Forest Health Update

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Asian Longhorned Beetle

Very Good Hosts

Maple

Box elder

Horse chestnut

Buckeye

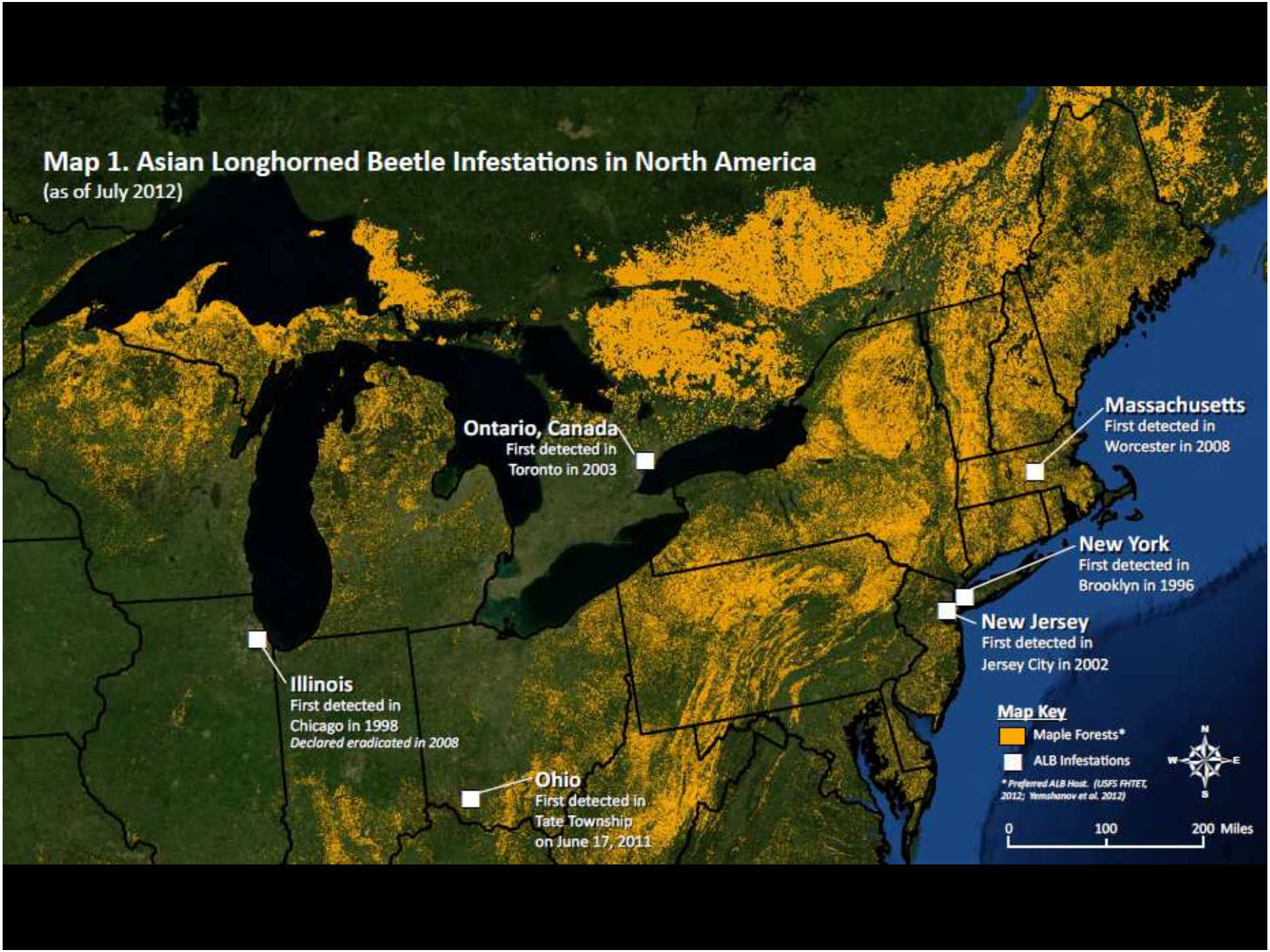
Willow

Elm

Good Hosts

Birch

Sycamore


Map 1. Asian Longhorned Beetle Infestations in North America
(as of July 2012)
Ontario, Canada
First detected in
Toronto in 2003
Massachusetts
First detected in
Worcester in 2008
New York
First detected in
Brooklyn in 1996
New Jersey
First detected in
Jersey City in 2002
Illinois
First detected in
Chicago in 1998
Declared eradicated in 2008
Ohio
First detected in
Tate Township
on June 17, 2011
Map Key
Maple Forests*
ALB Infestations
* Preferred ALB Host. (USFS FHTET, 2012; Yemshanov et al. 2012)
N
W
E
S
0
100
200 Miles

What Have We Learned?

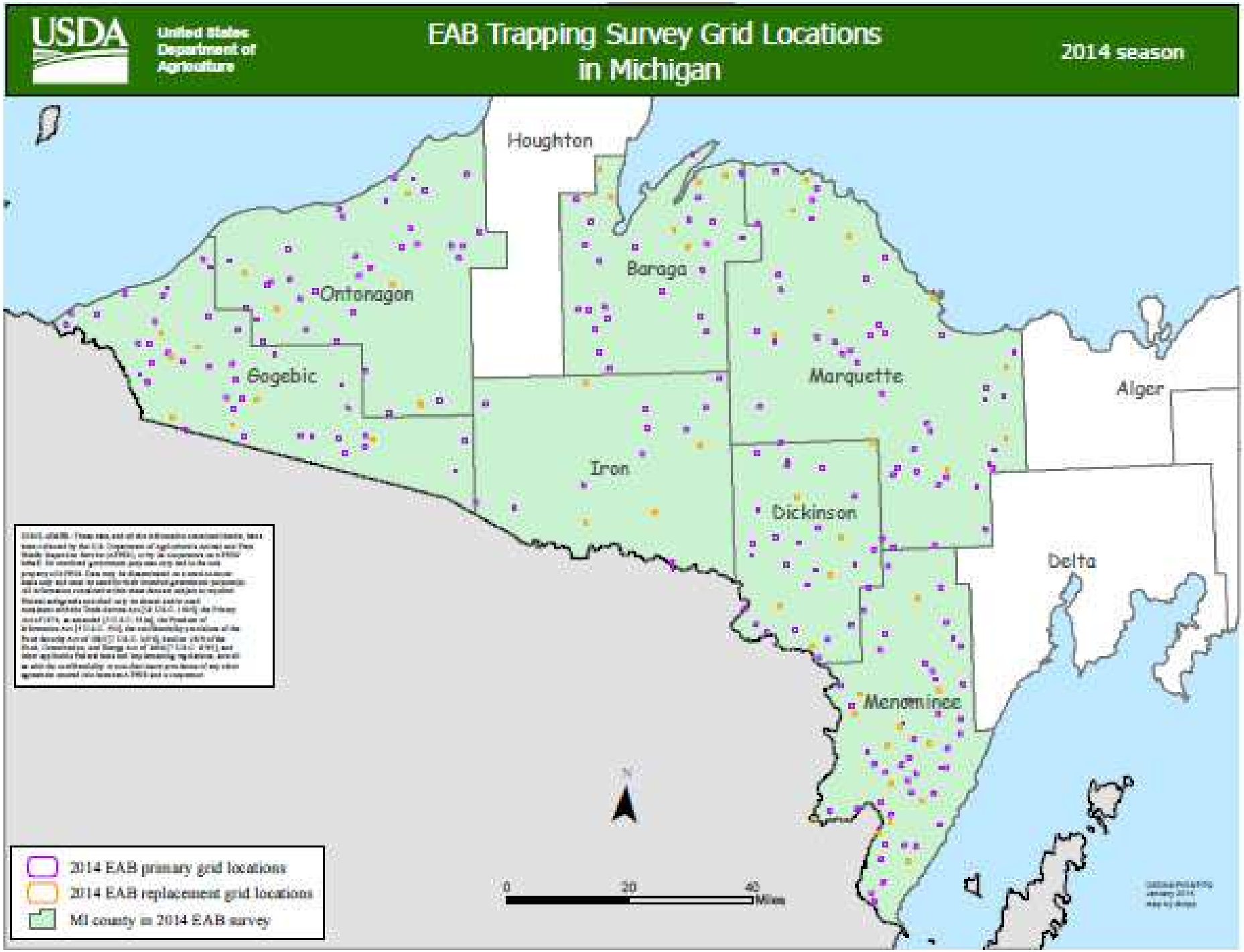
- ALB is not outright killing forest trees
  - Little impact on tree growth
  - 10-15 years before decline!
- ALB found in forest trees of all sizes
- ALB attacked and survived at higher rates in red maple
- Basswood is good!

Emerald Ash Borer (EAB)

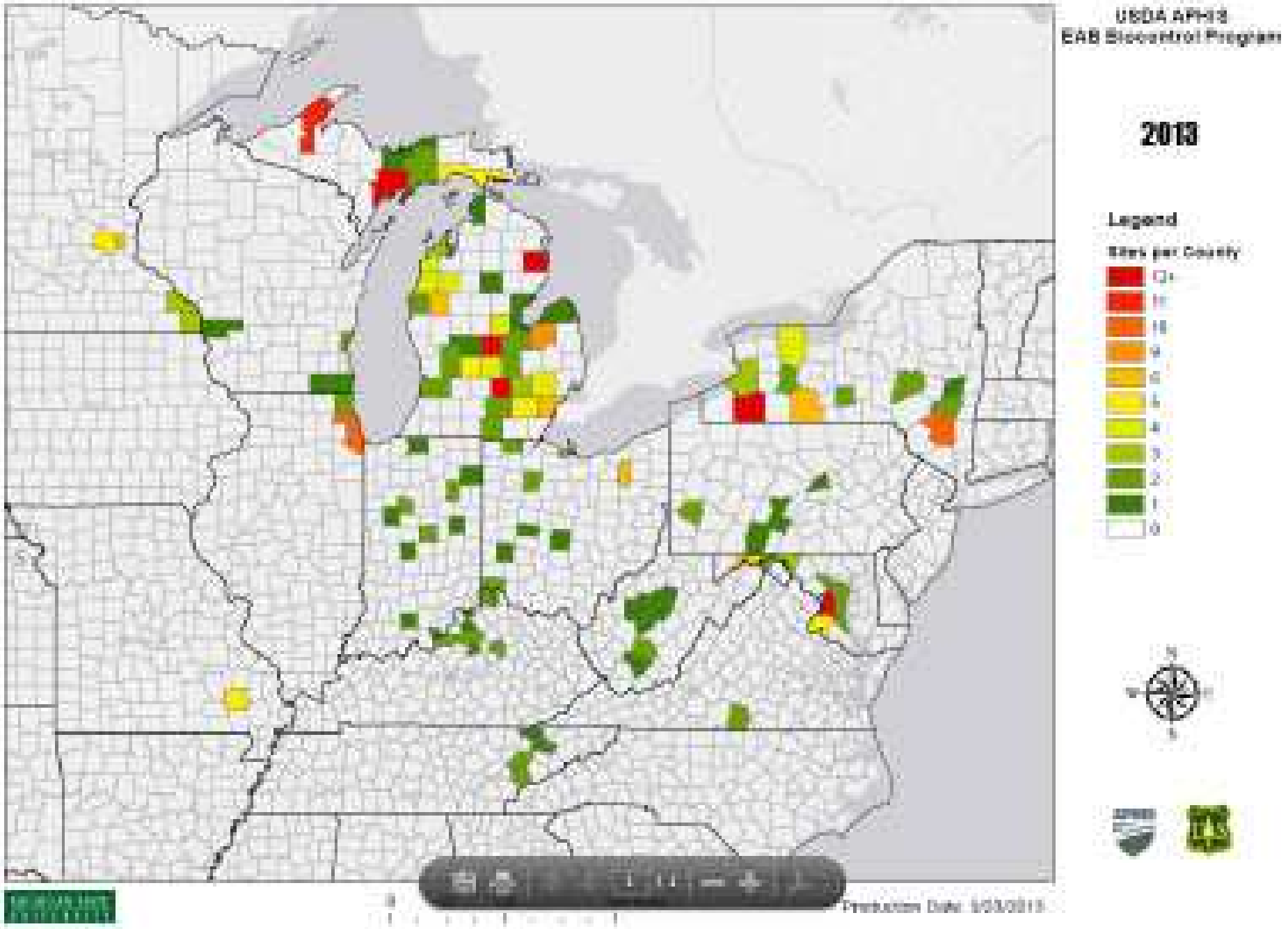
Adults are present mid-May to August. Live for 3-6 weeks and feed on ash leaves.

Woodpecker Damage

Scaling


USDA
United States Department of Agriculture
EAB Trapping Survey Grid Locations in Michigan
2014 season
Houghton
Baraga
Ontonagon
Marquette
Alger
Gogebic
Iron
Dickinson
Delta
Menominee
2014 EAB primary grid locations
2014 EAB replacement grid locations
MI county in 2014 EAB survey
0
20
40
Miles

EAB Biological Control Program: Number of Release Sites per County



Ash & Beech Salvage on State Forestlands

State Forests:

448,000 acres with ash and/or American beech

166,000 acres of > 8-inch dbh & > 10% of stand

Salvage efforts target these 166,000 acres.

Harvest decisions criteria:

- Is resource is infested?
- If not, proximity to the nearest infested site;
- Value and volume of at-risk resources
- Ease of access

Three Stages of Invasion

- Advancing Front
  - Scales only
- Killing Front
  - *Nectria* & Mortality
- Aftermath Forest
  - Few trees; defects & decline in residual trees

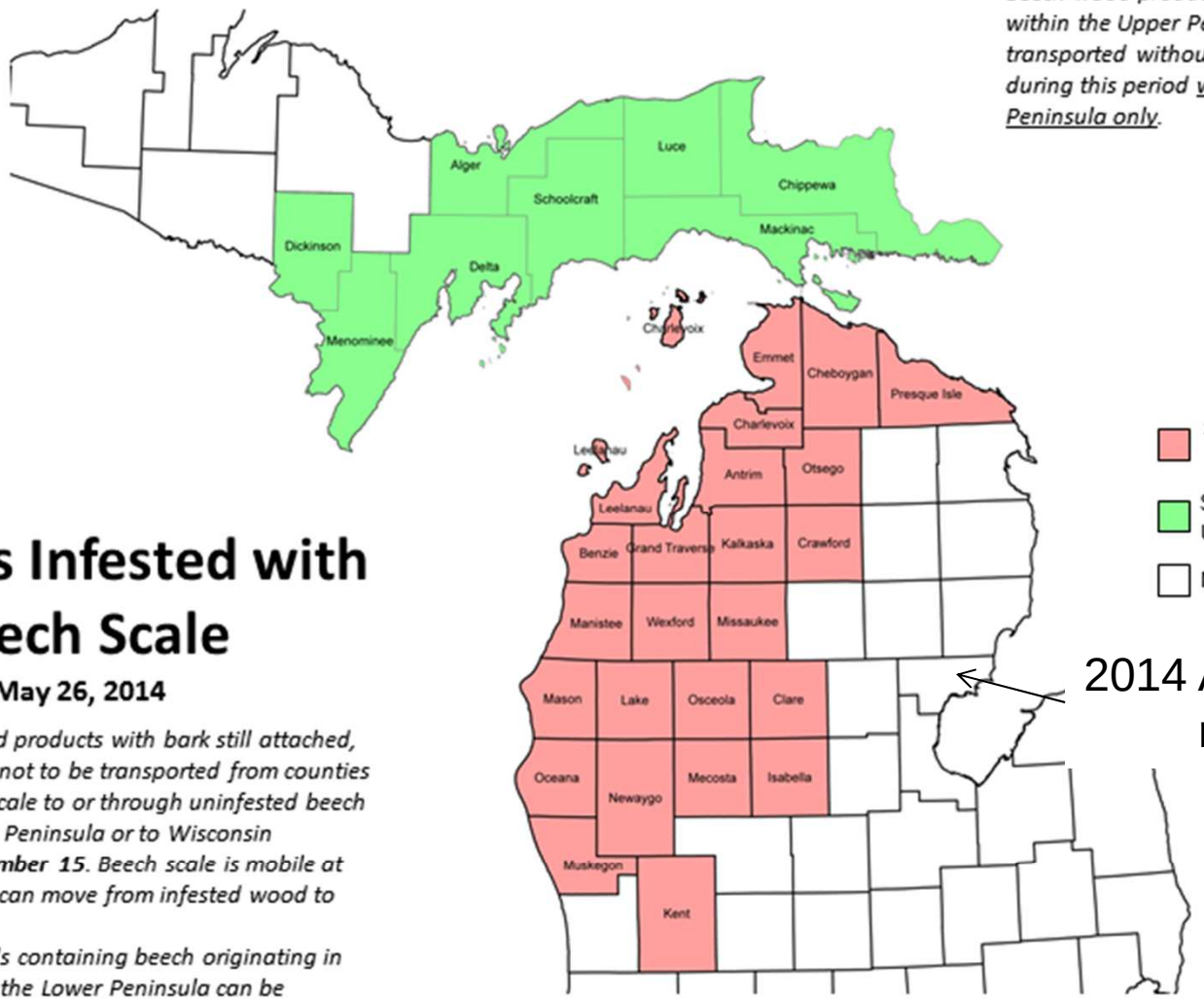
Counties Infested with Beech Scale

May 26, 2014

American beech wood products with bark still attached, other than chips, are not to be transported from counties infested with beech scale to or through uninfested beech counties in the Lower Peninsula or to Wisconsin from ***July 15 to November 15****. Beech scale is mobile at this time of year and can move from infested wood to live beech.*

Exception: *Truckloads containing beech originating in an infested county in the Lower Peninsula can be transported through uninfested counties to another infested county in the Lower Peninsula provided the truck takes the most direct route using only primary roads and does not stop in uninfested counties.*

Beech wood products originating within the Upper Peninsula can be transported without restrictions during this period within the Upper Peninsula only.



2014 Arenac Co. report

Beech Snap - Reason for:

- Hazard Tree Management
- Salvage Cutting

Beech regeneration mixed with striped maple

Michigan's Upper Peninsula
First Resistant Tree at initial detection site

Light green lichen on many resistant beech

Not all resistant trees have smooth bark

Resistance Research

- USFS Research Lab, Delaware, OH
  - Collect scions
- MSU - Reporting form
  - Database
  - > 9” dbh
  - # tag & painted “R”
  - Leave a buffer

Michigan Department of Natural Resources – Forest Resources Division

COOPERATIVE BEECH BARK DISEASE RESISTANCE SURVEY

This information is requested under the authority of the Department of Natural Resources.

MSU TAG #
DATE

OBSERVER

Name	Organization
Address	Telephone ( )
City, State, ZIP	E-mail

LANDOWNER

Name	Organization
Address	Telephone ( )
City, State, ZIP	E-mail

Land Use

☐ Residential ☐ Recreation Area ☐ Private Non-Industrial ☐ Federal ☐ State

SITE LOCATION

County	Political Township	TRS Q. Sec

GPS Coordinates (preferred) (NAD83; Lat./Long. in decimal degrees) (Lat. 45.71717 / Long. -85.12343)

TREE DATA

DBH (inches): _____ / Scales: ☐ Absent; ☐ Sparse/Date Resistance Observed: _____

Tree Condition

☐ Healthy

☐ Unhealthy (describe e.g. % Dieback, Discoloration):

SITE AND DIAGNOSTIC DATA

BEECH COMPONENT OF AREA

☐ <21% beech stems

☐ 21-40% beech stems

☐ >40% beech stems

Distance to nearest scale infested trees _____ feet

CONDITION OF BEECH IN AREA

☐ Scales only

☐ Scales and Nectria cankers

☐ Beech Bark Disease (BBD) induced decline/mortality

Major Overstory Species: _____

CANDIDATE TREES MUST BE

1) ≥ 9" in diameter at breast height
2) Adjacent to trees heavily infested by beech scale, or residual beech in a BBD aftermath forest.
3) Free of scales, or scales have remained scarce for ≥ 1 year.

Please sketch tree location on Mapping Area on the back of this survey and provide comments necessary to find candidate tree.

Mark resistant trees with an "R" on two sides of the tree. Use white tree marking paint.

BBD Resistance: Next Steps

- To preserve beech bark disease resistant germplasm
- To produce beech bark disease resistant planting stock & seed
- To restore American beech as a sustainable component of our North American forest resource

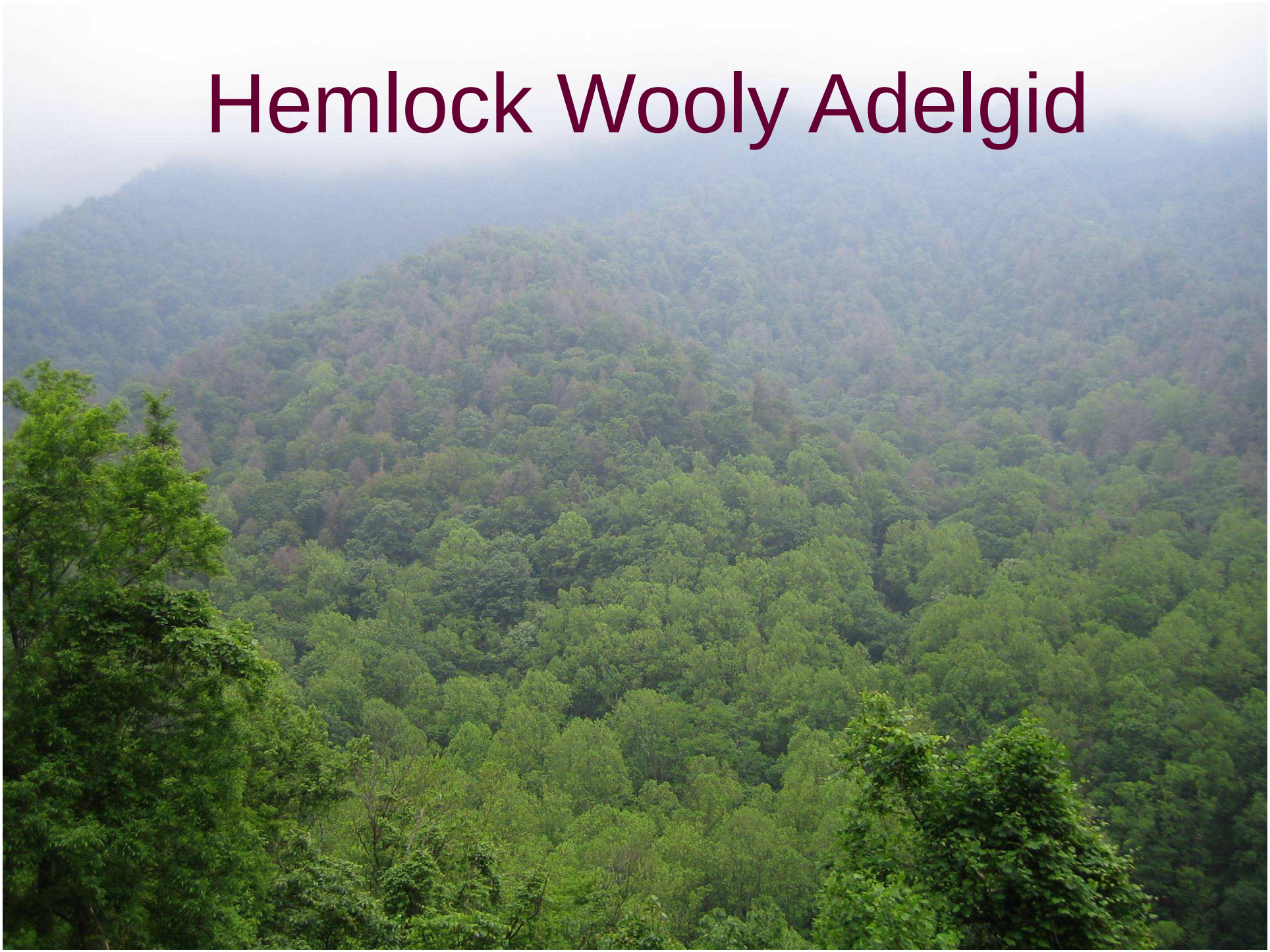
Restoration Plantings

- Target beech bark disease salvage and pre-salvage timber sales and special areas like Ludington State Park
- Seedlings planted in blocks to ensure cross fertilization of resistant parents.
- A goal of these plantings will be to establish enhanced seed production areas.
- Plantings could be established ahead of the beech bark disease killing front to reduce the impacts of the disease once it arrives.

135 BBD Resistance Saplings Planted in EUP, Fall 2011

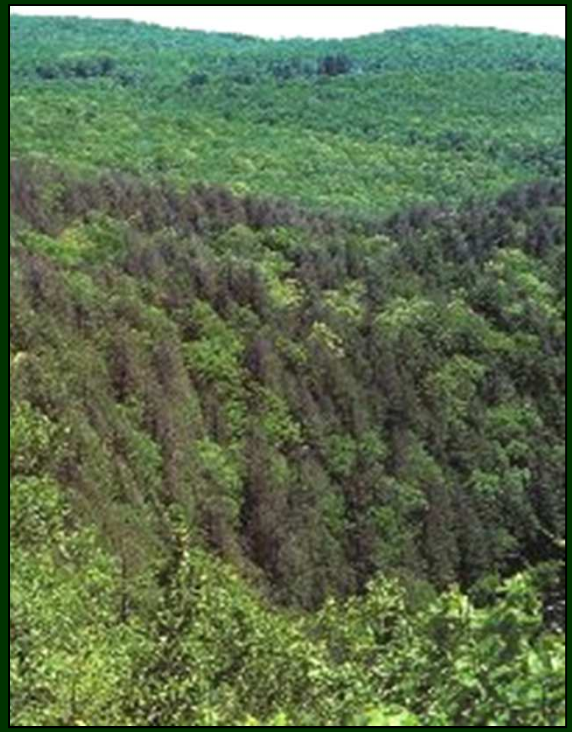
The "Beech" Boys

Hemlock Wooly Adelgid

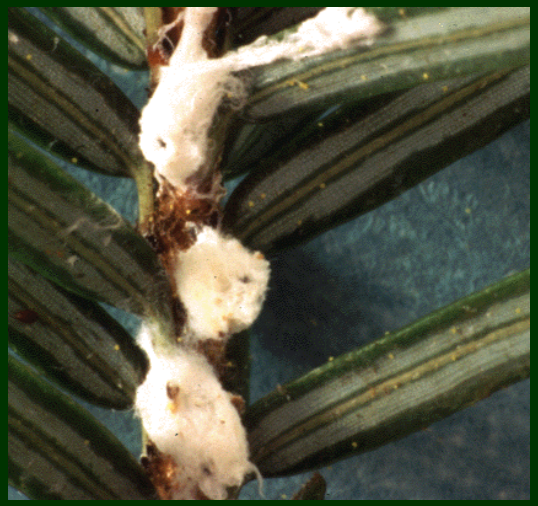


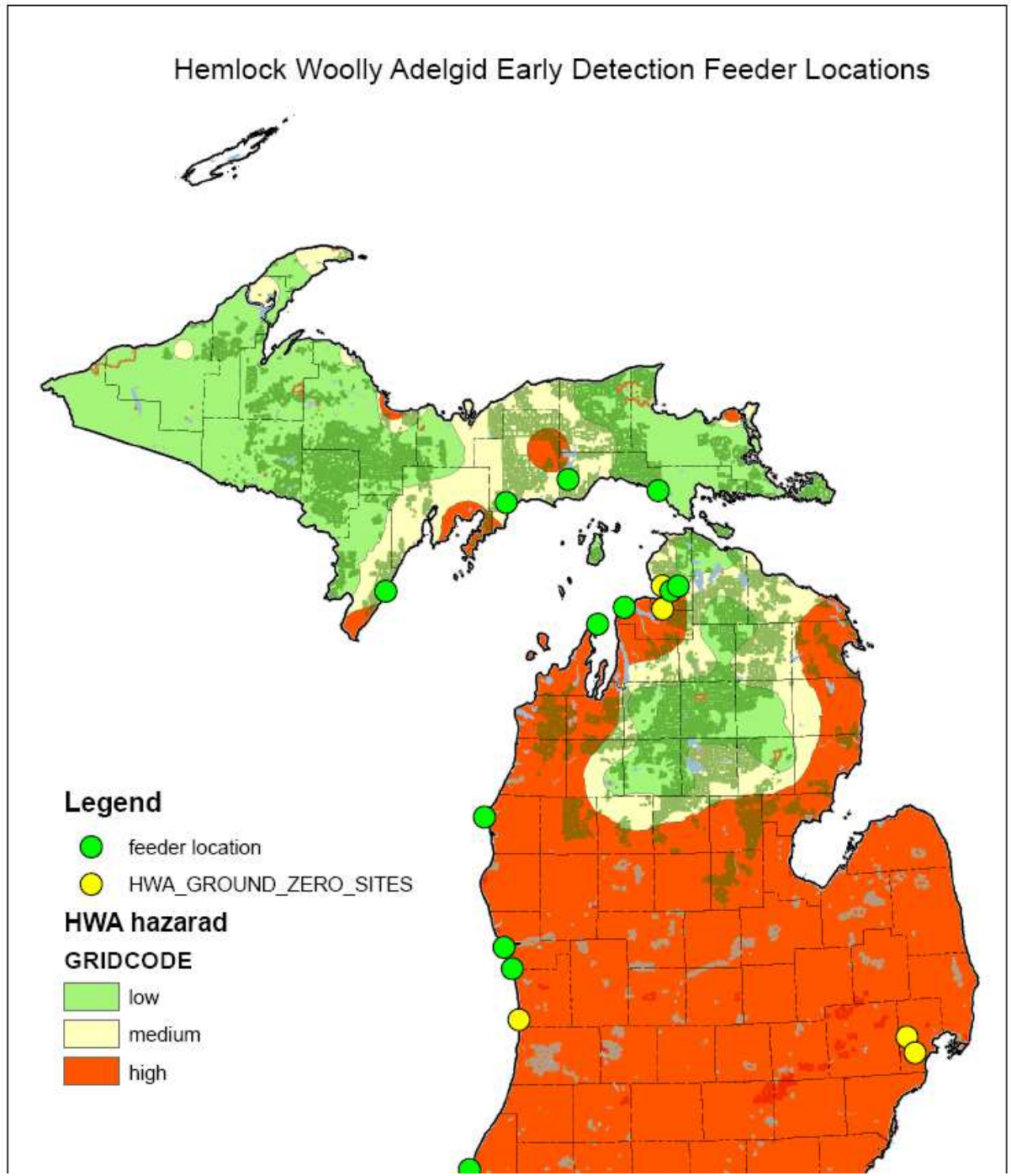
Hemlock Mortality

Hemlock decline and mortality typically occur within 4 to10 years (stress increases impacts).



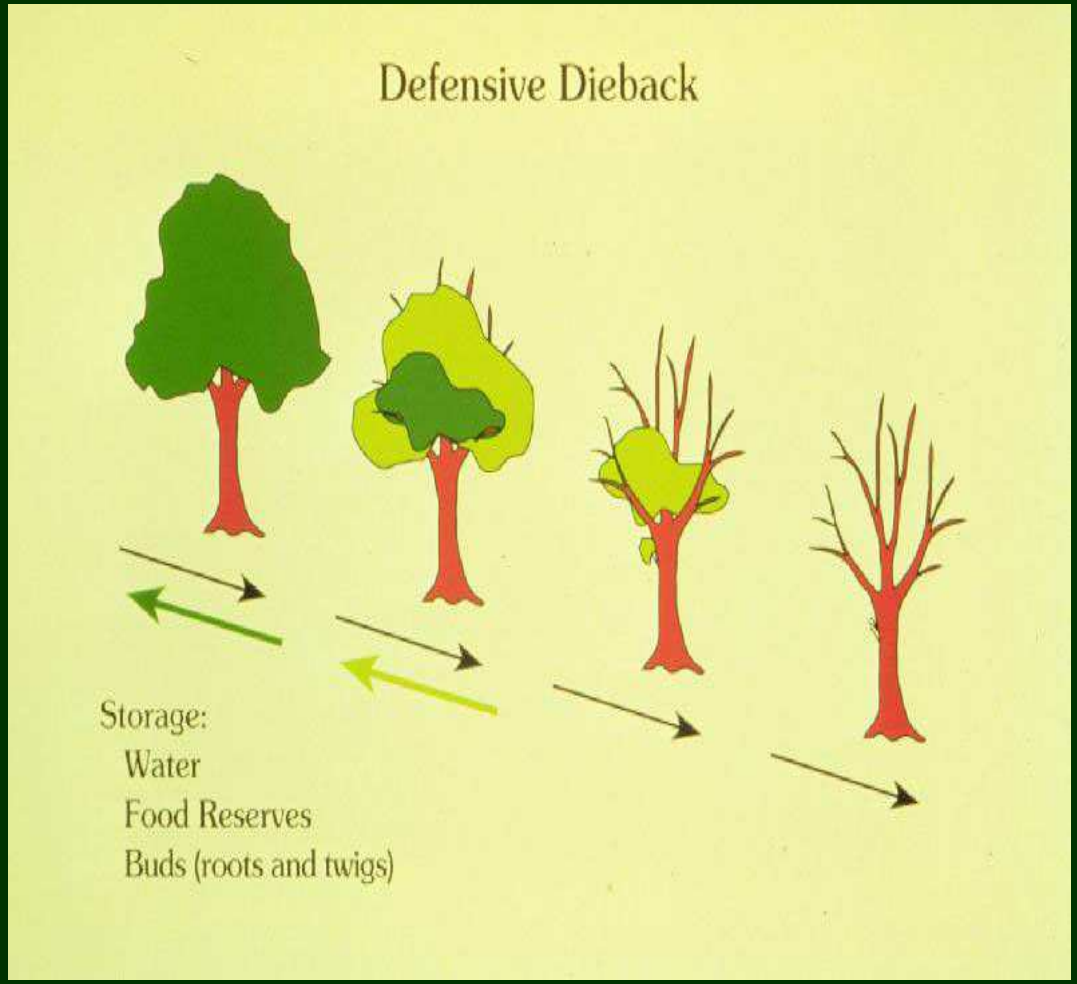
Hemlock Woolly Adelgid




Hemlock Woolly Adelgid Early Detection Feeder Locations
Legend
feeder location
HWA_GROUND_ZERO_SITES
HWA hazarad
GRIDCODE
low
medium
high

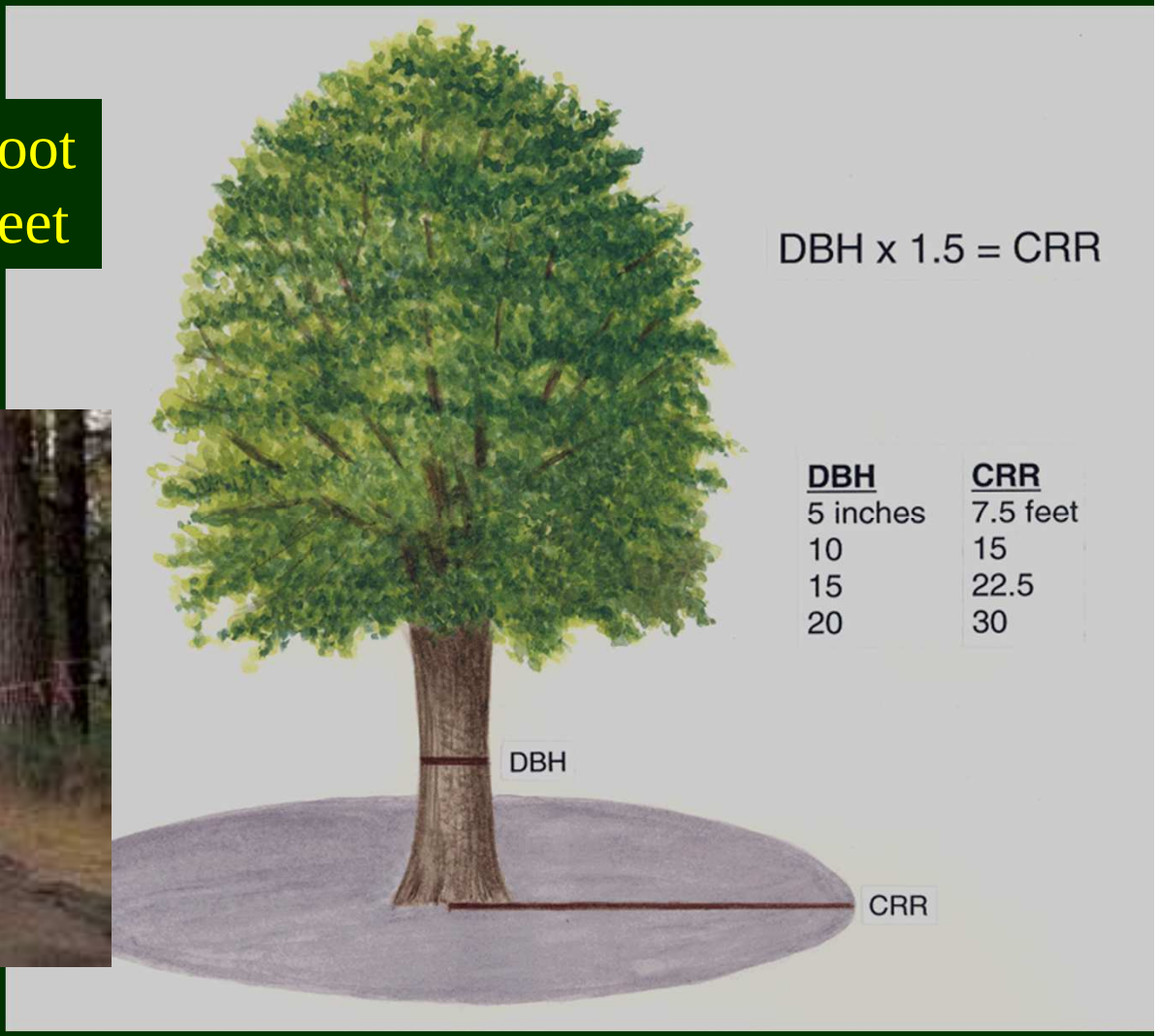
Recent Forest Declines in Michigan

- Declines of:
  - Ash
  - Aspen
  - Balsam fir
  - Basswood
  - Hickory
  - Maple
  - Oak
  - Walnut
  - White Spruce
  - White Birch



Roots: *The Foundation of Forest Health*

75% of roots in top 1 foot
90% of roots in top 3 feet



Sapstreak disease

Stunting, cupping of foliage, thin crowns.
Eventually (2-4 years) fatal.

Infection through wounds at the bases of trees, or roots.
Often associated with harvesting.

Caused by *Ceratocystis coerulescens*, related to other fungi that cause stains in wood.

Extensive discoloration of the wood is diagnostic. Fungus may sporulate profusely on cut ends of stumps and logs.

Thank you

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