Threats to Oak Trees in the Eastern U.S.

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Oaks in the eastern U.S.

- 50 species
- Native to every eastern state
- About 1 in 4 trees in natural areas are oaks
- Important for...pretty much everything
  - Timber
  - Wildlife
  - Ecology
Oaks are everywhere
There’s lots of oak

- Volume = 1.2 billion ft$^3$

= 8,282 of these

Moser et al. 2006
Issues are on the radar

- From Rick’s talk yesterday:
  - Gypsy moth
  - Polyphagous shot hole borer
  - Sudden oak death
  - Winter moth
  - Forest tent caterpillar
  - Oak wilt
  - Gold spotted oak borer
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Categorizing threats to eastern oaks

- Native
- Already here
- Management ✓
- Know potential ✓
Oak Wilt: Background

• Native fungal disease and found only in N. America
• All oak species are susceptible:
  • red oaks most susceptible and die suddenly
  • white oaks die more slowly
• Came in the limelight in 1980s from tree wounding during home construction within oak forests
  • Historical fire suppression possibly allowed oaks to grow where they normally would not
Oak Wilt: Symptoms

- Wilt symptoms appear just after full leaf expansion in Spring, especially with water and willow oaks
- Leaf margins scorched, vein necrosis on live oaks
Oak Wilt: Symptoms

- Dark staining is present within sapwood of branches
- Vertical bark cracks on trunks at least 12” DBH may indicate fungal mats underneath
Oak Wilt Disease Cycle

Infection of Quercus spp. by Bretziella fagacearum in Texas

1. Red Oak Phase
- Dead Red Oak (next spring)
- Dying Red Oak (Fall)
- Infected Red Oak (late summer)
- Dead Red Oak (early summer)

Nitidulid Beetles

Mat Formation

Contaminated Nitidulids = “Overland spread”

2. Live Oak Phase
- No mats, no beetles
- “Local spread” = Rapid, spreading Live oak mortality
- Root Connections
- Diseased Live Oak
- Healthy live oak
- Healthy Red oak

Prepared by D.N. Appel
July 2015
Categorizing threats to eastern oaks

- Invasive
- Already here
- Management ✅
- Know potential ✅
Gypsy moth

- 6 Rows: Red Spots
- 5 Rows: Blue Spots

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[Images of gypsy moth and caterpillar with text labels]

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[Images of gypsy moth on bark]

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[Images of gypsy moth and caterpillar on branch]

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[Image credit: Joe Boggs, OSU Extension]
STS Gypsy Moth Trap Catch in 2016 and the 2017 Draft Action Area

DRAFT. Data current as of October 25, 2016

Proposed 2017 STS Action Area based on a weighted average of the 2014-2016 multilines. This is the preliminary 100 km boundary upon which analyses are based.

Interpolated moth catch
- da_bounds_cp
- 0 to 0.1 moth
- > 0.1 to 1 moth
- > 1 to 3 moths
- > 3 to 10 moths
- > 10 to 30 moths
- > 30 to 100 moths
- > 100 to 300 moths
- > 300 moths

Gypsy moth trap catch data were obtained through the National Gypsy Moth Slow the Spread Project and associated state and federal agencies.
Categorizing threats to eastern oaks

- Native
- Not here (yet?)
- Management
- Know potential
Goldspotted oak borer

- Native to AZ, Mexico
- Prefer red oak group
  - Almost never white oak group
  - 27 red oak group sp. in eastern NA
- Major oak mortality
  - Natural
  - Park/camping areas
Goldspotted oak borer damage

95% of trees die within 8 years of infestation
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Euwallacea shot hole borers

- Aggressive ambrosia beetles
  - Polyphagous (PSHB)
  - Kuroshio (KSHB)
**Euwallacea shot hole borers**

- Several oak species attacked
- No known treatment other than sanitation
So...

Now what?
We have an opportunity to learn from our experiences.

We also have an opportunity to be more proactive.
Any questions?