

# Emerald Ash Borer

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# Emerald ash borer (EAB)

- What is an EAB
- EAB lifecycle
- Origin
- Food Source
- Ash Symptoms
- Dispersion
- Effects
- Issues and concerns
- Mitigation



# What is EAB?

- Emerald Ash Borer is a beetle native to northeast China, Japan, and east Russia
- Dark metallic green, slender and very small
- Highly destructive to ash trees



# Lifecycle



Adults mate

Adults lay eggs in ash bark

Eggs hatch into larvae and tunnel into tree



Larvae feed under bark, creating S-shaped galleries



Larvae pupates

Adults emerge, leaving D-shaped exit holes



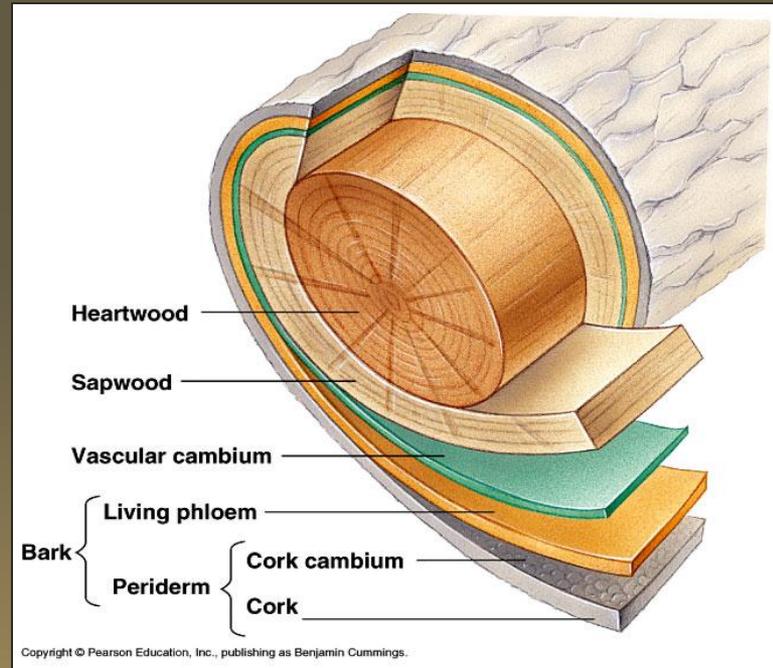
# Origins

- Japan, Korea, Eastern Russia, & China is the native range
- Found in US (Michigan) in 2002
  - Cargo packing in ships



# Food Source

- All ash trees in North America are susceptible
- Larval stage consumes the cambium layer.
  - Cambium is essentially the vascular system
  - Effectively girdles the tree, killing it quickly from the top down.



# Signs / Symptoms

- Thinning of tree canopy
- Crown dieback
- Mortality in 1-4 years depending on tree size and vigor.

Cambridge Station Rd. street trees (pictured) in Louisville



# Signs / Symptoms

- D-shaped exit holes in bark
- Won't see holes in main trunk until tree has succumb to borer
- Start from the top (tender shoots) and work down.



# Dispersion

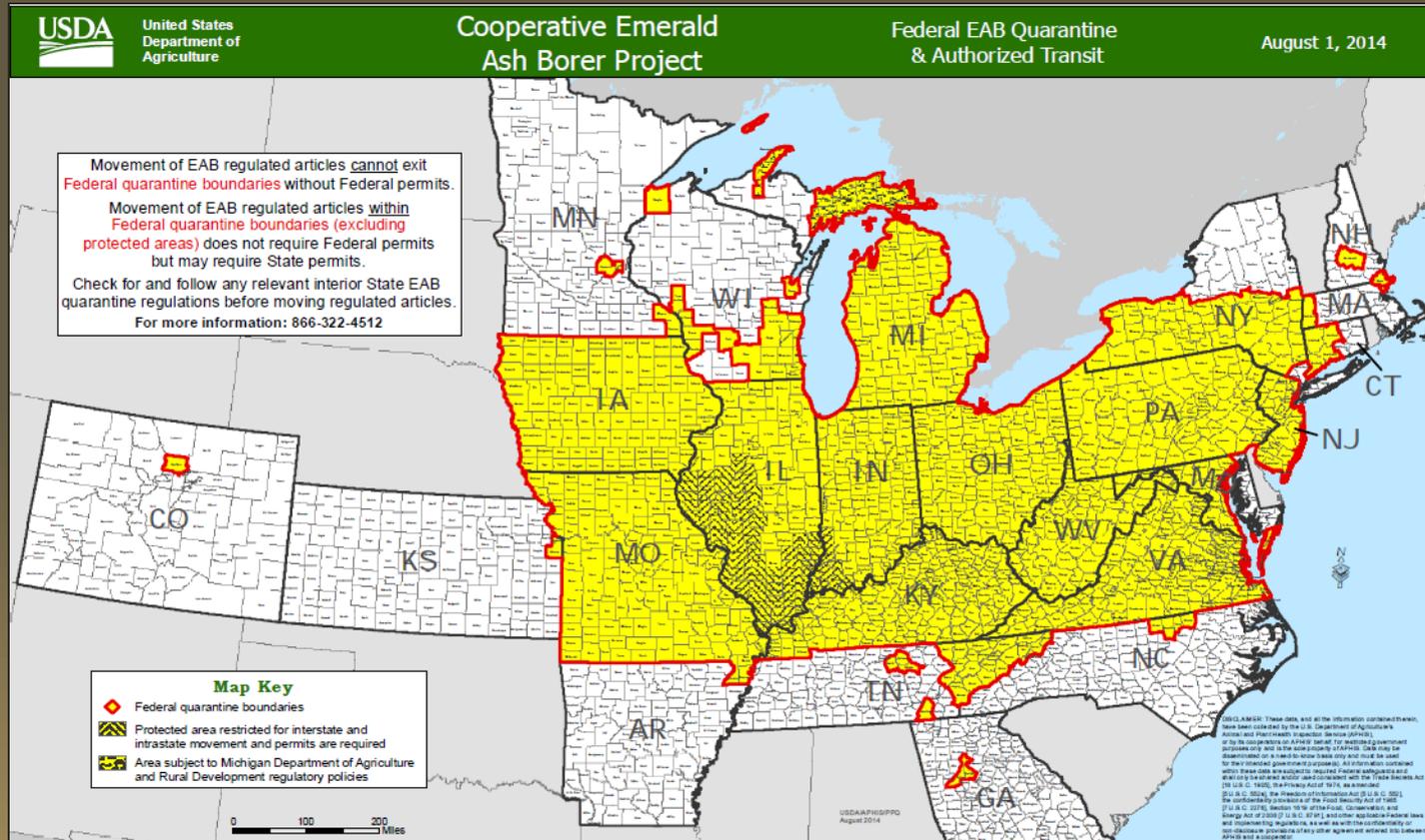
- Normal flight is between one-half to two miles per year
- Firewood has been a major means of transporting EAB, especially by hunters and campers



# Dispersion

In 2014, a STATEWIDE quarantine was issued:

- Total EAB infestation by 2022 in Kentucky
- The below map shows the Federal EAB Quarantine Map



# What are the Effects

- The most destructive non-native insect in the history of the United States to date
  - Infested 24 states and Canada since 2002
  - 8 billion ash trees in U.S. forests and woodlands – More than the number of people that are living in the world (7 billion in 2012)
- ECONOMIC IMPACT
  - Valuable trees for timber production
  - Loss from city and suburban landscapes
- ECOLOGICAL IMPACT
  - Forest ecosystems and biodiversity
  - Browse and protection for a variety of insects and animals
  - Thermal cover

# What are the effects

- Removal of trees does not include the full economic impact
  - Ash comprises a major component of municipal trees in some cities
  - Once ash trees die, they become a serious danger to everything around them
    - Decay relatively quickly
    - Homes, vehicles, power lines, and people
    - Alters neighborhoods, diminishes property value
      - Clark Station Rd
    - Storm water increases, shade decreases



Pictured: Large ash tree near school and power-line to one side, residential homes on the other in the Highlands of Louisville

# Effects of EAB in Michigan

- EAB has killed an estimated 35 million ash
- Consumers Energy:
  - Estimated 150% increase in tree related outages over 5-7 years
  - 30 mph wind = outages for 2 days
  - Estimated customer impact
    - \$18M per year for 10 years
      - Outage restoration costs
      - Lost revenue
      - Affect 1M additional customers per year
      - Plus, an estimated \$6M per year to remove the threat over 10 year period

# EAB Effect in Ohio



June 2006



August 2009

[http://www.oardc.ohio-state.edu/hermslab/images/Herms\\_EAB\\_Trial\\_Results\\_July\\_2012.pdf](http://www.oardc.ohio-state.edu/hermslab/images/Herms_EAB_Trial_Results_July_2012.pdf)

# Louisville Concentrations

- East of I-65 and I-64 corridor
  - Crestwood
    - Anchorage, Pewee Valley, Yew Dell Gardens
  - Centerfield
    - Ash canopy >50% in many locations
  - Eastwood
    - Valhalla Golf Course, Floyds Fork Park, Long Run Park
  - Prospect
    - Harrods Creek



Pictured: Ash near  
power lines.  
Anchorage, KY

# Issues and Concerns

- Estimated 266 million ash trees in KY
  - Ash represents 4% of tree population
- Louisville
  - Ash represents 17% of tree population
  - 3600 line miles
- 25% of dieback or greater = cannot safely climb
  - Trunks break off at ground line
  - Tree will also uproot due to root decay
  - Total removal, cannot make safe
  - Back yard bucket where feasible
- Proactive vs. Reactive
  - Review every infested circuit annually



# Louisville EAB Mitigation

- Staffing
  - 3 contractors
  - 2 full time work planners
    - Locating
    - Permitting
    - Mapping
  - 16 crews (51 men)
    - Removing
- Number of Ash removals
  - 2,700 trees
- 2014 budget
  - \$2.2M



# EAB Mitigation

- LGE/KU appropriated \$27M over 10 yrs to “Battle the EAB”
- \$2.1M for 2015
  - I-64 corridor
  - \$ allocated to areas based upon need and concentration of EAB
- Being proactive is key



# Questions?

## ■ Sources:

- Impact Analysis of EAB on the LG&E-KU Distribution System. December 2012.
- UK College of Agriculture website. Entomology Department.
- Emeraldashborer.com
- Wikipedia.org
- Herms\_EAB\_Trial\_Results\_July\_2012. OSU Report. [http://www.oardc.ohio-state.edu/hermslab/images/Herms\\_EAB\\_Trial\\_Results\\_July\\_2012.pdf](http://www.oardc.ohio-state.edu/hermslab/images/Herms_EAB_Trial_Results_July_2012.pdf)
- Emeraldashborer.info
- Poland, Therese; McCullough, Deborah (April–May 2006). "Emerald Ash Borer: Invasion of the Urban Forest and the Threat to North America's Ash Resource". *Journal of Forestry*.
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