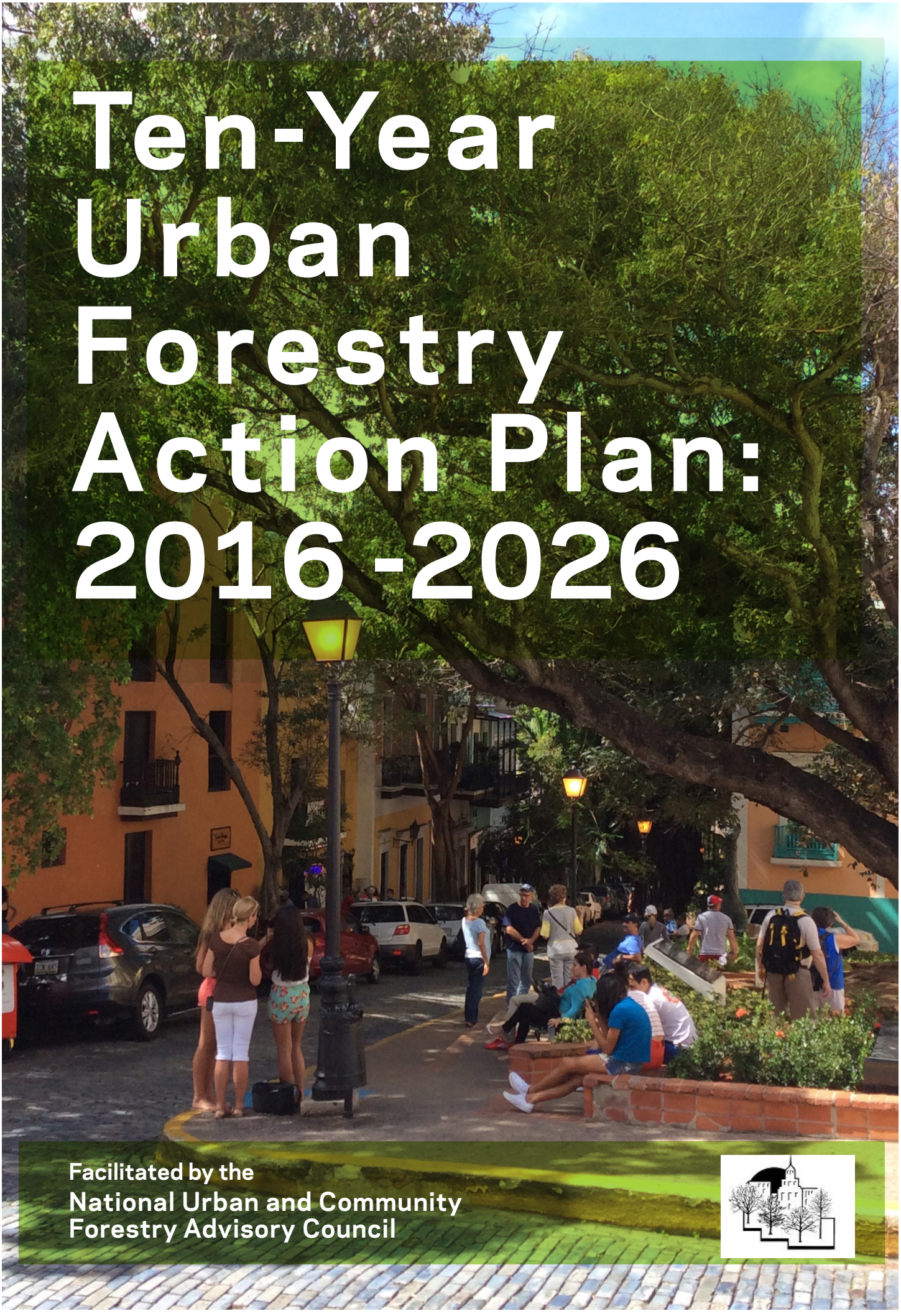
Ten-Year Urban Forestry Action Plan: 2016-2026



Facilitated by the
National Urban and Community
Forestry Advisory Council

The U.S. Forest Service (Forest Service) works across our nation's forested lands to proudly serve the citizens of United States and its territories. We continue our mission as we announce the release of the National Urban and Community Forestry Advisory Council's (NUCFAC) 2016- 2026 Ten Year Urban Forestry Action Plan. The plan complements the Forest Service's Strategic Plan, and will serve as a reference guide for all communities, stakeholders and individuals interested in the development and management of their urban and community forests.

This plan was developed by national cooperators and interested stakeholders in partnership with NUCFAC. We greatly appreciate our partnership with NUCFAC and the annual recommendations they present to the Forest Service and the Secretary of Agriculture.

NUCFAC worked closely with the American Forest Foundation to provide an extensive assessment of partners' current urban forestry activities. This plan reflects input from 1,000 stakeholders across the nation.

The last two decades of urban and community forestry actions have set the groundwork for the next ten years—including how urban forest systems provide vital services that sustain and improve the resiliency of our communities—economically, socially, and environmentally.

We invite you to read the Action Plan and see the opportunities that lie ahead for implementing its goals in the next ten years. Thanks go to the American Forest Foundation, the National Urban and Community Forestry Advisory Council, Forest Service staff, and our valued partners and cooperators for compiling this comprehensive document that captures past efforts, recognizes current issues and opportunities, and identifies goals and strategies to move urban and community forestry programs forward across the nation.

THOMAS L. TIDWELL, CHIEF

U.S. Forest Service

Dear Partners,

In 1990, the Food Agriculture Conservation and Trade Act amended the Cooperative Forestry Assistance Act to expand authorities for Urban and Community Forestry, ushering in a new appreciation of urban trees and creating the National Urban and Community Forestry Advisory Council. Countless seedlings have been planted thanks to that legislation, seedlings that have taken root and are now beginning to reach their full potential. And it's not just trees that have flourished over this period. Research, technology, public policy, professional management, citizen scientists programs, and stewardship in support of urban trees have grown tremendously as well, setting the stage for an unprecedented expansion of the social and environmental benefits associated with urban forestry.

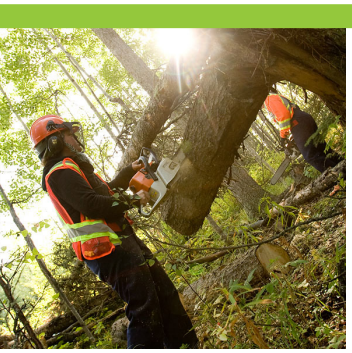
The 2016–2026 National Ten Year Action Plan that we introduce here, is built on sound principles and challenging goals, supported by rigorous science and research. Those principles, goals and benefits will not be realized without an investment commensurate with the enormous value of the urban forest. Even with a $2.4 trillion structural value delivering $17 billion in annual benefits, the urban forest remains an underappreciated asset. Increasing the annual investment in urban and community forestry to $85 million, as recommended in the plan, is an important first step towards unlocking its true value and one we all need to support.

The world has changed dramatically since 1990 and no one can be sure what the next twenty-five years has in store. We do know that urban communities will continue to grow and grapple with development and the impacts of climate change will be felt more keenly in our daily lives. Urban forestry, and the full range of ecosystem services it encompasses, responds to those challenges with a unique set of resources and attributes that can make communities across the country more sustainable, resilient and equitable. Thanks to contributions from thousands of people representing all corners of the urban forestry community and a talented consultant team, the 2016-2026 National Ten-Year Urban Forestry Action Plan offers an innovative, ambitious and comprehensive roadmap for creating a bright green future in the cities and towns where over 80% of Americans live and work. As members of the National Urban and Community Forestry Advisory Council, we are proud of this plan and embrace the opportunity it presents us. We urge everyone interested in a future where people and nature prosper together to join us in bringing this plan to life.

Sincerely,

Liam Kavanagh

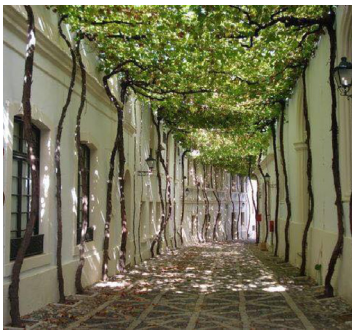
Chair, National Urban and Community Advisory Forestry Council











*Title page photo credit: Kathleen Wolf

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Table of Contents

*Also available as a separate document

Acknowledgments

We thank the USDA Forest Service for funding the development of the Ten-Year Urban Forestry Action Plan for the National Urban and Community Forestry Advisory Council.

We thank everyone who contributed to this plan—nearly 1,000 people across the nation overall. This Ten-Year Action Plan reflects the wisdom, experience, and aspirations of the urban forestry community. People contributed via emails, interviews, digital engagement, conference calls, focus groups, and conferences. (For more details on urban forestry community engagement, see Appendix 5.)

We give special thanks to the 26 thought leaders whose in-depth interviews shaped the identification of key issues, progress, challenges, and opportunities in the field (see Appendix 5). Data from the key issues shaped the foundation of the Action Plan.

We thank the USDA Forest Service for providing data from the "Community Accomplishment Reporting System" (CARS), which the IEN team used to assess the last ten years of urban forestry. The CARS data was useful as a starting point for this assessment. While the CARS data relies on self-reporting by hundreds of professionals in the field, it was an invaluable tool for this assessment. This Action Plan articulates the need for developing new robust methods for measuring progress in urban forestry, which will make future assessments easier and more comprehensive.

We give special thanks for the assistance and support provided by the following individuals, whose generous time, thought, and experience shaped this Action Plan.

Project Team: For ongoing guidance and Action Plan development

- Kathy McGlauflin, American Forests Foundation, project oversight and contract management, expertise in Urban and Community Forestry education programs
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- Jennifer Cotting, University of Maryland Environmental Finance Center, finance and costing
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- Mark White, Ph.D., University of Virginia McIntire School of Economics, economic finance and costing

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Action Plan Funding Needs

- Jennifer Cotting, University of Maryland Environmental Finance Center, finance and costing
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*Please note that the bibliographies for each Goal section may be found at the end of the Action Plan, and additional actions, programs, tools, resources, and resources for each goal may be found in the Appendices, as well as other key information.

Photo credit: Kristina Brezanso

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- Robert Ruano, President, Ecostrata Services, Inc.

Executive Summary

The National Ten-Year Urban and Community Forestry Action Plan is developed by and for the urban forestry community. The Plan's purpose is to expand awareness of the benefits that our urban forests, as a green infrastructure system, provide to communities throughout the nation, and increase investments in these urban forest resources for the benefit of current and future generations. The Plan provides specific goals, actions, and recommendations for improving the status of urban and community forestry for the United States and its territories. The Plan also identifies research needs, messaging and communications needs, and innovative funding and collaborative opportunities for urban forestry initiatives. Notably, this Plan also serves as a framework for funding and recommendation priorities to be developed by the National Urban and Community Forestry Advisory Council (NUCFAC) for the USDA Forest Service's National Urban and Community Forestry program and the program's National Challenge Cost Share Grants. The urban forestry community, including the USDA Forest Service and other applicable Federal agencies, are to use the Action Plan as a guide to implement and expand urban and community forestry for the next ten years (2016 -2026).

Plan Vision

Urban and Community Forests Increase Sustainability, Wellness, and Resilience in All Communities.

Plan Mission

Help All Communities Create Urban and Community Forests that are Diverse, Healthy, and Accessible for All Citizens.

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

A: Support inclusion of trees and forests as elements of all community comprehensive and master planning efforts.

B: Support the integration of urban forestry into all scales of city, regional, and state-scale master plans.

C: Launch a public awareness and education campaign to elevate recognition of the value of urban trees and urban forests ecosystems as essential contributors to community sustainability and resilience.

D: Increase community capacity to use urban trees and forestry in public space planning, infrastructure, and private development.

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

A: Expand opportunities for collaboration with the health community.

B: Champion a nationwide marketing campaign that links trees to human health and wellness.

C: Plan, design and manage urban forests to improve human health and wellness.

D: Develop tools to improve and highlight the relationship between improved public health, wellness, and urban and community forestry and green infrastructure.

Goal 3. Cultivate Diversity, Equity, and Leadership Within the Urban Forestry Community

A: Increase diversity, equity, and accessibility in urban and community forestry.

B: Engage underserved communities in urban and community forestry.

C: Develop effective leadership at all levels to build a national voice for urban forestry.

D: Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.

E: Promote expanded collaboration, training and communication within the field of urban and community forestry to build workforce professional development.

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

A: Increase the biodiversity, health, and resilience of trees in urban and community forests.

B: Foster resilience, restoration, and sustainability of urban and community forests facing climate change challenges.

C: Support use of urban forests for increasing community food resilience and access to local foods.

Goal 5. Improve Urban and Community Forest Management, Maintenance, and Stewardship

A: Improve urban and community forest management, maintenance, and arboricultural practices.

B: Develop comprehensive programs, policies, and resources for enhancing urban forestry stewardship.

C: Promote better use of technology and tools in urban forestry.

D: Facilitate expanded research and delivery of scientific findings to all stakeholders. (See Research Needs)

Goal 6. Diversify, Leverage, and Increase Funding for Urban and Community Forestry

A: Increase funding and grants for urban and community forestry.

B: To leverage and diversify funding, expand collaboration between urban forestry and related fields, agencies, and sectors.

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

A: Create environmental education programs that focus on urban and community forestry issues.

B: Create a nationwide urban forestry public awareness and education campaign.

C: Increase engagement of undeserved and minority communities in urban forestry establishment and stewardship.

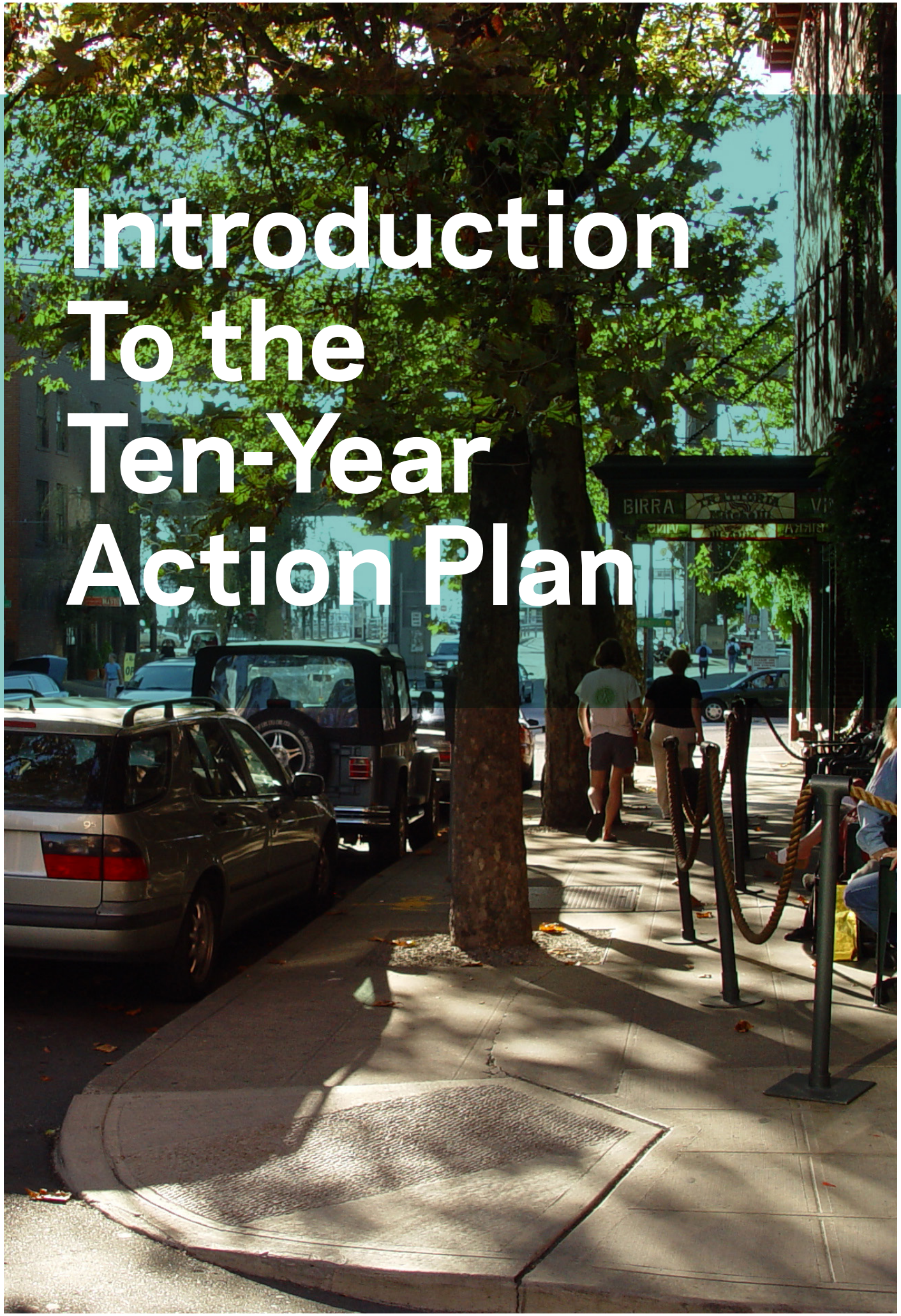


Photo credit: Guy Kramer

Introduction To the Ten-Year Action Plan

Overarching Principles

1 Advance Health and Wellness of Forests, Ecosystems, and People

Public and private health costs, for the full range of preventive to curative health services, are soaring, now representing about 18% of U.S. Gross Domestic Product. Daily environmental settings are important contributors to positive health outcomes, and urban and community forests are a crucial and cost-effective tool that the nation can use in the next ten years to address major public health challenges. Human and natural systems are interconnected and synergistic, and actions that improve one naturally leads to an improvement in the other. However, trees, forests, and green spaces are not self-managing and will require consistent and thoughtful maintenance and stewardship over the next ten years to assure ecosystem health. These improvements in urban and community forest health will also improve human health and wellness as highlighted under Action Plan Goal 2.

2 Maximize Community and Ecosystem Sustainability

Sustainability, as defined by the 1987 Brundtland Commission, is now commonly understood as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability has become a core tenet of 21st century community development and planning, noted by the many community sustainability plans across America. To achieve sustainability, all three legs of the "sustainability stool" – environmental, social, and economic – must be equally strong. In the next decade, as communities develop strategies to manage local ecosystems, improve local quality of life, and strengthen local economies, urban and community forestry offers a core cost-effective tool for achieving all three. Sustainability is woven throughout this plan by growing community forests across the nation in size, diversity, and health and creating tools and technologies that enhance effective citizen maintenance and stewardship.

3 Build Community and Natural Ecosystem Resilience

Resilience is a central element in the Action Plan, reflecting the need for urban and community forests to help address the rising stressors on communities from natural, human, and economic pathways. Resilience is defined as a community's ability to recover from a stressor in a way that equals or surpasses its previous condition. Urban and community forestry is a core contributor to community and natural ecosystem resilience, as it provides an important "buffering" capacity against multiple natural, social and economic stressors. Thus, to increase overall community and natural resiliency, this plan envisions the need to increase urban and community forestry resiliency itself. This theme is expressed in the plan's strategy to build forest biodiversity and health, as well as community leadership, consistent and diversified funding, equitable access to the benefits of our forests, diversification of the profession, and increased public engagement and social networks.

Action Plan Goals

1. Integrate Urban and Community Forestry into All Scales of Planning
2. Promote the Role of Urban and Community Forestry in Human Health and Wellness
3. Cultivate Diversity, Equity and Leadership within the Urban Forestry Community
4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience
5. Improve Urban and Community Forest Management, Maintenance and Stewardship
6. Diversify, Leverage and Increase Funding for Urban and Community Forestry
7. Increase Public Awareness and Environmental Education to Promote Stewardship

Action Plan Research Needs

Science, analytics and metrics are essential for effective and efficient operations of all urban built and natural systems. In recent decades urban forest planning, planting, and management have evolved from being informed by expert experience to adoption of widely shared, evidence-based best practices. Tree planting practices that promote longer lived, healthier trees have emerged from decades of arboriculture science. Full city assessments of tree canopy and tree inventories, used by many urban forest managers and their collaborators (such as community non-profits), have become a standard data set from which to set policy, create management plans, and sustain programs.

> **Scientists representing many disciplines have discovered the functions and benefits that trees and urban forest ecosystems provide for urban residents.**

In addition, scientists representing many disciplines have discovered the functions and associated benefits that trees and urban forest ecosystems provide for urban residents. Original research has been used to construct analytic models (such as i-Tree) that define and reveal ecosystem services (such as air quality, stormwater management, and human health) to help citizens and decision makers understand why investing in the urban forest is important.

This report presents a framework of research needs for urban forest ecosystems and metro nature for the next decade. The recommendations were derived from extensive document review, interviews with scientists, and listening sessions with national representatives of local communities and organizations. It should be noted that not all of the research needs align directly with the program goals and strategies of the core Action Plan. Nonetheless, the science recommendations, in total, continue the development of a knowledge base that demonstrates why and how urban forest ecosystems are essential in all cities.

Research Needs

What are the key science needs? What are the research questions that synchronize with the guiding principles? Distilled from a multi-modal national outreach, each Research Need is described in greater detail, with listed science strategies, in the pages that follow.

A Understand Ecosystem/Ecological Services

B Promote Human and Community Health

C Planting, Inventory, and Analysis for Forest and Environmental Health

D Prepare for Pests, Threats, Climate and Associated Changes and Risks

E Enable Civic Stewardship and Improved Local Governance

F Integrate Knowledge Networks and Data for Urban Socio-Ecological Systems

Guiding Principles

In order to deliver the greatest return for the nation's investment in urban socio-ecological studies, new research initiatives must carefully consider the full field of science opportunities. Several key ideas should guide decision making and implementation concerning future research and assessments:

- Means to the End - Build Local Capacity
- Build on Strength and Explore New Needs
- Replicate and Confirm
- Expand and Connect Science from Local Needs to National Programs
- Synthesize and Amplify Existing Knowledge

The Research Needs and Guiding Principles, explained in greater detail in this report, generally support the core Action Plan. Urban forestry program goals are supported by diverse, integrated research activity.

Action Plan Funding Needs

The development of strategies like the National Urban and Community Forestry Advisory Council's Ten-Year Action Plan result in important guiding documents for advancing urban and community forestry. These planning documents become even more powerful when they include a discussion of the resources necessary for implementation, as well as the benefits associated with these investments.

The landscape of urban and community forestry includes vast and intricately entwined layers of federal, state, local, nonprofit, and private sector organizations with little standardization in how funding investments and benefits are scaled, recorded, tracked, and communicated. Attempting to assign a line item cost to the activities associated with each of the Action Plan's seven goals and build a "from the ground up" overall cost estimate with the data currently available would have required a level of extrapolation, estimates, and assumptions that could potentially impact the credibility and integrity of the Plan as the data is not currently available to support this.

Considering just a few of the additional needs outlined in the Ten Year Action Plan where cost estimate data is available suggests annual funding needs in the range of approximately $85 million.

Two existing trends tied closely to urban and community forestry, however, offer an intriguing proxy for developing a ten-year funding needs estimate that adapts current and advocated funding levels to the anticipated increased urban land area demand scenarios.

The United States is rapidly becoming more urban. It is estimated that in the first half of the 21st century, urban land in the United States will increase to 8.1% of total land, or an area larger than the state of Montana. This rate of urban growth suggests, and feedback from participants received in the goal development process confirms, that integrating urban and community forestry into all levels of planning will be needed to sustain the ecosystem services and products growing urban population require, and this translates to a need for additional investment.[2]

The scope of urban forestry needs and the significance of urban forestry services appear to be increasing in communities. The number of communities receiving urban and community forestry assistance over the past ten years has remained relatively flat, yet current data indicates an almost 15% transition of these communities from "developing" their urban and community forestry program to actually "managing" these natural resources.[3] This suggests programs that may have been established as beautification efforts are gradually shifting to programs that focus on providing greater community services and ecosystem benefits.

Using urbanization as an indicator of at-minimum future needs, the analysis suggests the USDA Forest Service's Urban and Community Forestry program will require annual funding levels in the range of approximately $32 million. This funding is required just to maintain the existing level of service in the face of anticipated increases in urbanization and does not account for any desired increase in the level of service that may be associated with implementation of the Ten-Year Action Plan. Looking at a sampling of Action Plan activities that are above and beyond existing Urban and Community Forestry Program Budget, where reliable cost estimates were available, begins to suggest the scale at which the current level of urban forestry funding is insufficient. **Considering just a few of the additional needs outlined in the Ten-Year Action Plan where cost estimate data is available suggests annual funding needs in the range of approximately $85 million.** While the urban and community forestry community has proven highly effective at leveraging USDA Forest Service dollars with state, local, nonprofit, and private sector funding streams – in fact, some sources indicate a match of 2:1 or in many cases significantly more[4] – this estimate suggests that scale to which current funding is clearly insufficient.

The critical need to increase investment in urban and community forestry, or at the very least maintain existing levels, can be well-supported by a discussion of the multiple benefits derived; however, given the emerging state of ecosystem service benefits valuation and accounting, calculating return on funding investment applicable at a national scale is not currently possible. There is a strong body of existing research, technology-based tools, and ongoing initiatives within the urban and community forestry community that could inform the standardization process and be built upon, much of which owes its origins to USDA Forest Service support. What is lacking, however, is a consensus driven process for how these data points can be aggregated to a national, community of practice-wide scale. Broadly adopted standard metrics would allow for the systematic allocation of budgets and the ability to more precisely determine return on investment and future funding needs.

If urban and community forestry programs are to keep pace with urbanization and the resulting expanded need for urban forestry services, identifying, diversifying, and leveraging additional sources of funding will be needed. Being able to more precisely discuss true costs, ecosystem services, and associated benefits will enable urban and community forestry's strong network of implementers to better communicate the value of community impact and return on investment to the urban forestry community, external stakeholders, and the breadth of funding sources.

2 Nowak and Walton. Projected Urban Growth and Its Estimated Impact on the US Forest Resource

3 CARS data 2005 – 2014, See Table 1, in Appendix

4 Sustainable Urban Forest Coalition Fiscal Year 2016 House Interior Appropriations Testimony, March 25, 2015.

Who is the National Urban and Community Forestry Advisory Council?

The National Urban and Community Forestry Advisory Council (NUCFAC) is an appointed advisory council to the Secretary of Agriculture on urban forestry and related issues. The 1990 Farm Bill created NUCFAC to bring together the wide variety of voices raised about a common concern: the present health and future preservation of America's urban forests. NUCFAC was founded to synthesize the full spectrum of views into a consistent vision, as a foundation for practical policy on urban forestry. Current membership of NUCFAC can be found here:

NUCFAC Membership

The NUCFAC Mission

The Council is established to encourage all sizes of towns and cities to properly plant, maintain and preserve trees in greatly increasing number so that America's communities will have:

Enhanced energy savings; clean air and water; quieter streets and neighborhoods; stronger urban economies; and overall improved environment for all Americans.

Photo credit: Amigos de los Rios

NUCFAC's Purpose

Congress created the National Urban and Community Forestry Advisory Council in the 1990 U.S. Farm Bill to advise the Secretary of Agriculture on matters relating to the protection, planting, and care of trees and forests in our nation's cities and communities. The Council's specific purpose is to:

1 Develop a National Urban and Community Forestry Action Plan and every ten years thereafter. The Plan is to include:

- An assessment of the current status of urban forest resources,
- A review of urban and community forestry programs and activities, including education and technical assistance,
- Recommendations for improving the status of the nation's urban and community forest resources, including education and technical assistance;
    - A review of urban and community forestry research;
    - Recommendations for new and expanded research efforts; and
    - A summary of Research needs and an estimate of the funds needed to implement such research, on an annual basis, for the next ten years.
- Proposed criteria for evaluating proposed projects under the urban and community forestry challenge cost share grant program
- An estimate of the resources needed to implement the National Urban and Community Forestry Action Plan for the succeeding ten fiscal years

2 Evaluate how the Plan has been put into effect.

3 Develop criteria and recommendations for the USDA Forest Service's Urban and Community Forestry Challenge Cost Share Grant Program.

What are Urban and Community Forests?

Urban forests are trees for people, where they live, work and play. Each person has a different way of thinking about the urban forest. In this Action Plan, and for many professionals, the urban forest includes all trees in the city, on public and private property, and within the many land uses one finds in cities and towns - homeowners' yards, school campuses, tree-lined streets, government properties, parks, and green spaces.

Urban forests and vegetation are an urban ecosystem that is aesthetically pleasing, contributes to quality of life, supports community development and green infrastructure, and provides a wealth of benefits and values to cities and towns. Routine management is essential, and special care and practices are needed when trees are damaged following storms or other catastrophic events.

> **In this report, the urban forest includes all trees in the city, on public and private property.**

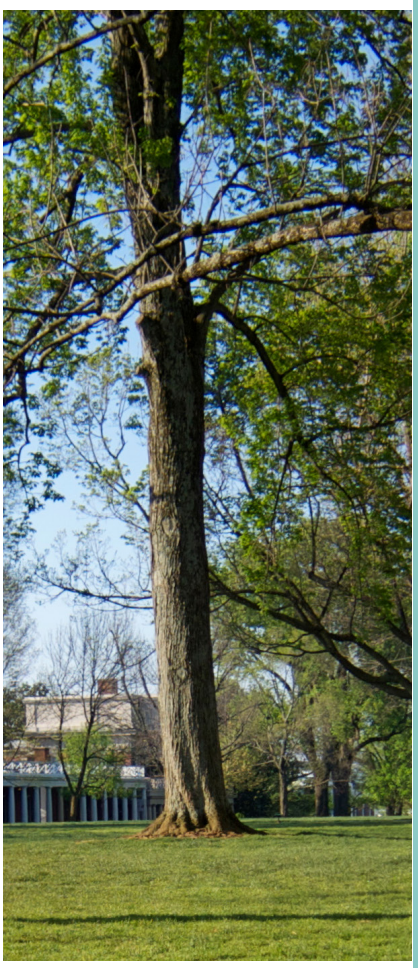
Why Should We Maintain These Forests?

Trees are important assets to communities of all sizes and geographies. They offer a core, cost-effective foundation for community and ecosystem health, strengthening green infrastructure, sustainability and resilience. Green infrastructure, including urban forests, provides many more benefits than gray infrastructure including improving stormwater management, protecting drinking water, reducing energy costs and stress, as well as creating a sense of place in communities. Like any other community asset, a community's forest requires ongoing care and stewardship.

An urban forest that is maintained will function the way it was intended, and thereby make a meaningful difference in protecting and enhancing people's lives, property, natural resource value, and community quality of life. The return on investment for community forests is demonstrably high, yet until this fact is widely understood, communities may continue to place higher priority on other assets. In the next ten years, urban and community forestry will need to build new 21st century solutions to the imperative for ensuring healthy, vibrant community forests. The time is now to invest in these assets.

> **If not properly maintained the health of trees can diminish and potentially become the source of risk and liability.**

This Plan envisions community forests supported by public and private tree professionals working in collaboration with local citizen stewards, who are in turn supported by local champions and leaders. It envisions collaborative partnerships and strategies that leverage funding for specific purposes, such as diversity and equity, targeted environment challenges, or climate resilience. While the shape of these partnerships and strategies cannot be predicted, civic engagement and stewardship will be core strategies that will ensure our urban forests make our communities sustainable and resilient.



How do Urban and Community Forests Benefit Us?

Environmental

The earliest research about tree benefits, dating back to the 1970s, has been about environmental services. Multiple studies across multiple regions in the U.S. show that having a well-maintained, high-quality urban forest contributes to better air quality and improved stormwater management. Strategically placed trees can reduce building energy use in hot climates, and reduce urban heat island effect which helps with improved air quality. These studies are the reason that some cities are using tree planting programs to meet the performance standards of clean air and water regulations.

Social

Improved Human Health and Wellness

More recent studies have found that having nearby nature, including trees, may be more important than trips to 'big nature' beyond the city for human health and well-being. Simply being able to see trees, parks, and gardens while in the city has been scientifically linked to faster healing in hospitals, reduced mental and physical stress, better student performance in school, and better attention to tasks while at work. Public health officials and healing centers, such as hospitals, are now starting to plan for urban nature as an important contribution to disease prevention and health promotion.

Better Communities

The urban forest creates environments that support quality of life and better human habitat. Tree-lined streets are more walkable, leading to more active and health lifestyles, rather than being accident risks. Carefully planned roadside tree plantings can reduce both the number of traffic accidents, and severity of injury for car and pedestrian or cyclist crashes. Some studies indicate that well-managed vegetation in neighborhoods may reduce both personal and property crime. Finally, having a well-managed tree canopy can create business districts that attract shoppers, and commercial centers that attract the best talent and workers.

Economic

When thinking of trees and economics, many people will think of timber harvest, lumber, plywood, and other forest products. But the highest economic values of trees in cities are from living, thriving trees! Valuation studies for urban forest benefits are the most recent field of research. If we think about all the benefits described above, the return-on-investment potential becomes obvious. Research confirms cost savings for trees as green infrastructure, including reduced investments in air and water quality 'gray' infrastructure. Recent monetizations of health benefits show cost savings across the human life cycle from children to elders. Finally, numerous studies show increased property values associated with having nearby trees and parks, and these values can be converted to local government revenues to support tree programs.

Ten-Year Progress Overview

Americans Understand Threats Facing American Forests

Public awareness and understanding around the need for and benefits of urban and community forestry is one of the greatest opportunities for support for improving the health of urban forestry in the coming decade. Based on a nationwide survey of voters to assess key public perceptions and values related to forests, voters report strongly valuing the nation's forests for its sources of clean air and water (Public Opinion Strategies, 2011).

92 percent of voters surveyed believe that helping to keep the air clean is at least a "very" important benefit of forests, including 58 percent who believe it is "extremely" important.

A nearly identical 91 percent of voters assign similar importance to forests' role in filtering water to keep it clean.

Two-thirds of voters (67 percent) say they live within ten miles of a forest or wooded area.

At least three in five voters see major threats to forests from wildfire, development, and insects and diseases.

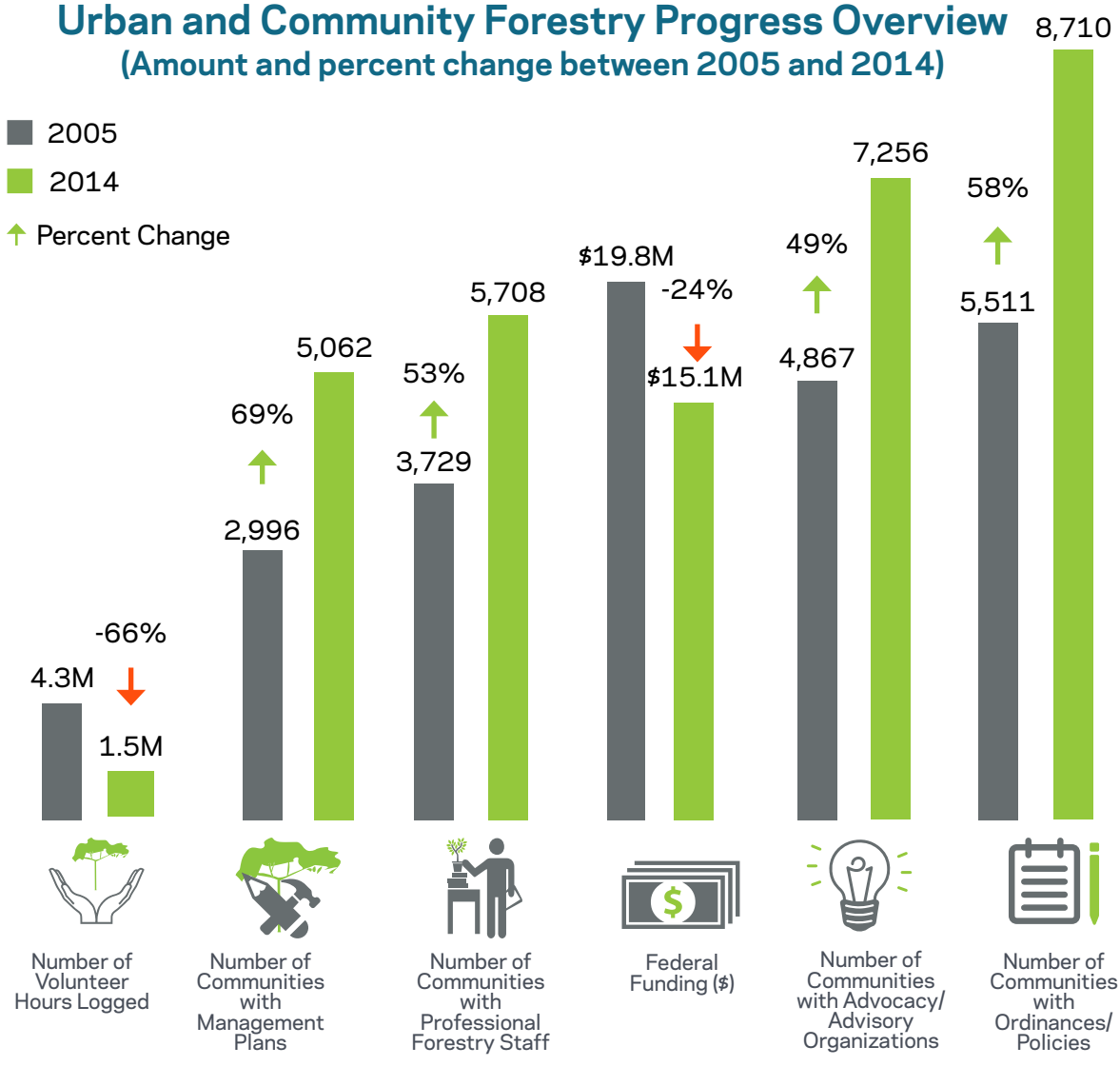


Figure 1: USDA Forest Service Federal Program: Urban and Community Forestry Assistance Program, Community Accomplishment Report System for Urban and Community Forestry (CARS)

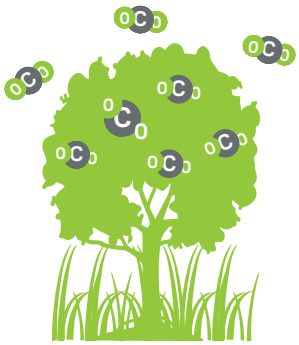
Urban Forests Save Us Money

$6.8 Million

Using the iTree software, the city of Minneapolis calculated that not only had they saved approximately $6.8 million in energy expenditure by planting trees, but they had also increased property values by $7.1 million (City Of Minneapolis, Minnesota Municipal Tree Resource Analysis).

i-Tree

By understanding the local, tangible ecosystem services that trees provide, i-Tree users can link urban forest management activities with environmental quality and community livability [USDA Forest Service]



22.8 Million Tons/Year

Based on the field data of 10 USA cities and a national urban tree cover data, it is estimated that urban trees in the contiguous USA currently store 708 million tons of carbon (tC) ($14,300 million value) with a gross carbon sequestration rate of 22.8 million tC/year ($460/million per year) (Nowak et al. ,2002).

$2.4 Trillion

Nationally, urban forests in the United States are estimated to contain about 3.8 billion trees, with an estimated structural asset value of $2.4 trillion (Nowak et al., 2002).*

*Note: Structural asset value is based, in part, on extrapolations of estimated replacement costs of trees of the same size, condition, species, and location.

Investment Return: $1.37 - $3.09

A study on the value of street and park trees in five U.S. cities found that for every dollar invested in urban tree management resulted in benefits valued between $1.37 to $3.09 annually (McPherson, et al., 2005).

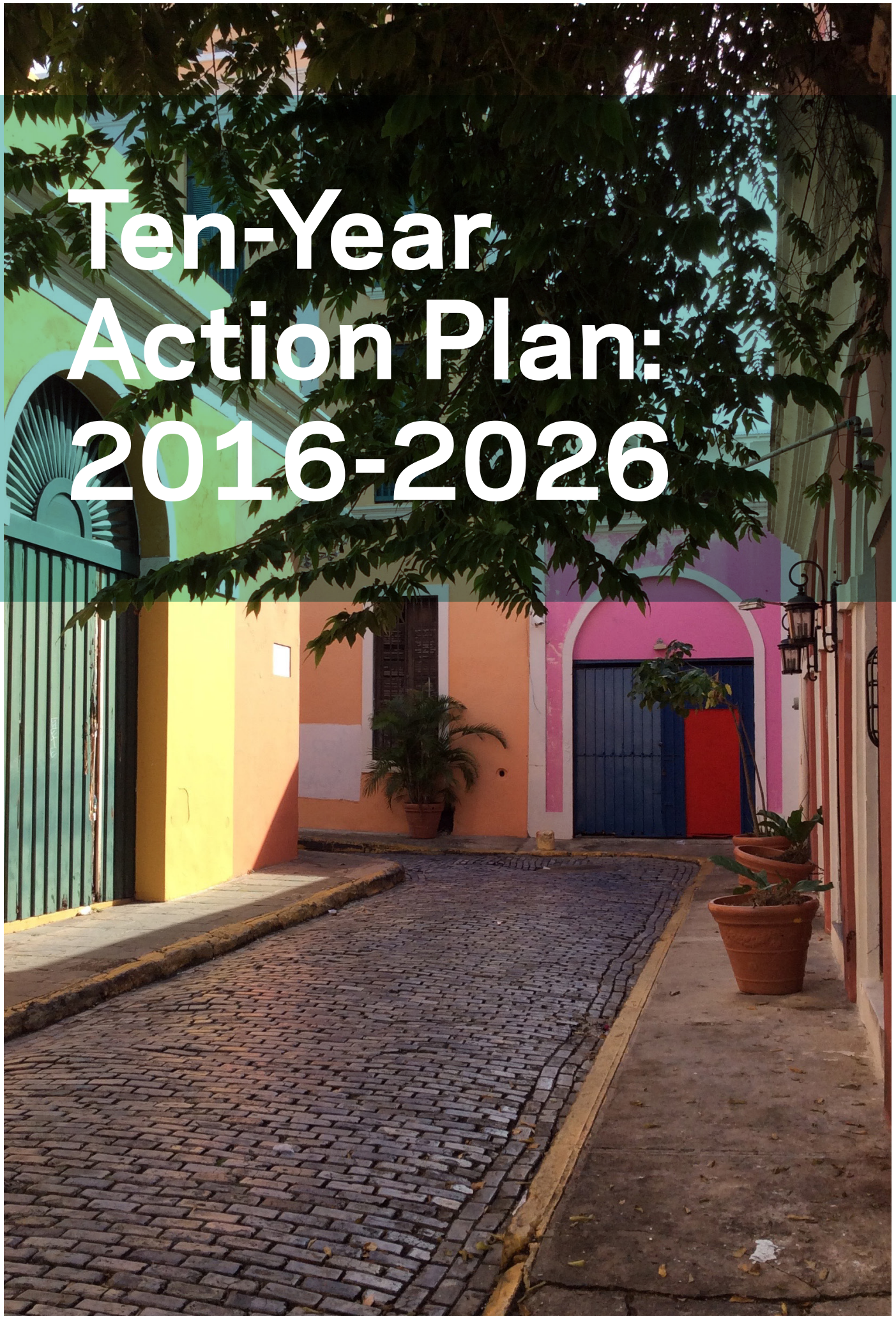


Photo credit: Kathleen Wolf

Ten-Year Action Plan: 2016-2026

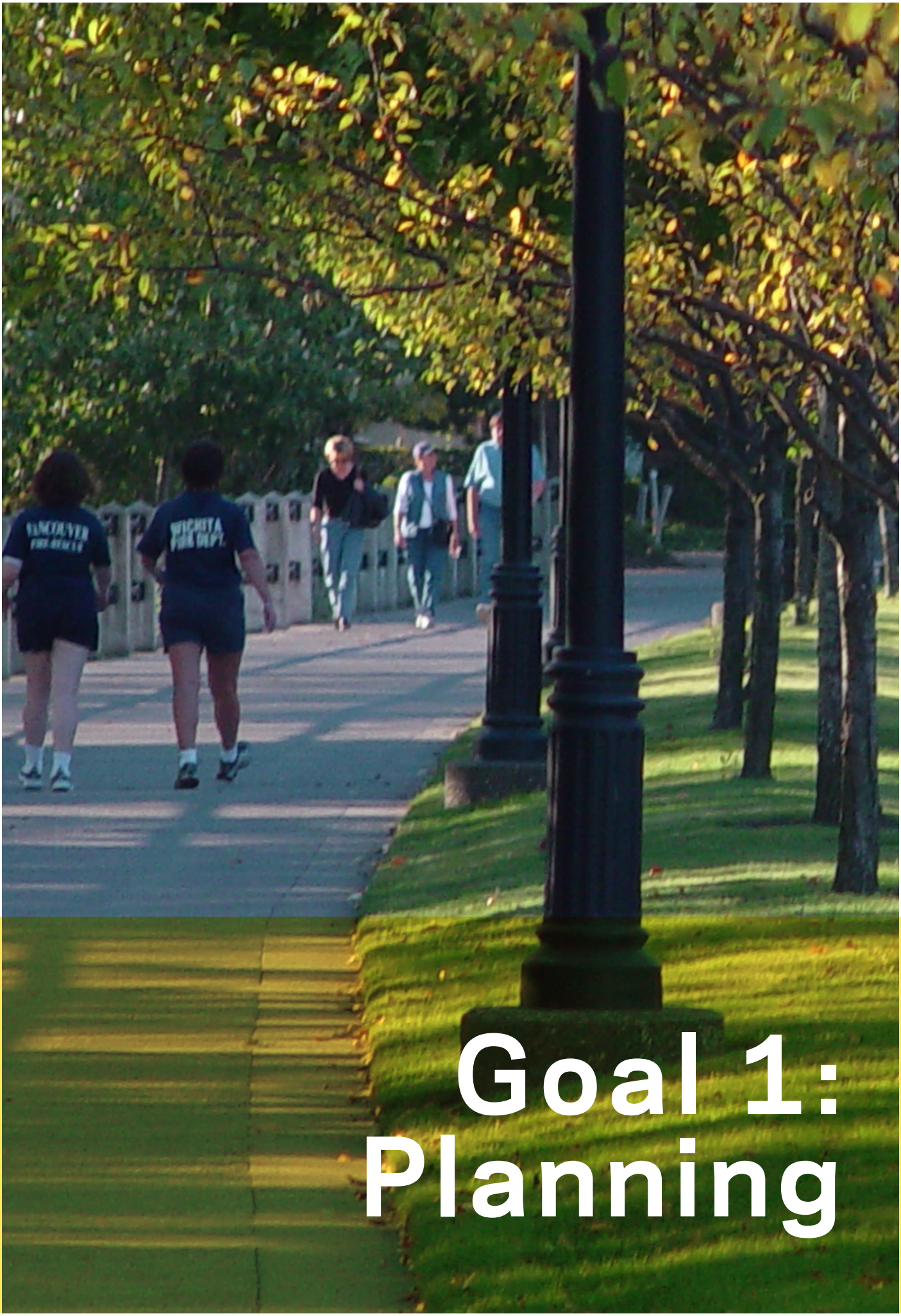


Photo credit: Guy Kramer

Goal 1: Planning

Goal 1
Integrate Urban and Community Forestry Into All Scales of Planning

For the full range of human and environmental benefits of urban forest systems to be realized, cities need to be planned with natural systems as a core feature of community infrastructure, instead of an afterthought, for optimal communities' future growth, health, and well-being. Urban and community forestry systems are an important integral component at all system levels: neighborhood, local, community, regional, watershed, and bioregional. For maximum effectiveness and benefit, urban and community forestry systems need to be planned and managed at the community, state, and regional scales as well as integrated into other city systems, such as transportation, housing, and infrastructure.

Strategy A

Support inclusion of trees and forests as elements of all community comprehensive and master planning efforts.

Strategy B

Support the integration of urban forestry into all scales of city, regional, and state-scale master plans.

Strategy C

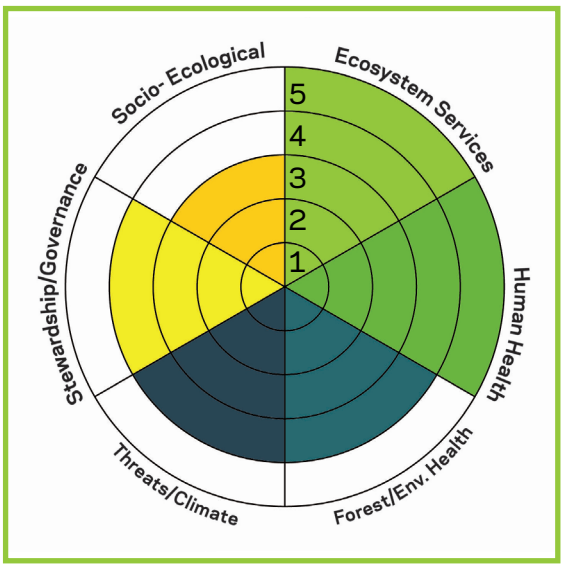
Launch a public awareness and education campaign to elevate recognition of the value of urban trees and urban forests ecosystems as essential contributors to community sustainability and resilience.

Strategy D

Increase community capacity to use urban trees and forests in public space planning, infrastructure, and private development.

Relevant Research Needs

Urban planning is informed by analytics of all systems, including transportation, housing, and utility service. Urban forest ecosystems science, past and future, provides the data and robust analytics that enable living natural resources to be integrated with other planned systems. Research needs aimed at better understanding of forest health, threats and resilience, and knowledge networks can provide the working knowledge to sustain urban natural resources systems in cities. In addition, research needs addressing better understanding of ecosystem services and human health help local officials recognize that the urban forest is an essential dimension of the city, deserving of investment and administrative support across city departments.



Research Needs Connected to Goal 1

Implementation Targets

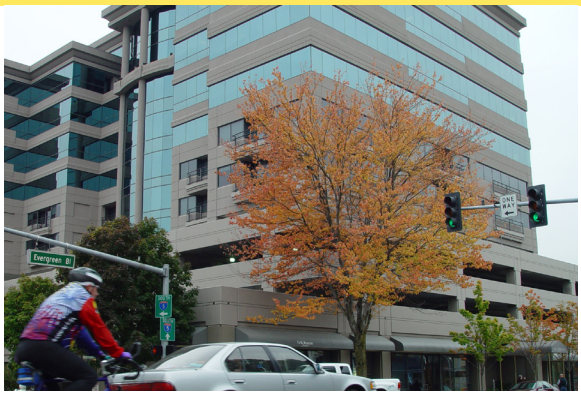


Photo credit: Guy Kramer

1. A suite of regional planning tools are developed and disseminated to assist and encourage regional planning that integrates urban forestry into planning efforts.
2. Criteria and benchmarks for measuring sustainability are made available to cities and communities.
3. A standard measure for urban forestry and green infrastructure benefits is adopted and disseminated for widespread use.

Why is it Important?

Figure 1.1

$4.7 Billion **Estimated savings by metropolitan Washington D.C. in stormwater management construction costs every 20 years.**

The estimated amount saved by Washington D.C. in stormwater management. The region boasts a tree canopy of 46 percent that reduces stormwater retention needs by 949 million cubic feet, saving an estimated $4.7 billion in construction every 20 years (Schwab, 2009).

45% **Costs reduced by integrating green infrastructure into plans.**

By incorporating green infrastructure into planned capital improvement projects, versus ad hoc implementation, the City of Lancaster, PA reduced implementation costs by 45 percent (Environmental Protection Agency, 2014).

$1 Million **Estimated amount saved by Frederick, Maryland from the cooling benefits of trees.**

The estimated amount saved by Frederick, Maryland from the cooling benefits of trees. Residents collectively save $1 million per year from existing trees, and with more strategically placed trees; the city would save an addition $2 million per year (Schwab, 2009).

Figure 1.2

Figure 1.3

$1.95 Billion **Real dollar benefits of planting trees.**

Los Angeles' Million Trees Initiative provides an estimated $1.3 to $1.95 gross billion dollars in ecosystem benefits over a 35-year period (McPherson, Simpson, Xiao, & Wu, 2011).

In the past ten years...

Photo credit: Amigos de los Rios

We've done a good job

Over the last ten years urban and community forestry has made significant inroads in the realm of community planning. Community leaders now frequently consider their tree canopy and urban forests in planning efforts, whereas ten years ago many did not see the need or relevance. The following is a summary of gauges of progress made in the last decade (2006-2016) which demonstrate increased integration of urban forestry into different scales of planning:

• The number of communities with forestry management plans has risen by 70 percent, and 10 percent more of the nation's population is living in communities with management programs. These numbers vary by region with the Pacific Northwest and Hawaii leading the way (CARS, 2005-2014).

• Community tree policies and ordinances are on the rise, with a 58 percent increase since 2005. New York, Hawaii, and Puerto Rico have experienced the greatest increase in ordinances and policies (CARS, 2005-2014).

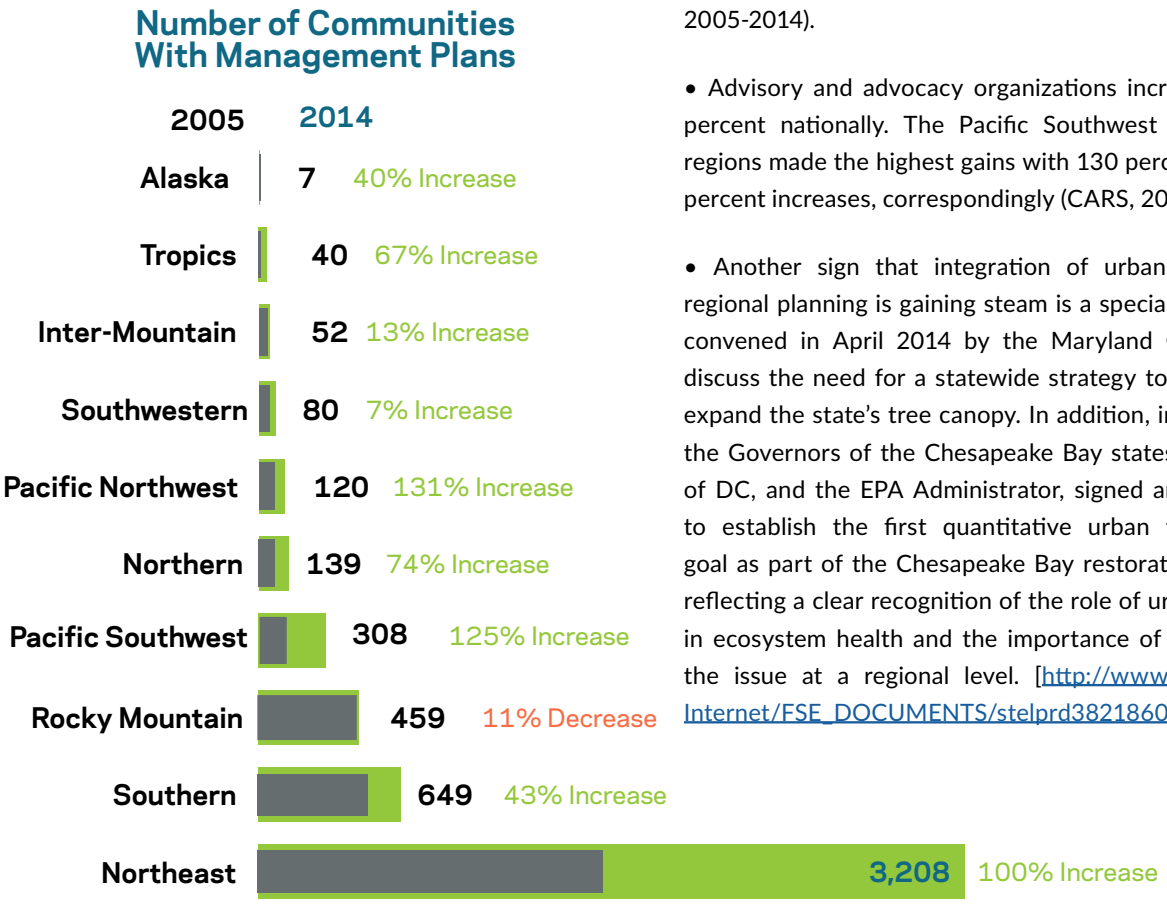


Figure 1.4 : Data drawn from CARS, 2005-2014

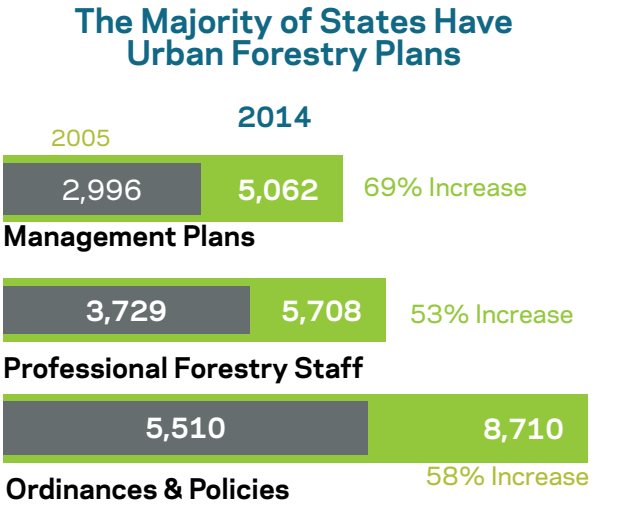


Figure 1.5: Data drawn from CARS, 2005-2014

• The demand for urban forest managers in communities is reaching an all-time high, with an additional 2,000 communities now using professional forestry staff (CARS, 2005-2014).

• Advisory and advocacy organizations increased by 49 percent nationally. The Pacific Southwest and Tropics regions made the highest gains with 130 percent and 500 percent increases, correspondingly (CARS, 2005-2014).

• Another sign that integration of urban forestry in regional planning is gaining steam is a special Roundtable convened in April 2014 by the Maryland Governor to discuss the need for a statewide strategy to protect and expand the state's tree canopy. In addition, in June 2014, the Governors of the Chesapeake Bay states, the Mayor of DC, and the EPA Administrator, signed an agreement to establish the first quantitative urban tree canopy goal as part of the Chesapeake Bay restoration strategy, reflecting a clear recognition of the role of urban forestry in ecosystem health and the importance of approaching the issue at a regional level. [http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3821860.pdf]

In the next ten years...

We still have a lot to do

Although communities with urban forestry management programs have grown significantly, not even half of the nation (only 47 percent) lives in communities that are managing programs to plant, protect, and maintain their urban forests. (CARS, 2005-2014). In fact, the 2010 Statewide Forest Resources Assessment found the gap in management plans and data to be the top urban and community forestry challenge. Further, some regions have lost community tree ordinances and policies. For example, the Southwest region experienced a 10 percent drop in urban and community forestry ordinances and policies from 196 to 177, while Kentucky reported a decrease of 43 percent. Declines such as this can often be attributed to increased tracking accuracy in CARS.

> **Less than half of America (47 percent) lives in communities with programs to plant, protect and maintain their urban forests.**

The goal of integrating urban forestry into plans is a tremendous opportunity for greater inclusion in the programs, tools, and resources developed in the last decade (see Appendix 1 for urban forestry programs, tools and resources). Of the 54 programs assessed, integration of urban forestry into all scales of planning is mentioned by 20 percent (11 programs). Of 61 tools assessed, integration of urban forestry into all scales of planning is mentioned by 5 percent (3 tools). This suggests there is a significant opportunity, reflective of the growing awareness and need for urban forest planning at the regional and state scales, for development of tools and programs to foster the integration of urban forestry into local, regional and state-level planning.

> **41 percent of Americans report that "more needs to be done" to manage and protect forests and trees in their state.**

Expansion of community tree canopy also has great potential and is critical to document now so communities can create base data to measure the health of our urban forests.

In the coming decade, as the nation grapples with the impacts of climate change and the need to offset heat island effects from the continuing growth of gray impervious infrastructure, tree canopy cover will be increasingly important to communities as a cost-effective tool to offset these impacts. In 2009, Schwab estimated that impervious surfaces had increased by 20 percent over the past twenty years, costing taxpayers more than $100 billion. American Forests reports that, using the i-Tree tool, current U.S. urban forests offset the impacts of community development and climate change through cooling temperatures, removing pollutants, respiration, avoided emissions, and more, to the tune of saving 15.6 billion dollars per year, or $760 per acre of tree cover.

Lastly, while more communities have urban forestry ordinances and policies, there is still room for significant advancement in policies that include community forestry as a core tool to address emerging challenges. For example, states such as Hawaii (2007), Minnesota (2007), and California (2006) are mandating reductions in greenhouse gases. Trees and urban forests are recognized cost-effective tools for this effort. California's bill requires a reduction in greenhouse gas emissions to 1990 levels by 2020, and its strategy includes urban forestry as an explicit tool in many key recommended actions, such as creating a Forest Carbon Plan and expanding urban forestry and green infrastructure programs and investments, particularly in California's environmental justice communities. As more states follow this path, communities will address their increasingly complex challenges with plans that recognize urban forestry as a vital tool.

Tree cover in urban areas in year 2000*

*Understanding that all states have different climate conditions and urban forest potential

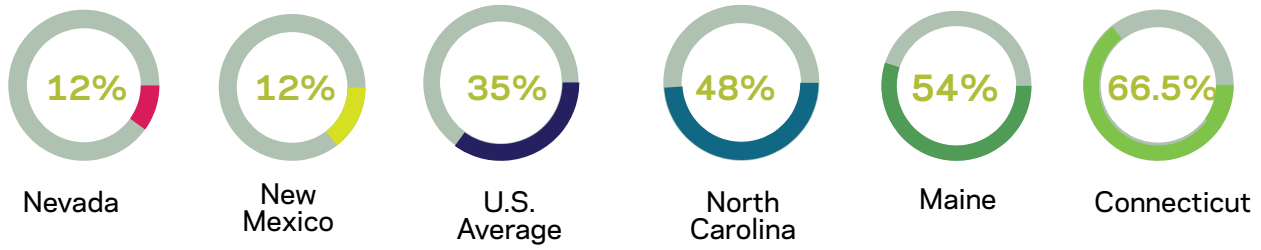


Figure 1.6: Data drawn from Dwyer, Nowak, Noble, & Sisinni, 2000

How can we get there?

Goal 1 Strategies and Actions

Strategy A: Support inclusion of trees and forests as elements of all community comprehensive and master planning efforts.

- ☐ **Action 1:** Create measurable targets for optimal urban forest health, site preparation, and Best Management Practices (BMPs), such as the SITES certification, to be an integral part of a city's planning process.
- ☐ **Action 2:** Train existing foresters to become part of the decision-making process at the local level.
- ☐ **Action 3:** Champion inclusion of trees in all community comprehensive or master plans, and develop benchmarking for sustainability goals.
- ☐ **Action 4:** Support urban forestry development and planning that reflects available and projected water resources.

Strategy B: Support the integration of urban forestry into all scales of city, regional, and state-scale mater plans.

- ☐ **Action 1:** Support collaboration to develop a national hierarchical planning template that integrates urban forest ecosystems (natural resources) into regional, state and local planning.
- ☐ **Action 2:** Facilitate development and implementation of regional urban forestry master plans that foster connectivity of green spaces and address the region's specific human health, equity and environmental health issues.
- ☐ **Action 3:** Assess and assist State Forestry Agencies' updates of their State Comprehensive Plan and State Forestry Action Plans to integrate a natural resources/ urban forest /green infrastructure component as needed.
- ☐ **Action 4:** Support use of site-appropriate species in regional urban forests, with a focus on species that are adaptable to climate change threats, can foster resilience, build biological diversity, and are resistant to insect and disease damage.
- ☐ **Action 5:** Facilitate development of model zoning codes, policies, and maintenance requirements that support resilient urban forests at the regional and community scale.
- ☐ **Action 6:** Encourage tracking and monitoring of progress of urban forest health on a regional, community and neighborhood scale.

Strategy C: Launch a public awareness and education campaign to elevate the value of urban trees and urban forests ecosystems as essential contributors to community sustainability and resilience.

- ☐ **Action 1:** Develop and implement key messages to communicate the importance of having one comprehensive regional master plan that includes urban forests.
- ☐ **Action 2:** Facilitate educational workshops at national conferences that build capacity for the integration of urban forest planning and management into regional master plans.
- ☐ **Action 3:** Partner with regional-focused groups and organizations to help promote integration of urban forestry into all levels of planning.

Strategy D: Increase community capacity to use urban trees and forestry in public space planning, infrastructure, and private development.

- ☐ **Action 1:** Develop training opportunities in urban forestry for planners (e.g., through American Planning Association (APA) chapters), for communities that don't have an urban forester.
- ☐ **Action 2:** Promote the use of trees and urban forests for effective stormwater management, wastewater treatment, and green infrastructure.
- ☐ **Action 3:** Identify financing opportunities for urban forest ecosystems for local, regional, state, and national elected officials and community leaders.
- ☐ **Action 4:** Develop assessment tools and conservation strategies to protect existing urban woodlands and create urban forests, parks, and open spaces.

See Appendix 3 for the full suite of actions related to Goal 1.

Case Study: Best Practices for Tree Ordinances

In 2009, the American Planning Association developed a document "Planning the Urban Forest: Ecology, Economy, and Community Development" (Schwab, 2009). Through a collaborative process with foresters and planners, they identified lessons and strategies for integrating urban forestry into the planning process. In that report, planners and urban foresters identified ordinance best practices, two of which are provided below. For the full set of best practices go here.

- Leverage tree planting by linking trees to good community development practices, such as new urbanism, smart growth, low-impact and conservation development, walkable neighborhoods, multimodal transportation systems, and transit-oriented development.
- Ensure that trees are maintained and that maintenance is enforced. For example, an ordinance that states that "all tree, landscaping, and vegetative buffering requirements should be part of a checklist used in the final site plan approval process before a certificate of occupancy can be granted", is likely to ensure enforcement.

Photo credit: Mike Kuhns

Case Study: Philadelphia Integrates Urban Forestry to Address Stormwater Overflows

Like more than 800 other communities nationwide, according to a report by Valderrama, each year Philadelphia's rainwater rushes off impervious structures and strains the city's combined sewer system, causing approximately 13 billion gallons of untreated sewage mixed with polluted runoff to cause overflow issues. To alleviate this, Philadelphia's Green City, Clean Waters created a 25-year plan to protect and enhance local watersheds using green infrastructure. Their ambitious goal, to transform 10,000 acres of impervious area into green spaces, required numerous partners as well as new regulations and zoning. The City's 2015 annual report indicates that since 2007 the city has successfully transformed 1,455 acres into green spaces. Without the regional plan and partners, none of this would have happened.

Photo credit: forestsforwatersheds.org

Case Study: Intertwine Alliance Creates Regional Plan Integrating Urban Forestry

The Intertwine Alliance, a unique coalition of more than 120 public, private and nonprofit organizations in the Portland/Vancouver region, created a Regional Conservation Strategy that integrates urban forestry into its vision and Action Plan. To provide significant nesting opportunities for avian species, the Alliance envisions "a healthy urban forest canopy that contributes to improvements in stormwater management and air quality". An exemplary part of the Strategy is Chapter 3, which outlines how it fills the gaps and integrates with existing local, regional, state, and federal plans. The Strategy identifies priorities of mutual interest, while providing a snapshot of relevant environmental laws and other federal information pertaining to the region's Federal lands. (Source: http://theintertwine.org/Conservation)

Focus Area > 40th Street Station Area

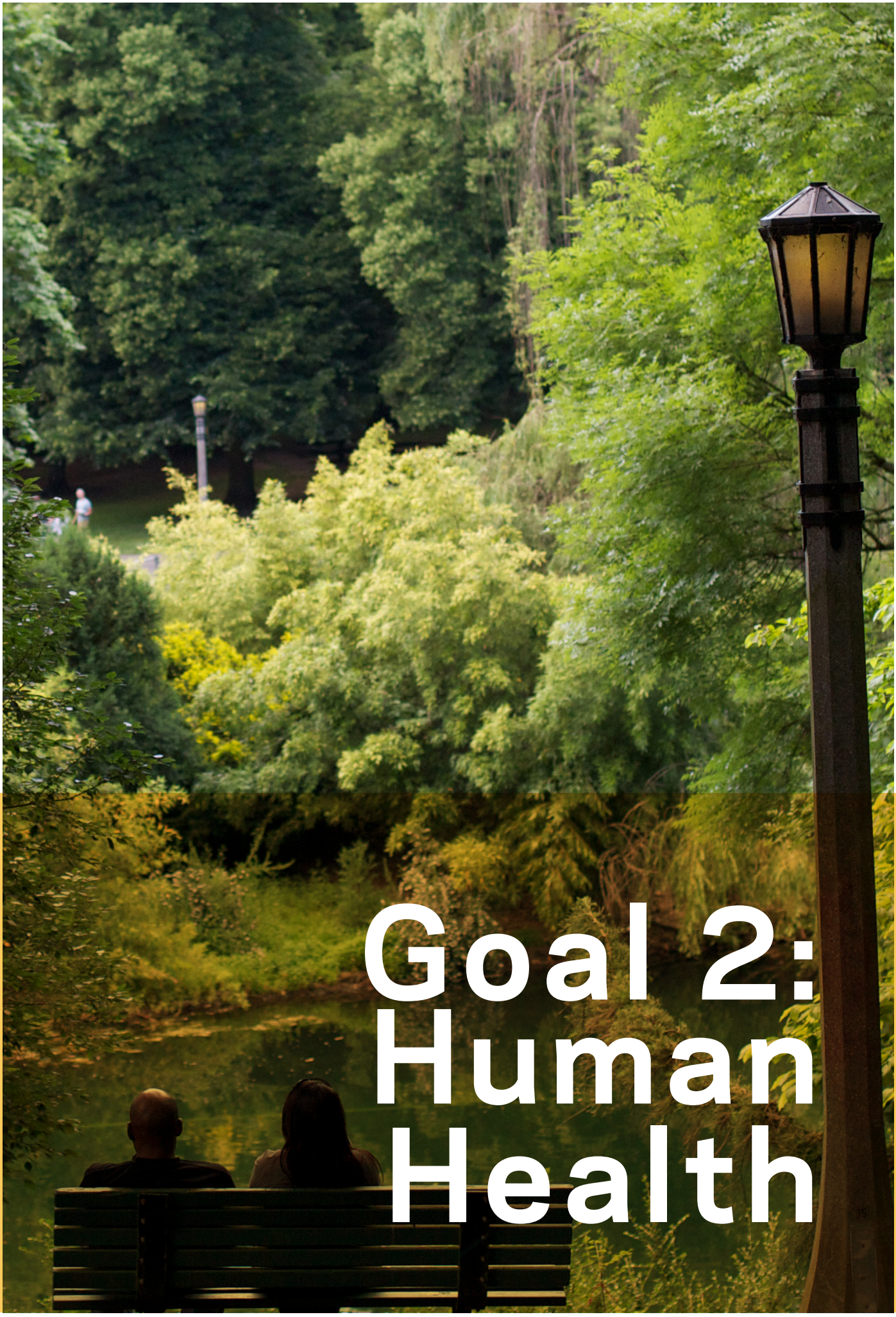


Photo credit: Guy Kramer

Goal 2: Human Health

Goal 2

Promote the Role of Urban and Community Forestry in Human Health and Wellness

Due to the high costs of disease treatment and therapies, health professionals are becoming more interested in innovative strategies for health promotion and disease prevention. An extensive range of research demonstrates significant relationships between experiences of nearby nature in cities, including trees, and positive health response. The depth of evidence supports the need for actively improving human health and welfare through urban and community forestry.

Strategy A

Expand opportunities for collaboration with the health community.

Strategy B

Champion a nationwide messaging campaign that links trees and urban forests to human health and wellness.

Strategy C

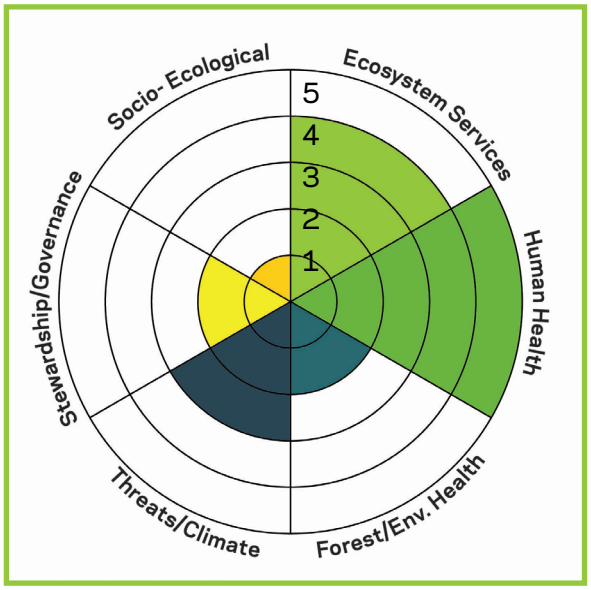
Plan, design and manage urban forests to improve human health and wellness.

Strategy D

Develop tools to improve and highlight the relationship between improved public health, wellness and urban and community forestry and green infrastructure.

Relevant Research Needs

Many factors contribute to human health, including individual behaviors and access to healthcare. Public health and medical officials are increasingly interested in the role of community environment for health promotion and disease prevention. Ecosystem services of trees and urban forest systems have been studied for decades. The first wave of evidence revealed that trees contribute environmental services that have health consequences, such as air quality, and reduced urban heat island effect. More recent studies align with epidemiology, revealing contributions to cognitive, emotional, and physiological health (such as weight management and stress reduction). Ongoing research will reveal practical ways that the urban forest can promote human health and quality of life.



Research Needs Connected to Goal 2

Implementation Targets

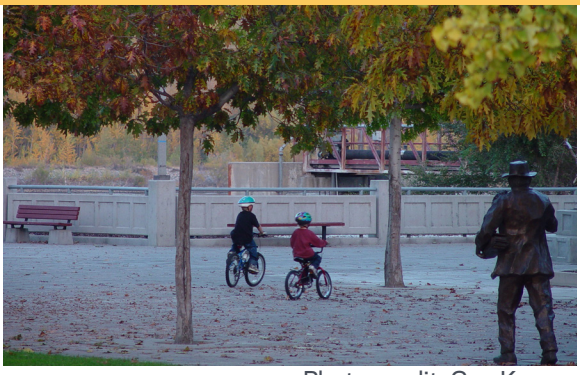


Photo credit: Guy Kramer

1. Major social media providers (such as Facebook) advertise the benefits of urban forests. Federal, state and local urban forestry interests participate in providing web-based advertising on benefits of urban forestry and green infrastructure.
2. Tools to measure the positive impacts of urban forestry on human health and wellness are made widely available to communities.
3. The benefits of urban forestry and green infrastructure for human health, wellness and productivity are promoted through partnerships with the health community.
4. Investments in urban forestry are made by health organizations to reduce healthcare costs and improve health outcomes.
5. A minimum daily dose of "Vitamin Tree" is developed and disseminated through health practitioners.

Why is it Important?

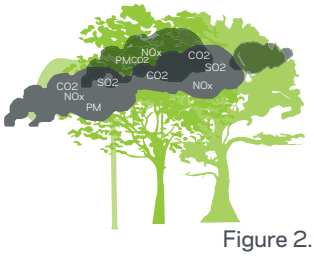


Figure 2.1

$60.1 Million

Value of annual particulate pollution removed by trees in New York City, reducing human mortality

Removal of fine particulate pollution from the air by trees improves human health. Values vary from 5.2 tons removed annually in Syracuse to 71 tons in Atlanta, with values from $1.1 million in Syracuse to $60.1 million in New York City (Nowak, et.al., 2013).

6 Minutes

A study found that briefly viewing videos of tree canopy reduced self-reported stress.

Tree canopy goals count! People viewing a 6-minute video with canopy density of about 60%, reduced their stress levels by 60 % compared to others who watched a video with about 2 percent tree cover (Jiang, B., D. Li, L. Larsen, and W.C. Sullivan, 2014.).

Figure 2.2

Figure 2.3

1 Day

The average reduced length of stay in a hospital for patients with bedside windows with leafy views.

The average reduced length of stay in a hospital for patients with bedside windows with leafy views. Additionally, patients need less pain medication and have fewer post-surgical complications (Ulrich, R.S, 1984).

In the past ten years...

Photo credit: Amigos de los Rios

We've done a good job

Over the last ten years the connection between urban and community forestry and human health and wellness has become better understood, providing yet more reasons to plan, plant, and maintain urban forests. We now know, for example, that the urban forest – including parks, gardens and open spaces – is recognized as an important factor in human health promotion and disease prevention. Research is gathering data on nature's ability to reduce stress responses, heart rates, and blood pressure as well as improve mental health, social cohesiveness (including reduced crime), and community economics. As our understanding of the linkages between nature and health has increased, community and school programs have increased their focus on tree plantings, community gardens, and urban foraging.

Health industry leaders, such as Kaiser Permanente, are also increasingly making a connection to urban natural resources. Health care settings are incorporating more urban forest ecosystem design and programming to address health issues, such as nature prescription programs, workplace wellness initiatives, and therapy gardens.

On a national level, initiatives that connect the built environment with public health and wellness have grown significantly in the last decade. The Urban Land Institute started a Building Healthy Places Initiative in 2013. The Centers for Disease Control and Prevention (CDC) launched a Built Environment and Health Initiative in 2011. The Robert Wood Johnson's Active Living Program promotes activity-friendly communities. The American Planning Association started its Planning and Community Health Center, and in 2010 California passed "Health in All Policies" to improve health in multiple ways, an approach later adopted by other states across the country (Rudolph, et al., 2013).

These trends are also represented in urban ordinances and plans. Napa, California offers an example of how city tree ordinances support actions that promote health and quality of life by creating cleaner air, conserving soil and energy, creating scenic beauty, and enhancing property values (Diaz, et al., 2008). In Baltimore, another example of increasing awareness is a poll in which city public agencies ranked public health and safety and water quality as the most important social and ecological criteria for decision-making related to tree planting (Figure 2.6) (Locke, et al., 2013).

Expressed Preferences for Major Criteria Related to Urban Forests

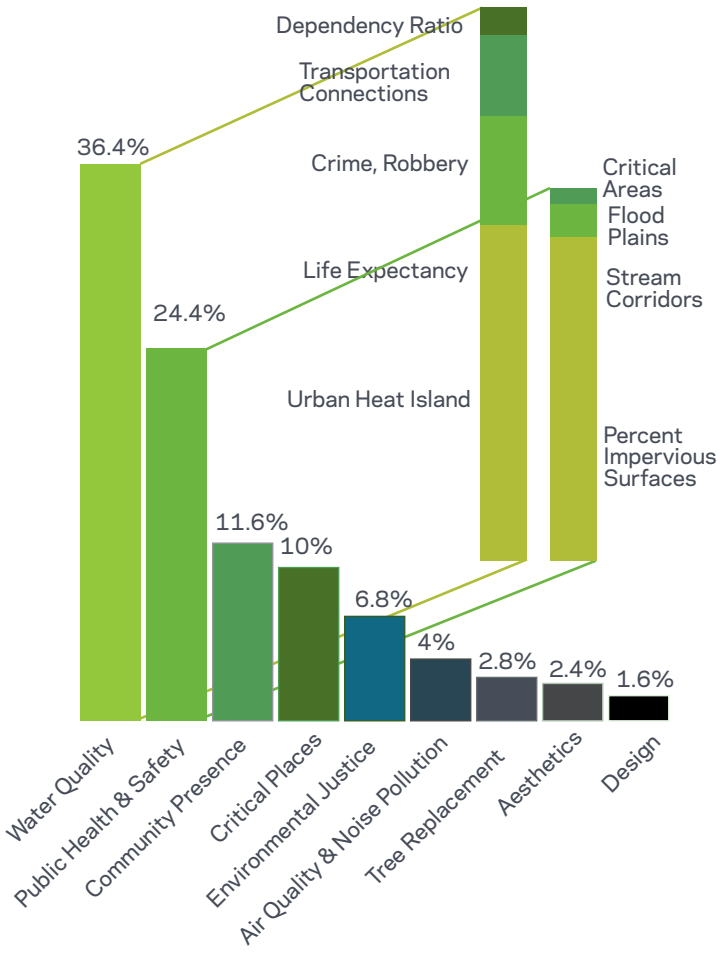


Figure 2.4: City Agencies in Baltimore Think Health-Related Criteria are Most Important When Making Tree Canopy Decisions. Note: Major criteria are summary categories that represent clusters or groupings of variables. Data drawn from Locke, et al., 2013.

We still have a lot to do

Science will continue to link urban and community forests to health outcomes over the next decade. The next challenge will be to design and implement programs that reflect this linkage, followed by assessments and measurement to sharpen program effectiveness.

Moving forward, numerous gaps need to be filled. Specific and measurable health targets for both the field of public health and urban and community forestry need to be aligned. Research is needed to better understand how much, how often, and what kind of urban and community forest ecosystems contribute to specific health effects. Some innovative prescription programs have been piloted, such as RxPlay, NatureRx, and Doctor Walks, all of which prescribe doses of nature to improve health issues. Even as these programs expand across the nation, however, more research is needed to understand the baseline "dosage" needed to achieve specific health impacts.

> **The urban forestry field must now develop ways to assess, measure, and implement programs that relate community health and wellness to forestry.**

Another significant gap relates to increased awareness of the linkage between environmental justice and human health. Studies using remote sensing and aerial photographs of tree canopy and parks distribution have revealed that underserved neighborhoods often have access to fewer trees and green space. In the next decade, as cities target underserved neighborhoods for greening programs, new policy is needed that incorporates environmental justice principles to ensure that the benefits of urban and community forests are distributed more equitably.

A third gap relates to the need for more tools, technologies, and programming for improving human health and wellness through urban and community forestry. During the assessment for this ten-year plan, scientists and thought leaders identified numerous needs including i-Tree for health and wellness, urban forest design guidelines for walkable, multimodal and safe communities, guidelines for urban and community forest networks, and pilot studies that translate health benefits research into urban and community forestry programs.

Finally, mental health is a significant aspect of human health and wellness that merits attention in urban and community forestry, as nearly one in four adults experiences a mental health illness each year, including depression, anxiety, or elder cognitive disorders. Urban and community forest ecosystems are a possible tool worthy of study to facilitate reduced stress and address mental health issues in specific therapeutic settings such as hospitals, elder care facilities, community gardens and broader community settings.

Connections to the health and wellness industries offer exciting opportunities for new collaboration and funding sources for urban and community forestry. New partners might include facility planners, architects and designers of health-related facilities as well as other nontraditional partners such as school districts, health insurance companies, and community-based clinics. Over the next decade, improved data, measurement and communication of urban and community forest benefits for human health and wellness will likely open up untapped avenues of awareness and funding.

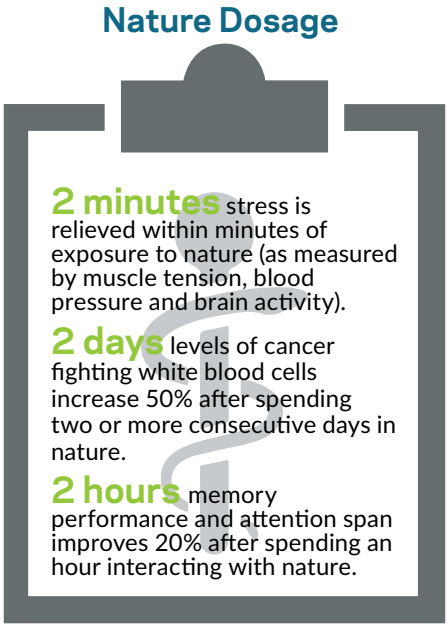


Figure 2.5: Contact with nature can be an affordable, accessible and equitable form of preventative and restorative medicine. Data drawn from Shepley et al., 2013.

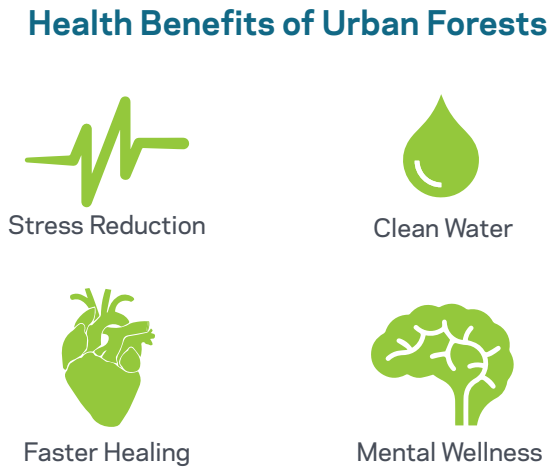


Figure 2.6: Drawn from Wolf, K.L., and A.S.T. Robbins. 2015

How can we get there?

Goal 2 Strategies and Actions

Strategy A: Expand opportunities for collaboration with the health community.

- ☐ **Action 1:** Foster new funding opportunities to support use of urban forestry and green infrastructure as a critical therapeutic tool for improving community health and quality of life.
- ☐ **Action 2:** Support the creation and dissemination of a prescription formula (or dosage) for urban parks and forests for health professionals to use.
- ☐ **Action 3:** Support and promote additional research into the benefits of urban forests and green infrastructure for human health and wellness.

Strategy B: Champion a nationwide messaging campaign that links trees and urban forests to human health and wellness.

- ☐ **Action 1:** Facilitate funding for a nationwide messaging campaign that links urban forestry and green infrastructure to preventative care and health promotion.

Strategy C: Plan, design and manage urban forests to improve human health and wellness.

- ☐ **Action 1:** Endorse modifications in urban infrastructure to better facilitate the planting of large shade trees and other vegetation in areas most where they are absent and most needed to improve health and wellness.
- ☐ **Action 2:** Connect urban forestry with urban agriculture to support healthy eating.
- ☐ **Action 3:** Connect urban forestry with healthy lifestyles and active living.

Strategy D: Develop tools to improve and highlight the relationship between improved public health, wellness and urban and community forestry and green infrastructure.

- ☐ **Action 1:** Facilitate increased funding for the development of tools (such as i-Tree) to evaluate and document improvements in human mental and physical health and wellness contributed by urban forestry.
- ☐ **Action 2:** Facilitate increased funding for research that quantifies the economics of both environmental and social benefits of tree canopy and green spaces, to provide more quantifiable data on the impacts of urban forests on health and crime outcomes.
- ☐ **Action 3:** Develop effective means for delivering science and research findings that make the connection between urban forestry and community health and wellness, to elected officials, communities, the public health community, and urban forestry practitioners.

See Appendix 3 for the full suite of actions related to Goal 2.

Case Study: Active Design Guidelines by Center for Active Design

Published in 2010 by this New York City nonprofit, this guide provides architects and urban designers with a manual of strategies for creating healthier buildings, streets, and urban spaces, based on the latest academic research and best practices in the field. While it is aimed at designers, the guide provides strategies for parks, open spaces, and recreational facilities that could be used by all groups designing community and urban forests. The nonprofit has published other toolkits relevant to community forestry such as "Building Healthy Places Toolkit" and "Active Design Toolkit for Schools." (Center for Active Design 2015).

Photo credit: Guy Kramer

Case Study: Nonprofit Creates Worldwide Resource Hub for Connecting Children and Families to Nature

The Children & Nature Network believes that information is power. The Network is a leader in the movement to connect children, families, and communities to nature through innovative ideas, evidence-based resources and tools, collaboration, and grassroots leadership. In 2014, the network supported 369 grassroots campaigns that connected 3.5 million children to nature experiences worldwide. A database of literature enables decision-makers to make the case about the impact that nature has on children's development. This data is supplemented by training programs that aim to build a growing team of experts. All of this work is essential as green schoolyards and neighborhoods help to alleviate stress, increase physical activity levels, and increases socialization in children (Children & Nature 2015).

Photo credit: Greg Mannion

Case Study: Edible Forest in Seattle Connects Ecosystems and Healthy Eating

Called an edible forest ecosystem, Seattle's Beacon Food Forest is located in one of Seattle's urban neighborhoods and is designed for the community to plant, grow, and gather in the edible urban forest. Designed by students who were inspired by a permaculture design course, the forest will consist of seven acres, and will include an edible arboretum, a berry patch, nut grove, community garden for families to grow their own food, a gathering plaza, and a kids' area. The project coordinators hope that the forest will inspire the community to both grow its own food and rehabilitate the local ecosystem (Beacon Food Forest 2015).

Photo credit: beaconfoodforest.org

Students from the Paul Public Charter School in Washington, D.C. pretend to use binoculars in search of their urban forest. Photo credit: USDA

Goal 3: Diversity, Equity and Leadership

Goal 3

Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

The urban forestry community should embody the changing demographics of our nation, and its cities, towns and counties. The next Ten-Year Urban Forestry Action Plan must continue to focus on addressing the needs of underserved communities. There is an urgent need to increase diversity within the urban forestry community, both at the professional level and among the citizen leadership that drives the urban and community forestry agenda forward. Urban and community forestry needs to be seen as a progressive, innovative and inclusive profession at all levels, from entry level to senior leadership. Over the next ten years, a new professional cadre that is culturally, ethnically and economically diverse must emerge from an expanding network of vocational programs in high school, community colleges and professional certified university programs. Vocal and visible champions need to be developed at all levels in the next decade to bring attention to the ability of urban forests to offer comprehensive and cost-effective solutions to critical community issues and to apply those solutions within their own communities. In the federal structure, urban and community forestry need to deliver strategies and programs for existing and anticipated challenges by coordinating the work of multiple agencies and leveraging their resources to promote equity and diversity in urban and community forestry.

Strategy A

Increase diversity, equity and accessibility in urban and community forestry.

Strategy B

Engage underserved communities in urban and community forestry.

Strategy C

Develop effective leadership at all levels to build a national voice for urban forestry.

Strategy D

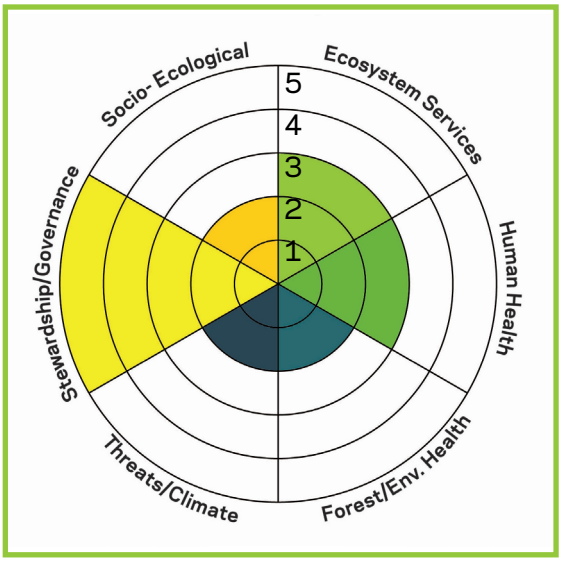
Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.

Strategy E

Promote expanded collaboration, training, university-based learning, and communication within the field of urban and community forestry to build workforce professional development.

Relevant Research Needs

While the earliest research about trees in cities focused on biophysical topics, social science studies have gained momentum in recent years. The National Science Foundation has funded two Urban Long Term Ecological Research projects and each is premised on the idea of socio-ecological systems. Such studies attempt to understand the linkages and feedback loops that are inevitable within ecosystems that are occupied by high-density human populations. Research also explores stewardship and local governance, addressing important issues of engagement and environmental equality for all residents of cities and towns. In addition, leadership that includes natural resource professionals and other sectors, is essential for social sustainability and resilience.



Research Needs Connected to Goal 3

Implementation Targets

Photo credit: Dr. Jianbang Gan

1. The principles of diversity and inclusion are widely adopted by local, state, federal government offices managing urban forestry, as well as foundations and non-profit organizations.

2. Tools to measure deficiencies in ecosystem services across communities are developed and used by government agencies and community organizations to target urban forestry investments.

3. Youth are introduced to the full range of education, employment and community development opportunities available in the urban forestry sector.

4. The range of jobs offered in urban forestry that are publicly characterized as "green jobs" has measurably increased.

Why is it Important?

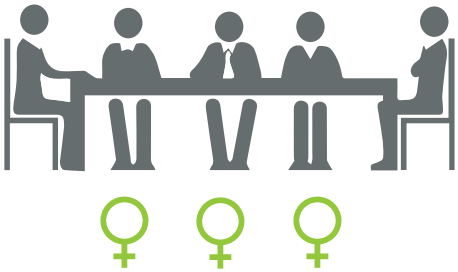


Figure 3.1

16.8% **Return on sales for companies with at least three women serving on the boards of directors.**

Outperforms the average 11.5 percent return. These companies show a similar 16.7 percent return on equity, outperforming the average 11.5 percent return, and a 10 percent return on invested capital, outperforming the average 6.2 percent return (Nelson, 2014).

Many studies reveal that the distribution of trees and park space often disproportionately benefits predominantly White and more affluent communities (Wolch, J.R., J. Byrne, and J.P. Newell, 2014).

Figure 3.2

Figure 3.3

75% **Percent of municipal arborists engaged in managing green space assets to produce ecosystem services.**

Community forestry provides leadership in ecosystem services, with 75 percent of municipal arborists reporting their organization is moderately to very engaged in managing green space assets to produce ecosystem services.

In the past ten years...

Photo credit: Amigos de los Rios

We've done a good job

> **The widespread nature of this rise in professional forestry staff suggests that urban forestry is impacting more geographically and demographically diverse communities.**

In the last ten years, the urban and community forestry profession has made progress by generating jobs and by encouraging diversity, equity and leadership. With an upsurge of staff, there also has been movement in programs, tools, and resources that are more progressive, innovative, and inclusive at all levels, from entry level to senior leadership. For example, i-Tree tool has opened opportunities for underserved communities to assess their urban canopy by reducing costs and providing something that is easy to use. Additionally, in the past decade, forestry professionals have increasingly identified the importance of cultivating diversity, equity, and leadership through stated goals, objectives, and benchmarks. Accomplishments in the last ten years include:

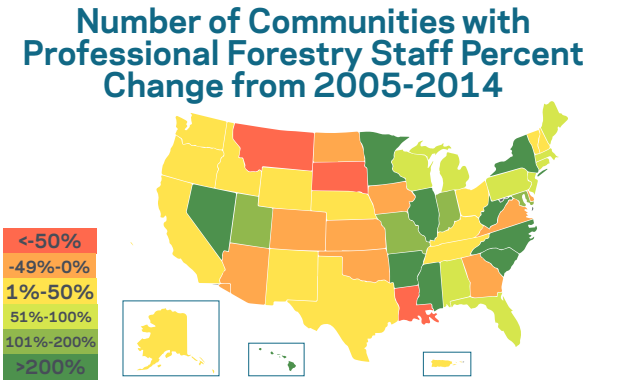
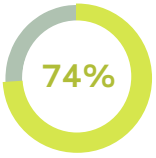


Figure 3.4: Data drawn from CARS, 2005-2014

Out of 135 cities surveyed in 2007, 63 percent report having staff at, or who report to, the executive level of city government to coordinate multiagency and public-private efforts to preserve or enlarge the tree canopy. This example demonstrates how urban forestry is now being seen as a leadership issue (Diaz, et al., 2008).



From 2005-2014, 37 states (74 percent) have increased the number of communities with forestry staff. The widespread nature of this rise in professional forestry staff suggests that urban forestry is impacting more geographically and demographically diverse communities (CARS 2005-2014).

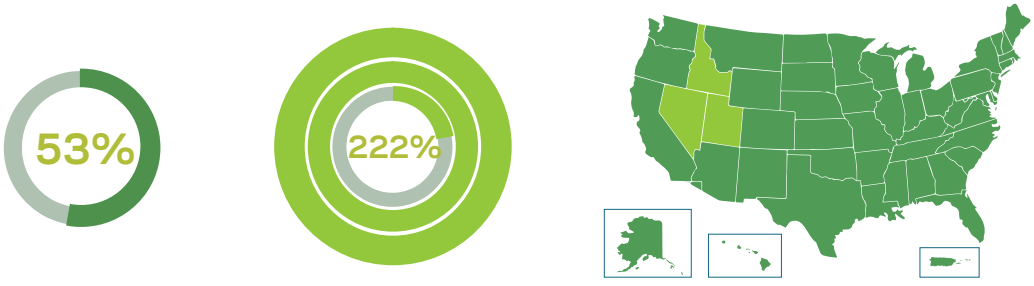


Figure 3.5: Nearly 2,000 additional American communities have employed or retained professional forestry staff, a gain of 53 percent. The Intermountain Region has experienced the greatest increase of all, with a remarkable 222 percent increase in forestry staff. Data drawn from CARS, 2005-2014.

We still have a lot to do

Despite progress, much work is still needed to intentionally strengthen opportunities for diversity and leadership. A 2007 report by Bonta and Jordan acknowledged that "our diversity crisis is a systemic problem," and so requires a systematic approach to address the issue. A 2014 study by Taylor on the state of diversity in environmental organizations found that gender diversity has improved, but the gains have gone mostly to white women. Men are more likely than women to hold leadership positions. Organizations who participated in Taylor's study reported that the biggest barriers to hiring are few job openings and lack of diverse applicants.

> **There is a strong need to increase both programs, tools and resources that focus on increasing diversity, equity and leadership, as well as making them a core component of Action Plan implementation in the next ten years.**

Moving forward, improvements to expanding vocational programs will be one avenue for creating greater access to the urban forestry field for underserved communities. This is essential as a 2002 nationwide U.S. study found that only 10 percent of urban forestry professionals were women and 5 percent minorities. Although these two underrepresented groups have been growing, much more needs to be done.

Progress can be activated by increasing access to learning and development opportunities. Of the 48 Accredited and Candidate Degree Programs by the Society of America Foresters, only 11 have an accredited option in Urban Forestry. More accredited programs in urban forestry are needed in more geographically diverse locations. Also, increasing workforce development opportunities, such as youth, training, and green job placement opportunities, can expand diversity in the field.

Effective and vocal leaders who are engaged corroboratively with other fields are greatly needed to help guide and inspire diversification in urban and community forestry. These champions can expand the urban forestry circle of influence to other fields while also highlighting the ability of urban forests to offer comprehensive and cost-effective solutions to critical community issues.

To improve their effectiveness in the next decade, urban foresters will need to cultivate leadership, communication and networking skills. Creating reciprocal relationships of trust and value with all constituencies will be important for broadening the pipeline of green jobs, as well as increasing diversity and equity in urban forestry.

Further, the urban forestry ecosystem is not equally distributed across cities, and is disproportionately present in affluent neighborhoods. There is a large gap in programs and tools that can help address this issue. For example, out of 54 programs assessed in 2015, diversity, equity, and leadership were mentioned only seven times, and in only 1.6 percent of all tools assessed. There is a strong need to increase both programs, tools and resources that focus on increasing diversity, equity and leadership, as well as making them a core component of Action Plan implementation in the next ten years.

Additionally, in the next ten years, the urban forestry field must better engage a diverse stakeholder group when making decisions. As Ostoic reported in 2015, public participation that is representative leads to programming that is better suited to community preferences. The Green 2.0 Working Group has identified several barriers to increasing diversity in the environmental and natural resource professions, as well as several opportunities for increasing leadership. More information may be found in the first case study on page 47.

Percentage of Minorities in Leadership Positions in Environmental Organizations

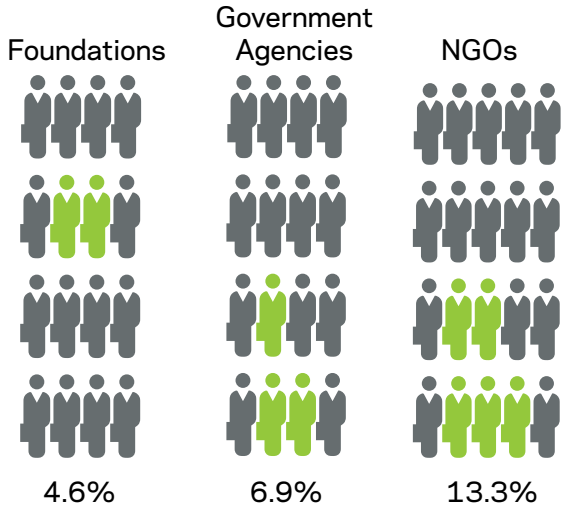


Figure 3.6: Data drawn from Taylor, 2014

How can we get there?

Goal 3 Strategies and Actions

Strategy A: Increase diversity, equity and accessibility in urban and community forestry.

- ☐ **Action 1:** Promote diversity in the urban forestry community by developing metrics and outreach training.
- ☐ **Action 2:** Translate key urban forestry materials and resources into other languages to make them more accessible through social media. Identify avenues for introducing urban forestry to more diverse audiences.
- ☐ **Action 3:** Create partnerships to promote urban and community forestry with media, sports and entertainment organizations that communicate effectively with diverse communities.

Strategy B: Engage underserved communities in urban and community forestry.

- ☐ **Action 1:** Target urban forestry funding and other resources specifically to underserved communities and low-canopy neighborhoods.
- ☐ **Action 2:** Work through existing networks, community groups and organizations to create dialogue with underserved communities, learn their needs and goals, and build opportunities for urban and community forestry around those needs.
- ☐ **Action 3:** Develop relationships, build partnerships, and identify opportunities to collaborate with organizations to advance urban forestry in underserved communities.

Strategy C: Develop effective leadership at all levels to build a national voice for urban forestry.

- ☐ **Action 1:** Expand and clarify NUCFAC's congressionally authorized leadership role in advancing urban forestry nationally.
- ☐ **Action 2:** Build leadership through collaboration and increased collective impact by local, state, federal, nonprofit, and industry partners.
- ☐ **Action 3:** Offer programs to nurture the leadership talents of students and young professionals.
- ☐ **Action 4:** Support the development of a central source for all interested parties to find the latest information and efforts pertaining to urban forestry to share ideas, projects, etc.
- ☐ **Action 5:** Improve communication between federal agencies, the urban forestry community, and the lay audience.
- ☐ **Action 6:** Build on existing and new partnerships to innovate urban forestry educational, planning and management opportunities with allied professionals such as planners, landscape architects, and engineers.
- ☐ **Action 7:** Support building nonprofit leadership capacity for effective outreach and networking efforts.
- ☐ **Action 8:** Cultivate national leaders to highlight the importance of urban forestry in the political arena.

Strategy D: Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.

- ☐ **Action 1:** Focus on youth across various demographics to increase exposure to and professional opportunities in urban forestry.
- ☐ **Action 2:** Promote training and education opportunities in urban and community forestry.
- ☐ **Action 3:** Encourage development and adoption of consistent national standards for certified arboricultural professionals.
- ☐ **Action 4:** Develop green job placement and training opportunities in urban forest tree planting, maintenance, and data collection for unemployed and underemployed residents of low-income communities.

Strategy E: Promote expanded collaboration, training, university-based learning, and communication within the field of urban and community forestry to build workforce professional development.

- ☐ **Action 1:** Build professionalism and broader access to the field by increasing the number of urban forestry professional training programs.
- ☐ **Action 2:** Distribute an annual survey to understand and connect to urban forestry needs at the grassroots level.
- ☐ **Action 3:** Develop opportunities to work as interdisciplinary teams at local, city, state and federal levels. Focus on urban forestry program development, installation, and maintenance. National efforts should be localized for greatest possible effectiveness where possible.
- ☐ **Action 4:** Improve communication between the urban forestry community and lay audiences.
- ☐ **Action 5:** Work through existing umbrella organizations to boldly and effectively communicate the top needs, opportunities, and actions for the field.
- ☐ **Action 6:** Consider the unique collaboration and communication that is taking place in the Islands' networks; there could be important sharing and learning between island and national audiences. Site-based collaborative opportunities may also be appropriate for many island communities.

See Appendix 3 for the full suite of actions related to Goal 3.

Case Study: Report Examines Why Decades of Promises to Diversify are Falling Short in the Mainstream Environmental Movement

Green 2.0 Report findings include three highlights about why diversity promises are falling short: 1. The "Green Ceiling"; 2. Unconscious bias, discrimination, and insular recruiting; and 3. Lackluster effort and disinterest in addressing diversity that results in an overwhelmingly white "Green Insiders' Club."

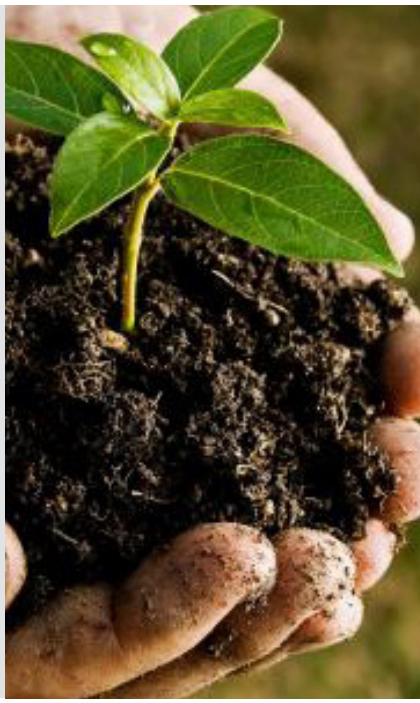
Leaders Identify Factors That Make Diversity Initiatives Successful including:
1. Adequate and stable funding. 2. Adequate and committed leadership.
3. Adequate organizational buy-in. 4. Ability to communicate across race, class, gender, and cultural lines. 5. Institutionalizing diversity, equity, inclusion goals.
6. Translate diversity training into action. (Source: http://diversegreen.org)

Case Study: Principles of Environmental Justice Can Guide Urban Forestry Leadership

Adopted in 1991 by the First National People of Color Environmental Leadership Summit, the 17 principles of environmental justice serve as a defining and guiding document for the growing grassroots movement for environmental justice. As urban and community forestry organizations seek to address the needs of underserved neighborhoods in the next decade, an important first step can be to gain fluency in environmental justice via these principles. Formal adoption of these principles as a guide for organizing and networking can demonstrate a meaningful commitment to increasing diversity in the field. (Source: http://www.ejnet.org/ej/principles.html)

Case Study: Society of Municipal Arborists Exchange Program Encourages Idea-Sharing Internationally

In an effort to exchange urban forestry expertise, management ideas, and technology, The Society of Municipal Arborists (SMA), has hosted an international exchange program since 2003. SMA and contributing sponsors provide funding for airfare and basic expenses to spend at least one week visiting and working with another city's forestry department. Exchange cities range from as far as Turin, Italy and Cape Town, South Africa to as local as Charlotte, North Carolina. In 2013, Simon Wallace visited Kildare County, Ireland and shares his valuable experiences in an article, which all participants write. He writes, "While building the urban forestry program in Lexington, I apply the wealth of knowledge I've received from these amazing experiences every day". Not only does the program facilitate the transfer of knowledge, but it also helps create an international community of urban forestry. (Source: http://www.urban-forestry.com/arborist-exchange)



A Short-Eared Owl. Photo credit: Gregg Thompson

Goal 4: Environmental Health

Goal 4

Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Increasing urban and community forest and green infrastructure health, biodiversity and resilience are urgent needs, particularly as invasive species, pests, drought and challenges associated with climate change, such as extreme weather events, will offer both key challenges and opportunities in the next ten years. Native and drought tolerant street trees are important to create stability and functional food webs for a diverse array of animals, insects, birds and people. Knowledge of regionally-adapted pest and insect-resistant species needs to be developed and disseminated.

Strategy A

Increase the biodiversity, health and resilience of trees in urban and community forests.

Strategy B

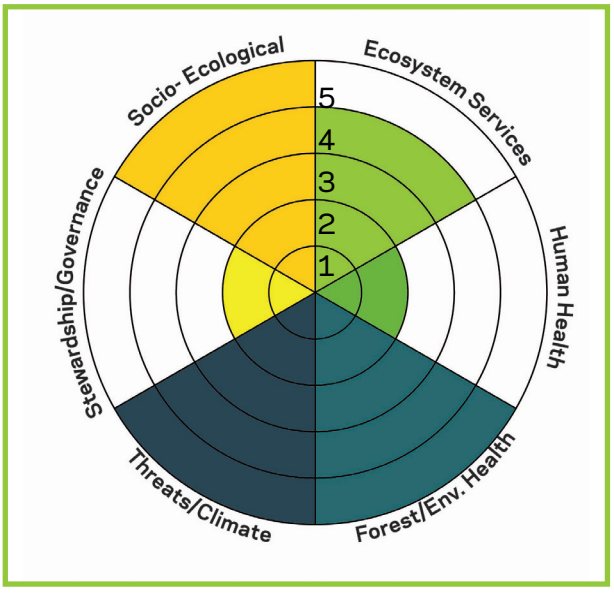
Foster resilience, restoration and sustainability of urban and community forests facing climate change challenges.

Strategy C

Support use of urban forests for increasing community food resilience and access to local foods.

Relevant Research Needs

Several research activities address this program need. First, ongoing refinement of a robust body of knowledge about tree planting, inventory, and analysis will continue to inform the management best practices that support forest health and biodiversity. More emergent in recent years, is the science about pests, threats, and change, including climate. Ongoing science about these topics will aid communities and managers in optimizing forest planning and investment for health and biodiversity. Finally, ecosystem services readily recognize the importance of forest health and biodiversity in order to optimize the functions and services that forest systems and other ecosystems provide in cities and regions.



Research Needs Connected to Goal 4

Implementation Targets

Photo credit: Guy Kramer

1. Tools and comprehensive data are developed and widely disseminated that enable communities to map projected climate change, create management plans for increased resilience, and plan for the use of native and regionally adopted trees, shrubs and perennials.
2. An integrated network of training technology and talent helps communities respond to and recover from severe storm events.
3. Food forest plans (including fruits, berries, nuts and foraged foods) are made widely available to communities.

Why is it Important?

Figure 4.1

5.6 Million

The estimated number of trees lost in communities across Texas.

5.6 million trees were killed in urban areas due to the drought in 2011. This figure may represent as much as 10 percent of the total number of trees, decreasing the ecosystems services the urban forests provide (Texas A&M Forest Service).

20,000 Trees

The estimated number of public trees destroyed as a result of Hurricane Sandy (USFS Northern Research Station, NYC Urban Field Station).

45,000 Trees

In 2008, Galveston, Texas was severely hit by Hurricane Ike and lost nearly 50% of its total canopy. An estimated 45,000 trees were destroyed due to wind and salt-water storm surges (Riley, 2014).

Figure 4.2

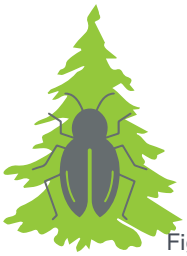


Figure 4.3

$2.7 Billion

The estimated cost for municipalities and homeowners to remove trees killed by non-native pests.

Homeowners lose another $1.5 billion in property values (Campbell, 2014).

In the past ten years...

Photo credit: Morgan Housden

We've done a good job

Over the last decade there has been increasing work to address the health of urban and community forests. Past events and current issues show us that there are plenty of ways a forest can be crippled, fragmented and destroyed, whether it is from invasive species, pests, drought, hurricanes or any other side effect of climate change and urbanization. Along with increasing public recognition of the challenges affecting forest health and long-term resilience, there are many governmental programs and initiatives that have made significant progress in addressing these problems. The following is a summary of gauges of progress made in the last decade (2006-2016), all of which demonstrate increased efforts to strengthen urban and community forestry health and biodiversity.

> **Since 2000, 31 states have developed comprehensive Climate Action Plans.**

• President Obama's Climate Action Plan is pushing forward to tackle the imminent threat of climate change.

• Nearly 1,000 communities in the United States have signed a climate action agreement (Nowak et al., 2010).

• The Chesapeake Bay Agreement has identified the development, retention and enhancement of urban tree canopy as an effective strategy to improve the health of the Chesapeake Bay.

• As part of a multinational effort, a knowledge sharing website on emerald ash borer was developed. This is a great model for knowledge sharing and networked information delivery; a future need.

• Tools like i-Tree tool have evolved impressively in the last 10 years.

• The USDA Forest Service is working on incorporating invasive pest risk maps into i-Tree.

- i-Tree Pest Detection Module is a portable, accessible and standardized protocol for observing a tree for possible insect or disease problems. It is currently available within the i-Tree Streets and i-Tree Eco programs; Pest Detection can be adapted to other external tree inventory programs.
- i-Tree Storm provides a method for a community to assess widespread storm damage in a simple, credible, and efficient manner immediately after a severe storm. It is adaptable to various community types and sizes and provides information on the time and funds needed to mitigate storm damage.
- STEW-MAP is a tool for understanding stewardship networks in a city. Having this info in a city helps managers/leaders know which areas of the city are neglected, and the networks help a city know the strength of partner relationships, which they can use in times of disaster or for rebuilding.

Thirty-eight percent of those with a sustainability or climate protection plan report that their plan specifically cites the contribution of trees or tree canopy to achieving the plan's goals (Diaz, Nickels, Kautz, & Cochran, 2008).

Percentage of states that have developed comprehensive Climate Action Plans that often use urban forestry techniques as a tool to both mitigate and adapt to a changing climate ("State and Local," 2015).

Of 135 cities surveyed, 84 percent viewed their activities relating to trees as part of their overall sustainability and climate protection efforts (Diaz, Nickels, Kautz, & Cochran, 2008).

We still have a lot to do

Climate disruptions, as well as vulnerability to crisis and disaster, have increased over the past 40 years and are projected to continue increasing in the future (Rodin, 2014) (U.S. Global Change Research Program, 2014). In 2007, cities reported that their tree resource management efforts had been hindered recently by serious storms (53 percent), infestations (41 percent), and drought (55 percent). However only 57 percent of those cities reported that they have plans in place to respond to large or sudden disturbances. This gap suggests that, at the time, nearly half of our cities still don't have plans in place that will enable managing the inevitable urban and community forest crises easier and more cost-effective.

> **Climate disruptions have increased over the past 40 years and are projected to continue increasing in the future.**

How can we address and improve the health of urban forests? Professionals working within the natural environment in our cities and communities, such as urban foresters, park managers, and planners are not the only ones who can and should maintain and nourish our urban and community forests. This task will take everyone's involvement, including new program leadership, governance, institutions, policies, and incentives. All of which will need to innovate and adapt to keep up with a changing climate, rising populations, aging infrastructure, and limited funding. As water becomes limited, for example, the height and density of tree canopies will be reduced. In some areas, these dry conditions also will likely exacerbate and spur more large and intense wildfires in the wild land-urban interface, consequently increasing risks of erosion and reducing the carbon storage potential of trees. Along with changes in temperature, the frequency of extreme weather events will increase, such as high winds, ice storms, hurricanes, flooding and landslides, which all have devastating effects on trees.

Additionally, the potential for urban areas to contain significant amounts of biodiversity must continue to be recognized by city planners and urban foresters so that management practices aimed to preserve and promote diversity can be accomplished. Management should focus on increasing biodiversity in all aspects of the urban and community forest, from street trees to urban parks and woodlots (Alvey, 2006).

Non-native invasive species will continue to threaten urban and community forests, such as emerald ash borer, Asian long-horned beetle, gypsy moth, hemlock woolly adelgid, sudden oak death, and thousand cankers disease ("States and Accomplishments", 2013). One study estimates that approximately 12 percent of plants imported from other countries, during the study period, had reportable pests (Campbell, 2015). This is meaningful as Americans import 3 to 4 billion plants per year. In fact, in the past ten years, 28 new tree-killing pests have been detected in the United States (Campbell, 2014).

These greater risks call for thorough planning and management needs in the next ten years. Improvements in tree inventories and assessments (such as a standard protocol for maintaining data over time, managing issues on a regional scale, early detection to find and manage infestations, and developing management plans in all communities) will all be increasingly important in the next ten years.

The effects that urbanization, globalization, land use and climate change will likely have on urban and community forestry are daunting, but with the right leadership and messaging, the task can increase opportunity and recognition for the urban and community forestry field. For example, the Kresge Foundation awarded $1.35 million to an initiative in Indianapolis called Reconnecting to Our Waterways. A key aspect of this initiative, led by non-profit partner; Keep Indianapolis Beautiful, is the strategic greening and planting of trees to improve the urban and community forest.

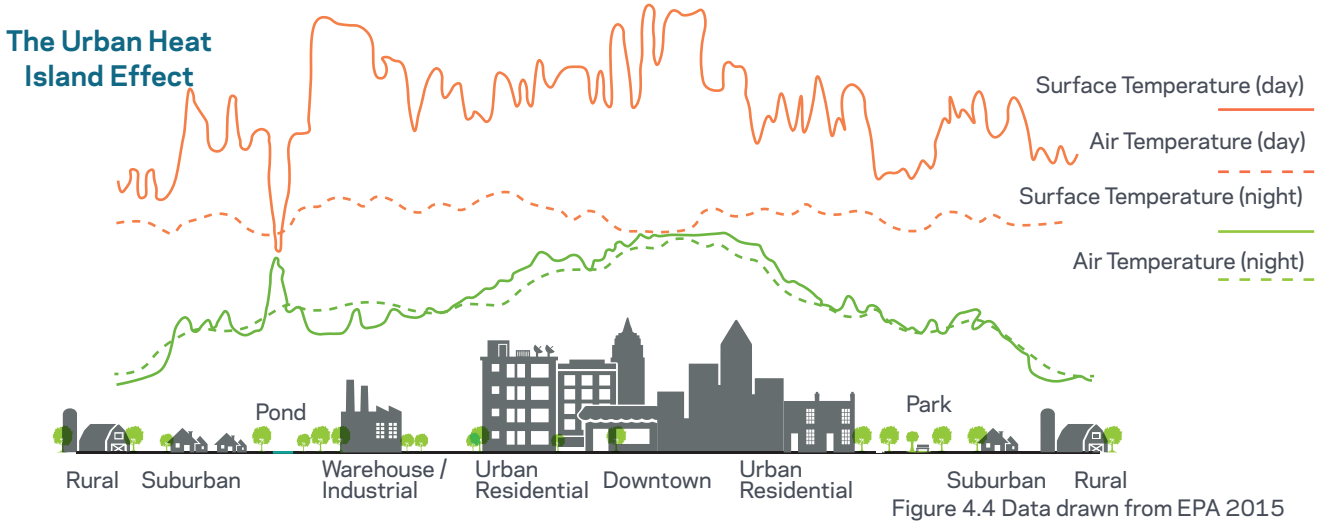


Figure 4.4 Data drawn from EPA 2015

How can we get there?

Goal 4 Strategies and Actions

Strategy A: Increase the biodiversity, health and resilience of trees in urban and community forests.

- ☐ **Action 1:** Support the use of more locally grown, regionally-adapted, insect and pest-resistant, and diverse native or site-appropriate species.
- ☐ **Action 2:** Focus on trees as a priority at the beginning of all new design and infill development efforts, with a focus on opportunities for preservation of existing trees.
- ☐ **Action 3:** Facilitate funding and direct resources for proper site preparation to address soil and water needs for urban trees and forests.
- ☐ **Action 4:** Determine areas at greatest risk from threats from invasives and threats of climate change, and take proactive measures to reduce and mitigate risks.
- ☐ **Action 5:** Focus on the Right Tree, Right Place in urban forestry establishment.

Strategy B: Foster resilience, restoration and sustainability of urban and community forests facing climate change challenges.

- ☐ **Action 1:** Facilitate funding to develop "urban forestry first responders" to respond after a storm or disaster to manage urban trees and forests and develop hazard mitigation strategies.
- ☐ **Action 2:** Support the development of region-specific climate change plans for both the short- and long-term, building on existing federal interagency plans.
- ☐ **Action 3:** Develop standards and Best Management Practices (BMPs) to foster resilience and sustainability for urban forests. Standards and BMPs should be developed for different bioregions (desert, tropical, eastern forest, etc.).
- ☐ **Action 4:** Promote the restoration of degraded urban forests and increase the capacity of other degraded urban lands to support tree growth.
- ☐ **Action 5:** Conduct more technical long-term studies to address the effects of climate change planning on a 10, 20 to 30-year horizons instead of only a 6 to 12-month horizon.

Strategy C: Support use of urban forests for increasing community food resilience and access to local foods.

- ☐ **Action 1:** Support the design and creation of urban orchards and edible forests with partners from the permaculture, urban food, and agroforestry communities.
- ☐ **Action 2:** Connect private landowners with tools and resources to grow fruit trees on private lands (such as the Arbor Day Foundation Tree Wizard tool).
- ☐ **Action 3:** Promote the reduction of lawn area in America and replacement of lawns with orchard trees, vegetable gardens, rain gardens, and locally-appropriate trees and vegetation.
- ☐ **Action 4:** Create a public awareness campaign that connects the planting of trees to our national security (increasing food supply security, providing urban food, feeding pollinators, reducing urban heat island effect, etc.).

See Appendix 3 for the full suite of actions related to Goal 4.

Case Study: White House Priority for Climate Resilience Supports Forest Health and Biodiversity

The Climate and Natural Resources Priority Agenda represents the United States' first comprehensive commitment across the Federal Government to support resilience of our natural resources. It identifies how federal agencies will work together to increase resilience. The agenda identified four priority strategies: foster climate-resilient lands and waters; manage and enhance U.S. carbon sinks; enhance community preparedness and resilience by utilizing and sustaining natural resources; and modernize federal programs, investments, and delivery of services to build resilience and enhance sequestration of biological carbon. Urban forestry is integrated throughout the report in a variety of ways, including the need to improve monitoring systems for carbon sinks, control invasive species, and increase ecosystem connectivity.

Case Study: Urban Forest Products Alliance Puts All Wood From Urban Trees to Good Use

Leaders and experts from a variety of disciplines, including forestry tree care, wood processing and green building, formed the Forest Products Alliance with the mission of advancing the sustainable recovery and the highest and best use of the products of urban forests. The Alliance operates under five basic beliefs, the first is described below:

Urban trees have their highest value while living. When they come down, urban trees should be put to their highest and best uses to maximize their economic, environmental, and societal benefits for people in urban areas and beyond.

(Source: http://www.urbanforestproducts.org/)

Case Study: Vermont's Forest Pest Detector Program Trains Volunteers to Control the Emerald Ash Borer

In response to a growing threat of invasive pests, Vermont's Forest Pest Detector Program trains volunteers to help communities control the devastating emerald ash borer. As of 2013, 118 volunteers have been trained to increase public awareness of tree pests, serve as local experts, and help coordinate local volunteer efforts to survey pests. With training they are able to teach others about pest signs, symptoms, and screening protocols. One volunteer called this an "ingenious program to get volunteers to help our overworked State Agencies! Great job by all those involved, and the inter-agency cooperation is very impressive." (VT Invasives, 2015)

Photo credit: The Seattle Department of Transportation (SDOT)

Goal 5: Management

Goal 5

Improve Urban and Community Forest Management, Maintenance and Stewardship

The expansion of innovative technologies in the last decade is expected to continue, and will provide new important opportunities for improving the urban and community forest management, arboricultural practices and increased urban natural resources stewardship skills. Appropriate design and maintenance are core needs for optimizing urban and community forest ecosystem services. As our urban and community forests continue to grow, stewardship in future decades will require community engagement and support, which in turn will require the development of new stewardship programs. Additionally, key research findings and new technologies need to be made more accessible and relevant to leaders, decision makers, educators and practitioners for enhancing more effective and responsive urban natural resources stewardship.

Strategy A

Improve urban and community forest management, maintenance and arboricultural practices.

Strategy B

Identify mechanisms and resources for enhancing citizen urban forestry stewardship.

Strategy C

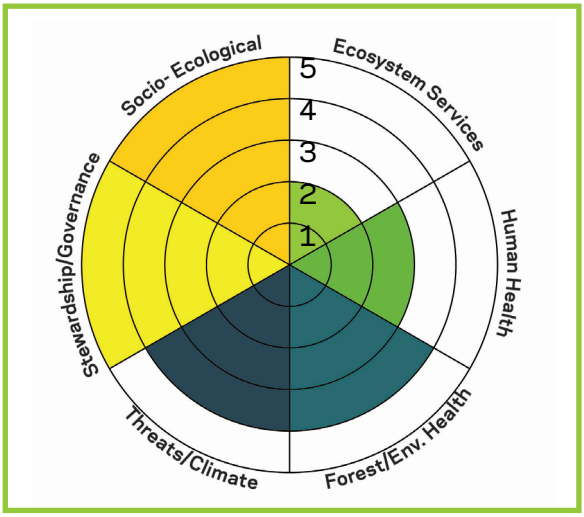
Promote better use of technology and tools in urban forestry.

Strategy D

Facilitate expanded research and delivery of scientific findings to all stakeholders (See Section D on Research Needs).

Relevant Research Needs

All of the research recommendations serve to support this goal. Some of the research activity is aimed at better understanding the forest resource, that is, 'what do we have?' Other research recommendations focus on knowledge that supports best practices and efficient management strategies, that is, 'how do we steward it?' Additional research is intended to determine forest functions and benefits, that is, to answer the question of 'why is this important?' Finally, studies of stewardship, governance, and knowledge networks all address the human dimensions and social dynamics that assure better connection of people with nearby nature and natural systems.



Research Needs Connected to Goal 5

Implementation Targets

Photo credit: Ryan Jackson from Edmonton Journal

1. An urban Forestry and Green Infrastructure "scorecard" is developed and widely disseminated to enable communities to measure progress and success.
2. A nationwide urban tree census is conducted in 2020.
3. Tools are created to project tree growth patterns and measure structural soundness to improve maintenance decisions and reduce risks associated with urban trees.
4. National nonprofits provide recognition to cities, towns and counties with certified community forestry management.

Why is it Important?

Figure 5.1

47.5 Million

The value of volunteer hours logged for urban and community forestry in 2014.

The value of volunteer hours logged for urban and community forestry in 2014 was estimated at 47.5 million dollars. Although between 2005 and 2014, there was a 66% loss in the number of volunteer hours logged (from 4.3 million hours logged to 1.5 million hours), volunteerism still significantly contributes to urban forestry stewardship (USDA z Public-Private Partnership Strategy, 2011).

$79/Tree

An i-Tree analysis of Minneapolis found that the municipal street tree resource provides approximately $15.7 million, or $79 per tree, in net total annual benefits to the community.

Figure 5.2

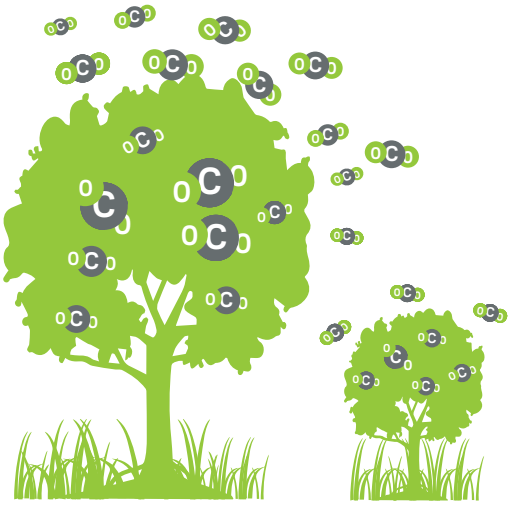


Figure 5.3

90 Times

Additional carbon sequestered by large trees compared to small trees.

The additional carbon sequestered annually by large trees as compared to small trees (Talking trees, 2006).

In the past ten years...

Photo credit: Stephen Gorman

We've done a good job

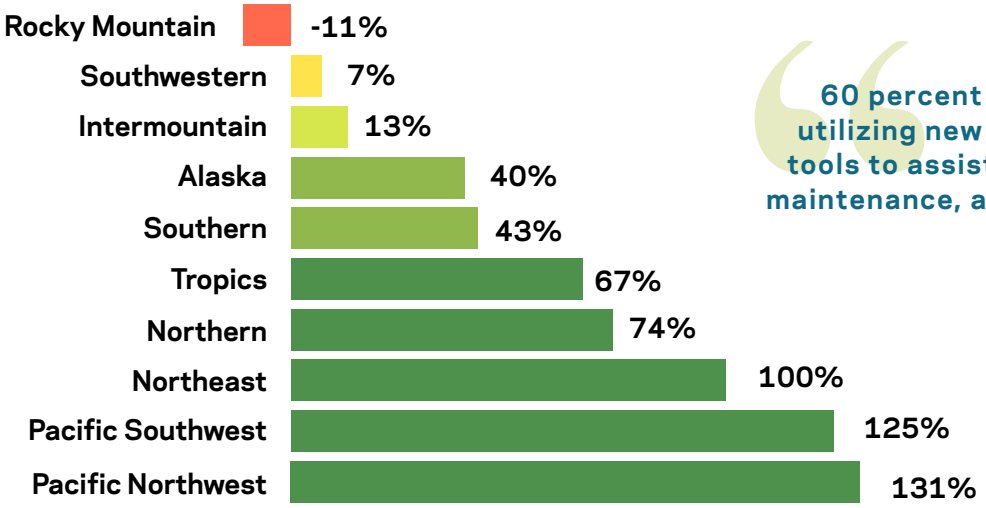
The tools, resources, programs and activities to support the growing urban and community forestry field have greatly expanded in the last decade. These new suites of tools and programs have assisted a variety of groups from private landowners to national urban forestry planners make better-informed decisions that improve maintenance practices such as tree planting techniques and tree species selection (Roman, Bartens, McPherson, & Scharenbroch, 2013).

Innovative tools developed or improved in the last ten years include: i-Tree Tool, a suite of tools from the USFS that provides urban and community forest analysis and benefits assessment capabilities to communities; The Urban Tree Canopy (UTC) Assessment Program, which provides canopy maps for communities to assess tree cover and canopy extent in their communities; EnviroAtlas, created by the EPA as a collection of interactive tools and resources that allows users to explore ecosystem services in American communities; and LiDAR (LIDAR—Light Detection and Ranging), a remote sensing method used to examine the surface of the Earth and which increases accuracy and precision. These technologies have become more readily available in the last ten years, helping urban foresters get a more accurate depiction of urban canopy cover when using geographic information systems.

> **Stewardship has made progress in the last ten years through large-scale urban tree planting programs.**

Urban and community forestry stewardship has also made progress in the last ten years through large-scale urban tree planting programs. In the last decade initiatives such as Million Trees NYC initiative, Million Trees Los Angeles, Tree Pittsburgh, and Casey Trees all initiated large-scale tree plantings. Aside from progress in tree quantity, these initiatives have also forged public-private partnerships, heightened recognition of the urban and community forestry field, increased social media usage, and energized volunteerism.

Percent Change in Number of Communities with Management Plans Between 2005 and 2014



> **60 percent of cities are utilizing new and emerging tools to assist management, maintenance, and stewardship.**

Figure 5.4: Data drawn from CARS, 2005-2015

In the next ten years...

We still have a lot to do

Despite significant progress developing tools and strategies to better maintain the urban and community forest, work still remains to strengthen these tools in the next ten years. For example, the Statewide Forest Resource Assessments and Strategies Report found that, to meet their urban forest objectives, 42 percent of states report that they needed to expand the use of technology, improve technical training, and provide more support in disciplines related to urban and community forestry management (SAFRAS Report, 2010). Further, the 2010 USFS urban and community forest national assessment found that the most frequently reported challenge (35 percent) was the lack of data or management plans.

> **The most frequently reported challenge is the lack of data or management plans.**

To assist with these gaps in the next ten years, improved long-term monitoring data is needed to better understand the change of urban and community forestry over time, such as canopy loss. This can be most impactful and cost efficient if coordinated on a national or regional level by developing protocols for data collection. A 2013 study found that data protocols are currently a big challenge for 28 percent of urban and community forestry organizations, supporting the need for more initiatives to develop such data protocols over the next ten years (Roman, et al., 2013).

Maintenance of large-scale tree plantings will also need to put greater focus on the right tree in the right place. Community forest management will increasingly need to reflect regional soil and environmental conditions as well as be strategically planned for wildlife corridors, urban orchards, air quality, water quality, and stormwater management. Moving forward, to be as strategic as possible, increased technical assistance that addresses needs of specific ecosystem regions will be essential. Maintenance efforts can be magnified with increased volunteer stewardship, but continued education initiatives about the importance of urban and community forestry will continue to be important to energize this stewardship and volunteerism.

Urban and community foresters will also need to create and promote opportunities for homeowners to plant and maintain trees on their property. This is essential as 56 percent of America's forests are privately owned and contribute to cleaner water, air, and wildlife habitat (Stein, et al., 2009). Some community programs offer micro-grants as in Hillsborough County, Florida, which provides $2,500 to neighborhood and homeowner associations to encourage increased planting of trees ("Tree Program Mini-Grant", n.d). On a smaller scale, design standards can assist with mandating trees on commercial and residential properties. For example, Minnesota's Minimal Impact Design Standards (MIDS) aim to improve stormwater management by setting performance goals for new and redevelopments, in which trees can provide important stormwater management services (Minimal Impact Design Standards, 2013).

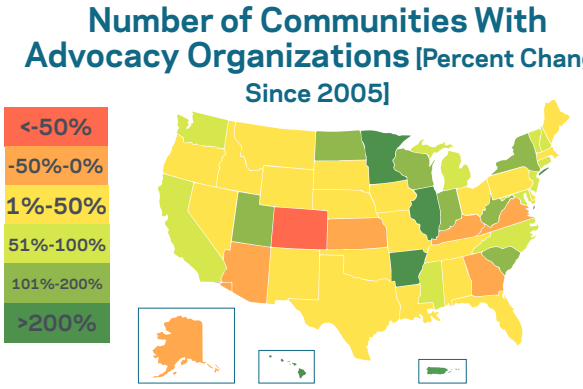


Figure 5.6: Data drawn from CARS 2005-2015

On the positive side, Americans agree that more needs to be done. In a 2011 nationwide survey by National Voter Attitudes Toward America's Forests to assess key public perceptions and values related to forests, 41 percent of Americans reported that "more needs to be done" to manage and protect forests and trees in their state, with 21 percent reporting that they "don't know enough to say," and only 34 percent reporting that "enough" is being done. This suggests that the majority of people who feel knowledgeable enough to voice an opinion would support increased efforts to manage urban and community forests.

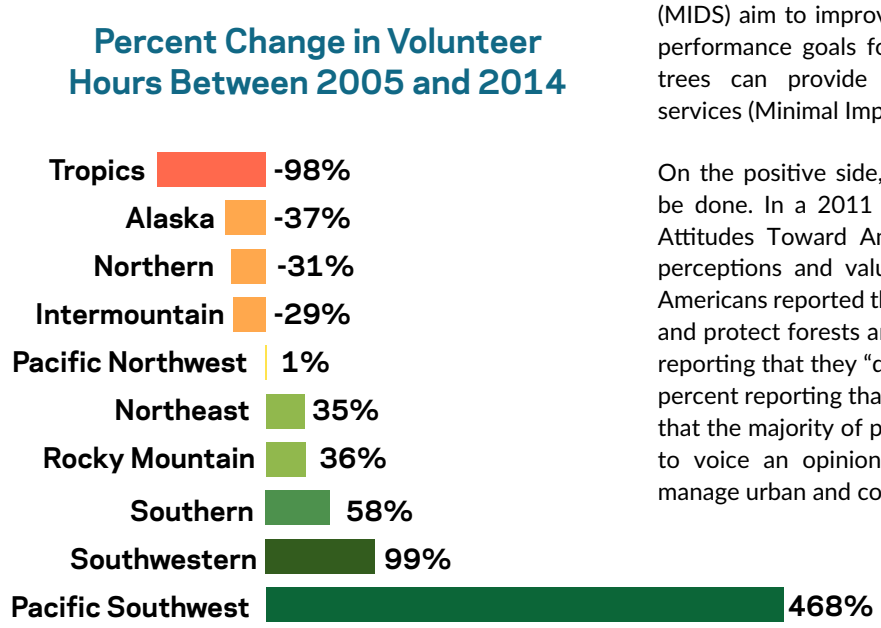


Figure 5.5: Data drawn from CARS, 2005-2015

How can we get there?

Goal 5 Strategies and Actions

Strategy A: Improve urban and community forest management, maintenance and arboricultural practices.

- ☐ **Action 1:** Facilitate funding to promote planting higher quality trees in urban forests with less emphasis on the quantity of trees planted (such as the published International Society of Arboriculture guidelines).
- ☐ **Action 2:** Facilitate increased funding for urban forest management and arboricultural practices with special emphasis on preservation and maintenance.
- ☐ **Action 3:** To foster improved urban forestry, facilitate funding for urban forestry BMPs (design, management, maintenance), including indicators and benchmarks for success.
- ☐ **Action 4:** Develop programs to increase utilization of urban forest waste and generate revenue (such as production of biofuel, organic soil amendment, mulch, consumer products, etc.).
- ☐ **Action 5:** Promote opportunities for homeowners to plant and effectively maintain trees in their yards and on private lands.

Strategy B: Identify mechanisms and resources for enhancing citizen urban forestry stewardship.

- ☐ **Action 1:** Develop multiple pathways for urban forest stewardship including trained volunteers and municipal engagement in collaborative efforts for urban forestry care.

Strategy C: Promote for better use of technology and tools in urban forestry.

- ☐ **Action 1:** Facilitate funding and opportunities for communities and organizations to better use tools and technologies.
- ☐ **Action 2:** Promote integrated use of technology by all for stronger decision-making, responses to opportunities and challenges at a regional scale, better placement of trees, and sharing best practices.
- ☐ **Action 3:** Facilitate funding and development of more technologies to address pests and other climate change threats.
- ☐ **Action 4:** Consider refining technology tools for different regions, such as for the unique conditions of coastal and tropical areas (e.g., additional reference cities are needed for the i-Tree suite to provide reliable and accurate information, such as for Alaska).
- ☐ **Action 5:** Support development of technologies for advancing urban forestry monitoring and management.

Strategy D: Facilitate expanded research and delivery of scientific findings to all stakeholders. (See Section D on Research Needs)

- ☐ **Action 1:** Support and collaborate with USFS Science, technology delivery team, Extension, American Forests and others to expand their research to tech transfer platform. Ensure use of plain and accessible language, availability in multiple-languages, and that is 508 compliant to provide software and website accessibility to people with disabilities.

See Appendix 3 for the full suite of actions related to Goal 5.

Case Study: San Francisco Plant Finder Encourages Community Stewardship of Urban Forest

Developed in the last ten years, SF Plant Finder is a plant database that provides information for community members on the types of plants to plant in different regions of the city. The plants in the database were selected based on biodiversity, water, and conservation practices in mind due to drought and provisions for wildlife. The database allows users to search by plant species, plant community, or by place. For example, when searching "Haight Street," the user can find 109 plants appropriate for the ecology of the neighborhood. The Plant Finder recommends appropriate plants for sidewalks, private backyards and roofs that are adapted to San Francisco's unique environment, climate and habitats. This tool was developed as part of the Green Connections project. (Source: http://sfplantfinder.org)

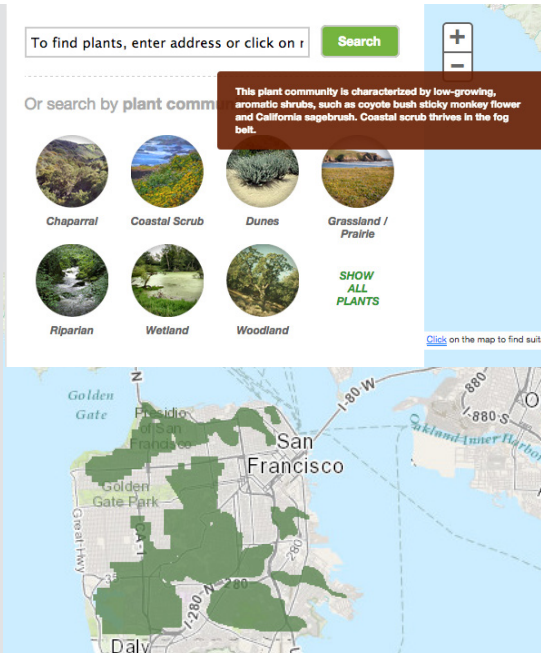


Photo credit: http://sfplantfinder.org/

Case Study: "Plant MOre Trees" Fosters More Active Volunteer Stewardship

Forest ReLeaf of Missouri has developed a new tree plotting tool designed to track trees planted by volunteers throughout Missouri. This new application, funded by the Missouri Department of Conservation with technical support from Plan-It Geo, will play a key role in measuring success toward a new statewide community tree planting goal. In January 2016, Forest ReLeaf, along with the Missouri Community Forestry Council, will launch "Vision 20/20 – Plant 1 Million MOre Trees by 2020." Planting groups from throughout Missouri will be encouraged to plot the location, species and other details about their newly planted trees. According to Donna Coble, executive director of Forest ReLeaf, "We see this as a great way to get more volunteers out planting and caring for trees, while also providing us with very valuable data. This is a "call to action" – a way to get the citizens of Missouri to work together toward a big goal that benefits us all."

Photo credit: Guy Kramer

Case Study: Open Tree Map Facilitates Data Collection to Improve Urban Forest Management

Open Tree Map is a crowd sourcing platform map that solicits community members to post tree's geographically. The outcome is a map website that is searchable by tree species, location, tree diameter, date planted, or even tree characteristics. The map administrator also has the capability to customize the search options to match a specific community agenda. This tool engages community stewards and can be easily translated into a useful inventory for urban forest planners. Cities such as San Diego, Philadelphia, Tampa, and Grand Rapids among many others have successfully utilized this tool. (Source: http://opentreemap.github.io)

Photo credit: Kathleen Wolf

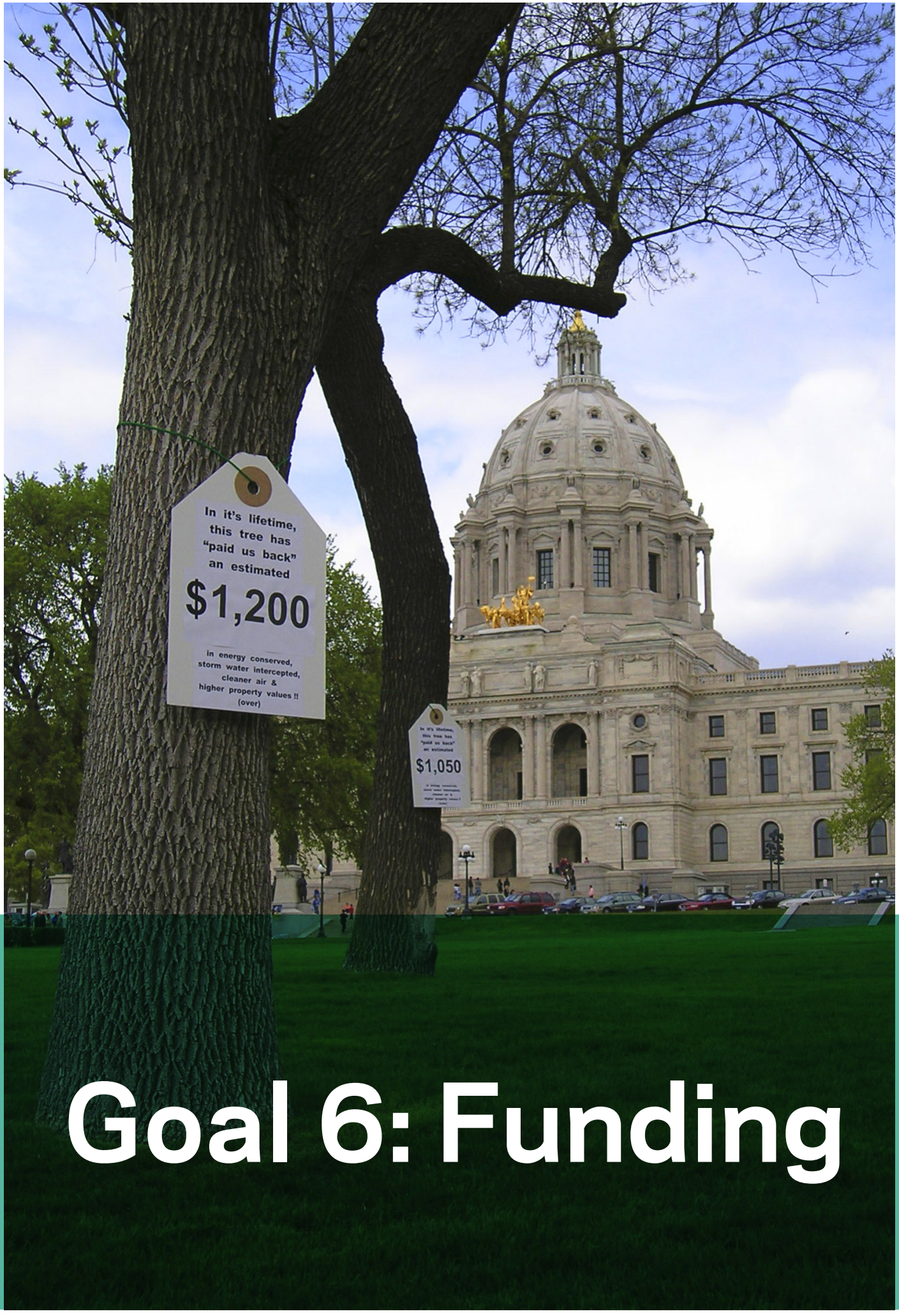


Photo credit: Creative, Effective and Lasting (CEL)

Goal 6: Funding

Goal 6

Diversify, Leverage and Increase Funding for Urban and Community Forestry

The urban forestry community should embody the changing demographics of our nation's cities, towns and counties. The next Ten-Year Urban Forestry Action Plan must focus on addressing the needs of underserved communities. This can be accomplished in three ways – increasing diverse access to the field; increasing the diversity of champions; as well as increasing equitable distribution of trees and other natural amenities across all neighborhoods. There is an urgent need to increase cultural, ethnic and economic diversity within the urban forestry community, both at the professional level and among the citizen leadership that drives the urban and community forestry agenda forward. The field needs to become a progressive, innovative and inclusive profession at all levels, from entry level to senior leadership. Vocal and visible champions need to be developed at all levels in the next decade to bring attention to how community forests offer comprehensive and cost-effective solutions to urgent community issues. In the federal structure, urban and community forestry need to deliver strategies and programs for existing and anticipated challenges by coordinating the work of multiple agencies and leveraging their resources to promote equity and diversity in the profession, as well as equitable access to the trees and forests themselves.

Strategy A

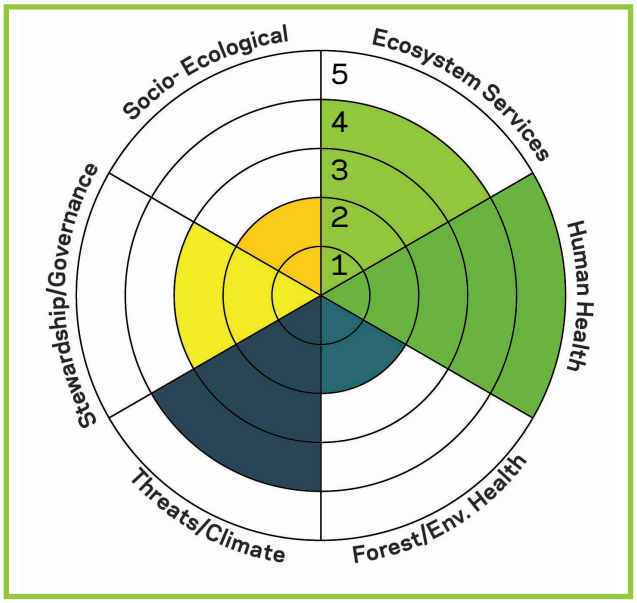
Enhance funding resources for urban and community forestry.

Strategy B

Leverage and diversify funding through expanded collaboration between urban forestry and related fields, agencies and sectors.

Relevant Research Needs

Urban forestry professionals continue to encounter limited public perceptions about the values and functions of trees in cities in some communities. While important for quality of life, common perceptions about tree benefits being limited to beauty and amenities fail to generate the levels of fiscal and political support needed to support quality urban forestry programs. Some research recommendations promote better understanding of the urban forest resource and the ecosystem services and benefits provided by the resource. Such knowledge can help expand residents' and local leaders' understandings, leading to expanded funding and collaborations for trees.



Research Needs Connected to Goal 6

Implementation Targets

Photo credit: Christine Gyovai

1 Funding for urban forestry is broad, deep and stable, reflecting the multiple challenges that it addresses, with a growing percentage funding from nontraditional channels (resilience, climate, health, food, urban forest products).

2 Federal programs relating to urban forestry are working together to increase their collective impact and expand urban tree canopy.

3 The urban forestry community has developed public-private partnerships with major corporations that want to be associated with the environmental, health and community benefits derived from urban ecosystems.

Why is it Important?

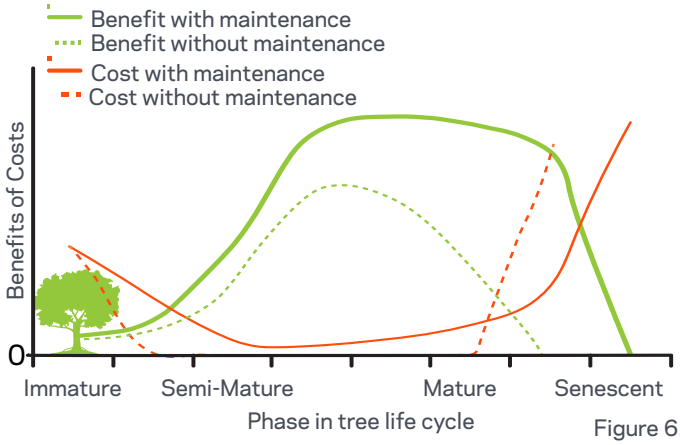


Figure 6.1

Benefits of Maintenance Demonstrate Importance of Funding

Theoretical costs and benefits profiles over the lifetime of an individual tree, with (solid lines) and without (dashed lines) adequate maintenance. Benefits are maximized during the mature phase of a tree and decline rapidly through senescence, while costs show an inverse pattern. Without sufficient funding for maintenance, benefits are not realized (Hauer et al., 2014).

$7.1 Million

Increased property values in Minneapolis

Using the iTree software, the city of Minneapolis calculated that not only had they saved approximately $6.8 million in energy expenditure by planting trees, but they had also increased property values by $7.1 million (City Of Minneapolis, Minnesota Municipal Tree Resource Analysis).

Figure 6.2

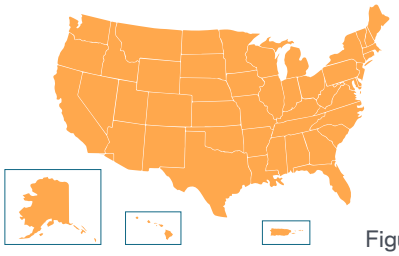


Figure 6.3

-24%

Percent Change in Federal Funding for the Nation

In the last decade, the average percent change between 2005 and 2014 in the 10 USFS regions was negative 19.6 percent. The Pacific Southwest had the greatest percent change with negative 100 percent and the Northeastern Region had the greatest gains with a positive 10 percent change (CARS 2005 – 2014).

In the past ten years...

We've done a good job

In a response to a significant decline in federal funding over the last decade, urban and community forestry continues to seek creative and innovative partnerships and funding sources to support the growth and development of urban and community forestry. For example, planners have increasingly passed ordinances that require developers to incorporate trees and tree maintenance into their designs. This might be characterized as the decade when private-public partnerships came into their own as funders began to set award criteria that favored multi-sector partnerships and as organizations began to see that they could more easily leverage their funding through expanded partnerships. Partnerships for urban and community forestry include every sector of activity imaginable, from water and power utilities, state regulatory authorities, to commercial ski areas and non-governmental organizations.

This trend toward partnerships is evident in the USDA Forest Service Public-Private Partnership Strategy initiated in 2011, which is expanding partnerships to increase social and capital investments. While partnerships often lead to increased funding, they also create immense value through increased forged relationships with communities and improved innovation.

49 percent more communities have advocacy or advisory organizations related to urban forestry, suggesting a rise in leveraged funding.

The following is a summary of gauges of progress made in the last decade (2006-2016), which demonstrate more diversified and leveraged funding for urban and community forestry:

- There are 49 percent more communities with advocacy or advisory organizations related to urban forestry, and this increase is reported across most the United States, in eight of the ten USDA Forest Service regions. The increasing numbers of advocacy organizations suggest an associated increase in partnerships and, in turn, an associated increase in leveraged funding (CARS 2005 – 2014).

- The value of volunteer hours logged for urban forestry in 2014 was estimated at 47.5 million dollars. Although between 2005 and 2014, there was a 66 percent loss in the number of volunteer hours logged (from 4.3 million hours logged to 1.5 million hours), volunteerism still significantly contributes to urban forestry stewardship (CARS 2005 – 2014).

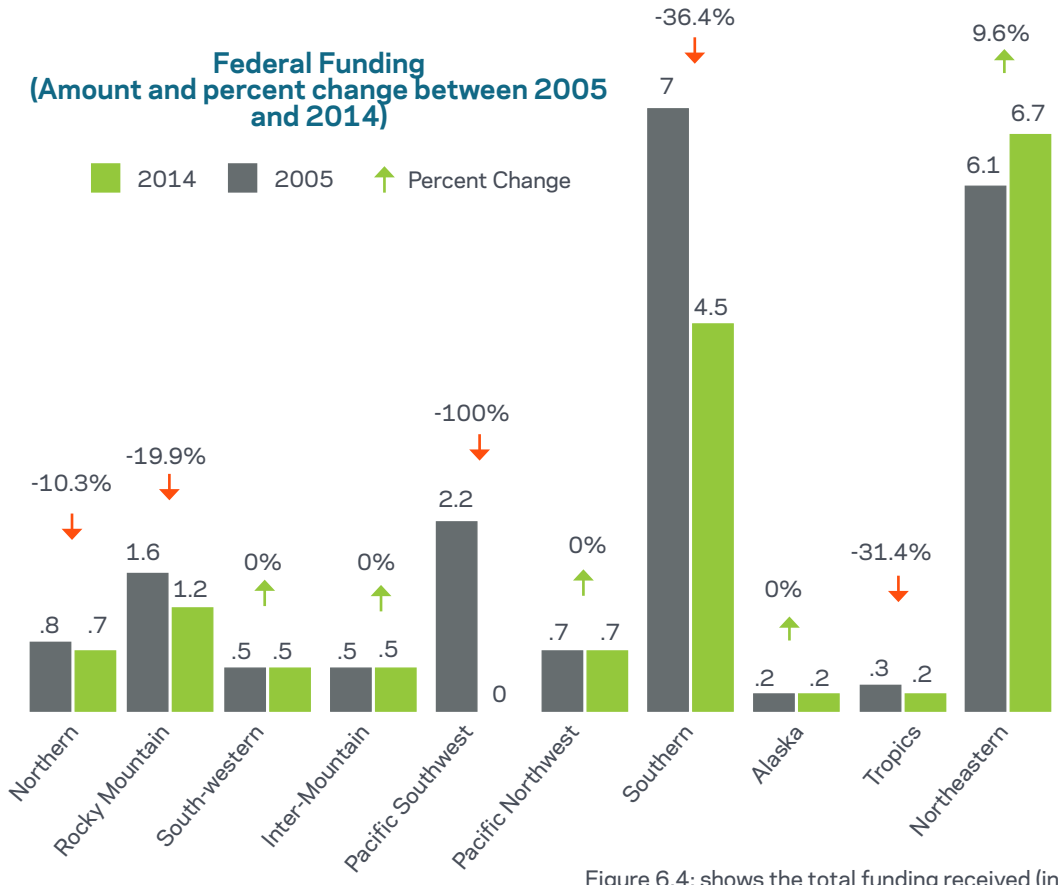


Figure 6.4: shows the total funding received (in millions) in 2014 by region. [CARS 2005-2014]

We still have a lot to do

In the last decade, the majority of states have lost federal funding for urban and community forestry. Funding fluctuated from state to state, with the State of California losing all of its federal urban and community forestry funding to fund critical fire fighting efforts. The only state to experience an increase in federal urban forestry funding was the State of New York, with a budget approaching $1 million. In 2014, significantly more federal funding was needed than available to effectively manage and steward our urban and community forests. For example, funding needs for the nation's urban and community forests were estimated at $31 million while funding received was $15.1 million, creating a staggering funding gap of 50 percent. Further, from 2005 to 2014, the amount spent per capita in communities assisted by the USDA Forest Service decreased by as much as 33 percent (CARS 2005 – 2014). To make matters worse, while funds have decreased, needs are continuing to escalate due to urban resilience and climate change challenges. Attention to funding the growing urban forestry needs is essential as the majority of America now live in urban areas, and movement to cities and urbanized areas is expected to continue over the next decade (Nowak, 2010). Lastly, further compounding this challenge is the fact that less than 7 percent of all donated dollars go to environmental issues, suggesting that urban and community forestry is one area where the private donation sector cannot compensate for loss of federal dollars.

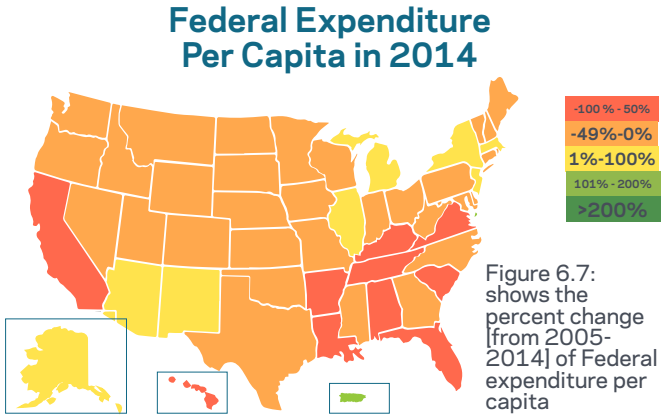


Figure 6.7: shows the percent change [from 2005-2014] of Federal expenditure per capita

To facilitate an understanding of why urban and community forestry funding should be a top funding priority, a message must be strategically crafted to communicate how urban and community forestry is a cost-effective, core solution to numerous urgent and complex urban challenges in environmental and human health. Communication is key, as urban and community forestry could and should become a "go-to" tool to help address the myriad issues that are better funded, such as health, economic development, and resilience.

Communication through annual briefings to the USDA Forest Service Chief and outreach to elected officials will also be important. Further, building upon progress in the last ten years, there is a need to expand collaboration between urban forestry and related fields, such as forged partnerships with healthcare professions and community designers and developers. Specifically, there is a need to foster federal inter-agency collaboration to leverage funding and strategies from within the USDA Forest Service, as well as to foster inter-professional collaboration outside of the USDA Forest Service. Funding strategies that will be important to develop in the next decade include supporting young or developing state and local programs, developing incentive programs, rewarding exemplary efforts, and funding public awareness campaigns.

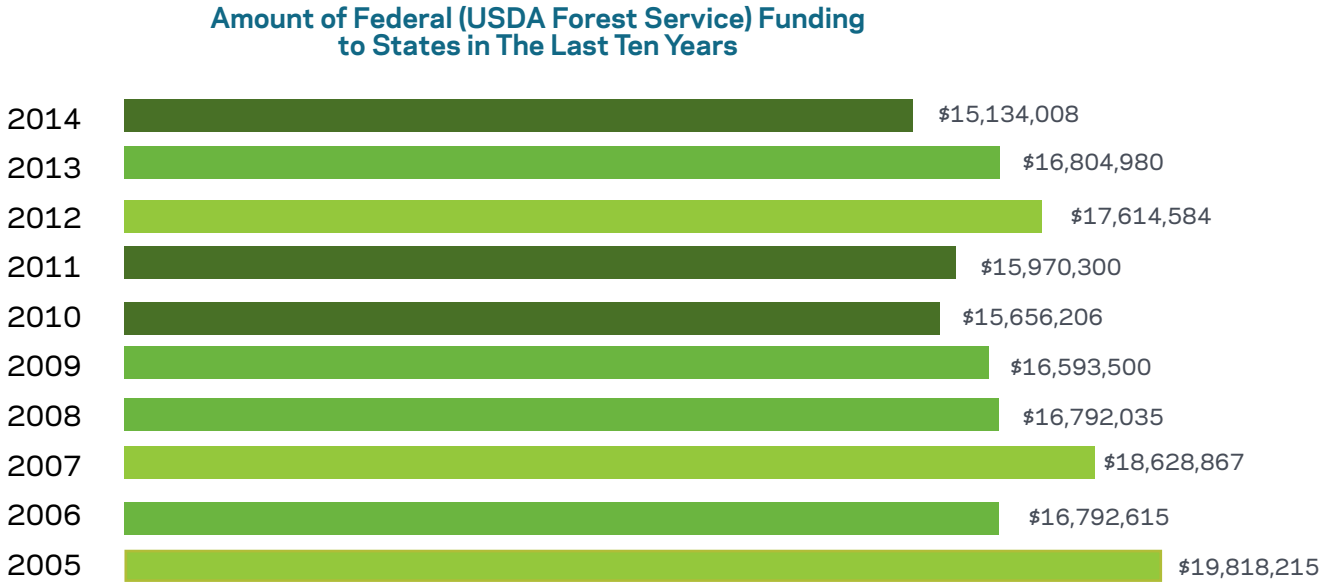


Figure 65: shows the amount [$] of USFS Funding in the last ten years

How can we get there?

Goal 6 Strategies and Actions

Strategy A: Enhance funding resources for urban and community forestry.

- ☐ **Action 1:** Hold annual briefings for the USFS Chief on the progress and value of urban and community forestry and the need for increased funding. Emphasize that urban and community forestry funding should not be redirected toward fire control.
- ☐ **Action 2:** Conduct targeted outreach to elected officials to increase urban forestry funding and to maintain a dedicated source of urban forestry funding.
- ☐ **Action 3:** Facilitate an increase in federal funding for urban forestry to support young or developing state and local programs.
- ☐ **Action 4:** Align resources with key agencies (Federal, State, Local) and partnerships (for-profit, non-profit, etc.) in order to recognize diversified and enhanced funding.
- ☐ **Action 5:** Develop incentive programs to reward and recognize successful urban forestry efforts and actions.
- ☐ **Action 6:** Cultivate new funding opportunities in conjunction with a national urban forestry public awareness campaign (see goal 7).
- ☐ **Action 7:** Work with partners to redirect existing funding to urban and community forestry and develop new sources of funding.
- ☐ **Action 8:** Capture the value of urban forest products in managing urban forests. Develop and connect to urban wood utilization programs (for timber products rather than solely chipping urban trees).
- ☐ **Action 9:** Develop new innovative sources of stable funding for urban forestry from private sources.

Strategy B: Leverage and diversify funding through expanded collaboration between urban forestry and related fields, agencies and sectors.

- ☐ **Action 1:** Convene Federal agencies to foster inter-agency links and connections, and to develop a plan for urban forestry coordination and collaboration among federal agencies.
- ☐ **Action 2:** Align urban and community forestry research with additional research resources (including Federal, State, Local, for-profit and non-profit) to develop research findings that advise strategic investment of enhanced funding resources.
- ☐ **Action 3:** Foster opportunities for collaborative research between different research arms of the USDA Forest Service, to broaden community applications and impacts.
- ☐ **Action 4:** Foster connections between urban forestry and related departments in municipalities.

See Appendix 3 for the full suite of actions related to Goal 6.

Case Study: The Urban Waters Federal Partnership Breaks Down Federal Program Silos and Leverages Funding

Founded in 2011, the Urban Waters Federal Partnership focuses on revitalizing urban waters and the communities that surround them while breaking down federal program silos to promote efficiency of resources and improved coordination of investments. The partnership consists of 11 federal agencies that have broad goals from creating local jobs to protecting health. The initial partnership efforts are taking place in seven pilot cities: Baltimore, the Bronx, Denver, Los Angeles, New Orleans, Northwest Indiana and Washington. An example of how these partnerships are leveraging funding, the ground work in Baltimore includes revitalizing the Patapsco Watershed with tree planting around Baltimore to reduce run-off, repaving alleys and streets leading to the river to limit pollution, and developing a Green Infrastructure Plan with the city government. (Source: http://www.urbanwaters.gov/)

Photo credit: http://www2.epa.gov/urbanwaters/what-communities-are-doing

Case Study: Funding for Urban Forestry in California Newly Available in many Communities

According to the National Association of State Foresters, "California, as part of its greenhouse gas reduction initiative, has taken the unprecedented move of allocating a large pot of urban forestry money exclusively to disadvantaged communities plagued by pollution. Advocates for Urban Releaf, an Oakland-based urban forestry company, has applied for the forestry dollars as part of an ongoing statewide grant process. They are hopeful that the new program will go a long way toward adding greenery to historically neglected Oakland neighborhoods. The $18 million urban forestry fund is under the control of the California Department of Forestry and Fire Protection (Cal Fire) and is part of the state's broader cap-and-trade initiative, which was established after the 2006 passage of Assembly Bill 32. That legislation, the California Global Warming Solutions Act, targets climate change by requiring the state to reduce greenhouse gas emissions to 1990 levels by 2020."(Source: http://www.stateforesters.org/news-events/blog/california-communities-receive-urban-forestry-funding#sthash.jhtROWoP.dpuf

Photo credit: Kathleen Wolf

Case Study: American Public Works Association Outlines Best Management Practices for Urban Forestry Budgeting and Funding

The American Public Works Association (APWA) along with the Society of Municipal Arborists outlines best management practices including typical budget allocation for urban forestry. For example, public works managers can find that The National Arbor Day Foundation requires that a community forestry program be supported by an annual budget of at least $2 per capita for its Tree City USA program. However, they state that the more realistic number is probably $5 per capita. Further the guide summaries sources of funding from federal and private grants to tax districts, capital improvement projects, tree work permits, development, inspection fees, and environmental fines. (Source: https://www2.apwa.net/Documents/About/CoopAgreements/UrbanForestry/UrbanForestry-1.pdf)

Photo credit: Kathleen Wolf

Community members join Casey Trees for tree plantings at Noyes Elemetary School in 2010 and on Massachussetts Avenue in 2014.
Photo credit: Casey Trees

Goal 7: Education and Awareness

Goal 7

Increase Public Awareness and Environmental Education to Promote Stewardship

Urban and community forests are key infrastructure at the regional, municipal, neighborhood, and home scale across America, and more public education is needed to provide informed decision making and support for the development and maintenance of our urban and community forests.

Strategy A

Strengthen environmental education programs that focus on urban and community forestry issues.

Strategy B

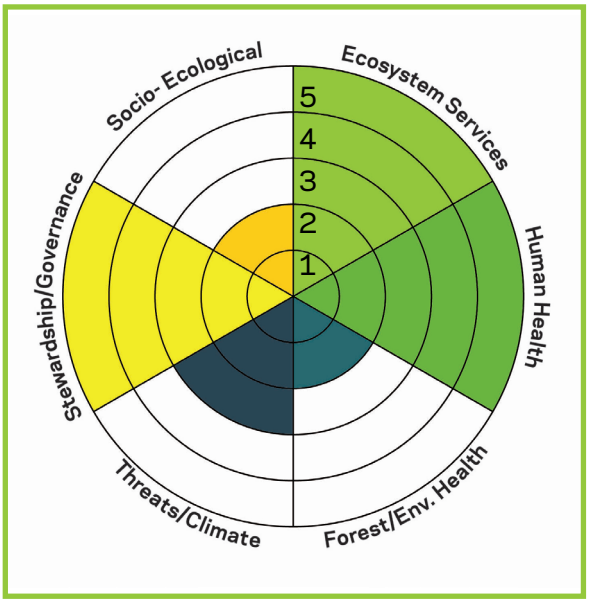
Create a nationwide urban forestry public awareness and education campaign.

Strategy C

Increase outreach and educational opportunities for underserved and diverse communities to increase urban forestry stewardship.

Relevant Research Needs

Research has, and will continue to, provide the knowledge that intrigues, engages, and welcomes public awareness and engagement. Prior studies have become widely applied models that reveal to managers and the public the extent and value of the urban forest. i-Tree is an example and new science will inform new assessment models, helping communities to visualize and put a value on their urban forest. Local urban forest managers and collaborators can use such tools for awareness building and education. In addition, residents can be recruited to participate in the data collection, building deeper understanding and commitment to the local urban and community forest ecosystem.



Research Needs Connected to Goal 7

Implementation Targets

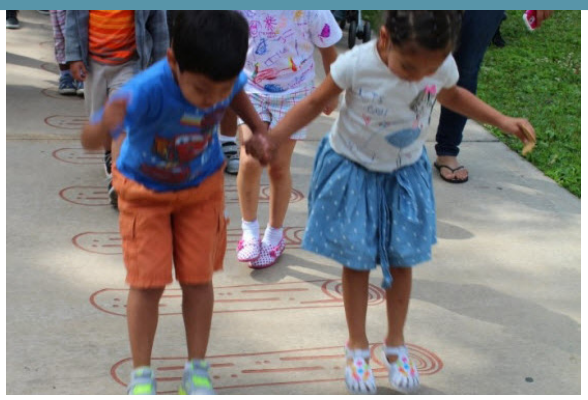


Photo credit: Amigos de los Rios

1 A national education campaign galvanizes political, corporate and popular support for the economic, health and environmental benefits developed by urban and community forestry.

2 An on-line platform is developed and used to track stewardship activities, measure their impacts, aggregate results, and connect stewards locally and nationally.

3 An expanded environmental education curriculum incorporating urban forestry is widely adopted by school systems nationwide.

Why is it Important?

Figure 7.1

4000

The number of Project Learning Tree GreenSchools across the country.

Project Learning Tree GreenSchools are engaged in investigating their school site and taking action to maintain and increase the tree cover around their campus.

7 Hours

The average amount of time children engage in media each day.

Children ages 8 – 18 engage in over 7 hours of media time (e.g., watching TV, listening to music, using the Internet/computer, playing video games) each day (Rideout, Foehr & Roberts, 2010)

Figure 7.2

Annual studies conducted by the Outdoor Foundation reveal a similar pattern. These reports show decreasing participation rates in outdoor activities for youth ages 6-17 each of the past four years, from about 76% of youth participating in 2006 to about 60% participating in 2009 (Outdoor Foundation, 2008, 2009, 2010).

Figure 7.3

Figure 7.4

385

The number of service volunteers recruited to a planting event in Portland, Oregon through tweeting and posting on Facebook.

In the past ten years...

We've done a good job

Over the last ten years, broader considerations such as the human health and urban resilience benefits of trees have garnered attention and importance in both the public and academic research arenas. Prior to this time, attention was focused more on demonstrating and educating the public about the environmental health services of urban forests. Put another way, our understanding of urban forestry benefits has expanded into realms that now touch every aspect of community wellness. Consequently, urban and community forestry now has the potential for a greatly expanded circle of influence, reaching into numerous other health and community development professions. It also offers a far richer and deeper toolbox for raising awareness and educating people about urban forestry. Additionally, as understanding of the impacts of urban forestry has broadened, urban foresters have expanded their roles from traditional functions of tree selection, placement, and management, to engaging their community in creating collaborative partnerships that strive for broader community goals while encouraging public stewardship of the community forest.

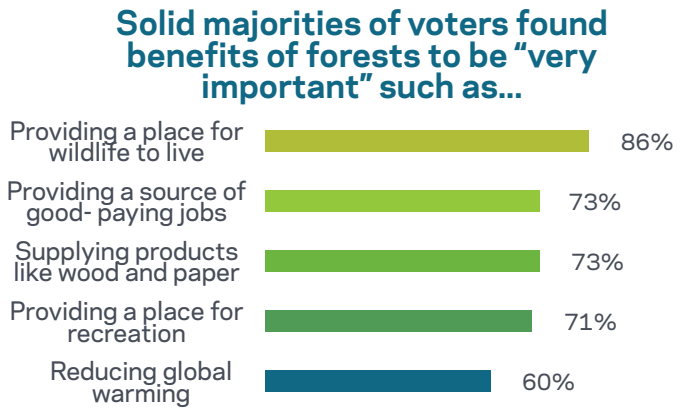


Figure 7.5: Data drawn from Public Opinion Strategies, 2011

To promote stewardship of urban forests, new communications strategies are growing public awareness, such as achieving outreach to new audiences through social media. Another tool is environmental education, a long-term effort that provides age-appropriate instruction for everyone from youth to seniors, which builds knowledge, understanding, critical-thinking, and problem-solving skills. In the past ten years, a combination of communications and education strategies have been used to change people's attitudes and behavior towards urban and community forests.

Using communication tools, non-profit tree organizations now frequently engage the public through social media websites such as Facebook, Twitter, Flickr, Pinterest, and blogs. Exemplary sites include Arbor Day Foundation's Tree Campus USA Pinterest page, which highlights their activities at college campuses across the nation through an interactive picture map. Another example is New York City's Million Trees Initiative, which effectively uses its Facebook page to broadcast events, educate on the importance of trees, and celebrate successes.

Organizations have also increasingly recognized the importance of communicating messages that are visually appealing, appropriate for specific populations, and that convey a simple message. Exemplary campaigns include The Intertwine Alliance's "Our Common Ground" campaign, Northern Kentucky Urban Forest Council's "Kentucky Roots" campaign, and Minnesota's "Trees Pay Us Back" campaign.

Through environmental education, schools, non-profit organizations, and community groups are intentionally and systematically emphasizing the importance of understanding the many values of urban trees and of getting students outside to learn. Environmental education is a process that increases the learner's awareness and knowledge about the environment and related issues. It helps to develop the necessary skills and expertise to address these issues, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978).

The following gauges of progress in the last decade (2006-2016) demonstrate increased public awareness and environmental education:

- More than 200,000 educators have participated in Project Learning Tree's professional development to help educate PreK-12 students about the importance and value of trees in our lives (AFF, 2015).

- Project Learning Tree (PLT) has designed, developed, tested, published, distributed, and formally evaluated an array of environmental education activities for PreK-12 students focused on trees and forests. Each activity is intentionally aligned with current state and national academic standards to ensure use in schools. From 2006-2016 alone, 200,000 copies of PLT's PreK-12 Environmental Education Activity Guide, 50,000 copies of PLT's Environmental Experiences for Early Childhood, 17,000 copies of PLT's high school module Focus on Forests and 21,000 copies of Places We Live have been distributed to educators across the country through in-person PLT professional development workshops.

- Project Learning Tree's GreenWorks! grant program has supported more than 520 service-learning projects specifically related to enhancing students' knowledge of trees through planting trees and gardens on school grounds and in communities.

In the next ten years...

Photo Credit: Amigos de los Rios

We still have a lot to do

Repositioning urban forestry is more important now than ever. Urban forestry is growing as a recognizable field with much to offer in the way of solutions and tools for addressing urgent community human and environmental health challenges. Building upon this momentum to communicate what urban forestry has to offer would lead to improved research, funding, political support, and professionalism in the field.

While much has been accomplished, there is still much more to do. In a 2011 nationwide survey by National Voter Attitudes Toward America's Forests, key public perceptions and values related to forests were assessed. A large 21% reported that they "don't know enough to say." This suggests that the public would strongly benefit from an awareness and education campaign.

There is also an alarming lack of awareness from mayors in small towns on the importance of trees in cities. In a 2008 study, over 500 Southern mayors in small towns in 13 states ranked tree maintenance lowest among community initiatives. Interestingly, the initiatives ranked highest by the mayors, such as crime and economic development, could easily be supported by urban forestry. When these mayors were asked to rank the values of trees, mayors ranked their aesthetic qualities highest, indicating a lack of understanding of the many human and ecosystem health services provided by community trees. With appropriate campaign messages, decision makers and community members will gain understanding and appreciation that the value of community trees is real, far beyond aesthetic qualities, and can be measured in billions of dollars.

More specifically, the benefits of urban and community forestry include improved physical and mental health, ecosystem health, recreational opportunities, urban resilience, and economic development. However, communication campaigns and environmental education initiatives in the coming years will need to align well with each of these distinct interests and be targeted to their specific stakeholder communities. In addition to targeting specific topical interests, messages and education programs will also need to be targeted for specific professional interests. Audiences that should be considered include elected officials, city managers, planners, public health policy makers, health delivery professionals, public and private K-12 school teachers and students, allied professional organizations, legislators, homeowners, recreationists, parents, and the general public.

> **With appropriate campaign messages, we will gain understanding and appreciation that the value of community trees is real, far beyond aesthetic qualities.**

For example, Project Learning Tree is developing new online educational units about trees and forests that support the teaching of STEM (science, technology, engineering, and math) and also address Common Core State Standards and the new Next Generation Science Standards. Teachers who aren't able to find the time to attend workshops can instead take self-paced online courses. Communication and environmental education strategies can also build on the growing Green Schools movement, and encourage tree planting and stewardship on their school campus.

In the coming decade, messages will need to mature from communicating the scientific facts about trees to demonstrating how urban forests are related to the things that matter most to a specific intended audience. Effective persuasion consists of sharing how individuals will benefit. If the target population was neighborhood associations, then an important message could be about the role of the community tree canopy and how trees absorb water runoff and pollutants so that citizens can breathe cleaner air, drink cleaner water, and fish, swim or paddle in cleaner streams. For town planning boards, the message might be targeted to address more complex concepts, such as the role of a community tree canopy in the carbon cycle, how trees can mitigate climate change and improve community resilience. For other audiences, the messages might be more narrowed and specific. For example, if the target population were real estate developers, then an important message could be about homes selling for higher prices in the presence of trees.

How can we get there?

Goal 7 Strategies and Actions

Strategy A: Strengthen environmental education programs that focus on urban and community forestry issues.

- ☐ **Action 1:** Cultivate urban forestry educational programs and resources for environmental and outdoor education.
- ☐ **Action 2:** Foster the development of urban forestry education from the elementary to graduate school level.
- ☐ **Action 3:** Facilitate funding for mini-grants for education, including educational art.

Strategy B: Create a nationwide urban forestry public awareness and education campaign.

- ☐ **Action 1:** Re-brand urban forestry with pop culture, social media, radio, TV, billboards, and advertising.
- ☐ **Action 2:** The national awareness campaign should connect citizens with civic engagement opportunities locally.

Strategy C: Increase outreach and educational opportunities for underserved and diverse communities to increase urban forestry stewardship.

- ☐ **Action 1:** Engage underserved and diverse communities with educational programs.
- ☐ **Action 2:** Connect underserved and diverse communities with programs that distribute edible trees (fruits, berries, nuts).
- ☐ **Action 3:** Connect underserved and diverse communities with urban forestry through groups they are already connected to, e.g. existing civic, school and church groups. Use health benefits of urban forests to interest and engage underserved and minority communities.

See Appendix 3 for the full suite of actions related to Goal 7.

Case Study: Trees are Good Website is an Accessible Platform for Learning About Trees

The International Society of Arboriculture operates the "Trees are Good" website. This site provides an accessible platform for those looking to learn more about trees, stay up to date on the latest news, or find tools to help understand trees and urban forestry. The site also provides a list of community activities, games, and online resources to promote Urban and Community Forestry education. Source: http://www.treesaregood.com/

Photo credit: Vanessa Bullwinkle

Case Study: Urban School Tree and Garden Plantings Educate Students and the Community About the Value of Trees

Barnard Elementary (Washington, DC) students, in partnership with Project Learning Tree and the Casey Tree Foundation, planted over a dozen fruit trees on the school campus. Both students and the community take pride in maintaining and caring for the trees and gardens, which enhance student achievement and health. Students apply their math and science skills while planting the seeds of stewardship in the next generation.

Photo credit: Christine Gyovai

Case Study: Creative, Effective, and Lasting (CEL) Suggest Six Tips for an Effective Urban Forestry Communication Campaign

CEL recommends the following six tips when implementing an urban forestry campaign:

1. Good partners are "not usually the regular suspects for foresters" because often your best partners are people not like you.
2. When approaching a potential partner, come prepared with a sample so that the partner can clearly understand what they may gain from the partnership.
3. Address a hot issue related to the target community at that point in time. In general, energy and money savings talk to people and the connection between human health and urban and community forestry is increasingly important.
4. To create clear messages, choose one key message and three to five sub-messages (See Kentucky Roots Campaign)
5. Choose how to measure success. This measure may be adapted to make sense to a consumer, not a forester.
6. Celebrate successes. When urban foresters go into the community and do something that works well, they should bring it back to the field as a case study and show their stakeholders what they have been doing rather than moving on to the next thing.

Photo credit: Kathleen Wolf

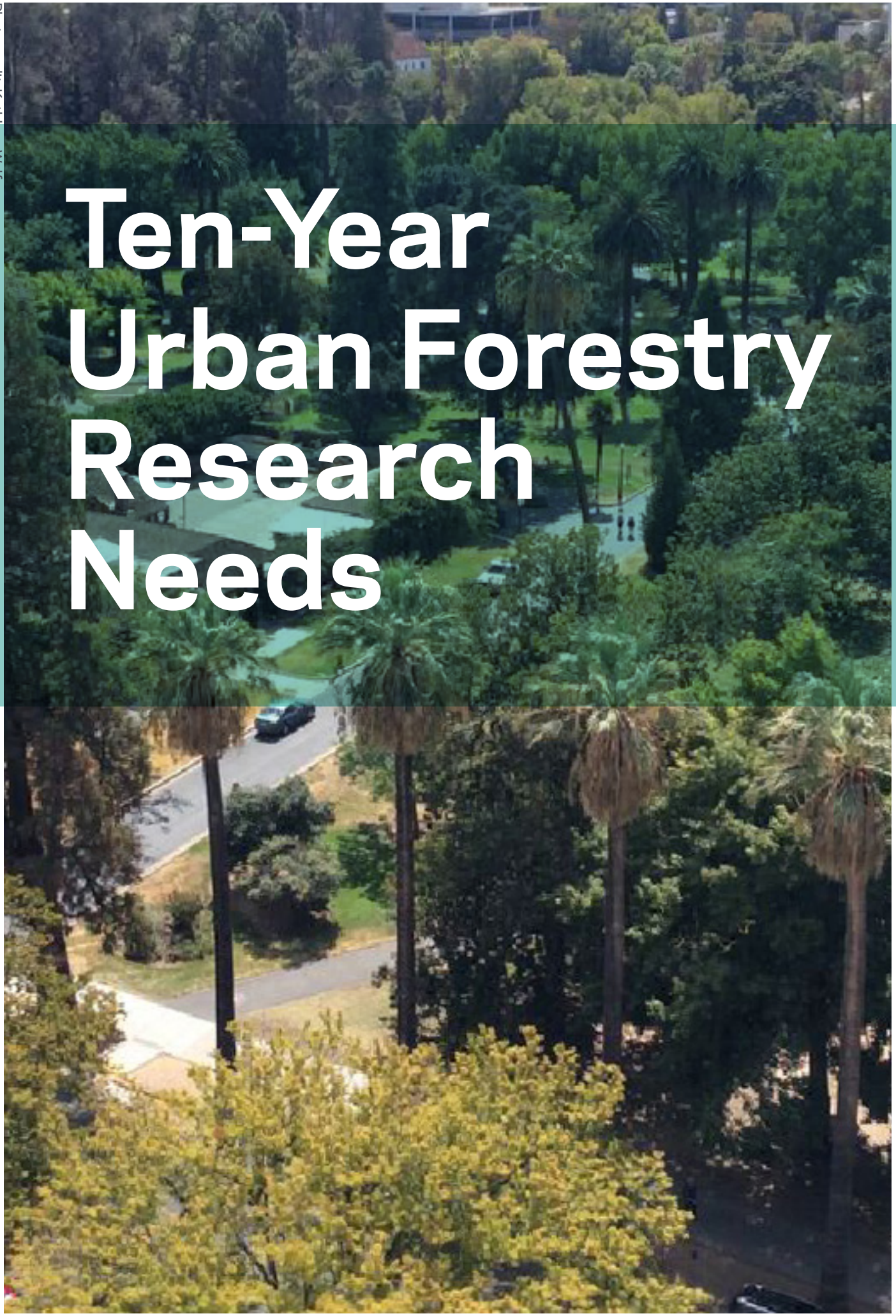


Photo credit: Kathleen Wolf

Ten-Year Urban Forestry Research Needs

Research for Action

Communities are coming to understand the importance of natural processes and ecosystems in cities as the source of solutions for urban challenges, and the urban forest is a key element. Urbanization pressures threaten both ecology and biodiversity, as well as human wellness and quality of life. Urban planning and design principles of the past are evolving to meet challenges and demands posed by both human and natural systems changes, often happening rapidly. The functions and benefits of natural systems within cities are increasingly recognized as being essential, not just nice to have. Traditional, predominantly gray infrastructure is being replaced by innovative, exploratory combinations of gray and green systems.

> **Ongoing research, assessment, and science delivery is absolutely necessary to inform emerging urban planning approaches, as well as sustainability and resiliency policy. Research must inform alternative approaches and translate findings to practical solutions.**

Tremendous challenges are encountered by community leaders and the 240 million residents of American cities. In most U.S. communities the scientific understanding of nature as a solution has either lagged or not been effectively integrated into local policy, programs or best practices. The solutions offered by urban forestry and ecosystems do not pertain only to specific natural spaces in cities, such as parks, gardens, and open spaces. In fact, recent research suggests that the presence of urban green contributes to solutions of some of the most important concerns of cities, such as air and water quality, transportation planning, human health, crime, high heat events and climate change, and community resilience.

Compared to traditions of wildland and rural landscape research, researchers must work together with local stakeholders and communities to address urban problems and solutions. When local stakeholders collaborate with experts and scientists, they become more aware of community systems and can initiate evidence-based solutions. Also, experts gain meaningful insight when they collaborate with community members to set up research projects.

While "urban forestry" is the focus of the Action Plan, the scientific community does research at two general levels. Some research provides ongoing, better knowledge about trees - their planting, growth, and management. Other research focuses on the urban forest as a component of more comprehensive city systems. Such studies explore green infrastructure, urban ecology, and/or socio-ecological systems.

Photo Credit: Rich Hallet

What is Science?

Basic and applied research is conducted by a science community that partially engages with the professional, civic and local government communities. Science questions are often formulated in collaboration with urban forestry and program-based professionals, and science projects are often conducted in the communities and contexts where urban forest planning and management occur.

Yet, the process and products of science are distinct from most program and professional activities. There are important interrelationships, yet research, being a process of discovery, is often conducted with an acceptance of uncertainty of outcomes and some level of risk. Some science may generate practical conclusions in a fairly short time frame; the 'payback' from other studies may extend into a greater time in the future or may not play out at all.

Analytic methods are important for solving problems, adding new knowledge, and decision support. Yet, applying measures, metrics or statistics to a situation or objects is not always a science activity. New, rigorous science projects can be costly, but can produce widely usable knowledge. Some analytics are applied to more specific situations, and at lower cost. Research findings can also be translated to some situations without use of new measures, again at a cost savings. Communities should carefully consider the types of analytics and research that will best support their urban forest programs.

> **Basic research (also called fundamental research or discovery research) is a systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena, and may not apply to the real world in a direct way. Applied research is used to answer a specific question that has direct application, and may solve a problem. Urban ecosystems studies are often a blend of these two research functions.**

Science Planning

What are the best analytic products to support urban forestry actions and programs? Stakeholders and agencies should consider these distinctions in future planning and budgeting:

Science/Research

The pursuit of new knowledge and understanding (for basic or applied purposes) by systematically developing research question(s) or hypotheses that reference theory and prior studies, propose appropriate methods, and apply analytic methods to discover original findings that are reported in peer-reviewed publications, particularly journals.

Assessment

The applied, repeated use of research that has been standardized as a best practice, often including guidelines for measures, field protocols, and technical reporting.

Science Delivery (aka Technology Transfer)

The process of translating either original research or assessments into products that enable practical application of findings, or display findings in ways that support local policy or programs.

An example of this distinction is the i-Tree suite of tools. Basic and applied research over the past two decades was published in scientific journals and informed the construction of models and tools, such as i-Tree Streets and Eco. Initial tools were field tested and validated across multiple regions of the U.S. They are now applied in cities and communities as assessments, and a standardized technical report is the product used by many communities to better understand their urban forest resource. Ongoing communications about the cumulative findings of the assessments, as well as the technical reports, is an example of science delivery. New basic and applied research continues to support development of new assessment models and resulting tools.

Urban Tree Canopy (UTC) Assessments are the outcome of a similar evolution. Initiated by original research using remote sensing data, agency labs and consulting firms now provide technical support for assessments in communities. Ongoing research continues to inform new versions of UTC. Considering the social sciences, Stewardship Mapping (Stew-Map) is in transition from original research launched in New York City to use as a standardized assessment across multiple cities in the U.S.

Research Guiding Principles

Any planning for future research should recognize both past work and anticipate future needs. Budgets within the USDA Forest Service (and other agencies) have not kept pace with the demand for urban natural resources (UNR) research and city-based application. In order to deliver the greatest return for the nation's limited investment in UNR studies, new research initiatives must be carefully considered in light of all potential science opportunities. These key ideas should guide decision making and implementation concerning future research and assessments:

Means to the End - Building Local Capacity

Some outreach responses imply that science is a process of problem solving or data collection for a specific outcome. As research resources are limited, a potential litmus for developing and supporting science programs is a discussion about how potential products can build the capacity of decision-makers, managers, professionals, local agencies and NGOs to generate and sustain local urban forest ecosystems. Science delivery is also important to build community capacity.

Build on Strengths and Explore New Needs

Some research and assessment activities are momentum science that serves increasingly broader sets of populations and communities. Such a research program or series of studies has generated a critical knowledge base that supports assessment or management, and merits ongoing support. i-Tree and Stewardship Mapping are examples. Other topics represent emergent needs that will require resources to expand in effectiveness (such as urban wood utilization or environmental equity); to date there may be little evidence available to support programs or increase their effectiveness, but communities recognize increased need for knowledge.

Replicate and Confirm

The stakeholders and professional partners seek new research approaches and resources to support urban forest decision making and programs. In other instances, urban forestry community requests are for replicate studies to confirm that findings are specifically relevant in their own bioregions or urban megaregion. Such local research can have national significance if scaled up into networked knowledge that can be shared across regions or communities.

Expand and Connect Science from Local Needs to National Programs

Efforts should be made to standardize research programs and practices. So while a study may be conducted within a city or region, developing standard protocols (rather than one-off studies) will enable the resulting knowledge and data to become part of a larger effort (such as i-Tree and Stewardship Mapping) to build a better knowledge base.

Synthesize and Amplify Existing Knowledge

Effective science delivery will be just as important to the urban forestry community as are original studies. Focused, periodic review of current science - by theme, geographic or regional relevance, or in response to high priority issues - can then be distributed using effective, multi-mode process and products to assure that good science is put to good use. Educational institutions, including K-12 and higher education, can be engaged as both collaborating creators and users of science-based products.

Expanding the Scale of Science

The scale of research has become increasingly important in recent scientific publications, and was reinforced by expert contributions to this framework. The first suggestion concerning scale is to expand on trees as the focus of research. City trees and the urban forest are an important functional element across many urban places and urban systems. Yet a research focus on trees alone may restrict the value of research investments, and limit potential collaborations.

> **City trees and the urban forest are an important functional element across many urban places and urban systems.**

Broader opportunities are possible. For instance, a healthy, extensive urban forest contributes to green infrastructure (GI). The study and design of GI networks in metropolitan areas is an emerging interdisciplinary science that integrates local needs with diverse agency mandates (including air and water quality, and environmental justice). Interdisciplinary research teams, building knowledge that spans diverse needs, can help to create robust green infrastructure networks for our nation's cities, and then ensure systematic application of science in an equitable manner within and across cities.

The networking potential for multicity, regional, and national studies is another consideration of scale. Place-based urban social-ecological research is immensely valuable in providing science to inform local programs and decision-making, including planning and land-use decisions, conservation policies, and urban forestry, parks, and public health programs. Place-based, or city-based, research efforts that are nationally networked are even more meaningful; this is when research and applications are replicated across an engaged network of cities and new knowledge is shared. Multicity data sets and shared methodologies allow for cross-comparative study, identification of broader scale patterns and trends, generalized knowledge and tools, peer learning, and diverse communities of practice.

Initial efforts at cross-city networked science are supporting advances in urban sustainability, resilience, and practical problem solving. The Forest Service's urban field stations, the National Science Foundation's network of Urban Long-Term Research Area Exploratory projects (ULTRA-Ex; now ceased), the Urban Waters Federal Partnership, and The Nature Conservancy's new North American urban network are milestone opportunities for nationally networked, place-based research.

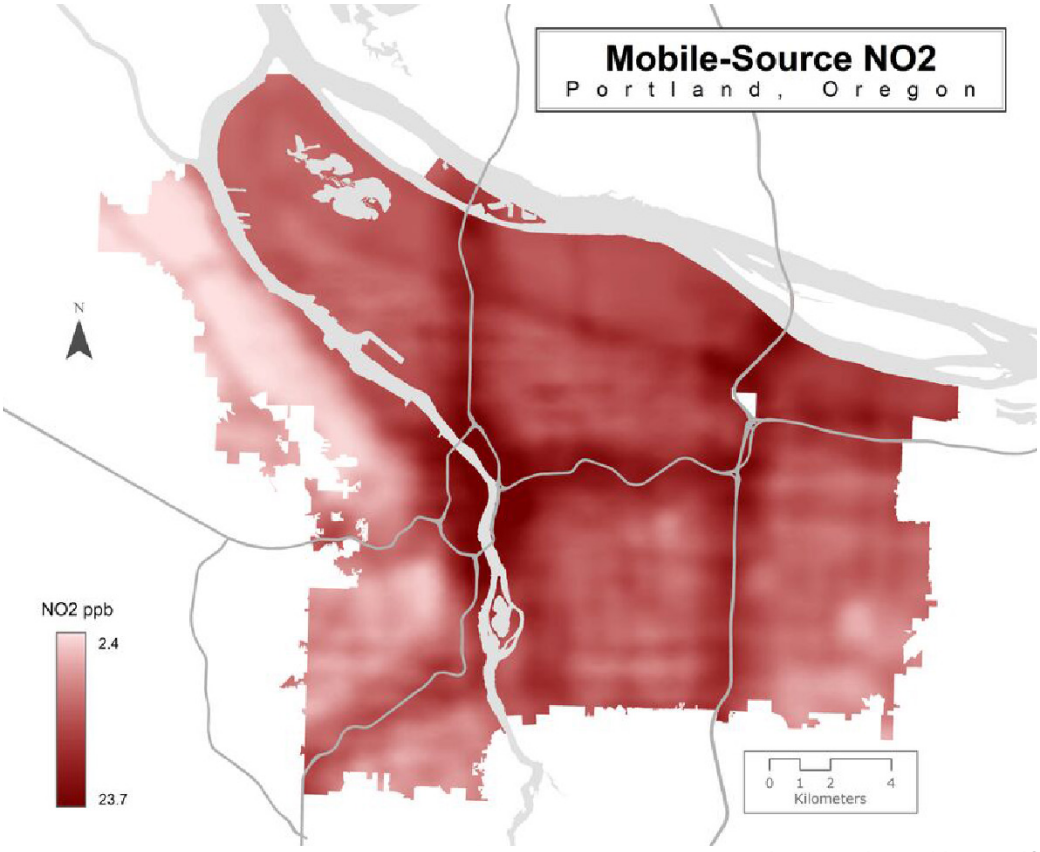


Photo Credit: Kathleen Wolf

Research Needs Framework

A framework of urban forest research needs is provided below. This framework is not intended to address every research or assessment need in every community. Its intent is to guide programs of science that respond to high priority needs in communities, and from a national perspective. Many entities support or conduct research on urban socio-ecological systems; the framework can also be used by the USFS, other national agencies, and cooperating scientists (at universities and other institutions) in collaborative efforts to establish research and funding priorities over an extended time frame.

A Understand Ecosystem/ Ecological Services

B Promote Human and Community Health

C Planting, Inventory, and Analysis for Forest and Environmental Health

D Prepare for Pests, Threats, Climate and Associated Changes and Risks

E Enable Civic Stewardship and Improved Local Governance

F Integrate Knowledge Networks and Data for Urban Socio-Ecological Systems

Key to Objectives

Momentum Objective	Emergent Objective
■ Research activity is well established and needs sustained support.	□ Research activity either has begun recently and results hold high promise for urban forest planning, programs and management, or has been underway for some time but needs greater effort.

Photo credit: Rich Hallet

A Understand Ecosystem/ Ecological Services

Within several decades our understanding about the reasons to have trees in cities has moved from aesthetics to recognition of a wide array of human benefits and ecosystem services. Fact-based knowledge about urban forest ecosystem services and benefits often supports the first wave of messaging that builds local community support for urban forestry programs. Still, much of the U.S. population has relatively little knowledge about or understanding of how urban resources and nature provide critical benefits to communities and improve human well-being. Even fewer people may recognize how ecosystem threats (such as climate change and invasive species) may diminish quality of life by reducing or eliminating current services. Ongoing research can boost the effectiveness of urban forest planning and management in achieving local policy initiatives (such as tree canopy goals), regulatory requirements (such as federal or state clean water laws), market-based conservation approaches, and environmental literacy. Additional study should address scale. For instance, science focused on biogeographic regions can provide information that is suitably generalized across multiple communities; science can also be applied to site-specific service benefit opportunities, such as use of plant materials to remove urban soils toxins.

> **Science focused on biogeographic regions can provide information that is suitably generalized across multiple communities.**

Momentum Objectives

- Develop indicators for urban forest promotion and maintenance of urban environments and biogeochemical systems (air, water temp, carbon).
- Continue to translate evidence-based knowledge about urban forest ecosystem services to regionally relevant assessment models (e.g. i-Tree) that indicate urban forest structure, benefit, and value.
- Continue research on energy sourcing or savings related to trees, particularly in collaboration with organizations in the energy sector.

Emergent Objectives

- Study how urban forest structure and functions can best meet regulatory requirements.
- Assess and communicate regional ecosystem profiles across the U.S. (to include climate, weather, hydrology, and plant selections) to promote optimal urban forest ecosystem services outputs for diverse locations.
- Explore the use of plant materials in bioremediation to mitigate toxins and pollutants.
- Expand recognition of and develop metrics for the full range of urban ecosystem services (e.g. cultural services, urban wood utilization).

Photo credit: Kathleen Wolf

B Promote Human and Community Health

Cities are places of concentration of humans and their activities; they are the places where more than 80% of the U.S. population lives, works, learns, and seeks quality of life. A body of research representing many disciplines - including psychology, environmental health, epidemiology and anthropology - hints at the positive associations between urban forest ecosystems and human health and wellness. The Green Cities: Good Health web site, a catalog of such research, shows that nature supports disease prevention and health promotion.

Additional research can address several needs. Communities need more knowledge about how benefits play out across social scales, from individuals to households, to neighborhoods, and even entire cities. Also, additional information about vegetation character and exposure dosage (time and activity) can help communities better plan the places and nature-based programs that will promote health. In some instances urban vegetation can contribute to health concerns, such as pollen and asthma or harboring disease vectors like mosquitos, so science about disease prevention is also important. Finally, concerning resilience, studies should explore the initial findings suggesting that urban forestry stewardship helps to build the social networks and capacities that enable people to be 'first responders' and cope with dramatic changes in their communities.

Urban forestry stewardship helps to build the social networks and capacities that enable people to be 'first responders' and cope with dramatic changes in their communities.

Momentum Objectives

- Develop focused studies concerning public health benefits and concerns regarding tree canopy, urban ecosystems, and green infrastructure, to include health promotion and disease prevention, particularly in collaboration with public health and epidemiology organizations (such as the CDC and NIH).
- Expand knowledge of nature and community well-being and economy (such as crime prevention, transportation safety, and business and worker attraction).
- Continue studies about mitigation of negative health influences of vegetation, such as air quality in some settings, or habitat for disease vectors.

Emergent Objectives

- Provide evidence of improved human function and performance associated with presence of nearby nature (such as schools, offices, and workplace).
- Continue studies of individual and community resilience through civic ecology and nature-based recovery.
- Provide knowledge to promote environmental justice/ equity and cultural relationships in urban forest and ecosystem programs.

Photo credit: Lance Davisson

C Planting, Inventory and Analysis for Forest and Environmental Health

As one scientist pointed out, if communities don't have healthy trees, they can't capture the health, energy, ecological, and other benefits that urban forests provide. Creating or conserving an urban forest in a community - in order to provide benefits and ecosystem services and enhance quality of life - requires several data supported activities. First, a community must be able to understand the character, extent, and health of the current urban forest. Standard canopy assessment or tree inventory practices are widely used; these were informed by early research and should be expanded as studies continue. Second, choices must be made about tree selection, care, and maintenance and research has helped to shape best practices, and scientific support should continue to inform on-the-ground urban forest management. Lastly, the urban forest is a dynamic, living resource that is being recognized as an important element across other urban systems. Additional research is needed to better understand how the urban forest, as a green infrastructure element, can be integrated with other urban systems, such as stormwater management installations, and with grey infrastructure like roofs and parking lots. Science-based assessment and decision support tools are also needed to more rapidly recognize and respond to threats that may negatively impact the essential contributions of trees and forest patches across the entire urban to rural landscape gradient.

> **If communities don't have healthy trees, they can't capture the health, energy, ecological, and other benefits that urban forests provide.**

Momentum Objectives

- Continue to develop strategies & protocols to measure and monitor extent and condition of urban forests and canopy cover, locally as well as nationally (e.g. urban FIA, UTC), with attention to cost and data collection efficiencies for communities.
- Continue original research to support development of additional assessment models and tools (such as LIDAR and hyperspectral remote sensing for forest canopy and health condition assessments, and i-Tree).
- Expand knowledge of tree selection, placement, and growth factors (including soils), specifically to promote resilience (especially in response to climate change).
- Provide evidence to continue to develop, establish and promote standards & best practices for urban forest sustainability.

Emergent Objectives

- Expand diagnostics for urban forest health and threats and construct protocols for early detection, as well as routine and systematic assessment & reporting.
- Develop models and decision tools to support optimal urban forest, other green infrastructure, and gray infrastructure integration and configurations.
- Expand initial implementations of Urban FIA (USFS Forest Inventory and Analysis) for forest condition assessment and monitoring.

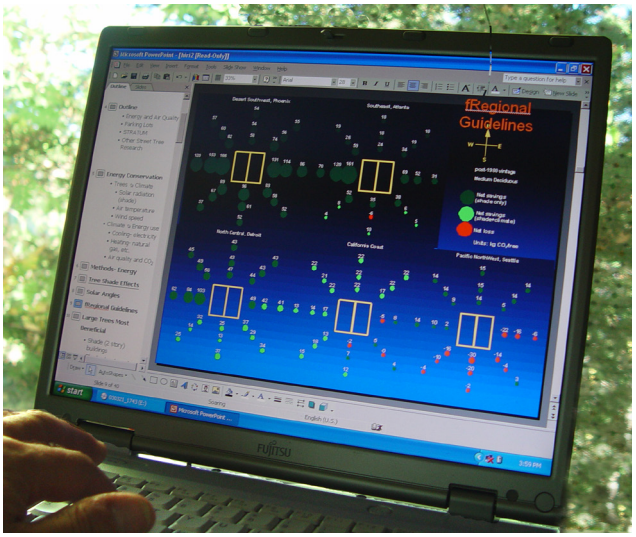


Photo credit: Guy Kramer

D Prepare for Pests, Threats, Climate and Associated Changes and Risks

Cities and regions are encouraged to conduct tree canopy assessments or tree inventories, set urban forest goals and policies, and adopt management plans to promote consistent, stable urban forest programs. Yet ever more communities are experiencing abrupt changes and threats. Some change transcends the urban forest system, such as a hurricane or tornado damage that impacts all city systems, including the urban forest. The 2014 National Climate Assessment summarized the impacts of climate change in the United States, now and in the future, and called out the wide-ranging changes and threats for all communities, including natural resources. Other changes are tree-focused, threatening the health or productivity of the forest, such as an insect pest or virulent disease. Some threats are abrupt, showing consequences in hours or days, and others simmer for years with gradual implications (such as invasive plant species). Research is needed to better understand and monitor current threats, to diminish tree loss, maintain urban forest health, and to sustain ecosystem services. Studies are also needed to help anticipate emergent threats or negative conditions to enable proactive management response. For example, the Urban Resilience to Extremes Sustainability Research Network (UREx SRN) is a NSF funded project involving an international network of diverse cities and scientists that will study integrated topics including flooding, extreme heat, and drought. Finally, social or policy studies can help to reveal the institutional best practices that can be put in place for threat response and community engagement for forest sustainability.

Some threats are abrupt, showing consequences in hours or days, and others simmer for years with gradual implications (such as invasive plant species).

Emergent Objectives

- ☐ Given likely changes of the Anthropocene, effort is needed to better understand and work within change trending to anticipate and integrate Urban Forestry goals with likely futures, and study of vulnerable situations (such as found in tropical forestry) can provide insight for broader patterns and responses.
- ☐ Continue and expand studies of climate change and urban ecosystems implications to develop better, prioritized community response policy and programs.
- ☐ Clearly define and describe, then quantify urban forest threats and impacts from national to local scales, to include invasive plant species, insect pest invasions, land use development, urban wildfire, and climate scenarios.
- ☐ Create models and decision tools to support urban threat forecasting and management response, including trade-offs analysis for policy and budget scenarios.
- ☐ Use current and new evidence to construct best practices for tree/forest/ecosystem threat planning and management.

Photo credit: Rich Hallet

E Enable Civic Stewardship and Improved Local Governance

Unlike a more traditional forest reserve (such as a National Forest) an urban forest spans a complex mosaic of land uses, parcel sizes, and ownership types (including private, public, and institutions). In many instances tree canopy goals, a common expression of urban forest planning and management, can not be achieved solely by plantings on public properties so engagement of private property owners is necessary. At one level the funding and budget dynamics of this complex social and administrative situation are little understood. In addition, local governance of all urban systems, including the urban forest, is highly participatory as residents demand government transparency and a voice in the policies that shape their communities. Finally, few local governments have adequate resources to maintain and manage their urban forest resources so they are relying increasingly on the services of volunteer civic stewards and the organizations that support them. Residents are being engaged as citizen scientists to help build local knowledge; youth participate and learn about natural resources careers and the importance of urban forest ecosystems in their communities. All of these social dynamics point to a need to continue and expand recent research initiatives in the realm of urban natural resources stewardship. The complex dynamics of social participation and engagement that are aligned with urban natural resources programs should be studied to both optimize the efforts of contributors, and to better understand human relationships to urban ecosystems. Finally, research is needed to address the needs and disparities of underserved groups or communities, and to actively engage them in urban forestry for community benefit and jobs development.

Residents are being engaged as citizen scientists to help build local knowledge; youth participate and learn about natural resources careers and the importance of urban forest ecosystems in their communities.

Momentum Objective

- [x] Develop detailed cost-benefit analysis, including capital asset estimations, for local government budgets, to include tree maintenance and other direct tree costs, stewardship, civic engagement, and urban forest governance.

Photo credit: Amigos de los Rios

Emergent Objectives

- [ ] Study how to enlist and support citizens & property owners to plant trees and improve natural resource management on private properties.
- [ ] Conduct social marketing studies to more effectively present knowledge of physical, mental, and societal benefits of urban forestry and ecosystems, and urge positive behavior.
- [ ] Generate better knowledge about civic environmental stewardship motivations by volunteers and community organizations.
- [ ] Understand and develop collective impact stewardship networks & governance systems at the landscape scale, including stewardship mapping (Stew-Map), social networks and including knowledge-action networks.
- [ ] Promote concepts and evaluation approaches concerning how the urban forestry NGO community of practice can initiate and optimize partnerships, resources, and programs.

F Integrate Knowledge Networks and Data for Urban Socio-Ecological Systems

This goal was expressed by most scientists, but is a broader science 'ecosystem' idea, rather than a collection of research questions or topics. Most of the scientists are anticipating the necessity for 'big data' to address the complexity of both biophysical and social challenges in cities. Many spoke of cities as socio-ecological systems, also described (by the National Science Foundation) as coupled human and natural systems.

Regional Data Platform

Scientists envision the possibility of a common data platform that would be constructed across a region (including city/county jurisdictions) or geoclimate zone to consolidate research and science management. In this way efficiencies of data collection and analysis are gained as standardized measures and metrics enable more consistent and efficient problem solving. Computational power and access is rapidly making this vision possible. This approach is being explored and incrementally underway within the Urban Long Term Ecological Research projects funded by the National Science Foundation (in Baltimore and Phoenix). The EnviroAtlas project (sponsored by the Environmental Protection Agency) is generating place-based data platforms for cities, and incorporates USDA Forest Service data.

Scientists envision the possibility of a common data platform that would be constructed across a region (including city/county jurisdictions) or geoclimate zone to consolidate research and science management.

Example of Regional Science

To illustrate this vision, consider this scenario for 'Big City'. One team collects routine urban FIA (Forest Inventory and Assessment) data and enters it into a shared data platform, hosted and managed by a local university. Another does a thorough parks and open space assessment, including social data on users. Another team collects Stewardship Mapping data about stewardship groups and their project sites. Another uses LIDAR data to analyze tree stress and incidence of Emerald Bad Bug. The city and county contribute their data layers, such as parks locations, parcel ownership, crime statistics, etc. All data sets are accessed from a shared data portal (having protocols for inputs and use).

After some time there is a 'critical mass' of data sets that enables more complex research questions and analysis. Scientists with a focus on modeling advance i-Tree analysis, generating new models with both biophysical and social metrics. Other modelers explore the socio-ecological relationships of stewardship activity, urban forestry management practices, and climate outcomes. A steering committee reviews new data layer proposals, and also reaches out to scientists across multiple agencies (such as USFS, EPA, NASA, or HUD) that can leverage the existing data to enhance their analytic contributions.

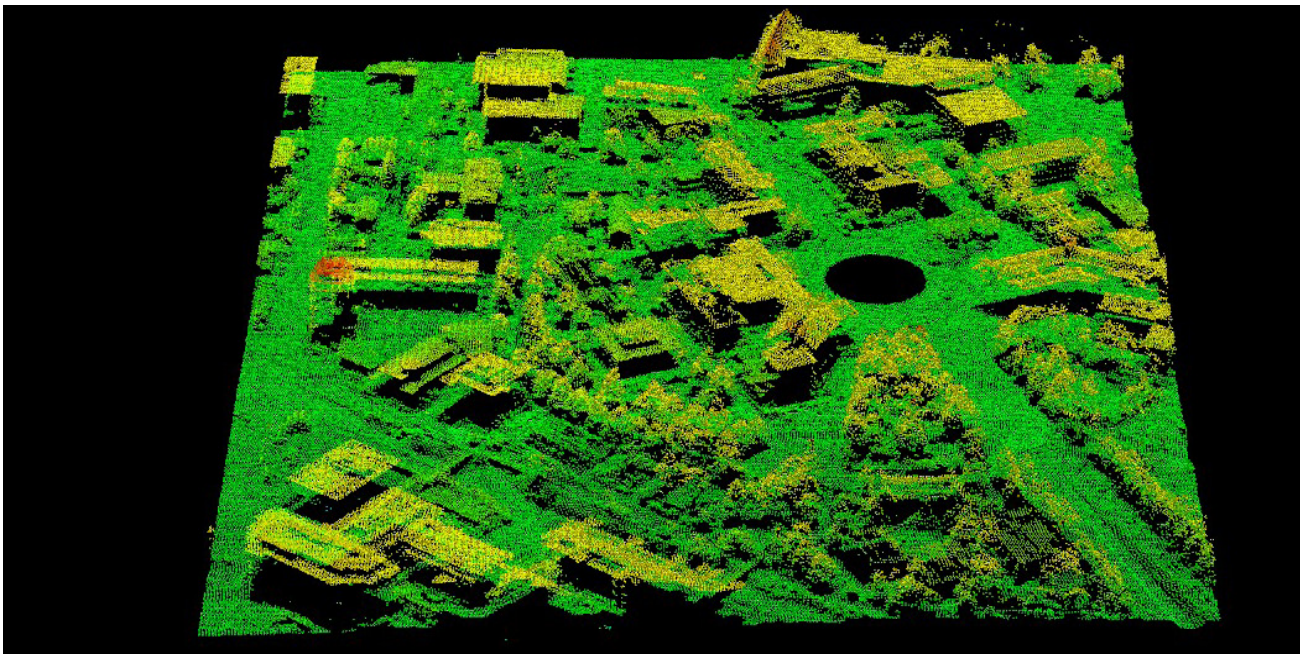


Photo credit: Kathleen Wolf

Research Framework Discovery Process

How were these research needs identified? Who helped craft the urban and community forestry research framework?

A multi-step process was used to formulate then finalize this framework of current and future science needs concerning urban ecosystems. The ongoing focus of the outreach and synthesis was to discover and communicate the practical science and evidence that can help communities to better plan, manage and sustain their urban forests, and make their communities more resilient.

In an exploratory phase key documents were identified. There are several scientific reviews that make research recommendations, including a report from a National Academy of Sciences workshop. Second, science needs have been identified by several working groups (such as the Sustainable Urban Forests Coalition (SUFC) and the Vibrant Cities Task Force. The USDA Forest Service also has a research needs briefing.

The Action Plan is intended to reflect the needs of professional, management, NGO, and urban forestry communities. The second discovery phase involved professional and manager inputs. Numerous research suggestions were sorted from the national outreach for the core plan. In addition, a research needs brainstorming workshop was conducted at the national Alliance for Community Trees members meeting in November 2014 (> 100 participants).

Based on document inputs and urban forestry community engagements a research framework was drafted. The framework was vetted in several ways. It was discussed by a group of scientists that participate in monthly USDA Forest Service Urban Field Station calls, and the National Program Lead for Urban Research with the USDA Forest Service. Confirmatory interviews were scheduled with 12 scientists representing the USDA Forest Service, universities, private sector, and arboreta. The framework was also reviewed by the Research Committee of the Sustainable Urban Forests Coalition and the National Urban and Community Forestry Action Plan Advisory Team.

Science Delivery Needs

The national outreach and synthesis process revealed a very complex and dynamic scientific and technical 'ecosystem' concerning urban forest ecosystems and urban ecology. Given the pace of urbanization of the U.S. (and the world) the past decade seems to have brought forth much greater interest and activity in urban based science.

There were paradoxes in both the written and verbal inputs:

- **Needs Disparities** - Some informants would call out the need for additional science about a topic, and other informants would say, 'no, we know enough to do good'. In some instances a person claiming a need seemed to not be aware of existing science.

- **Regional Replication** - Some informants may be able to call out the need to replicate a study in their community, to address the specific biophysical and/or social aspects of their place. Others would respond that work had already been done in the bioregional location, though in a different city. And there was some discussion of the understanding of the generalizability of science, in that research design is often intended to address a question that is salient to many situations though the field work may be conducted in one place.

- **Science Sourcing** - In some instances informants called for new science for a place, and others observed that the question may have been answered locally by an agency, municipal technical department, or NGO. Ever-more local entities have science and technical capacity and their products may be the on-the-ground information that is needed by the urban forest managers. Often this information is not found in peer-reviewed publications; the technical reports are often of high quality, yet not widely known.

> **Each of these situations is an indication of the need for a national, comprehensive program of science delivery.**

Each of these situations supports the need for a national, comprehensive program of science delivery. The collection and translation of scientific and technical evidence should be made available for easy distribution and access. While USDA Forest Service products should be highlighted, local community partnerships are also important. For instance, local agencies and non-profits may be able to distill findings that are particularly relevant in their community, translate key points into multiple languages, and more effectively distribute materials within their communities.

Acknowledgments and Credits

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- ACTrees staff and leadership of member research organizations;
- Sustainable Urban and Community Forests Coalition Research Committee members;
- The scientists that participate in the USDA Forest Service Urban Field Station standing calls, including Morgan Grove of the Baltimore Ecosystem Study;
- Twelve interviewed scientists representing agencies, universities, and the private and nonprofit sectors; and
- Several reviewers of draft documents.

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The Action Plan Funding Needs

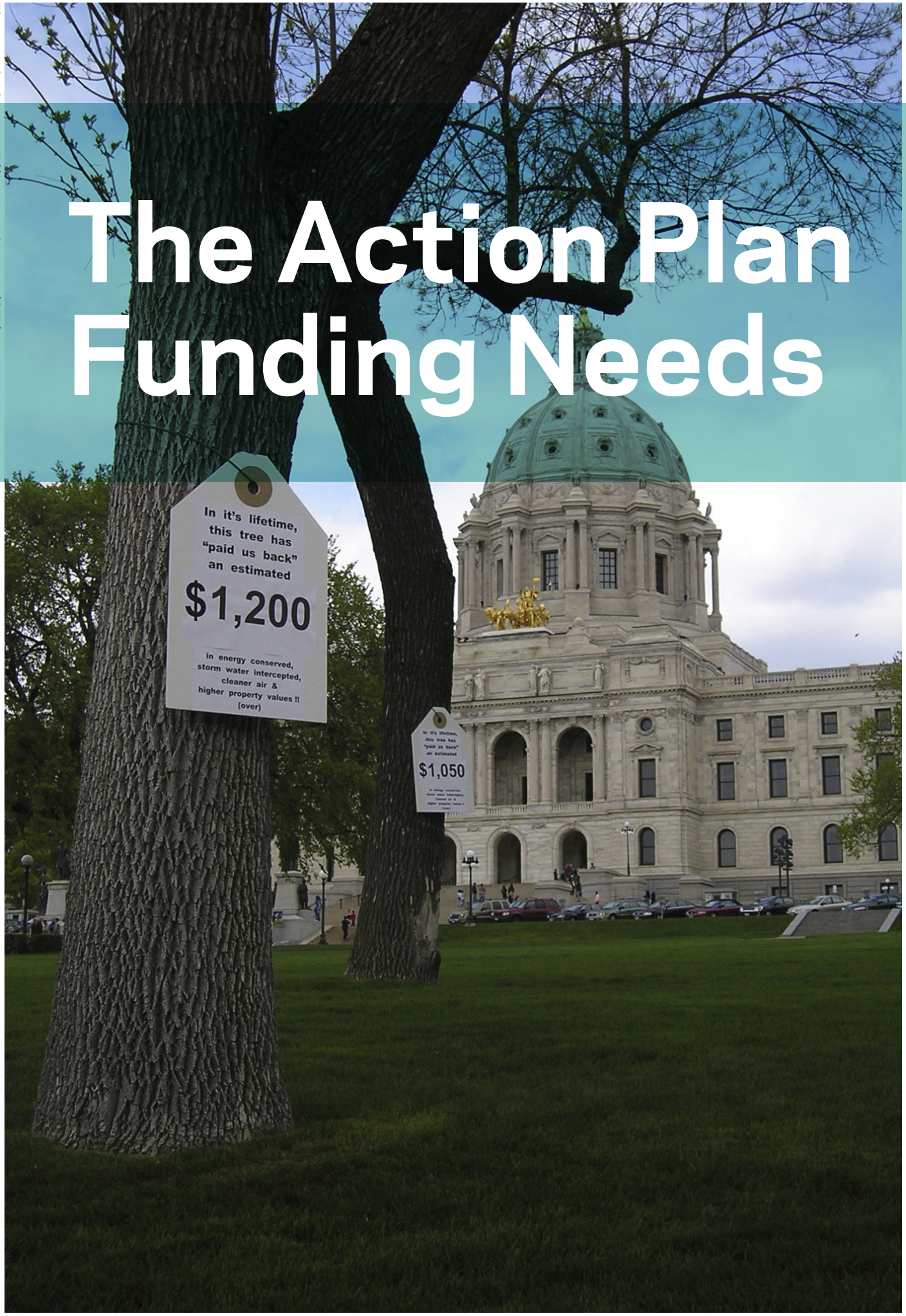


Photo credit: Creative, Effective and Lasting (CEL)

Introduction

Endeavors like the development of the National Urban and Community Forestry Advisory Council's Ten-Year Action Plan result in important guiding documents for advancing urban and community forestry. These planning documents become even more powerful when they include an examination of the scale of resources necessary for implementation, as well as the benefits associated with these investments. While the breadth and depth of both the actions included in this plan and the community of practice members who will ultimately carry out those actions precludes a discussion of exactly where implementation dollars for each action may flow from, the University of Maryland's Environmental Finance Center (EFC) offers the following funding discussion, particularly in the context of future urbanization, designed to inform funding and budgeting decision-making.

Benefits of Maintenance Demonstrate Importance of Funding

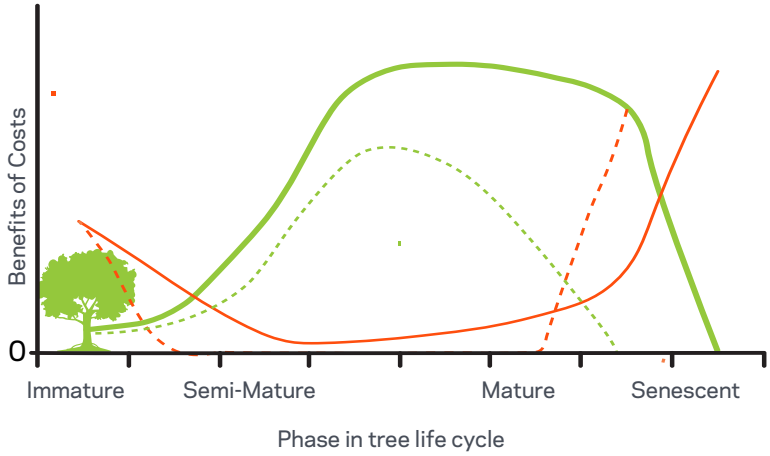
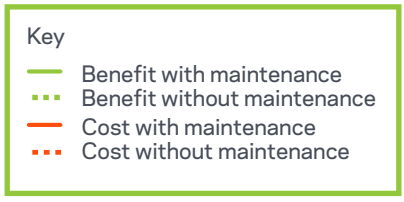


Figure data drawn from Hauer et al., 2014.

The figure to the left demonstrates theoretical costs and benefits profiles over the lifetime of an individual tree, with (solid lines) and without (dashed lines) adequate maintenance. Benefits are maximized during the mature phase of a tree and decline rapidly through senescence, while costs show an inverse pattern. Without sufficient funding for maintenance, benefits are not realized



Investment Return: $1.37 - $3.09

A study on the value of street and park trees in five U.S. cities found that for every dollar invested in urban tree management resulted in benefits valued between $1.37 to $3.09 annually (McPherson, et al. 2005).

$1.95 Billion Dollars in Ecosystem Benefits

Los Angeles' Million Trees Initiative provides an estimated $1.3 to $1.95 billion dollars in ecosystem benefits over a 35-year period (McPherson 2011).

Photo credit: Kristina Brezanso

Approach to Funding

Typically, budgeting is a process which starts at the per unit level, assigning line item cost estimates to programmatic activities that are aggregated into sub-budgets and finally summed into an overarching agency, plan, or organizational budget. For the Ten-Year Action Plan, however, the EFC used an approach that considered historical levels of urban and community forestry funding and examined those in the context of emerging trends and potential return on investment. This was used to develop an estimated range of funding needed to support the advancement and implementation of the Ten-Year Action Plan.

This approach was chosen for several reasons. First, it seemed to be best aligned with USDA Forest Service's traditional approach. While there are a few methods of forecasting future programmatic costs, USDA Forest Service tends to plan future funding allocations based on historical spending and existing formulaic calculations.

Second, the landscape of urban and community forestry includes vast and intricately entwined layers of federal, state, local, nonprofit, and private sector organizations with little standardization in how funding investments and benefits are scaled, recorded, tracked, and communicated. Undertaking an exercise of attempting to assign a line item cost to the activities associated with each of the Action Plan's seven goals and build a "from the ground up" overall cost estimate based on currently available data would have required a level of extrapolation, estimates, and assumptions that would potentially impact the credibility and integrity of the Plan.

There is a growing and compelling collection of good urban and community forestry research that includes a discussion of costs and associated benefits. However, these studies have not occurred at the national, urban forestry community-wide scale in which the Ten-Year Action Plan is founded, nor have they used a consistent set of protocols for data collection and analysis. Extrapolating this data to a national scale, over a ten year time period, across multiple participation groups would result in a funding needs estimate that would be difficult to defend, and any ensuing discussion of the validity of the estimate would distract energy and resources from implementation of the Plan.

Finally, the Ten-Year Action Plan is designed for the full urban and community forestry community, and as such, actions within the plan could ultimately be carried out by any one of a number of stakeholders. The existing knowledge, capacity, location, and resources of the urban forestry community responsible for implementation of a given action could have significant impacts on the level of funding needed to carry the action out, and assigning actions to specific implementers was outside the scope of this project.

Photo Credit: Eric Reed

Influential Trends

Two existing trends tied closely to urban and community forestry formed the core of the analysis – the increasing rate of urbanization and the growing significance of urban and community forestry services.

The United States is rapidly becoming more urban. It is estimated that in the first half of the 21st century, urban land in the United States will increase to 8.1% of total land, or an area larger than the state of Montana. It is also estimated that by 2050, four states – Rhode Island, New Jersey, Massachusetts, and Connecticut – will be more than 50% urban, and the amount of US forestland estimated to be subsumed by urbanization is an area roughly the size of Pennsylvania. This rate of urban growth suggests that integrating urban and community forestry into all levels of planning will be needed to sustain the ecosystem services and forests products required by a growing urban population and will require an associated increased investment of resources.[2]

The United States is rapidly becoming more urban. It is estimated that in the first half of the 21st century, urban land in the United States will increase to 8.1% of total land, or an area larger than the state of Montana.

The scope of urban forestry needs and the significance of urban forestry services appear to be increasing in communities. While the number of communities receiving urban and community forestry assistance over the past ten years has remained relatively flat, at approximately around 7,200 communities, data seems to indicate that there has been an almost 15% transition of communities from "developing" their urban and community forestry program to actually "managing" these natural resources.[3] This suggests that community programs which may have had an emphasis on beautification have gradually shifted to programs which are more robust and provide greater community services and ecosystem benefits.

While the number of communities receiving urban and community forestry assistance over the past ten years has remained relatively flat, at approximately around 7,200 communities, data seems to indicate that there has been an almost 15% transition of communities from "developing" their urban and community forestry program to actually "managing" these natural resources.

The very nature of urban forestry, as well as the USDA Forest Service's broader mission of "Caring for the Land and Serving the People," speaks to investments made and benefits derived "where the people are" – in urban areas. So, in the absence of any other codified projections of the scale and responsible parties for future urban and community forestry needs, and for the purposes of Ten-Year Action Plan implementation discussions, urbanization was used as a proxy for developing a ten-year funding needs estimate that adapts current and advocated funding levels to the anticipated increased urban land area demand scenarios.[4]

Using currently available data and making minimal assumptions, this analysis suggests that simply adjusting to future urbanization, funding in the range of approximately $32 million annually is needed for the USDA Forest Service's Urban and Community Forestry program. This estimate was developed by examining current urban land data and research projections of future urbanization patterns; developing an implied annual urbanization growth rate; and, applying this annual growth rate to current and advocated funding levels to derive an estimate of the funds necessary to maintain current levels of service to manage future increases in urban forestry area. This estimate does not account for supporting important existing urban forestry research and efforts or the many new and urgently needed activities outlined in the Ten-Year Action Plan. In other words, this is a bare bones estimate of the funding required just to maintain the existing level of service in the face of anticipated increases in urbanization and does not account for any desired increase in the level of service that may be associated with implementation of the Ten-Year Action Plan.

Looking at a sampling of actions related to the goals of the Ten-Year Action Plan that are above and beyond existing Urban and Community Forestry Program budget where reliable cost estimates were available begins to suggest the scale at which the current level of urban forestry funding is insufficient.

2 U.S. Urban Forest Statistics, Presentation to the 2014 Partners in Community Forestry Conference, Charlotte, NC, David Nowak.
3 CARS data 2005 – 2014, See Table 1, in Appendix.

4 This estimate relies on a change of one variable, i.e. urbanized area. Our judgment is that this is a factor and a variable that impacts the discussion of urban forestry at all levels. We acknowledge that the rate of urbanization may change when viewing locally; however, we believe that given the granularity of census data, organizations of a local nature may be able to understand and employ the method for planning discussion purposes. This estimate does not include other future factors which may have an effect on program delivery, such as, inter alia, technological efficiencies, economies of scale in program delivery, dissemination of information, efficiencies from increases in standards or level or professionalism, availability of funding, rate of program funding, or rate of program adoption.

Table 1: Base Funding Items

Action Plan Activities	Base Funding (millions)	Associated Action Plan Goal
UC&F Program Funding	$ 31.30	Funding, Management, Multiple
Forest Health Management	$ 7.97	Management
Inventory Analysis	$ 20.00	Planning, Multiple
Tools - iTree	$ 1.30	Planning, Multiple
Urban Tree Canopy	$ 2.80	Planning
Stewardship mapping	$ 1.20	Management
Trees + Crime	$ 1.60	Human Health
Trees + Health	$ 1.00	Human Health
Trees + Water	$ 1.00	Human Health, Environmental Health
Urban Forest Products	$ 1.20	Management
Estimate of additional urban research and action items	$ 14.48	Multiple
Total of Items	**$ 83.85**	

An estimate of funding needs for a sampling of Ten-Year Action Plan activities outside the Urban and Community Forestry Program was developed by examining input from USDA Forest Service and other urban forestry researchers and data from a review of current funding requests in the context of current urban land area.[2] **Considering this in addition to the baseline Urban and Community Forestry Program needs and then adjusting for the impacts of future urbanization suggests annual funding needs in the range of approximately $85 million.** This estimate was developed by examining current urban land data and research projections of future urbanization patterns; developing an implied annual urbanization growth rate; and, applying this annual growth rate to the combination of current and advocated funding levels and the Action Plan activity estimates (see Table 1) to derive an estimate of the funds necessary to maintain current levels of service to manage future increases in urban forestry area.

Considering this in addition to the baseline Urban and Community Forestry Program needs and then adjusting for the impacts of future urbanization suggests annual funding needs in the range of approximately $85 million.

Again to be clear, this estimate does not represent a comprehensive price tag for implementation of the full Ten-Year Action Plan, it merely uses data available on a sampling of actions to indicate the scale of the urban forestry funding gap. In addition, the extent to which the more than $50 million in additional funds needed would come from direct budget increases to the Urban and Community Forestry or other USDA Forest Service programs, or through further leveraging of the other federal, state, local, nonprofit, and private sector funding streams at play in urban and community forestry will be an important discussion for the urban forestry community moving forward.

2 Please see methodology for detail on sources, estimation method, and caveats.

Limitations, Benefits, Emerging Research, and the Need to Standardize Accounting

As previously indicated, there are multiple levels and organizational units within the urban forestry community, including roughly 7,200 communities, more than 50 states and territories, and over 4,000 service, advocacy, and community organizations. The challenges of developing a detailed, accurate, and lasting estimate of funding needs across this scale and diversity of organizational units, along with the lack of a universally accepted accounting framework are real and there is a risk that a funding estimate of incorrect scope could quickly become outdated or distract from the overall message of the Ten-Year Action Plan.

> **Urban and community forestry is only now being more widely recognized as a public infrastructure service essential for addressing the needs of a nation having more than 80% of residents living in urbanized areas.**

One reason this challenge exists is that urban and community forestry, and the role it plays more broadly as a critical component of urban green infrastructure networks, is only now being more widely recognized as a public infrastructure service essential for addressing the needs of a nation having more than 80% of residents living in urbanized areas. City programs have had to quickly adapt from beautification goals, management, and reporting practices to a focus on the delivery of critical ecosystem goods and services. Meanwhile, the accounting and benefits measurement remain an emerging stage of research, development, and implementation.

The critical need to increase investment in urban and community forestry, or at the very least maintain existing levels, can be well-supported by a discussion of the multiple benefits derived; however, given the emerging state of ecosystem service benefits valuation and accounting, developing a simple equation or mathematical formula to calculate return on funding investment applicable to a national scale is not currently possible across all types of benefits.

To be clear, that is not to suggest that benefit values cannot or have not been calculated. There is a body of strong existing research, technology-based tools, and ongoing initiatives within the urban and community forestry community that could inform the standardization process and be built upon, much of which owes its origins to USDA Forest Service support. In fact, the Ten-Year Action Plan document is rife with examples from across the country that span human health and wellness, water and air quality, energy conservation, recreation, economic development, transportation, and public safety, often in the most vulnerable and underserved communities. While there is currently research into this area, currently what is lacking, as discussed earlier, is a consensus driven process for how these data points can be aggregated to a national, community of practice-wide scale.

Broadly adopted standard metrics would allow for the systematic allocation of budgets and the ability to more precisely determine return on investment and future funding needs. Standardization could also open access to other sources of urban forestry funding to support operations, growth, and the delivery of services. Codified systems for benefit measurement and accounting would enable access to emerging "green" financial markets, socially responsible investment funds, foundations, and impact investing capital pools.

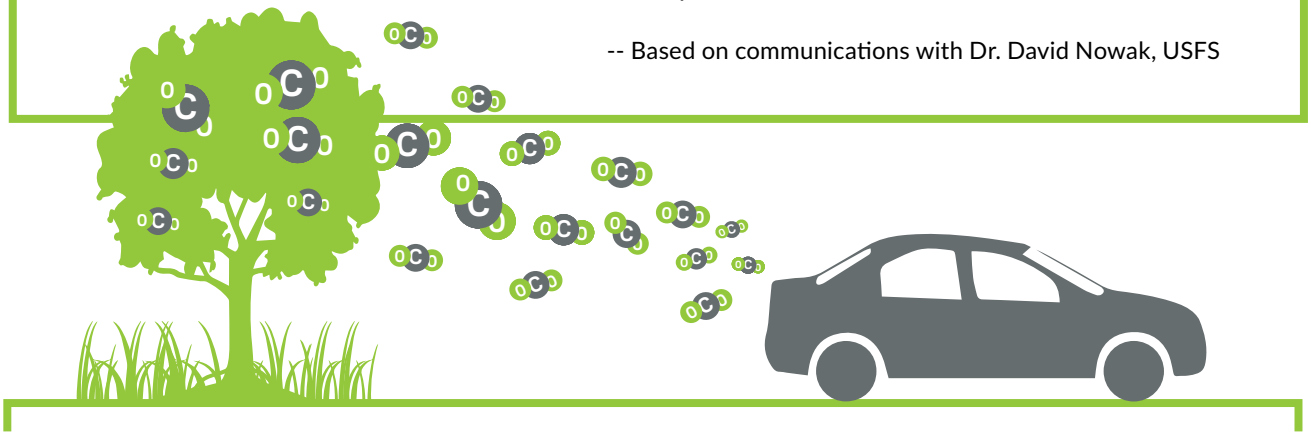
While it may sound like a daunting undertaking, developing an "industry standard" for urban and community forestry accounting could likely build upon existing tools and technologies already in place, but identifying a process with the greatest potential for efficiency, effectiveness, and accuracy would require additional investigation. The complexities of such a task will likely require a collective approach managed by an independent, neutral party that would begin with assembling a diverse panel of experts to evaluate existing data, technologies, and methodologies that can be built upon, determine associated gaps and limitations, and suggest methods for filling data gaps; and then, using this group's findings to serve as the basis for recommendations for developing a more standardized accounting system for both urban forestry investments made and benefits derived.

National Benefits and Funding

While only a few benefits, such as pollution removal, carbon sequestration, and energy conservation, have actually been quantified, those benefits have been conservatively estimated at $17 billion per year. In other words, the millions invested in urban forestry represent a fraction of a percent of the return on this investment.

To sustain the benefits communities receive from urban forestry requires an investment in the maintenance of the resource, as well. The urban forest is continually evolving and faces constant threat from development, climate change, insects and diseases, invasive plants, and more. Given the number of additional benefits, such as those related to health, drinking water, and the like that have not yet even been quantified on a national scale, the urban forest is clearly a resource that is substantially undervalued.

-- Based on communications with Dr. David Nowak, USFS



28.2 Million Tons/Year

Based on the field data of 10 USA cities and a national urban tree cover data, it is estimated that urban trees in the conterminous USA currently store 708 million tons of carbon ($14,300 million value) with a gross carbon sequestration rate of 22.8 million tC/year ($460/million per year) (Nowak et al., 2002).

20 Million Automobiles

This equals annual carbon emissions from about 20 million automobiles. Thus urban forests annually remove carbon equivalent to about 8% of U.S. registered vehicles (Nowak et al., 2010).

Conclusion

Ensuring that Urban and Community Forestry Programs keep pace with urbanization and the resulting expanded need for urban forestry services will require identifying, diversifying, and leveraging additional sources of funding. In addition, continuing support is needed to standardize, account for, and communicate both the funding investments being made in urban and community forestry, as well as the ecosystem services and benefits that urban forests provide. On a regional and national level, being able to more precisely speak to true costs, ecosystem services, and benefit measurements will enable urban and community forestry's strong network of implementers, policy makers, and grassroots support organizations to better communicate urban and community forestry's value, community impacts, and return on investment, to the urban forestry community external stakeholders, and the breadth of funding sources.

Photo Credit: Eric Reed

Methodology

Background

Background. The USDA Forest Service's Urban and Community Forestry program provides technical and financial assistance to cities, suburbs, and towns across the nation to maintain and enhance urban tree and forest cover, respond to storm and other disturbance events, support integrated containment of invasive pest threats, and manage risks. The program also supports valuation work and cost-benefit analysis, enabling communities to better understand the benefits provided by urban forests to non-forest sectors, such as public health energy conservation, and economic development.

The Urban and Community Forestry program's contribution to moving communities towards greater economic, environmental, and social sustainability has been significant. In FY 2014 alone, the program delivered assistance to over 190 million people, or 60% of the US population, in over 7,000 communities across the country. A key reason for the program's extended reach is that the federal investment made through the Urban and Community Forestry program leverages non-federal funding – often at a match of 2:1 or in many cases significantly more.[2]

Given the leveraged nature of funding deployed by the Urban and Community Forestry program, the University of Maryland Environmental Finance Center elected to focus on urban and community forestry funding data which seemed the most widely accepted and could provide examples when planning for urbanization within the community of practice.

This included data from:

- USDA Forest Service Annual Budget Requests and Justifications
- Studies of Urbanization by USDA Forest Service Researchers
- 2010 United States Census Data
- Advocated Consensus Budget

2 Sustainable Urban Forest Coalition Fiscal Year 2016 House Interior Appropriations Testimony, March 25, 2015.

Photo credit: Bettina Ring

Step One: Estimating Change in Urban Land Area

To conduct the analysis, state estimates of the percentage of land by state that will be urban in 2050 were gathered from the study Projected Urban Growth (2000 – 2050) and Its Estimated Impact on the US Forest Resource.[2] The 2010 Census data on total land area and total urban area for fifty states and the District of Columbia was gathered and organized by state.[3] Census data expressed in square meters was converted to square miles.

The estimated percentage of 2050 urban land by state was then applied to current total state land area to derive an estimated "2050 urban area square mile by state." The difference between estimated 2050 urban land area by state and 2010 Census Urban Land Area was then calculated and expressed as a percentage of 2010 Census Urban Land Area by state. The total 2010 Census Urban Land Area by state and the Estimated 2050 Urban Land Area by state was aggregated to arrive at totals for the fifty states and the District of Columbia.[4] Table 1: Estimating Change in Urban Land Area below provides this data.

2 Projected Urban Growth 2000 - 2050 and Its Estimated Impact on the Forest Resource. Nowak, David and Walton, David. Journal of Forestry. December 2005

3 United States Census Bureau, Geography, 2010 Census Urban Lists Record Layouts, 2010 Percent Urban and Rural by State, File Name PctUrbanRural_State.xls, https://www.census.gov/geo/reference/ua/ualists_layout.html, accessed February 7, 2015

4 Please note that the table does not include United States territories as data on future urban land areas was unable to be located.

Table 1: Estimating Change in Urban Land Area

State	Census 2010 State Area (AREA_ST) (m2) [1]	Census 2010 Urban Area (AREA_URBAN) (m2) [1]	Census 2010 Urban Area (mi2)	Estimated Percentage of State Land that will be urban in 2050 [2]	Estimated 2050 Urban Area (mi2)	Estimated Increase in Urban Land Area (mi2)	Estimated Increase as a % of Census 2010 Urban Area
Alabama	131,170,787,086	5,716,365,701	2,207	10.70%	5,419	3,212	145.53%
Alaska	1,477,953,211,577	673,703,920	260	0.05%	285	25	9.69%
Arizona	294,207,314,414	5,663,221,936	2,187	5.10%	5,793	3,607	164.95%
Arkansas	134,771,261,408	2,841,198,188	1,097	5.80%	3,018	1,921	175.12%
California	403,466,310,059	21,287,926,350	8,219	15.00%	23,367	15,148	184.29%
Colorado	268,431,246,426	3,956,737,225	1,528	3.90%	4,042	2,514	164.58%
Connecticut	12,541,641,427	4,730,500,209	1,826	60.90%	2,949	1,123	61.46%
Delaware	5,046,703,785	1,053,792,304	407	39.50%	770	363	89.17%
District of Columbia	158,114,680	158,114,680	61	100.00%	61	0	0.00%
Florida	138,887,481,596	19,173,902,265	7,403	27.90%	14,961	7,558	102.10%
Georgia	148,959,236,603	12,423,724,190	4,797	14.30%	8,224	3,428	71.46%
Hawaii	16,634,529,975	1,018,212,915	393	6.12%	393	0	0.00%
Idaho	214,044,680,857	1,292,606,730	499	1.80%	1,488	988	198.06%
Illinois	143,793,362,385	10,218,955,838	3,946	14.60%	8,106	4,160	105.44%
Indiana	92,789,193,658	6,540,696,730	2,525	16.70%	5,983	3,458	136.91%
Iowa	144,669,296,857	2,468,980,575	953	4.90%	2,737	1,784	187.11%
Kansas	211,754,095,913	2,519,183,616	973	3.20%	2,616	1,644	168.98%
Kentucky	102,269,141,641	3,653,655,859	1,411	8.80%	3,475	2,064	146.32%
Louisiana	111,897,594,452	5,097,451,640	1,968	11.10%	4,796	2,827	143.66%
Maine	79,882,800,680	931,423,305	360	3.80%	1,172	812	225.90%
Maryland	25,141,638,381	5,191,942,757	2,005	37.50%	3,640	1,636	81.59%
Massachusetts	20,202,057,805	7,735,338,848	2,987	61.00%	4,758	1,771	59.31%
Michigan	146,435,075,220	9,384,151,623	3,623	13.70%	7,746	4,123	113.78%
Minnesota	206,232,309,199	4,416,575,848	1,705	4.80%	3,822	2,117	124.14%
Mississippi	121,530,715,928	2,864,191,371	1,106	7.00%	3,285	2,179	197.02%
Missouri	178,039,716,301	5,320,506,862	2,054	6.90%	4,743	2,689	130.89%
Montana	376,961,878,670	769,702,271	297	0.80%	1,164	867	291.80%
Nebraska	198,973,681,461	1,357,102,386	524	1.80%	1,383	859	163.91%
Nevada	284,331,937,541	1,987,575,459	767	2.20%	2,415	1,648	214.72%
New Hampshire	23,187,259,277	1,668,054,122	644	17.10%	1,531	887	137.70%
New Jersey	19,047,341,691	7,561,624,746	2,920	63.60%	4,677	1,758	60.21%
New Mexico	314,160,748,240	2,141,181,968	827	2.10%	2,547	1,721	208.12%
New York	122,056,806,947	10,597,911,232	4,092	18.50%	8,718	4,627	113.07%
North Carolina	125,919,791,207	11,937,724,456	4,609	19.10%	9,286	4,677	101.47%
North Dakota	178,711,239,147	475,973,352	184	1.00%	690	506	275.46%
Ohio	105,828,706,692	11,448,575,862	4,420	22.90%	9,357	4,937	111.68%
Oklahoma	177,660,021,556	3,384,365,635	1,307	4.70%	3,224	1,917	146.72%
Oregon	248,607,802,255	2,866,510,400	1,107	3.50%	3,360	2,253	203.55%
Pennsylvania	115,883,064,314	12,186,542,023	4,705	22.10%	9,888	5,183	110.15%
Rhode Island	2,677,566,454	1,037,649,938	401	70.50%	729	328	81.92%
South Carolina	77,856,841,944	6,168,413,106	2,382	18.30%	5,501	3,119	130.98%
South Dakota	196,349,580,075	586,090,288	226	1.00%	758	532	235.02%
Tennessee	106,797,885,992	7,524,311,791	2,905	15.30%	6,309	3,404	117.16%
Texas	676,586,997,978	22,651,009,601	8,746	7.00%	18,286	9,541	109.09%
Utah	212,818,329,473	2,369,045,186	915	2.50%	2,054	1,140	124.58%
Vermont	23,871,030,489	404,380,140	156	5.30%	488	332	212.87%
Virginia	102,278,849,309	6,902,790,588	2,665	12.60%	4,976	2,311	86.69%
Washington	172,119,001,610	6,150,546,552	2,375	9.20%	6,114	3,739	157.46%
West Virginia	62,258,675,601	1,658,489,502	640	7.70%	1,851	1,211	189.05%
Wisconsin	140,268,064,888	4,866,498,071	1,879	8.30%	4,495	2,616	139.23%
Wyoming	251,470,069,067	503,865,599	195	0.60%	583	388	199.45%
Total	**9,156,460,226,723**	**279,879,819,054**	**108,062**		**238,034**	**131,648**	

Note 1: United States Census Bureau, Geography, 2010 Census Urban Lists Record Layouts, 2010 Percent Urban and Rurual by State, File Name PctUrbanRural_State.xls, https://www.census.gov/geo/reference/ua/ualists_layout.html, accessed and downloaded February 7, 2015.

Note 2: Projected Urban Growth 2000 - 2050 and Its Estimated Impact on the Forest Resource. Nowak, David and Walton, David. Journal of Forestry. December 2005)

Step Two: Derive the Implied Annual Growth Rate

The implied annual growth rate,[2] calculated at 1.99%, was then applied to an estimated annual funding amount in order to approximate additional funding needs related to annual increases in urban land. Table 2: Estimated Implied Annual Growth Rate demonstrates the application of the growth rate formula to the 2010 and 2050 data using the footnoted calculation.

2 Implied Annual Rate = (2050UrbanArea/2010UrbanArea)^(1/40)–1

Table 2: Estimated Implied Annual Growth Rate

2010 Census Estimated Urban Area (mi2)	Estimated 2050 Urban Area (mi2)	Implied Annual Growth Rate
108,062	238,034	1.99%

Step Three: Compile a List of Current Estimated Funding Needs for Items such as Programs, Actions, Tools, and Research

Table 3: Estimated Funding Needs before Adjusting for Urbanization below lists a sampling of the Ten-Year Action Plan activities in need of funding, the estimated funding needed for each, the associated Ten-Year Action Plan goal, and the basis or source for each estimate. The data builds on the consensus driven Sustainable Urban Forests Coalition needs estimate with data layers from a number of sources including USDA Forest Service researchers. In the absence of available data, an estimate was derived applying urban land area to 2016 funding levels. When summed, we arrive at total current funding need estimate of $83.85 million.

Table 3: Estimated Funding Needs before Adjusting for Urbanization

Action Plan Activities	Base Funding (millions)	Associated Action Plan Goal	Notes
UC&F Program Funding	$ 31.30	Funding, Management, Multiple	SUFC consensus recommended funding for Urban and Community Forestry Program 1
Forest Health Management	$ 7.97	Management	Line item in federal budget is $99.6 million. The estimate uses assumption that 8% allocated towards urban
Inventory Analysis	$ 20.00	Planning, Multiple	Estimate from Dr. Nowak. Assumes 200 plots in 100 metro areas per year at a cost of $1000 per plot
Tools - iTree	$ 1.30	Planning, Multiple	Estimate from Dr. Nowak
Urban Tree Canopy	$ 2.80	Planning	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Stewardship mapping	$ 1.20	Management	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Trees + Crime	$ 1.60	Human Health	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Trees + Health	$ 1.00	Human Health	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Trees + Water	$ 1.00	Human Health, Environmental Health	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Urban Forest Products	$ 1.20	Management	Northern Research Station Data Multiplied by 4 Research Stations. Please see caveats.
Estimate of additional urban research and action items	$ 14.48	Multiple	This number is total Urban R&D Estimate less the specific research items above. Line item in Federal Budget is $291 million. This estimate makes an assumption that 8% of R&D is allocated to Urban Land. This results in a total R&D budget of $23.28 million annually.
Total of Items	$ 83.85		

The first line item is specifically funding for the USDA Forest Service Urban and Community Forestry Program. The estimate uses a funding base of $31.3 million as was recommended by the Sustainable Urban Forests Coalition (SUFC) in March 2015 when SUFC recommended program funding return to pre-sequestration levels.[2] In our judgment this represents a consensus funding estimate and represents an increase of more than $7 million when compared to the FY 2016 budget of $23.686 million.[3]

The additional line items in the table represent a sampling of Ten Year Action Plan activities that have traditionally been funded by programs other than the Urban and Community Forestry Program. These include restoring resilient landscapes, forest health management, inventory analysis, tool, monitoring, and research. Urban and community forestry is not always accounted for as a separate funding item within USDA Forest Service budgets making it difficult to discern between urban forestry needs and overall forestry needs.[4] USDA Forest Service researchers and 2016 budgets data offered a sampling of funding requests which impact urban and community forestry at the national level include:

- Forest health management, which comprises all land areas of forest health management including urban, $99.6 million annually.[5]

- Inventory Analysis, at $90 million annually, includes urban inventory analysis.[6]

- Research and Development, at $291 million annually, includes research focused on urban applications.[7]

- Northern Research Station Research funding needs of $2.35 million annually for items such as urban tree canopy, stewardship mapping, urban forest products, trees and crime, trees and health, and trees and water.[8]

2 Sustainable Urban Forests Coalition Fiscal Year 2016 House Interior Appropriations Testimony, March 25, 2015.
3 USDA, United States Forest Service, Fiscal Year 2016 Budget Justification, Urban and Community Forestry, Page 117 http://www.fs.fed.us/sites/default/files/media/2015/07/fy2016-budgetjustification.pdf accessed March 19, 2015
4 This is not to imply that urban and community forestry was to have been accounted for separately, or should be accounted for separately, rather in our analysis, it was difficult to discern a separation. For some of these items, it is difficult to see where a dividing line between urban and community forestry and general forestry maybe be drawn.

5 United States Department of Agriculture, United States Forest Service, Fiscal Year 2016 Budget Justification, Urban and Community Forestry, Page 84 http://www.fs.fed.us/sites/default/files/media/2015/07/fy2016-budgetjustification.pdf accessed March 19, 2015.
6 United States Department of Agriculture, United States Forest Service, Fiscal Year 2016 Budget Justification, Urban and Community Forestry, Page 57 http://www.fs.fed.us/sites/default/files/media/2015/07/fy2016-budgetjustification.pdf accessed March 19, 2015.
7 United States Department of Agriculture, United States Forest Service, Fiscal Year 2016 Budget Justification, Urban and Community Forestry, Page 57 http://www.fs.fed.us/sites/default/files/media/2015/07/fy2016-budgetjustification.pdf accessed March 19, 2015.
8 Deploying Trees to Improve Quality of Life in Cities: Research Needs. Grove, Rains, Westphal. USDA Forest Service, Northern Research Station. February 2015. The table below was developed by NRS and does not represent all regions in terms of priorities and costs. It does appear to represent national perspectives for bringing urban tree canopy and stewardship mapping to enterprise mode. Please note that these needs do not include i-Tree or investments in place-based research undertaken by the urban field stations/place-based units, etc. This information is offered as an exemplar and is not meant to be an indication of total research needs. These numbers would need to be augmented to avoid underestimating urban research investment recommendations or under-representing southern, western, and other regional research needs.

Table 4: Exemplar Chart of Northern Research Station Research Needs

	Year 1	Year 2	Year 3	Year 4	Year 5
Urban Tree Canopy	$700,000	$700,000	$500,000	$500,000	$350,000
Stewardship mapping	$300,000	$300,000	$250,000	$250,000	$175,000
Trees + Crime	$400,000	$300,000	$250,000	$250,000	$200,000
Trees + Health	$400,000	$400,000	$400,000	$400,000	$400,000
Trees + Water	$250,000	$250,000	$250,000	$250,000	$250,000
Urban Forest Products	300,000	300,000	250,000	200,000	200,000
Total Investment	2,350,000	2,250,000	1,900,000	1,850,000	1,575,000

Step Four: Use the Implied Annual Growth Rate to Estimate Additional Funding Needs Related to Future Urbanization.

Table 5: Estimated Additional Need Based on Future Urbanization and Total Estimate of Annual Funding applies the implied annual urbanization growth rate from Step 2 to the funding need estimate derived in Step 3, resulting in an estimated annual funding need adjusted for urbanization over the next ten years.

Step Five: Estimate Present Value Over the Ten Year Period

As a final step, the EFC made an estimate of the present value of the funding needs over the next ten years. The intent of this exercise is to express estimated plan funding needs in terms of present value for discussion purposes only. The exercise does not assume either the source or recipient of the funding, but applies a 3% discount rate to estimated future funding needs to discount the stream of future funding needs back to present. We are not suggesting this is the case, but a question could arise, how one might compare different funding options to make up a financing gap in the era of sequestered budgets. A present value exercise is one method employed which can advance plan discussion, with the caveat that it is not the only path, with the caveat that estimates of present value become very uncertain and can vary widely the longer into the future projections are made, and with the caveat that the method is not employed, and thus may not be useful, across all organizations in the urban forestry community.

Table 5: Estimated Need Based on Future Urbanization and Total Estimate of Annual Funding

Item	Amount (million)
Total Funding from Table of Items	$83.85

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Present Value of 2016 - 2025 Future Estimated Funding Need
Additional Estimated Funding need above SUFC related to Estimated Urbanization Increase	$1.67	$1.71	$1.74	$1.77	$1.81	$1.85	$1.88	$1.92	$1.96	$2.00	$15.54
Annual Funding Need	$85.52	$87.23	$88.97	$90.74	$92.55	$94.39	$96.28	$98.20	$100.15	$102.15	

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- David Nowak, Ph.D., Research Forester, Northern Research Station, Unites States Department of Agriculture, USDA Forest Service
- Jeffrey Peterson, Northern Arizona University

Funding Needs References

1. U.S. Urban Forest Statistics, Presentation to the 2014 Partners in Community Forestry Conference, Charlotte, NC, David Nowak.

2. Nowak and Walton. Projected Urban Growth and Its Estimated Impact on the U.S. Forest Resource.

3. CARS data 2005 – 2014, See Table 1, in Appendix.

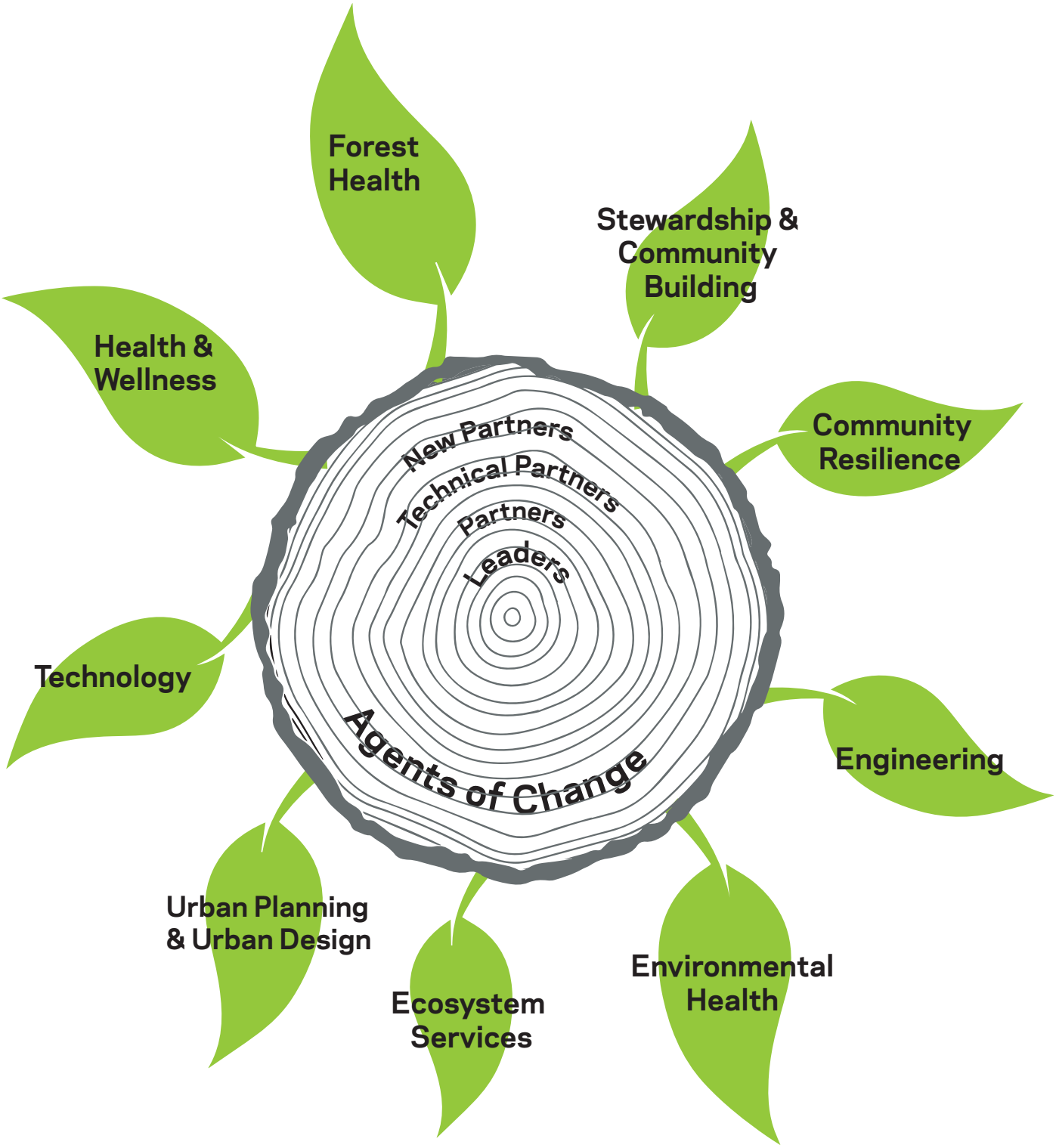
4. This estimate relies on a change of one variable, i.e. urbanized area. Our judgment is that this is a factor and a variable that impacts the discussion of urban forestry at all levels. We acknowledge that the rate of urbanization may change when viewing locally; however, we believe that given the granularity of census data, organizations of a local nature may be able to understand and employ the method for planning discussion purposes. This estimate does not include other future factors which may have an effect on program delivery, such as, inter alia, technological efficiencies, economies of scale in program delivery, dissemination of information, efficiencies from increases in standards or level or professionalism, availability of funding, rate of program funding, or rate of program adoption.

Action Plan Implementation

Photo credit: Christine Gyovai

Who Will Implement the Plan?

The Entire Urban Forestry Community!



The Urban Forestry Community Includes

Leaders

Entities whose core mission is urban and community forestry. At the core of the urban forestry community are urban and community forestry lead organizations whose responsibility is to "build a fire" of activity strong enough to draw people and organizations to encourage greater participation. Some of these leaders include federal, state, and local representatives; non-profits; and private sector professionals.

Allied Professionals

Entities whose mission is related to ecosystem and human health services provided by urban and community forestry, who are aware of urban and community forestry, and who either work or are willing to work with urban and community forestry. Some of these partners include universities, planning organizations, federal public health agencies, parks and recreation organizations.

Technical Support

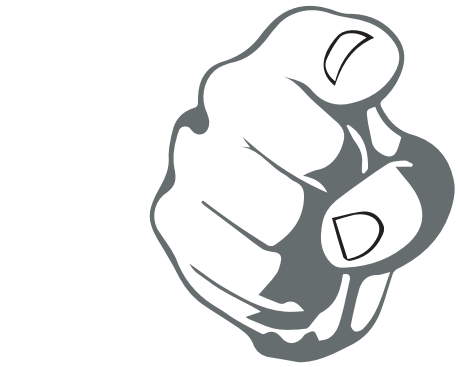
Entities that work with trees, although urban and community forestry is not yet explicitly a part of or related to their mission. (See page 114 for a list of federal agencies that can offer technical support).

New Partners

Entities whose work intersects with urban and community forestry, although they may not yet be either aware of urban forestry or be directly connected with the field yet. New partners could be public works offices, urban design college programs, and regional planning commissions.

What Can YOU Do to Implement This Plan?

- Seek a USDA Forest Service grant to implement the Action Plan goals and strategies.
- Share with NUCFAC the goals and strategies that you are working on.
- Check the NUCFAC website to learn about annual priorities and Plan updates.
- Join your community's urban forestry network (local government, private practitioners, non-profits, and grassroots activists).
- Contact NUCFAC if you have ideas about how to implement this plan. 1-800-832-1355



NUCFAC's Facilitation Process

The Council has identified the following goals and strategies for the first couple of years to initiate the Action Plan from their position. The Council reserves the right to change or modify these items listed base on emerging issues and opportunities.

NUCFAC roles:

- Steward implementation of the plan.
- Track progress toward reaching goals.
- Assist with aligning research around the goals in the plan.
- Identify their goals, and targets.
- Make annual recommendations to the Secretary of Agriculture.
- Annually report on the Action Plan's accomplishments made by the urban forestry community

Possible NUCFAC Sub-Team Roles

- Identify priority goals, develop appropriate targets, track progress, and report continuing needs.
- Identify and make recommendations regarding the Secretary of Agriculture, USDA Forest Service, and other agencies to the full Council for review, acceptance, and submission.
- Identify and shape inter-agency collaboration and encourage urban forestry community to implement the Plan for collective impact.
- Disseminate the Action Plan and communicate progress in implementing the Plan, and provide broad access to products, tools and resources.

NUCFAC's Timeline

The following graphic represents a broad implementation plan that is intended to be iterative, i.e. reviewed and amended as needed to ensure maximum impact.

1st Quarter (Calendar Year)

- Align grant categories with priorities.
- Advertise Grant Request for proposals (annual RFP).

2nd Quarter

- Develop grant categories for the following year.

3rd Quarter

- Review recommended grant categories and approve them for release in January.
- Develop presentation on progress for Partners in Community Forestry conference.
- Work with the USDA Forest Service to develop a Federal Agency Collaboration Strategy.

4th Quarter

- Review progress.
- Present progress at Partners in Community Forestry conference.
- Develop next 3-year priorities and targets.

Subsequent 3-Year Phases

Annual Activities

- Align grant categories with priorities.
- Advertise Grant Request for proposals (annual RFP).
- Develop grant categories for the following year.
- Review recommended grant categories and approve them for release in January.
- Continue to advance the Federal agency collaboration strategy.
- Review Progress.
- Develop presentation on progress for annual Partners Conference.
- Present progress at Partners Conference.

Third Year

- All annual activities
- Consult urban forestry community on priorities for the next three-year period.
- Develop next 3-year priorities and targets.
- Conduct national assessment of resources (science/technology tools) available to implement these priorities.
- Communicate new priorities and resources to implement them.

Federal Agencies Connected to Urban and Community Forestry

Environmental Protection Agency

- Smart Growth Program (Office of Sustainability)
- Our Town (EPA/HUD/DOT)
- Healthy Watersheds Initiative (EPA-Water)
- Community Grants Program (Office of Env. Justice)
- Chesapeake Bay Program (EPA-Mid-Atlantic)
- Greening America's Capitals (Office of Sustainability)
- Integrated Climate & Land Use Scenarios (Global Change Impacts)
- Enviroatlas
- Urban Waters Restoration Grant Program (EPA- Water)
- State Environmental
- Cooperative Agreement (Office of Env. Justice)
- Green Infrastructure Initiative (EPA-Water)
- PestWise (Office of Pesticide Programs)

Department of Agriculture (USDA)

- Financial Assistance Programs (Natl. Resources & Conservation)
- Climate Change Program Office (Office of Economist)
- Forest Research Advisory Council Grant Program (Natl. Institute of Food & Agriculture)
- Conservation Technical Assistance Program (Natl. Resources & Conservation)
- EPOC Forestry and Natural Resources (Institute of Food & Agriculture)
- Landscape Initiatives, Landscape Planning (Natural Resources & Conservation)
- National Agroforestry Center
- USDA Natural Resource Conservation Service
- Resource Conservation Districts on soil health, urban farming and pollinators
- Urban and Community Forestry Technology Transfer (USDA Forest Service)
- Cooperative Forestry (USDA Forest Service)
- Urban and Community Forestry (USDA Forest Service)
- National Urban and Community Forestry Advisory Council (USDA Forest Service)
- USDA Forest Service Research and Development

Department of Defense (DOD)

- Readiness & Environmental Protection Integration Program (REPIP)
- Army Corps of Engineers -Ecosystem restoration

Department Of Interior

- Land & Water Conservation Fund (National Parks)
- Conservation Study Institute (National Parks)
- Rivers, Trails, & Conservation Assistance Programs (National Parks)
- Landscape Conservation Cooperatives (Fish & Wildlife)
- Coastal Program (Fish & Wildlife Services)
- State and Tribal Wildlife Grant Program (Natl. Wildlife Federation)
- Endangered Species (Fish & Wildlife Service)
- America's Great Outdoors (Multiple)
- Nature Play Corps (Natl. Wildlife Federation)
- U.S. Geological Survey

National Science Foundation (NSF)

- Environmental Sustainability Program
- ULTRA Grants
- Research Collaboration Network (RCN)
- Sustainability Research Networks (SRN)
- Coupled Natural and Human Systems Funding (CNH)

Department of Labor

- Green Infrastructure Training

Department of Housing And Urban Development

- Community Development Block Grants (Community Planning & Development)

Recommendations for Aligning Programs and Policies of Relevant Federal Agencies

- [x] To accomplish this task, the team first identified all federal agencies and programs relevant to urban and community forestry. The list (shown here) was refined with significant feedback from participants at the 2014 Partners in Urban Forestry Conference, the Advisory Team, and NUCFAC.
- [x] Survey these agencies to better understand the overlap and intersection of programs and policies. A survey was attempted, but participation was too low, despite repeated attempts to engage program contacts. Another survey is not recommended.
- [ ] Convene as many federal agency programs as possible, to explore how programs can work together to avoid redundancies, align activities, and/ or leverage funding for achieving shared goals and increasing collective impact.

Federal Agency Partnerships

Urban Waters Federal Partnership
(14 Federal Agencies)

This partnership will reconnect urban communities, particularly those that are overburdened or economically distressed, with their waterways by improving coordination among federal agencies and collaborating with community-led revitalization efforts to improve our Nation's water systems and promote their economic, environmental and social benefits.

Partnership for Sustainable Communities
(3 Federal Departments)

The Partnership for Sustainable Communities (PSC) works to coordinate federal housing, transportation, water, and other infrastructure investments to make neighborhoods more prosperous, allow people to live closer to jobs, save households time and money, and reduce pollution. The partnership agencies incorporate six principles of livability into federal funding programs, policies, and future legislative proposals.

Department Of Energy (DOE)

- State and Local Solution Center (Office of Energy Efficiency & Renewable Energy)
- Federal Energy Management Program (Office of Energy Efficiency & Renewable Energy)
- Office of Soil & Ground Water Remediation Program (Environmental Management)

Department of Transportation (DOT)

- Sustainable Highway Initiative (Fed. Highway Administration)
- Pipeline and Hazardous Materials Safety Administration
- TIGER Discretionary Grants (Office of Infrastructure Finance & Innovation)

Federal Emergency Management Agency (FEMA)

- Disaster Recovery Framework
- Hazard Mitigation
- Planning for Disaster Resistance Communities

Department Of Education

- Green Ribbon Schools
- Green Strides
- Environmental Education

Centers For Disease Control & Prevention (CDC)

- Healthy Communities Program (Community Health)
- Go Green, Get Healthy Initiative (Office of Sustainability)
- National Center for Environmental Health
- Health Impact Assessment (Healthy Places)

U.S. Botanic Garden

- Sustainable Sites Initiative
- Sustainability Program

National Aeronautics and Space Administration

National Oceanographic Agency

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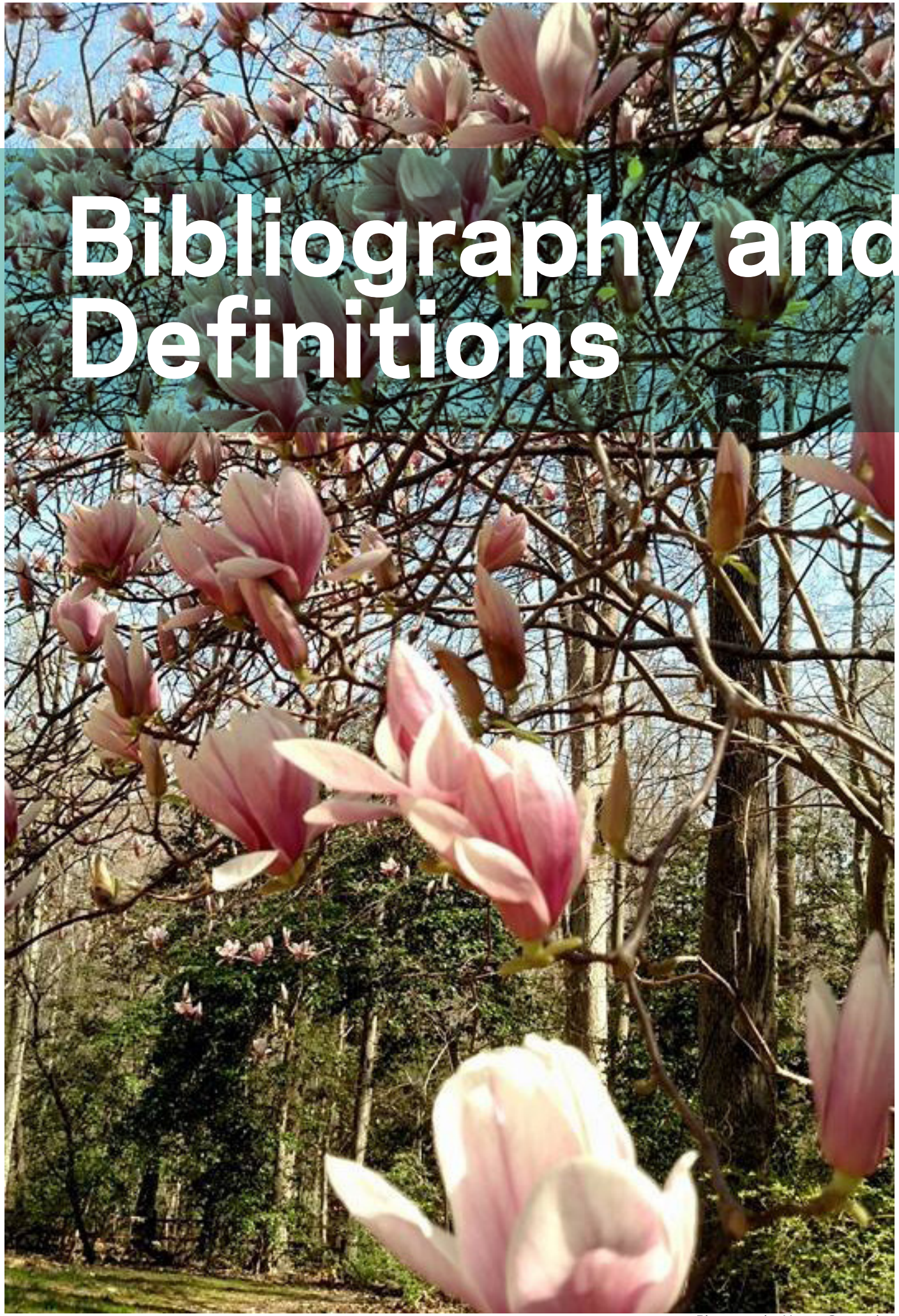

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Figure 1.1: Modified version of Tree by Alberto Guerra Quintanilla, MX and Bucket by Ema Dimitrova

Figure 1.2: Modified version of House by Naomi Atkinson and Barrel by Randall Barriga

Figure 1.3: Modified version of Money by Caroline Lancaster, U.S. and Tree by Alberto Guerra Quintanilla, MX

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Figure 4.1: Modified version of Tree by TiRo, PT

Figure 4.2: Modified version Spiral by Eli Ratus, IL and Tree by Alberto Guerra Quintanilla, MX

Figure 4.3 Modified version of Bug by USICON. US

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Definitions

Urban and Community Forest ("Urban Forest"): The term urban and community forest encompasses cities, their suburbs, and large and small towns. It refers to all publicly and privately owned trees within an urban area – including individual trees along streets and in backyards, as well as stands of remnant forest (Nowak et al., 2001). Urban forests are an integral part of community ecosystems, whose numerous elements (such as people, animals, buildings, infrastructure, water, and air) interact significantly to shape the quality of community life at all levels. The urban forest includes street and yard trees, parks, cemeteries, school grounds, and undeveloped green spaces, and green infrastructure. In the Cooperative Forestry Act of 1978, as amended through 2008, and revised in May 2011, urban and community forests provides the following benefits:

(1) the health of forests in urban areas and communities, including cities, their suburbs, and towns, in the United States is on the decline;

(2) forest lands, shade trees, and open spaces in urban areas and communities improve the quality of life for residents;

(3) forest lands and associated natural resources enhance the economic value of residential and commercial property in urban and community settings;

(4) urban trees are 15 times more effective than forest trees at reducing the buildup of carbon dioxide and aid in promoting energy conservation through mitigation of the urban heat island effect in urban areas;

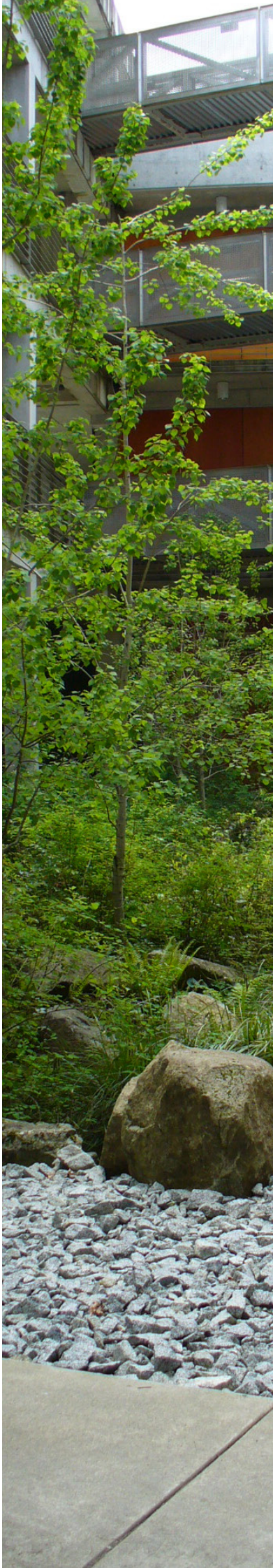
(5) tree plantings and ground covers such as low growing dense perennial turf grass sod in urban areas and communities can aid in reducing carbon dioxide emissions, mitigating the heat island effect, and reducing energy consumption, thus contributing to efforts to reduce global warming trends; and

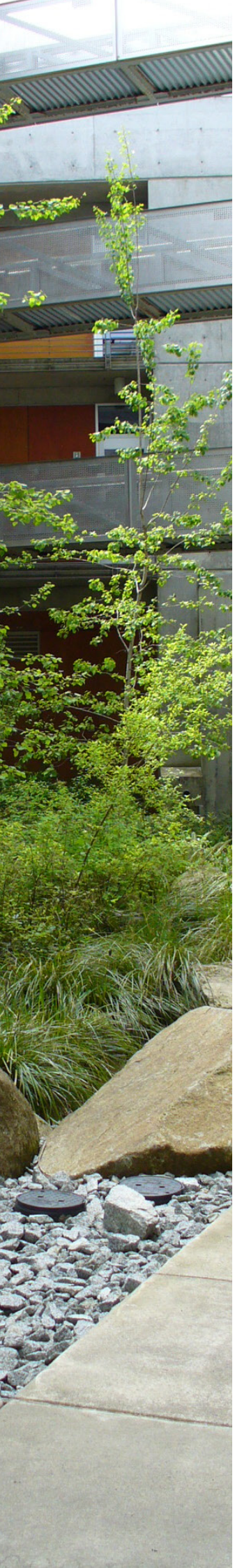
(6) efforts to encourage tree plantings and protect existing open spaces in urban areas and communities can contribute to the social well-being and promote a sense of community in these areas.

Urban and Community Forestry ("Urban Forestry"): The term urban and community forestry refers to the art, science, and technology of managing trees, forests, and natural systems on public lands in and around cities, suburbs, and towns for the health and well-being of all people. It encompasses the growing professional cadre of programs, activities, tools, resources and research that are needed to manage, maintain and steward the urban forests, for the purpose of ensuring that urban forests are healthy and provide their optimal range of community benefits.

Non-governmental organizations: A non-governmental organization (NGO) is any non-profit, voluntary citizens' group organized on a local, national or international level. Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bring citizen concerns to governments, promote and monitor policies and encourage political participation through provision of information. They provide analysis and expertise, serve as early warning mechanisms and help monitor and implement community policies and programs.

Underserved Communities: Underserved communities are communities that do not receive equitable financial and technical assistance as other communities might, in maximizing the benefits from the conservation and management of their natural resources. In this context, the term "underserved" encompasses low income, under-represented racial / ethnic minorities; Native Americans; people with disabilities; and the elderly.





Ecologically Underserved: Communities lacking sustainable ecosystem services due to inadequate urban forest structure and management that diminishes environmental, socioeconomic, and health benefits

Green Infrastructure: Green infrastructure is strategically planned and managed networks of natural lands, working landscapes, and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

Sustainability: As defined by the 1987 U.N. Brundtland Commission, sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability has become a core tenet of 21st century community development and planning, reflected in the rise across America of community sustainability plans. Sustainability typically encompasses three key elements: environmental, social, and economic.

Ecosystem: An ecosystem is a community of people, plants, animals, and microorganisms interacting with one another and their nonliving environment (water, soils, nutrients).

Resilience: Resilience is broadly defined as "the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity" (Walker et al. 2006: 2), with "shock" being another term for a disturbance or pulse effect. Resilience is a relatively new addition to the national lexicon, reflecting the rising stressors on communities from natural, human, and economic pathways. Resilience is the ability of a whole system to be better prepared for bumps, shocks, even disasters. Rather than "bouncing back" from these events and rebuilding in the same way as before, resilience implies that the community will "bounce forward" as it learns from these events and rebuilds in a continual improving process

Community Resilience (CR): Is defined as the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise.

Urban Heat Island: The term urban heat island (UHI) describes the phenomenon in which cities are generally warmer than adjacent rural areas.

Biophilic Cities: Biophilic cities are cities of abundant nature in close proximity to large numbers of urbanites; biophilic cities are biodiverse cities, that value, protect and actively restore this biodiversity; biophilic cities are green and growing cities, organic and natureful. Biophilic cities are cities that provide abundant opportunities to be outside and to enjoy nature through strolling, hiking, bicycling, exploring; biophilic cities nudge us to spend more time amongst the trees, birds and sunlight

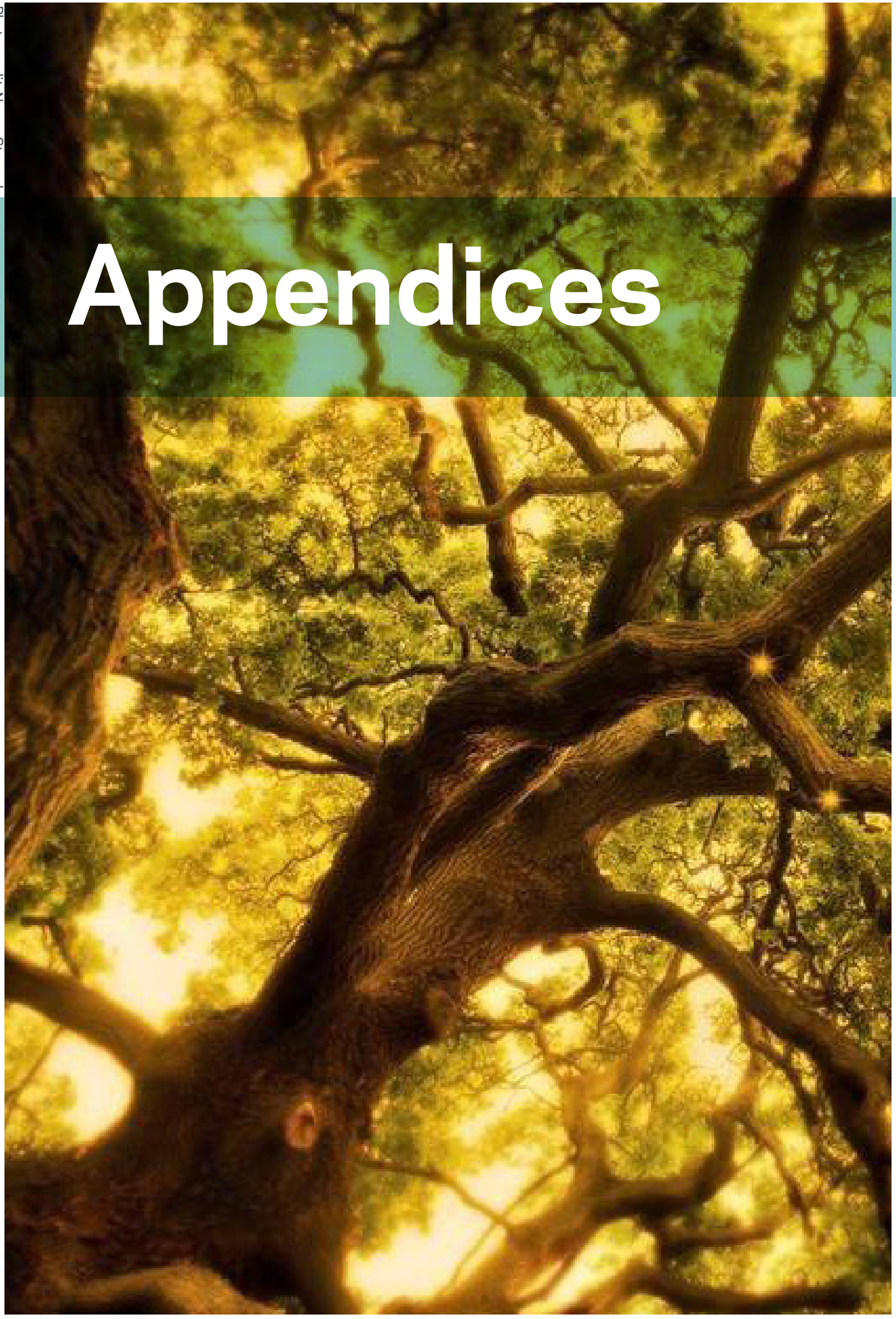


Photo credit: Nancy Stremple

Appendices

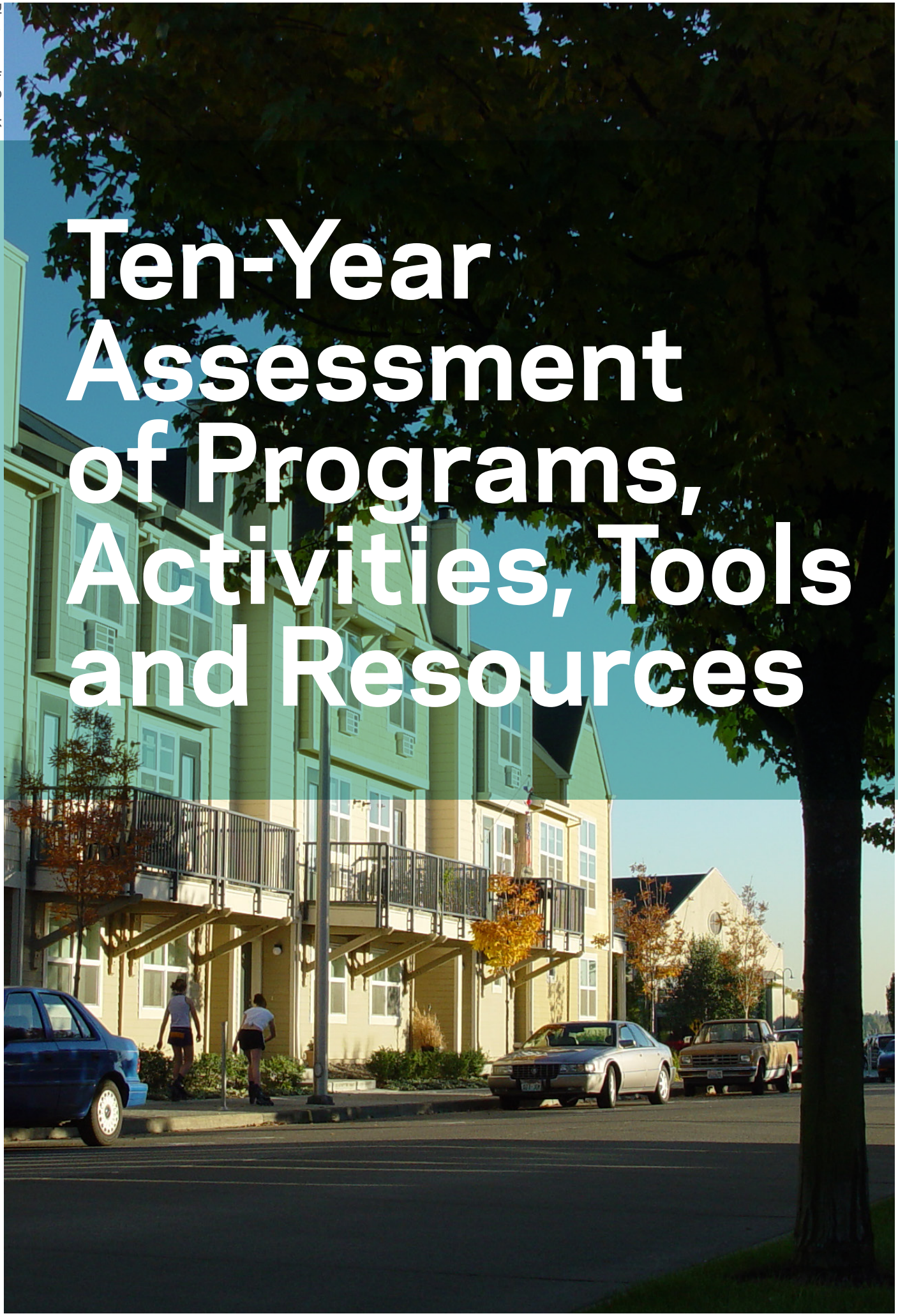


Photo credit: Guy Kramer

Ten-Year Assessment of Programs, Activities, Tools and Resources

Analysis of Programs, Activities, Tools and Resources

Part of the Action Planning process required by federal legislation involved the assessment of the status of urban and community forestry programs, activities, tools, and resources. As the team began the assessment process, it quickly learned that no tracking system for progress in these areas was present. The need for establishing a progress tracking system has been recognized by the National Urban and Community Forestry Advisory Council, and it is a priority of theirs to institute and use a tracking system, which will make the next assessment in ten years an easier task. In the absence of this tracking system, the Project Team settled on using two approaches: qualitative and quantitative.

Qualitative Assessment

For qualitative information about progress made in the past ten years, the following steps were taken:

- The Project Team (PT), Advisory Team (AT), Urban and Community Forestry state-level coordinators in all 50 states, NUCFAC board members, and USDA Forest Service staff (USFS), were all asked to identify documents, websites, articles, and reports that would contribute to a ten-year retrospective assessment.

- More than 60 thought leaders were recommended by the PT, AT, NUCFAC, and USFS. From these, 25 were selected (Appendix 5) to represent broad national geographic and substantive diversity. During the in-depth interviews, thought leaders were asked to share their perspective and insights about progress made in the last ten years, as well as to highlight specific progress in the realm of programs, activities, tools, and resources.

- The PT, AT, NUCFAC, USFS, and 26 thought leaders were asked to identify key issues that are facing the field of urban and community forestry, as well any global or regional trends that would be influencing the field over the next ten years.

- Graduate students at the Institute for Environmental Negotiation (IEN) conducted an in-depth literature search, and also researched the leads provided by all project advisors. More than 150 urban and community forestry documents were identified as relevant and assembled as a result of this effort, including the 2010 "Vibrant Cities" report, and the 2010 Federal analysis of the 50 state Forest Resource Assessments entitled "Urban and Community Forest Related Content in 2010 Statewide Forest Resource Assessments." In a second path of research, the team also scanned available resources (documents, websites, tools, etc.),

These multiple inputs were synthesized into a Key Issues Report (Appendix 4), which identified 14 Key Issues for the next ten years, and also provided a preliminary assessment of the progress and trends over the last ten years.

Quantitative Assessment

- The IEN team continued to assemble more documents referred by members of the PT/ AT/ NUCFAC. The team continued to sort, coding, and analyze these documents in a spreadsheet format. Once the priority Action Plan Goals were finalized in Spring 2015, this spreadsheet was analyzed to determine how often each of Goals 1 to 7 were mentioned or addressed in the urban forestry documents (including reports, websites, etc.). This analysis was done to identify where the last ten years have proven to be strong, and where there are gaps – indicating a need for attention in the next ten years. The results of this analysis are shown in pie charts in this Appendix.

- The USDA Forest Service provided the "Community Accomplishment Reporting System" (CARS) to the IEN team for analysis. CARS is a detailed set of data collected from the Urban Forest Coordinators throughout the nation, and it represents progress made in specific arenas between 2005 to 2012.

- The IEN conducted an analysis of these data, and the graphic results are provided in this Appendix, as well as in relevant places throughout Goals 1 to 7.

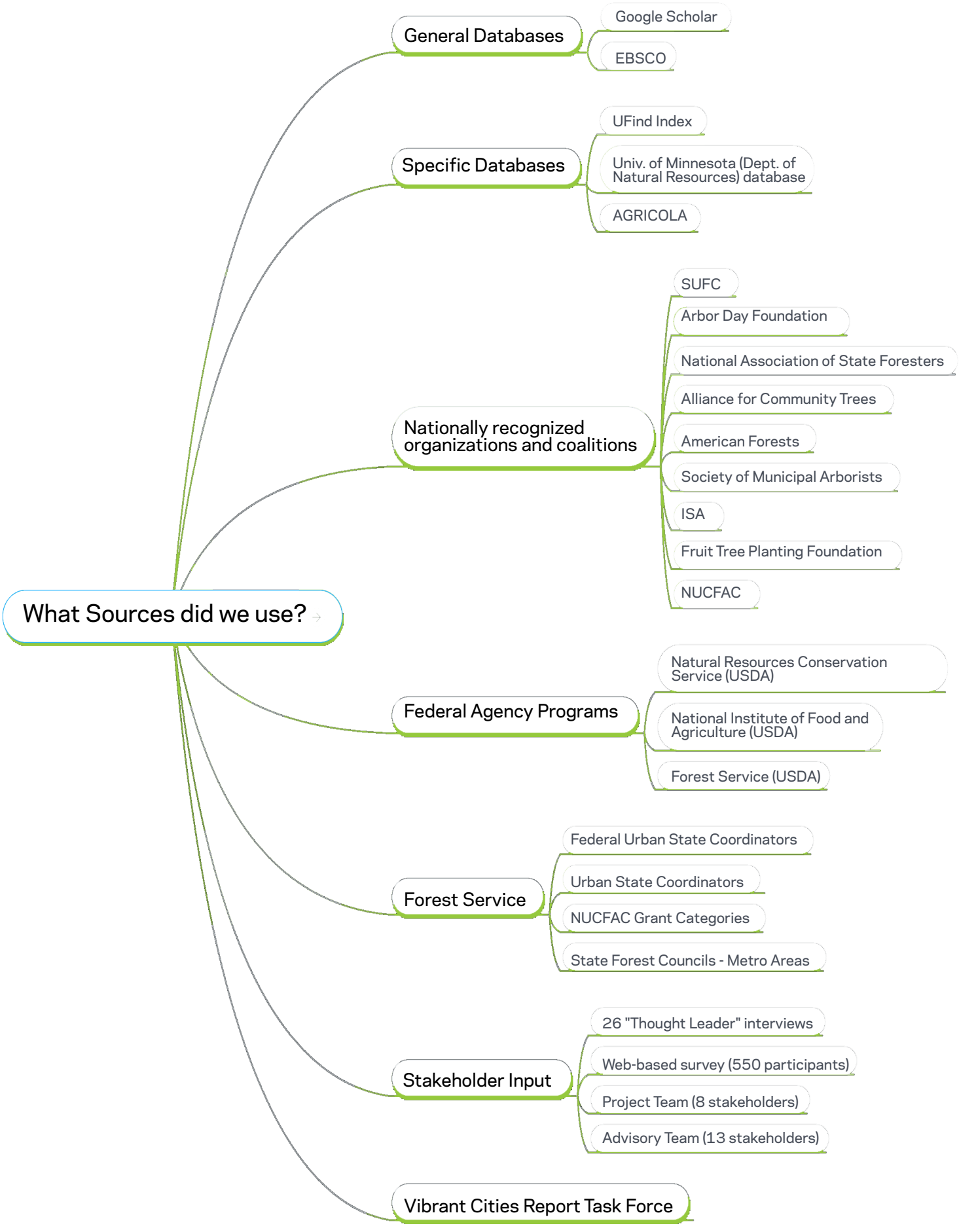
Readers will find both quantitative and qualitative assessment findings in three places:

1) Ten-Year Progress Overview (p 20);

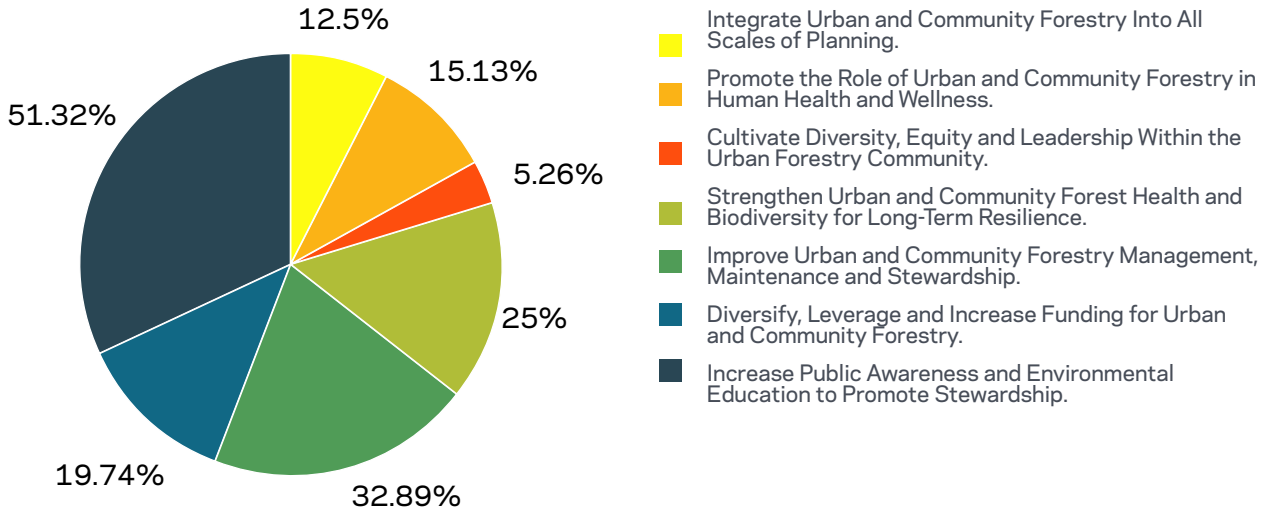
2) each Action Plan Goal section on "We've Done a Good Job" and "We Still Have a Lot to Do;"

3) Appendix 1, which offers the full spreadsheet of programs, activities, tools, and resources, as well as the analysis of the CARS data.

Caveat: While use of CARS was requested, a few Action Plan advisors raised concerns about the CARS data, noting that it relies on self-reporting by hundreds of professionals in the field. This self-reported data may not meet the robust standards of science because reporters may not be consistent in interpretation or quality of data. Nevertheless, the CARS data provides a valuable window into the progress, trends and gaps in urban and community forestry. Therefore, we ask the reader to consider the CARS data as rough indicators of general trends, not precise measurements.

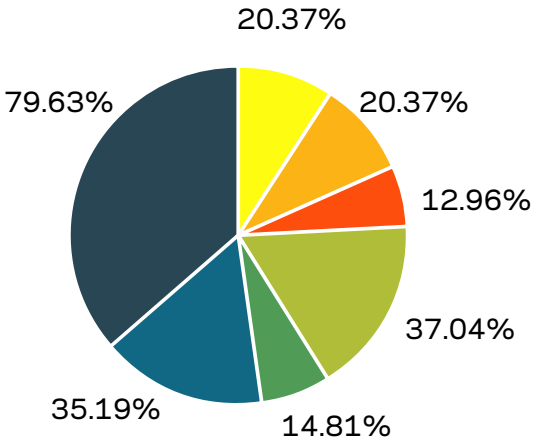

What Sources did we use?
General Databases
Google Scholar
EBSCO
Specific Databases
UFind Index
Univ. of Minnesota (Dept. of Natural Resources) database
AGRICOLA
Nationally recognized organizations and coalitions
SUFC
Arbor Day Foundation
National Association of State Foresters
Alliance for Community Trees
American Forests
Society of Municipal Arborists
ISA
Fruit Tree Planting Foundation
NUCFAC
Federal Agency Programs
Natural Resources Conservation Service (USDA)
National Institute of Food and Agriculture (USDA)
Forest Service (USDA)
Forest Service
Federal Urban State Coordinators
Urban State Coordinators
NUCFAC Grant Categories
State Forest Councils - Metro Areas
Stakeholder Input
26 "Thought Leader" interviews
Web-based survey (550 participants)
Project Team (8 stakeholders)
Advisory Team (13 stakeholders)
Vibrant Cities Report Task Force

Percentage of times Goals mentioned throughout the Assessment Process



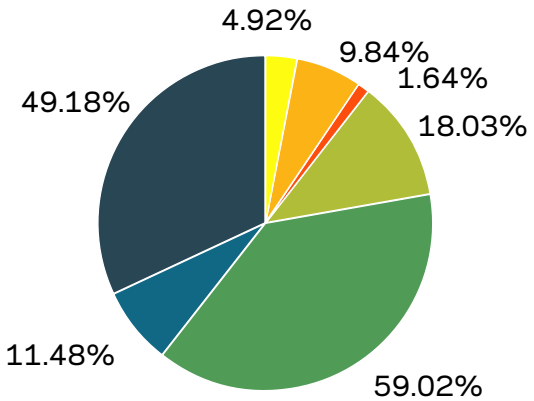
- Out of 152 tools, resources, programs and activities assessed, only 8 (5%) are related to Goal 3 - Cultivate Diversity, Equity, and Leadership within the UCF Community making Goal 3 the least mentioned.
- Goal 7 - Increase Public Awareness and Environmental Education to Promote Stewardship is the goal that is mentioned the most in the assessment with 78 programs, activities, tools and resources making reference to it.

Percentage of Times Goals Mentioned in Programs/Activities



- Goal 7 - Increase Public Awareness and Environmental Education to Promote Stewardship is mentioned in 43 of the 54 programs (80%) assessed in the inventory, making it the goal that is mentioned the most in the programs and activities category.
- Goal 3 - Cultivate Diversity, Equity, and Leadership within the UCF Community was mentioned only 7 times out of 54 programs (13%). This is the lowest prevalence for both tools and programs as compared to the other six goals in this Ten-Year Action Plan.

Percentage of Times Goals Mentioned in Tools/Resources



- Based on the assessment of existing resources and tools, there is a need for growth in tools, technologies, and programming related to improving human health and wellness through urban forestry. Out of 61 tools and resources assessed, only 6 tools (10 percent) mentioned human health and wellness.
- Goal 5 - Improve UCF Managements, Maintenance, and Stewardship is mentioned in 36 of the 61 programs (59%) assessed in the inventory, making it the goal that is mentioned the most in the tools and resources category.

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Programs

Name/title	Key Agency/Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Forest Preservation Strategy	Montgomery County, MD	Local ordinances/ legislation	Best local law example	No
New York Restoration Project	City of NY, MillionTreesNYC	Public park and public garden revitalization, tree planting	Large-scale, NYC example	Yes
TreesNY Stormwater Vegetative Control	Trees NY	Installing new tree beds with additional design elements to intercept, store, and evaporate stormwater before they have a chance to run into the storm sewer.	Best technology for stormwater mgmt	Yes
Greenscape Jacksonville	Greenscape of Jacksonville	Plant trees	Volunteer training	Yes
Shreveport Green	Shreveport Green	Offers a plethora of programs and information of which people can participate and get involved	Informative	No
National Association of State Foresters	National Association of State Foresters	Networking and educational tools	Building Professionalism in field	Yes
Adding Green to Urban Design	City of Chicago	Plan to guide development	Provides guidance to high-level decision makers on practical steps to add "green" to urban design	No
Million Trees NYC Contact	Public/Private Partnership between: ▪ City of New York Department of Parks and Recreation ▪ New York Restoration Project (non-profit)	7 subcommittees were established: * Tree planting * Education * Stewardship * Public policy * Research/evaluation * Marketing * Green jobs	▪ Integrated into the city's long term sustainability plan. ▪ Successful business plan that leveraged public and private resources.	Local
Greenprint	Sacramento Tree Foundation	Compiled technical advice from planners, engineers, arborists, landscape architects, and policy makers into a formal document "Guiding Principles and Best Strategies"; uses i-Tree; quantifying annual benefits and costs of trees and identifying most important tree management needs	Done in response to the regions "Blueprint"; result: urban tree canopy cover of 35% and tree benefits >$100 million/year; 26 of 28 cities and county governments in Sacramento area have signed on	No
Tree City USA designation and standards	Arbor Day Foundation	Four Core Standards to achieve Tree City USA status: 1. Maintaining a tree board/department 2. Having a community tree ordinance 3. Spending at least $2 million per capita on urban forestry 4. Celebrating Arbor Day	▪ Puts not just planting tress, but maintenance and celebration for trees at the forefront ▪ Has a search for which tree is best for your zip code	No

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is This Included? (Best Innovative, New Ideas)	Does it Offer Training Programs?
TreeKit	Treekit	Mapping block by block/ alive and dead trees	That it is so specific and block by block	Yes at the party they come for a few hours
CITY TREES Sustainability Guidelines and Best Practices	Tree Trust / Bonestroo	▪ Point system to assess credit compliance. ▪ Seven specific Criteria	Compilation of best practices	No
TreeKit: NYC Street Trees	Tree KIT			Yes for those that want to map a neighborhood

Research

Name / Tittle	Key Agency / Organization	Specific Technology Or Methodology Utilized	Why Is This Included? (Best, Innovative, New Ideas)	Does It Offers Training Programs?
Partners in Community Forestry 2013 Slides	Arbor Day Foundation	N/A	Presenter's slides are all included- provides info on a wide range of issues	No
Applications of Urban Tree Canopy Assessment and Prioritization Tools: Supporting Collaborative Decision Making to Achieve Urban Sustainability Goals	N/A			N/a

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is This Included? (Best Innovative, New Ideas)	Does it Offer Training Programs?
Chicago Wilderness Climate Action Plan	Chicago Wilderness		First regional analysis of complexities of nature conservation with changing climate	No
Forest Action Plans	National Association of State Foresters	Includes Forest Action Plan assessment, strategy, and executive summary for each state.	Detailed reports for every state, include strategies for implementation.	No
Alliance for Community Trees Guide and Workbook	NeighborWoods	Guideline outlining five steps centered on activities to explore community forests, create capacity for community action, projects for forest stewardship, environmental education and additional engagement.	Contains a specific range of projects suitable for a range of ages.	No

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

Programs

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
CityPlants	City of Los Angeles	Provides trees to neighborhoods and organizations in LA	Emphasis on low-canopy area, educating about cooling	Yes
Open Lands Project	Open Lands Project	Secure, protect, and provide public access to land	Regional scale conservation	No
Climate Action Plan for Nature	Chicago Wilderness	Carbon estimation, climate change adaptation info	Climate change plan	No
Forest Preservation Strategy	Montgomery County, MD	Local ordinances/legislation	Best local law example	No
Urban and Community Forestry- CalFire	State of California, Cal Fire	UF field specialists provide expert urban forestry support to communities, non-profit groups and other municipal governments to create and maintain sustainable urban forests.	Best- state support of UC	Yes
White House Council for Environmental Quality	U.S. Office of the President	Interagency working groups and coordination with agencies and other White House offices, CEQ works to advance the President's agenda. It also balances competing positions, and encourages government-wide coordination, bringing federal agencies, state and local governments, and others together on matters relating to the environment, natural resources and energy.	Presidential commitment to env. Quality	No
Shreveport Green	Shreveport Green	Offers a plethora of programs and information of which people can participate and get involved	Informative	No
Tree Folks	Tree Folks	Plant trees	Volunteer training program	Yes
Fruit Tree Planting Foundation	The Fruit Tree Planting Foundation	Donate orchards where the harvest will best serve communities	Donations	No
Keep America Beautiful	Keep America Beautiful	Recycling education	Funding for community beautification projects	Yes
Alliance for Community Trees Advocacy	Advocacy Alliance for Community Trees	Reports, promote for certain legislature initiatives	Advocacy - not too much going on there	Policy summit meeting

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is This Included? (Best Innovative, New Ideas)	Does it Offer Training Programs?
National Research Plan for Urban Forestry: 2005 - 2015	National Urban and Community Forestry Advisory Council	Establish six specific goals to guide the research, development and technology transfer in Urban and Community Forestry in the next 10 years.	It is part of the Current 10 Year Action Plan (by Kathy Wolf)	No
Forest Action Plans	National Association of State Foresters	Includes Forest Action Plan assessment, strategy, and executive summary for each state.	Detailed reports for every state, include strategies for implementation.	No

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is This Included? (Best Innovative, New Ideas)	Does it Offer Training Programs?
ICLEI's Urban Forestry Toolkit for Local Government: "Talking Trees" An Urban Forestry Toolkit for Local Governments"	CLEI - Local Governments for Sustainability (Association of cities & counties committed to climate action, clean energy, and sustainability)	7 Fact sheets ▪ 3 Case studies ▪ 1 Policy Guide for succesful programs. ▪ Tools for quantifying the impacts of Urban and Community Forestry. ▪ 1 Protocol	▪ It offers clear, useful & well organized technical information for local governments regarding benefits. ▪ Address 6 "Big themes"	No, but if offers an extensive list of Links and Resources
CITY TREES Sustainability Guidelines and Best Practices	Tree Trust / Bonestroo	▪ Point system to assess credit compliance. ▪ Seven specific Criteria	Compilation of best practices	No
"Smart Green Infrastructure"	TreePeople	Video about how to make an urban ecosystem	Transferrable and cheap	No
Portland State University Article: PSU study shows Portland's urban forest reduces air pollution but also finds hazards	Portland State University 's interdisciplinary Trees and Health Research Team	Model building		No
Georgia Tech: Built Environment/Public Health Clearinghouse	Georgia Institute of Technology's School of City and Regional Planning	Dashboards and data systems	Nexus of planning and public health	Yes
Urban Timberworks - Success Story Portland	Urban Timberworks		Furniture is healthy	No

Research

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Does it Offer Training Programs?
Health Benefits of Nature Experience: Psychological, Social and Cultural Process (Chapter 5)	Address the research in 3 stages: 1. What has been 2. Where we are now 3. Where we are going	Kathy Wolf's recommendation	No
Promoting human health through forests: overview and major challenges	Includes trends in Japan, Korea and world wide.	Kathy Wolf's recommendation	No
Coping with ADD: The Surprising Connection to Green Play Settings	Survey of parents		N/A
Bringing nature Home			N/A

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Programs

Name/title	Key Agency/Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
CityPlants	City of Los Angeles	Provides trees to neighborhoods and organizations in LA	Emphasis on low-canopy area, education about cooling	Yes
The Garden Project	The Garden Project	Job training programs. On-site, hands-on training	Social Justice. Job Training. Education.	Yes
Green Skills	Urban Resources Initiative-Yale School of Forestry	Job training programs. On-site, hands-on training	Social Justice. Job Training. Education.	Yes
Sustainable South Bronx	Sustainable South Bronx	Green collar workforce training	Faculty training	Yes
GreenRoutes	Delaware Dept. of Labor	Job training programs. On-site, hands-on training	Innovative- social justice and access, professionalism	Yes
Los Angeles Conservation Corps	Los Angeles Conservation Corps	Workforce development program	Innovative	Yes
Urban Forestry student recruitment and retention program	Southern University, A&M College Baton Rouge, LA	Training, recruitment, and internships	Unique	Yes

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is This Included? (Best Innovative, New Ideas)	Does it Offer Training Programs?
"Smart Green Infrastructure"	TreePeople	Video about how to make an urban ecosystem	Transferrable and cheap	No

Photo Credit: Kathleen Wolf

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Programs

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Climate Action Plan for Nature	Chicago Wilderness	Carbon estimation, climate change adaptation info	Climate change plan	No
Urban Strategies Initiative	Nature Conservancy	Whole-system conservation methods	Comprehensive	Yes
Trees Forever	Trees Forever	Advocacy, events, education	Innovative	Yes
Urban and Community Forestry- CalFire	State of California, Cal Fire	UF field specialists provide expert urban forestry support to communities, non-profit groups and other municipal governments to create and maintain sustainable urban forests.	Best- state support of UC	Yes
Baton Rouge Green	Baton Rouge Green	Volunteer hours to do community work. Ordinance adopted by City Council.	Strong education, advocacy, and collaborative work	Yes
West Atlanta Watershed Alliance	West Atlanta Watershed Alliance	Community building	Environmental Justice focus	Yes
Trees Atlanta	Trees Atlanta	Planting trees and educating volunteers	Volunteer training	Yes
Fruit Tree Planting Foundation	The Fruit Tree Planting Foundation	Donate orchards where the harvest will best serve communities	Donations	No
National Association of State Foresters	National Association of State Foresters	Networking and educational tools	Building Professionalism in field	Yes
The Earth Institute	Columbia University	Various research and educational methods	Innovative	Yes
HortScience, Inc.	HortScience, Inc	GIS, tree risk assessment	Example of consultant specializing in Urban and Community Forestry	No
Adding Green to Urban Design	City of Chicago	Plan to guide development	Guidance to high-level decision makers on practical steps to add "green" to urban design	No
Million Trees NYC	Public/Private Partnership between: ▪ City of New York Department of Parks and Recreation ▪ New York Restoration Project (nonprofit)	- 7 subcommittees were established: * Tree planting * Education * Stewardship * Public policy * Research/evaluation * Marketing * Green jobs	▪ Integrated into the city's long term sustainability plan. ▪ Successful business plan that leveraged public and private resources.	Local
Action Plan for Improved Urban Forestry Science Delivery	USDA Forest Service	* Assemble a national team of USDA Forest Service staff to collaborate. * Three specific actions sets: A. Streamline information flow and communications B. Modernize delivery methods C. Engage key stakeholders and delivery partners	Kathy Wolf's recommendation	No

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Programs Continued

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Greenprint	Sacramento Tree Foundation	Compiled technical advice from planners, engineers, arborists, landscape architects, and policy makers into a formal document "Guiding Principles and Best Strategies"; uses i-Tree; quantifying annual benefits and costs of trees and identifying most important tree management needs.	Done in response to the regions "Blueprint"; result: urban tree canopy cover of 35% and tree benefits >$100 million/year; 26 of 28 cities and county governments in Sacramento area have signed on	No
Illinois Forestry Assistance Programs:	State of Illinois	Increase awareness, create partnerships, implement natural resource management	Don't know much about the program (just a small paragraph)	Local tree planting and care and protection
Tree City USA Standards	Arbor Day Foundation	Four standards for Tree City recognition include the creation of a tree board or department, a tree care ordinance, a community forestry program with a minimum annual budget, and an arbor day observance.	Represents a significant tool and metric of success	No
Regional Trees Initiative	The Morton Arboretum	Findings from the Regional Tree Census and uses coalition of agency, industry, and community representatives	It is a regional protection program	No
Urban and Community Forestry	USDA U.S. Forest Service	Provides reports and manuals, an advisory council, and lists available grants		No
Agroforestry Riparian Buffer Program	The USFWS Partners for Fish and Wildlife Program		They have the potential to promote water resource protection along with economic development in rural communities	No

Research

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Trees and Development: A Technical Guide to Preservation of Trees During Land Development				N/A

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Tree City USA Bulletin Archive	Arbor Day Foundation	Guidelines	Guidelines	No
UFORHIC (Urban Forest Health Information Center)	USDA Forest Service, Davey Trees, CERIS-Purdue University		Allows aggregation and sharing of data from across political borders, and at various scales (local, regional, national); data can be extracted to create reports for policy making	No
i-Ped (Inventory Pest Evaluation, Description, and Reporting)	USDA Forest, collaborators	i-tree tool, PDF methodology is analyzing pests and identifying tree health	Very specific instructions on pest management	Instructions and Workshops
Urban Forest Project Reporting Protocol	USDA Forest Service	Working group of scientists and professionals.	Collaboration for tree health	Annual conference and hosted field trip
CITYgreen	American Forests	All CITY green releases analyze the following: Stormwater Runoff Air Pollution Removal Carbon Storage and Sequestration Land cover Breakdown Alternate Scenario Modeling	Useful tool	No

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Resources/Tools Continued

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Urban Forestry South Resource List	Urban Forestry South	Urban Forestry South focuses on technology and information that supports urban forest management, tree health, tree biology, and the measurement of ecosystem benefits derived from trees in urban settings.	Regional and includes disaster preparedness	Newsletter
SelecTree and Tree Browser	Utah State University Cooperative Extension and CalPoly San Luis Obispo	Help find the name of a tree or choose a tree with desired attributes; provides research, community and technical resources for learning about the importance of protecting healthy urban forests and incorporating urban wood into the marketplace	Easy to use for the community	No
Urban Forest Project Protocol	Climate Action Reserve	Very specific recommendations of what to measure and how to list a protocol	Large scale, comprehensive, and specific	No
CITY TREES Sustainability Guidelines and Best Practices	Tree Trust / Bonestroo	▪ Point system to assess credit compliance. ▪ Seven specific Criteria	Re compilation of best practices	No
Tree Space Regulations	Casey Trees	Information including a design manual, streetscape standards, and parking lot tree requirements	Smaller scale concepts that are useful	No
"Smart Green Infrastructure"	TreePeople	Video about how to make an urban ecosystem	Transferrable and cheap	No

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Vibrant Cities Report -	- Conceived by the USDA Forest Service and implemented by: - New York Restoration Project (non-profit) is the leader of the initiative. - Each recommendation has a Suggested Action Steps & a Rationale.	- Each recommendation has a Suggested Action Steps & a Rationale.	- A group of 25 peer-designated interdisciplinary experts was in charge of the report. - This experts were chosen within a group of 150 nominations.	No
Chicago Wilderness Climate Action Plan	Chicago Wilderness		First regional analysis of complexities of nature conservation with changing climate	
Forest Action Plans	National Association of State Foresters	Includes Forest Action Plan assessment, strategy, and executive summary for each state.	Detailed reports for every state, include strategies for implementation.	No
Alliance for Community Trees Guide and Workbook	NeighborWoods	Guideline outlining five steps centered on activities to explore community forests, create capacity for community action, projects for forest stewardship, environmental education and additional engagement.	Contains a specific range of projects suitable for a range of ages.	No
SUFC Policy Principles	SUFC	N/A	Principles show collaboration over a range of efforts, including resources, trees, and green spaces.	No
Chicago Climate Action Plan	Chicago Climate Task Force	Developed specific guidelines to reduce CO2 levels to 25% below the 1990 levels, by 2020.	Contains measurable benchmarks for a specific city	

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Programs

Name/Title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best, Innovative, New Ideas)	Does it Offer Training Programs?
Climate Action Plan for Nature	Chicago Wilderness	Carbon estimation, climate change adaptation info	Climate change plan	No
TreesNY Stormwater Vegetative Control	TreesNY	Installing new tree beds with additional design elements to intercept, store, and evaporate stormwater before they have a chance to run into the storm sewer	Best technology for stormwater mgmt.	Yes
Smart Trees Pacific	Smart Trees Pacific/ Friends of Hawaii's Urban Forest	LEED, forest mgmt. Plans, technical expertise, GIS tools	Hawaii	Yes
National Association of State Foresters	National Association of State Foresters	State Foresters Networking and educational tools	Building Professionalism in field	Yes
The Earth Institute	Columbia University	Various research and educational methods	Innovative	Yes
HortScience, Inc.	HortScience, Inc.	GIS, tree risk assessment	Example of consultant specializing in Urban and Community Forestry	No
Citizen Forester Program	Tree people	1. Organize a green team of volunteers 2. Assess, map, and record project site. 3. Design create a greening plan 4. Learn by attending workshops 5. Do/create the plan 6. Maintain/monitor the status.	It isn't unique but it invites people from universities and throughout the city	Yes
Urban and Community Forestry	USDA Forest Service	Provides reports and manuals, an advisory council, and lists available grants		No

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
National Research Plan for Urban Forestry: 2005 - 2015	National Urban and Community Forestry Advisory Council	Establish six specific goals to guide the research, development and technology transfer in Urban and Community Forestry in the next 10 years.	It is part of the Current 10 Year Action Plan (uploaded by Kathy Wolf)	No
Chicago Wilderness Climate Action Plan	Chicago Wilderness		First regional analysis of complexities of nature conservation with changing climate	

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Enviroatlas	EPA	GIS	Comprehensive mapping tool of ecosystem services	No
i-Tree Tool	- USDA Forest Service and numerous co-operators	Analysis Tools: i-Tree Eco, i-Tree Streets, i-Tree Hydro, i-Tree Vue, i-Tree Design, i-Tree Canopy. Utility Programs: i-Tree species, i-Tree pest detection modules, i-Tree Storm.	- Robust free tool that quantify environmental services of urban forests.	Yes workshops and videos and workbooks
Urban Tree Canopy Assessment	USDA Forest Service The University of Vermont	-Based on remotely sensed data (High-resolution satellite imagery). - It extracts information from high resolution satellite imagery and integrates it with GIS data sets.	It integrates into a community's existing GIS database.	PDF instructions
A Report on Washington, D.C.'s Existing and Possible Urban Tree Canopy	USDA Forest Service The University of Vermont	-Based on remotely sensed data (High-resolution satellite imagery). - It extracts information from high resolution satellite imagery and integrates it with GIS data sets.	It integrates into a community's existing GIS database.	No
ICLEI's Urban Forestry Toolkit for Local Government: "Talking Trees : An Urban Forestry Toolkit for Local Government"	CLEI - Local Governments for Sustainability (Association of cities & counties committed to climate action, clean energy, and sustainability)	▪ 7 Fact sheets ▪ 3 Case studies ▪ 1 Policy Guide for successful programs. ▪ Tools for quantifying the impacts of Urban and Community Forestry. ▪ 1 Protocol	▪ It offers clear, useful & well organized technical information for local governments regarding benefits. ▪ Address 6 "Big themes"	No, but if offers an extensive list of Links and Resources.
STEW-MAP Database and Online maps Database Online Map	USDA Forest Service Northeast Region Station, NYC Urban Field Station, in partnership with the Environmental Stewardship Project at UMD-College Park and UVM Spatial Analysis lab	Interactive map	It is being replicated in Chicago, Baltimore, and Seattle	No
Forests on the Edge	State and Private Forestry, Cooperative Forestry Staff of the USFS; sponsored by Resources Planning Act Assessment staff of USFS	Uses data prepared and analyzed by scientists across the country to increase public understanding of America's forests and create new tools for strategic planning	Identify areas across the country where private forest services such as timber, wildlife habitat and water quality might be affected by factors such as development, fire, insect pests, and diseases.	No
EnviroAtlas	▪ Collaborative project developed by EPA, in cooperation with: ▪US Geological Survey (USGS) ▪ U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) ▪ Forest Service ▪Landscape America	▪ Interactive Maps (Scale data for all states) ▪Browser (shows the relationship between ecosystems, their services and human health) ▪GIS and analysis tools	Collaborative Project from different organizations / Recommended by Kathy Wolf / User friendly	The tool has videos/FAQ that teach how to use it.
i-Ped (Inventory Pest Evaluation, Description, and Reporting)	USDA Forest, collaborators	i-tree tool, PDF methodology is analyzing pests and identifying tree health	Very specific instructions on pest management	PDF instructions and workshops
CITYgreen	American Forests	All CITYgreen releases analyze the following: Stormwater Runoff Air Pollution Removal Carbon Storage and Sequestration Land cover Breakdown Alternate Scenario Modeling	Useful Tool	No

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Resources/Tools Continued

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Urban Forestry South Resource List	Urban Forestry South	Urban Forestry South focuses on technology and information that supports urban forest management, tree health, tree biology, and the measurement of ecosystem benefits derived from trees in urban settings.	Regional and includes disaster preparedness	Newsletter
SelectTree and Tree Browser California Utah	Utah State University Cooperative Extension and CalPoly San Luis Obispo	Help find the name of a tree or choose a tree with desired attributes; provides research, community and technical resources for learning about the importance of protecting healthy urban forests and incorporating urban wood into the marketplace	Easy to use for the community	No
OpenTreeMap	Azavea	Open tree map cloud - online analysis, networking	One of the few examples of private developers (through a USDA grant), has a blog of examples of how its used, incorporates analysis and social media	webinars
Treekit	Treekit	Mapping block by block/alive and dead trees	That it is so specific and block by block	Yes at the party they come for a few hours
Urban Forest Project Protocol	Climate Action Reserve	Very specific recommendations of what to measure and how to list a protocol	Large scale, comprehensive, and specific	No
Urban Conservation Easements			Easements are typically thought of as a tool to protect rural/agricultural land	
Tree Space Regulations	Casey Trees	Information including a design manual, streetscape standards, and parking lot tree requirements	Smaller scale concepts that are useful	No
National Tree Benefit Calculator	Casey Trees and Davey Tree Expert Co.	i-tree tool	Economic benefits by location, tree type, and location	No
Urban Forest Management Plan Toolkit	California Urban Forests Council and Inland Urban Forest Council, CalFire	Engaging template website for entering a forest management plan	Unique, useful, and easy	Has a detailed description on how to use
SITES v2	Sustainable Sites Initiative	18 prerequisites, 48 total credits total 200 points. Four certification levels.	Considers not just the building itself, but the landscape around the building as a contributor to sustainability	Webinars
Urban Forest Data	USDA Forest Service: Northern Research Station	ArcGIS	Good source of data	No
vTree	Virginia Tech	Leaf identification, hub of information, university-based collection of UTF (it is a class)	University-based resource	It is a class
Tree$ense	Davey Resource Group	App.	Interesting to see the types of apps that are being used	No
Colorado Tree Finder	Colorado State Forest			
Tree Trails	Texas Forest Service			
Map my Property	Texas Forest Service	Easy to use map that people can make about their own land	Only of its kind, could be easily replicated	No

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Resources/Tools Continued

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
rePhoto	ImageQuest	You can also view the other projects. Interface is unlike the other digital resources.	Interface is unlike the other digital resources. Also the team helps people get started.	No
WalkScope	PlaceMatters	Interactive map	Interdisciplinary potential	No
Urban Forest Cloud	Tree Plotter and Canopy Planner tools, Plan-It Geo	Website/software that you pay for or pay for consultants	Interesting tools that you can pay for	No, consultants
Story Maps	Esri ArcGIS Online			
EcoSMART	USFS, CalFire, UC Davis			
Digital Coast	NOAA			
TreeKit: NYC Street Trees	Tree KIT			Yes for those that want to map a neighborhood
Forest Planner	EcoTrust			
Leafsnap	Columbia University, University of Maryland, Smithsonian Institution, Finding Species			

Research

Name/Title	Key Agency/ Organization	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Solutions for Sustainable Urban Forest Governance and Management	Based on Ostrom Design Principles	Kathy Wolf's recommendation	No
Integrating Human and Natural Systems in Community Psychology: An Ecological Model of Stewardship Behavior		Kathy Wolf's recommendation	No
Trees and Development: A Technical Guide to Preservation of Trees During Land Development			N/A
Using Geo spatial Tools to Assess Tree Canopy: Decision Support for Local Governments	Case study: Winchester VA		N/A

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Programs

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
CityPlants	City of Los Angeles	Provides trees to neighborhoods and organizations in LA	Emphasis on low-canopy area, education about cooling	Yes
PlaNYC	NYC	Sustainability and resiliency blueprint for NYC	Collaborates with agencies, organizations, and New Yorkers to make plans a reality	No
Climate Action Plan for Nature	Chicago Wilderness	Carbon estimation, climate change adaptation info	Climate change plan	No
Forest Preservation Strategy	Montgomery County, MD	Local ordinances/legislation	Best local law example	No
Urban Strategies Initiative	Nature Conservancy	Whole-system conservation methods	Comprehensive	Yes
Urban and Community Forestry-CalFire	State of California, Cal Fire	UF field specialists provide expert urban forestry support to communities, non-profit groups and other municipal governments to create and maintain sustainable urban forests.	Best- state support of Urban and Community Forestry	Yes
Smart Trees Pacific	Smart Trees Pacific/ Friends of Hawaii's Urban Forest	LEED, forest mgmt. Plans, technical expertise, GIS tools	Hawaii	Yes
Baton Rouge Green and Baton Rouge Tree Ordinance	Baton Rouge Green	Volunteer hours to do community work. Ordinance adopted by City Council.	Education, advocacy, and collaborative work	Yes
White House Council for Environmental Quality	U.S. Office of the President	Interagency working groups and coordination with agencies and other White House offices, CEQ works to advance the President's agenda. It also balances competing positions, and encourages government-wide coordination, bringing federal agencies, state and local governments, and others together on matters relating to the environment, natural resources and energy.	Presidential commitment to env. Quality	No
Shreveport Green	Shreveport Green	Offers a plethora of programs and information of which people can participate and get involved	Informative	No
Sustainable South Bronx	Sustainable South Bronx	Green collar workforce training	Faculty training	Yes
Keep America Beautiful	Keep America Beautiful	Recycling education	For community beautification projects	Yes
Million Trees NYC	Public/Private Partnership between: ▪ City of New York Department of Parks and Recreation ▪ New York Restoration Project (nonprofit)	7 subcommittees were established: * Tree planting * Education * Stewardship * Public policy * Research/evaluation * Marketing * Green jobs	▪ Integrated into the city's long term sustainability plan. ▪ Successful business plan that leveraged public and private resources.	Local

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Programs Continued

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Action Plan for Improved Urban Forestry Science Delivery	USDA Forest Service	* Assemble a national team of USDA Forest Service staff to collaborate. * Three specific actions sets: A. Streamline information flow and communications B. Modernize delivery methods C. Engage key stakeholders and delivery partners	Kathy Wolf's recommendation	No
Greenprint	Sacramento Tree Foundation	Compiled technical advice from planners, engineers, arborists, landscape architects, and policy makers into a formal document "Guiding Principles and Best Strategies"; uses i-Tree; quantifying annual benefits and costs of trees and identifying most Important tree management needs	Done in response to the regions "Blueprint"; result: urban tree canopy cover of 35% and tree benefits >$100 million/year; 26 of 28 cities and county governments in Sacramento area have signed on	No
Kresge Environment Program Foundation	Kresge Environment Program Foundation	Accelerating place-based innovation We support efforts that are anchored in cities and have a strong potential to serve as models for climate resilience.	Mentioned in interview; wonder if there should be a separate section for "funding opportunities"	No
Illinois Forestry Assistance Programs: Urban and Community Forestry Program	State of Illinois	Increase awareness, create partnerships, implement natural resource management		Local tree planting and care and protection
Tree City USA Standards	Arbor Day Foundation	Four standards for Tree City recognition include the creation of a tree board or department, a tree care ordinance, a community forestry program with a minimum annual budget, and an arbor day observance.	Represents a significant tool and metric of success	No
Urban and Community Forestry	USDA Forest Service	Provides reports and manuals, an advisory council, and lists available grants		No

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
STEW-MAP Database and Online maps Database Online Map	USDA Forest Service Northeast Region Station, NYC Urban Field Station, in partnership with the Environmental Stewardship Project at UMD-College Park and UVM Spatial Analysis lab	Interactive map	It is being replicated in Chicago, Baltimore, and Seattle	No
Urban Forest Project Protocol	Climate Action Reserve	Very specific recommendations of what to measure and how to list a protocol	Large scale, comprehensive, and specific	No
Urban Forestry for Public Works project	American Public Works Association with support from USDA Forest Service Urban and Community Forestry Program, NUCFAC	4 reports covering best management practices; an online presentation; and handouts	Collaboration between organizations, has budgeting and funding information	No
T.R.E.E.S.: Trans agency Resources for Environmental and Economic Sustainability	Tree People, The National Urban and Community Forestry Advisory Council	Demonstration project in LA and best management practices identified	The only demonstration project on the assessment and identified best management practices	No
"The Miracle On Elmer Avenue"	TreePeople	Video explaining flooding problems in a specific area for climate change	Transferrable and cheap	No
"Smart Green Infrastructure"	TreePeople	Video about how to make an urban ecosystem	Transferrable and cheap	No

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Resources/Tools Continued

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Georgia Tech: Built Environment/Public Health Clearinghouse	Georgia Institute of Technology's School of City and Regional Planning	Dashboards and data systems	Nexus of planning and public health	Yes
Nature Play & Learning	National Wild-life Federation/ Natural Learning Initiative/ North Carolina State University	Guidelines		No

Research

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
EUREKA! A Transformative Approach to Sustaining California's Urban Forests	California ReLEAF	Looks at specific funding strategies and their economic merit and attainability	Simple, easy to read source discussing a range of funding possibilities.	No
Urban Forestry Research Needs: A Participatory Assessment Process	N/A	Participatory Assessment Process (Delphi process).	Kathy Wolf's recommendation	No

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Sustainable Urban Forest Coalition Appropriations for FY14 (House of Representatives).	Sustainable Urban Forest Coalition Appropriations for FY14 (House of Representatives). Sustainable Urban Forest Coalition Recommendations are for three specific programs: * Urban and Community Forestry Program * USDA Forest Service Research & Development Account * USDA Forest Service Health Management Program Funding issues	Recommendations are for three specific programs: * Urban and Community Forestry Program * USDA Forest Service Research & Development Account * USDA Forest Service Health Management Program	Funding issues	No
Sustainable Urban Forest Coalition - Research & Development Platform	SUFC	N/A	It is a report from a Coalition of organizations	No

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Programs

Name/title	**Key Agency/ Organization**	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
CityPlants	City of Los Angeles	Provides trees to neighborhoods and organizations in LA	Emphasis on low-canopy area, education about cooling	Yes
Climate Action Plan for Nature	Chicago Wilderness	Carbon estimation, climate change adaptation info	Climate change plan	No
New York Restoration Project	City of NY, MillionTreesNYC	Public park and public garden revitalization, tree planting		Yes
Municipal Arborist Exchange Program	Society of Municipal Arborists	N/A	Innovative- provides trained arborists to communities without one. Share of knowledge.	Yes
Urban Strategies Initiative	Nature Conservancy	Whole-system conservation methods	Comprehensive	Yes
Municipal Forestry Institute	Society of Municipal Arborists	Professional development	Job training	Yes
Trees Forever	Trees Forever	Advocacy, events, education	Innovative	Yes
Urban and Community Forestry- CalFire	State of California, Cal Fire	UF field specialists provide expert urban forestry support to communities, non-profit groups and other municipal governments to create and maintain sustainable urban forests.	Best- state support of Urban and Community Forestry	Yes
The Garden Project	The Garden Project	Job training programs. On-site, hands-on training	Social Justice. Job Training. Education.	Yes
Smart Trees Pacific	Smart Trees Pacific/ Friends of Hawaii's Urban Forest	LEED, forest mgmt. Plans, technical expertise, GIS tools	Hawaii	Yes
Baton Rouge Green and Baton Rouge Tree Ordinance	Baton Rouge Green	Volunteer hours to do community work. Ordinance adopted by City Council.	Strong education, advocacy, and collaborative work	Yes
Green Skills	Urban Resources Initiative-Yale School of Forestry	Job training programs. On-site, hands-on training	Social Justice. Job Training. Education.	Yes
Pecan Trees- Richard Bland College	Richard Bland College	Tree planting and maintenance	Innovative- econ. Dev. And edible forestry	No
Trees Atlanta	Trees Atlanta	Planting trees and educating volunteers	Volunteer training	Yes
Children and Nature Network	Children and Nature Network	Connect children and families to nature	Educating children and families	Yes
Friends of Trees	Friends of Trees	Education, planting, training	Best- education, planting	Yes
Greenscape Jacksonville	Greenscape Jacksonville	Plant trees	Volunteer training	Yes
Shreveport Green	Shreveport Green	Offers a plethora of programs and information of which people can participate and get involved	Informative	No
Tree Folks	Tree Folks	Plant trees	Volunteer training program	Yes
Sustainable South Bronx	Sustainable South Bronx	Green collar workforce training	Faculty training	Yes

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Programs Continued

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Keep Indianapolis Beautiful	Keep Indianapolis Beautiful/Nonprofit	Support community improvement projects with volunteers	Volunteers receive instructions from trained staff	Yes
TreeTenders	Philadelphia Horticultural Society	Educational and volunteer training programs	Volunteer training program	Yes
GreenRoutes	Delaware Department of Labor	Job training programs. On-site, hands-on training	Innovative- social justice and access, professionalism	Yes
Free Student Membership-ISA	ISA		Access- building professionalism- education	Yes
Trees are Good	ISA	Various educational materials	Public education and awareness	Yes
National Association of State Foresters	National Association of State Foresters	Networking and educational tools	Building Professionalism in field	Yes
The Earth Institute	Columbia University	Various research and educational methods	Innovative	Yes
HortScience, Inc.	HortScience, Inc.	GIS, tree risk assessment	Example of consultant specializing in Urban and Community Forestry	No
Adding Green to Urban Design	City of Chicago	Plan to guide development	Provides guidance to high-level decision makers on practical steps to add "green" to urban design	No
Keep America Beautiful	Keep America Beautiful	Recycling education	Funding for community beautification projects	Yes
Los Angeles Conservation Corps	Los Angeles Conservation Corps	Workforce development program	Innovative	Yes
Million Trees NYC	Public/Private Partnership between: ▪ City of New York Department of Parks and Recreation ▪ New York Restoration Project (nonprofit)	- 7 subcommittees were established: * Tree planting * Education * Stewardship * Public policy * Research/evaluation * Marketing * Green jobs	▪ Integrated into the city's long term sustainability plan. ▪ Successful business plan that leveraged public and private resources.	Local
Action Plan for Improved Urban Forestry Science Delivery	USDA Forest Service	* Assemble a national team of USDA Forest Service staff to collaborate. * Three specific actions sets: A. Streamline information flow and communications B. Modernize delivery methods C. Engage key stakeholders and delivery partners	Kathy Wolf's recommendation	No
Urban Forestry student recruitment and retention program	Southern University, A&M College Baton Rouge, LA	Training, recruitment, and internships	Unique	Yes
Arborist Certification Program	International Society of Arborists	Handbooks, exams, credentialing code of ethics	Provides networks and standards	Exam books and code of ethics
Illinois Forestry Assistance Programs: Urban and Community Forestry Program	State of Illinois	Increase awareness, create partnerships, implement natural resource management		Local tree planting and care and protection
Citizen Forester Program	Tree people	1. Organize a green team of volunteers 2. Assess, map, and record project site. 3. Design - create a greening plan 4. Learn- by attending workshops 5. Do - create the plan 6. Maintain - monitor the status.	It isn't unique but it invites people from universities and throughout the city	Yes
Tree Board University	USDA Forest Service Urban and Community Forestry Assistance Program	Courses: TreeBoard for members on a community tree board.	Training for those who may not have a background in marketing, planning, and financials of urban tree forests.	Yes

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Programs Continued

Name/title	Key Agency/ Organization	Specific Technology or Methodology Utilized	Why is This Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Municipal Forestry Institute training program	Society of Municipal Arborists	There are eight online courses that take between 2 and 5 hours each.	Education	Yes
Tree City USA Standards	Arbor Day Foundation	Four standards for Tree City recognition include the creation of a tree board or department, a tree care ordinance, a community forestry program with a minimum annual budget, and an arbor day observance.	Represents a significant tool and metric of success	No
Regional Trees Initiative	The Morton Arboretum	Findings from the Regional Tree Census and uses coalitions of agency, industry, and community representatives	It is a regional protection program	No
Alliance for Community Trees Advocacy	Alliance for Community Trees	Reports, promote for certain legislature initiatives	Advocacy	Policy summit meeting
Urban and Community Forestry	USDA Forest Service	Provides reports and manuals, an advisory council, and lists available grants		No

Resources/Tools

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Guide to Forestry and Natural Resources Programs	Society of American Foresters		Comprehensive list of educational programs	No
Tree City USA Bulletin Archive	Arbor Day Foundation	Guidelines	Very specific resources	No
STEW-MAP Database and Online maps Database Map	USDA Forest Service Northeast Region Station, NYC Urban Field Station, in partnership with the Environmental Stewardship Project at UMD-College Park and UVM Spatial Analysis lab	Interactive map	It is being replicated in Chicago, Baltimore, and Seattle	No
Urban Forests Case Studies. American Forests	American Forests	Interviews and research	Compilation of good practices	No
Forests on the Edge	State and Private Forestry, Cooperative Forestry Staff of the USFS; sponsored by Resources Planning Act Assessment staff of USFS	Uses data prepared and analyzed by scientists across the country to increase public understanding of America's forests and create new tools for strategic planning	Identify areas across the country where private forest services such as timber, wildlife habitat and water quality might be affected by factors such as development, fire, insect pests, and diseases.	No
OpenTreeMap	Azavea	Open tree map cloud - online analysis, networking	One of the few examples of private developers (through a USDA grant), has a blog of examples of how it's used, incorporates analysis and social media	Webinars
Urban Natural Resources Institute Webcasts for Urban Forestry	FS Norther Research Station	Webcasts on an array of topics within urban tree forests	Very specific and unique	Yes
James Urban Blog	Green Infrastructure Blog	Blogs and videos of news, research, and case studies	Great case studies, very specific	No
Urban Forestry for Public Works project	American Public Works Association with support from USDA Forest Service Urban and Community Forestry Program, NUCFAC	4 reports covering best management practices; an online presentation; and handouts	Collaboration between organizations, has budgeting and funding information	No
Tree Space Regulations	Casey Trees	Information including a design manual, streetscape standards, and parking lot tree requirements	Smaller scale concepts that are useful	No

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Resources/Tools Continued

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Urban Tree Key	Urban Forest Ecosystems Institute Cal Poly, CalFire, Urban Ecos	Website/online survey	For community members	No
National Tree Benefit Calculator	Casey Trees and Davey Tree Expert Co.	i-tree tool	Economic benefits by location, tree type, and location	No
Benefits Calculator	Sacramento Tree Foundation	Based on information from the "Tree Guidelines for San Joaquin Valley Communities" The calculator assumes an average mix of small, medium, and large trees in the Sacramento region, as well as an average mix of public and private trees. For a more precise calculation of an individual tree's benefits based on species and location	"Challenge a friend" Social media/ catered to a younger population perhaps	No
Second Nature: Adapting LA's Landscape for Sustainable Living California Utah	Tree People	Design-based recommendations, pictures and goals	Great book that is local and could be very useful for local professionals	No
"Capture the Rain and Rebuild the Economy!"	Tree People	Video explaining the importance of urban trees	Transferrable and cheap	No
"The Miracle On Elmer Avenue"	Tree People	Video explaining flooding problems in a specific area for climate change	Transferrable and cheap	No
"Smart Green Infrastructure"	Tree People	Video about how to make an urban ecosystem	Transferrable and cheap	No
Envirothon Competition 2014 Theme on Urban Forestry	Envirothon	Includes learning objectives and key topics in the field of urban forestry	Inspires innovation in the field	Yes
Urban Natural Resources Institute	USDA Forest Service, Northern Research Station			
Georgia Tech: Built Environment/Public Health Clearinghouse	Georgia Institute of Technology's School of City and Regional Planning	Dashboards and data systems	Nexus of planning and public health	Yes
Nature Play & Learning	National Wild-life Federation/ Natural Learning Initiative/ North Carolina State University	Guidelines		No
Inter-Tribal Gathering Garden	Cully Park- City of Portland, OR	Video. Volunteers.	Involvement and consideration of Native American ecological relationship and practices.	No

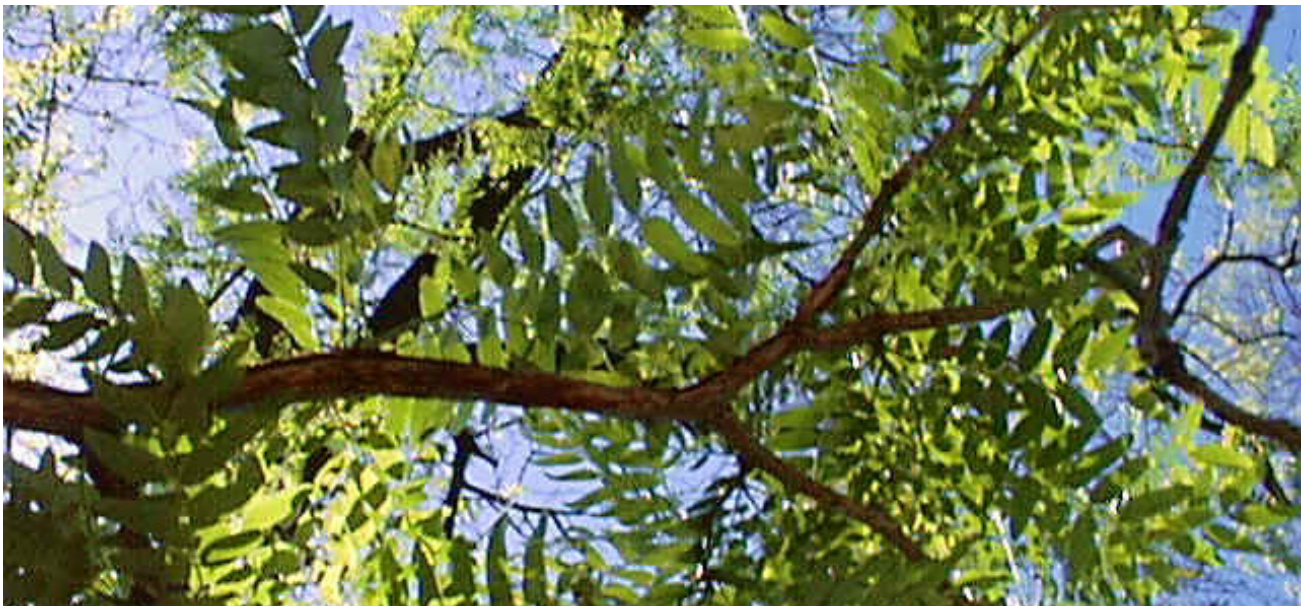
Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Research

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Sustaining America's Urban Trees and Forests	N/A	Answers 2 questions: * Where in the USA are UF providing the relative canopy cover and giving the greatest benefits? * Where is there potentially available space to increase tree canopy cover in urban areas?	Kathy Wolf's recommendation	It lists several tools and useful web links.

Strategic Planning Resources

Name/Title	Key Agency/ Organization	Specific Technology or Methodology	Why is this Included? (Best Innovation, New Ideas)	Does it Offer Training Programs?
Chicago Wilderness Climate Action Plan	Chicago Wilderness		First regional analysis of complexities of nature conservation with changing climate	
Forest Action Plans	National Association of State Foresters	Includes Forest Action Plan assessment, strategy, and executive summary for each state.	Detailed reports for every state, include strategies for implementation.	No
Alliance for Community Trees Guide and Workbook	NeighborWoods	Guideline outlining five steps centered on activities to explore community forests, create capacity for community action, projects for forest stewardship, environmental education and additional engagement.	Contains a specific range of projects suitable for a range of ages.	No
Guidelines for Developing and Evaluating Tree Ordinances	International Society of Arboriculture	Process for developing, revising, drafting, and evaluating tree ordinance	Comprehensive resource which includes a study of over 160 county and city tree ordinances	No



Urban and Community Forestry Progress Report 2005 to 2014

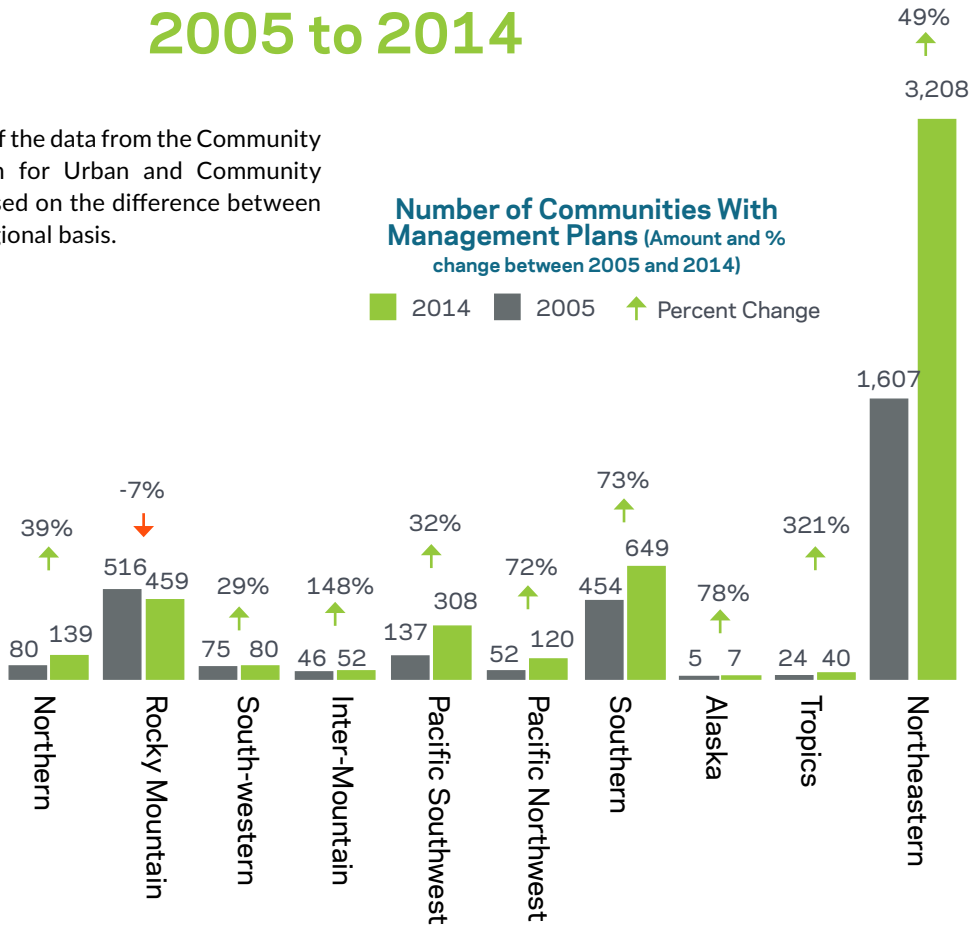
This report presents an analysis of the data from the Community Accomplishment Report System for Urban and Community Forestry (CARS). It was done based on the difference between the years 2005 and 2014 at a regional basis.

A. Quantitative Analysis

1. Number of communities with active urban & community tree and forest management plans developed from professionally-based resource assessments/ inventories.

Analysis:

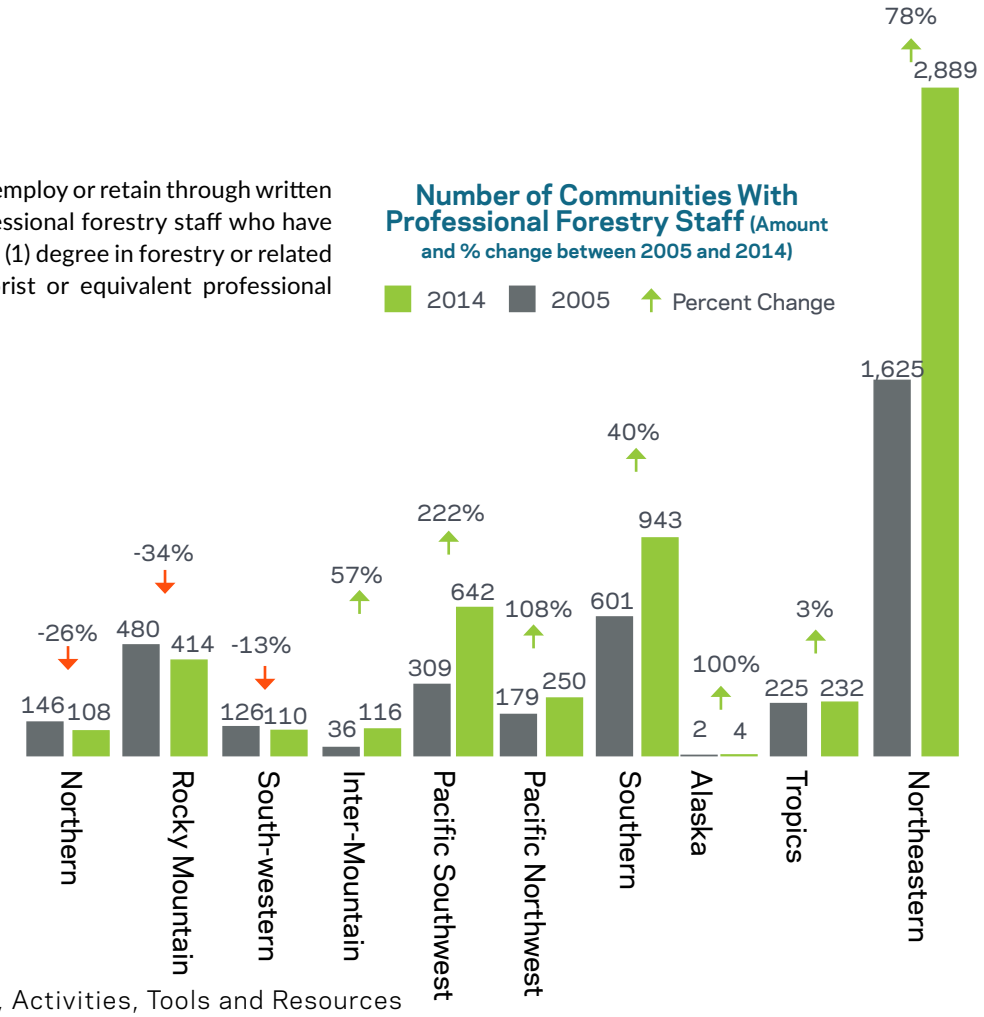
- Out of the 10 regions, 9 increased in their number of communities with management plans, only the Rocky Mountain Region didn't.
- The Pacific Northwest region had the highest increase with 131%.
- The total % of change since 2005 to 2014 for the whole Nation was 69%, which is a significant increase.



2. Number of communities that employ or retain through written agreement the services of professional forestry staff who have at least one of these credentials: (1) degree in forestry or related field and (2) ISA certified arborist or equivalent professional certification.

Analysis:

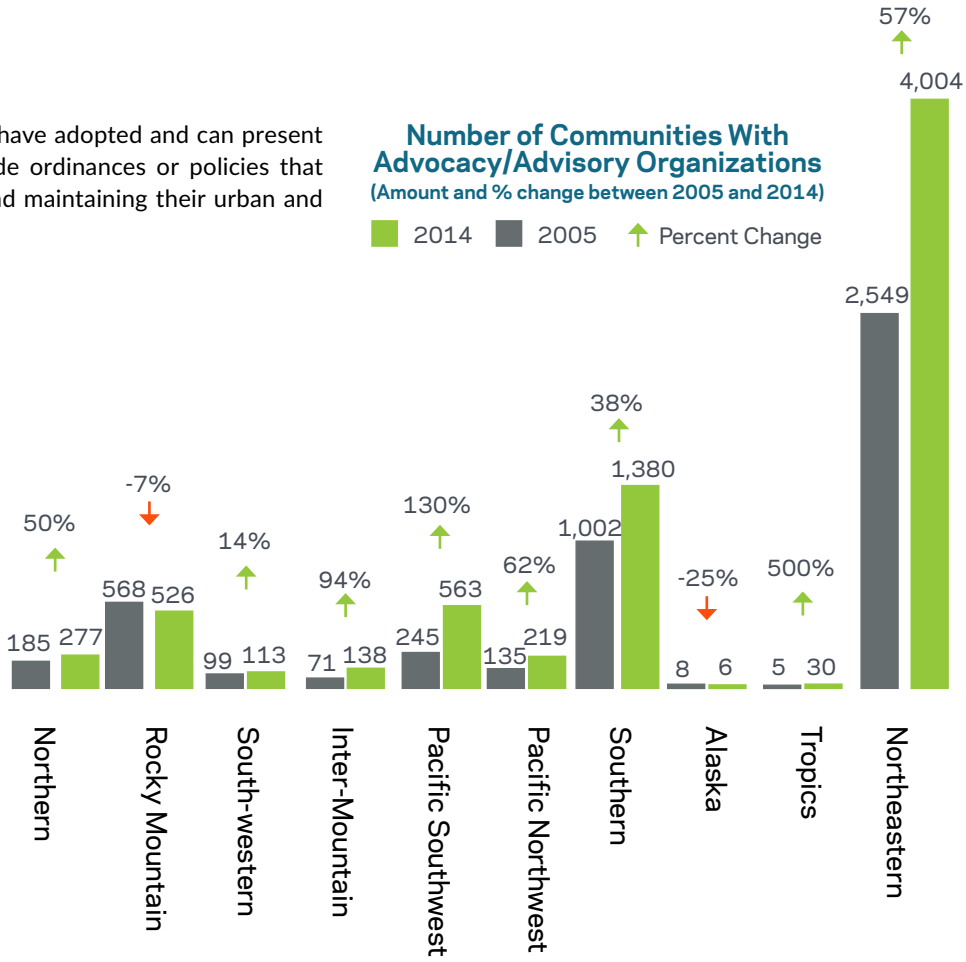
- Out of the 10 regions, 7 increased in their number of communities with professional forestry staff and 3 decreased.
- The intermountain region had the highest increase with 222%.
- The total % of change since 2005 to 2014 for the whole Nation was a 53%, which is a significant increase.



3. Number of communities that have adopted and can present documentation of local/statewide ordinances or policies that focus on planting, protecting, and maintaining their urban and community trees and forests.

Analysis:

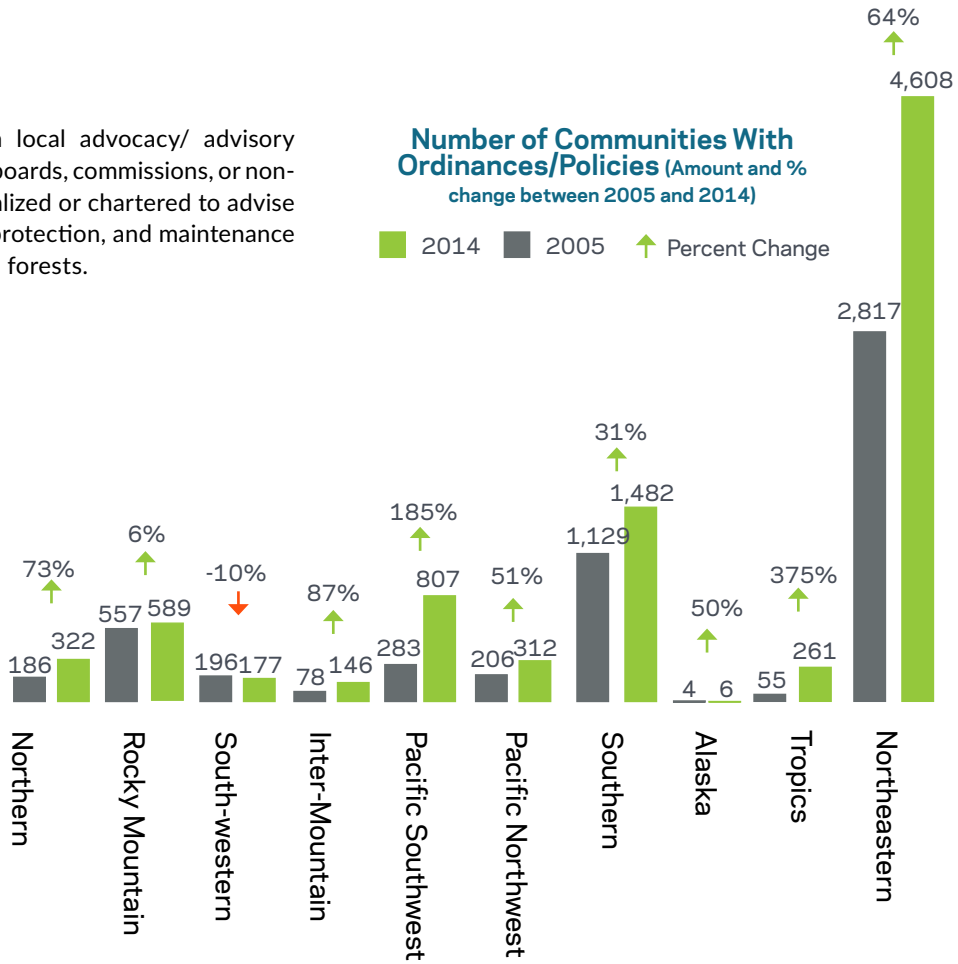
- Out of the 10 regions, 8 increased in their number of communities with advocacy and/or advisory organizations.
- The Tropics region had the highest increase with 500%.
- The total % of change since 2005 to 2014 for the whole U.S. was 49%.



4. Number of communities with local advocacy/ advisory organizations, such as, active tree boards, commissions, or non-profit organizations that are formalized or chartered to advise and/or promote for the planting, protection, and maintenance of urban and community trees and forests.

Analysis:

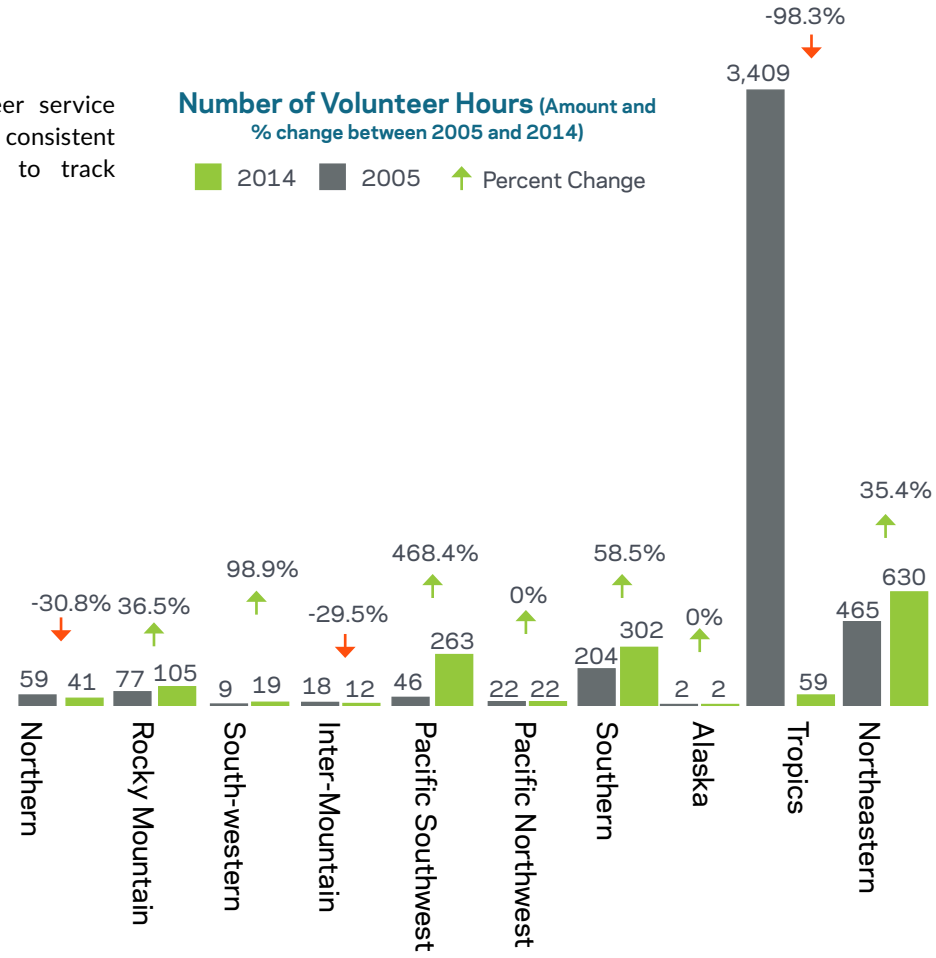
- Out of the 10 regions, 9 increased in their number of communities with management plans, only the Southwester Region didn't.
- The Tropics region had the highest increase with 375%.
- The total % of change since 2005 to 2014 for the whole U.S. was 58%, which is a significant increase.



5. Number of hours of volunteer service logged. (An agency-wide consistent methodology to be developed to track volunteer hours)

Analysis:

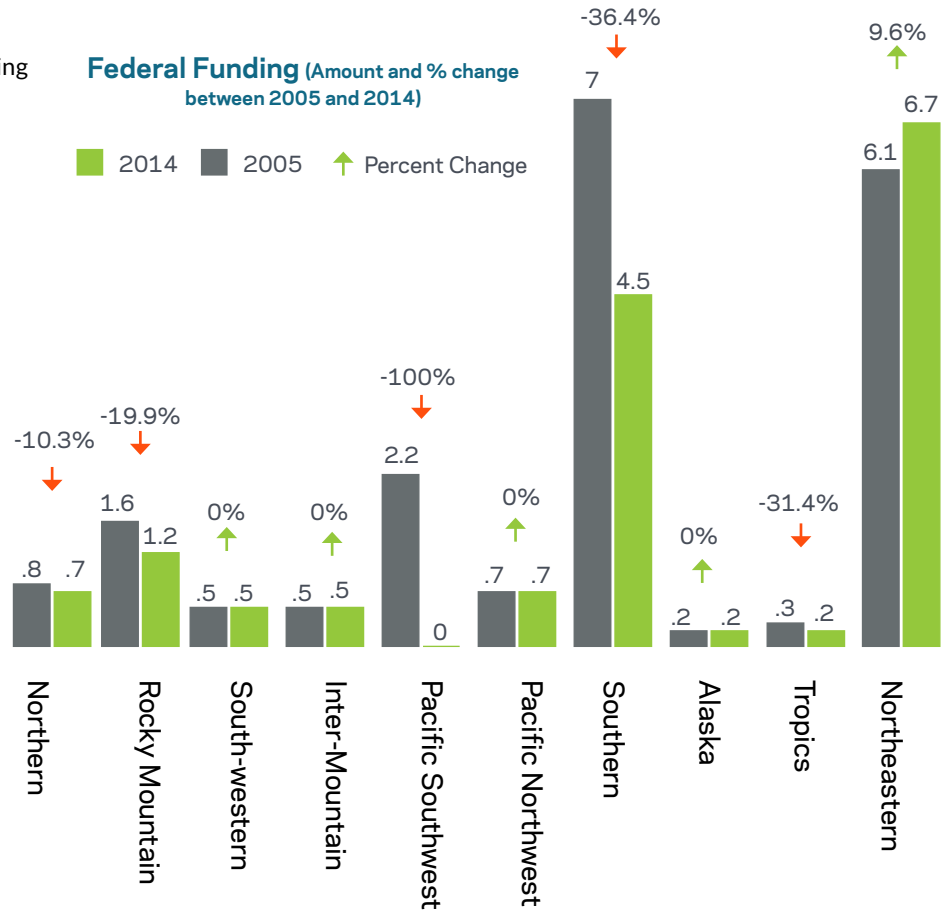
- Out of the 10 regions, 5 increased in the number of volunteer hours logged, stayed the same and 3 decreased. It is important to notice that the Tropics Region went through a dramatic decrease of almost -100%.
- The Pacific Southwest had the highest increase of 468%.
- The total % of change since 2005 to 2014 for the whole Nation was -66%.



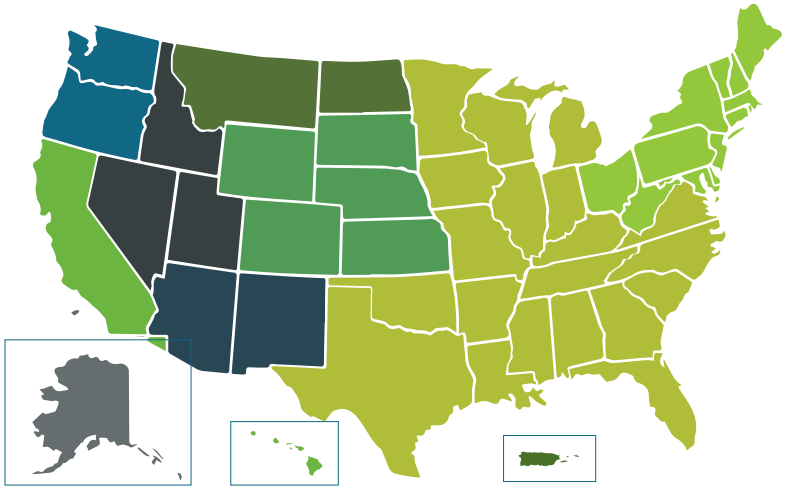
6. Amount of Federal (USFS) funding to States

Analysis:

- 8 out of the 10 regions suffered a decrease in federal funding, 1 had a 1% increase and the other one received the same amount of money.
- The Pacific Southwest had the highest decrease, obtaining no federal funding in 2014.
- The total % of change since 2005 to 2014 for the whole Nation was -24%.



USDA Forest Service Regions



- Northern
- Rocky Mountain
- South-western
- Intermountain
- Pacific Southwest*
- Pacific Northwest
- Southern
- Alaska
- Tropics**
- Northeastern

*Pacific Southwest also includes American Samoa, Guam, Northern Mariana Islands, Federated States of Micronesia, Marshall Islands, and Palau

**Tropics also includes U.S. Virgin Islands

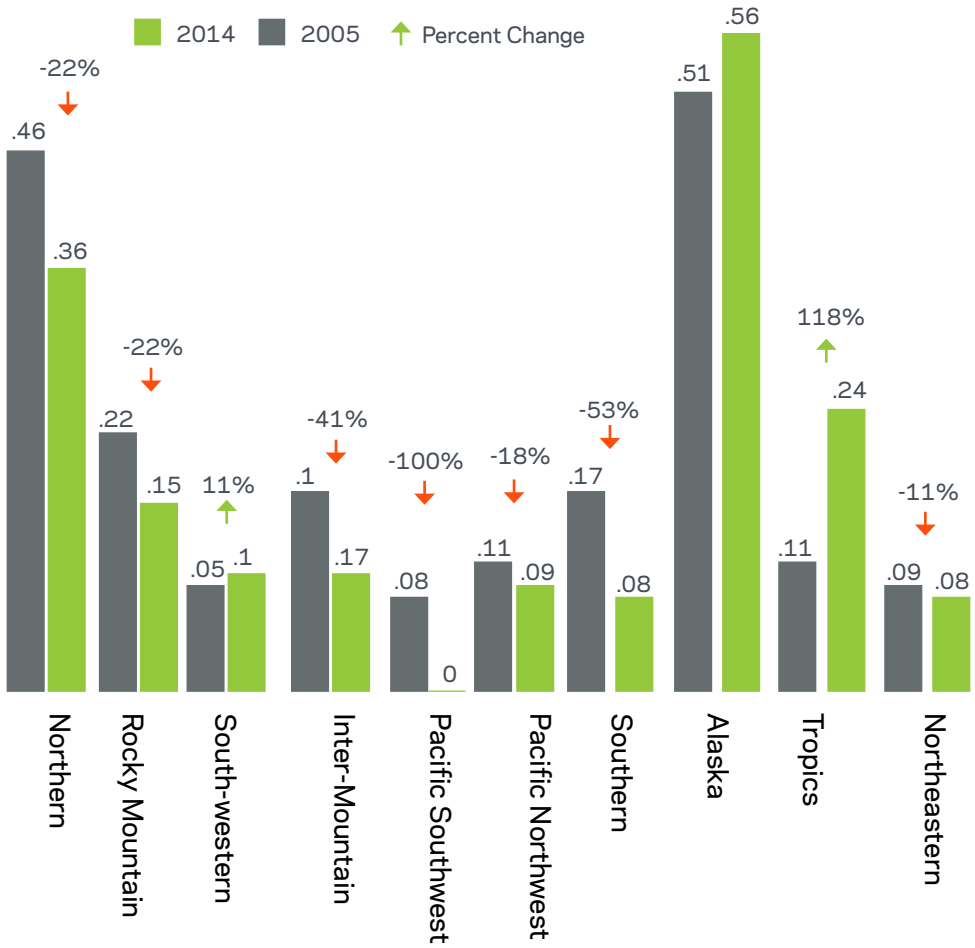
7. Federal (USFS) dollar cost or expenditure per capita in community assisted.

Analysis:

- 8 out of the 10 regions suffered a decrease in the cost per capita and 2 increased.
- The Tropics region had the highest increase, a total of 118%. The Pacific Northwest region had a -100% because they didn't received any funding.
- The total % of change since 2005 to 2014 for the whole Nation was -33%.

Federal (USFS) Dollar Cost Per Capita in Community Assisted

(Amount and % change between 2005 and 2014)



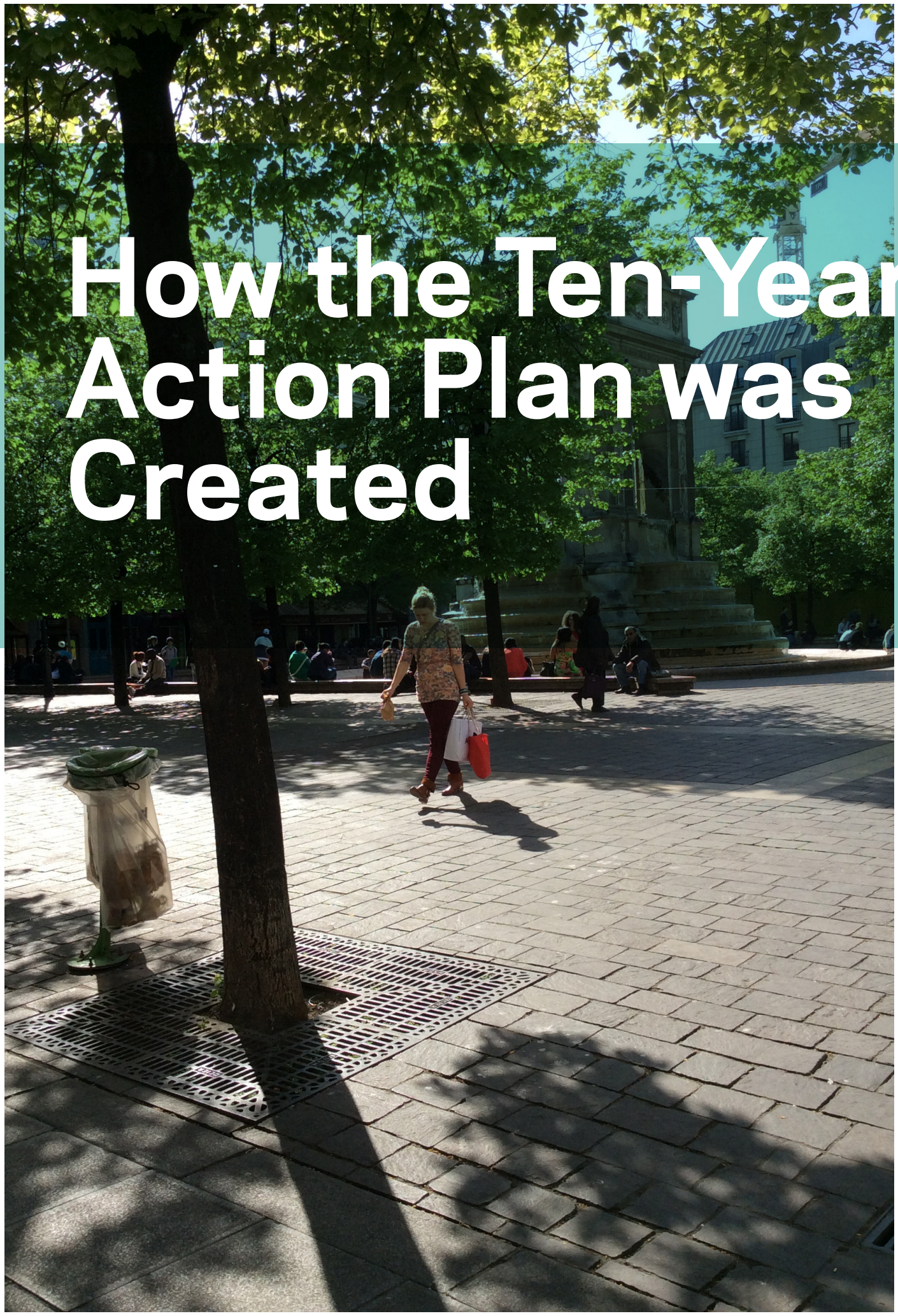


Photo credit: Kathleen Wolf

How the Ten-Year Action Plan was Created

Development of the 2016-2026 National Urban and Community Forestry Advisory Council (NUCFAC) Ten-Year Action Plan for the Urban Forestry Community

Project Overview

The purpose of this project was to review and assess the current state of urban and community forestry in the United States, and to develop a Ten-Year Action Plan with recommendations for improving the status of urban and community forestry. The Action Plan will provide goals and actions developed by and for the urban and community forestry. It is also intended to serve as a framework for funding priorities by the NUCFAC for the USDA Forest Service's National Urban and Community Forestry Challenge Cost Share Grant Program.

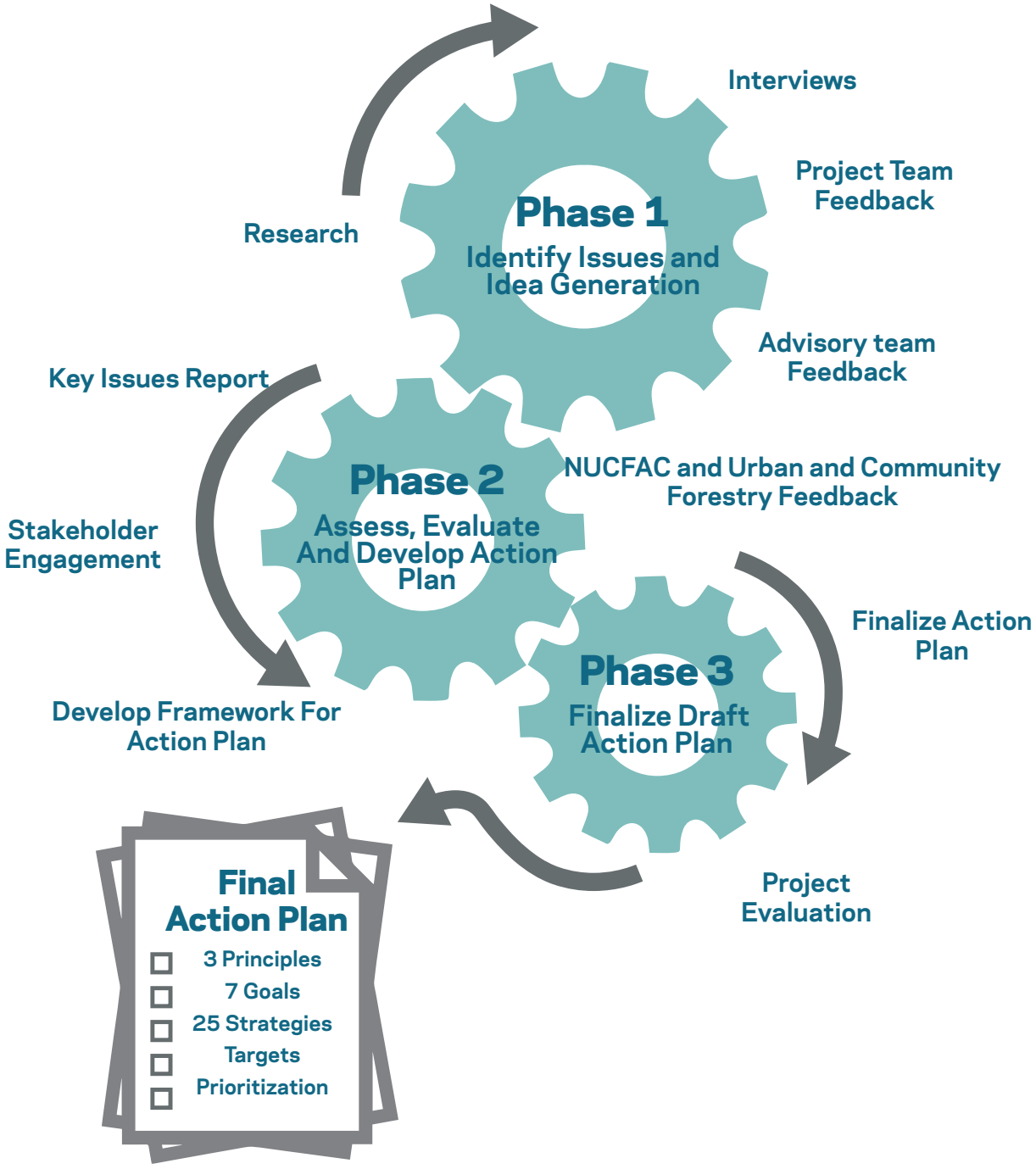
To accomplish this task, the Project Team reviewed trends and factors that influence urban and community forestry in the next 10 years, as well as strengths, opportunities, issues and challenges. It also reviewed the current status of urban and community forestry programs, activities, resources, and scientific research. Contributing to this assessment were key informant stakeholder interviews, guidance from the Strategic Advisory Team (see below), and diverse methods of engaging the urban and community forestry community of practice. The project team (see below) synthesized all of these inputs to identify specific urban and community forestry needs and gaps and develop the Ten-Year Action Plan. These draft goals and actions were vetted through community engagement as well as guidance from the Strategic Advisory Team, and were refined into the final Ten-Year Action Plan.

Highlights of the Action Planning Process

- Multidisciplinary Project Team: facilitation; community engagement; forestry; social psychology; planning; economics and finances; research.
- National Strategic Advisory Team: represents key stakeholder groups in community of practice.
- Big Picture Key Issues report: trends and factors influencing urban and community forestry in the next 10 years, strengths and opportunities, issues and challenges.
- Inventory Nuts and Bolts Assessment: programs and activities, resources, and scientific research.
- Community Engagement: a mix of key stakeholder interviews, workshops at key conferences, and online engagement using new technologies, to develop and refine recommendations for the next ten years.
- Vision, Goals, Strategies and Implementation Targets: finalization of urban and community forestry ten-year priorities for the urban forestry community.
- Funding Needs: analysis of funding trends of needs to ensure urban forestry community has the resources needed to keep pace with growth and to implement its ten-year priorities.
- Research Needs: review of research trends and needs resulting in identification of guiding principles and research needs for the next ten years.
- Final Action Plan: integrates the assessment of the last ten years, with needs for the next ten years, to create a cohesive story for each Goal.
- Final Report: includes two sections – a profile of urban and community forestry in the United States, and the Ten-Year Action Plan.
- Evaluation: an online survey of all participants in the process.

Photo credit: Guy Kramer

Creation of the Ten-Year Action Plan



Acknowledgments

We give special thanks for the assistance and support provided by the following individuals, whose generous time, thought, and experience shaped this Action Plan.

Project Team: For ongoing guidance and Action Plan development

- Kathy McGlauflin, American Forests Foundation, project oversight and contract management, expertise in Urban and Community Forestry education programs
- Tanya Denckla Cobb, University of Virginia Institute for Environmental Negotiation (IEN), project direction and lead, facilitation and community engagement
- Christine Muehlman Gyovai, Dialogue + Design Associates, senior project management, facilitation and community engagement
- Tatiana Marquez, IEN Project Manager
- Abigail Sandberg, IEN, document and graphic design
- IEN staff, Eiline Cai, Elise Cruz, Katie Gronsky, Jason Knickmeyer, Elizabeth Moore, Ross Weaver, and Shujing Zhang
- Nancy Stremple, National Urban Forestry Specialist, USDA Forest Service: project guidance
- Kathleen Wolf, Ph.D., University of Washington, expertise in socio-ecological research
- Jennifer Cotting, University of Maryland Environmental Finance Center, finance and costing
- Eric Reed, University of Maryland Environmental Finance Center, finance and costing
- Mark White, Ph.D., University of Virginia McIntire School of Economics, economic finance and costing

Action Plan Research Needs

- Kathleen Wolf, Ph.D., University of Washington

Action Plan Funding Needs

- Jennifer Cotting, University of Maryland Environmental Finance Center, finance and costing.
- Eric Reed, University of Maryland Environmental Finance Center, finance and costing
- Mark White, Ph.D., University of Virginia McIntire School of Economics, economic finance and costing.

Photo credit: Frank Dukes

Photo credit: Kristina Brezanso

Advisory Team

- Federal Interests: Ed Macie, USDA Forest Service Urban Forestry Coordinator
- State Interests: Nick Kuhn, Missouri State Urban Forestry Coordinator
- Municipal Interests: Angel Spell, City of Spokane
- Broad Community of Practice Interests, and NUCFAC liaison: Greg Ina, Davey Resources Group, and Liam Kavanagh, City Parks Alliance
- Professional Association and Nonprofit Interests: Jennifer Judd Hinrichs, Convener: Sustainable Urban Forests Coalition
- Grassroots Community-Level Interests: Carrie Gallagher, Director, Alliance for Community Trees (first half of the project), Sarah Anderson, Program Director, Alliance for Community Trees (second half of project)
- Scientific Community Interests: Lynne Westphal, Research Social Scientist, Northern Research Station, USDA Forest Service and Beth Larry, National Program Lead, Urban Research, USDA Forest Service
- Project Team: Kathy McGlauflin, Tanya Denckla Cobb, Christine Muehlman Gyovai, Nancy Stremple

National Urban and Community Forestry Advisory Council

- Liam Kavanagh, Executive Board Member, City Parks Alliance
- Claire Robinson, Metropolitan Greenspace Alliance—Amigos de los Rios
- Paul Revell, Urban and Community Forestry Coordinator, Virginia Department of Forestry
- Sara Davis, Program Manager, Office of the City Forester, City and County of Denver
- Lisa Ortega, City Urban Forester, Henderson
- Walt Warriner, Walter Warriner Consulting Arborist
- Rosaria Lecaroz, Professor, University of Puerto Rico/President CAFUCOPR
- Kamran Abdollahi, Ph.D., Urban Forestry Program Leader and Graduate Director, Southern University and A&M, LA
- Steve Goetz, President, The Pacific Resources Group
- William Hubbard, Ph.D., Regional Forester—Cooperative Extension Service, US Southern Region
- Patti Hirami, Associate Deputy Chief, State and Private, USDA Forest Service
- Robert Ruano, President, Ecostrata Services, Inc.
- Lance Davisson, Owner/Consultant, Keystone Concept, LLC
- Greg Ina, General Manager, The Davey Institute, The Davey Tree Expert Company
- Dr. Scott Josiah, State Forester and Director, Nebraska Forest Service, University of Nebraska-Lincoln

USDA Forest Service

- Steve Koehn, Director, Cooperative Forestry
- Jan Davis, National Program Leader, Urban and Community Forestry Program
- Nancy Stremple, National Urban Forestry Specialist
- Beattra Wilson, Urban Forestry Program Staff
- Mike Amacher, Urban Forestry Program Staff
- Alice Ewen, Urban Forestry Program Staff
- Lauren Marshall, Urban Forestry Program Staff
- Beth Larry, National Lead, Urban Research

NUCFAC Ten-Year Action Plan Sub-Team

- Liam Kavanagh, Executive Board Member, City Parks Alliance, Team Lead
- Stephen Goetz, President, The Pacific Resources Group
- Lance Davisson, Owner/Consultant, The Keystone Concept
- Claire Robinson, Metropolitan Greenspace Alliance—Amigos de los Rios
- Nancy Stremple, National Urban Forestry Specialist
- Lisa Ortega, City Urban Forester, Henderson
- Robert Ruano, President, Ecostrata Services, Inc.

Interviews

The team conducted a series of personal interviews with 26 key thought leaders who represented diverse sectors, regions and interests. These interviews proved to be the most productive and useful line of inquiry, as they offered nuanced and diverse insights and a rich trove of ideas for the Action Plan. As a whole, there is much hope for the future in the field of urban and community forestry. The thought leaders who were interviewed expressed a wide range of ideas, fears, excitement, challenges, possibilities for collaboration, and hopes that urban and community forestry will be a strong pillar for healthy, strong, and vibrant futures in communities across America.

The 26 key thought leaders who were interviewed were all asked the same set of questions, which prompted them to share ideas and feedback about the most significant areas of progress that Urban and Community Forestry has made in the last decade; the top opportunities, challenges, gaps and needs facing Urban and Community Forestry in the next ten years; hopes for the next Ten-Year Urban Forestry Action Plan; ideas for how to engage underserved communities and others; and specific action ideas for the next Action Plan. The full interview findings may be found on page 199 in the Key Issues Report section.

Interview Questions

1. What is your history with, or how do you work with urban and community forestry?

2. What are two or three things in which significant progress has been made in the last 10 years (programs/activities, tools/resources and research)?

3. What are the most important factors influencing the urban and community forestry field in the next 10 years?

4. What are the most important opportunities for the urban and community forestry field in the next ten years?

5. What are the most important challenges and issues for the urban and community forestry field in the next ten years (especially around how to engage underserved communities)?

6. What are the most important gaps and needs for the urban and community forestry field in the next ten years?

7. What are your greatest hopes for this 10 Year Action Plan?

8. What ideas do you have for how the community of practice could achieve these hopes and/or address the challenges? Are there specific goals and /or actions that you think are essential in the next 10 years?

9. Is there anyone else who should be consulted in this effort, who we should make sure to include in the community engagement part of the process (they could be invited to a conference, a webinar, a survey, or other methods)?

10. What suggestions do you have for our community engagement around how to best engage all the different stakeholder communities in contributing to the next Ten Year Action Plan? (Ideas for reaching and engaging “underserved communities”)

11. Is there any other information or feedback about Urban and Community Forestry that you would like to share with us?

12. Would you please send us links or PDFs of key summary, overview, or other important documents, surveys, conference reports, research – that you think could inform the next Action Plan?

Additional Potential Questions

a. What are the most important elements of the current Ten Year Action Plan?

b. What are the limitations of the current Action Plan?

c. What are your hopes for the next Ten Year Action Plan

Funding Issues and Trends

a. How could USDA Forest Service funding become more effective?

b. Are there any nontraditional sources for Urban and Community Forestry funding that are being used?

c. What are the most important trends in funding for Urban and Community Forestry? (i.e., are certain areas of research or activity being funded more than others?)

Interviewees

Last Name	First Name	Title	Organization	Geography	Sector (Civic, Public or Private)
Buscaino	Mark	Executive Director	Casey Trees	Washington, DC	Nonprofit
Cline	Keith	Director- Urban Forestry Division	DPW and Environmental Services, Fairfax, Virginia	South	Government-Local
Cole	Preston	Director of Operations	Milwaukee Department of Public Works	Midwest	Government-Local
Crumrine	Danielle	Executive Director	Tree Pittsburgh	Eastern (East Coast)	Nonprofit
Davis	Sara	Program Manager	Office of the City Forester - City and County of Denver	Inter-Mountain West	Government-Local
Gallagher	Carrie	Executive Director	Alliance for Community Trees	Washington, DC	Nonprofit
Gonzalez	George	Chief Forester	City of Los Angeles	Eastern (East Coast)	Government-Local
Ina	Greg	General Manager	Davey Trees	Eastern (Midwest)	Private
Ina	Greg	General Manager	Davey Trees	Eastern (Midwest)	Private
Kruidenier	Bill	Former NUCFAC chair and President of ISA. Professor	U. of Illinois-Natural Resources and Env. Sciences	Eastern (Midwest)	Academia
Kuhn	Nick	Community Forestry Coordinator	Missouri Dept of Conservation	Eastern (Midwest)	Government-State
LaHaie	Jerri	Executive Director	Society of Municipal Arborists	South	Nonprofit
Lambe	Daniel	Vice President, Programs	Arbor Day Foundation	Midwest	Nonprofit
Lipkis	Andy	Founder and President	Tree People	Pacific Southwest	Nonprofit
Macie	Ed	Regional Coordinator; Urban Forestry Group Leader	USFS, Southern Research Station	South	Government-Federal
Ortega	Lisa	Urban Forester	City of Henderson, Nevada	Inter-Mountain West	Government-Local
Rains	Michael	Director, Northern Research Station	USFS	Eastern (East Coast)	Government-Federal
Ramsay	Shannon	Founding President and CEO	Trees Forever, Iowa	Eastern (Midwest)	Nonprofit
Ries	Paul	Director, Graduate Certificate in Urban Forestry	Oregon State Dpt. of Forest Ecosystems and Society	Pacific Northwest	Academia
Shukur	Kemba	Executive Director	Oakland Releaf	Pacific Southwest	Nonprofit
Shurtz	Steve	City Forester	"Baton Rouge, Louisiana"	South	Government-Local
Silvestri	Nikki	Executive Director	Green For All, Oakland	Pacific Southwest	Nonprofit
Skiera	Jim	President	ISA	Midwest	Nonprofit
Tallamy	Doug	Professor & Chair of Entomology and Wildlife Ecology	University of Delaware	Eastern (East Coast)	Academia
Trethaway	Ray	Executive Director	Sacramento Tree Foundation, CA	Pacific Southwest	Nonprofit
Trueman-Madriaga	Theresa	Executive Director	Smart Trees Pacific	Territories - West	Nonprofit
Westphal	Lynne	Project Leader/ Research Social Scientist	USFS Northern Research Station	Eastern (Midwest)	Government-Federal

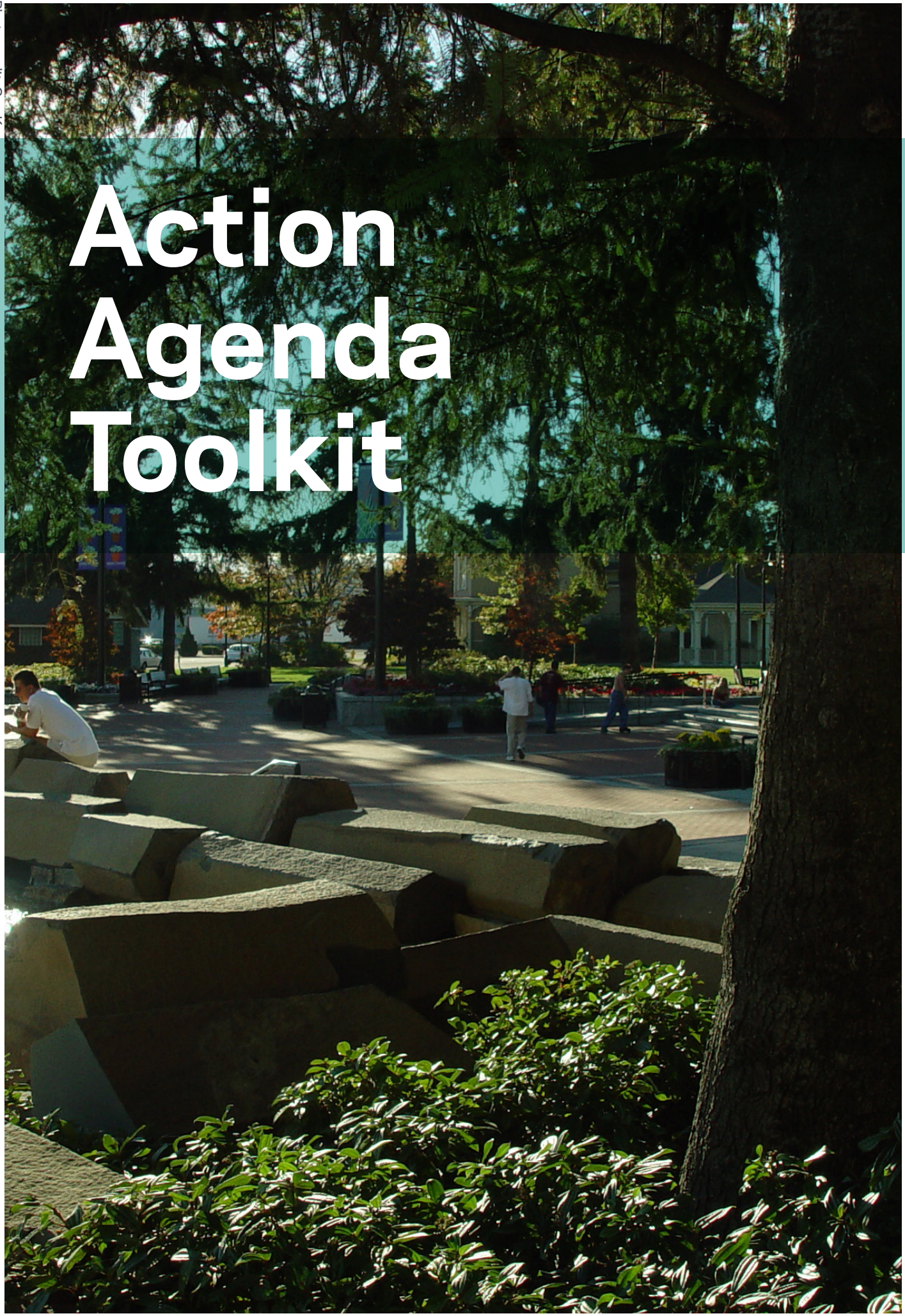


Photo credit: Guy Kramer

Action Agenda Toolkit

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Strategy A

Support inclusion of trees and forests as elements of all community comprehensive and master planning efforts.

Action 1

Create measurable targets for optimal urban forest health, site preparation, and BMPs, such as the SITES certification, to be an integral part of a city's planning process. Possible methods include:

Implementation Toolkit

- Support zoning requirements for green space that encourage maintaining and expanding tree canopy.
- Recognize and encourage individuals, sites and communities that achieve a high level of urban forest inclusion and preservation through efforts such as the SITES certification (a product of the Sustainable Sites Initiative).
- Develop a minimum canopy cover standard and criteria for new site development or retrofits (at the local or regional scale).
- Use current technologies to benchmark ecosystem services, and then plan and manage urban forests to maintain that given level of services (around land use change and urbanization).

Action 2

Train existing foresters to become part of the decision-making process at the local level. Possible methods include:

Implementation Toolkit

- Facilitate "floating" urban forester positions that can be available to localities that do not have urban foresters on staff (as well as for public relations and urban forestry- awareness staffing needs).
- Include urban foresters on "green teams," involved in planning teams and reporting their work as indicators of progress towards sustainability goals (i.e. stormwater capture, green house gas reduction, etc.).
- Develop and promote trainings in planning for traditional and urban foresters, to foster their participation in community and regional planning processes.
- Conversely, develop training opportunities in urban forestry for planners, through APA chapters, for communities that don't have urban foresters.

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Strategy A

Support inclusion of trees and forests as elements of all community comprehensive and master planning efforts.

Action 3

Champion inclusion of trees in all community comprehensive or master plans, and develop benchmarking for sustainability goals. Possible methods include:

Implementation Toolkit

- Develop urban forest programs as part of a community's public works office.

Action 4

Support urban forestry development and planning that reflects available and projected water resources. Possible methods include:

Implementation Toolkit

- Prioritize planting trees over turf in water-scarce regions.

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Strategy B

Support development of citywide and regional-scale master plans for urban forests.

Action 2

Facilitate development and implementation of regional urban forestry master plans that foster connectivity of green spaces and address the region's specific human health, equity and environmental health issues. Possible methods include:

Implementation Toolkit

- Facilitate a national discussion between federal agencies, organizations, and states to develop a national template for regional urban forestry master plans.
- Include USDA Forest Service, the Environmental Protection Agency, the American Planning Association, and others.
- Encourage partnering between federal, state, and local agencies to develop and achieve regional goals.
- Facilitate funding for three model regional urban forestry plans for use by different regions. Include urban, rural, and tropical communities; however, these may be multi-state and based on geographic or climactic boundaries. Incorporate biodiversity research and resilience as part of the over-all master plan to address the impacts of climate change.
- Facilitate funding to selected regional projects funding for three model local urban forestry plans demonstrating the connection with various scales (local, regional and national).
- Develop, implement and replicate model regional urban forestry master plan in two new regions every three years. Connect state and local plans into regional plans.
- Facilitate funding and technical assistance to support cities and communities to develop master plans through a green infrastructure planning process.

Action 4

Support use of site-appropriate species in regional urban forests, with a focus on species that are adaptable to climate change threats, can foster resilience, build biological diversity, and are resistant to insect and disease damage. Possible methods include:

Implementation Toolkit

- Coordinate and expand availability of vegetation, possibly for each Forest Service region.
- Connect with educational institutions, nurseries, botanical gardens and extension in implementation.
- Consider region-specific planning needs in different geographic areas (such as using trees native to the drier Southwest or trees for very dense urban areas or suburban areas).

Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning

Strategy C

Launch a public awareness and education campaign to elevate the value of urban trees and urban forests ecosystems as essential contributors to community sustainability and resilience.

Action 3

Partner with regional-focused groups and organizations to help promote integration of urban forestry into all levels of planning. Possible methods include:

Implementation Toolkit

- Consider groups such as the Council of Mayors, National Association of Regional Councils, International City/County Management Association, National Association of Counties, metropolitan planning organizations, applicable Federal agencies, and regional counter parts and other possible funding sources and partnerships.

Strategy D

Increase community capacity to use urban trees and forestry in public space planning, infrastructure, and private development.

Action 4

Develop assessment tools and conservation strategies to protect existing urban woodlands and create urban forests, parks, and open spaces. Possible methods include:

Implementation Toolkit

- Identify, prioritize, and conserve areas that should be preserved from development.

Photo Credit: Frank Dukes

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

Strategy A

Expand opportunities for collaboration with the health community.

Action 1

Support the creation and dissemination of a prescription formula (or dosage) for urban parks and forests for health professionals to use. Possible methods include:

Implementation Toolkit

- Facilitate funding and technical support to develop healing gardens and therapeutic landscapes at hospitals and healing facilities to foster better recovery rates.
- Educate public and private health care providers on the connection between human health, healing and therapeutic gardens, as well as green spaces that promote active living.
- Connect with medical students and professionals through curriculum development, workshops, and key meetings.
- Identify replicable examples and models of therapeutic plantings that planners, designers and health care professionals can use to increase the positive health impacts of urban forests and green infrastructure.

Action 2

Foster new funding opportunities to support use of urban forestry and green infrastructure as a critical therapeutic tool for improving community health and quality of life. Possible methods include:

Implementation Toolkit

- Partner with and support efforts by the CDC and others (e.g. Biophilic Cities) to develop the desirable dosage for human contact with parks.
- Develop partnerships with health insurance companies to improve the connection between human health and urban forestry.

Action 3

Support and promote for additional research into the benefits of urban forests and green infrastructure for human health and wellness

Implementation Toolkit

- Actively disseminate results of research, research funding opportunities, and ongoing research needs with NGO's, public officials, and community members.
- Support research on the number of lives that urban forestry can save and other benefits and costs associated with climate change (e.g., reduction of urban heat island effects on vulnerable populations).
- If compelling, consider the possibility of region-specific research regarding human health and wellness that can be messaged by planners, designers and urban forestry practitioners.

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

Strategy B

Champion a nationwide messaging campaign that links trees and urban forests to human health and wellness.

Action 1

Facilitate funding for a nationwide messaging campaign that links urban forestry and green infrastructure to preventative care and health promotion. Possible methods include:

Implementation Toolkit

- Encourage customization of the messaging by regions and sectors.
- Partner and link these messaging efforts with those underway in the health community.
- Request that the Forest Service collaborate with federal environmental, education and health related agencies on possible shared opportunities.
- Continue support of the Green Cities: Good Health web portal of metro nature and human health research.
- Request that the Surgeon General endorse the promise and potential of urban forestry and green infrastructure to improve health outcomes.
- Consider partnering with groups involved in urban greening and sustainability to request an endorsement by the Surgeon General of the importance of urban nature (including urban forestry) for promoting human health.
- Highlight research findings that demonstrate the benefits of urban forestry and green infrastructures benefits to human health, wellness, and preventative care.
- Build awareness of human health and wellness in urban and community forestry as an economic development driver. For example, young professionals may be attracted to live in a particular area due to strong trail systems and healthy residents.
- Create a messaging toolkit about the health benefits associated with the experience of nature in cities.
- Use social messaging principles to develop visual and publication messaging that focuses on diverse influential audiences using market segmentation principles.

Photo Credit: Eric Reed

Goal 2. Promote the Role of Urban and Community Forestry in Human Health and Wellness

Strategy C

Plan, design and manage urban forests to improve human health and wellness.

Action 1

Endorse modifications in urban infrastructure to better facilitate the planting of large shade trees and other vegetation in areas most where they are absent and most needed to improve health and wellness. Possible methods include:

Implementation Toolkit

- Encourage local planners and practitioners to consider the use of lower allergen-producing trees in high-density urban areas.
- Collaborate with regional arboretums, landscape and tree care providers to foster support and provide outreach to educate the public on the benefits of and need to expand the amount of urban forest/ green infrastructure.
- Consider the development of a "shade score" (similar to a walkability score) for skin cancer prevention.

Action 2

Connect urban forestry with urban agriculture to support healthy eating.

Implementation Toolkit

- Support the development of food forests and edible landscaping.
- Connect with urban agriculture and local foods initiatives to support healthy eating and access to fresh fruits, nuts and vegetables.
- Link urban forestry and green infrastructure to the growing network of community gardening.

Action 3

Connect urban forestry with healthy lifestyles.

Implementation Toolkit

- Plan, design and create green and safe routes to schools, shopping and recreation.
- Expand the number of trees and green spaces to promote active lifestyles (for walking, jogging, biking, commuting, recreating, etc.).
- Support student school health education that teaches them that planting, protecting, and caring for urban forests and green infrastructure leads to a healthier lifestyle.

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy A

Increase diversity, equity and accessibility in urban and community forestry.

Action 1

Promote diversity in the urban forestry community by developing metrics and outreach training. Possible methods include:

Implementation Toolkit

- Develop tools that address barriers to diversity in a safe and open manner.
- Utilize Green 2.0 (diversegreen.org) and Diverse Environmental Leaders (delnsb.com) to develop effective strategies for engaging and developing relationships with underrepresented groups.
- Make urban forestry conferences and professional opportunities more inclusive and diverse through internship opportunities and scholarships.

Photo Credit: Amigos de los Rios

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy B

Engage underserved communities in urban and community forestry.

Action 1

Target urban forestry funding and other resources specifically to underserved communities and low-canopy neighborhoods. Possible methods include:

Implementation Toolkit

- Assemble and promote a free and accessible toolkit for assessing ecosystem services and designing community greening plans for communities with low tree canopy levels.

Action 3

Develop relationships, build partnerships, and identify opportunities to collaborate with organizations to advance urban forestry in underserved communities. Possible methods include:

Implementation Toolkit

- Work with national groups who are already engaged with urban residents and are catalysts for change such as NAACP, Urban League, the National Community for Latino Leadership, and others.
- Learn about community empowerment and working in underserved communities by developing partnerships with the human health, food justice, and environmental justice movements.
- Develop partnerships with local groups located in underserved communities to establish trees and food forests where they are most needed.
- Engage and train the local community in tree maintenance to ensure tree establishment, management, and stewardship.
- Develop new partnerships and programs to increase underserved community member engagement in urban forestry professional opportunities.

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy C

Develop effective leadership to build a national voice for urban forestry.

Action 1

Expand and clarify NUCFAC's congressionally authorized leadership role in advancing urban forestry nationally. Possible methods include:

Implementation Toolkit

- NUCFAC will report on the status of Action Plan and progress at the Partners in Community Forestry annual conference.
- Raise the profile of the urban forestry program within the USFS agency to a Deputy-level program. Consider the best placement for urban and community forestry in the USDA Forest Service (USFS) – perhaps moving it to a more central, integrated location within the USFS.

Action 2

Build leadership through collaboration and increased collective impact by local, state, federal, nonprofit, and industry partners. Possible methods include:

Implementation Toolkit

- Use existing groups to foster partnerships, such as the Alliance for Community Trees and the Sustainable Urban Forest Coalition.
- Recruit local and metro-level champions and leaders and develop opportunities for them to promote the benefits and potential for urban forestry within their communities.
- Create more opportunities to bring together professionals and community members from different fields, such as increased collaboration with groups such as SUFC.
- Create an annual summit to improve communication among federal agencies, the urban forestry community, and the general public around urban forestry.
- Develop opportunities within federal agencies for cross-sector engagement to reach different audiences. Note that USDA USFS is the Federal Agency to lead collaboration to achieve broader urban forestry program implementation.
- Build on and enhance existing partnerships and opportunities for demonstrating urban and community forestry leadership, including efforts such as the Urban Waters Federal Partnership, New Partners for Smart Growth, Partnership for Sustainable Communities, Strong Cities/Strong Communities, Metropolitan Greenspaces Alliance, and the Municipal Forestry Institute.

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy C

Develop effective leadership to build a national voice for urban forestry.

Action 4

Support the development of a central source for all interested parties to find the latest information and efforts pertaining to urban forestry to share ideas, projects, etc. Possible methods include:

Implementation Toolkit

- Make better use of American Grove by encourage state coordinators and others to share success stories.

Action 5

Improve communication between federal agencies, the urban forestry community, and the lay audience. Possible methods include:

Implementation Toolkit

- Increase awareness of the urban forestry profession so it has higher recognition and importance with elected officials, at the municipality level, within allied professionals, and the public (related to goal 6).
- Educate elected officials about the importance of urban forestry to gain their support for urban forestry programs.
- Provide speakers and displays at conferences of allied professionals and for new audiences to engage new partners.

Action 6

Build on existing and new partnerships to innovate urban forestry educational, planning and management opportunities with allied professionals such as planners, landscape architects, and engineers. Possible methods include:

Implementation Toolkit

- Foster opportunities to develop training for CEU's in urban forestry with allied professions, and with academic programs in related fields.
- Connect with groups including the Electric Utility Industry Arborists, American Public Garden Assoc., Cooperative Extension, American Public Works Assoc., American Society of Landscape Architects, American Planning Assoc., Arbor Day Foundation, schools, general contractors, Audubon, native plant societies, master gardeners, National Academy of Sciences, and the Professional Grounds Management Society.

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Action 7

Support building nonprofit leadership capacity for effective outreach and networking efforts. Possible methods include:

Implementation Toolkit

- As part of a professional development strategy, develop forums for national urban forestry leaders to connect with urban forestry at the grassroots level on an ongoing basis, to better understand emerging issues and trends and to share best practices.

Action 8

Cultivate national leaders to highlight the importance of urban forestry in the political arena. Possible methods include:

Implementation Toolkit

- Implement a national public awareness campaign using national leaders and partners.
- Enlist national urban forestry leaders to engage health advocates, educators, youth, and community groups, going beyond those already engaged in urban forestry to broaden the base of allies for urban forestry.
- Enlist constituent groups to lobby for improved and expanded urban forestry programs.

Photo credit: Christine Gyovai

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy D

Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.

Action 1

Focus on youth across various demographics to increase exposure to and professional opportunities in urban forestry. Possible methods include:

Implementation Toolkit

- Support the work of local extension systems and non-profit organizations that provide training and work experience in urban forestry for young people.
- Involve the Corps Network, the Student Conservation Association, and other organizations in the development of a model youth conservation corps such as the Onondaga Earth Corps.
- Build cooperative programs among the professionals to encourage students to enter the field of urban forestry.
- Offer bilingual training and programs aimed at youth.
- Develop a Youth Conservation Corps focused on urban and community forestry. Work with the Corporation for National and Community Service, the Department of Interior and other agencies (with USDA USFS as a possible lead).

Photo credit: Frank Dukes

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy D

Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.

Action 2

Promote training and education opportunities in urban and community forestry. Possible methods include:

Implementation Toolkit

- Increase awareness of advanced academic programs, such as the Society of American Foresters Accredited Forestry Colleges and Universities list which includes many colleges and universities that offer two and four year degrees in forestry, urban forestry, and natural resources management.
- Expand the capacity of local extension services to offer urban and community forestry training in underserved communities.
- Replicate and expand successful programs for professional development.
- Develop scholarships specifically for members of underserved communities to enter professional urban forestry programs with universities and colleges that specialize in the urban forestry.
- Train and educate professionals and aspiring students, volunteers, or advocates through programs including the Society of Municipal Arborists intern program and the Cooperative Extension Service Master Urban Forester class series.

Action 3

Encourage development and adoption of consistent national standards for certified arboricultural professionals. Possible methods include:

Implementation Toolkit

- Involve groups including the Society of American Foresters, the Society of Municipal Arborists, the American Society of Consulting Arborists and the tree care industry.
- Develop registration / licensing for the urban forestry field similar to architects and engineers.
- Promote the use of professionally certified arborists for municipal, utility, and private development and maintenance projects and programs.
- Emphasize education and training at the entry level to the field.

Goal 3. Cultivate Diversity, Equity and Leadership Within the Urban Forestry Community

Strategy E

Promote expanded collaboration, training, university-based learning, and communication within the field of urban and community forestry to build workforce professional development.

Action 1

Build professionalism and broader access to the field by increasing the number of urban forestry professional training programs. Possible methods include:

Implementation Toolkit

- Focus on multiples scales including university, continuing education, and vocational tree care work programs. Connect to emerging technologies and tools.
- Promote the adoption and accreditation of university -evel Urban Forestry education to help build the capacity for individuals to gain entry-level positions in communities throughout the country.
- Facilitate funding to support and expand existing successful private sector urban forestry professional training and college internship programs. Expand and develop programs such as that offered by Society of Municipal Arborists.
- Develop standards for urban forestry education programs with core training opportunities in related fields (such as planning, design, arboriculture, communications, public relations, cultural sensitivity).
- Increase the funding base and scholarships for urban ecology and urban forestry education programs in state and private universities.

Action 2

Distribute an annual survey to understand and connect to urban forestry needs at the grassroots level. Possible methods include:

Implementation Toolkit

- Direct survey to state urban forestry coordinators, state urban forestry councils, and other national leaders on an ongoing basis around issues such as funding for urban forestry maintenance and sharing best practices.

Action 5

Work through existing umbrella organizations to boldly and effectively communicate the top needs, opportunities, and actions for the field. Possible methods include:

Implementation Toolkit

- Connect to a public awareness campaign (Goal 7) and increase urban forestry funding to increase effectiveness of umbrella organizations to carry this out.

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Strategy A

Increase the biodiversity, health and resilience of trees in urban and community forests.

Action 1

Support the use of more locally grown, regionally-adapted, insect and pest-resistant, and diverse native or site-appropriate species. Possible methods include:

Implementation Toolkit

- Develop and publish of an annual list of regionally-adapted insect and pest-resistant native and edible species available for various regions.
- Consider seeking assistance from Cooperative Extension to develop and make lists available in each Forest Service Region.
- Create standards for ordinances and polices that encourage the use of resilient and diverse tree and vegetation options in urban forestry.
- Establish nurseries and support planting of regionally-adapted, insect- and pest- resistant, and native and edible species in urban and community forests. Work with nurseries to increase the supply of available species appropriate for urban spaces, and to broaden the availability of plants to aid in diversification.
- Support adoption of ordinances that encourage or require use of appropriate species for urban forest site and region.
- Consider non-native species when they may be more appropriate than native species to adapt to new climactic regions, resist invasive species, build biological and age diversity, or increase species resilient to weather extremes, insects and disease.
- Focus on vegetation that are beneficial to native insects, especially pollinators, as well as fauna.

Action 2

Focus on trees as a priority at the beginning of all new design and infill development efforts, with a focus on opportunities for preservation of existing trees. Possible methods include:

Implementation Toolkit

- Proper urban forestry site preparation and BMP's, including ample root zones for growth, should be specified in designs.
- Involve foresters and arborists when designing new sites and in school and community planning.
- Develop proper training at the local level and basic design standards and specifications ready made for these processes by architects, landscape architects and planners.

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Action 3

Facilitate funding and direct resources for proper site preparation to address soil and water needs for urban trees and forests. Possible methods include:

Implementation Toolkit

- Consider regional variations (such as drier conditions in the southwest, or wetter conditions in tropical areas) and create resources for proper soil and site preparation for a tree to become successfully established and maintained.
- Work with Cooperative Extension to expand its programs to include urban forestry.

Action 4

Determine areas at greatest risk from threats from invasives and threats of climate change, and take proactive measures to reduce and mitigate risks. Possible methods include:

Implementation Toolkit

- Use tools, technology and peer-to-peer learning opportunities between communities to share best practices and lessons learned to improve the ability to manage complex urban ecosystems (such as Urban Tree Canopy assessments and aerial photography to predict where ash trees are and develop proactive responses to Emerald Ash Borer).
- Support research into urban forest tree species that are most resilient for a number of future climate change scenarios (e.g. drought, heat).

Action 5

Focus on the Right Tree, Right Place in urban forestry establishment. Possible methods include:

Implementation Toolkit

- Develop and collate many existing lists and distribute Standard Street Tree lists by region, highlighting best-suited species for each area.
- Focus on trees and vegetation that can support food webs, carbon sequestration potential, pollination capacity, drought and watershed management.
- Customize lists by geographic regions.

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Strategy B

Foster resilience, restoration and sustainability of urban and community forests facing climate change challenges.

Action 1

Facilitate funding to develop "urban forestry first responders" to respond after a storm or disaster to manage urban trees and forests and develop hazard mitigation strategies. Possible methods include:

Implementation Toolkit

- Develop and expand urban forestry "strike teams" and training nationally.
- Strengthen connections between state foresters and state emergency managers in preparation, response, and recovery from storm events.

Action 2

Support the development of region-specific climate change plans for both the short- and long-term, building on existing federal interagency plans. Possible methods include:

Implementation Toolkit

- Promote regional models that allow for the inclusion of variables focused on current and future threats to urban forests.
- Connect with the Rockefeller Foundation's 100 Resilient Cities Initiative, and federal agencies including NOAA, FEMA, Homeland Security, and other efforts aimed at promoting resilience.

Photo credit: Frank Dukes

Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience

Strategy C

Support use of urban forests for increasing community food resilience and access to local foods.

Action 1

Support the design and creation of urban orchards and edible forests with partners from the permaculture, urban food, and agroforestry communities. Possible methods include:

Implementation Toolkit

- Identify fruit trees, shrubs, and plants that are appropriate for a variety of urban areas and bioregions.
- Focus on management and maintenance education, outreach, and short and long term planning with community groups and programs (including pruning, selecting disease-resistant species, addressing pests, harvesting and stewarding trees).

Action 3

Promote the reduction of lawn area in America and replacement of lawns with orchard trees, vegetable gardens, rain gardens, and locally-appropriate trees and vegetation. Possible methods include:

Implementation Toolkit

- Focus homeowner and community education efforts to support this with topics including soil health, tree care, and the benefits of trees and urban forests.

Action 4

Create a public awareness campaign that connects the planting of trees to our national security (increasing food supply security, providing urban food, feeding pollinators, reducing urban heat island effect, etc.). Possible methods include:

Implementation Toolkit

- Look to the food security movement as a model for creating social norms.

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Strategy A

Improve urban and community forest management, maintenance and arboricultural practices.

Action 2

Facilitate increased funding for urban forest management and arboricultural practices with special emphasis on preservation and maintenance. Possible methods include:

Implementation Toolkit

- Ensure that funding allows for planning, management and maintenance for at least three years after trees are planted.
- Direct funding toward improving science-based management at the local level, fostering collaboration between nonprofits and local government.
- Develop strategies to enhance urban ecosystem health (tree species, soil, air, water, etc.).
- Focus on promoting science-based arboricultural practices and urban forest management practices (such as young tree health care and planting the "right tree for the right site.").
- Direct increased funding to urgent practices (such as structural trimming and watering).

Action 3

To foster improved urban forestry, facilitate funding for urban forestry BMPs (design, management, maintenance), including indicators and benchmarks for success. Possible methods include:

Implementation Toolkit

- Compile and synthesize available materials on BMPs.
- Develop the BMPs with professional and trade associations, educational and research organizations, and other supporting groups (such as American Planning Association, American Society of Landscape Architects, LEED, Sustainable SITES initiative, the Sustainable Urban Forest Coalition).
- Refine BMPs for the local and regional scale with consideration for different site requirements and geographic regions.
- Focus on developing science-based urban forest management and maintenance models that can be replicated in other communities.
- Disseminate BMPs to end users and on-the-line urban foresters, as well as to regions, localities, and nonprofit organizations (such as the Sustainable Sites Initiative).
- Link improved maintenance and management with monitoring to reduce future risk and costs.
- Elevate the level of urban land stewardship recognition and prestige (similar to LEED standards).

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Strategy A

Improve urban and community forest management, maintenance and arboricultural practices.

Action 4

Develop programs to increase utilization of urban forest waste and generate revenue (such as production of biofuel, organic soil amendment, mulch, consumer products, etc.). Possible methods include:

Implementation Toolkit

- Develop such programs in collaboration with supporting and expert organizations (such as academic and research organizations, the Alliance for Community Trees, the Sustainable Urban Forest Coalition, the Society of Municipal Arborists, and Cooperative Extension.)

Action 5

Promote opportunities for homeowners to plant and effectively maintain trees in their yards and on private lands. Possible methods include:

Implementation Toolkit

- Connect homeowners with tools and resources to effectively select and maintain trees, and encourage large, native trees for planting in private lands.
- Develop incentives to encourage private homeowners and renters to see their site as part of a broader urban ecosystem.
- Utilize existing tools (e.g. Arbor Day Foundation Tree Wizard) and develop incentives for homeowners to plant "the Right Tree in the Right Place" in their backyards, and to provide appropriate care for trees and urban woodlands.
- Develop model legislation to encourage proactive management of tree risk for citizens.

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Strategy B

Identify mechanisms and resources for enhancing citizen urban forestry stewardship.

Action 1

Develop multiple pathways for urban forest stewardship including trained volunteers and municipal engagement in collaborative efforts for urban forestry care. Possible methods include:

Implementation Toolkit

- Facilitate the replication of successful volunteer urban forest stewardship programs (such as the Tree Pittsburgh Tree Tenders program).
- .Consider ways to address liability concerns with Citizen Tree Steward Programs (such as insurance being held through a host nonprofit or municipality).
- Develop BMPs for volunteer training programs, planting and pruning. Develop strong volunteer training programs in the field at training sites.
- Develop a citizen scientist program to effectively use data and technology in stewarding urban forests.
- Connect civic stewardship with urban forestry educational opportunities.
- Develop opportunities for citizens to utilize urban forestry tools to a greater extent for private urban tree planting, management and maintenance.
- Develop opportunities for citizens to gather data and use tools such as GIS for better urban forestry management. This might include noting where dead or dying trees are, where to expand root space for trees or remove impervious surfaces.

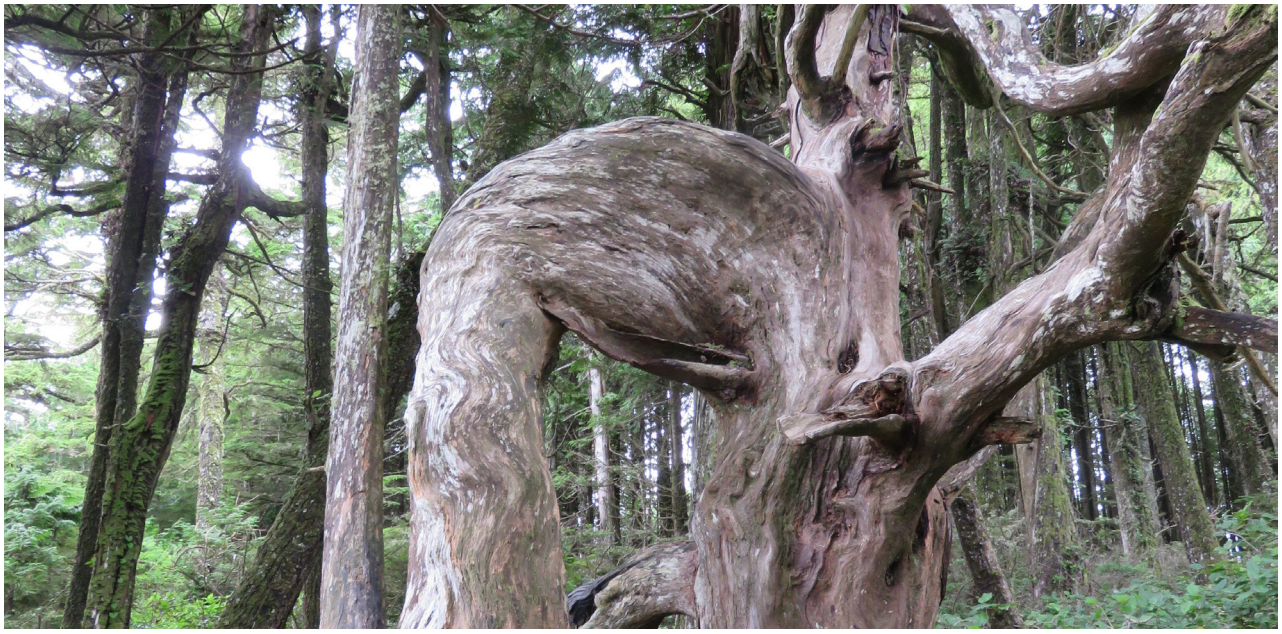


Photo credit: Frank Dukes

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Strategy C

Promote for better use of technology and tools in urban forestry.

Action 1

Facilitate funding and opportunities for communities and organizations to better use tools and technologies. Possible methods include:

Implementation Toolkit

- Facilitate funding to translate the data collected by communities in Urban Tree Canopy (UTC) Assessments into actions for improving urban forest health.
- Monitor and measure increased urban forest health based on UTC data over time through consistently updated surveys.
- Encourage communities to conduct Urban Tree Canopy Assessments and support consistent methodologies in data collection and utilization.
- Facilitate the establishment of a single platform to enable broad access to URBAN FORESTRY technology and tools. (E.g., make i-Tree data accessible to a wide variety of users.)
- Develop public access databases for tree data, including the possibility of a model training program.
- Target funding to assist stewardship planning, such as providing training for USFS professionals to help interpret large datasets or assist cities develop urban forest plans.
- Focus on metropolitan planning agencies and councils of government as a point of connection for regional planning and use of data.
- Develop ongoing technical training for tree professionals and citizens on how to use technology effectively.
- Connect with environmental education programs to develop curricula for student collection and use of data.

Action 2

Promote integrated use of technology by all for stronger decision-making, responses to opportunities and challenges at a regional scale, better placement of trees, and sharing best practices. Possible methods include:

Implementation Toolkit

- Technologies suggested for greater use include the i-Tree suite, Lidar, Urban Tree Canopy Assessment, Stewardship Mapping and Assessment Project, Tree Asset Manager, Arbor Day Tree Wizard program, and others.
- Use technologies to track and monitor progress of urban forest health on a regional scale (related to goals 1 and 3), as well as at the neighborhood and community scale.

Goal 5. Improve Urban and Community Forest Management, Maintenance and Stewardship

Action 5

Support development of technologies for advancing urban forestry monitoring and management. Possible technological needs:

Implementation Toolkit

- Measuring aspects of urban forest structure and composition other than canopy;
- Digital enhanced software that will do a complete 3-D analysis from a digital photo;
- Open source tools and technology that are available online;
- Expanded use of open tree map with added functionality;
- Integration of i-Tree with database management software used by municipalities (such as TreeKeeper, Tree Tracker, etc.) for easier report generation;
- Integration of technology into other planning efforts such as "indicator" projects for municipalities (such as for canopy);
- Expansion of the Forest Inventory and Analysis (FIA) to include urban forests to gather information on the structure, function, and value of urban forests, and ensure FIA data can be compatible with city inventories.
- Inventories to manage trees as assets (not just tracking data); for example, "if we spend X we get Y results" – to show the financial benefits from urban forestry; and
- Remote sensing.

Photo credit: Frank Dukes

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Strategy A

Enhance funding resources for urban and community forestry.

Action 2

Conduct targeted outreach to elected officials to increase urban forestry funding and to maintain a dedicated source of urban forestry funding. Possible methods include:

Implementation Toolkit

- Facilitate convergence of infrastructure investments in transportation, water resources protection, open space and recreation, and biodiversity with urban and community forestry.
- Target education and outreach to elected officials on appropriations committees related to urban and community forestry, in conjunction with national and regional NGO's such as the Sustainable Urban Forest Coalition, Urban Sustainable City Managers and Green Cities Clean Waters.
- Facilitate funding for including trees in the municipal accounting systems.

Action 3

Facilitate an increase in federal funding for urban forestry to support young or developing state and local programs. Possible methods include:

Implementation Toolkit

- Focus on areas that were most severely cut during the economic downturn.
- Build alliances and programs to fund Urban Forestry and Green Infrastructure to meet newly emerging State Cap and Trade legislation.

Action 4

Align resources with key agencies (Federal, State, Local) and partnerships (for-profit, non-profit, etc.) in order to recognize diversified and enhanced funding. Possible methods include:

Implementation Toolkit

- Support and enhance development of policy and advocacy partnerships (i.e. Sustainable
- Urban Forest Coalition (SUFC), etc.) at the National, State and local level that align resources around a common vision that support the overall goal.
- Seek out diverse and creative partnerships to diversify funding mechanisms.
- Example partnerships may include the arenas of: Emergency Management, Ecosystem Services, Sustainability, urban agriculture, climate change and resiliency, etc.
- Effectively communicate successful growth of partnerships and resulting funding to leadership. Coordinate dissemination of successful urban forestry business case studies to relevant federal agencies to support adequate funding. This supports continued growth and alignment of resources and informs similar efforts throughout the country.
- Create a cross-agency task force for urban forestry and green infrastructure.

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Strategy A

Enhance funding resources for urban and community forestry.

Action 5

Develop incentive programs to reward and recognize successful urban forestry efforts and actions. Possible methods include:

Implementation Toolkit

- Facilitate funding to guide and reward maximized ecosystem management and Best Management Practices (BMPs) in urban forestry, including proper maintenance of urban forests.

Action 6

Cultivate new funding opportunities in conjunction with a national urban forestry public awareness campaign (see goal 7). Possible methods include:

Implementation Toolkit

- As more community members and elected officials understand the value of urban forests, develop funding connections where urban forestry intersects with related fields (such as stormwater management, water quality improvement, urban farming, climate resilience, public health, etc.).
- Market research studies that demonstrate how urban forestry contributes to a healthier future, and relate to people's hearts and emotions.

Action 7

Work with partners to redirect existing funding to urban and community forestry and develop new sources of funding. Possible methods include:

Implementation Toolkit

- Direct some of the several hundreds of millions that are already invested locally and regionally in green infrastructure and sustainable communities efforts toward urban forestry.
- Focus on finding ways for the Fish and Wildlife Service and the Natural Resources Conservation Service to adopt urban priorities to sustain the state and non-profit networks that the USFS urban forestry program currently supports.
- Build relationships between umbrella organizations, businesses, and large private utilities to help with underwriting initiatives and programs.
- Leverage and connect funding to address climate change and resilience issues through urban forestry.

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Strategy A

Enhance funding resources for urban and community forestry.

Action 9

Develop new innovative sources of stable funding for urban forestry from private sources. Possible methods include:

Implementation Toolkit

- Partner with businesses and industry to establish an 'innovation fund' to make micro-investments in underserved communities for projects such as pest management, reuse of urban wood, and water quality management.
- This might include a small tax on gas/fuel, a forestry tax (such as in Sacramento, Madison and Toledo) and carbon sequestration legislation.
- Look for funding opportunities that overlap with but are not strictly focused on urban forestry.
- At the local level, consider a set-aside of development funding to be directed for urban forestry.

Strategy B

Leverage and diversify funding through expanded collaboration between urban forestry and related fields, agencies and sectors

Action 1

Convene Federal agencies to foster inter-agency links and connections, and to develop a plan for urban forestry coordination and collaboration among federal agencies. Possible methods include:

Implementation Toolkit

- Connect with the federal programs listed on pages 114-115 of the Action Plan including connecting with EPA, CDC, FEMA and others.
- Consider how all HUD developments could include tree canopy requirements and plantings.
- Demonstrate how urban trees can help meet EPA stormwater capture and purification requirements for combined stormwater overflow.
- Develop a congressional mandate for the Natural Resources Conservation Service to integrate urban areas and practices into their watershed health initiatives

Goal 6. Diversify, Leverage and Increase Funding for Urban and Community Forestry

Strategy B

Leverage and diversify funding through expanded collaboration between urban forestry and related fields, agencies and sectors

Action 2

Align urban and community forestry research with additional research resources (including Federal, state, local, for-profit and non-profit) to develop research findings that advise strategic investment of enhanced funding resources.

Implementation Toolkit

- Develop a research collaborative at the Federal level that enhances communication and coordination of research activities among agencies
- Through collaboration with a national collaborative (i.e. SUFC as mentioned in Strategy A) to advise strategic investment in research activities
- Effectively communicate this efficiency and the resulting funding to leadership.

Action 4

Foster connections between urban forestry and related departments in municipalities. Possible methods include:

Implementation Toolkit

- Focus on the importance of including urban forestry in urban planning, utilities, public works, engineering and landscape architecture and to partnering with urban foresters on projects in cities and towns.
- Focus on savings and benefits of urban forestry such as urban heat island reduction and water quality improvement in coordinated planning and management.

Photo credit: Frank Dukes

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Strategy A

Strengthen environmental education programs that focus on urban and community forestry issues.

Action 1

Cultivate urban forestry educational programs and resources for environmental and outdoor education. Possible methods include:

Implementation Toolkit

- Support a dedicated source of federal funding for a national urban and community forestry education programs.
- Partners and coordinators may include state urban forestry coordinators, the Envirothon, Project Learning Tree, Project Wild, Project Wet, Nature Explore, the NASF My Tree Our Forest campaign, the Children and Nature Network, environmental education organizations, local experts, and other NGOs.
- Support the development, implementation, and availability of local urban forestry data and content.
- Plant urban orchards and urban forests at schools and in public spaces as both demonstration sites and outdoor classroom laboratories.
- Offer "tree shop" (similar to auto shop) at the high school level for aspiring arborists.

Action 2

Foster the development of urban forestry education from the elementary to graduate school level. Possible methods include:

Implementation Toolkit

- Focus on underserved and minority communities.
- Connect urban forestry and urban ecosystems educational opportunities to the new Next Generation Science Standards (national teaching standards).
- Develop opportunities for students in schools to utilize urban forest tools in their communities. (E.g., connect the i-Tree suite of tools (or similar resource) to middle and high schools to enable youth to conduct assessments in localities.)
- Assist in the creation of a youth-focused urban forestry conference with a focus on both raising awareness of urban forestry and increasing environmental stewardship.
- Develop educational materials or resources that support middle and high school urban and community forestry ("arbor-school") certification.
- Emphasize educational programs with a practical aspect of arboriculture such as pruning, climbing, rigging, and equipment operation so "graduates" can work in the field upon program completion as well as connecting with STEM education through hands-on, service-learning experience outdoors (which can be delivered by youth conservation corps and extension education systems).

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Strategy A

Strengthen environmental education programs that focus on urban and community forestry issues.

Action 3

Facilitate funding for mini-grants for education, including educational art.

Implementation Toolkit

- Consider projects that interact with trees (dance, exercise, book, illustrations, sculpture, etc.) and makes it fun to learn about urban forestry, while increasing the knowledge base for urban forestry.

Strategy B

Create a nationwide urban forestry public awareness and education campaign.

Action 1

Re-brand urban forestry with pop culture, social media, radio, TV, billboards, and advertising. Possible methods include:

Implementation Toolkit

- Facilitate funding to hire a professional public relations or marketing firm to develop a nationwide campaign that can be customized for regional and local audiences.
- Develop an icon that people can relate to (including at an emotional level), and focus on the benefits of urban forestry.
- Make the campaign accessible to middle and smaller communities and non-governmental organizations that may not have any resources or staff for public relations or effective communication tools.
- Reach out beyond the "urban forestry choir" to under-engaged community members and the public as a whole.
- Increase the understanding of the benefits of urban forests while promoting proper stewardship to mitigate the challenges and risks of urban trees. Address the misperception of the costs and hazards of urban trees.
- Enlist the support of other federal agencies, national and state partners, and private entities in the creation and implementation of public awareness campaign.
- Collaborate with media to create entertaining and informative broadcasts or internet shows that highlight science based urban forestry practices. (See examples of shows including Car Talk, This Old House, Top Gear).

Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship

Action 2

The national awareness campaign should connect citizens with civic engagement opportunities locally. Possible methods include:

Implementation Toolkit

- Develop tools so that a national campaign can be customized and made more relevant for local communities.
- Consider how to engage and motivate citizens on how they can improve their yard, connect with and help their neighbors, and engage with their community.
- Develop and replicate best practices for communities to communicate effectively to connecting citizens, urban forests and stewardship.
- Develop means to motivate millennials to plant, adopt, and steward urban trees. Connect with trends, including youth and young adults wanting to live in urban areas and be engaged in their community (look to programs such as Philadelphia's "Arborly Love" program as successful examples).
- Develop programs to engage citizens in understanding trees and urban forests as a vital part of a community's health and security, essential services, and infrastructure. Make connections to issues of recent concern: water shortages, storm events, and energy consumption.

Strategy C

Increase outreach and educational opportunities for underserved and diverse communities to increase urban forestry stewardship.

Action 1

Cultivate urban forestry educational programs and resources for environmental and outdoor education. Possible methods include:

Implementation Toolkit

- Follow edible tree giveaway programs with urban forestry education and stewardship opportunities (including tree giveaways). Examples of successful programs include Miami, Florida; Portland, Oregon; and Los Angeles, California.

Key Issues Report

Photo credit: Guy Kramer

Ten-Year Urban Forestry Action Plan

KEY ISSUES REPORT:
PRELIMINARY IDEAS for the DRAFT ACTION PLAN

November 10, 2014

Prepared by the University of Virginia Institute for Environmental Negotiation and Dialogue + Design Associates

Table of Contents

Ten-Year Urban Forestry Action Plan

Executive Summary of Preliminary Key Issues for the Draft Action Plan

Work on America's next Ten-Year Urban Forestry Action Plan began in April 2014 by a collaborative Project Team of facilitators, researchers, and economists with guidance by a national Strategic Advisory Team. Required by federal legislation, the next national Ten-Year Urban Forestry Action Plan, which will cover 2016-2026, is intended to guide the work of the National Urban and Community Forestry Advisory Council (NUCFAC) in its development of grant categories for the Forest Service's National Urban and Community Forestry Challenge Cost Share Grant Program and advisory role, as well as the broader urban and community forestry community of practice at all levels of work for the coming decade. The following is a synthesis of key issues facing urban and community forestry in the next ten years, based on research and in-depth interviews conducted with 26 key thought leaders during the summer of 2014 by the Project Team. These key issues will be vetted and prioritized through community engagement to inform the Draft Ten-Year Urban Forestry Action Plan in early 2015, and are not yet presented in any particular priority order. The full Key Issues Report, available at www.urbanforestplan.org, contains ideas for action for each key issue.

Key Issue #1: Building Human Health and Welfare through Urban and Community Forestry

The next decade brings both an important opportunity and need for actively improving human health and welfare through urban and community forestry.

Key Issue #2: Expanding Utilization of Technology

The explosion of technologies in the last decade is expected to continue, and will facilitate important opportunities to improve urban forest development, maintenance, and health, as well as increase multiple modes of community engagement with their forests.

Key Issue #3: Enhancing Collaboration and Communication in the Field: Build on Existing Work and Partnerships

Increasing collaboration with allied professions, and the community at large, is both an opportunity and significant need in the coming decade.

Key Issue #4: Making Urban Forestry a Central Element of Community Planning at the Regional Scale

For the full range of human and environmental benefits of urban forests to be realized, cities need to be planned with trees and urban forests as a core feature of community infrastructure, instead of as an afterthought.

Key Issue #5: Increasing Urban Forest Health, Biodiversity and Resilience

Increasing urban forest health, biodiversity and resilience is a key need. Challenges of climate change (including pests and invasive species) will offer both key challenges and opportunities.

Key Issue #6: Expanding and Targeting Urban and Community Forestry Research

Research needs for the coming decade are to validate and replicate key studies; identify value-added research; and make the science accessible and relevant to leaders and educators.

Key Issue #7: Building Effective Leadership to Champion Urban and Community Forestry

Vocal and visible champions need to be developed in the next decade, to bring attention to the ability of urban forests to offer cost-effective solutions to critical community issues.

Key Issue #8: Increasing Funding for Urban and Community Forestry

As we enter the "age of the city," funding needs to keep pace with the growth of urban forests, particularly as they are core infrastructure for sustainable and resilient communities.

Key Issue #9: Expanding Public Awareness, Education and Environmental Literacy

Urban forests are key infrastructure at the regional, municipal, neighborhood, and home scale across America, and public education is needed to align public perception with reality.

Key Issue #10: Improving Urban and Community Forestry Management and Maintenance

Maintenance is a core essential need for ensuring that urban forests deliver their full benefits, and forest design and maintenance should reflect regional soil and environmental conditions.

Key Issue #11: Enhancing Stewardship of Both Trees and Their Urban and Community Forests

As urban forests are growing, stewardship in future decades will not be possible without community engagement and support, including development of stewardship programs.

Key Issue #12: Building Professionalism and Broader Access to the Field

The demand for trained urban forestry professionals has outpaced the supply, so there is a need for more professional training programs along with increased access to the profession.

Key Issue #13: Increasing Diversity for Social Justice and Inclusivity

To successfully address all of the other key issues, there is an urgent need to increase diversity within the urban forestry profession as well in citizen leadership and engagement.

Key Issue #14: Fostering Federal Agency Collaboration and Program Improvement

As urban forestry is a core solution to so many emerging community challenges, its placement in the federal structure needs to be shifted to a more central and visible role, and collaboration with other federal agencies is urgently needed to leverage program goals and scarce resources for mutual gain.

SPEAK UP!

You can influence the next Ten-Year Action Plan. If you have experience in urban and community forestry or a related field, please participate in our ongoing community engagement at the project website. Additional information and the full Key Issues Report are available as well.

www.urbanforestplan.org

I. Introduction and Background for Ten-Year Urban Forestry Action Plan

Federal legislation[1] requires that an Action Plan for America's urban and community forests be developed every ten years. The next national Ten-Year Urban Forestry Action Plan, which will cover 2016-2026, is intended to guide the work of the National Urban and Community Forestry Advisory Council (NUCFAC) in its development of grant categories for the Forest Service's National Urban and Community Forestry Challenge Cost Share Grant Program and advisory role. The Ten-Year Urban Forestry Action Plan also serves as a guide for the urban and community forestry (UCF) community of practice at all levels of work, from grassroots nonprofits to academic researchers, private practitioners and local and state governments.

A core Project Team was assembled under the leadership of American Forests Foundation (AFF) in April 2014, with the University of Virginia's Institute for Environmental Negotiation (IEN) serving as the project leader, and including other team members from Dialogue + Design Associates, University of Maryland Center for Economic Finance, University of Washington, and UVa McIntire School of Commerce. A national level Strategic Advisory Team was also convened to help provide guidance and direction to the action planning process. A listing of Project and Advisory Team members may be found in *Appendix C.*

The development of the next Ten-Year Urban Forestry Action Plan is considered a significant opportunity to step back to look at the big picture. What has been happening with our nation's urban and community forests over the past ten years, what have we learned, where have we made progress, and what are emerging needs? It is also considered a significant opportunity to engage the UCF community of practice, to learn from people working at all levels and to elicit their needs, insights, visions and hopes for the next ten years.

This report presents preliminary findings from the first phase of work conducted in the summer of 2014, and will serve as the basis for further comprehensive community engagement, outreach and prioritization for the development of the next Ten-Year Action Plan. During the summer, the IEN team reviewed more than 70 key UCF documents gathered, including the 2010 Vibrant Cities Report and the 2010 Federal analysis of the 50 state Forest Resource Assessments, entitled "Urban and Community Forest Related Content in 2010 Statewide Forest Resource Assessments." In a second path of research, the team also scanned available resources (documents, websites, tools, etc.), which were identified through outreach to the NUCFAC board members, state UCF coordinators, and other leaders. In a third path of research, the team conducted a series of personal interviews with 26 key thought leaders who represented diverse sectors, regions and interests. These interviews proved to be the most

[1] Congress passed legislation for Cooperative Forestry Program of the State and Private Forestry (S&PF) mission area of the Forest Service, U.S. Department of Agriculture, as amended through 2008. One of the laws included is the Urban and Community Forestry Assistance.

productive and useful line of inquiry, as they offered nuanced and diverse insights and a rich trove of ideas for the Action Plan, and they form the foundation of this Key Issues Report.

As a whole, there is much hope for the future in the field of urban and community forestry. The thought leaders who were interviewed expressed a wide range of ideas, fears, excitement, challenges, possibilities for collaboration, and hopes that urban and community forestry will be a strong pillar for healthy, strong, and vibrant futures in communities across America.

The 26 key thought leaders who were interviewed were all asked the same set of questions, which prompted them to share ideas and feedback about the most significant areas of progress that UCF has made in the last decade; the top opportunities, challenges, gaps and needs facing UCF in the next ten years; hopes for the next Ten-Year Urban Forestry Action Plan; ideas for how to engage underserved communities and others; and specific action ideas for the next Action Plan. *(See Appendix A for the list of thought leaders and questions.)* A synthesis of these interviews, combined with ideas gleaned from the broader assessment, has led to the preliminary identification of 14 key issues that UCF will face in the next ten years. These are summarized in the Executive Summary. A more detailed summary of top opportunities and challenges for each key issue, ideas for possible action, as well as other preliminary findings from the UCF assessment and more detailed information may be found in Section IV of this report. Finally, *Appendix B* contains weblinks to key programs and resources that were discussed by thought leaders during the interviews.

Please note that the key issues are not presented here in any particular priority order. The Project Team will both ground-truth and prioritize these key issues through a digital engagement with the UCF community of practice and stakeholders in Fall 2014 and in early 2015. If you would like to contribute to this planning effort by participating in the digital stakeholder engagement, please contact the Project Team or see more information at www.urbanforestplan.org *(see Appendix C for contact information).*

II. Progress in Urban and Community Forestry during the 2005-2015 Action Plan

In the last ten years, since 2005, urban and community forestry has grown from an infant profession that often needed to justify its place at the table to a young adult that is often, but still not always, invited to the community planning table—though many thought leaders noted that UCF should have a seat at the head of the table. Urban population centers are growing, with 83% of Americans now living in cities. Urban forests in the United States are estimated at 138 million acres, and are expected to continue to grow. To put this in perspective, urban forests are approaching the size of our national forests, which encompass 177 million acres. But in some ways, urban forests could be said to exert a far more profound influence on American health and welfare because their circle of influence is both extensive (through impacting four-fifths of our nation's population) and intensive (through repeated exposure on a daily basis). Thought leaders expressed a range of ideas about the areas of the most significant progress in the UCF field in the past decade, primarily around the following ideas.

Public Awareness

The maturation of urban forestry is evident at all levels in a community. Most thought leaders felt that over the past ten years the public has gained significant awareness of the trees in their environment and the benefits they provide. One thought leader pointed to climate change as one contributing factor for this increasing public awareness about urban forests. Many others noted that there is significant need to expand public awareness in the next decade with a national leader and a unified field moving ahead, particularly around the threats from climate change and a continued net loss of urban tree canopy in America.

Community Planning

An additional area of progress in the field is around collaboration in planning – community planners and decision-makers now frequently discuss the nature, extent, role and maintenance of their tree canopy and urban forests, whereas ten years ago most did not see the need or relevance. This heightened awareness among planners has also led to greater awareness and interest in urban forests among decision-makers such as mayors and policy makers, who are responding to pressures to develop sustainability plans. Evidence of the increasing attention to the role of urban forests are the thousands of communities that did not have tree ordinances ten years ago but now do.[2] Additionally, evidence that concern for community trees is that demand for tree work has reached an all-time high.

Paradigm Shift

Another area of significance is that the paradigm for understanding urban forests has matured from a focus on tree selection and placement to a broader focus on forest and ecosystem management. The latest step in this progression, some suggest, is the emerging understanding of cities as urban ecosystems in which urban forests are assuming a central role as the first point of defense for urban human and environmental health. Additionally, there has been a significant shift in the increased understanding for the need for highly functioning, connected urban forests and functional, interconnect urban ecosystems. Moreover, broader considerations such as the psycho-social, health, and resilience benefits of trees are being strongly considered when looking at the value of urban forests through the lens of ecosystems services, beyond solely the environmental health services of urban forests. Many noted that considering the potential benefits of trees, especially around psycho-social and health benefits, will catapult the field ahead in the coming decade.

Collaborative Partnerships

In the past ten years the number of collaborative partnerships between nongovernmental organizations (NGOs) working in urban forestry and a wide range community partners has greatly increased, according to interviewed thought leaders. Because of these partnerships, urban forestry has created linkages to a variety of public services and urban stewardship

[2] Over 3,400 communities are currently a Tree City USA, for which having a tree ordinance is a key requirement. http://www.arborday.org/programs/treeCityUSA/about.cfm

causes, which was not widely evident ten years ago. Thought leaders noted that there are many opportunities to build on the existing network of partnerships in the next decade. Thought leaders also noted that the creation or expansion of umbrella organizations, such as Sustainable Urban Forest Coalition (SUFC), the Alliance for Communities Trees, and Arbor Day Foundation, has been and will be very important, particularly for increasing communication and collaboration in the field.

Professionalism

Over the past ten years urban forestry has come into its own as a recognized profession. Universities and schools of forestry offer more programs in urban forestry than before, and more young foresters are aware of career opportunities in urban forestry. Arboriculture, a specialized field within urban forestry, has also made significant strides in safety equipment and standards of practice. Improvements in tree planting technologies involving soils, species selection, infrastructure, have helped tree planting initiatives be more successful. Thought leaders observed that the field of urban forestry has broadened its tent to include more disciplines such as stormwater management, urban and environmental planning, and potential threats from climate change, thereby strengthening the knowledge base. One thought leader suggested that the field has made advancements by using webinars and professional training such as the week-long Municipal Forestry Institute training and the Tree Board University. Lastly, interviewees noted some gains have been made in professional diversity, with more people of color in the profession thanks to different university scholarships and programs like that offered by Southern University. However, all seemed to agree that there is still a long way to go in this arena.

Research

The primary advancement in research in the past ten years cited by thought leaders was in the arena of social science research, particularly research on the public health, mental/ psychological, and other social benefits of trees. Research by Ming Kuo, Bill Sullivan and Kathy Wolf were frequently cited as pioneering and groundbreaking contributions. Thought leaders felt this kind of research has helped communicate the benefits of trees to both the public and policy makers, and is more powerful than research on just the biophysical benefits of trees alone. Thought leaders noted several opportunities for collaboration and advancement around specific research needs, as well as ideas to build on the existing body of research in UCF in the coming decade.

Technology, Tools and Resources

Perhaps most importantly, the tools, resources, programs and activities to support this growing field have literally exploded in the last decade. These resources have allowed for a more integrated understanding of the urban forest, as well as the opportunities and challenges facing UCF. Many thought leaders noted the progress made with new valuable tools and technology. In particular, most interviewees highlighted the importance of the i-Tree tools suite, the Stew-Map, and Urban Forest Canopy assessment. These tools are readily available to communities and have made the biggest difference in enabling communities to communicate the benefits of trees, to survey the current status of their urban forest canopies, and to identify possible

locations for increasing urban tree canopy cover in specific locations. Additionally, many technology advancements have drastically reduced costs of local data gathering on urban forests and have helped communities prepare for threats such as the Emerald Ash Borer as it moves west.

Grant Funding

Many thought leaders suggested the NUCFAC grant program has been helpful for strategically supporting innovation and addressing real needs in urban forestry. However, there were mixed feelings about NUCFAC's cost-share grant program. Some felt that the grant program has greatly improved in the last four to five years by placing an emphasis on strategic priorities. However, others noted that the grant process is cumbersome and doesn't sufficiently help build the capacity of fledgling initiatives or urban forestry maintenance programs. Others noted and applauded the recent effort by NUCFAC to support grants for communities that haven't been previously reached. However at least one thought leader felt that NUCFAC has lost the ability to fund new and innovative ideas and is now only funding green infrastructure. Outside of NUCFAC, another change in the last ten years is that private foundations have increased their funding for urban forestry. Virtually all interviewees noted that funding is not keeping pace with the either the physical growth of our urban forests or the rising importance of urban forests as a core tool for improving urban health. One example given by several interviewees is that, without funding for maintenance, urban forests may limp along and fail to provide needed community benefits in air quality, water management, or human health. Thought leaders noted the need to look to new funding sources for UCF, to look to public/ private partnerships for new opportunities, as well as making connections around the benefits and needs of UCF with non-traditional sources of UF funding.

III. Overarching UCF Themes and Challenges In the Next Ten Years

A number of overarching UCF themes emerged from early discussions with the Project Team, the Advisory Team, and key thought leaders. These themes help inform and frame the key issues, revealing the complexity of the challenges that lie ahead in the coming decade. Some of these themes reflect global trends and needs that will influence the field in the coming decade, and some reflect emerging values within the field. Many of these could be considered issues in their own right, requiring their own set of actions. However, in an effort to make the next Action Plan as useful as possible to the UCF community of practice, a decision was made to focus on the key issues that are specific to urban and community forestry, while recognizing these themes as a cross-cutting and overarching framework. (Also note that some thought leaders suggested the Vibrant Cities Task Force 12 suggestions, which may be found in *Appendix B* as core suggestions for the next Ten-Year Urban Forestry Action Plan.)

- Community health and resilience (obesity, diabetes, etc.)
- Recreation opportunities accessible to all community members
- Environmental education and literacy (e.g., preventing nature deficit disorder)
- Climate variability and change (including threats such as new pests, diseases, increased storms, increased urban heat island effect, changing plant adaptation capacity, drought, etc.)
- Natural disasters (prevention and crisis management)
- Invasive species, especially insects
- Social and environmental justice
- Water (e.g., shortages, stormwater management, and water quality)
- Impacts of development
- Continued net loss of urban tree canopy in the United States
- Green infrastructure
- Natural capital / ecosystem services (public health, economic)
- Multi-functional urban forests (e.g., urban orchards, edible forests, agroforestry, permaculture)
- Professionalization of UCF/ Building expert urban forestry capacity within the field
- Urban Forest Health (e.g. “Asset management” approaches)
- Community education
- Connected with underserved community members
- Funding to keep pace with role and growth of UCF
- UCF as a tool for community solutions
- Growth of “big data” – large data sets that can be utilized for multiple purposes for community and regional UCF planning
- Social benefits/ services
- Incentives for UCF
- Collective Impact

IV. Key Issues: A Look At Opportunities, Challenges, Gaps And Ideas For Action In The Next Decade

Below, the key issues that emerged from our discussions with 26 thought leaders and other assessment research are explored more fully. Each issue reflects a variety of opportunities, challenges, gaps, needs as well as potential actions suggested by thought leaders. These ideas are seen as a beginning platform for building the next Ten-Year Urban Forestry Action Plan for NUCFAC and the UCF community of practice. Again, please note that the key issues are not presented here in any particular priority order and they will continue to be refined and change with input from NUCFAC and the community of practice.

Key Issue #1: Building Human Health and Welfare through Urban and Community Forestry

The opportunities for building human health and welfare through urban and community forestry are numerous. Interviewees noted that this is an area that is likely to grow significantly in the coming decade through increased awareness and understanding of human health and welfare benefits from UCF, and thus an increased demand for them. Thought leaders noted the need for expanded research around opportunities in human health and welfare as this has been a largely untapped area thus far, and to make stronger connections between the health care field and urban and community forestry. Research is needed to support this emerging area of collaboration in the coming decade as well.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Create a national campaign related to trees and health.
- Connect to the health community through a message from Surgeon General, as well as other health care professionals, about the promise and potential of UCF to improve health outcomes.
- Promote UCF as a means to enhance public health, decrease the urban heat island effect, reduce energy consumption and decrease carbon production.
- Plant large shade trees in areas most needed for increasing urban health, using technology, community needs and ground-truthing to determine locations.
- Find ways to partner with the health care community around the benefits of UCF and linking them to preventative care, and potential incentives for health connected to UCF.
- Expand opportunities for collaboration with the health community, and the need to create more collaboration with people working on public health and human well-being as it relates to the natural world.

Key Issue #2: Expanding Utilization of Technology

Increased use of technology was cited by many thought leaders as the primary area of progress in urban and community forestry in the last decade. However, technology is also an area ripe for continuing important progress in the next ten years. We may not be able to foresee the emerging technologies in the coming decade, but we do know that new technologies will emerge to significantly improve urban forest development, maintenance, and health. Also, given the explosion of tools that enable greater public engagement through social media and smart phones apps, it is likely that new technologies will emerge to enable greater public interest in and stewardship of urban forests. Many thought leaders noted that development of tools that enable identification of ideal urban forest placement for both forest and human health is a strong need for building public awareness.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Expand the utilization of the three UCF primary tools – the i-Tree tools suite[3], the Stewardship Mapping and Assessment Project (STEW-MAP)[4], and Urban Tree Canopy Assessment[5] – developed in the last ten years for communities, agencies and organizations – have built significant capacity to analyze and quantify numerous aspects of our urban forests. In the next ten years, the hope is that tools like these will be used to assist better placement of urban forests to maximize their functions and benefits at the neighborhood, city and regional scale.
- Develop more technologies to address pests and other climate change threats; share best practices among communities and researchers nationally.
- Translate the data collected by communities in Urban Tree Canopy Assessments (UTC) into actions, so that they will be implemented, monitored, and outcomes measured.
- i-Tree data collected during assessments needs to be available to UCF managers, stewards and planners for continued and expanded planning and monitoring.
- Encourage more communities to conduct urban tree canopy assessments, and support the development of consistent methods for urban tree canopy assessments.
- Connect the i-Tree suite of tools to schools, particularly at the middle and high school level, to enable youth to conduct actual assessments in localities and to foster partnerships between schools, municipalities and NGOs.
- Establish a single platform to enable broad access to these technology tools. One possibility might be to use the "EcoPiazza" UF communication website that Ed Macie and others of the USDA Forest Service is developing.

[3] The i-Tree tools suite: www.itreetools.org
[4] The Stewardship Mapping and Assessment Project: www.nrs.fs.fed.us/nyc/focus/stewardship_mapping/
[5] Urban Tree Canopy (UTC) Assessment tool: www.nrs.fs.fed.us/urban/utc/

- Develop tools that can use "big data" (large data sets such as UTC canopy data sets for an entire city) for improving the ability to manage complex urban ecosystems. For example, Milwaukee is utilizing aerial photography to identify ash trees across the city, ground-truthing the location of those trees, and developing treatment strategies to address the threat of Emerald Ash Borer at the city-scale.

Key Issue #3: Enhancing Collaboration and Communication in the Field: Build on Existing Work and Partnerships

Increasing collaboration in the field, from both allied fields and those in related but currently non-engaged fields, was noted as a significant opportunity and gap. Urban and community forests influence and impact virtually every aspect of community life, from human health and safety to carbon sequestration, air filtration and stormwater management. As a result, there is a very strong need for increased dialogue and collaboration with allied professionals such as landscape architects, city planners, architects, engineers, public works officials, and other design professionals and their professional organizations. Similarly, improving dialogue and collaboration with the community at large is equally important, using networks and groups that include nonprofit organizations, churches, schools, and community groups. Thoughts leaders noted that collaboration and dialogue are needed both for a host of purposes: raising public awareness; strengthening the cohesiveness of the UCF field; developing a shared agenda for working on UCF challenges and building opportunities together; increasing urban forests on the ground; increasing the capacity for maintenance and care of UCF; and also increasing the demand for and knowledge about UCF across the country. Building on existing work within the field, especially the efforts of the Vibrant Cities Task Force, was discussed by many as both an opportunity and need moving forward. Additionally, interviewees noted that the Vibrant Cities report could serve as a strong base for the future Ten-Year Urban Forestry Action Plan. NUCFAC has done valuable and positive work to advance UCF nationally, and there is an opportunity for an increased role for NUCFAC as a leader in the field in coming decade.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Build on existing work within the field, especially the efforts of the Vibrant Cities Task Force. Support more joint, collaborative initiatives and processes like Vibrant Cities, which bring together people from different fields. The Vibrant Cities Report contains key ideas to combat threats from climate change and to build resiliency, but needs sustained funding and support. Preliminary funding estimates to make it a reality range from $100 to $300 million.
- Work through existing umbrella organizations, such as the Sustainable Urban Forests Coalition (SUFC), to reach out to member organizations to boldly and effectively communicate the top needs, opportunities and actions for the field and the next Ten-Year Urban Forestry Action Plan. Then follow-up, to align the needs of the UCF community with those of allied professionals.

- Nurture current relationships: it is very important to maintain the existing network of partnerships and agencies that already exist within the USDA Forest Service (USFS) structure.
- Actively connect and network with other professions. Develop opportunities to work as interdisciplinary teams at city, state and federal levels to focus on UCF program development, urban forest installation and maintenance.
    - Focus on partnerships and network with related professionals, such as landscape architects, arborists, the health care community, engineers, and mayors. Network and collaborate with all levels of government foresters.
    - Foster a shift in educating related professions (e.g. urban planners) from managing pieces of the urban system to managing urban ecosystems.
    - Go beyond the "usual suspects" and build bridges with other professions that are doing parallel work, such as public health and medicine, as well as groups working on intersecting issues, such as food justice and environmental justice.
    - Creating interdisciplinary teams is both a big opportunity and a challenge, as educational systems do not adequately prepared foresters to effectively work in teams.
    - Foster networking among UCF organizations especially at the local level: too often UCF groups are not aware of what others are doing, competing for limited local resources, and feeling like others are "encroaching on their territory."
    - Create opportunities for cross-sector learning between the private and public sectors.
    - Create opportunities to learn from and connect with international urban forestry professionals.
    - Host UCF conferences that span silos, reach out to broader audiences, and create opportunities for learning from each other.
    - Expand awareness of UCF groups and organizations working both locally and nationally, and develop joint opportunities for working collaboratively to maximize UCF resources (instead of competing for resources at the local or federal level). Provide means for each organization to retain their organizational autonomy, effective collaboration and shared funding opportunities.
- Improve communication between the community of practice and lay audiences.
- Build the capacity of USFS staff and traditional foresters to connect with urban core issues.

  - Provide training and opportunities for USFS staff to increase their capacity to connect more directly with communities of color, low-income communities, and around urban issues. Forestry has traditionally focused more on rural settings, and there are opportunities to build foresters' skills and capacity to engage in urban settings. *(Related to Key Issue 14 as well.)*

- Foster sharing between USFS regions: Create opportunities for USFS regions to share their work with other regions, and encourage adaptation of their work for the broader nation. For example, a training video developed for one region could be equally useful to other regions. (*Related to Key Issue 14 as well*.)
- Disseminate the next Ten-Year Urban Forestry Action Plan to a broad range of professional organizations, such as the American Planning Association (APA), the American Society of Landscape Architects (ASLA), the American Public Works Association (APWA), and others for feedback, goal alignment, and to foster collaboration.

Key Issue #4: Making Urban Forestry a Central Element of Community Planning at the Regional Scale

For the full range of human and environmental benefits of urban forests to be realized, cities need to be planned with trees and urban forests as a core feature of community infrastructure, instead of as an afterthought. Thought leaders suggested that a shift is needed in how trees are understood – from thinking about individual trees to managing urban forests at a regional scale. There is a need to find new ways to manage trees and urban forests as central infrastructure both within municipalities and at the regional level. For example, the urban forestry department in the city of Milwaukee is located within the public works department, and trees are considered any time a decision affects the city's infrastructure. Lastly, to maximize urban forest health and function as well as the ecological and psycho-social benefits of community forests, forests needs to be approached and managed across political boundaries on a larger scale, at the bioregional or watershed scale.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Encourage and train foresters to become part of the decision-making process at the local level. Foresters need to be at the table with the planners, municipal utilities, landscape architects, and developers from the beginning, so that soils and trees are part of the planning process from the beginning.
- Support the development of master plans at the regional scale for urban forests, which include planning for resilience and biodiversity.
- Support inclusion of urban and community forestry as central elements of all community comprehensive or master planning efforts.

  - Develop template goals for urban forests and parks to be accessible to all community members.
  - Develop metrics and standards for urban forest access, such as a metric that everyone should be able to access an urban forest within a five minute walk or one-quarter mile.
  - Consider encouraging bioregional or watershed level planning for urban forests through Planning District Commissions, or at a Federal agency planning level, to ensure that urban forests are managed for optimal health.
  - Support development of adequate funding for regional planning and urban forest installation and maintenance.
  - Develop metrics for measuring how well urban forests are being managed for resilience, sustainability, health and safety.

- Through an effective public awareness and education campaign, increase the value placed on trees and urban forests as an integral piece to sustainable infrastructure. Increase UCF visibility in public space planning, infrastructure and private development. Develop design standards for UCF to have a higher priority over development, and focus on no net loss of existing urban and community forested areas.
- Create measureable means for both urban trees and site preparation (maintenance, preparation, watering and pruning needs) to be an integral part of a city's planning process. Urban and community planning, as well as architect and landscape architect-driven designs need to pay particular attention to designing for urban trees and forests as it is not possible to put them in as afterthoughts.
- In the development process, foster the expectation that architects should specify urban forests at the outset of a development process so they are not eliminated if budgets are cut. Also, encourage reduction or elimination of impervious surfaces that fragment and threaten urban forests.
- Expand opportunities for urban foresters to be part of the decision making process at the locality level. There is a strong need for foresters to be at the table with the planners, municipal utilities, landscape architects, and developers at the beginning of decisions affecting community infrastructure, development, and urban trees and forests.
- Highlight the benefits of contiguous urban forests for wildlife, habitat, feeding grounds, active and passive recreation, and psycho-social benefits of urban forests, especially with regionally-adapted native trees and plants.
- Encourage use of urban conservation easements as a means to preserve remaining forested lands in urban areas. Casey Trees in Washington D.C. has just started this program.

Key Issue #5: Increasing Urban Forest Health, Biodiversity and Resilience

Increasing urban forest health, biodiversity and resilience is a key need, as all thought leaders noted that stresses on urban forests will only worsen in the next decade. Climate change, including pests and invasive species threats, were cited frequently as both a primary challenge and opportunity for urban forests. Many interviewees detailed the multiple potential threats from climate change including changing weather patterns, increased storm severity, increased heat and drought, changes in plant distribution patterns and plant adaptability. They emphasized that additional science, professional collaboration, and planning to prepare for future decades need to start today. To ensure that urban forests will continue to serve their core functions, thought leaders suggested that another strong need is to enhance urban forest tree biodiversity–especially with regionally appropriate native plants.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Develop metrics for urban tree canopies to catalyze collective impact.[6]
- Develop an "Integrated Command Center" approach for urban ecosystem management, to manage, adapt and protect the UCF to rebuild local economies.
    - Use USFS Fire Scope as a model: it has one standard, one language.
    - Support use of arborists as first responders after storms.
    - Foster or initiate federal inter-agency collaboration for managing urban forests after natural disasters.
- Encourage more use of locally grown, regionally-adapted native species by private homeowners, and public urban forests.
    - Work with nurseries to increase the supply of native species appropriate for urban spaces. For example, large shady trees such as hickory are an ideal urban tree species, but are not frequently available because they are hard to start and slow to grow.
    - Work with nurseries to increase the quality of cloned trees that are more disease and pest resistant.
    - Replant urban forests with insect and pest-resistant trees.
    - Support adoption of ordinances that encourage or require use of appropriate native species. Native street trees are important to create stability and functional food webs for a diverse array of animals, insects, and birds.
    - Support data collection and tracking of canopy loss to invasive species, such as the Emerald Ash Borer.

[6] See this link for additional information on Collective Impact: http://www.vee.org/wp-content/uploads/2013/10/collective-impact-basics.pdf

- Assist communities in developing their own nurseries of native biodiverse trees.
    - This might be accomplished through partnerships with schools, cemeteries, botanic gardens and parks, using simple accessible technology such as hoop houses and bare-root planting. Tree Pittsburgh's program can be used as a model for this.
    - Work with Cooperative Extension to expand its programs to include urban forestry, and to assist in constructing nurseries and hoop houses.
- Build on existing partnerships the permaculture community has developed to build new or expanded UCF programs, especially for multi-functional urban and community forests.
- Reengage all sectors of communities to reforest cities as resilient, vibrant urban ecosystems.
- Support development of region-specific climate change plans, for both short and long-term. The potential consequences of climate change for urban forest health and resilience are significant, and can also vary significantly between regions.
- Plan for regional UCF management and planning; different regions have different urban forest needs for planning for water, soil health, species selection and management regimes and should be taken into account at the city, state and federal levels.
- Support research into urban forest tree species that are most resilient for a number of future climate change scenarios (e.g. drought, heat).
- Support community education to increase UCF accessibility and program implementation.
- Support education about and use of trees for effective stormwater management alternatives as well as wastewater treatment facilities.[7]
- Support education about the important of soil types for ensuring urban tree health.
- Promote the reduction of lawn area in America, which contributes to air, noise, and waterway pollution, and replacing these with trees. Plant half of America's lawns – 20 million acres – in well-planned naturalized areas, to create a "Homegrown National Park."
- Support use of urban forests for increasing community food resilience, by designing and creating urban orchards, edible forests, permaculture and agroforestry in public and private urban settings.
- Create a ranking of all plant genera by region in terms of: 1. Ability to support food webs; 2. Carbon sequestration potential; 3. Pollination capacity; 4. Watershed

[7] Arcata, California, has an innovative wastewater treatment facility that has a wetland and community forest with education and recreation as core components.

management. This ranking is currently being done for food webs, and could be expanded to forests.[8]

Key Issue #6: Expanding and Targeting Urban and Community Forestry Research

Expanded research was cited as both an area of progress in the last decade and also a strong continuing need in the next ten years. Thought leaders noted three primary needs around science and research: 1) validating and replicating research, 2) creating value-added research – conducting research in areas it is most needed, and 3) science delivery – how to use the science and make it accessible and relevant to leaders in community groups, municipalities, and across sectors and agencies. Areas of urgent research needs were suggested in both technical and human arenas, such as improved soil tree pit design for UCF sustained health, climate change impacts, regionally-adapted biodiverse plant species, and replication and expansion of existing studies about psycho-social impacts on human health and safety. The delivery and accessibility of research continues to be a challenge, so a priority for the next ten years is to develop ways to make research results relevant and accessible to community members and professionals.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Conduct further social research on understanding potential human health benefits, including economic benefits of UCF, in a more comprehensive and sustained manner. Other research needs include:
    - Conduct more core base research into UCF benefits, to answer simple questions such as "what do birds eat?" which are critical yet little understood.
    - Connect UCF design, placement, and management strategies with Best Management Practices identified in existing and emerging research.
    - Conduct research on the barriers to entry into the UCF field and how to reduce them for young people entering the arboriculture and urban forestry profession.
    - Conduct research on UCF in tropical regions; build on and expand past collaborative research agendas such as a past NUCFAC meeting in Puerto Rico.
    - Expand the availability and accessibility of data and research related to the psychological, health, an ecological benefits of UCF.
- Conduct more technical long-term studies to address the effects of climate change planning on a ten, 20, to 30-year horizon instead of only a six to 12-month horizon.

[8] See Doug Tallamy's research for additional information.

- Gather and utilize data for urban tree canopy assessments; develop a national protocol for how to utilize UTC data nationwide.
- Make research and data accessible to community members, advocates and practitioners so they can regularly utilize it. For example, i-Tree tool data should be able to be shared among different agencies and NGOs within a municipality.
- Increase the number of UCF researchers within the USFS. For example, there are 273 scientists in the USFS but only seven are urban forest scientists. *(Related to Key Issue 14 as well.)*
- Connect research efforts by different federal agencies that have urban forests programs to leverage dollars, and to thereby enable more difficult research into causation rather than correlation.
- Utilize social media in research to gather information from the community of practice and from the general public, being mindful of using appropriate protocols to ensure quality and reliable citizen-collected data. For example, it should be possible to use trained volunteers to help count ash trees in communities, monitor those trees for Emerald Ash Borer, and upload data via a smart phone app.
- Develop an "i-Tree Anthro" to quantify the human health benefits of trees; this could open significant possibilities for potential increased awareness and funding.

Key Issue #7: Building Effective Leadership to Champion Urban and Community Forestry

Most thought leaders felt that urban and community forestry is still vastly underutilized as a source of solutions to issues communities face, primarily because it has lacked vocal and visible champions in the past. While this tide has started to turn, strong national leadership is needed to bring attention to the ability of urban forests to offer cost-effective solutions to critical community environmental and human psycho-social issues, from stormwater management to nature deficit disorder. Working through public and private partnerships, expanding the capacity of existing nonprofit organizations, and clarifying the purpose and function of existing groups (such as NUCFAC or the Sustainable Urban Forest Coalition) was discussed as an urgent need in the next decade to foster greater collaboration, communication, and public awareness around UCF. Developing a strong national voice would help mature the field, foster effective collaboration and dialogue, elevate public awareness of urban forestry, and advance the use of urban forests as a core go-to solution for community problems, of equal importance to housing and transportation.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Develop effective leadership, collaboration and coordination of the variety of local, state and federal partnerships, in addition to nonprofit and industry partners. Utilize and maintain the existing network of partnerships and agencies that exists to build a national voice for UCF.

- Develop methods for national UCF leaders to understand and connect to UCF needs at the grassroots level in communities on an ongoing basis for issues such as in creased funding for UCF maintenance, protocols for data management, and opportunities to share best practices at the city and regional scale.
- Build on the leadership work of SUFC, in collaboration with SUFC and NUCFAC.
- Expand and clarify NUCFAC's role and identity to continue to advance UCF nationally.
    - Align research goals and agendas between The National Research Advisory Council (NRAS) and NUCFAC.
    - Advance and communicate the Vibrant Cities Task Force recommendations – this could be a possibility for NUCFAC or NUCFAC and SUFC working in partnership.
    - Increase the representation of nonprofits in NUCFAC.
- Work in a coordinated manner with a national leader to highlight the importance of UCF in the political arena; clear leadership at a national level will help increase funding opportunities and create partnerships with elected officials for UCF.
- Build nonprofit leadership to increase outreach and networking efforts.
- Enlist constituent groups to lobby for improved and expanded UCF programs.
- Enlist a national UCF leader to engage health advocates, educators, youth, and community groups, going beyond those already engaged to broaden the base of allies in UCF.
- Bring federal agencies together to collaborate and communicate to better understand what each agency does and how agencies can work together to meet cross-agency objectives by shared means. Strengthen the role that USFS plays in this regard, increasing convening, leadership and facilitation opportunities by USFS with other federal agencies.

Key Issue #8: Increasing Funding for Urban and Community Forestry

Increasing funding at all levels – from federal agencies, foundations and municipalities – was discussed by almost all thought leaders as a strong need to advance urban forestry in the next Ten-Year Urban Forestry Action Plan. If community forests are to provide the infrastructure support needed to create sustainable and resilient communities, then forests need to be maintained properly, canopies need to be expanded, and emerging uses and functions for these forests need to be understood and utilized. Funding for urban forestry has been cut significantly in many localities throughout the nation, and sometimes even eliminated, since 2008. Interviewees noted that federal funding for urban forestry has not increased substantially in the past decade. If this community asset is to fulfill its potential, more funding is strongly needed,

both from federal sources as well as more public-private partnerships. Thought leaders noted the need to look to new funding sources for UCF, to look to public-private partnerships for new opportunities, as well as connecting the benefits and needs of UCF with non-traditional sources of UCF funding. For example, interviewees noted the new policies around carbon in California have become a significant source of funding for UCF organizations and agencies. Other new sources of funding could include the health community and other federal agency programs such as EPA's stormwater program.

IDEAS FOR ACTIONS - Gaps, Needs, Opportunities

- Use funding to guide and reward appropriate ecosystem management, including proper maintenance.
- Invest in the human component of UCF (human energy, intelligence, systems), using community engagement and facilitation.
- Use "seed funding" for support resources and staff, to encourage cities and states to support UCF programs.
- Increase funding and grants for planting and, more importantly, maintenance of trees and urban forests; trees are often maintained in a reactive rather than proactive basis which can be detrimental to tree life and UCF health.
- Maintain a dedicated source of UCF funding at the USFS. UCF funds should not be directed toward fire control. The USFS UCF program needs to be viewed as having a greater level of importance by state foresters and USFS leadership to retain and expand funding levels.
- Foster collaboration around funding resources between municipal forestry institutions and nonprofits, and among nonprofits – "a rising tide lifts all ships."
- Increase public awareness about the benefits and needs of UCF so they are more likely to support increased funding for UCF at the community, state and federal level. *(Related to Key Issue 9 as well.)*
- Revise the current USFS cost-share program grant structure for how funding is distributed. Currently all funds go through state foresters, but the USFS frequently isn't aware of how effective that funding is or where it is having the greatest impact. State foresters may not want to direct funding toward cities, potentially preferring to fund non-urban projects. Develop more opportunities for federal funding to go to NGOs and municipalities. *(Related to Key Issue 14 as well.)*
- Increase federal funding for UCF to support developing state and local programs (especially those that were most severely cut during the economic downturn). An increase of the current budget by tenfold was mentioned as an important target. Develop a sustainable long-term source of funding to support new higher program dollar amounts. Sustainability of this funding is important, including for continuity of the program itself.

- Develop new innovative sources of funding for UCF from private foundations, a small tax on gas/fuel, carbon sequestration legislation, redirecting redirect a portion of the existing gas tax from gray infrastructure to focus on green infrastructure, or utility businesses. Look for funding opportunities that have overlap with UCF but are not strictly focused on UCF. Examples of these funding opportunities might include:
    - Projects related to city infrastructure requirements.
    - Linking tree work to stormwater management fees, regulatory processes, and permitting processes.
    - Funding from Climate Change grants or programs, taking advantage of the use of trees as carbon sinks. Thirty percent of the *States National Assessment* respondents also suggested utilizing UCF for climate change mitigation and carbon market trading.
    - Air quality funding offers other sources of new funding for UCF, to implement Federal legislation such as the EPA Clean Air Act. For example, in California, the UCF program received $17 M from the state's Greenhouse Gas Initiative for cap and trade (the nationwide budget was $25M). Also, California approved the use of Urban Forestry as a mitigation measure to improve clean air, and in Sacramento urban forestry is used as a common method to comply with the new air quality laws.
    - Connect federal agencies to share cross-agency funding and connect program goals.
    - Look for funding opportunities to go beyond existing partnerships to organizations and fields in which trees and urban forests play an integral (but perhaps under-recognized role) regarding funding. For example, the nonprofit Trees Pacific partners with the NFL pro-bowl in Hawaii who does fundraising for them as a way to offset the environmental impact of games. They also partner with utility companies, who have a vested interest in the management of urban trees.
    - Seek funding from private foundations such as Kresge Foundation, whose grant program gives $100,000 to five cities to advance resiliency.
    - Apply a carbon tax as a funding resource under the premise of paying for what we take from the environment.
    - Dedicate 1/100th of a cent from every gasoline sale to fund UCF.
- Develop standards for and require Best Management and Design Practices (such as the Sustainable Sites Initiative[9]) for urban forestry in federal infrastructure programs. Federal infrastructure programs should require UCF where applicable and as standard practice.

[9] See www.sustainablesites.org for more information.

- Refocus and refine NUCFAC's ability to fund new and innovative ideas in the grant program.
    - Conduct UCF cost-benefit analyses by broadly-focused multi-disciplinary groups (not only advocacy groups) to increase credibility of the analyses.
- Connect UCF to top wildlife issues such as the need for additional habitat and food for pollinators. For example, Trees Forever did a strong public relations campaign that connected the role of trees with pollinators which was very successful.
- The National Forest Foundation could serve as a fiduciary body for Forest Service Research and Development as it does for the National Forest. *(Related to Key Issue 14 as well.)*
- Implement the model of how Jim Lyons' USFS Urban Resources Program, which could appropriate resources to help leverage additional funding; this program captures dollars from different fields (i.e. stormwater management), combines them in a large pot, and redirects them to where they are needed and can make the most difference—i.e. trees—in UCF funding opportunities across the field.

Key Issue #9: Expanding Public Awareness, Education and Environmental Literacy

Most thought leaders noted the need and opportunity to raise public awareness of UCF and increase UCF educational opportunities at both the community and national level. Urban forests need to be viewed as key infrastructure at the municipal, neighborhood, and home scale across America. A national-level public awareness campaign is needed with celebrity participation, social media, and a strong public relations campaign. A strong "boots on the ground" approach by nonprofit and community groups is also needed to connect communities with their urban forests and to highlight the role and benefits of urban forests. For example, giving away and planting fruit trees has successfully started many UCF programs in places such as Pittsburgh and Los Angeles. Most thought leaders also viewed creating or expanding programs in natural resource education, environmental education, and environmental literacy as a key need at multiple scales – in the home, in all levels of education, with school and community groups, in municipalities, and within the field itself.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

Public Awareness

- Develop a massive collective effort to create a national public awareness/education campaign, re-branding UCF with a pop-culture driven public relations campaign, with social media, radio, TV, billboards, and advertising to significantly increase national awareness of UCF. Develop a catchy campaign title such as "Not Just a Tree Hugger." Develop a website with celebrities promoting UCF, and pathways for practitioners to collaborate to a greater level. Utilize well known public relations companies to develop this, or potentially USFS public relations staff members.

  - Use an icon like Smoky the Bear or Lorax type of character that speaks to kids and adults alike.
  - Focus on social media to reach a wide audience in a short period of time around key UCF issues.
  - Take advantage of existing networks like SUFC and the Alliance for Community Trees to build a public awareness campaign.
  - Focus on public awareness at the community, state and federal levels.
  - Use multiple avenues to highlight the importance of trees and UCF through ideas such as happy hours to school program education.
  - Market the *benefits* of trees and not just the trees themselves.
  - Increase the focus on climate change in the discussion around UCF and planning for the future of communities. Focus on how UCF and plants create climate resilience at a basic level, which is a strong need in public awareness and communication.
  - Focus public awareness efforts on how urban forests are the habitat for urban citizens. For example, the bald eagle didn't rebound until its habitat was restored and protected. Focus on the effects of the destruction or loss of function of our human habitat – urban forests – and how to take action to halt its destruction.

- Engage citizens in UCF awareness and education opportunities with a focus on understanding trees and urban forests as a vital part of a community's health, essential services and infrastructure. Communicate the benefits of trees in health care and energy savings to citizens.
- Translate key UCF documents and resources to other languages so they are accessible to a wider range of citizens and practitioners.
- Develop an urban forestry communication hub (such as the "Eco Piazza" independent web-based communications website under development by Ed Macie of the USFS and others) for practitioners to discuss UCF issues, acquire resources, and where communication and cross-pollination of ideas can take place.
- Focus UCF outreach by theme and by population to increase efficiency of communication.
- Implement fruit tree giveaway and planting programs, potentially with shade trees as well. This has been a highly successful approach in some communities for increasing UCF interest and awareness.
- The Faces of Urban Forestry program from the Arbor Day Foundation is a model resource for public awareness. They are working on telling the story of different individuals whom have benefited from local, state and federal programs and investments.

- Support the professional standards of the International Society of Arboriculture and the Society of Municipal Arborists to increase recognition of these safety and professional standards in the field.
- Create a youth-focused UCF conference with a focus on both raising awareness of UCF, increasing environmental literacy and stewardship, and building awareness for the next generation of UCF leadership.
- Develop environmental literacy programs to create a more informed citizenry who will influence our natural resources in the future. For example, in 2014, the high school Envirothon competition 2014 theme is Urban Forestry. This type of activity helps raise public awareness of the field of urban forestry and with youth.
- Address the misperception of the costs and hazards of urban trees in a public awareness campaign (such as trees falling on top of houses, bikes running into trees); the actual risk of urban trees and urban forests is extremely low.
- Develop a strong public awareness effort around the biophysical needs of trees, geared toward planners, designers and architects, such as creating sufficient space, healthy soil, and efficient watering and maintenance programs for urban trees and community forests.
- Create a UCF public awareness campaign that is specific to policy makers to impart the importance of urban forestry and to make UCF research relevant. Create model ordinates or model legislation to promote UCF and share it with local, state and federal elected officials as they frequently don't have the UCF expertise but do have a design to "green" their cities or focus on sustainability efforts. *(Related to Key Issue 6.)*
- Increase communication opportunities between researchers and policy makers at a local, state, and federal levels. *(Related to Key Issue 6.)*

Educational opportunities and Environmental Literacy

- Develop opportunities for students in schools to utilize urban forest tools in their communities, especially at the middle and high school levels. These opportunities should include learning about the function and design of urban forests. Children will help educate their parents—for example children who grow up in a home without trees are less likely to plant trees around their homes when they are older.
- Develop urban education programs for children where they are already living and learning, with a focus on cities as urban ecosystems, urban and community forestry issues, and environmental educational opportunities in cities. (Thought leaders noted that many children may not ever make it to a national or state park, and will learn about natural resources and stewardship in the urban environment.)
- Develop a dedicated source of federal funding for a national urban and community forestry education program. Extension services could help implement this education program.

- Foster the development of UCF education from the elementary to graduate school level, but especially at the college level within planning, landscape architecture, engineering, and public works fields to ensure UCF literacy.
- Design outreach programs for academics, and for public works managers, to help them understand the function and appropriate design of UCF.
- Implement tree planting programs in schoolyards where children spend most of the day and where there are existing programs for tree care stewardship and maintenance. Connect with SOLs, common core science standards, and other teaching standards around UCF, environmental education, and opportunities to engage youth in UCF.
- Connect UCF with existing educational programming and resources, such as the Children and Nature Network (Richard Louv's organization -- www.childrenandnature.org), and environmental and outdoor education schools.
- Plant urban orchards and urban forests at schools as both demonstration sites, outdoor classroom laboratories for science and environmental education, as a vector for teaching about STEM (science, technology, engineering and math topics), urban ecology, and around urban and community forestry.
- Connect UCF and urban ecosystems educational opportunities to the new Next Generation Science Standards (national teaching standards), Standards of Learning, and other national school testing focus areas.
- Connect UCF issues and ideas for the next Ten-Year Urban Forestry Action Plan with educational leaders at events such as the Children and Nature Network 2015 conference.

Key Issue #10: Improving Urban and Community Forestry Management and Maintenance

Many thought leaders noted that current urban forestry funding and programs focus on tree *planting*, but not maintenance. Many noted the need for a shift in focus to maintenance and management of urban *forests*, rather than just trees, along with supportive funding. Regionally appropriate design and maintenance strategies for these forests need to be developed to reflect regional soil and environmental conditions. Further, these design and maintenance strategies also need to take into account and safeguard specific eco-services provided by urban forests, such as wildlife corridors, urban orchards ("food forests"), air quality, water quality, and stormwater management. Thought leaders noted that urban forest design, maintenance, and management strategies need to be developed before planting initiatives are started. For example, soil pits need to be designed for trees that require soils specific to Rocky Mountain West-adapted trees, and watering strategies need to take into account the needs of regionally-adapted trees (i.e. trees native to Denver have different water needs than trees native to Boston). Finally, the benefits of regional-scale urban forests to humans and the environment need to be taken into account when planning their planting, maintenance and management.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Increase funding for UCF maintenance and management; programs need to be developed with maintenance and management planned for at least three years to ensure survivability of urban trees and forests. *(Related to Key Issue 8.)*
- Focus on the quality and not necessarily on the quantity of trees being planted – it is much better to have incremental and strategic growth of tree canopy to obtain the greatest impact.
- Focus on appropriate urban forestry placement in a community for maximum benefit, overall tree species composition, and connection to habitat and people (such as providing wildlife corridors, recreation areas, or shading for neighborhoods).
- Include trees in the municipal accounting systems. Trees "appreciate" instead of depreciate.
- Offer cities USFS technical expertise on how to utilize the data from the UTC and implement it to be able to measure results over time. *(Related to Key Issue 1.)*
- Encourage development of urban forest programs as part of the municipal public works office, which may be the best place to manage the UCF. Increase the awareness of the importance of trees so they are viewed as a part of the city's core infrastructure.
- Create a model policy for municipalities to adopt that provides incentives to protect trees so they cannot be cut down if they are greater than 15 inches in diameter.
- Manage UCF at a regional scale rather than by municipality. For example, it is much more cost and time effective to control pests regionally *(related to Key Issue 4).*
- Focus on ways to increase awareness and training for how to properly establish and maintain both existing and newly planting trees, how to utilize technology and data for best UCF placement, and to implement UCF Best Management Practices for optimal urban tree health so there is no net loss of canopy in communities.
- Focus on soil health to increase urban tree and urban forest health. Soil replacement is frequently needed when planting new trees in previously hard-capped soil because it is so highly damaged.
- Develop programs to decrease the amount of impervious services in municipalities. Models for achieving this include the Urban Conservation Easement program that Casey Trees has developed, through water quality enhancement policies, or incentives for planting and protecting urban forests. There is a continuing increase of impervious surfaces in most urban areas; in New York City, impervious surfaces have reached somewhere around 60-70%.

- Develop a national UCF management and maintenance plan for sustained UCF planning, health and maintenance in collaboration with NGOs, and state and federal governments. This program should not be directed from the federal level only as federal priorities change and program implementation could be threatened over time. Work on the ground with the communities to implement such a program, asking for help from nonprofits to work as bridges between the federal and state governments and the local communities.
- Expand the Forest Inventory and Analysis (FIA) to include urban forests to gather information on the structure, function and value of urban forests; there is a significant amount of private land in urban areas, so this offers an opportunity to identify private lands where tree canopy could be increased.
- Increase utilization of UCF for biomass and wood products instead of wasting urban forest wood.
- Utilize the technological advances in remote sensing to improve the UTC Assessment.

Key Issue #11: Enhancing Stewardship of Both Trees and Their Urban and Community Forests

Stewardship of urban forests is seen as more than just a maintenance task for community staff. Most thought leaders suggested that stewardship in future decades will not be possible without community engagement and support. Thought leaders suggested that more focused funding and programming for stewardship and volunteer engagement is most needed at the local level. Programs such as Tree Pittsburgh's Tree Tenders training program was cited as a model example for volunteer urban forest care and stewardship. Training was cited as a strong need for professional arborists, municipalities, and community groups.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Use the Asset Based Community Development (ABCD) tool to approach communities around increasing UCF programs.
- Focus on UCF planning and maintenance models that can be replicated in other communities to create efficiencies and cross-jurisdictional learning.
    - Develop programs for training and education around proper care for urban trees in private yards and properties.
- Utilize the successful Tree Tenders Program from Tree Pittsburgh as a model to teach volunteers how to work with trees (http://treepittsburgh.org/become-tree-tender).
- Develop incentives for homeowners to plant larger trees in backyards; to do so, focus on benefits for private landowners and homeowners to plant urban trees.

One example is the Virginia Cooperative Extension program to plant native fruit trees in riparian buffers.[10] Several thought leaders suggested fruit tree planting and giveaway programs as a means to engage community members in urban tree planting and then possibly as a means to also plant larger shade trees.

- Incorporate into a national public awareness campaign ways to increase public involvement in valuing, actively participating in, expanding and caring for UCF. Twenty-six percent of States report in the *National States Assessment* that a lack of community involvement or capacity is a serious challenge.
- Develop multiple means for UCF stewardship including trained volunteers and municipal engagement for sustained UCF care. For example, in Portland, Oregon all municipal trees are maintained by citizen volunteer groups, whereas in Milwaukee trees are cared for as part of the Public Works department urban forestry maintenance program.
- Connect civic stewardship examples with UCF educational opportunities: people will care for something they understand. For example, when people learn that a chickadee needs 6,000 to 9,000 caterpillars for one clutch of chickadees to grow, they may place an increased value on urban trees and their ability to support urban wildlife.

Key Issue #12: Building Professionalism and Broader Access to the Field

Enhancing professionalism and increasing access to urban forestry is a core need in the next decade. The more communities recognize the multiple cost-effective ecosystem and human health services provided by urban forests, the more urban forests will become an essential element in community infrastructure. In turn, proper maintenance of urban forests to ensure that they are delivering these benefits will become a more urgent community priority, creating a need for knowledgeable, trained staff. Already many cities, companies and NGOs aren't able to fill tree care positions, and this demand is only expected to continue growing in the next decade. New training programs are needed in both academic settings, within communities, and among professionals, as well as the opportunity to learn about international arboriculture practices. Internship and professional exchange programs were suggested as a strong need, as well as developing urban forestry programs in urban areas, with outreach particularly to those that may be unfamiliar with the field and to increasingly diverse groups.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Increase the funding base for urban ecology education programs in state universities.

[10] See this link for more information: http://www.jswconline.org/content/69/2/140.refs

- Increase the number of UCF professional training programs at multiples scales including university undergraduate and graduate levels, continuing education opportunities for professionals in allied fields, as well as vocational tree care work programs in vocational schools or at the community college level. Connect these programs with real world UCF experience and training. Ensure that these opportunities include African-American colleges with programs such as the one at Southern University, which are key to engage traditionally underserved community members in urban forestry and arboriculture *(connected with Key Issue 13).*
- Expand existing successful private sector UCF professional training programs and college internship programs such as that offered by Society of Municipal Arborists.
- Rebrand and increase awareness about the tree care profession as it is not well known and is often misrepresented and as a result, there is difficulty recruiting people to enter this profession. Increase the connection around how the tree care profession is a "green job" and to federal programs around green jobs.
- Replicate the USFS Southern Region program of scholarships for urban forestry studies in other regions.
- Hold one significant UCF conference that has a large audience to create more professional cohesion, coordination, and collaboration, instead of multiple smaller conferences.
- Build on existing and new partnerships to innovate UCF educational opportunities with allied professionals such as planners, landscape architects, and engineers *(connected with Key Issue 3)*.
- Increase awareness of the UCF profession so it has higher recognition and importance at the municipality level, within allied professionals, and the public. UCF professionals should be consulted when decisions within a community will affect the urban forest, such as clearing for a new roadway.
- Develop connections and collaboration opportunities with international urban forestry professionals, such as through the International Society of Arboriculture chapters abroad.

Key Issue #13: Increasing Diversity for Social Justice and Inclusivity

In order for significant headway to be made in addressing these key issues in the next ten years, it will be imperative to increase diversity within the urban forestry profession as well as to increase diversity in citizen leadership and engagement. For community forests to be stewarded by their communities, their communities must assume ownership of their forests. Residents of all ages, cultures, race, and gender need to relate to their own neighborhood trees, and understand that these trees are part of a larger whole that creates a healthier community. Whether business owners, property owners, homeowners, tenants, commuters, or youth, all have a role and all need to be engaged. Achieving diversity in both the profession and

citizen leadership and engagement is seen as a pivotal baseline, without which urban forestry will continue to struggle to achieve its other key goals. In order to do this, thought leaders noted that working through existing NGOs, community groups, schools and churches is key to engaging people in underserved communities, as is increasing awareness of the importance of UCF. Meeting people where they are and connecting to what is important to them is key to increasing both awareness and canopy cover particularly in underserved communities. Additionally, increasing the number of UCF training programs in African-American colleges, as well as in urban areas and new venues in partnership with established community groups and NGOs, was suggested as a means to increase diversity in the field.

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Focus on underserved communities as a top priority in the next Ten-Year Urban Forestry Action Plan.
- Increase the capacity of USFS staff members to work in underserved communities where the USFS has not traditionally had numerous programs. Expand UCF programs to connect USFS staff with community groups and nonprofit organization leaders in urban areas and to increase capacity for collaboration.
- Initiate a dialogue about the nature, extent and impacts of institutional racism in UCF, a term describing differential access that stems from the perpetration of existing networks of influence. The challenge of institutional racism is that it appears as if collective action is being taken, but with no individual, identifiable perpetrator. The goal of the dialogue would be to raise awareness about this difficult issue while enabling people to discuss it in a safe and open manner.
- Develop partnerships with the human health, food justice and environmental justice movements to learn from their knowledge about community empowerment and how to work effectively in underserved communities.
- Develop relationships and work with existing nonprofit organizations, school, church and community groups to building partnerships and opportunities to collaborate around UCF in underserved communities and especially low-canopy or low-income areas. Invest in these existing nonprofits to expand their capacity for UCF programs, including their ability to educate their communities, establish and maintain urban forests, and address other UCF opportunities and challenges. Use their communication streams and networks to learn and develop culturally appropriate engagement methods for UCF.
- Direct UCF funding to underserved communities and low-canopy neighborhoods. Focus on UCF expansion and maintenance in low-canopy and low-income neighborhoods.
- Use fruit tree giveaway and planting programs as a means to engage community members in urban tree planting and possibly as a means to also plant larger shade trees *(connected with Key Issue 9).*

- Develop "shovel-ready job" UCF opportunities, similar to the Civilian Conservation Corps, to find green job placement for unemployed or underemployed citizens in urban forest tree planting, maintenance, data collection and program collaboration. Often, underserved communities have the highest levels of under-employment, thus training in specific aspects of urban forestry would offer an excellent way to engage and build awareness while also building stewardship capacity and real job skills. Offering bilingual training will also help expand access. Lastly, training programs for youth will develop youth confidence, leadership and job skills while also serving as a prime avenue for educating parents.
- Focus on strategies to make urban forestry conferences and volunteer and professional opportunities in the field more inclusive and diverse at the community, state and federal level. These need to be long-term sustained efforts for real change. For example, create more scholarships made available to youth of color to attend UCF conferences. Another example is to create more UCF internship opportunities focused on youth from underserved and low-income communities.
- Use communication and outreach means that are familiar to those in diverse communities around UCF opportunities, noting that these communication means may not be ones that USFS or UCF professionals commonly use, such as face-to-face engagement, social media, and community group outreach. For example, one UCF nonprofit organization has very successful block parties with music from different cultures, speakers, and where they also plant and maintain urban forests during the block party.
- Utilize the program Enviroscreen as a way to highlight underserved neighborhoods and provide an opportunity to direct funding to places of greatest need.
- Provide training for urban foresters to gain skills in asset-based approaches for more effective community outreach. One example of a successful program is MERGE – *Methods to Engage Residence and Grassroots and the Environment*. Important features of asset-based approaches are that urban foresters would work with established networks of trust and channels of communication (e.g., nonprofits, schools, churches), and facilitate the identification of neighborhood needs and strengths, building on these in ways identified by the neighborhood (e.g., starting with fruit trees), as opposed to coming in with pre-established goals and plans. One example of success was an effort in a low-income Los Angeles neighborhood to interest residents in tree planting by beginning with fruit trees. Another example of a successful approach is the Western Watershed Alliance (WAWA) initiative to work in blighted urban neighborhoods and tackling core environmental issues like controlling mosquitoes and stream bank restoration
- Identify policy barriers for effective engagement in underserved communities, such as zoning ordinances.

Key Issue #14: Fostering Federal Agency Collaboration and Program Improvement

Many thought leaders suggested that urban forestry may reach its potential only when federal agencies are able to collaborate across silos, to leverage their different programs and sources of funding, and to ensure that policies across programs are aligned and streamlined for maximum effectiveness. Since urban forestry was recognized by the federal government as an important program 20 years ago, the role of urban forestry has evolved and grown dramatically. Now, for example, community forests are seen as a cost-effective long-term solution for numerous human and environmental ills – producing cleaner air, cleaner water, reduced stormwater, and a healthier psycho-social environment. Urban forestry is now a central solution to central community problems. But urban forestry isn't fully utilized as a cost-effective solution, and opportunities are lost, because of its programmatic conceptualization 20 years ago. To address this structural weakness, thought leaders suggested several possible strategies. First, federal agencies should be brought together to identify ways that overlapping program goals and funding can be leveraged – e.g. for cleaner air, cleaner water, healthier communities. Additionally, thought leaders noted that the UCF program needs to receive a higher amount of federal funding, and the need for more opportunities for direct involvement and connection with urban communities and the program (for example, many noted that traditional rural-focused forestry models of management are still being utilized by some USFS foresters, and new programming is needed to directly connect foresters with the opportunities and needs in urban communities, which frequently differ from those in rural communities). Finally, there is a need for more oversight of state programs to determine if the needs of urban communities are being addressed (for example, for state foresters to provide information about key UCF tools, resources, and highlights in current research to urban communities and NGOs).

IDEAS FOR ACTION - Gaps, Needs, Opportunities

- Foster increased opportunities for dialogue in the field such as the Vibrant Cities Task Force to bring together people from different fields. NUCFAC is in a perfect position to foster more of this dialogue and collaboration within the field.
- Consider the best placement for urban and community forestry in the USDA Forest Service (USFS) – perhaps moving it to a more central, integrated location within the USFS or to consider partnerships with other federal agencies.
    - Consider moving the UCF program to another federal agency or maybe to a Department Level to elevate its importance and effectiveness at the Federal level – possibly collaborating with other land management organizations such as the Natural Resources Conservation Service (NRCS) or to a higher level within the USFS.
- Increase the importance of the USFS UCF program within the agency to a Deputy-level program; one option would be to bundle all programming related to urban natural resources management at a Deputy Chief level called Urban Natural Resource Stewardship, and this Deputy Chief would report directly to the USFS Chief.

- Improve communication between federal agencies, the community of practice and the lay audience. See Key Issues 3 and 7 for specific ideas for action.
- Provide cultural sensitivity training opportunities for USFS staff members to continue to be aware of and responsive to urban contexts which have a very different set of issues than rural issues (such as ways to effectively work in inner city neighborhoods, engaging underserved communities, and partnering with nonprofit organizations and community groups).
- Develop opportunities within federal agencies for cross-sector engagement to reach different audiences, not just the "usual tree suspects" but ways to "get outside the urban forester identity silo." Greater federal inter-agency collaboration and communication are needed, as well as a need for federal agencies to reach out and connect with nonprofit organizations and the grassroots level.

V. Ideas for Community Engagement

One explicit goal of the next Ten-Year Urban Forestry Action Plan, established by the NUCFAC in its original Request for Proposals for the next Action Plan, is that it must be based on effective and authentic community engagement. When asked about the next Action Plan during their interviews, thought leaders independently confirmed the importance of community engagement when they expressed hopes that the next Ten-Year Urban Forestry Action Plan will reflect thoughts and ideas of the community of practice and general public. Most suggested that the IEN team attend national or regional conferences in order to have a face-to-face engagement. Some suggested that college and association publications be used to disseminate information about the process and broaden stakeholder engagement. Some also suggested enlisting key professional and nonprofit organizations that have long experience in engaging urban forestry stakeholders. Many also offered specific ideas for the "how," not only the "who," to engage.

While the IEN team will be able to personally attend one or two conferences, numerous stakeholder conferences were identified as opportunities for stakeholder engagement as part of the ongoing effort of outreach, collaboration, and increased communication in the next Ten-Year Urban Forestry Action Plan. The IEN team will seek to disseminate information to as many of these conferences as possible to encourage stakeholders to participate in the ongoing digital engagement such as the Partners in Community Forestry Conference; American Planning Association (APA); American Society of Landscape Architect (ASLA); Society of Arboriculture (ISA); North America Congress for Conservation Biology; Good Jobs, Green Jobs National Conference; Canadian Urban Forest Conference; International Union of Forest Research Organizations (IUFRO): XXIV IUFRO World Congress 2014; Children and Nature Network Conference in 2015; and Society of American Foresters (SAF) Conference.

Frontiers, a monthly publication form the Ecological Society of America (ESA) was suggested as a good means to disseminate information to encourage stakeholder engagement. Several

thought leaders agreed to serve as contacts with related fields such as the permaculture community and National Society of Professional Engineers.

A specific concern raised by a number of thought leaders in developing the next Action Plan is the importance of engaging underserved communities. Southern University was mentioned as a good resource, as well as Sustainable Urban Forestry Coalition (SUFC) and the National Alliance for Community Trees (ACTrees), as well as other community groups.

These thought leaders suggested that engagement with underserved communities has not been effective in the past two decades for several reasons. First, they suggested that the profession itself is not diverse and has not developed a high comfort level or experience in working with low-income or multi-cultural communities of color. This led to recommendations for the next decade for diversifying the profession and providing professional training to increase both comfort and experience in this arena. A closely related issue is that networks of trust between urban forestry and underserved communities are either rare or not yet established, which fundamentally undermines and renders ineffective efforts in underserved city neighborhoods.

This led to a recommendation that urban forestry professionals partner with nonprofits and other community groups that have established networks of trust with underserved communities. When people are approached through their networks of trust – friends, neighbors, trusted community partners – the ability to engage community members can be transformed from an uphill battle to one of enthusiastic participation. Using established networks of trust also enables creative points of entry. One thought leader gave an example of how an attempt to offer shade trees to an underserved neighborhood fell flat, until they decided to offer fruit trees, which caused a rush on the supply of fruit trees. As people were educated and had a greater understanding for the importance of trees, the demand then also quickly expanded to encompass shade trees. This example demonstrates the importance of finding entry points that are meaningful to neighborhood residents. The urgency of this need to reach underserved communities could not be overstated, according to these thought leaders, as forests are core infrastructure for healthy city ecosystems. If the next decade is to be successful, urban forests must be planted, stewarded, and fully functional in all parts of a community, not just in neighborhoods of means.

VI. Hopes for the Next NUCFAC Ten-Year Urban Forestry Action Plan and Conclusion

Thought leaders expressed numerous hopes for urban and community forestry and for its next Ten-Year Urban Forestry Action Plan. Many expressed the hope that the field will become more cohesive, building bridges to enable public and private practitioners to work together more effectively. Many noted the hope that funding will catch up with, and keep pace with the continuing growth in urban forestry. Lastly, many expressed hope that the field will find ways to share and leverage limited resources more effectively, to avoid duplication and share experiences.

In terms of how urban and community forestry is understood by others, many expressed the hope that the public will come to value trees for their role in the larger urban forest, and will understand that these forests provide important community services that need their attention as well as attention by professional "doctors."

The Vibrant Cities Report was cited numerous times as an important starting point for the next Ten-Year Urban Forestry Action Plan. Many hope it will serve as a primary guiding document for the next Plan, while also expressing the hope that NUCFAC and other organizations will embrace implementation of the Vibrant Cities Report more aggressively. In terms of the next Action Plan itself, many articulated the need for a clear "short and sweet" plan, with specific achievable goals rather than vague or lofty goals. Yet others expressed the need to not "simplify" the ideas for actions and goals in the Action Plan to the point of losing their meaning and possibility for impact. Some even expressed the hope that the plan would become a kind of accessible "Bible," or the go-to document for the broad community of practice, including state programs, professionals and planners who can take urban forestry to the next level. Hopes were expressed that the plan will contain specific actions and recommendations that each stakeholder can take on, including NUCFAC, and that it identify which actions might be best suited for which stakeholder in order to accomplish the broader ten-year goals. Finally, most thought leaders shared their hope that the next Ten-Year Urban Forestry Action Plan will inspire leadership within federal and state agencies, business and private sectors, and even Congress.

Another hope expressed by thought leaders is that the next Ten-Year Urban Forestry Action Plan should be inclusive, addressing the needs of all communities of all sizes, large and small, and of all means, privileged and underserved. A core hope for the next Ten-Year Urban Forestry Action Plan is that it will help urban forestry increase environmental justice throughout the country.

In terms of how the plan will be used by NUCFAC, several expressed the hope that the Plan will encourage or enable NUCFAC to fund innovation in the field, help clarify the Council's identity, and help clear the way for NUCFAC to be a stronger leader in the field. They expressed the idea that innovation is an important way for advances to be made, and that funding shouldn't be tied to programs that are only a sure success. It should be okay for an innovative effort to fail, as lessons can be learned from that, while those that do succeed can serve as a model for others to replicate or adapt in other parts of the country.

Finally, several expressed the hope that the Action Plan will be consistently utilized by NUCFAC during the next decade, with the capacity to offer a clear roadmap that will facilitate accountability, and enable it to be updated, revised and reported on annually at the Partners in Community Forestry Conference and within the USFS as well.

Conclusion

As a whole, thought leaders are acutely aware of the environmental, economic and political challenges facing urban and community forestry, and are stalwart promoters of the promise that urban and community forestry offers for the future of America. The future is bright for the field of urban and community forestry in the coming decade, as a core contributor to healthy, strong, and vibrant cities across our nation.

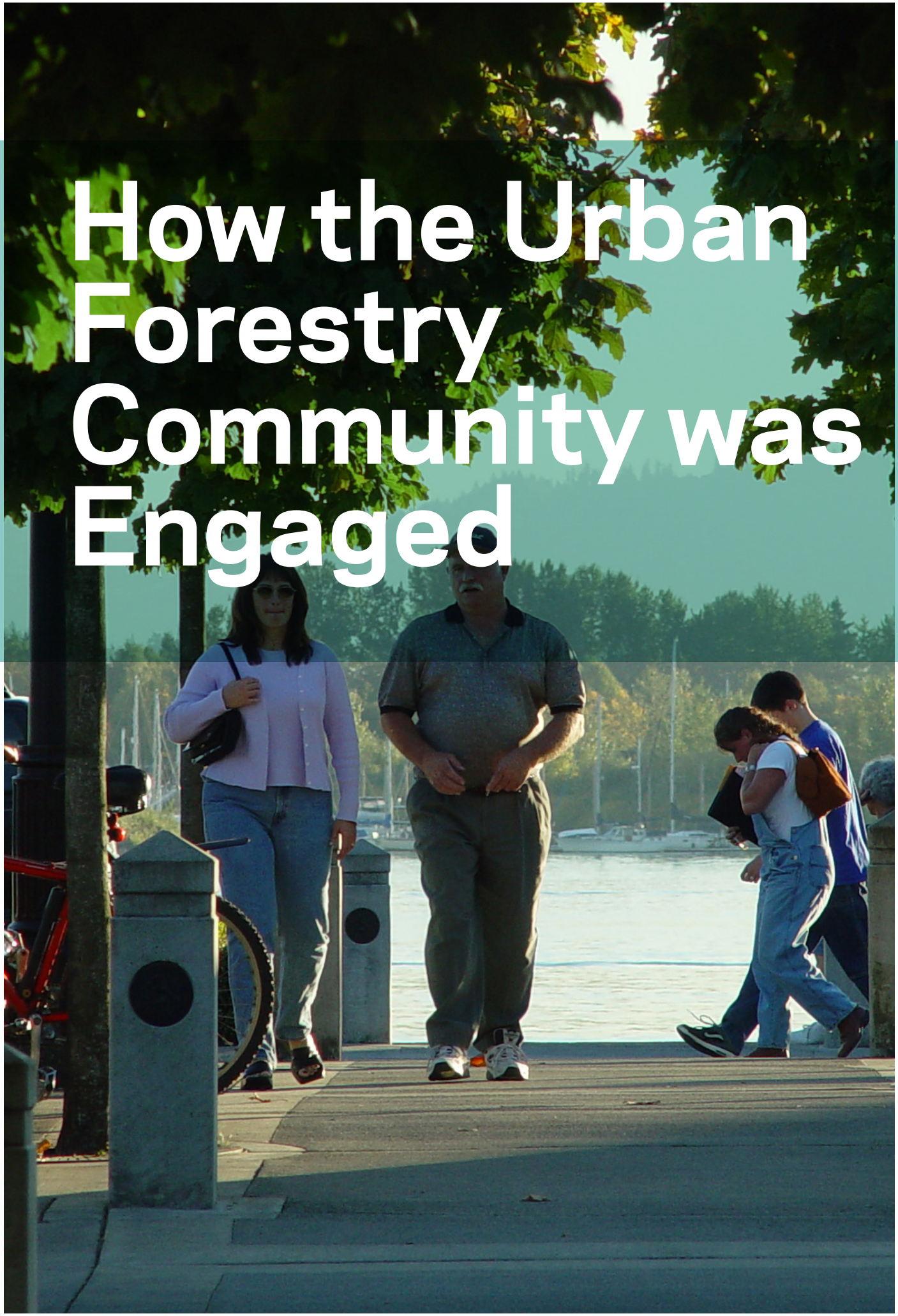


Photo credit: Guy Kramer

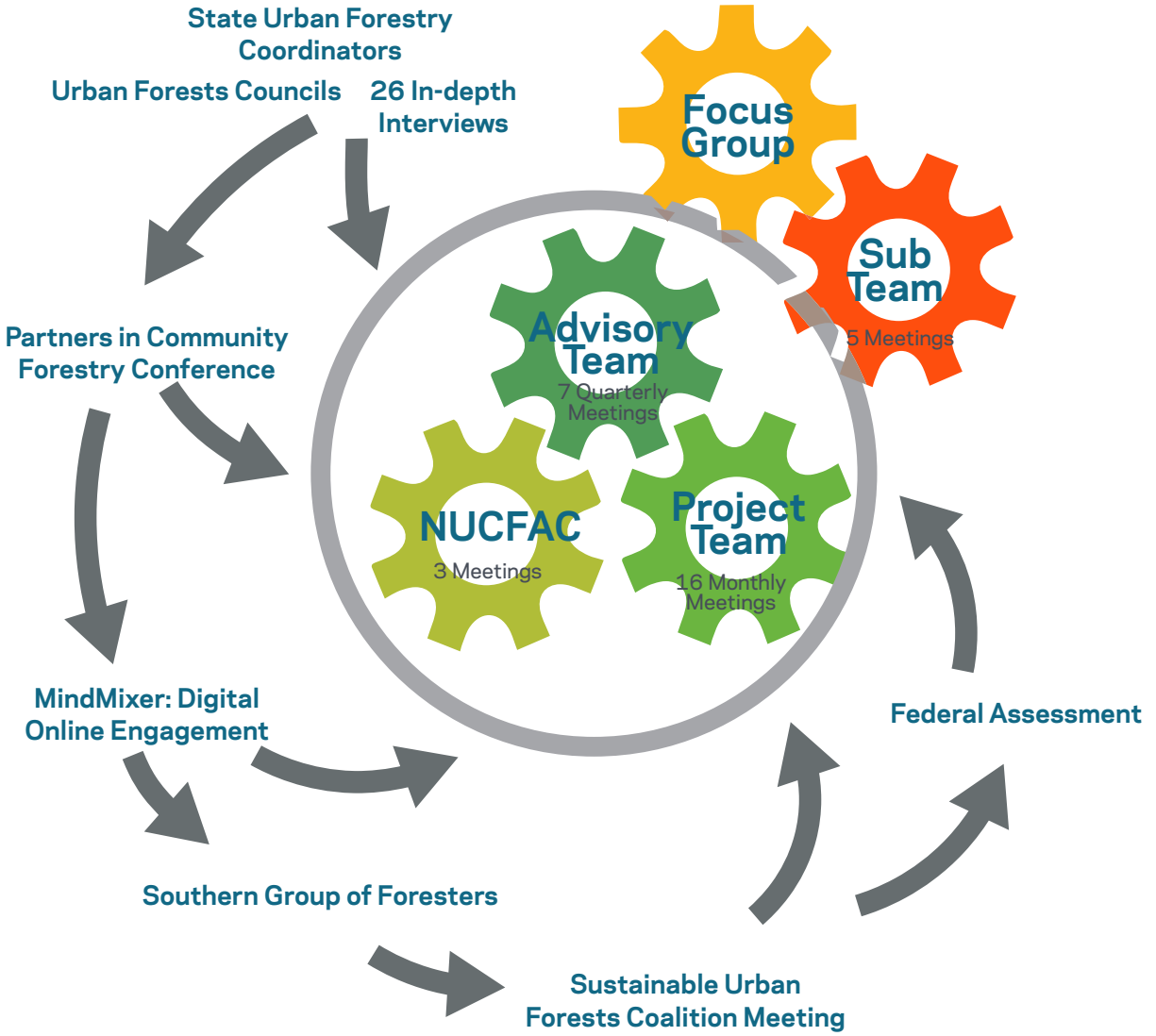
How the Urban Forestry Community was Engaged

Urban Forestry Community Stakeholder Engagement

A national stakeholder engagement using the MindMixer Platform, elicited urban forestry community feedback during November and December 2014. Participants prioritized the 14 Key Issues and developed ideas for implementation strategies. Nearly 3,000 unique individuals visited the site, about 550 people answered one or more questions, and there were more than 15,000 page views. The average age of participation was 47, and more than half of the participants have ten or more years of experience in the urban forestry field (see graphics to the right). While nearly every state had someone participating in the engagement, most participants were from coastal and metropolitan regions.

Additional input and guidance on priority was provided by input from the PT, AT, NUCFAC, USFS, as well as the Southern Group of Forester

These inputs were synthesized into a Draft Action Plan which was refined through the spring into seven priority Goals with their associated Strategies and Actions.



Ten-Year Urban Forestry Action Plan: Round One Engagement Summary

Stay Engaged! Check our website for updates on the planning process.

www.urbanforestplan.org

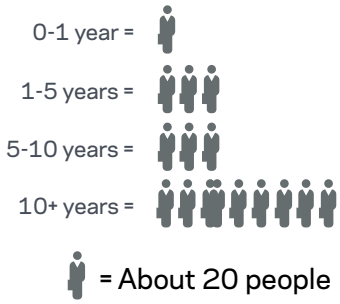
This was the first round of engagement for the Ten-Year Urban Forestry Action Plan for the National Urban and Community Forestry Advisory Council and the Community of Practice. All of these ideas and insights helped us prioritize goals and identify areas of strength, concern, and potential growth in the field. Here you will find a summary of the participation in the engagement.

Nearly **3,000** unique visitors to the engagement site

About **550** individuals answered one or more questions

Over **15,000** page views

Number of Years working in the field

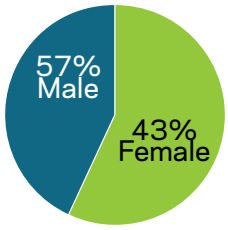


233 Participants did not respond to this question

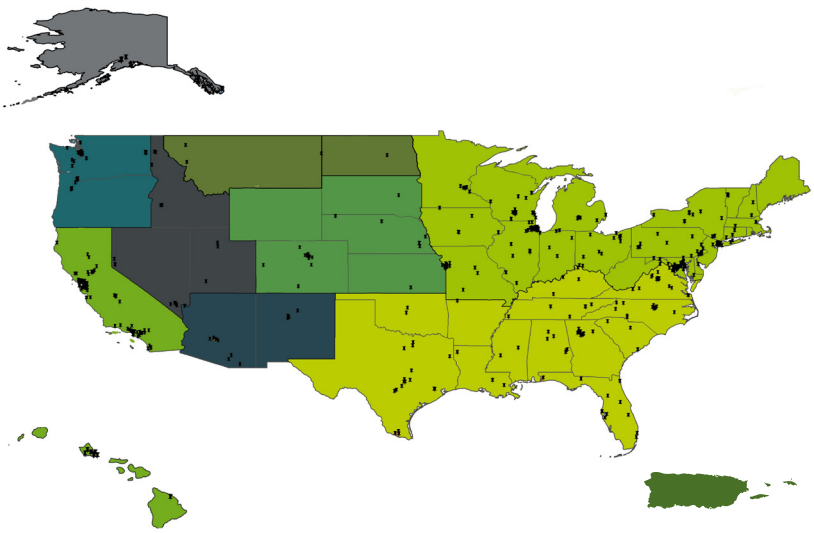
Number of Social Media Shares

47

Average age of participants



Geographical Distribution of Participants in the MindMixer Digital Engagement (November-December 2014)



- Northern (9 participants)
- Rocky Mountain (19 participants)
- Southwestern (7 participants)
- Intermountain (11 participants)
- Pacific Southwest* (33 participants)
- Pacific Northwest (26 participants)
- Southern (76 participants
- Alaska (7 participants)
- Tropics** (1 participant)
- Northeastern (130 participants)

*Pacific Southwest also includes American Samoa, Guam, Northern Mariana Islands, Federated States of Micronesia, Marshall Islands, and Palau

**Tropics includes Puerto Rico and U.S. Virgin Islands

Program Manager Survey for USFS NUCFAC Action Plan or Federal Agency Survey

The IEN Team worked with the USDA Forest Service to create a survey and cover letter for Federal Agencies (below), and then sent the survey to 45 directors of the different Federal Agency Programs related to the urban and community forestry field (see Action Plan Implementation, Section F4). This survey's purpose was to gather information on prospects for leveraging money and increasing partnerships among Federal Agencies. Three directors of the different Federal Agency Programs responded to the survey. Because of the inadequate response, the IEN was not able to use the information collected. However, in the Action Plan, a recommendation is included (see Goal 6, Strategy B) that identifies the need for bringing together the directors of the different Federal Agency Programs related to the urban and community forestry field, so that they can explore ways to work together, increase their collaboration for collective impact, and leverage limited federal funding through partnerships.

Program Manager Survey for USFS NUCFAC Action Plan

Welcome

Thank you for participating in this survey. We anticipate this will take no longer than 20 minutes to complete.

The Institute for Environmental Negotiation is implementing this survey as a contractor for the Secretary of Agriculture's National Urban and Community Forestry Advisory Council (NUCFAC) in an effort to craft the mandated Ten-Year Urban Forestry Action Plan for 2016-2026*. NUCFAC is part of the U. S. Forest Service's Urban and Community Forestry Assistance Program.

Part of the process is identifying collaborative opportunities with other Federal agencies involved in urban and community natural resources. More information about the Action Plan and planning process can be found at www.urbanforestplan.org.

Your responses are instrumental in the analysis of federal agency programs and may help guide funding in the coming years. Please share your contact information on the last page so that the Project Team helping to facilitate the development of the Action Plan may contact you for follow-up if needed.

Your responses will be compiled and reported anonymously in an aggregate form as part of the National Ten-Year Urban Forestry Action Plan, without individual attribution. Individual responses will not be included as part of the final report, but will be used to inform next steps in the development of collaborative opportunities.

Thank you in advance for your time!

If you have questions about this survey, please contact Katie Gronsky at kg3nu@virginia.edu.

_____

*More information about the Urban and Community Forestry Program and NUCFAC

The U. S. Forest Service's Urban and Community Forestry Program (U&CF) plays a critical role in the management, protection and wise use of over 100 million acres of urban and community forest land. For over 35 years U&CF has provided assistance to cities, suburbs and towns, where more than 80% of Americans live, to improve the health of urban and community forests for the benefit of all.

The U&CF Program has authorities and mandates that allow the Agency to improve trees and forests across the public lands where people live. U&CF provides technical, financial, educational, and research services to communities so they can plant, protect, and maintain community trees and forests to maximize social, environmental, and economic benefits.

All Americans benefit from the multitude of services that the urban tree canopy provides: improved human health and wellbeing, green jobs, energy conservation, improved air and water quality, carbon sequestration, recreation, and wildlife habitat. Forest Service researchers have been at the forefront of research, modeling and tools development that now shows the extent and quantitative value of these ecosystem services. The Program is delivered through a continually expanding partnership network of state forestry agencies, local governments, nonprofit groups, the private sector, community organizations, volunteers, other federal agencies, and other Forest Service programs.

The Secretary of Agriculture's National Urban and Community Forestry Advisory Council provides recommendations and guidance, to the Forest Service's Urban and Community Forestry Program and National U&CF Challenge Cost-share Grant Program. Nearly $1 million annually is awarded to nonprofits, local governments, academic institutions, and other partners that generate fresh approaches and science based projects to demonstrate the beneficial impact of urban trees and forests. This partnership network, and the unique public-private partnerships that have been established in communities, are critical to the Forest Service's Strategic Plan goal to "Engage Urban America in Forest Service Programs" and plays an important role in enhancing the quality of life for all Americans.

1

Program Manager Survey for USFS NUCFAC Action Plan

1. In what ways do you think your program relates to, enhances, or is different from urban and community forestry? (See * on first page for more information.)

2. What opportunities and needs do you see for federal agencies working together around urban forestry? (check all that apply)

- [ ] Share tools and resources
- [ ] Avoid duplication of efforts
- [ ] Leverage funding to have greater collective impact
- [ ] Form a federal program Urban Forestry (or similar urban natural resource) "coalition" or "cohort"
- [ ] Coordinate/harmonize program goals

Other (please specify)

3. Do you have any recommendations for improving the status of the Nation's urban forest / natural resources? (i.e. education, technical assistance, modifications to existing programs and policies, etc.)

4. Would it be helpful for a meeting to be convened for federal agency programs related to urban forestry / natural resources to discuss ways programs might leverage funding and or coordinate activities to improve the status of the nation’s urban forest?

- ◯ Yes
- ◯ No
- ◯ Not Sure

If not, what might be helpful to find ways to create a dialogue for coordination and collaboration among federal agency programs whose work relates to, or involves, urban forestry / natural resources?

Program Manager Survey for USFS NUCFAC Action Plan

5. What is your current fiscal year-appropriated budget for your program?

6. Is this amount drastically different from the amounts appropriated in the past ten years?

- ◯ No
- ◯ Yes, much less than previously appropriated.
- ◯ Yes, much more than previously appropriated.

Photo credit: Ed Macie

Program Manager Survey for USFS NUCFAC Action Plan

Federal Program support of Urban and Community Forestry

The public, Forest Service, and partners have identified the following goals and strategies to be integrated into the next Ten Year Urban Forestry Action Plan. Please check the box if your program could contribute to these strategies. Strategies are nested under seven goals. Check all that apply.

7. Goal 1: Integrate Urban and Community Forestry into All Scales of Planning.

- ☐ Support the development of regional-scale master plans for urban forests.
- ☐ Support inclusion of trees and forests as elements of all community comprehensive or master planning efforts.
- ☐ Launch a public awareness and education campaign to elevate the value of urban trees and urban forest ecosystems as essential contributors to community sustainability and resilience.
- ☐ Increase community capacity to use urban forestry in public space planning, infrastructure, and private development.

8. Goal 2: Improve Human Health and Wellness through Urban and Community Forestry.

- ☐ Expand opportunities for collaboration with the health community.
- ☐ Champion a nationwide marketing campaign that links trees to human health and wellness.
- ☐ Plan, design and manage urban forests to improve human health and wellness.
- ☐ Develop tools to improve and highlight the relationship between improved public health, wellness and urban and community forestry and green infrastructure.

9. Goal 3: Cultivate Diversity, Equity and Leadership within the Urban Forestry Community

- ☐ Increase diversity, equity, and accessibility in urban and community forestry.
- ☐ Engage underserved communities in urban and community forestry.
- ☐ Develop effective leadership to build a national voice for urban forestry.
- ☐ Increase workforce development opportunities and green jobs in urban and community forestry, with particular attention to underserved communities.
- ☐ Promote expanded collaboration, training, and communication within the field of urban and community forestry to build workforce professional development.

10. Goal 4: Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience.

- ☐ Increase the biodiversity, health and resilience of trees in urban and community forests.
- ☐ Foster resilience, restoration and sustainability of urban and community forests facing climate change challenges.
- ☐ Support use of urban forests for increasing community food resilience and access to local foods.

11. Goal 5: Improve Urban and Community Forestry Management, Maintenance, and Stewardship

- [ ] Improve urban and community forest management, maintenance, and arboricultural practices.
- [ ] Develop comprehensive programs, policies, and resources for enhancing urban forestry stewardship.
- [ ] Advocate for better use of technology and tools in urban forestry.
- [ ] Facilitate expanded research and delivery of scientific findings to all stakeholders.

12. Goal 6: Diversify, Leverage, and Increase Funding for Urban and Community Forestry

- [ ] Increase funding and grants for urban and community forestry
- [ ] Expand collaboration between urban forestry and related fields, agencies, and sectors to leverage and diversify funding,

13. Goal 7: Advance Broad Public Awareness and Commitment to Action and Stewardship for Local Urban Forest Programs

- [ ] Create environmental education programs that focus on urban and community forestry issues.
- [ ] Create a nationwide urban forestry public awareness and education campaign.
- [ ] Increase engagement of underserved and minority communities in urban forestry establishment and stewardship.

Program Manager Survey for USFS NUCFAC Action Plan

14. Please enter your contact information for possible follow-up from the Project Team.

Name:	
Agency/Program:	
Address:	
Address 2:	
City/Town:	
State:	-- select state --
ZIP:	
Country:	
Email Address:	
Phone Number:	

List of stakeholders engaged from Project Team, Advisory Team, NUCFAC, MindMixer, and Interviews

The following pages list the names of the people that participated either in the MindMixer digital engagement or through list serves and other outreach efforts.

Adam	Cohen
Alaina	Mallette
Alan	Moore
Alan	Haywood
Alex	Roylance
Alfred	Burt
Alice	Hannon
Alif	Burgett
Alison	Berry
Allan	West
Alyssa	K
Amy	Morsch
Andrew	Saunders
Andrew	Walker
Andrew	Koeser
Andrew	Newman
Andrew	Lisignoli
Andy	Padvorac
Angel	Spell
angeloca	garcia
annalee	Garletz
Anne	Fenkner
Anne	Hanenburg
Anne	Buckelew
Anne	Neale
Anne	Gilbert
Annette	Saul
Anthony	Hilliard
Art	Chappelka
Arthur	Lyle
Axel	Ringe
Bailey	Johansen
Barbara	Garrity
Barbara	Richards
Barry	Kreiner
Beige	Turner
Bert	Cregg
Betty	Perez
Bill	Jenkins
Bill	Hickman
Birgit	Sharp
bob	gorton
Brady	Simmon
brenda	k
Brian	Wahl
brian	dierks
Brian	Kane
Brian	Berg
Bryce	Ruddock
Burk	Renner
Busara	Firestone
Caitlyn	Snyder
Cara	Boucher
Carla	Calhoun
Carla	Calhoun
Carol	Kwan
Carolyn	Hall
Carrie	Gallagher
Casaundra	Calloway
Cass	Turnbull
Cassi	Saari
Cassie	Schumacher-Georgopou
Catherine	Conolly
Cayenne	Engel
Cene	Ketcham
Chadwick	Clink
Charlene	Kuprel
Charles	Newton
Cheryl	Jones
Chris	Conlee
Chris	Donnelly
Chris	Johnson
Chris	Solloway
Christopher	Fischer
Chuck	McLellan
Cindy	Blain
Citizen	X
Colleen	Murphy-Dunning
Cordelia	Rasa
Curtis	Smalling
Cynthia	Orlando
d	lewis
Dale	Crutchfield
Dale	Dickens
dan	jensen
Dan	Staley
Dan	Murray
Dana	Coelho
Dana	Harper
Daniel	Secinaro
Daniel	Gibson
Daniella	Pereira
Danielle	Gift
Darin	Crew
David	Hawkins
David	Jahn
David	Brown
DAVID	BIENEMANN
David	Flaig
David	Nowak
David	Stephenson
David	Maddox
David	Bengston
dawn	fluharty
Dawn	Freeman
Dean	Miller
Deane	Wang
Debbie	Cook
Donna	Rogler
Donna	Curtis
Dorothy	Abeyta
doug	wright
Douglas	Borzynski
Dr Andy	kaufman
Drew	Burnett
Dudley	Hulbert
e	p
Earl	Reaves
Ed	Macie
Ed	Macie
Ed	Murdock
Edith	Makra
Elise	Schadler
Elizabeth	Dierickx
Elizabeth	Burns
Elizabeth	Larry

Elizabeth	Thompson	Heather	Gallo	Jeff	Wood
Ellen	Arnstein	Heather	Barrar	Jeffrey	Watson
emily	king	Heather	Holley	Jen	Cotting
Emily	Spillett	Heather	Davis	jennifer	gulick
Emily	Blanton	Hedge	Croft	Jennifer	Hinrichs
Emily	Federer	Henry	Gerhold	Jennifer	Hinostroza
Eric	Reed	Humberto	Mojica	Jennifer	Dann
Eric	Berg	Ian	Scott	Jennifer	Franklin
Eric	Carlson	Ian	McDermott	Jennifer	Behnken
Eric	Hendrickson	Igor	Lacan	Jeremy	Barrick
Eric	Wiseman	Intertribal	Gathering Gardens	Jeremy	Pickett
Eric	Gyllenhaal	Irene	Ogata	jerry	clark
Eric	Muecke	Isabel	ColaÃŒÂ¤o	Jerry	Moreno
Eric	Carlson	J	Talbot	Jesse	Kirk
Erik	Wilson	Jack	Sahl	Jessica	Vogt
Erik	Mauel	Jacob	Schmidt	Jessica	Sanders
Erin	Quetell	James	Semelka	Jill	Johnson
Erin	Powell	James	Lemyre	Jim	Cortese
Eva	Longmire	James	Nichnadowicz	Jim	Wasden
Everett	Sharpe	James	Theiss	Jimi	Scheid
Everett	Chu	Jamie	Kirby	Joan	Maloof
Faith	Campbell	Jana	Dilley	Joe	Benassini
Forest	Fox	Jane	Goodman	Joe	Burgess
Frank	Ono	Jannelle	McCoy	Joe	Purohit
Frank	Rodgers	Jannelle	McCoy	joetta	dailey
Fred	Cowett	Jare	Manzo	john	leffingwell
Fred	Bicha	jared	kofsky	John	Conway
Fritz	Lecker	Jared	Weaver	John	Lough
gary	allen	Jarod	Cassada	John	McClenahan
Gene	Hyde	Jasen	Johns	John	Goodrick
Gene	Stano	Jason	Lubar	John	Morlan
George	Gonzalez	JASON	THURM	John	Gall
Gerald	Jasmer	Jason	Toedter	John	Melvin
Gerri	Makay	Jason	Grabosky	John	Stremple
Glen	Olson	Javier	Gomez	john	white
Gordon	Mann	Jay	Banks	John	McKenzie
Greg	Ina	jay	Cody	Jolie	Wanger
greg	nace	Jean	SmilingCoyote	Jon	Hathaway
Greg	Dahle	Jeannette	Wheeler	Jon	Storvick
Greg	Huse	Jeff	Wooten	Jordan	Endahl
Gregory	MacDonald	jeff	watkins	Joseph	Jackson
Gregory	Shaner	Jeff	Roe	Joseph	Sentance
Harold	Anderson	Jeff	Treu	Joseph	Wilson

Joseph	Townsend	Kim	Knox	Mark	Hughes
joseph	booth	Kim	Kostelnik	Mark	Porter
Joseph	File	Krista	Bailey	Mark	Kellogg
Joseph	Rothleutner	Kristen	King	Mark	Garvin
Josh	Behounek	Kristina	Bezanson	Mark	Maguillicuty
jud	kirkness	Kurt	Dahlgren	Mark	Kroeze
Judith	Cook	Kurt	Fickeisen	Marla	Eddy
Judy	Thomas	L	Cline	martin	bixby
Julia E	Jones	Lance	Davisson	Mary	Hogue
Juliana	Arthuso	Larry	Apple	Mary	Bowman
Julie	Sacco	Laura	Connelly	Mary Lynne	Beckley
Julie	Ernest	Laura	Eisenberg	Matt	Horn
Justin	Freedman	laura	bover	Matthew	Lindsay
K	Meurer	Laura	Charlton	Matthew	Koepnick
K	Wolf	Laurence	Wiseman	Matthew	Stephens
K	Fernholz	Lee	Ayres	Maura	Baldwin
kamie	long	Leif	Hubbard	Meghan	Holtan
Kamran	Abdollahi	Leigh	Martin	Melanie	Sifton
Karen	Emmerich	Lenny	Williams-Herma	Melissa	Custic
Karen	Hall	Leonard	Dunn	Meredith	Borchardt
karen	Morby	Liam	Kavanagh	Meridith	Perkins
Karin	Conway	Lincoln	Cruz	met	smelt
Karley	Rodriguez	Linda	Eremita	Michael	Putnam
kathleen	alexander	Lisa	Ortega	Michael	Collins
Kathy	Wolf	Lisa	Ortega	Michael	Yadrick
kathy	McGlauflin	Lisa	Smith	Michael	Galvin
Katie	Gibbons	Lisa	Grant	Michael	Leff
Katie	Kosanke	Lissa	Martinez	Michael	Gonzalez
Katie	Meyer	Liz	Gilland	Michael	DePappa
Keith	O'Herrin	lucas	mitchell	Michael	Connery
Keith	Cline	Lucas	T	Michelle	Kondo
Keith	Martin	Lydia	Scott	Michelle	Hickey
Keith	Wood	Lynn	Crump	Michelle	Sutton
Kelly	Chadwick	Magaly	Figueroa	Micki	McNaughton
Ken	Brown	Marc	Kiefer	Mike	Petersen
Ken	Green	Margaret	Paget	mike	parker
Ken	Lacasse	Margie	Ewing	Mike	Inaba
kerry	smith	margo	moehring	Mike	Wallich
Kesha	Braunskill	Maria	Arnold	mike	marianno
kevin	zytkovicz	Maria	D'Agostino	Mike	Duran-Mitche
Kevin	Sayers	Marie	Trigona	Mike	Mansour
Kevin	Eckert	Marilyn	Loser	Mike	Erickson
Kevin	Patton	Marissa	Houlberg	Mike	Scheitz

Mike	Schlegel	Preston	Hill	Shannon	Alexander
mike	oliver	Quin	Holifield	Sharon	LIlly
Ming	Kuo	Rachel	G-Z	Sharon	Williams
Mollie	Freilicher	Rachel	Vail	sheila	gray
Molly	Sinnott	Rachel	Comte	Shino	Tanikawa
Monica	Halka	ralph	villasenor	Shirl	McMayon
Nancy	Stremple	randal	smith	shirley	vaughn
Nancy	Falxa Sonti	rebecca	wildenthal	Sidney	Pan
Naomi	Zurcher	Rebecca	Turner	Sojourner	Atlass
Nathaly	Agosto Filion	Regina	Ramos	Stacey	Ray
nathan	slack	Reinee	Hildebrandt	Stacy	Borden
Nathan	Dubosh	Rev	Dele	Stein	Jason
Nathan	Barrett	Rhonda	Wood	Stephanie	Ridl
Neal	Aven	Rich	Lefebure	Stephen	Harris
Neal	Styka	Richard	Adkins	Stephen	Harris
Neil	Clark	Richard	Gibney	Stephen	Pree
Neil	Norton	Richard	Reid	Stephen	rifici
Neil	Letson	Rick	Joyce	Stephen	Nickel
Neil	Letson	ridhi	dcruz	Stephen	Hauptli
Neville	Mann	Robert	Fahey	Steve	Lenzo
Nicholas	Drunasky	Robert	Benjamin	Steve	Saari
Nick	Kuhn	Robin	Rivet	Steve	Apicelli
Nick	Nichols	Rogard	Ross	Steve	Krotz
Nick	Cadwallender	Roger	Blanchard	Steve	Grace
olÃŒÃ s	GÃŒ_mez	Ronda	Headland	Steven	McConnell
Nikol	Hlady	Rory	Denovan	Steven	Frank
Nina	Bassuk	Rose	Smiechowski	Sue	Miller
Novem	Auyeung	Russ	Cohen	sumana	serchan
Olivia	Shanahan	Russell	Hansen	Susan	Helmink
OLIVIA	WITTHUN	Ryan	Fenwick	Susan	Day
Patricia	Bourne	Ryan	Allen	Susan	Traver
Patricia	Joyner	Sally	Darney	susan	Stiltz
Patricia	Farrell	Sam	Hinnant	Susan	Granbery
Paul	West	Sara	Davis	Suzanne	Remien
Paul	Revell	Sara	Bellchamber	Sycamore	Tree
Paul	Eriksson	Sara	Singer	Tchukki	Andersen
Paul	Buck	Scott	Allen	Teresa	Trueman-Madri
Paul	Ries	Scott	Schumacher	Tess	Mondello
Paula	Peper	Scott	Baker	Thais	Perkins
Perry	Odom	Scott	Polster	theodore	thomas
Pete	Hoag	Scott	Johns	Therese	Annis
Phillip	Rodbell	Scott	Rowan	Thomas	Munn
Phillip	Lindstrom	Selena	O'Shaughnessy	Thomas	Eddy

Thomas	Owen
Tim	Kohlhauff
tim	w
Tim	Maguire
Tim	McDonnell
Tina	McKeand
Tom	Jacobs
Tom	Walsh
tom	murphy
Tom	Shimalla
Tom	Wells
Torrey	Young
Tracy	Salisbury
Travis	Miller
Tree	Stewards
Tualatin	Riverkeepers
Ty	Nielsen
Tyler	Stevenson
Urban	Releaf
V	Francis
Valerie	Ramirez
Vanessa	Roanhorse
vern	fridley
Verna	Jigour
Vincent	Cotrone
Vincent	Verweij
Vincent	Verweij
W	Warriner
Walt	Fujii
Walter	Passmore
Ward	Peterson
William	Kruidenier
William	Porter
William	Sullivan
William	Diedrichs
William	Callahan
Yolanda	Manzone
Zaina	Gates

Thomas	Owen
Tim	Kohlhauff
tim	w
Tim	Maguire
Tim	McDonnell
Tina	McKeand
Tom	Jacobs
Tom	Walsh
tom	murphy
Tom	Shimalla
Tom	Wells
Torrey	Young
Tracy	Salisbury
Travis	Miller
Tree	Stewards
Tualatin	Riverkeepers
Ty	Nielsen
Tyler	Stevenson
Urban	Releaf
V	Francis
Valerie	Ramirez
Vanessa	Roanhorse
vern	fridley
Verna	Jigour
Vincent	Cotrone
Vincent	Verweij
Vincent	Verweij
W	Warriner
Walt	Fujii
Walter	Passmore
Ward	Peterson
William	Kruidenier
William	Porter
William	Sullivan
William	Diedrichs
William	Callahan
Yolanda	Manzone
Zaina	Gates

FIRST NAME	LAST NAME	SECTOR	ORGANIZATION
A.J.	Dupere	State Government	New Hampshire
Aaron	Wang	Federal Government	USDA
Aaron	Wang	State Government	South Dakora Urban Forestry Advisory Council
Aaron	Wang	State Government	South Dakota
Aaron	Durnbaugh	Nonprofit	Center for Urban Environmental Research and Policy; Chicago Wilderness (Vice Pres.), Institute of Environmental Sustainability, Loyola University
Abigail	Derby Lewis	Academia/Education	Field Museum
Al	West	Federal Government	USDA
Alan	Risenhoover	Federal Government	Department of Commerce
Alan	Risenhoover	Government	Department of Commerce
Alice	Ewen	Federal Government	USDA
Alix	Rogstad	State Government	Arizona
Alyson	Jordon	Government	National Association of County and City Health Officials
Ammy	Smith	Nonprofit	WWFUS North America
Amy	Freitag	Nonprofit	JM Kaplan Fund
Andree	Walker	Nonprofits	The Utah Society for Env. Education
Andrew	Saunders	State Government	Georgia Urban Forest Council
Andrew	Frederick	State Government	New Mexico
Andrew	Walker	Nonprofit	Green Infrastructure Center
Andrew	Hillman	Nonprofits	Davey Resources Group (Davey Trees)
Andy	Lipkis	Nonprofit	Tree People
Andy	Kaufman	Academia/Education	University of Hawaii
Angel	Spell	Local Government	City of Spokane
Angela	Hernandez-Marshall	Federal Government	Department of Education
Angela	Hammond	State Government	New Hampshire Community Forestry Advisory Council
Ann	Forsythe	Academia/Education	University of Minnesota - Design Center for American Urban Landscape
Anna	Dooley	Nonprofit	Greenscape Jacksonville
Anne	Bartusca	Federal Government	USDA
Annie	Hermansen	Federal Government	USDA
Art	Novy	Federal Government	US Botanic Garden
Arthur	Blazer	Federal Government	USDA
Ashlee	Ransom	Federal Government	USDA
Ava	Heap	Nonprofit	University of Illinois
B.Graeme	Lockaby	Academic	Auburn University School of Forestry and Wildlife Sciences
Barbara	Young	Federal Government	Department of Education
Barbara	Duke	Nonprofit	Tree Fund
Basiende	Atan	State Government	Chuuk

Beattra	Wilson	Federal Government	USDA
Beattra	Wilson	Federal Government	USDA
Beth	Larry	Federal Government	USDA
Betty	Shimo	State Government	NY State Urban Forestry Council
Bill	Kruidenier	Academia/Education	University of Illinois-Natural Resources and Environmental Sciences
Billie	Lindsey	Academic	Western Washington University
Brenda	Chapin	Federal Government	USDA
Brenda	Chapin	Government	Department of Agriculture
Brian	Wegener	State Government	Oregon Community Trees
Brian	Rucker	State Government	Tennessee
Brian	Kitler	Nonprofit	Pinchot Institute
Bruce	Hamilton	Federal Government	NSF
Bryant	Scharenbroch	Nonprofit	The Morton Arboretum
Buckelew	Anna	Federal Government	USDA
Burnell C	Fischer	Academic	School of Public and Environmental Affairs Indiana University
Camillia	Easley	Government	National Association of County and City Health Officials
Carl	Roundtree	Federal Government	BLM
Carlos	Rodriguez-Franco	Federal Government	USDA
Carrie	Gallagher	Nonprofit	Alliance for Community Trees
Cassandra	Johnson	Federal Government	USDA
Cassandra	Moseley	Academic	Institute for a Sustainable Environment
Cathering	Nagel	Nonprofit	City Park Alliance
Cem	Akin	Nonprofit	Fruit Tree Planting Foundation
Charles	Vandersteen	State Government	Louisiana Forestry Association
Charles	Marcus	State Government	Florida
Chelsea	Clark	Government	Obesity Society
Chris	Weydeveld	State Government	Wyoming Assistance Forestry Council
Chris	Donnelly	State Government	Connecticut
Chris	Caldwel	Nonprofit	Sustainable Development Institute
Chris	Topik	Nonprofit	Nature Conservancy
Chris	Hunt	Nonprofit	Trout Unlimited
Christl	Tate	Government	National Environmental Health Association
Cindy	Bouchie	State Government	Louisiana Urban Forestry Council
Cindy	Blain	Nonprofit	Sacremento Tree Foundation
Cindy	Terry	Nonprofits	ACRT, Inc.
Claire	Robinson	Nonprofit	Amigos de los Rios
Coe	Roberts	Nonprofit	Arbor Day Foundation
Colleen	Langan-McRoberts	Nonprofit	Bernco
Conni	Kunzler	Nonprofit	ACTrees
Courtney	E .Kimmel	Academia/Education	Virginia Tech
Croy	Owen	Local Government	City of Surrey
Dale	Dickens	State Government	Alabama
Dana	Coehlo	Federal Government	USDA
Daniel	Lambe	Nonprofit	The Arbor Day Foundation

Daniel	Ructor	Nonprofits	APHA
Daniella	Pereira	Nonprofit	Open Lands
Danielle	Fitzko	State Government	Vermont
Danielle	Crumrine	Nonprofit	Tree Pittsburg
Dave	Nowack	Federal Government	USDA
Dave	Howlett	State Government	Nevada
Dave	Forsell	Nonprofit	Keep Indianapolis Beautiful
Dave	Crutchfield	Nonprofits	Dominion
David	Flaig	State Government	Colorado Tree Coalition, Attn: Front Range Urban Forestry Council
David	Raheal	State Government	Vermont Urban and Community Forestry Council
David	Stephenson	State Government	Idaho
David	Siegel	Nonprofits	AEA, NSPE
David	Dyjack	Government	National Association of County and City Health Officials
Davisson	Lance	Nonprofits	The Keystone Concept, LLC
Dean	Marriott	Local Government	City of Portland Bureau of Environmental Services
Dominique	Luekenhoff	Federal Government	EPA
Dominique	Luekenhoff	Government	EPA Water Protection Division
Dominique	Luekenhoff	Government	EPA Water Protection Division
Donna	Murphy	Federal Government	USDA
Donna	Yowell	State Government	Mississippi Urban Forest Council
Donna	Drewes	State Government	NJ Community Forestry Council
Dorothy	Abeyta	State Government	California Urban Forests Council
Doug	Tallamy	Academia/Education	University of Delaware
Douglas	L. Airhart	Academic	Tennessee Tech University
Dr. Bert	Cregg	Academic	Michigan State University Department of Horticulture
Dr. Yaoqi	Zhang	Academic	Auburn University
Drew	Todd	State Government	Ohio Urban Forestry Advisory Committee
Drew	Becher	Nonprofit	Pennsylvania Horticultural Society
Dudley	Hartel	Federal Government	USDA
Ed	Macie	Federal Government	USDA
Ed	Macie	Federal Government	USDA
Eliva	Rodriguez-Ochoa	Nonprofit	Open Lands
Ellen	Roane	State Government	Pennsylvania
Elsa	Haubold	Federal Government	FWS
Elsa	Haubold	Government	Fish and Wildlife Landscape Conservation Cooperative
Elsa	Haubold	Government	Fish and Wildlife Landscape Conservation Cooperative
Emma	Bruemmer	State Government	Iowa
Enrico	Ruzzier	Nonprofit	
Eric	Norland	Federal Government	USDA
Eric	Berg	State Government	Nebraska

Eric	Vance	Nonprofit	National Council for Air and Stream Improvement (NCASI)
Eric	Norland	Government	Department of Agriculture
Errol 'E.J.'	Solomon	Federal Government	USDA
Even	Hjerpe	Nonprofit	The Wilderness Society
Fa'afo'I	Tony Mauga-lei	State Government	American Samoa
Fiona	Watt	Local Government	Forestry Division in NY
Frank	Cownie	Local Government	City of DesMoines
Fred	Kapp	State Government	Alabama Urban Forestry Association
Garett	Kopczynski	Local Government	City of Keene
Gary	Allen	State Government	Maryland Forestry Board Foundation (MFBF)
Gavin	McMillan	Nonprofits	Hargreaves Associates
Gene	Hyde	Local Government	City of Chattanooga
General	email	Nonprofits	SAF
Genny	Gulick	Nonprofits	Davey Trees
George	Gonzalez	Local Government	City of Los Angeles
George	Brown	Nonprofit	Agenda 2020 Technology Alliance
Georges	C. Benjamin	Nonprofits	APHA
Gerri	Makay	Federal Government	USDA
Gerri	Makay	State Government	North Dakota
Gerry	Gray PhD	Nonprofit	ACTrees
Gibson	Susumu	State Government	Micronesia
Glenda	Brooks		Hollenbeck POC
Green	Communities Research Center	Nonprofits	ASLA
Greg	McPherson	Federal Government	USDA
Greg	Ina	Nonprofits	Davey Trees
Greg	Shriver	Academia/Education	Department of Entomology and Wildlife Ecology, University of Delaware
Harvey	Benjamin	State Government	Kosrae
Helene	Combs Dreiling	Nonprofits	American Institute of Architects
Holly	Jones	State Government	Indiana Urban Forest Council
Ian	Hanoa	Nonprofits	plan-it GEO, LLC
Iris	Magaly Zayas	Federal Government	USDA
J.	Keith Gilless	Academic	University of California, Berkeley
Jackie	Carerra	Nonprofit	Parks and People Foundation
Jaime	Zaplatosch	Nonprofit	Open Lands
James	Schwab	Government	FEMA/APA
James	Davenport	Local Government	National Association of Counties
James E.	Johnson	Nonprofits	IUFRO
Jamie	Kirby	State Government	Montana Urban and Community Forestry Association
Jamie	Kirby	State Government	Montana
Jan	Davis	Federal Government	USDA
Jan	Ames Santerre	State Government	Project Canopy
Jan	Ames Santerre	State Government	Maine

Jason	Weller	Federal Government	USDA
Jason	Grabosky	Academic	Rutgers University
Jason	Weller	Government	Department of Agriculture
Jason	Weller	Government	Department of Agriculture
Jason	Weller	Government	Department of Agriculture
Jeanne	Current	State Government	Rhode Island Tree Council
Jeanne	Freeman	Academic	Western Washington University
Jeff	Luvall	Federal Government	NASA
Jeff	Gohringer	Nonprofit	League of Conservation Voters
Jennifer	Smith	Local Government	Metro Nashville Public Works
Jennifer	Hinrichs	Nonprofit	Sustainable Urban Forestry Coalition
Jennifer	Hinrichs	Nonprofits	SUFC
Jennifer	Li	Government	National Association of County and City Health Officials
Jerri	LaHaie	Nonprofit	Society of Municiple Arborists
Jerry	Way	Local Government	City of Sacramento
Jill	Johnson	Federal Government	USDA
Jill	Smith	State Government	Tennessee Urban Forestry Council
Jim	Calkins	State Government	Minnesota Shade Tree Advisory Committee
Jim	Tolbert	Local Government	City Planning Department
Jim	Skiera	Nonprofit	ISA
Jim	Skiera	Nonprofits	ISA, TCIA, SUFC, SAF
Jim	Schwab	Nonprofits	APA
Jim	Clark	Nonprofits	HortScience, Inc. consulting; Board of Dirctors, California Releaf
Jimmy	Reaves	Federal Government	USDA
Jimmy	Walters	State Government	South Carolina
Joan	Chadde	State Government	Michigan Urban and Community Forest Council
Joanna	Nadeau	Nonprofit	Audubon International
Jodi	Paterson	Academia/Education	National Science Teachers Association
Joe	Scorcio	State Government	Washington Community Forest Council
Joe	Wilson	Nonprofit	Greening Milwaukee
Joe	Bischoff Ph.D.	Nonprofits	ANLA and OFA
Joe	Benassini	Local Government	City of Sacramento
Joel	Beauvais	Federal Government	EPA
John	Parry	Federal Government	USDA
John	Balbus	Federal Government	Department of Health and Human Services
John	Giedraitis	State Government	Texas Forest Service
John	Melvin	State Government	California
John	Norquist	Nonprofit	Congress for New Urbanism
John	Ball	Academia/Education	South Dakota State University
John	Ball	Academic	South Dakota State University
Josh	Behounek	State Government	Missouri Community Forestry Council
Joyce	Berry	Academic	Colorado State University
Julie	Coop	State Government	Massachusetts

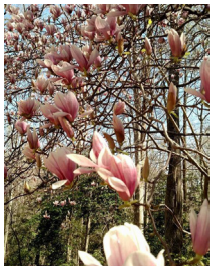
Justin	Freedman	State Government	Florida Urban Forestry Council
Justin	Santos	State Government	Guam
Kamie	Long	Nonprofit	Front Range Urban Foresters Council
Kamillia	Hoban	Nonprofits	Southwest Conservation Corps
Kamran	Abdollahi	Federal Government	USDA
Karen	Doherty	State Government	Massachusetts Tree Wardens and Foresters Assn.
Karen	Hauck	State Government	Trees SC
Karness	Kusto	State Government	Marshall Islands
Kathy	Sheehan	Federal Government	USDA
Kathy	McGlaughlin	Nonprofit	American Forest Foundation
Kathy	Wolf	Academic	University of Washington
Keith	Wood	State Government	Colorado
Keith	Cline	Local Government	Department of Public Works and Environmental Services, Fairfax, Virginia
Kemba	Shukur	Nonprofit	Oak Land Releaf
Ken	Knoch	State Government	Idaho Community Forestry Partners
Ken	Holman	State Government	Minnesota
Kevin	Sayers	State Government	Michigan
Kim	Coder	Academic	University of Georgia
Kiran	Bharthapudi	Government	Association of State and Terretorial Health Officials
Kristin	Ramstad	State Government	Oregon Department of Forestry
Kristina	Bezanson	State Government	Virginia Urban Forest Council
Kyle	Cunningham	State Government	Arkensas Urban Forestry Council
Kyle	Hoyd	State Government	Delaware
Larry	A. Kotchman	State Government	North Dakota Forest Service
Larry	Marcum	Government	National Environmental Health Association
Laura	Buynum	Local Government	APWA
Laura	Kunkle	Nonprofits	ANLA and OFA
Laura	Hanen	Government	National Association of County and City Health Officials
Laura	Hawpe	Government	National Tree Trust
Laurence	D. Wiseman	Academic	Virginia Tech
Leslie	Moorman	State Government	North Carolina Urban Forest Council
Liam	Kavanaugh	Local Government	NYC Parks
Liam	Heneghan	Academia/Education	Department of Environmental Science, Depaul University
Linden	Lampman	State Government	Washington
Lisa	Hair	Federal Government	EPA
Lisa	Hadway	State Government	Kaulunani Urban and Community Forestry Program
Lisa	Ortega	State Government	Nevada Shade Tree Council
Lisa	Ortega	Local Government	City of Henderson, Nevada
Liza	Lester	Nonprofits	ESA
Lou	Anella	State Government	Oklahoma Urban and Community Urban Forestry Council

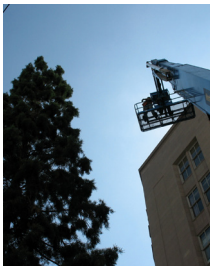
Lydia	Scott	Nonprofit	The Morton Arboretum
Lyle	Minshull	State Government	Nebraska Community Forestry Advisory Council
Lynne	Westphal	Federal Government	USDA
Magaly	Figueroa	Federal Government	USDA
Maitreyi	Roy	Nonprofit	Bartram's Garden
Margaret	Haines	Federal Government	USDA
Margaret	Roberts	Academic	University of Montana
Margie	Ewing	Federal Government	USDA
Marian	Honeczy	State Government	Maryland
Marilyn	Chakroff	State Government	Virgin Islands
Mark	Duntemann	State Government	Illinois Forestry Development Council
Mark	Bays	State Government	Oklahoma Department of Agriculture--Forestry Services
Mark	Hughes	State Government	Wyoming State Forestry Division
Mark	Bays	State Government	Oklahoma
Mark	Hughes	State Government	Wyoming
Mark	Buscaino	Nonprofit	Casey Trees
Mark	Garvin	Nonprofits	TCIA
Mark	Parish	Local Government	Pokagon Band of Potawatomi
Marla	Eddy	State Government	Wisconsin Urban Forestry Council
Martin	J. Chavez	Nonprofit	Local Governments for Sustainability
Mary	Kramarchyk	State Government	New York
Mary	Evelyn Northridge	Nonprofits	American Journal of Public Health
Mashani	Allen	Nonprofit	Tree People
Masood	Akhtar	Nonprofit	Bioenergy Deployment Consortium
Mathew	Bokach	Federal Government	USDA
Matt	Harris	Nonprofit	Arbor Day Foundation
Matt	Grubisich	Nonprofit	Texas Trees Foundation
Matt	Lieber	Government	National Environmental Health Association
Mayoriko	Victor	State Government	Pohnpei
Melissa	Cook	Nonprofit	Sustainable Development Institute
Meredith	Allen	Government	Association of State and Terretorial Health Officials
Meridith	Perkins	State Government	Utah
Mia	Colson	Nonprofit	National Association of Regional Councils
Michael	Rains	Federal Government	USDA
Michael	Creasey	Federal Government	NPS
Michael	Leff	State Government	PA Community Forests Council
Michael	D'Errico	State Government	New Jersey
Michael	Brune	Nonprofit	Sierra Club
Michael	Sultan	Nonprofits	Davey Resources Group (Davey Trees)
Michael	Culp	Government	Department of Transportation
Michael	Creasey	Government	Department of the Interior
Mike	Houck	Nonprofit	Urban Green Spaces Institute
Mike	Foreman	Private Sector	Chesapeake Bay Program

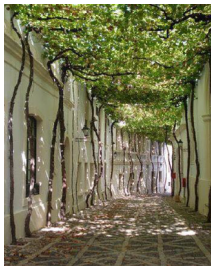
Monica	Lear	State Government	District of Columbia
Mrs. Colleen	Murphy-Dunning	Academic	Yale University
Ms. Abigail	Cocke	Local Government	City of Baltimore
Nancy	Stremple	Federal Government	USDA
Nancy	Stairs	State Government	North Carolina
Naomi	Edelson	Federal Government	NWF
Naomi	Edelson	Nonprofit	National Wildlife Federation
Naomi	Edelson	Government	Department of the Interior
Nathan	Lojewski	State Government	Alasca Community Forest Council
Nathan	Spillman	Nonprofits	Society for Conservation Biology
National	Wildlife Society	Nonprofit	National Wildlife Society
Nelda	Matheny	Nonprofits	HortScience, Inc. consulting; Board of Dirctors, California Releaf
Neville	Mann	State Government	Texas Urban Forestry Council
Nick	Kuhn	State Government	Missouri Dept of Conservation
Nick	Kuhn	State Government	Missouri
Nikki	Silverstri	Nonprofit	Green For All, Oakland
Nina	Bassuk	Academia/Education	Cornell University
Pam	Louks	State Government	Indiana
Paolo	Fontana	Nonprofit	
Patrice	Sheehan	State Government	Delaware Community Forestry Council
Patricia	Joyner	State Government	Alaska Division of Forestry
Patricia	Joyner	State Government	Alaska
Patricia	Pineda	Nonprofits	National Philanthropy and the Toyota USA Foundation
Patti	Erwin	State Government	Arkansas
Paul	Ries	Federal Government	USDA
Paul	Ries	State Government	Oregon
Paul	Revell	State Government	Virginia
Pete	Smith	State Government	Texas
Peter	King	Local Government	APWA
Phil	Rodbell	Federal Government	USDA
Phil	Ross	State Government	West Virginia Urban and Community Forestry Council
Philip	Silva	Nonprofit	TreeKIT
Phillip	Rodbell	Federal Government	USDA
Preston	Cole	Local Government	Milwaukee Department of Public Works
Pua	Michael	State Government	Palau
Rachael	Broadbent Alder	State Government	Utah Community Forest Council
Rachel	Comte	Nonprofits	Davey Resources Group (Davey Trees)
Rachel	Malarich	Nonprofit	Tree People
Rakesh	Singh	Government	Kaiser Family Foundation
Ransom	Ashlee	Federal Government	USDA
Ray	Trethway	Nonprofit	Sacramento Tree Foundation
Reed	Stockman	Nonprofits	Association of Funding Professionals
Regina	Harris	Federal Government	EPA
Regina	Harris	Government	Environmental Protection Agency

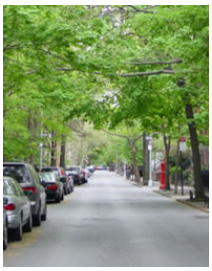
Renee	Hildebrandt	State Government	Illinois
Richard	Adkins	State Government	Arizona Community Tree Council
Richard	Rideout	State Government	Wisconsin
Richard J.	Roll	Nonprofits	America Homeowners Association
Ries	Paul	Academic	Oregon State Department of Forest Ecosystems and Society
Robert	Ricard	State Government	Connecticut Urban Forest Council
Robert	Hannah	State Government	West Virginia
Robert	Smith	Academic	Virginia Tech
Robert	Ruano	Nonprofits	Ecostrata Services, Inc.
Robert	Benjamin	Private Sector	SBC Global Advisors
Robin	Sidel	Government	Kaiser Family Foundation
Robyn	Bjornsson	Government	Children and Nature Network
Rosa	María Quiles	State Government	Puerto Rico
Rosario	Lecaroz	Academic	University of Puerto Rico
Salvatore	Galletta	Nonprofits	AEA, NSPE
Sam	DeMarias	State Government	North Dakota Urban and Community Forestry Assocaition
Sara	Davis	Local Government	Office of the City Forester City and County of Denver
Sarah	Gracey	State Government	Kentucky
Satyendra	Huja	Local Government	Charlottesvile
Scott	Beuerlein	State Government	Northern Kentucky Urban & Community Forestry Council
Scott	Josiah	State Government	Nebraska State Forestry
Scott	Robson	Local Government	Evergreen Park and Recreation District
Scott	Maco	Nonprofits	Davey Resources Group (Davey Trees)
Scott	Briscoe	Government	Association of State and Terretorial Health Officials
Shannon	Ramsay	Nonprofit	Treesforever
Sherry	Prowda	Nonprofit	Forterra
Skip	Moore	Local Government	City of Des Moines
Sonia	Garth	Nonprofits	ISA, TCIA, SUFC, SAF
Stacy	Hansen	State Government	Oklahoma
Stephanie	Houk-Sheetz	State Government	Iowa Urban Tree Council
Stephanie	Pincetl	Academic	Center for Sustainable Urban Systems at the University of California, Los Angeles, Institute of the Environment and Sustainability
Stephen	Shurtz	Local Government	East Baton Rouge City-Parish Department of Public Works
Steve	Castorani	Nonprofits	North Creek Nurseries, Inc.
Steve	Goetz	Nonprofits	Pacific Resources Group
Steven D.	Frank	Academic	North Carolina State University
Sue	Probart	State Government	New Mexico Urban Forest Council
Susan	Granberry	State Government	Georgia
T.M. Franklin	Cownie	Local Government	Des Moines
TeeJay	Boundreau	State Government	Rhode Island

Teresa	Trueman-Madriaga	State Government	Hawaii
The	Earth Institute	Nonprofit	Earth Institute, Columbia University
Theresa	Trueman-Madriaga	Nonprofit	Smart Trees Pacific
Thomas	Baerwald	Federal Government	NSF
Tim	McDonnell	State Government	Kansas
Tom	Dilley	Federal Government	USDA
Tom	Jacobs	State Government	Mid-America Regional Council
Tyler	Stevenson	State Government	Ohio
Tympel	Blansett	State Government	Mississippi
Ursula	Lemanski	Federal Government	NPS
Ursula	Lemanski	Federal Government	NPS
Valentino	Orhaitil	State Government	Yap
Valerie	Keefe	Nonprofit	Green For All, Oakland
Van	Jones	Nonprofit	Green For All; Rebuild the Dream
Vanessa	Bullwinkle	Nonprofit	PLT
Vicky	Bass	Government	National Association of County and City Health Officials
Victor	Deleon Guerrero	State Government	Northern Mariana Islands
Viveka	Neveln	Nonprofits	American Horticultural Society
Wayne	Lucas	State Government	Maryland Urban & Community Forest Committee
Whitney	Wallace	State Government	Louisiana
William	Hubbard	Federal Government	USDA
William	Price	Nonprofit	Pinchot Institute
William	Sullivan	Academia/Education	University of Illinois
Wink	Hastings	Federal Government	NPS
Wood T	Hudson	Local Government	Charlottesville
Zander	Evans	Nonprofit	Forest Guild

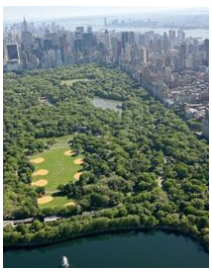
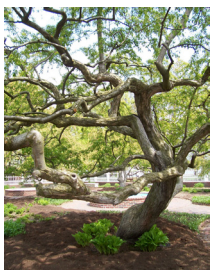


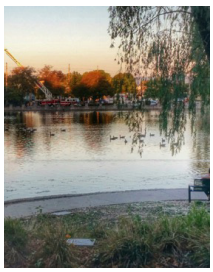
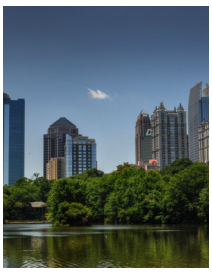
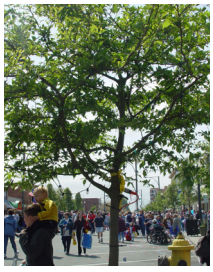
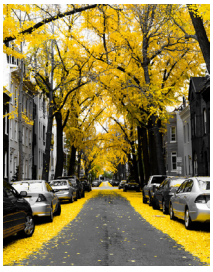


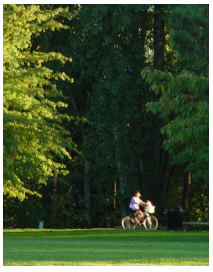
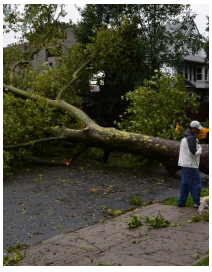




When I Am Among the Trees

When I am among the trees,
especially the willows and the honey locust,
equally the beech, the oaks and the pines,
they give off such hints of gladness,
I would almost say that they save me, and daily.

I am so distant from the hope of myself,
in which i have goodness, and discernment,
and never hurry through the world
but walk slowly, and bow often.

Around me the trees stir in their leaves
and call out, "Stay awhile."
The light flows from their branches.

And they call again, "It's simple," they say,
"and you too have come
into the world to do this, to go easy, to be filled
with light, and to shine."

~Mary Oliver, Thirst. *Boston: Beacon Press. 2006*