



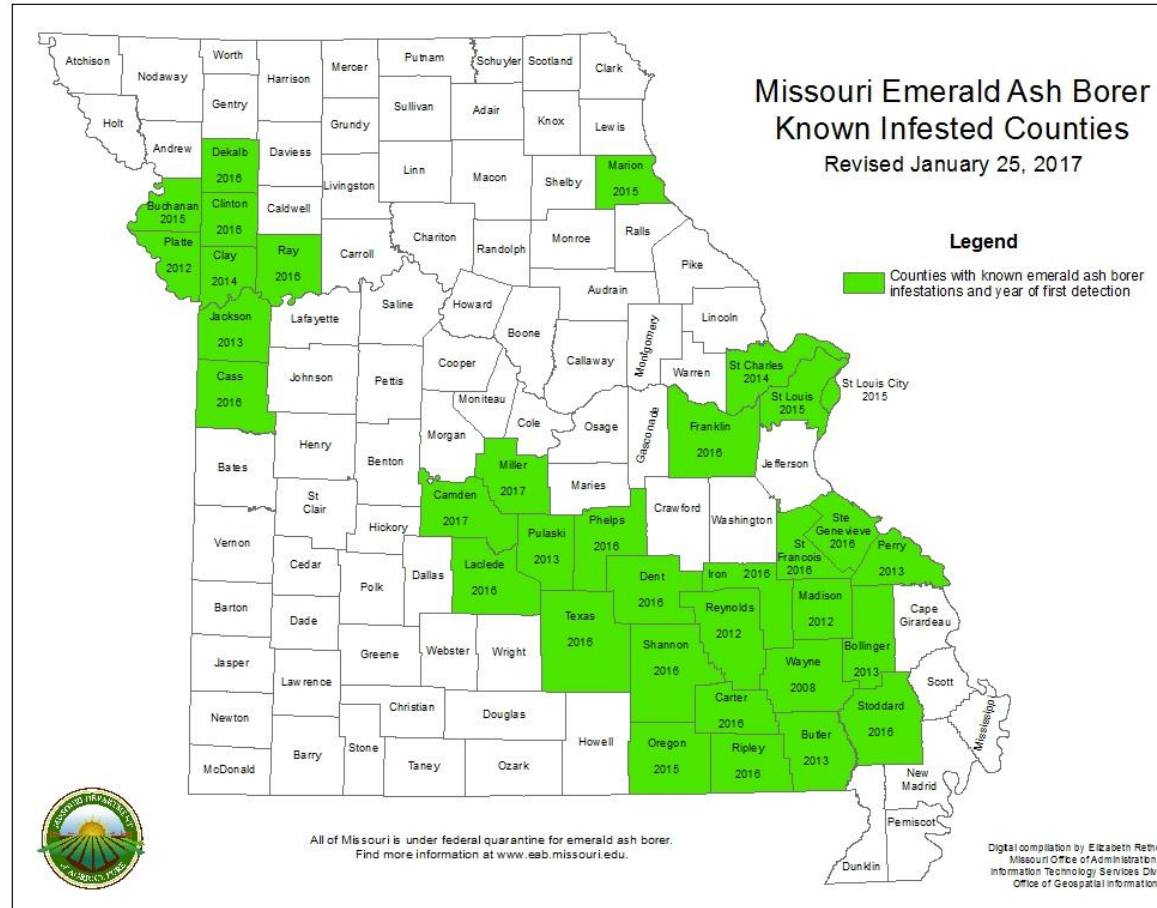
# Emerald Ash Borer Update

Missouri Invasive Forest Pest Council  
January 30, 2016

Collin Wamsley  
State Entomologist  
Missouri Department of Agriculture

# 2016 EAB Survey and Detections

- ▶ 2016: 16 new counties confirmed
- ▶ 2017: *Camden and Miller*
- ▶ 232 purple traps placed
- ▶ 33 trap trees (data available February)
- ▶ Visual Survey
- ▶ Citizen Reports
- ▶ MDA, PPQ, USACE, MU, MDC





# 2016 New County Detections

- ▶ Carter: PPO Shoemaker visual survey, Ozark Natl Scenic Riverway
- ▶ Cass: rural residence report to MDC
- ▶ Clinton: rural residence report to MDC
- ▶ DeKalb: MDA purple trap
- ▶ Dent: PPO Shoemaker visual survey, Mark Twain Natl Forest
- ▶ Franklin: MDA purple trap
- ▶ Iron: PPQ Shoemaker visual survey, Mark Twain Natl Forest
- ▶ Laclede: MDC Conservation Area
- ▶ Phelps: PPQ Shoemaker visual survey, Mark Twain Natl Forest
- ▶ Ray: rural residence report to MDC
- ▶ Ripley: PPQ Shoemaker visual survey, Mark Twain Natl Forest
- ▶ Shannon: PPQ Shoemaker visual survey, Current River Cons Area
- ▶ St. Francois: PPQ Shoemaker visual survey, MDC Knob Lick Tower
- ▶ Ste. Genevieve: PPQ Shoemaker visual survey, Mark Twain Natl Forest
- ▶ Stoddard: PPQ Shoemaker visual survey, Mingo Natl Wildlife Refuge
- ▶ Texas: PPQ Shoemaker visual survey, Mark Twain Natl Forest

# New EAB State Detections in 2016

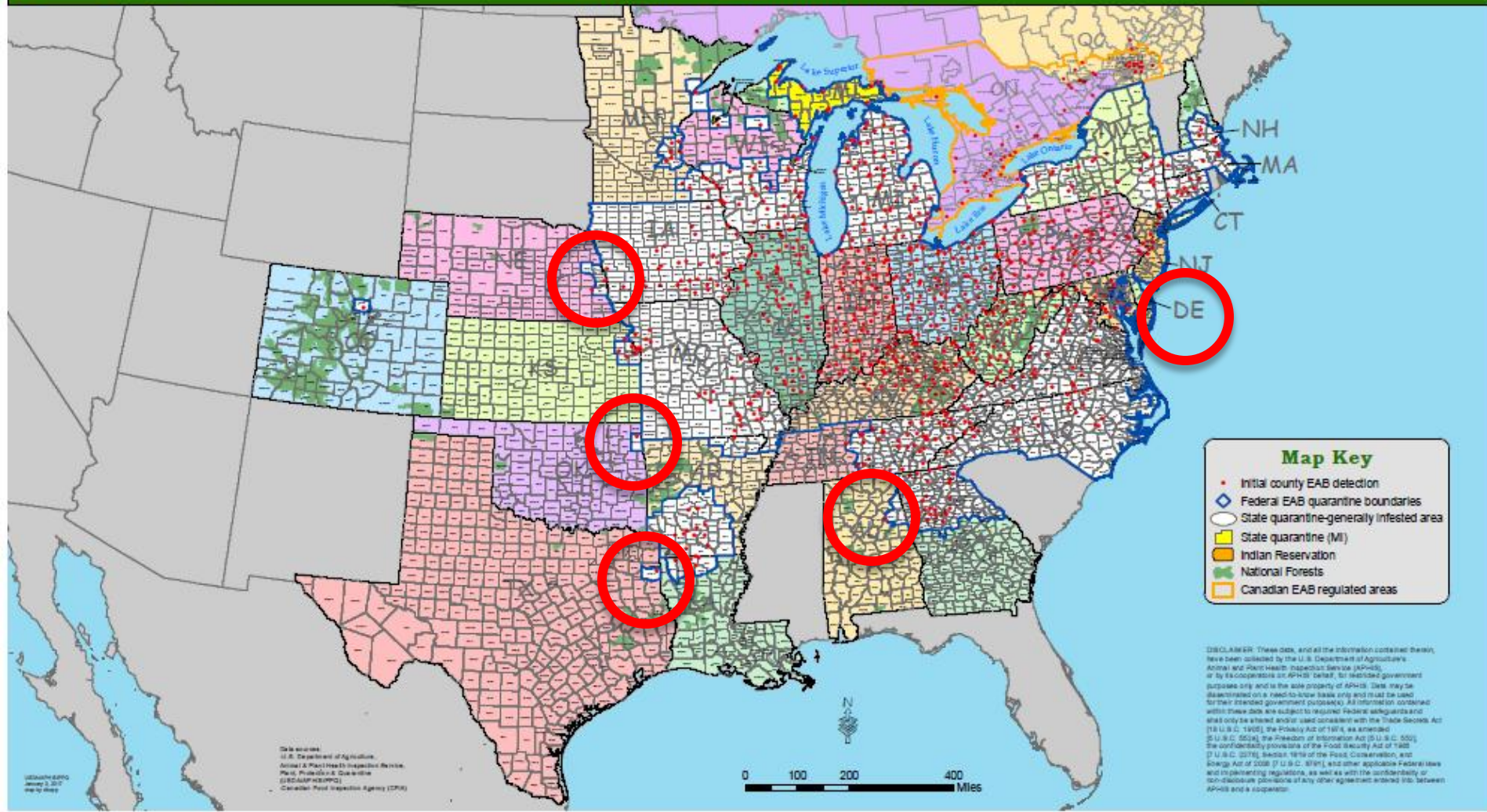
## Texas, Nebraska, Delaware, Oklahoma, Alabama



United States  
Department of  
Agriculture

Cooperative Emerald Ash Borer Project  
Initial county EAB detections in North America

January 3, 2017



# EAB Federal Quarantine

31 EAB Compliance Agreements in Missouri  
Firewood, Mulch, Lumber, Pallets



United States  
Department of  
Agriculture

Cooperative Emerald  
Ash Borer Project

Federal EAB Quarantine  
& Authorized Transit

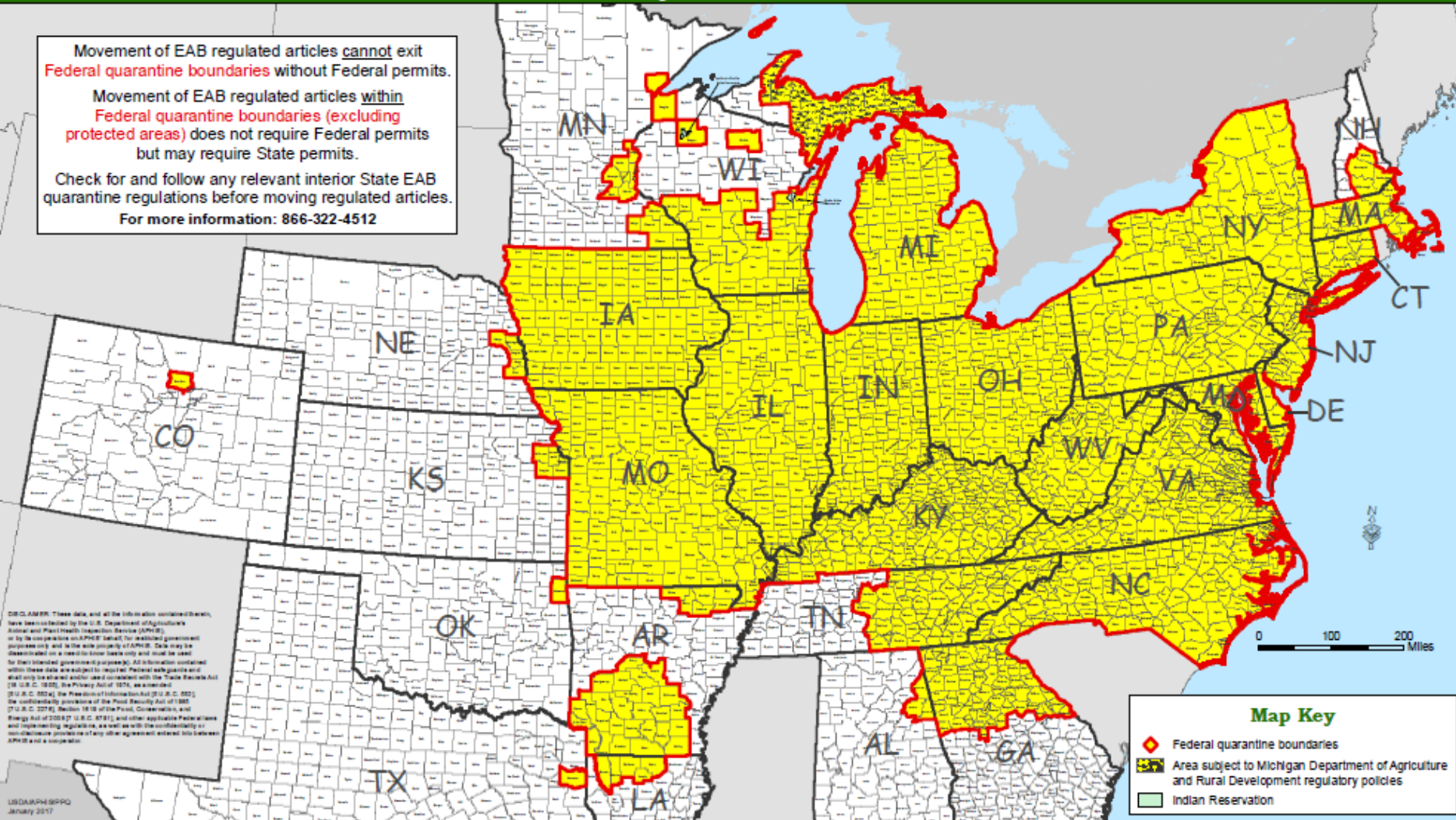
January 3, 2017

Movement of EAB regulated articles cannot exit Federal quarantine boundaries without Federal permits.

Movement of EAB regulated articles within Federal quarantine boundaries (excluding protected areas) does not require Federal permits but may require State permits.

Check for and follow any relevant interior State EAB quarantine regulations before moving regulated articles.

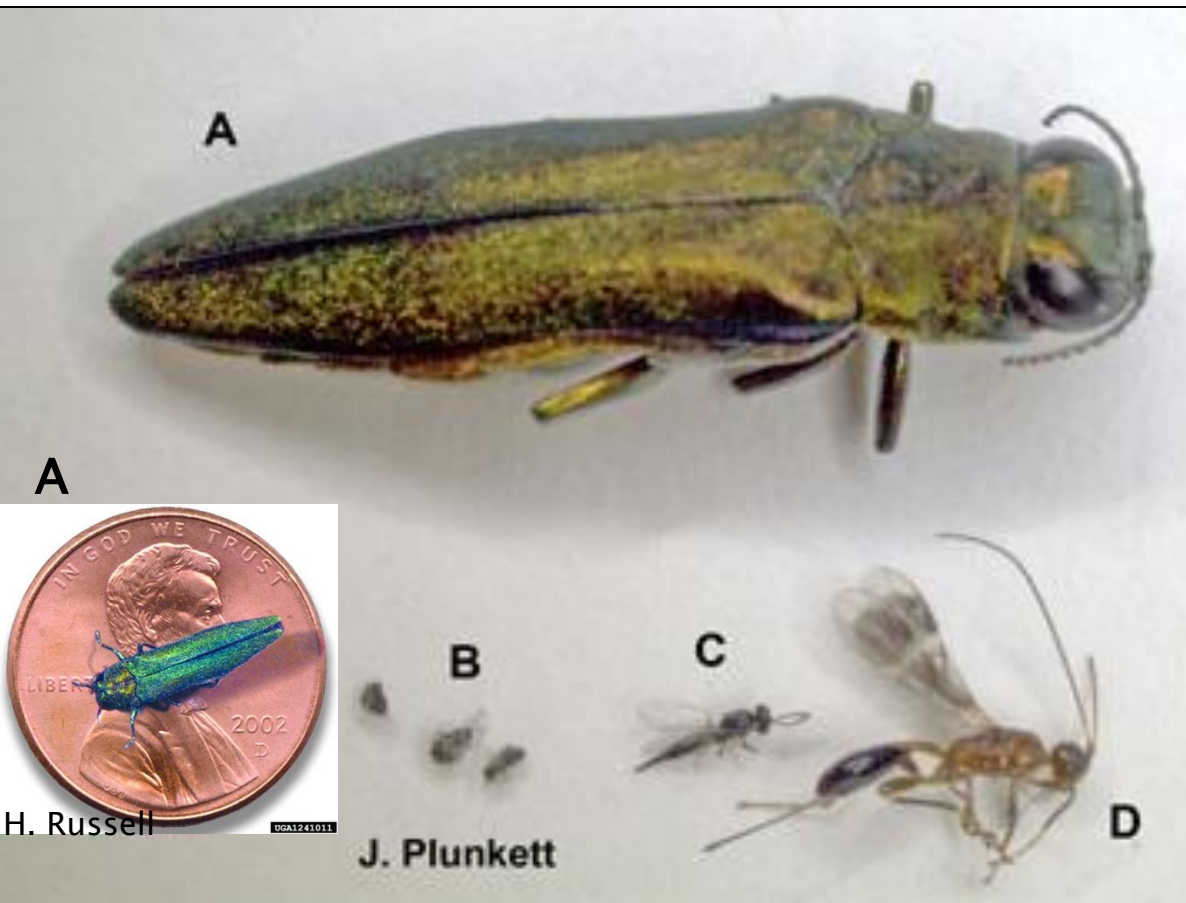
For more information: 866-322-4512



# 2017 Missouri EAB Survey

- ▶ MDA Purple Trap Survey
  - SW Missouri (Springfield, Joplin, Neosho, etc)
  - Central MO
  - East Central
  - Northeast
  - North Central
  - NW Missouri
- ▶ MU (Columbia Campus)
- ▶ PPQ Visual
- ▶ USACE (St. Louis District)
- ▶ MDC – Citizen report follow-ups

# EAB Biological Control



- A. EAB adult
- B. Egg parasite:  
*Oobius agrili*
- C. Larval parasite:  
*Tetrastichus planipennisi*
- D. Larval parasite:  
*Spathius agrili*



Egg parasite (B) attacks EAB eggs; larval parasitoids (C and D) attack EAB larvae or immature stage. EAB adults are approx 1/2 inch in length.

Photos: J. Plunkett, MN Dept Ag,  
Howard Russell, Bugwood.org,  
Houping Liu, Bugwood.org



# *Spathius agrili*

- ▶ In China, 30–50% parasitism
- ▶ Up to 85% in some stands
- ▶ No-choice host specificity tests in China: no non-targets attacked
- ▶ Tests in U.S.: other *Agrilus* were attacked, but at lower rates
- ▶ Some indication that the two-lined chestnut borer could serve as a possible host.



# *Tetrastichus planipennis*

- ▶ In China, 20–40% parasitism
- ▶ Results of no-choice assays indicate that *T. planipennis* is highly specific to EAB




# *Oobius agrili*

- ▶ In Michigan lab tests, EAB parasitism rates near 60%
- ▶ Results of no-choice assays show *O. agrili* could develop on two-lined chestnut borer, bronze birch borer and red-necked cane borer, but has a clear preference for EAB





# MO EAB Biocontrol Release History

- ▶ (2012) Wayne County
  - ▶ (2013) Wayne County
  - ▶ (2014) Platte County
  - ▶ (2015) Clay, Platte, Pulaski and St. Charles Counties
  - ▶ (2016) Clay and St. Charles Counties and the City of St. Louis.
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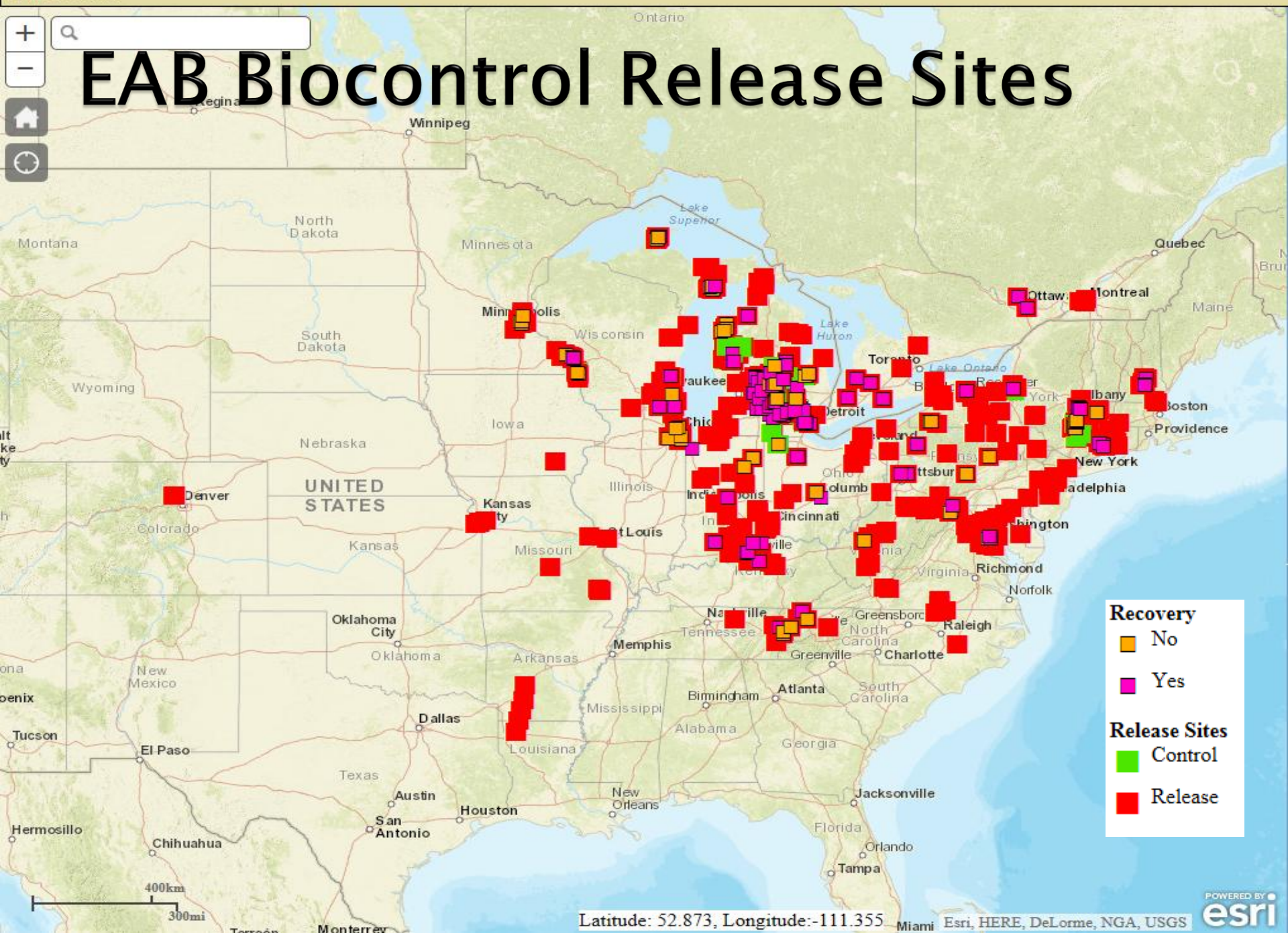
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Home

Refresh

# EAB Biocontrol Release Sites

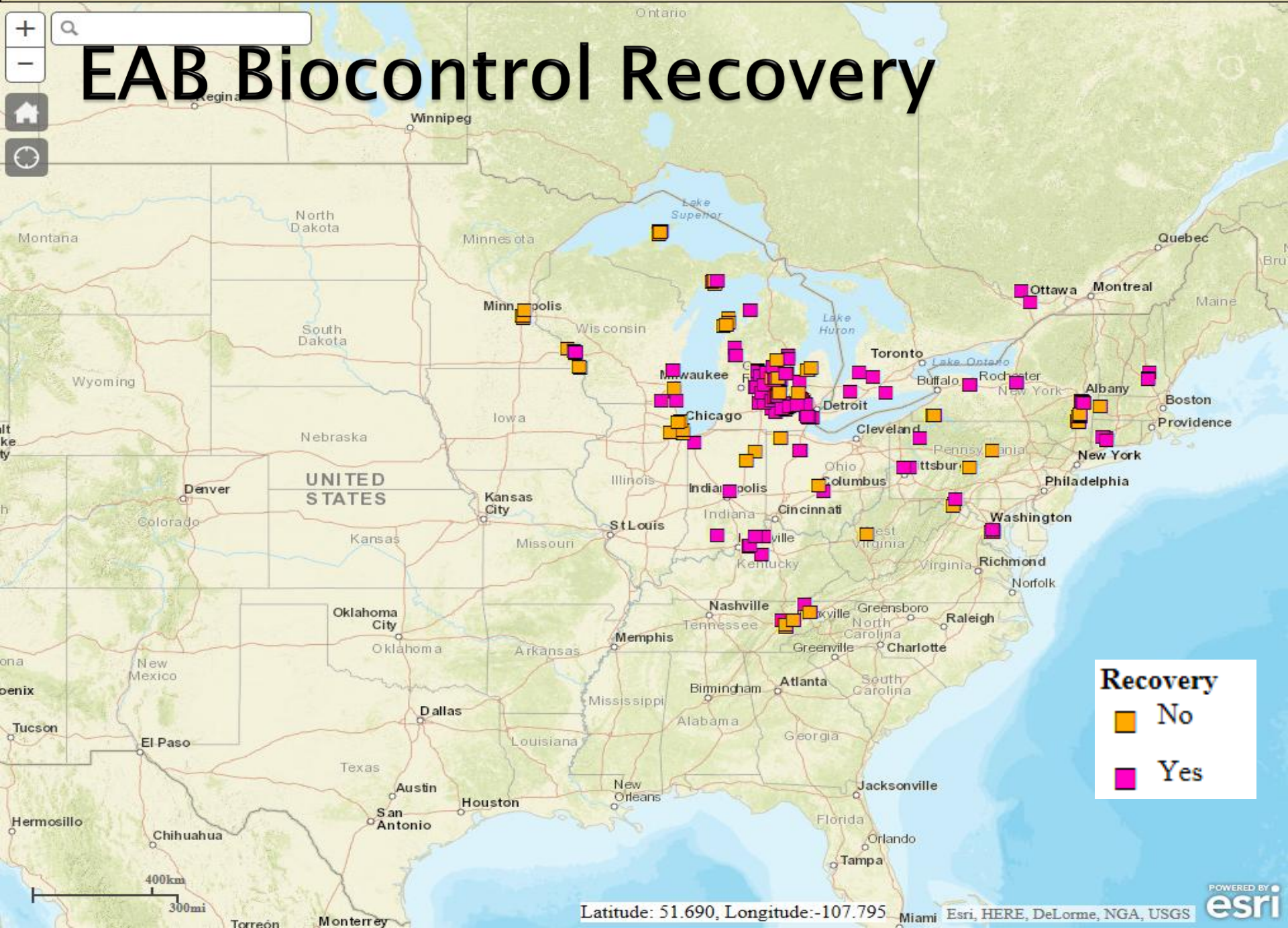


Latitude: 52.873, Longitude: -111.355

Esri, HERE, DeLorme, NGA, USGS

# EAB Biocontrol Recovery

Map navigation controls including a search bar, zoom in (+) and zoom out (-) buttons, a home button, and a refresh button.



**Recovery**  
No (orange square)  
Yes (pink square)

# *Spathius galinae*





# Yellow Pan Traps

- ▶ Checking for establishment of parasitoids.
- ▶ Two sites in Wayne county surveyed in 2016
- ▶ 21 traps total
- ▶ 6 collection periods
- ▶ ~5-day collection period each
- ▶ Late May to Mid September
- ▶ Collections being screened by Juli Gould, USDA APHIS PPQ

