



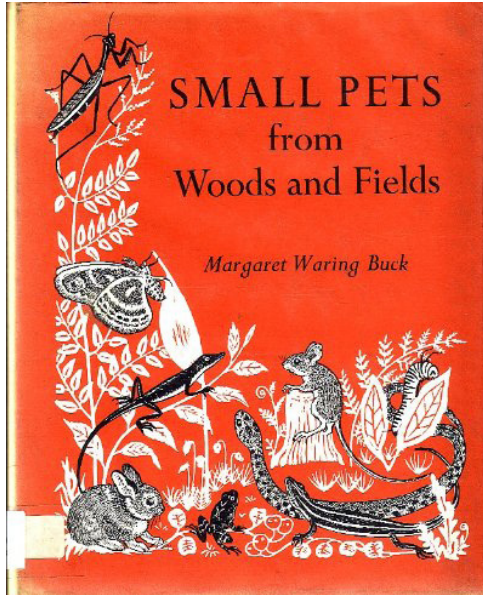
Urban Landscape Inspirations from  
Native Plant Communities

Ethan M. Dropkin, MLA, MPS Horticulture  
Larry Weaner Landscape Associates



# Professional Autobiography

- Gardening since age 12 in the lower Hudson Valley region
- BS Secondary Education at University of Vermont (volunteered and worked at the campus greenhouse)
- New York City Parks gardener 2007-2010
- MLA and MPS Horticulture at Cornell University 2010-2013
- Designer at Michael Van Valkenburgh Associates 2014-2016
- Designer and Associate at Larry Weaner Landscape Associates 2016-Present



## Woody Shrubs for Stormwater Retention Practices

Northeast and Mid-Atlantic Regions  
Second Edition



Ethan M. Dropkin, Nina Bassuk and Trevan Signorelli



Woody Shrubs for Stormwater Retention Practices 1



## Plants in Ideal Conditions



# Plants in the Urban Environment



# Compaction



# Flooding



credit: Katarzyna Bialasiewicz

# Salinated Conditions



High pH





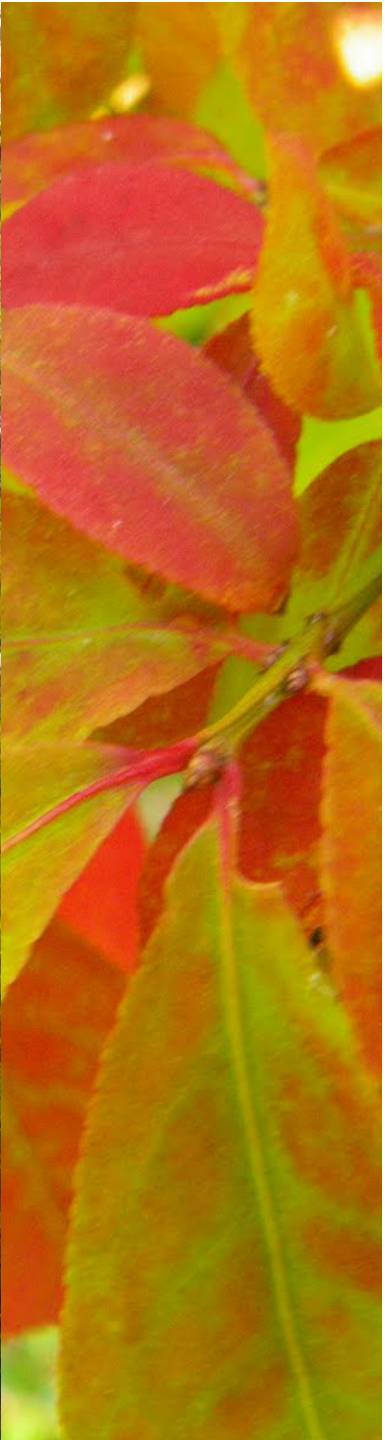
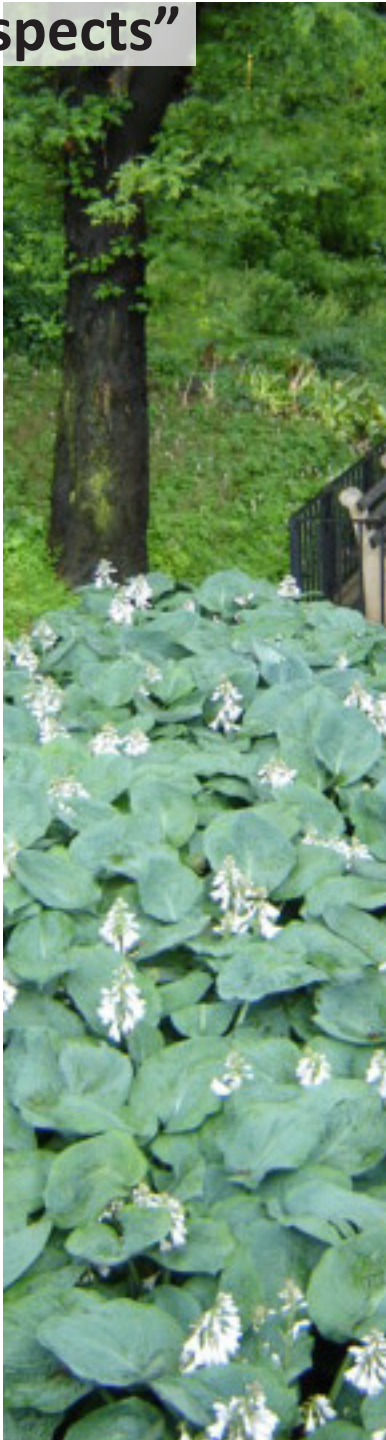
# Dog Urine



# Reflected Heat Load



# "The Usual Suspects"



# Communities as Analogues

- native plant communities share characteristics with urban environments.
- by utilizing plants adapted to urban analogues we can turn problems into opportunities.
- by breaking out of the urban plant palette rut we can create more original, unique designs.
- by using regionally native species we create a landscape that fixes a city geographically.
- native plants provide more nuanced ecological function that supports beneficial biodiversity.



# Analagous Communities

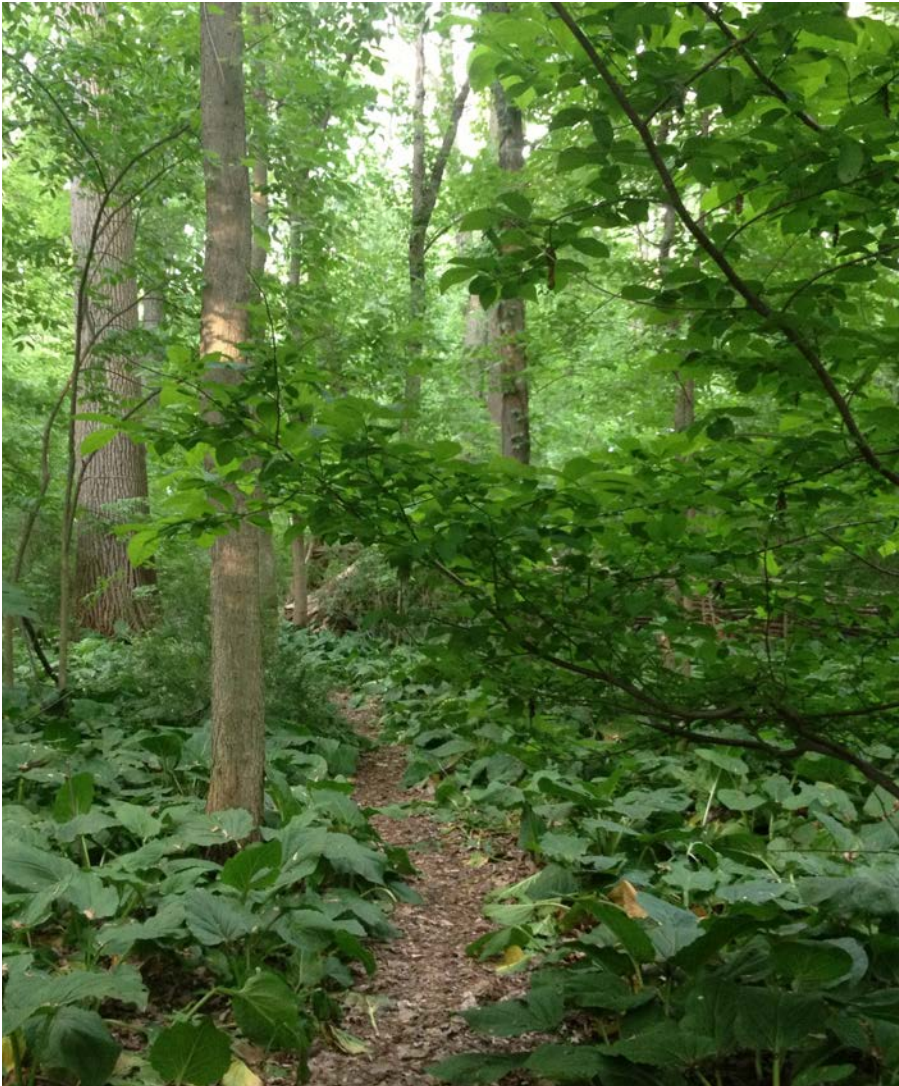
Urban planting conditions and their plant community analogues include:

- Tree Pits  $\approx$  **Floodplain Forests**
- Stormwater Infiltration features (bioswales, etc.)  $\approx$  **Shrub Swamps**
- Urban Parks and Gardens  $\approx$  **Dry Calcereous Woodlands/Shrublands**
- Green Roofs  $\approx$  **Outcrops and Barrens**



# Floodplain Forests

- are adapted to flooded soils and are often adapted to heavy soils = low-oxygen conditions
- adapted to wide flood drought swings
- some trees are adapted to high pH soil conditions



# Soil pH Considerations



*Acer rubrum*

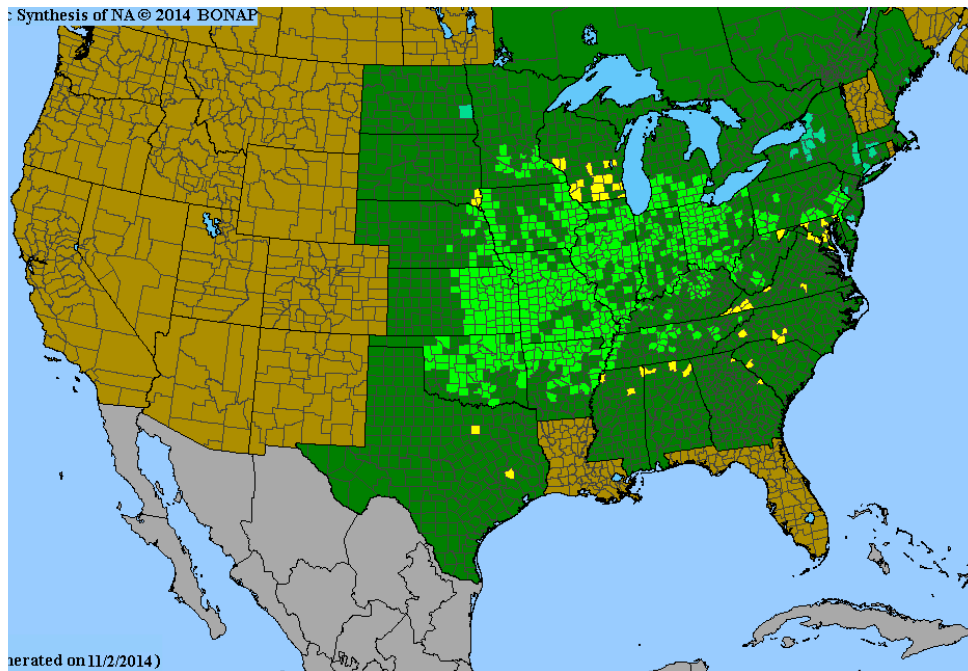


*Quercus palustris*

# Floodplain Street Trees

*Gymnocladus dioicus* - Kentucky Coffee Tree  
Fabaceae (Pea/Bean Family)

- high pH tolerant
- tolerant of flooding and drought
- tropical-looking form
- large seed pods, 'Espresso' is a fruitless male cultivar

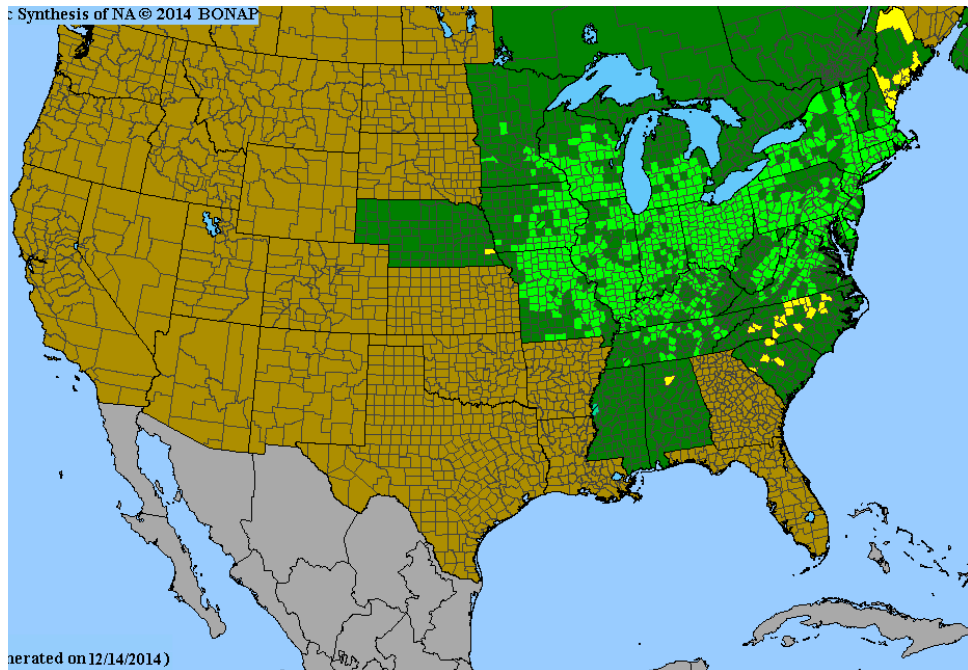




# Floodplain Street Trees

*Quercus bicolor* - Swamp White Oak  
Fagaceae (Beech Family)

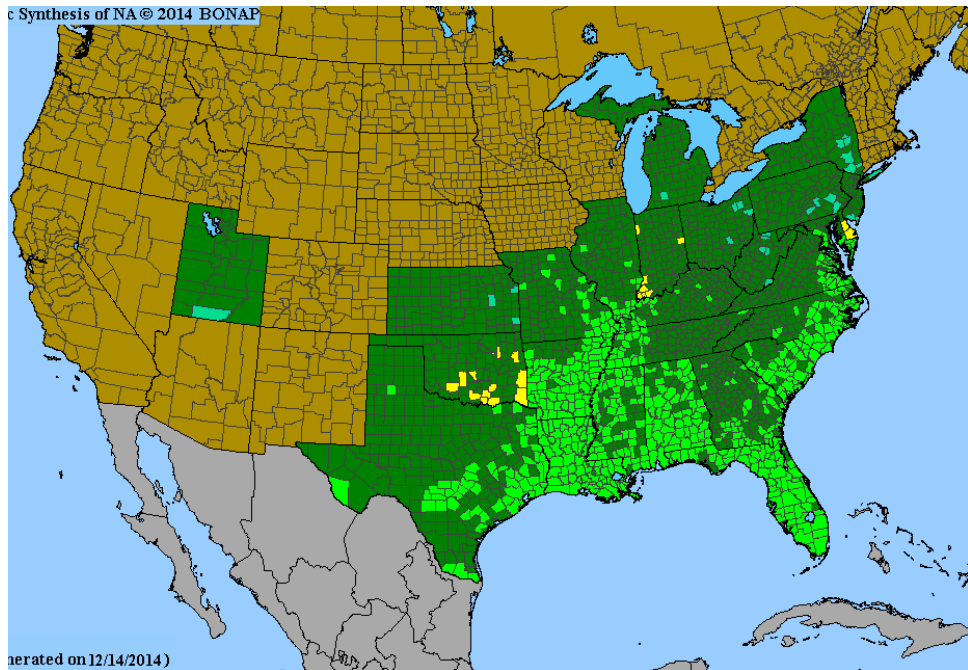
- tolerant of flooding and drought
- one of the easiest to transplant oaks
- high ecological value
- relatively high pH tolerant



# Floodplain Street Trees

*Taxodium distichum* - Bald Cypress  
Cupressaceae (Cypress Family)

- extremely flood tolerant
- surprisingly drought and cold tolerant
- early leaf break and unique copper fall color
- tolerant of heavy and compacted soils



# Shrub Swamp

- adapted to low oxygen soils
- flood tolerant, and (often surprisingly) drought tolerant
- shrubs have lower long-term maintenance needs than do herbaceous dominated plantings
- many options that are high pH tolerant, some with salt-tolerance



# A (plug) Resource

- Free and available on-line
- originally published in 2013 with Dr. Nina Bassuk as co-author through Cornell's Urban Horticulture Institute
- meant to serve as a catch-all resource for laypeople and professionals alike
- covers the why and wherefore of stormwater and planted retention practices
- contains an extensive and detailed list of shrubs for use in planted stormwater retention and detention practices
- now in its second edition with the help of Trevan Signorelli

## Woody Shrubs for Stormwater Retention Practices

Northeast and Mid-Atlantic Regions  
Second Edition



Cornell University  
School of Integrative Plant Science,  
Horticulture Section

Ethan M. Dropkin, Nina Bassuk and Trevan Signorelli



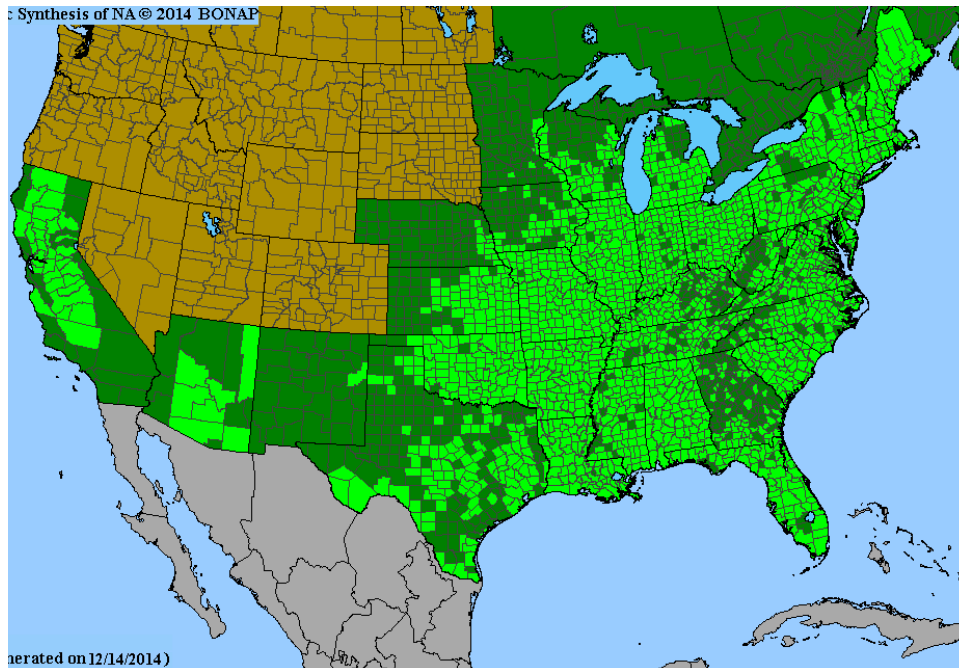
# Stormwater Retention Shrubs

*Cephalanthus occidentalis* - Buttonbush  
Rubiaceae (Madder Family)

- extremely flood tolerant
- marked tolerance to mesic soils
- unique orange fall color
- tolerant of heavy and compacted soils
- straight species can get 12' tall and wide, semi-dwarf cultivars ('Sugar Shack', 'Fiber Optic' may be best for tight spaces.



credit: Plants Nouveau, LLC.

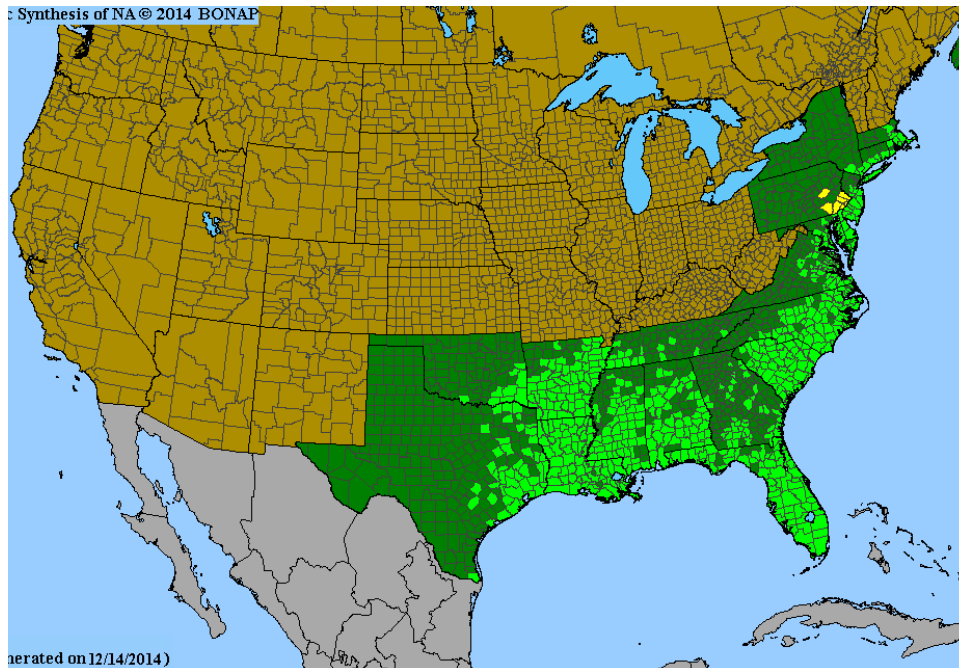


# Stormwater Retention Shrubs

*Baccharis halimifolia* - Groundsel tree

Asteraceae (Sunflower Family)

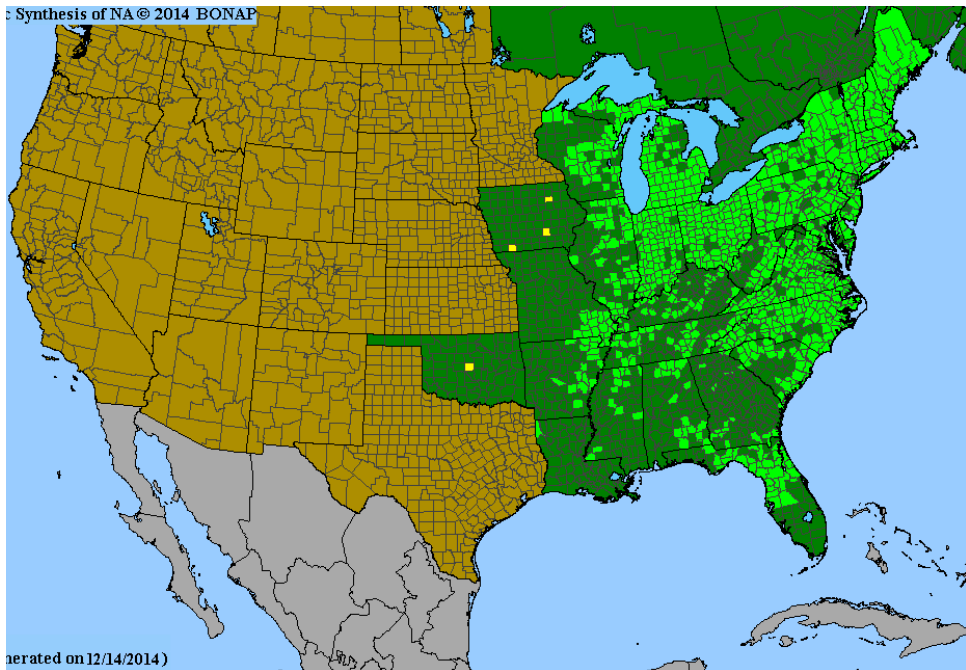
- extremely salt tolerant
- takes pruning well
- silvery pappus provides excellent fall interest
- dioecious



# Stormwater Retention Shrubs

*Rosa palustris* - Swamp Rose  
Rosaceae (Rose Family)

- showy flowers
- flood and drought tolerant
- persistent fruits
- pH flexible



# Dry Calcareous Woodland/Shrubland

- droughty high pH soils
- plants are adapted to variable shade regimes
- many plants for these communities tolerate a broad range of growing conditions making them eminently adaptable and useful

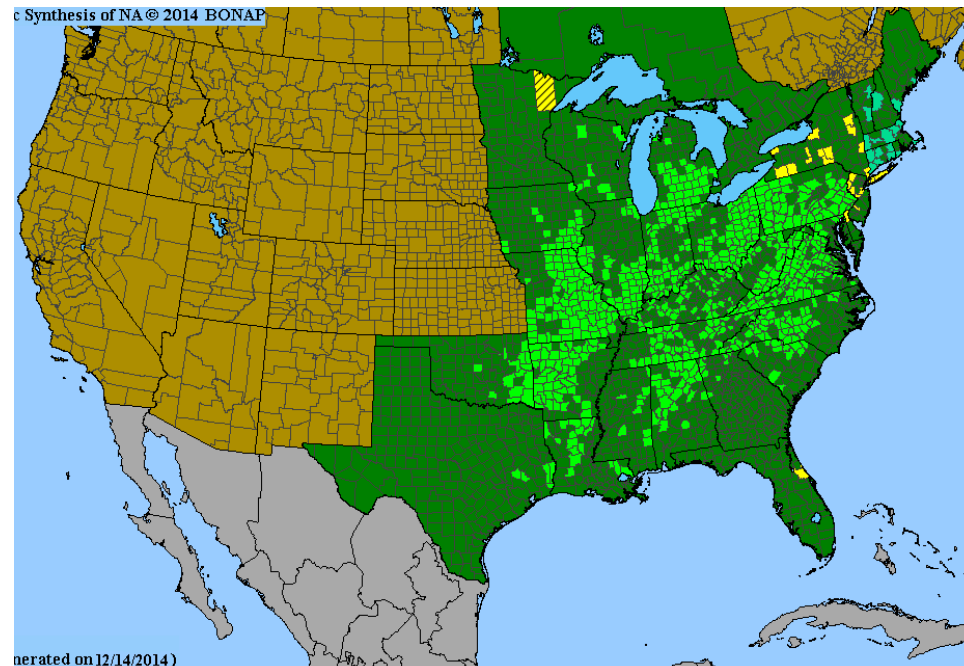




# Drought and High pH Tolerant Plants

*Hypericum spp.* - Shrubby St. Johnswort spp.  
Hypericaceae (St. Johnswort Family)

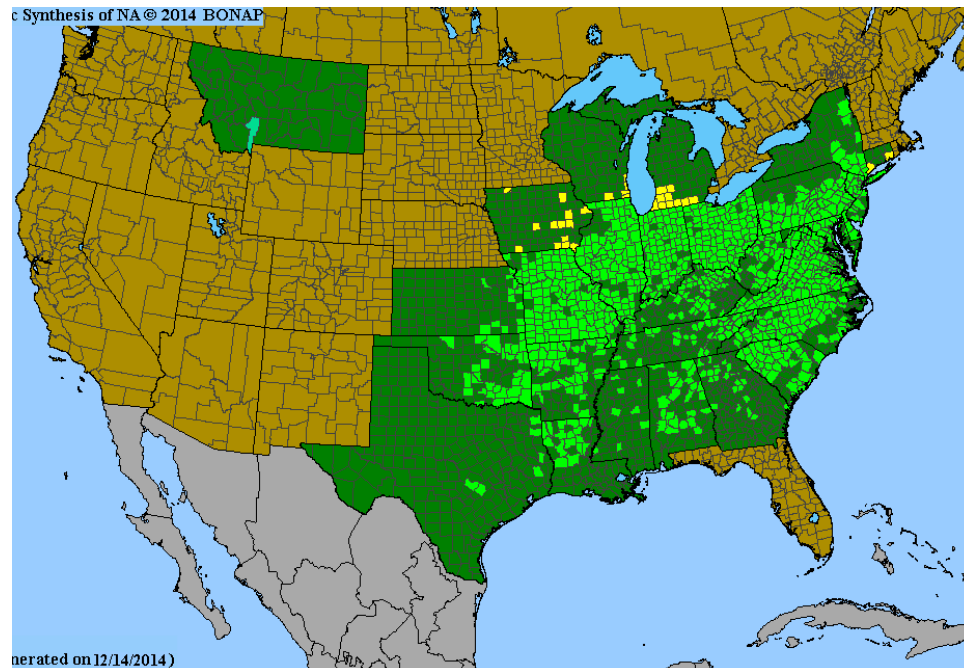
- *H. prolificum*, *H. kalmianum*, *H. frondosum*
- tolerates sun and shade equally
- highly drought adapted once established
- deer-resistant
- spectacular blooms and fall color



# Drought and High pH Tolerant Plants

*Viburnum prunifolium* - Blackhaw  
Adoxaceae (Moschatel Family)

- viburnum leaf beetle resistant
- sun and shade tolerant
- drought and high pH tolerant
- showy flowers, fruits and fall color



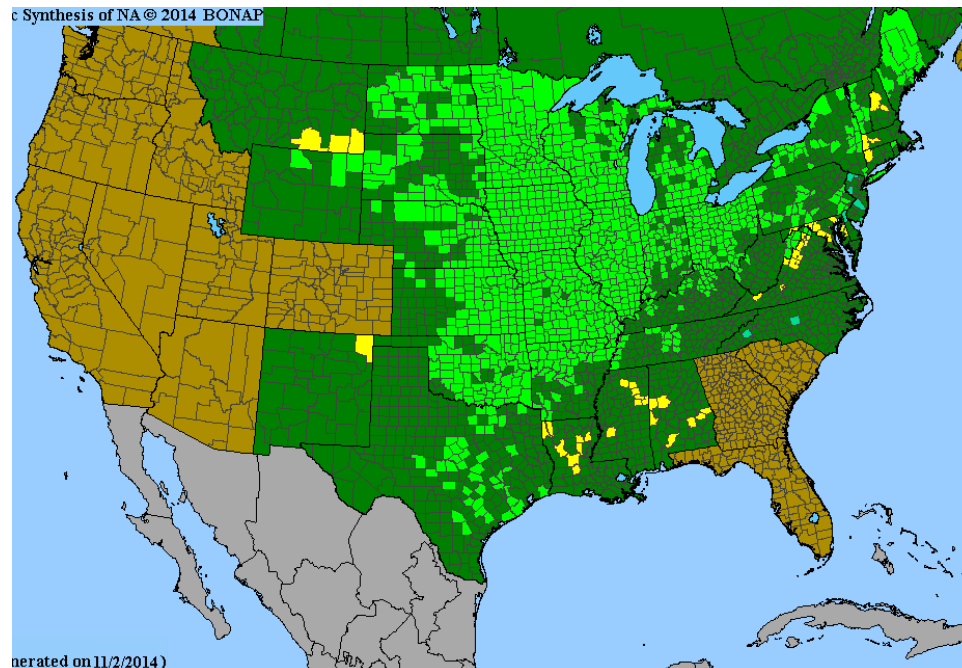
# Drought and High pH Tolerant Plants

*Quercus macrocarpa/muehlenbergii* -

Bur/Chinkapin Oak

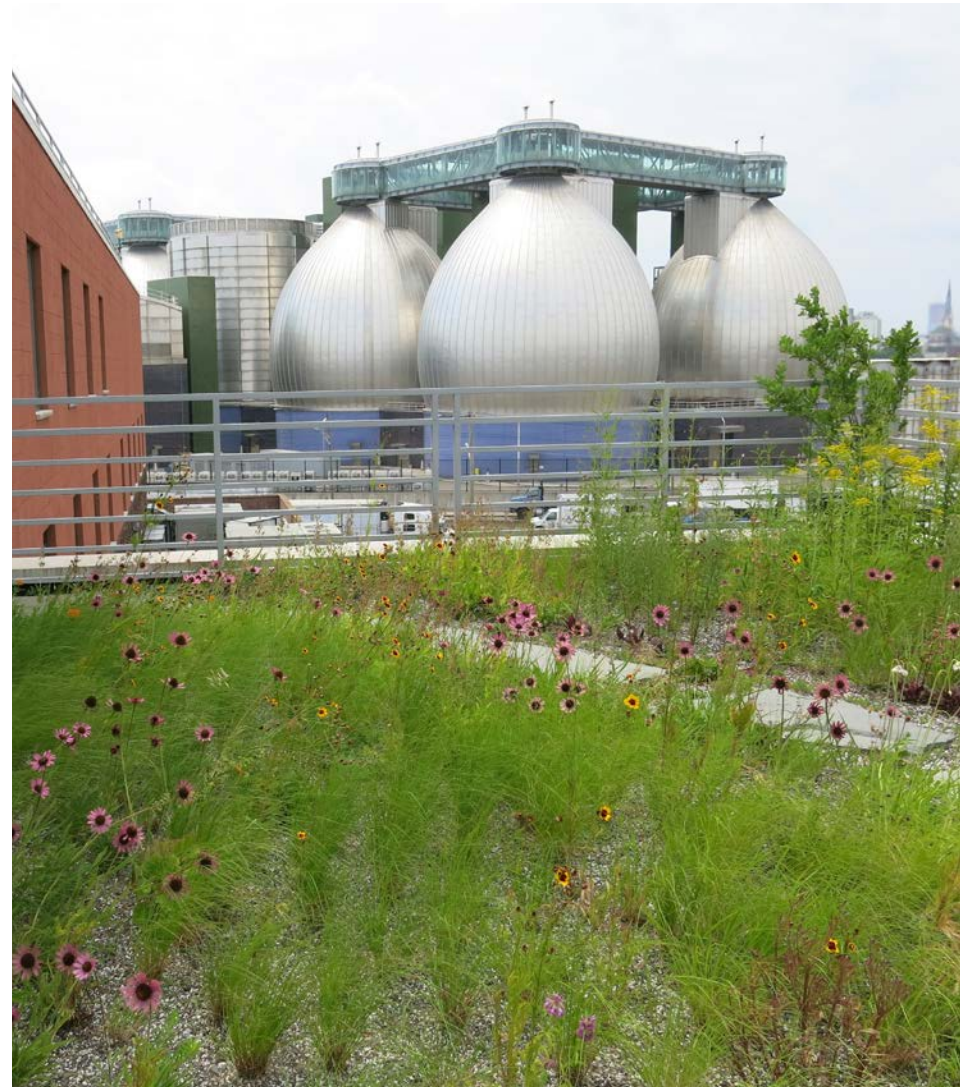
Fagaceae (Beech Family)

- the most high pH tolerant native oaks
- highly drought adapted once established
- spectacular large shade trees
- high ecological value



# Outcrops and Barrens

- plants can be high pH adapted
- plants are drought tolerant and adapted to wide swings of soil moisture
- plants tolerate thin soil profiles
- communities contain high numbers of rarities and endemics



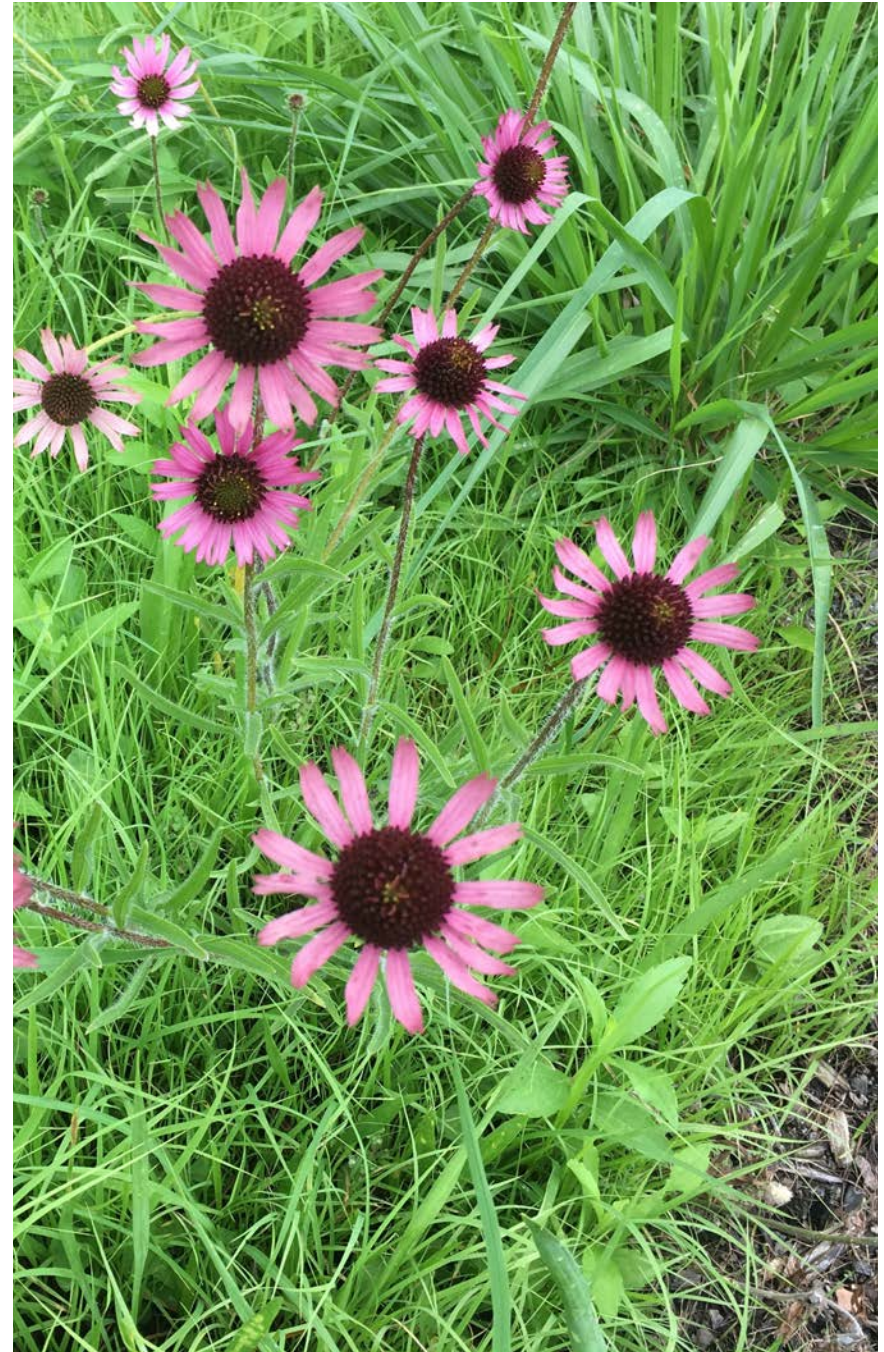
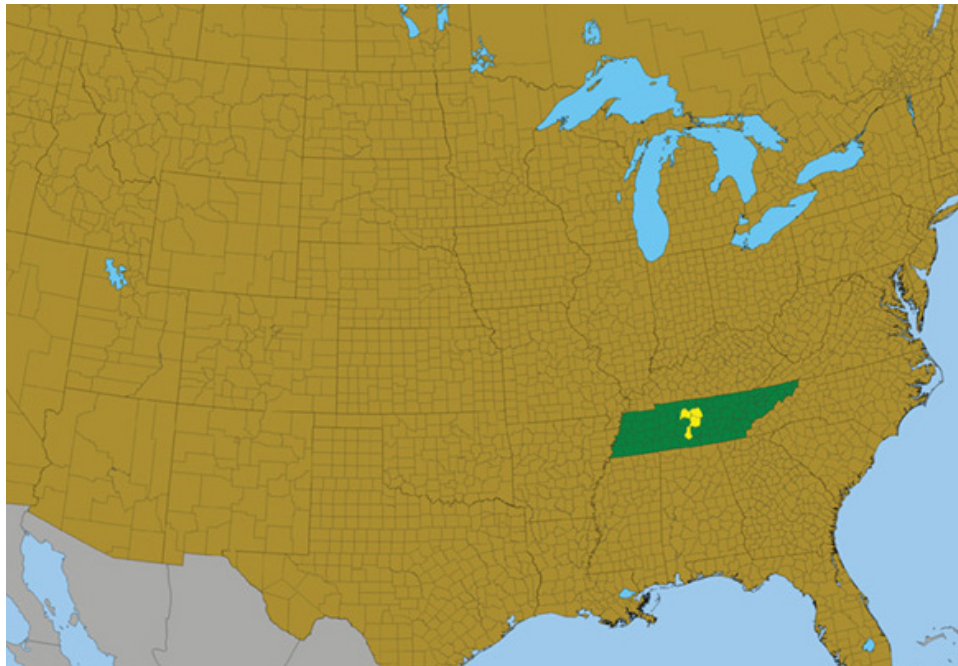
# Green Roof Plants

*Echinacea tennesseensis* -

Tennessee Coneflower

Asteraceae (Sunflower Family)

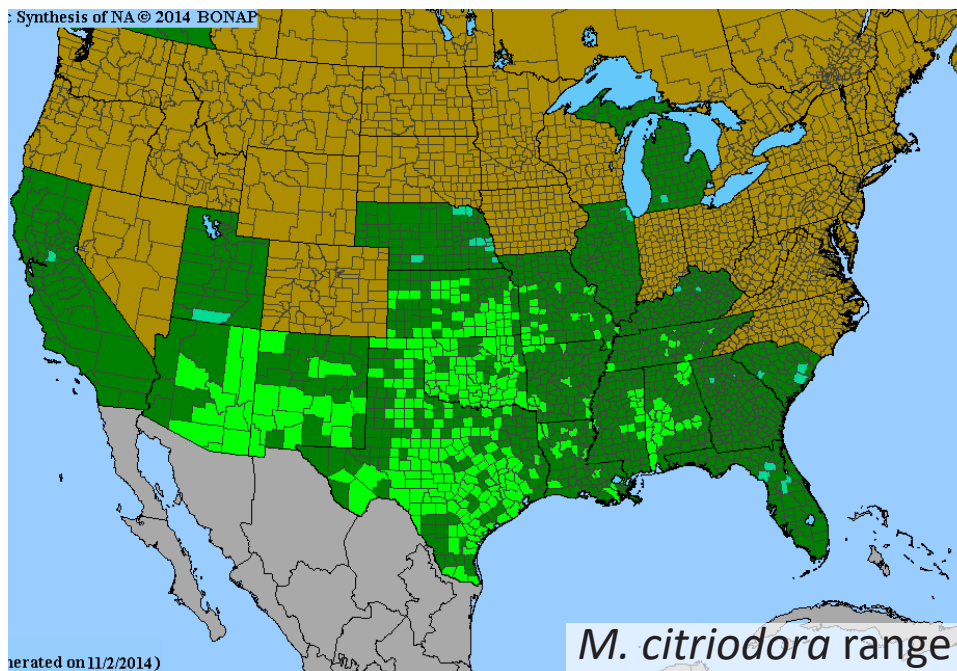
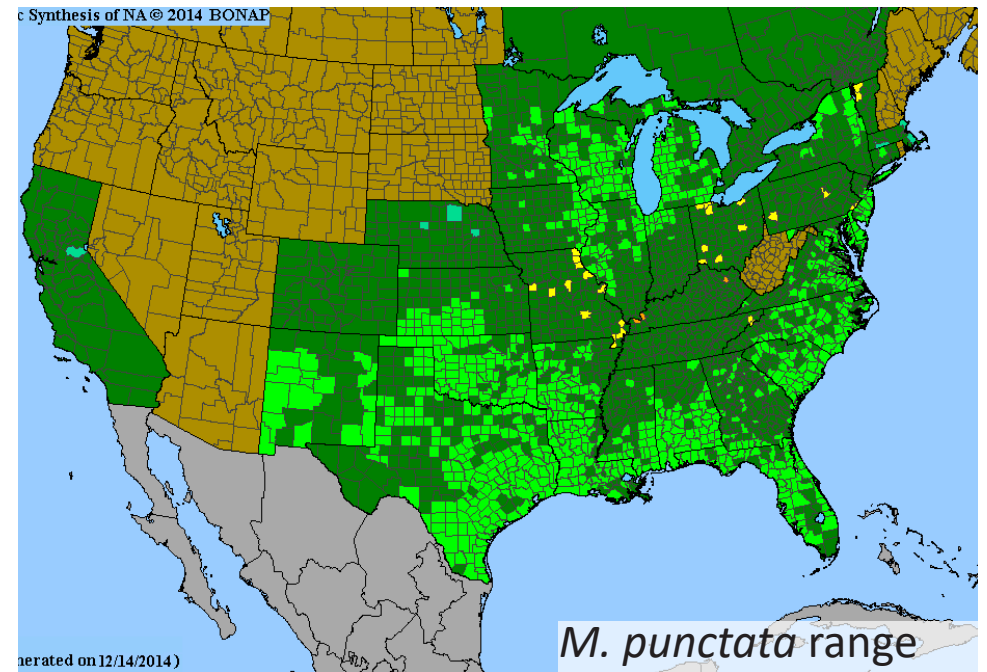
- central Tennessee endemic
- calcareous pavement barren plant
- short stature 1'>
- highly adaptable outside of native range if grown in proper conditions



# Green Roof Plants

*Monarda citriodora/punctata* -  
Lemon Beebalm/Dotted Horsemint  
Lamiaceae (Mint Family)

- annual/biennial
- prefer dry, full sun and high pH soils but tolerate a variety of conditions
- bear citrus/mint-scented foliage
- bracts (colorful modified leaves) are the big show
- excellent powdery mildew resistance



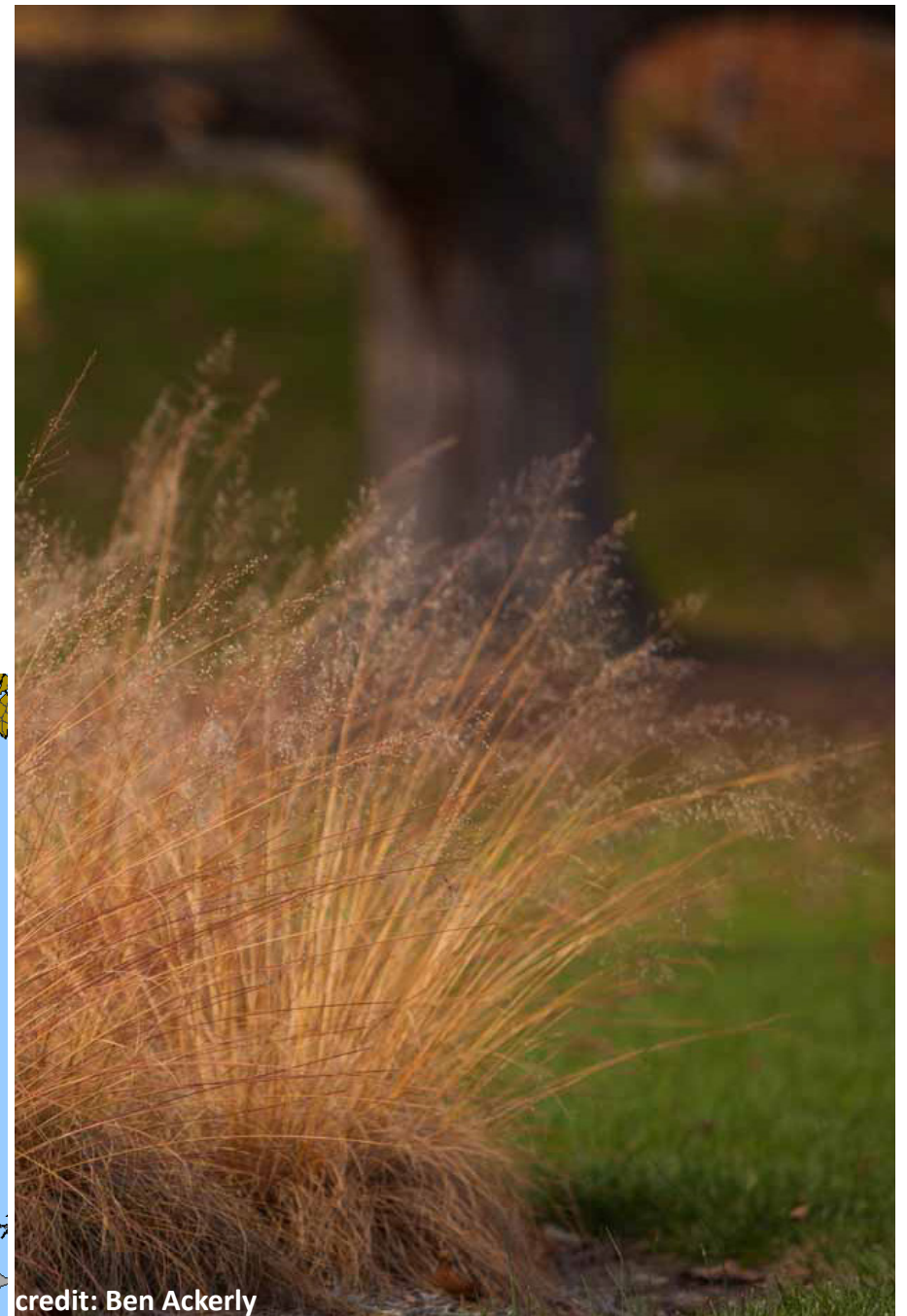
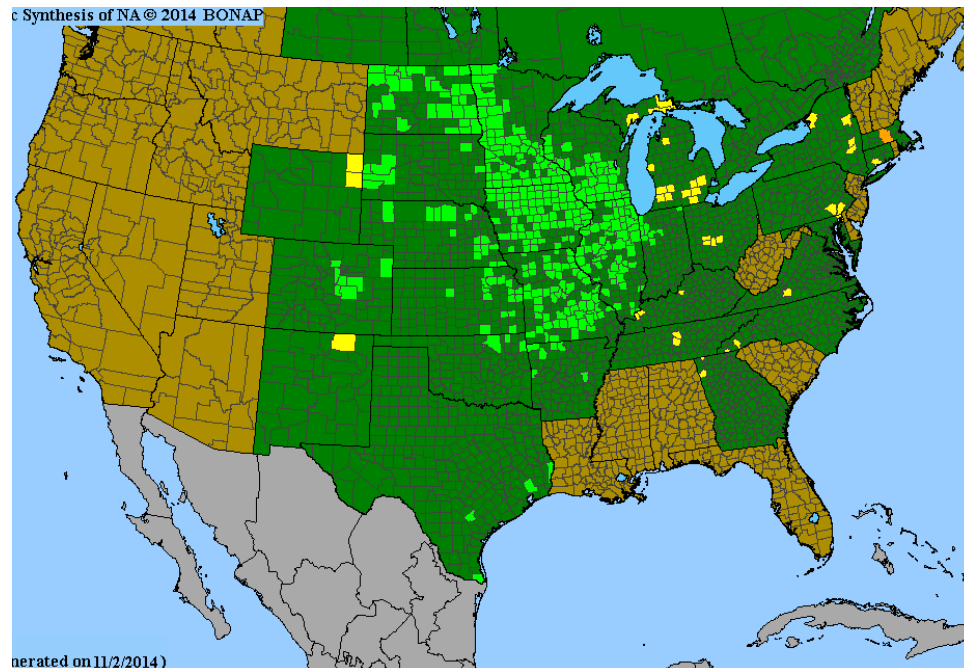
# Green Roof Plants

*Sporobolus heterolepis*-

Prairie Dropseed

Poaceae (Grass Family)

- rarity in the east
- fine foliage texture
- fragrant seedheads in autumn
- green roof workhorse



## Presentation Take-Aways

- Urban planting conditions are limiting but we don't need to turn to exotics to make functional landscapes.
- By using native analogue communities we can create urban tolerant native landscapes and we can leverage urban problems into ideal growing conditions.
- Using regionally native plants helps us ground our cities in a regional vocabulary.
- Native plants help plug our cities into the greater ecological systems they exist within.

