SHIFTING PALETTEs

Challenges and Opportunities in Tree Species Selection in Baltimore,
For Baltimore.

Established in 2008, the Baltimore Tree Trust is building a local workforce to protect Baltimore's urban forest and plant a greener, healthier city for all of our neighbors.

By Baltimore.
Our Typical Projects

Street Trees
- Tree Wells, Medians,
- Residential

Open Space (50%)
- Golf Courses, Schools, Parks,
- Hospitals

Since Founding:
- 17,000 trees planted
- 100,000 sqft impervious surface removed
- ~5,000 trees currently under maintenance
URBAN CONDITIONS
‘Based on mortality rates reported in planting cohort studies, the population half-life for planted urban trees (i.e., when survivorship is 50%) is:
• 7 to 11 years - worse-than-normal
• 13 to 18 years - “middle-of-the-road
• 33 to 38 years - better-than-normal

(Hilbert, 2019)

Urban Tree Life Expectancy 19-28 years

(Roman, 2011)
Urban Environment Challenges

**Urban Soil**
- Compaction
- Sterile
- Variable type/conditions

**Built Environment**
- Pedestrian + Vehicle considerations
- Restricted space for roots
- Utility concerns (above and below ground)
- Sight Lines

“Wild Card”
Baltimore City Approved Street Tree List (2019)

- **“Small Tree”**
  - 33 species here with 12 being native

- **“Large Street Tree”**
  - 52 species with 41 being native

- **“Large Open Space Tree”**
  - 9 species with all being native

- **“Banned List”**
  - 24 species (and genuses: Salix, Fraxinus, Populus)
  - Rationale from poor branch structure to invasive species
**Pests + Diseases**

- **Emerald Ash Borer**
  - Used to be a staple of tree planting projects and has left a big hole
  - Lots of replacement work to be done

- **Dutch Elm Disease**
  - DED Resistant Species have proven reliable

- **Chestnut Blight**
  - Not a great street tree, but a former keystone species with some hopeful cultivars

- **Oak Decline?**
  - Major Concern...
  - Oaks Comprise ~20% of our plantings

*(Image Credit: Baltimore Magazine)*
Sugar Berry (C. Laevigata)
Bald Cypress (T. distichum)
Sugar Maples (A. saccharum) - noted as “good capability for change” in NIACS report, but anecdotally in Baltimore it is not performing too well

Climate Change

Climate Change Projections for Individual Species (NIACS, 2021)

“New Habitat with Migration Potential”
Sugar Berry (C. Laevigata)
Bald Cypress (T. distichum)

“Poor Capability”
Several Oak species (Q. palustirs, Q. bicolor, Q. imbricaria)

Eye on the South for inspiration (with concern for our northern species)
Sugar Maples (A. saccharum) - noted as “good capability for change” in NIACS report, but anecdotally in Baltimore it is not performing too well
Sourcing

Tree Baltimore
- Major and Essential Partner!
- Provide trees for free for planting on city property and right of way

Nursery Shortages
- Some is pest driven (Fireblight + Redbuds)
- Echos of Great Recession + COVID
- Massive Surge in demand

Species + Growing Logistics
- Red Maples are cheap, Male Ginkgos are not
- Tap root species (Carya) are challenging
Other Tree Selection Considerations

- Native Species
- Timing (Fall vs Spring planting)
- Baltimore is an Ecotone
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quercus bicolor</td>
<td>Swamp White Oak</td>
<td>11.6%</td>
</tr>
<tr>
<td>Celtis laevigata</td>
<td>Sugarberry</td>
<td>6.7%</td>
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<tr>
<td>Gleditsia triacanthos</td>
<td>Honey Locust</td>
<td>5.9%</td>
</tr>
<tr>
<td>Quercus phellos</td>
<td>Willow Oak</td>
<td>4.8%</td>
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<tr>
<td>Nyssa sylvatica</td>
<td>Blackgum</td>
<td>4.75%</td>
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<tr>
<td>Cercis canadensis</td>
<td>Eastern Redbud</td>
<td>4.4%</td>
</tr>
<tr>
<td>Platanus occidentals</td>
<td>Sycamore</td>
<td>4.2%</td>
</tr>
<tr>
<td>Acer rubrum</td>
<td>Red Maple</td>
<td>4.2%</td>
</tr>
<tr>
<td>Liquidambar styraciflua</td>
<td>Sweetgum</td>
<td>3.3%</td>
</tr>
<tr>
<td>Quercus lyrata</td>
<td>Overcup Oak</td>
<td>3.21%</td>
</tr>
</tbody>
</table>

**BTT’s Planting Palette**
(since Fall 2021)

- **5,200 total trees**
- **97 total species**
- **51 species (>10 trees planted)**

*(does not include FA21 mitigation project)*
Shifting Pallette

Science + Data
- Species Data is very strong and accessible
- Urban data is typically very broad and the Urban Landscape is very heterogeneous.

Pragmatic Considerations
- Getting from academia -> practice is a challenge
- Logistical and practical constraints

Urgent Need
- Many exciting/ambitious Urban Planting Projects
  - Many unknowns
Takeaways

- Finite Pallet of tree species

- This Pallette is shrinking
  - Loss of foundational species like Elm and Ash (and worringly Oak) severely exacerbates this

- Opportunities to “grow” this pallet are uncommon but necessary