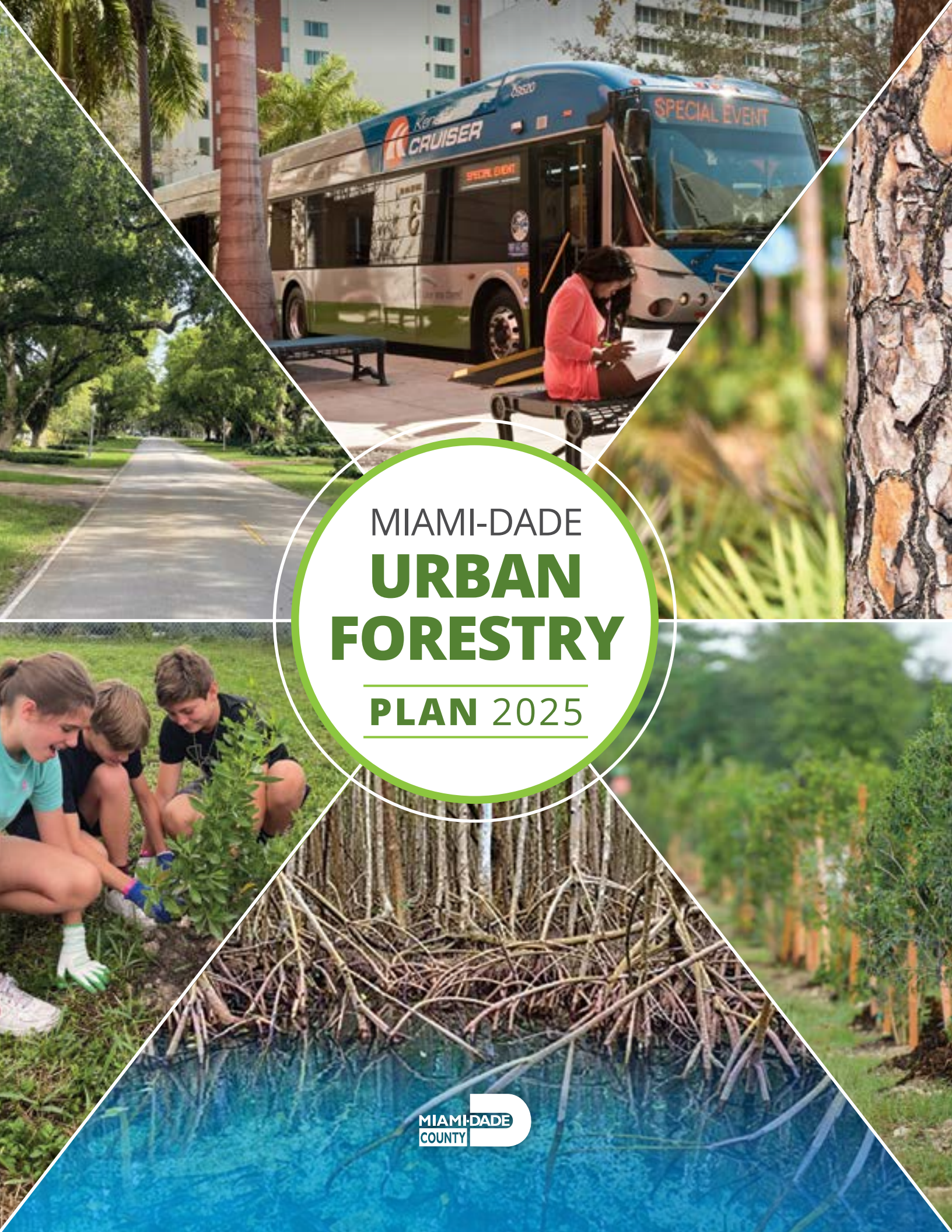
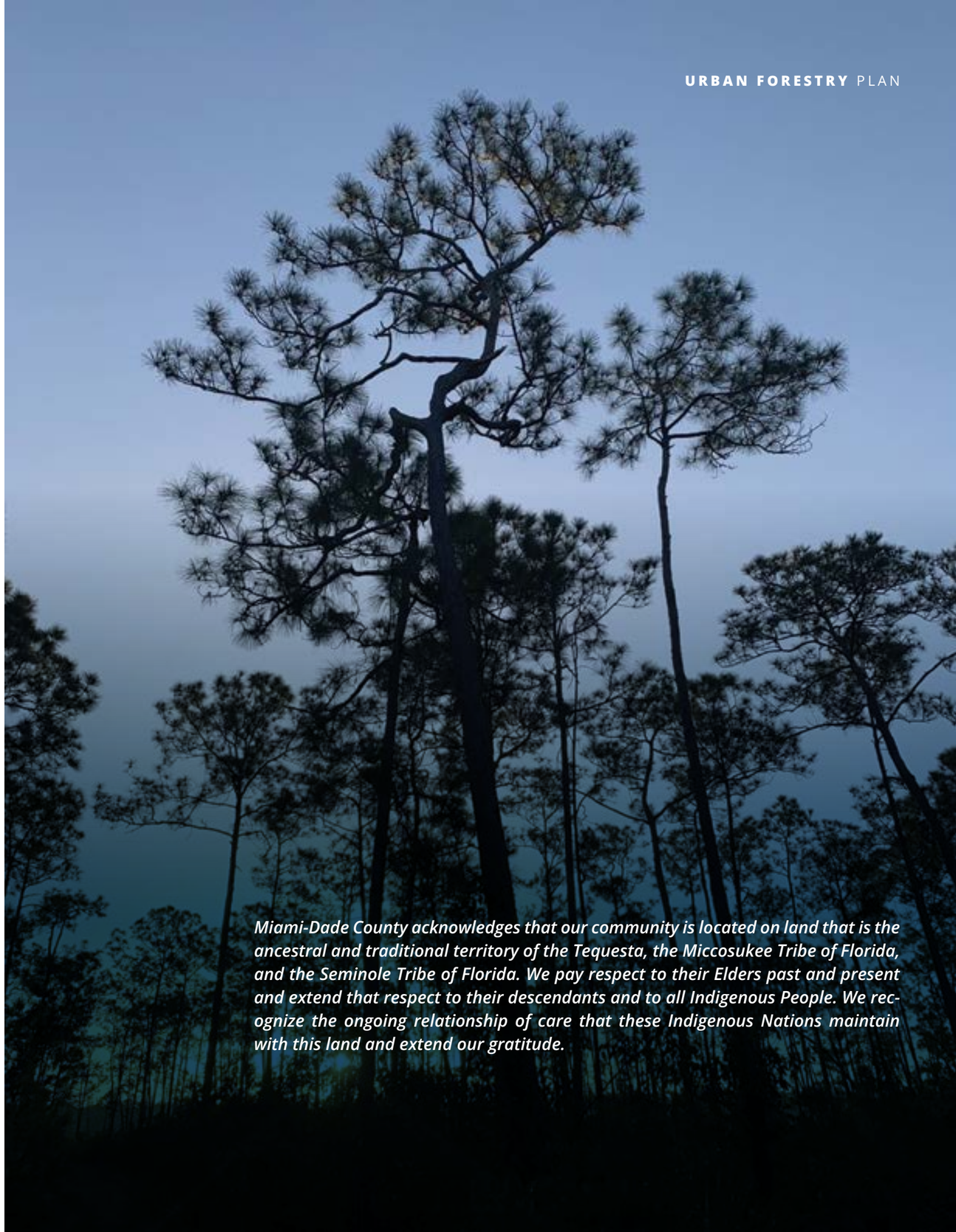


MIAMI-DADE URBAN FORESTRY PLAN 2025

MIAMI-DADE COUNTY



Miami-Dade County acknowledges that our community is located on land that is the ancestral and traditional territory of the Tequesta, the Miccosukee Tribe of Florida, and the Seminole Tribe of Florida. We pay respect to their Elders past and present and extend that respect to their descendants and to all Indigenous People. We recognize the ongoing relationship of care that these Indigenous Nations maintain with this land and extend our gratitude.

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EXECUTIVE SUMMARY

Trees and urban forests are critical infrastructure, providing essential services within our communities, including shade and neighborhood cooling, stormwater management, improving air quality, beautification and habitat conservation. Miami-Dade County has long valued and promoted policies and programs to support the preservation and planting of trees and restoration of forests through tree giveaways, tree planting, policies, design guidelines, and protecting and restoring environmentally sensitive areas.

The County has held a goal of getting to a minimum of 30% tree canopy since 2006. Many challenges make this an ambitious target – including disease and storms that drive loss of tree cover, rapid urbanization and the fact that the County has direct jurisdiction over only a portion of the land where we need to expand our tree canopy. Between 2008 and 2016, our tree canopy grew from 12% to 20%, while from 2016 to 2021, the urban tree canopy remained at a flat 20%. Maintaining 20% canopy during this period required significant inputs, in the face of rapid development, multiple major storms, and a state exemption allowing the removal of trees without any replacement.

Mayor Daniella Levine Cava is committed to making all possible progress on these goals. Under her leadership, the County has doubled the number of trees it plants annually, from 8,000 to 16,000, and built partnerships with the Miami-Dade County School Board and faith-based organizations to prioritize tree planting in areas with current low canopy. In June 2022, the Board of County Commissioners directed the Mayor to develop a comprehensive plan for our County's urban tree canopy, to identify funding for the plan and to compile data (Resolution No. R-588-2). This plan was developed by a working group co-chaired by Chief Operating Officer Jimmy Morales and Chief Heat Officer Jane Gilbert. The Draft Urban Forestry Plan was released for public review, with 159 stakeholders participating in in-person and virtual workshops, and 183 people providing comment via an online survey. Community input was reviewed and incorporated into the final plan.

Miami-Dade County will lead efforts for preserving and enhancing a healthy and equitable tree canopy and urban forests on its own land and right of ways. Since the vast majority of the land is not owned by the County, we must strengthen existing partnerships and build new ones that enhance public engagement and recommend and implement policies that preserve and increase our tree canopy and urban forests Countywide.

[1] *Miami-Dade County Urban Tree Canopy Assessment,* October 2021

OUR GOALS

1. **Invest in the lowest canopy areas.**
2. **Increase the quality of tree canopy and forests.**
3. **Proactively protect, maintain and plant trees.**
4. **Engage communitywide stakeholders.**
5. **Establish dedicated funding to support urban forestry.**

The following strategies will be implemented to reach our goals:

1. **Accelerate tree and forest preservation, growing and maintenance** on County land, and on all public lands through leases and agreements.
2. **Expand and strengthen private, municipal and institutional partnerships** to accelerate public engagement and progress on canopy goals.
3. **Advance planning, policy and regulatory opportunities** to require and incentivize urban reforestation Countywide and establish dedicated funding.
4. **Support growth of forestry jobs and business opportunities** particularly arborist and landscape businesses in the urban core and nursery businesses in South Dade.
5. **Integrate systems for tracking** tree canopy, inventorying, and identifying current and future vulnerabilities with the capability to also account for tree canopy progress.

These five strategies will advance the growth and preservation of a robust, resilient and equitable urban forest. Progress on these strategies will be reported on annually.

LETTER FROM MAYOR DANIELLA LEVINE CAVA

Our trees and urban forest system are critical for cooling our streets, cleaning our air, reducing floods, and storing carbon, all essential to creating a more resilient County where all residents can live, work, and thrive.

My administration is dedicated to increasing and improving our tree canopy. In the past two years, the Board of County Commissioners and I have doubled investment in tree planting efforts from approximately 8,000 trees in Fiscal Year 2021 to 16,000 in Fiscal Year 2023. We secured key funds from the U.S. Department of Agriculture's Forest Service for tree planting, and developed key partnerships with our educational and faith-based institutions to plant and preserve trees on their properties. In all these efforts and our municipal matching grant program, we continue to prioritize planting in low canopy and high potential areas.

While the County has had a long-time commitment to preserving, growing, and restoring our trees and urban forests, we continue to face challenges in achieving our ambitious goal of 30% coverage. The 2021 urban tree canopy assessment revealed that while we made gains in several areas, we lost ground in others and overall remained at a flat 20% since 2016.

Included with this letter is our Plan to advance our goals. We cannot build and protect a robust, resilient tree system without you. We welcome your involvement, so that together, we can protect and grow a healthy tree canopy, especially where it's needed most.

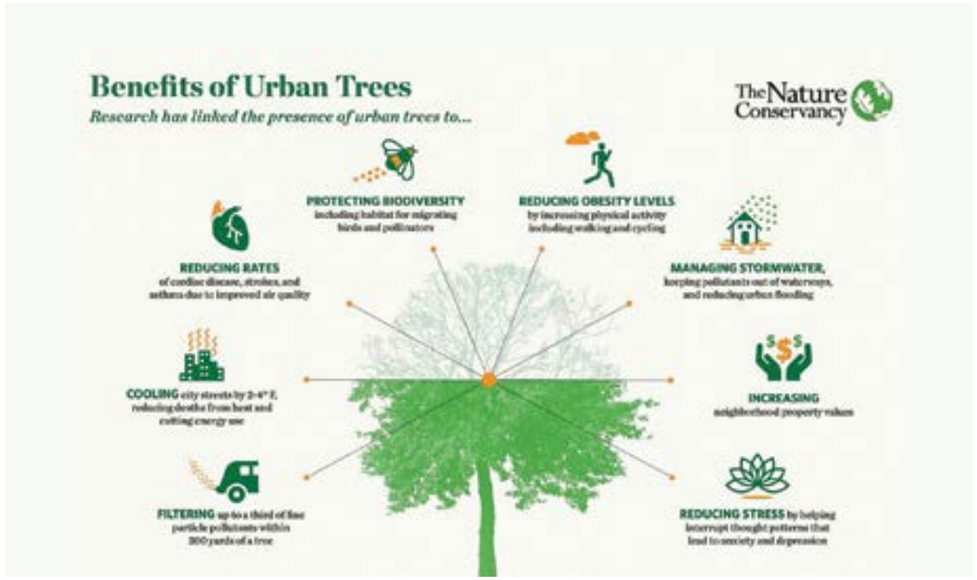
Thank you for your support in this vital work,

Daniella Levine Cava

OFFICE OF THE MAYOR
DANIELLA LEVINE CAVA

BENEFITS OF OUR URBAN FOREST

Trees and forests within urban areas provide multiple benefits to people and our environment, including stormwater management, reduced heat island effects, reduced soil erosion, improved air and water quality, reduced cooling costs, increased property values, captured carbon dioxide and improved mental and physical well-being. A robust and and well-distributed tree canopy provides safe and enjoyable areas for walking and recreating and will improve public health. Together, all the trees and shrubs in Miami-Dade County form our **urban forest**. The urban forest provides a greater range of benefits than any one tree alone. According to Cities4Forests, "an urban forest encompasses the trees and shrubs in an urban area, including trees in yards, along streets and utility corridors, in parks and protected areas, including forests and forest fragments, and in watersheds. This includes individual trees, street trees, green spaces with trees and associated vegetation and the soil beneath the trees."



Green infrastructure refers to natural systems including plants, habitats, forests, floodplains, wetlands, coastal and marine areas, and soils and sediments that provide infrastructure-type benefits for human well-being and safety, such as flood protection, shade, and climate regulation. Trees are a primary component of green infrastructure. While ecosystem services and habitat restoration are complex, one impactful and easily understandable way to improve natural areas is supporting and maintaining a connected and resilient tree canopy.

Urban trees and forests also provide food, shelter, nesting sites and other essential wildlife habitat components that help balance the negative impacts to wildlife resulting from human development and habitat destruction. Despite fragmentation, Miami-Dade County urban forests are home to numerous endangered animals and plants found nowhere else in the world.

In Miami-Dade County, the ground is very porous, and rainfall causes pollutants including nutrients to easily percolate through the limestone into the aquifer, which degrades the quality of our ground water and can deprive the soil of valuable nutrients. Larger, mature trees provide significant capacity to store stormwater and control runoff rates through the benefits of soil storage, interception, and evapotranspiration while also improving water quality by slowing run-off and trapping pollutants. By slowing down the conveyance of stormwater, trees assist in returning nutrients to the system thereby improving groundwater quality and reducing the need for artificial fertilizers.

Trees and other vegetation lower surface and air temperatures by shading concrete, asphalt and other surfaces in urban areas that would otherwise absorb sunlight and contribute to heat islands. Areas that have a higher tree canopy can be up to 11 degrees Fahrenheit cooler than neighborhoods with lower tree canopy (McDonald, Robert, et al PLOS ONE 2023) making them more enjoyable and safer places to walk, bike and recreate outside while also reducing cooling costs for surrounding buildings. While trees break up wind and protect homes during storms and extreme weather events by serving as the "front line of defense," downed trees can cause hazards. Therefore, it is essential to maximize the benefits of trees in safeguarding our cities. Therefore, it is essential to maximize the benefits of trees in safeguarding our cities. These wise nature-base solutions include planting the right trees in the right places and maintaining them with proper pruning and support, especially when trees are young or recently planted.

Current State of Our Urban Forest

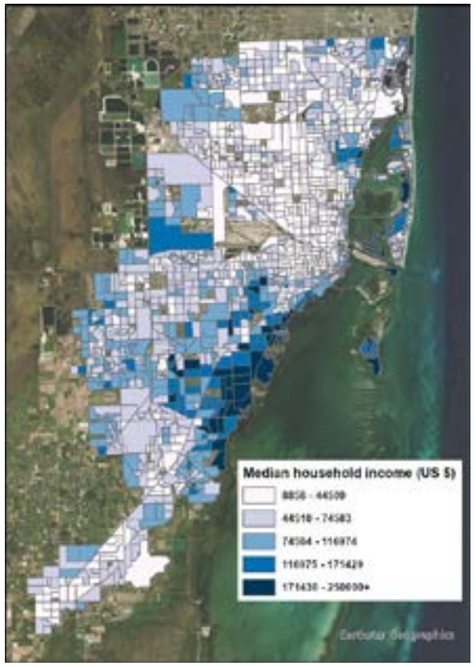
With rapid growth and development, Miami-Dade's urban forests have become increasingly fragmented contributing to rising temperatures, imperiled land and marine ecosystems, and worsening air quality. The early 2000s were years of many low points in the County's tree canopy history largely due to Hurricane Andrew along with the loss of nearly all citrus trees due to devastating diseases.

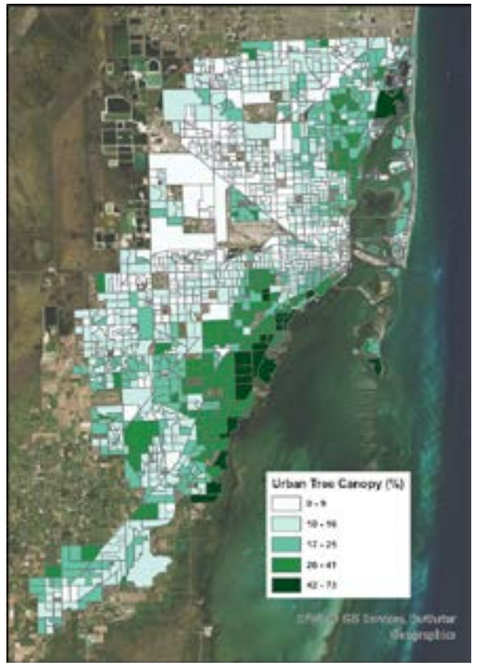
A 2008 tree canopy assessment indicated that urban tree cover was only 12%. This assessment was different than those conducted in 2016 and 2020 in that it accounted for difficult-to-measure considerations such as canopy cover from non-trees due to their trunk size and excluding tall grasses. This analysis led the County to adopt a 30% tree canopy goal in the Comprehensive Development Master Plan.

The apparent growth in tree canopy from 12% in 2008 to 20% in 2016 (not like-to-like measurements) can be largely attributed to aggressive County action since the early 2000s. This includes nearly a quarter million trees being distributed to property owners through Adopt-a-Tree at nation-leading survival rates, the adoption of the Street Tree Master Plan, the launch of Million Trees Miami-Dade County and the GREEN Miami-Dade County Matching Grant leading to public and private partnerships advancing tree planting and protections in parks along with a matching grant program for municipalities. The Environmentally Endangered Lands (EEL) Program acquired more than 7,000 acres of environmentally sensitive areas since 2006. The County also sought to preserve and enhance its tree canopy through regulatory measures such as the tree protection ordinance and landscape code.

However, since the 2016 assessment, the tree canopy within our Urban Development Boundary has remained essentially at a flat 20%, according to the **2021 Urban Tree Canopy Assessment**. The 2021 Urban Tree Canopy Assessment had additional findings that were similar to other previous ones, including:

- The canopy is inequitably distributed with higher canopy areas generally within census block groups with higher median incomes and areas with lower median income generally having much lower canopy.





Source: *Miami-Dade County Urban Tree Canopy Assessment, 2021*

- Areas with higher tree canopy had lower rates of respiratory and heat-related illnesses and overall hospitalization rates.
- A large portion of the County offers potential areas for additional urban tree canopy based on aerial photographs. These areas consist of pervious surfaces (grass, bare ground) and impervious surfaces (asphalt). However, this doesn't take into account conflicts and planning considerations. Many of these areas are already dedicated to a specific purpose, such as utilities, golf courses, or airports, which often cannot accommodate additional trees.
- Increases in surface temperature were observed from 2016 to 2020 at locations where a) tree canopy was replaced by impervious surfaces, or b) pervious surfaces were changed to impervious surfaces.

- Utilities, parks and recreational areas, vacant lands, schools, and institutional lands comprise the highest percentage of areas with potential for additional tree canopy. Assessments showed these lands are followed by single family and duplex homes as areas with high potential for additional tree canopy. Complexities of siting trees based upon pervious surface area should be considered, for example, "utility corridors" have high potential planting areas, however trees within these corridors can pose significant risk to infrastructure during storms if the planted trees are not of the proper size or species.

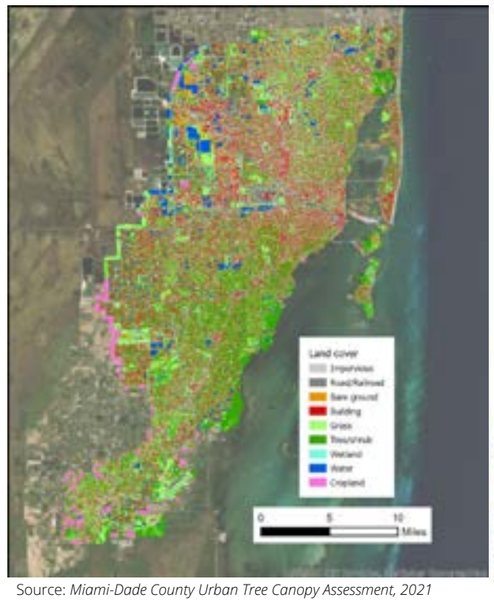
Miami-Dade's 2022 Heat Vulnerability Assessment also found that the ZIP codes with the highest rates of heat-related emergency department visits also had the highest land surface temperatures and a low percentage of tree canopy. In response to these findings, public concern, the 2021 Thrive305 plan and 2021 Climate Action Strategy, the County reaffirmed the goal of achieving 30% tree canopy within the Urban Development Boundary and adjusted the timeline from 2020 to 2030, along with some standard-setting strategies that would leverage County-owned lands, especially in areas where tree canopy is most needed. Reaffirming the 30% tree canopy CDMP goal through these plans means adding 50% more tree canopy than currently exists in our urban areas.

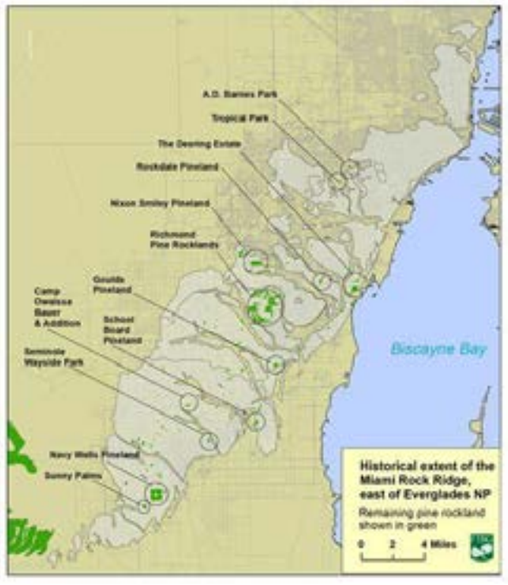
Growing the Countywide tree canopy by 50% is achievable as the County has done it before, when faced with significant challenges from past tree losses. However, this new goal presents its own difficulties, particularly due to urban development, which limits available planting space, especially in communities most in need of tree canopy expansion.

Risks to Our Urban Forest

Miami-Dade County's forests are a combination of native habitats and tree canopy, landscaped tree canopy and exotic species. Many urban forests are endangered due to development pressures. Some trees, particularly invasive species, need to be removed to prevent issues like forest fires, while native and non-invasive trees enrich our neighborhoods, enhancing the quality of life for residents and visitors and expanding the healthy biodiversity in our backyards, streets and parks.

The distribution of trees in the County reflects its unique geography and development history. Urban and agricultural areas lie between Everglades National Park to the west and Biscayne National Park to the east. This strip of land was at one time a mix of wetlands dotted with tree islands, a higher limestone ridge of upland forests, and a mangrove coastline along Biscayne Bay. This area underwent rapid development in the 20th century, leading to a significant loss of the original tree canopy while the surrounding National Parks have remained protected.





Source: *Miami-Dade County Urban Tree Canopy Assessment, 2021*

There are also immutable drivers that have shaped our forests, such as hurricanes, that trigger loss of canopy on a semi-regular basis. As the County learned during the citrus disease outbreaks 20 years ago, disease outbreak can trigger extreme losses of canopy. Prior to disease outbreak, citrus trees were the most common cultivated tree in the County. Today Miami-Dade has experienced significant tree loss due to laurel wilt disease that has impacted both our native bay trees as well as our treasured avocado trees that had replaced citrus trees as the most commonly cultivated tree in our urban areas.

Miami-Dade County's urban tree canopy is fragmented and affected by regional drainage and invasive non-native species. Less than 2% of the native upland forest remains outside Everglades National Park. In the urban core, protected areas support 17 plant and 14 animal species that are listed as endangered under the U.S. Endangered Species Act, along with many more protected at the state and local levels. Many of these species are unique to

South Florida. The habitats mainly include globally imperiled pine rocklands, hardwood hammocks, scrub, freshwater glades, and saltwater wetlands (primarily mangrove forests).

Between habitat fragments are tree canopy and landscaped areas with agricultural use, native plantings, invasive plant species and exotic landscape. The distribution of habitat and canopy is uneven. Some communities and particularly low-income areas have canopy well below 10% (e.g. Hialeah and Hialeah Gardens) while other communities have tree canopy over 40% (e.g. Coral Gables and Pinecrest). Due to historic planting/landscaping preferences, canopied areas in the urban landscape are often dominated by low performing palm trees that provide little to no shade.

The future of our existing tree canopy is also at risk due to complex drivers, including increasing heat stress, increasing flooding (due to sea level rise and changing precipitation patterns), coastal erosion damage and increased windstorms. While the risks of these stressors can be mitigated in part by tree canopy and high performing environmental areas, these challenges also jeopardize critical canopy resources. Risk reduction from these stresses is addressed by improving:

- **Regional restoration improving the watershed where the canopy exists**
- **Tree species quality of the canopy**
- **Urban planning strategies to leverage tree benefits and provide adequate space to preserve existing mature trees as well as plant large species of shade trees that can grow to maturity.**

Since 2006, canopy assessments have generally included total coverage of tall plants and have not considered important factors like the presence of invasive species and habitat quality. Areas such as globally imperiled pine rocklands, which offer valuable environmental benefits, should not be designated for additional tree planting that can harm the forests. Additionally, removal of invasive species should not be described as a contributor for tree canopy loss, since some of these species aren't classified as trees due to their structure, and they can pose serious risks to both human health and ecosystems.

In June 2022, the Board of County Commissioners directed the Mayor to develop a comprehensive plan relating to urban tree canopy, to identify funding for the plan and to compile data (Resolution No. R-588-2). Per the Commission directive, the plan will, at a minimum:

- Address inequities in urban tree canopy coverage currently experienced in low-income communities as identified in the 2021 Report, prioritizing those communities within UMSA and County-controlled land
- Include strategies to collaborate with non-governmental entities
- Identify legally available funding to implement the plan and achieve the canopy goals at the earliest timeline possible
- Include a communications plan to:
  - clarify to public how trees are managed (*what County is doing, property owners' responsibilities, and limits to County authority*)
  - include a call to action for community engagement on acceleration efforts
  - enhance education/outreach on benefits and particulars of tree management

The Mayor charged Chief Operating Officer Jimmy Morales and Chief Heat Officer (CHO) Jane Gilbert to co-chair an interdepartmental Urban Forestry Plan Working Group.

VISION STATEMENT

Residents, businesses, governments and organizations recognize the critical importance of a robust, resilient and equitable urban forest system to our collective health and quality of life.

As a result, these stakeholders work together to protect and enhance our tree canopy throughout Miami-Dade County and increase the quantity of tree canopy in non-hurricane/ tree disease years by 5% per year until 30% tree canopy is achieved.

Sean McKrackine (pictured) served as the Mayor's Policy Advisor to the Urban Forestry Plan Working Group.

PUBLIC ENGAGEMENT

The Urban Forestry Plan Working Group released the Draft Urban Forestry Plan for public review. A total of 159 stakeholders participated in an in-person or virtual workshop, and 183 people provided comments via an online survey.

Community input was overwhelmingly supportive of the County taking proactive, strong measures to improve tree canopy and tree protections. A summary of responses and comments received is included in the table below. The draft plan was updated significantly to reflect public input received.

Key challenges that the County faces in increasing tree canopy:

Coordination and Collaboration: Ensuring all municipalities align with the 30% tree canopy goal and developing a cohesive, coordinated plan across departments and agencies (e.g., Environmental Resources, Public Works, and municipalities).

Policy Gaps and Maintenance: Addressing policy gaps, improving communication between agencies, and securing more budget for tree maintenance for both large and small trees.

Education and Community Engagement: Raising awareness about the value of trees to increase community involvement in maintenance and exploring models from other cities to engage the public.

The County should prioritize the following goals:

Tree Planting Alignment and Prioritization: Ensure tree planting locations align with canopy goals, considering tree size, and prioritize planting on readily available lands like school board properties.

Policy, Personnel, and Funding: Focus on policy changes, hiring and funding personnel, and establishing long-term contracts with tree growers to ensure a steady supply of suitable trees.

Community Engagement and Education: Build a tree culture through education and outreach, including programs for local homeowners, schools, and other institutions to promote long-term care and awareness.

Incentives and Accountability: Create incentives for private businesses and residents to participate in urban forestry and hold government and companies accountable for tree preservation, with penalties for non-compliance.

The Urban Forestry Plan should focus on:

Total Coverage and Shade: Prioritize total tree coverage and shade, not just tree numbers. Address the lack of shade in community parks, improve shaded median parkways, and widen sidewalks for both aesthetic and practical benefits.

Sustainability and Education: Ensure proper tree planting and care by providing guidance to residents, addressing future conditions like increasing extreme heat events and flooding, and developing education goals to make all other goals achievable. Engage schools and community members in tree maintenance and care.

Collaboration and Funding: Collaborate with local organizations, developers, and community partners to achieve canopy goals. Focus on reforestation in low-canopy areas, protect natural spaces, and ensure sustainable maintenance practices. Address funding accessibility for urban forestry projects.

Linking Tree Canopy to Health and Economic Benefits: Tie tree canopy improvements to public health, economic benefits (like better air quality and property values), and quality of life outcomes to help secure funding.

Innovative Solutions and Maintenance: Explore innovative solutions like permeable sidewalks and green roofs, and establish clear maintenance requirements, integrating data across systems for tree and stormwater management.

URBAN FORESTRY GOALS

This plan sets forth guiding goals to achieve 30% urban tree canopy through an ecologically sound, community-driven and planning-consistent approach:

1. Prioritize the lowest canopy areas:

- Deepen relationships with residents and other community stakeholders in low-canopied neighborhoods to promote support for and stewardship of tree canopy.
- Prioritize tree and forest investments in vulnerable communities where there is a strong correlation between poverty rate and low tree canopy.
- Identify the drivers of low canopy in impacted neighborhoods, and take action to prevent an uneven distribution of trees within the urban core.

2. Increase the quality of tree canopy and forests:

- Implement prohibited species eradication requirements on County properties.
- Determine vulnerabilities to existing trees from disease, incompatible invasive plants and conflicts with the built environment.
- Develop informed strategies to confront vulnerabilities such as sea and groundwater level rise, increasing heat, diseases/pests and storms.

3. Proactively protect, maintain and plant trees:

- Preserve existing trees and urban forests and ensure the long-term success of newly planted trees by:
  - updating policies and practices to prioritize protecting trees,
  - selecting the right tree and right place,
  - Investing in preparing sites adequately and
  - increasing maintenance capacity to provide the care needed for low risk, healthy trees.
- Foster a “growing” mindset rather than a “planting” mindset.

4. Engage community stakeholders:

- Promote programs and activities that raise awareness and engage stakeholders on the value of protecting existing urban forests and properly planting new trees.
- Engage residents and other stakeholders in local decision-making about tree protection and planting.

5. Establish a dedicated funding source for reforestation capacity:

- Seek policy and procedural updates that would ensure capital improvement projects prioritize investments in green infrastructure including protecting and planting trees.
- Strengthen in-house capacity and partnerships to improve systems for tracking canopy Countywide, provide technical support, develop policy, provide tree/forest planning, and implement tree planting and reforestation projects as needed.
- Create incentives for private businesses and residents to participate in urban forestry and hold government and companies accountable for tree preservation, with penalties for non-compliance.
- Seek voter-approved funding for urban forest maintenance and expansion.

STRATEGIES FOR REALIZING TREE CANOPY GOALS

The following strategies are necessary to accelerate and coalesce the approach to tree canopy to achieve 30% tree canopy:

1. **Accelerate tree and forest preservation, growing and maintenance** on County land and on all public lands via leases, and agreements
2. **Expand and strengthen private, municipal and institutional partnerships** to accelerate canopy metrics and public education and engagement
3. **Advance planning, policy and regulatory opportunities** to require and incentivize urban reforestation Countywide
4. **Support growth of forestry jobs and business opportunities** particularly arborist and landscape businesses in the urban core and nursery businesses in South Dade
5. **Integrate systems for tracking** tree canopy, inventorying, and identifying current and future vulnerabilities and that can account for tree canopy progress

These five strategies will advance the growth and preservation of a robust, resilient and equitable urban forest and are detailed further below.

STRATEGY 1:

Accelerate tree and forest preservation, growing and maintenance on County land and on all public lands via leases and agreements.

Miami-Dade County must lead by example, treating trees and forests as a key component of County infrastructure that provides essential environmental and economic benefits directly improving the health, resilience and quality of life for County residents, businesses and visitors now and in the future. Often trees are treated as afterthoughts, incorporated only when they fit in easily at the end of planning rather than being integral parts of the overall initial design. Differing from inanimate County infrastructure like roads, bridges and buildings, trees require proactive planning and routine maintenance to ensure their survival. A wonderful thing about trees is they increase in value over time, providing more benefits 5-10 years after planting. However, the first 5 years of growth are often when trees fail as a result of maintenance "accidents" such as weed whacking or failure to remove stakes. Additionally, space must be identified and reserved specifically for forest preservation purposes, with priority given to the ecological services provided, over other development opportunities.

1.1 Invest in urban forest maintenance and education

Existing mature trees are more valuable than newly planted trees because of all the benefits they provide. Trees in years 2-5 are most vulnerable to impacts such as weed whacking. As young trees grow in their new homes, conflicts can arise that were not considered at the time of planting. The County will provide trainings for its staff and contractors involved in tree and landscape maintenance activities. Tracking impacts is also needed on County-owned lands, County leases, and tree plantings funded by the County to other institutions, particularly those that are required by regulatory action. Moreover, the County will need to continue to increase funds for maintenance as it has done in the past two years.

Metrics: # of trainings; # of trees pruned; # of trees weed whacked or effectively destroyed (self reported or observed); # of replacements identified due to maintenance or tree selection failures

1.2 Finalize and implement an Administrative Order to improve preservation of existing tree resources

The County needs to issue an Administrative Order that specifies protocols to preserve as many trees as possible on County-owned or leased property in their current locations with a particular emphasis on the protection/preservation of specimen trees as per the Code and CDMP. At the planning stage of proposed County projects or projects on County-owned or leased land, tree resources must be identified, and their preservation coordinated with project requirements. While the initial review of County projects by biologists and certified arborists would consider the preservation of tree resources in place, the reality is that some trees may not be healthy enough to preserve on-site. This initial review must include an on-site evaluation of tree resources to determine the species, size, and condition of the tree (both health and structural integrity), to determine appropriate actions including identification/ prioritization of all specimen trees to be preserved on-site or through relocation.

Metrics: Issuance of Administrative Order; Trainings provided on the Administrative Order to capital project managers, #project complying with AO, #trees preserved

1.3 Lead by example regarding tree canopy goal

Within the UDB, all County facilities should attain an average of at least 30% canopy and outside the UDB this number should average at least 50%. With the approval of the jurisdictional department, County facilities that have 20% or greater tree planting potential (i.e. open space) should identify the portions of open space that are critical to facility function and identify other locations, preferably on site or on nearby user department managed sites, that can be used to plant trees. This could be enforced through the Administrative Order described in Action 1.2 and/or the update to the Sustainable Buildings Program described in Action 3.2.

Metrics: # of properties canopied or mitigation opportunities identified

1.4 Expand preserved lands

Miami-Dade County properties that qualify as environmentally endangered or as a Natural Forest Community (NFC) pursuant to the County qualification form, and that are not already protected within a similar conservation area should be managed by the Environmentally Endangered Lands (EEL) Program if on the acquisition list, or into a similar land conservation program if not on the EEL Acquisition List. An exception is made for those properties that are needed for critical infrastructure provided canopy loss is mitigated at a ratio of not less than 2:1 (mitigated: impacted). Environmentally sensitive properties owned by private and public entities that qualify shall be swapped for other County parcels wherever possible.

Metrics: Area transferred to EEL program for preservation; Quantity of canopy mitigated at a higher rate for critical infrastructure projects

1.5 Invest in restoration of critical habitats, especially in low canopy areas

Miami-Dade County's Division of Environmental Resource Management (DERM) implements monitoring, education, restoration, regulatory and land management programs to protect water quality, drinking water supply, air quality and natural resources that are vital to the health and well-being of all Miami-Dade County residents, businesses and visitors and the ecosystem. Many of these initiatives are accomplished through the acquisition, preservation, enhancement, restoration, and conservation of environmentally sensitive lands for the benefit of present and future generations. Many public facilities in underserved communities still contain neglected or overlooked remnants of natural habitats (e.g., pine rockland, scrub, tree islands, hardwood hammock) that are not included in Natural Forest Communities (NFC) inventory but should be inventoried and prioritized for maintenance instead of being lost to invasive vegetation.

Metrics: # of additions to Natural Forest Communities (NFC) inventory; # of natural habitat acres maintained, # of EEL acquisition list acres purchased; # of EEL acquisition lands eligible for purchase

1.6 Continue to increase investments for planting and establishing trees

An ambitious yet achievable target for increasing planting and improving tree maintenance and preservation would be to plant or give away a total of more than 250,000 trees by 2032 (commencing 2022), particularly where trees will be protected and maintained. This would be a more than doubling of the annual planting (prior to 2023) while also continuing prioritization of planting within lower income neighborhoods that currently have less than 20% tree canopy. It would also include significant expansion of planting in County parks and on the rights-of-way within unincorporated Miami-Dade County in priority areas, leveraging the 5-year $10 million grant received by the Parks, Recreation, and Open Spaces Department (PROS) from the USDA US Forest Service. The County will explore converting impervious to pervious surfaces and burying utility lines in a strategy that leads to additional tree canopy while realizing the limitations of local governments to regulate utilities in this way and mandates to provide level of service/safety considerations on impervious surfaces.

Metrics: # and sizes of trees planted, # of trees planted in low canopy census places, # of trees given away

1.7 Demonstrate innovative green infrastructure solutions

Green infrastructure, such as trees and vegetated swales, pervious and high albedo surfaces have great potential to mitigate urban heat, manage stormwater and improve aesthetics of public spaces. Inclusion of green infrastructure in coordination with trees will maximize their impact. Additionally, in cases where the inclusion of trees may conflict with the intended use of the right of way, other types of green infrastructure should be prioritized.

The goal of this action is to establish demonstrated designs, performance metrics, capital expenditures and maintenance costs to make it easier for green infrastructure options to be implemented in rights of way, parking lots and small green spaces.

The County will identify right of way, parking lot, and greenway projects where landscaping, pavements and substrate specifications can be used and the impacts on microclimate and stormwater filtration/retention are monitored. We will look to select demonstration sites in both lowland areas and upland sites (reducing impacts on lower floodplain areas) for managing high precipitation events and chronic extreme heat.

Metrics: # of projects underway and % completion; creation of a framework and guidance document for procuring and designing infrastructure in rights of way and parking lots

STRATEGY 2:

Expand and strengthen private, municipal and institutional partnerships to accelerate canopy metrics and public education and engagement.

Trees require terrain to grow on and while the County is a significant property owner, much of the County's property consists of roadways with limited opportunities for tree planting or is already forested or contains sensitive habitat. The strategies implemented on County land can serve as a leading example of urban canopy/forest care, living laboratories for inspiration and role models of urban planning. However, because the County owns only 12% of the property within the Urban Development Boundary, the vast majority of our urban canopy additions must be on stakeholder properties. Similarly, land use regulations create constraints on tree canopy and drive uneven distribution of tree density, leading to extremely low canopy in some areas, such as those zoned for industrial uses while other land types such as forests/natural areas contain 50% of the trees within any urban area nationwide.

2.1 Develop a Countywide engagement campaign

The County needs to continue building a coordinated outreach and engagement campaign that leverages the County's successful tree and plant giveaway and educational programs.

Messaging will highlight success stories of residents and businesses protecting mature trees and enhancing their properties with native trees and landscaping. A coordinated kit of messages will be provided to departments and municipalities along with institutional, community and HOA partners to communicate that this is an all "hands-on-deck" moment. Messaging will emphasize the importance of planting the right trees in the right places while providing easy-to-follow guidance for species and site selection, proper care and maintenance. To help improve public knowledge, trees in public spaces should be labeled, particularly on infrastructure that protect trees such as tree guards.

Metrics: % completion of the communications kit; # reached through multimedia; # of outreach events; # of resident interactions

2.2 Create a volunteer tree ambassador training program

The tree ambassador program will partner with community-based organizations in preparing engaged residents to educate neighbors about the benefits of trees, how to access County tree giveaways, identify priority locations for tree planting in their neighborhoods and provide maintenance and care to support long-term success of those trees. Establishment of this program will be prioritized in the 15 census places identified as under canopied and socioeconomically vulnerable. Create a citizen science campaign to document and record heritage and champion trees.

Metrics: Creation of program; # of tree ambassadors recruited and trained; # of people reached through multimedia and in person engagement activities; # of volunteers; # of heritage trees recorded

2.3 Build on priority institutional partnerships

Miami-Dade County Public Schools (MDCPS) is the second largest landholder in the County and has a high percentage of land that has tree planting potential. The County and MDCPS shall leverage an existing MOU and partnerships with educational nonprofits to implement tree canopy on these high potential properties and integrate learning about the benefits of trees and forests. Similarly, faith-based organizations collectively own the most land with tree planting potential in the low canopy areas. Recent pilots indicate how beneficial faith-based properties can be to achieving canopy goals. Both programs could be expanded with support from private philanthropy and nonprofit partnerships.

Metrics: # of school, faith-based and other community sites; # of trees planted

2.4 Reinvigorate the role of the Neat Streets Miami-Dade County (NSM) board

Housed within PROS, Neat Streets Miami was designed by the community advisory board to help achieve our canopy goals. The County cannot realize the goal of a 30% urban tree canopy without a shared commitment with our residents and businesses along with our municipal and institutional stakeholders. In 2011, the NSM board launched the Million Trees Miami-Dade County initiative with the goal of reaching a 30% tree canopy for our community. In 2016, the NSM board created the GREEN Miami-Dade County Matching Grant. In 2022, the board updated its mission and vision to reflect this broader focus on enhancing and preserving a robust canopy for all.

The board name could be changed to better align with the overall branding name for the urban forestry goal. In addition, members from key agencies, municipalities, organizations, and institutions can be strategically recruited to participate in meetings and asked to report on their own progress toward supporting the Countywide goals of this plan.

Metrics: # of municipalities/agencies/organizations represented, outreach support, name change

2.5 Improve exchange with and support to municipalities in advancing tree canopy goals

The County will explore ways to enhance capacity building and financial support to municipalities for tree canopy improvement. This will include the creation of an urban forestry coordinating council with municipal staff to share best practices, challenges, resources, tool and opportunities to strengthen our collective approach to incentivizing and protecting green infrastructure.

In 2016, the Neat Streets Miami-Dade County board created the Growing Roots for Environmentally Equitable Neighborhoods (GREEN) Miami-Dade County Matching Grant, formerly known as the Street Tree Matching Grant. Funded by Miami-Dade County's Tree Trust Fund, this annual grant engages municipalities, agencies, non-profits, foundations, and community groups in planting native or Florida-friendly trees on public land, including corridors, gateways, bus stops, libraries, schools, and parks. Through this program, managed by PROS staff, $3,062,802 have been awarded to 32 different entities, which were leveraged with an additional $2,991,839 in matching funds. As a result, more than 10,000 new trees have been planted. In 2023, the United States EPA's Heat Island Program recognized the GREEN Miami-Dade County Matching Grant program as an example of a creative way to increase tree canopy and highlighted the program on their Community Actions Database.

While the program has been an effective tool to leverage funds into much needed municipal spaces, there has been reduced fund availability, which requires that the funds be further prioritized to meet canopy goals.

Metrics: # of engagements; # of municipal staff attending; # of grant submittals; # and $ amounts of grants awarded/ $ leveraged

2.6 Increase community involvement in tree and forest care

More than 3,000 volunteers participate in tree and landscape plantings at Miami-Dade parks annually. These events, coordinated by PROS and the Neat Streets Miami-Dade County board, provide an opportunity to teach residents about the benefits of trees and best practices related to siting, species selection, and proper planting techniques.

More than 5,000 volunteers participate in DERM's habitat restoration and clean-up activities annually. Our Environmentally Endangered Lands and natural areas are under-resourced, so the conservation and restoration activities provided by volunteers are critical for

habitat, fire mitigation and supporting a healthy resilient tree canopy. If not properly maintained, these areas can offer unwanted safe harbor for invasive species and the accumulation of flammable debris that can lead to dangerous wildfires in the urban core. Managing forests by restoring them, removing invasives species, improving hydrologic conditions, and planting native trees on these properties also supports survival of the urban forests during wind events by expanding the stands of healthy trees and lowering the amount of invasive vines that bring down urban canopy.

The County will seek on-going partnerships with community organizations to support the restoration of parks, Environmentally Endangered Lands and other natural areas.

Metrics: # of volunteers engaged, # of educational engagements

2.7 Expand the footprint of high performing forests

Miami-Dade County forests outside Everglades National Park today only extend approximately 2% of their historic range. Despite low coverage, these habitats (pine rocklands, hammocks, scrub, etc.) provide outsized ecosystem services for the small areas they occupy, hence are considered "high performing." In this context, a high performing forest is defined as a habitat that absorbs and cleans stormwater at a far higher rate and is far cooler than surrounding areas and would be detrimental to the surrounding community if degraded or removed. One strategy for implementing success in high performing environmental areas is to expand the number and size of existing forests in parks, pocket parks, protected areas and other institutional lands. Miami-Dade County should adopt a strategy to expand local forests in their former range and into appropriate altered conditions for the purposes of carbon capture, habitat improvement for endangered species and numerous resilience co-benefits with the goal expanding from 2% to 3% by 2040. Such plans are strategized through a number of interagency and partner initiatives.

Metrics: # of new forests; area of new forest created

2.8 Improve the quality of tree canopy for increased resilience of power lines to hurricanes through partnerships with local governments and Florida Power and Light Company (FPL)

This proposed policy would engage FPL, Miami-Dade County, and any local government Public Works Departments in a coordinated effort to systematically remove prohibited tree species (as defined by County code) located in rights of way and corridors. The goal of this strategy is to target especially problematic exotic species such as Ficus benjamina that have repeatedly been shown to damage power lines during storms. Where possible, these trees should be replaced with more wind resilient species that are of an appropriate size at maturity for the location. In addition, the County should continue dialogue with FPL on measures to incentivize the undergrounding of utility lines, especially in areas in need of greater shade canopy.

Metrics: # of invasive trees removed; # of trees replaced

2.9 **Prioritize replacement of invasive, hazardous trees with native “right tree, right place" trees**

Identifying stakeholder properties dominated by prohibited or invasive species and underfunded for natural habitat or landscape management should be a priority for invasive eradication and reforestation with the landscape and environmentally sensitive native plant communities. Prohibited trees also occupy spaces where new trees could be planted creating new areas that naturally can accommodate trees. All trees replacing prohibited species must be planted with “right tree, right place” principles. This strategy must also comply with canopy replacement requirements of **CON-8I of the CDMP** (p IV-13-14).

Metrics: # of invasive trees removed and replaced

2.10 **Identify funding opportunities through grants, private partnerships, and individual donations**

The County will build on existing successful public-private partnerships leveraging public funding. Since 2016, PROS' Roadways & Community Forestry & Beautification division has secured an average of $481,000 per year (a total of $13,846,090) in corporate sponsorships and other private funding, leveraging public dollars (a total of $8,242,365) in support of their activities to plant trees and plants on County-owned properties, as well as to host tree and plant giveaways. These funding opportunities have developed largely through partnerships cultivated with national organizations such as Arbor Day Foundation, American Forests, One Tree Planted, and Keep America Beautiful. The County has also actively supported nonprofit and institutional partners in their fundraising and volunteer activities.

The County will continue to pursue additional private and public funding sources and partnerships, prioritizing grants and partnership opportunities that will advance our goals to engage and involve residents, businesses, and other stakeholders; invest in low canopy areas; and advance our capacity to design sustainable and resilient green infrastructure into capital improvement projects.

Metrics: Funding raised from non-County sources

STRATEGY 3:
Advance Planning, Policy, Regulatory, and Funding Opportunities for Urban Reforestation

This strategy emphasizes the need for proactive planning, policy, and regulatory measures to require and incentivize urban reforestation across the County, while establishing dedicated funding sources. Improvements to landscape codes and regulatory frameworks should be combined with private sector creativity and strategic land use to effectively expand and protect tree canopy coverage.

Successful implementation requires a communitywide effort involving residents, business leaders, and elected officials who recognize the economic, social, and environmental value of a robust and equitable urban forest system. The County will build on existing support for municipalities, the School Board, community organizations, and private property owners.

While some actions can be initiated through internal reorganization and grants, long-term funding, staffing, and capital are needed for sustained execution of this plan. The County's past reforestation efforts since the 1970s provide valuable policies and regulations that can serve as models for future statewide efforts. Since much of the land necessary for reaching a 30% tree canopy is privately owned, improving regulations will play a crucial role in increasing tree canopy coverage. The Urban Forestry Plan cannot be accomplished with current levels of staffing. Each team has reassigned staff and secured outside funding to the extent possible to meet this County priority.

3.1 **Identify and recommend regulatory updates to account for tree benefits and losses**

The County will explore and develop recommended updates to Chapter 24-49 Tree Protection Ordinance, Chapter 18 Landscape Code, landscape enforcement, land use amendment requirements, stormwater design standards and permitting and urban design center regulations so that they adequately account for tree benefits and losses and do not conflict with tree preservation requirements. These policy updates include:

- Adjusting size and species of qualifying trees, and updating mitigation/replacement tables.
- Eliminating a loophole that allows trees to be removed in Natural Forest Communities (NFCs) without any mitigation requirements.
- Fee schedule updates should be recalculated to not incentivize the removal of trees and to ensure that mitigation requirements enable full replacement starting with public lands. Later changes should include private NFCs as well.
- Mitigation for the destruction of globally imperiled habitat shall not facilitate a net reduction in this habitat.
- Regulatory approvals for all landscaping requirements that are moved offsite (e.g. incorporated into urban forest, an existing park or other open space and preserved in perpetuity) must also include landscaping improvements on nearby lands.
- Build greater incentives for tree preservation and relocation into requirements for large scale development projects.

Metrics: Policy and regulatory practice updates. Fees collected and trees planted for mitigation purposes. Engage with municipalities to further identify regulatory and policy opportunities.

3.2 Consider an update to the Implementing Order 8-8 of the Sustainable Buildings Program

Miami-Dade County's **Sustainable Buildings Program (SBP)** was created by the Sustainable Buildings Program Ordinance (07-65) on May 8, 2007. This ordinance, together with Implementing Order 8-8, established a County policy to incorporate, wherever practical, Green Building Practices into planning, budgeting, design, construction, operations, management, renovation, maintenance and decommissioning of Public Projects.

In order for the County to make progress on the 30% tree canopy goal, and showcase leadership in tree preservation, County-owned or leased properties and County-funded projects should be governed by a stronger policy than the existing Chapter 18 - Landscape and Chapter 24 - Tree Protection requirements. County-led projects should:

1. Avoid all impacts to Natural Forest Communities, pine rocklands, specimen-sized trees, endangered species and assemblages of tree resources greater than 100 square feet;
2. Offset unavoidable impacts to tree resources by planting trees on-site where tree resources can be co-located for maximum preservation; and
3. As a last resort, offset unavoidable impacts to tree resources by planting trees on an off-site, public or privately-owned property.

To avoid disruption to the development approval process and to reduce the time for tree permit approvals, Miami-Dade County should, with the assistance of specific departments and municipalities, identify recipient sites for tree planting and relocation to expedite the process, including creation of "up-front" mitigation.

Metrics: Update the Implementing Order 8-8 of the Sustainable Buildings Program to reflect these recommendations

3.3 Integrate Green Infrastructure as part of any capital improvement project

The County should explore a fee for its own capital improvement projects to adequately fund impact analysis, scoping for professional guidance on tree centric design, implementation of that design and/or mitigation. This fee will be used to fund technical staff and to provide financial assistance to projects that can enhance tree canopy in the built environment and County projects. Project developers may first engage an arborist/biologist/environmental planner to inventory and assess the condition and ecosystem services of the trees on the property. Secondly, a Landscape Architect or be part of the initial site planning and design team from the outset. The fee structuring should incentivize planning for tree canopy and green infrastructure as a first step rather than an afterthought and bridge the gap between expensive projects that are intensely developed and cannot accommodate trees, while providing resources to lower cost projects that can include (but perhaps not fund) larger amounts of canopy enhancements. This fee could also assist project developers in designing and implementing creative solutions to address tree planting conflicts and invest in infrastructure to improve tree health, achieve compliance with regulatory tree preservation requirements, and assure compliance with existing planning goals that are difficult to reach. This would involve updating existing impacts so funding is adequate to mitigate them and determining whether existing impact fees can be used for implementation of the Urban Forestry Plan.

Metrics: Updates to impact fees for County capital infrastructure projects; # of qualified green infrastructure projects assessed; # of green infrastructure projects planned; # of green infrastructure projects implemented

3.4 Continue to prioritize tree planting, maintenance and outreach in General Fund

Over the past two years, the County was able to dedicate $1.5 million to street tree planting and maintenance and an additional $2.5 million toward tree canopy preservation and enhancement initiatives. This funding came from a combination of general fund and American Recovery and Reinvestment Act funding. This funding allowed for critically needed street tree planting and maintenance, prioritized plantings in parks and other public lands in low canopy areas, support for municipal matching grant funds, launching partnerships with MDCPS and faith-based organizations, and tree inventory services. Over this time, the County has doubled the number of trees planted annually, caught up on deferred maintenance for trees in parks and inventoried over 53,000 trees. ther existing impact fees can be used for implementation of the Urban Forestry Plan.

Metrics: General funds dedicated for tree and forest preservation, maintenance, planting, growing and monitoring activities

3.5 Propose renewal of voter-approved funding for urban forests

Concerned about the continuing loss of forests and other natural areas, Miami-Dade County voters approved a temporary property tax collected between 1990 and 1992 to fund the acquisition, restoration, and maintenance of Environmentally Endangered Lands (EEL). While attaining massive return on investment by using these funds as matching funds to seek state and other grants, the EEL Program has purchased and/or is managing more than 28,000 acres of land since the program's inception. However, no referendum mandating new taxes has occurred since that time and after almost 35 years, the EEL trust funds are now functionally depleted. A new long-term funding source is needed such as a bond or a new referendum similar to the 1990 EEL referendum that includes green infrastructure footprints so long as those footprints serve habitat functions and are able to be preserved in perpetuity. Additional direction should be included to prioritize buffer lands adjacent to environmental areas that have the potential to threaten the environmental land if developed. Buffer lands are important opportunities for tree planting resulting in heat mitigation and recreational support and should be prioritized in the funding effort. Replenishing the management and acquisition funds of the EEL program is key to preserving the County's urban forests. This effort could partially be funded

through a bond program and maintenance of the purchased lands would likely need a voter referendum or short-term funding efforts until a long-term management fund mechanism can be established because funding through a bond issue only provides for acquisition, not maintenance after purchase. Statewide, County and local referendums to acquire and manage environmentally important land have had a high success rate in recent years and the once-in-a-generation call to action to protect the County's forests is needed again.

Metrics: Activities related to proposing a voter referendum and bond program; proposals for a voter referendum and bond program

STRATEGY 4:

Support growth of urban forestry jobs and business opportunities particularly arborist and landscaping businesses in the urban core and nursery businesses in South Dade

A key driver for the tree canopy call to action is the sheer number of co-benefits that trees and forests provide. As an enhancement to the urban landscape, few resources provide as many benefits as trees. Advancing tree/forest creation, management and maintenance requires economic and technical support for various enterprises including agricultural and landscaping entities that work with commercial and residential property owners to beautify space, developers to cut down invasive trees while preserving and planting beneficial ones, and local governments to plant and maintain trees and landscaping industry. This strategy seeks to highlight and identify resource/investment opportunities in the economy centered around urban forestry.

4.1 Promote education and training opportunities for professionals and property owners

Ensuring landscapers, tree trimmers, construction professionals and property owners have access to trainings on proper tree site and species selection, inspecting trees prior to planting, proper growing, maintenance and pruning methods can go a long way to improving tree survival and preservation rates. As such, the County will work with partners to promote accessible and affordable training and certification opportunities through University of Florida Institute UF/IFAS, Landscape Inspector Association of Florida (LIAF), the Florida Nursery Growers and Landscape Association (FNGLA), and ISA for arborists, tree trimmers, landscapers, and construction professionals involved in tree maintenance, planting and removal, similar to what is offered in nearby urban areas. Create a voluntary certification program or offering that would indicate that proper practices are being implemented in their work.

Metrics: # of training offerings promoted

4.2 Develop a wood recovery ecosystem

In order to provide the opportunity to salvage wood from trees that are not preserved or relocated on County-owned lands, a fifteen-day salvaging notice should be issued by the County to anyone wanting to salvage woody debris. The County shall maintain a list of entities interested in salvaging woody debris from natural areas on County lands, Miami-Dade County property maintenance, and private properties affected by Environmentally Endangered Lands covenants or Natural Forest Community covenants. This material may be made available for pick up and re-used in a program similar to, or as an extension of, the Christmas tree mulch program. Material that contains prohibited species shall be stored as mulch for a minimum of 180 days or sent for incineration. Woody material from the covenant holders should be picked up free of charge to the covenant holders.

Metrics: Quantity of woody debris reused

4.3 Work with growers to provide long term contracts

Many of the County's tropical and subtropical trees are grown in South Dade where a robust agricultural community developed into a thriving urban megalopolis. When possible, one way to support County contractors is to provide long growing periods that assure delivery of contracts and make available under-represented and/or slower growing but higher value tree species in the nursery trade.

Metrics: # of 2 year contracts; # of 1 year contracts; # of trees locally grown

4.4 Avoid plant families that cause risk to agricultural crops

Strong evidence suggests that the largest changes in tree canopy are less associated with hurricanes and development and more attributed to landscape level tree diseases, a number of which are active in laurel and citrus plant families that put our urban canopy and agricultural economy at risk. The County should work to ensure that no tree species are planted or given away which might be capable of spreading these diseases. The County should also be wary of the progression of beech (and oak) family diseases that are spreading nationwide.

Metrics: # of disease carrying citrus and laurel family trees installed or given away

4.5 Maximize services on County contracts to enhance local economy

Unprecedented investment from County, state and federal government sources has led to significant economic activity in this sector. This investment should be directed to local contractors to maximize economic activity for urban landscapers and local growers. Strategies must be put in place to ensure the private sector attains the maximum benefit and has a strong platform for advancing local business knowledge and expertise to ensure canopy goals are attained and sustained to continue supporting quality of life and economy.

Metrics: Compare local employment and income levels to national averages in the industry, monitoring changes over time.

4.6 Identify County lands that can serve as a tree bank and/or tree staging sites

Tree management requires capability to stage trees, store larger relocations and act quickly upon opportunities. County-owned land will be identified to serve as tree-staging areas, tree banks and nurseries to support the County tree-planting and relocation initiatives. The sites should be distributed across the County and be adjacent to transit routes that can accommodate moving large trees. To invest in the growth of our urban forestry economy, the tree banks should be managed by private contractors, and staffed with arborists qualified to relocate trees for preservation.

Metrics: # of north sites for trees, # central sites, and # of south sites

STRATEGY 5:
Integrate systems for tracking canopy, protecting trees and identifying current and future vulnerabilities

A holistic approach of accounting for tree and forest resources Countywide requires integrating asset management with information provided through regulatory and contractual services. This dataset will not only allow us to keep track of our goals for tree canopy but also account for forest quality. An integrated approach will better position the County to recover from natural disasters, decimating diseases/pests and stressors from climate change. The County will also consider how best to record the many co-benefits associated with expanding our tree canopy including for human health, reduced energy burden, improved air and water quality, and carbon sequestration.

5.1 Complete and maintain a tree inventory

Critical to proactively preserving trees is having an inventory of tree species, diversity, needs, context, benefits/conflicts and disposition. The inventory will help the County develop "tree plans" for such purposes as maintenance requirements, diversity management, prioritization and identification of planting/replacement opportunities and learning from failures to help establish best practices. The inventory must be capable of reacting to losses after a storm and provide a tool for tracking all new trees planted by all departments every year. This strategy can be accomplished by continuing to inventory trees on County property and incorporating existing and new tree disposition in areas where the County retains regulatory authority as development plans are submitted.

Metrics: # of trees inventoried/year

5.2 Develop an in-house high-resolution urban tree canopy assessment

The County assessment should be updated with every LIDAR flight (which is currently flown approximately every 5 years). County benchmarks for vegetation signature will be correlated to land use, ZIP code, census place, census block, municipality and commission district. To

support this work, the County should update the 2008 urban forestry tree plots and integrate this information into the tree canopy model and refine Geo AI processing of tree polygons along with updating the aerial signature of the assessment every five years or whenever full aerial data is collected by the County. The first in-house assessment since 2008 and the 1990s should include tree species spread and planning tools relevant to the County's decision making while also providing a robust "like for like" framework so that increases or decreases in tree canopy can be measured and explained in a repeatable way. Updates will be provided in a report and included in a web viewer. This will also serve to inform the County's efforts to develop a reliable methodology for measuring CO2 sequestration from trees and vegetation.

Metrics: Annual updates on status including how it has been improved, provide a benchmark assessment by processing 2020 LiDAR data by end of 2025

5.3 Update canopy vulnerability analysis taking climate projections into account

Canopy vulnerability analysis is to be completed by the County in partnership with Florida universities. Findings will be publicly available and inform updates to the Tree Species Selection Guide to assist in selecting suitable tree species for health and climate outcomes. This will include looking at current and projected increases in temperature along with changes in precipitation and storm patterns, and in sea and groundwater levels.

Each changing condition requires unique analyses. For example, changes in temperature and humidity will cause some currently native tree species to no longer be as successful in our climate while some Caribbean species will become more suitable.

Current and projected water and soil conditions increasingly threaten the longevity of tree species not adapted to wetter and potentially saltier environments caused by climate change. Ensuring that trees' relationship to water promotes rather than hinders maturity is critical to the success and health of the urban forest. Sea level rise is associated with groundwater rise, saturating soils with water and depriving trees of oxygen typically absorbed through soil air pockets. A high groundwater table may injure trees in this way without any visible surface flooding leading to tree death and falling.

The County will develop tree planting guidelines for public and private landowners that consider present and projected groundwater and stormwater flooding risks including recommended actions for maintenance both long-term and following inundation events.

In the case of sea level rise and storm surge, salt can accumulate in the soil and kill tree species with low salt tolerance. This is especially evident along the coasts particularly in neighborhoods that experience intrusion of king tides. The high quantity of ornamental, non-native species as well as non-flood adapted native species in high-risk areas poses a systemic threat of forest collapse following severe weather events and prolonged stresses from rising waters. The County will develop tree planting guidelines for coastal neighborhoods and king tide areas including recommended actions for maintenance both long-term and following tidal inundation events.

Protocols will be developed for site analysis within different geographic areas within the County to account for the diversity of landscapes, as there is no one-size fits all measure.

Metrics: Updates on status of analysis and, once completed, updates to Tree Species Selection Guide and tree planting and maintenance guides, sharing findings with key internal and external stakeholders, and evidence of findings informing development and landscape plans.

5.4 Provide support to County departments through comprehensive planning

There is room to do better by providing a concurrent technical review from RER and/or PROS to fill in gaps and empower other departments to meet their specific needs while also advancing our County's tree canopy goals. RER and PROS consulting services may include a review of design options that maximize tree canopy and quality in construction projects and encourages the use of green infrastructure for stormwater management and heat mitigation on institutional lands.

Metrics: # of projects with tree review and support, # of institutional lands plantings

5.5 Analyze areas for natural forest restoration within low canopy areas

Create EEL applications and evaluations for pine rockland business plan proposed footprints and degraded habitats within the 15 priority census places. A planning effort should be made in the first year to recommend degraded habitats within priority areas for land conservation and funding for their purchases so that the few remaining patches of green space in low canopy neighborhoods are not solely being acquired for commercial/residential purposes and their conservation is at least an option.

Metrics: # of EEL evaluations and applications within low canopy areas

5.6 Target hurricane vulnerabilities in tracking and identify private/public strategies for a more storm adapted tree canopy

The County will measure tree groupings where possible due to their ability to survive storms better than standalone trees. In addition, the County will assess and strategize around non-native vines (particularly aroids) that can trigger canopy collapse and tree failure. The County will also identify space for tree groupings and incorporate hurricane resistance in tree tracking and future plantings.

Metrics: annual report on vine removal activities, identified opportunities for tree clumps and storm-resistant oriented plantings

The County's Office of Environmental Risk and Resilience (OERR), with input and review from RER-DERM and PROS, will be responsible for reporting on progress twice a year to the Mayor and annually to the BCC. DERM will be responsible for monitoring the progress on our tree canopy goal and reporting on the health of our urban forests. Once this plan is finalized, a work implementation table will identify lead departments and supporting entities while also providing a timeline for major milestones and completion as appropriate. A progress report shall include four sections A) Direct Tree Canopy Actions; B) Action Towards Future Canopy; C) Education and Outreach; and D) Policy, County Spotlights and Partnerships. All the metrics listed in the strategy section will be organized into the annual report with the following milestones:

A. Direct Canopy Actions

- # of trees planted and details associated with tree priorities including:
  - # of trees planted Countywide by the County: Trees on or immediately adjacent to streets; Trees planted on public land (non-streets); Trees planted in priority areas
  - Trees planted with partners on public land
- # of trees given away and one year survival if applicable
- Square footage of canopy removed via tree permitting on County properties
- Number of trees planted via regulatory mechanisms on County properties
- # of plants and seed planted within habitats and/or environmentally sensitive lands
- # of plants planted on other County lands
- Habitat management metrics

Maintenance metrics: # of trainings, # of trees pruned, # updates to tree inventory, # of trees weed whacked or effectively destroyed, # of replacements identified due to maintenance/tree selection failures

B. Actions Toward Future Canopy

- # of trees inventoried
- # of acres added to the Environmentally Endangered Lands acquisition list in and outside priority areas
- # of sites and acreage retained in Natural Forest Communities
- # of new Endangered Lands Covenants
- # of acres of County land acquired for trees/habitat
  - Total acreage
  - Acreage within priority census places

- # of acres of landscape area on public or priority land set aside for trees through policy or planning mechanisms

C. Education and Outreach

- Total # of volunteers engaged
  - # of volunteers engaged in habitats
  - # of volunteers engaged in tree activities
- # of educational interactions regarding trees or environmental lands
- # of public "tree" events and number of attendees

D. Policy, County Spotlights and Partnerships

- Project spotlights from different departments
- Policy and procedures updates
- Citizen/expert recommendations on County policy and projects (board reports)
- Partner summary and reports as available
- Status report on canopy projections as generated
- Case studies from departments highlighting accomplishments

In 2032, and every 5 years thereafter once the updated urban tree canopy assessment is completed, we will reassess the progress, challenges and opportunities for achieving the goals set forth in this plan and make updates to the plan accordingly.

WHAT ABOUT MANGROVES?

While the management of mangroves is largely considered outside the purview of this plan, mangroves are a significant component of the County's forest system and therefore worthy of note. The latest DERM assessment documented more than 100,000 acres of mangrove wetlands within the County, located primarily from Coral Gables southward with the largest mangrove forests within Biscayne and Everglades National Parks. Significant mangrove forests also remain in the northern portions of the County, most notably in and around the Oleta River State Recreation Area.

Mangroves stabilize bottom sediments and protect shorelines from erosion and storm surge and can potentially reduce damage to developed upland areas from hurricanes. Mangrove trees provide nesting and roosting habitat for many resident and migrating birds in addition to providing habitat to many species of marine life. Mangrove leaves are also a large component of the near shore food web, and mangroves are also important because they sequester carbon, recently estimated at storing 150 tons of carbon per acre.

Development pressures on mangrove wetlands have reduced their size over the past 60 years. With this loss of mangrove wetlands, a subsequent decline has been observed in the animal and plant life supported by these ecosystems – including a number of commercial fish species. In order to better protect this vital ecosystem from development, Miami-Dade has designated most remaining mangroves as Mangrove Protection Areas pursuant to the County's Comprehensive Development Master Plan. With rising sea levels, additional mangrove wetlands will be lost in areas where development prevents their natural migration landward. In these areas, sea level rise will result in water depths that are too great for mangroves at present wetland elevations. An important resilience strategy in undeveloped areas of south Miami-Dade is to increase protection of remaining undeveloped areas landward of these mangrove forests so that they can naturally migrate inland as sea levels increase.

- Miami-Dade County shall prioritize the acquisition of mangrove forests that remain in private ownership through its Environmentally Endangered Lands (EEL) Program and DERM shall continue to coordinate and implement conservation, enhancement and restoration of mangrove forests through EEL and in conjunction with DERM's longstanding Restoration and Enhancement Section's coastal habitat restoration program.

- Miami-Dade County shall continue to partner with the state and federal governments in the planning and implementation of the Comprehensive Everglades Restoration Plan and the Back Bay Study to protect, restore and enhance mangrove forests. DERM will lead interagency efforts for the County to implement innovative technologies to enhance mangrove forests and mitigate mangrove die-offs triggered by climate stressors.

- Miami-Dade County shall explore partnerships with other levels of government to implement and accelerate mangrove restoration projects outside of current state and federal efforts in order to advance regional restoration efforts.

GLOSSARY

Working definitions to better understand the content of this document

Affected tree – Any tree which shall be, or already has been, removed, relocated, or effectively destroyed, thereby requiring a permit.

Aquifer - An underground layer of water-bearing rock or materials (such as gravel, sand, silt, or clay) from which groundwater can be extracted using wells. In Miami-Dade County the Biscayne Aquifer is a crucial source of fresh water for drinking, irrigation, and industrial use. The other aquifer in the County is the Floridan Aquifer.

Arborist - An arborist, by definition, is an individual trained in the art and science of planting, caring for, and maintaining individual trees. Arborists are knowledgeable about the needs of trees and are trained and equipped to provide proper care.

Canopy coverage - The areal extent of ground within the drip line of a tree.

Carbon Capture or Carbon Sequestration - The process of capturing and storing atmospheric carbon dioxide. This is a key strategy for reducing greenhouse gases in the atmosphere to mitigate climate change.

Certified Arborist - Certified Arborists are individuals who have achieved a level of knowledge in the art and science of tree care through experience and by passing a comprehensive examination developed by some of the nation's leading experts on tree care. Certification is generally obtained through the International Society for Arboriculture.

Coastal band community - A mangrove community that borders Biscayne Bay or one (1) of the tributaries of Biscayne Bay and that receives frequent tidal inundation and whose dominant floral constituent is mature Rhizophora mangle. The boundary of a coastal band community shall not be limited or affected by artificial boundaries such as, but not limited to, property lines.

Comprehensive Development Master Plan (CDMP) - The Comprehensive Development Master Plan (CDMP) expresses Miami-Dade County's general objectives and policies addressing where and how it intends development or conservation of land and natural resources will occur during the next 10-20 years, and the delivery of County services to accomplish the Plan's objectives. The CDMP establishes the broad parameters for government to do detailed land use planning and zoning activities, functional planning and programming of infrastructure and services. As such, it is a framework for use by other programs to be developed to support its long-range planning goals.

Drainage area - A geographically defined land surface having topographical features such that stormwater runoff will be directed toward a drainage structure or natural waterway.

Diameter at Breast Height (DBH) - is a standard method of measuring the diameter of a tree trunk. It is taken at a height of approximately 4.5 feet above the ground.

Endemic species - Species that are native to a specific geographic area and found nowhere else. Protecting endemic species is crucial for biodiversity conservation in Miami-Dade County and worldwide.

Environmentally-sensitive tree resources - A specimen tree, Natural Forest Community, or any other tree or trees that substantially contribute(s) to the aesthetics of an area.

Environment -The complex ecological or climatic systems or conditions that act upon an organism or community and ultimately determine its form and survival.

Evapotranspiration - The sum of evaporation from land and water surfaces and transpiration from plants. It is a critical component of the water cycle and helps to regulate climate and maintain soil moisture.

Flooding - The accumulation of stormwater on the ground surface that occurs as a result of excessive rainfall precipitation that has saturated the soil and filled canals, lakes, ditches and drainage structures beyond their storage and transmission capacities.

Forest management plan - A document specifying techniques to be implemented for the maintenance and preservation of an individual Natural Forest Community.

Green infrastructure - Natural systems including plants, habitats, forests, floodplains, wetlands, coral reefs, and soils that provide infrastructure-type benefits for human well-being and safety, such as flood protection, shade, and air and water pollution abatement. Trees and urban forests are a primary component of green infrastructure.

Heat Vulnerability Assessment - A study that identifies areas and populations most at risk from extreme heat. The assessment helps prioritize areas for tree canopy expansion to mitigate heat impacts.

Impervious area - A division of the horizontal ground surface incapable of being penetrated by rainwater, including, but not be limited to, all structures, roof extensions, slabs, patios, porches, driveways, sidewalks, parking areas, swimming pools, athletic courts, and decks.

LIDAR - Light Detection and Ranging, a remote sensing method that uses laser light to measure distances and create high-resolution maps. Used in urban planning and forestry to accurately map tree canopy, terrain, and other features.

Mangrove tree - Mangroves are tropical or subtropical trees that live in intertidal coastal zones. There are three species of mangroves in Florida: Avicennia germinans (black mangrove), Rhizophora mangle (red mangrove), Laguncularia racemosa (white mangrove).

Native plant species - A plant species with a geographic distribution indigenous to all or part of Miami-Dade County. Plants described as being native to Miami-Dade County in botanical manuals are native plant species within the meaning of this definition. Plant species introduced into Miami-Dade County by man are not native plant species.

Natural Forest Communities - All stands of trees (including their associated understory) designated as Natural Forest Communities on the Miami-Dade County Natural Forest Community Maps and approved by the Board of County Commissioners. These maps may be revised periodically by resolution to reflect current conditions and to ensure that, at a minimum, the canopy and understory of designated Natural Forest Communities are dominated by native plant species.

GLOSSARY

Preservation area - A site protected from any tree or understory removal (except as required for maintenance of the preserve) and maintained without any development.

Rare, threatened and endangered species - Includes all species classified as endangered, threatened or rare as listed in the conservation element of the CDMP.

Relocated tree - A transplanted tree that continues to be viable at least one (1) year after relocation.

Replacement tree - A shade tree, small tree, or palm tree required to be planted.

Shrub - A self-supporting woody perennial plant of low to medium height characterized by multiple stems and branches continuous from the base.

Soil Erosion - The removal of the top layer of soil due to wind, water, or other natural forces. Trees help prevent soil erosion by stabilizing the ground with their root systems.

Specimen tree - A tree with an individual trunk which has a DBH of eighteen (18) inches or greater, provided, however, that the following trees are not specimen trees: non-native fruit trees that are cultivated or grown for the specific purpose of producing edible fruit, including, but not limited to, mangos, avocados, or species of citrus; non-native species of the genus Ficus; all multi-trunk trees in the palm family, except Acoelorrhaphe wrightii and Phoenix reclinata, which have a minimum overall height of fifteen (15) feet.

Stormwater - The water that results from rainfall.

Thrive305 Plan - A community-driven plan focused on improving quality of life in Miami-Dade County through various initiatives, including environmental sustainability. The plan supports the goal of increasing tree canopy.

Tree canopy - The layer of leaves, branches, and stems of trees that cover the ground when viewed from above. The canopy plays a crucial role in providing shade, reducing heat, and supporting wildlife.

Tree island - A vegetative community located within freshwater wetlands whose dominant vegetative components consist of native hardwood trees and shrubs.

Tree survey - A drawing overlaid directly on a site plan sufficient to provide the following information: the location, plotted by accurate techniques, in relation to all development, of all existing trees with disposition: destroyed, relocated or preserved; the common and scientific name of each tree; the Diameter at Breast Height (DBH) of each tree, or if a multiple trunk tree, the sum DBH for all trunks; and an estimate of the height of the canopy.

Tree well - A soil retaining structure designed to maintain the existing natural ground elevation beneath a tree to preserve the tree when the surrounding area is filled to raise the ground elevation. Tree wells shall have a minimum radius of three (3) feet from the trunk of the tree and a maximum radius of ten (10) feet from the trunk of the tree.

Tree - a woody or fibrous perennial plant with a trunk having a minimum DBH of three (3) inches or with an overall height of twelve (12) or more feet. Tree shall not include any mangrove tree.

Understory - The complex of woody, fibrous, herbaceous, and graminoid plant species that are typically associated with a Natural Forest Community.

Urban Development Boundary (UDB) - A line delineated by local governments to separate areas designated for urban growth from those to be preserved for agriculture, open space, or natural resources. The line is established by the Miami-Dade County Board of County Commissioners delineating the approved urban development boundary for Miami-Dade County, as amended by ordinance from time to time. The goal is to achieve 30% tree canopy within the UDB.

Urban forest - Together, all the trees in Miami-Dade County form its urban forest. The urban forest provides a greater range of benefits that any one tree alone. According to Cities4Forests, “an urban forest encompasses the trees and shrubs in an urban area, including trees in yards, along streets and utility corridors, in protected areas including forests and forest fragments, and in watersheds. This includes individual trees, street trees, green spaces with trees and associated vegetation and the soil beneath the trees.”

Urban heat island - An urban area that is significantly warmer than surroundings due to human activities, the prevalence of impervious surfaces and the absence of a tree canopy. Trees and green spaces help mitigate the urban heat island effect by providing shade and cooling through evapotranspiration.

Urban reforestation - Planting and maintaining trees in urban areas to increase green spaces and canopy cover. Reforestation aims to enhance environmental quality, reduce urban heat islands, and improve community well-being. Urban reforestation should incorporate appropriate native plant communities and establish reforestation goals consistent with an ecological reference as its goal.

Utility corridors - Designated pathways for the installation and maintenance of utilities like water, electricity, and communication lines. Utility corridors have high potential for tree planting but require careful planning to avoid conflicts with infrastructure.

Vulnerabilities - Weaknesses or susceptibilities to harm. In urban forestry, vulnerabilities refer to risks and potential damages that can affect tree health and canopy cover, such as diseases and environmental stressors like wind and heat.

DEDICATION AND ACKNOWLEDGMENTS

The late **Sean McCrackine** had a wealth of knowledge, experience and commitment to preserving and enhancing our urban forests. This plan and, more importantly, its implementation are dedicated to Sean.

This Urban Forestry Plan could not have been achieved without the contributions of Sean and many others, including the following members of our Urban Forestry Plan Working Group:

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