EMERALD ASH BORER

THE GREEN MENACE

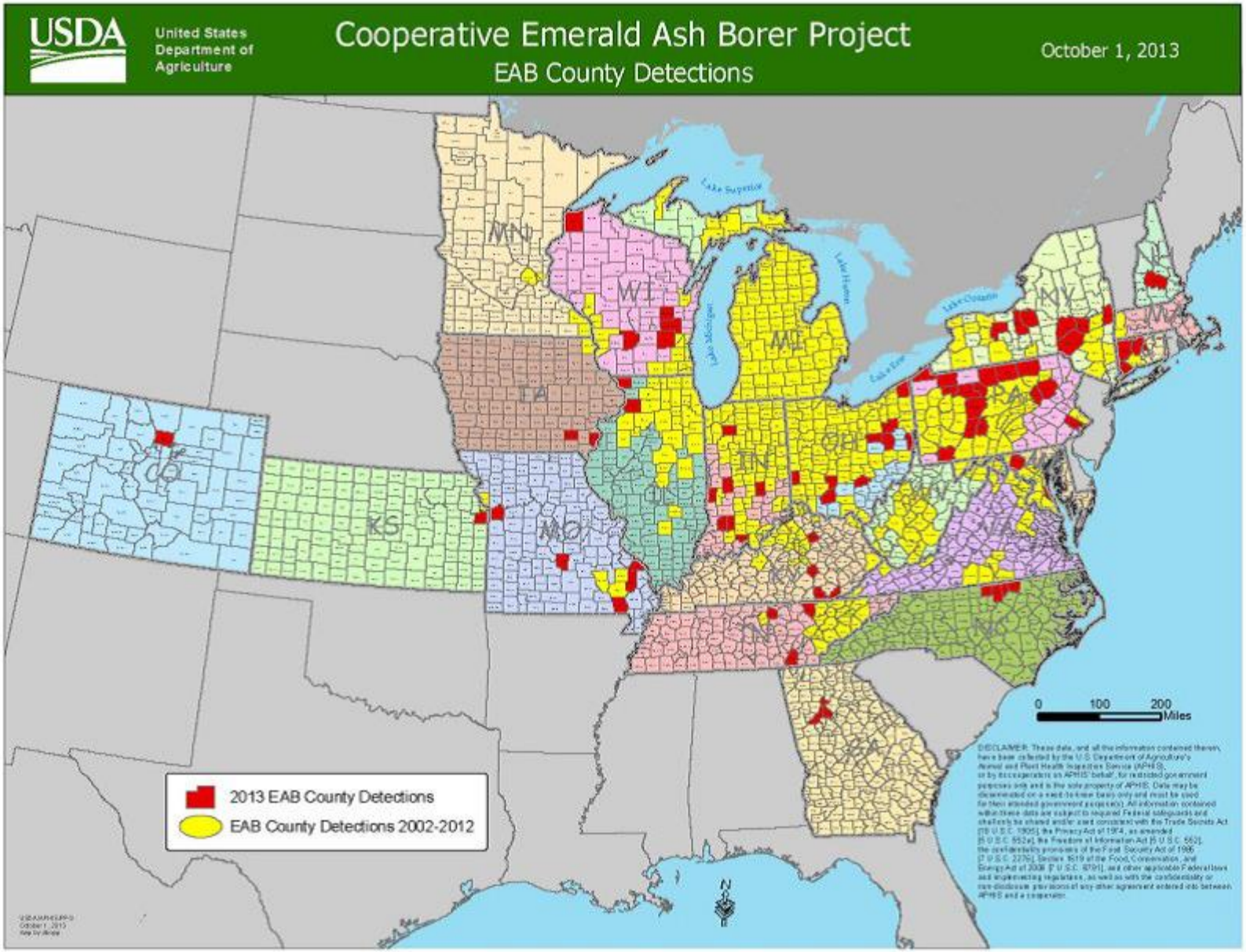
What is an invasive species?

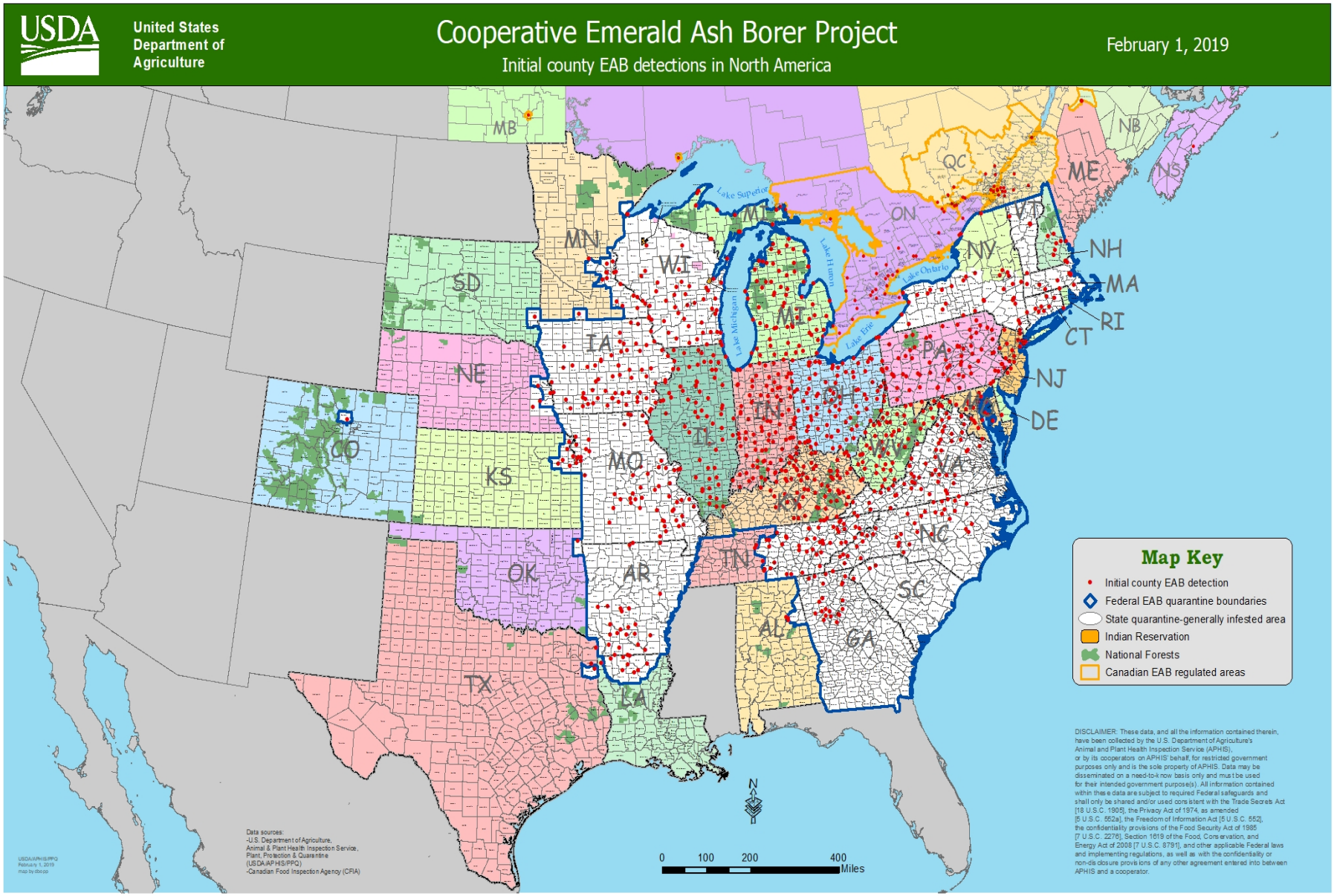
- moves in from somewhere (not native)
- rapidly grows out of control
- out-competes native species for food, water and sunlight.

Invasive species have a negative impact on:

- biodiversity
- human and ecosystem health
- natural resources and international trade
- Harmful to environment

It has no native predators to keep it in check!


USDA
United States Department of Agriculture
Cooperative Emerald Ash Borer Project
EAB County Detections
October 1, 2013
MN
WI
MI
IA
IL
IN
OH
KS
MO
KY
WV
VA
NC
SC
GA
NY
PA
0 100 200 Miles
2013 EAB County Detections
EAB County Detections 2002-2012


USDA
United States Department of Agriculture
Cooperative Emerald Ash Borer Project
Initial county EAB detections in North America
February 1, 2019
MB
NB
QC
ME
NS
ON
VT
NH
MA
RI
CT
NY
MN
WI
MI
SD
IA
PA
NJ
DE
NE
IL
IN
OH
MD
WV
VA
CO
KS
MO
KY
NC
TN
SC
OK
AR
MS
AL
GA
TX
LA
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Map Key
Initial county EAB detection
Federal EAB quarantine boundaries
State quarantine-generally infested area
Indian Reservation
National Forests
Canadian EAB regulated areas
Data sources:
-U.S. Department of Agriculture, Animal & Plant Health Inspection Service, Plant Protection & Quarantine (USDA/APHIS/PPQ)
-Canadian Food Inspection Agency (CFIA)
0 100 200 400
Miles
N
DISCLAIMER: These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. Data may be disseminated on a need-to-know basis only and must be used for their intended government purpose(s). All information contained within these data are subject to required Federal safeguards and shall only be shared and/or used consistent with the Trade Secrets Act [18 U.S.C. 1905], the Privacy Act of 1974, as amended [5 U.S.C. 552a], the Freedom of Information Act [5 U.S.C. 552], the confidentiality provisions of the Food Security Act of 1985 [7 U.S.C. 2276], Section 1619 of the Food, Conservation, and Energy Act of 2008 [7 U.S.C. 8791], and other applicable Federal laws and implementing regulations, as well as with the confidentiality or non-disclosure provisions of any other agreement entered into between APHIS and a cooperator.


2006 - 2009

What is the Emerald Ash Borer (EAB)?

EAB - small, metallic green, wood-boring beetle; kills all species of ash trees

Marianne Prue, Ohio Department of Natural Resources - Division of Forestry, Bugwood.org

Emerald Ash Borer (EAB)

Agrilus planipennis

History

- Invasive wood-boring beetle Native to Asia
- Probably introduced to SE Michigan area in 1999 – likely brought in ash wood used for shipping pallets & packing materials
- Confirmed in 2002
- EAB feed on and eventually kill all native ash trees (*Fraxinus spp*.)
- Since its introduction into NA, 35 states, and the District of Columbia, have confirmed infestations.
- 2009 - Confirmed in western Cattaraugus Co. NY

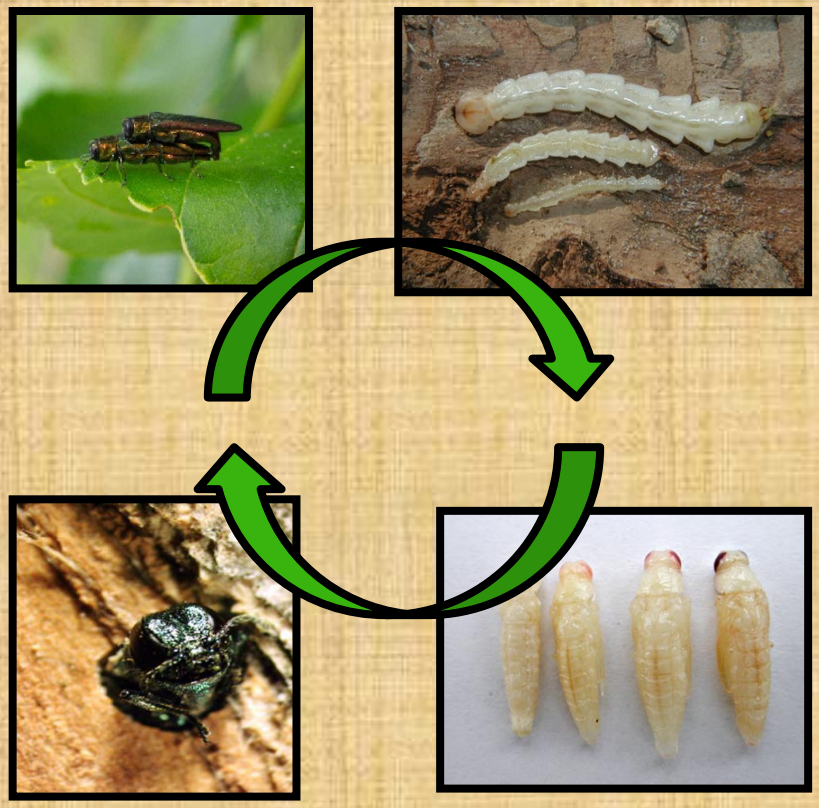
More history

- Natural spread of EAB = ~ 2miles/year
- However, rapid spread through NA most likely due to –

Transport of infested firewood, ash nursery stock, unprocessed ash logs, and other ash products

- Federal and state agencies have instituted quarantines of infested areas to regulate the transport of ash products

The EAB Life Cycle



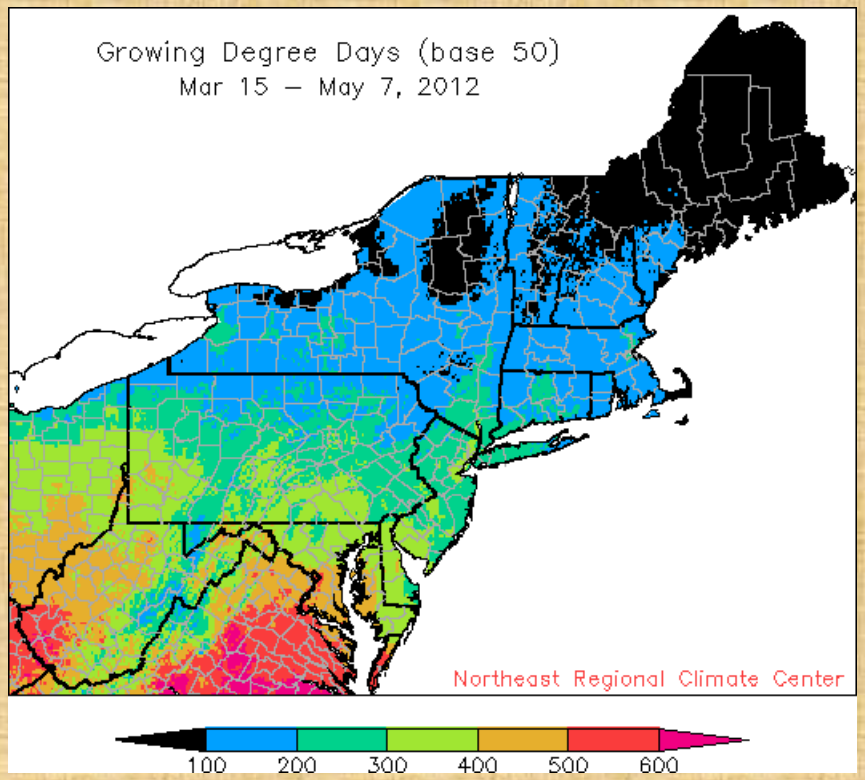
EAB Life Cycle

- Adult EAB feeds along leaf margins
- Females feed 1-2 weeks before laying eggs
- Average female EAB may lay 60-100 eggs, placing eggs singly in bark crevices or under bark flaps on trunk or branches

EAB eggs and “nested bells” larvae

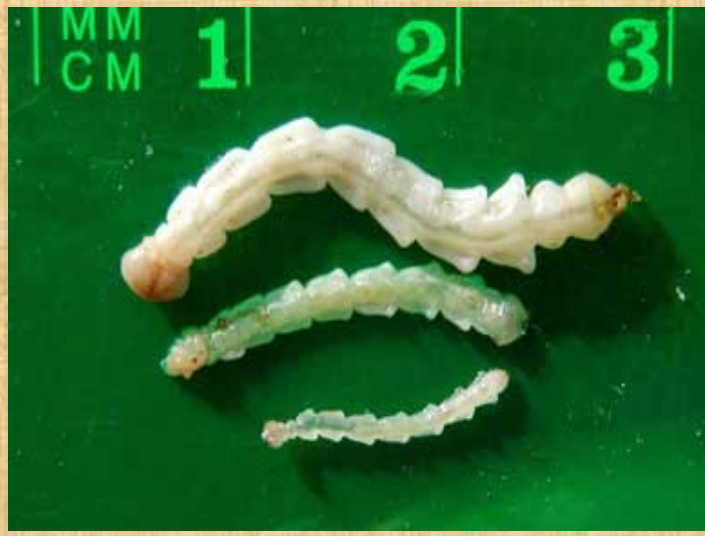
When to look for emerging EAB adults

450-500 GDD



Flowering Black Locust

Beetle larva feed in the phloem (inner bark – the “pipeline”) and the cambium (the growing part of the trunk between the phloem and sapwood), effectively girdling the tree


MM
CM
1
2
3

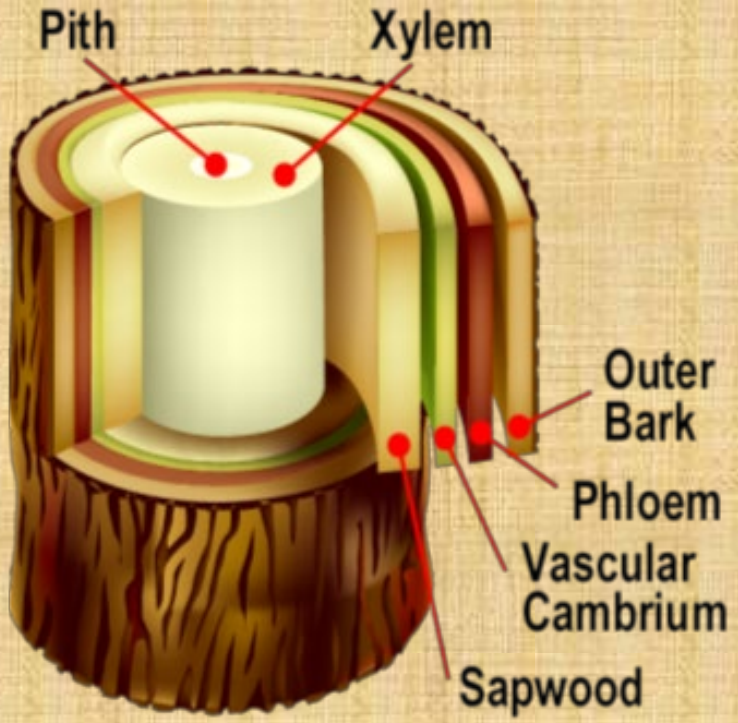
Larval feeding ends in fall. Pupation takes place late spring

Signs of EAB

- “D” shaped exit hole
- “S” shaped galleries under the bark

Hello Emerald Ash Borer…

Goodbye Ash Trees



EAB infestations have been detected in 35 states and the District of Columbia;

Alabama,
Arkansas,
Colorado,
Connecticut,
Delaware,
Georgia,
Illinois,
Indiana,
Iowa,
Kansas,
Kentucky,
Louisiana,
Maine,
Maryland,
Massachusetts,
Michigan,
Minnesota,
Missouri,
Nebraska,
New Hampshire,
New Jersey,
New York,
North Carolina,
Ohio,
Oklahoma,
Pennsylvania,
Rhode Island,
South Carolina,
South Dakota,
Tennessee,
Texas,
Vermont,
Virginia,
West Virginia,
Wisconsin

What do ash trees look like?

White ash

Green ash

Black ash

Herbarium
Cofrin Center for Biodiversity
University of Wisconsin-Green Bay

Pinnately compound leaf and samaras

Ash tree (*Fraxinus spp*) ID – opposite branching & bark

Branches are located opposite each other on a limb (Photo by Michigan State University)

Mountain Ash (*Sorbus spp*) – not affected by EAB

Photos courtesy of University of Maine

Symptoms of EAB

- Dieback in the canopy
- Excessive woodpecker activity
- Suckering from the base and stem (epicormic shoots)

James W. Smith, USDA APHIS PPQ, Bugwood.org

10% thinning of canopy

60-70% thinning of canopy

Vertical splits – dead bark over infested wood; and “Wood Pecks”

Effects of EAB

As the Emerald Ash Borer gets established, ash trees will begin to die

Commonly mistaken for EAB - Six-spotted tiger beetle – a good guy!

What's the Issue?

- 1 in 14 trees in New York is an ash tree
- Thousands of ash line our trees, shade our parks and fill our public spaces
- Thousands more dot our home landscapes
- Millions can be found in our woodlots and along our rivers and streams

EAB puts all of these trees in danger!

What are the Concerns?

- Ash trees break down quickly once they die, potentially dropping large limbs in public areas or on personal property
- These trees become “hazard trees”
- Trees are costly to treat and remove

Pennsylvania Department of Conservation and Natural Resources - Forestry Archive,

Once an infestation is confirmed, nearly all ash trees in the surrounding area are doomed to die, according to Ginger Nickerson, the forest pest education coordinator at the Vermont Urban & Community Forestry program.

Proactively taking down healthy ash trees is safer — and less expensive — than waiting for the beetle to do its damage, she said. Ash trees generally are very brittle when they die, and that's even truer when the borer kills them.

"They will come apart in very unpredictable and sudden ways," Nickerson said. "And the tree just shatters."

Green Mountain Power—line item charge for removal of ash trees along their right-of-way

Community Cost Examples

Deforest, Wisconsin: population 8,500

- **455** ash trees in urban forest (13% of total)
  – 330 are under 6” in diameter, decreasing the removal cost (average $700-$800 per tree)

- Village estimated removal cost:
  $75,000- $100,000

Village of DeForest web site: http://www.vi.deforest.wi.us/

Monitoring & Detection of EAB

Purple prism monitoring traps

***Cerceris fumipennis* - biosurveillance**

More than 40% of EAB discoveries come from individuals reporting the insect!

DEC & US Forest Service Staff found EAB larvae in “detection trees”

“Detection Trees” & SLAM

- “Detection Trees” are made by girdling the tree
- Girdled trees produce extra chemical volatiles that attract female EAB to lay eggs in the bark
- These trees are cut down & sampled for larvae the following winter
- All part of SLAM (**SL**ow**A**sh**M**ortality) initiative
- DEC’s SLAM significantly delays loss of ash trees & subsequent costs to communities for their removal and replacement

Other “help” on hand

Firewood – primary means of spread!

Insecticidal Controls?

Several types of insecticide applications can control emerald ash borer.

Emerald ash borer insecticides move systemically in plants and are typically applied as either soil drenches, trunk sprays or direct injections into the trunk, depending on product.

Insecticides can prevent new injuries by emerald ash borer and if damage to the tree caused by the insect is not too advanced, trees may recover when insecticides are used.

SLAM—Slow Ash Mortality

PLEASE DON'T MOVE FIREWOOD!

For more information:

http://www.nyis.info/

Or call DEC's Emerald Ash Hotline at:

1-866-640-0652