Emerald Ash Borer Mitigation

Pokagon Band of Potawatomi

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Department of Natural Resources

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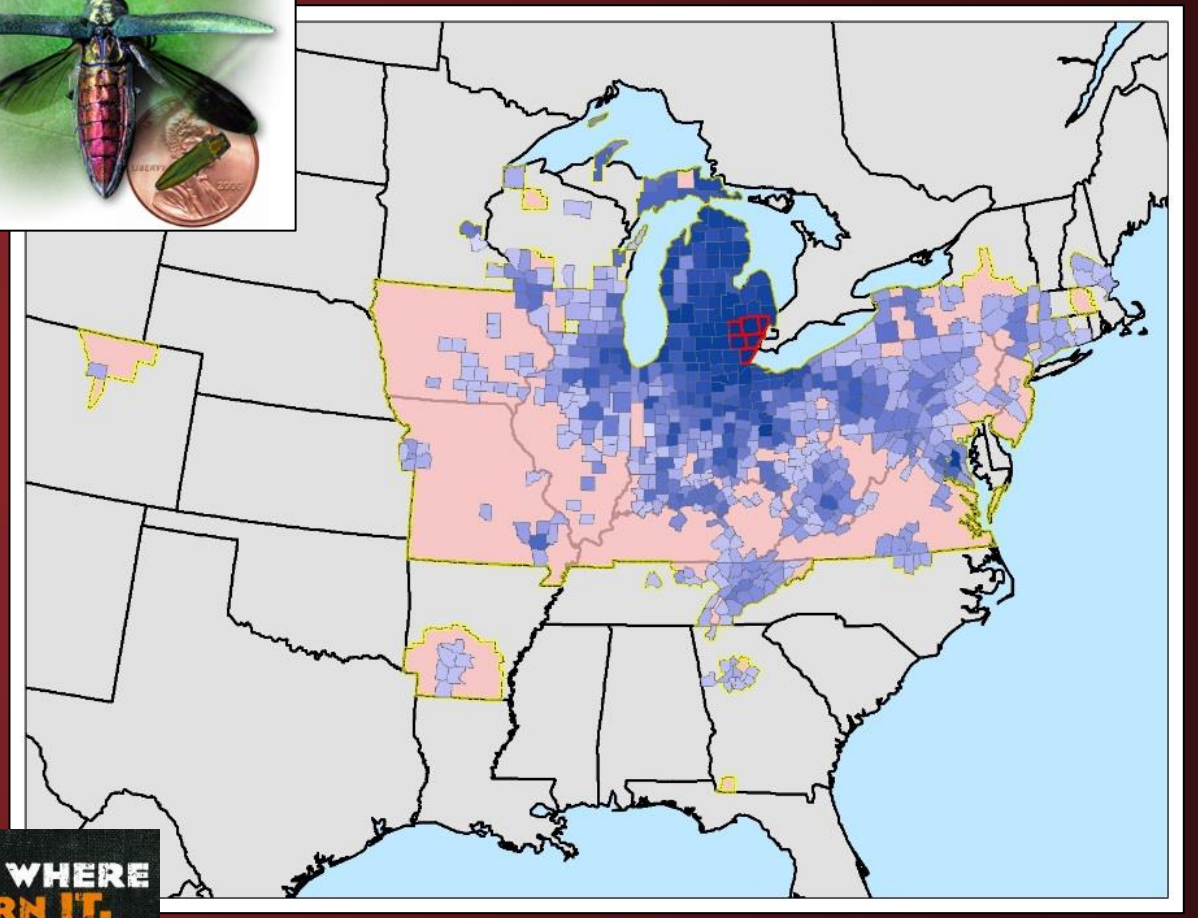
Pokagon Band

- Federally recognized in 1994
- Owns and manages approximately 6500 acres in a 10-county service area in southwest MI and northern IN
- Cultural importance of ash for a variety of practical and ceremonial goods

EAB history/ecology

- First identified in 2002 in southeast MI near Detroit
- Has since spread to nearly half the country
- Has reduced ash dramatically
  - Upwards of 90% for some species
- Spreads small distance on its own, longer distances via humans

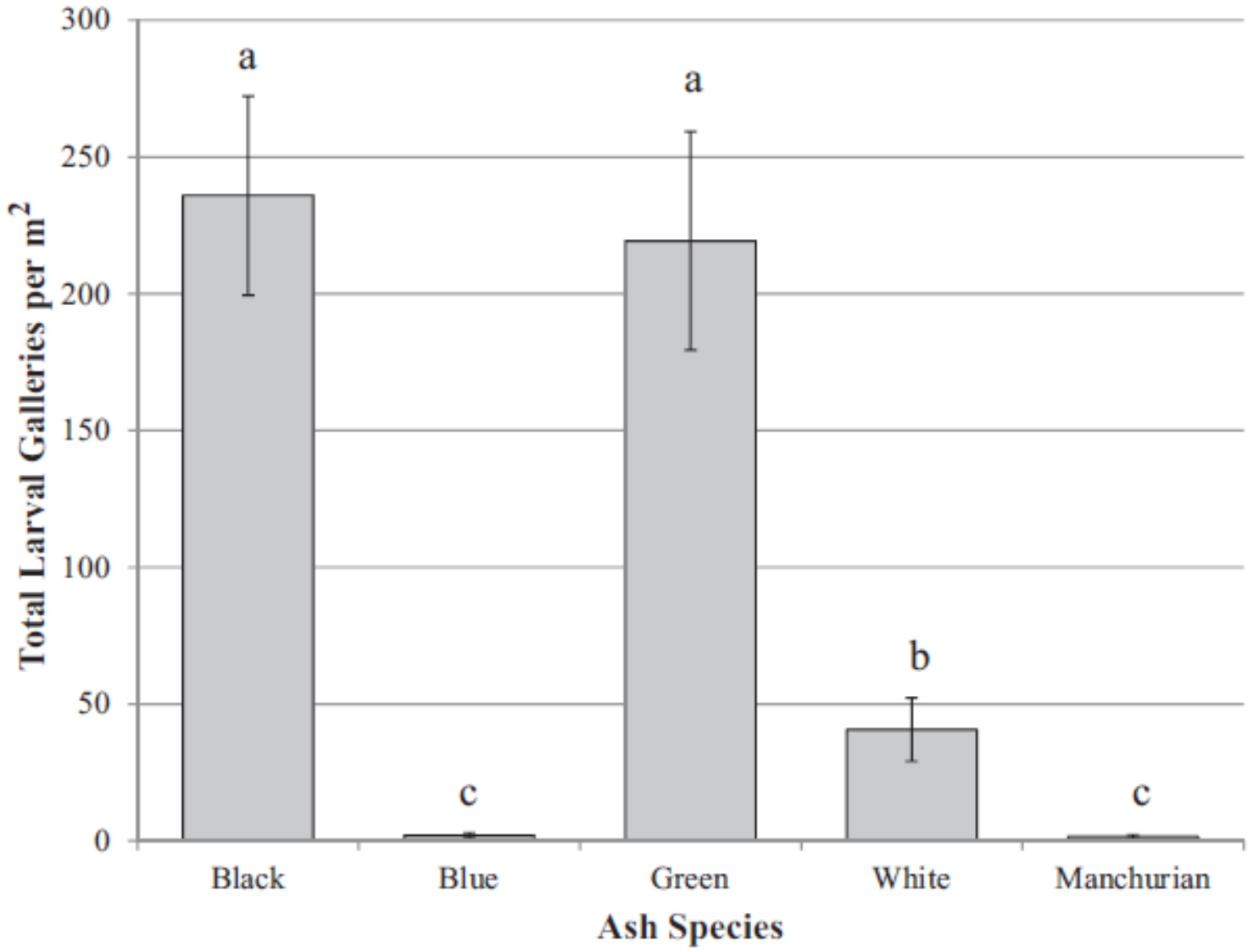


EAB history/ecology

- Kills trees by girdling via larvae feeding behavior
- North American ash have some resistance but are overwhelmed
- Cold winter slow beetles down but will not kill them

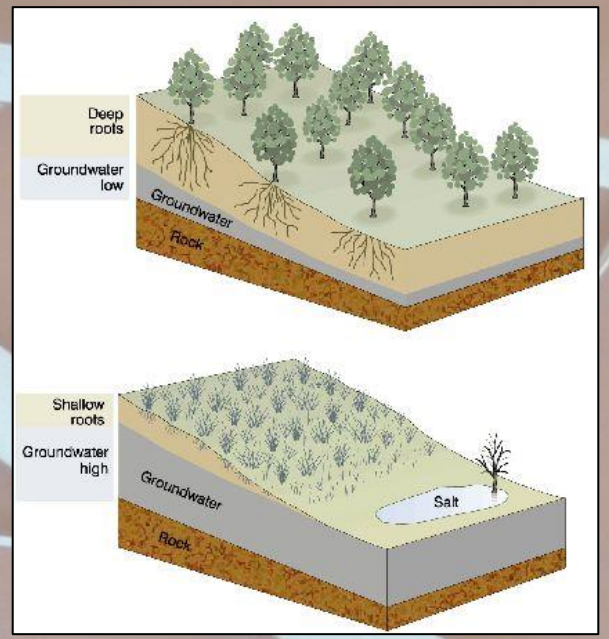
What it means

- For tribes
  - Dramatic reduction in ash observed/expected
    - Cultural uses will be affected


300
250
200
150
100
50
0
Total Larval Galleries per m2
a
a
b
c
c
Black
Blue
Green
White
Manchurian
Ash Species

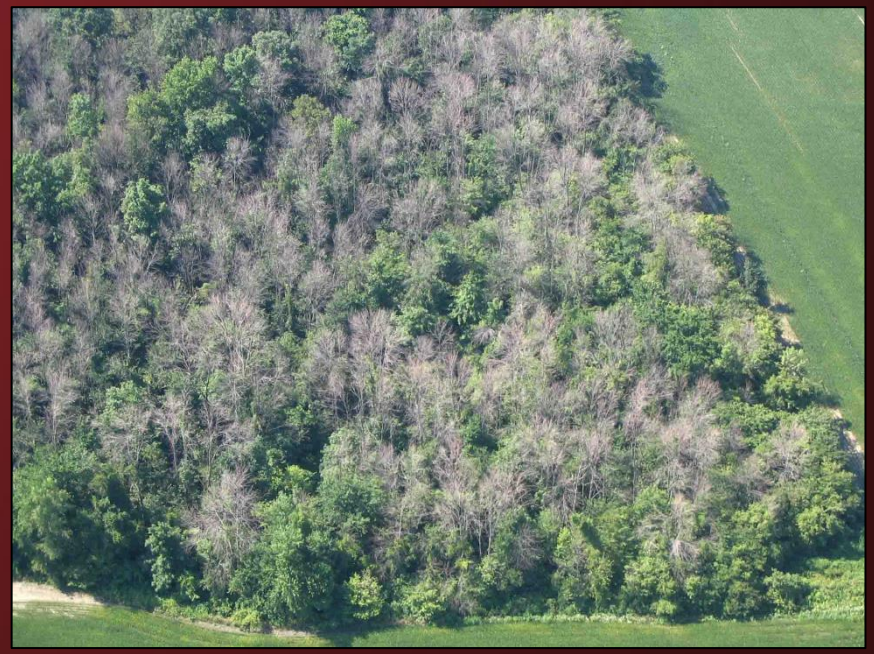
What it means

- For wildlife/habitat
  - A shift in the food web
  - A shift in succession
  - Water table considerations



What it means

- For economies
  - Industries affected (furniture, baseball bats, wood handles for tools, etc)
  - Logging and wood product industries
  - Municipal uses of ash (safety, aesthetics)



What can be done

- Harvest trees?
- Treat trees?
- Release parasitoid wasps?
- Wait and see?

PBDNR EAB history

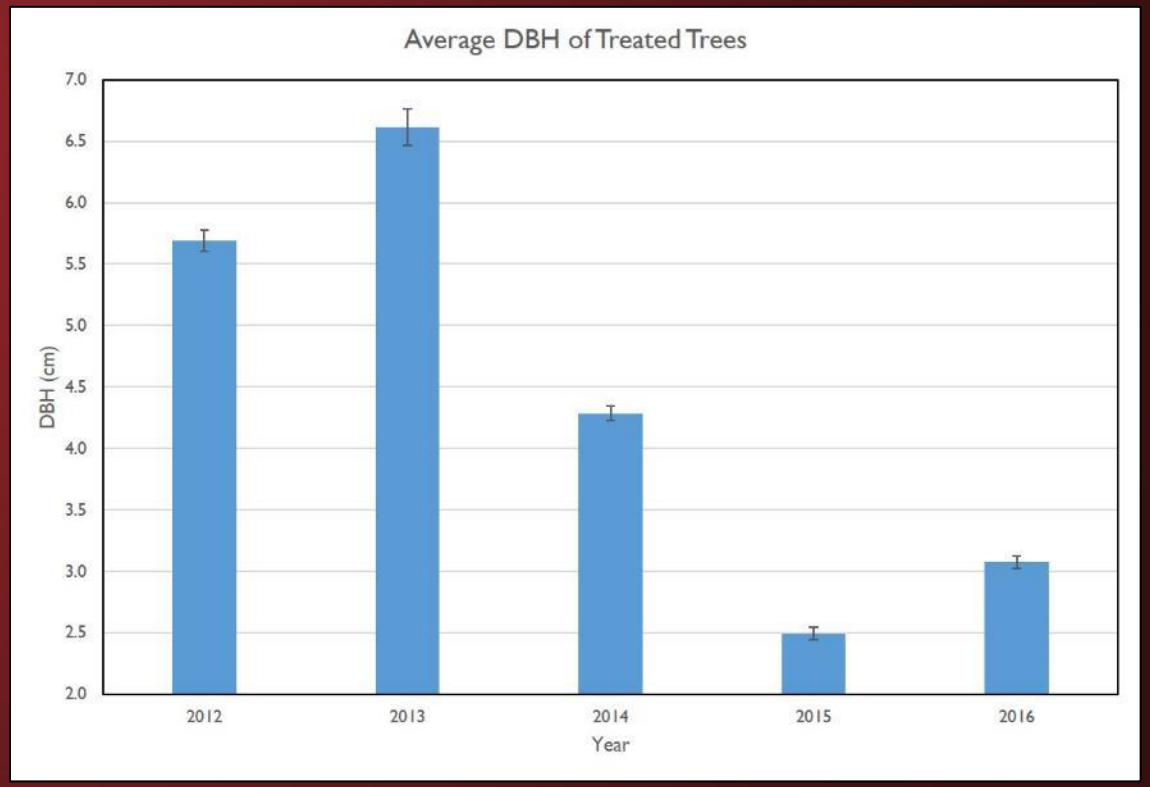
- Ash decline noticed as early as 2007-2008
- Initial uncertainty on how to address and mitigate EAB
- In 2012 began treating trees with pesticide

Treating trees

- Tree-äge (emamectin benzoate)
  - Systemic insecticide
  - Will protect trees from insects that consume leaves, bark, etc.
  - Protects for at least 2, perhaps 3 years

Treating trees

- Since 2012, we have treated approximately 3,500 trees (mostly black ash)
- Treatment requires pesticide applicator permit, specialized equipment
- Arborist contractor used to address tree health knowledge

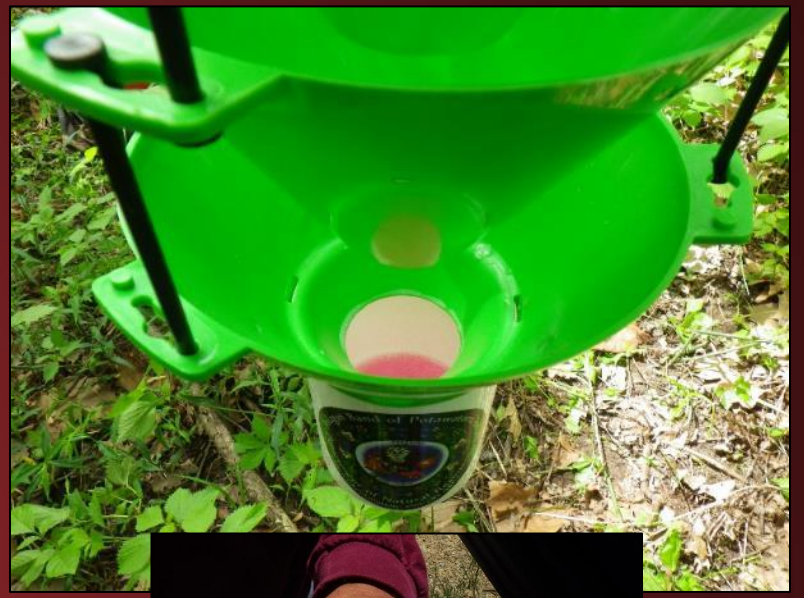


PBDNR EAB history

- In 2015 began releasing parasitoid wasps, trapping EAB
- Future plans: continue treating/monitoring trees, monitoring wasps

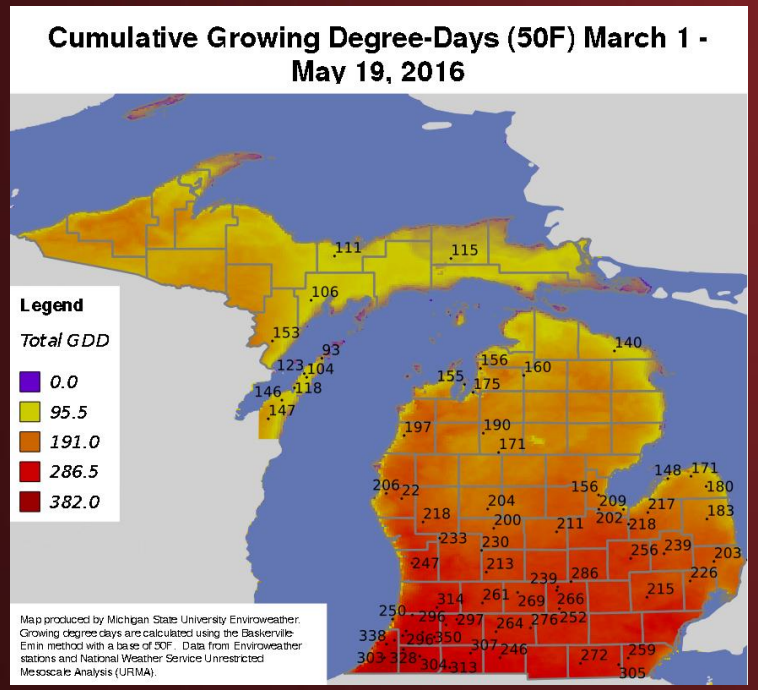
Trapping beetles

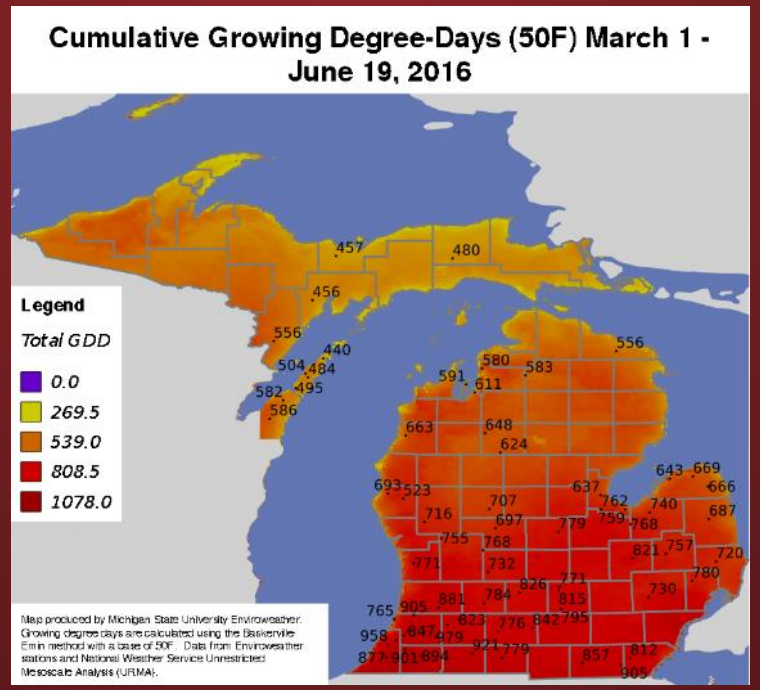
- Funnel traps w/pheromone pouches
- Establish baseline
  - Reduced EAB populations due to reduced ash density
- Monitor trends
  - We are past the wave, what do beetles do in the post-wave environment?

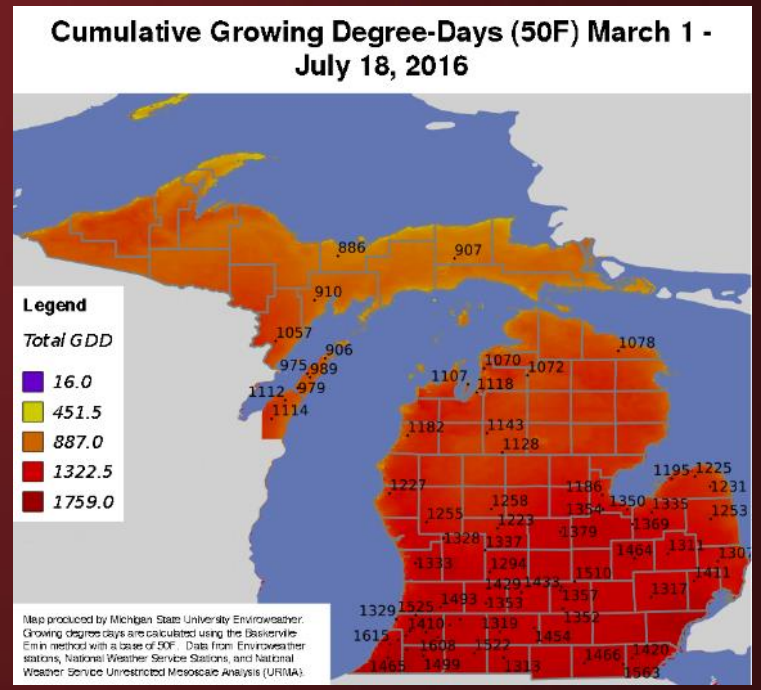


Trapping beetles

- Growing-degree days
  - Beetles emerge 400-500 GDD
  - Peak of activity is 900-1300
- Pheremone pouches last for 60 days
  - Most years one pouch will be effective from 500-1400 GDD

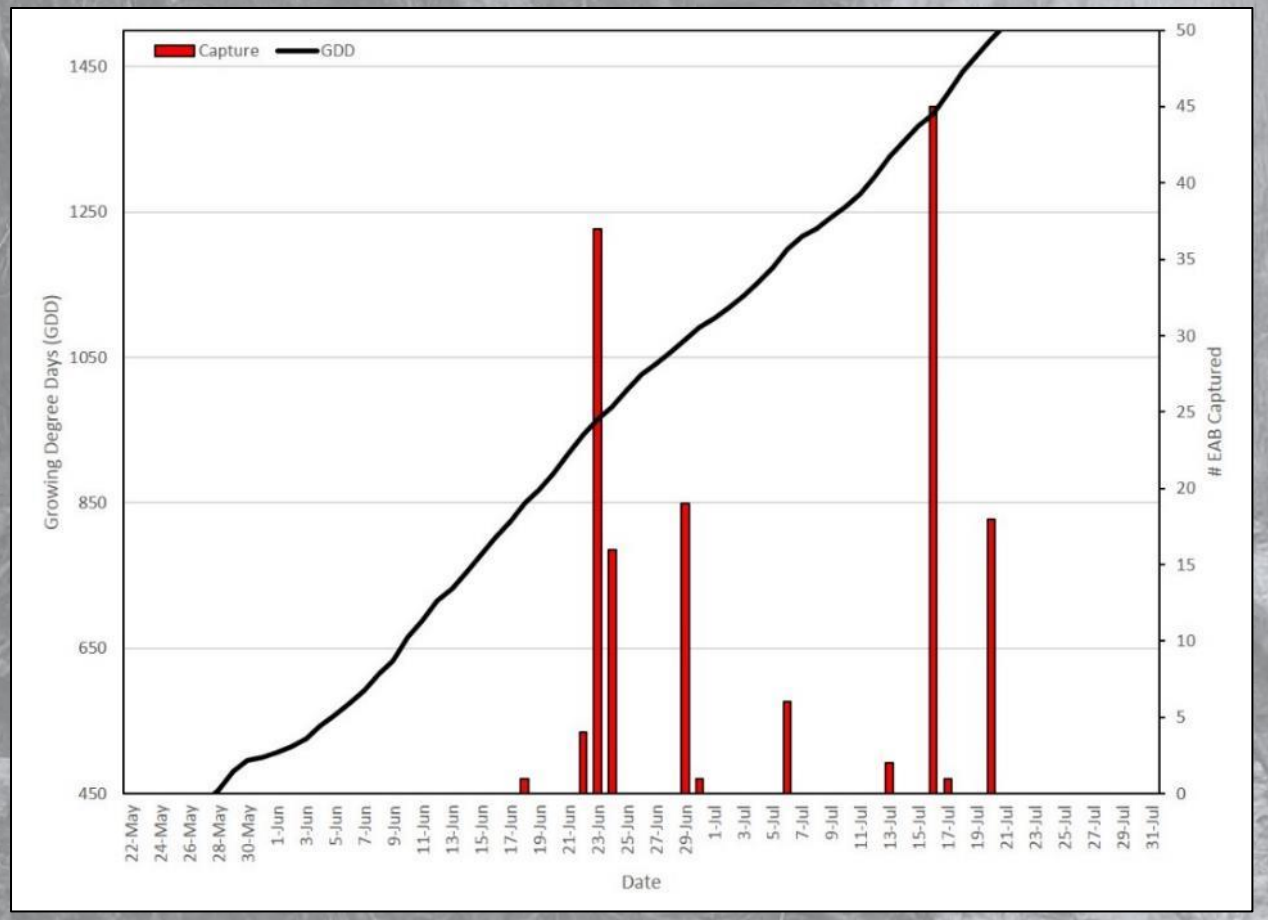






Funnel trap results

- 2015
  - 48 traps
    - 224 checks from late May – mid July
  - 172 EABs
- 2016
  - 50 traps
    - 335 checks from early June – late July
  - EAB identification TBD

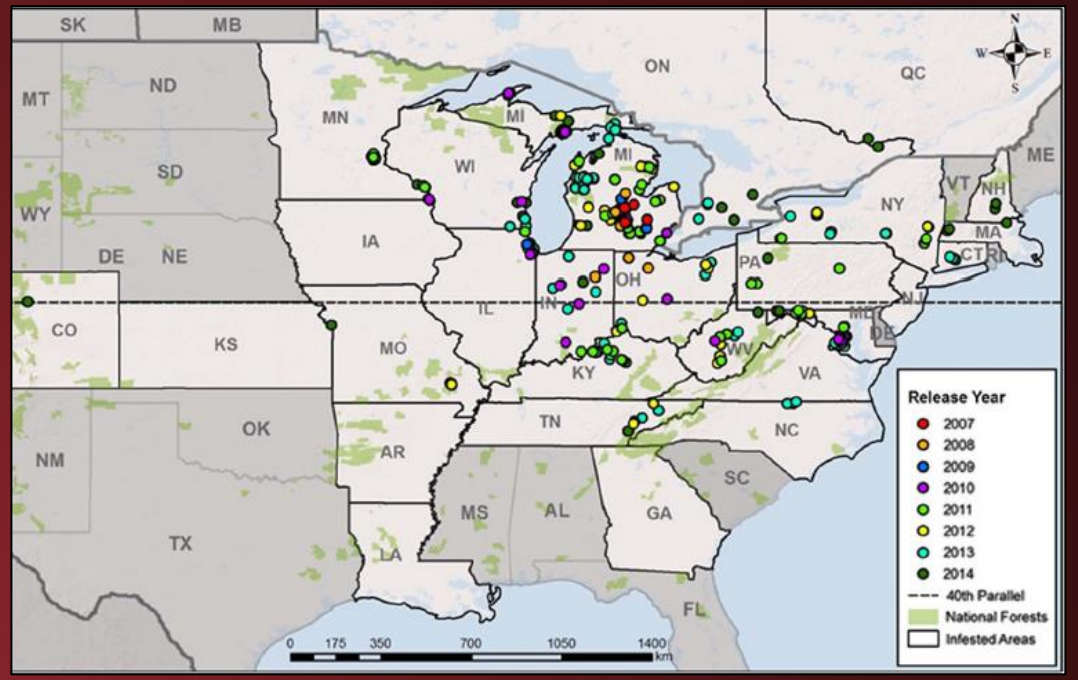


Parasitoid wasps

- *Oobius*
  - Egg parasitizers
- *Tetrastichus*
  - Larvae parasitizers

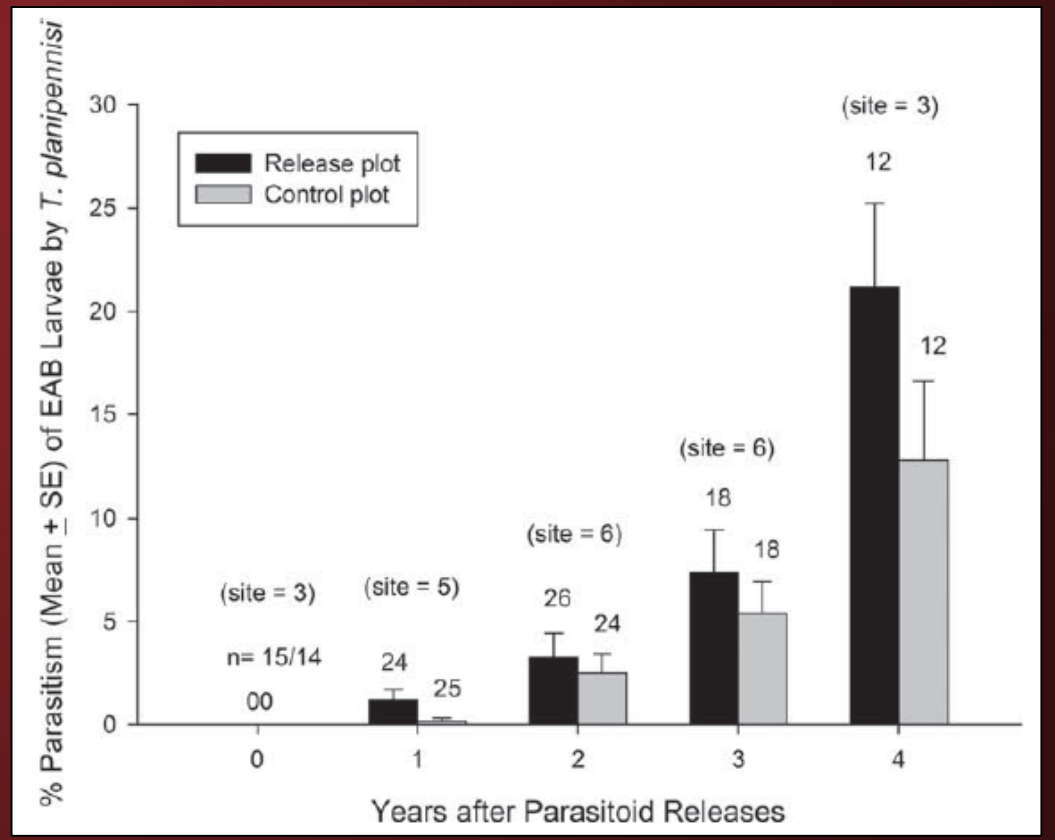
Parasitoid wasps

- 2015
  - Released ~25,000 wasps from Jul – Sep
  - 3 locations
- 2016
  - Continue releases at 3 locations, added 1 additional
- 2017
  - Will check 2015 release locations for wasp establishment



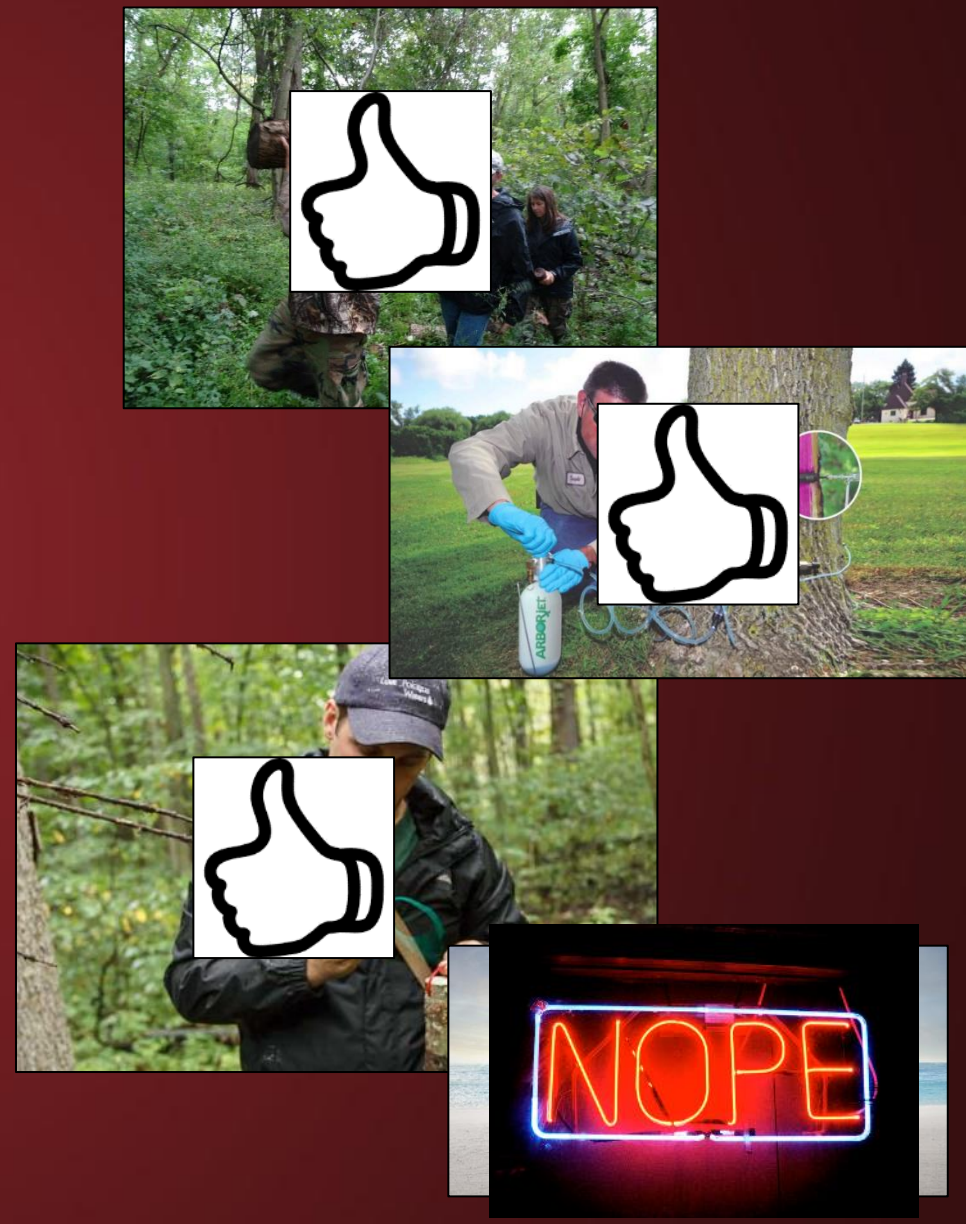
The long-term goal

- Naturalize wasps, EAB
- Reduce their impact on ash into the future
- 50% EAB mortality on ash? 40? 25? 10?
- Low density EAB, stand management enough?
  - Reduced/no insecticide?



The long-term goal

- Research suggests a 7-year period before wasps have appreciable effect on beetles
- A wealth of data has been collected since 2002
- Managers outside of EAB infestation range have more options today
- Integrated management approach suggested by researchers



Things to consider

- Cost of treatment < cost of tree removal (urban settings)
- Loss of cultural heritage does not have a price tag
- Use of chemicals may be controversial, may impact cultural uses

Things to consider

- Treating trees and releasing parasitoids should have synergistic effect
  - Treated trees will have few developed larvae (which *Tetrastichus* target)
  - Egg parasites (*Oobius*) should be able to complete development on treated or untreated trees
- "Lethal" trap trees
  - Tree-äge plus girdling will increase attraction

Things to consider

- Dying trees will produce last-ditch crop of seeds
- GIS work easier in winter, ideally coincides with treatment

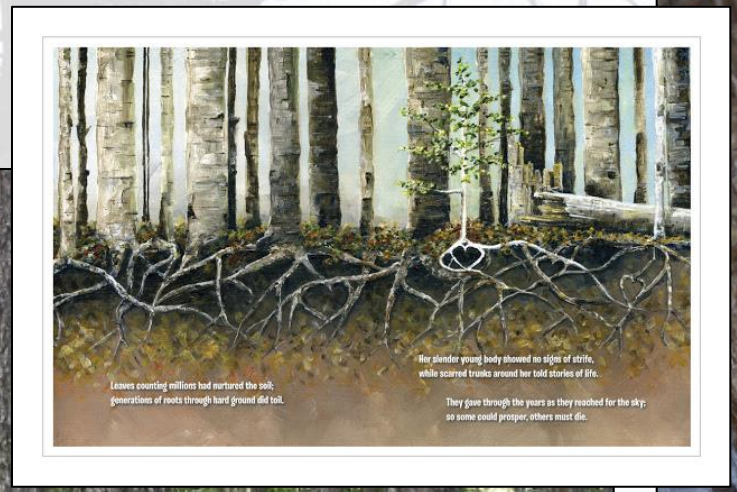
Things to consider

- Funnel traps
  - Relatively expensive
  - Need pheromone pouches
  - Time-consuming
  - Have to be hung from trees
  - Storage requirements
  - Fluon treatment loses potency over time
  - Bugs can be maintained indefinitely, ID easy

- Prism traps
  - Relatively inexpensive
  - Can be DIY
  - Messy
  - Can be mounted on 10’ conduit posts
  - Storage requirements
  - Bug ID can be a challenge
  - Bugs are destroyed

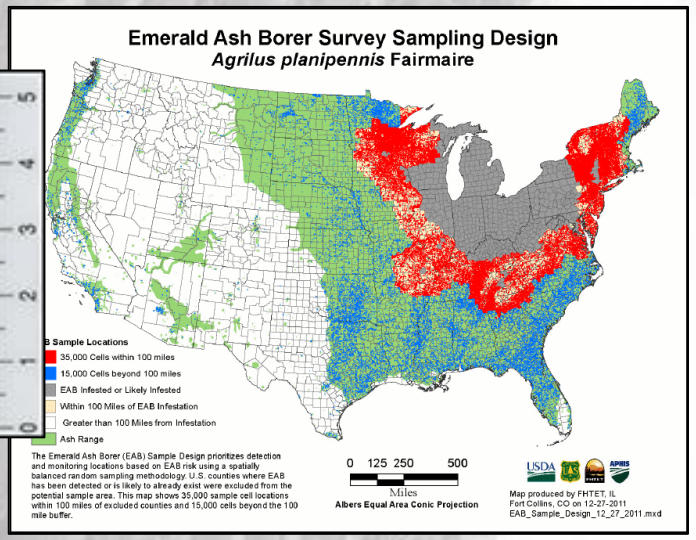
Things I wish we had done

- Locate/inventory black ash groves prior to arrival
- Establish plots, monitor trees before/during/after arrival
  - Treat some, leave some alone



Things I wish we had done

- Harvest seeds/trees for cultural use
  - Eventually some trees that EAB will kill without control efforts may survive once they are naturalized
- Monitor EAB during/after arrival
  - What population levels should be expected in a naturalized forest?



Some resources

- USDA-APHIS website (trap protocol, parasitoid release info)
- www.emeraldashborer.info
- Friendly neighborhood USDA-APHIS liaison
- International Society of Arboriculture
- 2015 *Canadian Entomologist* v. 147

POKÉGNEK
BODÉWADMIK

Gékéndasen, mikwénden, dbaden odé Bodwéwadmimwén
POKAGON BAND LANGUAGE PROGRAM

USDA
APHIS