CFAES

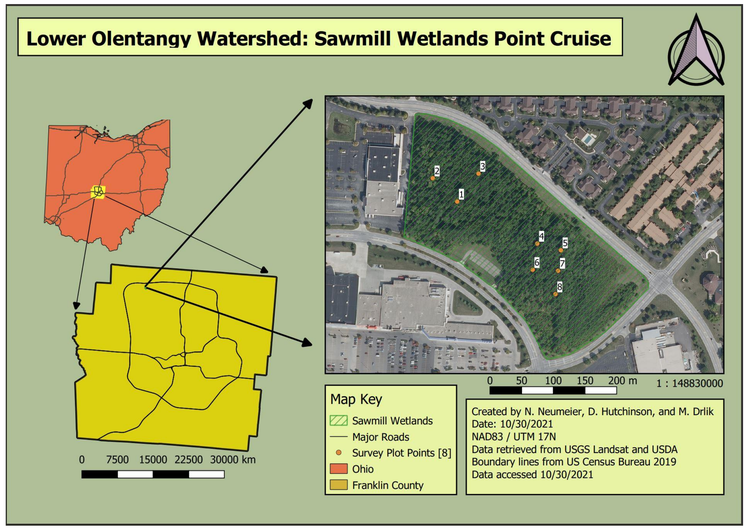
SCHOOL OF ENVIRONMENT NATURAL RESOURCES

Sawmill Wetlands Forest Assessment

Danielle Hutchison, Madison Drlik, Nicholas Neumeier

Background

- Focus on supplementing ecosystem to be more adaptive to changing climate conditions
- Climate adaptability through adaptive and diverse species introduction
- Goal of developing species recommendation list of 24 native adaptive trees
- Forest assessment of wetlands provides current makeup and insight to “missing elements” within the stand
- Urban forests subject to anthropogenic disturbances of habitat fragmentation, pollution, and consequences of human recreation
- Midwest conditions are on average more wet



Site Description

- Sawmill Wetlands is a 17-acre wildlife education area located in an urbanized part of Franklin county, OH.
- Poorly drained silt clay loam soils across the site.
- Planting area is in the eastern corner of the site and is dominated by herbaceous vegetation, inviting full sun and weather exposure.
- Herbivorous browsing by deer has historically been a challenge to planting projects in this area.

Methods

Species Selection

- Using USFS Tree Atlas for Greater Columbus:
  - Eliminated tree species with an SSo value >1
  - Eliminated "low" adaptability values
  - Eliminated "poor" and "fair" Cap45 values
- This process provided 13 tree species we identified as meeting our threshold of climate resilience. We then cross referenced these 13 species with the inventory of available trees at Davey Tree Nursery
- We then evaluated each of the 7 available tree species according to environmental criteria relevant to our site:
  - Tolerance to wet soils
  - Tolerance to drought
  - Tolerance to sun exposure
  - Tolerance to browsing/ browsing potential

Sawmill Wetlands Day of Tree Planting

Forest Inventory

- We surveys 5 plots of 33-foot radius in addition to 3 plots of the same dimensions surveyed by FLOW.
- In each plot, we identified and measured DBH of each tree with a diameter >10 cm.
- Survey plot locations were selected by using QGIS to develop a site map with sufficiently spaced plots.
- We then calculated composition by percent and basal area by percent.

Results

Species Recommendations

- Evaluation of the seven most viable species
- Highest scoring were honeylocust, American elm, and yellow poplar

Species	Tolerance of wet soils	Drought Tolerance	Sun Tolerance	Browsing Tolerance	Total
American elm	3	2	2	3	10
Black oak	2	1	2	2	7
Hackberry	3	2	2	1	8
Honeylocust	3	3	3	3	12
Northern red oak	2	2	3	1	8
Shagbark hickory	2	1	3	2	8
Yellow-poplar	2	1	3	3	9

Forest Assessment

- Our forest inventory found that Oak (*Quercus spp.*) and American elm (*Ulmus americana*) dominated the stand in terms of species composition. Oak made up most of the basal area of the stand.
- Oak was the most **important** species in the stand, followed by American elm and then maple spp.

Species	Relative Density	Relative Dominance	Importance Value
American beech	2.22%	0.27%	1.25%
Shagbark hickory	14.44%	5.04%	9.74%
Sycamore	1.11%	2.30%	1.70%
Black cherry	3.33%	1.31%	2.32%
Oak	41.11%	70.04%	55.58%
American elm	31.11%	5.54%	18.33%
Maple	6.67%	15.52%	11.09%

Main Takeaways

- Proper species selection can help prepare urban forests for changing climate conditions.
- 24 trees were planted at Sawmill Wetlands: 8 American elm, 8 honeylocust, and 8 yellow-poplar.

Acknowledgements

Peters, M.P., Prasad, A.M., Matthews, S.N., & Iverson, L.R. 2020. Climate change tree atlas, Version 4. U.S. Forest Service, Northern Research Station and Northern Institute of Applied Climate Science, Delaware, OH.