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Compensatory Wetland Mitigation

- Impacts of >0.10 acres to federally regulated wetlands = mitigation at 1:1 or 2:1 ratio
- Administered by the USACE/EPA, DNREC, and/or New Castle County
- On-Site or Off-Site Wetland Creation
- 3-5 Year Monitoring Plans with Annual Reports
 - Monitoring of Hydrology, Soils, Vegetation, & Wildlife



Typical Forested Mitigation Performance Standards

- Wetland Hydrology
- Evidence of anaerobic soil conditions
- Majority of vegetation are hydrophytic sp.
- Wetland-dependent Wildlife
- **Minimum 85% survival rates of planted Trees & Shrubs**









Vegetation Monitoring Methods

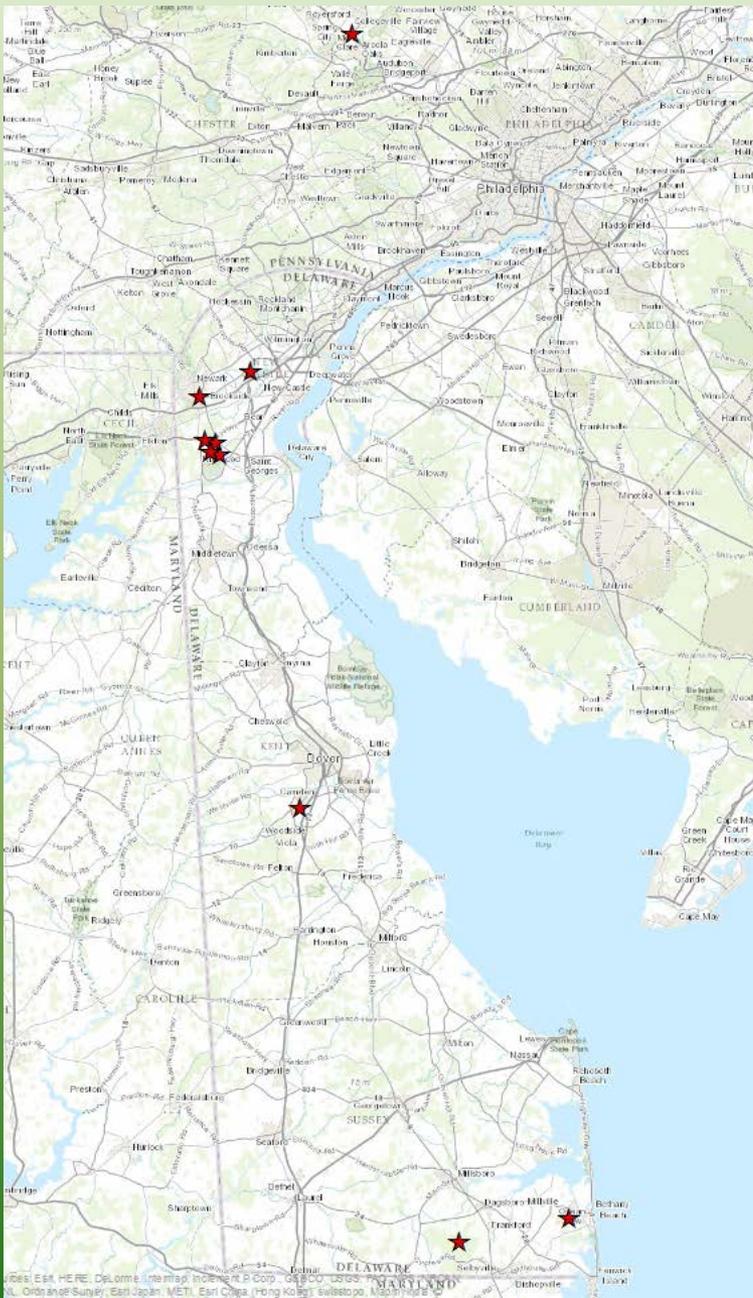
- Comprehensive lists and Overall Dominance
- Permanent Vegetation Data Points
- Survival Rate Counts per Planted Species



Woody Plant Survival Rates

- Reducing variation produced a data set of 13 species from 10 sites
- All sites with similar hydroperiods & depths
- Over-excavated by 1' & replaced topsoil to final grade
- Pinelands Nursery
- Same planting crew & oversight
- Min. Maintenance





- 6 in NCC, 1 in Kent, 2 in Sussex, and 1 in Montgomery County PA
- Range in size from 0.3-3.0 acres
- Trees and shrubs planted 5-10' on-centers
 - Fallsington loam, Elinsboro loam, Sassafra loam, Mullica-Berryland Complex, Woodstown Loam

- *Acer rubrum*, Red Maple
- *Alnus serrulata*, Smooth Alder
- *Betula nigra*, River Birch
- *Cephalanthus occidentalis*, Buttonbush
- *Cornus amomum*, Silky Dogwood
- *Fraxinus pennsylvanica*, Green Ash
- *Platanus occidentalis*, Sycamore



- *Quercus bicolor*, Swamp White Oak
- *Quercus palustris*, Pin Oak
- *Quercus phellos*, Willow Oak
- *Sambucus canadensis*, Elderberry
- *Taxodium distichum*, Bald Cypress
- *Viburnum dentatum*, N. Arrow-wood



Mean Survival Rates (2-5 years)

#1: *Betula nigra*, River Birch = 98.0%

#2: *Quercus bicolor*, Swamp White Oak = 94.9%

#3: *Taxodium distichum*, Bald Cypress = 94.8%

#4: *Quercus palustris*, Pin Oak = 90.1%

#5: *Cornus amomum*, Silky Dogwood = 83.8%

#6: *Cephalanthus occidentalis*, Buttonbush = 81.7%

#7: *Fraxinus pennsylvanica*, Green Ash = 81.6%

#8: *Quercus phellos*, Willow Oak = 80.6%

#9: *Platanus occidentalis*, Sycamore = 80.2%

#10: *Acer rubrum*, Red Maple = 75.3%

#11: *Viburnum dentatum*, Northern Arrow-wood = 69.3%

#12: *Sambucus canadensis*, Common Elderberry = 58.5%

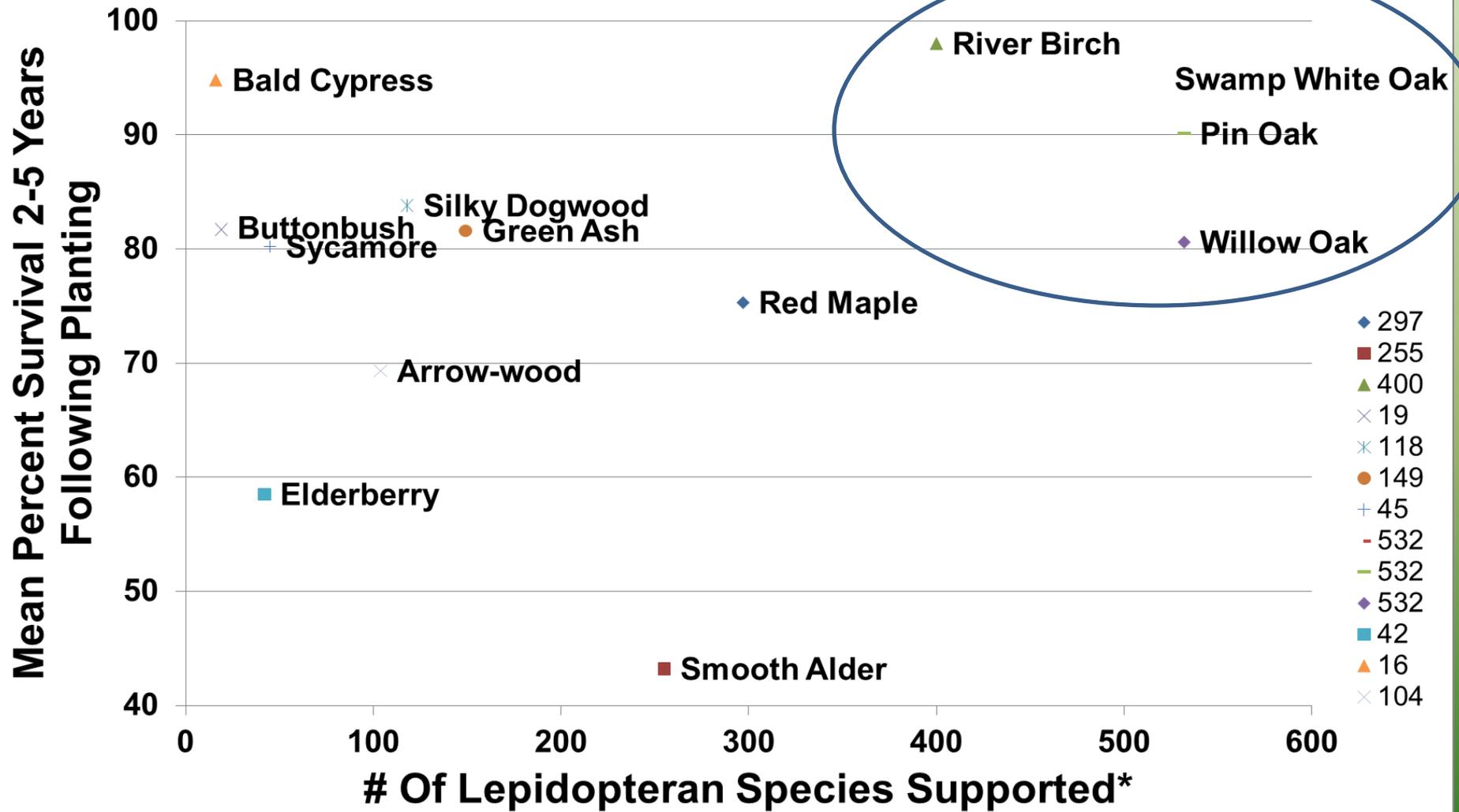
#13: *Alnus serrulata*, Smooth Alder = 43.2%



Attracting Wildlife to Mitigation Wetlands



2-5 Year Survival Rates and Number of Lepidopteran Supported



*(Data compiled by:) Tallamy, Douglas. 2007. Bringing Nature Home: how native plants sustain wildlife in our gardens. Timber Press, Inc.



Questions or comments please

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