

Detecting Biological Invasions with Sentinel Plantings in Alabama

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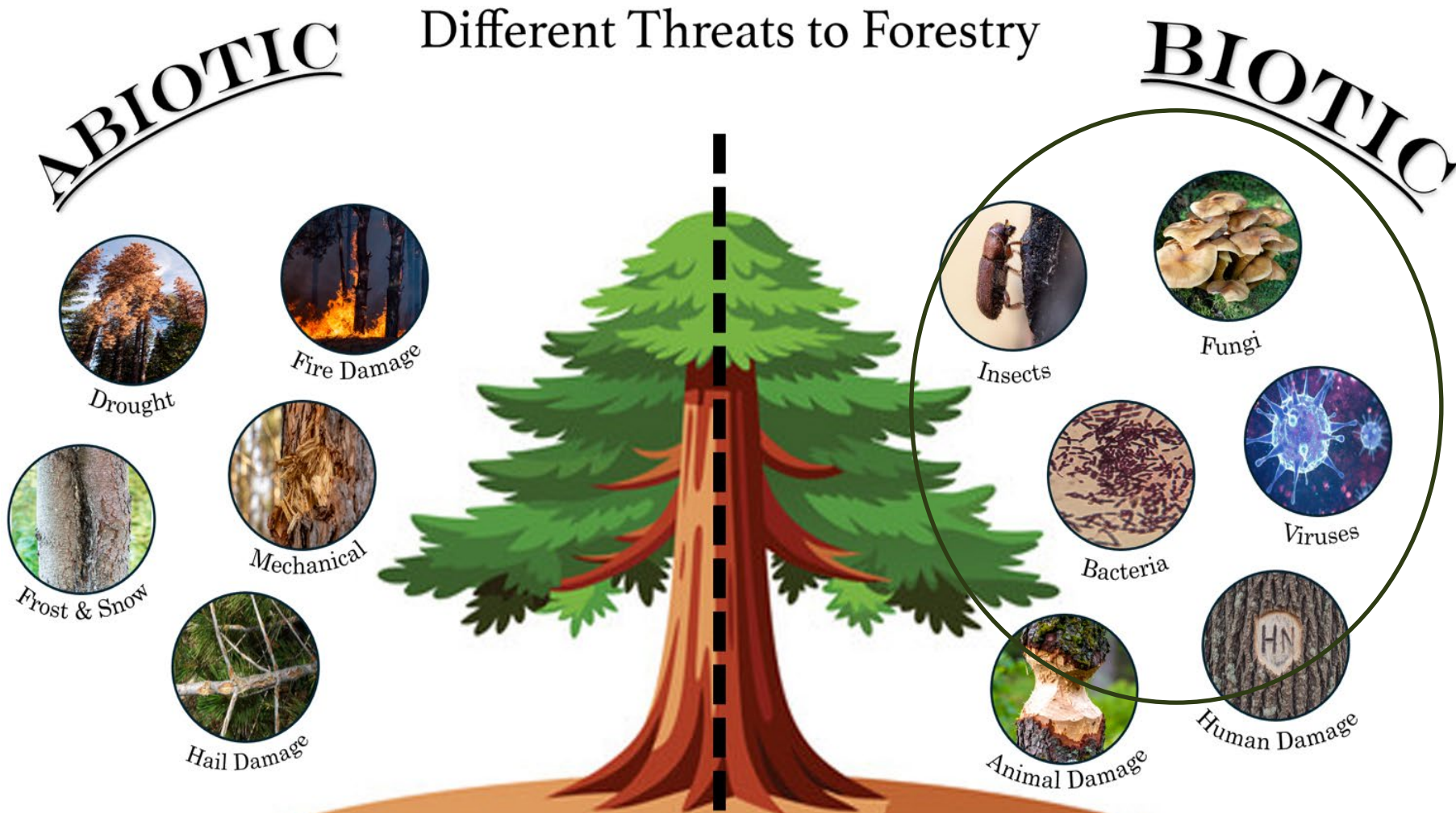


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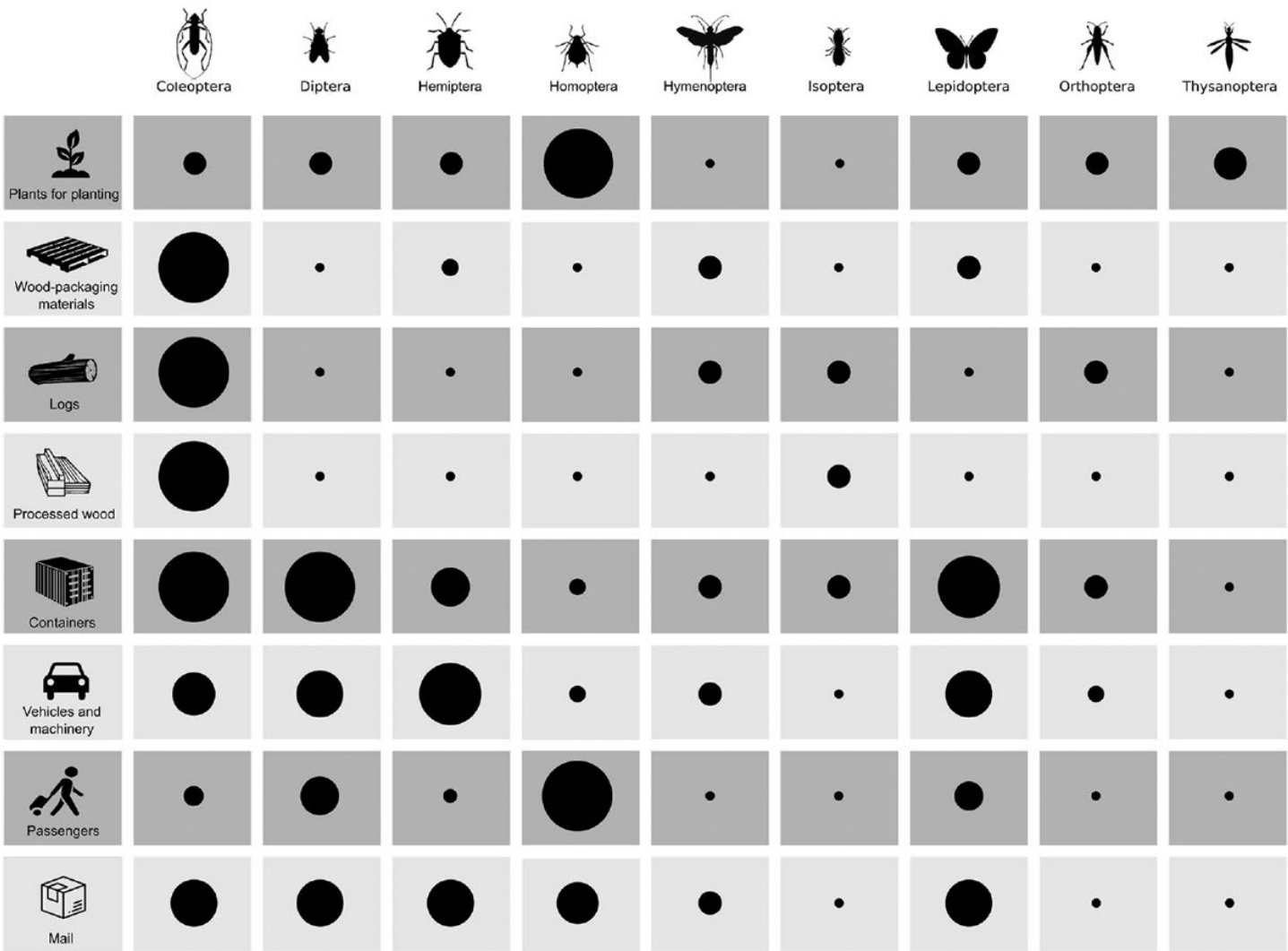


Threats to Forestry



Common pathways by which non-native forest insects move internationally and domestically

Nicolas Meurisse¹  · Davide Rassati² · Brett P. Hurley³ · Eckehard G. Brockerhoff⁴ · Robert A. Haack⁵



Ports of Entry



Ports and international airports are important bottleneck in biological invasion pathways!

Introduction



Introductions

Plants & Insects

- Cogongrass (*Imperata cylindrica*) 1911 (Mobile)
- Black Imported Fire Ant (*Solenopsis richteri*) 1918 (Mobile)
- Red Imported Fire Ant (*Solenopsis invicta*) 1933, 1945 (Mobile)
- Asian Longhorned Borer (*Anoplophora glabripennis*) 1996 (New York)
- Formosan Termites (*Coptotermes formosanus*) 1950s (New Orleans & Charleston)

Introductions

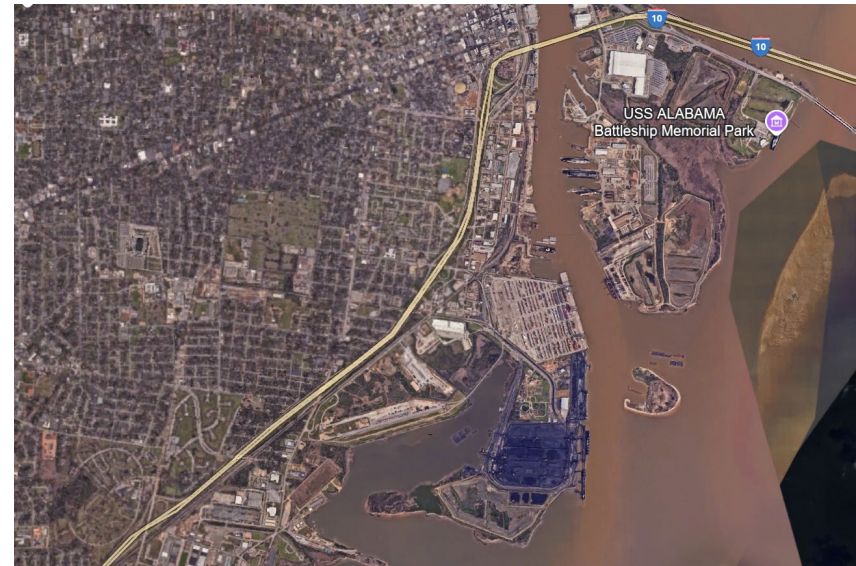
- Tree pathogens
 - Chestnut Blight (*Cryphonectria parasitica*) 1900s
 - Infected nursery stock
 - Dutch Elm Disease (*Ophiostoma ulmi*) 1930s
 - Infected wooden logs
 - Sudden Oak Death (*Phytophthora*) 1990s
 - Ornamental plant trade
 - White Pine Blister Rust (*Cronartium ribicola*) 1900s
 - Laurel Wilt (*Raffaella lauricola*) 2002

Mitigation & Protection

- Stricter regulations and enforcement
- Improved inspection and screening
- Phytosanitary certificates
- Managing importation risks
- Early detection and monitoring

Introduction

- Alabama has a major seaport in Mobile
 - Railway and Trucking
 - Nearby urban communities
- Early warning system



Overall Goals

1. To establish sentinel plantings and develop educational programming for communities near the Mobile port.
2. To establish a sentinel planting at the Jules Collins Smith Museum of Fine Arts for training citizen science groups and as an educational facility for extension, classes, master gardeners, 4H and FFA, scouts, K thru 12, etc.

Objectives

1. Establishing and demonstrating a sentinel planting approach
2. Conducting general surveys and sampling for exotic insects and diseases, including non-regulated species
3. Incorporating education and community science in monitoring
4. Measuring the immediate and longer-term impacts of outreach on the effectiveness of early detection

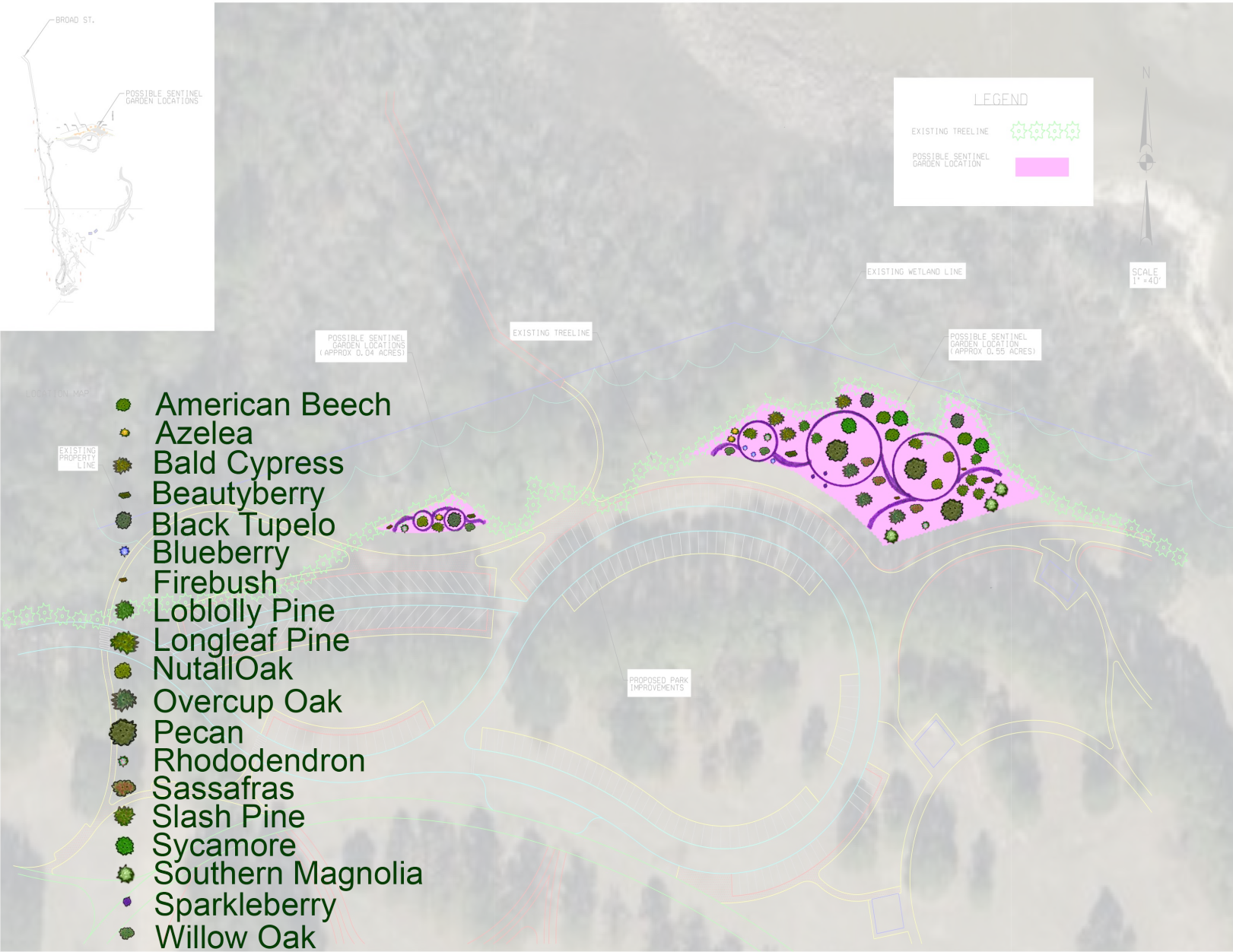
Project Timeline

Task	YR1	YR2	YR 3
Select tree species and sources			
Order, acquire and propagate seedlings			
Select locations and design gardens			
Site prep planting sites			
Establish plantings (Fall Year 2 and Year 3)			
Maintenance of planting sites			
Monitoring			
Insect Trapping			
Spore trapping			
Organize listening sessions and workshops			
Train and engage citizen scientists			
Measure project impacts			

Sentinel Planting Sites







Training Sentinel Planting Site



Auburn University CFWE
Sentinel Garden- Potential Site B
~1.3 Acres ~ 1,200ft Perimeter

Map created by Preston Payne Alabama RF #2439

0 95 190 380 Feet



Auburn University Jule Collins Smith Museum of Fine Arts Auburn, Alabama

Sentinal Garden Design

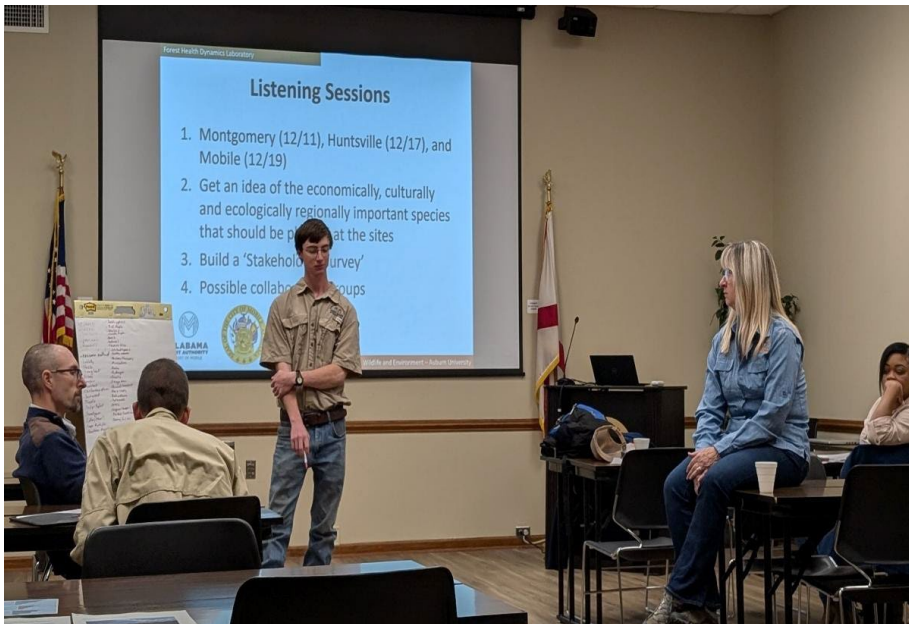
Plant Symbol Key

- American Beech
- Sycamore
- Bald Cypress
- Black or Water Tupelo
- Loblolly Pine
- Longleaf Pine
- Slash Pine
- Nuttall Oak
- Overcup Oak
- Willow Oak
- Pecan
- S. Magnolia
- Shrubs:**
- Azalea
- Beautyberry
- Blueberry
- Sparkleberry
- Firebush
- Rhododendron Spp.
- Sassafras



Listening Sessions

1. Montgomery, Mobile, and Huntsville
2. Met with members of federal, state, and private organizations.



Stakeholder Survey

1. Determine priority plants and pests to monitor at the planting sites
2. Economically, culturally, and ecologically regionally important species in the planting sites
3. Sent to important stakeholder groups throughout the State
4. Analyze data to determine plantings

Tree & Shrub Species

Tree Species & Donors

- American Beech (Heritage Seedlings)
- Bald Cypress (Arborgen)
- Black Tupelo (Heritage Seedlings)
- Loblolly Pine (Arborgen)
- Longleaf Pine (Arborgen)
- Nuttall Oak (Arborgen)
- Overcup Oak (Arborgen)
- Pecan (Arborgen)
- S. Magnolia (Moon's Tree Farm)
- Slash Pine (Arborgen)
- ***Sycamore***
- Willow Oak (Arborgen)
- ***Eastern Red Cedar***

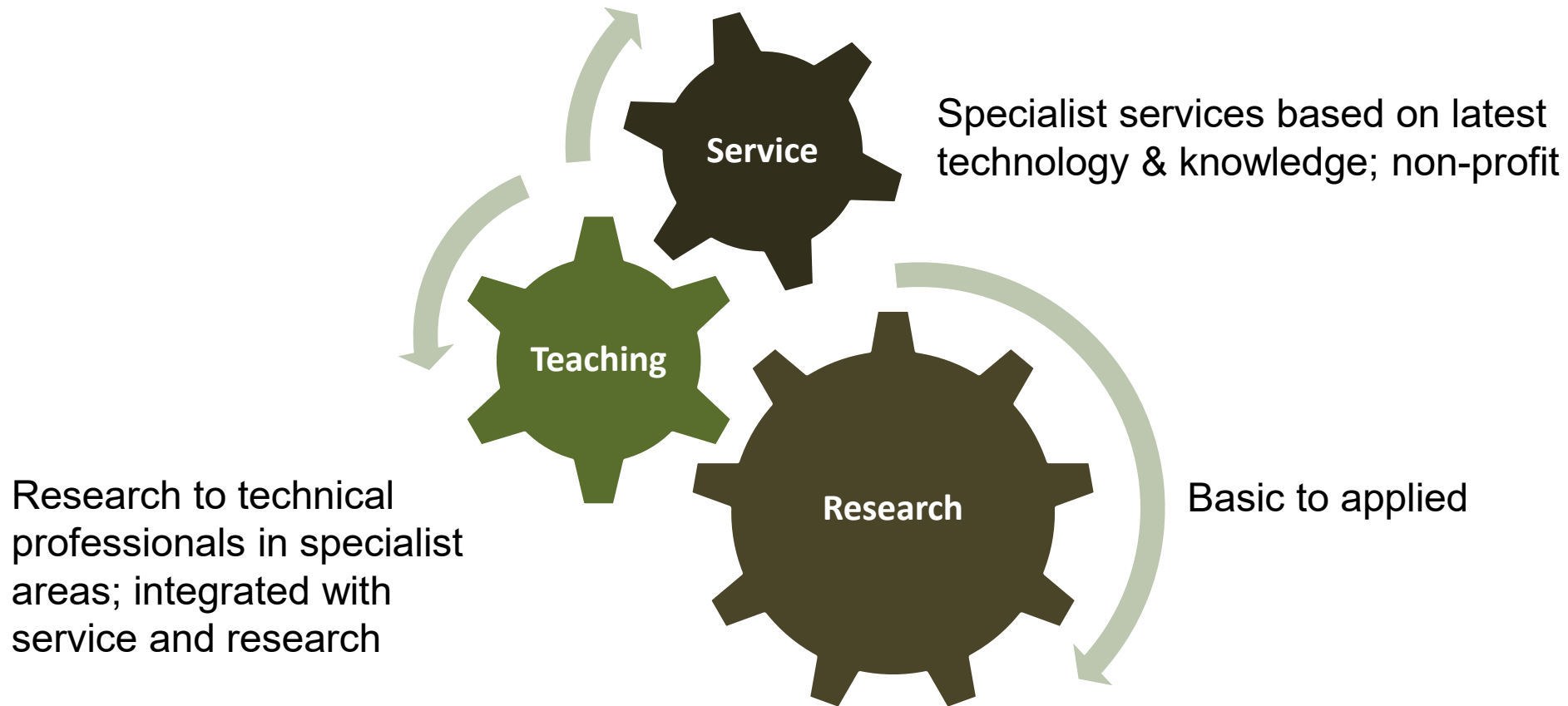
Shrub Species & Donors

- Azalea (Tom Dodd)
- Beautyberry (Superior Tree)
- Blueberry (Tom Dodd)
- ***Firebush***
- Native Azalea (Nemophilly Natives)
- ***Rhododendron***
- Sassafras (Native Wildflower Nursery)
- ***Sparkleberry***

Other Materials & Donors

- Topsoil (158 Dirt and Rock)
- ***Mulch***
- ***Pine Straw***

Sentinel Garden Core Functions



Integrated research, training and service

Acknowledgements

- Partners: Port of Mobile & City of Mobile
- Donors: Arborgen, Heritage Seedlings, Moon's Tree Farm, Native Wildflower Nursery, Nemophilly Natives, Superior Trees, Tom Dodd, 158 Dirt and Rock
- Funding provided by the US Forest Service International Programs – G0017985



Thank you!

If you are interested in donating any materials or learning more about how your organization can participate, please don't hesitate to reach out.

Your contribution will play a vital role in supporting plant biosecurity, environmental health, and public outreach in our coastal and urban communities.

We would be honored to recognize your support in our public communications and project signage. In addition, these gifts may qualify your company for a gift-in-kind tax credit, should you choose to participate by making a donation.