Scope of Laurel Wilt Mortality to Redbay Forests

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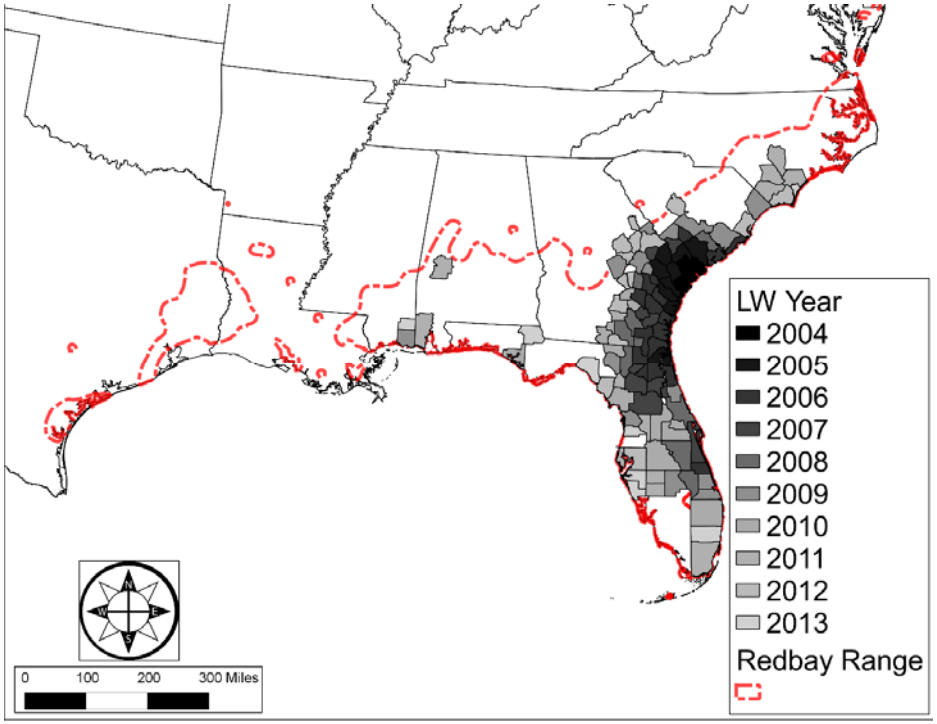
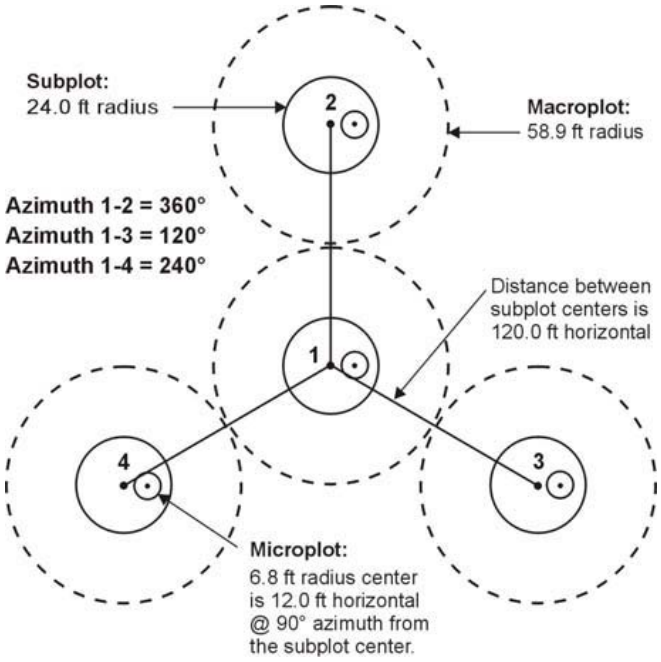
Research Topics

- Large-scale population impacts
- Redbay (*Persea borbonia*) and swampbay (*P. palustris*) communities
- Aftermath of Laurel Wilt
- Seedling survival



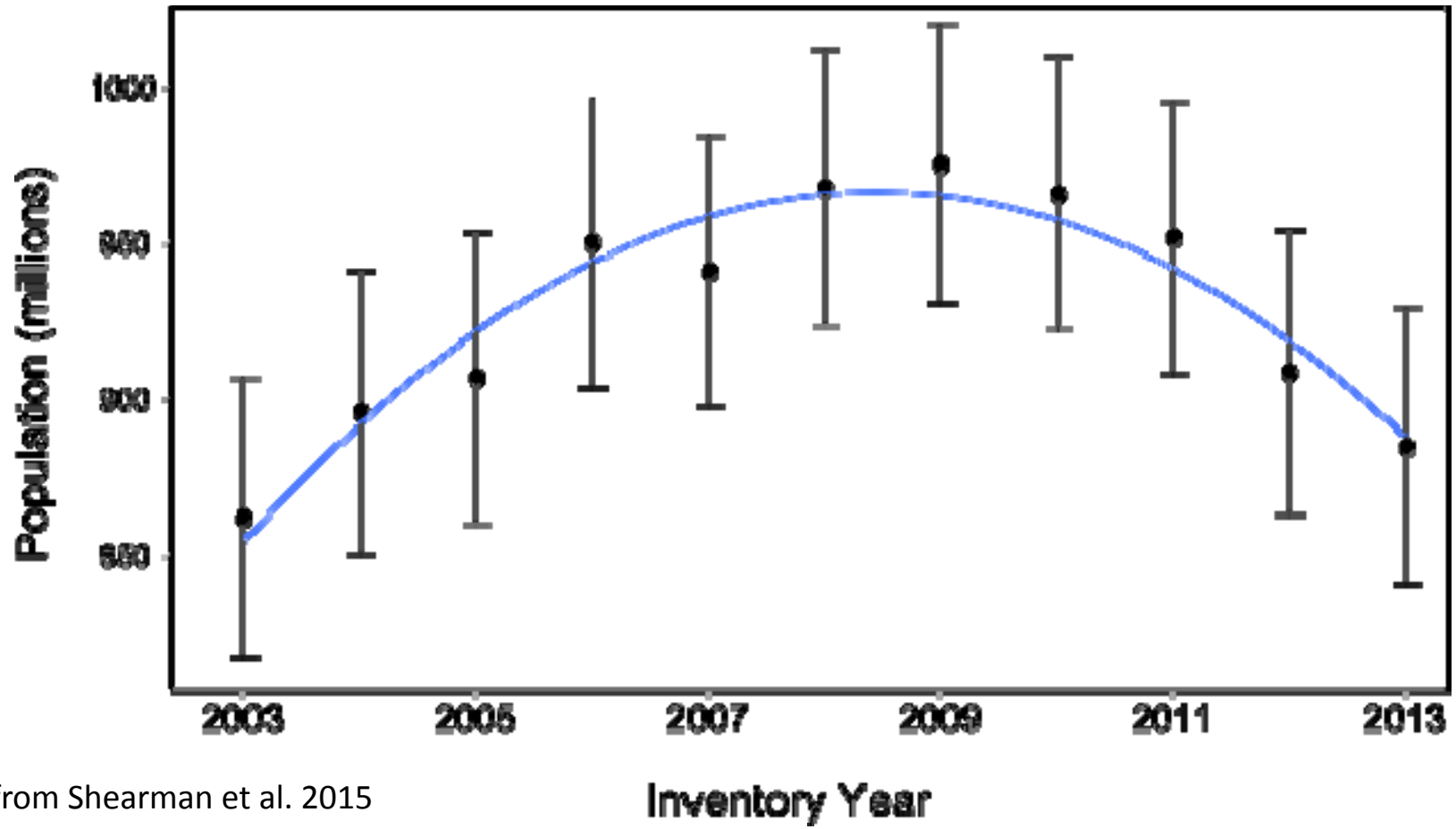
Large-Scale Population Impacts

- Forest Inventory and Analysis (FIA) Database
  - National inventory
  - Two phases: remote sensing and ground survey
  - Population estimates calculated from moving mean
- Four Scales
  - Range-wide population
  - State-wide populations
  - County level density
  - Individual mortality predictions



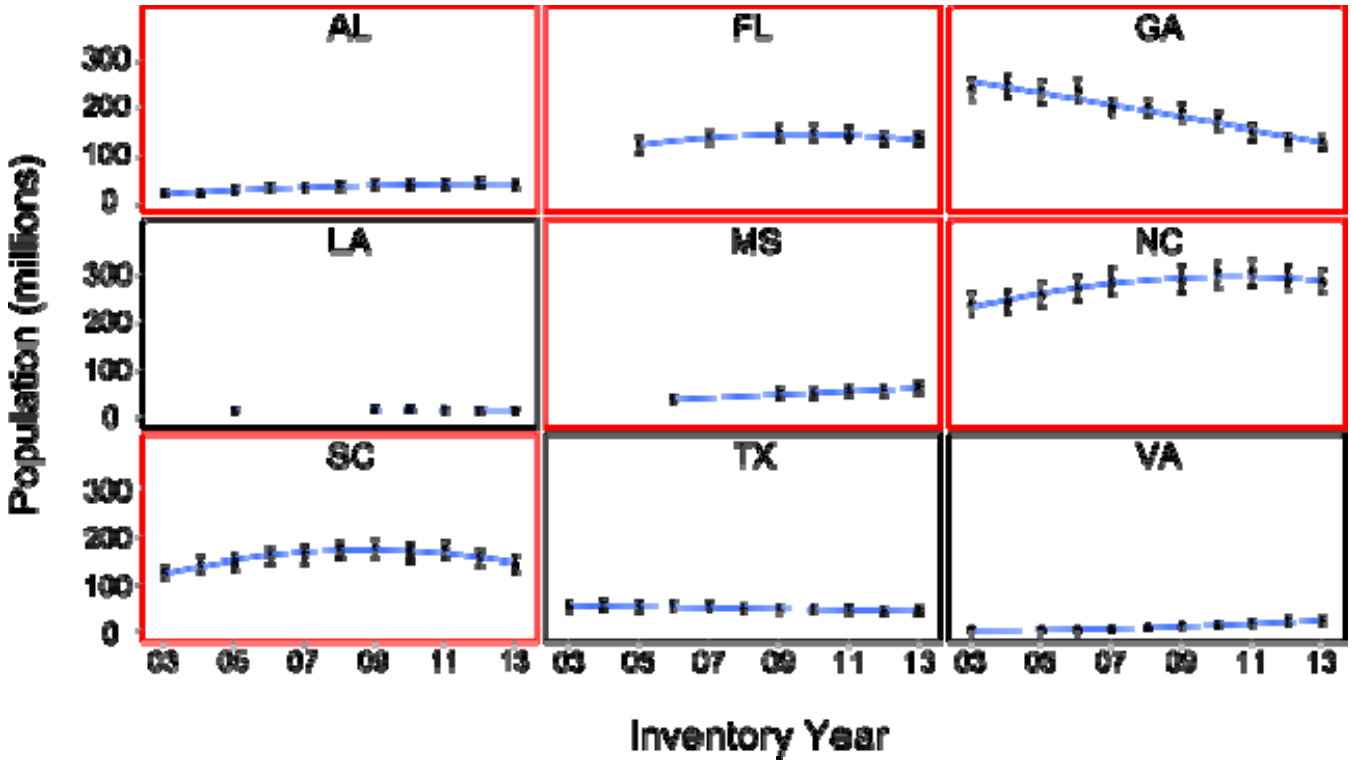
O'Connell et al. 2015

Range-Wide Population



Modified from Shearman et al. 2015

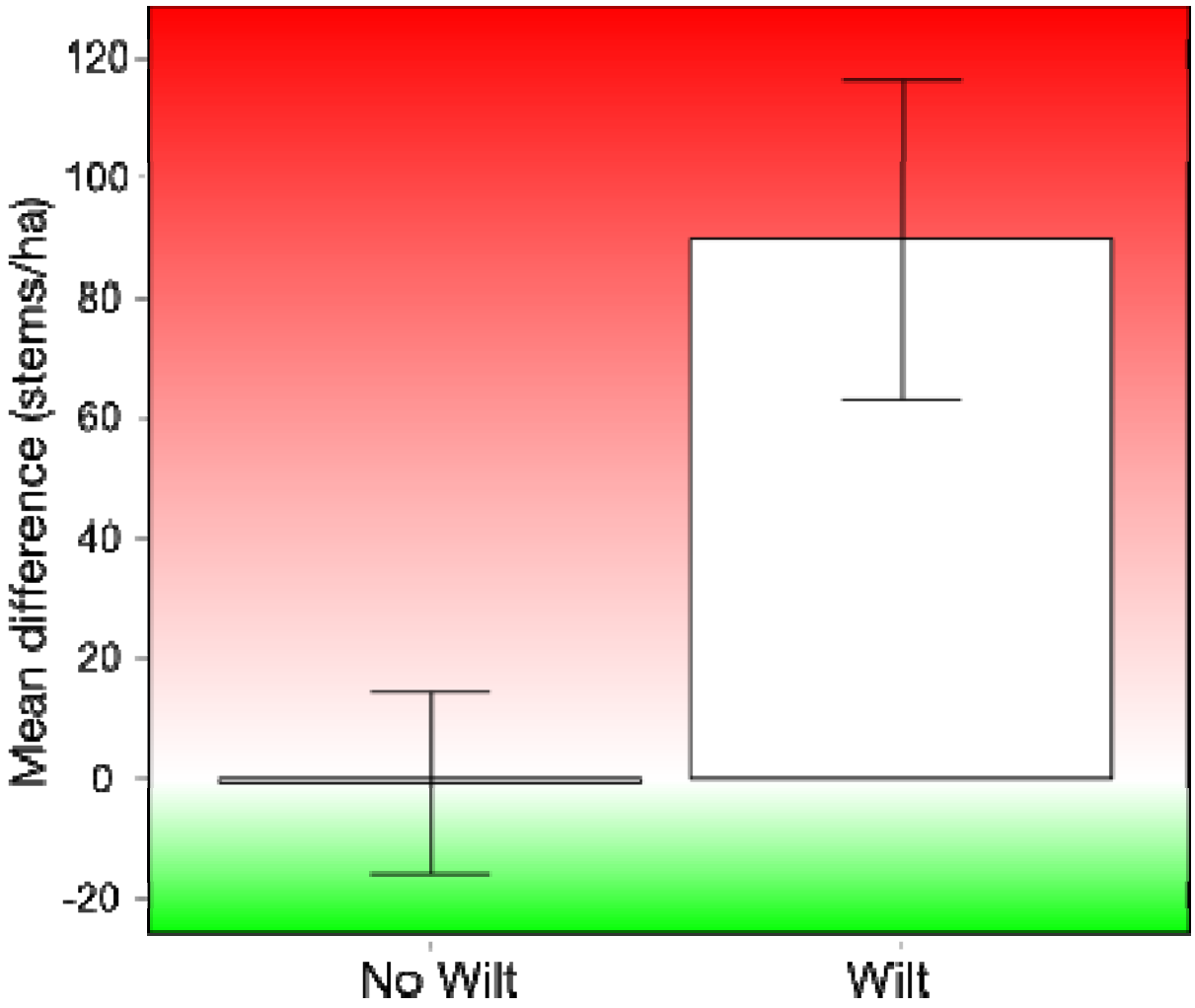
State-Wide Population



Modified from Shearman et al. 2015

County-Level Density

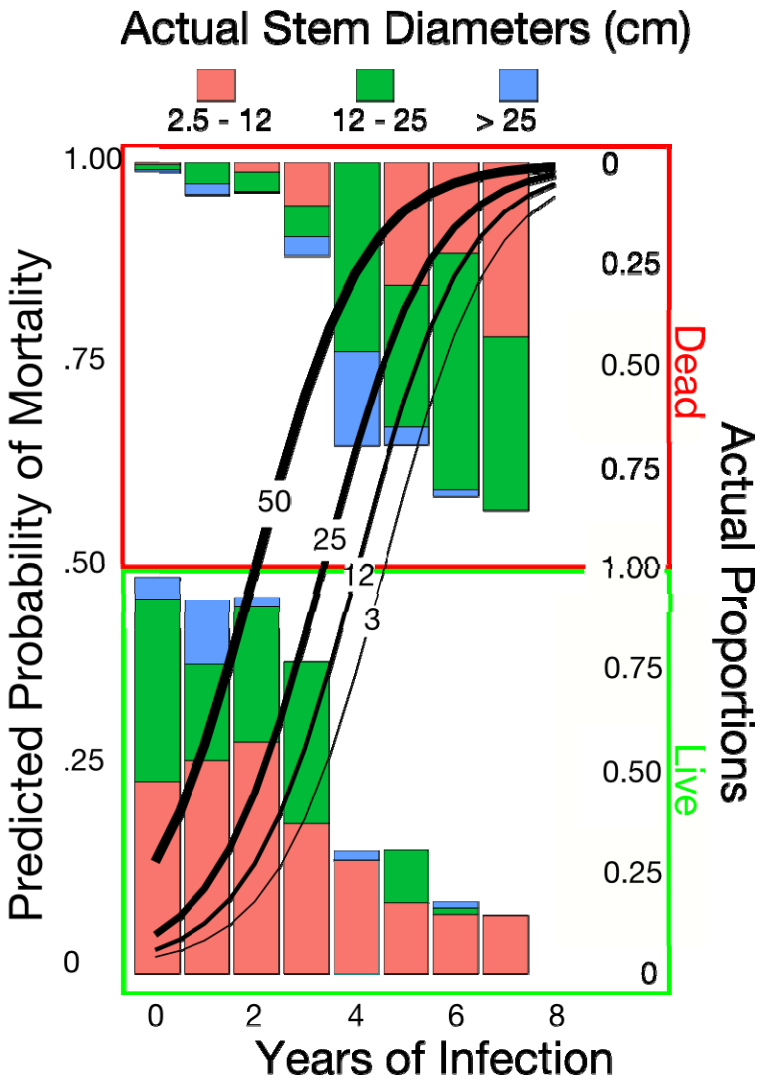
- First Survey
  - No LWD in county for all plots
- Second Survey
  - No Wilt, n = 382
  - Wilt, n = 229



Shearman et al. 2015

Individual Mortality Predictions

- Logistic Regression
  - Diameter
  - Years of Infection
- Two data sets:
  - Model data, n = 828
  - Validation data, n = 883
- Overall Accuracy = 94%
  - 97% Live
  - 74% Dead



Shearman et al. 2015

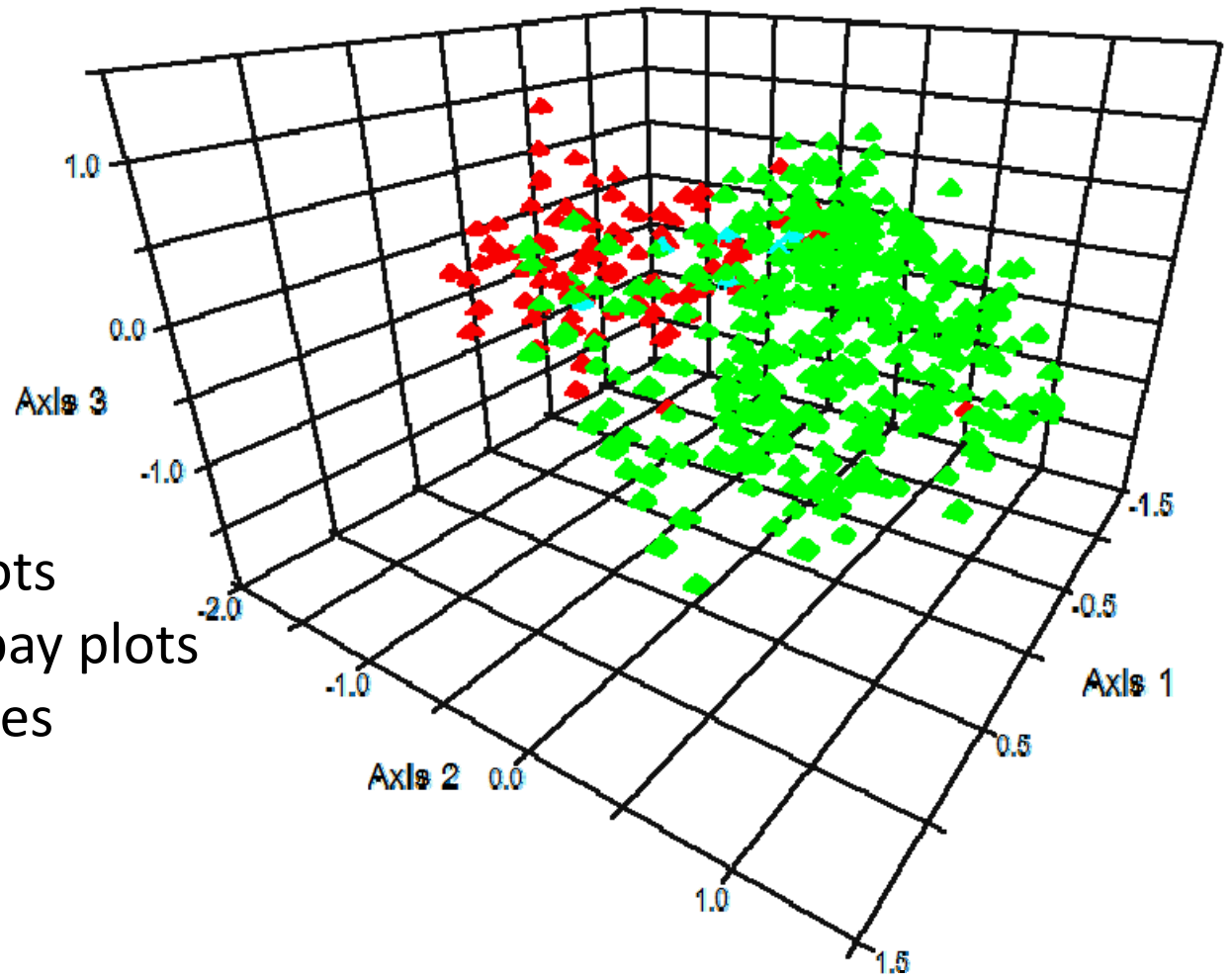
Redbay and Swampbay Communities

- Are there differences in redbay and swampbay communities?
- Do these vegetation groups differ in terms of bay importance?
- Which communities are more at risk?

Redbay and Swampbay Communities

- Carolina Vegetation Survey (CVS)
  - Designed to document natural vegetation of the Carolinas
  - www.cvs.bio.unc.edu
  - 452 plots surveyed from 1988 – 2012
    - NC, SC, and GA
    - Only sites with redbay and swampbay
- Ordination, cluster analysis, indicator species analysis

NMS Ordination

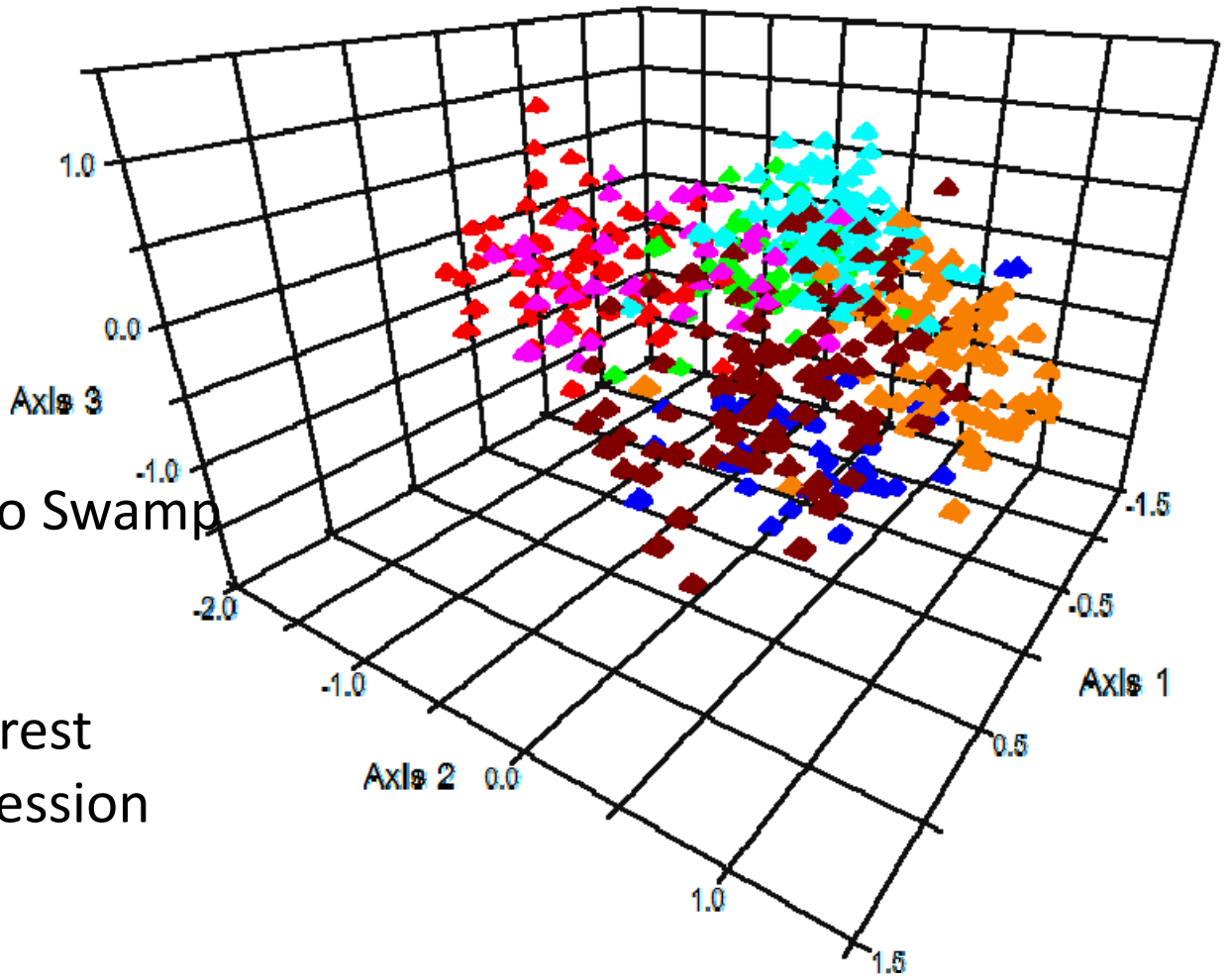


Red pyramids = Redbay plots
Green pyramids = Swampbay plots
Teal pyramids = Both species

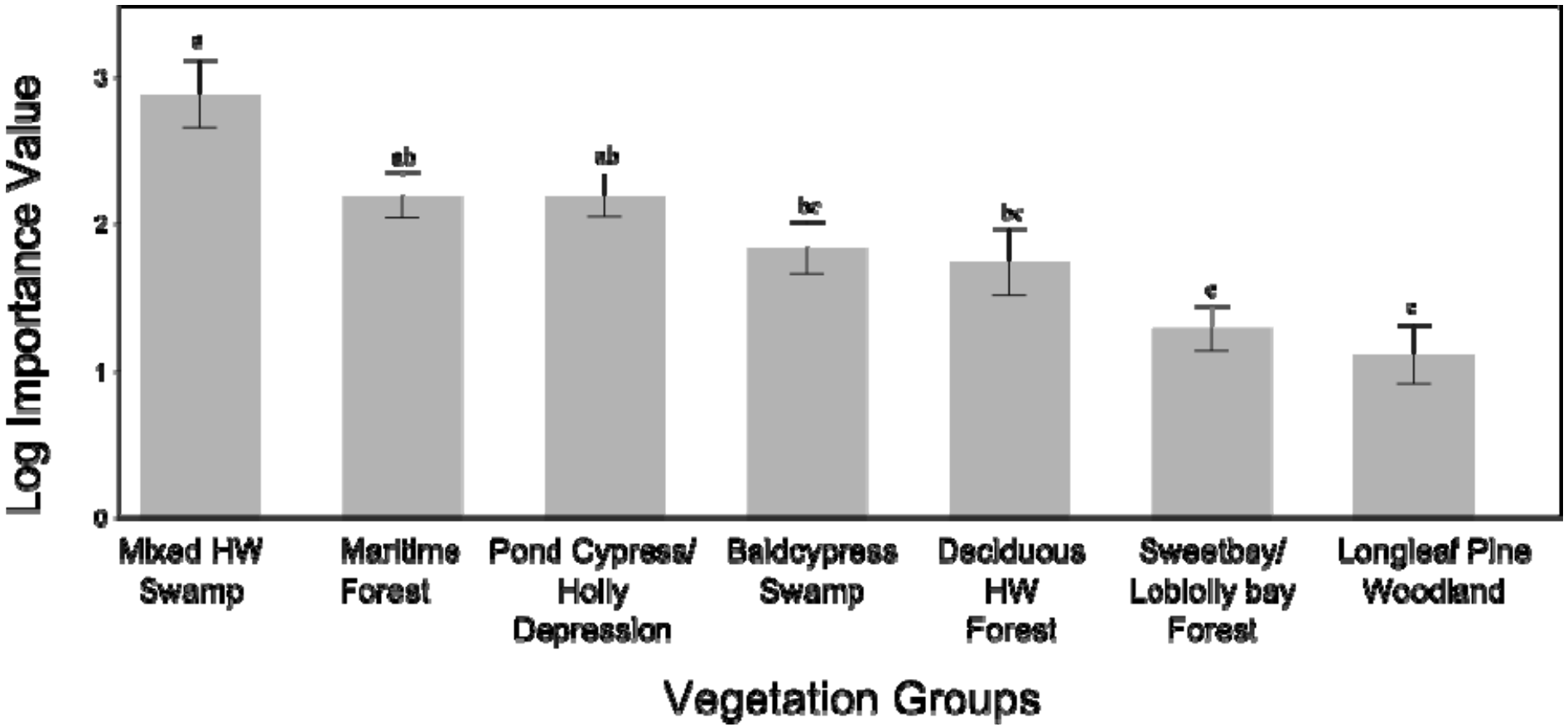
NMS Ordination + Cluster Analysis

Seven unique groups:

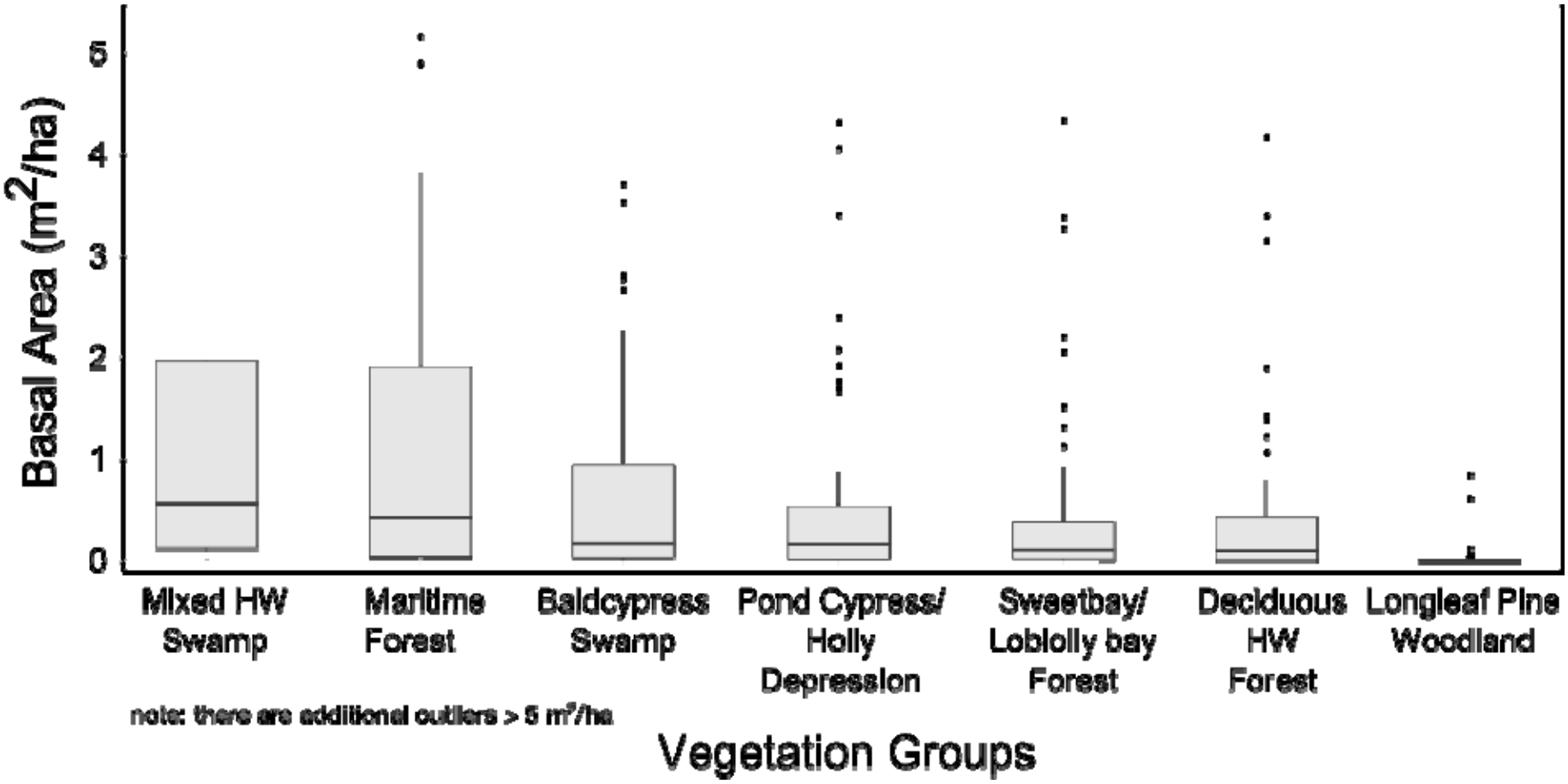
- Maritime Forest
- Deciduous Hardwood
- Baldcypress/Water Tupelo Swamp
- Mixed Hardwood Swamp
- Longleaf Pine Woodland
- Sweetbay/Loblolly bay forest
- Pond Cypress/Holly Depression



Bay Importance



Bay Basal Area



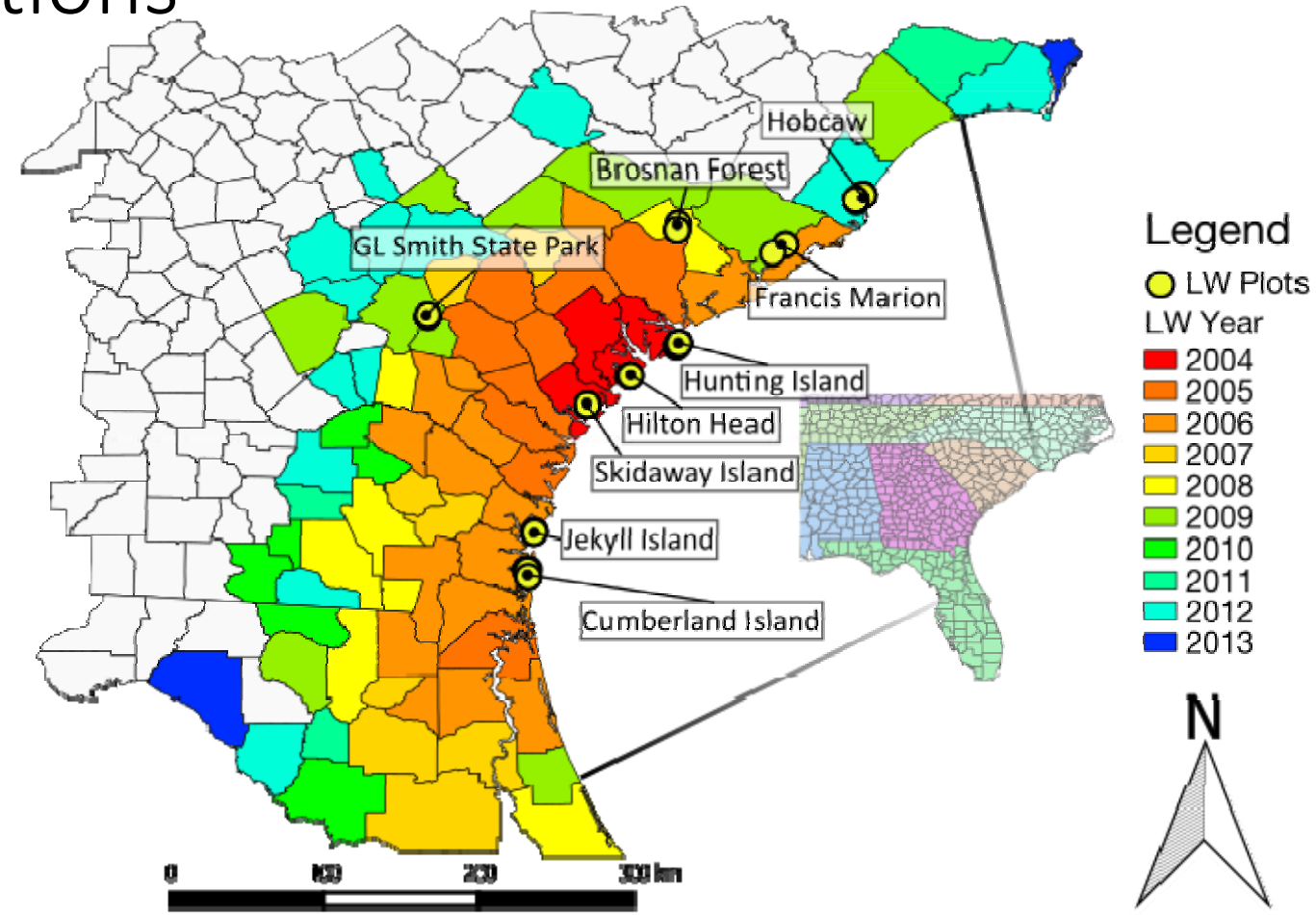
After Laurel Wilt

- What is the community response after LWD?
- Is there regeneration of *Persea* spp.?
- Does the increase of woody debris have implications on fire behavior?
- Is the response different between redbay and swampbay communities?

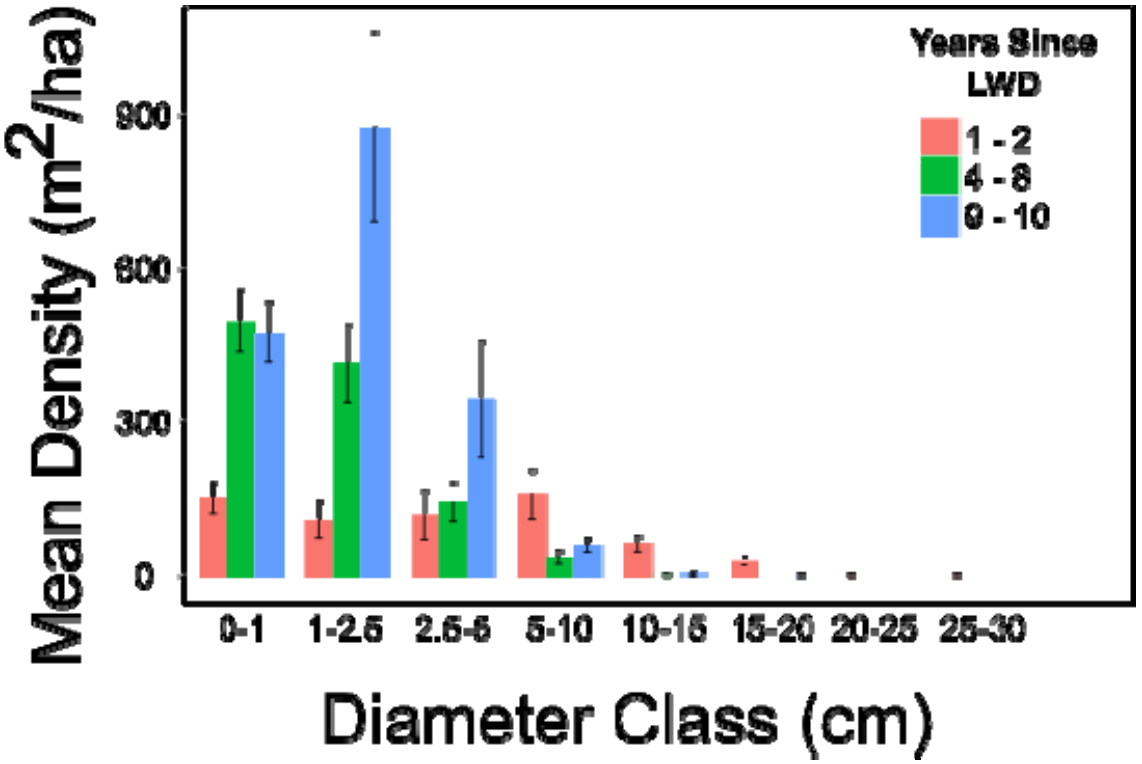
Project Overview

- Survey communities impacted by LWD
  - Different years of recovery
  - CVS Protocol
  - Measure down woody debris

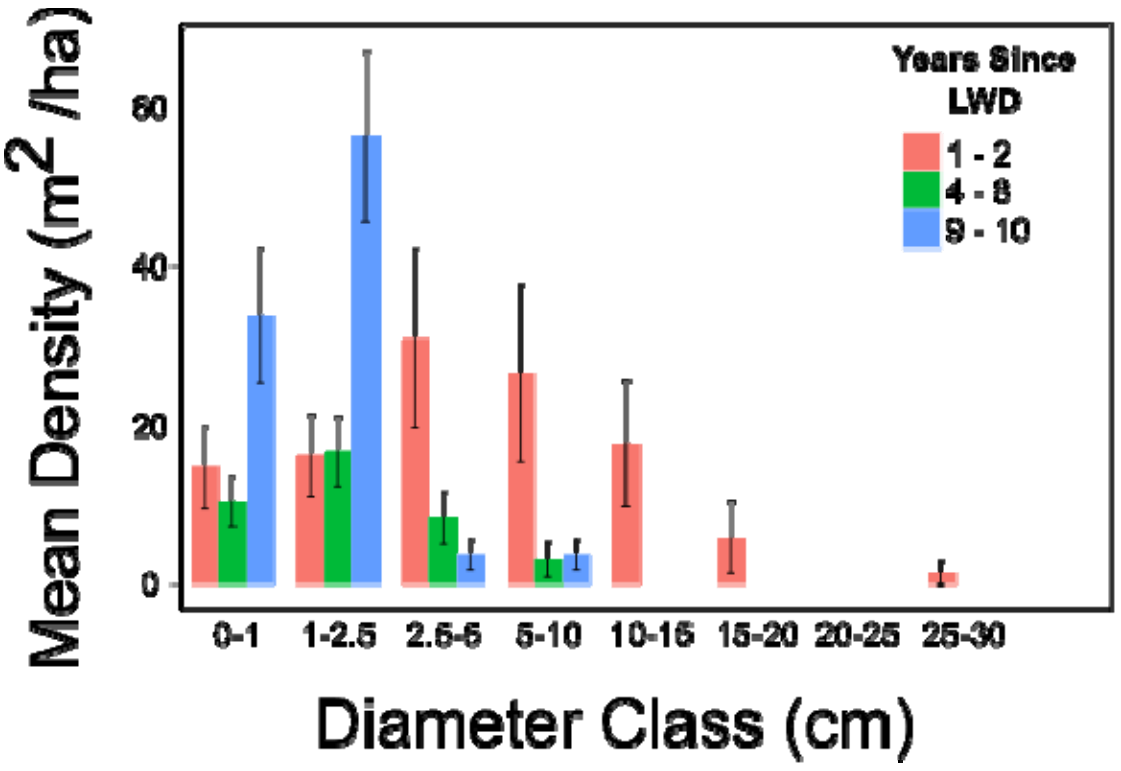
Site Locations



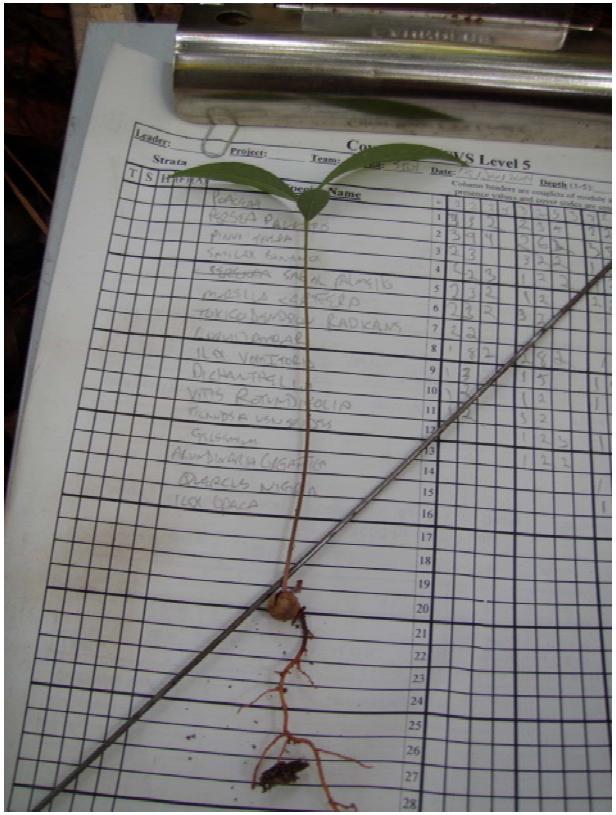
Live Redbay Stems



Wilted Redbay Stems



Seedling Survival



Sources of Recruitment?

Special Thanks!

- Laurie Reid – South Carolina Forestry Commission
- Forest Health Monitoring Program
- Stan Hutto – SC Dept. of Parks, Recreation & Tourism
- Scott Cameron – Georgia Forestry Commission
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- Doug Hoffman – Cumberland Island National Sea Shore
- Ben Carswell – Jekyll Island
- John Bowers and Carson Barefoot

Special Thanks!

- Bob Peet and Michael Lee – Carolina Vegetation Survey
- US Forest Inventory and Analysis Program
- Brosnan Forest

Questions?