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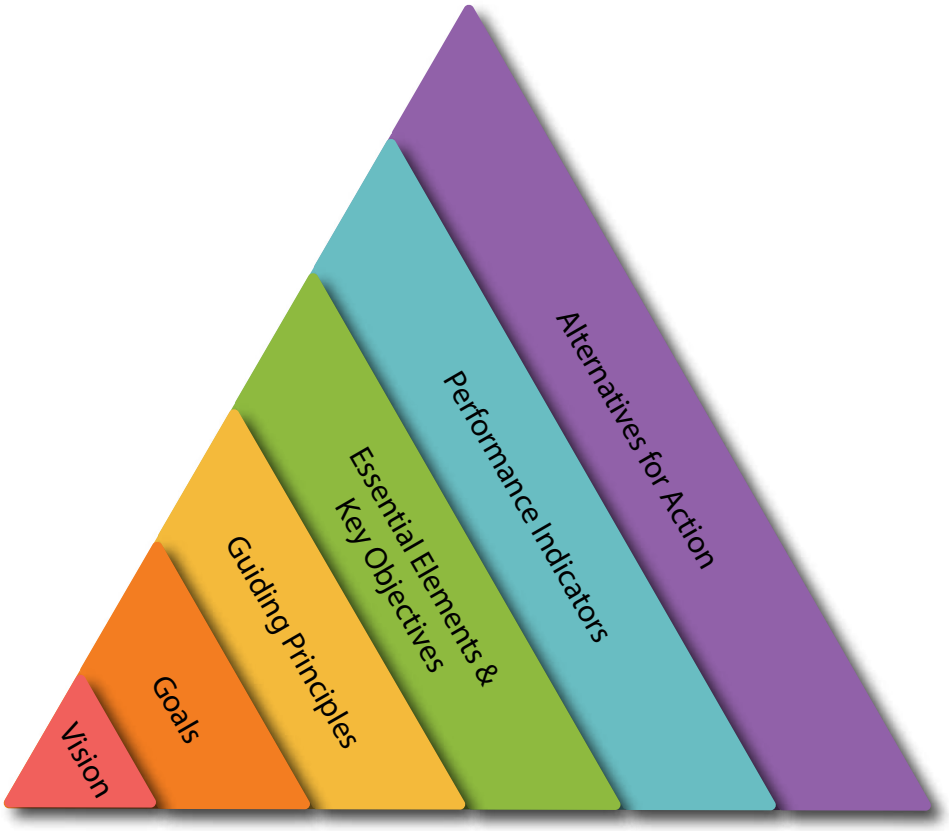
City of Gainesville Urban Forest Management Plan

2020



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City of Gainesville Urban Forest Management Plan

August 2020

Mayor

Lauren Poe

City Commission Members

Reina Saco
Harvey Ward
Gail Johnson
David Arreola
Gigi Simmons
Adrian Hayes-Santos

City Manager

Lee R. Feldman

Internal Technical Advisory Committee

Fred Murry, Assistant City Manager
Dan Hoffman, Assistant City Manager
David McIntire, Fire District Chief
Mo Deel, Coordinator - CRA Business Operations
Malisa McCreedy, Director of Department of Transportation and Mobility
Steve Philips, Director of Parks, Recreation and Cultural Affairs
Linda Demetropoulos, Nature Operations Manager
Phil Mann, Director of Public Works
Andrew Persons, Director of Department of Sustainable Development
Bobbie Griffith, Director of Strategic Initiatives
Erik Bredfeldt, Director of Economic Development and Innovation
Peter Backhaus, Supervisor - Code Enforcement
Thomas Brown, Chief Operating Officer - Gainesville Regional Utilities
John Veilleux, Engineer Utility Designer 4
Shelby Taylor, Director of Communications

Public Committee on Urban Forest Sustainability

John Fleming, Trimark (developer)

Erik Lewis, University of Florida Planning, Design & Construction

Shirley McNish, Duval Neighborhood

Ivor Kincaide, Tree Advisory Board

Russell Adams, Tree Advisory Board

Jay Brown, JBrown Professional Group

Erick Smith, Tree Advisory Board

Jason Smith, Tree Advisory Board

Kentucky Costellow, Private Citizen

EJ Bolduc, Tree Advisory Board

Julia Reiskind, League of Women Voters

City Staff

Liliana Kolluri, Department of Sustainable Development

Dave Conser, Public Works

Joe Wolf, Gainesville Regional Utilities

Emily Nieves, Public Works

Chelsea Proia, Department of Sustainabile Development

University of Florida/IFAS

Dr. Michael G. Andreu, School of Forest Resources and Conservation

Robert J. Northrop, Extension

Acknowledgements

Matt Mears, Former City Arborist

Brian Watkins PhD, Former City Arborist

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Introduction

The City of Gainesville's urban forest consists of the remnants of native forest found within private property, parks, medians and rights-of-way; and planted trees, palms and shrubs found on all public and private property.

Gainesville's urban forest plays a significant role in maintaining the health and vitality of urban life. The urban forest provides a wealth of benefits to neighborhoods and residents through the reduction of energy consumption, the removal of pollutants from the air and water, reduction in storm- water flows, increased valuation of private property, increased worker productivity, reduction in stress and violent crime, as well as providing recreational opportunities and aesthetic diversity. At the same time stresses from the urban environment including air pollution, damage by vehicles, increased impervious surface, soil compaction, and maintenance neglect reduce the diversity and magnitude of these benefits and may lead to tree-related problems.

The inherently close interaction between people and trees in Gainesville requires active and diligent management of the urban and community tree and forest resources to ensure public safety. A scientifically grounded management program is necessary in order to maximize the value and minimize the risk associated with trees within this complex and dynamic human ecological system called the. The initial step in meeting these challenges is the identification and organization of baseline information in the form of an inventory that describes the location, composition, structure, and health of the trees and woodlands. The 2016 Urban Forest Ecological Analysis and its publication led to broad public support for the development of a management plan designed to enhance urban forest sustainability.

The City of Gainesville Urban Forest Management Plan was developed through a collaborative effort supported by Gainesville's City Commission, that involved all the departments of the City of Gainesville, the University of Florida, business and professional organizations, and citizens. This strategic plan for the management of Gainesville's urban forest addresses the numerous challenges to growing and maintaining a healthy urban forest in an efficient manner. Management of the urban forest, with its long biological life cycles and slow growth, is a long-term investment. The plan recognizes that attempts to enhance its vigor, longevity, and diversity must reflect this reality.

Gainesville's strategic urban forest management plan was developed with a 20-year planning horizon to meets the challenge of programmatic continuity by planning on a long time framework. At the same time it provides guidance for intermediate 5-year citywide work planning. In turn it provides direct input into short-term annual departmental operational plans and decision-making.

How the Plan Was Developed

In 2019 the City Council authorized funding for the development of a science-based comprehensive Urban Forest Management Plan. The plan was to include specific recommendations on policies, procedures and practices, and provide information required by policy makers, planners, utilities, environmental managers, businesses and citizen volunteers to optimize the benefits of the urban forest while minimizing management costs.

The initial step in the development of the urban forest management plan required obtaining a clear understanding of how the city's residents felt about their urban forest. Understanding what the citizens consider important in the urban forest is vital for management. Assessing what the public considered important before any planning began was crucial for complementing, enhancing, or broadening what guides management and ensuring that the plan would be truly citizen centered and people empowered.

The second step in the development of the urban forest plan began with the organization of the Public Committee on Urban Forest Sustainability (2019-2020) by the city government. The members of the committee represented a broad diversity of government, business and neighborhood interests. Through a series of facilitated sessions, the Committee developed a consensus vision statement and series of goals.

From the work of the Public Committee on Urban Forest Sustainability, the City developed six principles used to guide the development of the plan and test each of its components for consistency with the original vision statement and goals. The Public Committee reviewed and approved the guiding principles.

The City of Gainesville Urban Forest Management Plan was developed following a model for strategic urban forest planning first introduced by Clark et al. (1997) which recommended the use a series of management criteria and performance indicators to measure urban forest management success. Building on the work of Clark et al. (1997), Kenney et al. (2011) described a more comprehensive criteria and performance indicators. The model developed by Kenney et al. was identified as an appropriate template to use in the development of Gainesville's urban forest management plan, and accepted by the Public Committee. The City representatives then worked with the project team from the University of Florida to outline a framework for plan development that would meet the unique biological, physical and social characteristics of the City.

The City then organized an Internal Technical Advisory Committee to work on drafting the Gainesville specific elements, objectives and performance indicators. The Directors of all of the City's departments appointed members of the Internal Technical Advisory Committee. The Internal Technical Advisory Committee worked through a deliberate step by step review and edit process over the course of several months. Their work led to a detailed set of elements, objectives and performance indicators for urban forest management that reflected the perspectives of each department.

Throughout the deliberation of the Internal Technical Advisory Committee, City staff continued to share information on progress with the Public Committee on Urban Forest Sustainability to ensure that the plan remained true to the initial vision and goals (see appendix for example of test for consistency. A website was established and used by the City to disseminate meeting notes and intermediate documents.

Following completion of the first draft of the elements, objectives and performance indicators the directors of the City's departments reached consensus on the language and intent of the plan. The final draft of the elements and performance indicators were reviewed for comments by the Public Committee.

The performance indicators for each of the elements were then evaluated to determine the present state of urban forest management in Gainesville. Alternatives for action were then developed that, if implemented, would be expected to incrementally move the performance indicators to the next highest level. These alternatives were specific actions, policies or programs that could be initiated by the City of Gainesville. A total of 158 quantifiable alternatives for action were developed (see Appendix F). The alternatives for action were reviewed and edited by the Internal Technical Advisory Committee'.

The edited set of alternatives for action was then evaluated with consideration of requirements for capital expenditures, potential personnel costs, length of time to achieve a measurable outcome, and the need to sequence certain actions. A set of alternatives for action were chosen to guide the first 5-year Implementation Plan. These actions and intended outcomes are to become part of the annual departmental operational plans and individual work plans.

Organization of the Plan

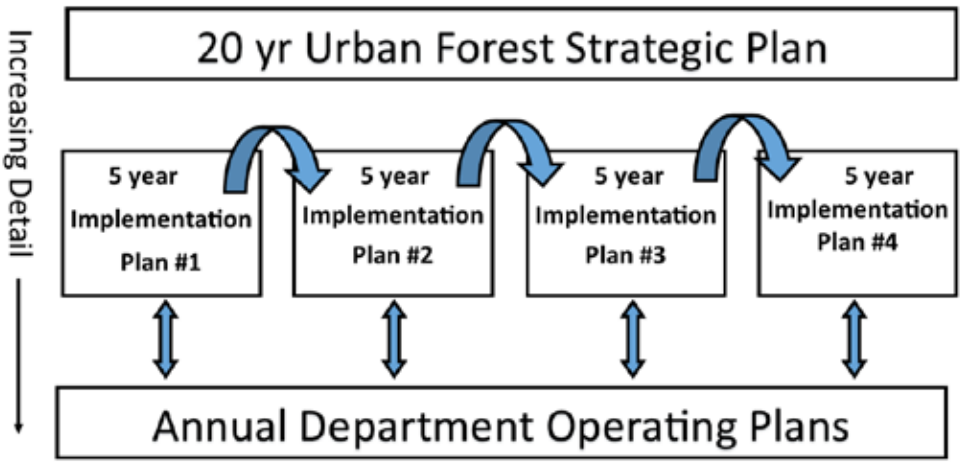
The City of Gainesville's Urban Forest Management Plan identifies a series of quantifiable steps that guides activities and resources to accomplish predetermined outcomes, the time frame for implementation and the responsible agency or partnership. Clear lines of responsibility and measurable objectives tied to reasonable timelines allow the city to measure successes and identify programmatic areas in need of further attention. The plan itself is best seen as a long-term process, a living and adaptable plan of action, and not a static product.

Specific elements and performance indicators for sustainable urban forest management developed by the City of Gainesville provide a framework for defining sustainable urban forest management and assessing progress toward this goal. The elements define essential plan components against which sustainability of urban forest management is judged, with due consideration paid to the environmental, economic and social and cultural roles of the urban forests and remnant forest ecosystems. Elements are envisioned as a large-scale reflection of public values and reflect the vision and goals initially set by the Public Committee on Urban Forest Sustainability.

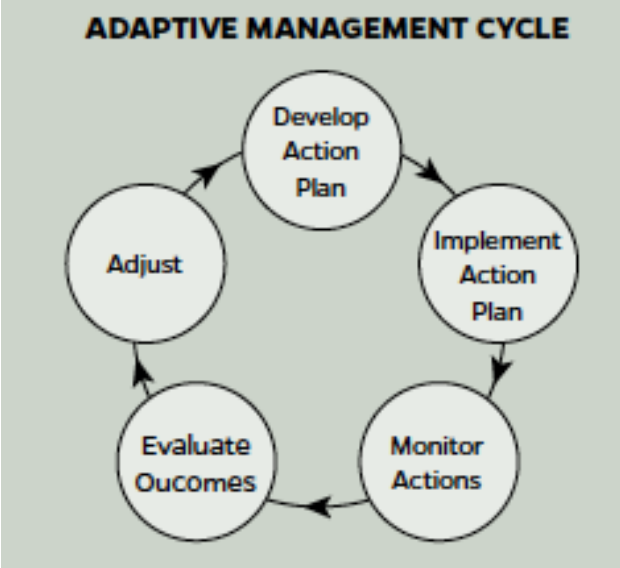
Performance indicators enable measurement of progress towards the achievement of the objectives for each element. Each element's performance indicators are to be monitored to assess the effectiveness of urban forest management within the City of Gainesville, and to facilitate decision-making in the City's urban forest policy processes. The ultimate aim of this tool is to promote improved urban forest management practices over time, and to further the development of a healthier and more productive urban forest.

The elements and performance indicators are tied to the 5-year cycle of urban forest assessment. The Urban Forest Ecological Analysis provides a source of reference information for policy makers, resource managers, and concerned citizens. This information presents a concise and comprehensive assessment of the City of Gainesville's Urban Forest. It also provides information needed for tracking long-term trends and analysis concerning management of the City's urban forests for present and future generations.

The elements and performance indicators allow the City of Gainesville the assessment capability to use an adaptive management approach to urban forestry, and promote flexible decision-making. Careful monitoring of the indicators will help the administration adjust policies or operations as part of an iterative learning process leading to more effective decisions and enhanced benefits, while reducing tensions among stakeholders.



Adaptive Management & Monitoring



Adaptive Management

Using an adaptive management approach will require the consistent monitoring of all the city's criteria for urban forest sustainability. The City will be able to judge if its new approaches to urban forest conservation are being effective, develop relationships between management actions and outcomes, and identify significant trends. This will allow the City to adjust management actions over time as changes occur both in the physical/biological environment and in the expectations of the City's residents.

Few activities suggested by the plan are as important to the success of urban forest management as monitoring, but this step is often overlooked, poorly designed, and often underfunded by most cities. Monitoring the city's natural resources is a process very similar to those already developed for business. The basic applications have already been developed, and there is little reason to reinvent the processes. We present a design for the monitoring program that incorporates the principles of sampling design theory and experimental design. Careful consideration has been paid to the selection of indicators.

Types of Monitoring

Monitoring here refers to the periodic and systematic measurement of observations of process or object. The City should institute three forms of monitoring in association with the management plan: implementation, effectiveness and validation.

The implementation monitoring will determine if the plan is being implemented as designed. It asks, "Did we do what we set out to do?"

Effectiveness monitoring determines if the action achieved the stated goal or objective. It asks, "Did it work?"

Validation monitoring determines if assumptions and models being used are valid and effective.

Implementation Monitoring

The Internal Technical Advisory Committee will review, on a semi-annual basis the implementation of the 5-year Management Plan's preferred alternatives for action (see Appendix). They will report their findings to the Tree Advisory Board. Once a year these two committees will hold a joint session to discuss accomplishments and recommend strategies for accomplishing the scheduled objectives. Each year these two committees will jointly publish a report to be distributed to the Mayor, City Council, Department Directors and communities.

Effectiveness Monitoring

The Urban Forest Analysis, conducted in 2016 serves as the beginning of the effectiveness-monitoring program. Information from Urban Forest Analysis describes the present state of the urban forest and Periodically repeating the Urban Forest Analysis will allow for the identification change and trends. The use of the elements, objectives and performance indicators allow the City to better understand and correlate the effectiveness of its urban forest management practices and policies to reaching specific outcomes.

Effectiveness monitoring will formally be conducted every 5 years, following the publication of the latest urban ecological analysis and social survey. Effectiveness monitoring will be reviewed by the Internal Technical Advisory Committee and Tree Advisory Board and jointly reported out in a public meeting.

Validation Monitoring

Prior to contracting the 5-year Urban Forest Analysis and Social Survey the City will review the scientific methods and models to be used to characterize the urban forest and citizen values. Choosing appropriate forms of analysis will be extremely valuable in supporting management decision-making. The Internal Technical Advisory Committee will conduct the review with the assistance of scientists from the University of Florida.

Recommended Approaches for Monitoring the Plan

Adoption of the Urban Forest Management Plan as the strategic plan for management of the City of Gainesville's urban forest

- Formal coordination of interdepartmental/interagency processes for implementation of the urban forest plan
- Intra and Interagency cooperation and collaboration
- Departments (including GRU) and City Commission are provided support and training on urban forest benefits and implementation of the City's urban forest management plan

i-Tree Inventory and Analysis

(includes formal public report on the State of the Urban Forest along with results from the Social Survey – 5 yr cycle)

- Canopy Cover – no net loss by land use type
- Urban Forest Stormwater Function
- Tree and Shrub Suitability – all land use type except Natural Areas
- Human Health
- Air Quality
- Greenhouse Gas Sequestration
- Invasive Species – all land use type except Natural Areas
- Energy Conservation (residential ONLY)

Departmental Accounting

(compiled for and reviewed by the Tree Advisory Board and submitted to the City Commission)

Departmental Reporting of complaints, citations per year (or other cycle)

- Professional standards and ethics
- Workshops offered and attendance
- Time and budget allocated to staff for continuing professional education
- Municipal urban forestry staff's continuing education
- Percentage of new landscape designs that contribute to water conservation
- Percentage of new commercial development that meet or exceed 'LEEDS' certification standards for energy savings.

Departmental Reports

- Children – schools, clubs, camps, 4-H
- Wildlife – percentage of new industrial/commercial/institutional sites actively implement a wildlife habitat plan
- Crime Prevention – percentage of new building/landscape designs that meet or exceed CPTED standards
- Fire Prevention – hazard rating (FL Wildfire Risk Assessment) of new landscape designs in Wildland Urban Interface
- Risk Damage from Trees
- General Public Outreach
- Values specific to neighborhoods and/or districts
- Resilience to fire (Natural Areas)
- Visual Access – percentage of new landscape and architectural design provide visual access to naturalistic landscapes from all workspaces

Social Survey Coupled to i-Tree Analysis (5-yr cycle)

(formal public report of the Social Survey along with the i-Tree State of the Urban Forest– 5 yr cycle)

- Citywide Values Regarding the Urban Forest
- Values Specific to Neighborhoods and/or Districts (as needed prior to capital program design)
- Physical access to natural areas and nature parks
- Incorporation of citizen values into the design of utility rights-of-way along public transportation routes

Natural Areas Scientific Inventory – 10-year Cycle

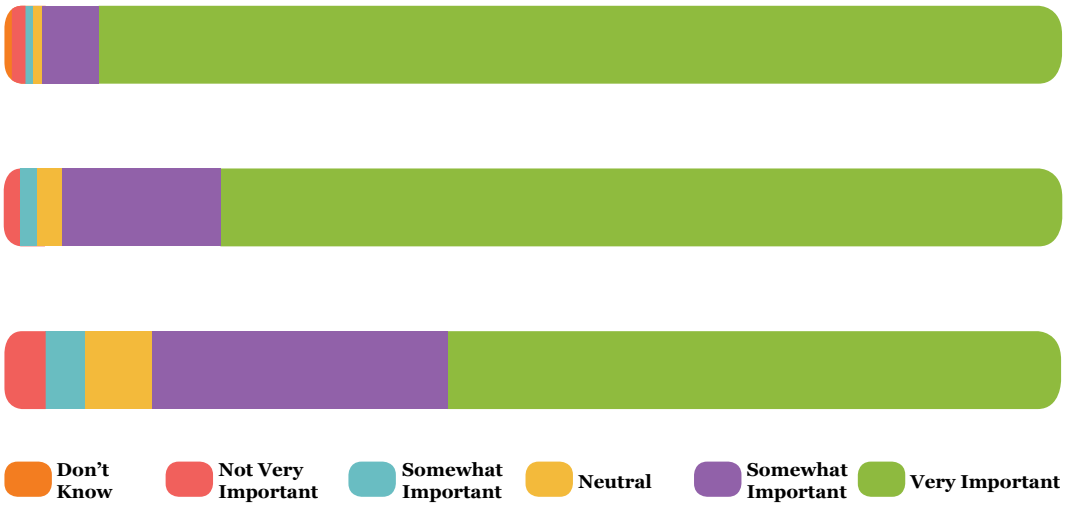
- Vegetative Inventory and Monitoring Systems
- Species – Shrubs and Trees
- Standing Dead and Down Woody Material
- Abundance
- Diameter Distribution
- Invasive Species (every 5 years)
- Percent of Fire Dependent Natural Communities Managed with Prescribed Fire Program

Developed Parks/Open Spaces – 5-year cycle

- Species – shrubs and trees – percentage change in native species present, every 5 years
- Tree canopy cover – percentage of canopy cover every 5 years
- Wildlife – percentage of parks with wildlife habitat assessments
- Wildlife – percentage of new landscape plans that incorporate native plant and animal conservation and restoration
- Invasive Species – annual visual assessment
- Stormwater – demonstrate the prioritization of future parks sites that directly support watershed hydrologic integrity
- Risk – damage from trees – annual Level 1 risk assessment each year in high use areas
- Energy conservation – percentage of new landscape plans to directly incorporate the reduction of heat loading

What the City of Gainesville's Urban Forest Social Survey Tells Us

1. The Urban Forest is **very important** to the people of Gainesville
2. Expansion of community based urban forestry projects is **very important** to the people of Gainesville
3. The urban forestry program when compared to other City programs is **very important** to the people of Gainesville



4. People of Gainesville consider themselves to be knowledgable about the benefits derived from their urban forest.
5. People of Gainesville have no one preferred way of communicating about urban forest related issues.
6. People of Gainesville consider the development of an urban forest management plan the most important step to ensuring a healthy urban forest.
   - Political support, best management practices, sustainable funding and active community support – come in 2nd
7. People of Gainesville consider the lack of a formal plan or strategy for to be the top barrier to achieving a healthy urban forest.
   - Second, Insufficient funding of urban forestry program
   - Third, lack of proactive approach to urban forest management
8. People of Gainesville consider the development of an urban forest management plan to be the top priority for urban forest management.
   - Second, work toward achieving tree canopy cover goals
   - Third, revise tree related ordinances

739 residents participated in the survey

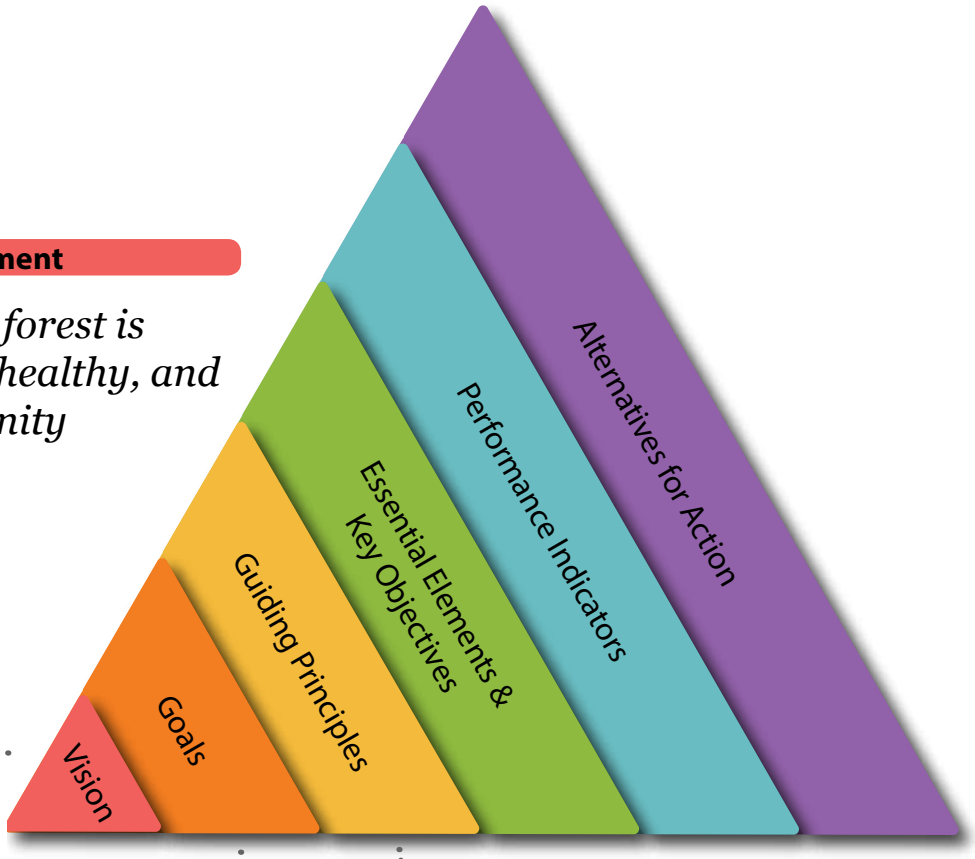
Survey Participation Race Demographics

	Survey Participants	US Census
White	87%	60%
Hispanic or Latino	5%	19%
Black or African American	3%	13%
Asian American	2%	6%
American Indian or Alaskan Native	2%	1%
Native Hawaiian or Pacific Islander	1%	<1%

The Plan

Vision Statement

Gainesville's urban forest is abundant, diverse, healthy, and benefits the community



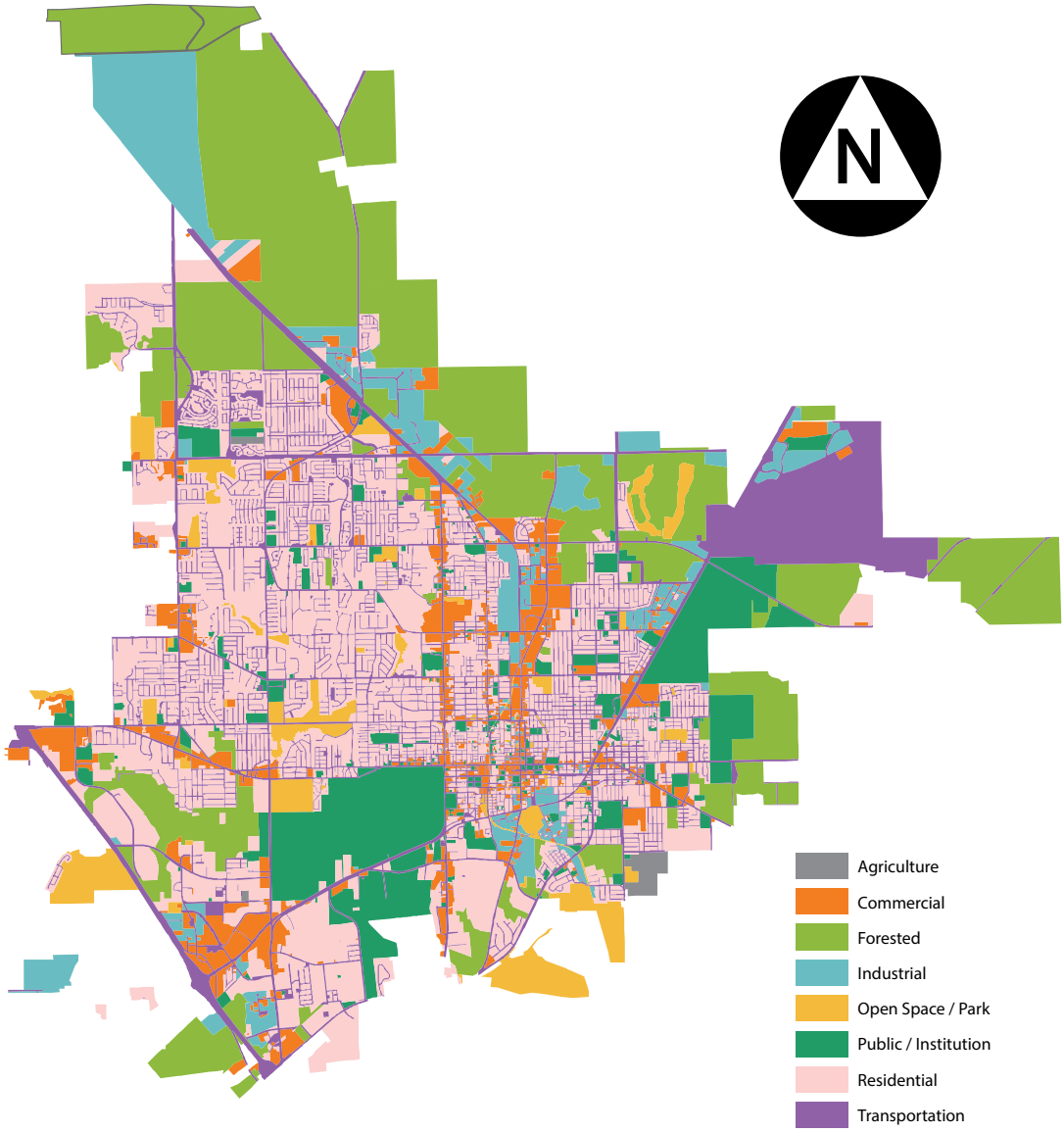
Goals

1. The urban forest should predominantly reflect the diversity of the surrounding native forest.
2. The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.
3. The urban forest should include woodlands, parks, old trees that reflect the historic character of the region, tree-lined roadways, individual trees, and understory vegetation.
4. The urban forest should support a mutually enhancing relationship between the natural and the built environments.
5. Citizens and their government should be educated about the urban forest and its benefits.
6. The urban forest should bring beauty, interest, and a calming atmosphere to the urban environment.
7. The urban forest should support Gainesville communities' values and unique character.

Guiding Principles

- Government efficiency
- Economic growth
- Social support equity
- Maintain environmental integrity
- Increase the social, environmental and economic benefits of the urban forest while reducing costs
- Support neighborhoods
- Support basic tenets of the City's Comprehensive Plan

The plan divides Gainesville's urban forest into five basic categories or land use types, and includes a separate section on city-wide elements. Each land use type has particular physical characteristics and issues, provides various benefits and serves different needs. Each is managed by different sets of departments and individuals to achieve different results. The health and quality of the urban forest in each land use type depends on the knowledge, skills and involvement of managers.



The Urban Forest Management Plan used the following stratification of land uses, which is correlated to the 5-year cycle of urban forest analysis (see Crosswalk from 2016 Urban Forest Analysis on pg. #):

Land Use Type	Description	Acres	Percent of City
Residential	All forms of housing	11,792	28.9
Nature Parks/Woodlands/ Natural Areas	Upland and wetland forest, both natural areas and planted	11,098	27.2
Commercial/ Institutional/ Industrial	Government offices, hospitals, schools, churches, and industrial uses including municipal water, waste and power facilities	6,945	17
Transportation	Roads, railroads and aiports	6,218	15.3
Developed Parks/ Open Spaces	Park and recreational lands, cemeteries and golf courses	1,719	4.2
Agriculture	Crops	141	0.3

How To Read The Plan

First, take a look at an example...

Element within the land use category

INVASIVE SPECIES

Objective: Invasive plant and animal species are eliminated.

Optimal Performance Indicator	All Commercial/Industrial/Institutional land is free of invasive plant species.

☐	**Good**	Net decrease in the abundance and diversity of invasive plant species on Commercial/Industrial/Institutional land.
☐	**Moderate**	City-wide formal assessment of invasive species.
☑	**Low**	No formal assessment of invasive species.

present state of management

Performance indicators enable measurement of progress towards the achievement of the objectives for each element

Then you'll see consensus action(s), which were developed on by the Internal Technical Advisory Committee

Consensus Action(s) for the 2021 - 2025, 5-year Implementation Plan

1. Conduct invasive species assessments on the commercial/industrial/ institutional lands type as part of the i-Tree ecological analysis.

DSD

Gainesville Police Department	City Attorney's Office	Department of Transportation Mobility	Gainesville Regional Utilities	Parks, Recreation and Cultural Affairs	Department of Sustainable Development	Public Works	Human Resources	Strategic Initiatives	Communication Officer	City Manager	Gainesville Fire Department
GPD	CA	DTM	GRU	PRCA	DSD	PW	HR	SI	CO	CM	GFD
pg. 22, 28, 39, 47	pg. 15	pg. 32-35	pg. 15, 19, 21, 32, 33,	pg. 12, 14, 16, 18, 19, 24-30, 40-47	pg. 11, 12, 14, 16, 18, 19, 20, 22, 23, 26, 28, 30, 36-40, 42, 43, 45, 46,	pg.11-20, 23, 26, 30-34, 36, 38, 45	pg. 15	pg. 16, 17	pg. 17	pg. 15	

City-Wide

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

CANOPY COVER

Objective: Total tree canopy coverage is 50% or greater (Comp Plan, Strategic Framework 4 c).

✓	**Optimal Performance Indicator**	**No statistically significant net loss of canopy cover since the 2016 Urban Forest Analysis.**
☐	**Good**	Canopy Cover is 45% or greater.
☐	**Moderate**	Canopy Cover is 40% or greater.
☐	**Low**	Canopy Cover is lower than 40%.

Consensus Action(s)

1. Design and implement a canopy cover monitoring program. — DSD, PW
2. Prepare a digital City of Gainesville 'illustrated booklet' on tree care and maintenance Best Management Practices for inclusion on urban forestry website. — PW

HYDROLOGY

Objective: Prevent adverse impacts to the water quality of creeks, lakes, wetlands, foodplains, groundwater and uplands (Art VIII #28).

	Optimal Performance Indicator	The urban forest is an integral part of a comprehensive system for water conservation/management (Comp Plan Stormwater; Policy 1.2.1 g).
☐	**Good**	Urban forest stormwater function is 10% higher than measured in the 2016 Urban Forest Analysis.
☐	**Moderate**	Urban forest stormwater function is 5% higher than measured in the 2016 Urban Forest Analysis.
☑	**Low**	**No net loss of urban forest stormwater function since the 2016 Urban Forest Analysis.**

Consensus Action(s)

1. Design and implement an inventory and condition assessment of riparian woodland buffers and forested wetlands. — DSD

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

TREE AND SHRUB SPECIES SUITABILITY

Objective: Tree and shrub species are suitable for Gainesville's physical urban environment and adapted to the regional climate (Strategic Framework 4 c).

Optimal Performance Indicator	All publically and privately planted trees and shrubs suited to the planting site, the urban environment and adapted to the regional climate (hardiness zone) (Strategic Framework 4 c).
☐ **Good**	>85% of the publically planted trees and shrubs are suited to the planting site, the urban environment and adapted to the regional climate (hardiness zone).
☐ **Moderate**	> 70% of the publically planted trees are suited to the planting site, the urban environment and adapted t to the regional climate (hardiness zone).
☑ **Low**	**Tree planting is *ad hoc*.**

Consensus Action(s)

1. Expand the City of Gainesville's Tree Matrix to include shrubs. DSD PW

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

HUMAN HEALTH

Objective: No net loss of human health benefits from the urban as defined by the EPA health benefits model used within the i-Tree analysis program (Strategic Framework 3 b).

Optimal Performance Indicator	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 10 minute walk (0.6 mi) from any home.
☐ **Good**	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 15 minute walk (1 mi.) from any home.
☐ **Moderate**	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 5 minute drive from any home.
☑ **Low**	**No net loss of acreage of existing parks, greenways and trails with green infrastructure (trees and shrubs) since 2016.**

Consensus Action(s)

1. Calculate the distance and travel time to parks (Arc-GIS, spatial analyst). PRCA

2. Develop Citywide strategic plan for acquisition and development of parks, greenways and trails to ensure equitable accessibility. DSD PRCA

AIR QUALITY

Objective: Ensure air quality levels comply with state and national ambient air quality standards (Comp plan Conservation Goal 2; obj. 2.5).

✓	**Optimal Performance Indicator**	**No net decline in the urban forest's leaf area index since 2016 Urban Forest Analysis.**
☐	**Good**	Net decline in the urban forest's leaf area index does not exceed 10% since 2016 Urban Forest Analysis.
☐	**Moderate**	Net decline in the urban forest's leaf area index does not exceed 20% since 2016 Urban Forest Analysis.
☐	**Low**	Net decline in the urban forest's leaf area index does exceed 20% since 2016 Urban Forest Analysis.

Consensus Action(s)

1. Continue assessment of urban forest effects on air quality using the i-Tree ecological analysis. PW

GREENHOUSE GAS SEQUESTRATION

Objective: No net loss of the ability of the urban forest to sequester and store atmospheric carbon.

✓	**Optimal Performance Indicator**	**No net decline in the urban forest's leaf area index since the 2016 Urban Forest Analysis.**
☐	**Good**	Net decline in the urban forest's leaf area index does not exceed 10% since 2016 Urban Forest Analysis.
☐	**Moderate**	Net decline in the urban forest's leaf area index does not exceed 20% since 2016 Urban Forest Analysis.
☐	**Low**	Net decline in the urban forest's leaf area index does exceed 20% since 2016 Urban Forest Analysis.

Consensus Action(s)

1. Continue assessment of urban forest effects on greenhouse gas sequestration using the i-Tree ecological analysis. PW

Goal 5

Citizens and their government should be educated about the urban forest and its benefits.

PRIVATE PROFESSIONAL ARBORISTS, LANDSCAPE ARCHITECTS, ENGINEERS, ETC.

Objective: Through formal training and municipal workshops the landscape and arboriculture industries operate with high professional standards and ethics, and commit to the goals as stated in the City's urban forest management plan.

Optimal Performance Indicator	Professional associations formally share the City's vision and goals for the urban forest.

☐	**Good**	Specific cooperative arrangements with City.
☑	**Moderate**	**General cooperation among nurseries, tree care companies etc.**
☐	**Low**	No cooperation among segments of the green industry. No adherence to professional standards and ethics.

Consensus Action(s)

1. Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care.

DSD PRCA PW

MUNICIPAL URBAN FORESTRY STAFF

Objective: Professional urban forestry staff are provided ongoing training and education to coordinate and implement management of the City's urban forest system.

Optimal Performance Indicator	Urban forestry staff are provided budget and time to attend at least one national conference or workshop each year to develop of effective skills in critical thinking, communication, planning and social and bio-physical assessments to coordinate and implement management of the City's urban forest system, and support their professional organizations.

☐	**Good**	Urban Forestry staff (City Arborist, inspectors, environmental coordinator, horticulturalist, tree crew leader) are provided a training budget and time to attend education programs that lead advanced certifications that benefit City operations.
☑	**Moderate**	**Urban Forestry staff (City Arborist, inspector, environmental coordinator, horticulturalist, tree crew are provided a training budget and time to attend continuing education programs to maintain City required professional certifications.**
☐	**Low**	Training budgets and time are allocated on an *ad hoc* basis.

Consensus Action(s)

1. Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City.

CM GRU DSD HR PW

GAINESVILLE GOVERNMENT AGENCIES AND COMMISSION

Objective: Departments (including GRU) and City Commission are provided support and training on urban forest benefits and implementation of the City's urban forest management plan.

Optimal Performance Indicator	Formal coordination of interdeparmental/interagency processes for the implementation of the urban forest plan are directed through a central interdisciplinary committee.

☐	**Good**	Municipal standards, including utility standards, are in place for implementing the urban forest management plan by interdepartmental/ interagency processes on all municipal projects.
☐	**Moderate**	Interdepartmental/interagency coordination for the implementation of the urban forest plan occurs through informal and *ad hoc* decision making processes.
☑	**Low**	**No coordination of interdepartmental/interagency processes to support implementation of the urban forest plan.**

Consensus Action(s)

1. Prepare a draft resolution, for City Commission consideration, that recognizes the UFMP as the strategic plan for the management of the City of Gainesville's urban forest.

CA DSD

OTHER GOVERNMENTS AND ORGANIZATIONS

Objective: Training and workshops support the collaboration and interaction among planning agencies and governments concerning forest sustainability within the Oklawaha and Santa Fe River Basins.

Optimal Performance Indicator	Watershed, natural resources and comprehensive land use plans are developed through cooperation and interaction among neighboring regional planning agencies and governments.

☐	**Good**	Regional planning for forest sustainability occurs on an *ad hoc* basis.
☑	**Moderate**	**Government and planning agencies share similar policy vehicles.**
☐	**Low**	No cooperation between City and regional planning agencies and governments regarding land use—all operate independently

Consensus Action(s)

1. Host a summit on forest sustainability that includes all relevant federal, state, regional and local government agencies and NGO's operating within the greater City of Gainesville region.

SI DSD PW

CHILDREN—SCHOOLS, CLUBS, CAMPS, 4-H

Objective: Through education children understand the contribution of the urban forest to the social, economic and ecological well-being of the community

Optimal Performance Indicator	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in all school, club and camp curriculums.

☐	**Good**	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in >or=50% of school, club and camp curriculums.
☐	**Moderate**	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in 26 - 50% of school, club and camp curriculums.
☑	**Low**	**The role of the urban forest in supporting the social, economic and ecological well-being of the community is not formally included in school, club and camp curriculums.**

Consensus Action(s)

1. Incorporate urban forest curriculum into Park summer programs and Earth academy.

PRCA

Goal 7

The urban forest should support Gainesville communities' values and unique character.

CITYWIDE VALUES REGARDING THE URBAN FOREST

Objective: Priorities for each 5 year management cycle reflect the values of the City's citizens are determined through a science based social survey

	Optimal Performance Indicator	Citizen values are assessed for all capital improvement projects that impact urban forest canopy cover, leaf area index or open space accessibility objectives of the urban forest management plan
☐	**Good**	Assessment of citizens values and reflects a strong correlation to demographics of citizens at time of survey.
☐	**Moderate**	Assessment of citizens values completed since 2019.
☑	**Low**	**No assessment or survey since 2019.**

Consensus Action(s)

1. Incorporate a social survey and assessment of citizen interest in urban forest management into the i-Tree ecological analysis.

SI CO PW

Residential

All forms of housing

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

SPECIES – SHRUBS AND TREES

Objective: Tree and shrub diversity predominantly reflect the native forest as described by the Florida Natural Areas Inventory (FNAI)

Optimal Performance Indicator	Net increase of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis.

☑	**Good**	**No net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis.**
☐	**Moderate**	Net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis is <10%.
☐	**Low**	Net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis is >or=10%.

Consensus Action(s)

1. Expand the City of Gainesville's Tree Matrix to include shrubs. DSD PRCA PW

CANOPY COVER

Objective: Tree canopy cover is no less than 45%.

✓ **Optimal Performance Indicator**	**No absolute net loss of canopy cover since the 2016 urban forest analysis.**

☐	**Good**	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is <10%.
☐	**Moderate**	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is <15%.
☐	**Low**	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is >15%.

Consensus Action(s)

1. Design and implement a canopy cover monitoring program. DSD PW

WILDLIFE

Objective: Property owners/residents are knowledgeable about wildlife that may occur on their property.

Optimal Performance Indicator	All commission districts have received City sponsored workshop/training about urban wildlife once per 5 year period.

☐	**Good**	50 % of commission districts have received City sponsored workshop/ training about urban wildlife once per 5 year period.
☐	**Moderate**	25 - 50% of commission districts have received City sponsored workshop/ training about urban wildlife once per 5 year period.
☑	**Low**	**No workshops given to residents.**

Consensus Action(s)

1. Organize and present at least one workshop on urban wildlife management per Commission District every 4 years. PRCA

HYDROLOGY

Objective: No adverse impacts to the water quality of creeks, lakes, wetlands, floodplains, groundwater and uplands (Article VIII 28).

Optimal Performance Indicator	Urban forest stormwater function is >10% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.

☐	**Good**	Urban forest stormwater function is 10% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.
☐	**Moderate**	Urban forest stormwater function is 5% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.
☑	**Low**	**No net loss of urban forest stormwater function on residential land since the 2016 Urban Forest Analysis as measured by avoided runoff.**

Consensus Action(s)

1. Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. GRU DSD PW

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

INVASIVE SPECIES

Objective: Property owners/residents eliminate invasive plant species.

Optimal Performance Indicator	All residental land is free of invasive plant species.

☐	**Good**	Net decrease in the abundance and diversity of invasive plant species on residential land.
☐	**Moderate**	City-wide formal assessment of invasive species.
☑	**Low**	**No formal assessment of invasive species.**

Consensus Action(s)

1. Continue to conduct an invasive species assessment on residential lands as part of the i-Tree ecological analysis. PW

TREE AND SHRUB SPECIES SUITABILITY

Objective: Tree and shrub species are suitable for Gainesville's physical urban environment and adapted to the regional climate.

Optimal Performance Indicator	All publicly mandated planted trees and shrubs are suited to the planting site the urban environment and adapted to the regional climate (hardiness zone) according to the Gaineville Tree Matrix.

☐	**Good**	>75% of publicly mandated planted trees and shrubs are suited to the planting site, the urban environment and adapted t to the regional climate (hardiness zone) according to the Gainesville Tree Matrix.
☐	**Moderate**	Publicly mandated tree plantings are evaluated using the Gainesville Tree Matrix for planting site suitablility, use in the urban environment and adapted to the regional climate (hardiness zone).
☑	**Low**	**Tree planting is *ad hoc*.**

Consensus Action(s)

1. Expand the City of Gainesville's Tree Matrix to include shrubs. DSD PW

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

RISK-DAMAGE FROM TREES

Objective: Risk of property damage or personal injury is reduced to as low as reasonably practical.

Optimal Performance Indicator	All trees within the residential land use are managed to reduce risk to as low as reasonably practical.

☐	**Good**	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure'.
☑	**Moderate**	**Level 1 tree risk assessment (ANSI 3000) is available to all residential land owners.**
☐	**Low**	Tree risk is managed on an ***ad hoc*** basis.

Consensus Action(s)

None

ENERGY CONSERVATION

Objective: Heat loading of residential buildings is reduced by shade produced from tree and shrub canopy.

Optimal Performance Indicator	Net 10% increase in energy savings since the 2016 Urban Forest Analysis.

☐	**Good**	Net 5% increase in energy savings since the 2016 Urban Forest Analysis.
☑	**Moderate**	**No net loss in energy savings since the 2016 Urban Forest Analysis.**
☐	**Low**	5% loss in energy saving since the 2016 Urban Forest Analysis.

Consensus Action(s)

1. Provide homeowners with training and information concerning the proper placement of trees around their home to reduce heat loading. GRU

CRIME PREVENTION

Objective: The City's urban forest supports a safe environment for residents and visitors.

Optimal Performance Indicator	CPTED design standards are in place within all residential neighborhoods.

☐	**Good**	CPTED design standards are in place on within all new residential neighborhoods.
☐	**Moderate**	CPTED design standards are in place within at least 50% of new residential neighborhoods.
☑	**Low**	**CPTED design standards are in place within less than 50% of all new residential neighborhoods.**

Consensus Action(s)

1. Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards. GPD DSD

FIRE PREVENTION

Objective: Property owners/residents implement landscape designs and fire prevention techniques that reduce forest fuel fire hazard.

Optimal Performance Indicator	All residential landscapes in Wildland Urban Interface meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50).

☐	**Good**	All residential landscapes in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).
☐	**Moderate**	Some residential landscapes in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).
☑	**Low**	**Residents in Wildland Urban Interface do not assess landscapes for Wildfire Risk.**

Consensus Action(s)

1. Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. DSD

Goal 5

Citizens and their government should be educated about the urban forest and its benefits.

GENERAL PUBLIC OUTREACH

Objective: Property owners/residents have access to information, training and assistance on tree and shrub care.

Optimal Performance Indicator	Urban forestry staff collaborate with aligned organizations to provide technical tree and shrub care information and training for property owners/residents.

☐	**Good**	Technical tree and shrub care information and training for property owners/residents is designed, organized and presented by the City.
☑	**Moderate**	**Technical tree and shrub care information and training for property owners/residents is actively supported by the City on an *ad hoc* basis.**
☐	**Low**	Technical tree and shrub care information and training for property owners/residents is not actively supported by the City.

Consensus Action(s)

1. Community arborist program to mimic UF Master Gardeners. PW

Goal 7

The urban forest should support Gainesville communities' values and unique character.

VALUES SPECIFIC TO NEIGHBORHOODS AND/OR DISTRICTS

Objective: Urban forest conservation practices are defined at the neighborhood scale.

Optimal Performance Indicator	All capital improvement projects focused at the neighborhood scale are vetted for urban forest conservation concerns before final design.

☐	**Good**	Capital improvement projects focused at the neighborhood scale are planned and designed with the active involvement of the City's urban forestry program or neighborhood residents.
☐	**Moderate**	Capital improvement projects focused at the neighborhood scale are planned without active involvement of the City's urban forestry program or neighborhood residents.
☑	**Low**	**Capital improvement projects focused at the neighborhood scale are planned, designed and implemented without the active involvement of the City's urban forestry program or neighborhood residents.**

Consensus Action(s)

1. Prepare a Land Development Code (LDC) code amendment that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing urban forest resources. DSD

Nature Parks/Woodlands/Natural Areas

Upland and wetland forests, both natural areas and planted

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

SPECIES – SHRUBS AND TREES

Objective: Tree and shrub diversity reflect the native forest as described by the FNAI.

	Optimal Performance Indicator	All forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.
☐	**Good**	Greater than 85% of all forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.
☐	**Moderate**	Greater than 75% of all forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.
☑	**Low**	**Less than 75% of all forest stands in the system contain the complete regionally appropriate 'FNAI charcter set of species' for each specific natural community.**

Consensus Action(s)

1. Prepare natural resource management plans that identify criteria and quantifiable performance objectives for City-owned natural areas. PRCA

STANDING DEAD AND DOWN WOODY MATERIAL

Objective: Standing dead and downed woody material is consistent with native forest communities described by FNAI.

✓	**Optimal Performance Indicator**	**Dead standing and downed woody material are conserved as a functional part of the natural forest ecosystem, if not posing a risk to visitors.**
☐	**Good**	Dead standing and downed woody material are conserved to meet the minimum levels described by the FNAI.
☐	**Moderate**	All standing dead trees are cut to ≤12 feet in height to reduce risk to visitors along active trails and visitor facilities.
☐	**Low**	All standing dead and downed trees are removed from natural forest ecosystems.

Consensus Action(s)

1. Initiate vegetative inventory and monitoring systems (dead woody material) on 50% of the nature park area every 5 years. PRCA

ABUNDANCE

Objective: Native plant abundance is consistent with native forest communities as described by the FNAI.

Optimal Performance Indicator	Parks/Woodlands/NA are assessed every 5 years and scored similar to the appropriate FNAI plant community reference site.

☐	**Good**	Native plant abundance is assessed every 10 years.
☑	**Moderate**	**Native plant abundance is not systematically assessed.**
☐	**Low**	Native plant abundance is unknown.

Consensus Action(s)

1. Initiate vegetative inventory and monitoring systems (plant abundance) on 50% of the nature park area every 5 years. PRCA

CANOPY COVER

Objective: Tree canopy cover of no less than 70% in non-fire-adapted natural communities in nature parks land use type.

✓ **Optimal Performance Indicator**	**No absolute net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis.**

☐	**Good**	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is <10%.
☐	**Moderate**	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is <15%.
☐	**Low**	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is >15%.

Consensus Action(s)

1. Initiate vegetative inventory and monitoring systems (canopy cover) on 50% of the nature park area every 5 years. PRCA

DIAMETER DISTRIBUTION

Objective: Size class distribution for native tree species is consistent with native forest communities described by FNAI.

Optimal Performance Indicator	Diameter size distribution by species approximates a 'reverse J' shape when graphed.

☐	**Good**	Diameter size distribution by species approximates a 'reverse J' shaped curve when graphed but does not extend to the highest size class potentials of a species.
☐	**Moderate**	All stands have a formal assessment.
☑	**Low**	**No formal assessment.**

Consensus Action(s)

1. Initiate vegetative inventory and monitoring systems (tree diameter distribution) on 50% of the nature park area every 5 years. PRCA

HYDROLOGY

Objective: Prevent adverse impacts to water bodies and conserve aquatic and terrestrial habitat (Art VIII obj. 15; Comp Plan Conservation goal 2; policies 2.4.3, 2.4.6).

Optimal Performance Indicator	Forest uplands, wetlands, floodplains and riparian stream corridors are actively managed to increase water infiltration; stabilize banks; serve as conservation corridors; and provide aquatic and terrestrial habitat.

☐	**Good**	Forests and woodlands have management plans prepared that identify specific outcomes for enhancement of watershed function, aquatic and terrestrial habitat.
☑	**Moderate**	**Forests and woodlands are systematically assessed for potential contribution to enhancement of watershed function, aquatic and terrestrial habitat.**
☐	**Low**	*Ad hoc* manipulation of forests and woodlands to support existing watershed function or aquatic and terrestrial habitat.

Consensus Action(s)

1. Incorporate specific and measurable outcomes for water quality in all Nature Park management plans. DSD PRCA PW

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

RESILIENT TO FIRE

Objective: Maintain publicly-owned fire adapted habitats in a healthy condition.

Optimal Performance Indicator	An active prescribed fire program, as identified by the FNAI, is used to maintain all fire adapted habitats within the nature park land use type.

☐	**Good**	>80% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.
☐	**Moderate**	60 - 80% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.
☑	**Low**	**<60% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.**

Consensus Action(s)

1. Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks. PRCA

INVASIVE SPECIES

Objective: Invasive plant and animal species are eliminated.

Optimal Performance Indicator*	All non-native invasive species are monitored and treated with appropriate science-based management practices to maintain invasive plant cover at <10% over all nature park acreage.

☐	**Good**	At least 80% of nature park acreage is maintained at <10% invasive plant cover.
☐	**Moderate**	50-80% of nature park acreage is maintained at <10% coverof invasive plants.
☐	**Low**	<50% of nature park acreage has <10% cover of invasive plants.

**Unable to assign a performance level due to lack of information*

Consensus Action(s)

1. Design and conduct an invasive species inventory and assessment every 5-years. PRCA

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

RISK – DAMAGE FROM TREES

Objective: Risk of property damage or personal injury is reduced to as low as reasonably practical within high visitor use areas.

Optimal Performance Indicator	Risk in all trees reduced to as low as reasonably practical within high visitor use areas.

☐	**Good**	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure'.
☐	**Moderate**	Level 1 tree risk assessment (ANSI 3000) on a documented frequency.
☑	**Low**	**Tree risk is managed on an *ad hoc* basis.**

Consensus Action(s)

1. Conduct Level 1 tree risk assessment (ANSI 3000) of all trees in high use areas. PRCA

CRIME PREVENTION

Objective: The City supports a safe environment within its woodlands/natural/nature parks.

Optimal Performance Indicator	CPTED design standards are in place within all high visitor use areas.

☐	**Good**	CPTED design standards are practiced in all high visitor use areas.
☐	**Moderate**	CPTED design standards are considered in all high visitor use areas.
☑	**Low**	**CPTED design standards are not practiced in all high visitor use areas.**

Consensus Action(s)

1. Prepare an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards GPD DSD

FIRE PREVENTION

Objective: Forest fuels are managed to eliminate risk of wildfire.

Optimal Performance Indicator	Fire regimes are aligned with natural plant communities as described by FNAI, and the 12 foot wide fire breaks and management to reduce flammable vegetation along the zone where structures and other human development abut fire-type vegetation in nature parks.

☐	**Good**	12 foot wide fire breaks and management to reduce flammable vegetation along the zone where structures and other human development abut fire-type vegetation in natural areas.
☐	**Moderate**	12 foot wide fire breaks in all areas where human development abuts fire-type vegetation in nature parks.
☑	**Low**	**Fire breaks in some areas where human development abuts fire-type vegetation in nature parks.**

Consensus Action(s)

1. Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks. PRCA

Goal 6

The urban forest should bring beauty, interest, and a calming atmosphere to the urban environment.

PHYSICAL ACCESS

Objective: Public nature parks/natural areas offer a safe and welcoming experience (Comp Plan Recreation goal 2).

Optimal Performance Indicator	The City's park and open space system ensures the visibility of, preservation o and access to environmentally significant open spaces.

☐	**Good**	City nature parks actively address the most significant perceptions of security and welcomeness.
☐	**Moderate**	City has a formally assessed awareness of residents' perceptions of security and welcomeness at nature parks.
☑	**Low**	**City has limited understanding of residents perceptions of security and welcomeness at nature parks.**

Consensus Action(s)

1. Cooperate with social science experts in the design of a social survey to assess City resident perceptions of security and welcomeness at nature parks. PRCA

Transportation (Corridors)

Roads, railroads and airports

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

SPECIES – SHRUBS AND TREES

Objective: Urban forest tree and shrub species are suitable to Gainesville's physical urban environment and regional climate.

Optimal Performance Indicator	Net increase of native shrub and tree diversity, in transportation land use type since the 2016 urban forest analysis .

☑	**Good**	**No net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis.**
☐	**Moderate**	Net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis is <10%.
☐	**Low**	Net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis is >or=10%.

Consensus Action(s)

1. Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. — DSD, PRCA, PW
2. Expand the City of Gainesville's Tree Matrix to include shrubs. — DSD, PW

CANOPY COVER

Objective: Tree canopy cover no less than 35% (Strategic Framework – 4 (c)).

✓ **Optimal Performance Indicator**	**No absolute net loss of canopy cover since the 2016 urban forest analysis**

☐	**Good**	Canopy Cover is 30% or greater.
☐	**Moderate**	Canopy Cover is 25% or greater.
☐	**Low**	Canopy Cover is lower than 25%.

Consensus Action(s)

1. Design and implement a canopy cover monitoring program. — DSD, PW

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

HEALTH

Objective: All publicly managed trees within rights-of way are maintained to maximize current and future benefits, tree health and condition.

	Optimal Performance Indicator	All trees within the transportation land use type are rated in very good to excellent health and condition.
☐	**Good**	1-5% of the trees within the transportation land use type are rated in poor or dead health and condition according to the City's 2016 Urban Forest Analysis.
☐	**Moderate**	5-10% of the trees within the transportation land use type are rated in poor to dead health and condition according to the City's Urban Forest Analysis.
☑	**Low**	**>10% of the trees within the transportation land use type are rated in poor to dead health and condition according to the City's 2016 Urban Forest Analysis.**

Consensus Action(s)

1. Utilize systematic rapid (mobile) risk assessment surveys to identify 'hazardous' trees and prioritize their removal, with emphasis on emergency and evacuation routes. PW

INVASIVE SPECIES

Objective: Management eliminates invasive plant species.

Optimal Performance Indicator	Invasive species are monitored and treated with appropriate science-based practice, following the City's formal invasive species management strategy along all transportation corridors.

☐	**Good**	The City has a formal invasive species management strategy for some transportation corridors.
☐	**Moderate**	Assessment invasive species and treatment on an *ad hoc* basis.
☑	**Low**	**No assessment**

Consensus Action(s)

1. Conduct a rapid invasive species inventory and assessment along all City rights-of-way on an annual basis. DTM
2. Develop a strategic plan for invasive species management within the City's transportation corridors. DTM

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

STORMWATER

Objective: Trees and shrubs are an integral part of a Complete - Green street design for urban water conservation.

Optimal Performance Indicator	15% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.

☐	**Good**	10% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.
☐	**Moderate**	5% net gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.
☑	**Low**	**No net loss of avoided stormwater runoff based upon the 2016 Urban Forest Analysis.**

Consensus Action(s)

1. Target tree planting in areas of high impervious surface within Transportation Corridors. DTM GRU PW

UTILITY RIGHTS-OF-WAY (GOAL 4, ELEMENT C)

Objective: Provide a safe and reliable utility infrastructure

Optimal Performance Indicator	Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards and incorporates citizen values into strategic decision making.

☑	**Good**	**Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards and industry standards for line clearance.**
☐	**Moderate**	Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards.
☐	**Low**	Tree pruning within utility rights-of-way along public transportation routes is inconsistent with ANSI standards and/or industry standards for line clearance.

Consensus Action(s)

1. Conduct social surveys once every 5 years to determine citizen values concerning vegetative management within utility rights-of-way. GRU PW

MULTI-MODAL TRANSPORTATION

Objective: The urban forest supports the choice of pedestrian travel within the City's multi-modal transportation network (Comp Plan – Mobility, goal 2; policy 2.1.6) Strategic Framework – Community; (a) (b)).

Optimal Performance Indicator	100% of the miles within the multi-modal transportation network support tree lined streetscapes designed and maintained to provide a sense of place/ community space and shade that promotes pedestrian travel.

☐	**Good**	75% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.
☐	**Moderate**	50% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.
☑	**Low**	**Tree lined streetscapes are not considered when designing pedestrian use of the multi-modal transportation network.**

Consensus Action(s)

1. Following the City of Gainesville's Tree Matrix implement design standards for the multi-modal transportation network to support healthy trees that provide at least 40% shade cover. DTM

MULTI-MODAL TRANSPORTATION

Objective: The urban forest supports the choice of pedestrian travel within the City's multi-modal transportation network (Comp Plan – Mobility, goal 2; policy 2.1.6) Strategic Framework – Community; (a) (b)).

	Optimal Performance Indicator	100% of the miles within the multi-modal transportation network support tree lined streetscapes designed and maintained to provide a sense of place/ community space and shade that promotes pedestrian travel.
☐	**Good**	75% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.
☐	**Moderate**	50% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.
☑	**Low**	**Tree lined streetscapes are not considered when designing pedestrian use of the multi-modal transportation network.**

Consensus Action(s)

1. Following the City of Gainesville's Tree Matrix implement design standards for the multi-modal transportation network to support healthy trees that provide at least 40% shade cover. DTM

RISK – DAMAGE FROM TREES

Objective: Risk of property damage or personal injury is reduced to as low as reasonably practical

✓	**Optimal Performance Indicator**	**Publically managed trees are monitored, and then maintained, through a 3–year cycle of inventories that identify structural, disease and insect problems.**
☐	**Good**	Publically managed trees are monitored, and then maintained, through a 4-year cycle of inventories that identify structural, disease and insect problems.
☐	**Moderate**	Publically managed trees are monitored, and then maintained, through a 5-year cycle of inventories that identify structural, disease and insect problems.
☐	**Low**	Publically managed trees are monitored, and then maintained, through a >5-year cycle of inventories that identify structural, disease and insect problems.

Consensus Action(s)

1. Maintain 2020 internal policy and procedures regarding tree inspection and 3-year pruning cycle within the City's Transportation Corridors. DTM PW

ENERGY CONSERVATION

Objective: Heat loading of buildings and paved transportation surfaces is reduced by shade produced from tree and shrub canopy (Art. VIII obj. 1 Strategic Framework—Env; (a)).

	Optimal Performance Indicator	Tree lined streetscapes are designed to support 40% shading of buildings, sidewalks and roads.
☐	**Good**	Tree lined streetscapes are designed to support shading of buildings, sidewalks and roads.
☐	**Moderate**	Formal assessment
☑	**Low**	**No assessment**

Consensus Action(s)

1. Assess the City's Transportation Corridors for tree and shrub shade.

Goal 6

The urban forest should bring beauty, interest, and a calming atmosphere to the urban environment.

VISUAL ACCESS TO NATURE

Objective: Exemplary tree streetscapes occur within historic areas, along major thoroughfares, and throughout highly visible locations (Strategic Framework—3 (a)).

	Optimal Performance Indicator	Contiguous tree lined streets are designed to support pedestrian travel and access to visually diverse naturalistic landscapes.
☐	**Good**	Multi-modal tree lined streets are used for informal gathering and recreation.
☐	**Moderate**	Pedestrian use of tree lined streets increases (statistical significance).
☑	**Low**	**Pedestrian use of tree lined streets remains unchanged.**

Consensus Action(s)

1. Monitor pedestrian use of shaded vs non-shaded streets. DTM

Commercial/Industrial/Institutional

Government offices, hospitals, schools, churches and industrial uses including municipal water, waste and power facilities

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

SPECIES – SHRUBS AND TREES

Objective: Tree and shrub diversity predominantly reflect the native forest as described by the Florida Natural Areas Inventory (FNAI).

✓ **Optimal Performance Indicator**	**No net loss of native shrub and tree diversity, in Commercial/ Industrial/Institutional land use type, since the 2016 urban forest analysis.**
☐ **Good**	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is <10%.
☐ **Moderate**	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is <30%.
☐ **Low**	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is >30%.

Consensus Action(s)

1. Continue to conduct tree and shrub diversity assessment within the i-Tree ecological analysis. PW

CANOPY COVER

Objective: Tree canopy cover not less than 35%.

✓ **Optimal Performance Indicator**	**No net loss of canopy cover since the 2016 urban forest analysis.**
☐ **Good**	Canopy cover is greater than 30%.
☐ **Moderate**	Canopy cover is greater than 25%.
☐ **Low**	Canopy cover is less than 25%.

Consensus Action(s)

1. Design and implement a canopy cover monitoring program. PW DSD

HYDROLOGY

Objective: No adverse impacts to the water quality of creeks, lakes, wetlands, floodplains, groundwater and uplands (Article VIII 28, Comp Plan Conservation Goal 2).

Optimal Performance Indicator	Property owners implement landscape designs that contribute to 15% gain in water conservation.

☐	**Good**	10% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.
☐	**Moderate**	5% net gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.
☑	**Low**	**No net loss of avoided stormwater runoff based upon the 2016 Urban Forest Analysis.**

Consensus Action(s)

1. Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. DSD

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

INVASIVE SPECIES

Objective: Invasive plant and animal species are eliminated

Optimal Performance Indicator	All Commercial/Industrial/Institutional land is free of invasive plant species.

☐	**Good**	Net decrease in the abundance and diversity of invasive plant species on Commercial/Industrial/Institutional land.
☐	**Moderate**	City-wide formal assessment of invasive species.
☑	**Low**	**No formal assessment of invasive species.**

Consensus Action(s)

1. Conduct invasive species assessments on the commercial/industrial/institutional lands type as part of the i-Tree ecological analysis. DSD

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

RISK-DAMAGE FROM TREES

Objective: Risk of property damage or personal injury is reduced to as low as reasonably practical.

Optimal Performance Indicator	Risk in all trees within the Commercial/Industrial/Institutional land use type is reduced to as low as reasonable practical.

☐	**Good**	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure.'
☐	**Moderate**	Level 1 tree risk assessment (ANSI 3000) is available to all Commercial/ Industrial/Institutional land owners.
☑	**Low**	**Tree risk is managed on an *ad hoc* basis.**

Consensus Action(s)

1. Notify commercial, industrial and institutional landowners of the City's ability to provide level 1 tree risk assessment. PW

ENERGY CONSERVATION

Objective: Heat loading of buildings and pavement reduced by shade produced from tree and shrub canopy (Art. VIII obj. 1).

Optimal Performance Indicator	Designed tree lined streetscapes are optimized for shading of buildings, sidewalks, roads and parking lots.

☐	**Good**	Published sun azimuth and atmospheric data along with tree structure descriptions are used to design tree lined streetscapes and landscapes that reduce heat loading within the Commercial/Industrial/Institutional land use type.
☐	**Moderate**	Consideration of published sun azimuth and atmospheric data are incorporated into guidelines for the design of streetscapes.
☑	**Low**	**Streetscapes are designed and implemented without explicit energy saving consideration.**

Consensus Action(s)

1. Prepare a Land Development Code (LDC) code amendment to require all new landscape designs meet LEEDS 'Certification' standards. DSD

CRIME PREVENTION

Objective: The City's urban forest supports a safe environment for businesses and workers

Optimal Performance Indicator	CPTED design standards are in place on all Commercial/Industrial/ Institutional properties

☐	**Good**	CPTED design standards are in place on all new Commercial/Industrial/ Institutional properties.
☐	**Moderate**	CPTED design standards are in place within at least 50% of new Commercial/Industrial/Institutional properties.
☑	**Low**	**CPTED design standards are in place within less than 50% of all new Commercial/Industrial/Institutional properties.**

Consensus Action(s)

1. Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards. GPD DSD

FIRE PREVENTION

Objective: Prevention of structure fires through directed manipulation of the urban forest.

Optimal Performance Indicator	All Commercial/Industrial/Institutional landscapes meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50).

☐	**Good**	All Commercial/Industrial/Institutional landscapes in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).
☐	**Moderate**	Some Commercial/Industrial/Institutional landscapes in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).
☑	**Low**	**Commercial/Industrial/Institutional properties within Wildland Urban Interface are not assessed for Wildfire Risk.**

Consensus Action(s)

1. Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. DSD

WILDLIFE HABITAT

Objective: Conservation and management of wildlife habitat.

Optimal Performance Indicator	All new industrial sites, commercial parks and institutional lands actively implement a wildlife habitat plan prepared by a certified wildlife biologist CWB® or active involvement of the Florida Fish and Wildlife Commission/ Florida Forest Service.

☐	**Good**	New industrial sites, commercial parks and institutional lands implement wildlife habitat conservation practices on an *ad hoc* basis
☐	**Moderate**	On all new industrial sites, commercial parks and institutional lands wildife habitat values are identified through a science-based assessment on conserved open space
☑	**Low**	**All new industrial sites, commercial parks and institutional lands conserve open space for habit values**

Consensus Action(s)

1. In cooperation with state universities and Florida Fish and Wildlife Conservation Commission develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. DSD PRCA

2. Prepare a Land Development Code (LDC) code amendment that requires the use of the rapid assessment of wildlife habitat and habitat conservation on all new commercial/industrial/institutional parks 1. over 10 acres in size; or 2. considered to be of strategic value in the protection of native plants and animals; or 3. aquatic habitat. DSD

Goal 6

The urban forest should bring beauty, interest, and a calming atmosphere to the urban environment.

VISUAL ACCESS

Objective: Workers within buildings on industrial sites, commercial parks and institutional lands have visual access to naturalistic landscapes.

Optimal Performance Indicator	Landscape and architectural design provide visual access of naturalistic landscapes from all workspaces within the building.

☐	**Good**	All new industrial sites, commercial parks and institutional lands incorporate landscape and architectural design to support partial visual access of naturalistic landscapes from within buildings.
☐	**Moderate**	All new industrial sites, commercial parks and institutional lands design naturalistic landscapes that support visual access from within buildings.
☑	**Low**	**All new industrial sites, commercial parks and institutional lands do not incorporate naturalistic landscape design that considers visual access to nature from within buildings.**

Consensus Action(s)

1. Prepare a Land Development Code (LDC) code amendment that requires landscape designs incorporate native plant species. DSD

Developed Parks/Open Spaces

Parks and recreational lands, cemeteries and golf courses

Goal 1

The urban forest should predominantly reflect the diversity of the surrounding native forest.

SPECIES—SHRUBS AND TREES

Objective: Tree and shrub diversity reflect the native forest as described by the FNAI.

Optimal Performance Indicator	Net increase of native shrub and tree diversity in developed/open space land use type

☐	**Good**	No net loss of native shrub and tree diversity in developed/open space land use type
☐	**Moderate**	Formal assessments
☑	**Low**	**No assessment**

Consensus Action(s)

1. Create and implement a vegetative assessment tool for use in Developed Parks. PRCA

STANDING DEAD AND DOWN WOODY MATERIAL

Objective: Standing dead and downed woody material are left in place when not posing a risk to visitors or infrastructure.

Optimal Performance Indicator	Dead standing and downed trees are conserved as a functional part of the natural forest ecosystem, if not posing a risk to visitors.

☐	**Good**	Dead standing and downed trees are inspected annually and managed to reduce risk to as low as is reasonably practical for visitors and propert
☐	**Moderate**	All dead standing and downed trees are removed from only high use areas (ie. playgrounds, picnic tables, etc.)
☑	**Low**	**All dead standing and downed trees are removed.**

Consensus Action(s)

1. Incorporate the conservation of standing dead and down woody material into landscape maintenance policies and procedures within developed parks. PRCA

2. Maintain at least one Parks, Recreation and Cultural Affairs staff member as an ISA Cert Arborist and TRAQ certified. PRCA

TREE CANOPY COVER

Objective: Tree canopy cover not less than 45%

✓ **Optimal Performance Indicator**	**No absolute net loss of canopy cover since the 2016 urban forest analysis**

☐	**Good**	Canopy cover greater than 40%
☐	**Moderate**	Canopy cover greater than 35%
☐	**Low**	Canopy cover greater than 30%

Consensus Action(s)

1. Design and conduct tree and shrub canopy cover assessment every 5-years. DSD PRCA

WILDLIFE

Objective: Park design and management support the conservation of native plants and animals.

Optimal Performance Indicator	Formal landscape plans that incorporate native plant and animal conservation and restoration guide active management and monitoring on all developed parks/open spaces.

☐	**Good**	Formal landscape plans incorporate native plant and animal conservation and restoration on all developed parks/open spaces.
☐	**Moderate**	Native plants and animals suited to developed park/open space sites are identified through a science-based assessment on an *ad hoc* basis.
☑	**Low**	**No assessment**

Consensus Action(s)

1. In cooperation with state universities and Florida Fish and Wildlife Conservation Commission, develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. DSD PRCA

NATURAL COMMUNITY TYPES

Objective: Landscape design reflects the structure and composition of native forest communities.

Optimal Performance Indicator	Native trees, shrubs and non-woody plants suitable for Gainesville's physical urban environment and adapted to the regional climate are central to all landscape designs.

☐	**Good**	New landscape design incorporate native plant associations and vegetative structure supported by site conditions.
☐	**Moderate**	Assessment of vegetation site conditions occurs on all developed parks/ open spaces.
☑	**Low**	**Vegetation site condition assessments are conducted on an *ad hoc* basis.**

Consensus Action(s)

1. Design and implement vegetative inventories and assessments on a 5 year basis. PRCA

Goal 2

The urban forest should be healthy, resistant to insect infestation and diseases, and resilient to damage and disturbance.

INVASIVE SPECIES

Objective: Invasive plant and animals are eliminated.

Optimal Performance Indicator	Invasive species are monitored and treated with appropriate science-based cultural practice, following the City's formal invasive species management strategy on all developed parks/open space.

☐	**Good**	The City has a formal invasive species management strategy for some developed parks/open space.
☐	**Moderate**	Assessment of invasive species and controlled on an *ad hoc* basis
☑	**Low**	**No assessment**

Consensus Action(s)

1. Conduct a visual assessment of invasive species in all Developed Parks annually. PRCA

Goal 4

The urban forest should support a mutually enhancing relationship between the natural and the built environments.

STORMWATER

Objective: Prevent adverse impacts to the water quality of creeks, lakes, wetlands, foodplains, groundwater and uplands (Art VIII #28).

Optimal Performance Indicator	Urban forest stormwater function is 10% higher on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis and forested floodplains and riparian forest stream corridors are managed to encourage infiltration as part of a comprehensive water conservation/stormwater management system.

☐	**Good**	Urban forest stormwater function is 10% higher on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis.
☐	**Moderate**	Urban forest stormwater function is 5% higher on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis.
☑	**Low**	**No net loss of urban forest stormwater function on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis.**

Consensus Action(s)

1. Prioritize the acquisition of Developed Parks/Open Space sites that directly support watershed hydrologic integrity. DSD PRCA

RISK-DAMAGE FROM TREES

Objective: Risk of property damage or personal injury is reduced to as low as reasonably practical

Optimal Performance Indicator	Risk in all trees within high use areas of the developed park land use type is reduced to as low as reasonably practical

☐	**Good**	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure'
☐	**Moderate**	Level 1 tree risk assessment (ANSI 3000) is conducted annually
☑	**Low**	**Tree risk is managed on an *ad hoc* basis.**

Consensus Action(s)

1. Conduct a Level 1 tree risk assessment (ANSI 3000) in high use areas each year. PRCA PW

ENERGY CONSERVATION

Objective: Heat loading of buildings and pavement is reduced by shade produced from tree and shrub canopy.

Optimal Performance Indicator	Published sun azimuth and atmospheric data are used in the design and implementation of landscapes to mitigate urban heat island effects on all developed parks/open spaces.
☐ **Good**	Published sun azimuth and atmospheric data are used in the design and implementation of landscapes on all new developed parks/open spaces to reduce urban heat island effects.
☐ **Moderate**	Landscapes are designed and implemented with consideration of urban heat island effects.
☑ **Low**	**Landscapes are designed and implemented without consideration of urban heat island effects.**

Consensus Action(s)

1. Prepare a Land Development Code (LDC) code amendment that requires that all RFP's for landscape designs on public parks include an element that addresses the reduction of urban heat loading. PRCA

FIRE PREVENTION

Objective: Prevention of structure fires and wildfire associated with the urban forest through directed manipulation of the urban forest structure

Optimal Performance Indicator	All structures in developed parks/open space meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50) .
☐ **Good**	All structures in developed parks/open space in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).
☑ **Moderate**	**Some structures in developed parks/open spaces in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).**
☐ **Low**	Structures in developed parks/open space in Wildland Urban Interface are not assessed for Wildfire Risk.

Consensus Action(s)

1. Map the Wildland Urban Interface within the City of Gainesville. DSD

CRIME PREVENTION

Objective: The City supports a safe environment within its developed parks/open spaces.

Optimal Performance Indicator	CPTED design standards are in place within all high visitor use areas.

☐	**Good**	CPTED design standards are practiced in all high visitor use areas.
☐	**Moderate**	CPTED design standards are considered in all high visitor use areas.
☑	**Low**	**CPTED design standards are not practiced in all high visitor use areas.**

Consensus Action(s)

1. Map high use zones
2. Prepare a MOU to require Police Dept review all Developed Parks for CPTEC compliance in high use zones.

GPD PRCA

Goal 6

The urban forest should bring beauty, interest, and a calming atmosphere to the urban environment.

VISUAL AND PHYSICAL ACCESS

Objective: >90% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.

Optimal Performance Indicator	All structures in developed parks/open space meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50) .

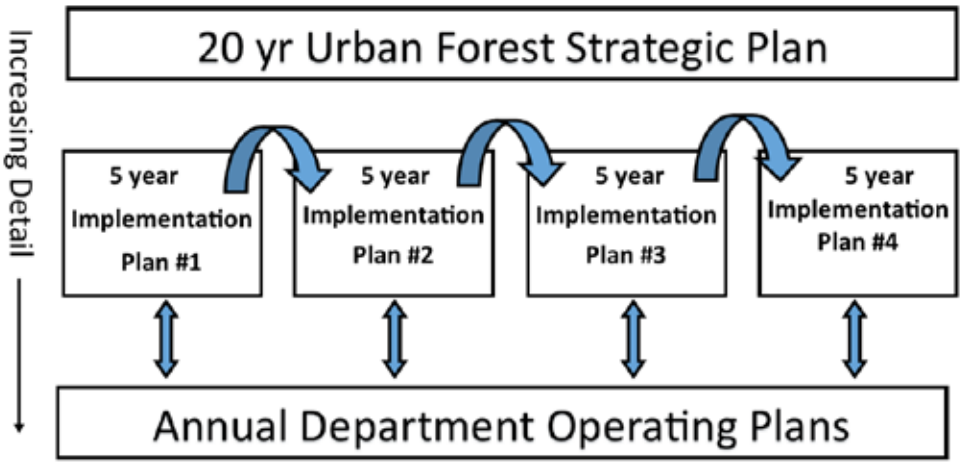
☐	**Good**	75 to 90% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.
☑	**Moderate**	**25 to 75% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.**
☐	**Low**	<25% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.

Consensus Action(s)

None

5-year Implementation Plan #1, 2021 – 2025 by Category

The 5-year Implementation Plan represents the initial set of actions, identified by the City's Internal Technical Advisory Committee, needed to lay the foundation for an inclusive and comprehensive urban forest management program. Actions chosen for 5-year Implementation Plan are intended to lead to long-term efficiencies in operational or capital costs. These actions address internal processes, procedures, public policy and education to support the institutional, community and technical capacities needed for management of the City's urban forest.



Actions for the 5-year Implementation Plan are arranged by category. The responsible or lead City departments are indicated.

Public Policy

- Prepare a draft resolution, for City Commission consideration, that recognizes the UFMP as the strategic plan for the management of the City of Gainesville's urban forest. — CO, DSD
- Prepare a Land Development Code (LDC) code amendment that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing urban forest resources. — DSD, PW
- Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. — DTM, DSD, PW
- Prepare a Land Development Code (LDC) code amendment to require all new landscape designs meet LEEDS 'Certification' standards. — DSD
- Prepare a Land Development Code (LDC) code amendment that requires landscape designs incorporate native plant species. — DSD
- Prepare a Land Development Code (LDC) code amendment that requires that all RFP's for landscape designs on all Developed Public Parks include an element that addresses the reduction of urban heat loading. — DSD, PRCA
- Prepare a Land Development Code (LDC) code amendment that requires the use of the rapid assessment of wildlife habitat and habitat

conservation on all new commercial/industrial/institutional parks 1. over 10 acres in size; or 2. considered to be of strategic value in the protection of native plants and animals; or 3. aquatic habitat. DSD

Monitoring the Urban Forest

- Incorporate a social survey and assessment of citizen interest in urban forest management into the i-Tree ecological analysis PW SI CO
- Conduct social surveys once every 5 years to determine citizen values concerning vegetative management within utility rights-of-way. Continue i-Tree urban forest ecological analysis on 5-yr cycle to include measurement of: GRU PW
    - air quality
    - greenhouse gas sequestration
    - invasive species assessment on residential lands
    - tree and shrub diversity assessment
- Design and implement a tree canopy cover monitoring program. PW DSD DTM
- Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. DSD
- Design and implement an inventory and condition assessment of riparian woodland buffers and forested wetlands. DSD
- Monitor pedestrian use of shaded vs non-shaded streets. DTM
- Design and conduct tree and shrub canopy cover assessment in Developed Parks every 5-years. PRCA
- Conduct a visual assessment of invasive species in all Developed Parks annually. PRCA
- Conduct a rapid invasive species inventory and assessment along all City rights-of-way on an annual basis. DTM

Education

- Provide homeowners with training and information concerning the proper placement of trees around their home to reduce heat loading. GRU
- Develop and Implement a Community Arborist Program – Use UF Extension Master Gardeners Program as a model. PW
- Prepare a digital City of Gainesville 'illustrated booklet' on tree care and maintenance Best Management Practices for inclusion on urban forestry web site. PW
- Incorporate urban forest curriculum into Park summer programs and Earth academy. PRCA
- Organize and present at least one workshop on urban wildlife management per Commission District every 4 years. PRCA

Staff Enhancement

- Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City.

CM HR DSD PW GRU DTM

Inter and Intra-agency Cooperation

- Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs.

PW DSD GRU DTM

- Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care.

PRCA PW DSD

- Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards.

GPD DSD

- Prepare a MOU to require Police Dept review all Developed Parks for CPTEC compliance in high use zones.

PRCA GPD

- Expand the City of Gainesville's Tree Matrix to include shrubs.

PW DSD

- In cooperation with state universities and Florida Fish and Wildlife Conservation Commission, develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville..

DSD PRCA

- Host a summit on forest sustainability that includes all relevant federal, state, regional and local government agencies and NGO's operating within the greater City of Gainesville region.

PW DSD SI

Public Lands and Publicly Administered Rights-of-Way

Stewardship - Nature Parks

- Initiate vegetative inventory and monitoring systems on 50% of the Nature Parks every 5 years.
    - dead woody material
    - plant abundance
    - plant diversity
    - tree diameter distribution
    - invasive species inventory and assessment

PRCA

- Prepare natural resource management plans that identify criteria and quantifiable performance objectives for City-owned Natural Parks.

PRCA

- Cooperate with social science experts in the design of a social survey to assess City resident perceptions of security and welcomeness at Nature Parks.

PRCA

- Incorporate specific and measurable outcomes for water quality in all Nature Parks management plans.

PRCA PW DSD

- Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks.

PRCA

Stewardship - Developed Parks

- Calculate the distance and travel time to parks (Arc-GIS, spatial analyst). PRCA
- Develop Citywide strategic plan for acquisition and development of parks, greenways and trails to ensure equitable accessibility. PRCA DSD
- Prioritize the acquisition of Developed Parks/Open Space sites that directly support watershed hydrologic integrity. PRCA DSD
- Maintain at least one Parks, Recreation and Cultural Affairs staff member as an ISA Cert Arborist and TRAQ certified. PRCA
- Map high use zones in Developed Parks. PRCA
- Conduct Level 1 tree risk assessment (ANSI 3000) of all trees in high use areas of Developed and Nature Parks. – PRCA PRCA
- Create and implement a vegetative assessment tool for use in Developed Parks. PRCA
- Incorporate the conservation of standing dead and down woody material into landscape maintenance policies and procedures within Developed Parks. PRCA

Transportation Rights-of-Way

- Utilize systematic rapid (mobile) risk assessment surveys to identify 'hazardous' trees and prioritize their removal, with emphasis on emergency and evacuation routes. PW DTM
- Maintain 2020 internal policy and procedures regarding tree inspection and 3-year pruning cycle within the City's Transportation Corridors. PW DTM
- Target tree planting in areas of high impervious surface within Transportation Corridors. PW DTM GRU
- Develop a strategic plan for invasive species management within the City's transportation corridors. DTM

5-Year Implementation Plan #1, 2021 – 2025 by Department

The 5-year Implementation Plan represents the initial set of actions, identified by the City's Internal Technical Advisory Committee, needed to lay the foundation for an inclusive and comprehensive urban forest management program. Actions chosen for 5-year Implementation Plan are intended to lead to long-term efficiencies in operational or capital costs. These actions address internal processes, procedures, public policy and education to support the institutional, community and technical capacities needed for management of the City's urban forest.

Actions for the 5-year Implementation Plan are arranged by the responsible or lead City departments.

Department of Sustainable Development

- Prepare a draft resolution, for City Commission consideration, that recognizes the UFMP as the strategic plan for the management of the City of Gainesville's urban forest. DSD CA
- Prepare a Land Development Code (LDC) code amendment that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing urban forest resources. DSD PW
- Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. DSD PW PRCA DTM
- Prepare a Land Development Code (LDC) code amendment to require all new landscape designs meet LEEDS 'Certification' standards. DSD
- Prepare a Land Development Code (LDC) code amendment that requires landscape designs incorporate native plant species. DSD
- Prepare a Land Development Code (LDC) code amendment that requires that all RFP's for landscape designs on all Developed Public Parks include an element that addresses the reduction of urban heat loading. DSD PRCA
- Prepare a Land Development Code (LDC) code amendment that requires the use of the rapid assessment of wildlife habitat and habitat conservation on all new commercial/industrial/institutional parks 1. over 10 acres in size; or 2. considered to be of strategic value in the protection of native plants and animals; or 3. aquatic habitat. DSD
- Design and implement a tree canopy cover monitoring program. DSD PW DTM
- Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. DSD
- Design and implement an inventory and condition assessment of riparian woodland buffers and forested wetlands. DSD

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- Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City. DSD PW GRU CM HR
- Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. DSD PW GRU
- Expand the City of Gainesville's Tree Matrix to include shrubs. DSD PW
- Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. DSD PW PRCA
- In cooperation with state universities and Florida Fish and Wildlife Conservation Commission, develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. DSD PRCA
- Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards. DSD GPD
- Host a summit on forest sustainability that includes all relevant federal, state, regional and local government agencies and NGO's operating within the greater City of Gainesville region. DSD SI
- Develop Citywide strategic plan for acquisition and development of parks, greenways and trails to ensure equitable accessibility. DSD PRCA
- Prioritize the acquisition of Developed Parks/Open Space sites that directly support watershed hydrologic integrity. DSD PRCA
- Incorporate specific and measurable outcomes for water quality in all Nature Parks management plans. DSD PW PRCA

Public Works

- Prepare a Land Development Code (LDC) code amendment that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing urban forest resources. PW DSD
- Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. PW PRCA DSD DTM
- Incorporate a social survey and assessment of citizen interest in urban forest management into the i-Tree ecological analysis. PW SI CO
- Conduct social surveys once every 5 years to determine citizen values concerning vegetative management within utility rights-of-way. PW GRU
- Continue i-Tree urban forest ecological analysis on 5-yr cycle to include measurement of: PW
    - air quality
    - greenhouse gas sequestration
    - invasive species assessment on residential lands

- tree and shrub diversity assessment

- Design and implement a tree canopy cover monitoring program. PW DTM DSD
- Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City. PW DSD GRU HR CM
- Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. PW GRU DSD
- Expand the City of Gainesville's Tree Matrix to include shrubs. PW DSD
- Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. PW PRCA DSD
- Incorporate specific and measurable outcomes for water quality in all Nature Parks management plans. PW PRCA DSD
- Utilize systematic rapid (mobile) risk assessment surveys to identify 'hazardous' trees and prioritize their removal, with emphasis on emergency and evacuation routes. PW DTM
- Maintain 2020 internal policy and procedures regarding tree inspection and 3-year pruning cycle within the City's Transportation Corridors. PW DTM
- Target tree planting in areas of high impervious surface within Transportation Corridors. PW DTM
- Notify commercial, industrial and institutional landowners of the City's ability to provide level 1 tree risk assessment. PW GRU

Parks, Recreation and Cultural Affairs

- Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. PRCA DSD PW DTM
- Prepare a Land Development Code (LDC) code amendment that requires that all RFP's for landscape designs on all Developed Public Parks include an element that addresses the reduction of urban heat loading. PRCA PW
- Design and conduct tree and shrub canopy cover assessment in Developed Parks every 5-years. PRCA
- Conduct a visual assessment of invasive species in all Developed Parks annually. PRCA
- Incorporate urban forest curriculum into Park summer programs and Earth academy. PRCA
- Organize and present at least one workshop on urban wildlife management per Commission District every 4 years. PRCA
- Prepare a MOU to require Police Dept review all Developed Parks for CPTEC compliance in high use zones. PRCA GPD

- Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. PRCA DSD PW
- In cooperation with state universities and Florida Fish and Wildlife Conservation Commission, develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. PRCA DSD
- Prepare natural resource management plans that identify criteria and quantifiable performance objectives for City-owned Natural Parks. PRCA
- Calculate the distance and travel time to parks (Arc-GIS, spatial analyst). PRCA
- Develop Citywide strategic plan for acquisition and development of parks, greenways and trails to ensure equitable accessibility. PRCA DSD
- Prioritize the acquisition of Developed Parks/Open Space sites that directly support watershed hydrologic integrity. PRCA
- Cooperate with social science experts in the design of a social survey to assess City resident perceptions of security and welcomeness at Nature Parks. PRCA
- Maintain at least one PRC, Recreation and Cultural Affairs staff member as an ISA Cert Arborist and TRAQ certified. PRCA
- Map high use zones in Developed Parks. PRCA
- Conduct Level 1 tree risk assessment (ANSI 3000) of all trees in high use areas of Developed and Nature Parks. PRCA
- Incorporate specific and measurable outcomes for water quality in all Nature Parks management plans. PRCA DSD PW
- Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks. PRCA
- Initiate vegetative inventory and monitoring systems on 50% of the Nature Parks every 5 years. PRCA
    - dead woody material
    - plant abundance
    - plant diversity
    - tree diameter distribution
    - invasive species inventory and assessment
- Create and implement a vegetative assessment tool for use in Developed Parks. PRCA
- Incorporate the conservation of standing dead and down woody material into landscape maintenance policies and procedures within Developed Parks. PRCA

Department of Transportation and Mobility

- Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds.

- Design and implement a tree canopy cover monitoring program.

- Monitor pedestrian use of shaded vs non-shaded streets.

- Conduct a rapid invasive species inventory and assessment along all City rights-of-way on an annual basis.

- Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City.

- Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs.

- Utilize systematic rapid (mobile) risk assessment surveys to identify 'hazardous' trees and prioritize their removal, with emphasis on emergency and evacuation routes.

- Maintain 2020 internal policy and procedures regarding tree inspection and 3-year pruning cycle within the City's Transportation Corridors.

- Target tree planting in areas of high impervious surface within Transportation Corridors.

- Develop a strategic plan for invasive species management within the City's transportation corridors.

Gainesville Regional Utilities

- Conduct social surveys once every 5 years to determine citizen values concerning vegetative management within utility rights-of-way.

- Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City.

- Provide homeowners with training and information concerning the proper placement of trees around their home to reduce heat loading.

- Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs.

- Target tree planting in areas of high impervious surface within Transportation Corridors.

Appendicies

Appendix A: Consistency Between Vision, Goals and Urban Forest Management Plan

This document provides an example of consistency between Vision and Goals set by Public Committee on Urban Forest Sustainability, the Guiding Principles, and Elements, Objectives and Alternatives for Action.

Vision Statement

Gainesville's urban forest is abundant, diverse, healthy, and benefits the community.

Goal

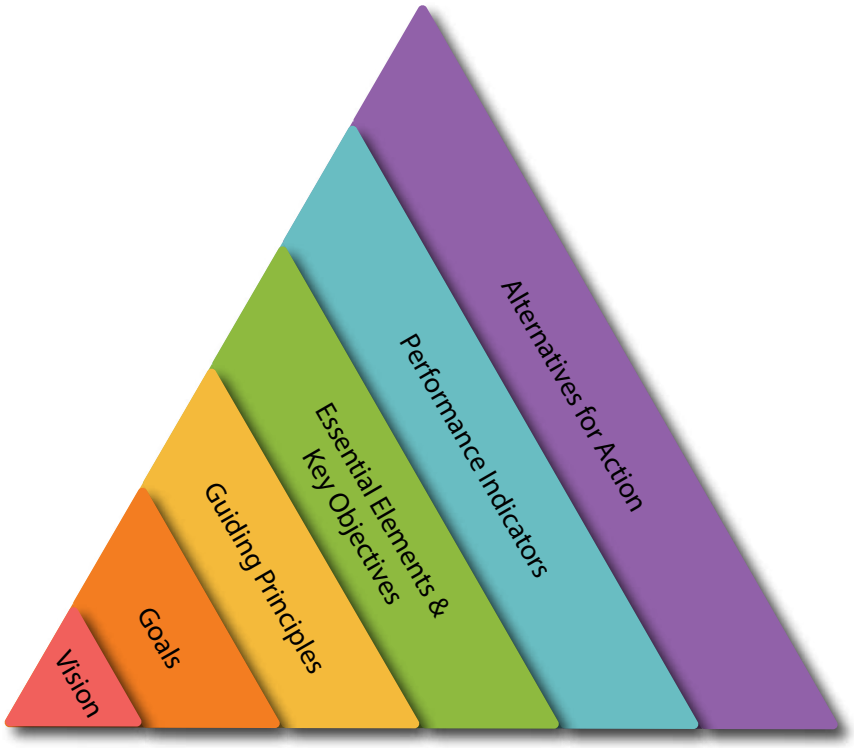
1. The urban forest should predominantly reflect the diversity of the surrounding native forest.

Guiding Principles

1. government efficiency; public – private partnerships

2. support neighborhoods

3. increase the social, environmental and economic benefits of the urban forest by reducing costs; and support basic tenets of the City's Comprehensive Plan.



Essential Elements & Key Objectives

Canopy Cover	Species (Shrubs & Trees)	Wildlife	Hydrology
Total canopy coverages is 50% or greater (city-wide)	Tree and shrub diversity predominantly reflect the native forest as described by the Florida Natural Areas Inventory (FNAI)	Property owners/ residents are knowledgeable about wildlife that may occur on their property	Prevent adverse impacts to the water quality of creeks, lakes, wetlands, floodplains, groundwater and uplands
1. Design and implement a canopy cover monitoring program 2. Prepare a digital City of Gainesville 'illustrated booklet' on tree care and maintenance Best Management Practices	1. Expand the City of Gainesville's Tree Matrix to include shrubs	1. Organize and present at least one workshop on urban wildlife management per Commission District every 4 years	1. Design and implement an inventory and condition assessment of riparian woodland buffers and forested wetlands

Appendix B: Cost-Benefit Analysis of Urban Trees

Calculating Benefits

Note* Benefits are realized at four geographic scales: parcel, neighborhood, community and global.

Annual benefits are calculated as:

$B = E + AQ + CO2 + H + A$

Where

E = value of net annual energy savings (cooling and heating)

AQ = value of annual air-quality improvement (pollutant uptake, avoided powerplant emissions, and BVOC emissions) CO2 = value of annual CO2 reductions (sequestration, avoided emissions, release from tree care and decomposition) H = value of annual stormwater-runoff reductions

A = value of annual aesthetics and other benefits

Annual costs (C) are the sum of costs for residential yard trees (CY) and public trees (CP) where: $CY = P + T + R + D + I + S + Cl + L$

$CP = P + T + R + D + I + S + Cl + L + A$

Where

P = cost of tree and planting

T = average annual tree pruning cost

R = annualized tree and stump removal and disposal cost

D = average annual pest and disease control cost

I = annual irrigation cost

S = average annual cost to repair/mitigate infrastructure damage

Cl = annual litter and storm cleanup cost

L = average annual cost for litigation and settlements from tree=related claims

A = annual program administration, inspection and other costs

Net benefits are calculated as the difference between total benefits and costs:

Net benefits = B – C

Benefit – cost ratios (BCR) are calculated as the ratio of benefits to costs: $BCR = B \div C$

Case Study: U.S. Forest Service, Central Florida

The U.S. Forest Service conducted a research project to determine benefits and costs of urban forests in Central Florida using Orlando, Florida field data and other information drawn from across the region including St. Petersburg, City of Tampa and Dunedin (Peper et. al. 2010).

The outcome of their work is a process for the quantification of benefits and costs for representative small, medium and large broadleaf trees and a conifer in the Central Florida region, which can be used as a starting point for more specific benefit cost analysis for the City of Tampa.

Small broadleaf – crape myrtle

Medium broadleaf – southern magnolia Large broadleaf – live oak

Conifer – slash pine

The analysis distinguished between "yard trees" (those planted in residential sites) and "public trees" (those planted on streets or in parks). Benefits were calculated based on tree growth curves and numerical models that consider regional climate, building characteristics, air pollutant concentrations, and prices. Tree care costs and mortality rates were based on results from a survey of municipal and commercial arborists. A 60-percent survival rate was assumed over a 40-year timeframe.

General outcomes from the U.S. Forest Service research project:

Large trees provide the most benefits.

Average annual benefits over 40 years increase with mature tree size and differ based on tree location.

Except for conifers, the lowest values were for public trees and the highest values were for yard trees on the western side of houses.

Benefits range as follows (40 years after planting):

$23 to $30 for a small tree (24 ft tall)

$59 to $74 for a medium tree (46 ft tall)

$127 to $149 for a large tree (56 ft tall)

$32 to $34 for a conifer (67 ft tall)

*Benefits associated with reduced levels of stormwater runoff and increased property values accounted for the largest proportion of total benefits in this region. Energy savings, reduced levels of air pollutants and CO2 in the air were the next most important benefits.

*Energy conservation benefits differ with tree location as well as size. Trees located opposite west-facing walls provided the greatest net cooling energy savings.

The benefits of trees were offset by the costs of caring for them. Based surveys of municipal and commercial arborists from throughout the region, the average annual cost for tree care over 40 years ranges from $20 to $31 per tree.

Annual costs for yard and public trees, respectively:

$20 and $22 for a small tree

$23 and $27 for a medium tree

$25 and $31 for a large tree

$23 and $27 for a conifer

*Planting costs, annualized over 40 years, were the greatest expense for yard trees ($11 per tree per year); planting costs for public trees were significantly lower ($6 per tree per year).

*For public trees, pruning ($7 to $11 per tree per year) and removal and disposal expenses ($4 to $6 per tree per year) were the greatest costs.

*Public trees also incur administrative costs, including inspections ($2 to $4 per tree per year). Average annual net benefits (benefits minus costs) per tree for a 40-year period were calculated:

$1 for a small public tree to $10 for a small yard tree on the west side of a house

$32 for a medium public tree to $51 for a medium yard tree on the west side of a house

$96 for a large public tree to $123 for a large yard tree on the west side of a house

$7 for a public conifer to $9 for a yard conifer in a windbreak

*Environmental benefits alone, including energy savings, stormwater runoff reduction, improved air quality, and reduced atmospheric CO2, were greater than tree care costs for medium and large trees.

Net benefits for a yard tree opposite a west wall and a public tree were substantial when summed over the entire 40- year period:

$403 (yard) and $23 (public) for a small tree

$2,039 (yard) and $1,266 (public) for a medium tree

$4,939 (yard) and $3,859 (public) for a large tree

$344 (yard) and $296 (public) for a conifer

*Private trees produce higher net benefits than public trees. Survey results indicated that this was primarily due to higher maintenance costs for street and park trees. The standard of care is often higher for public trees because municipalities need to manage risk, maintain required clearances for pedestrians and vehicles, remove tree debris after hurricanes, and repair damage to sidewalks and curbing caused by tree roots.

Appendix C:
Gainesville Tree Matrix

Common Name	Scientific Name	Plant Family	Florida Native	Average Spread (35 yrs)	Mature Height	Growth Rate	pH	Drought Tolerance	Wind Resistance 99, 100 except as noted	Flood Tolerance	Soil Area (w/3ft depth) guidelines 102	Distance from Paved Surface guidelines 102	Hardiness Zone
American Holly[1]	*Ilex opaca*[2]	Aquifoliaceae[2]	yes[2]	15-25 feet[2]	35-50 feet[2]	slow[2]	acidic, slightly alkaline[2]	high[2]	high	extended[2]	20' x 20'	6'	5B to 9[2]
American Hophornbeam[1]	*Ostrya virginiana*[3]	Betulaceae[3]	yes[3]	25-30 feet[3]	30-40 feet[3]	slow[3]	alkaline, acidic[3]	high[3]	medium/high	none[3]			3A to 9A[3]
American Hornbeam[1]	*Carpinus caroliniana*[4]	Betulaceae[4]	yes[4]	20-30 feet[4]	20-30 feet[4]	slow[4]	acidic, slightly alkaline[4]	moderate[4]	hIgh	occasional[4]	10' x 10'	2'	3A to 9A[4]
Bald cypress[1]	*Taxodium distichum*[5]	Cupressaceae[89]	yes[5]	25-35 feet[5]	60-80 feet[5]	fast[5]	acidic, slightly alkaline[5]	high[5]	high	extended[5]	30' x 30'	10'	5A to 10B[5]
Basket Oak[1], Swamp chestnut oak[2]	*Quercus michauxii*[72]	Fagaceae[72]	yes[72]	40 feet[1]	60 feet[1]				medium/high				
Black Cherry[14]	*Prunus serotina*[6]	Rosaceae[6]	yes[6]	35-50 feet[6]	60-90 feet[6]	fast[6]	alkaline, acidic[6]	high[6]	medium/low	occasoinal[6]	30' x 30'	10'	3B to 9A[6]
Blackgum[1]	*Nyssa sylvatica*[7]	Cornaceae[90]	yes[7]	25-35 feet[7]	65-75 feet[7]	slow[7]	acidic[7]	high[7]	medium/high	extended[7]			4B to 9B[7]
Bluejack Oak[1]	*Quercus incana*[9]	Fagaceae[9]	yes[9]	30 feet[1]	40 feet[1]		acidic, slightly alkaline [9]	high[1]			20' x 20'	6'	
Box Elder[1]	*Acer negundo*[95]	Aceraceae[95]	yes[95]	35-40 feet[95]	40-50 feet[95]	fast[95]	acidic, alkaline[95]	high[95]	medium/low	extended[95]	30' x 30'	10'	3 to 8[95]
Cabbage Palm[14]	*Sabal palmetto*[10]	Arecaceae[91]	yes[10]	10-15 feet[10]	40-50 feet[10]	slow[10]	alkaline, acidic[10]	high[10]	high	extended[10]	20' x 20'	6'	8B to 11[10]
Canary Island Date Palm[1]	*Phoenix canariensis*[11]	Arecaceae[92]	no[11]	20-25 feet[11]	40-60 feet[11]	slow[11]	alkaline, acidic[11]	high[11]	high	none[11]	30' x 30'	10'	9 to 11[11]
Carolina Willow[14]	*Salix caroliniana*[15]	Salicaceae[15]	yes[15]		33 feet[15]	fast [101]	slightly acidic [101]	low [101]		extended [101]			
Chickasaw Plum[1]	*Prunus angustifolia*[12]	Rosaceae[93]	yes[12]	15-20 feet[12]	12-20 feet[12]	moderate[12]	acidic[12]	high[12]	medium/high	none[12]	10' x 10'	2'	6 to 9[12]

Common Name	Scientific Name	Plant Family	Florida Native	Average Spread (35 yrs)	Mature Height	Growth Rate	pH	Drought Tolerance	Wind Resistance 99, 100 except as noted	Flood Tolerance	Soil Area (w/3ft depth) guidelines 102	Distance from Paved Surface guidelines 102	Hardiness Zone
Chinese Fringetree[1]	*Chionanthus retusus*[13]	Oleaceae[13]	no[13]	10-15 feet[13]	15-20 feet[13]	slow[13]	acidic, alkaline[13]	moderate[13]	medium/high	occasional[13]			5B to 9[13]
Common Persimmon[1]	*Diospyros virginiana*[16]	Ebenaceae[16]	yes[16]	20-35 feet[16]	40-60 feet[16]	moderate[16]	alkaline, acidic[16]	high[16]	medium/high	extended[16]	30′ x 30′	10′	4B to 9B[16]
Crape myrtle[1]	*Lagerstroemia indica*[17]	Lythraceae[17]	no[17]	15-25 feet[17]	10-30 feet[17]	moderate[17]	alkaline, acidic[17]	high[17]	high	none[17]	10′ x 10′	2′	7A to 9A[17]
Dahoon Holly[1]	*Ilex cassine*[18]	Aquifoliaceae[18]	yes[18]	8-12 feet[18]	20-30 feet[18]	moderate[18]	slightly alkaline, acidic[18]	moderate[18]	high	extended[18]	10′ x 10′	2′	7A to 11[18]
Drake′ Chinese Elm[1]	*Ulmus parvifolia CV. Drake*[20]	Ulmaceae[20]	no[20]	35-50 feet[20]	35-45 feet[20]	moderate[20]	acidic[20]	high[20]	low	occasional[20]			7B to 10[20]
East Palatka′ Holly[1]	*Ilex x attenuata CV East Palatka*[21]	Aquifoliaceae[21]	yes[21]	10-15 feet[21]	30-45 feet[21]	moderate [20]	acidic [21]	high [21]			20′ x 20′	6′	7 to 9 [21]
Eastern Redbud[1]	*Cercis canadensis*[22]	Fabaceae[22]	yes[22]	15-25 feet[23]	20-30 feet[23]	fast[23]	acidic[23]	high	medium/high	occasional[23]	10′ x 10′	2′	4B to 9A[23]
Flatwoods Plum[1]	*Prunus umbellata*[24]	Rosaceae[24]	yes[24]	12-20 feet[24]	12-20 feet[24]	moderate[24]	slightly alkaline, acidic[24]	moderate[24]	resistant[24]	occasional[24]	10′ x 10′	2′	8A to 9B[24]
Florida maple[1]	*Acer floridanum (Barbatum)*[96]	Aceraceae[96]	yes[96]	25-40 feet[96]	50-60 feet[96]	moderate[96]	acidic[96]	high[96]	resistant[96]	occasional[96]	30′ x 30′	10′	6B to 9A[96]
Flowering Dogwood[1]	*Cornus florida*[25]	Cornaceae[25]	yes[25]	25-30 feet[26]	20-30 feet[26]	moderate[26]	acidic, slightly alkaline[26]	moderate[26]	high	none[26]	10′ x 10′	2′	5 to 9A[26]
Fringetree[1]	*Chionanthus virginicus*[27]	Oleaceae[27]	yes[27]	10-15 feet[28]	12-20 feet[28]	slow[28]	acidic[28]	moderate[28]	medium/high	occasional[28]	10′ x 10′	2′	3 to 9[28]
Green Ash[1]	*Fraxinus pennsylvanica*[29]	Oleaceae[29]	yes[29]	45-50 feet[30]	60-70 feet[30]	fast[30]	slightly alkaline, acidic [30]	high [30]	medium/low	extended[30]	20′ x 20′	6′	3 to 9A[30]
Jerusalem-Thorn[1]	*Parkinsonia aculeata*[31]	Fabaceae[31]	no[31]	20-25 feet[32]	15-20 feet[32]	fast[32]	alkaline, acidic[32]	high[32]		none[32]	10′ x 10′	2′	8B to 11[32]
Laurel Oak, Diamond Leaf Oak[1]	*Quercus laurifolia*[33]	Fagaceae[33]	yes[33]	35-45 feet[33]	60-70 feet[33]	fast[33]	acidic, slightly alkaline[33]	moderate[33]	low	occasional[33]	30′ x 30′	10′	6B to 10A[33]

Common Name	Scientific Name	Plant Family	Florida Native	Average Spread (35 yrs)	Mature Height	Growth Rate	pH	Drought Tolerance	Wind Resistance 99, 100 except as noted	Flood Tolerance	Soil Area (w/3ft depth) guidelines 102	Distance from Paved Surface guidelines 102	Hardiness Zone
Ligustrum[2]	*Ligustrum j aponicum*[34]	Oleaceae[34]	no[34]	15-25 feet[34]	8-12 feet[34]	MODERATE[34]	slightly alkaline, acidic[34]	moderate[34]	resistant[34]	none[34]			7B to 10A[34]
Loblolly Pine[1]	*Pinus taeda*[35]	Pinaceae[35]	yes[35]	30 feet[1]	90-110 feet[36]				medium/low				6B to 9 [35]
Loblolly-Bay[1]	*Gordonia lasianthus*[37]	Theaceae[37]	yes[37]	10-15 feet[37]	35-60 feet[37]	moderate[37]	acidic[37]	moderate[37]	resistant	extended[37]	30' x 30'	10'	7A to 9B
Longleaf Pine[1]	*Pinus palustris*[38]	Pinaceae[38]	yes[38]	30-40 feet[38]	60-80 feet[38]	fast[38]	acidic, slightly alkaline[38]	high[38]	medium/low	occasional[38]	30' x 30'	10'	7A to 10A
Loquat[1]	*Eriobotrya japonica*[39]	Rosaceae[39]	no[39]	30-35 feet[40]	20-30 feet[40]	moderate[40]	acidic, alkaline[40]	moderate[40]	medium/low	occasional[40]			8A to 11
Pecan[1]	*Carya illinoensis*[41]	Juglandaceae[41]	yes[41]	50-70 feet[42]	70-100 feet[42]	moderate[42]	alkaline, acidic[42]	high[42]	low		30' x 30'	10'	5B to 9A[42]
Pignut Hickory[1]	*Carya glabra*[43]	Juglandaceae[43]	yes[43]	30-40 feet[44]	50-65 feet[44]	moderate[44]	slightly alkaline, acidic[44]	high[44]	medium/high	occasional[44]	30' x 30'	10'	5 to 9[44]
Pindo Palm[1]	*Butia capitata*[45]	Arecaceae[45]	no[45]	10-15 feet[46]	15-25 feet[46]	slow[46]	slightly alkaline, acidic[46]	high[46]	high	none[46]	10' x 10'	2'	8B to 11[46]
Podocarpus[1]	*Podocarpus macrophyllus*[47]	Podocarpaceae[47]	no[47]	20-25 feet[48]	30-40 feet[48]	slow[48]	alkaline, acidic[48]	high[48]	high	none[48]	30' x 30'	10'	8B to 11[48]
Pond cypress[1]	*Taxodium ascendens*[49]	Cupressaceae[49]	yes[49]	10-15 feet[50]	50-60 feet[50]	fast[50]	slightly alkaline, acidic[50]	high[50]	high	extended[50]	30' x 30'	10'	5B to 9B[50]
Red bay[1]	*Persea borbonia*[57]	Lauraceae[57]	yes[57]	30-50 feet[57]	30-50 feet[57]	moderate[57]	alkaline, acidic[57]	high[57]	medium/low	occasional[57]	20' x 20'	6'	7B to 11[57]
Red Buckeye[1]	*Aesculus pavia*[51]	Hippocastanaceae[51]	yes[51]	15-25 feet[51]	15-20 feet[51]	moderate[51]	acidic[51]	moderate[51]	resistant[51]	extended[51]	10' x 10'	2'	6A to 9A[51]
Red Cedar[1]	*Juniperus virginiana*[52]	Cupressaceae[52]	yes[52]	10-20 feet[53]	40-50 feet[53]	fast[53]	alkaline, acidic[53]	high[53]	low	none[53]	20' x 20'	6'	2 to 9[53]
Red Maple[1]	*Acer rubrum*[54]	Aceraceae[54]	yes[54]	25-35 feet[55]	60-75 feet[55]	fast[55]	acidic[55]	moderate[55]	medium/low	extended[55]	30' x 30'	10'	4 to 9[55]
Red Mulberry[1]	*Morus rubra*[56]	Moraceae[56]	yes[56]	35 feet[1]	50 feet[1]	fast [56]	acidic, slightly alkaline [56]		medium/low	occasional [56]	30' x 30'	10'	

Common Name	Scientific Name	Plant Family	Florida Native	Average Spread (35 yrs)	Mature Height	Growth Rate	pH	Drought Tolerance	Wind Resistance 99, 100 except as noted	Flood Tolerance	Soil Area (w/3ft depth) guidelines 102	Distance from Paved Surface guidelines 102	Hardiness Zone
River Birch[1]	*Betula nigra*[94]	Betulaceae[94]	yes[94]	25-35 feet[94]	40-50 feet[94]	fast[94]	acidic[94]	moderate[94]	medium/high	extended[94]	20′ x 20′	6′	4A to 9A[94]
Sand Live Oak[1]	*Quercus geminata*[58]	Fagaceae[58]	yes[58]	50 feet[58]	60 feet[58]	moderate [64]		high [58]	high		30′ x 30′	10′	8a to 10B
Shumard Oak[1]	*Quercus shumardii*[59]	Fagaceae[59]	yes[59]	40-50 feet[60]	55-80 feet[60]	fast[60]	acidic[60]	high[60]	medium/high	occasional[60]			5B to 9[60]
Slash Pine[1]	*Pinus elliottii*[61]	Pinaceae[61]	yes[61]	35-50 feet[62]	75-100 feet[62]	fast[62]	acidic, slightly alkaline[62]	high[62]	medium/low	occasional[62]	30′ x 30′	10′	7 to 11[62]
Southern Live Oak[1]	*Quercus virginiana*[63]	Fagaceae[63]	yes[63]	60-120 feet[64]	60-80 feet[64]	moderate[64]	acidic[64]	high[64]	high	occasional[64]	30′ x 30′	10′	7B to 10B[64]
Southern Magnolia[1]	*Magnolia grandiflora*[65]	Magnoliaceae[65]	yes[65]	30-40 feet[66]	60-80 feet[66]	moderate[66]	slightly alkaline, acidic[66]	moderate[66]	high	extended[66]	30′ x 30′	10′	7 to 10A[66]
Sugarberry[1]	*Celtis laevigata*[69]	Ulmaceae[69]	yes[69]	50-60 feet[70]	50-70 feet[70]	fast[70]	alkaline, acidic[70]	high[70]	medium/low	extended[70]	30′ x 30′	10′	5 to 10[70]
Swamp Bay[1]	*Persea palustris*[71]	Lauraceae[71]	yes[71]	20 feet[1]	35 feet[1]								
Swamp Tupelo[1]	*Nyssa biflora*[1]	Cornaceae[73]	yes[73]		100 feet[74]	moderate[74]	acidic[74]	none[74]		extended[74]			5 to 9A [74]
Sweetbay Magnolia[1]	*Magnolia virginiana*[75]	Magnoliaceae[75]	yes[75]	15-25 feet[75]	40-50 feet[75]	moderate[75]	acidic[75]	low[75]	medium/high	extended[75]	20′ x 20′	6′	5A to 10A[75]
Sweetgum[1]	*Liquidambar styraciflua*[76]	Hamamelidaceae[76]	Yes[76]	35-50 feet[77]	100 feet[76]	moderate[77]	acidic, slightly alkaline[77]	moderate[77]	medium/high	extended[77]	30′ x 30′	10′	5B to 10A[77]
Sycamore[1]	*Platanus occidentalis*[78]	Platanaceae[78]	yes[78]	50-70 feet[78]	75-90 feet[78]	fast[78]	alkaline, acidic[78]	high[78]	medium/low	extended[78]	30′ x 30′	10′	4B to 9A[78]
Tulip tree[1]	*Liriodendron tulipifera*[97]	Magnoliaceae[97]	yes[97]	30-50 feet[98]	80-100 feet[98]	moderate[98]	acidic[98]	moderate[98]	low	occasional[98]	30′ x 30′	10′	5 to 9A[98]
Turkey Oak[1]	*Quercus laevis*[79]	Fagaceae[79]	yes[79]	30-50 feet[80]	30-50 feet[80]	moderate[80]	Slightly alkaline, acidic[80]	high[80]	high	none[80]	20′ x 20′	6′	6 to 7[80]
Walter viburnum[1]	*Viburnum obovatum*[8]	Caprifoliaceae[8]	yes[8]	6-10 feet[8]	8-25 feet[8]	moderate[8]	acidic, alkaline[8]	high[8]		occasional[8]	10′ x 10′	2′	7 to 10[8]
Washington Palm[1]	*Washingtonia robusta*[81]	Arecaceae[81]	no[81]	10-15 feet[82]	60-90 feet[82]	moderate[82]	acidic[82]	high[82]	low	occasional[82]	30′ x 30′	10′	9 to 11A[82]

Common Name	Scientific Name	Plant Family	Florida Native	Average Spread (35 yrs)	Mature Height	Growth Rate	pH	Drought Tolerance	Wind Resistance 99, 100 except as noted	Flood Tolerance	Soil Area (w/3ft depth) guidelines 102	Distance from Paved Surface guidelines 102	Hardiness Zone
Water Oak[1]	*Quercus nigra*[83]	Fagaceae[83]	yes[83]	60-70 feet[83]	50-60 feet[83]	fast[83]	acidic, alkaline[83]	high[83]	low	extended[83]	30' x 30'	10'	6A to 10A[83]
Waxmyrtle[2]	*Morella cerifera*[67]	Myricaceae[67]	yes[67]	20 to 25 feet[68]	15 to 25 feet[68]	fast[68]	alkaline, acidic[68]	moderate[68]	susceptable[68]	extended[68]	10' x 10'	2'	7B to 11[68]
White Ash[1]	*Fraxinus americana*[84]	Oleaceae[84]	yes[84]	40-60 feet[85]	50-80 feet[85]	fast[85]	acidic, alkaline[85]	moderate[85]	medium/high	extended[85]	30' x 30'	10'	3 to 9A[85]
Wild olive[1]	*Osmanthus americanus*[19]	Oleaceae[19]	yes[19]	10-15 feet[19]	15-25 feet[19]	moderate[19]	acidic[19]	moderate[19]	resistant[19]	extended[19]	10' x 10'	2'	5B to 9B[19]
Winged Elm[1]	*Ulmus alata*[86]	Ulmaceae[86]	yes[86]	30-40 feet[86]	45-70 feet[86]	fast[86]	alkaline, acidic[86]	high[86]	medium/high		30' x 30'	10'	6A to 9B[86]
Yaupon Holly[1]	*Ilex vomitoria*[87]	Aquifoliaceae[87]	yes[87]	15-20 feet[88]	15-20 feet[88]	moderate[88]	alkaline, acidic[88]	high[88]	high	extended[88]	10' x 10'	2'	7 to 9[88]

Footnotes

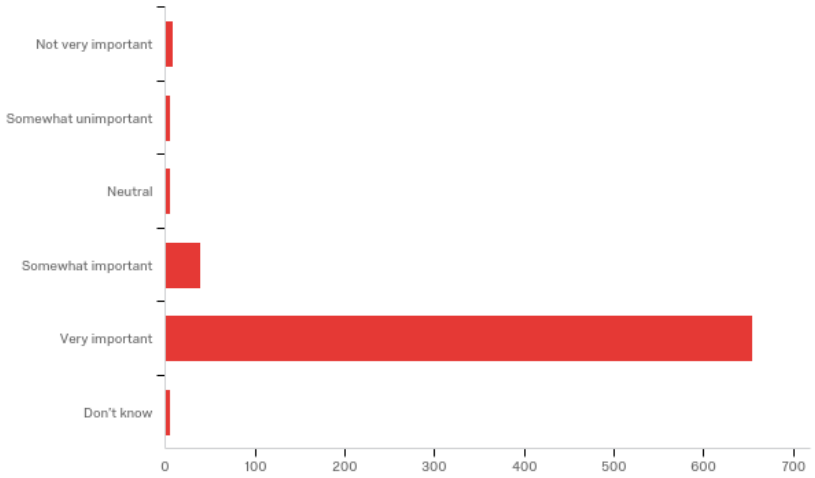
1 Gainesville Tree List Sec. 30_8.10
2 Edward Gilman and Dennis Watson Fact Sheet ST-304 Ilex opaca: American Holly
3 Edward Gilman and Dennis Watson Fact Sheet ENH-587 "Ostrya virginiana: American hophornbeam" November 1993
4 Edward Gilman and Dennis Watson Fact Sheet ENH-279 "Carpinus caroliniana: American Hornbeam" November 1993
5 Edward Gilman and Dennis Watson Fact Sheet ENH-778 "Taxodium distichum: Baldcypress"
6 Edward Gilman and Dennis Watson Fact Sheet ENH-675 "Prunus serotina: Black Cherry"
7 Edward Gilman and Dennis Watson Fact Sheet ENH-581 "Nyssa sylvatica: Blackgum"
8 Edward Gilman and Dennis Watson Fact Sheet FPS-604 ""Viburnum obovatum: Walter viburnum"
9 USDA Plant Profile: Quercus incana W. Bartram - bluejack oak
10 Edward Gilman and Dennis Watson Fact Sheet ST-575 "Sabal palmetto: Cabbage Palm"
11 Edward Gilman and Dennis Watson Fact Sheet ST-439 "Phoenix canariensis: Canary Island Date Palm"
12 Edward Gilman and Dennis Watson Fact Sheet ST-504 "Prunus angustifolia: Chickasaw Plum"
13 Edward Gilman and Dennis Watson Fact Sheet ST-160 "Chionanthus retusus: Chinese Fringe Tree"
14 City of Gainesville Urban Ecological Analysis: Appendix B
15 USDA Plant Profile: Salix Caroliniana - Coastal plain willow
16 Edward Gilman and Dennis Watson Fact Sheet ENH-390 "Diospyros virginiana: Common Persimmon"
17 Edward Gilman and Dennis Watson Fact Sheet ENH-501 "Lagerstroemia indica: Crape mytle"
18 Edward Gilman and Dennis Watson Fact Sheet ENH-458 "Ilex cassine: Dahoon Holly"
19 Edward Gilman and Dennis Watson Fact Sheet ENH-583 Osmanthus americanus: Devilwood
20 Edward Gilman and Dennis Watson Fact Sheet ST-653 "Ulmus parvifolia 'Drake': 'Drake' Chinese Elm"
21 Edward Gilman and Dennis Watson Fact Sheet ENH-473 "Ilex x attenuata 'East Palatka': 'East Palatka' Holly"
22 USDA Plant Profile: Cersis canadensis L - eastern redbud
23 Edward Gilman and Dennis Watson Fact Sheet ENH-304 Cercis canadensis: Eastern redbud
24 Edward Gilman and Dennis Watson Fact Sheet ENH-679 "Prunus umbellata: Flatwoods Plum"
25 USDA Plant Profile: Cornus florida L. - flowering dogwood
26 Edward Gilman and Dennis Watson Fact Sheet ST-185 "Cornus florida: Flowering Dogwood"
27 USDA Plant Profile: Chionanthus virginicus - white fringetree
28 Edward Gilman and Dennis Watson Fact Sheet ST-161 "Chionanthus virginicus: Fringetree"
29 USDA Plant Profile: Fraxinus pennsylvania - green ash
30 Edward Gilman and Dennis Watson Fact Sheet ST-266 "Fraxinus pennsylvanica: Green Ash"
31 USDA Plant Profile: Parkinsonia aculeata L. - Jerusalem thorn
32 Edward Gilman and Dennis Watson Fact Sheet ENH-590 "Parkinsonia aculeata: Jerusalem-Thorn"
33 Edward Gilman and Dennis Watson Fact Sheet ENH-707 "Quercus laurifolia: Diamond Leaf Oak"
34 Edward Gilman and Dennis Watson Fact Sheet ENH-511 "Ligustrum japonicum: Japanese privet"
35 USDA Plant Profile: Pinus taeda L. - loblolly pine
36 USFS Fire Effects Information System - Index of Species Information: Pinus taeda

37 Edward Gilman and Dennis Watson Fact Sheet ENH-443 "Gordonia lasianthus: Loblolly-bay"
38 Edward Gilman and Dennis Watson Fact Sheet ENH-628 "Pinus palustris: Longleaf Pine"
39 USDA Plant Profile: Eriobotrya japonica Lindl. - loquat
40 Edward Gilman and Dennis Watson Fact Sheet ST-235 "Eriobotrya japonica"
41 USDA Plant Profile: Carya illinoensis K. Koch - pecan
42 Edward Gilman and Dennis Watson Fact Sheet ST-122
43 USDA Plant Profile: Carya glabra (Mill.) Sweet - pignut hickory
44 Edward Gilman and Dennis Watson Fact Sheet ST-121
45 USDA Plant Profile: Butia capitata - South American jelly palm
46 Edward Gilman and Dennis Watson Fact Sheet ST-105
47 USDA Plant Profile: Podocarpus macrophyllus (Thunb.) Sweet - yew plum pine
48 Edward Gilman and Dennis Watson Fact Sheet ST-495
49 USDA Plant Profile: Taxodium ascendens Brongn. - pond cypress
50 Edward Gilman and Dennis Watson Fact Sheet ENH-777
51 Edward Gilman and Dennis Watson Fact Sheet ENH-223
52 USDA Plant Profile: Juniperus virginiana L. - eastern redcedar
53 Edward Gilman and Dennis Watson Fact Sheet ST-327
54 USDA Plant Profile: Acer rubrum L. - red maple
55 Edward Gilman and Dennis Watson Fact Sheet ST-41
56 USDA Plant Profile: Morus rubra L. - red mulberry
57 Edward Gilman and Dennis Watson Fact Sheet ENH-595
58 Gainesville Tree List Sec. 30_8.10
59 USDA Plant Profile: Quercus Shumardii Buckley - Shumard's oak
60 Edward Gilman and Dennis Watson Fact Sheet ST-561
61 USDA Plant Profile: Pinus elliottii Engelm. - slash pine
62 Edward Gilman and Dennis Watson Fact Sheet ST-463
63 USDA Plant Profile: Quercus virginiana Mill. - live oak
64 Edward Gilman and Dennis Watson Fact Sheet ST-564
65 USDA Plant Profile: agnolia grandiflora L. - southern magnolia
66 Edward Gilman and Dennis Watson Fact Sheet ST-371
67 USDA Plant Profile: Morella cerifera (L.) Small - wax myrtle
68 Edward Gilman and Dennis Watson Fact Sheet ST-410
69 USDA Plant Profile: Celtis laevigata Willd. - sugarberry
70 Edward Gilman and Dennis Watson Fact Sheet ST-138
71 USDA Plant Profile: Persea palustris (Raf.) Sarg. - swamp bay
72 USDA Plant Profile: Quercus michauxii Nutt. - swamp chestnut oak
73 USDA Plant Profile: Nyssa biflora Walter - swamp tupelo
74 USDA Conservation Plant Characteristics: Nyssa biflora Walter - swamp tupelo
75 Edward Gilman and Dennis Watson Fact Sheet ENH-543
76 USDA Plant Profile: Liquidambar styraciflua L. - sweetgum
77 Edward Gilman and Dennis Watson Fact Sheet ST-358
78 Edward Gilman and Dennis Watson Fact Sheet ENH-643
79 USDA Plant Profile: Quercus laevis Walter - turkey oak
80 Edward Gilman and Dennis Watson Fact Sheet ST-544
81 USDA Plant Profile: Washingtonia robusta H. Wendl. - washington fan palm
82 Edward Gilman and Dennis Watson Fact Sheet ST-670
83 Edward Gilman and Dennis Watson Fact Sheet ENH-711
84 USDA Plant Profile: Fraxinus americana L. - white ash
85 Edward Gilman and Dennis Watson Fact Sheet ST-261
86 Edward Gilman and Dennis Watson Fact Sheet ENH-805
87 USDA Plant Profile: Ilex vomitoria Aiton - yaupon
88 Edward Gilman and Dennis Watson Fact Sheet ST-311
89 USDA Plant Profile: Taxodium distichum (L.) Rich. - bald cypress
90 USDA Plant Profile: Nyssa sylvatica Marshall - blackgum
91 USDA Plant Profile: Sabal palmetto (Walter) Lodd. Ex Shult. & Shult. f. - cabbage palmetto
92 USDA Plant Profile: Phoenix canariensis hort. Ex Chaubaud - Canary Island date palm
93 USDA Plant Profile: Prunus angustifolia Marshall - chickasaw plum
94 Edward Gilman and Dennis Watson Fact Sheet ENH-253 Betula nigra: River Birch
95 USDA Plant Profile: Acer negundo L. - boxelder
96 Edward Gilman and Dennis Watson Fact Sheet ST-20 Acer negundo: Boxelder
97 USDA Plant Profile: Liriodendron tulipifera L. - tuliptree
98 Edward Gilman and Dennis Watson Fact Sheet ST-363
99 Duryea, M.L., E. Kampf, and R.C. Littell. 2007. Hurricanes and the Urban Forest: I. Effects on Southeastern U.S. Coastal Plain Tree Species. Arboric. & Urban Forestry 33(2):83-97.
100 Duryea, M.L., E. Kampf, R.C. Littell and Carlos D. Rodríguez-Pedraza. 2007. Hurricanes and the Urban Forest: II. Effects on Tropical and Subtropical Tree Species. Arboric. & Urban Forestry 33(2):98-112.
101 Dianne Hall et al. 2017. Ecology and Management of Carolina Willow. SJWMD Tech. Pub. SJ2017-1.
102 Edward Gilman Soil Space Guidelines https://hort.ifas.ufl.edu/woody/planting-guidelines.shtml

Appendix D: Social Survey Results

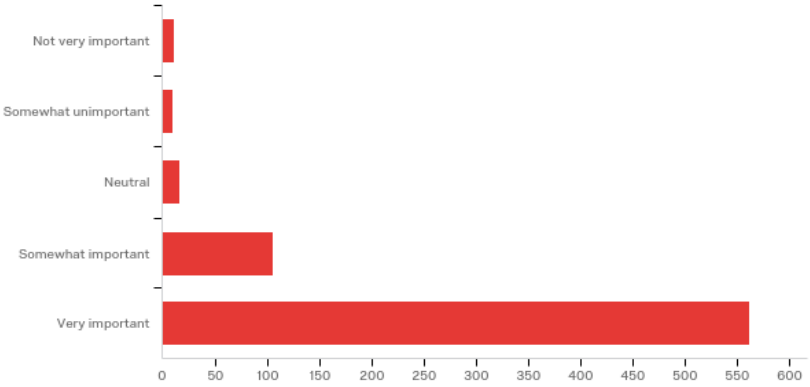
Q1 - How important is the urban forest to the City of Gainesville?

Answer	%	Count
Not very important	1.25%	9
Somewhat unimportant	0.70%	5
Neutral	0.84%	6
Somewhat important	5.43%	39
Very important	91.09%	654
Don't know	0.70%	5



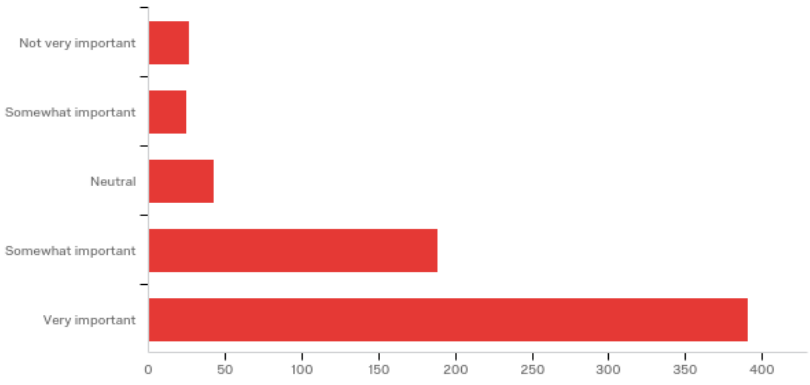
Q2 - How interested are you in seeing the City expand community based urban forestry projects?

Answer	%	Count
Not very important	1.56%	11
Somewhat unimportant	1.42%	10
Neutral	2.41%	17
Somewhat important	15.01%	106
Very important	79.60%	562



Q3 - How important do you think the urban forestry program is compared with other programs in the City?

Answer	%	Count
Not very important	3.86%	26
Somewhat important	3.71%	25
Neutral	6.38%	43
Somewhat important	28.04%	189
Very important	58.01%	391



Q4 - How knowledgeable are you about benefits derived from the City's urban forest?

Question	Not at all knowledgeable	A little knowledgeable	Somewhat knowledgeable	Very knowledgeable
Increase in property values	7.41%	17.48%	44.06%	31.05%
Creation of wildlife habitat	2.52%	9.37%	29.51%	58.60%
Decrease in home energy costs	6.49%	12.41%	35.97%	45.13%
Reduction in stormwater runoff	5.89%	12.76%	35.20%	46.14%
Improved public health and well-being	3.81%	9.31%	33.57%	53.31%
Increase in recreational activities	3.23%	10.10%	34.08%	52.59%
Reduced heat island effect	10.67%	12.08%	26.83%	50.42%
Increase community pride	4.35%	11.66%	33.57%	50.42%
Improvement in community aesthetics	1.83%	6.46%	25.70%	66.01%
Shade	0.98%	2.52%	20.62%	75.88%
Community livability	3.10%	9.01%	33.66%	54.23%
Improvement in air quality	1.12%	7.00%	26.61%	65.27%
Reduction in noise levels	3.94%	13.08%	31.79%	51.20%
Decrease in soil erosion	3.66%	10.13%	27.85%	58.37%
Improvement in water quality	6.08%	13.15%	31.97%	48.80%
Positive impact on consumer behavior	24.58%	22.05%	26.97%	26.40%
Reduction in crime rates	39.24%	24.05%	22.93%	13.78%

Q5 - What is the most successful way for engaging you concerning urban forest related issues?

Question	Not very successful	Somewhat unsuccessful	Neutral	Somewhat successful	Very successful
Holding community workshops	12.32%	10.62%	24.22%	40.37%	12.46%
Distributing pamphlets or brochures	11.21%	13.62%	21.28%	44.96%	8.94%
Organizing community events	4.26%	5.11%	12.50%	47.44%	30.68%
In person communication with city staff	7.78%	7.64%	24.75%	37.34%	22.49%
Neighborhood association meetings	11.14%	7.48%	22.28%	37.66%	21.44%
Information booths at citywide events	4.68%	4.68%	13.19%	49.79%	27.66%
Tree board/commission meetings	13.05%	12.62%	31.77%	29.79%	12.77%
Arbor Day activities	5.26%	6.40%	18.21%	42.11%	28.02%
Urban forestry website	3.97%	4.68%	16.88%	41.99%	32.48%
Public notification through newspapers	11.90%	11.47%	19.83%	37.54%	19.26%
Public hearings – ordinances	11.52%	14.08%	28.73%	32.43%	13.23%
Social media	4.94%	4.10%	10.45%	28.81%	51.69%
Partnerships with non-profits	4.99%	4.13%	18.38%	38.75%	33.76%
Corporate sponsorship of events	6.38%	7.23%	30.64%	37.16%	18.58%
Heritage or memorial tree programs	5.67%	5.82%	22.84%	39.01%	26.67%

Q6 - Please rank the top three items that the City needs to ensure a healthy urban forest. (Please place the number 1, 2 and 3 next to the item in order of importance .. 1 being the most important)

Question	#1	#2	#3
Political support	169	86	65
Tools for community outreach and education	28	50	64
Tree planting initiatives	55	59	51
Best management practices for tree preservation and maintenance	102	107	95
Training in establishing effective tree ordinances	20	42	40
Information on the benefits of urban trees	37	36	40
An urban forestry management plan	145	112	96
List of suitable local tree species	29	24	42
Sustainable funding	110	112	114
Active community support	98	111	116

Q7 - Please rank what you think are the top three barriers to having a healthy urban forest in the City. (Please place the number 1, 2 and 3 next to the item in order of importance .. 1 being the most important)

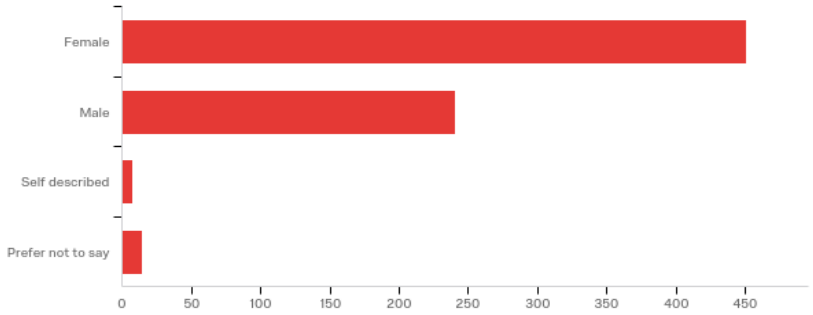
Question	#1	#2	#3
Low public support and interest	137	54	74
Technical assistance needs such education material or best management practices	17	34	26
A reactive, as opposed proactive, approach to urban forest management	89	96	101
Lack of trained personnel	14	29	30
Lack of political support	93	96	65
Conflicts surrounding public tree protection, maintenance and mitigation	91	97	70
Insufficient funding for City urban forestry program	106	116	97
Ordinance(s) related to the preservation and/or replanting of trees on development sites	79	84	68
Poor urban forest condition/tree problems	13	18	24
Lack of a formal plan or strategy for achieving a healthy urban forest	120	100	144

Q8 - Please rank what you think should be the top three future priorities for urban forest management in the City. (Please place the number 1, 2 and 3 next to the item in order of importance .. 1 being the most important)

Question	#1	#2	#3
Complete a full street tree hazard assessment of evacuation routes	33	40	50
Complete assessment of natural areas and parks	80	78	88
Development of an urban forest management plan	327	169	75
Community-based urban forestry workshops	41	94	96
Establish or revise tree related ordinances	111	123	113
Increase community recreation opportunities	33	63	83
Work toward achieving tree canopy cover goals	91	120	141
Proclaim and celebrate an Arbor Day observance	17	24	47

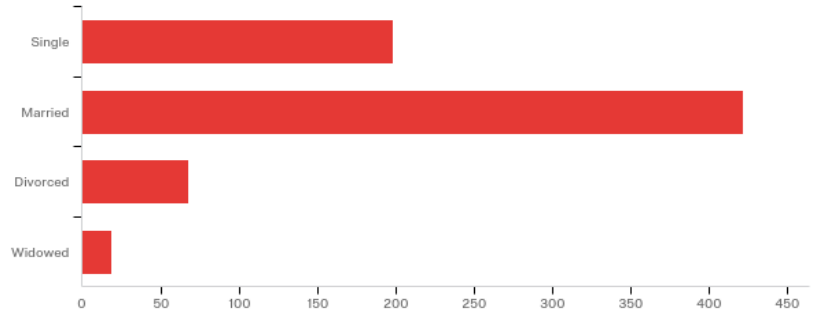
Q10 - You are

Answer	%	Count
Female	63.25%	451
Male	33.80%	241
Self-described	0.98%	7
Prefer not to say	1.96%	14



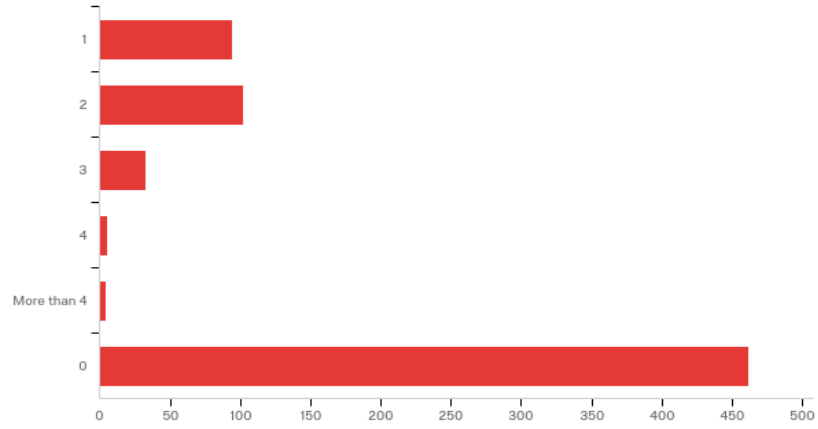
Q11 - Which of the following best describes your status?

Answer	%	Count
Single	28.01%	198
Married	59.69%	422
Divorced	9.62%	68
Widowed	2.69%	19



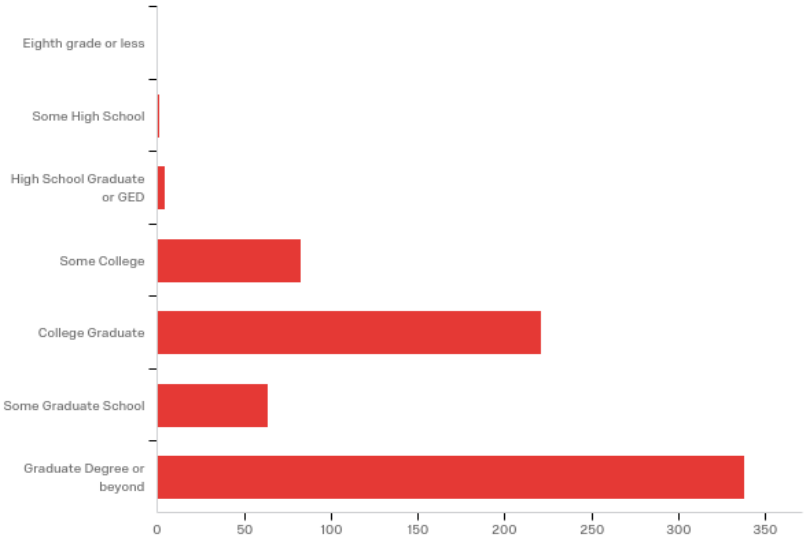
Q12 - How many children currently reside in your household?

Answer	%	Count
1	13.43%	94
2	14.57%	102
3	4.71%	33
4	0.71%	5
More than 4	0.57%	4
0	66.00%	462



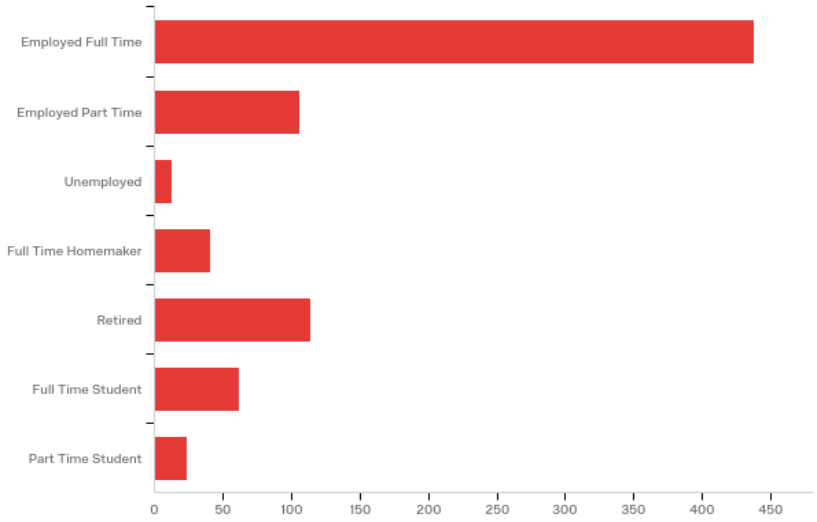
Q13 - What is the highest level of education you have completed?

Answer	%	Count
Eighth grade or less	0.00%	0
Some High School	0.14%	1
High School Graduate or GED	0.56%	4
Some College	11.67%	83
College Graduate	31.08%	221
Some Graduate School	9.00%	64
Graduate Degree or beyond	47.54%	338



Q14 - Are you presently… (Please mark all that apply)

Answer	%	Count
Employed Full Time	54.89%	438
Employed Part Time	13.28%	106
Unemployed	1.63%	13
Full Time Homemaker	5.14%	41
Retired	14.29%	114
Full Time Student	7.77%	62
Part Time Student	3.01%	24



Q15 - What is your profession or occupation?

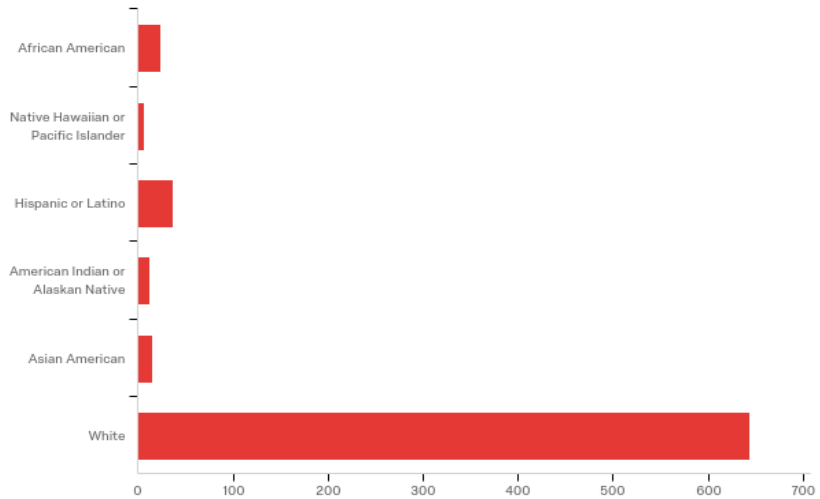
Vast majority professional (>95%)

Q16 - What year were you born?

Years	Responses
1940 – 49	66
1950 – 59	109
1960 – 69	115
1970 – 79	121
1980 – 89	136
1990 – 99	96
2000 - 2001	3

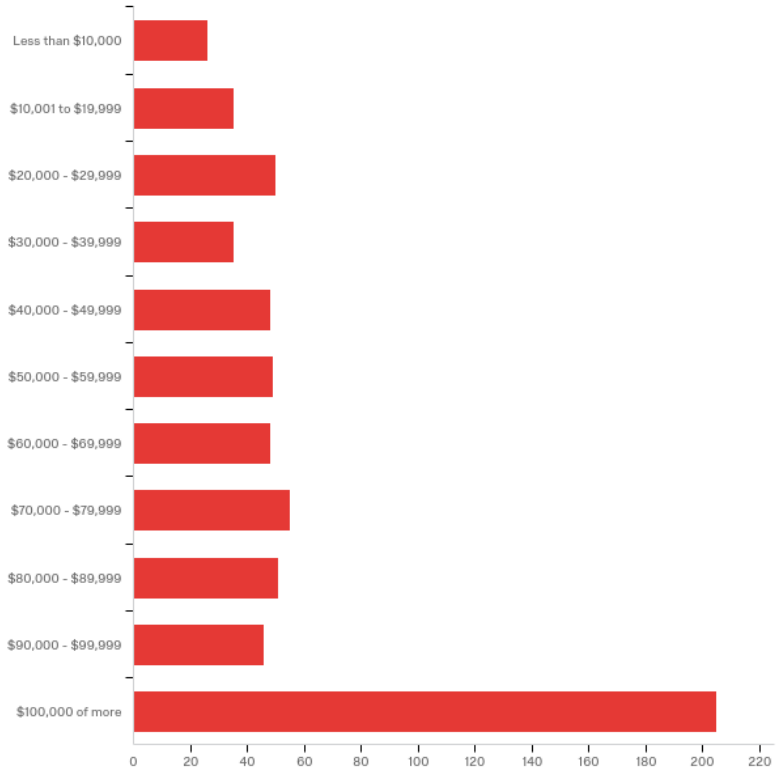
Q17 - What race or ethnic group(s) would you place yourself in? (please mark all that apply)

	Answer	U.S. Census
African American	3.25%	22%
Native Hawaiian or Pacific Islander	0.81%	
Hispanic or Latino	5.01%	11%
American Indian or Alaskan Native	1.76%	
Asian American	2.03%	7%
White	87.14%	68%



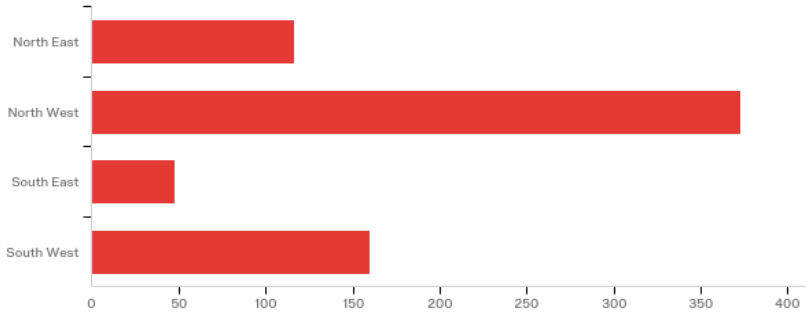
Q18 - What was your approximate total household income, before taxes this past year?

Answer	%	Count
Less than $10,000	4.01%	26
$10,001 to $19,999	5.40%	35
$20,000 - $29,999	7.72%	50
$30,000 - $39,999	5.40%	35
$40,000 - $49,999	7.41%	48
$50,000 - $59,999	7.56%	49
$60,000 - $69,999	7.41%	48
$70,000 - $79,999	8.49%	55
$80,000 - $89,999	7.87%	51
$90,000 - $99,999	7.10%	46
$100,000 of more	31.64%	205



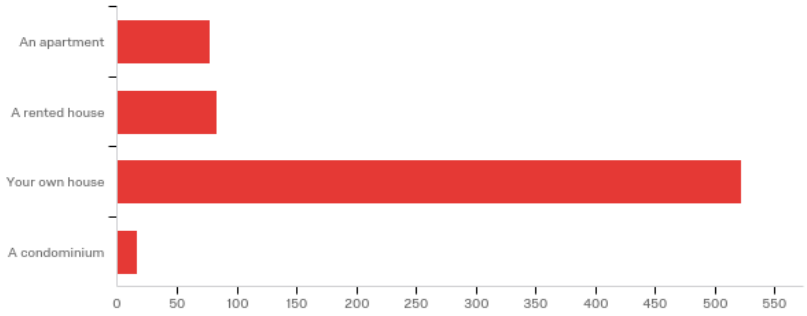
Q19 - What section of the City do you live in?

Answer	%	Count
North East	16.64%	116
North West	53.52%	373
South East	6.89%	48
South West	22.96%	160



Q20 - Do you live in:

Answer	%	Count
Apartment	11.02%	77
Rented house	11.87%	83
Your own house	74.68%	522
Condominium	2.43%	17



Appendix E:
Complete Set of Alternatives to Action

as developed by the Internal Technical Advisory Committee

City-Wide

Element	Performance Indicators	Objective
Canopy cover		Total tree canopy coverage is 50% or greater Ref. – Comp Plan Strategic Framework 4 c
Optimal	**No statistically significant net loss of canopy cover since the 2016 Urban Forest Analysis**	
Good	Canopy Cover is 45% or greater	
Moderate	Canopy Cover is 40% or greater	
Low	Canopy Cover is lower than 40%	

1. Design and implement a canopy cover monitoring program– PW, DSD

2. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5-years. – DSD

3. Prepare a digital City of Gainesville 'illustrated booklet' on tree care and maintenance Best Management Practices for inclusion on urban forestry web site – PW

4. Prepare a Land Development Code (LDC) code amendment that requires the use of the City of Gainesville Tree Matrix as a guidance document for all tree planting projects required through code or through use of public funds. – DSD

5. Prepare a Land Development Code (LDC) code amendment to require tree mitigation fund use to occur within the same land use type or other district, and with documented need identified by the urban forest inventory/analysis. – DSD

6. Require any tree planting or tree preservation required through by code or through use of public funds not lead to a net loss of tree canopy cover by municipal planning district.

Hydrology	The urban forest is an integral part of a comprehensive system for water conservation/management Comp Plan Stormwater; Policy 1.2.1 g	Prevent adverse impacts to the water quality of creeks, lakes, wetlands, foodplains, groundwater and uplands Ref. – Art VIII #28
Good	Urban forest stormwater function is 10% higher than measured in the 2016 Urban Forest Analysis	
Moderate	Urban forest stormwater function is 5% higher than measured in the 2016 Urban Forest Analysis	
Low	**No net loss of urban forest stormwater function since the 2016 Urban Forest Analysis**	

1. Promote more riparian buffers on private property. – DSD, PW

2. Prepare a change to the Land Development Code (LDC) that requires the restoration of degraded buffers

during development. – DSD

3. Target tree planting in areas of high impervious surface. – PW

4. Prioritize acquisition of conservation lands that directly support watershed hydrologic integrity. – PRCA, DSD

5. Develop and implement an inter-departmental strategy for increasing stormwater reduction through urban forest management – PW, DSD, PRCA

6. Design and implement an inventory and condition assessment of riparian woodland buffers and forested wetlands. – DSD

7. Establish a forestry working group with state agencies and county agencies that meets quarterly to coordinate programs and activities of mutual interest. – PW

8. Implement a stormwater credit system for the use of Low Impact Development design standards – PW

9. Conduct joint training for planners, urban forestry staff, and stormwater engineers on incorporating green infrastructure into a comprehensive stormwater/water conservation program. – PW, DSD

Tree and shrub species suitability		Tree and shrub species are suitable for Gainesville's physical urban environment and adapted to the regional climate. Ref. – Strategic Framework 4 c
Optimal	All publically and privately planted trees and shrubs suited to the planting site, the urban environment and adapted to the regional climate (hardiness zone)	
Good	>85% of the publically planted trees and shrubs are suited to the planting site, the urban environment and adapted to the regional climate (hardiness zone).	
Moderate	> 70% of the publically planted trees are suited to the planting site, the urban environment and adapted t to the regional climate (hardiness zone).	
Low	**Tree planting is *ad hoc*.**	

1. Prepare an amendment to the LDC to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. – DSD, PW, PRCA

2. Expand the City of Gainesville's Tree Matrix to include shrubs. – PW, DSD

3. Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. – PW, DSD, GRU, DTM

Human health		No net loss of human health benefits from the urban as defined by the EPA health benefits model used within the i-Tree analysis program Ref – Strategic Framework 3 b
Optimal	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 10 minute walk (0.6 mi) from any home.	
Good	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 15 minute walk (1 mi.) from any home.	
Moderate	Parks, greenways and trails with green infrastructure (trees and shrubs) exist within a 5 minute drive from any home.	
Low	**No net loss of acreage of existing parks, greenways and trails with green infrastructure (trees and shrubs) since 2016.**	

1. **Calculate the distance and travel time to parks (ArcGIS, spatial analyst) – PRCA**

2. **Develop Citywide strategic plan for acquisition and development of parks, greenways and trails to ensure equitable accessibility. – PRCA, DSD**

Air quality		Ensure air quality levels comply with state and national ambient air quality standards Ref – Comprehensive Plan Conservation Goal 2; obj. 2.5
Optimal	**No net decline in the urban forest's leaf area index since 2016 Urban Forest Analysis**	
Good	Net decline in the urban forest's leaf area index does not exceed 10% since 2016 Urban Forest Analysis	
Moderate	Net decline in the urban forest's leaf area index does not exceed 20% since 2016 Urban Forest Analysis	
Low	Net decline in the urban forest's leaf area index does exceeds 20% since 2016 Urban Forest Analysis	

1. **Continue assessment of urban forest effects on air quality using the i-Tree ecological analysis. – PW**

Greenhouse gas sequestration		No net loss of the ability of the urban forest to sequester and store atmospheric carbon
Optimal	**No net decline in the urban forest's leaf area index since the 2016 Urban Forest Analysis**	
Good	Net decline in the urban forest's leaf area index does not exceed 10% since 2016 Urban Forest Analysis	
Moderate	Net decline in the urban forest's leaf area index does not exceed 20% since 2016 Urban Forest Analysis	
Low	Net decline in the urban forest's leaf area index does exceeds 20% since 2016 Urban Forest Analysis	

1. **Continue assessment of urban forest effects on greenhouse gas sequestration using the i-Tree ecological analysis. – PW**

Private professional arborists, landscape architects, engineers, etc.		Through formal training and municipal workshops the landscape and arboriculture industries operate with high professional standards and ethics, and commit to the goals as stated in the City's urban forest management plan
Optimal	Professional associations formally share the City's vision and goals for the urban forest	
Good	Specific cooperative arrangements with City	
Moderate	**General cooperation among nurseries, tree care companies etc.**	
Low	No cooperation among segments of the green industry. No adherence to professional standards and ethics.	

1. **Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. – DSD, PRCA, PW**

2. Organize a workshop with landscape and arboricultural industries to formally introduce the Plan and discuss the need for adherence to the UFMP Goals. – DSD, PW, PRCA

3. Prepare an ordinance to require certification and licensing of landscape and arboriculture industry working within the City of Gainesville. – PW, DSD

Municipal urban forestry staff		Professional urban forestry staff are provided ongoing training and education to coordinate and implement management of the City's urban forest system.
Optimal	Urban forestry staff are provided budget and time to attend at least one national conference or workshop each year to develop of effective skills in critical thinking, communication, planning and social and bio-physical assessments to coordinate and implement management of the City's urban forest system, and support their professional organizations.	
Good	Urban Forestry staff (City Arborist, inspectors, environmental coordinator, horticulturalist, tree crew leader) are provided a training budget and time to attend education programs that lead advanced certifications that benefit City operations.	
Moderate	**Urban Forestry staff (City Arborist, inspectors, environmental coordinator, horticulturalist, tree crew leader) are provided a training budget and time to attend continuing education programs to maintain City required professional certifications.**	
Low	Training budgets and time are allocated on an ad hoc basis.	

1. **Establish an internal City continuing education policy to support the continued development of professional expertise needed to meet the challenge of implementing the UFMP in an expanding and dynamic City. – City Mgr., HR, DSD, PW, GRU**

2. Identify additional professional certifications and education beneficial to coordination and implementation of the City's urban forest management plan. – DSD, PW, GRU

Gainesville government agencies and Commission		Departments (including GRU) and City Commission are provided support and training on urban forest benefits and implementation of the City's urban forest management plan
Optimal	Formal coordination of interdeparmental/interagency processes for the implementation of the urban forest plan are directed through a central interdisciplinary committee.	
Good	Municipal standards, including utility standards, are in place for implementing the urban forest management plan by interdepartmental/interagency processes on all municipal projects.	
Moderate	**Interdepartmental/interagency coordination for the implementation of the urban forest plan occurs through informal and *ad hoc* decision making processes.**	
Low	No coordination of interdepartmental/ interagency processes to support implementation of the urban forest plan.	

1. **Prepare a draft resolution, for City Commission consideration, that recognizes the UFMP as the strategic plan for the management of the City of Gainesville's urban forest. – City Attorney's Office, DSD**

2. Prepare a draft Executive Order, for City Manager's consideration, that directs all City of Gainesville agencies to actively cooperate in the implementation of the UFMP. – DSD, City Attorney's Office

3. Incorporate the Urban Forest Management Plan into the City of Gainesville's Comprehensive Plan. – DSD

4. Establish an Internal Technical Advisory Committee, comprised of appointed departmental representatives. The committee will meet quarterly to review progress, as part of the adaptive management strategy, identify issues and make recommendations associated with the successful implementation of the UFMP. – PW, DSD

5. Establish and support an inter-departmental urban forestry working group to provide technical guidance on the implementation of the UFMP. – DSD, PW, GRU

Other governments and organizations		Training and workshops support the collaboration and interaction among planning agencies and governments concerning forest sustainability within the Oklawaha and Santa Fe River Basins
Optimal	Watershed, natural resources and comprehensive land use plans are developed through cooperation and interaction among neighboring regional planning agencies and governments.	
Good	Regional planning for forest sustainability occurs on an ad hoc basis.	
Moderate	**Government and planning agencies share similar policy vehicles.**	
Low	No cooperation between City and regional planning agencies and governments regarding land use. All operate independently.	

1. Host a summit on forest sustainability that includes all relevant federal, state, regional and local government agencies and NGO's operating within the greater City of Gainesville region. - DSD, Strategic Initiatives, PW

Children – schools, clubs, camps, 4-H		Through education children understand the contribution of the urban forest to the social, economic and ecological well-being of the community
Optimal	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in all school, club and camp curriculums.	
Good	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in >or=50% of school, club and camp curriculums.	
Moderate	The role of the urban forest in supporting the social, economic and ecological well-being of the community is formally included in <26 - 50% of school, club and camp curriculums.	
Low	**The role of the urban forest in supporting the social, economic and ecological well-being of the community is not formally included in school, club and camp curriculums.**	

1. Incorporate urban forest curriculum into PRCA summer programs and Earth Academy. – PRCA,

2. Incorporate urban forest curriculum into Camp Crystal – Alachua Co. School Board. – PRCA

Citywide values regarding the urban forest		Priorities for each 5 year management cycle reflect the values of the City's citizens are determined through a science based social survey.
Optimal	Citizen values are assessed for all capital improvement projects that impact urban forest canopy cover, leaf ara index or open space accessabiilty objectives of the urban forest management plan.	
Good	Assessment of citizens values and reflects a strong correlation to demographics of citizens at time of survey.	
Moderate	Assessment of citizens values completed since 2019.	
Low	**No assessment or survey since 2019**	

1. **Incorporate a social survey and assessment of citizen interest in urban forest management into the i-Tree ecological analysis. – PW, Strategic Initiatives, Communication officer**

Residential

Element	Performance Indicators	Objective
Species – shrubs and trees		Tree and shrub diversity predominantly reflect the native forest as described by the Florida Natural Areas Inventory (FNAI).
Optimal	Net increase of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis.	
Good	**No net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis.**	
Moderate	Net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis is <10%.	
Low	Net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis is >or=10%.	

1. Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. – DSD, PW, PRCA

2. Expand the City of Gainesville's Tree Matrix to include shrubs. – PW, DSD

3. Adopt Alachua County's Florida Friendly Landscape ordinance. – DSD

4. Amend the current landscape species diversity requirement to include shrubs and increase diversity requirement for trees. – DSD

5. Partner and fund Florida Friendly Landscaping with UF IFAS Extension.

6. Develop and implement a residential tree giveaway program that focuses on uncommon spp. found in the City's Tree Matrix and uses 3 gallon planting stock. –PW

Canopy cover		Tree canopy cover is no less than 45%
Optimal	**No absolute net loss of canopy cover since the 2016 urban forest analysis.**	
Good	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is <10%	
Moderate	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is <15%	
Low	Net loss of canopy cover, in residential land use type, since the 2016 urban forest analysis is >15%	

1. Design and implement a canopy cover monitoring program. – PW, DSD

2. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be

mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5-years. – DSD

3. Prepare a digital City of Gainesville brochure on tree care and maintenance for inclusion on urban forestry web site – PW

4. Prepare a Land Development Code (LDC) code amendment that requires the use of the City of Gainesville Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds.– DSD

5. Prepare a Land Development Code (LDC) to require tree mitigation fund use to occur within the same land use type or other district with demonstrated need identified by the urban forest inventory/analysis. – DSD

6. Require any tree planting or tree preservation required by the LDC to not lead to a net loss of tree canopy cover by the Residential land use type. – DSD

Wildlife		Property owners/residents are knowledgeable about wildlife that may occur on their property
Optimal	All commission districts have received City sponsored workshop/training about urban wildlife once per 5 year period.	
Good	50 % of commission districts have received City sponsored workshop/ training about urban wildlife once per 5 year period	
Moderate	25 - 50% of commission districts have received City sponsored workshop/ training about urban wildlife once per 5 year period	
Low	**No workshops given to residents.**	

1. Organize and present at least one workshop on urban wildlife management per Commission District every 4 years. – PRCA

Hydrology		No adverse impacts to the water quality of creeks, lakes, wetlands, floodplains, groundwater and uplands. Ref. – Article VIII 28
Optimal	Urban forest stormwater function is >10% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.	
Good	Urban forest stormwater function is 10% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.	
Moderate	Urban forest stormwater function is 5% higher on residential land than in the 2016 Urban Forest Analysis as measured by avoided runoff.	
Low	**No net loss of urban forest stormwater function on residential land since the 2016 Urban Forest Analysis as measured by avoided runoff.**	

1. **Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. – PW, DSD, GRU**

2. Organize and present at least one workshop on riparian woodland conservation per year. – PW, PRCA (can be in cooperation with other urban wildlife workshops)

3. Pursue grant funding for landscape conservation and retrofit. – GRU

4. Promote more riparian buffers private property. – DSD, PW

5. Prepare a LDC code amendment that requires the restoration of degraded buffers on lands undergoing land use change or new development (land use change). – DSD

6. Design and implement a stormwater credit system for the use of Low Impact Development as part of a citywide strategic plan for water conservation. – PW

Invasive species		Property owners/residents eliminate invasive plant species.
Optimal	All residental land is free of invasive plant species.	
Good	Net decrease in the abundance and diversity of invasive plant species on residential land.	
Moderate	City-wide formal assessment of invasive species.	
Low	**No formal assessment of invasive species.**	

1. **Continue to conduct an invasive species assessment on residential lands as part of the i-Tree ecological analysis. – PW**

Tree and shrub species suitability		Tree and shrub species are suitable for Gainesville's physical urban environment and adapted to the regional climate.
Optimal	All publicly mandated planted trees and shrubs are suited to the planting site, the urban environment and adapted to the regional climate (hardiness zone) according to the Gaineville Tree Matrix.	
Good	>75% of publicly mandated planted trees and shrubs are suited to the planting site, the urban environment and adapted t to the regional climate (hardiness zone) according to the Gainesville Tree Matrix.	
Moderate	Publicly mandated tree plantings are evaluated using the Gainesville Tree Matrix for planting site suitablility, use in the urban environment and adapted to the regional climate (hardiness zone).	
Low	**Tree planting is *ad hoc*.**	

1. Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds.– DSD, PW, PRCA

2. Expand the City of Gainesville's Tree Matrix to include shrubs. – PW, DSD

3. Expand the City of Gainesville's Tree Matrix to include appropriate trees for use in rights of way with GRU's transmission lines. – DSD, PW, GRU

Risk – damage from trees		Risk of property damage or personal injury is reduced to as low as reasonably practical.
Optimal	All trees within the residential land use are managed to reduce risk to as low as reasonably practical.	
Good	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure.'	
Moderate	**Level 1 tree risk assessment (ANSI 3000) is available to all residential land owners.**	
Low	Tree risk is managed on an ad hoc basis.	

No Actions

Energy conservation		Heat loading of residential buildings is reduced by shade produced from tree and shrub canopy.
Optimal	Net 10% increase in energy savings since the 2016 Urban Forest Analysis.	
Good	Net 5% increase in energy savings since the 2016 Urban Forest Analysis.	
Moderate	**No net loss in energy savings since the 2016 Urban Forest Analysis.**	
Low	5% loss in energy saving since the 2016 Urban Forest Analysis.	

1. Continue to conduct an energy conservation assessment on residential lands as part of the i-Tree ecological analysis. – PW, DSD

2. Design and implement a tree planting and establishment program for residential energy saving. – GRU

3. **Provide homeowners with training and information concerning the proper placement of trees around their home to reduce heat loading. – GRU**

Crime prevention		The City's urban forest supports a safe environment for residents and visitors.
Optimal	CPTED design standards are in place within all residential neighborhoods.	
Good	CPTED design standards are in place on all new residential neighborhoods.	
Moderate	CPTED design standards are in place within at least 50% of new residential neighborhoods.	
Low	**CPTED design standards are in place within less than 50% of all new residential neighborhoods.**	

1. **Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards. – GPD, DSD**

Fire prevention		Property owners/residents implement landscape designs and fire prevention techniques that reduce forest fuel fire hazard.
Optimal	All residential landscapes in Wildland Urban Interface meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50).	
Good	All residential landscapes in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Moderate	Some residential landscapes in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Low	**Residents in Wildland Urban Interface do not assess landscapes for Wildfire Risk.**	

1. **Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. – DSD**

2. Identify all residential homeowners in the WUI and provide them with written information on how to assess fire risk around their homes. - GFD

3. Provide voluntary assessment service of residential landscapes in Wildland Urban Interface. – GFD

General public outreach	Urban forestry staff collaborate with aligned organizations to provide technical tree and shrub care information and training for property owners/residents.	Property owners/residents have access to information, training and assistance on tree and shrub care.
Good	Technical tree and shrub care information and training for property owners/residents is designed, organized and presented by the City.	
Moderate	**Technical tree and shrub care information and training for property owners/residents is actively supported by the City on an *ad hoc* basis.**	
Low	Technical tree and shrub care information and training for property owners/residents is not actively supported by the City.	

1. **Citizen foresters program to mimic UF Master Gardeners. – PW**

2. Annual Arbor Day and Tree Giveaway

3. One Day Urban Forest Workshop

4. Award Program

5. Organize and present at least one workshop on riparian woodland conservation per year. PW, PRCA

6. Prepare a digital City of Gainesville 'illustrated booklet' on tree care and maintenance Best Management Practices for inclusion on urban forest web site. – PW

7. Organize and present at least one workshop on urban wildlife management per Commission District every 4 years – PRCA

Values specific to neighborhoods and/or districts		Urban forest conservation practices are defined at the neighborhood scale.
Optimal	All capital improvement projects focused at the neighborhood scale are vetted for urban forest conservation concerns before final design.	
Good	Capital improvement projects focused at the neighborhood scale are planned and designed with the active involvement of the City's urban forestry program or neighborhood residents.	
Modeate	Capital improvement projects focused at the neighborhood scale are planned without active involvement of the City's urban forestry program or neighborhood residents.	
Low	**Capital improvement projects focused at the neighborhood scale are planned, designed and implemented without the active involvement of the City's urban forestry program or neighborhood residents.**	

1. Prepare a Land Development Code (LDC) code amendment that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing urban forest resources. – PW

Nature Parks/Woodlands/Natural Areas

Element	Performance Indicators	Objective
Species – shrubs and trees		Tree and shrub diversity reflect the native forest as described by the FNAI.
Optimal	All forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.	
Good	Greater than 85% of all forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.	
Moderate	Greater than 75% of all forest stands in the system contain the complete regionally appropriate 'FNAI character set of species' for each specific natural community.	
Low	**Less than 75% of all forest stands in the system contain the complete regionally appropriate 'FNAI charcter set of species' for each specific natural community.**	

1. Initiate vegetative inventory and monitoring systems (plant diversity) on 50% of the nature park area every 5 years. – PRCA

2. **Prepare natural resource management plans that identify criteria and quantifiable performance objectives for City-owned natural areas. – PRCA**

Standing dead and down woody material		Standing dead and downed woody material is consistent with native forest communities described by FNAI.
Optimal	**Dead standing and downed woody material are conserved as a functional part of the natural forest ecosystem, if not posing a risk to visitors.**	
Good	Dead standing and downed woody material are conserved to meet the minimum levels described by the FNAI.	
Moderate	All standing dead trees are cut to ≤12 feet in height to reduce risk to visitors along active trails and visitor facilities.	
Low	All standing dead and downed trees are removed from natural forest ecosystems.	

1. **Initiate vegetative inventory and monitoring systems (dead woody material) on 50% of the nature park area every 5 years. – PRCA**

Abundance		Native plant abundance is consistent with native forest communities as described by the FNAI.
Optimal	Parks/Woodlands/NA are assessed every 5 years and scored similar to the appropriate FNAI plant community reference site.	
Good	Native plant abundance is assessed every 10 years.	
Moderate	**Native plant abundance is not systematically assessed.**	
Low	Native plant abundance is unknown.	

1. Initiate vegetative inventory and monitoring systems (plant abundance) on 50% of the nature park area every 5 years. – PRCA

Canopy cover (goal 1; element e)		Tree canopy cover of no less than 70% in non-fire- adapted natural communities in nature parks land use type.
Optimal	No absolute net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis.	
Good	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is <10%	
Moderate	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is <15%	
Low	Net loss of canopy cover in non-fire-adapted natural communities in the nature parks land use type, since the 2016 urban forest analysis is >15%	

1. Initiate vegetative inventory and monitoring systems (canopy cover) on 50% of the nature park area every 5 years. – PRCA

Diameter distribution (goal 1; element f)		Size class distribution for native tree species is consistent with native forest communities described by FNAI.
Optimal	Diameter size distribution by species approximates a 'reversed J' shape when graphed.	
Good	Diameter size distribution by species approximates a 'reversed J' shaped curve when graphed but does not extend to the highest size class potentials of a speces.	
Moderate	All stands have a formal assessment.	
Low	**No formal assessment.**	

1. Initiate vegetative inventory and monitoring systems (tree diameter distribution) on 50% of the nature park area every 5 years. – PRCA

Hydrology (goal 1; element h)		Prevent adverse impacts to water bodies and conserve aquatic and terrestrial habitat. Ref. – Art VIII obj. 15 and Comprehensive Plan Conservation goal2; policies 2.4.3, 2.4.6
Optimal	Forest uplands, wetlands, floodplains and riparian stream corridors are actively managed to increase water infiltration; stabilize banks; serve as conservation corridors; and provide aquatic and terrestrial habitat.	
Good	Forests and woodlands have management plans prepared that identify specific outcomes for enhancement of watershed function, aquatic and terrestrial habitat.	
Moderate	**Forests and woodlands are systematically assessed for potential contribution to enhancement of watershed function, aquatic and terrestrial habitat.**	
Low	*Ad hoc* manipulation of forests and woodlands to support existing watershed function or aquatic and terrestrial habitat.	

1. Incorporate specific and measurable outcomes for water quality in all Nature Park management plans – PRCA, PW, DSD

Resilient to fire		Maintain publicly-owned fire adapted habitats in a healthy condition
Optimal	An active prescribed fire program, as identified by the FNAI, is used to maintain all fire adapted habitats within the nature park land use type.	
Good	>80% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.	
Moderate	60 - 80% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.	
Low	**<60% of fire-dependent natural communities have characteristic structure and species composition (FNAI), and are maintained with an appropriate fire return interval as identified by FNAI.**	

1. Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks. – PRCA

2. Initiate vegetative inventory and monitoring systems on 50% of the nature park area every 5 years. –PRCA

Invasive species		Invasive plant and animal species are eliminated.
Optimal	All non-native invasive species are monitored and treated with appropriate science-based management practices to maintain invasive plant cover at <10% over all nature park acreage.	
Good	At least 80% of nature park acreage is maintained at <10% invasive plant cover	
Moderate	50-80% of nature park acreage is maintained at <10% coverof invasive plants	
Low	<50% of nature park acreage has <10% cover of invasive plants	

1. Design and conduct an invasive species inventory and assessment every 5 years. – PRCA

2. Prepare natural resource management plans that identify criteria and quantifiable performance objectives for invasive species on all City-owned natural areas. – PRCA

Risk – damage from trees		Risk of property damage or personal injury is reduced to as low as reasonably practical within high visitor use areas.
Optimal	Risk in all trees reduced to as low as reasonably practical within high visitor use areas.	
Good	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure.'	
Moderate	Level 1 tree risk assessment (ANSI 3000) on a documented frequency.	
Low	**Tree risk is managed on an ad hoc basis.**	

1. Conduct Level 1 tree risk assessment (ANSI 3000) of all trees in high use areas. – PRCA

2. Ensure that at least one PRCA staff member is an ISA Certified Arborist and TRAQ qualified (risk assessment). – PRCA

Crime prevention		The City supports a safe environment within its woodlands/natural/nature parks.
Optimal	CPTED design standards are in place within all high visitor use areas	
Good	CPTED design standards are practiced in all high visitor use areas	
Moderate	CPTED design standards are considered in all high visitor use areas	
Low	**CPTED design standards are not practiced in all high visitor use areas**	

1. Prepare an MOU, between the Gainesville Police Dept and DSD, that requires the review of all new development plans for compliance with CPTED standards. – GPD, DSD

Fire prevention		Forest fuels are managed to eliminate risk of wildfire.
Optimal	Fire regimes are aligned with natural plant communities as described by FNAI, and the 12-foot wide fire breaks and management to reduce flammable vegetation along the zone where structures and other human development abut fire-type vegetation in nature parks.	
Good	12-foot wide fire breaks and management to reduce flammable vegetation along the zone where structures and other human development abut fire-type vegetation in natural areas.	
Moderate	12-foot wide fire breaks in all areas where human development abuts fire-type vegetation in nature parks.	
Low	**Fire breaks in some areas where human development abuts fire-type vegetation in nature parks.**	

1. Develop and implement a Prescribed Fire Program and a Fire Management Program for all Nature Parks. – PRCA

2. Maintain 12-foot wide fire breaks around all Nature Parks. - PRCA

Physical access		Public nature parks/natural areas offer a safe and welcoming experience.
Optimal	The City's park and open space system ensures the visibility of, preservation of, and access to environmentally significant open spaces.	
Good	City nature parks actively address the most significant perceptions of security and welcomeness.	
Modearte	City has a formally assessed awareness of residents' perceptions of security and welcomeness at nature parks.	
Low	**City has limited understanding of residents perceptions of security and welcomeness at nature parks.**	

1. Cooperate with social science experts in the design of a social survey to assess City resident perceptions of security and welcomeness at nature parks. – PRCA

Transportation (Corridors)

Element	Performance Indicators	Objective
Species – shrubs and trees		Urban forest tree and shrub species are suitable to Gainesville's physical urban environment and regional climate.
Optimal	Net increase of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis.	
Good	**No net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis.**	
Moderate	Net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis is <10%	
Low	Net loss of native shrub and tree diversity, in transportation land use type, since the 2016 urban forest analysis is >or=10%	

1. Prepare a Land Development Code (LDC) code amendment to require the use of the City of Gainesville's Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. – DSD, PW, PRCA

2. Expand the City of Gainesville's Tree Matrix to include shrubs. – PW, DSD

3. Develop and implement an inter-agency strategic plan for tree acquisition, planting, establishment and long-term care. – PW, GRU, DTM, DSD

Canopy cover		Tree canopy cover no less than 35%. Ref. – Strategic Framework – 4 (c)
Optimal	**No absolute canopy cover loss, in the transportation land use type, since the 2016 urban forest analysis.**	
Good	Canopy Cover is 30% or greater	
Moderate	Canopy Cover is 25% or greater	
Low	Canopy Cover is lower than 25%	

1. Design and implement a canopy cover monitoring program.– PW, DSD

2. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5 years. – DSD

Health		All publicly managed trees within rights-of way are maintained to maximize current and future benefits, tree health and condition.
Optimal	All trees within the transportation land use type are rated in very good to excellent health and condition.	
Good	1 - 5% of the trees within the transportation land use type are rated in poor or dead health and condition according to procedures used in the City's 2016 Urban Forest Analysis.	
Moderate	5 - 10% of the trees within the transportation land use type are rated in poor to dead health and condition according to procedures used in the City's Urban Forest Analysis.	
Low	**>10% the trees within the transportation land use type are rated in poor to dead health and condition according to procedures used in the City's 2016 Urban Forest Analysis procedures.**	

1. Utilize systematic rapid (mobile) risk assessment surveys to identify 'hazardous' trees and prioritize their removal, with emphasis on emergency and evacuation routes. – PW

2. Develop an education program and materials to teach the public how to identify tree risk and know how to report it to urban forestry staff. – PW

3. Education about tree protection and construction.

4. Design transportation corridors to incorporate space and soil requirements for trees species as indicated in the City of Gainesville Tree Matrix as formal design elements. – DTM, PW

5. Revisit LDC requirements for planting space.

6. Use tree mitigation funds for structural improvement of tree planting sites along City Transportation Corridors. – DTM, PW, DSD

Invasive species		Management eliminates invasive plant species.
Optimal	Invasive species are monitored and treated with appropriate science-based cultural practice, following the City's formal invasive species management strategy along all transportation corridors.	
Good	The City has a formal invasive species management strategy for some transportation corridors.	
Moderate	Assessment invasive species and treatment on an *ad hoc* basis.	
Low	**No assessment.**	

1. Conduct a rapid invasive species inventory and assessment along all City rights-of-way on an annual basis. –DTM

2. Develop a strategic plan for invasive species management within the City's transportation corridors. – DTM

Stormwater		Trees and shrubs are an integral part of a Complete - Green street design for urban water conservation.
Optimal	15% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.	
Good	10% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.	
Moderate	5% net gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.	
Low	**No net loss of avoided stormwater runoff based upon the 2016 Urban Forest Analysis.**	

1. Target tree planting in areas of high impervious surface within Transportation Corridors. – DTM, PW, GRU

Utility rights-of-way		Provide a safe and reliable utility infrastructure.
Optimal	Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards[1] and incorporates citizen values into strategic decision making.	
Good	**Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards[1] and industry standards for line clearance.**	
Moderate	Tree pruning within utility rights-of-way along public transportation routes is consistent with ANSI standards.	
Low	Tree pruning within utility rights-of-way along public transportation routes is inconsistent with ANSI pruning standards and/or industry standards for line clearance.	

1. Conduct social surveys once every 5 years to determine citizen values concerning vegetative management within utility rights-of-way. – GRU, PW

2. Develop and implement a system-wide strategic plan for the management of vegetation within utility rights-of-way that incorporates citizen values. – GRU

Multi-modal transportation		The urban forest supports the choice of pedestrian travel within the City's multi-modal transportation network Ref. – Comprehensive Plan – Mobility, goal 2; policy 2.1.6 and Strategic Framework – Community; (a) (b)
Optimal	100% of the miles within the multi-modal transportation network support tree lined streetscapes designed and maintained to provide a sense of place/ community space and shade that promotes pedestrian travel.	
Good	75% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.	
Moderate	**50% of the miles within the multi-modal transportation network are actively designed to support tree lined streetscapes.**	
Low	Tree lined streetscapes are not considered when designing pedestrian use of the multi-modal transportation network.	

1. Assess the number of miles with tree lined streetscapes (40% canopy cover). – DTM

2. **Following the City of Gainesville's Tree Matrix implement design standards for the multi-modal transportation network to support healthy trees that provide at least 40% shade cover. – DTM**

Risk – damage from trees		Risk of property damage or personal injury is reduced to as low as reasonably practical.
Optimal	**Publically managed trees are monitored, and then maintained, through a 3-year cycle of inventories that identify structural, disease and insect problems.**	
Good	Publically managed trees are monitored, and then maintained, through a 4 – year cycle of inventories that identify structural, disease and insect problems.	
Moderate	Publically managed trees are monitored, and then maintained, through a 5 – year cycle of inventories that identify structural, disease and insect problems.	
Low	Publically managed trees are monitored, and then maintained, through a >5 – year cycle of inventories that identify structural, disease and insect problems.	

1. Maintain 2020 internal policy and procedures regarding tree inspection and 3-year pruning cycle within the City's Transportation Corridors. – PW, DTM

2. Develop and implement an ongoing risk abatement program to eliminate hazards along all emergency and evacuation routes. – PW, DTM

3. Prepare a Land Development Code (LDC) code amendment to require all trees planted in rights-of-way along emergency routes and evacuation routes, meet all above and below ground space requirements, as well as wind resistance as identified in the City of Gainesville's Tree Matrix. – PW, GRU, DTM, DSD

Energy conservation		Heat loading of buildings and paved transportation surfaces is reduced by shade produced from tree and shrub canopy. Ref. – Art. VIII obj. 1 Strategic Framework – Env; (a)
Optimal	Tree lined streetscapes are designed to support 40% shading of buildings, sidewalks and roads.	
Good	Tree lined streetscapes are designed to support shading of buildings, sidewalks and roads.	
Moderate	Formal assessment.	
Low	**No assessment.**	

1. Assess the City's Transportation Corridors for tree and shrub shade.

Visual access to nature (goal 6; element a)		Exemplary tree streetscapes occur within historic areas, along major thoroughfares, and throughout highly visible locations. Ref. – Strategic Framework – 3 (a)
Optimal	Contiguous tree lined streets are designed to support pedestrian travel and access to visually diverse naturalistic landscapes.	
Good	Multi-modal tree lined streets are used for informal gathering and recreation.	
Moderate	Pedestrian use of tree lined streets increases (statistical significance).	
Low	**Pedestrian use of tree lined streets remains unchanged.**	

1. Monitor pedestrian use of shaded vs non-shaded streets. – DTM

Commercial/Industrial/Institutional

Element	Performance Indicators	Objective
Species – shrubs and trees		Tree and shrub diversity predominantly reflect the native forest as described by the Florida Natural Areas Inventory (FNAI).
Optimal	**No net loss of native shrub and tree diversity, in residential land use type, since the 2016 urban forest analysis.**	
Good	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is <10%	
Moderate	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is <30%	
Low	Net loss of native shrub and tree diversity, in Commercial/Industrial/ Institutional land use type, since the 2016 urban forest analysis is >30%	

1. Continue to conduct tree and shrub diversity assessment within the i-Tree ecological analysis. – PW

Canopy cover (goal 1; element e)		Tree canopy cover not less than 35%.
Optimal	**No net loss of canopy cover since the 2016 urban forest analysis.**	
Good	Canopy cover is greater than 30%.	
Modearte	Canopy cover is greater than 25%	
Low	Canopy cover is less than 25%	

1. Design and implement a canopy cover monitoring program. – PW, DSD

2. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5-years. – DSD

3. Prepare a Land Development Code (LDC) code amendment that requires the use of the City of Gainesville Tree Matrix as a reference document for all tree planting projects required through code or through use of public funds. – DSD

4. Prepare a Land Development Code (LDC) to require tree mitigation fund use to occur within the same land use type or other district with demonstrated need identified by the urban forest inventory/analysis. – DSD

5. Require any tree planting or tree preservation required through the LDC or through use of public funds to not lead to a net loss of tree canopy cover by land use type. – DSD

Hydrology		No adverse impacts to the water quality of creeks, lakes, wetlands, floodplains, groundwater and uplands. Ref. – Article VIII 28 and Comp Plan Conservation Goal 2
Optimal	Property owners implement landscape designs that contribute to 15% gain in water conservation.	
Good	10% gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.	
Moderate	5% net gain in avoided stormwater runoff based upon the 2016 Urban Forest Analysis.	
Low	**No net loss of avoided stormwater runoff based upon the 2016 Urban Forest Analysis.**	

1. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5-years. – DSD

2. Develop and implement an inter-departmental strategic plan for incorporation of green infrastructure into City's stormwater and water conservation programs. – PW, DSD, GRU

3. Prepare a Land Development Code (LDC) code amendment that requires the restoration of degraded buffers on lands undergoing land use change or new development. – DSD

4. Design and implement a stormwater credit methodology for the use of Low Impact Development as part of a citywide strategic plan for water conservation.– PW, DSD

5. Organize a working group of DSD and PW staff to develop a plan to incorporate LID practices into the City of Gainesville's stormwater/urban water conservation regulatory system. – PW, DSD

Invasive species		Invasive plant and animal species are eliminated.
Optimal	All Commercial/Industrial/Institutional land is free of invasive plant species.	
Good	Net decrease in the abundance and diversity of invasive plant species on Commercial/Industrial/Institutional land.	
Moderate	City-wide formal assessment of invasive species.	
Low	**No formal assessment of invasive species.**	

1. Conduct invasive species assessments on the commercial/industrial/institutional lands type as part of the i-Tree ecological analysis. – DSD

Risk – damage from trees		Risk of property damage or personal injury is reduced to as low as reasonably practical.
Optimal	Risk in all trees within the Commercial/ Industrial/Institutional land use type is reduced to as low as reasonable practical.	
Good	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure.'	
Moderate	Level 1 tree risk assessment (ANSI 3000) is available to all Commercial/ Industrial/Institutional land owners.	
Low	**Tree risk is managed on an ad hoc basis.**	

1. **Notify commercial, industrial and institutional landowners of the City's ability to provide level 1 tree risk assessment. – PW**

Energy conservation		Heat loading of buildings and pavement reduced by shade produced from tree and shrub canopy. Ref. – Art. VIII obj. 1
Optimal	Designed tree lined streetscapes are optimized for shading of buildings, sidewalks, roads and parking lots.	
Good	Published sun azimuth and atmospheric data along with tree structure descriptions are used to design tree lined streetscapes and landscapes that reduce heat loading within the Commercial/Industrial/ Institutional land use type.	
Moderate	Consideration of published sun azimuth and atmospheric data are incorporated into guidelines for the design of streetscapes.	
Low	**Stretscapes are designed and implemented without explicit energy saving consideration.**	

1. **Prepare a Land Development Code (LDC) code amendment to require all new landscape designs meet LEEDS 'Certification' standards. – DSD**

Crime prevention		The City's urban forest supports a safe environment for businesses and workers.
Optimal	CPTED design standards are in place on all Commercial/Industrial/Institutional properties.	
Good	CPTED design standards are in place on all new Commercial/Industrial/ Institutional properties.	
Moderate	CPTED design standards are in place within at least 50% of new Commercial/Industrial/Institutional properties	
Low	No assessment of the use CPTED design standards on new Commercial/ Industrial/Institutional properties	

1. Develop and implement an MOU, between the Police Dept and DSD, that requires the review all new development plans for compliance with CPTED standards. – GPD, DSD

Fire prevention (goal 4; element k)		Prevention of structure fires through directed manipulation of the urban forest.
Optimal	All Commercial/Industrial/Institutional landscapes meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50).	
Good	All Commercial/Industrial/Institutional landscapes in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Moderate	Some Commercial/Industrial/ Institutional landscapes in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Low	Commercial/Industrial/Institutional properties within Wildland Urban Interface are not assessed for Wildfire Risk.	

1. Map the Wildland Urban Interface, as defined by the U.S. Forest Service, within the City of Gainesville. – DSD

2. Identify commercial/industrial and institutional properties in the City of Gainesville's Wildland Urban Interface. – DSD

3. ID FL Forest Service ability to participate in assessments – FD and DSD

4. Develop and implement an MOU, between the Fire Dept and DSD, that requires the review all new commercial/industrial/institutional development plans for wildfire risk – GFD, DSD

Wildlife habitat		Conservation and management of wildlife habitat.
Optimal	All new industrial sites, commercial parks and institutional lands actively implement a wildlife habitat plan prepared by a certified wildlife biologist - CWB® or active involvement of the Florida Fish and Wildlife Commission/Florida Forest Service.	
Good	New industrial sites, commercial parks and institutional lands implement wildlife habitat conservation practices on an ad hoc basis.	
Moderate	On all new industrial sites, commercial parks and institutional lands wildife habitat values are identified through a science – based assessment on conserved open space.	
Low	**All new industrial sites, commercial parks and institutional lands conserve open space for habit values.**	

1. **In cooperation with state universities and Florida Fish and Wildlife Conservation Commission develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. – PRCA, DSD**

2. **Prepare a Land Development Code (LDC) code amendment that requires the use of the rapid assessment of wildlife habitat and habitat conservation on all new commercial/industrial/ institutional parks 1. over 10 acres in size; or 2. considered to be of strategic value in the protection of native plants and animals; or 3. aquatic habitat. – DSD**

Visual access		Workers within buildings on industrial sites, commercial parks and institutional lands have visual access to naturalistic landscapes.
Optimal	Landscape and architectural design provide visual access of naturalistic landscapes from all workspaces within the building.	
Good	All new industrial sites, commercial parks and institutional lands incorporate landscape and architectural design to support partial visual access of naturalistic landscapes from within buildings.	
Moderate	All new industrial sites, commercial parks and institutional lands design naturalistic landscapes that support visual access from within buildings.	
Low	**All new industrial sites, commercial parks and institutional lands do not incorporate naturalistic landscape design that considers visual access to nature from within buildings.**	

1. **Prepare a Land Development Code (LDC) code amendment that requires landscape designs incorporate native plant species. – DSD**

Developed Parks/Open Spaces

Element	Optimal – Performance Indicator	Objective
Species – shrubs and trees		Tree and shrub diversity reflect the native forest as described by the FNAI.
Optimal	Net increase of native shrub and tree diversity, in developed/open space land use type.	
Good	No net loss of native shrub and tree diversity, in developed/open space land use type.	
Moderate	Formal assessments.	
Low	**No assessment.**	

1. Create and implement a vegetative assessment tool for use in Developed Parks. – PRCA

Standing dead and down woody material		Standing dead and downed woody material are left in place when not posing a risk to visitors or infrastructure.
Optimal	Dead standing and downed trees are conserved as a functional part of the natural forest ecosystem, if not posing a risk to visitors.	
Good	Dead standing and downed trees are inspected annually and managed to reduce risk toas low as is reasonably practical for visitors and property.	
Moderate	All dead standing and downed trees are removed from only high use areas (ie. playgrounds, picnic tables, etc.)	
Low	**All dead standing and downed trees are removed.**	

1. Incorporate the conservation of standing dead and down woody material into landscape maintenance policies and procedures within developed parks. – PRCA

2. Maintain at least one Parks, Recreation and Cultural Affairs staff member as an ISA Cert Arborist and TRAQ certified. – PRCA

Tree canopy cover		Tree canopy cover not less than 45%.
Optimal	**No absolute net loss of canopy cover since the 2016 urban forest analysis.**	
Good	Canopy cover greater than 40%	
Moderate	Canopy cover greater than 35%	
Low	Canopy cover greater than 30%	

1. Design and conduct tree and shrub canopy cover assessment every 5 years. – PRCA

2. Prepare a Land Development Code (LDC) code amendment that requires the loss of tree canopy be mitigated based upon replacement 'leaf area' or 3-dimensional canopy within 5 years. – DSD

Wildlife		Park design and management support the conservation of native plants and animals.
Optimal	Formal landscape plans that incorporate native plant and animal conservation and restoration guide active management and monitoring on all developed parks/open spaces.	
Good	Formal landscape plans incorporate native plant and animal conservation and restoration on all developed parks/open spaces.	
Moderate	Native plants and animals suited to developed park/open space sites are identified through a science – based assessment on an ad hoc basis.	
Low	**No assessment.**	

1. In cooperation with state universities and Florida Fish and Wildlife Conservation Commission, develop a methodology for rapid assessment of wildlife habitat within the City of Gainesville. – PRCA, DSD

2. Prepare a Land Development Code (LDC) code amendment that requires the use of the rapid assessment of wildlife habitat and habitat conservation on all City properties. – DSD

Natural community types		Landscape design reflects the structure and composition of native forest communities.
Optimal	Native trees, shrubs and non-woody plants suitable for Gainesville's physical urban environment and adapted to the regional climate[1] are central to all landscape designs.	
Good	New landscape design incorporate native plant associations and vegetative structure supported by site conditions.	
Moderate	Assessment of vegetation site conditions occurs on all developed parks/open spaces.	
Low	**Vegetation site condition assessments are conducted on an ad hoc basis.**	

1. Design and implement vegetative inventories and assessments on a 5 year basis. – PRCA

2. Require the use of bio-physical information obtained through site assessments to identify appropriate site specific native plants for use in landscape design. – PRCA

Invasive species		Invasive plant and animals are eliminated.
Optimal	Invasive species are monitored and treated with appropriate science-based cultural practice, following the City's formal invasive species management strategy on all developed parks/open space.	
Good	The City has a formal invasive species management strategy for some developed parks/open space.	
Moderate	Assessment of invasive species and controlled on an *ad hoc* basis.	
Low	**No assessment.**	

1. Conduct a visual assessment of invasive species in all Developed Parks annually. – PRCA

Stormwater		Prevent adverse impacts to the water quality of creeks, lakes, wetlands, foodplains, groundwater and uplands Ref. – Art VIII #28
Optimal	Forested floodplains and riparian forest stream corridors are managed to encourage infiltration as part of a comprehensive water conservation/ stormwater management system.	
Good	Urban forest stormwater function is 10% higher on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis	
Moderate	Urban forest stormwater function is 5% higher on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis	
Low	**No net loss of urban forest stormwater function on developed park/open space land use type as measured by avoided runoff since the 2016 Urban Forest Analysis.**	

1. Prepare a Land Development Code (LDC) code amendment to require the incorporation of LEED's 'Certification' standards into the design of all buildings in Developed Parks. – PRCA

2. Prepare a Land Development Code (LDC) code amendment to require the restoration of degraded woodland riparian buffers within all Developed Parks/Open Spaces. – DSD, PRCA

3. Prioritize the acquisition of Developed Parks/Open Space sites that directly support watershed hydrologic integrity. – PRCA, DSD

Risk – damage from trees		Risk of property damage or personal injury is reduced to as low as reasonably practical.
Optimal	Risk in all trees within high use areas of the developed park land use type is reduced to as low as reasonably practical.	
Good	Tree risk management is based upon 'standard of care' described in 'ANSI 3000: Tree Risk Assessment a. Tree Failure.'	
Moderate	Level 1 tree risk assessment (ANSI 3000) is conducted annually.	
Low	**Tree risk is managed on an ad hoc basis.**	

1. Conduct a Level 1 tree risk assessment (ANSI 3000) in high use areas each year. – PW, PRCA

2. Ensure that at least one Park, Recreation and Cultural Affairs staff member is an ISA Certified Arborist and TRAQ qualified (risk assessment). – PRCA

Energy conservation		Heat loading of buildings and pavement is reduced by shade produced from tree and shrub canopy.
Optimal	Published sun azimuth and atmospheric data are used in the design and implementation of landscapes to mitigate urban heat island effects on all developed parks/ open spaces.	
Good	Published sun azimuth and atmospheric data are used in the design and implementation of landscapes on all new developed parks/open spaces to reduce urban heat island effects.	
Moderate	Landscapes are designed and implemented with consideration of urban heat island effects.	
Low	**Landscapes are designed and implemented without consideration of urban heat island effects.**	

1. Prepare a Land Development Code (LDC) code amendment that requires that all RFP's for landscape designs on public parks include an element that addresses the reduction of urban heat loading. – PRCA

Crime prevention		The City supports a safe environment within its developed parks/open spaces.
Optimal	CPTED design standards are in place within all high visitor use areas.	
Good	CPTED design standards are practiced in all high visitor use areas.	
Moderate	CPTED design standards are considered in all high visitor use areas.	
Low	**CPTED design standards are not considered in all high visitor use areas.**	

1. Map high use zones

2. Prepare a MOU to require Police Dept review all Developed Parks for CPTEC compliance in high use zones. – PRCA,GPD

Fire prevention		Prevention of structure fires and wildfire associated with the urban forest through directed manipulation of the urban forest structure.
Optimal	All structures in developed parks/open space meet Low Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <50).	
Good	All structures in developed parks/open space in Wildland Urban Interface meet at least Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Moderate	Some structures in developed parks/ open spaces in Wildland Urban Interface meet Moderate Hazard Rating from the Florida Wildfire Risk Assessment Worksheet (Score <74).	
Low	**Structures in developed parks/open space in Wildland Urban Interface are not assessed for Wildfire Risk.**	

1. Map the Wildland Urban Interface within the City of Gainesville. – DSD

2. Identify Developed Parks/Open Spaces properties in the City of Gainesville's Wildland Urban Interface. – DSD, Parks

3. Prepare an MOU, between the Fire Dept and DSD, that requires wildfire risk assessment on all Developed Parks. – GFD, DSD

4. ID FL Forest Service ability to participate in assessments. – GFD and DSD

Visual and physical access		Visual and physical access to nature to support human health and well-being.
Optimal	>90% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.	
Good	75 to 90% of all developed parks/ open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.	
Moderate	**25 to 75% of all developed parks/ open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/ exercise.**	
Low	<25% of all developed parks/open spaces contain landscaping that reflects the native forest, are ADA compliant and provide opportunity of active recreation/exercise.	

No Actions

Appendix F: Glossary

Abundance: The number of organisms in a population, combining "intensity" (density within inhabited areas) and "prevalence" (number and size of inhabited areas).

Active recreation parks: Public lands that support outdoor recreational activities, such as organized sports, playground activities, that require extensive facilities or development or that have a considerable environmental impact.

Adaptable: Ability of an organism to change in form or behavior during its life as a response to environmental stimuli.

Air pollutants: Any substance in air that could, in high enough concentration, harm animals, humans, vegetation, and/or materials. Such pollutants may be present as solid particles, liquid droplets, or gases.

Air quality: pertains to the degree which the air is clean, clear and free from pollutants such as smoke, dust and smog among other gaseous impurities.

Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, among species and of ecosystems.

Canopy cover: The percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of the foliage of plants. Cannot exceed 100 percent (also called crown closure or crown cover).

Climate change: the long-term alteration of temperature and normal weather patterns in a place.

Energy conservation: Reduction in the amount of energy consumed in a process or system, or by an organization or society, through economy, elimination of waste, and rational use.

Forest: an ecosystem characterized by more or less dense and extensive tree cover usually consisting of stands varying in characteristics such as species, structure, composition, age class, and commonly includ- ing streams, fish, and wildlife.

Forest health: The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance.

Forest structure: The horizontal and vertical distribution of layers in a forest including the trees, shrubs, and ground cover (which includes vegetation and dead and down woody material.

Green Infrastructure: Green infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits. While single-purpose gray stormwater infrastructure—conventional piped drainage and water treatment systems—is designed to move urban stormwater away from the built environment, green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.

Greenhouse gas sequestration: The process of capturing and storing atmospheric gases associated with global climate change.

Greenhouse gas storage: The semi-permenant storage of atmospheric gases, including carbon dioxide (CO2), that lead to atmospheric warming within the urban forest's vegetation and soils.

Habitat: The environment of an organism; the place where it is usually found.

Hazardous trees: Unstable trees, in whole or part, that are within striking distance of people or property (a target). Hazard trees have the potential to cause property damage, personal injury or fatality in the event of a failure.

Historic or veteran trees: Trees that are of interest biologically, aesthetically or culturally because of their age; in the ancient stage of their life; or that are old relative to others of the same species.

Human health: The state of complete physical, mental and social well-being; and not merely the absence of disease or infirmity.

Hydrology: the branch of science concerned with the properties of the earth's water, and especially its movement in relation to land.

Invasive species: A species that is (1) nonnative to a given geographic area, (2) introduced by humans (intentionally or unintentionally), and (3) that does or can cause environmental or economic harm or harm to humans.

Landscape connectivity: The degree to which the landscape facilitates or impedes movement between resources patche.

Managed forest natural areas: A forest area managed to retain its historic physical features and species. Development and maintenance are limited to that required for health and safety.

Managed pine plantations: Forest stands established by planting or/and seeding in the process of afforestation or reforestation, and further managed for the production of raw wood products.

Multi-modal transportation: The combination of two or more modes of movement.

Native forest: Forestland consisting of forest plant communities and associated animals historically found in the region.

Natural area: A geographical area having a physical and cultural individuality developed through natural growth rather than design or planning.

Natural community types: A distinct and recurring assemblage of populations of plants, animals, fungi and microorganisms naturally associated with each other and their physical environment.

Open woodlands: An open canopy allows full sunlight to enter the woodland, limiting shade and moisture. These woodlands are often transition zones between different ecosystems, such as grasslands and true forests.

Predominantly: Constituting a minimum of 75 percent. (CP G# OBJ 3.1, POL 3.1.1)

Private woodlands: Woodlands owned by private citizens, communities, private cooperatives, businesses and other private institutions.

Production forest: Forest area designated primarily for production of wood, fiber, bio-energy and/or Non-wood forest products.

Public woodlands: Woodlands owned by governments; or by institutions or corporations owned by the public administration.

Resilient to drought: Capable of rapid recovery to its former condition after it has been disturbed drought.

Resilient to fire: Capable of rapid recovery to its former condition after it has been disturbed fire.

Resilient to flooding: Capable of rapid recovery to its former condition after it has been disturbed flooding.

Resilient to strong storms: Capable of rapid recovery to its former condition after it has been disturbed strong storms.

Resistant to insect infestation and diseases: The ability of a urban forest to avoid significant alteration of displacement from its present state by an insect infestation or disease.

Road traffic safety: The methods and measures used to prevent road users from being killed or seriously injured. Typical road users include: pedestrians, cyclists, motorists, vehicle passengers, horse-riders and passengers of on-road public transport (mainly buses and trams).

Shrub: A woody plant no more than 16 feet in height at maturity and without a definite crown. It can have several stems and is smaller than most trees.

Species: A group of organisms whose members have the same structural traits and who can
interbreed with each other.

Species distribution: The manner in which a biological taxon is spacially arranged.

Standing dead and down woody material: The dead twigs, branches, stems, boles of trees, and brush that have fallen and lie on or above the ground.

Stormwater: All of the water that doesn't infiltrate flows over the ground, over roofs and through gutters on buildings, into storm drains, and into the nearest waterway.

Tree: A perennial woody plant with an elongated stem, or trunk, supporting branches and leaves. In the case of coppice with several stems, having a more or less definite crown.

Tree diameter distribution: Range and frequency of 2" tree diameter classes.

Tree lined streets: City streets buffered by any sized trees.

Understory: The underlying layer of vegetation in a forest, especially the trees and shrubs growing between the forest canopy and the forest floor. Plants in the understory comprise an assortment of seedlings and saplings of canopy trees together with specialist understory shrubs and herbs.

Urban forest: Urban parks, street trees, landscaped boulevards, gardens, river and coastal promenades, greenways, river corridors, wetlands, nature preserves, shelter belts of

trees, and working trees at former industrial sites.

Utility rights-of-way: Legally defined shared use areas on private and public property for the placement and maintenance of above and below ground utilities, i.e electric, water, sewer, etc.

Vertical structure: The arrangement of vegetation in layers; largely according to the different heights to which trees and non-woody plants grow.

Wildlife: The native fauna (and sometimes flora) of a region.

Wildlife habitat: The environment of an organism; the place where it is usually found.

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