

Evolution of the Regulatory Response to Emerald Ash Borer Infestation in the USA

A history of adaptation across federal and state jurisdictions



Agrilus planipennis

PREPSYS OECD
06-09 Oct 2018
Vienna, Austria

Scott Pfister, Director
Otis Laboratory
USDA APHIS PPQ CPHST

Acknowledgements:

Robyn Rose, Paul Chaloux,
Ben Slager, Juli Gould,
Joe Francese, APHIS;
Juan Duan, ARS

The Emerald Ash Borer Program



Maintain Ash as a Viable
Part of the American
Landscape



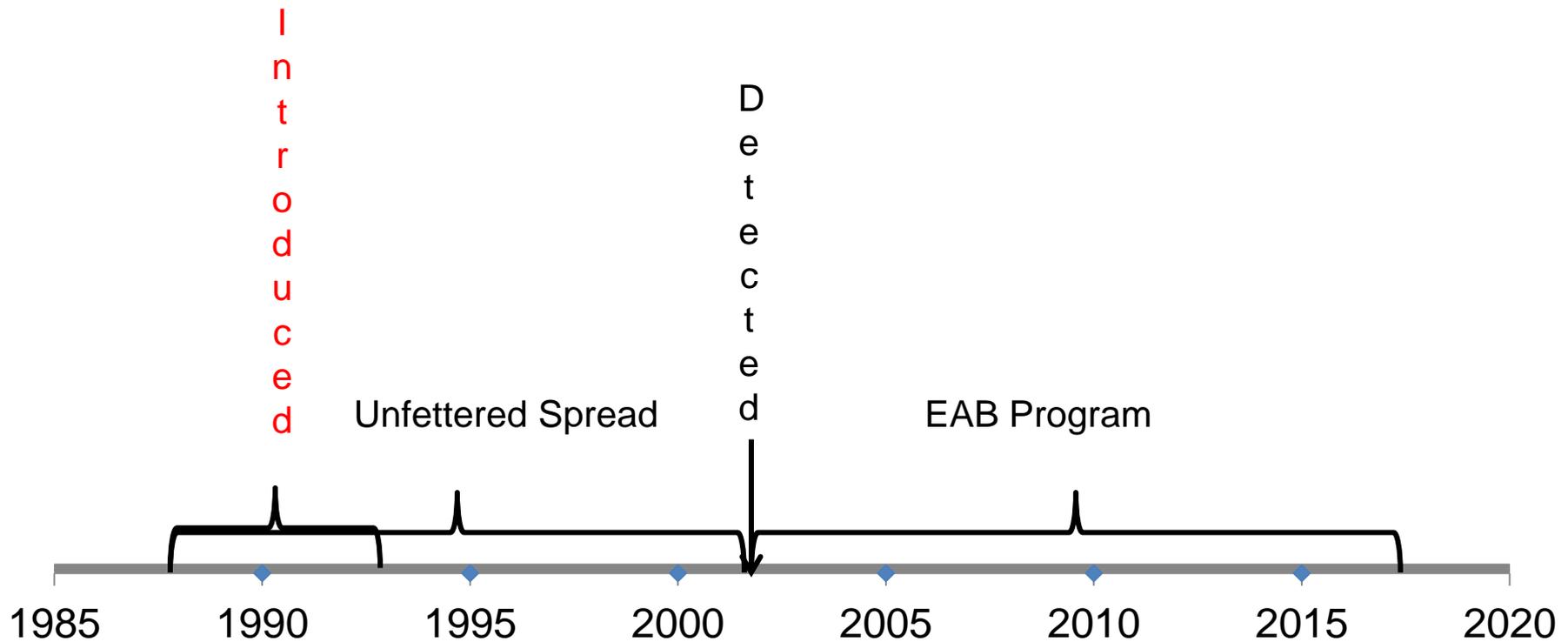


United States Department of Agriculture

OVERVIEW



Timeline of EAB in U.S.





1 From May to September, beetles mate and the female lays 60-90 eggs, one at a time, in crevices all over the bark of healthy ash trees.

Eggs



1/25 of an inch long

2 Eggs hatch as larvae, which tunnel through bark and into tree's cambial tissue. In winter, the larvae zig zag while feeding on cambial tissue that disrupts the tree's vascular tissue, eventually killing the tree.

Larvae



Mature larvae are about an inch long

3 When warmer weather arrives (usually in April), larvae enter the pupal stage. They transform from larvae into sexually mature adults.

Pupae

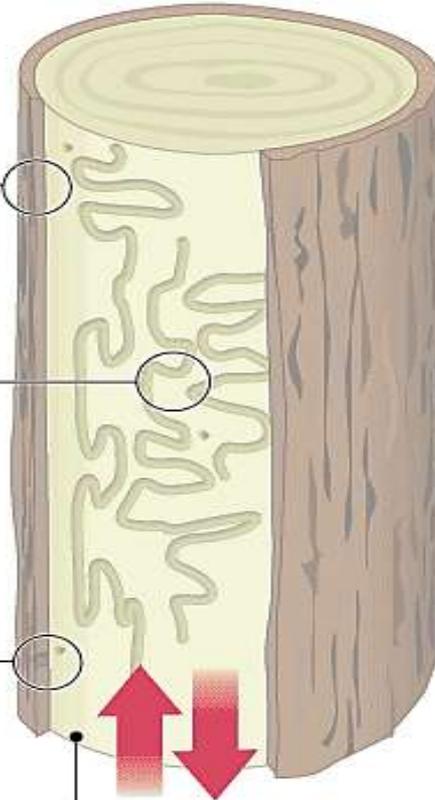


4 In mid to late May, the pupae turn into beetles and emerge through holes the larva left in the bark.

Beetle



Adult beetles are 1/3 to 1/2 inches long.



Cambial tissue:
The transportation system that takes water, minerals, and nutrients throughout the tree.

5 The cycle begins again as male and females feed on leaves at the top of trees and begin mating and laying eggs for three to four weeks before dying.





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EAB – larval damage





UGA1439002

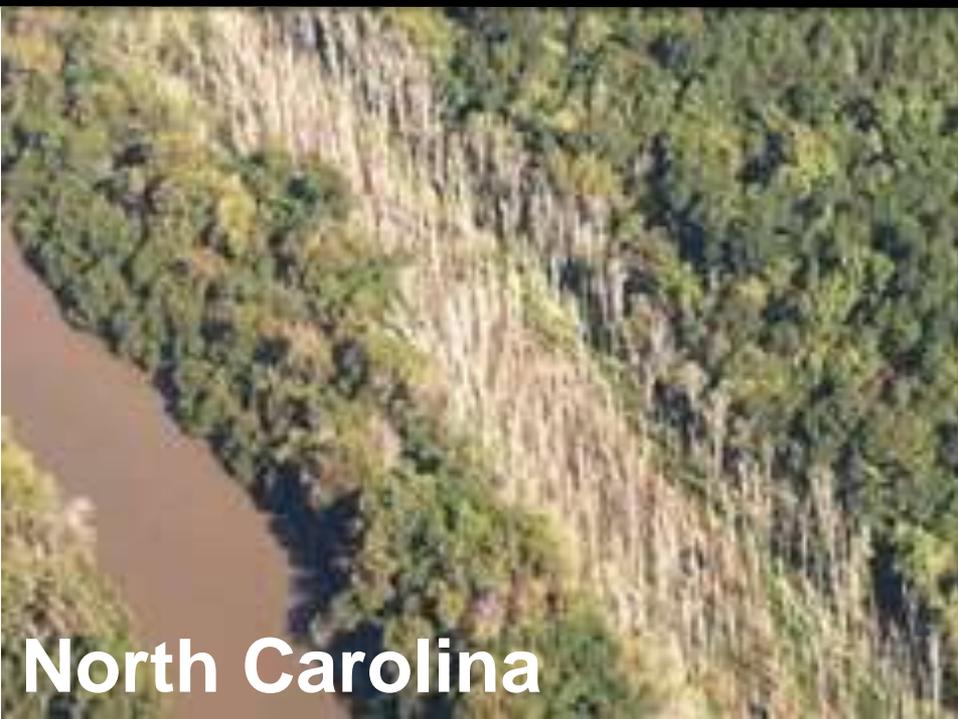




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EAB – damage

Ontario, Canada



North Carolina





Ash
Fraxinus spp.



White Fringe Tree
Chionanthus virginicus



Cultivated Olive
Olea europea

Feeding and Development of Emerald Ash Borer
(Coleoptera: Buprestidae) on Cultivated Olive,
Olea europaea

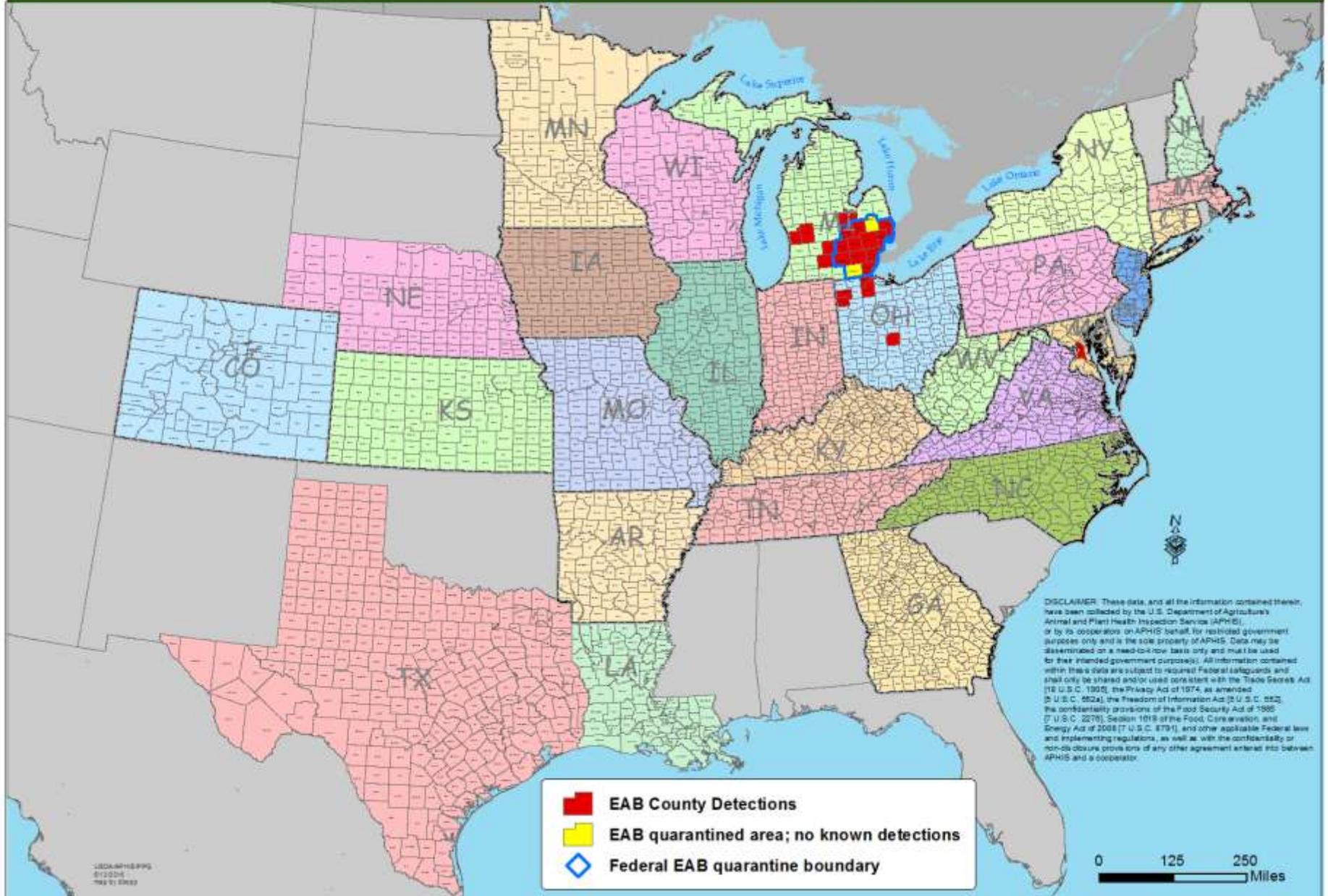
Journal of Economic Entomology - 2017

Don Cipollini,^{1,2} Chad M. Rigsby,^{1,3} and Donnie L. Peterson¹



Cooperative Emerald Ash Borer Project

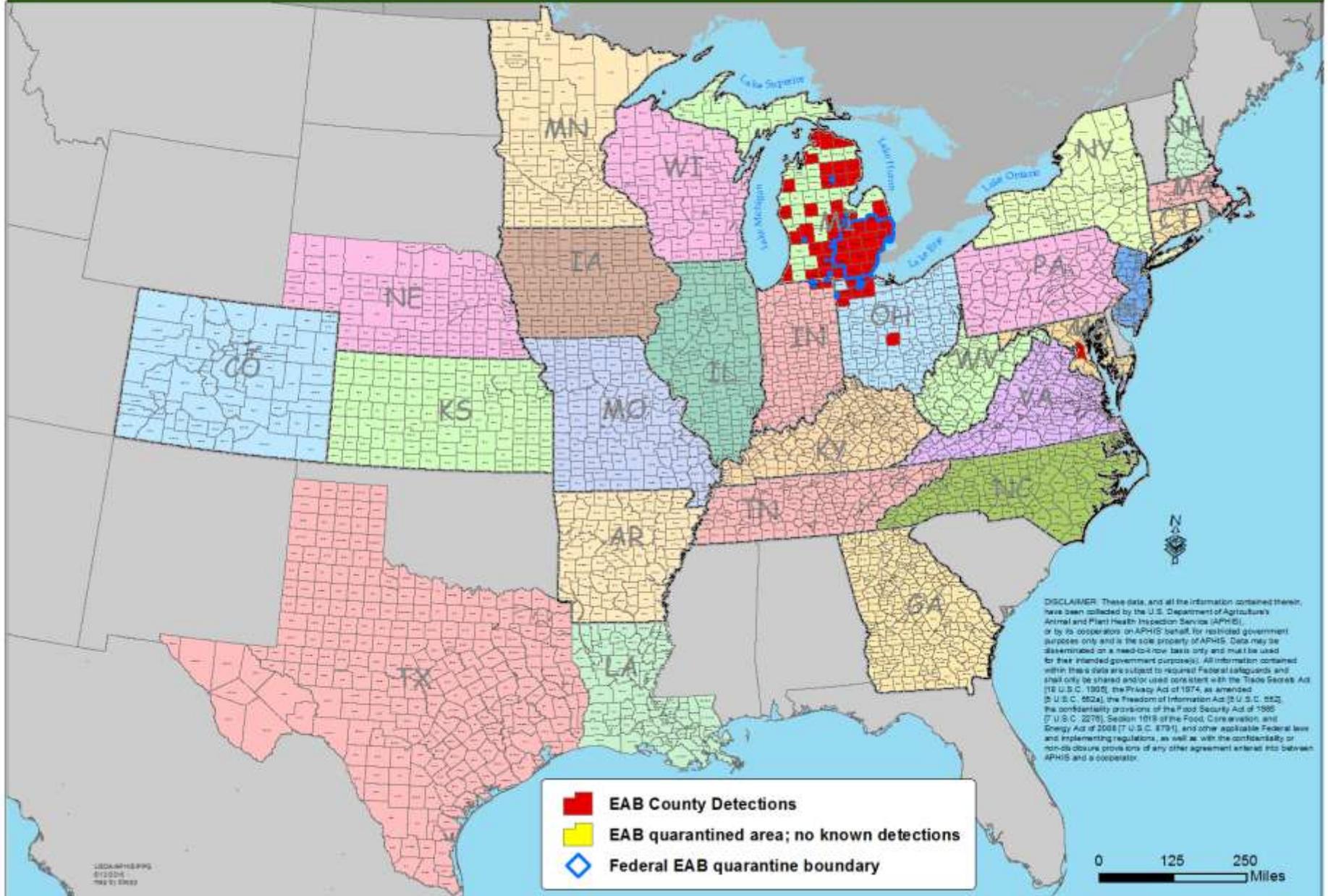
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

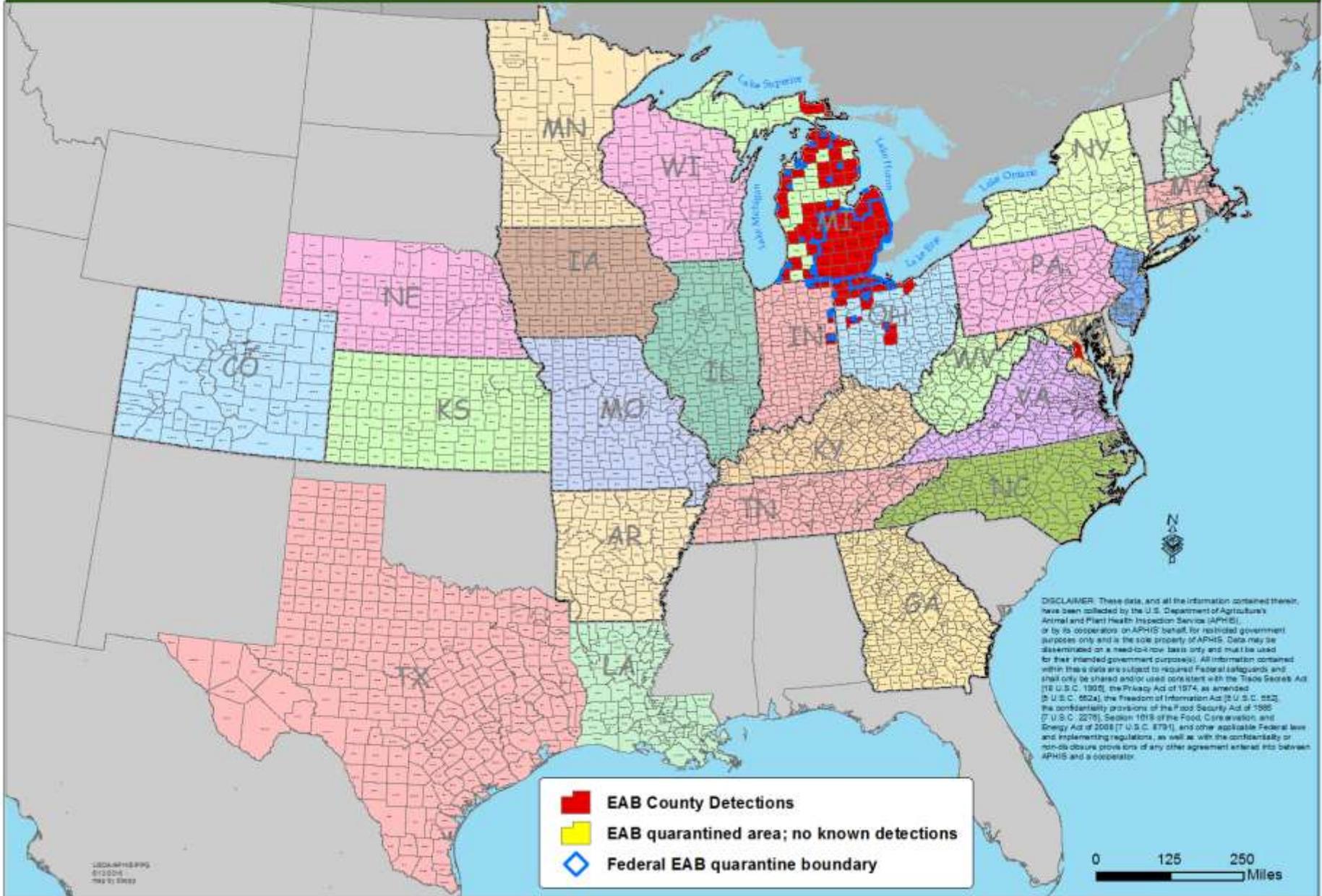
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

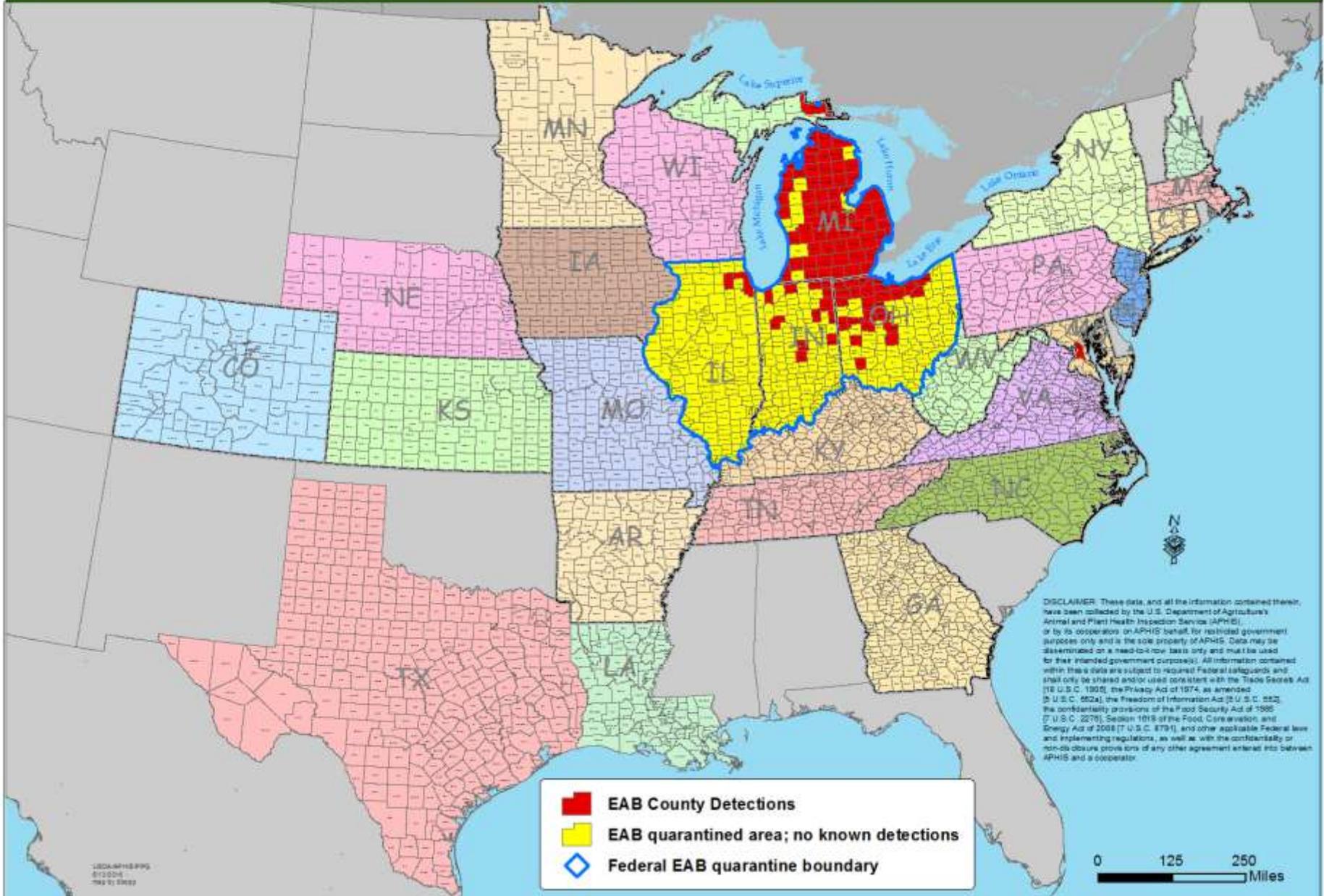
EAB County Detections with Federal Quarantine





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EAB County Detections with Federal Quarantine



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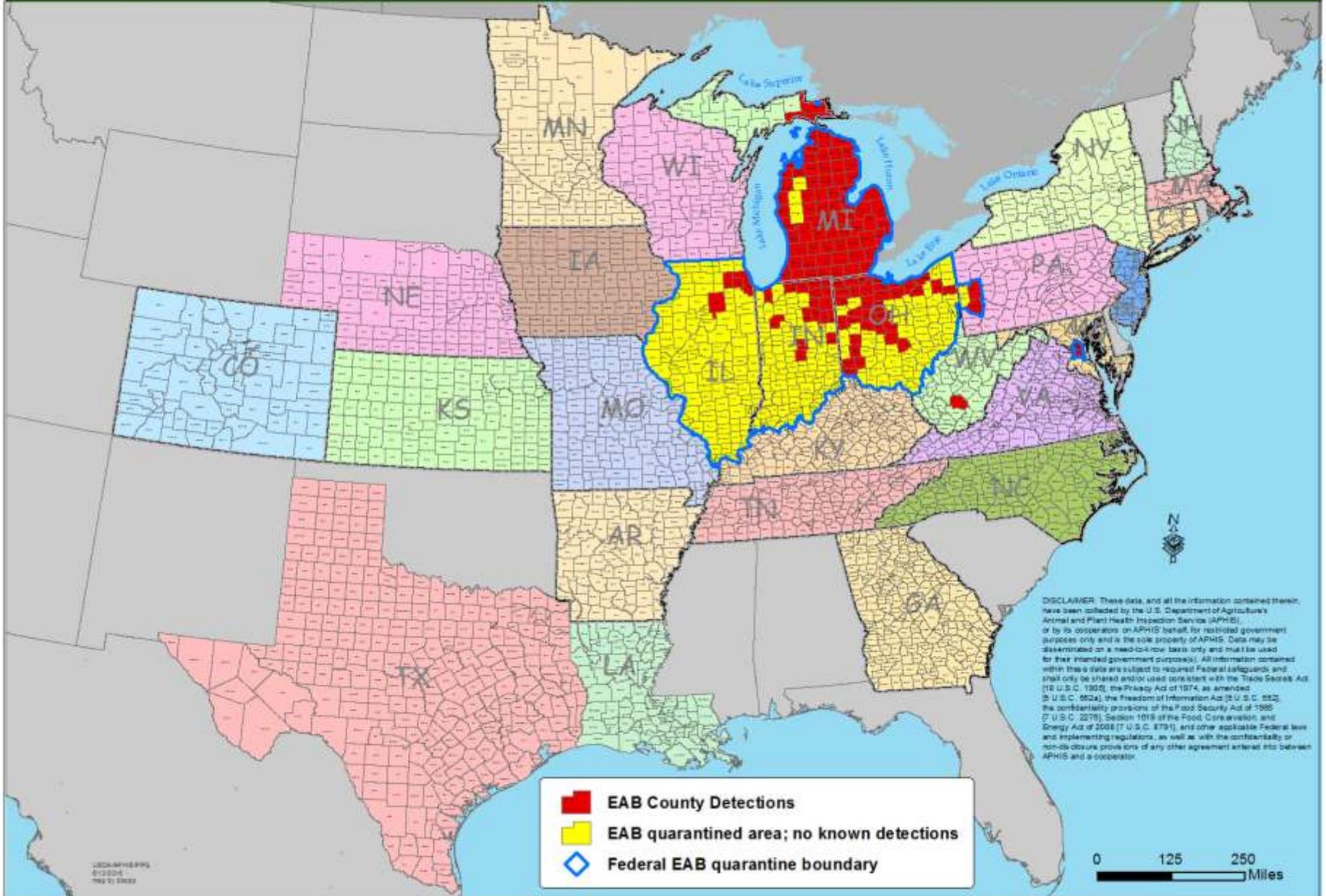
-  EAB County Detections
-  EAB quarantined area; no known detections
-  Federal EAB quarantine boundary





Cooperative Emerald Ash Borer Project

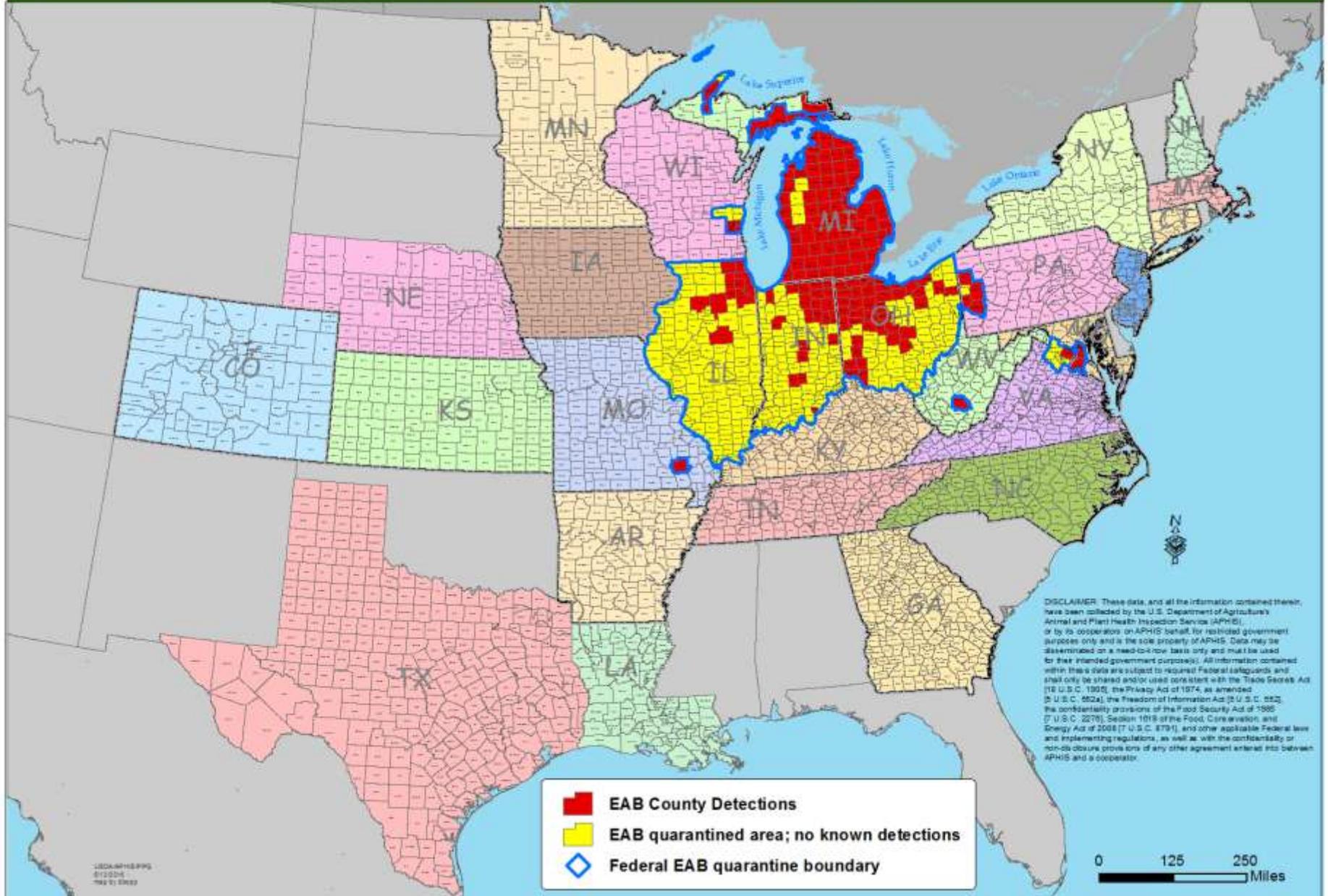
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

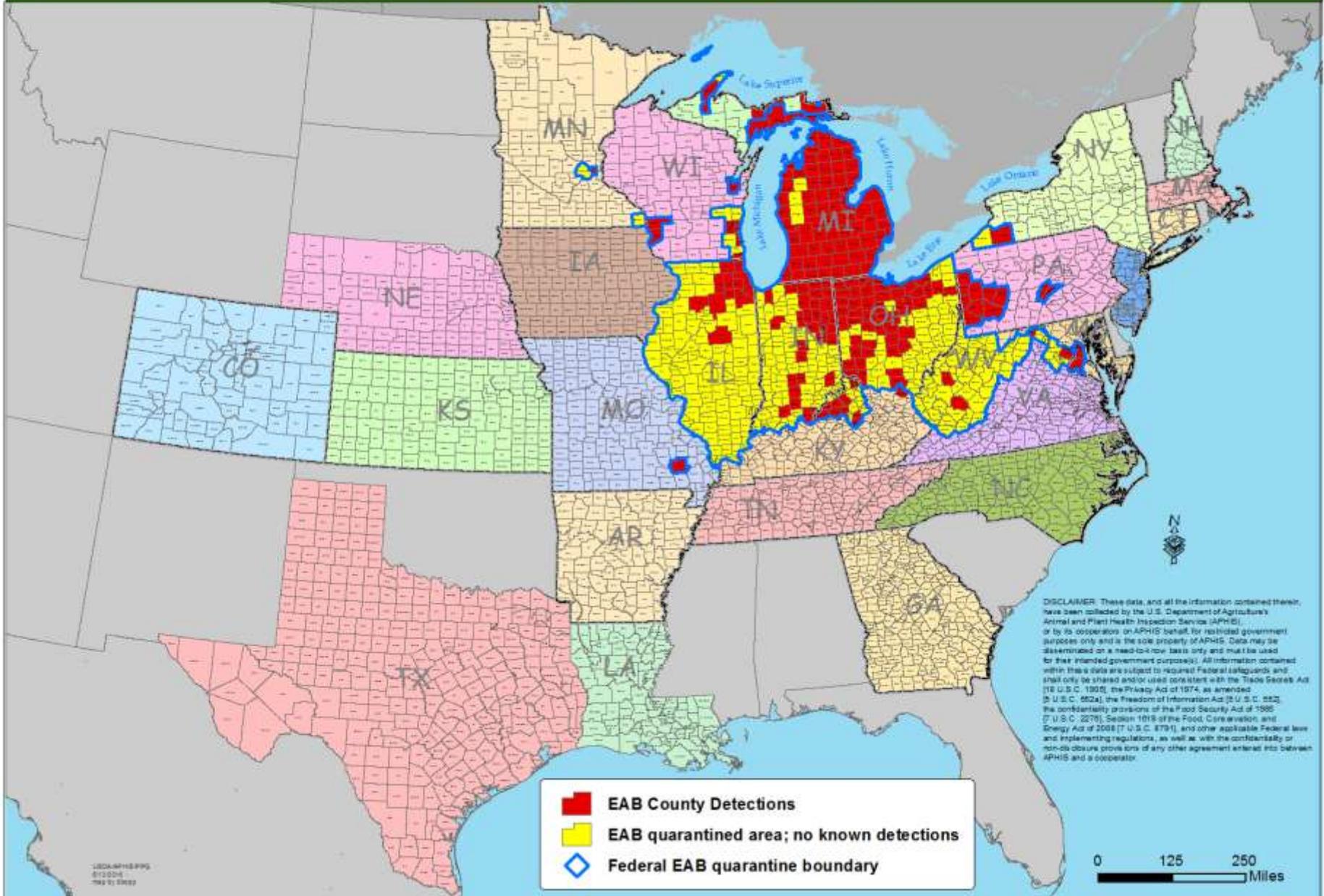
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

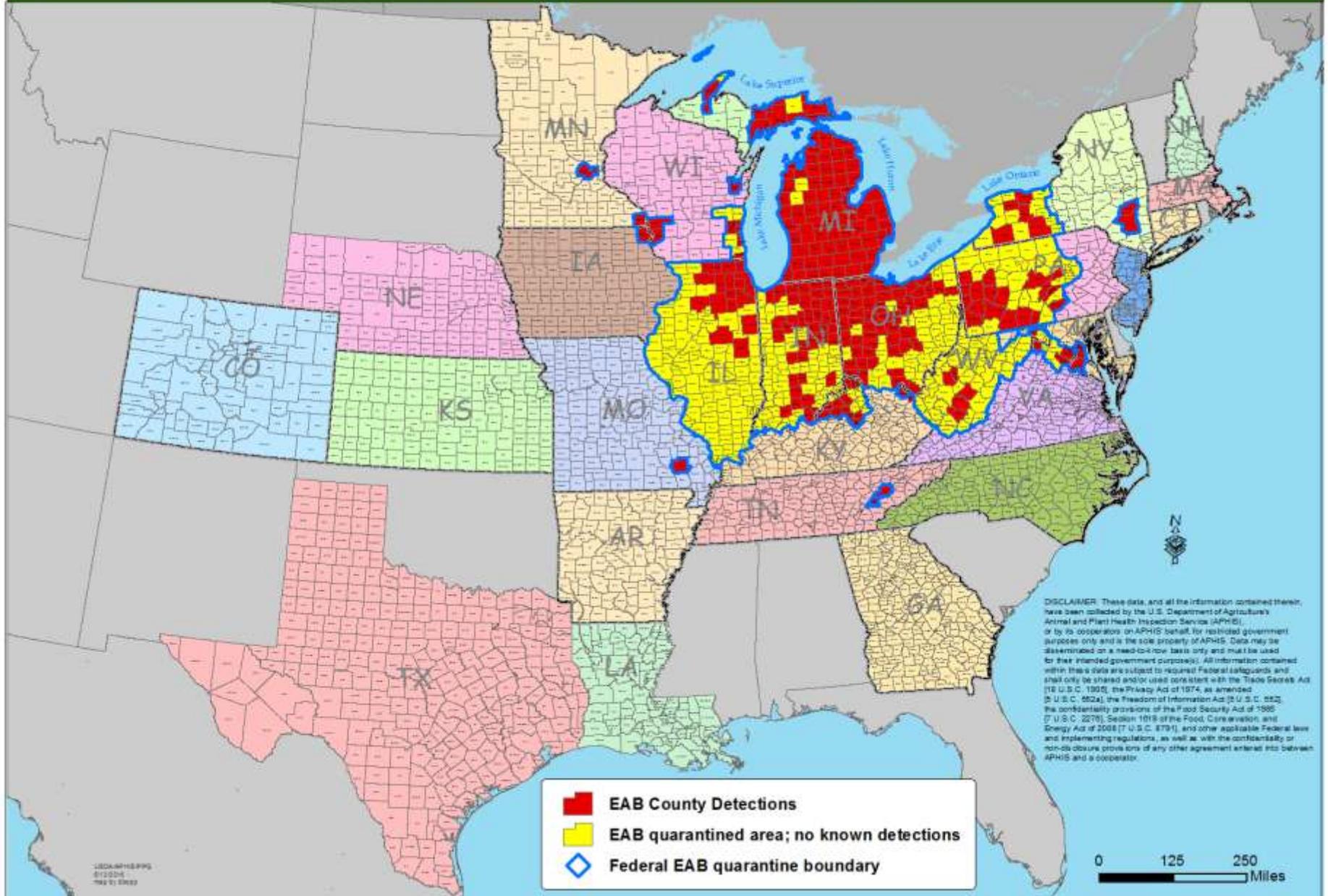
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

EAB County Detections with Federal Quarantine



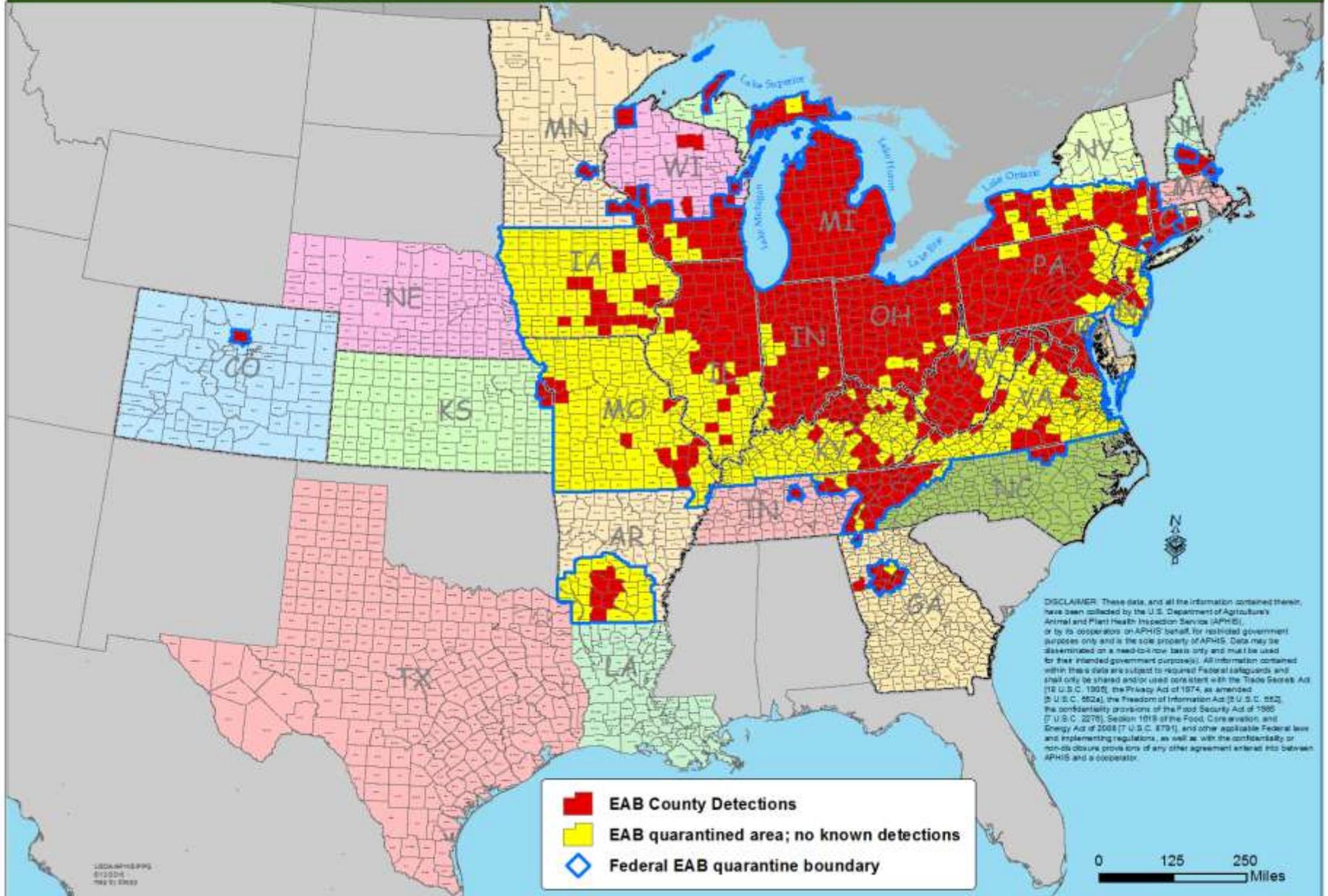
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Cooperative Emerald Ash Borer Project EAB County Detections with Federal Quarantine



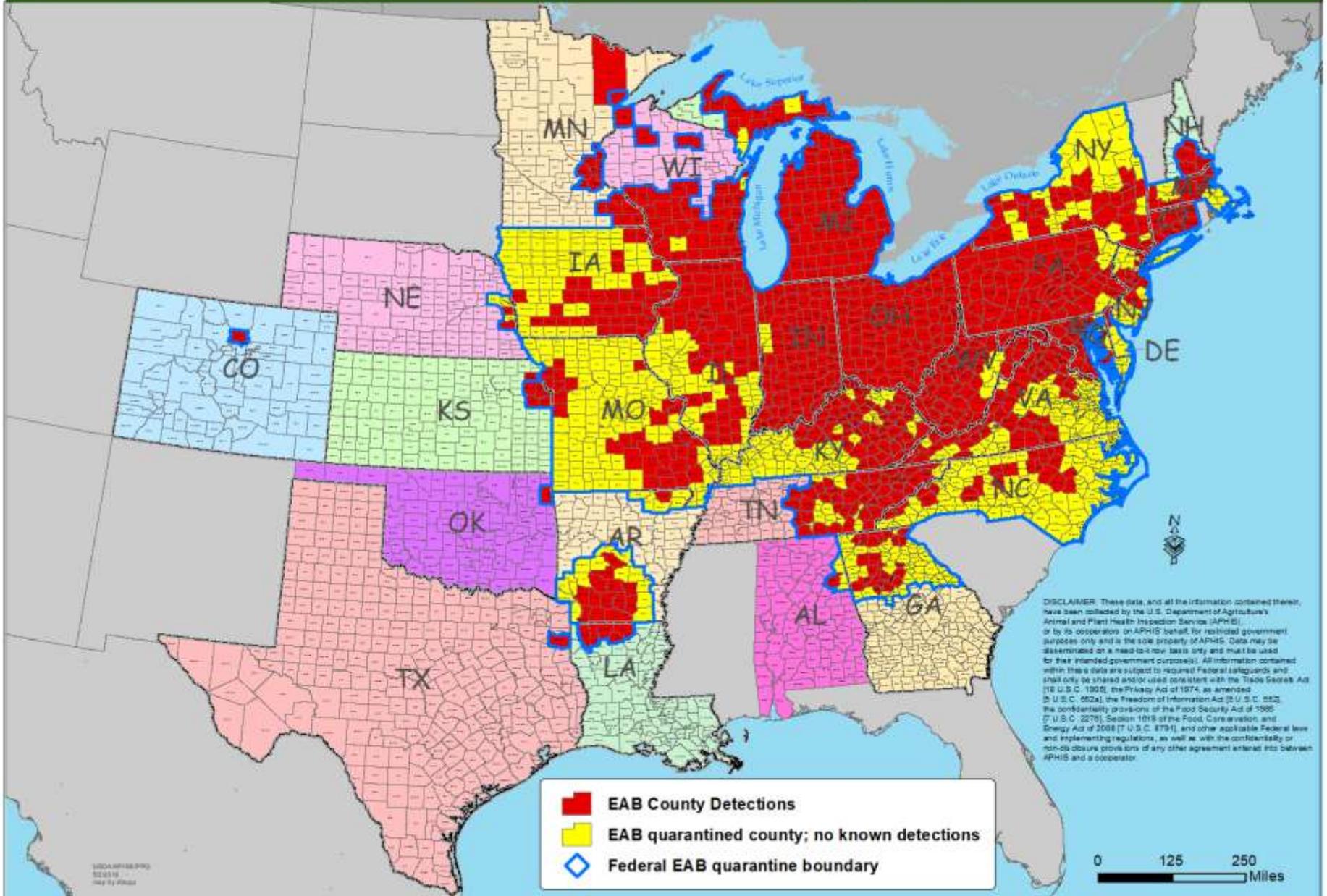
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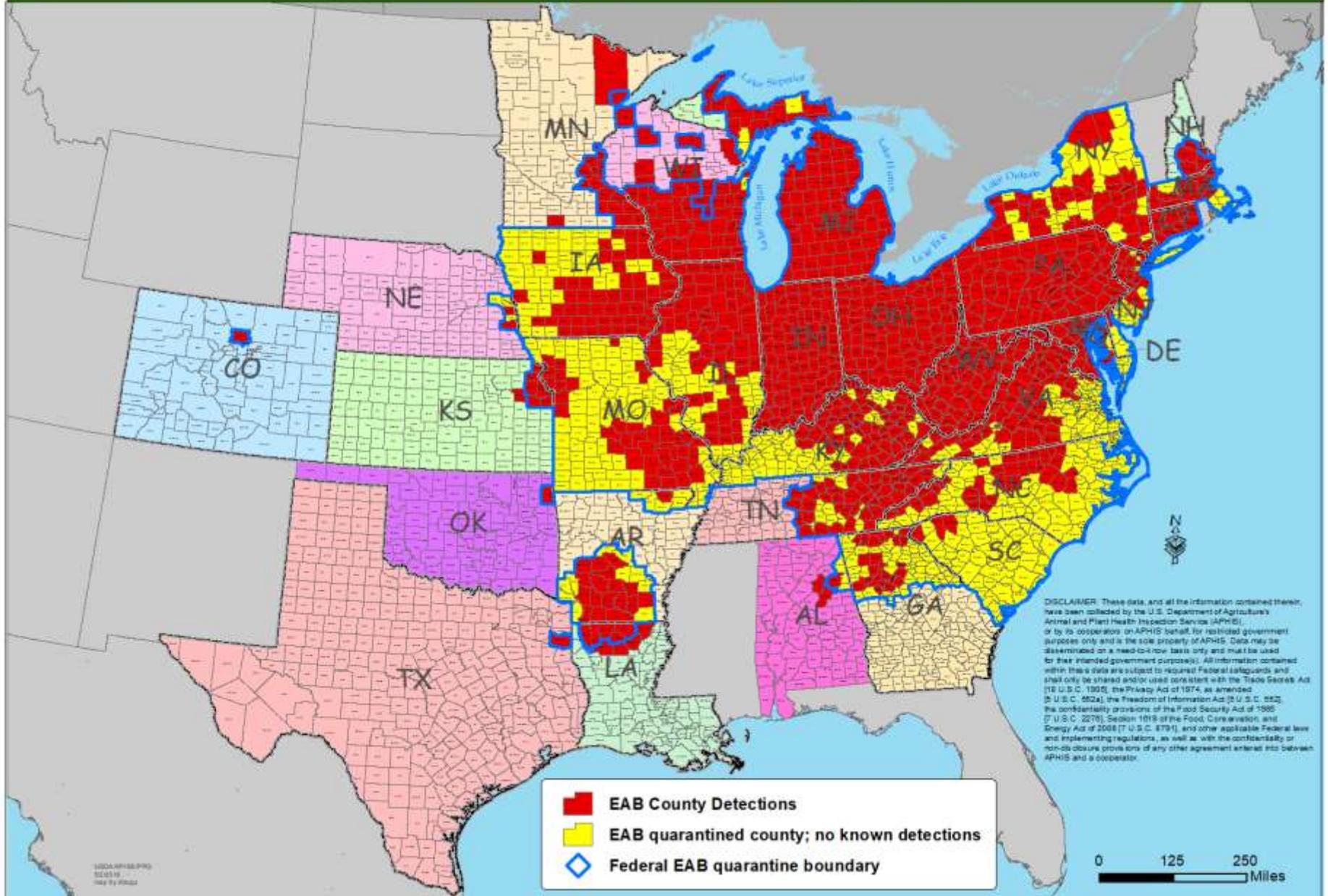
EAB County Detections with Federal Quarantine





Cooperative Emerald Ash Borer Project

EAB County Detections with Federal Quarantine

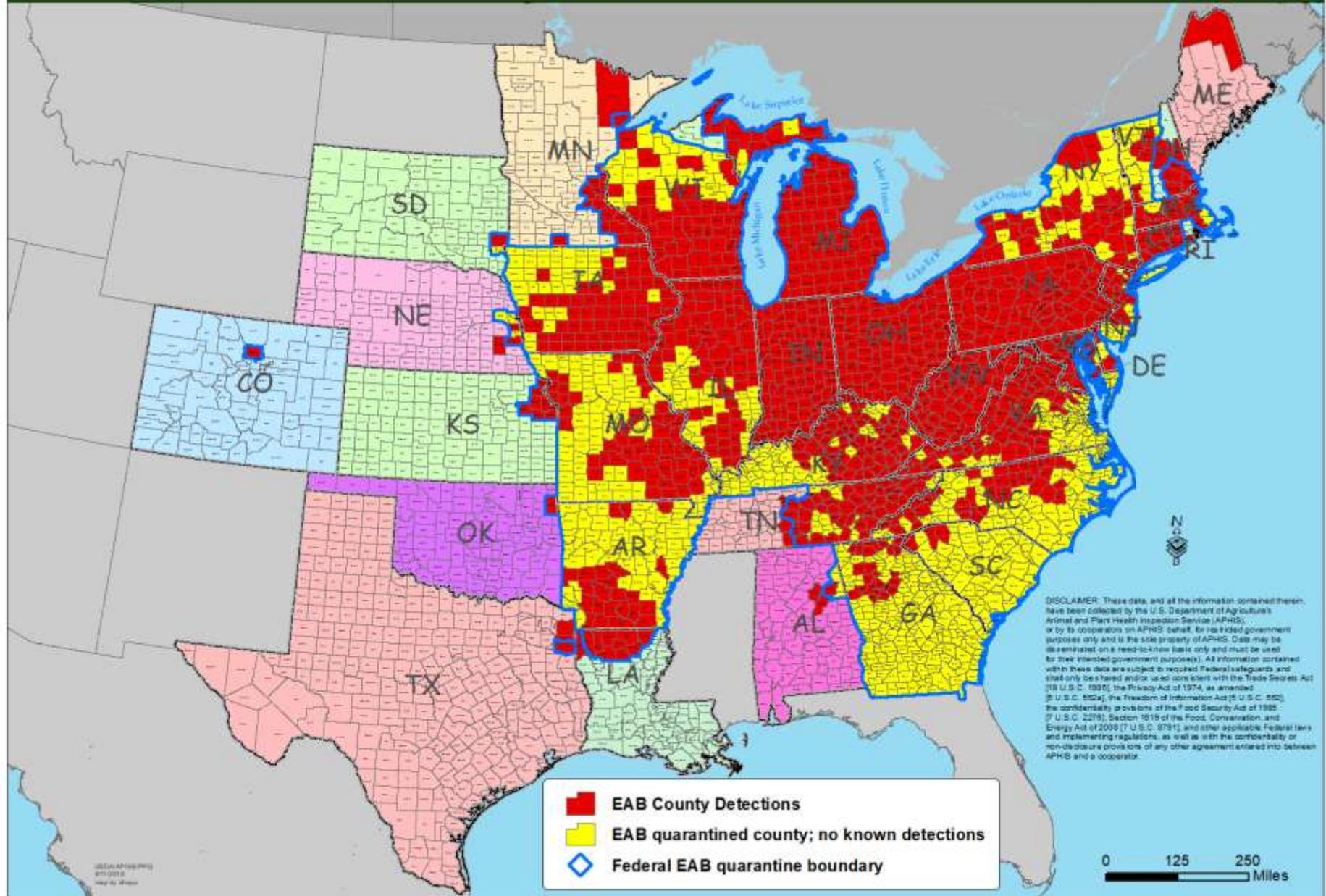




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EAB County Detections with Federal Quarantine

September 10, 2018



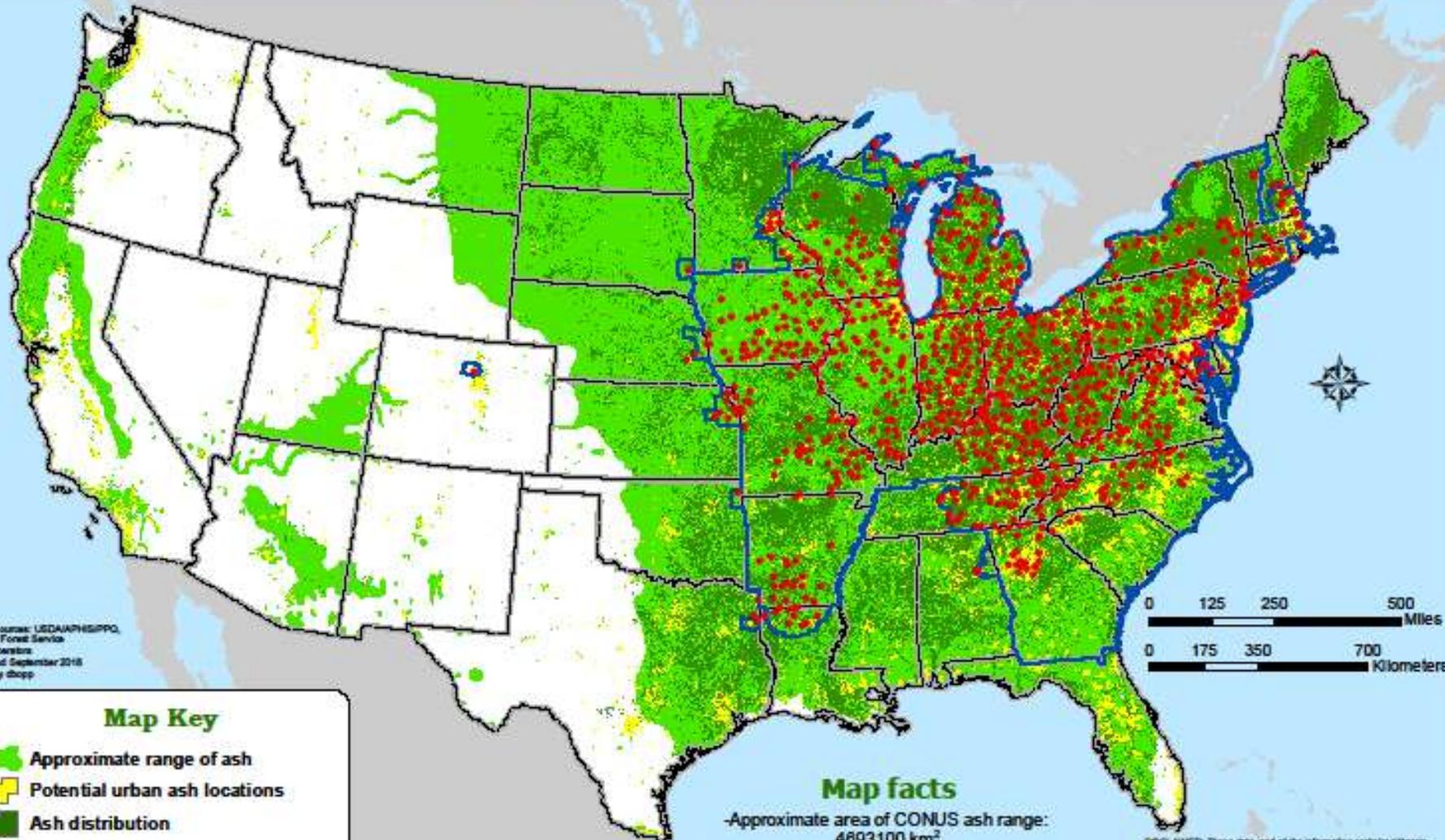


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Approximate range of ash species in the Contiguous U.S.
with EAB positives and Federal quarantines

September 6, 2018



Data source: USDA/APHIS/PPQ,
USDA Forest Service
& cooperators
updated September 2018
map by dlopp

Map Key

- Approximate range of ash
- Potential urban ash locations
- Ash distribution
- Federal EAB quarantine boundaries
- Initial county EAB detection

Map facts

-Approximate area of CONUS ash range:
4693100 km²

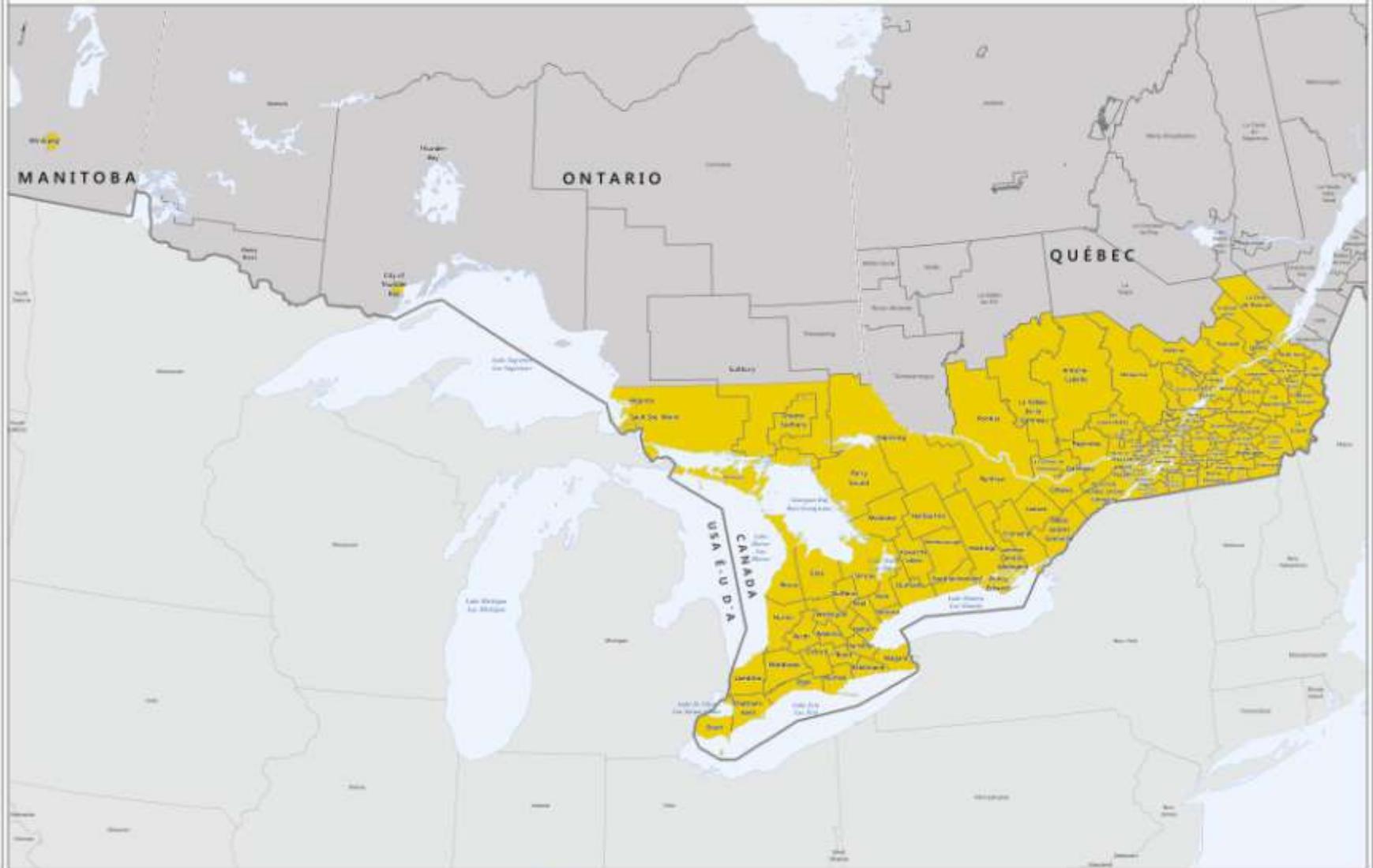
-Area of U.S. Federal quarantine:
2222855 km²

Total area of counties where EAB is present

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EMERALD ASH BORER REGULATED AREAS OF CANADA

LIEUX RÉGLEMENTÉS POUR L'AGRILE DU FRÊNE AU CANADA



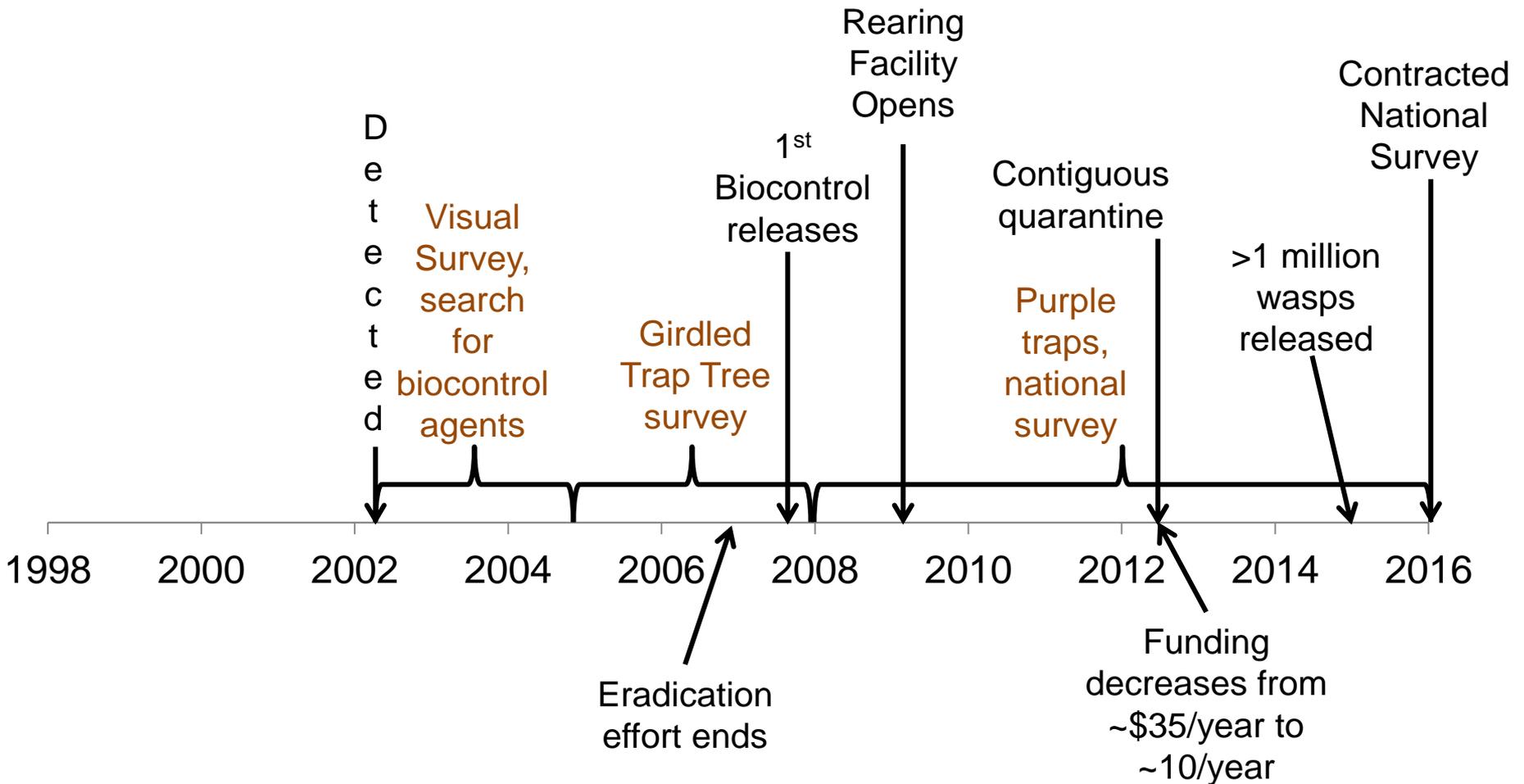
0 25 50 100 km
0 25 50 100 mi
Map Projection: Canada Albers Equal Area Conic / Projection: cartographie géométrique régulière de l'Albers-Canada

Areas regulated | Lieux réglementés

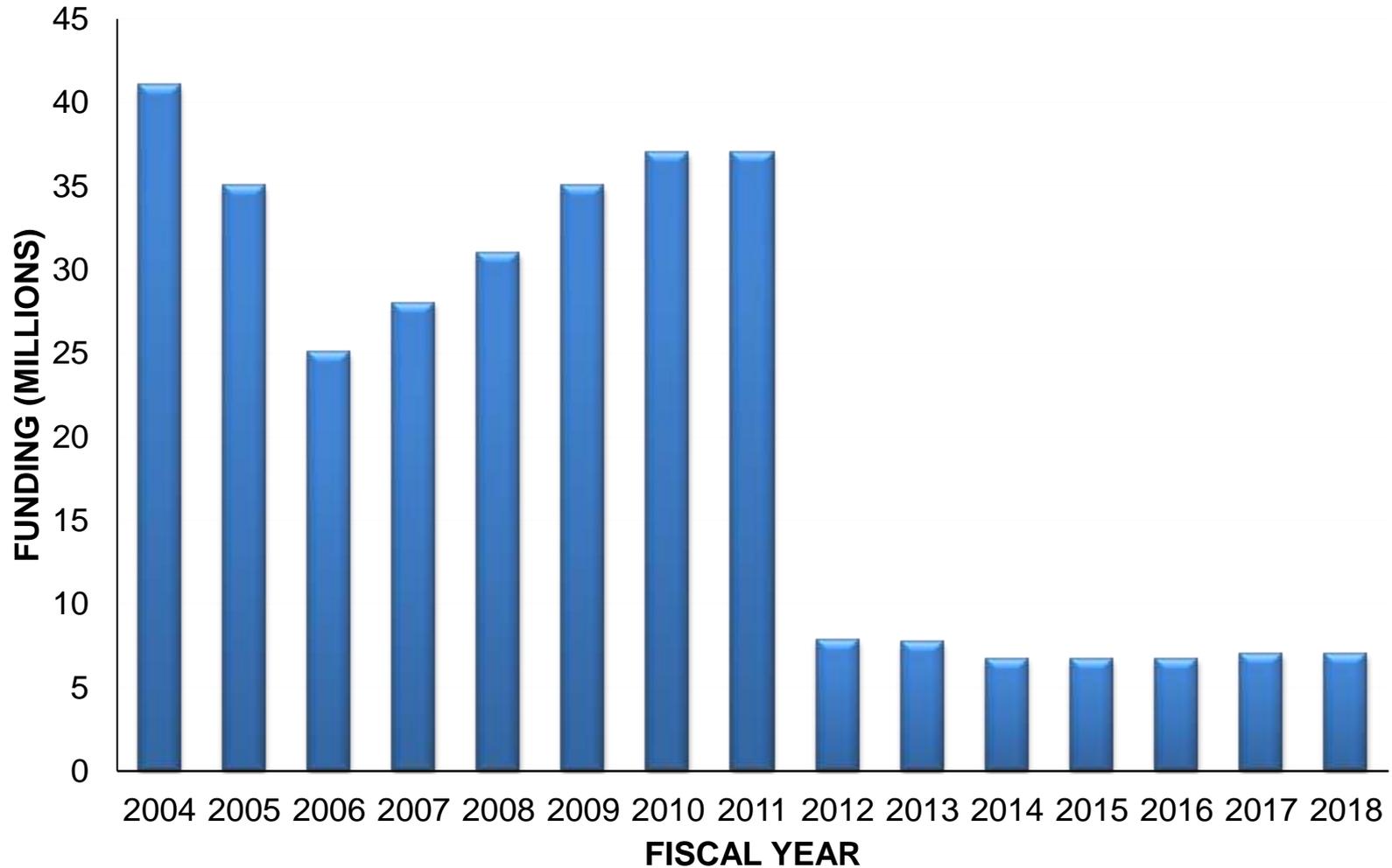
Version: 2017
March 12

© 2017 The Canadian Forest Inspection Agency (CFIA), Mapping and GIS Services, London, Ontario | L'Agence canadienne d'inspection des aliments, Cartographie et services SIG, London, Ontario

Timeline Of EAB Program



EAB Funding

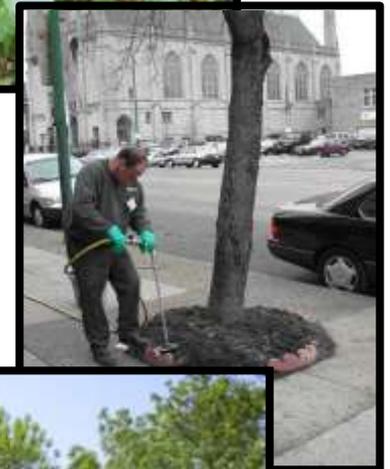


Initial Control Strategies

Mechanical



Chemical



Regulatory

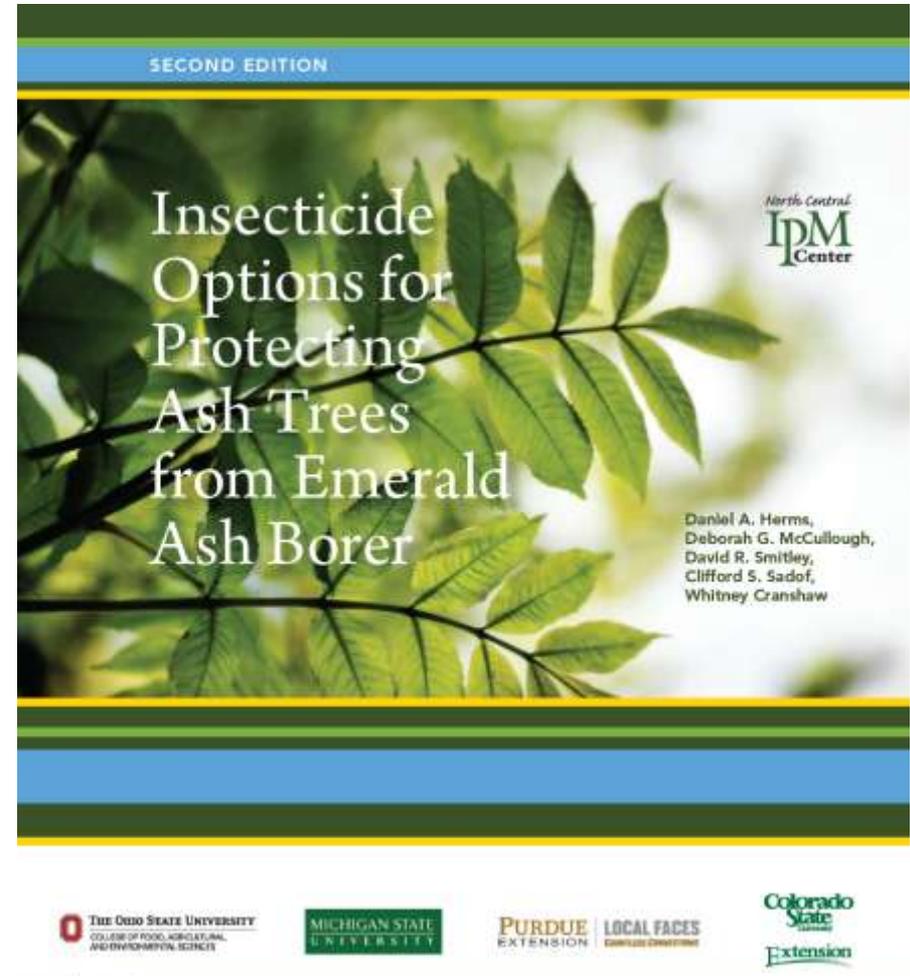


EAB Chemicals

Online publication outlining insecticide options compiled by Dan Herms, Deb McCullough, David Smitley, Clifford Sadof, Whitney Cranshaw

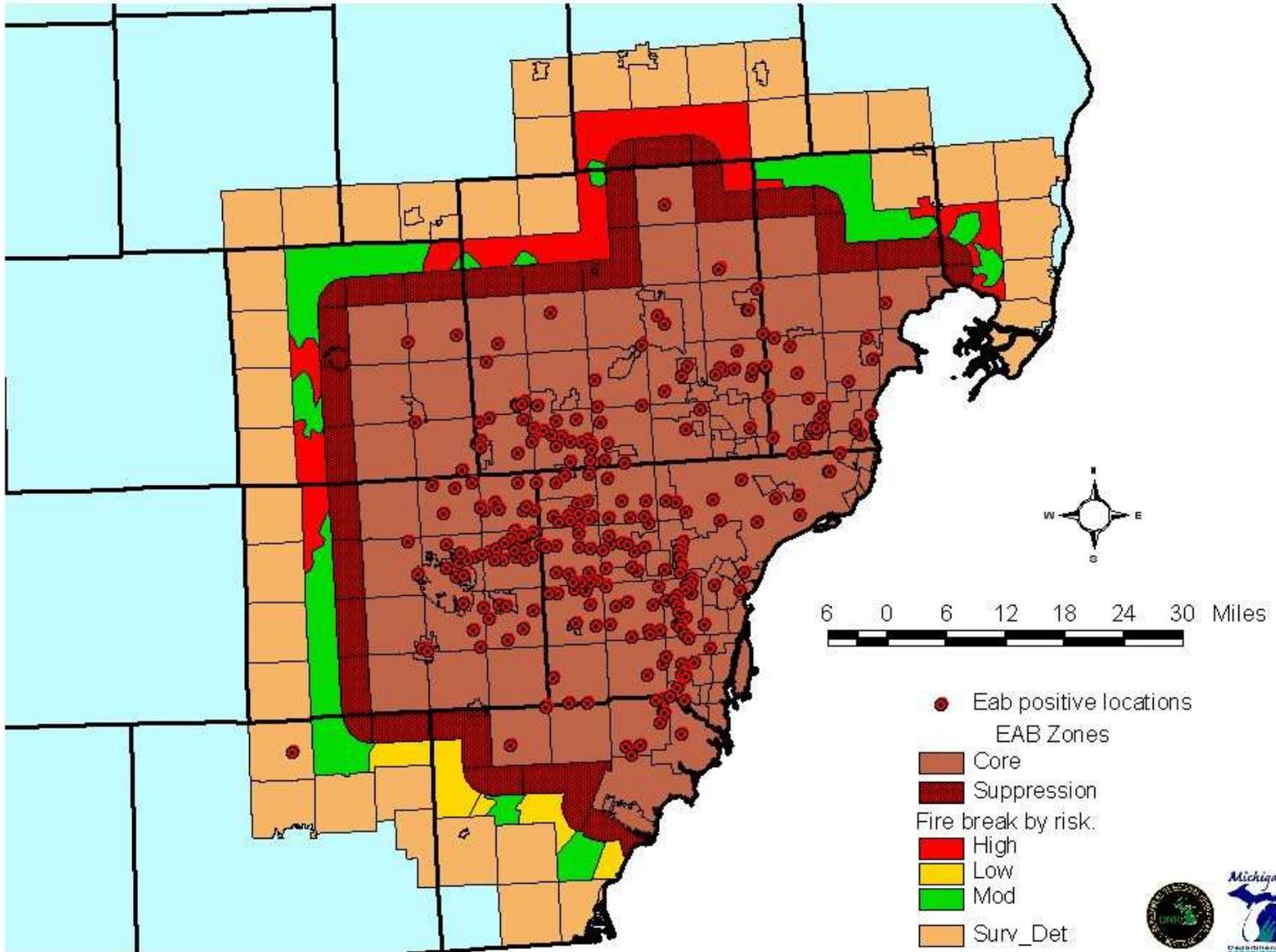
Emamectin benzoate is considered to be the ‘silver bullet’.

- It has been used as a rescue treatment for ash trees severely affected by EAB.
- A single treatment can protect a tree for multiple years and 99+% control has been observed.



http://emeraldashborer.info/files/multistate_EAB_Insecticide_Fact_Sheet.pdf

Proposed EAB Management Zones 12-20-02





United States Department of Agriculture

Movement





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PROGRAM - Outreach

**DON'T MOVE
FIREWOOD**



**Inspect and Report
1-866-322-4512**



TALK ABOUT EAB



ASK QUESTIONS



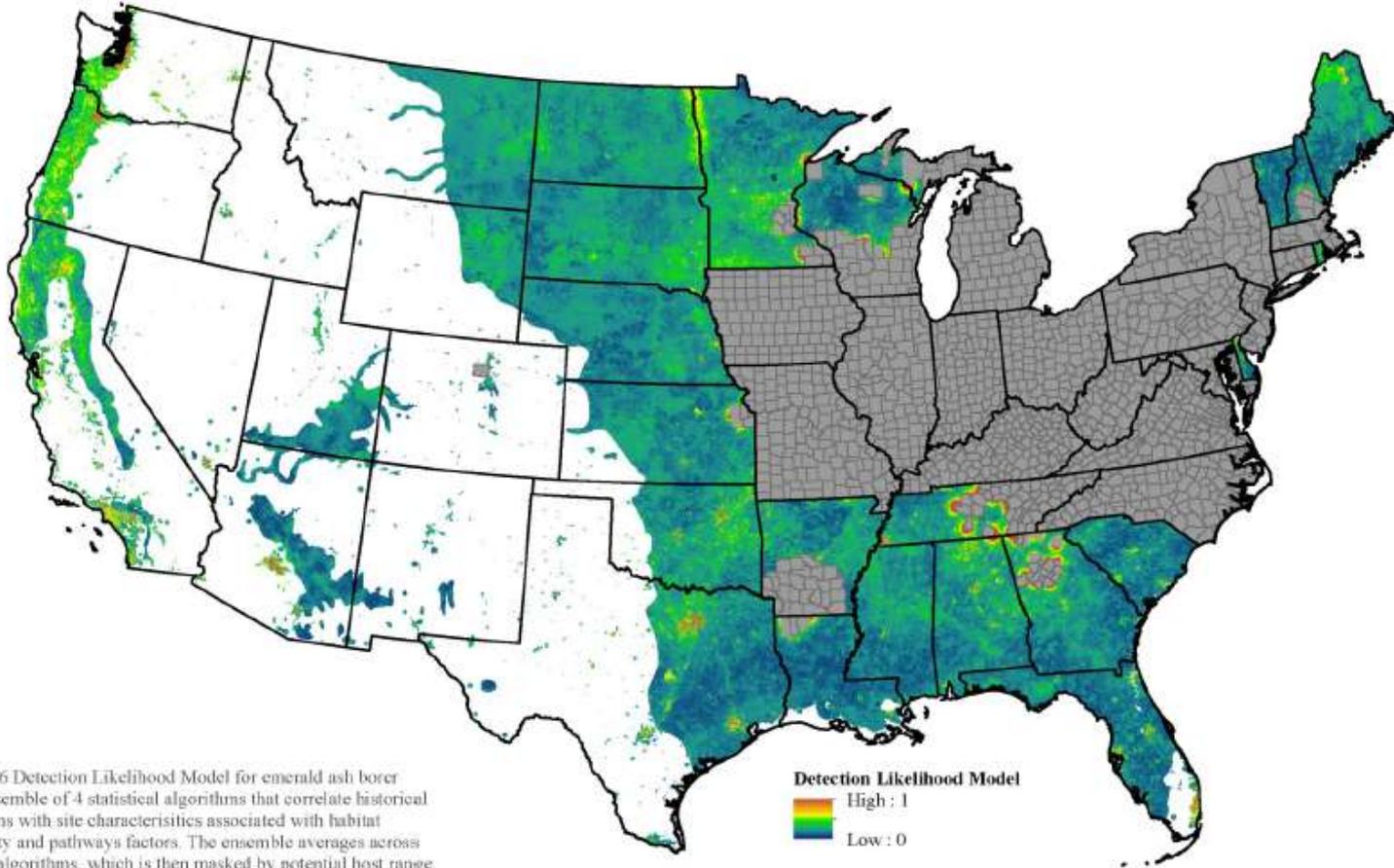


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PROGRAM – survey / trapping



2016 Emerald Ash Borer Detection Likelihood Model



The 2016 Detection Likelihood Model for emerald ash borer is an ensemble of 4 statistical algorithms that correlate historical detections with site characteristics associated with habitat suitability and pathways factors. The ensemble averages across all four algorithms, which is then masked by potential host range. The higher the value of the detection likelihood, the higher the risk of finding EAB due to similarity of site characteristics compared to where the pest has already been found.

Detection Likelihood Model



Federal Quarantine Area

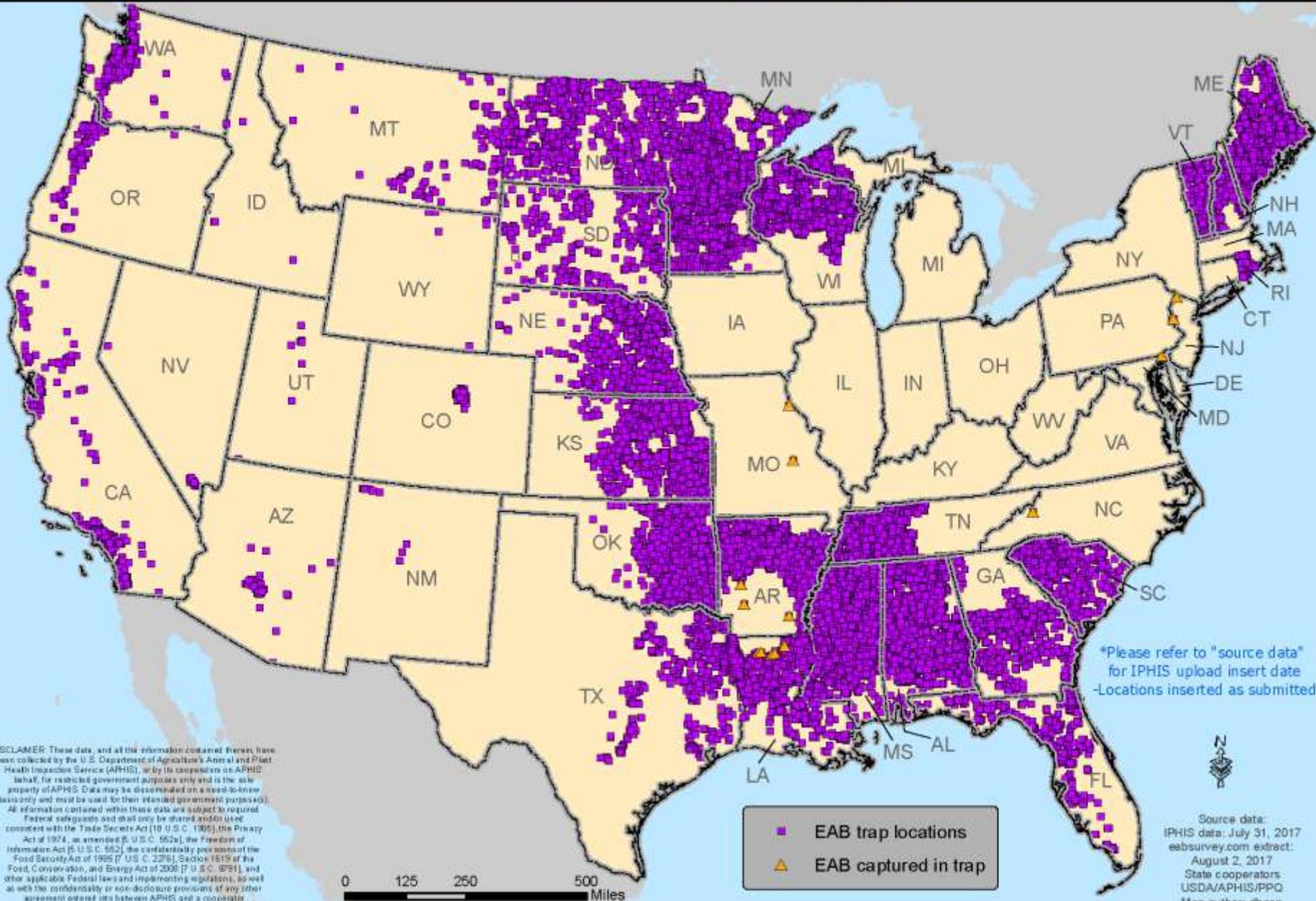




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2017 Season trap locations as reported August 2, 2017*



*Please refer to "source data" for IPHIS upload insert date
-Locations inserted as submitted

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0 125 250 500 Miles

■ EAB trap locations
▲ EAB captured in trap

Source data:
IPHIS data: July 31, 2017
eabsurvey.com extract:
August 2, 2017
State cooperators:
USDA/APHIS/PPQ
Map author: dboop



United States Department of Agriculture

PROGRAM - biocontrol

**Spathius
Galinae**



**Spathius
Agrili**



Tetrastichus



Oobius Agrili





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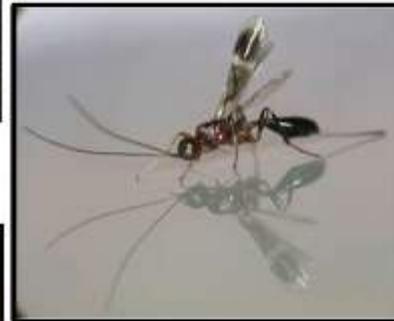
Animal and
Plant Health
Inspection Service

Emerald Ash Borer Biological Control Release Guidelines

Agricultural Research
Service

US Forest Service

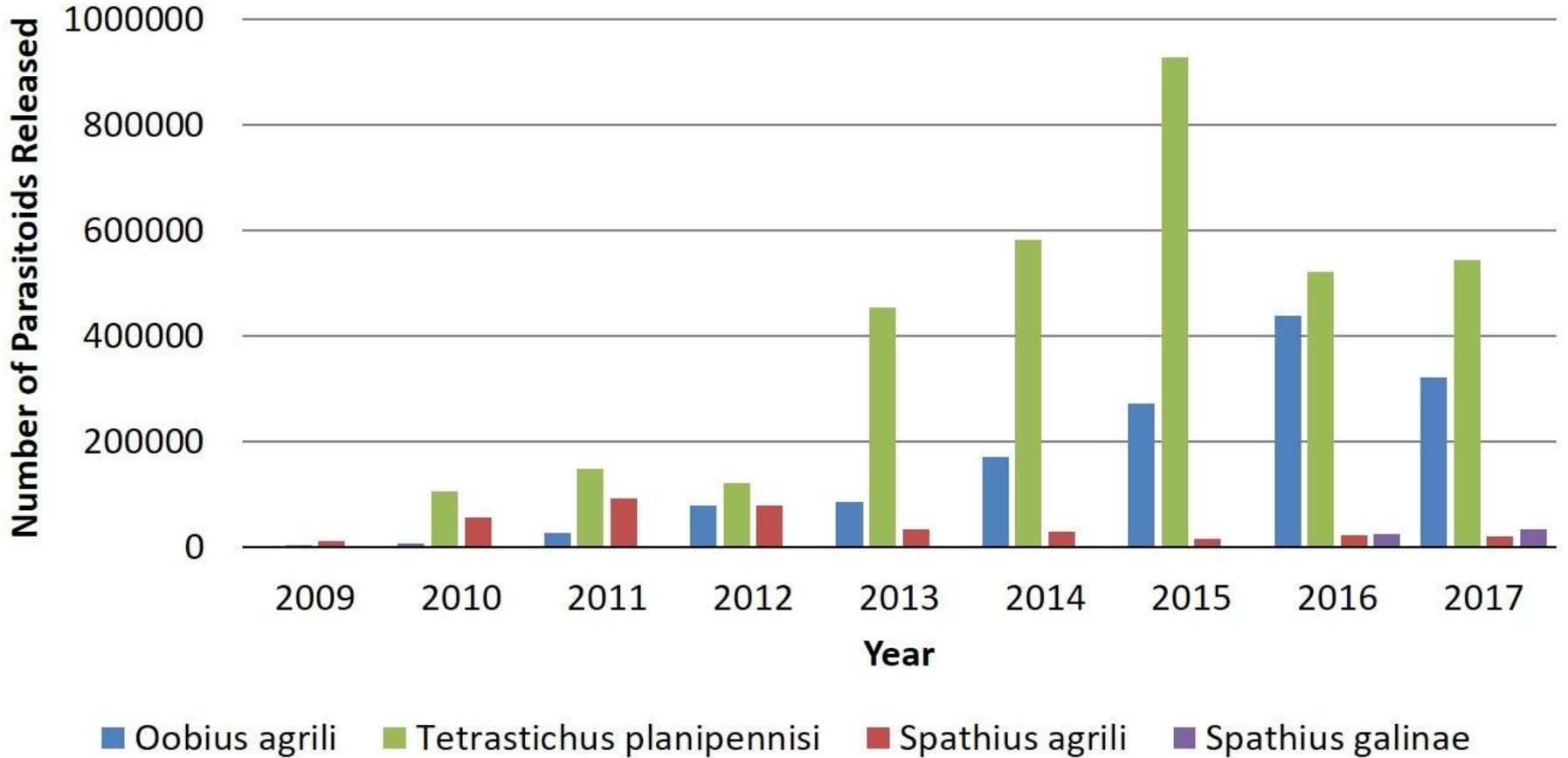
Cooperating State
Departments of
Agriculture

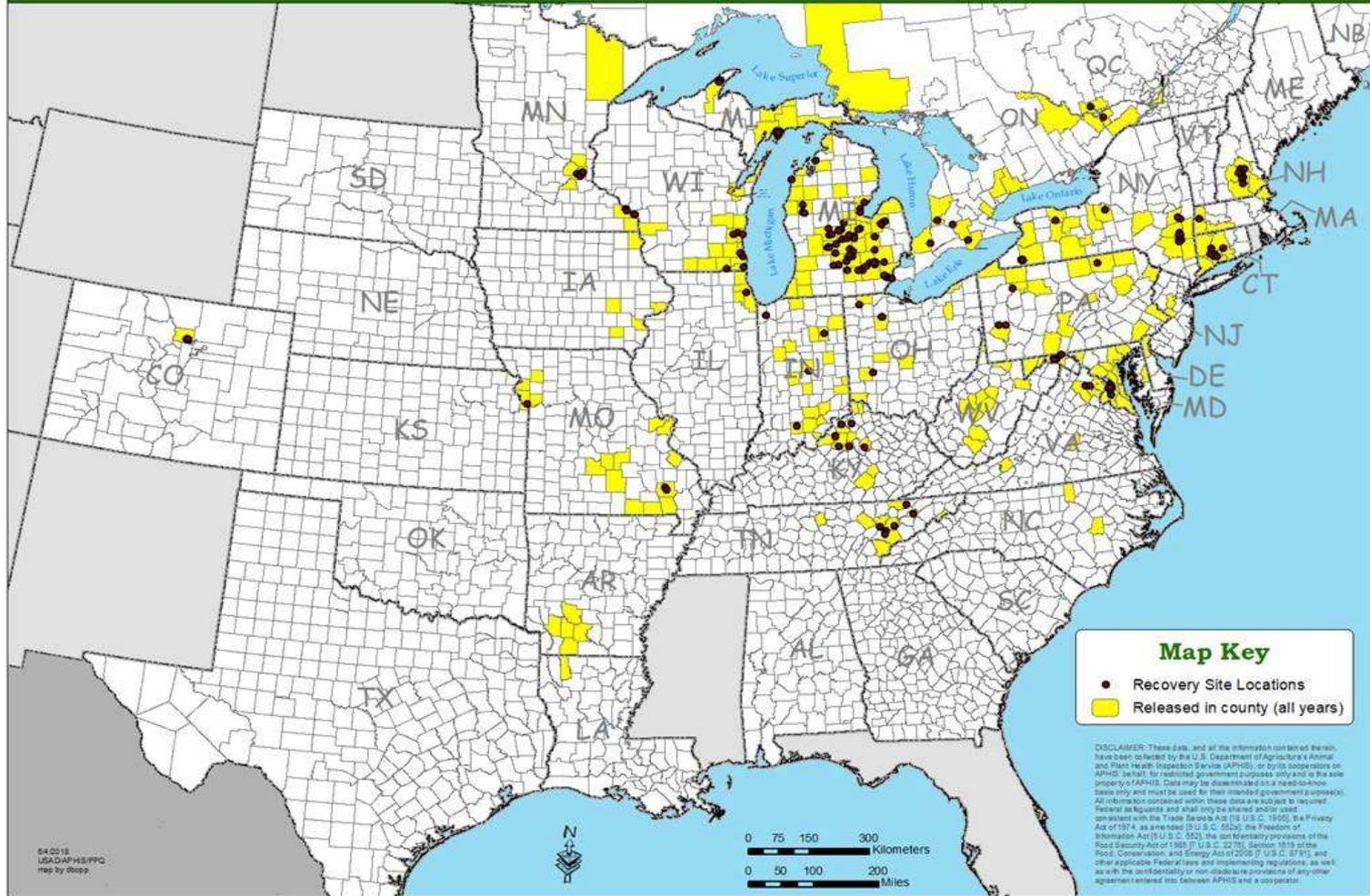


Link to EAB Biocontrol Release & Recovery Guidelines:

http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/EAB-FieldRelease-Guidelines.pdf

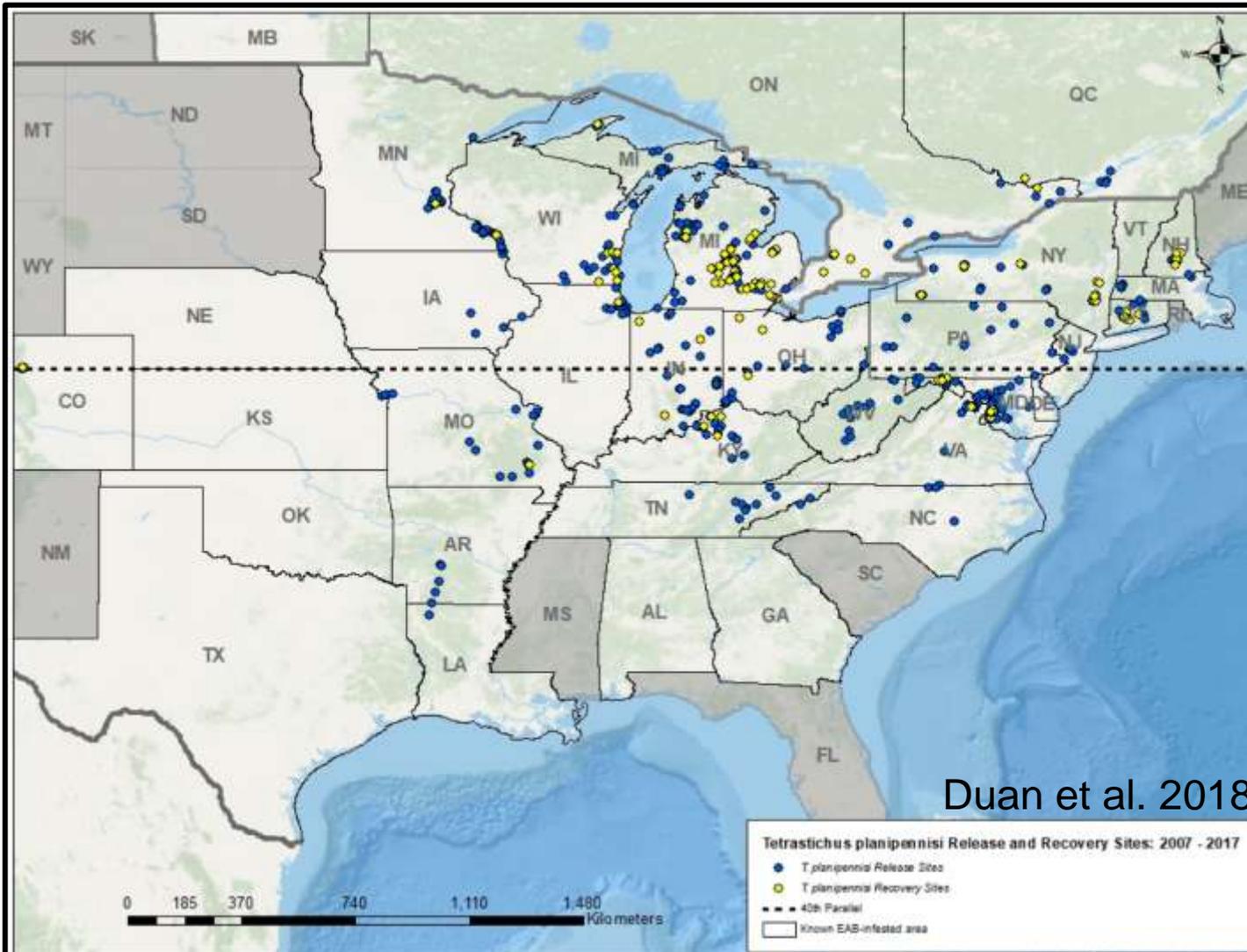
Parasitoids Released by Species



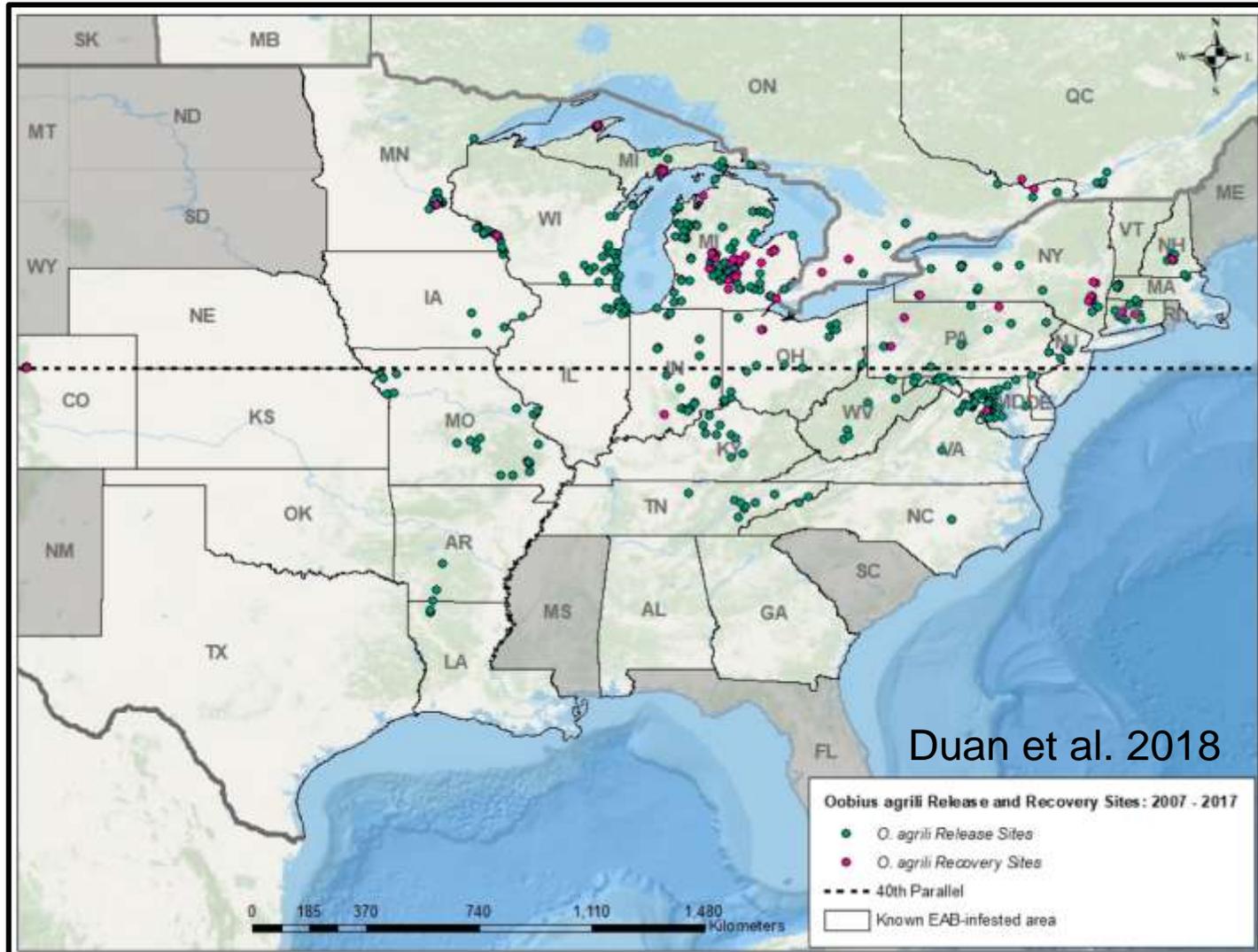


Released in 26 States, Recovered in 17 States

Tetrastichus planipennisi Recovered in 12 States



Oobius agrili Recovered in 9 States





Host resistance as a component of EAB management

Disadvantages:

Will not protect the existing ash resource.

Resistant varieties will likely not be available for years.

Advantages:

May be a necessary to keep ash as a viable component of natural and urban ecosystems.

Long-term and self-sustaining.

Compatible with other management tactics (e.g., biological control).

Could potentially include resistance to *Chalara* disease.



APHIS-PPQ funding for EAB host resistance work

Cooperator (PI)	FY	Description	Amount
Ohio State (Herms)	2007	Host relations and host resistance	\$120,000
	2008	Amendment to 2007 agreement	\$9,000
Ohio State (Herms)	2009	Continuation of ongoing work	\$164,451
Ohio State (Bonello)	2011, 12&13	Comprehensive chemical, genetic components of host resistance	\$1,458,827
Purdue (Ginzel)	2011	Evaluation of host volatiles, tri-trophic relations	\$125,782
Purdue (Pijut)	2011	Genetic transformation of ash	\$169,667
Ohio State (Bonello)	2014	Continuation of 2011 work with <i>Chalara</i> resistance added	\$159,298
US Forest Service (Koch, Knight, Poland)	2018	Monitoring, identification and characterization of lingering ash	\$225,000
Total			\$2,432,025

Proposed Rule to Deregulate

Published on 19 September 2018

The screenshot shows the homepage of regulations.gov. At the top left is the USDA logo and the text "United States Department of Agriculture". The main header features the "regulations.gov" logo with the tagline "Your Voice in Federal Decision Making". Navigation links for "Home", "Help", "Resources", and "Contact Us" are in the top right. A search bar is prominently displayed with "Search", "Browse", and "Learn" buttons. Below the search bar is a call to action: "Make a difference. Submit your comments and let your voice be heard." A large search input field is provided with a "Search" button and a link to "Advanced Search".

The main content area is divided into several sections:

- What's Trending:** Lists items such as "Protecting Statutory Conscience Rights in Health Care, Delegations of Authority" (closing on May 27, 2018), "Environmental Impact Statements, Availability, etc.: 2015-2024 Draft Proposed Outer Continental Shelf Oil and Gas..." (closing on May 18, 2018), "Modernization of Swine Slaughter Inspection" (closing on May 02, 2018), "Meetings: Third-Party Inspection Programs Under Animal Welfare Act" (closing on Mar 21, 2018), and "Requests for Information: Revisions to Personnel Regulations, Proficiency Testing Referral, Miscellaneous..." (closing on Mar 12, 2018).
- Comments Due Soon:** A list of items with their closing dates and comment counts: Today (17), Next 3 Days (77), Next 7 Days (145), Next 15 Days (348), Next 30 Days (769), and Next 90 Days (1,171).
- Newly Posted:** A list of items with their posting dates and counts: Today (76), Last 3 Days (305), Last 7 Days (477), Last 15 Days (982), Last 30 Days (2,648), and Last 90 Days (5,657).
- Unable to submit a comment?:** A message advising users to try disabling browser plugins and extensions (such as Grammarly) and retry.
- Navigation and Footer:** Includes links for "Home", "About Us", "Resources", "Help", and "Connect With". The footer contains links for "Search", "Advanced Search", "Browse by Category", "Learn", "eRulemaking Program", "Media Toolkit", "Agencies", "Awards & Recognition", "Enhancements & Fees", "Site Data", "Regulatory Agents", "Agency Reports Requested by State", "API Overview", "Developers", "How to use Regulations.gov", "FAQs", "Glossary", "Contact Us", "Privacy and Security Notice", "User Notice", and "Accessibility Statement".



United States Department of Agriculture

Questions?