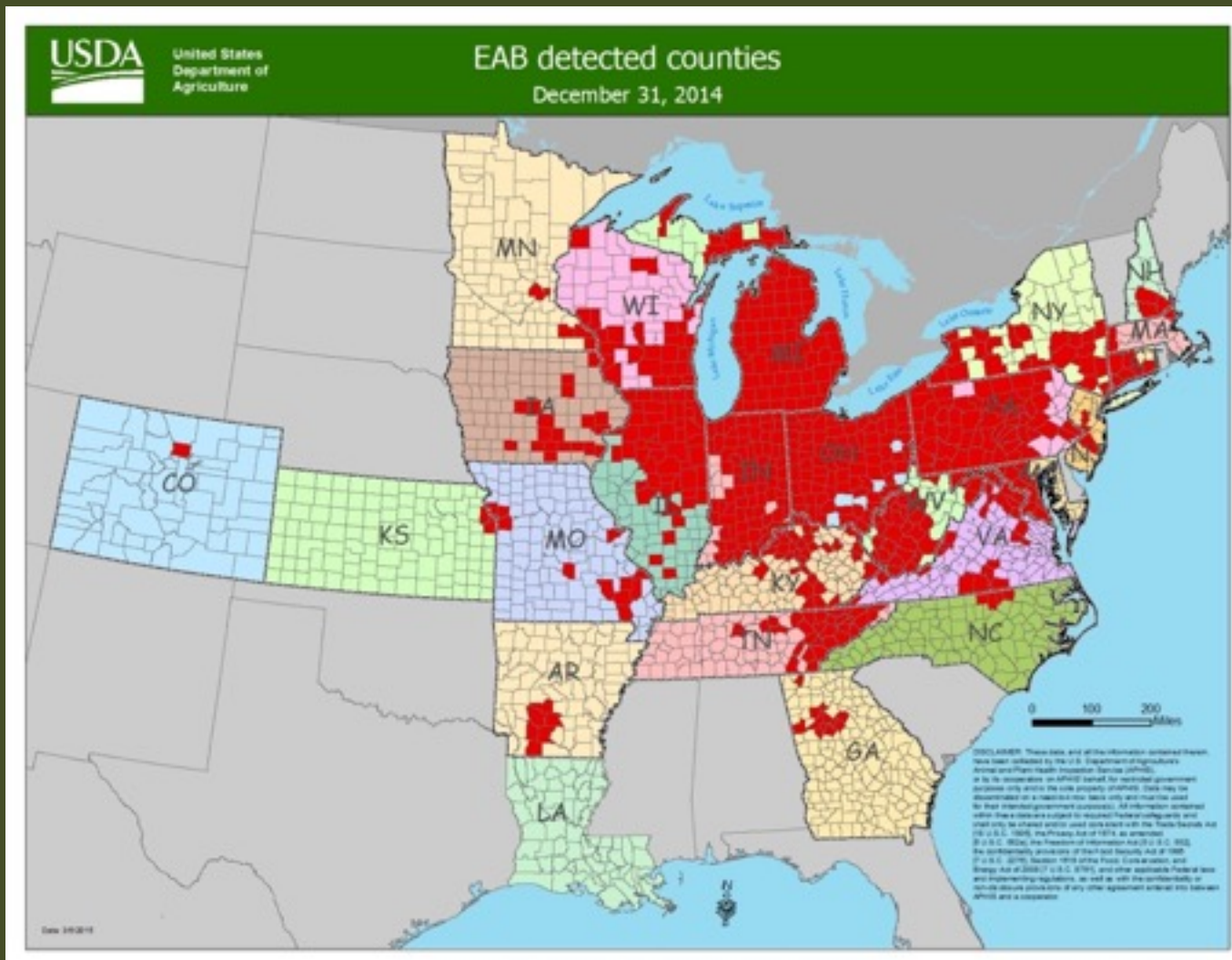


# The Spread of EAB

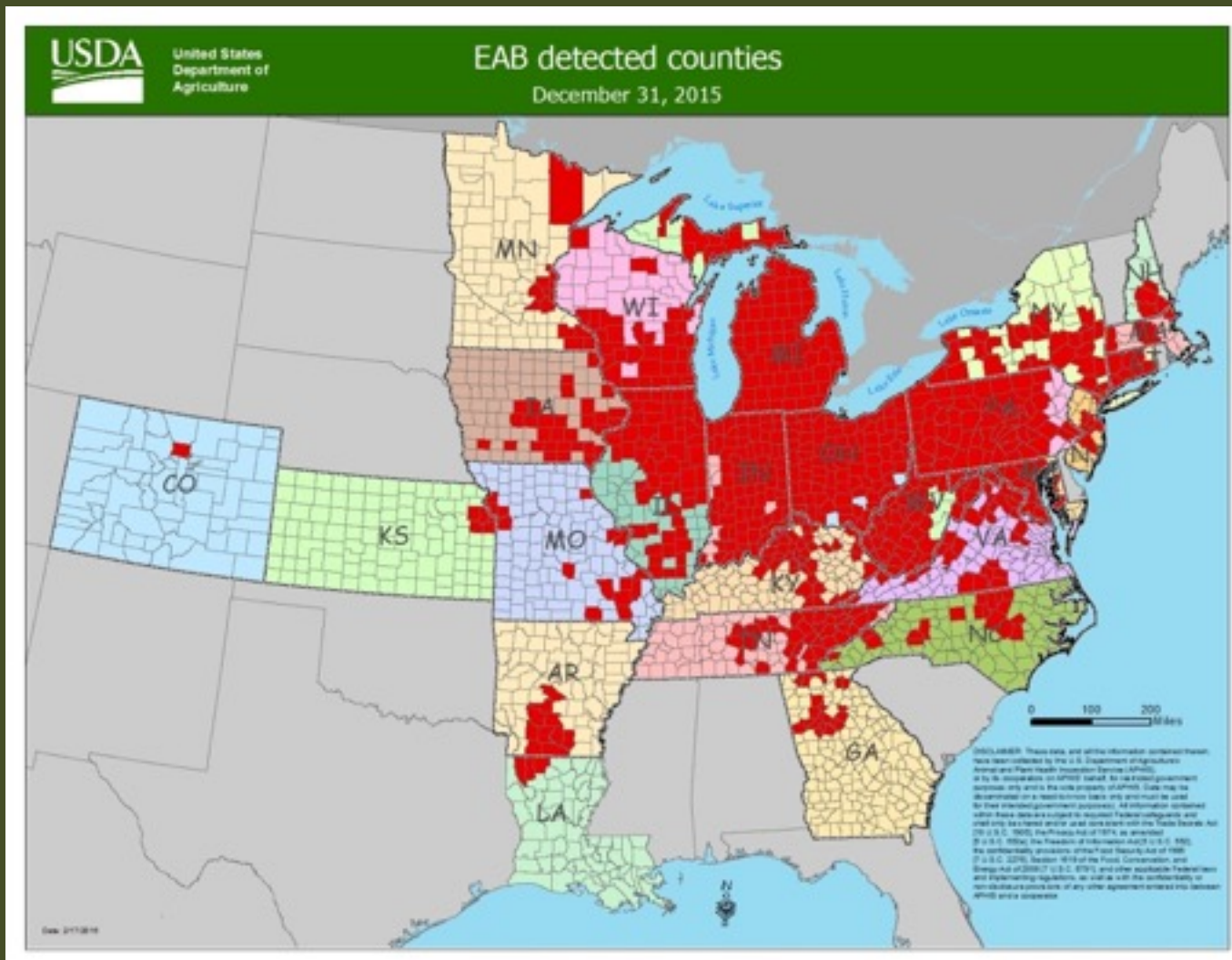




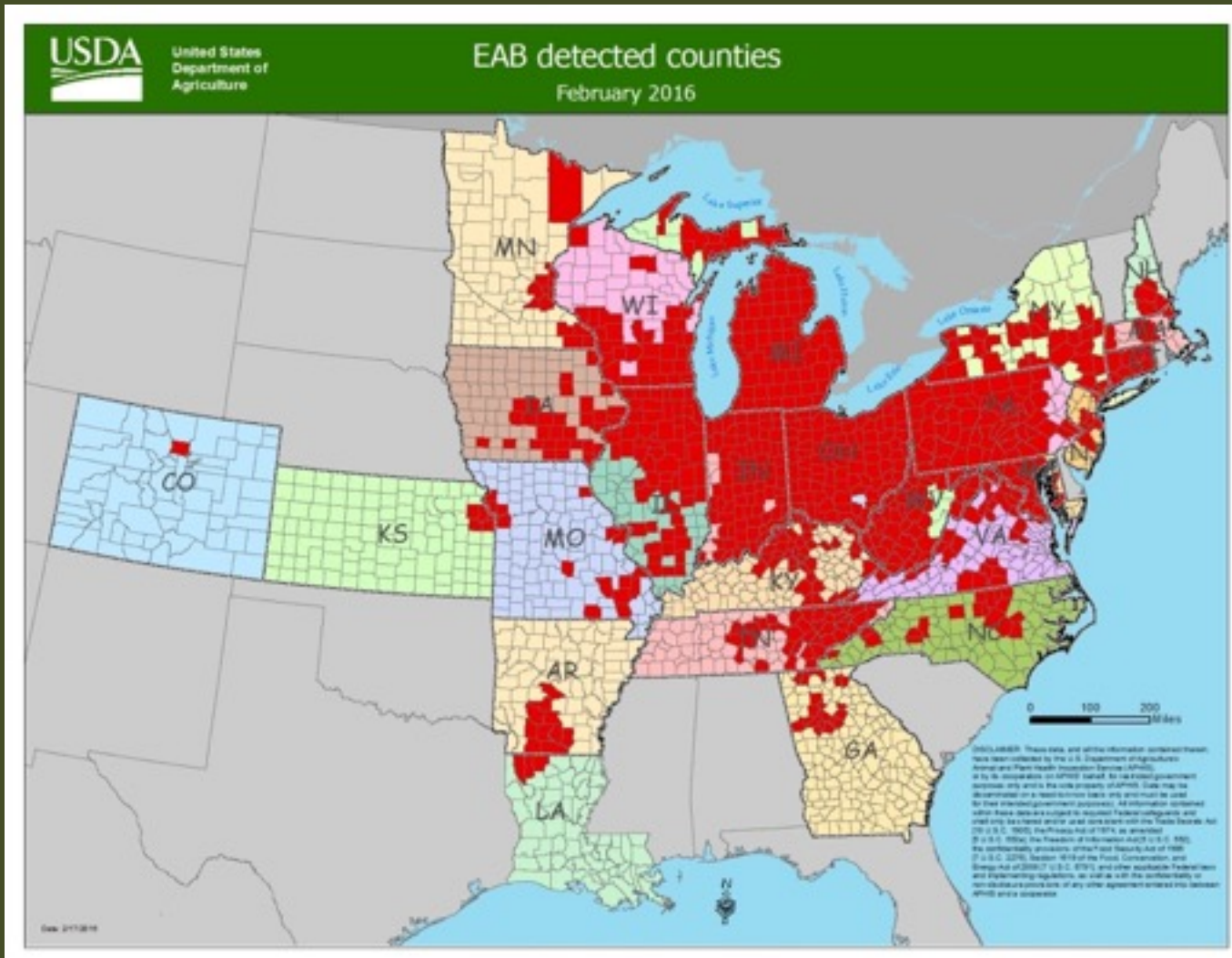
# The Spread of EAB



# The Spread of EAB

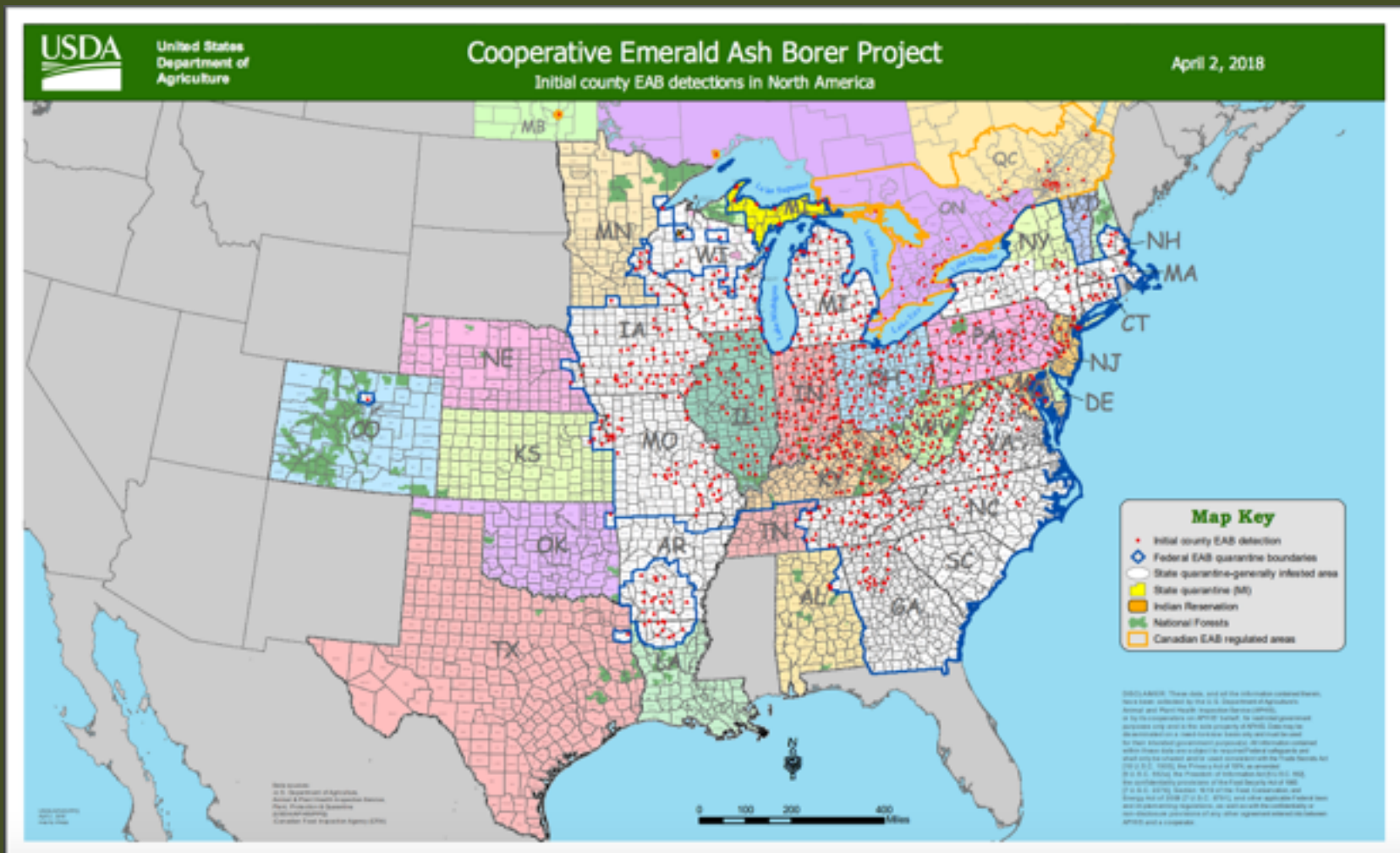


# The Spread of EAB





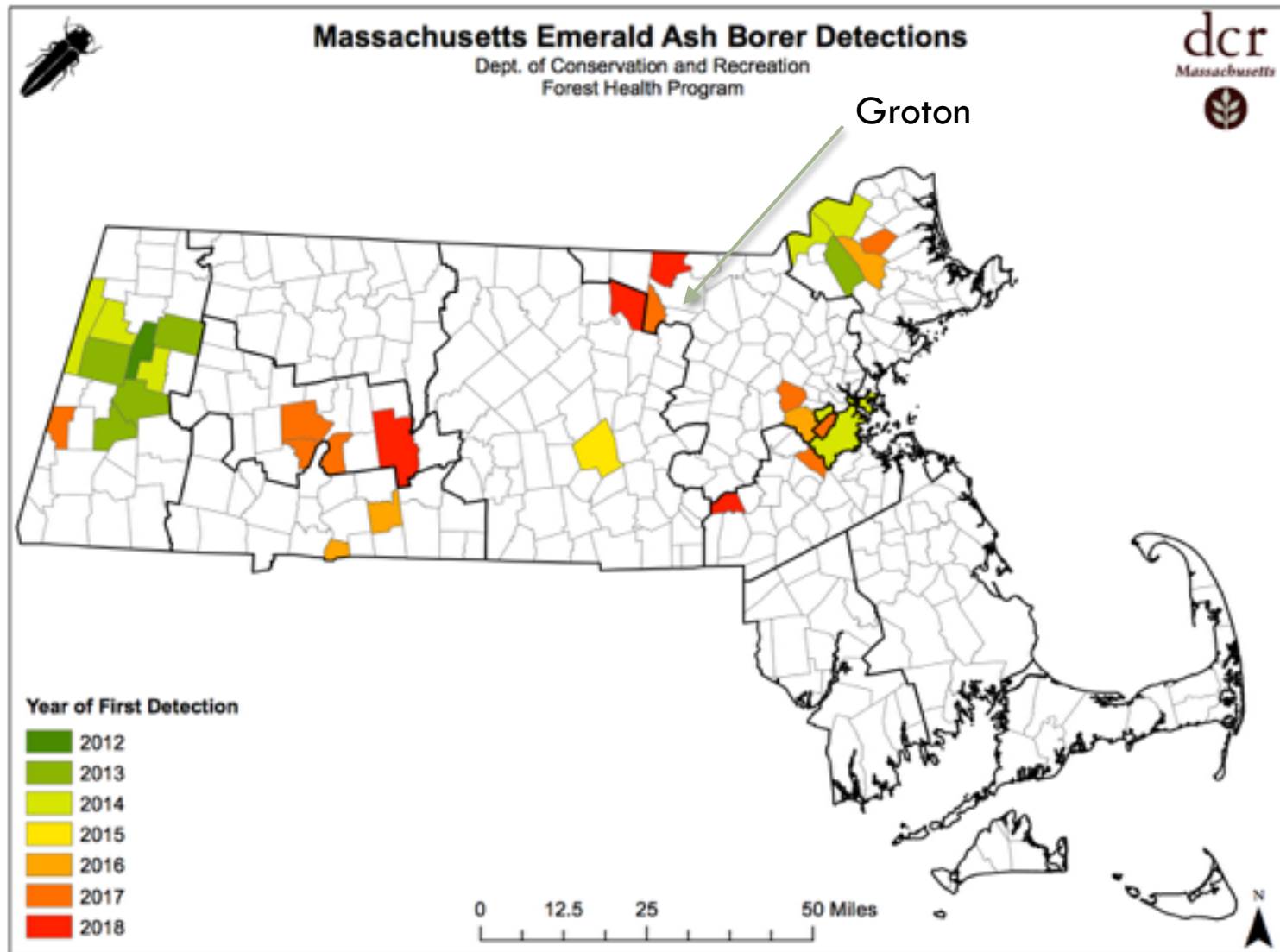
# Counties Detected in 2018



# EAB in Massachusetts

- EAB was first detected in MA in August 2012
  - Berkshire County (Dalton)
  
- Later detected in:
  - 2013 in Essex County (N. Andover)
  - 2014 in Suffolk County (Boston)
  - 2015 in Worcester County (Worcester)
  - 2016 in Hampshire and Middlesex County (Wilbraham, Newton and Boxford)
  - 2017 in Norfolk County (Brookline and Dedham)

# Current Distribution of EAB in Massachusetts



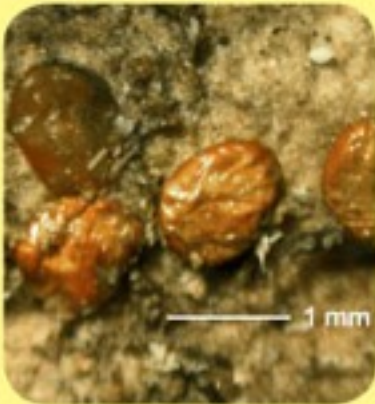


# EAB in Shirley



# Life Cycle of EAB

## **Emerald Ash Borer life cycle:**



Eggs: Adult EABs lay eggs from May-September on the bark of Ash trees.



Larvae: Eggs hatch into larvae that burrow under the bark of the tree to feed. Feeding occurs August - November.



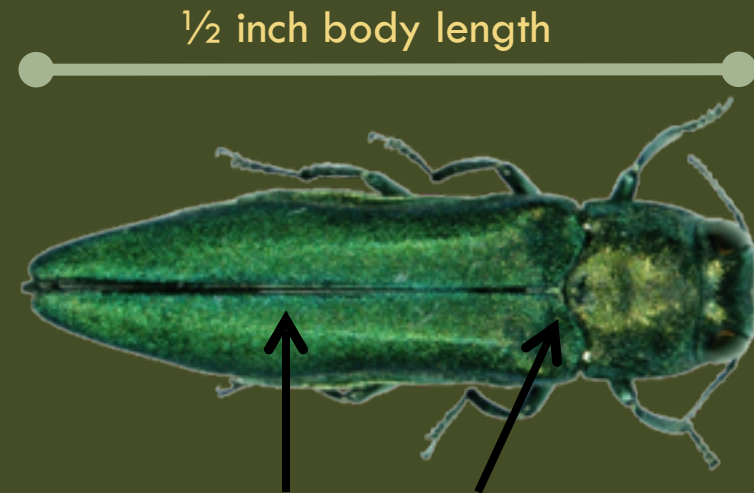
Pupae: Larvae turn into pupae and overwinter from November - April.



Adults: Pupae change into adult EABs and emerge from the tree from May - June.

# Adult EAB

- To confirm that an insect is emerald ash borer, check for these signs:



Wing covers, abdomen and head are iridescent, jeweled green

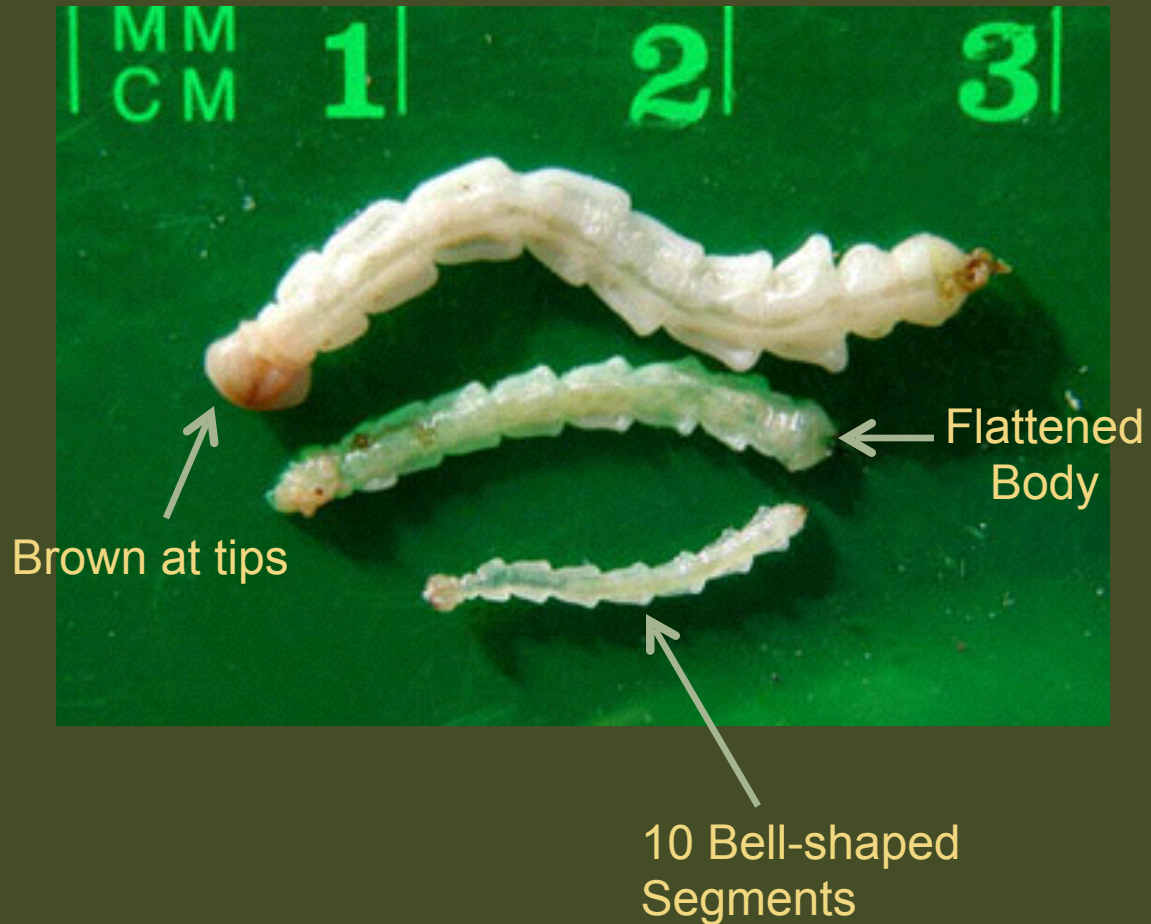


Coppery purple/red body under the wings



# EAB Larvae

- Larvae feed on inner bark of the tree, disrupting the transport of nutrients and water
- Smaller trees can die in as little as 1-2 years



# How to identify an Ash Tree

- Host trees:
  - **Ash (*Fraxinus* spp.) incl.**
    - white ash (*Fraxinus americana*)
    - black ash (*F. nigra*)
    - green ash (*F. pennsylvanica*)
    - other horticultural varieties
  - **Fringe Tree (*Chionanthus virginicus*)**



# EAB Tree Damage

- Distinct, S-shaped tunnels beneath bark
- Larval galleries filled with frass





# EAB Tree Damage

- D-shaped exit holes in bark



# EAB Tree Damage

- Increased woodpecker damage
- “Blonding”





# EAB Tree Damage



Canopy dieback & Bark splitting



Shoots emerging from roots or trunk

# EAB Similar damage

Banded Ash Borer (*Neoclytus caprea*)





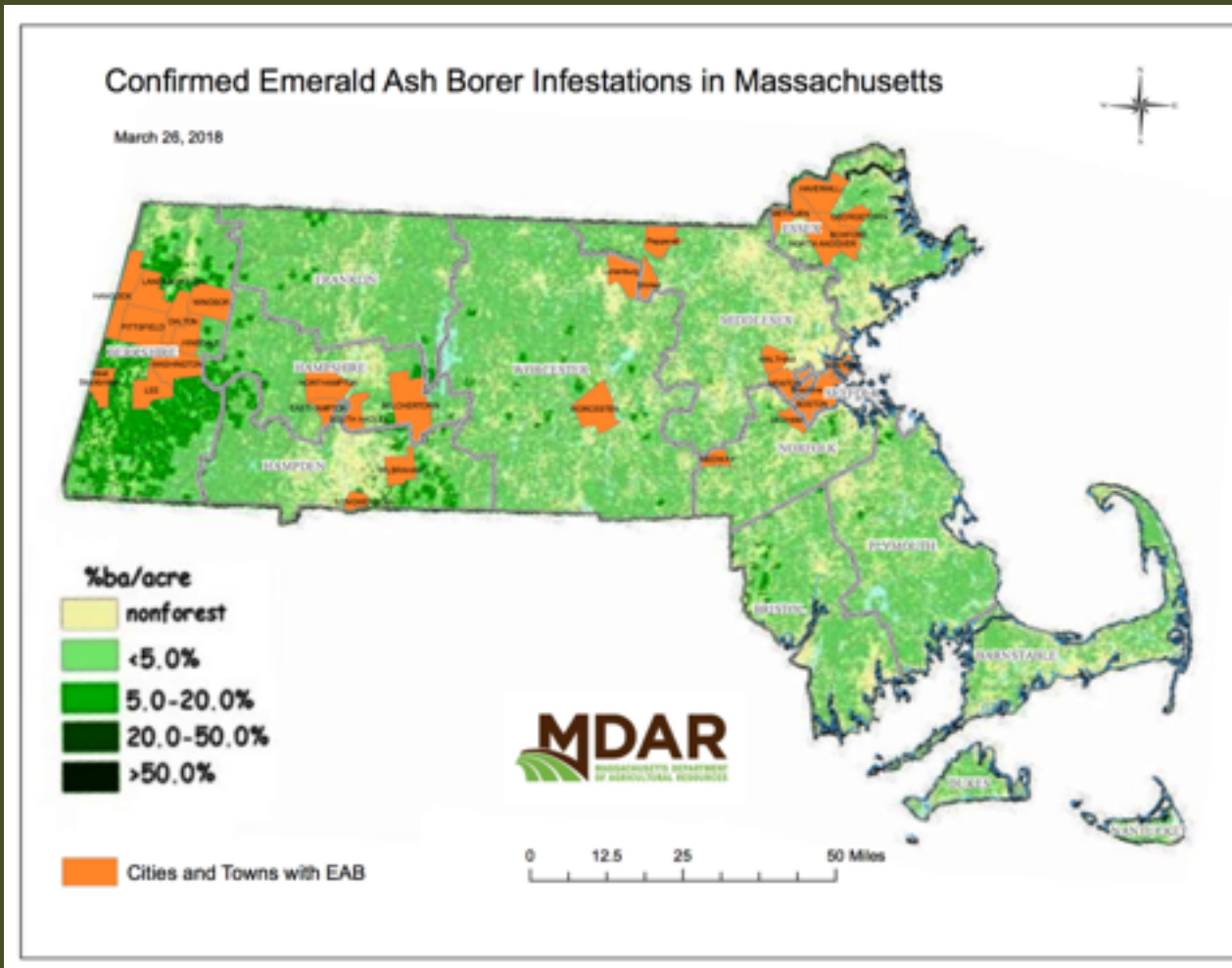
# EAB Similar damage

Ash Lilac Borer (*Podosesia syringae*)



# What is at risk?

- Our ash trees... and much more!



# What is at risk: Ash Trees Loss

- Ecosystem services
  - Habitat & biodiversity
  - Shade
  - Improved air quality
  - Erosion control
- Cultural significance
- Economic benefits
  - Lumber
  - Ornamental plantings
  - Wood products  
(Paper, Baseball bats, Tool handles, Furniture and more)





# What is at risk: Safety

- When EAB invades an ash tree:
  - Wood dries out rapidly, becoming brittle
  - Trees lose flexibility and strength
- Can cause massive, unpredictable structural failure and/or catastrophic stem failures





# What is at risk: Safety

- Increased chance of downed limbs and wood debris during storm events



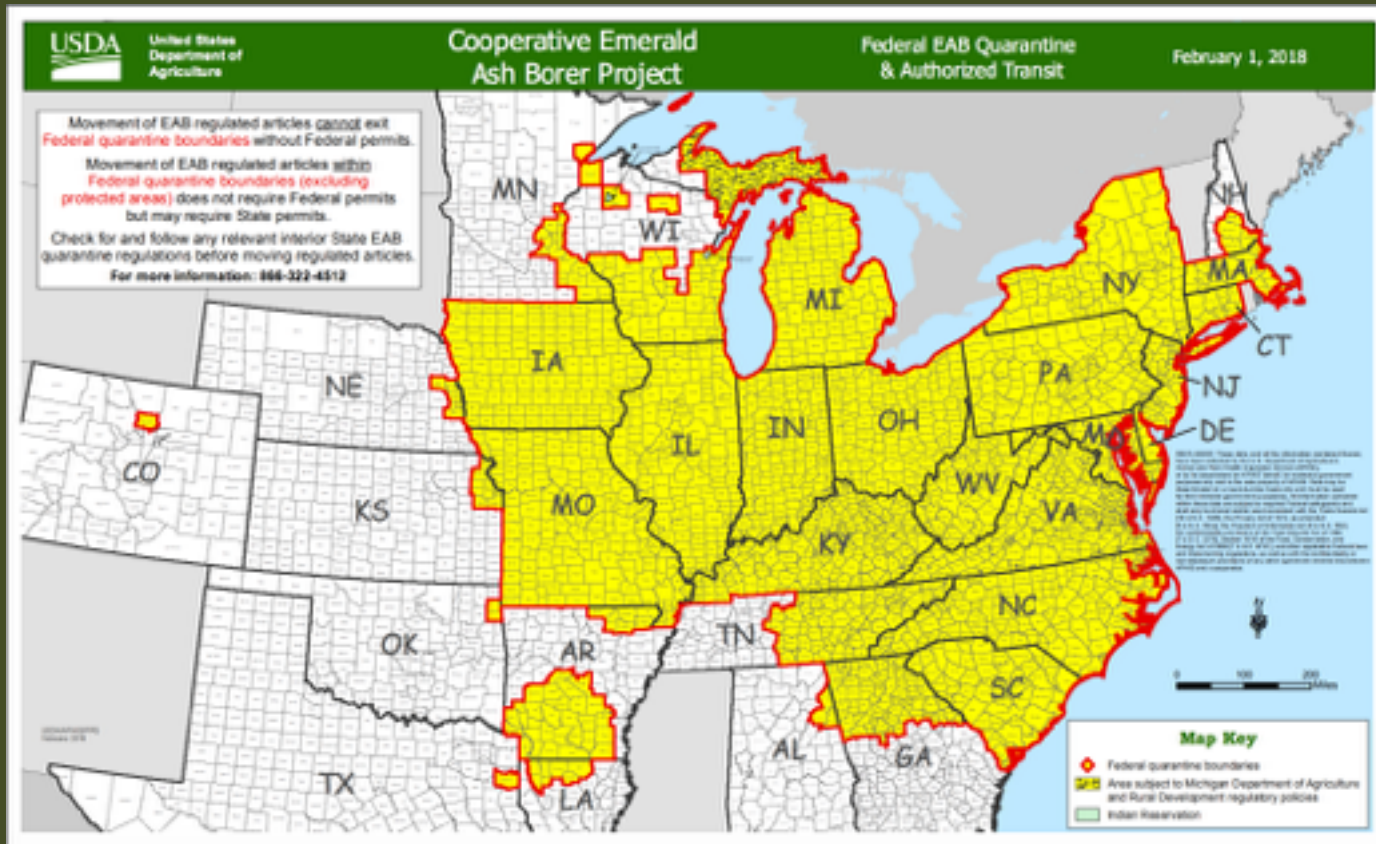
# What is at risk: Safety

- Dead ash trees will have an impact on:
  - Residential, commercial & public properties
  - Utility & public infrastructure (roads, guardrails, utility lines, bridges)
  - Recreation (trail maintenance requirements, hiking, fishing)



# EAB: What's Being Done

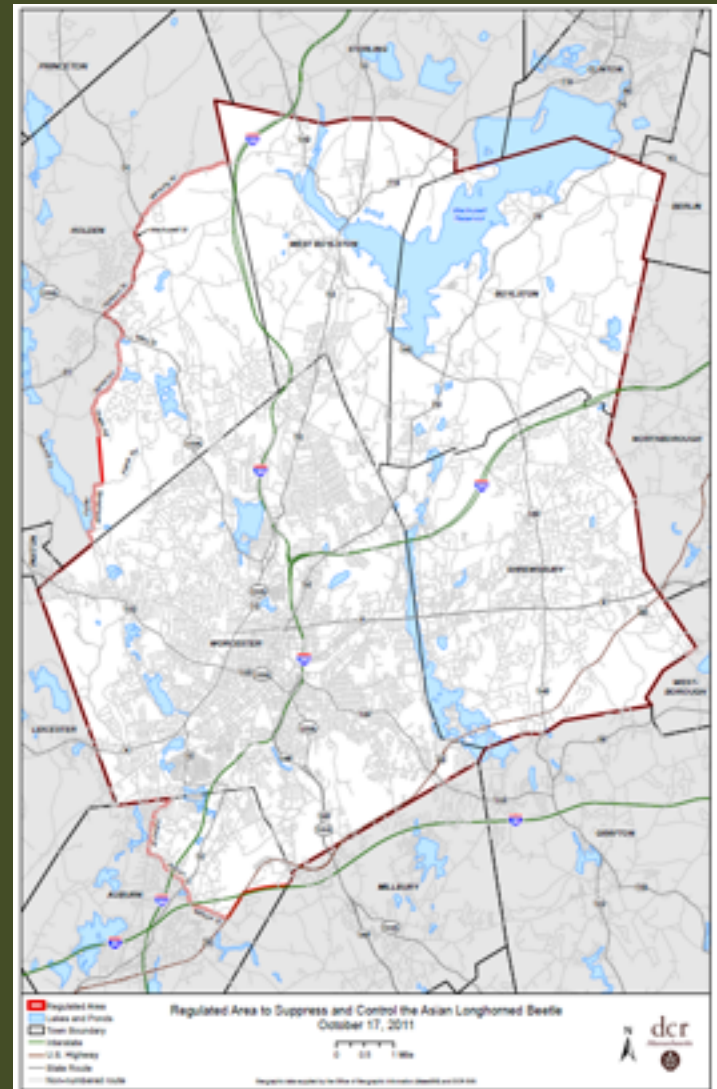
- Regulation of infested areas
  - The entire state is under the federal EAB quarantine
  - Restrict movement of ash, including firewood, lumber and logs





# Worcester County Regulations

- Ash is also a host tree for Asian Longhorned Beetle
- Ash cannot be moved out of the ALB regulated area



# EAB: What's Being Done

- DCR detection & monitoring
  - Visual Surveys
  - Green Funnel Traps & Purple Panel Traps
  - Girdled Trees
  - Biosurveillance



# EAB: What's Being done

## □ Biosurveillance

- The Wasp Watchers program targets native non-stinging wasps that hunt EAB (*Cerceris fumipennis*)
- The beetle carcasses (exoskeletons) are found around these nests and collected to monitor for EAB

<http://bit.ly/MassWaspWatchers>



Photos: U.S. Forest Service







# EAB: What Can Be Done

- Management
  - Insecticide use for prevention and treatment of low-level infestations
  - Girdled trees (removing population sinks)
  - Biocontrol insects
  - Research
  - Education and outreach

[www.emeraldashborer.info](http://www.emeraldashborer.info)



# EAB Preparedness: Education & Outreach

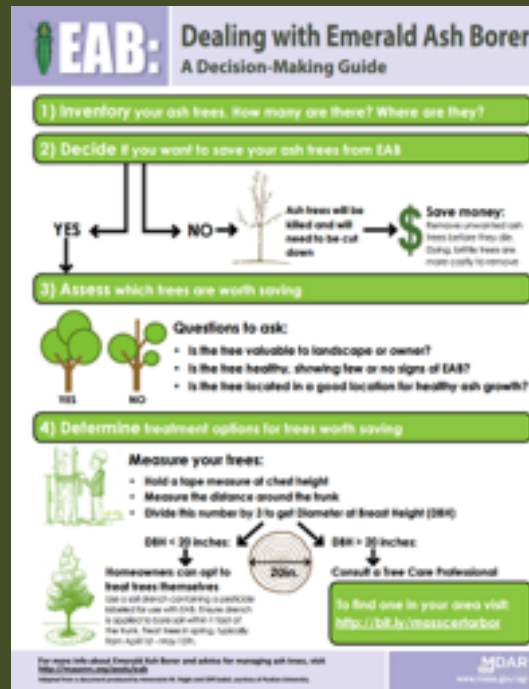
- Spread the word, not the beetle!
- MDAR can provide:
  - Materials for educational displays and tabling at events
  - Resources for tree tagging events
  - Presenters for groups interested in learning more about EAB





# Outreach Materials

- Decision guides
- Table-top ID card holders
- EAB Identification Kits



**Love trees? So does this beetle.**

The Emerald Ash Borer ("EAB") is an invasive pest that attacks ash trees.

EAB threatens the livelihood of Massachusetts forests and puts our nursery and timber producing industries at risk.

Since EAB was found in the USA in 2002, more than 30 million ash trees have been destroyed. Help us stop the spread of this pest in Massachusetts!

**How you can help:**

- Take a free EAB id card
- Report sightings at [masscforbor.org/pests/eabreport.htm](http://masscforbor.org/pests/eabreport.htm) or call toll-free 1-866-322-4512

**Our trees are counting on you!**

**MDAR**  
To get more info  
1-866-322-4512  
For more information call  
[www.mass.gov/mdar](http://www.mass.gov/mdar)

**NCA**  
National Center for Ash Borer  
1-866-322-4512  
For more information call  
[www.nca.org](http://www.nca.org)

**EMERALD ASH BORER (EAB) Identification Kit**

Michigan State University  
Department of Entomology and Forestry

FOR MORE INFO:  
[www.emeraldashborer.org](http://www.emeraldashborer.org)  
or call toll-free 1-800-628-4512

**Contents of kit:**  
EAB larva and EAB adult beetle  
EAB larva with EAB ID number  
EAB larva  
EAB larva in wood with EAB ID number  
EAB larva in wood with EAB ID number  
EAB larva in wood with EAB ID number

# EAB Preparedness: Monitor and Report

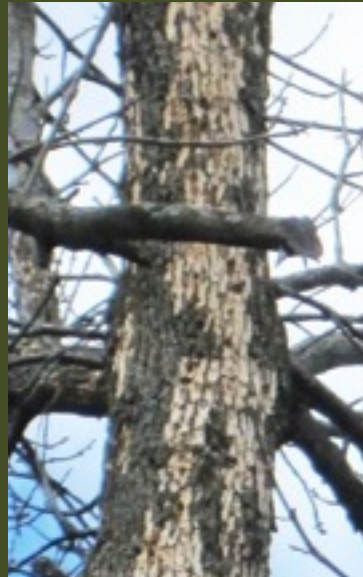
- Periodically check ash trees for signs of EAB infestation



D-shaped  
Exit Holes



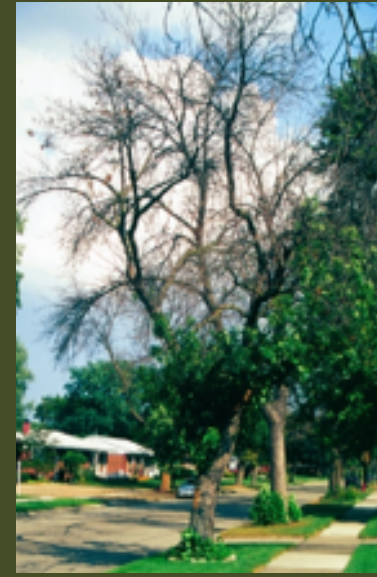
S-shaped  
Galleries



Woodpecker  
Damage



Epicormic  
Shoots



Canopy  
Dieback

# Emerald Ash Borer Reporting Form

\* Required

## Contact Information

**First Name \***

Your answer

**Last Name \***

Your answer

**Phone Number**

Your answer

**Email \***

Your answer

## Location of Sighting

**Street Address \***

(If there is no street address, describe as best you can the location [a park, a business name, etc.]. Please use any landmarks you observed at the site to help indicate the exact location. Note street intersection if appropriate.)

Your answer

**City/Town \***

Your answer

**Zip Code**



## Sighting Details

**Describe the insect seen, if one was observed**

(Color, size, shape, etc.)

Your answer

**Describe any ash tree damage seen, if any [NOTE: Emerald ash borer only attacks ash trees, genus Fraxinus.]**

(Holes in tree [indicate size and shape], S-shaped tunnels in bark, dieback of upper canopy of tree, etc.)

Your answer

## Additional Questions

**How did you hear about the emerald ash borer? \***

- ☐ News coverage on tv, radio, or in a newspaper
- ☐ An internet news source
- ☐ Word of mouth
- ☐ A presentation or training class
- ☐ A billboard or poster
- ☐ A public meeting (town meeting, etc.)
- ☐ A mailing or a flyer left at a residence
- ☐ Utility bill
- ☐ A display at an event, public library, etc.
- ☐ Other:

**Anything Else?**

(If you have any other questions or issues not addressed in this form, let us know here)

Your answer

SUBMIT



Common Invasive Plant Identification

Emerald Ash Borer

Invasive Plant Interpretive Trail

Invasive Species Management

Map of Reported Invasive Species

More Invasive Species Resources

Natives & Invasives in Your Yard

Report Invasive Species Sightings

Report Signs of Emerald Ash Borer

Home » Departments » Conservation » Invasive Species



## Report Signs of Emerald Ash Borer

Use this form to report an sightings of emerald ash borers or signs of emerald ash borer damage to ash trees. The Town's Conservation and Forestry Departments will review the information and then contact you about next steps.

Photographs and GPS coordinates are also helpful.

Name \*

Email

Phone \*

Location of sighting \*

Specific address and/or description of location (GPS coordinates if available)

Upload a photo

Choose File

No file chosen

Upload

Files must be less than 2 MB.

Allowed file types: gif jpg jpeg png.

Describe the insect seen, if one was observed

Describe any ash tree damage seen

Hole in tree (indicate size and shape), S-shaped tunnels in bark, die-back of upper canopy of tree, etc.

# What you can do: Prepare!



- Why prepare?
  - Respond quickly and efficiently to EAB
  - Slow Ash Mortality (SLAM)
  - Spread out costs over time
  - Save money \$\$\$



# EAB Preparedness: Plan

- Written document outlining objectives and approaches to address and mitigate the impact of EAB  
<http://bit.ly/PreparednessTemplate>

- Administration  
who is involved and what are their responsibilities
- Management Plan  
inventories, removals, treatments, replanting, wood utilization
- Monitoring and reporting
- Resources, needs, and opportunities  
personnel, financial, partnerships
- Education and outreach



# EAB Preparedness: Inventory

- Individuals and communities cannot begin planning for EAB unless they know what they have:
  - How many trees?
  - How many are ash?
  - Where are they?
  - What is their condition?



# EAB Preparedness: Inventory

- Only collect the information you need!
  - This may include: species, size, condition, location, management recommendations
  - Condition of trees should only be evaluated by professionals or well-trained individuals
  
- Data collectors might include:
  - municipal or in-house staff
  - hired consultant arborists
  - volunteers
  - any combination of these





# EAB Preparedness: Inventory

- DCR Urban and Community Forestry Challenge Grant
  - Annual grant program (\$1,000 - \$30,000)
  - Matching grant
  - Deadline November 1, 2018
  
- The DCR Urban and Community Forestry Program can also help with planning inventories & volunteer training

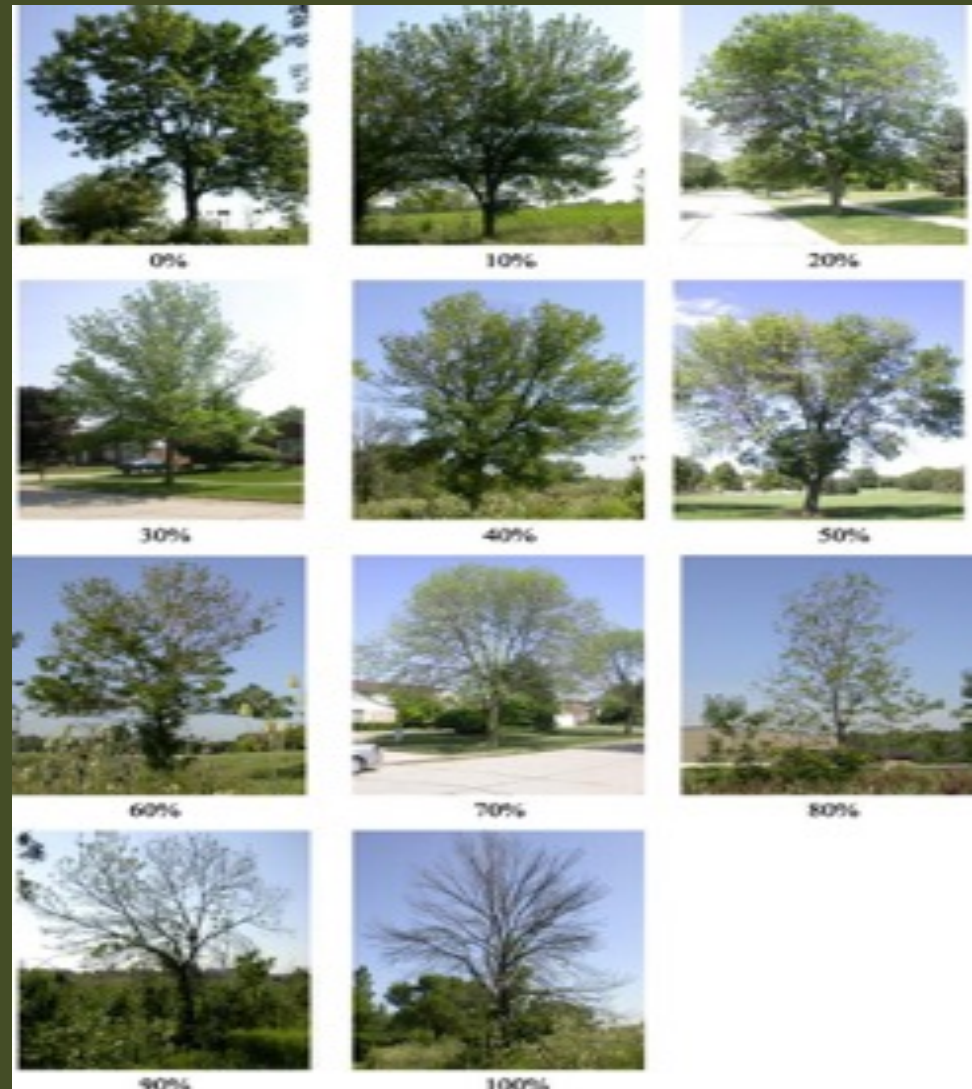
For more information visit:

[www.mass.gov/dcr/urban-and-community-forestry](http://www.mass.gov/dcr/urban-and-community-forestry)



# EAB Preparedness: Management Strategy

- Decide if the trees are worth saving
  - Balance costs and hazard
- Considerations for treatment vs. removal:
  - Extent of damage
  - Location
  - Size
  - Value (aesthetic, emotional)



# EAB Preparedness: Management Strategy



## Dealing with Emerald Ash Borer A Decision-Making Guide

1) Inventory your ash trees. How many are there? Where are they?

2) Decide if you want to save your ash trees from EAB

YES

NO



Ash trees will be killed and will need to be cut down



**Save money:**  
Remove unwanted ash trees before they die. Dying, brittle trees are more costly to remove.

3) Assess which trees are worth saving



Questions to ask:

- Is the tree valuable to landscape or owner?
- Is the tree healthy, showing few or no signs of EAB?
- Is the tree located in a good location for healthy ash growth?

4) Determine treatment options for trees worth saving



Measure your trees:

- Hold a tape measure at chest height
- Measure the distance around the trunk
- Divide this number by 3 to get Diameter at Breast Height (DBH)

DBH < 20 inches:

Homeowners can opt to treat trees themselves

Use a soil drench containing a pesticide labeled for use with EAB. Ensure drench is applied to bare soil within 1 foot of the trunk. Treat trees in spring, typically from April 1st - May 15th.

DBH > 20 inches:

Consult a Tree Care Professional

To find one in your area visit:  
<http://bit.ly/masscertarbor>

For more info about Emerald Ash Borer and advice for managing ash trees, visit <http://mass.gov/eab>

Adapted from a document produced by AnneMarie W. Nigh and Cliff Gault, courtesy of Purdue University.

MDAR  
www.mass.gov/ag

## Tree removal

- More cost efficient to remove trees before they become infested

## Treatment

- Find a tree care professional in your area

<http://bit.ly/masscertarbor>



# EAB Preparedness: Wood Utilization

- Use the wood in your backyard:
  - Lumber
  - Landscape materials
  - Art and furniture
  - Firewood
  
- Economically dispose of it:
  - Sell your ash to a reputable industry
  - Dispose of tree at a local disposal site
  - Provide materials to local woodworkers
  - Donate the wood



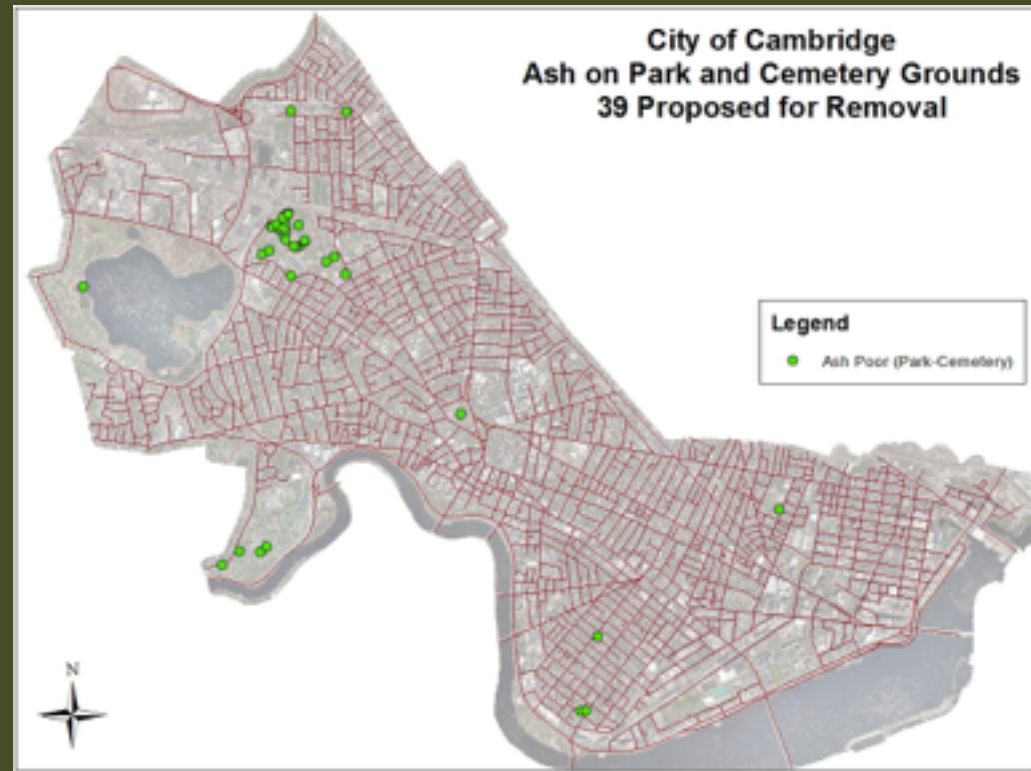
# EAB Preparedness: Wood Utilization

- Start a wood bank in your community!
  - Great for communities where wood is used to heat homes
  - Free wood for residents
  - Volunteer run
  
- The DCR Market & Utilization program can help, for more information:
  - <http://bit.ly/DCRutilization>
  - Peter Church, Director of Forest Stewardship  
617-626-1461 or [peter.church@state.ma.us](mailto:peter.church@state.ma.us)

# Municipality Case Study: Cambridge

## Inventories

- Forestry Division has an active tree inventory
- 775 ash trees in the City under the Tree Warden's jurisdiction
- Determine status of trees and priority removals





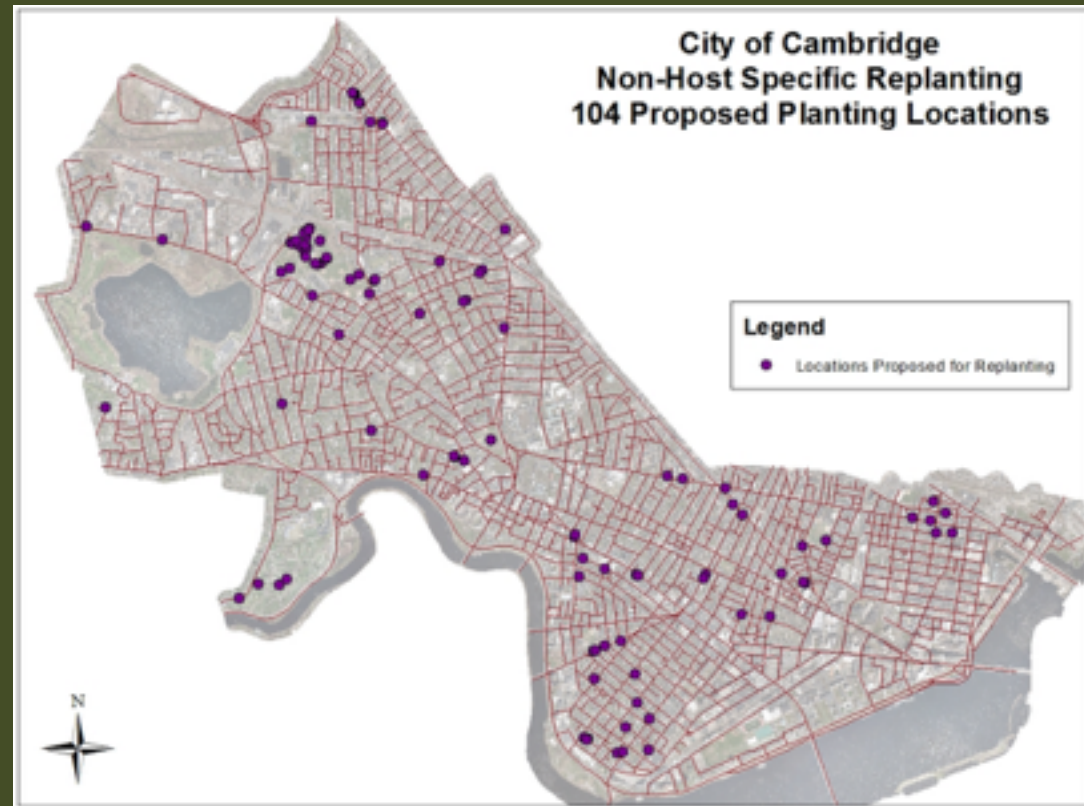
# Municipality Case Study: Cambridge

Response Plans  
Instituted an EAB  
management

Treatment

Removal of ash trees in  
poor/dead condition

Replanting locations



# Municipality Case Study: Cambridge

## Outreach Materials

- Created an EAB page on their Forestry website

[www.cambridgema.gov/eab](http://www.cambridgema.gov/eab)

- Site includes:

- EAB background
- Info on Cambridge plans
- City maps of replanting sites, removal sites, and potential removals)



# Municipality Case Study: Cambridge



## Treatments

- Have completed 1 full round of treatments using TreeAzin
  - ½ the ash population was treated Summer 2014
  - ½ of ash population was treated Summer 2015



# Tree Tagging Kits



- Kit includes:
  - Plastic tree tags
  - Fluorescent green flagging tape
  - Tips for a successful event
- Raises awareness by drawing attention to ash trees in your neighborhood, school yard, conservation land etc.
- Arbor Day Tree Tagging Project!

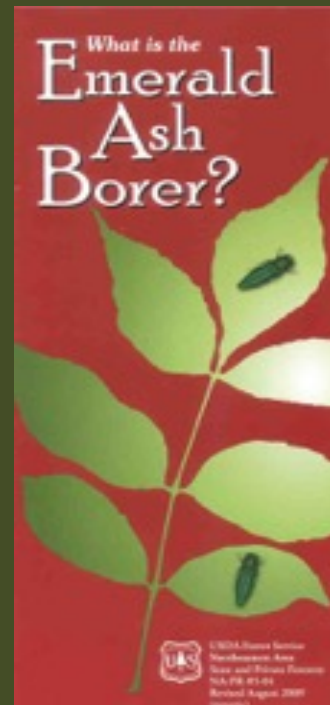
# Tree Tagging Kits





# Additional Outreach Materials & Swag

- ID cards
- Pamphlets
- Flyers & posters
- Pest alerts
- Stickers
- Temporary tattoos





# Key Points

- EAB is a destructive, wood-boring pest, now found in Massachusetts that threatens ash trees and safety
- It is essential to begin preparing for EAB now
- By preparing for EAB, individuals and communities can proactively respond to an infestation, allowing them to transition through this pest on their terms and budget

# More information

**Javier Marin**, Forest Pest Outreach Coordinator

617-626-1738

[javier.marin@state.ma.us](mailto:javier.marin@state.ma.us)

[www.massnrc.org/pests](http://www.massnrc.org/pests)

[www.emeraldashborer.info](http://www.emeraldashborer.info)



We can help with talks,  
surveys and outreach  
material!