



## Emerald Ash Borer

---

- History of Introduction and Spread
- Damage it Causes
- Biology
- Threat to Corps Lakes (region & nation)
- Control & Quarantine
- Potential Corps Management Steps
- Sources of Educational Material
- National EAB Program Contacts

13



## EAB - Appearance

---



Emerald Ash Borer – *Agrilus planipennis* - Adult  
Iridescent green and copper color & bullet shaped

14



## EAB - Appearance



EAB – Larval Stage  
4<sup>th</sup> Instar is about 3 centimeters long

15



## EAB - Appearance



16



## EAB - Appearance



**Characteristic S-shaped feeding galleries**

17



## EAB - Recognizing an Infected Tree

- Thinning of crown or yellowing of foliage.
- May be epicormic shoots (water shoots).
- May be extensive woodpecker damage or activity.
- D-shaped emergency holes (about 3mm diameter).
- Presence of larval galleries.

18



## EAB - Appearance

### Native range of Emerald Ash Borer in Asia



19



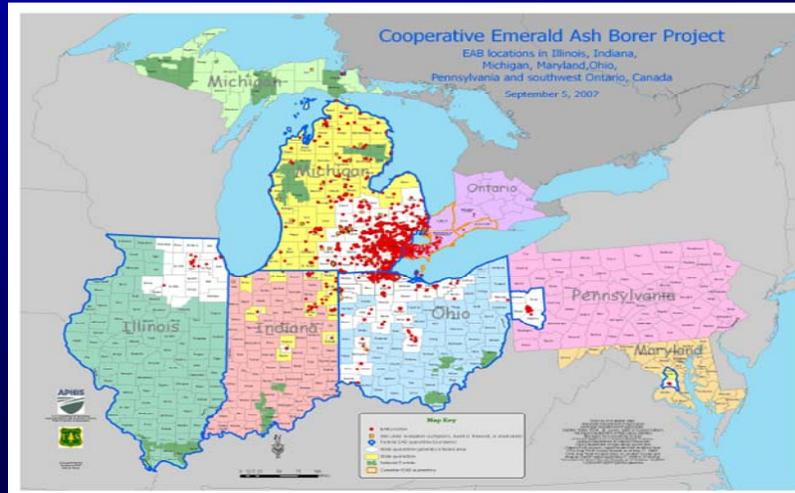
## Introduction & Spread

- Probably arrived in wood packing materials – possibly as early as 1993
- Officially first ID'd in 2002
- Southeastern Michigan & Windsor, Ontario
- Found in Ohio – 2003
- Found in northern Indiana – 2004
- Found in Illinois – 2006
- Found in Pennsylvania – 2007
- Found in Maryland - 2003

20



## EAB – Current Range



21



## EAB – So What?

- Attacks all 16 Native Ash Species
- In China it also attacks genera *Ulmus* (elms), *Juglans* (Walnuts and Butternuts), and *Pterocarya*
- Spread is being enhanced by movement of ash firewood (eggs & larvae, pupae) and illegal shipment of nursery stock
- Once tree is attacked, 100% fatality

22



## So What - Continued

---

- Attacks any size ash tree
- Hard to detect initially – upper crown
- Kills trees in 1 to 3 years
- Has already killed 25 – 30 Million Ash
- Potential Urban costs could be \$20 Billion, billions more in forest products

23



## So What - Continued

---

- Larvae construct galleries that sever phloem tissue – tree wilts and dies when damage is sufficient
- 1.7 billion ash trees eastern U.S.
- USDA has already expended over \$100 million to research and control
- Potential impact as severe as Dutch Elm Disease and Chestnut Blight

24



## EAB - Biology

---

- Adults emerge from trees late April to - May, peak in late June
- Mate 7 - 10 days after emergence
- Lay average of 77 eggs in bark crevices during months of May - July
- Larve hatch in 7 - 9 days and tunnel into cambium layer and feed on phloem tissue and outer sapwood

25



## EAB - Biology

---

- Move into sapwood as they grow larger and feed aggressively until cold weather
- Over winter in tree and pupate in late April to June (Total of 4 larval instars)
- Construct pupal chamber in sapwood and newly formed adults stay there for 8 - 15 days

26



## Biology - Continued

- Adults make characteristic D-shaped exit hole in late April to June
- Adult females live 22 days while males about 13 days
- Larvae may take two years to mature in healthy trees

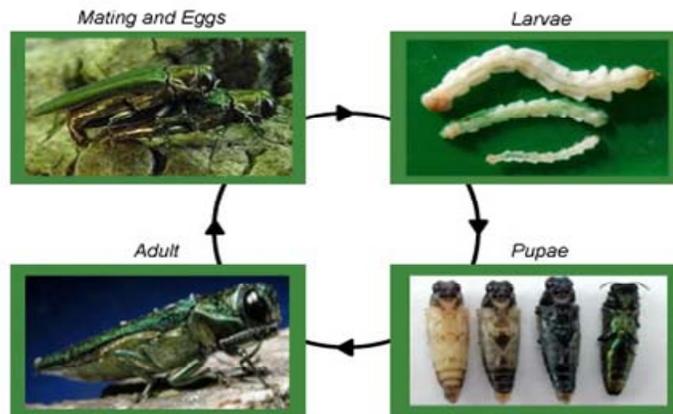
27



## Biology - Continued

*Emerald Ash Borer Life Cycle*

Click on each life stage for details



28



## EAB – Threat to COE

---

- 4 APHIS quarantined states in LRD (IL, MI, IN, OH)
- 40+ LRD lakes in quarantined states
- 82 lakes in or adjacent to these states
- 1.5 million campers – chief venue of spread is movement of firewood

29



## EAB – Threat to COE

---

- More than ½ million acres of COE forested land with ash being a major component of the ecosystem
- National Reservation System with campers moving across U.S. and Canada
- LRD COE could serve as avenue for spreading EAB across North America

30



## EAB - Control

---

- Early detection, removal of infected trees, clearing of ½ mile buffer where all ash trees are removed
- Burn diseased wood or chip (chips less than one inch in size)
- Primary control – prevent spread (leap frogging) by restricting movement of firewood and infected planting stock
- Normal spread about .5 miles/year

31



## EAB - Control

---

- Certify companies that trade and handle regulated products (green ash lumber, planting materials, chips, logs, etc.)
- Restrict movement of hardwood firewood outside of states with EAB infestations

32



## EAB – Spread Prevention

---

### *Plant Materials Quarantine*

- USDA APHIS Interstate Quarantine (Illinois, Indiana, Ohio, Lower Peninsula of Michigan, and soon Pennsylvania)
- Intrastate Quarantines by states of Illinois, Indiana, Ohio, and Michigan – by County

33



## APHIS QUARANTINES

---

- Published in Federal Register
- Prohibits interstate movement of hardwood firewood out of quarantined states
- Regulates interstate movement of Ash planting stock and ash raw materials such as green lumber and logs
- Enforced by APHIS Inspection Officials
- Fines of up to \$250,000 for violations

34



## Corps Management of EAB

---

- **Public Education**
  - **Press releases**
  - **Post materials on Gateway, USACE, Division, District, and Project websites**
  - **Post on NRRS Website**
  - **Post materials on Recreation Area bulletin boards, gatehouses**
  - **Distribute notices and materials to marinas, bait shops, concessions, etc.**
  - **Present interpretive programs on EAB**

35



## EAB Management – Cont'd

---

- **Employees (Train Rangers & Maintenance) – particularly in Identification of insects, symptoms of trees under attack, disposal of infected ash materials**
- **Work with concessionaires and local businesses that might be selling firewood (USDA Compliance Agreements, etc.)**
- **Work closely with state and APHIS EAB**

36



## EAB Management – Cont'd

---

- May have to establish District Engineer Title 36 local regulations prohibiting bringing hardwood firewood on project – particularly for projects in quarantined counties

37



## EAB – Educational Materials

---

### Educational Aids

- EAB Identification Guide Card (USFS NA-IN-12-06)
- EAB The Green Menace DVD
- USDA USFS EAB The Green Menace brochure (Program Aid 1769)
- USDA USFS EAB Pest Alert (NA-PR-02-04)
- APHIS EAB Firewood Poster (Program Aid 1887)
- Cooperative EAB Program Infestation maps
- EAB Key Chain

38



## EAB – Educational Sources

---

### Websites

- <http://www.emeraldashborer.info>
- [http://www.aphis.usda.gov/plant\\_health](http://www.aphis.usda.gov/plant_health)
- <http://www.entm.purdue.edu/EAB>
- <http://www.ohioagriculture.gov/pubs/plnt/curr/eab/>
- <http://www.michigan.gov/eab>
- <http://www.na.fs.fed.us/spfo/eab/>

39



## EAB - Contacts

---

If you suspect you might have EAB  
in your area call

- Michigan – 1-800-325-0023
- Indiana – 1-866-NO-EXOTIC
- Ohio – 1-888-OHIOI-EAB
- Pennsylvania – 1-866-253-7189
- Wisconsin – 1-800-462-2803
- USDA AHIS – 1-866-322-4512
- Maryland – 410-841-5920

40



## EAB Coop Program Contacts

---

- Overall Program Head – Mr. Ralph Bell – Raleigh, NC (901) 855-7312
- APHIS EAB Public Affairs Officer – Ms. Sharon Lucik – (801) 844-2713
- Central Ohio – Mr. Andrew Wright – Bowling Green, OH (419) 352-5434
- Tennessee – Mr. Jim Dattilo – (615) 907-3357, Ext. 52641

41



## Coop Prog. Contacts – Cont'd

---

- Southern Ohio – Ms. Allison Benzinski (614) 626-1032

If you want to talk about EAB you can call me at (513) 684-3192

[Michael.A.Loesch@LRDOR.usace.army.mil](mailto:Michael.A.Loesch@LRDOR.usace.army.mil)

U.S. Army Engineer Division, Great Lakes and Ohio

550 Main Street, Room 10032

ATTN: CELRD-PDS-O (Loesch)

Cincinnati, OH 45202-3222

42