Adapting Urban Forests to a Changing Climate

- Chicago Wilderness
- The Morton Arboretum
- The Field Museum
- NIACS-USFS

Adapting Urban Forests to a Changing Climate

- We developed **Strategies**, **Approaches**, and **Tactics** for adapting urban forests to climate change
  - Modeled on a document focused on NE region forests as a whole
- Urban systems face many specific challenges under climate change that differ from other landscapes
  - Social, Political, Ecological
- Urban Forests defined as: all trees and tree-dominated ecosystems within a metropolitan region
  - Tactics in many cases were split into "Developed Urban Sites" and "Urban Natural Areas"

Strategy 1: Sustain or Rebuild Fundamental Ecological Function

- *A* *rees to sites*
- *A* *restore and rebuild soil in urban areas*
  - anic matter to support
- *A*
  - Permeable paving,
- Approach 1.4: *M* *light*
  - Removing mowed turf – replace with org
- Approach 1.5: *Restore or maintain fi*

Strategy 2: Reduce the impact of biological stressors

- *he ability of forests to resist*

  evels - 5-10-20 rule

  n appropriate and feasible

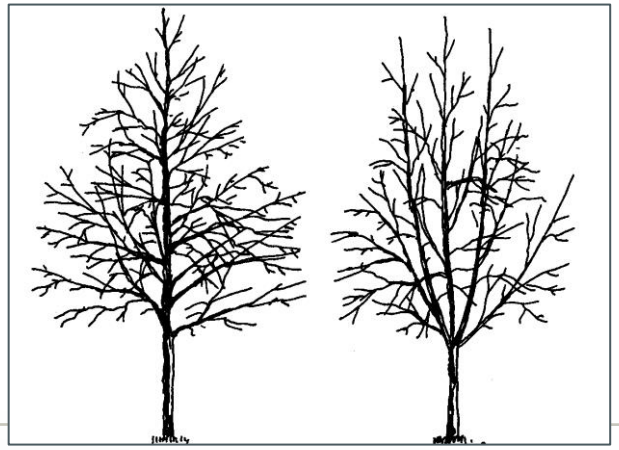
- *ntroductions and est*

  ove existing invasiv

  - Limiting use of kn

Strategy 3: Reduce the susceptibility and severity of damage from disturbances

- Approach 3.1: *Manage forest structure and composition to reduce risk or severity of wildfire.*
- Approach 3.2: *Maintain urban trees to minimize the likelihood of catastrophic tree failure*
  - Maintaining trees on a regular pruning cycle, using ANSI standards and BMPs as guidelines for tree care and maintenance



Strategy 4: Respond quickly to disturbance

- Approach 4.1: *Promptly remove major hazards*
- Approach 4.2: *Assess severity of damage and prioritize remediation*
  - Implementing appropriate tree crown restoration pruning strategies for less severely damaged trees
- Approach 4.3: *Promptly revegetate sites after disturbance*

Strategy 5: Maintain or create refugia

- Approach 5.1: *Identify, prioritize, maintain, restore, and recreate unique habitats*
  - Preservation and restoration of remnant natural areas
- Approach 5.2 & 3: *Prioritize and maintain sensitive or at-risk species or communities* and *Establish artificial reserves*
  - Including at-risk species (or species that provide habitat) in urban park/street/campus plantings whenever possible or feasible

Strategy 6: Maintain and enhance species and structural diversity

- Approach 6.1: *Promote diverse age structure*
  - Managing loss over time so there can be a variable age-structure - proactively planning for replacement as trees are lost
  - Rotatin at remova geogra

- Approac *and enh sity*
  - Promo rban tree
  - Using nd cover s in rooting
- Approac *legacies*
  - Mainta es during ment of urban a

Strategy 7: Increase ecosystem redundancy across the landscape

- Approach 7.1: *Manage habitats over a range of sites, conditions, land-uses, and ownerships*
  - Managing for underrepresented species/communities/ecosystems in urban habitats (esp. parks, campuses) to offset potential losses elsewhere
- Approach 7.2: *Expand or buffer*

Strategy 8: Pr
landscape

- Approach 8.1: *Reduce landsc*
  - Managing areas adjacent to na
    structure – e.g., continuous ca

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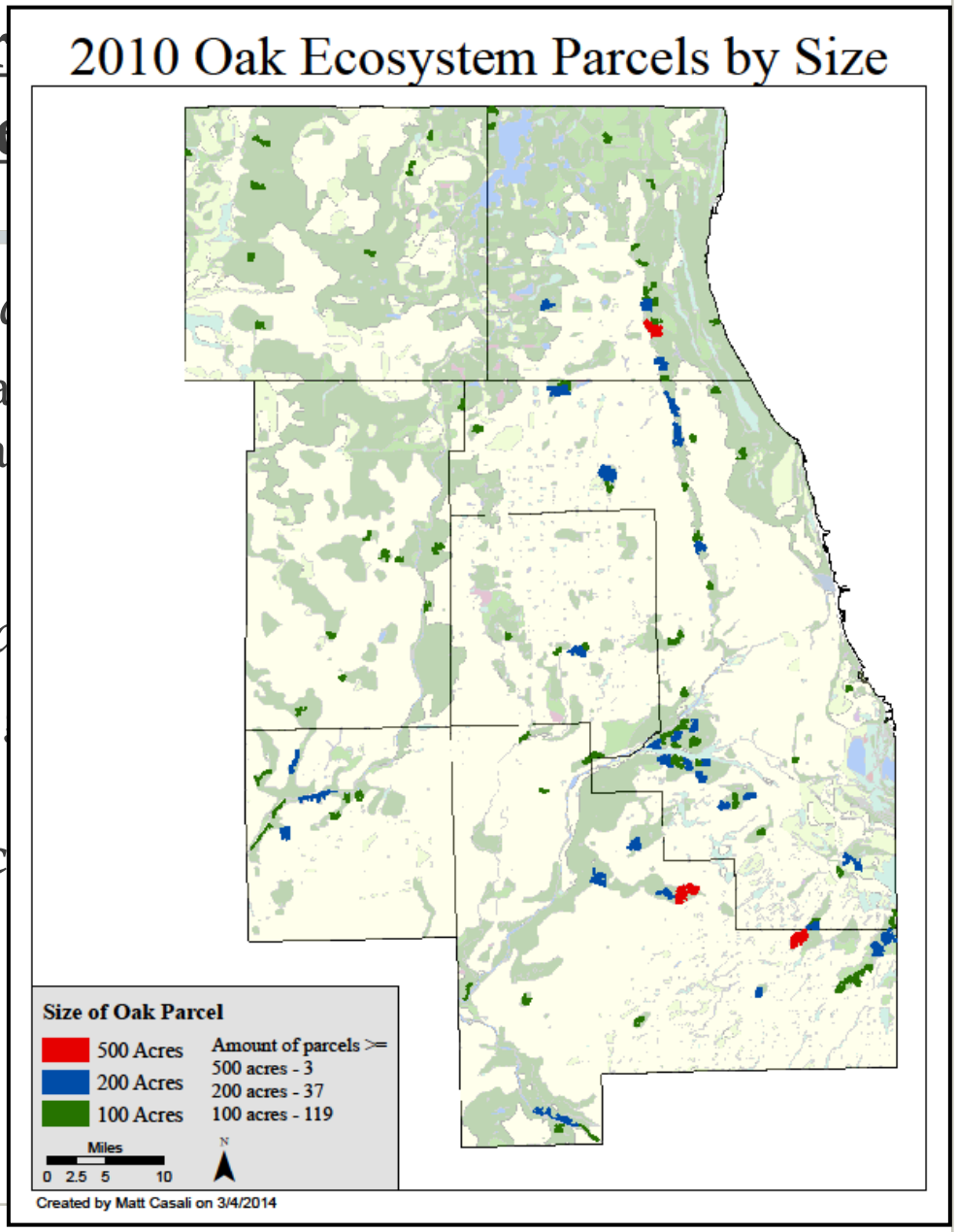
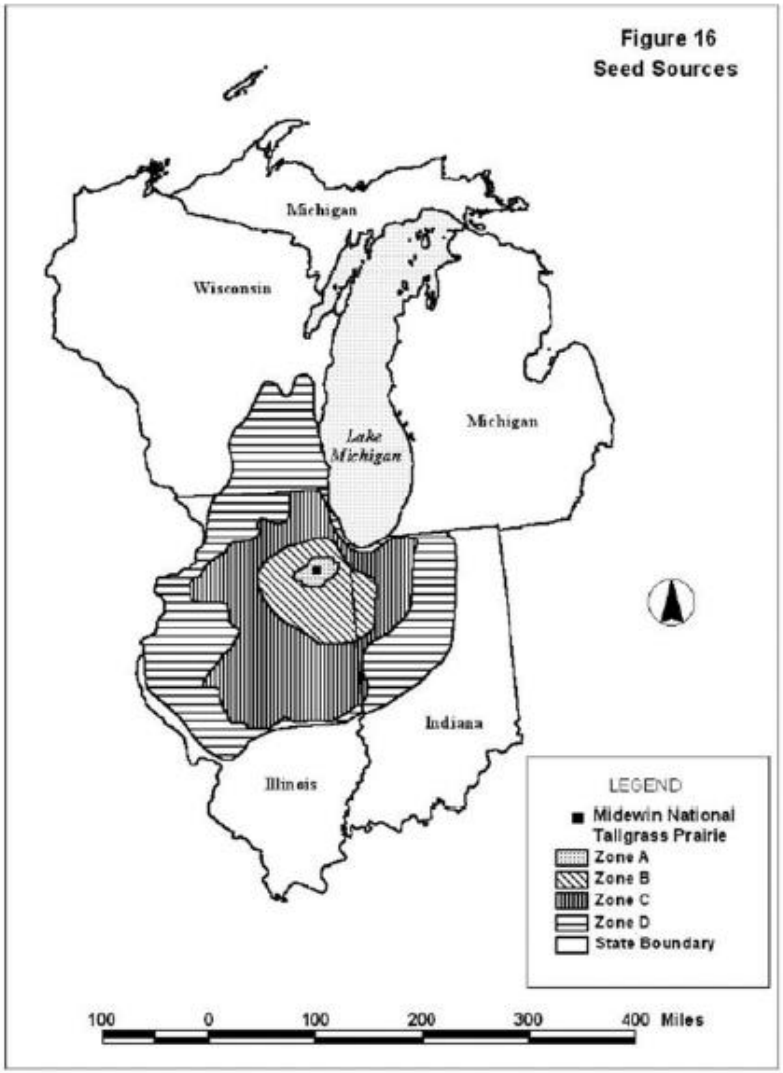


Strategy 9: Enhance genetic diversity

- Approach 9.1: *U* *etic material from across a grea*
  - To increase resili ermining a "future climate" is area

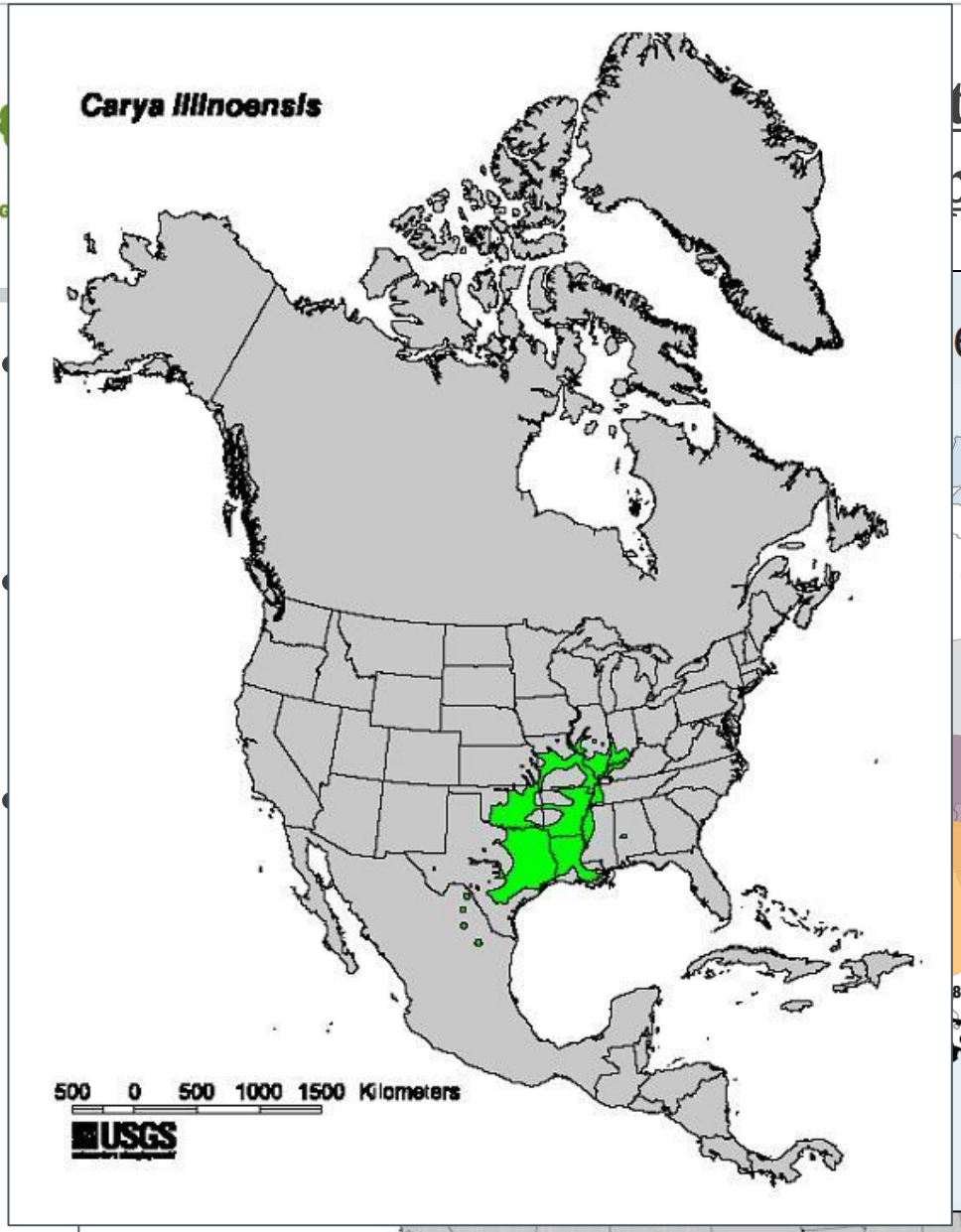


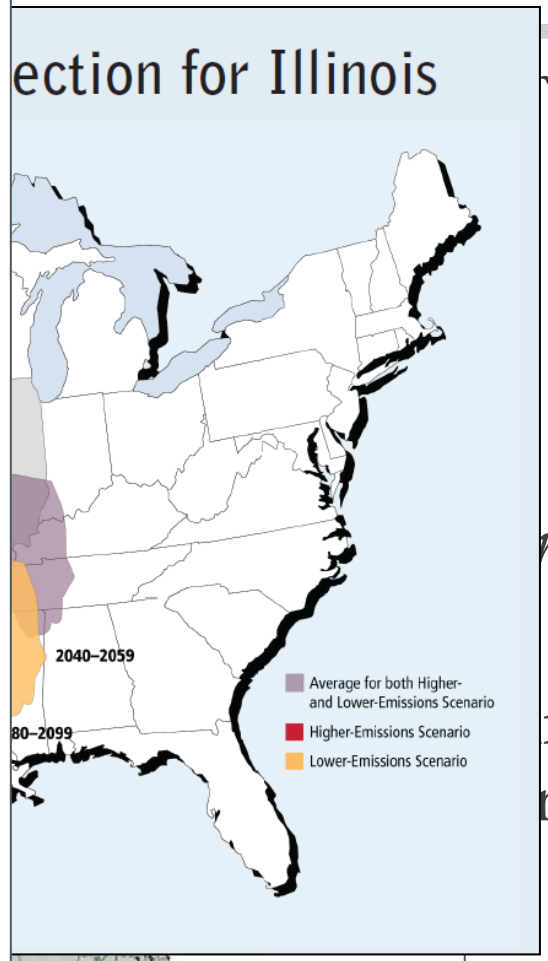
Strategy 9: Enhance genetic diversity

- Approach 9.2: *Favor existing genotypes that are well adapted to new climatic conditions*
- Approach 9.3: *Promote creation of new genotypes that can be better adapted to future threats and conditions*
  - Create new genotypes and cultivars of currently planted species that will be best adapted to climate changes

te composition

pecies transitions





native

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- enotypes with wide moisture
- seedlings and saplings from
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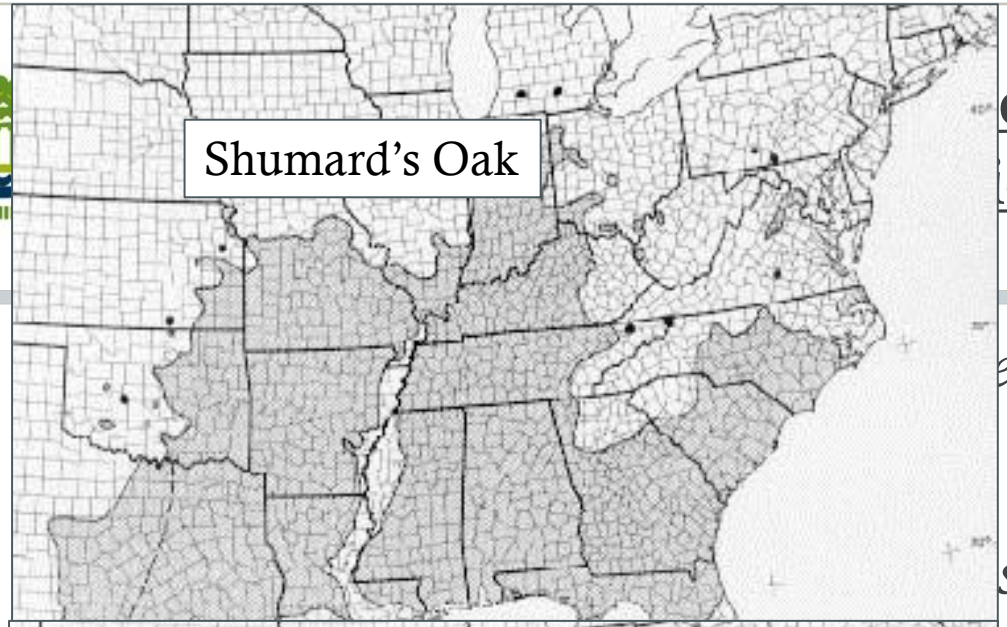

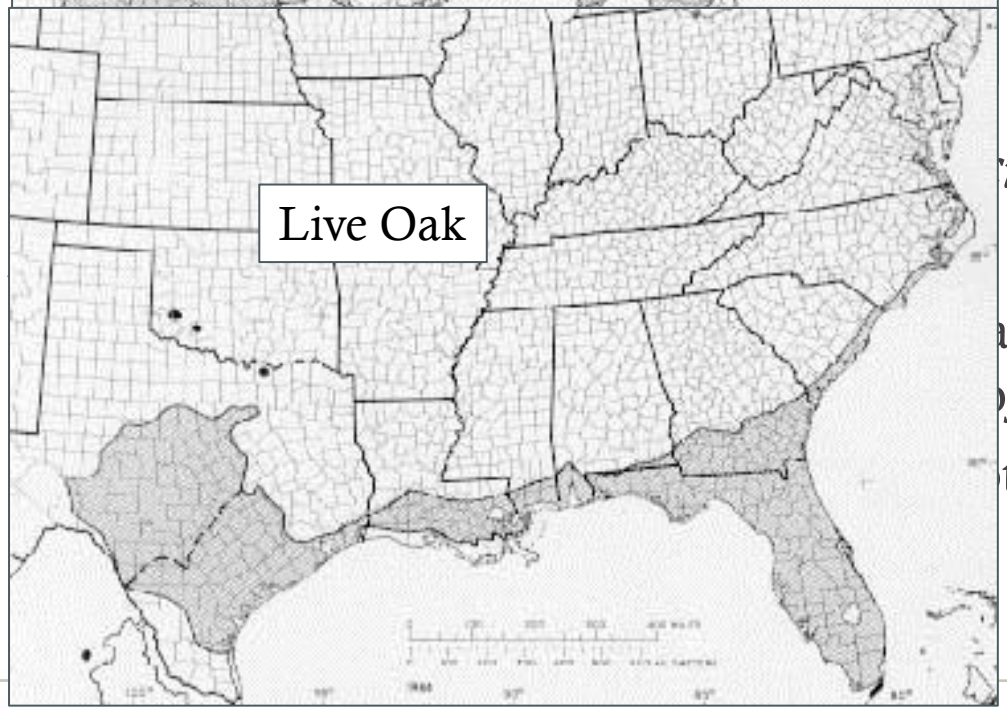

Urban Climate Response

Climate Change Response Framework

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- Central Appalachians
- Central Hardwoods
- Mid-Atlantic
- New England
- Northwoods
- Urban

Partnerships
Vulnerability Assessment
Forest Adaptation Resources
Demonstration Projects

Urban

Urban forests will experience local climate change impacts in the coming decades. To reduce these impacts, urban forest managers will need to adapt their management, but often lack the specialized knowledge and tools to do so.

The overall goal of this effort is to ensure that urban forests will continue to provide benefits to the people that live in urban communities as the climate changes. The Urban Forestry Framework project is in the beginning stages of planning and development. We are seeking urban forestry professionals from variety of organizations, both public and private, to work toward this goal by accomplishing the following objectives:

- Engage with communities across the Northeast, Mid-Atlantic, and Midwest that are interested in adapting their urban forest management to climate change.
- Work with these communities to assess the vulnerability of their urban forests to climate change.