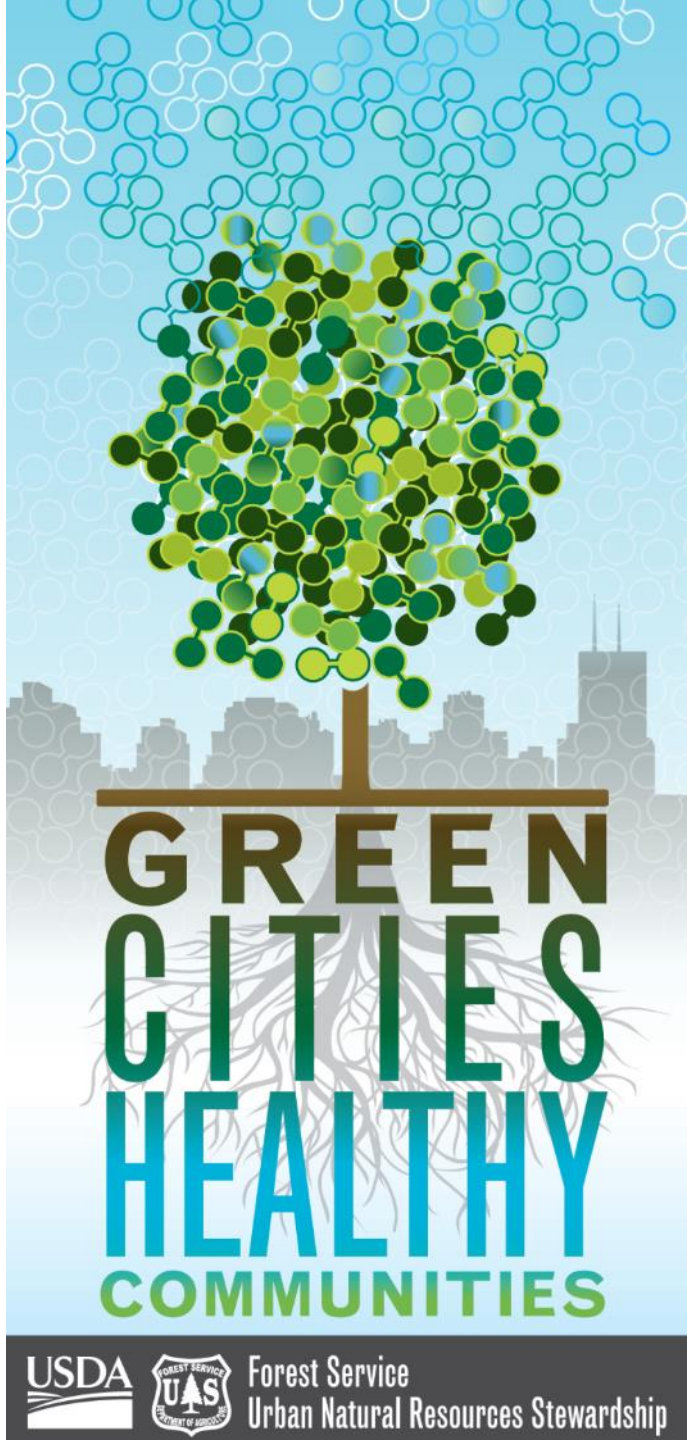

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Emerald Ash Borer Cooperative Management: Ideal and in-practice

Robert Haight

Research Forester/Economist

USDA Forest Service

rhaight@fs.fed.us

Jeff Hafner

Director of Municipal Consulting

Rainbow Treecare

jhafner@rainbowtreecare.com

USDA Forest Service
URBANFOREST CONNECTIONS
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Emerald Ash Borer Cooperative Management: Ideal and in-practice

Robert G Haight
USDA Forest Service
Northern Research Station
St. Paul, MN

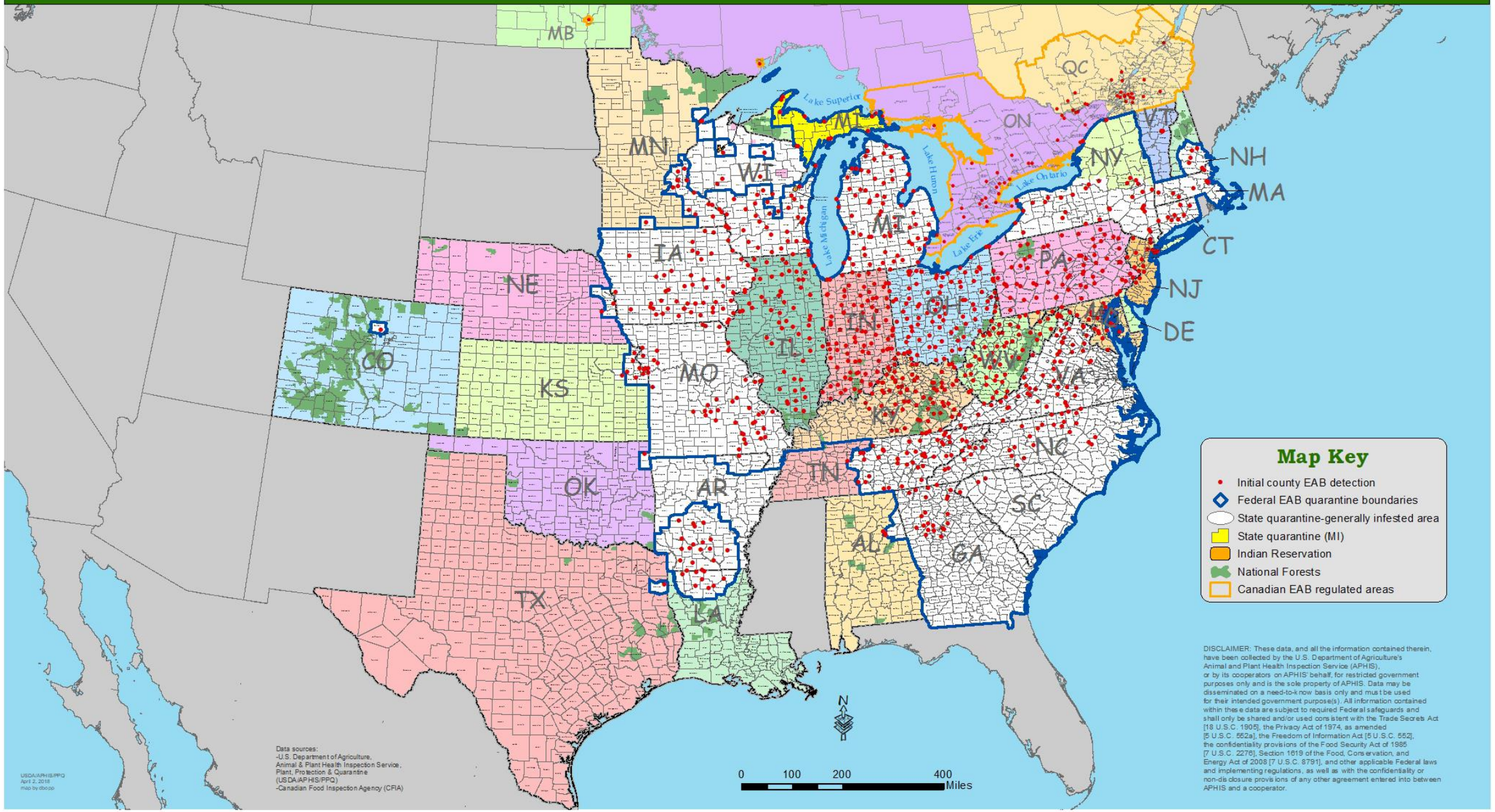
Jeff Hafner
Rainbow Treecare
Minneapolis, MN

United States Department of Agriculture

Cooperative Emerald Ash Borer Project

Initial county EAB detections in North America

April 2, 2018



Economics of EAB

- Cost of EAB damage in U.S. communities
- Economics of urban SLAM projects
- Gains from cooperative management and bargaining

Projecting Costs of EAB Damage in U.S. Communities, 2010-2020

- Identify communities in path of EAB invasion
- Estimate ash density in communities
- Project EAB infestation and mortality
- Calculate discounted cost of ash removal and property value loss

ELSEVIER

Contents lists available at ScienceDirect

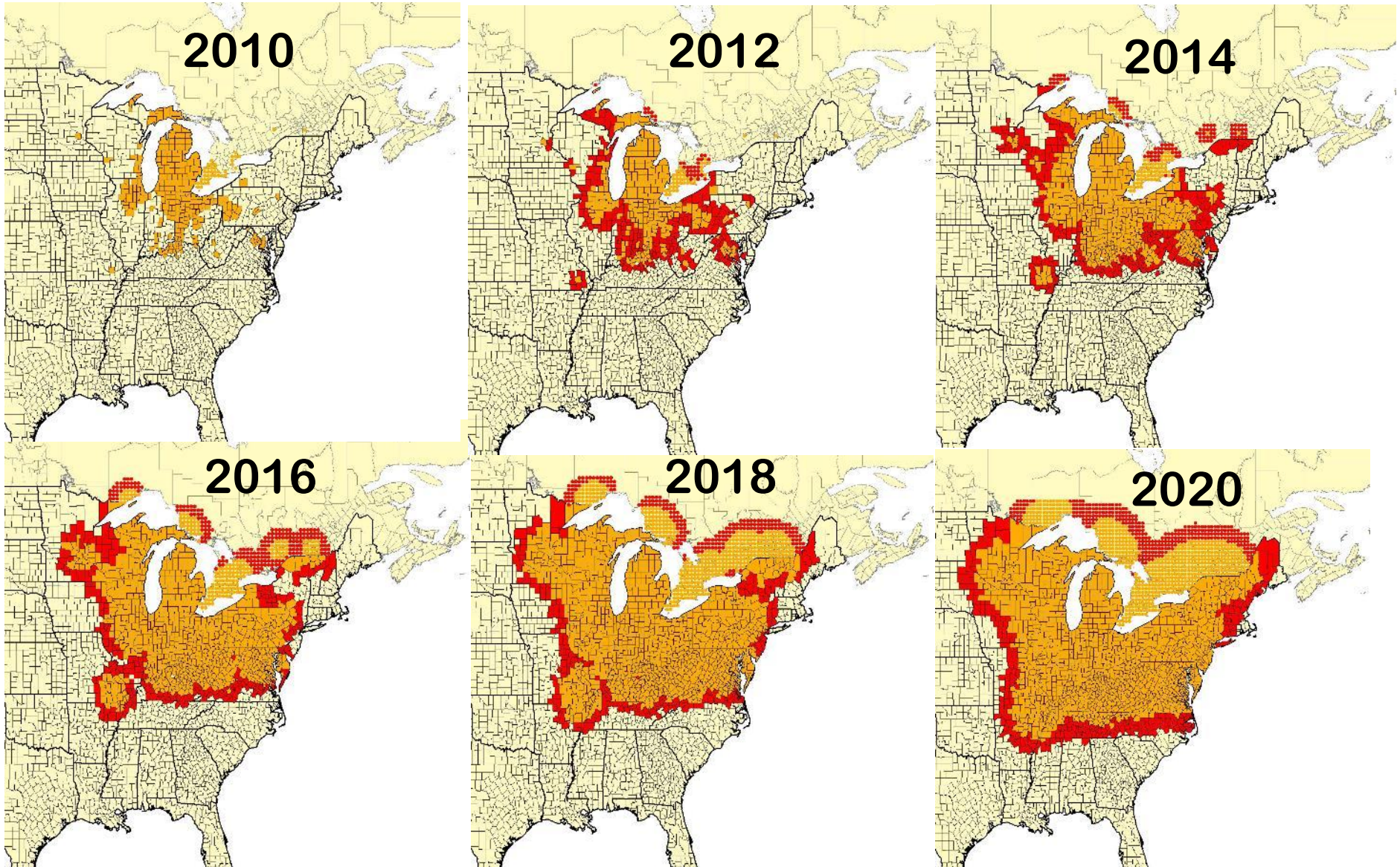
Ecological Economics 69 (2010) 569–578

Analysis

Cost of potential emerald ash borer damage in U.S. communities, 2009–2019

Kent F. Kovacs [a,*], Robert G. Haight [b], Deborah G. McCullough [c,d], Rodrigo J. Mercader [c], Nathan W. Siegert [c], Andrew M. Liebhold [e]

Projecting Costs of EAB Damage in U.S. Communities



Projecting Costs of EAB Damage in U.S. Communities, 2010-2020

Costs of ash removal and property value loss
($ billion)

Government	Homeowners	
Removal	Removal	Property loss
$8.5	$3.5	$3.8

SLAM: SLowing Ash Mortality

- An integrated strategy for controlling recently established, outlier EAB sites
  - Girdled ash trees
  - Systemic insecticide application
  - Removal of ash trees
  - Outreach to prevent transport

http://www.slameab.info/

Projecting costs of urban SLAM projects

- Create a hypothetical suburban landscape
- Develop a spatial-dynamic model of EAB
- Evaluation ash treatment and removal strategies

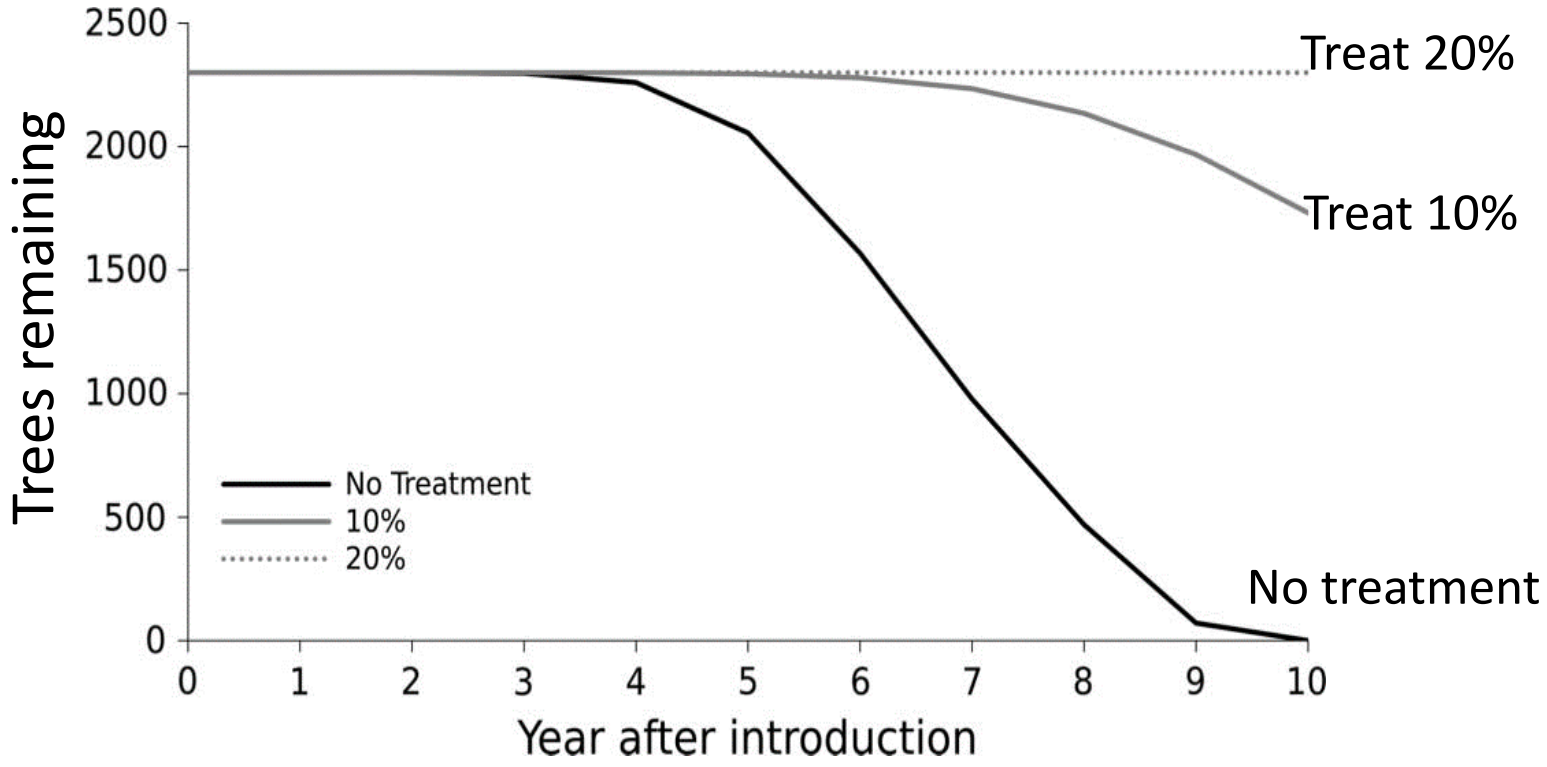
Evaluation of potential strategies to SLow Ash Mortality (SLAM) caused by emerald ash borer (*Agrilus planipennis*): SLAM in an urban forest

Deborah G. McCullough[a,b]* and Rodrigo J. Mercader[a,1]

International Journal of Pest Management
Vol. 58, No. 1, January–March 2012, 9–23

Taylor & Francis
Taylor & Francis Group

Projecting costs of urban SLAM projects



International Journal of Pest Management
Vol. 58, No. 1, January–March 2012, 9–23

How much does coordination among cities for the management of EAB increase urban forest benefits ?

ELSEVIER

Contents lists available at SciVerse ScienceDirect

Resource and Energy Economics

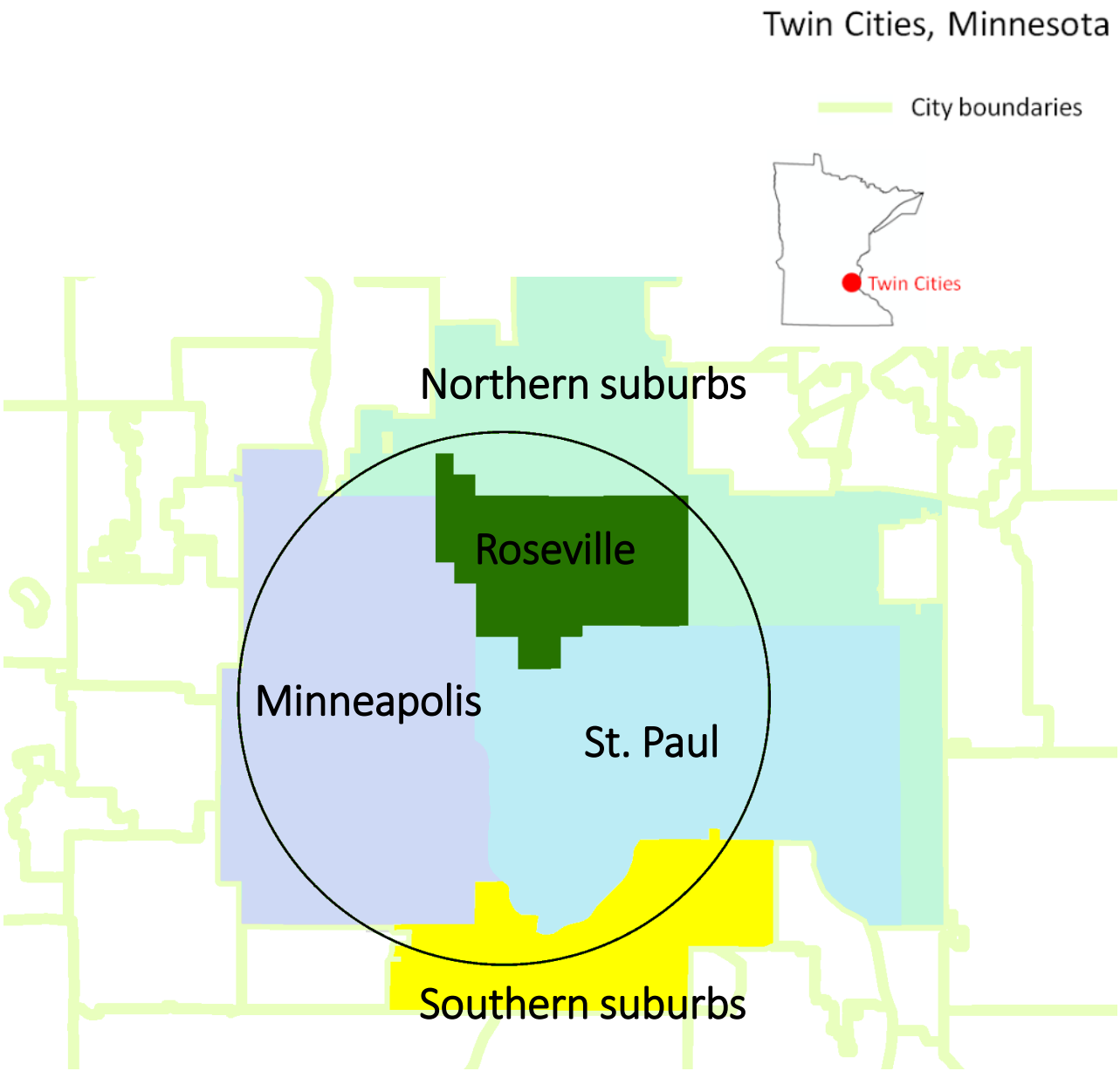
journal homepage: www.elsevier.com/locate/ree

A bioeconomic analysis of an emerald ash borer invasion of an urban forest with multiple jurisdictions

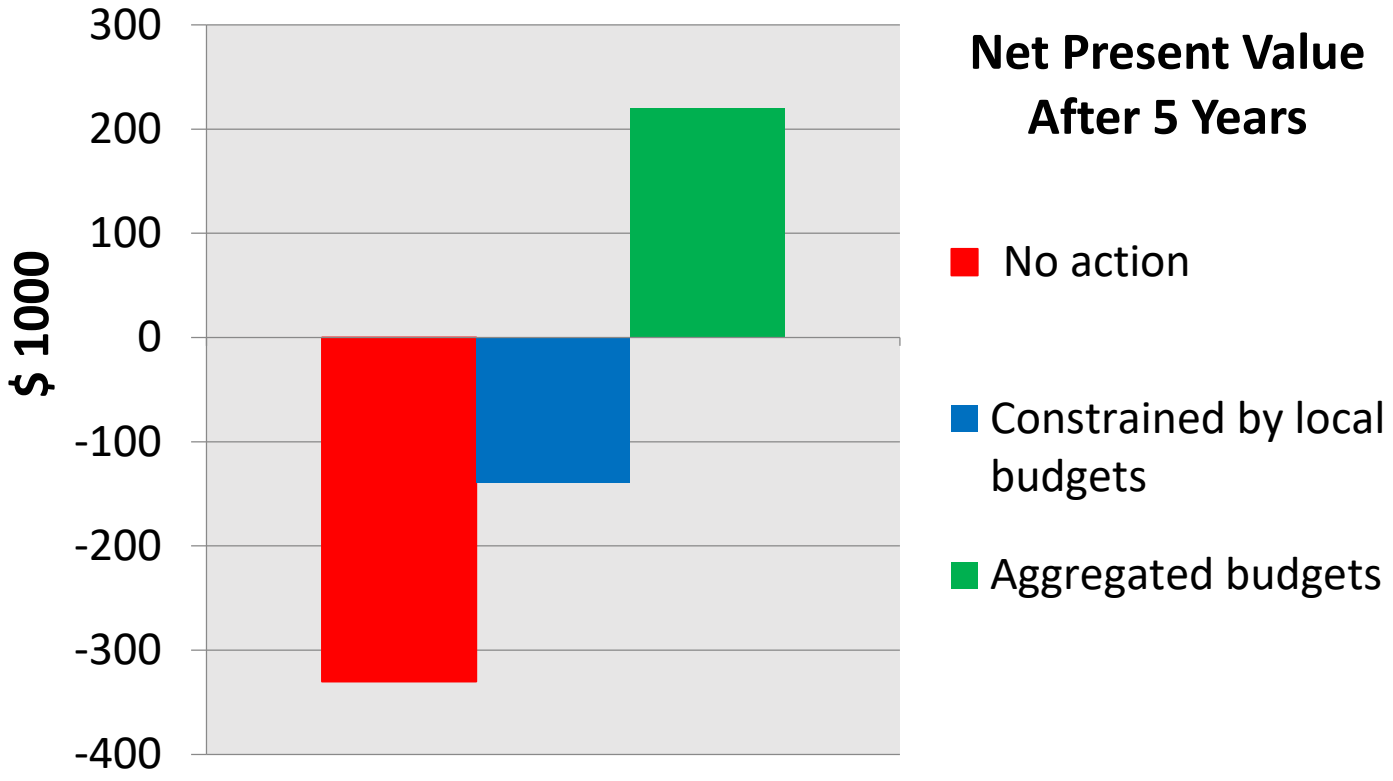
Kent F. Kovacs[a,*], Robert G. Haight[b], Rodrigo J. Mercader[c], Deborah G. McCullough[d,e]

Methods

- Identify a 300 km^2 study area in Twin Cities
- Develop a spatial-dynamic model of EAB
- Evaluate ash treatment and removal strategies across municipalities

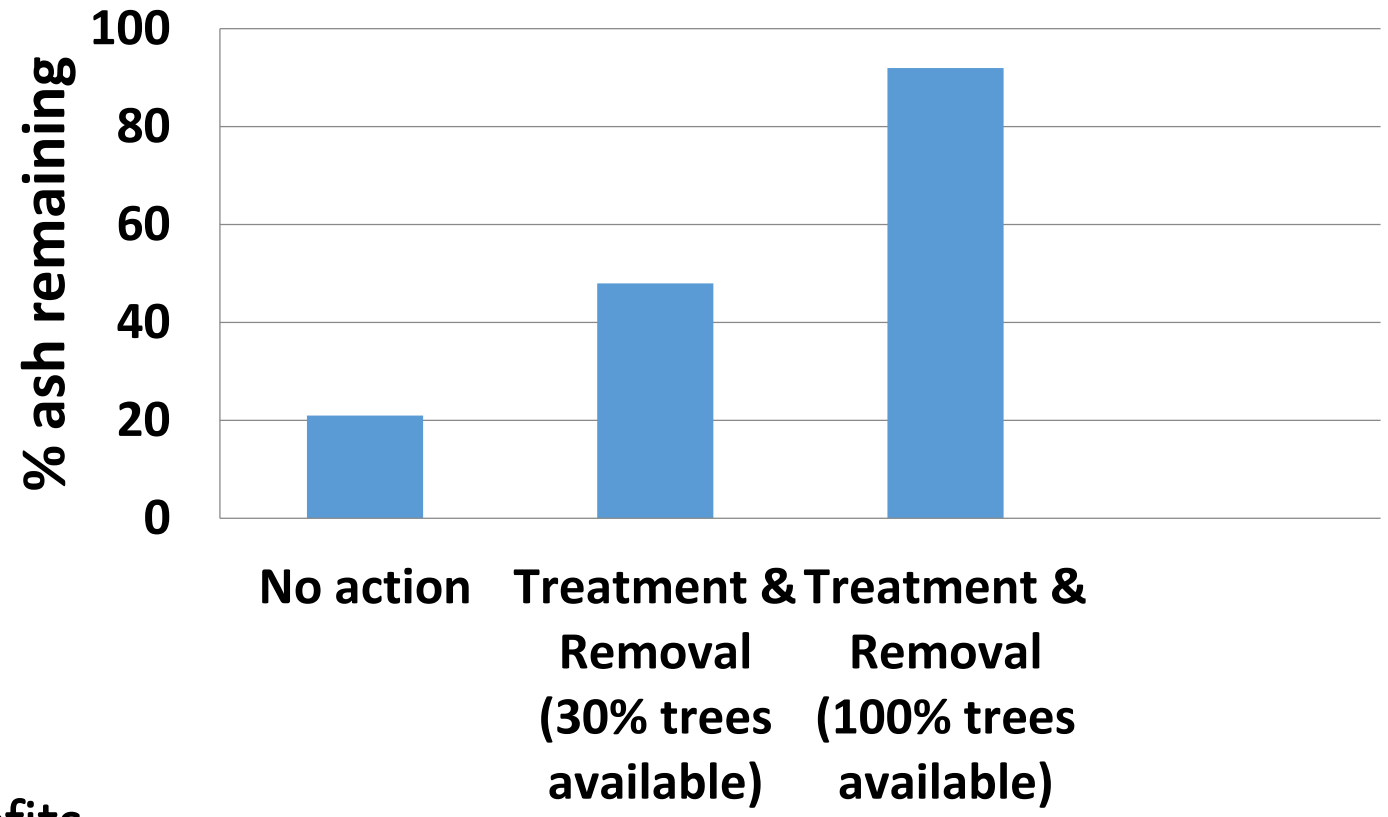


Projecting the benefits and costs of EAB management in the Twin Cities



A regional management and funding strategy would more effectively control the infestation than an inconsistent, city-by-city response, or no action.

Projecting the benefits and costs of EAB management in the Twin Cities



Net benefits $ 1000:	-330	220	1,090

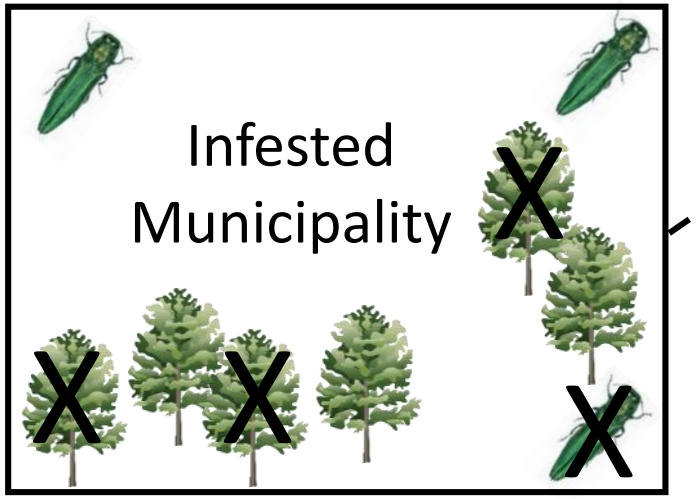
To what extent can bargaining between cities lower the social costs of EAB control?

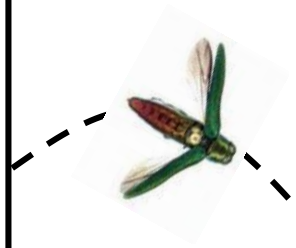
Cooperative Management of Invasive Species: A Dynamic Nash Bargaining Approach

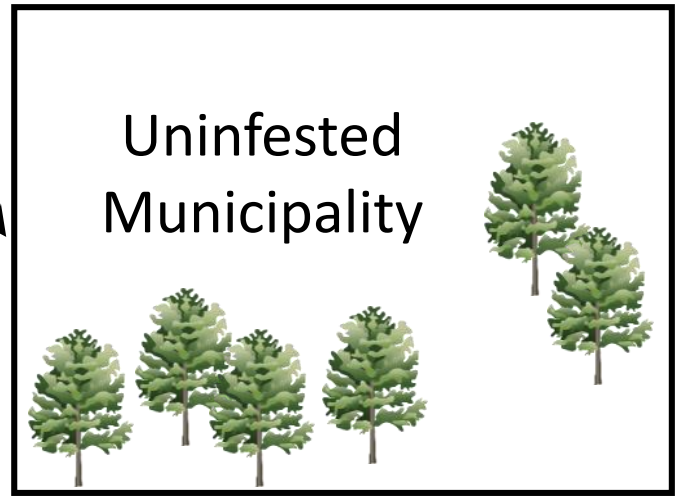
Kelly M. Cobourn, Gregory S. Amacher & Robert G. Haight

Infested municipality can reduce probability of spread by undertaking costly control

Uninfested municipality can offer a transfer payment to infested municipality to increase control, reduce probability of spread, and compensate for lost benefits







Costs of control:

1. Direct costs of host species removal
2. Loss in non-market benefits from host trees

Benefits of reduced probability of spread:

1. Reduced damage
2. Reduced control costs

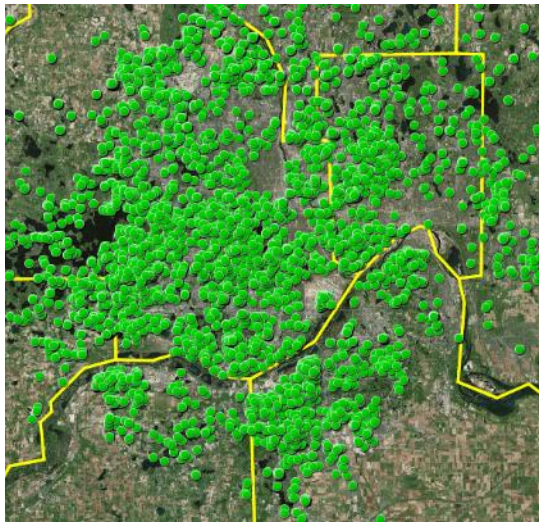
Research Has Demonstrated

- Tree protection is better than removal and replacement

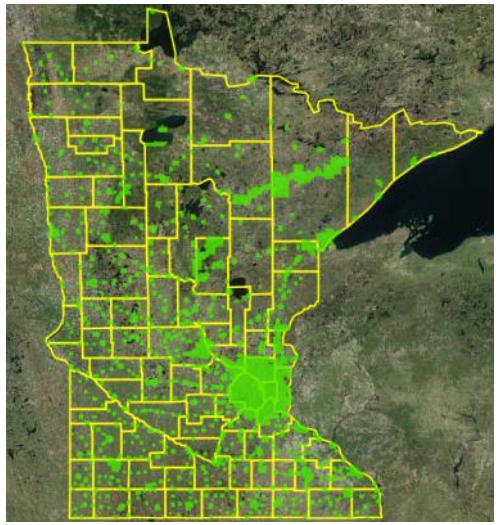
- The strategies and benefits of SLAM work on any scale

Neighborhood

City



Region



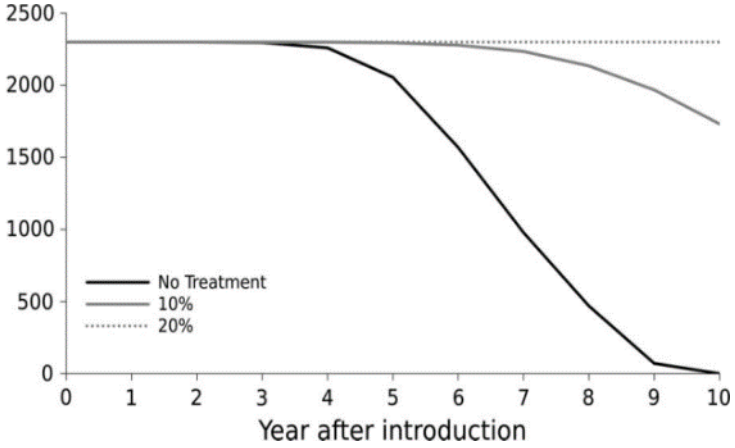
State

Research Has Demonstrated

- All tree owners benefit from slowed ash mortality

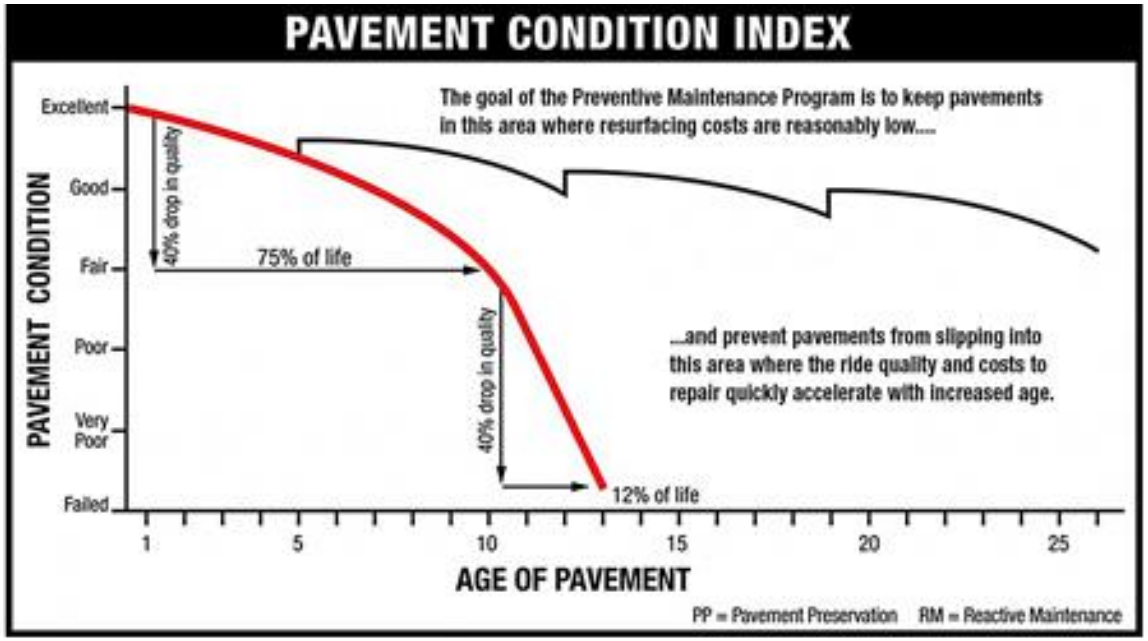
Limitations to Study Implementation

- Unknown infestation date
- Impractical to transfer funds between tree owners
- Jurisdictional limitations to ‘ideal’ tree volumes
- Trees have not obtained the privileges associated with infrastructure status

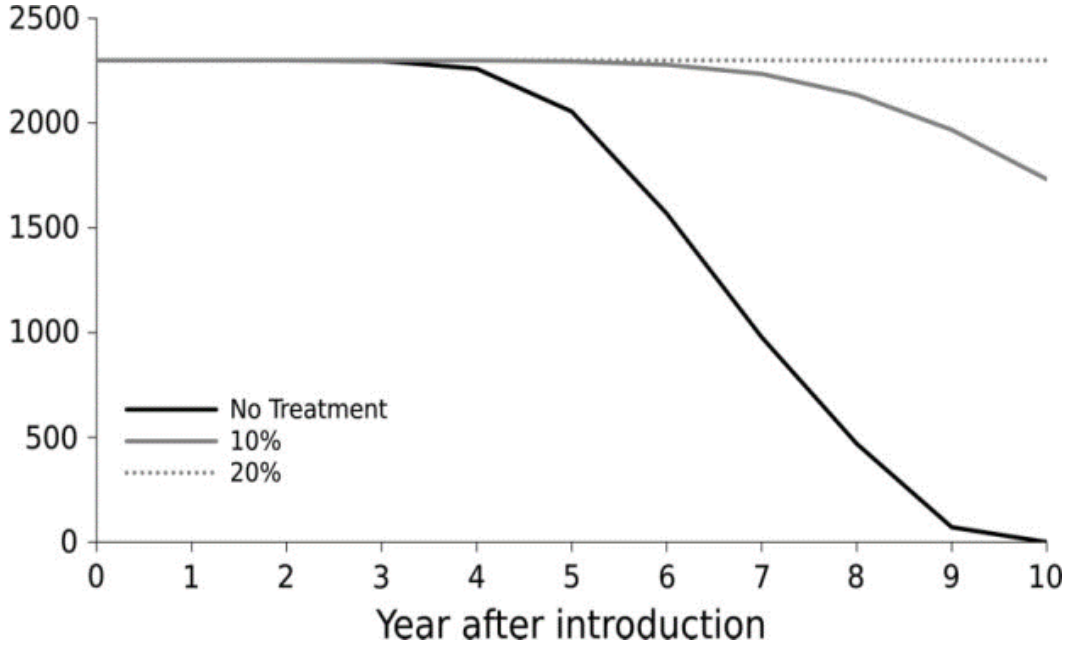


Limitations to Study Implementation

- Trees have not obtained the privileges associated with infrastructure status

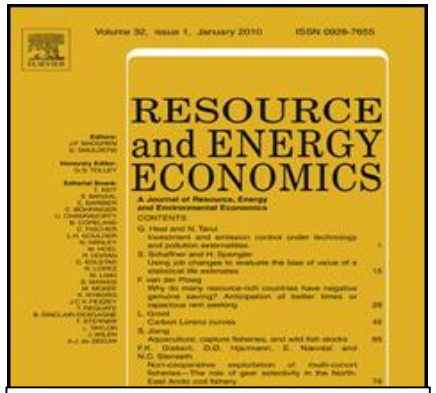


Widely accepted pavement management strategy



NOT widely accepted tree management strategy

A Science Based Solution



SLAM

Steps in Implementing a Strategy to
SL.ow **A**.sh **M**.ortality

March 2010

For further information contact: Steven Katovich, USDA Forest Service, skatovich@fs.fed.us
or Deborah McCullough, Michigan State University, mccullo6@msu.edu

Model Emerald Ash Borer Management Plan

Jeffrey M. Hafner and J. Michael Orange

Solution to the Stakeholders

Model Emerald Ash Borer Management Plan

Jeffrey M. Hafner and J. Michael Orange

Cooperative EAB Management: What is Ideal?

- Multi-state—possibly too large
  - Infestation could be many miles away; difficult for local governments to see benefits

- State—logical borders, familiar jurisdictional structures

- Region—Cooperative environmental agreements exist; not currently focused on trees in MN

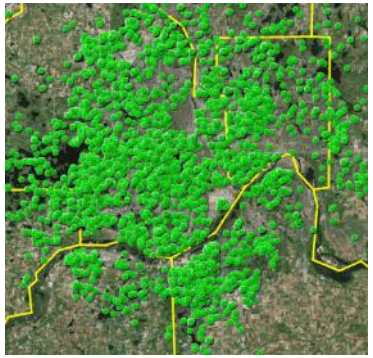
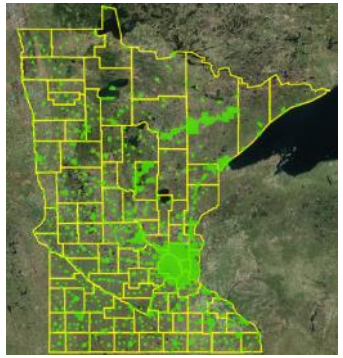
- Cities—Most implementable; money remains within jurisdiction
  - Incentivizes homeowner participation

- Neighborhoods—Can mobilize quickly, strong focus on neighborhood tree canopy

Cooperative EAB Management: What is Ideal?

- State
- Region
- Cities
- Neighborhoods

Success likely requires simultaneous efforts at all levels

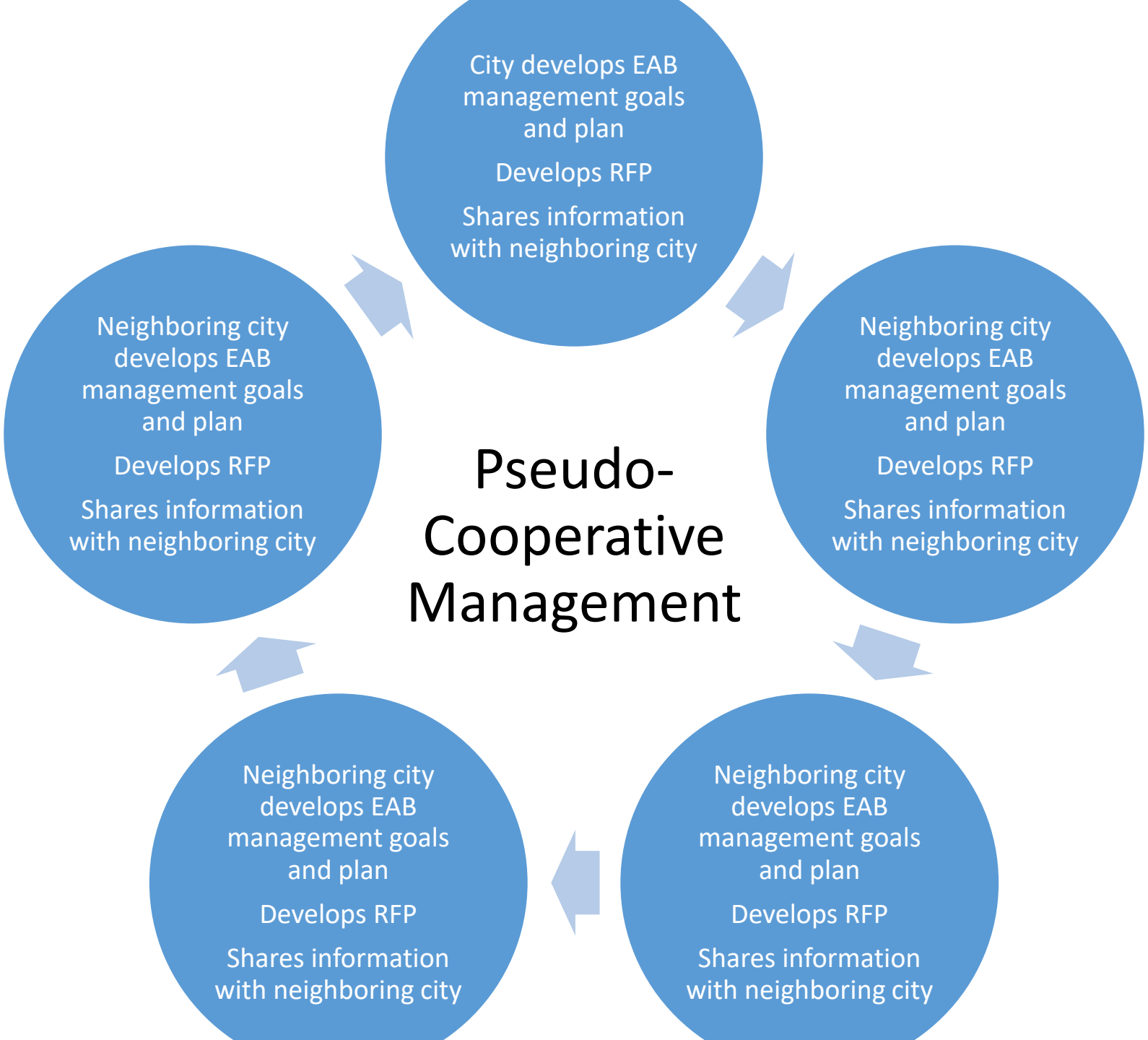
Municipal Plan Implementation & RFP's

Model EAB Management Plan Elements

- Scale able version of SLAM
- Incentivizes private tree owner participation
  - Does not require it
- Includes goals of accurate budget and tree tracking mechanisms
  - Helps with plan adoption
  - Tracks participation

Request for Proposals

- Requires contractor participation in education and outreach
- Requires GIS infrastructure and ash tree tracking
- When shared and utilized by multiple municipalities a pseudo-cooperative management approach is created


Pseudo-Cooperative Management
City develops EAB management goals and plan
Develops RFP
Shares information with neighboring city
Neighboring city develops EAB management goals and plan
Develops RFP
Shares information with neighboring city
Neighboring city develops EAB management goals and plan
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Neighboring city develops EAB management goals and plan
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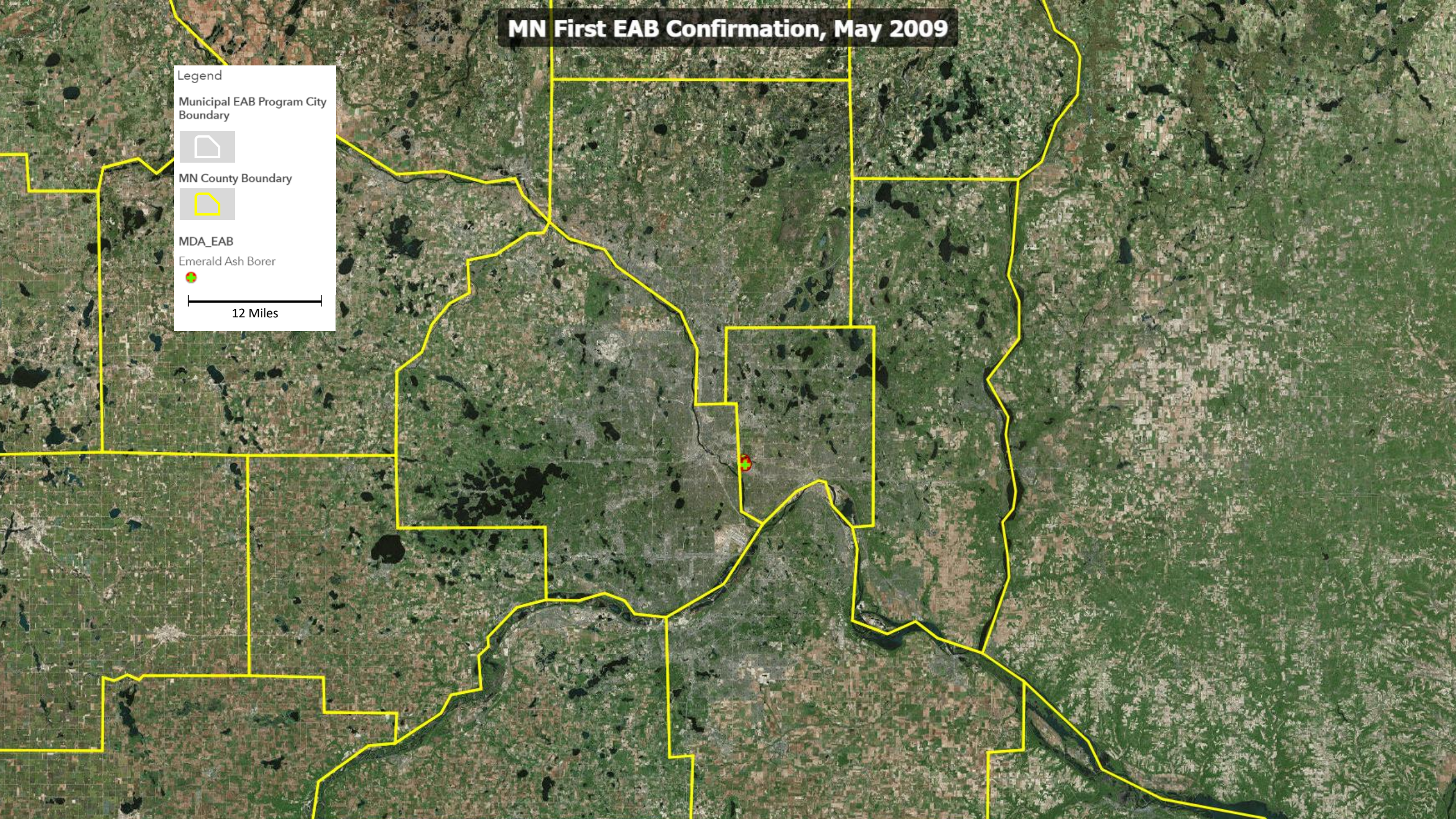
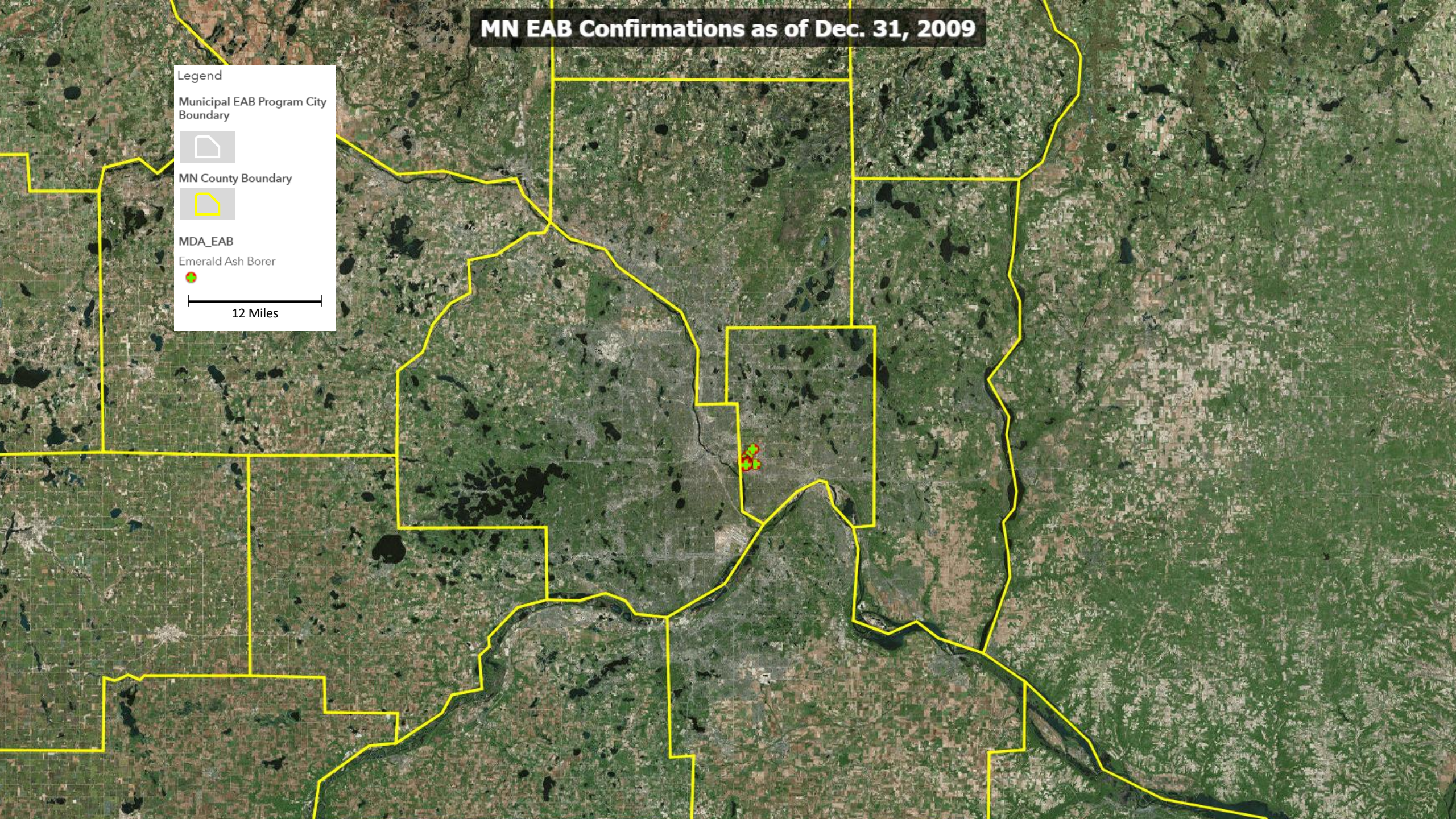
Neighboring city develops EAB management goals and plan
Develops RFP
Shares information with neighboring city

Pseudo-cooperative EAB management & infestation progression in Twin Cities metro

May 2009 - Today


MN First EAB Confirmation, May 2009
Legend
Municipal EAB Program City Boundary
MN County Boundary
MDA_EAB
Emerald Ash Borer
12 Miles


MN EAB Confirmations as of Dec. 31, 2009
Legend
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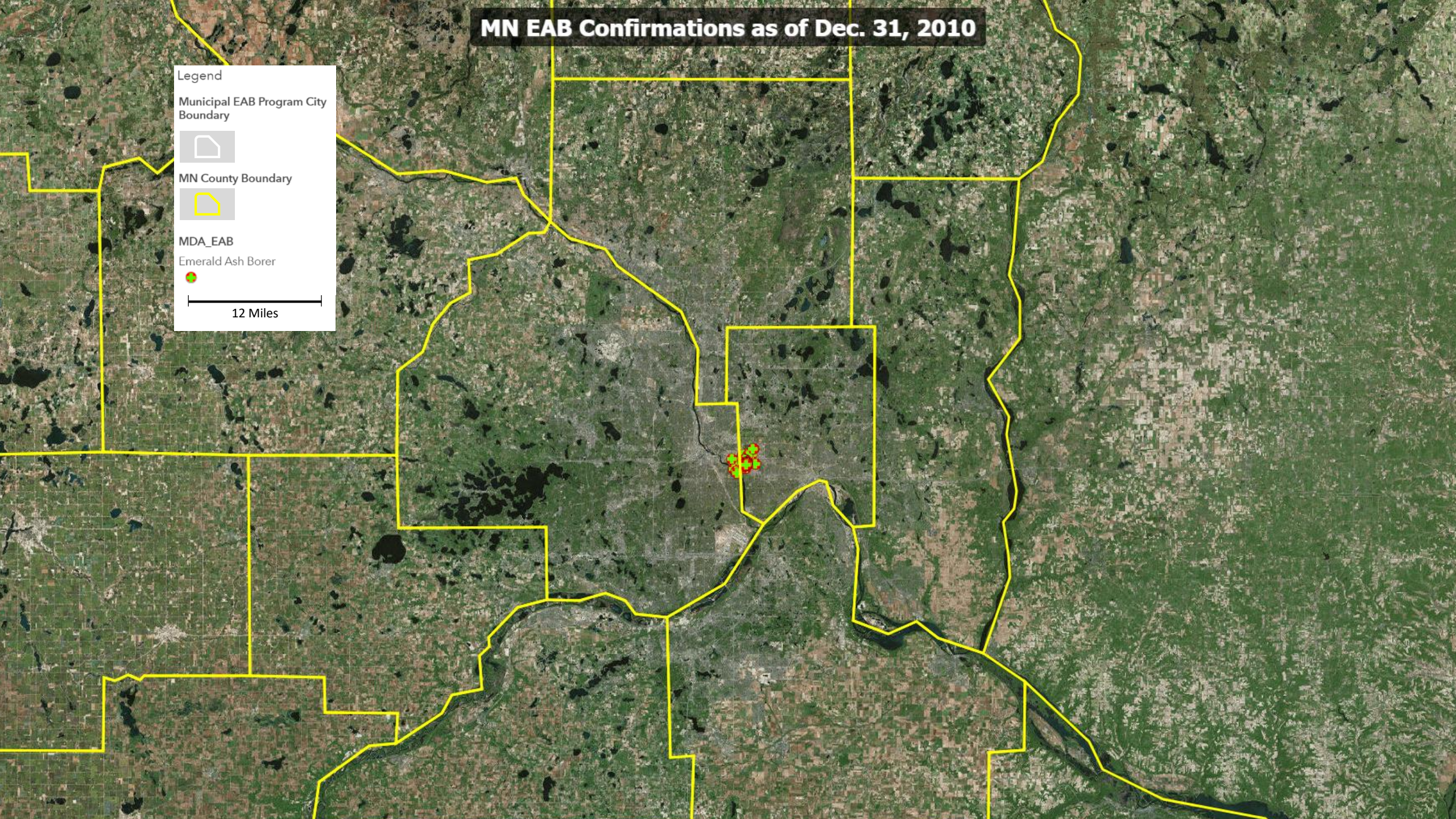
MN County Boundary
MDA_EAB
Emerald Ash Borer
12 Miles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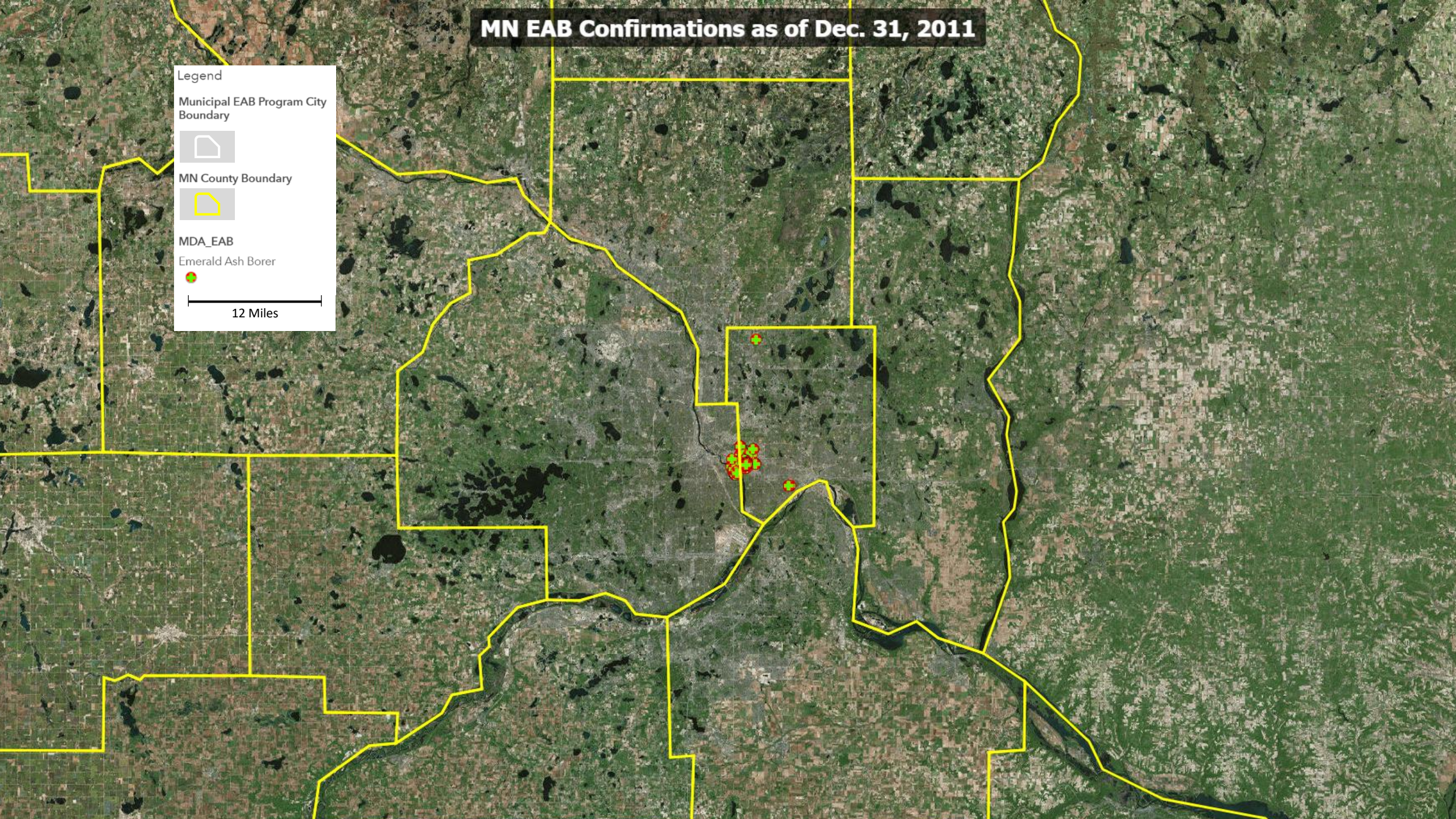
MN EAB Confirmations as of Dec. 31, 2011
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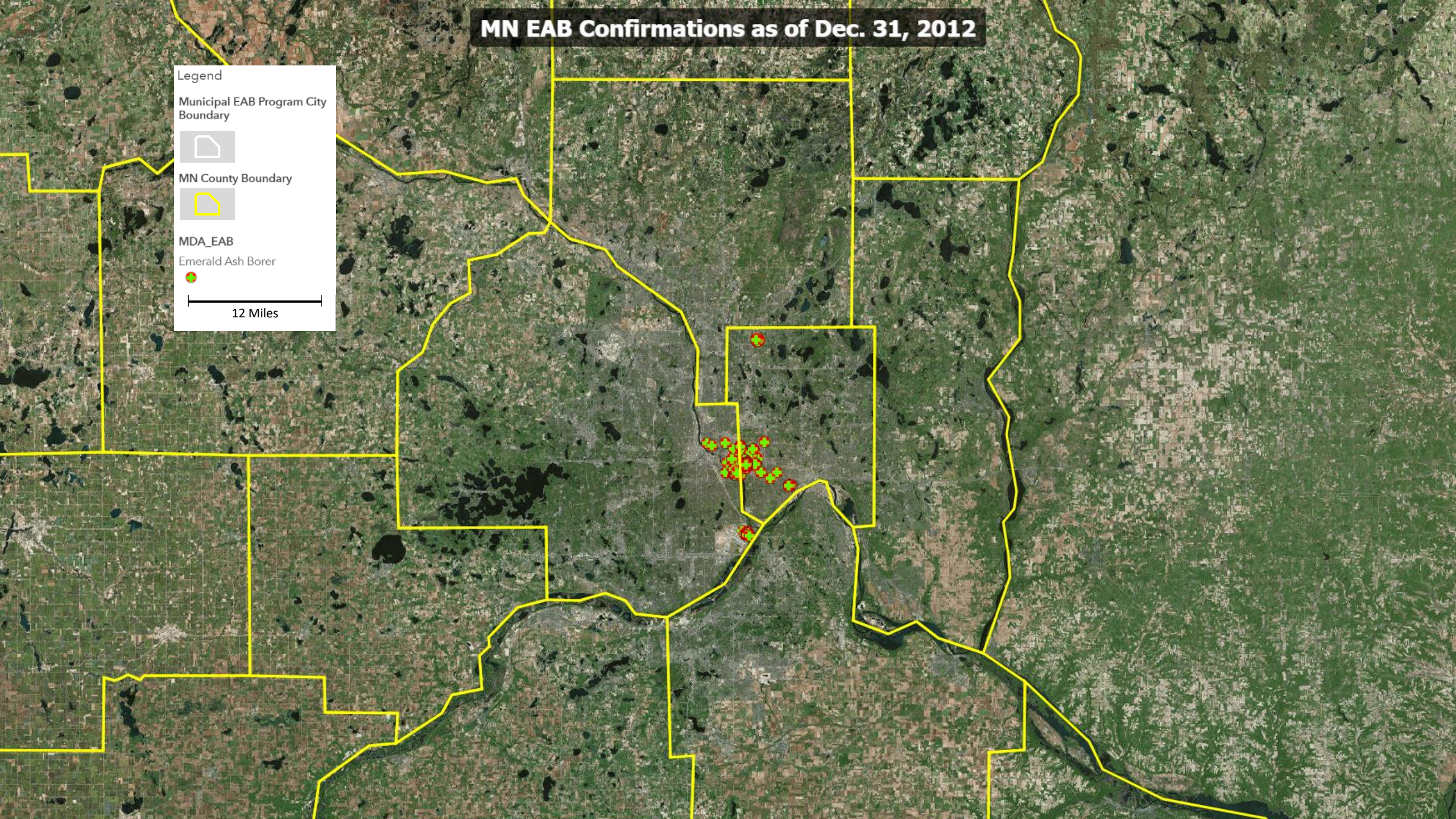
Emerald Ash Borer
12 Miles


MN EAB Confirmations as of Dec. 31, 2012
Legend
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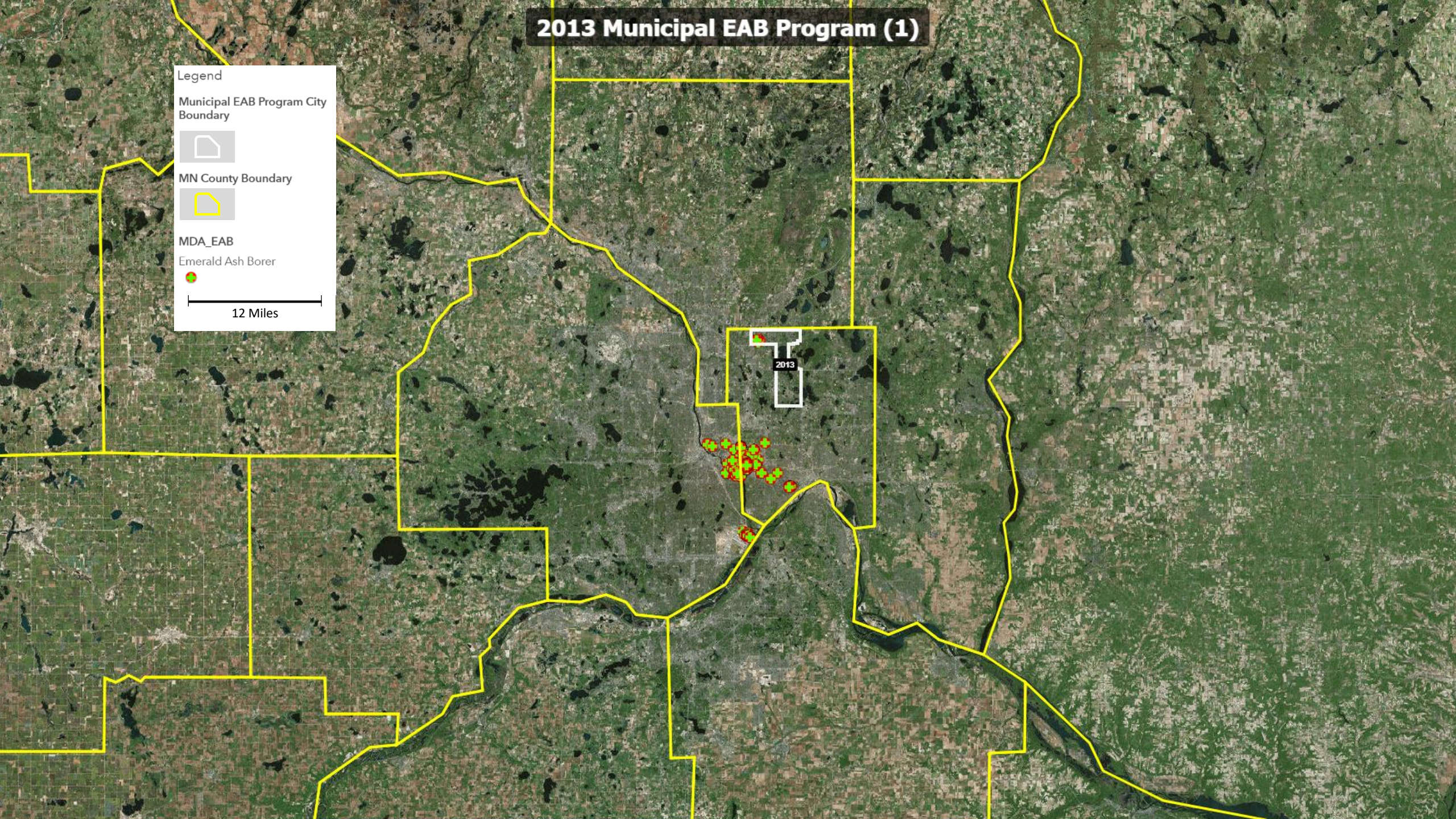
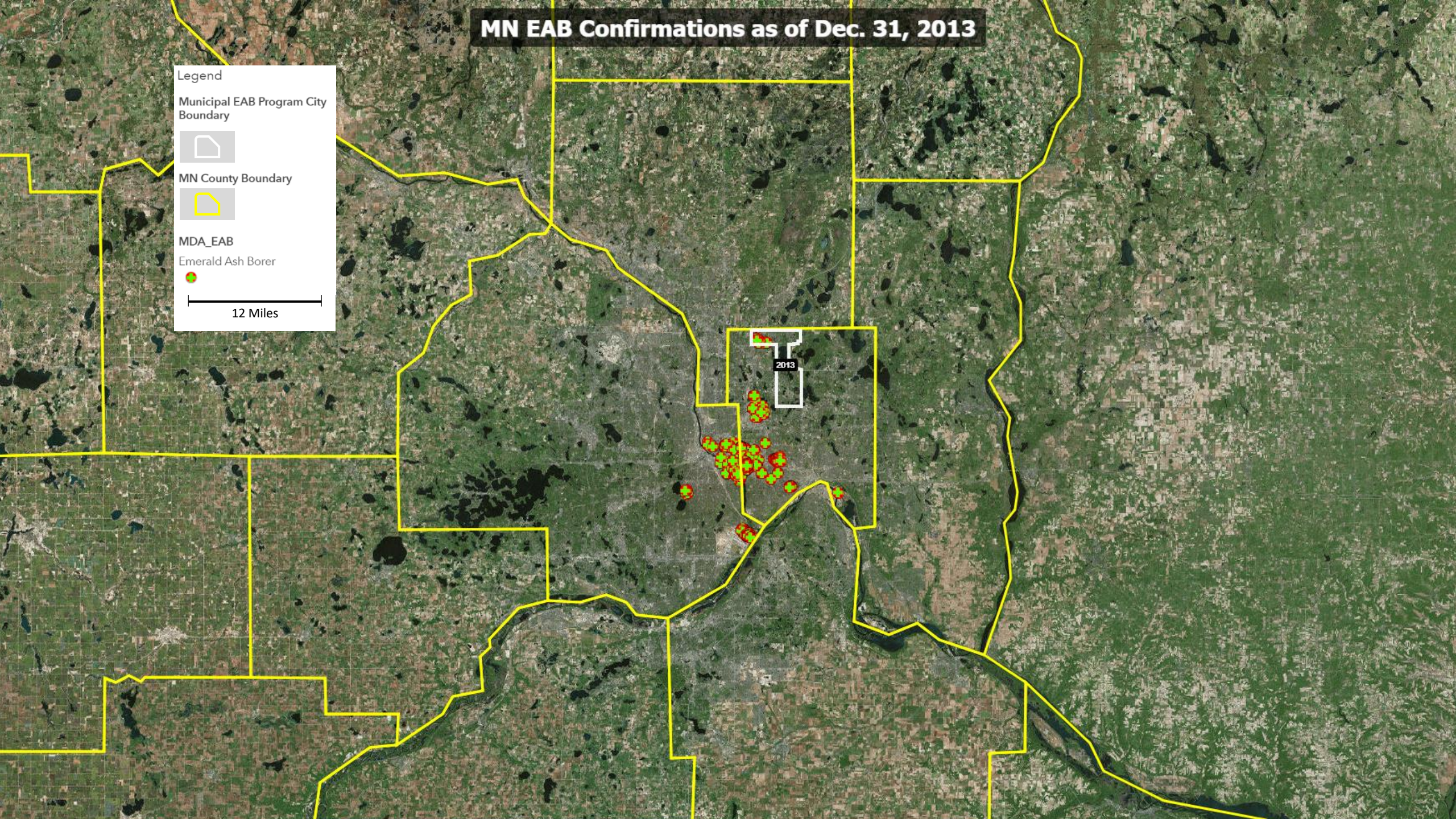
MN County Boundary
MDA_EAB
Emerald Ash Borer
12 Miles

2013 Municipal EAB Program (1)




MN EAB Confirmations as of Dec. 31, 2013
Legend
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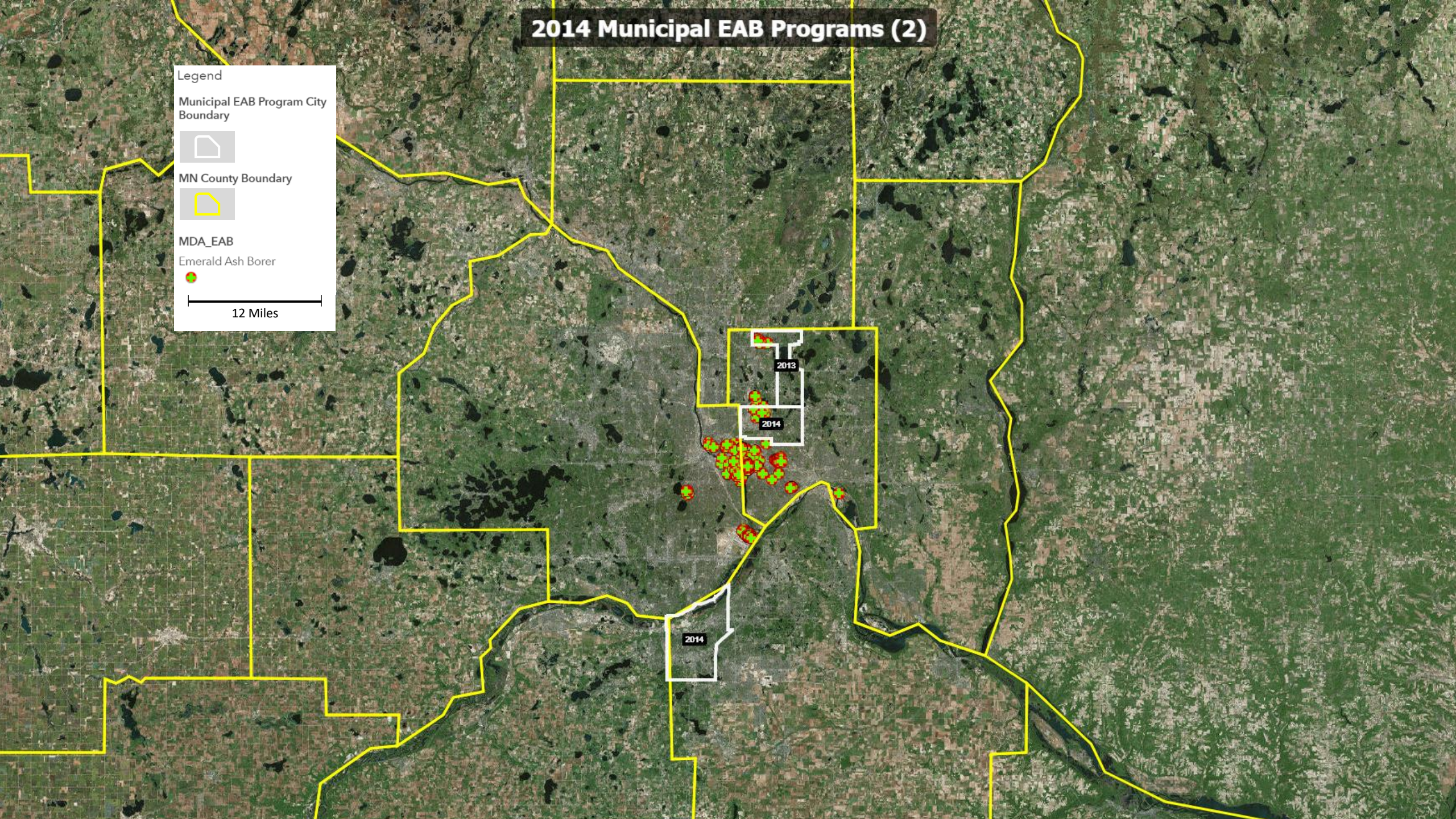
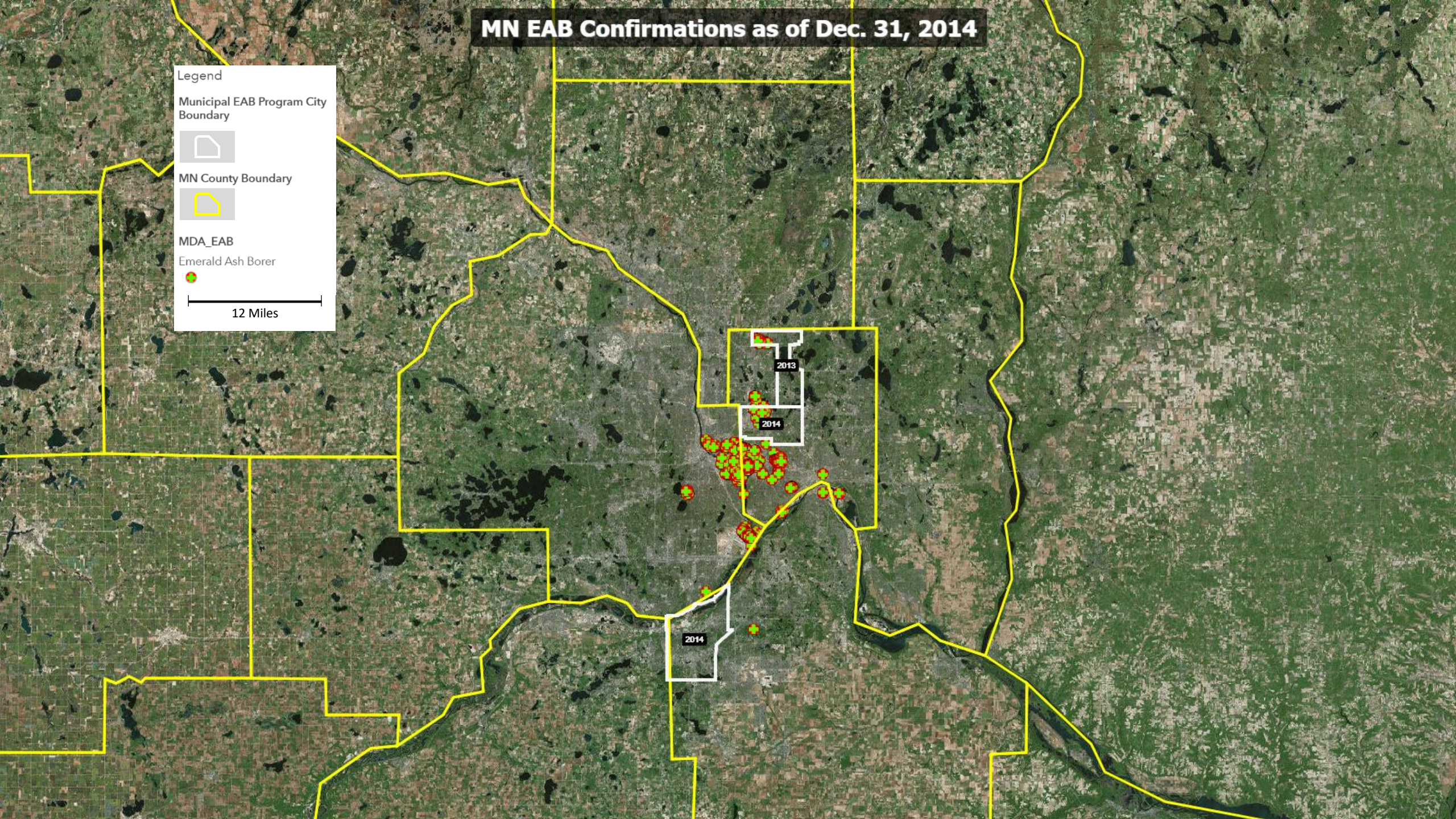
MDA_EAB
Emerald Ash Borer
12 Miles
2013

2014 Municipal EAB Programs (2)




MN EAB Confirmations as of Dec. 31, 2014
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Municipal EAB Program City Boundary
MN County Boundary
MDA_EAB
Emerald Ash Borer
12 Miles
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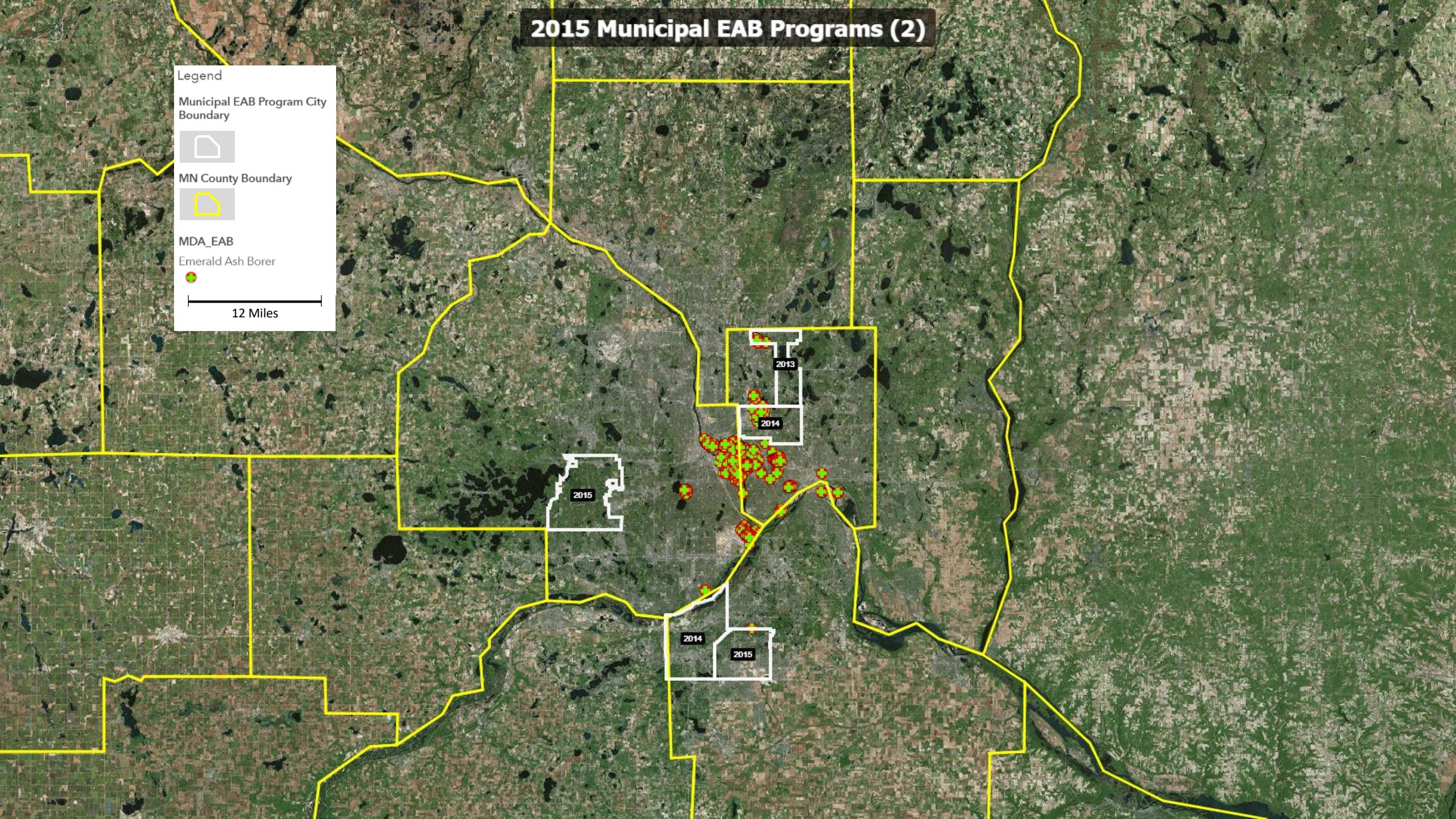
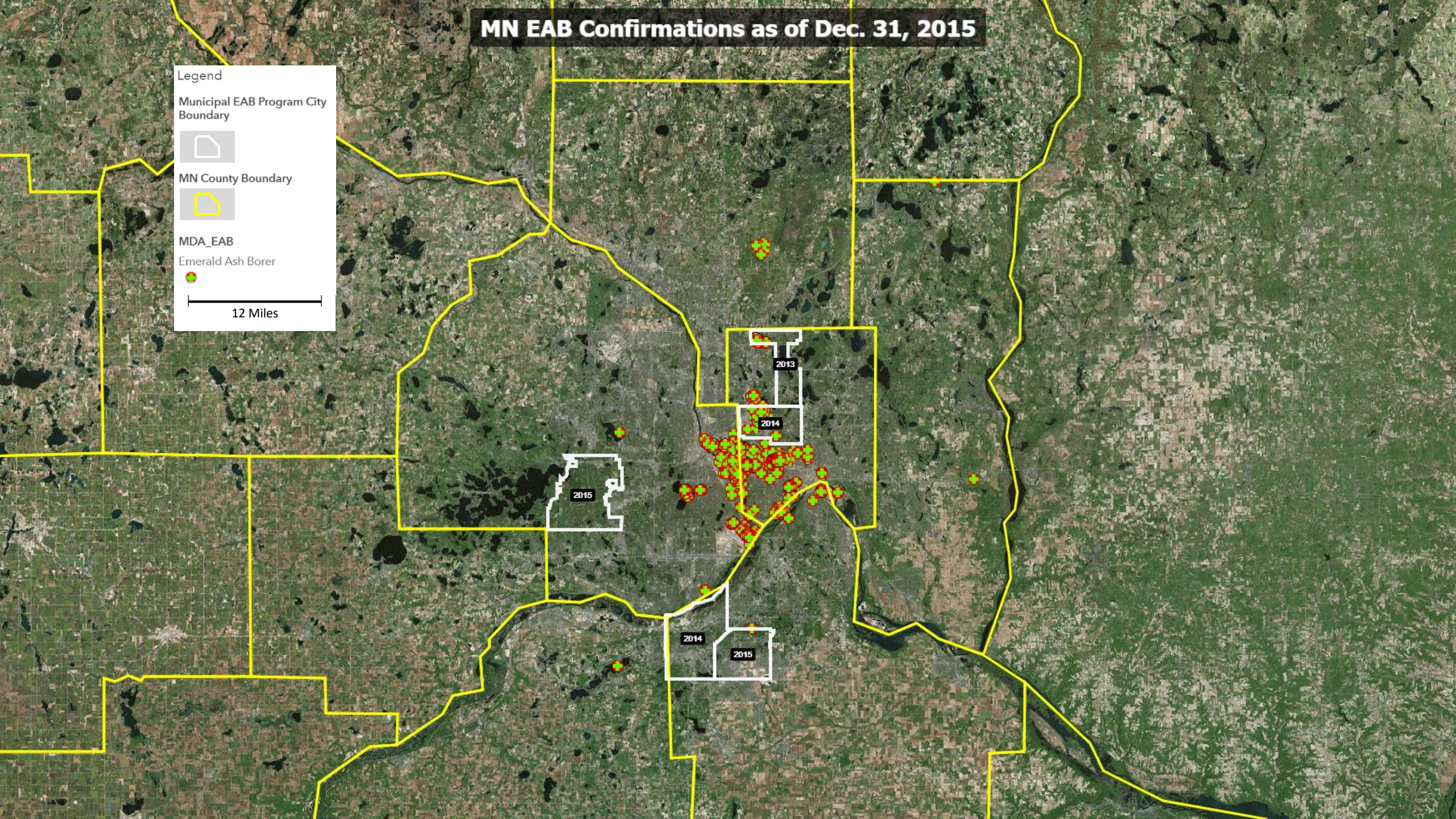
2015 Municipal EAB Programs (2)




MN EAB Confirmations as of Dec. 31, 2015
Legend
Municipal EAB Program City Boundary
MN County Boundary
MDA_EAB
Emerald Ash Borer
12 Miles
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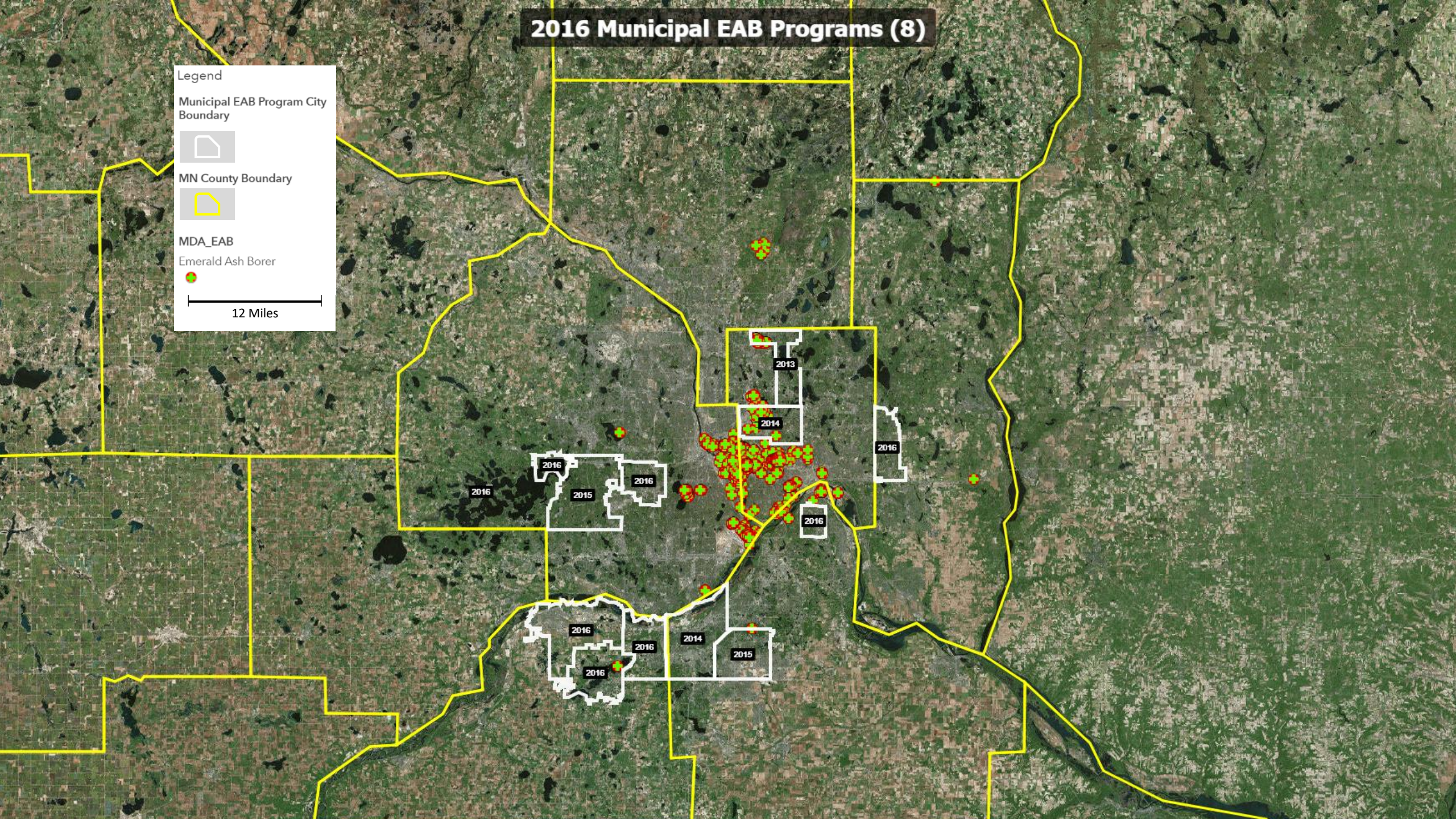
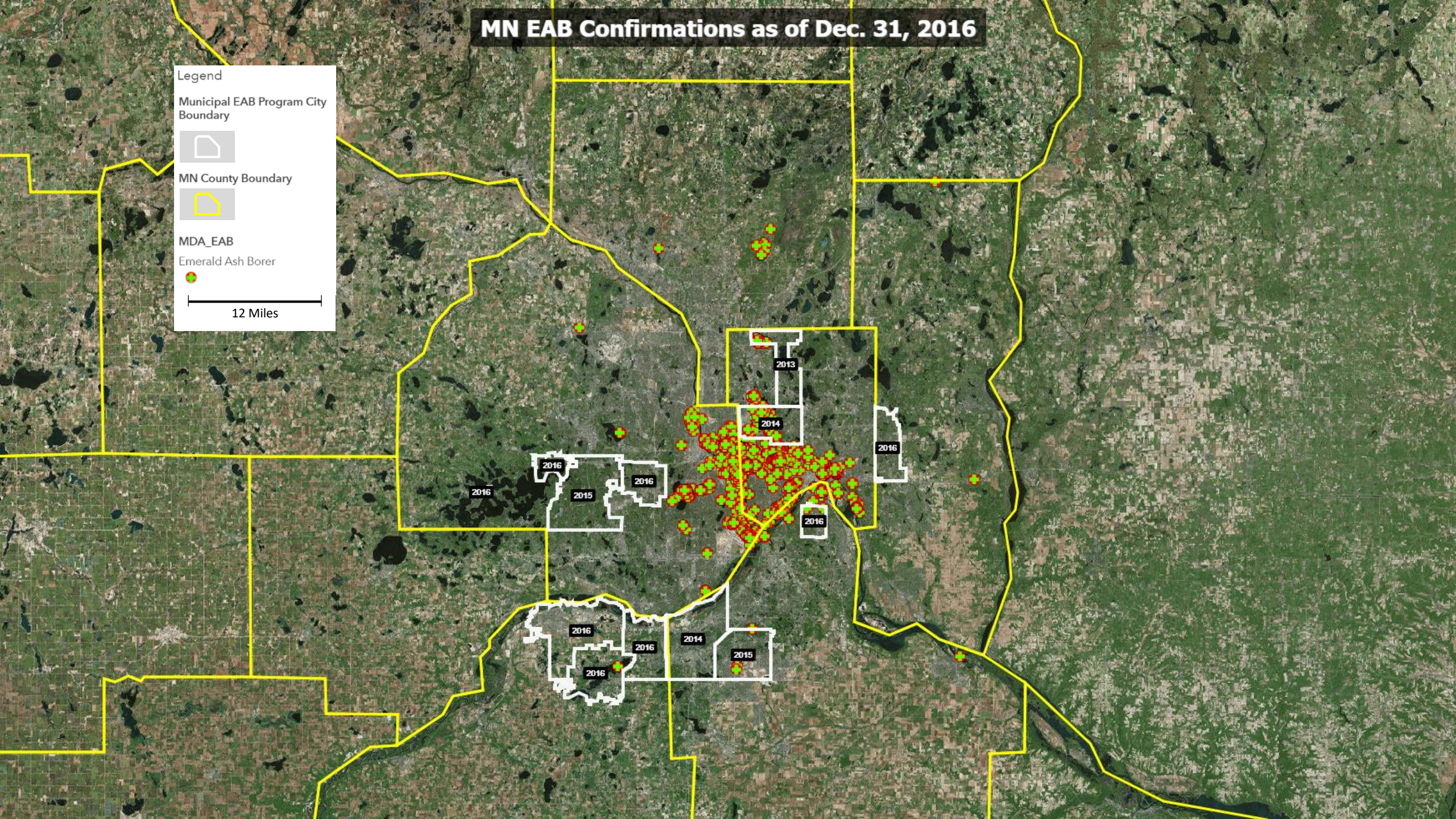
2016 Municipal EAB Programs (8)




MN EAB Confirmations as of Dec. 31, 2016
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MN County Boundary
MDA_EAB
Emerald Ash Borer
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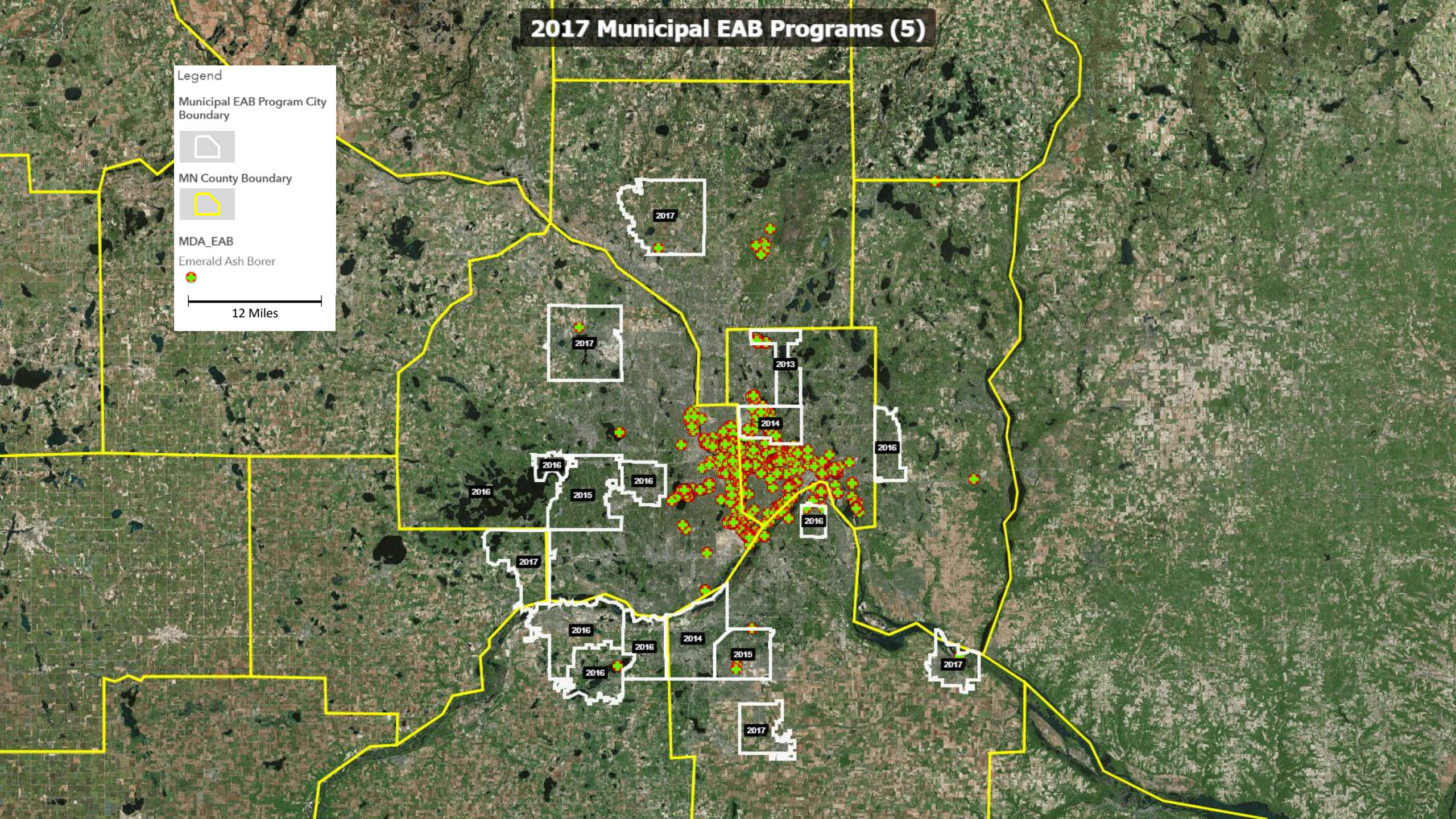
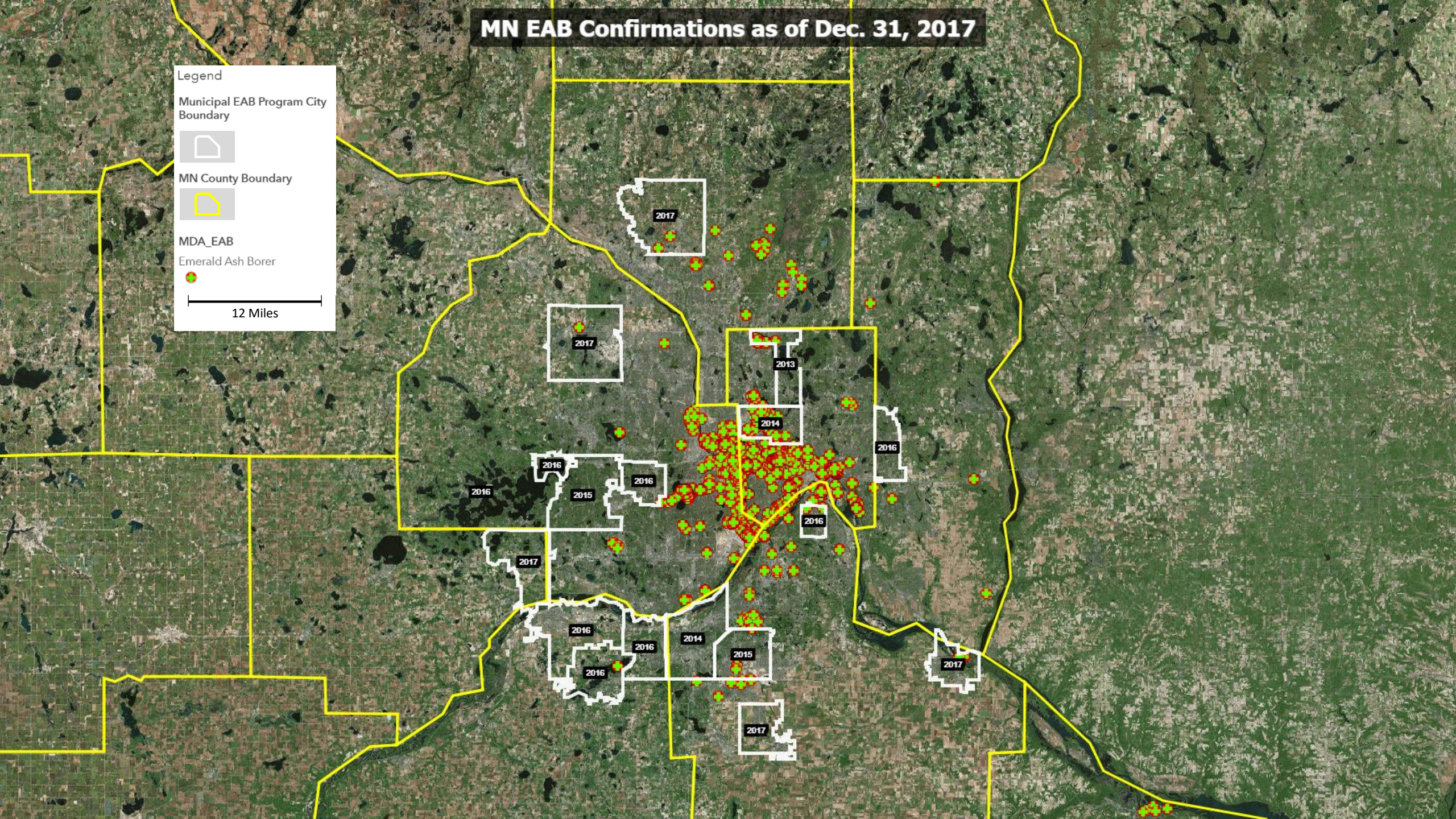
2017 Municipal EAB Programs (5)




MN EAB Confirmations as of Dec. 31, 2017
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Emerald Ash Borer
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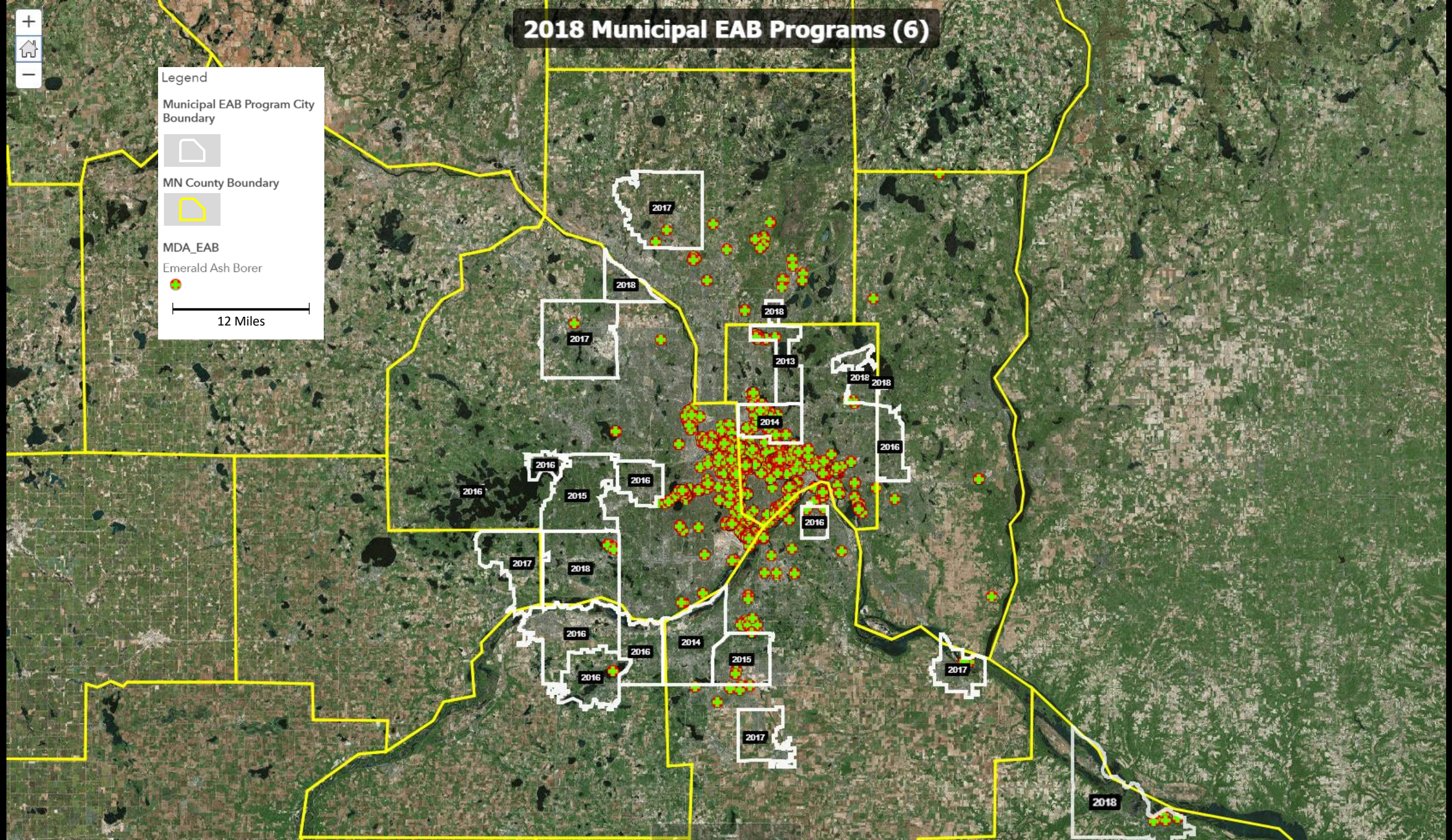
2018 Municipal EAB Programs (6)
Legend
Municipal EAB Program City Boundary
MN County Boundary
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Emerald Ash Borer
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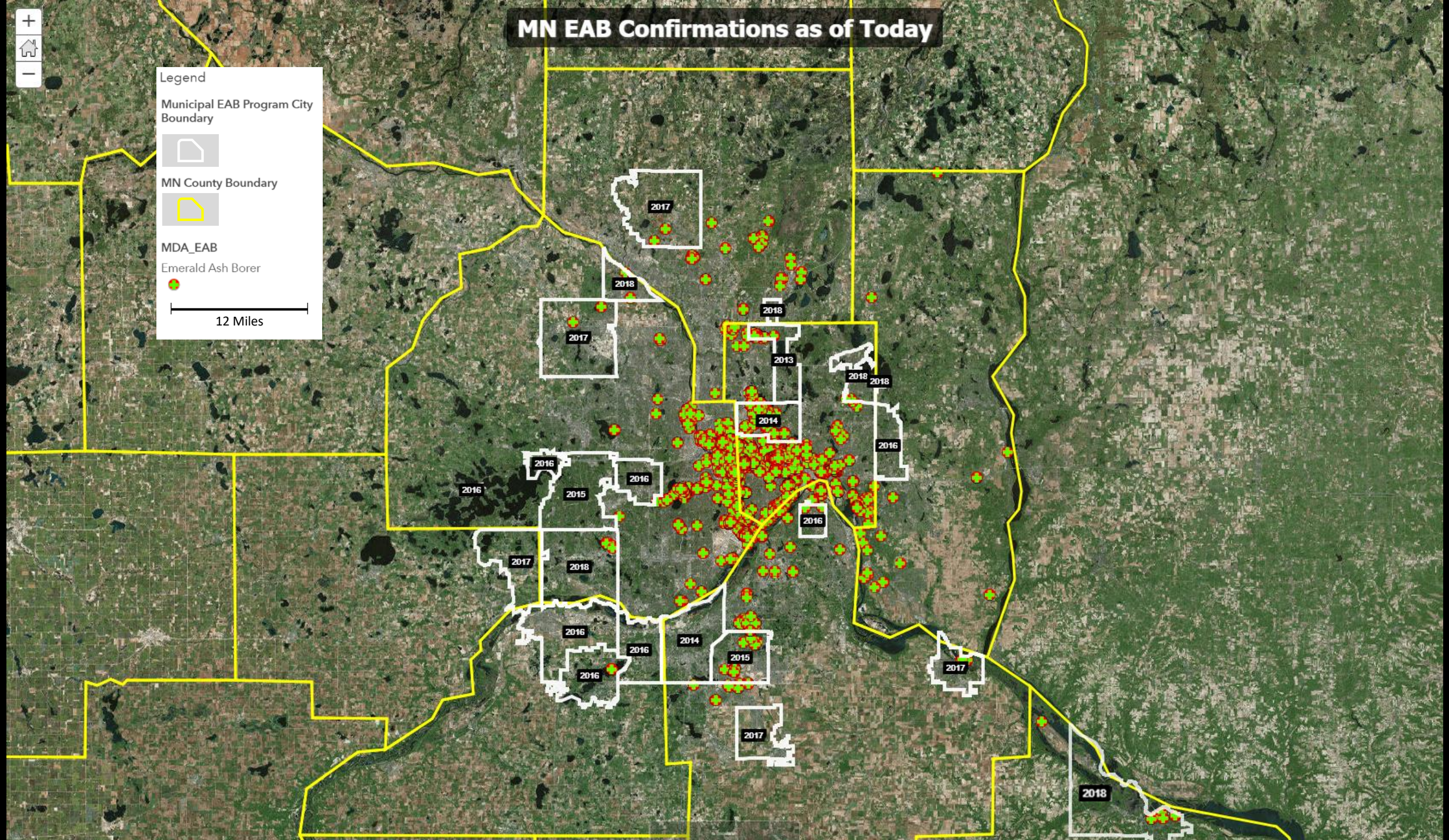
MN EAB Confirmations as of Today
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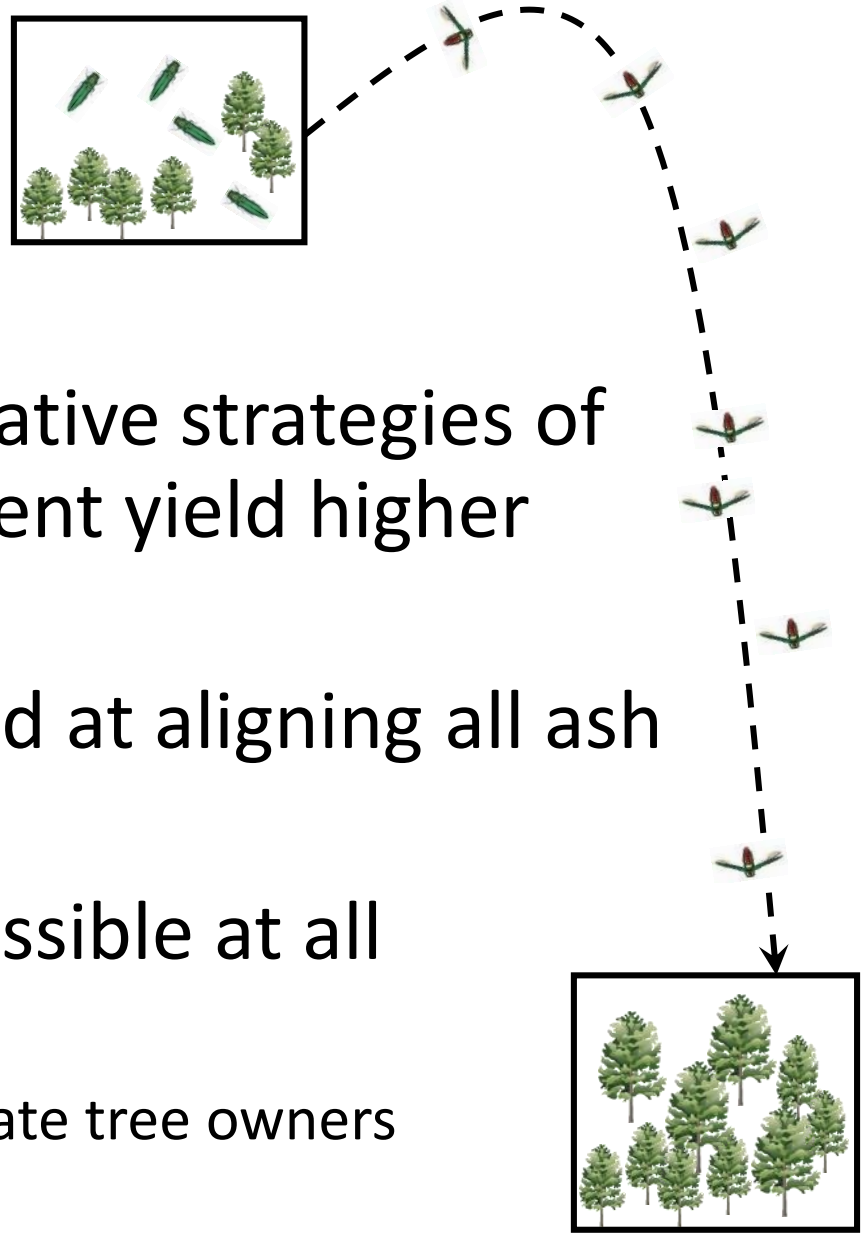
Conclusion



- Studies continue to suggest that cooperative strategies of EAB management which include treatment yield higher returns at lower costs
- Management plan goals should be aimed at aligning all ash tree owners in a unified strategy
- Scalable cooperative agreements are possible at all geographic levels
  - Municipal scale programs very influential on private tree owners