

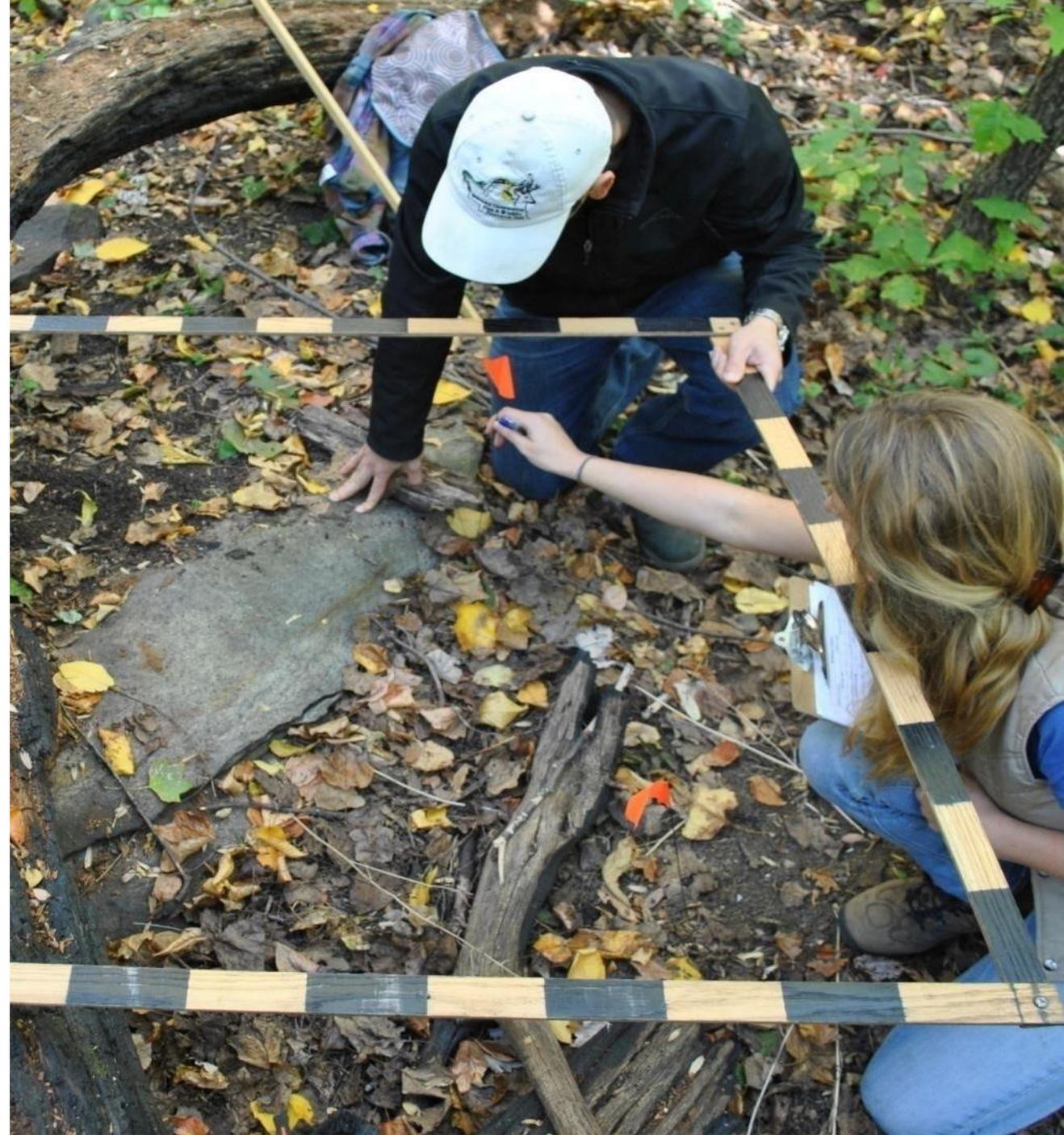


The Science and Practice of Managing Forests in Cities: A Shared Stewardship Approach to Urban and Rural Silviculture



Agenda

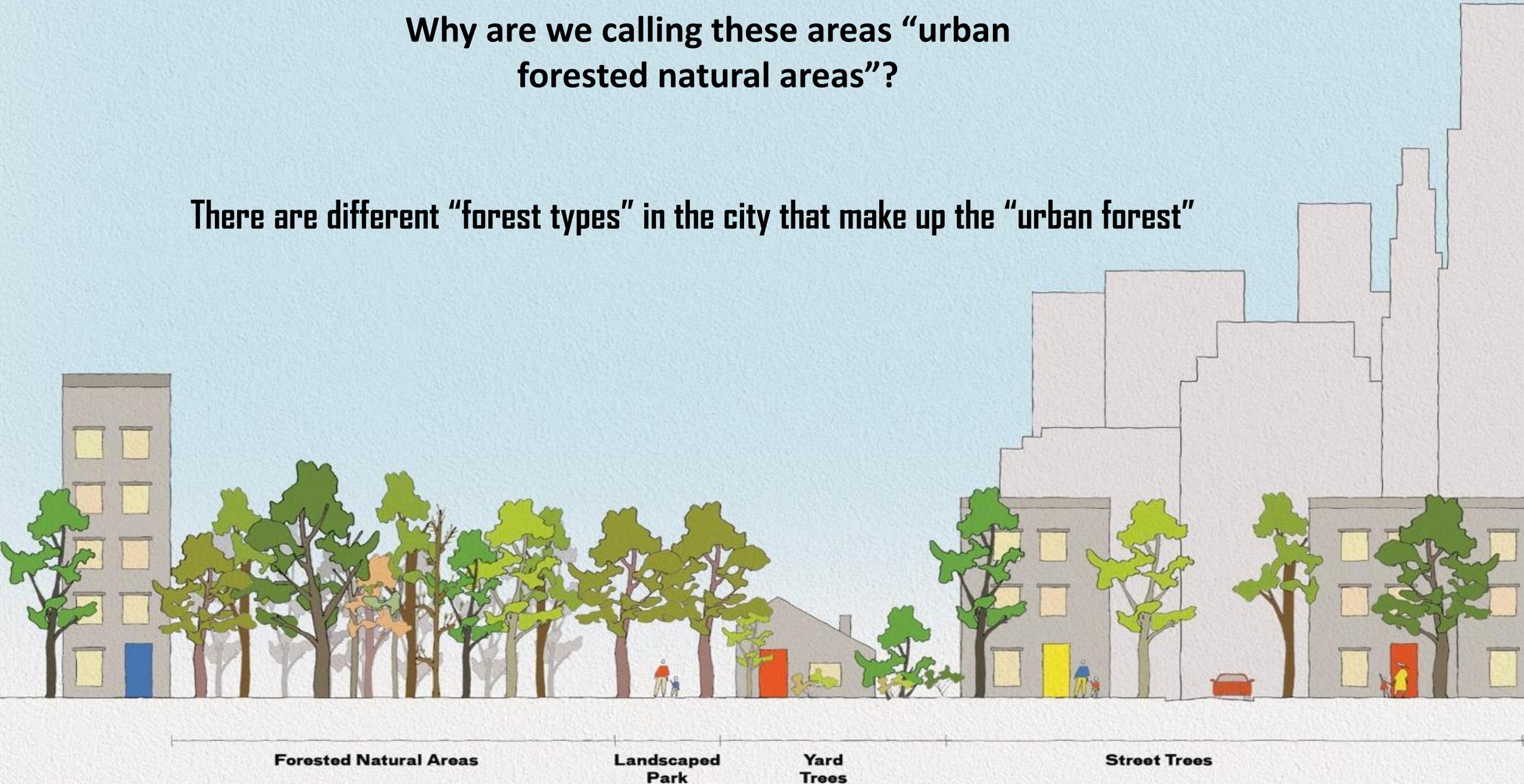
- Background on science of forests in cities
- Connecting with practitioners across the US
- Introduce 25 case studies about the management of Forests in Cities
- Urban Rural Learning Opportunities





Why are we calling these areas “urban forested natural areas”?

There are different “forest types” in the city that make up the “urban forest”



What is a forest?

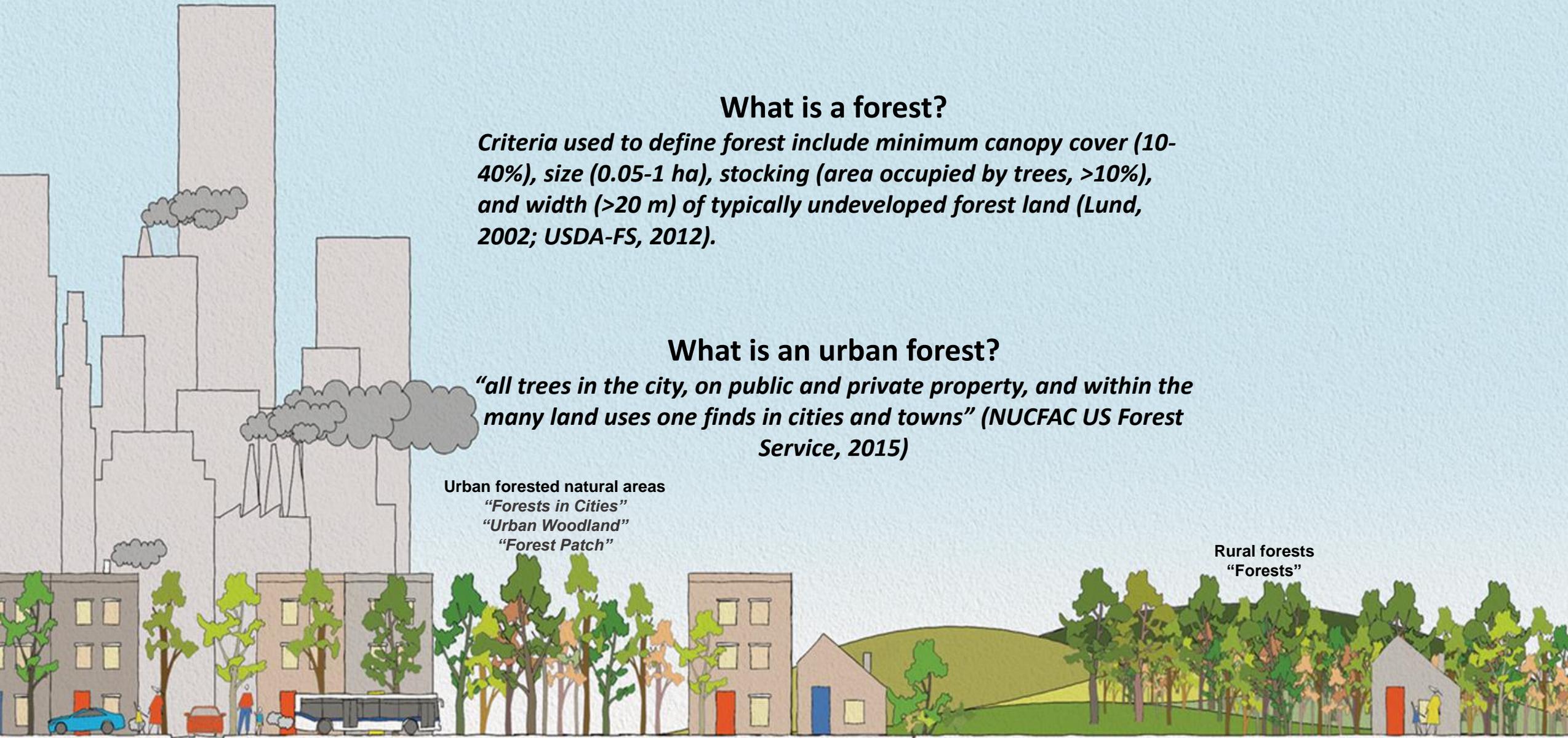
Criteria used to define forest include minimum canopy cover (10-40%), size (0.05-1 ha), stocking (area occupied by trees, >10%), and width (>20 m) of typically undeveloped forest land (Lund, 2002; USDA-FS, 2012).

What is an urban forest?

“all trees in the city, on public and private property, and within the many land uses one finds in cities and towns” (NUCFAC US Forest Service, 2015)

Urban forested natural areas
“Forests in Cities”
“Urban Woodland”
“Forest Patch”

Rural forests
“Forests”





Van Cortlandt Park
Bronx, New York City



Big leaf maple, Douglas fir forest
Seattle, WA



Paul Ruster Park
Indianapolis, IN



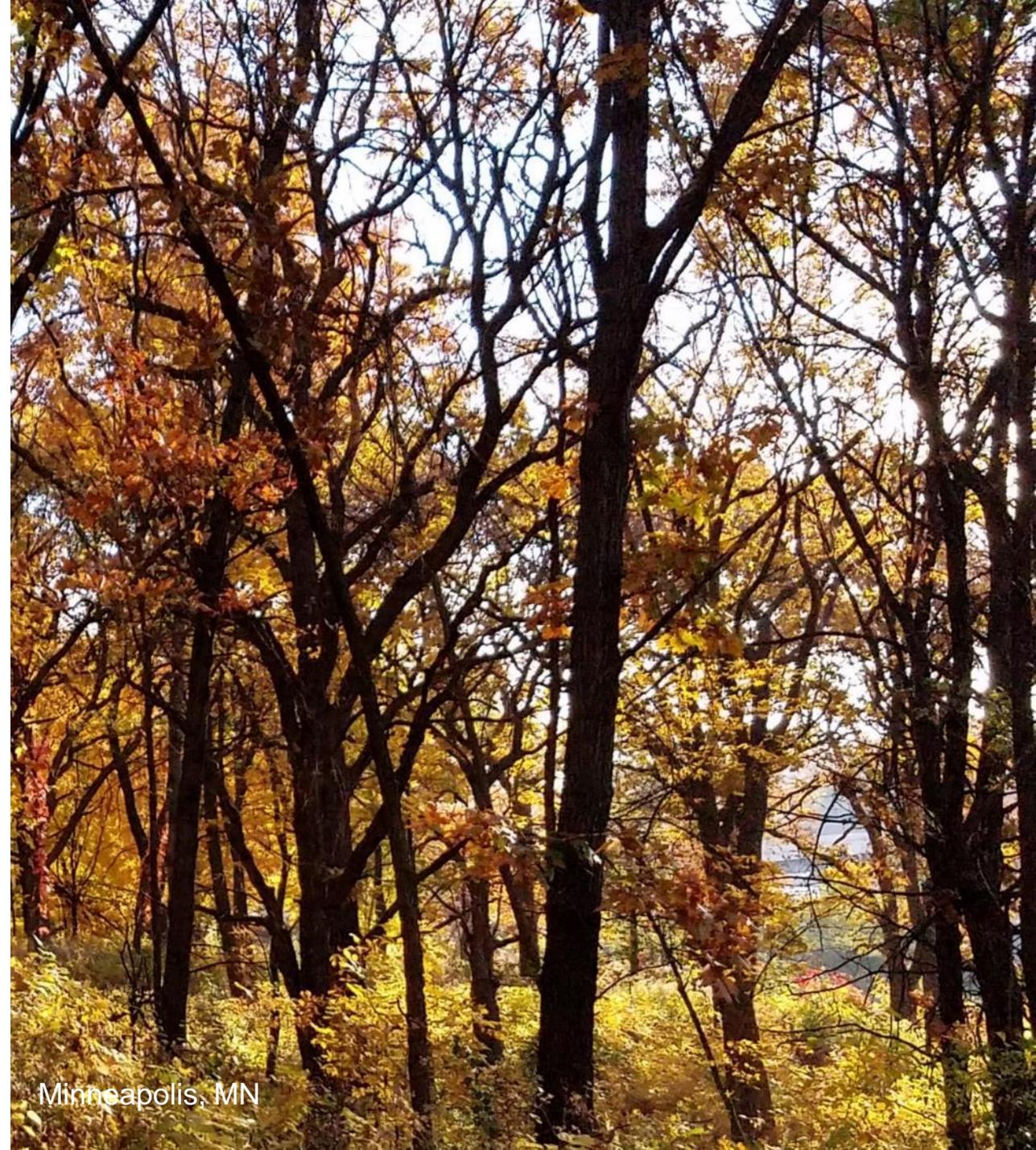
Pine Flatwood/Cypress Dome
Jacksonville, FL



Oak forest
Minneapolis, MN

Forests in Cities are a BIG Resource

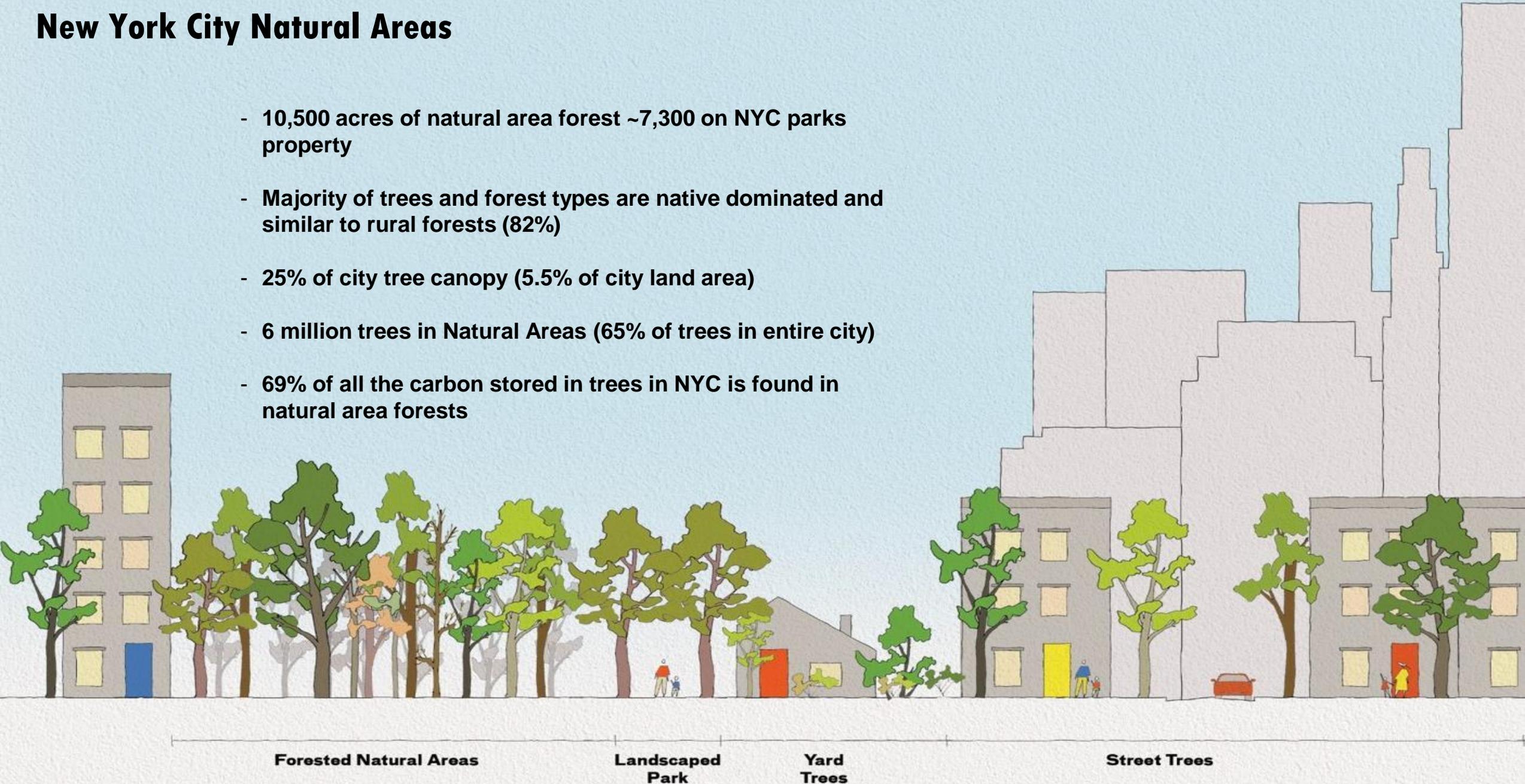
- Majority of people live in cities, and could only ever experience nature in cities. 50% of New Yorkers reported recreating **only** in NYC parkland
- 84% of city parkland in the US is natural areas (Trust for Public Land, 2017) - 64 million people live in the top 100 most populated cities
- Natural area parkland decreased 4% (37,702 acres) in 5 years (Pregitzer *et al. in review*).



Minneapolis, MN

New York City Natural Areas

- 10,500 acres of natural area forest ~7,300 on NYC parks property
- Majority of trees and forest types are native dominated and similar to rural forests (82%)
- 25% of city tree canopy (5.5% of city land area)
- 6 million trees in Natural Areas (65% of trees in entire city)
- 69% of all the carbon stored in trees in NYC is found in natural area forests



Forested Natural Areas

Landscaped Park

Yard Trees

Street Trees

The composition and structure of forested natural areas can vary and influence their ability to provide benefits and values.



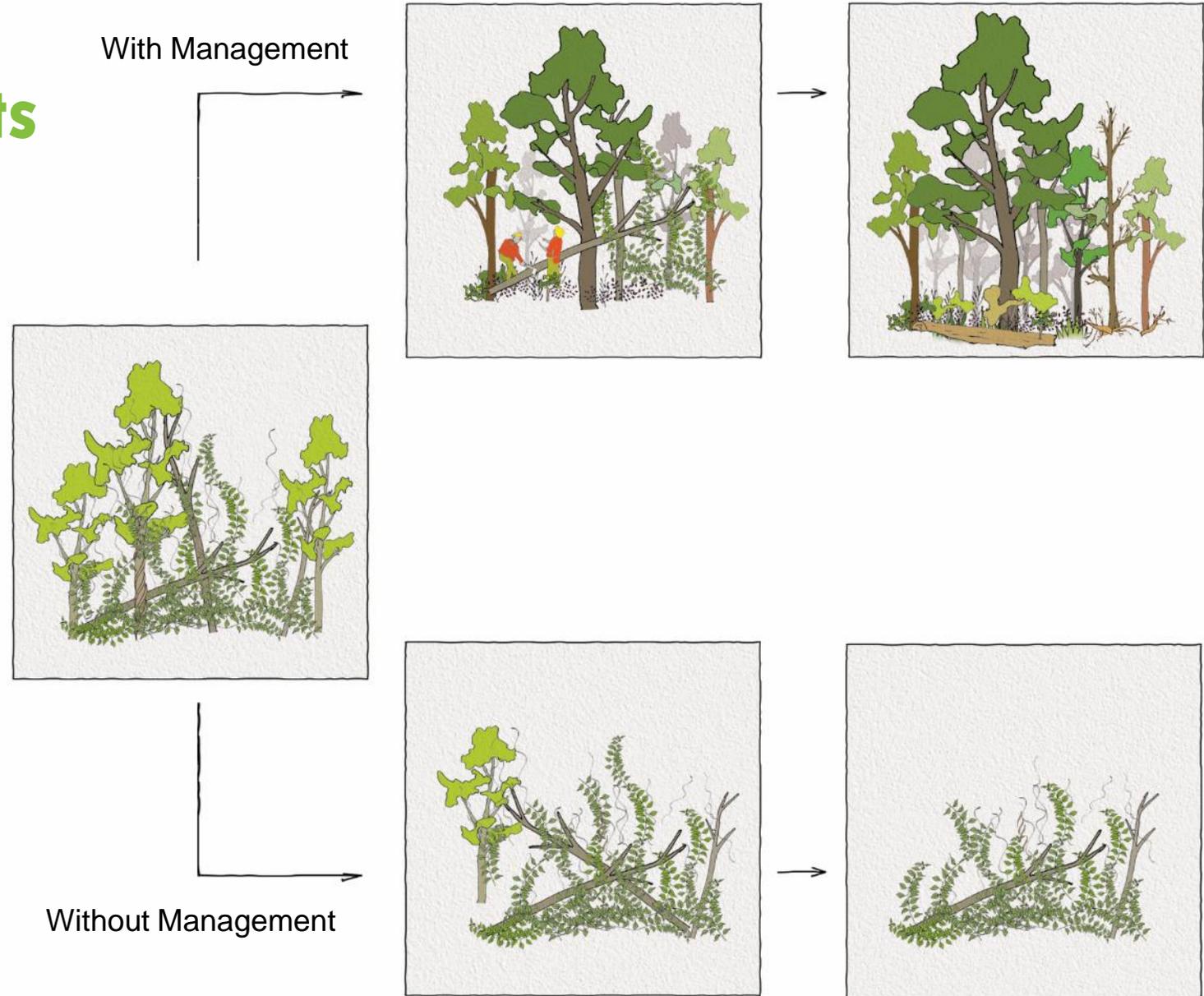
Invasive vineland



Native oak forest

Ensuring Healthy Forests

- Requires protection
- Requires management
- Requires partnership





Poll the Audience



Forests in Cities

Forest Management Framework

Healthy forest that is fully supported socially and financially.

- Connects forest condition with management recommendations across all NYC parks forested natural areas
- Financial model that includes volunteerism, and green jobs

Goal: 100% Active Management

Requires \$385 million over 25 years

Acquired \$4 million in 1st year

Forest Management Framework for New York City



Connecting with Cities Across the US

Goals

- Elevate national awareness
- Improve management
- Strengthen community of practice

National Survey - 2018

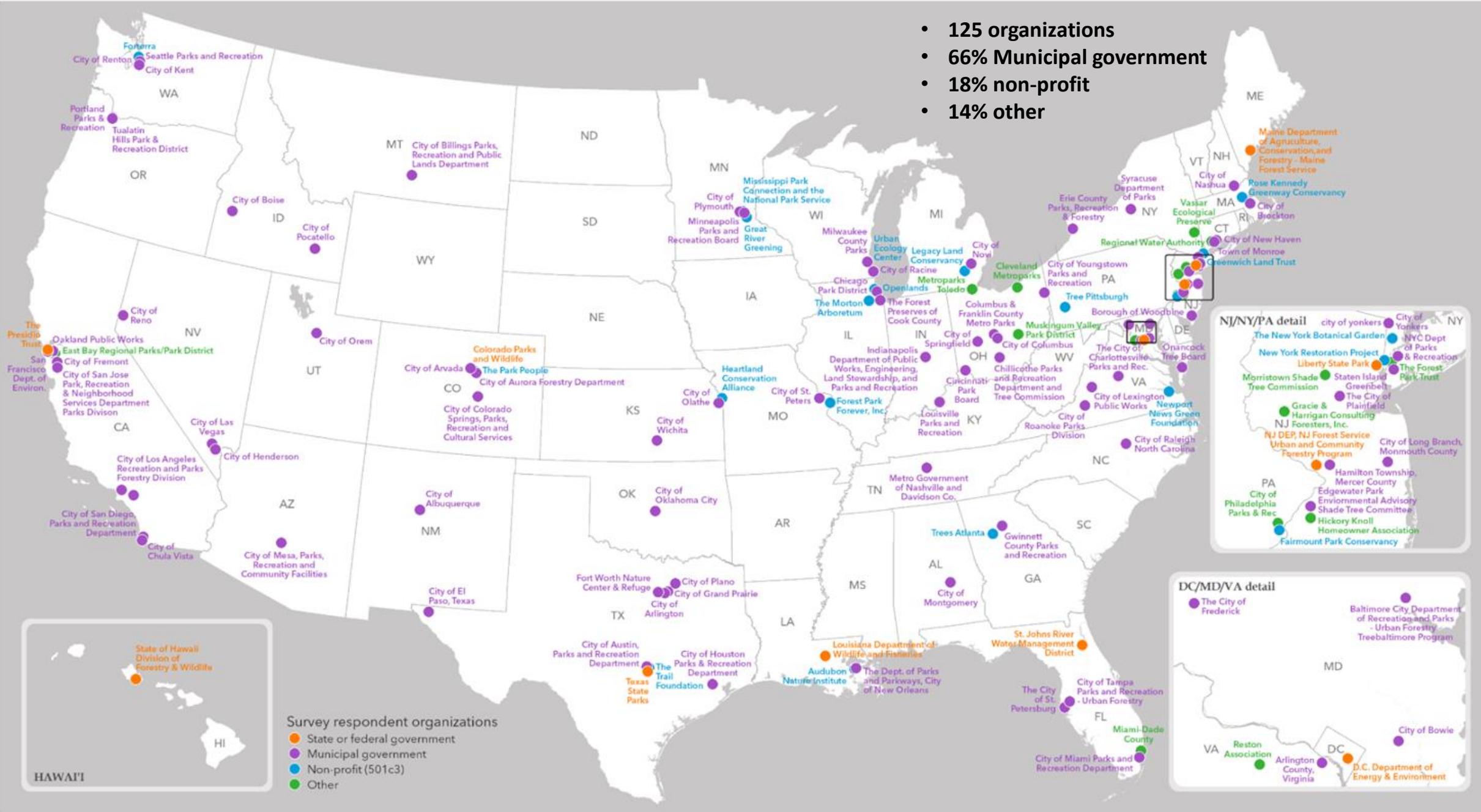
- Who is managing forested natural areas across the US and why?
- What are the challenges they face?

Targeted Engagement and Workshop- 2019

- Develop 25 case studies
- Share case studies of common themes in caring for forested natural areas
- Build awareness and broaden community of practice



- 125 organizations
- 66% Municipal government
- 18% non-profit
- 14% other



Survey respondent organizations

- State or federal government
- Municipal government
- Non-profit (501c3)
- Other

NJ/NY/PA detail

- city of yonkers
- City of Yonkers
- NYC Dept of Parks & Recreation
- The Forest Park Trust
- The New York Botanical Garden
- Liberty State Park
- Morristown Shade Tree Commission
- Staten Island Greenbelt
- The City of Plainfield
- Gracie & Harrigan Consulting
- NJ Foresters, Inc.
- NJ DEP, NJ Forest Service Urban and Community Forestry Program
- City of Long Branch, Monmouth County
- Hamilton Township, Mercer County
- Edgewater Park Environmental Advisory
- Shade Tree Committee
- Hickory Knoll Homeowner Association
- Fairmount Park Conservancy
- City of Philadelphia Parks & Rec
- Newport News Green Foundation
- City of Raleigh North Carolina
- City of Lexington Public Works
- City of Roanoke Parks Division
- City of Charlottesville Parks and Rec.
- Onancock Tree Board
- City of Youngstown Parks and Recreation
- Tree Pittsburgh
- Borough of Woodbine
- City of Columbus
- Chillicothe Parks and Recreation Department and Tree Commission
- Cincinnati Park Board
- Louisville Parks and Recreation
- Metro Government of Nashville and Davidson Co.
- Forest Park Forever, Inc.
- City of St. Peters
- Heartland Conservation Alliance
- City of Olathe
- City of Wichita
- City of Aurora Forestry Department
- City of Colorado Springs, Parks, Recreation and Cultural Services
- City of Arvada
- Colorado Parks and Wildlife
- The Park People
- City of Orem
- City of Las Vegas
- City of Henderson
- City of Los Angeles Recreation and Parks Forestry Division
- City of San Diego, Parks and Recreation Department
- City of Chula Vista
- City of Mesa, Parks, Recreation and Community Facilities
- City of Albuquerque
- City of El Paso, Texas
- City of Grand Prairie
- City of Arlington
- City of Plano
- City of Houston Parks & Recreation Department
- The Trail Foundation
- Texas State Parks
- City of Austin, Parks and Recreation Department
- City of New Orleans
- The Dept. of Parks and Parkways, City of New Orleans
- Audubon Nature Institute
- Louisiana Department of Wildlife and Fisheries
- St. Johns River Water Management District
- City of Montgomery
- City of Miami Parks and Recreation Department
- Miami-Dade County
- City of Tampa Parks and Recreation - Urban Forestry
- City of St. Petersburg
- Reston Association
- Arlington County, Virginia
- D.C. Department of Energy & Environment
- City of Bowie
- Baltimore City Department of Recreationalated Parks - Urban Forestry - Treebaltimore Program
- The City of Frederick

DC/MD/VA detail

- City of Frederick
- Baltimore City Department of Recreationalated Parks - Urban Forestry - Treebaltimore Program
- City of Bowie
- D.C. Department of Energy & Environment
- Reston Association
- Arlington County, Virginia

Forests in Cities Across the US: Key Take-aways

- Cities are facing common challenges:
 - 94% list invasive species a top challenge
 - 50% list having and using data on forest composition and structure and 94% list limited data as a key challenge
 - 90% list limited resources and 70% list low awareness as a challenge.
- All cities are conducting management interventions:
 - Invasive species removal is the most commonly conducted management activity.
 - Half of the cities have some data on how their forest is changing over time.
- Collaborations are happening locally, however it is less common to participate in regional or national partnerships.



Forests in Cities Workshop Participants

Austin, Texas

Baltimore, Maryland

Billings, Montana

Chicago Metro Region, Illinois

Houston, Texas

Indianapolis, Indiana

Miami, Florida

Twin Cities Metro Region,
Minnesota

New York, New York

St Louis, Missouri

Seattle- Puget Sound Region,

Washington

Hillsborough County, Florida

USDA Forest Service

American Forests

Cities for Forests



Themes of Workshop & Case Studies

1. Assessment
2. Prioritization and Planning
3. Organizing and community engagement
4. Innovations in restoration and management:.
5. Climate change adaptation and mitigation
6. Monitoring and Evaluating Success
7. Cross-sector partnerships
8. Urban Land Preservation and Policy



Publication: Cities and the Environment (CATE)

- Volume 13, Issue 1 published March, 2020
- Special Issue: The Science and Practice of Managing Forests in Cities
- 25 case studies developed by our 12 participant cities
- Highlighting best practices across the 8 workshop themes
- <https://digitalcommons.lmu.edu/cate/>



Restoration and Management of High-use Urban Missouri Woodlands and Forests

St. Louis, MO

Innovations in Restoration and Management

Witt, Amy L.; Faber, Shawnell C.; and Jankowski, Alan R. (2020) "Restoration and Management of High-Use Urban Missouri Woodlands and Forests in St. Louis," *Cities and the Environment (CATE)*: Vol. 13: Iss. 1, Article 17.

DOI: 10.15365/cate.2020.130117



Climate Change Vulnerability and Response in Seattle's Urban Natural Areas

Seattle, WA

Climate Change Adaptation

Plant Community Assessment and Management Recommendations for Minneapolis Park and Recreation Board Natural Areas

Minneapolis, MN

Assessment

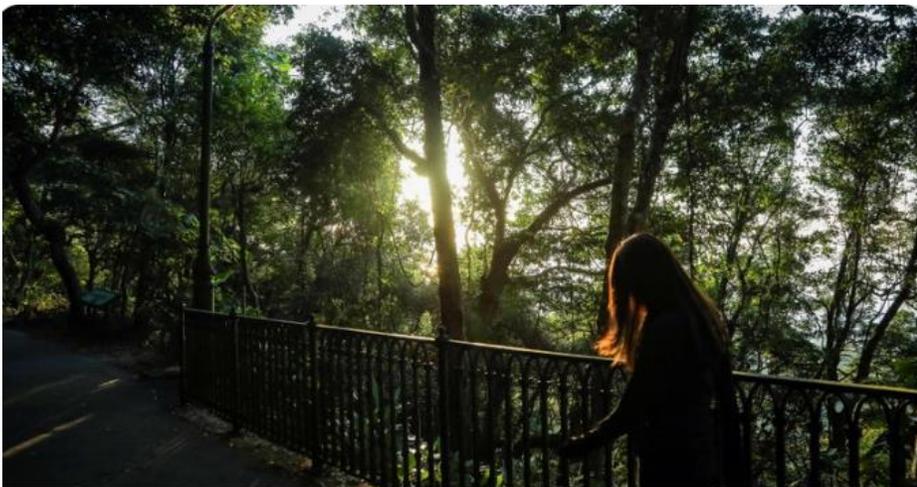




'It Sort of Gives You Hope': One Place New Yorkers Go to Escape Shutdo...
New Yorkers have headed outdoors to the parks to enjoy sunshine and nature — as long as they are 6 feet away from each other.
[nytimes.com](https://www.nytimes.com)



What outdoor activities are safe to do during the coronavirus outbreak?
Medical experts say outdoor activities are safe but to avoid large crowds and practice social distancing.
[usatoday.com](https://www.usatoday.com)



Go for a Walk. You're Allowed.
This is a pandemic. It is an emergency. And you can go for a walk.
[slate.com](https://www.slate.com)



"This Is Not Life As Usual": Please Only Use Parks For Solitary Walks
"Outdoor recreation is a solitary recreational exercise," Cuomo said. "It's running, hiking. It's not playing basketball with five other people."
[gothamist.com](https://www.gothamist.com)

Forested Natural Areas as a National Learning Lab

Richard Hallett

Research Ecologist, USDA Forest Service

Northern Research Station



 @working_trees



Urban forested natural areas are learning labs for managing national forests

Forests in cities are already experiencing:

Increased temperatures

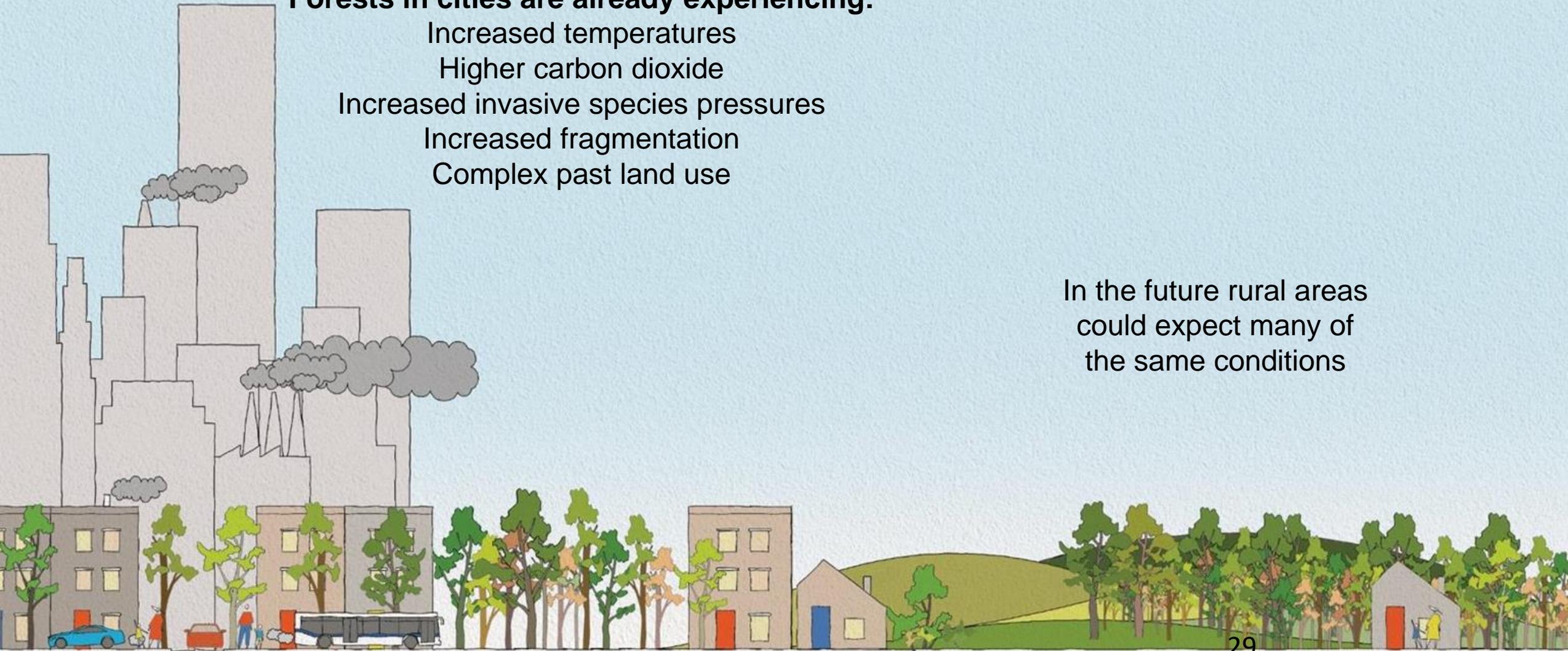
Higher carbon dioxide

Increased invasive species pressures

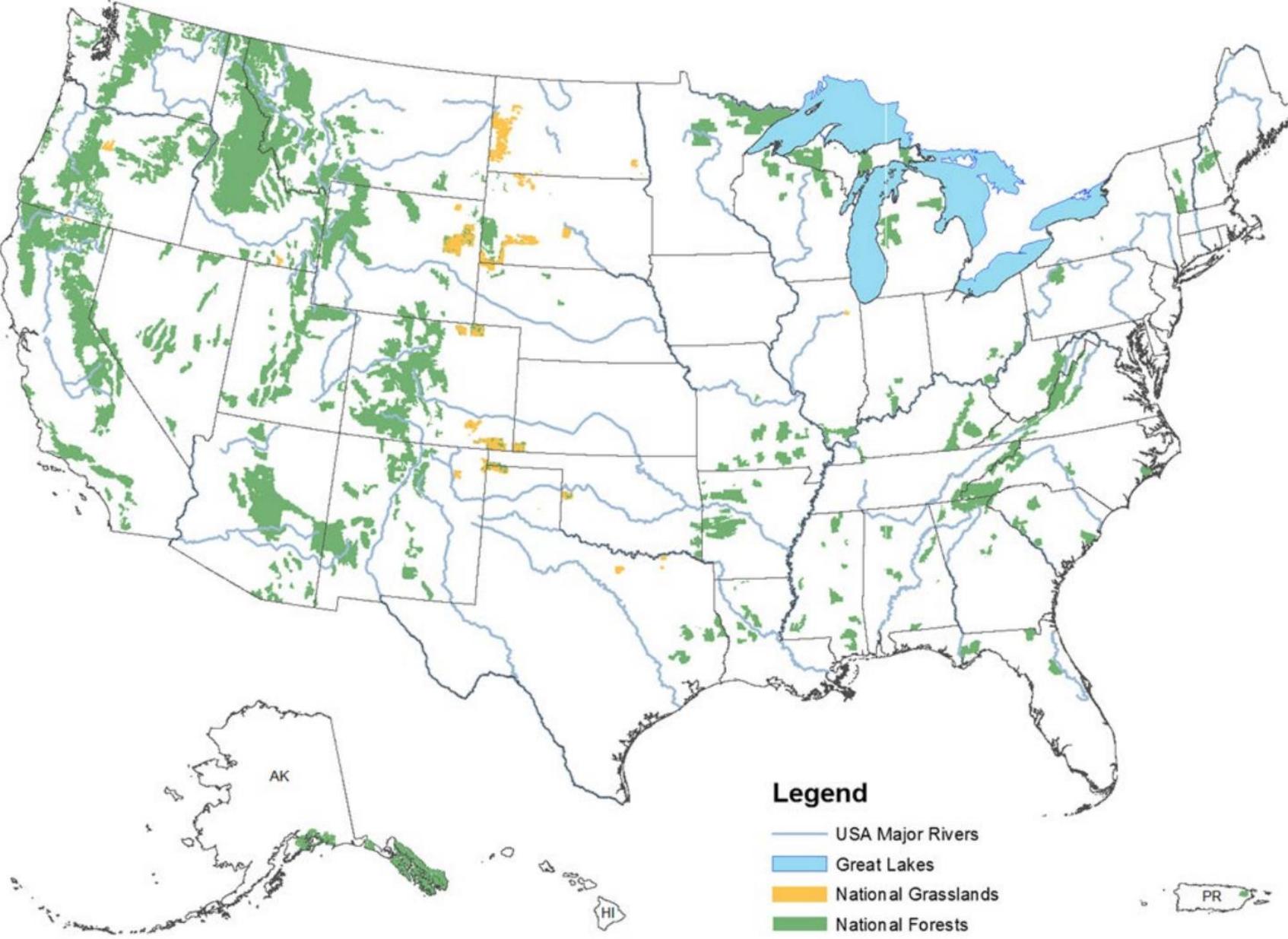
Increased fragmentation

Complex past land use

In the future rural areas
could expect many of
the same conditions



Where are our National Forests?



National Forest System

- 193 million acres of public land that are managed as national forests and grasslands.
- 44 states, Puerto Rico, and the Virgin Islands.
- 9% of the total land area in the United States.

Urban Land

- 68 million acres (2010)
- 163 million acres (2060).

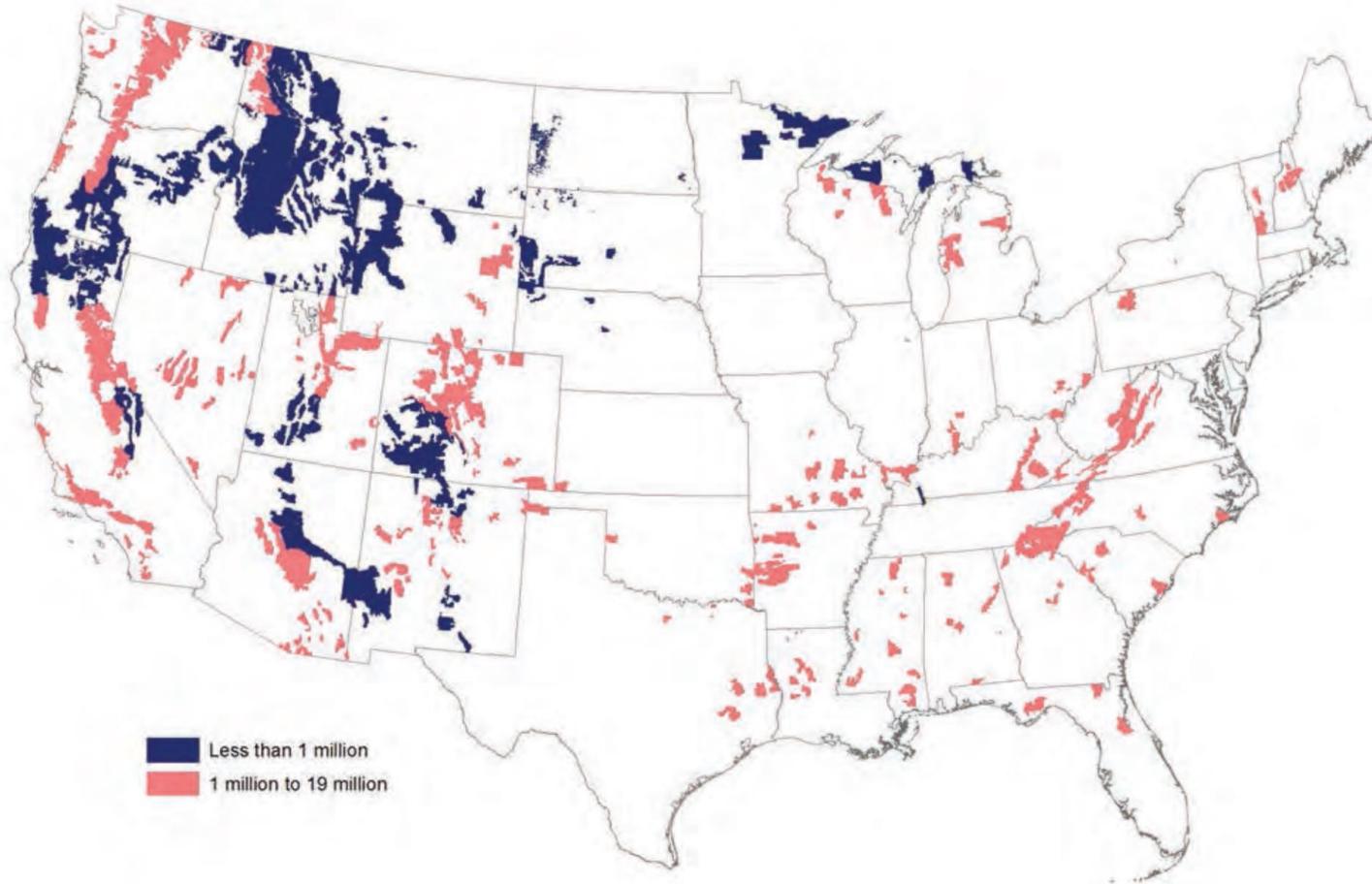


Shively D, Rothlisberger JD, Gillespie N, et al. 2018. Historical Perspectives and a New U.S. Forest Service Strategy for Fish and Aquatic Stewardship. *Fisheries* 43: 386–95.

Image: Hallett, RA: Hudson River from Inwood

Urbanizing National Forests

Figure 4—Location of national forests and grasslands in the coterminous United States. National forests and grasslands are shown to highlight areas that have at least 1 million people within a 50-mile radius. Population estimates are based on the 2010 U.S. Census.



1

The population is **increasing substantially** within 50 and 100 miles of national forests and grasslands

2

The number of people living within 50 miles of individual national forests and grasslands **ranges** from fewer than 500,000 to 19 million

3

Almost 60 national forests and grasslands that are identified as “**urban**” are surrounded by populations of 1 million or more people

4

Population **growth rates** near some national forests and grasslands were more than 20 percent between 2000-2010

5

Nationally, few **demographic changes** have occurred within the 50-mile and 100-mile zones

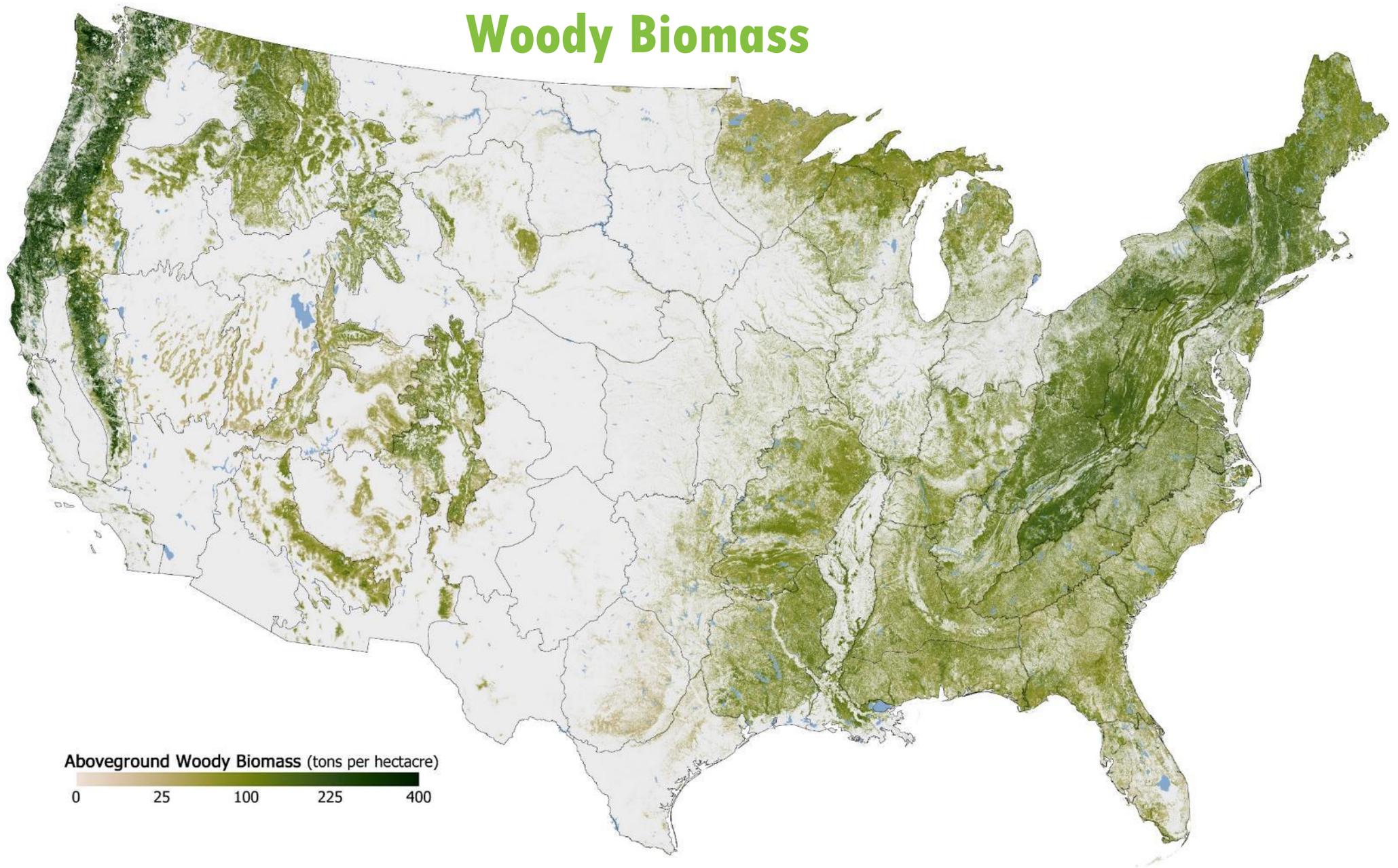
6

Average use by **local residents** varies greatly from one forest to another

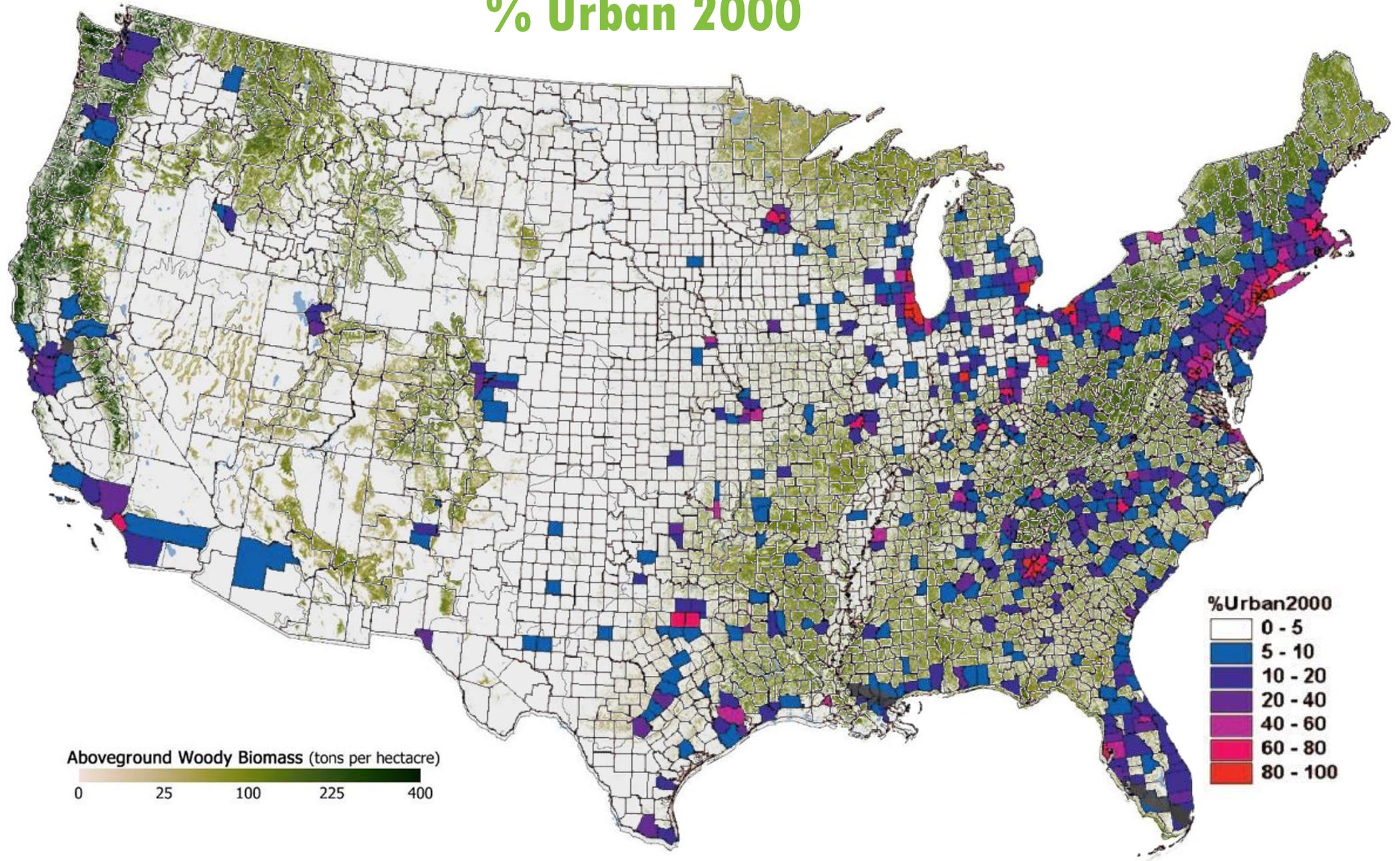
7

Substantial increases in **visitor use** are expected in the Intermountain West and parts of the South

Woody Biomass



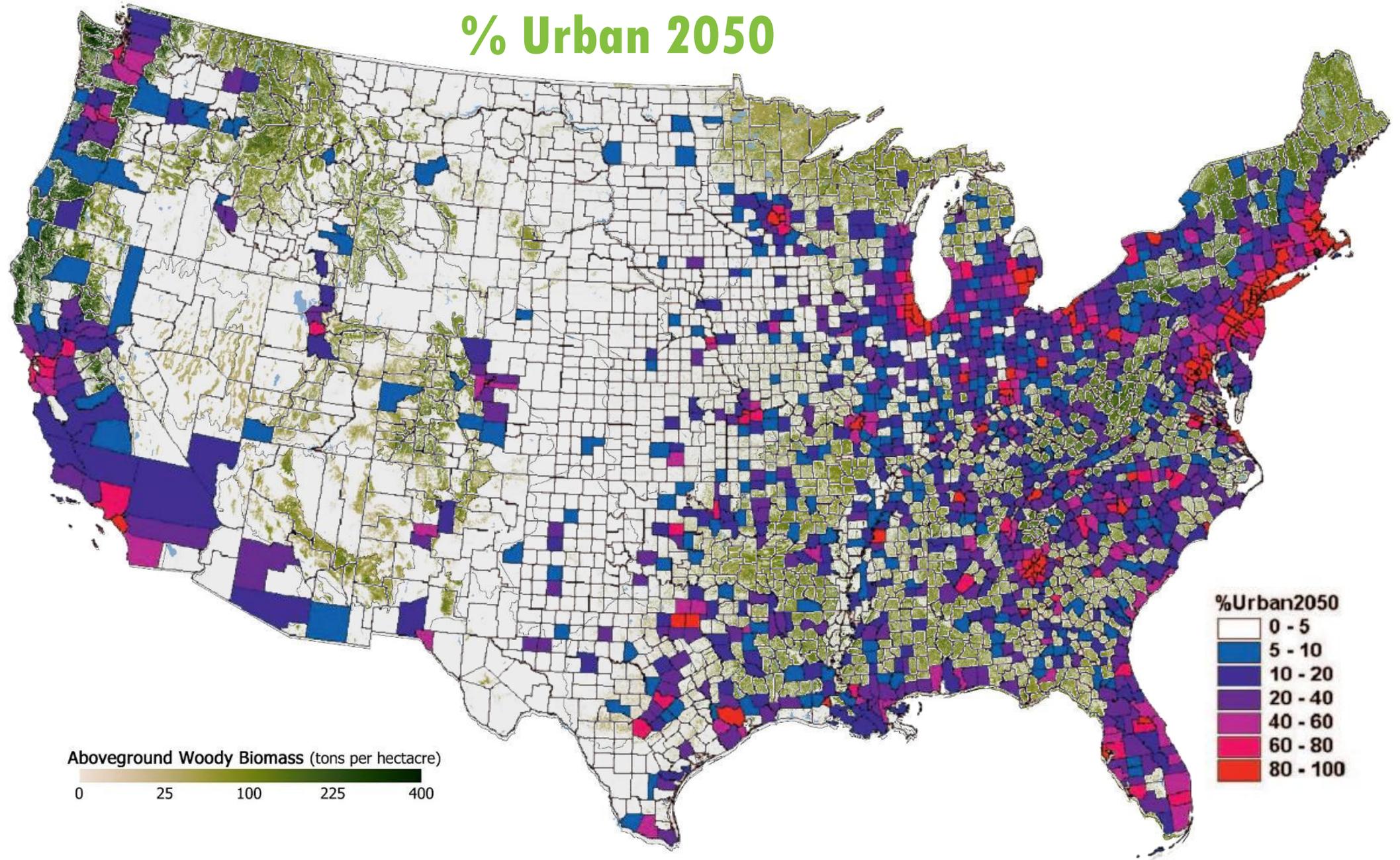
% Urban 2000



Aboveground Woody Biomass (tons per hectare)
0 25 100 225 400

%Urban2000
0 - 5
5 - 10
10 - 20
20 - 40
40 - 60
60 - 80
80 - 100

% Urban 2050





Piana M., Pregitzer C., Hallett R. In review. Advancing ecological management in urban forested natural areas: towards an urban silviculture? *Frontiers in Ecology and the Environment*.

Urban forest restoration techniques can help prepare rural forest managers for future urbanization pressures.



Rural forest silvicultural techniques can provide a starting point for urban forested natural area management.



Image: Hallett, RA: NYC viewed from Freshkills Park

Moving towards an urban silviculture.



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Silviculture

Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis. This is accomplished by applying different types of silvicultural treatments such as thinning, harvesting, planting, pruning, prescribed burning and site preparation. Intermediate treatments (thinning) are designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest. Regeneration treatments (harvesting) are applied to mature stands in order to establish a new age class of trees. Regeneration methods are grouped into four categories: coppice, even-aged, two-aged, and uneven-aged.

All vegetation activities, including prescribed fire, wildlife habitat improvement, timber harvesting and cutting trees in campgrounds for human safety must have a silvicultural prescription. A silvicultural prescription is a document which has a planned series of treatments designed to change current stand structure and composition of a stand to one that meets management goals. The prescription normally considers ecological, economic, and societal objectives and constraints. In the Forest Service, silvicultural prescriptions are prepared or reviewed by a certified silviculturist prior to implementing the project or treatment.



Reviewing a thinning.

Moving towards an urban silviculture.

Silviculture

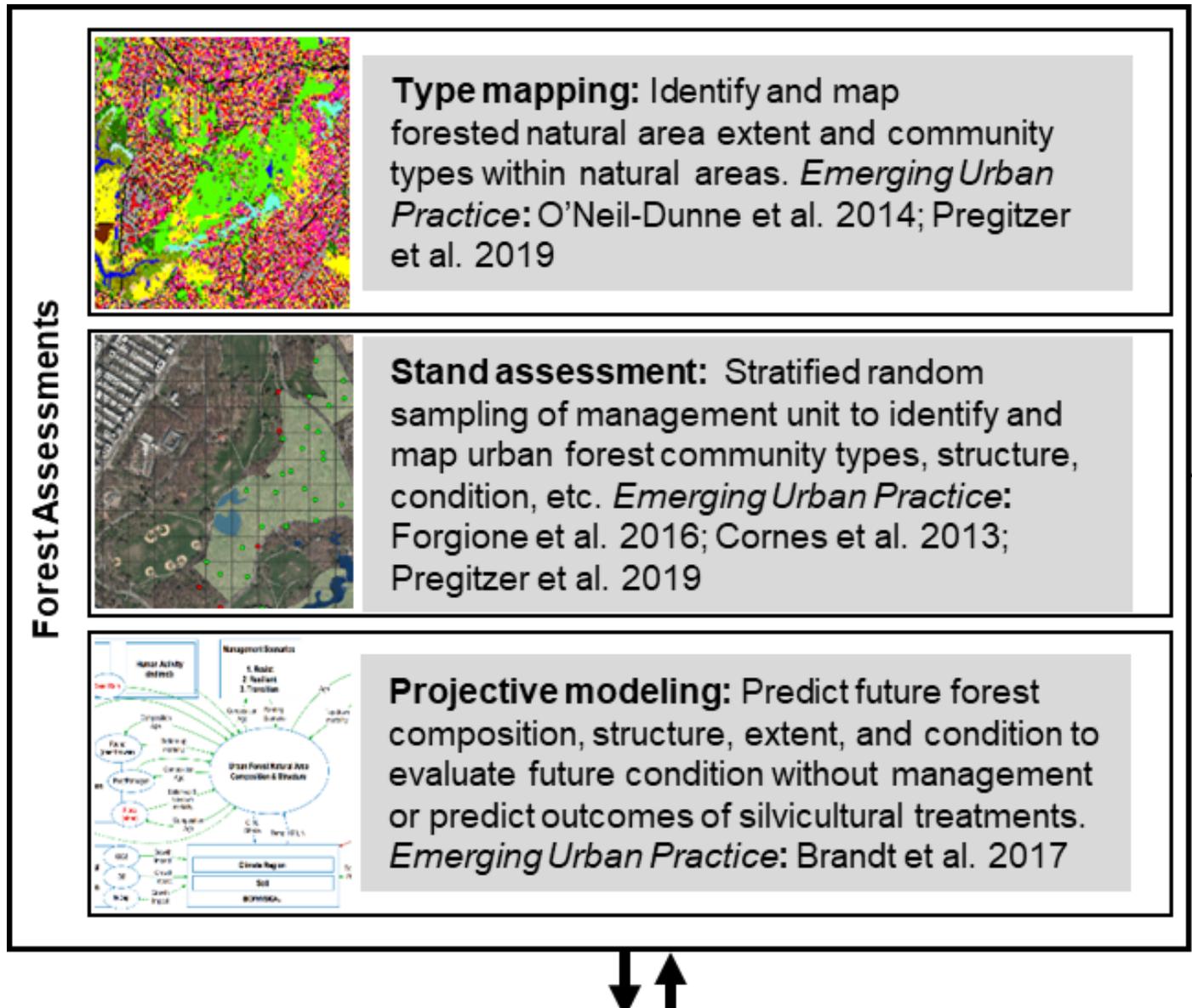
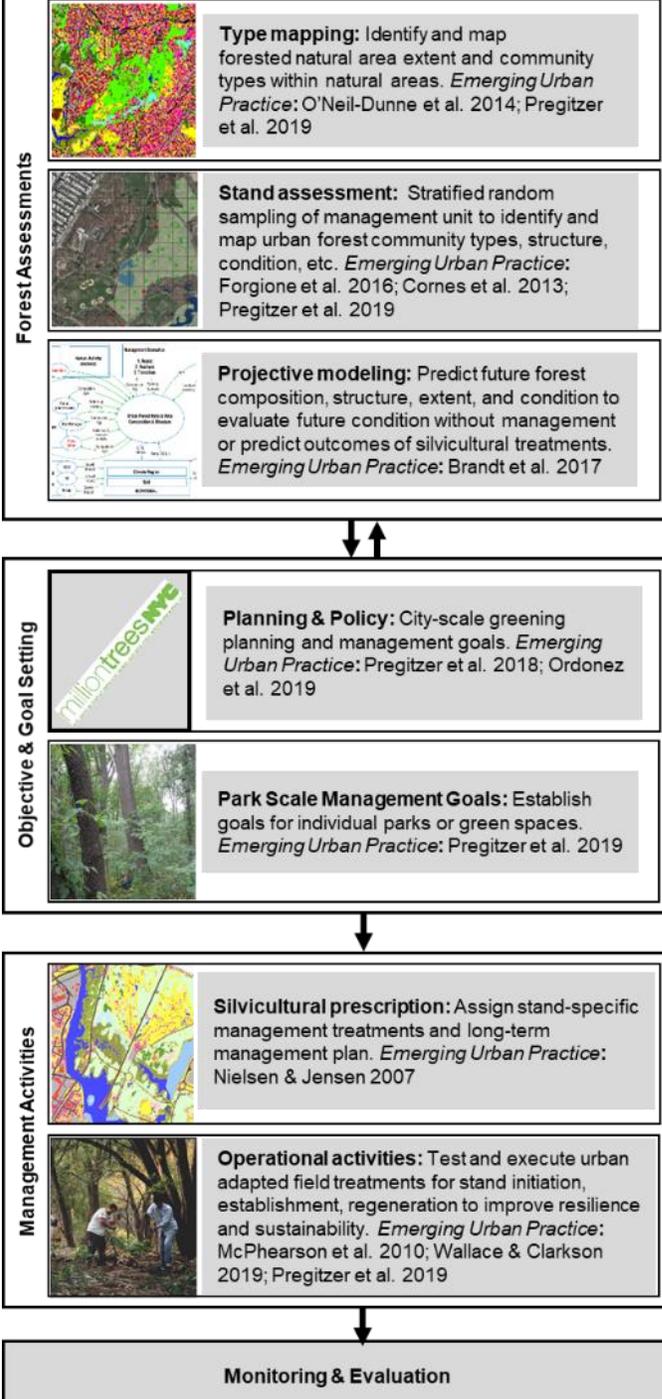
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Moving towards an urban silviculture.

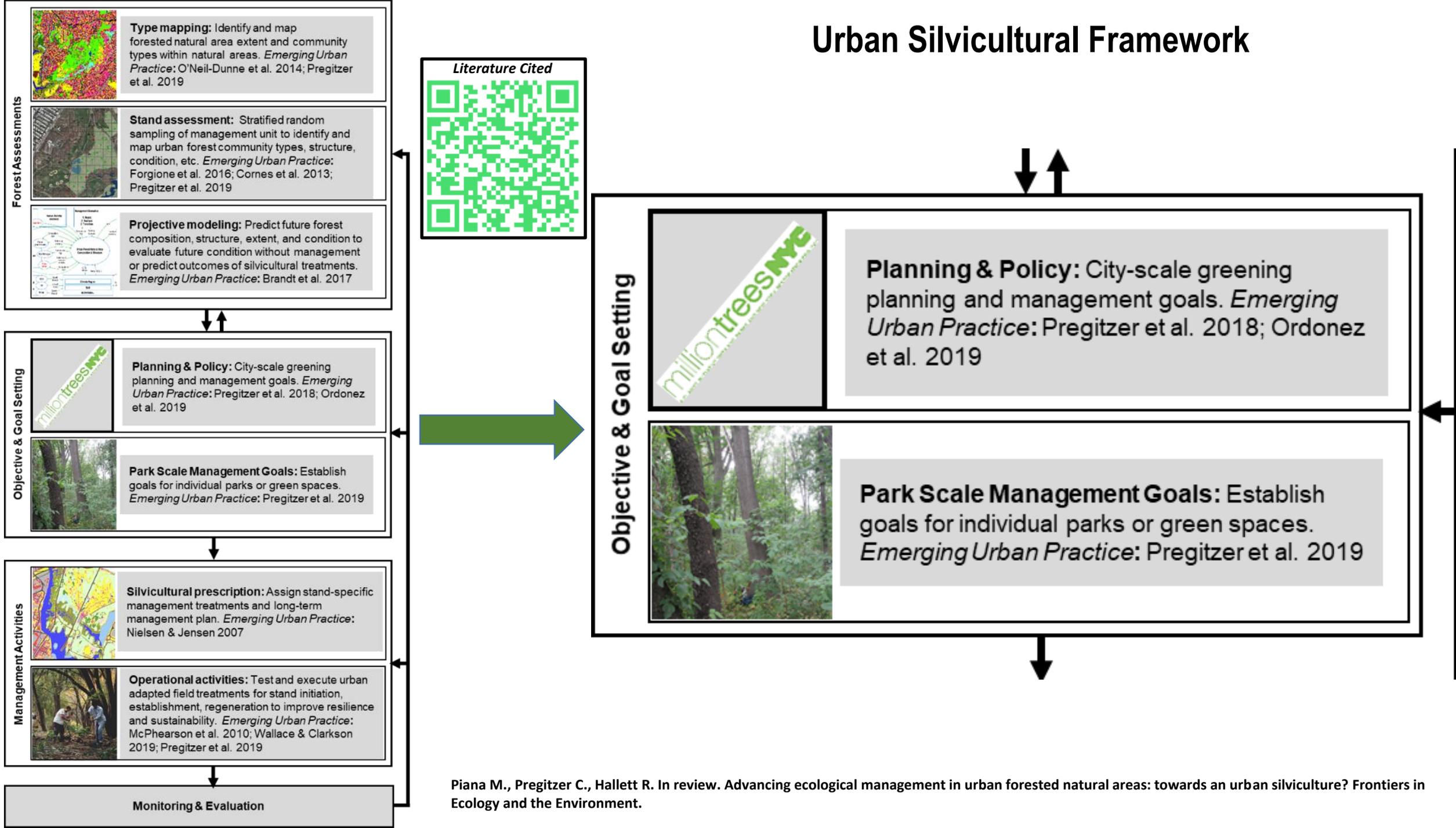
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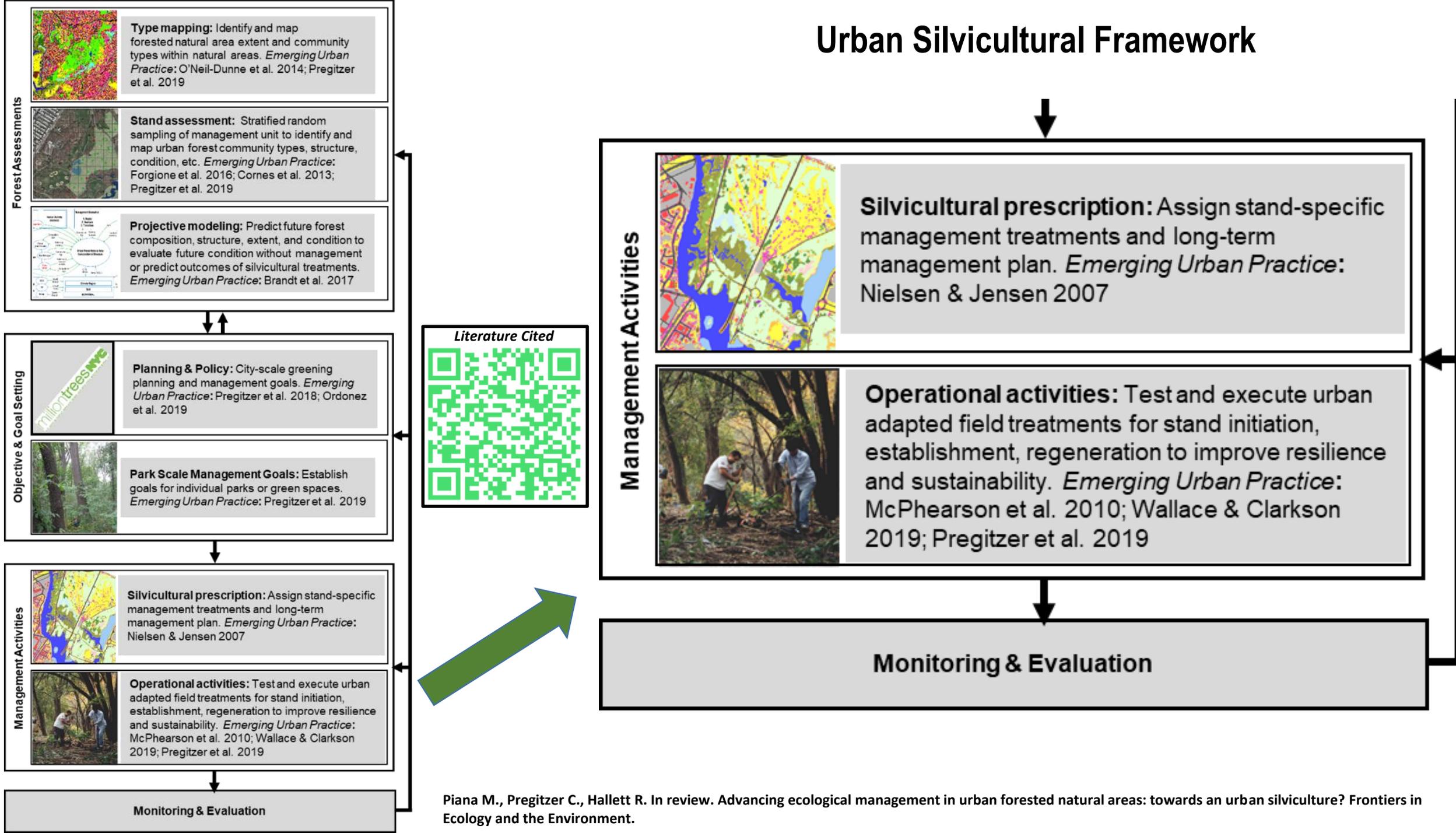
Urban Silvicultural Framework



Urban Silvicultural Framework



Urban Silvicultural Framework



Questions & Discussion

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