

Durham's Community Forest Benefits, Threats and Opportunities



Community Forestry?



Managing trees and forest resources in and around communities; for environmental, social, economic, and aesthetic benefits that trees provide society





Benefits

Ecosystem Services



- Aesthetics
- Air quality improvement
- Water quality improvement
- Cooler air temperature
- Building energy conservation
- Greenhouse gas reduction
- Noise reduction
- Wildlife habitat
- Social / physiological benefits
- Human health

Trees Reduce Storm Water Runoff

Three main ways:

- Rainfall interception
- Evapotranspiration
- Infiltration

The overall effect:

- Delay peak runoff during storms
- Increase infiltration and groundwater recharge
- Remove pollutants
- Decrease volume of stormwater that needs to be treated
- Cleaner Water

100 mature trees catch about 539,000 gallons of rainwater per year...

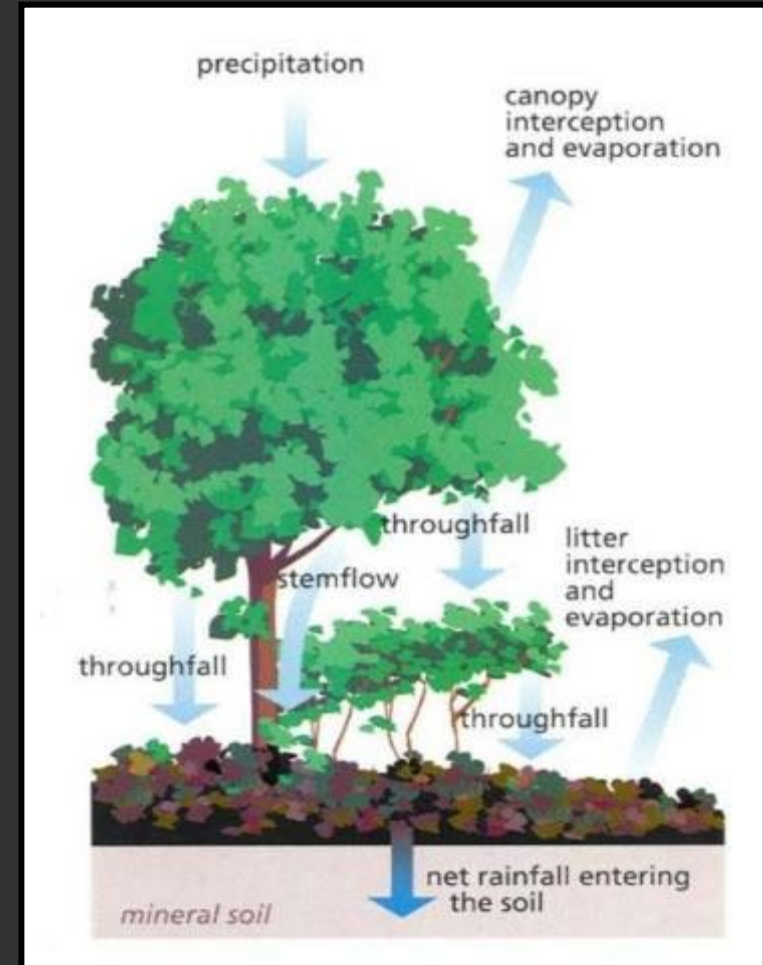


Figure 1. Schematic of a Tree's Hydrologic Cycle
(Source: FISRWG, 1998)

Trees Save Energy for Home Owners

Impacts Climate Change



Save 56% of annual air conditioning costs
Save up to 25% of winter heating costs

Trees Sell Houses (At higher prices)



**Each large front yard tree adds about 1% to sale price
(Up to 10% for total property value)**

Trees Mean Better Business



In tree-lined commercial districts...

- **More frequent shopping**
- **Longer shopping trips**
- **Shoppers spend more for parking**
- **Shoppers spend 12% more for goods**

Trees in Neighborhoods are Vital to Community Health.



- Tree-filled neighborhoods:
 - Lower levels of domestic violence
 - Are safer and more sociable
- Tree-filled landscapes reduce stress
- Trees decrease need for meds & speed recovery times

i-Tree

Calculates Value of Environmental Services

i-Tree Design v6.0
 Tools for Assessing and Managing Community Trees and Forests
 Get the Tools. [Download icon]
 Google Custom Search [Search]
 Username Password Login Register
 Forget Username or Password?

Home About Applications Utilities Resources Support News

i-Tree Design v6.0 8 Newmarket Rd, Durham, NH 03824, USA
 Start Over Save Progress About

Get started with these easy steps:

- 1. Draw Structures**
 Would you like to calculate the impact of trees on your cooling and heating utility bill?
 Yes No
To draw a structure:
 - Outline heated or air-conditioned areas only.
 - Drag this icon [Structure icon] to the first corner of the structure to start drawing. Then click on the next corner and continue in this way to outline your structure. Double-click on the final corner to complete your drawing.
 - Repeat to draw additional structures.
- 2. Place Trees**
- 3. Estimate Benefits**

i-Tree Design v6.0
 Tree Benefit Report - 08/11/2016
 8 Newmarket Rd, Durham, NH 03824, USA
 Trees Evaluated: 1

Total Projected Benefits (2016-2041) - Over the next 25 years, based on forecasted tree growth, i-Tree Design projects total benefits worth \$777:

- \$229 of stormwater runoff savings by intercepting 28,644 gallons of rainfall
- \$26 of air quality improvement savings by absorbing and intercepting pollutants such as ozone, sulfur dioxide, nitrogen dioxide, and particulate matter; reducing energy production needs; and lowering air temperature
- \$9 of savings by reducing 930 lbs. of atmospheric carbon dioxide through CO₂ sequestration and decreased energy production needs and emissions
- \$754 of summer energy savings by direct shading and air cooling effect through evapotranspiration
- \$-242 of winter energy savings by slowing down winds and reducing home heat loss

Figure 1. Tree benefit forecast for 25 years

Current Year - For 2016, i-Tree Design estimates annual tree benefits of \$31.08:

- \$9.17 of stormwater runoff savings by intercepting 1,146 gallons of rainfall
- \$1.10 of air quality improvement savings
- \$0.36 of carbon dioxide reduction savings
- \$30.14 of summer energy savings
- \$9.69 of winter energy savings

itreetools.org

Threats to the Urban Forest

- Invasive Insects & Plants
- Natural Disasters
- Poor Tree Care
 - Improper Planting & Species
 - Poor Pruning & Maintenance
- Human Activities
 - Pollution
 - Wounding/Vandalism
 - Soil Compaction
- Land Use Change
 - Construction Damage

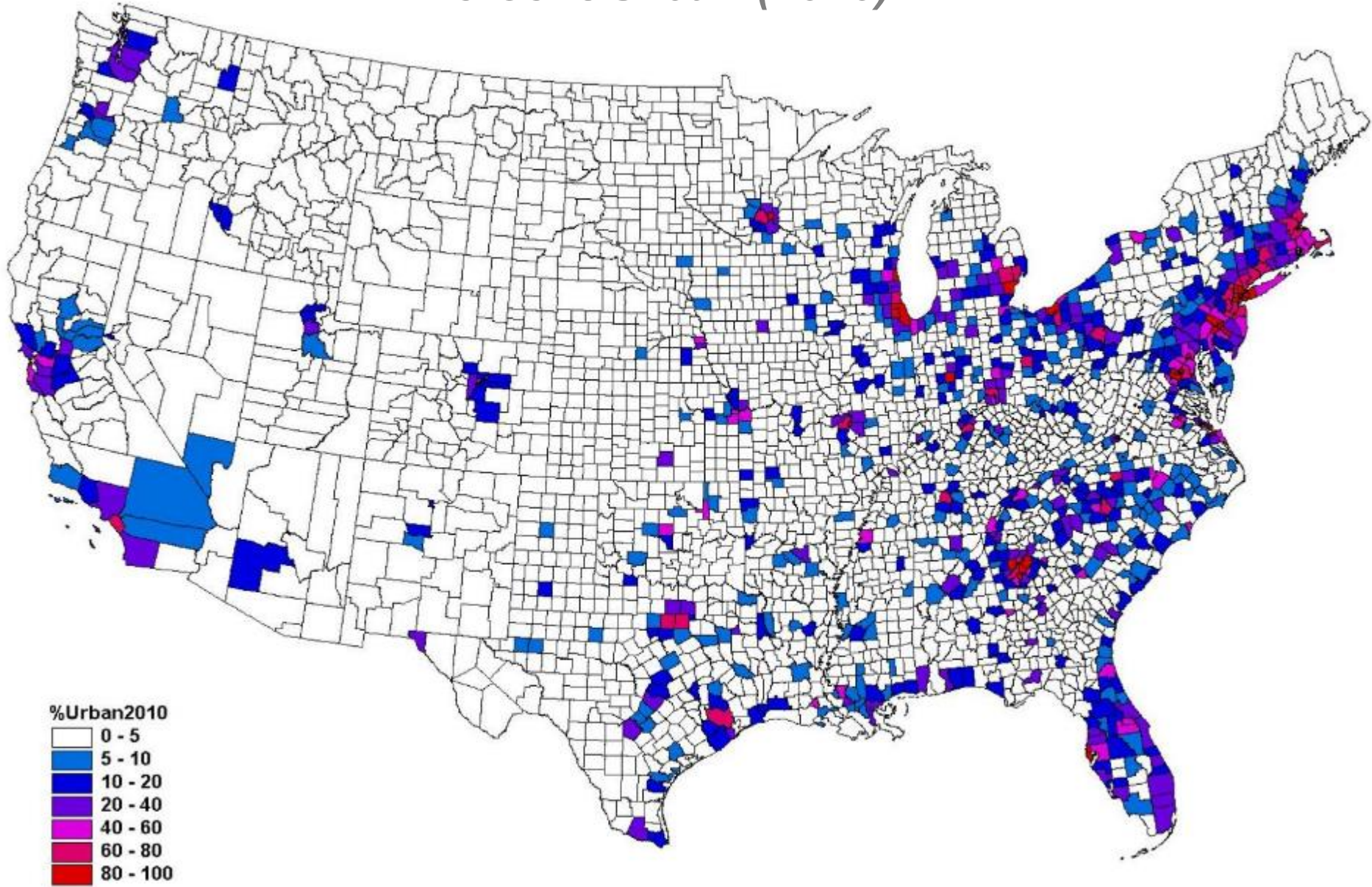




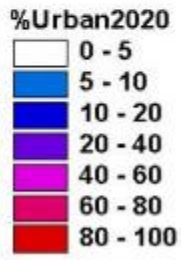
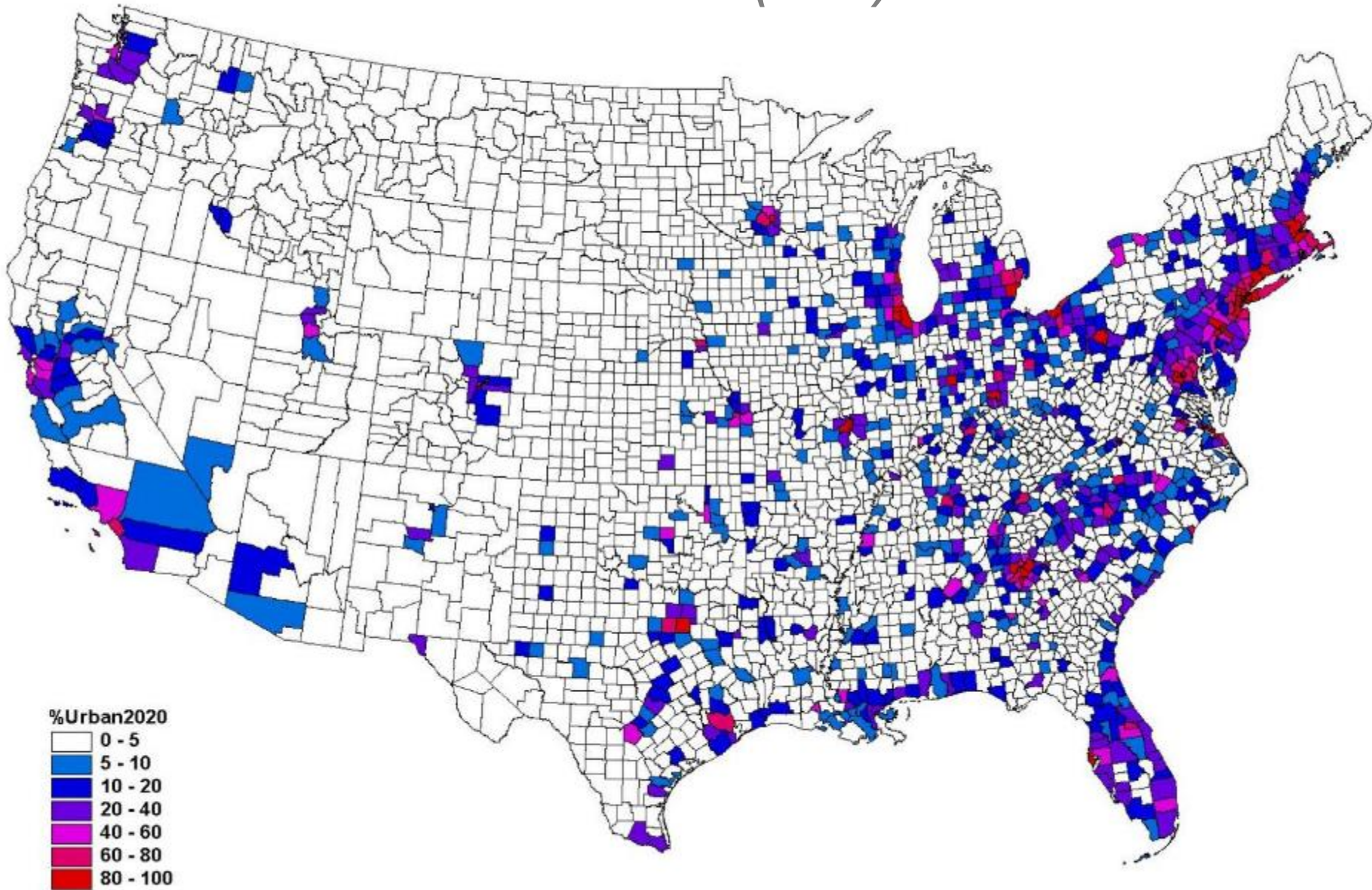
Invasive Species



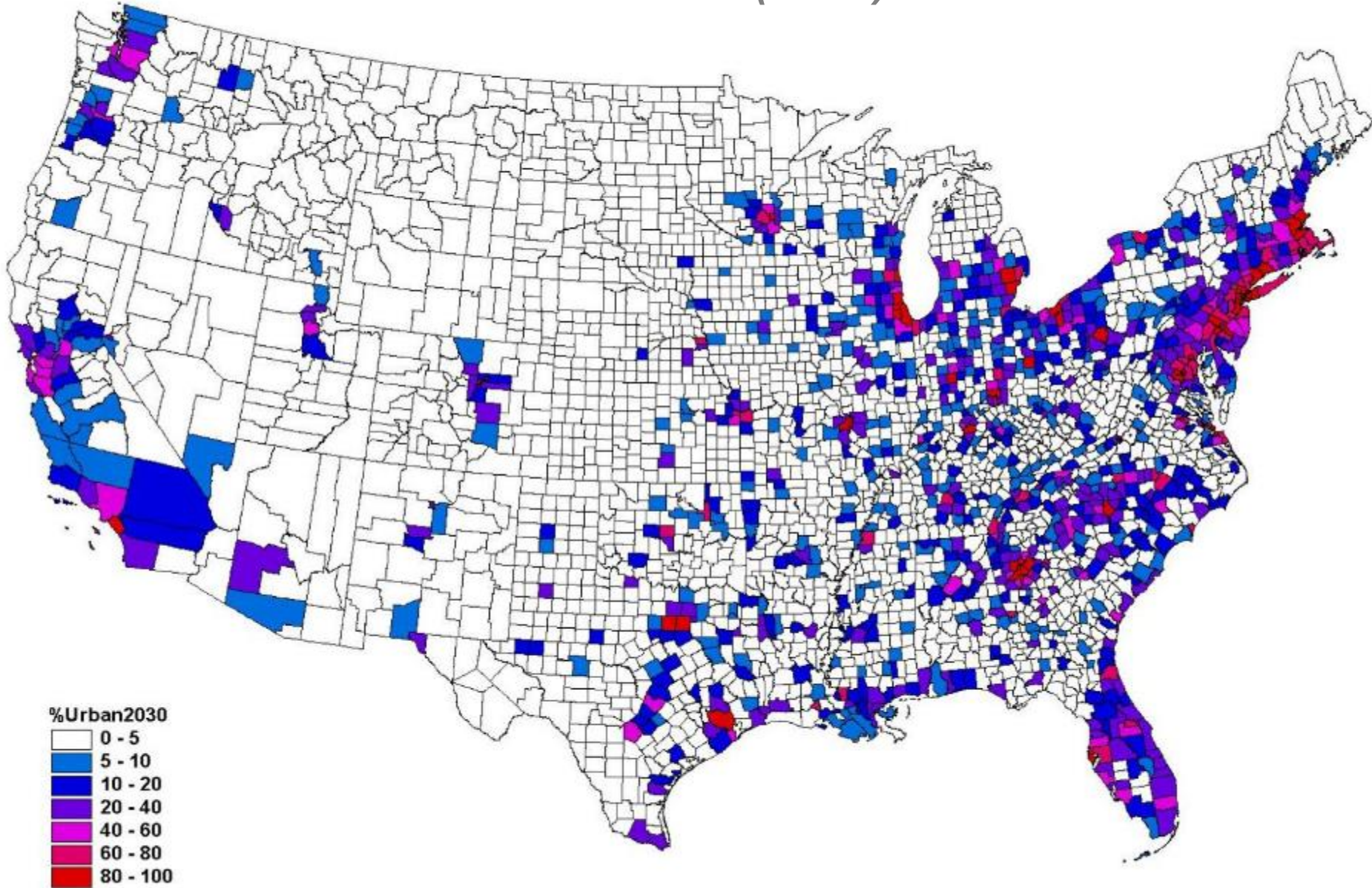
Percent Urban (2010)



Percent Urban (2020)

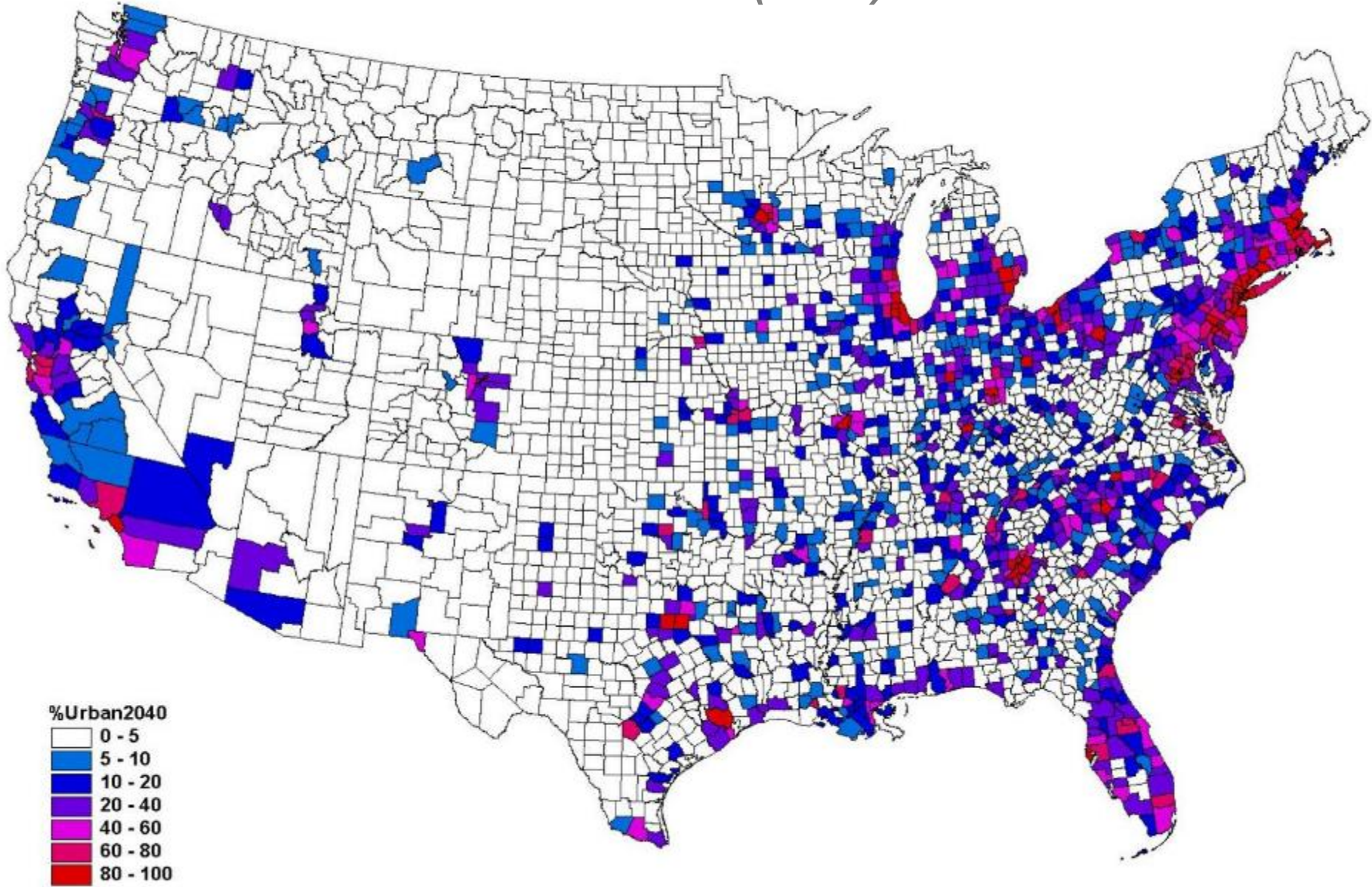


Percent Urban (2030)



%Urban2030
0 - 5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 - 100

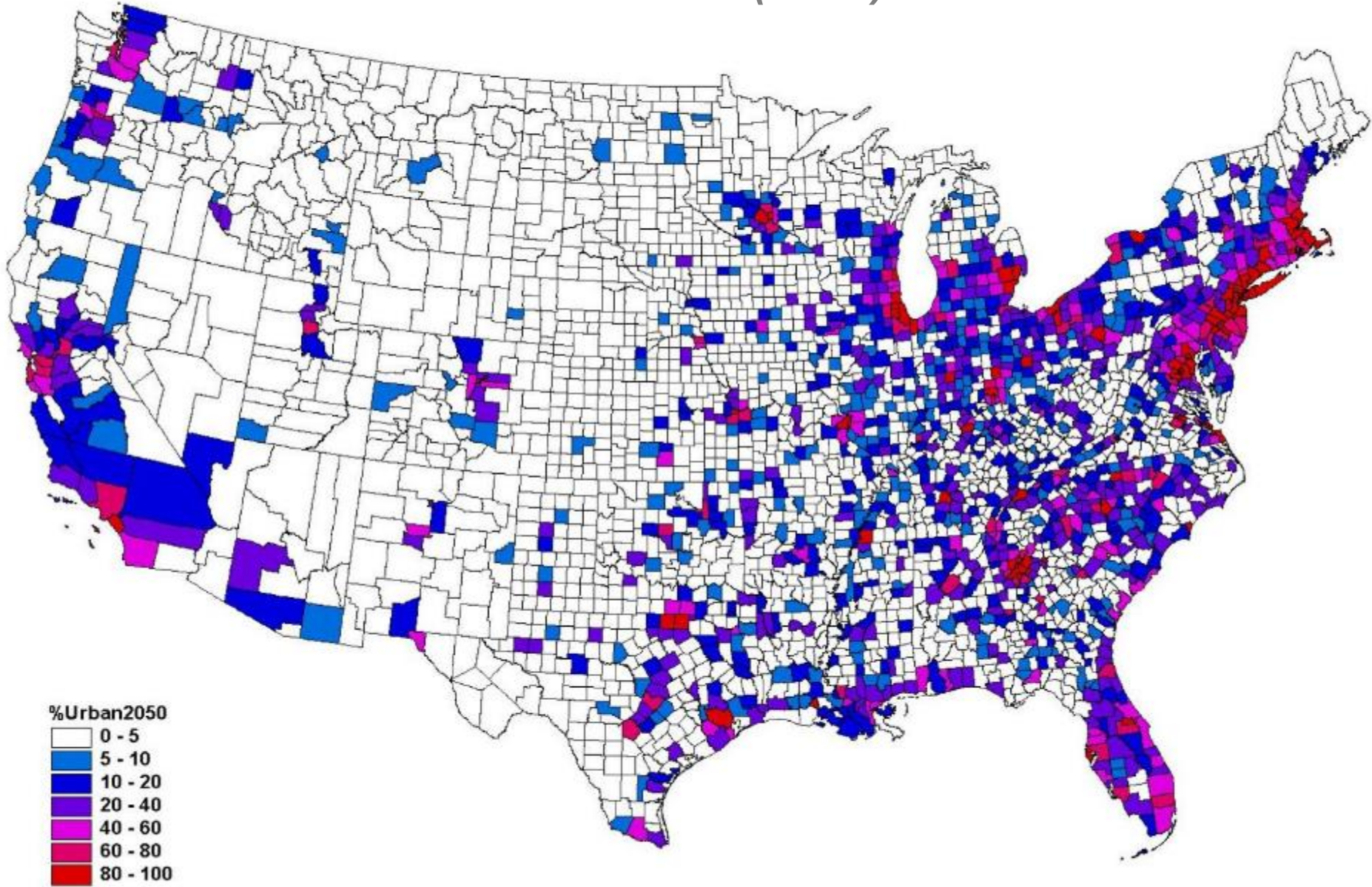
Percent Urban (2040)



%Urban2040

- 0 - 5
- 5 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100

Percent Urban (2050)



Opportunities in Durham

Increase The Quantity and Quality of Tree Cover

Protect, Plant and
Maintain Trees



Develop a Community
Forestry Program/Policy



Increase New Tree Planting

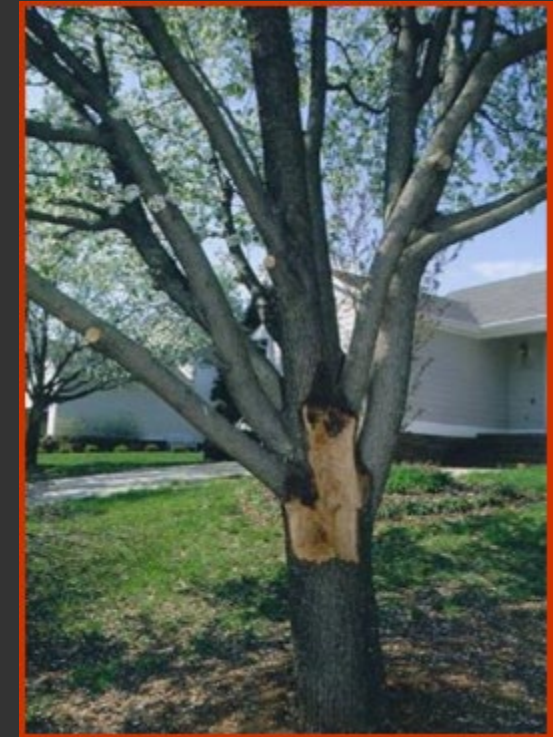


- Plant hardy urban species
- Largest Trees Possible
- Right Tree – Right Place

USFS Northern Trees website

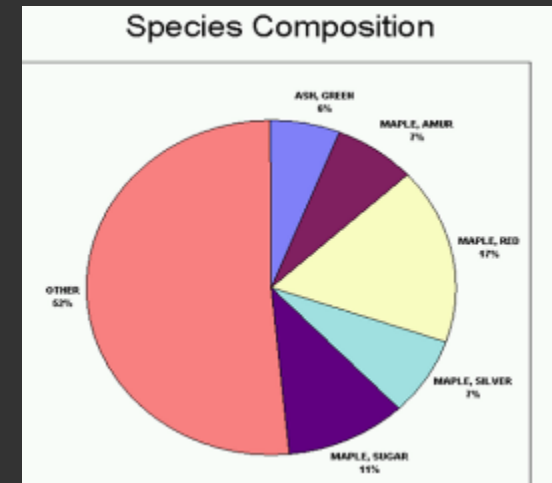
<http://lyra.ifas.ufl.edu/NorthernTrees/>

Picture shows pear tree a commonly planted species, which tends to have storm damage due to the branching pattern

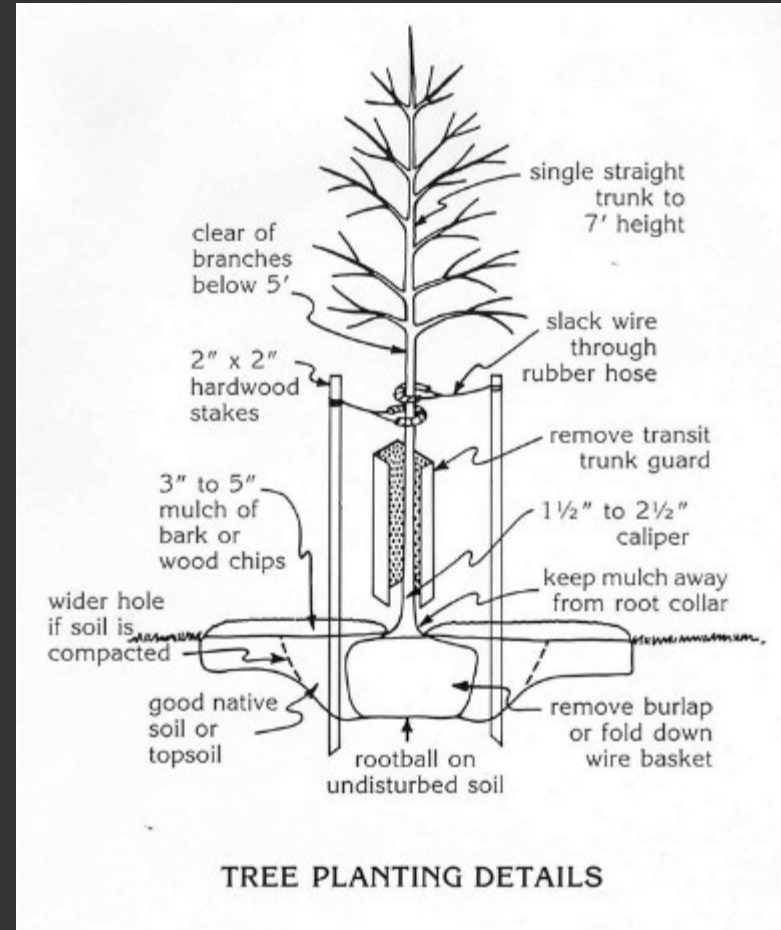


Species Diversity – Planting a variety of species helps avoid future insect and disease problems.

Graph shows tree population in this town is almost 50% ash and maple. Invasive insects (EAB and ALB) favor maple and ash)



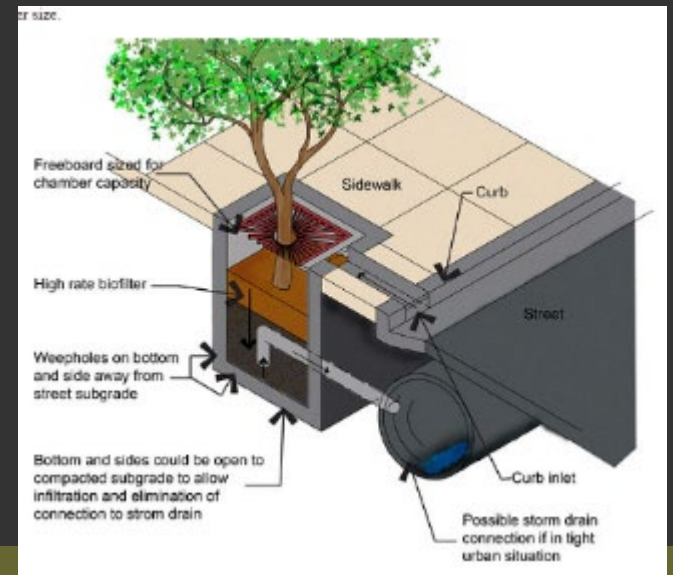
Proper Planting



Plan Space for Trees



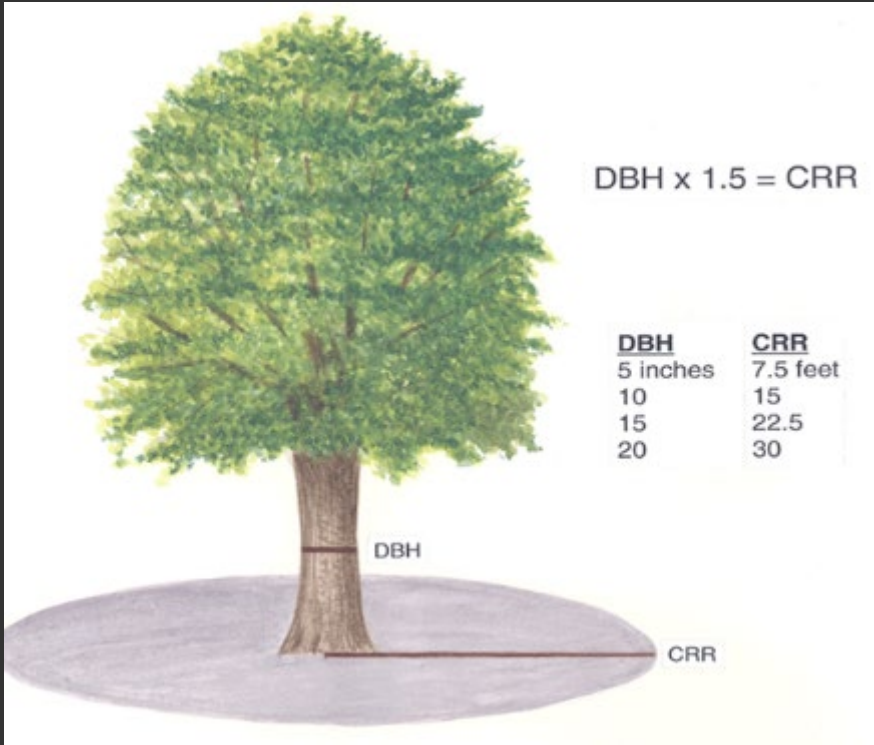
Design Hardscape Areas for Tree Growth



Protect Trees During Construction







Plan Development with Trees







Maintaining Trees



ID and Remove High Risk Trees



Develop a Community Tree Program

Involve the Right People

- Tree Committee or Board (DCC)
- Volunteers
- Tree Warden
- Knowledgeable Staff Tree
- Educate Public & Property Owners

Conduct a Tree Inventory

Develop a Management Plan

Write a Public Landscape Ordinance



Public Tree Inventory



Existing Trees



Vacant Sites



Primary Electric Wires



Secondary Wires

Management Plan & Landscape Ordinance

Concord NH

October 2008



Jerry Bond, Consulting Urban Forester
 Urban Forestry LLC
 3904 Willowdale Lane
 Geneva NY 14456-9267

1.2 Results and Recommendations

Results

- Concord's street tree population is estimated to be about 37,000.
- Total annual benefits from Concord's street trees is estimated to be about \$2,780,000.
- The value of air pollution removed amounts to \$247,000, with more than half being removed by just five species.
- Concord's street trees save almost \$1,000,000 in heating and cooling costs.
- The street trees overall are in good health, but 3% (about 1,000 trees) are estimated to be dead or dying.
- Species diversity is good, reducing exposure to devastation by lethal pests.
- About one-quarter of the street trees have dead wood in the crown.
- Approximately 500 trees are associated with a sidewalk lift greater than 1.5 in.
- Citywide, the replacement value of the street trees is estimated to be \$136,000,000.
- For every dollar invested in street trees, the City of Concord is receiving about \$20 in return.

Recommendations

- A full windshield inspection should be carried out to determine the actual location of dead and dying trees.
- A fixed cycle of rotating inspection followed by pruning/removal work should be considered if not in place already.
- Continue to promote the species diversity already evident in the street tree population.

For More Information

- U.S. Forest Service
 - <http://www.na.fs.fed.us/urban/inforesources/index.shtm>
- State of NH, Urban Forestry Program
 - <https://www.nhdfi.org/land-conservation/urban-forestry-center/>
- New Hampshire Arborists Association
 - <http://www.nharborists.org/>
- National Arbor Day Foundation
 - <https://www.arborday.org/trees/>
- International Society of Arboriculture
 - <http://www.isa-arbor.com/publicOutreach/index.aspxkkk>

Questions?

