



**New York City Council
Committee on Parks & Recreation Oversight Hearing
Ensuring the Short and Long Term Preservation of the City's Natural Forest**

October 25, 2018

Testimony By: Jennifer Greenfeld, NYC Parks, Assistant Commissioner for Forestry, Horticulture & NRG; Sarah Charlop-Powers, Natural Areas Conservancy, Executive Director

AC Greenfeld:

Good morning, Chair Grodenchik, and members of the Parks & Recreation Committee. I am Jennifer Greenfeld, the Assistant Commissioner of Forestry, Horticulture, & Natural Resources at the New York City Department of Parks & Recreation. Thank you for inviting me to testify today regarding the Parks Department's natural forests.

At NYC Parks, our mission is to offer resilient and sustainable parks, public spaces and recreational amenities, for present and future generations. NYC Parks is the steward of approximately 30,000 acres of land, 14 percent of New York City, including more than 5,000 individual properties, ranging in size and variety, from Coney Island Beach and Central Park, to Pelham Bay Park and Alley Pond Park, to community gardens and neighborhood pocket parks.

The Forestry, Horticulture and Natural Resources division builds on the Parks mission by pledging to protect, restore, expand, and manage New York City's green spaces and natural areas, to maximize their benefits for environmental and community health and resilience. When I tell people that my job is caring for and protecting nature in New York City, one of the first responses I get is a question, "Nature in New York City? You mean Central Park?" So I have to remind them that there are many more opportunities to enjoy nature right here in New York City than some would realize.

Roughly 10,000 acres, one-third of our parkland portfolio, consists of natural areas spread over 50 parks, including 2,000 acres of salt marshes and fresh-water wetlands, 1,444 acres of grassland, 60 miles of streams, and over 6 million trees. Of these trees, over 650,000 grow along the street, and 150,000 grow in the actively used areas of parks, but the vast remainder are located in our 7,300 acres of natural area forests. In fact, forested natural areas alone cover one quarter of city parkland.

While they may not be as well-known or as crowded as properties such as Central Park, natural areas still play a vital role in providing recreation and wellness opportunities within our city. According to a study in 2014 by our partners at the Natural Areas Conservancy and the US Forest Service that examined how people felt about and used natural areas in New York City Parks, 50% of people interviewed said that the only natural space they visit is in city parks. This tells us that people notice and care for these spaces. They seek refuge, walk their dogs, look for birds, get exercise, or just wander in the woods to find a quiet corner. We also learned that while 53% of people surveyed visiting a natural area are local, living nearby that park, 47% travel a distance of over 1 mile to experience the unique attributes of each site.



These forests offer exceptional recreational and educational opportunities, filter the air our children breathe, provide shade and temperature regulation, help protect homes from storm surges, and offer respite from the noise and pace of New York City for all our residents and visitors. As climate change impacts our region and as the City's population grows, the benefits nature provides to our residents and visitors become even more important.

We also need to acknowledge the critical role our forests and wetlands play in the regional ecosystem. Because of the city's location at the confluence of salt- and freshwater bodies, spanning both New England's rocky coast and the mid-Atlantic's coastal plain, our natural areas are home to over 400 species of wildlife, including black crowned night heron, chipmunks, salamanders, baby terrapin turtles, and the newly discovered leopard frog. Over a quarter of these species have a state, federal, or global designation as rare, threatened, or endangered, and of the 1,420 species of native plants found in our natural areas, including globe flatsedge and Golden Aster, one-fifth are similarly protected.

I have the privilege of overseeing the division at NYC Parks that carefully plans for these resources, selects appropriate species, and manages over \$381 million worth of expense and capital contracts. We play a vital role as technical experts to review plans to ensure that new projects don't further fragment our remaining natural areas, so we can maintain their ecological integrity and benefits for future generations. We manage two nurseries, one of which is internationally known for its plant conservation work, collecting seeds to grow native plants for restoration projects throughout the city. Through the Urban Field Station, we partner with the U.S. Forest Service to attract researchers from around the country to study New York City's nature, improving the quality and impact of our work.

Forests play a vital role in connecting New Yorkers of all ages to the natural world, and we are working to connect New Yorkers to their city by marking and mapping nature trails and leading volunteer stewardship activities throughout the year. Our Stewardship Team held 140 volunteer events in natural areas last fiscal year, engaging 3,542 New Yorkers. While helping us to maintain these valuable resources, these events also provide a chance for local residents to actively engage in the care of their city, and to have fun and get a workout while doing it! In addition, NYC Parks' Public Programs Division houses the much-beloved Rangers, who provide New Yorkers of all ages with educational tours and recreational experiences in our natural areas, ranging from bird walks to canoe trips to night hikes. This programming provides a fantastic way for the public to connect or reconnect with the great outdoors, right here in New York City.

For over 30 years, Parks has actively managed our forests and wetlands. The Natural Resources Group is one of the oldest municipal conservation organization in the country, founded in 1984. We built a national reputation with our salt marsh restoration in the 1990's in response to the Exxon Oil Spill in the Arthur Kill. Also in the 1990's we contributed to the nascent field of urban natural forest restoration through our work with early private investment in urban forests. Through PlaNYC and MillionTreesNYC, the city made a major commitment to forest restoration, which allowed us to contribute our knowledge and expertise and make a significant impact citywide, and the de Blasio administration has continued this commitment, through the Cool Neighborhoods program, reflecting a two-year investment of \$7.3 million dollars.



Our knowledgeable and tireless staff spend every day in all conditions--rain, snow, wind, and heat--removing invasive species, planting native species in forest gaps, and monitoring for new infestations, signs of dumping, fires and other negative uses. They know these forests well and think carefully about matching the appropriate interventions, whether physical, chemical or biological, to the specific situation and properly manage our finite resources. For larger restoration projects in our natural areas, we use capitally funded contractors, after which our staff implements long term management strategies, to make sure that the area doesn't revert to its damaged past.

To demonstrate our approach in a little more detail, let me explain how we are managing one relatively new invasive species: the mile-a-minute vine. Mile-a-minute was first discovered in New York City in 2010 in Pelham Bay Park, appearing after we removed a different primary invasive plant. It is an annual herbaceous vine that climbs vegetation to reach the sun, produces prolific and persistent seeds, and is known to grow in excess of six inches per day. This invasive species is extremely damaging to newly restored forest, as it loves the open, sunny spaces and takes advantage of the gaps in tree canopy to quickly overcome young seedlings and new shrubs.

Since that initial discovery in 2010, we have actively managed this species across over 200 acres of forest, utilizing over \$100,000 dollars in grant funding to specifically target mile-a-minute and release the mile-a-minute weevil, a biological control for the mile-a-minute vine.

Our team now closely monitors edges and newly restored open areas for the emergence of this species and has been successful in combatting its presence in newly restored areas.

So, what have we accomplished to date in natural forests?

- We've planted 686,000 native trees and shrubs since 2007
- We've held 562 volunteer events and engaged nearly 17,000 volunteers since 2014
- We've restored 520 acres since 1991
- We've made 30 miles of trails more accessible by formalizing them

This tremendous volume of work has led to a point in time at which we want to reflect and carefully assess our management strategy for natural areas. The successful management of natural forests, starts with gaining a full understanding of what we seek to manage. As you'll hear more about shortly, our colleagues at the Natural Areas Conservancy have helped fill in a major knowledge gap. With two years of field work, they compiled an unprecedented amount of information, not arcane data, but useful information which profiles our city's forests-- quantifying their health and the threats they face. We at NYC Parks have already started shifting our approach and prioritizing work based on this information and the resulting Forest Management Framework, which has provided our agency with an invaluable roadmap to guide our strategic decisions and better marshal our resources.

I would now like to introduce my colleague, Sarah Charlop-Powers, the Executive Director of our non-profit partner, the Natural Areas Conservancy, to provide more detail about these important joint efforts.



Ms. Charlop-Powers:

Good afternoon, my name is Sarah Charlop-Powers and I am the Executive Director of the Natural Areas Conservancy. Thank you, Chair Grodenchik and members of the Parks Committee, for giving us the opportunity to testify about this important topic. As Assistant Commissioner Greenfeld mentioned, the Natural Areas Conservancy is a nonprofit organization that was formed in 2012 with the goal of increasing the capacity of NYC Parks and its partners to restore and manage the 10,000 acres of forests, grasslands and wetlands under the agency's jurisdiction. Following in the footsteps of other successful park conservancies including the Central Park Conservancy and the Prospect Park Alliance, the Natural Areas Conservancy does NOT exist to replicate or replace the work of NYC Parks, rather we raise private funds, hire expert staff and work to complement and amplify the work of NYC Parks.

We commend the efforts of the Agency and the hardworking team of professionals in the Division of Forestry, Horticulture and Natural Resources to manage this large and complex resource. However, realizing the full potential of our city's natural forests for public recreation and environmental benefits will require marshaling the appropriate additional resources. To address this, we worked in partnership with NYC Parks colleagues to develop and release the "Forest Management Framework for New York City" in Spring 2018. This plan includes a comprehensive look at the condition of our city's natural forests and outlines the investment needed to manage them over the next 25 years, and we hope the Parks Committee and NYC Council will support this plan and help ensure its success.

Increased investment in our natural forests will allow us to address the following:

- 1) Our Natural forests – comprising ¼ of NYC's parkland – require comprehensive strategic management and the appropriate resources for NYC Parks and its partners.
- 2) Developing a citywide trail system will allow people - many in low and moderate income neighborhoods—new forms of recreation and opportunities for physical wellbeing. Improved opportunities for the enjoyment of nature contribute to mental and emotional wellbeing.
- 3) In the next 25 years, we will be living in a hotter and drier city with higher sea levels. NYC's forests are critical to mitigating the effects of climate change: extreme heat, capturing stormwater to reduce flooding and absorbing greenhouse gases. They should be considered an important part of the city's climate solution.
- 4) NYC's natural forests are at a tipping point - they need sustained strategic investment or will decline in quality. This will ensure that we do not find our forests in a crisis that creates a costly, generational backlog of work. Our forests are at risk of losing biodiversity that, once lost, can never be regained.

The participation by many groups in this hearing and increasing number of volunteers and users of natural areas indicate a growing and vocal constituency for this vital New York City resource.

In order for our plan to be successful, we first needed in-depth information about our city's natural resources. As a first step, we hired a team of expert researchers and conducted a comprehensive ecological assessment of all 10,000 acres of natural areas. This created a baseline of information about the condition of nature in NYC Parks. We also partnered with the US Forest Service, who conducted a



companion social assessment to understand how our city's natural areas are perceived and used. This extensive research is the basis for the Forest Management Framework and the other data-driven tools we've created.

Following the successful Million Trees campaign, the NAC identified the need to plan what came next and address a much larger area of New York City forests. We conducted an in-depth study of the condition of forests and wetlands.

Our findings were surprising:

- NYC's forests are diverse and dominated by native trees. Our mature forests are similar to the Catskills – dominated by old, native trees.
- The next generation is less healthy - in contrast to canopy trees, the understory is only 45% native. Our young forests are threatened by fast growing invasive species, dumping and unauthorized trails.
- Most of the trees in our natural areas were NOT planted. They are naturally occurring, growing from seeds. That is the sign of a healthy forest – and a less expensive alternative to planting trees.

Our research also found that natural forests are an important resource for New Yorkers. Spending time in nature provides significant cognitive and emotional benefits. Our city's natural areas offer an opportunity for New Yorkers to have a "wilderness experience" that includes access to beauty, inspiration and quiet that is unique from other experiences in our parks. However, interviews with more than 1,600 park users showed that people are more likely to recreate in natural areas that are maintained. This includes well marked trails, regular patrolling by rangers and enforcement officers, clear signage and healthy forests.

In addition to being an important resource for New York City residents for recreation, our natural forests are increasingly important in the face of climate change. Across the US, extreme heat kills more people each year than hurricanes, flooding and storms combined. Natural forests reduce local temperatures and also absorb carbon, providing a double benefit as a local climate solution.

The Framework includes a citywide model that maps the condition of forests in more than 50 parks. It allows us to understand the full range of conditions that exist across NYC and to estimate the investment needed in order to restore and manage all 7,300 acres over the long term.

The NAC led the development and promotion of the Framework, and NYC Parks has adopted the recommendations and uses the Framework to prioritize and track their work. The Framework calls for significant investment over a long-term period, an estimated \$385 million over 25 years, but we believe these costs are relatively modest, considering the critical impact this investment will make. We need to invest now in order to ensure that we do not find our forests in a crisis where deferred investment creates a generational backlog of work. New York City's forests are at risk of losing diversity that, once lost, can never be regained.



The Framework is both a financial planning tool and a new approach to prioritizing where and how to work. NYC Parks is using the Framework to prioritize where it works, to evaluate the effectiveness of its restoration efforts, to inform what species to plant. The NAC is working to continue research, expand public access, and create alignment between the work of nonprofit partners, park conservancies and NYC Parks. All with the goal of restoring and protecting nature through sound science.

We are striving to ensure that every New Yorker has access not just to a park, but a place where they can connect with wild nature. New York City's population is on the rise, leading to crowding in flagship parks such as Central Park. Congestion in parks can be relieved by the restoration and improvement of the city's natural forests, which occupy one quarter of the city's parkland. Developing a high quality, comprehensive trail system will open up quality, safe, recreational spaces citywide. We are working with NYC Parks, the Student Conservation Association, and other partners to improve trails, distribute trail maps, and make natural areas more easily accessible.

Pursuing the goal of effective and uniform forest management citywide, the NAC provides support to nonprofit conservancy partners, including helping them prioritize their natural resource projects and allow them to align their efforts with that of NYC Parks. In 2018, the NAC provided pro bono consulting to the Prospect Park Alliance and the Forest Park Trust to develop 5-year management goals for each park and to create a list of priority restoration projects and cost estimates. These organizations are using the NAC's recommendations to prioritize where to deploy existing resources and to fundraise for new investment in their forests. We seek support to expand this approach to more than a dozen additional partners such as Friends of Van Cortlandt Park, Alliance for Flushing Meadows Corona Park, Greenbelt Conservancy, and many other groups that are uniquely positioned to expand forest management efforts citywide.

Protecting and promoting NYC's nature cannot be done alone. NYC Parks, despite its size and reach, can't do it. The NAC can't do it alone, nor can our partner conservancies, or local groups. New York City Nature Goals 2050 was an initiative started by the NAC to develop shared goals and targets for NYC's myriad environmental groups, both large and small, and increase our coordination and advocacy for NYC nature. This coalition brings a powerful voice to plan and advocate for the future of New York City's nature.

With this said, I'd like to thank all our partners who've come out today to support our goals of managing our important and beautiful local forests and we hope you will support the Forest Management Framework as an important plan for the future of our city.

Investing in our natural forests is an idea whose time has come. This administration has the opportunity to continue to be a leader on this emerging topic. Together, we can make NYC more resilient, protect our natural history and incredible biodiversity, and provide our children and each other with access to inspiration and beauty right here in our own backyards.

Back to Jennifer:

As we hope today's testimony has demonstrated, the Forestry, Horticulture and Natural Resources Division at New York City Parks, in partnership with the Natural Areas Conservancy, is committed to protecting, restoring, expanding and managing New York City's natural areas, and the Council's support



and leadership is vital to our efforts. And just a note, that while these photos are breathtaking, nothing can substitute a walk in the woods where you experience the fresh smell of the trees and the quiet in the air. You have a standing offer to join me and my expert staff at any time of the year in visiting these beautiful spaces. Thank you for this opportunity to share our work for you, which is a vital part of Parks' mission and service to New Yorkers, as well as for your continued advocacy for our city parks. We will both now be happy to answer any questions that you may have.

Forest Management Framework for New York City



Authors

Clara C. Pregitzer
Helen M. Forgione
Kristen L. King
Sarah Charlop-Powers
Jennifer Greenfeld

Acknowledgements

BAND Foundation
Doris Duke Charitable Foundation
Ittleson Foundation
JPB Foundation
Mayor's Fund to Advance NY
The New York Community Trust
The Tiffany & Co. Foundation
Robert Wilson Charitable Trust
Wildlife Conservation Society Climate Adaptation Fund

Neda Arabshahi
Adrian Benepe
Lindsay Campbell
Georgina Cullman
Bram Gunther
Richard Hallett
Michelle Johnson
Liam Kavanagh
Mina Kim
Jesse Krauss
Laura Landau
Marit Larson
Leila Mougoui Bakhtiari
Shonet Newton
Nancy Falxa Sonti
Erika Svendsen

Natural Areas Conservancy

Board of Directors

Adrian Benepe
Karen Brown
Max Joel
David Langer
Karen McQuiston
Sarah R. Moros
Clare Peeters
Julia Robbins
KC Sahl
Eric Sanderson
Shika Saraf
Mitchell Silver, ex officio
Adam Silverman
Stacy Sonnenberg
Carter Strickland
Andrew Wallach
Ted Wolff

Please cite this report as follows:

Pregitzer, Clara C., Helen M. Forgione, Kristen L. King,
Sarah Charlop-Powers, and Jennifer Greenfeld. 2018.
Forest Management Framework for New York City.
Natural Areas Conservancy, New York, NY.

COVER:
Mature forest in Inwood Hill Park, Manhattan

Forest Management Framework for New York City





1234 Fifth Avenue | New York, NY 10029

April 2018

Dear New Yorkers,

The Natural Areas Conservancy (NAC) is proud to present a bold new vision for the restoration and long-term care of our city's forests with our partners at the New York City Department of Parks and Recreation (NYC Parks). The Forest Management Framework is a roadmap for the next 25 years to invest in and take care of the agency's 7,300 acres of forested natural areas. A sustained investment in this resource will:

- ensure safe, high-quality public access to nature for every New Yorker and
- protect New York City's biodiversity and unique forest communities.

Despite being the most densely populated city in the nation, New York has robust pockets of nature across every borough where people can lose themselves among the great trees and birdsong. Spending time in nature reduces stress, improves fitness, and refreshes the spirit. Our natural areas also provide clean air and water, cooler summer temperatures, and protection against storms and flooding. We want to ensure they continue to benefit future generations of New Yorkers.

NYC Parks realized the importance of our natural areas decades ago with the establishment of the Natural Resources Group, one of the first public divisions in the nation dedicated to natural areas restoration and conservation. More recently, the MillionTreesNYC program included the planting of over 500,000 trees in forested natural areas in all five boroughs and activated thousands of local stewards.

The NAC was formed in 2012 to build on the successes of NYC Parks' natural areas management and to envision and advocate for their future. The NAC has produced valuable data on the health and condition of our natural areas and added expertise to the forest management of NYC Parks. We have also given fuller voice and a higher profile to the conservation of New York City nature.

The Forest Management Framework comes at just the right time: our city is growing, and more people will need the open spaces of nature for recreation, renewal, and resilience in the face of climate change. Join us in our call to action: **to make forests a resource on par with the other great cultural resources of our city.**

Sincerely,

A handwritten signature in black ink, appearing to read "Sarah Charlop-Powers".

Sarah Charlop-Powers
Executive Director, Natural Areas Conservancy



NYC Parks

Mitchell J. Silver, FAICP
Commissioner

T 212.360.1305
F 212.360.1345

E mitchell.silver@parks.nyc.gov

City of New York
Parks & Recreation

The Arsenal
Central Park
New York, NY 10065
www.nyc.gov/parks

Dear Park Lovers:

When we at NYC Parks talk about our 30,000 acres of parkland, it is common to picture basketball courts, playgrounds, and the landscaped lawns of Central Park. But forested natural areas make up nearly a quarter of parkland in New York City—and they serve a vital purpose. These forests strengthen not only our city's ecosystem, but also the health and well-being of the New Yorkers who use them for free, accessible exercise and relaxation.

You can find Parks forests in every borough, from Conference House Park on Staten Island's southern tip to Pelham Bay Park at the northern border of the Bronx; in Riverside Park in Manhattan, Prospect Park in Brooklyn, and of course in Forest Park in Queens. And in all of our forests, you can find the work of our partner, the Natural Areas Conservancy, which since 2012 has supported the study and restoration of our natural areas through initiatives ranging from tree planting and trail blazing to data collection and creating tools for better management.

The new Forest Management Framework, a joint project of the Natural Areas Conservancy and NYC Parks, represents a significant step forward in improved management and resources for our natural areas. NYC Parks is excited by this framework's potential to improve one quarter of our park system and the health and well-being of all New Yorkers. The framework provides key insights into the state of our forests and recommends a 25-year investment to improve their long-term health. It is my hope and expectation that this framework will inform forest management not only here in New York City, but in cities across the country and around the world.

Thank you,

Mitchell J. Silver, FAICP, Hon. ASLA

Contents

Executive Summary	9
A New Vision for Urban Forest Management	10
Forest Management Goals	12
Overview of NYC's Forests	13
What Are the Conditions of NYC's Forests?	14
Major Findings	15
Developing a Citywide Model	22
Implementing the Management Framework	25
Conclusion	31
Appendices	33
Notes	40

Figures

1	Invest in Forests to Improve Their Condition	9
2	NYC's Land Cover	13
3	NYC's Natural Areas	13
4	NYC Parks' Forest	13
5	NYC Parks	14
6	NYC's Forest by Borough	16
7	Most Common Plant Species by Forest Layer	16
8	Key Findings	17
9	NYC Forest Condition Index	22
10	Forest Condition Matrix	23
11	Forest Condition Drives Management Strategy	27
12	Staffing Vision	28

Sidebars

Trails	18
Citywide Social Assessment of NYC Parks and Natural Areas	19
Who Takes Care of Urban Landscapes?	26
Aligning Forest Management across NYC— Conservancy Engagement Program	29
Climate-Adapted Planting Palettes	29

Appendices

A	Key Ecological Attributes of Healthy Urban Forests	33
B	NYC Forest Management Budget	34
C	NYC Parks in City Council Districts	36
D	City Council Districts for NYC Forested Parks	37
E	Rapid Site Assessment Checklist	38





Native trees staged to
be planted in Kissena
Park, Queens



Volunteers planting trees
at a forest restoration site

Executive Summary

NYC's forested natural areas provide important benefits to the city including high-quality recreation, enhanced biodiversity, and improved air and water quality. The Natural Areas Conservancy (NAC) and the New York City Department of Parks and Recreation (NYC Parks) have developed a 25-year Forest Management Framework intended to guide the restoration and management of NYC Parks' 7,300 acres of forested natural areas. The framework, NYC's first citywide forest management plan, is based on new comprehensive data that includes ecological conditions and visitor perceptions and experiences. The framework categorizes the condition of forests in more

than 50 parks across the five boroughs, based on metrics for ecological health and threat. Each condition category was correlated with best practices, staffing and contractual structures, and cost estimates. This approach facilitates the prioritization of future restoration activities, the ability to track changes in forest health over time, and the ability to estimate the level of investment needed to maximize ecological condition and visitor experience at the scale of a park, borough, or city. **The framework calls for an investment of \$385 million over 25 years to ensure that our city's forests achieve their full potential for recreation and conservation.**

FIGURE 1

Invest in Forests to Improve Their Condition

Through increased financial investment and targeted forest management, NYC will improve the health of our forests over time. Healthy forests are less expensive to manage.



A New Vision for Urban Forest Management

NYC contains significant forested natural areas.

NYC is 40.5% green—including landscaped parkland, private yards, cemeteries, and campuses, in addition to natural areas. The 7,300 acres of forested natural areas under NYC Parks' jurisdiction represent an area eight times as large as Central Park. These are not just open spaces but gateways to nature and all its history, complexity, and wonder. Healthy forests support habitat for native wildlife such as great horned owls, downy woodpeckers, coyotes, and red-backed salamanders, and native wildflowers such as spotted joe pye weed and New York aster: all species that have long called NYC home.

The urban forest has never been more important for people.

An unprecedented 80% of Americans live in urban areas,¹ and communities are increasingly disconnected from the natural world. Across multiple demographics children are spending more time using screen-based electronics and less time out of doors than their peers did 30 years ago.² Spending time in nature provides significant cognitive and emotional benefits, especially for youth in poor and underserved areas.³ High-quality urban nature has been shown to decrease crime and increase community cohesion.⁴ Safe access is therefore the first step toward realizing the benefits that nature provides for individuals and communities. As NYC grows in population, smart management of forested natural areas is critical.

Urban forests contribute to a healthy environment.

Trees are vital for mitigating urban heat-island effects and can lower air temperatures by up to nine degrees Fahrenheit.⁵ NYC's forested natural areas also naturally capture millions of gallons of stormwater each year and filter pollutants from that water.⁶ These forests are habitat for hundreds of species of resident birds and pollinators, as well as occupying a crucial location on the migratory paths of hundreds of additional species.

New data enables a new vision and leadership for NYC forest conservation.

In 2013 and 2014, the NAC conducted the first standardized assessment of 10,000 acres of forests and wetlands in 53 parks, including 7,300 acres of forested natural areas. These forests are incredibly diverse and are under threat from longstanding urban challenges such as fragmentation and the increased prevalence of invasive species, as well as the effects of climate change. The framework articulates management practices that directly address these threats and will restore and sustain healthy forests and secure their associated benefits over the long term.

The Forest Management Framework's 25-year plan to restore and conserve NYC's forests is grounded in robust ecological data, decades of professional expertise, and in-depth information about the staffing, costs, and practices associated with urban conservation activities. It includes guidelines for projecting costs, adapting best practices, encouraging local stewardship, and continued monitoring and research. If fully funded, the framework will ensure that 100% of the city's forests are under active management, are healthy, and are meaningful to and provide essential benefits for communities.

**Healthy Forest**

A healthy forest is characterized by its native canopy and multiple horizontal layers, including shrubs and ground cover.

**Unhealthy Forest**

An unhealthy forest is characterized by the dominance of invasive vines that can topple trees and disturb the canopy.

Forest Management Goals

The Forest Management Framework will result in forests that are healthy, provide recreation and enjoyment for all New Yorkers, and are fully supported financially.

Forests Are Healthy



People Benefit from Forests



Forests Are Supported



To realize these goals we must:

- Reduce ecological threats; bring the proportion of invasive species under 10%
- Promote healthy natural regeneration and biodiversity and the growth of native trees
- Make forests resilient to climate change
- Employ diverse and protective management strategies that are aligned with ecological conditions
- Provide safe, well-marked trails in natural areas; use trail-building techniques that contribute to forest health
- Help people find inspiration, reduce stress, improve fitness, and build communities
- Create opportunities for green jobs and encourage environmental education
- Increase collaboration between NYC Parks and other land managers, including park conservancies and other public agencies
- Galvanize an informed, involved, and active community around forest management and land stewardship
- Ensure NYC Parks Forever Wild protection guidelines continue to guard against forest fragmentation or inappropriate development

To achieve this vision, NYC Parks and its partners will need to commit \$385 million over 25 years.

Overview of NYC's Forests

FIGURE 2

NYC's Land Cover: **40.5% of NYC Is Green**



Source: Natural Areas Conservancy Ecological Coverture Map⁷

FIGURE 3

NYC's Natural Areas: **11.6 % of NYC's Land Cover Is Natural Areas**



Source: Natural Areas Conservancy Ecological Coverture Map⁸

FIGURE 4

NYC Parks' Forest: **60% of NYC's Forests Are in NYC Parks**



Source: Classification of Natural Areas Conservancy's Ecological Assessment Plots⁹

What Are the Conditions of NYC's Forests?

Assessment of NYC's Natural Areas

Using both remotely-sensed data and fieldwork, the NAC assessed the condition of 10,000 acres of natural areas in NYC Parks. Assessments were conducted in freshwater wetlands, saltmarshes, and 7,300 acres of forested natural areas. Field data on forest character and condition was collected in 53 parks from 1,156 sampling plots (see Appendix A). Data included size and health of trees, species composition, and soil condition.¹⁰ Working in partnership with the US Forest Service, the NAC also conducted a social assessment to better understand how park visitors perceive, use, and value urban natural areas.¹¹ This assessment data forms the foundation of the Forest Management Framework.

FIGURE 5
NYC Parks



Major Findings

Our first-ever citywide research shows incredible diversity and the need for an immediate increase in management activities.

1. NYC's forests are diverse and dominated by native trees.

Forest canopies are mostly native (85%) and composed of 109 native tree species and 43 unique forest types.¹² Some of the most common forest types include oak-hickory, oak-tulip tree, and successional sweetgum. Less common forest types include chestnut-oak and successional birch habitats. Vestiges of larger maritime-coastal forests, which are not commonly found elsewhere in the state, remain across the coastal areas of NYC.

2. The next generation is less healthy.

Despite a high percentage of native trees in the canopy, native species are less prevalent in the midstory and understory layers. Invasive herbaceous species are common (present in 85% of plots), and invasive vines were found climbing on trees in 57% of forest plots. Invasive herbaceous species can prevent native seedlings from reaching the canopy, affecting ecosystem composition and function. Invasive vines can repress growth and shorten the lifespan of native trees. Without intervention, these challenges will negatively affect the health and species composition of mature trees in the future.

3. NYC's most common forest type is also its most vulnerable.

We found that 40% of NYC's forests are successional hardwood forests, reflecting recent disturbance. These forest types typically have a higher stem density and have lower average tree diameters. Additionally, these successional forests have, on average, a 34% greater presence of invasive herbaceous species than mature hardwood forest types in NYC.

4. All forests need management, but not the same kind.

Accurate data on forest conditions across the whole city has increased the level and scope at which we understand our forests and changed how we prioritize and align management activities. To achieve healthy forests, interventions such as low-density tree planting or more surgical invasive species removal can be applied in areas that are relatively healthy or to stands in transition. In contrast, forests that are relatively unhealthy and dominated by invasive species might require afforestation, essentially planting a forest from scratch.

5. Well-managed forests are more welcoming.

Forests with fewer invasive vines offer higher visibility for visitors. Areas that receive regular maintenance, including formal trail systems and clear signage, feel safer and are more inviting.



Collecting data in
Van Cortlandt Park,
the Bronx

FIGURE 6
NYC’s Forest by Borough

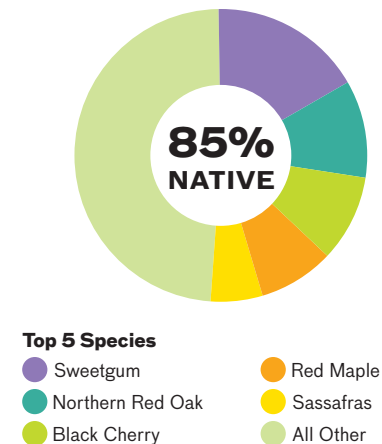
There are more than 10,500 acres of forested natural areas in all of the five boroughs of NYC. These forests are found on city, state, and federal property as well as on private property.

Borough of NYC	NYC Forest Acres	Percent of NYC Forest Acres
Bronx	2,041	19%
Brooklyn	599	6%
Manhattan	365	3%
Queens	1,971	19%
Staten Island	5,566	53%
Total	10,542	100%

FIGURE 7
Most Common Plant Species by Forest Layer

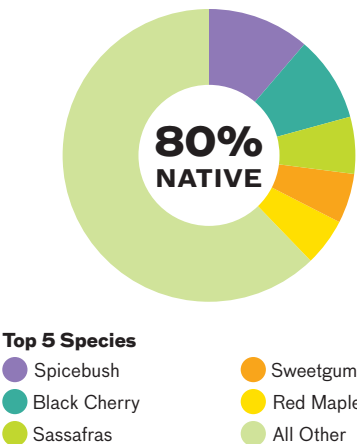
Canopy

We found 85% of all overstory species measured were classified as native to NYC. Sweetgum was recorded as the most common species, accounting for 16.9% of all species measured, followed by northern red oak, accounting for 10.5% of all species, and the greatest proportion of basal area (21.6%). The most common invasive tree species recorded was black locust (5.3%), followed by Norway maple (1.7%). Standing dead trees can provide important habitat for birds and wildlife. We found that 10.9% of the standing trees in the canopy were dead.



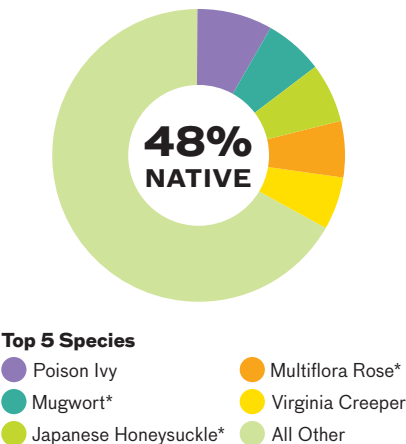
Midstory

Non-native species were more prevalent in the midstory than in the canopy. We found that 80% of all midstory species were native. The five most abundant native midstory species were spicebush (12.5%), black cherry (7.5%), sweetgum (6.4%), red maple (6.4%), and sassafras (5.5%). The most common invasive species were crab apple (3%), Norway maple (2.3%), Japanese angelica tree (2.1%), and black locust (2.3%).



Understory

Non-native species were more prevalent in the understory, with the mean proportion of native species of 48%. The most frequently occurring understory plants were woody vines. These included natives such as poison ivy and Virginia creeper, as well as non-natives such as Japanese honeysuckle and oriental bittersweet. Of the 10 most abundant species in terms of relative cover, half were non-native. Invasive vines pose a significant threat to standing trees by repressing growth and shortening lifespans.



* Invasive non-native species

FIGURE 8

Key Findings



Forest Canopy

In our assessment we found 213 tree species and that 85% of all tree species were native. This forest layer represents the most mature trees and is a representation of which tree species have successfully survived in a forest over time.

Midstory

Trees and shrubs found in this layer are important for creating structure for wildlife habitat and make up the next generation of trees for the canopy. We found that 80% of trees in the midstory were native.

Understory

While this layer held the greatest floristic diversity (561 species, or 73% of all species recorded in the study), the understory also had the lowest proportion of native species of all layers, with vines found to be the most frequently occurring type. Notably, 57% of NYC's forest plots had invasive vines in canopy trees, suggesting that the management of vines as well as invasive tree species may be critical for maintaining native-dominated urban forests.

Forest Floor

Organic matter including leaf litter and fallen trees and branches is an important component for nutrient cycling and habitat. Coarse woody debris was found in 38% of our plots, with the majority being recently fallen.

Soil

We found soils to be highly variable, with soil pH ranging from 2.54 to 6.77 and texture ranging from 0% to 100% sand, both factors that could limit or encourage specific forest types and species presence. These patterns can help us better manage and understand our forest. In addition, 19% of our plots fell within soil classified as anthropogenic, something unique to the urban context.

Deer Browse

High deer populations can cause significant damage to forest plants by eating vegetation or rubbing on saplings. In our assessment we found evidence of damage to vegetation by deer in 46% of our forest plots, with extreme prevalence in the borough of Staten Island, where 89% of plots showed evidence of deer browse.

Human Impacts

Forests in the urban environment are exposed to greater human activity compared to more rural forests. We found that 80% of our plots had some evidence of human modification: 67% had human-generated trash, 27% were bisected by a path, and 9% contained park infrastructure such as a fence, bench, or hydrant.



Natural areas trail work in Forest Park, Queens

Trails

There are over 300 miles of trails within NYC’s natural areas. The networks are often confusing and mostly unmarked. NYC Parks and the NAC have been working together since 2016 to formalize trails and improve their condition across the entire city. This work includes establishing well-marked networks in each park to improve public access and safety, strengthening community engagement, and improving forest health. Unwanted and redundant social trails (“desire lines”) are closed using restoration techniques such as decompaction and planting. After formal networks are established, the public can access hiking maps for natural areas, and NYC Parks and the NAC recruit volunteers to work on trail improvement projects along the official paths. This work ultimately decreases forest fragmentation while also creating a better user experience in natural areas across NYC. Trail formalization and improvement are especially successful when coupled with larger forest restoration efforts.

Before



After



Before and after maps of the 130-acre maritime forest in Marine Park, Brooklyn. Trail closures and plantings are in progress and will create the final trail system.

Citywide Social Assessment of NYC Parks and Natural Areas

Despite the importance of urban natural areas to the health and well-being of New Yorkers, we have little systematic evidence about how park visitors perceive, use, and value parks. A better understanding of this can provide insight into how parks can best serve visitors in a rapidly changing environment.

The US Forest Service, the NAC, and NYC Parks conducted a citywide social assessment of NYC parks and natural areas to explore the social meaning of approximately 9,000 acres of NYC parkland, including almost 5,000 acres of natural areas.

In this study, the primary research question was the following: What are the uses, functions, and values of parkland and natural areas as conveyed through people's park behaviors, descriptions, and narratives? In addition, researchers explored the differences in park use and social meaning according to site type and the gender of respondents. Drawing upon previous research, three data collection approaches were triangulated: direct observations of human activities, observations of material signs of human use, and 1,600 interviews with park users. The intent of this study was to capture why, how, when, and where urban residents engage with the outdoors in NYC.



Trail blazing in Bayswater Park, Far Rockaway, Queens



Conducting the social assessment in Marine Park, Brooklyn

Findings

- Urban parkland is a crucial form of “nearby nature” that provides space for recreation, activities, socialization, and environmental engagement and helps people feel connected to place and to each other. These interactions produce vital cultural ecosystem services that may help to strengthen social resilience.
- Urban parks support psychological, social, and spiritual well-being for a wide range of people who are seeking to connect with nature and a larger reality, as well as with the self and with others.
- New Yorkers describe both landscaped and natural park areas as a space for relaxation. However, natural areas offer visitors a sense of refuge and attachment to place and space for walking and nature recreation activities, while landscaped park areas provide space for sports activities, socializing, and structured children's play.
- 59% of park users interviewed in 2014 reported going into urban natural areas. Many of those who did not visit described a personal preference for recreating in other park areas, and others revealed a potential willingness to visit in the future. Those who did not visit natural areas cited concerns about safety, accessibility, or suitability for children.
- Women are more likely to bring children to parks than men are and are more likely to seek out parks for specific amenities. In addition, women are less likely than men to visit natural areas, citing concerns about safety in forests and wetland areas.
- People who participate in environmental stewardship groups are more likely to visit natural areas, suggesting that enhancement of stewardship programs may be a way to create a more inclusive experience for all New Yorkers in natural areas citywide.



Forest management in Bronx Park,
the Bronx
Photograph: Adam Stoltman



Developing a Citywide Model

Since the formation of the Natural Resource Group in 1984, NYC Parks has managed its natural areas park by park. In contrast, the Forest Management Framework uses information about the range of biological conditions across forested natural areas to prioritize activities, plan for the future, and evaluate the success of restoration across the five boroughs. It also provides the opportunity to understand the condition of an individual area within a single park relative to all forests within that park, forest type, or city.

To understand and communicate the conditions of forests citywide, the forest assessment created two indices: one to represent ecological health and the other for ecological threat. These indices enable representations of health and threat status at the assessment plot level that can be compared among plots citywide.

This framework captures the full range and extent of conditions that exist within NYC’s forested natural areas. It allows land managers to anticipate and match the appropriate effort and resources required to improve forests across a broad range of current conditions, as well as to prioritize sites across all of NYC’s natural areas.

A forest assessment plot that is high on the health axis and low on the threat axis is in good condition and requires little management intervention. If a plot has a high health score but also a high threat score, this plot is at risk of decline in function and composition; management will be critical to protect its healthy attributes. A plot that is low on the health axis but high on the threat axis represents the most degraded forests. These forests require intensive management intervention to shift their trajectory toward sustained health. The costs for management are lowest in the healthiest and less threatened forests and highest in the least healthy and most threatened forests.

FIGURE 9
NYC Forest Condition Index

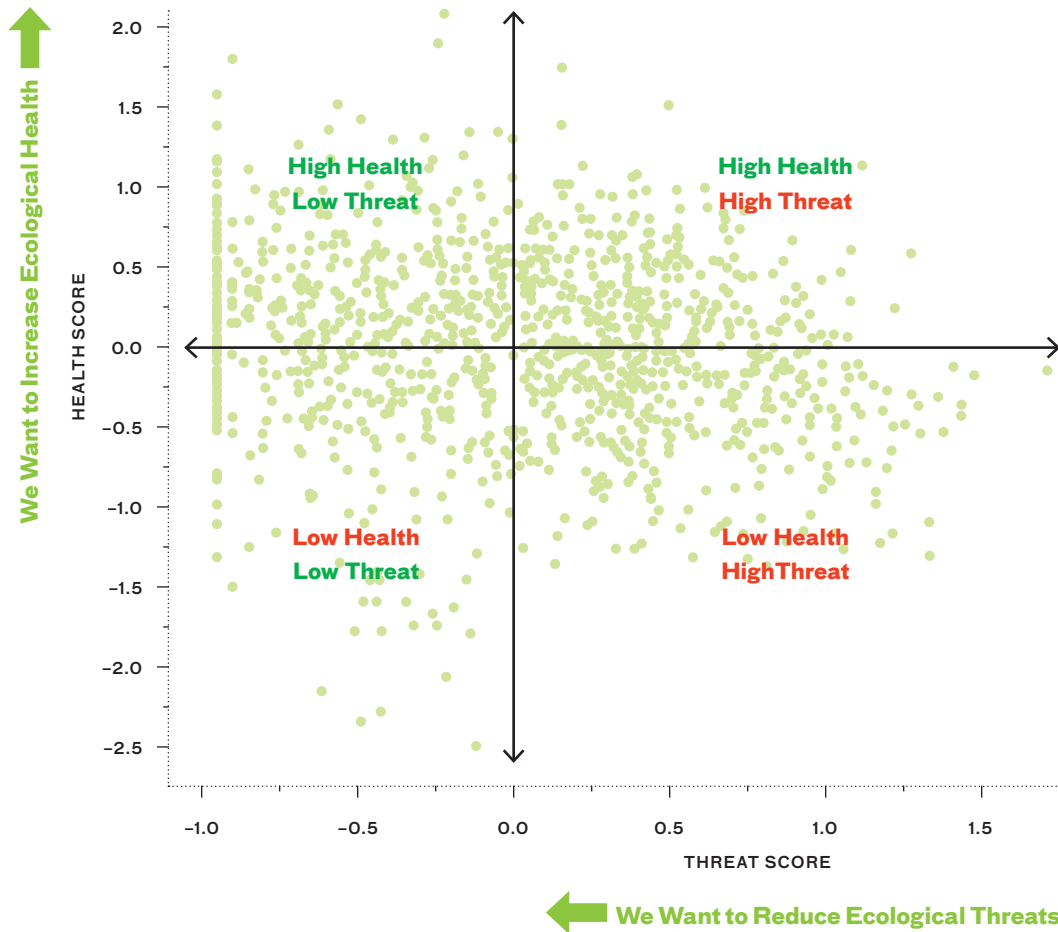
Using field data collected across all of NYC’s forests, an ecological index was created to represent overall forest health and overall forest threat. Indices for ecological health primarily represent desired vegetation conditions and are specific to different forest types. Threat indicators are relatively uniform across all forest types and only one index was created. All data was standardized to develop the index.

Ecological Health Index	
Mature Hardwood Forest	Native Forest Canopy + Native Midstory + Native Tree Seedlings + Native Herbaceous Cover + Native Species Richness
Successional Hardwood Forest	Native Forest Canopy + Native Midstory + Native Tree Seedlings + Native Herbaceous Cover + Native Shrubs + Native Species Richness
Maritime Coastal Forest	Native Midstory + Native Tree Seedlings + Native Herbaceous Cover + Native Species Richness
Swamp and Floodplain Forest	Native Forest Canopy + Native Midstory + Native Tree Seedlings + Native Herbaceous Cover + Native Shrubs + Native Species Richness
Ecological Threat Index	
All Forest Types	Invasive Forest Canopy + Invasive Midstory + Invasive Vines on Trees + Invasive Tree Seedlings + Invasive Herbaceous Cover

FIGURE 10

Forest Condition Matrix

Each point on this figure represents the standardized condition score of an ecological assessment plot (total 1,156 plots) in one of 53 parks.



High Health / Low Threat

Forests in this category are the highest quality. Less management intervention is needed, but monitoring is required to ensure that quality remains high and these forests are protected.



High Health / High Threat

These forests are in transition. While they have many threats, they also contain many of the metrics we look for in high-quality forests. Management is required to protect and shift the trajectory of these stands.



Low Health / Low Threat

Forests in this category have minimal threats, but desired structure and composition metrics are not met. Management can be used to accelerate the transition into high health, but monitoring over time with little intervention could result in improved health.



Low Health / High Threat

Forests in this category are the most degraded in NYC and require most management. Management actions could range from invasive species removal, tree planting, and afforestation and may take several years.



NAC field ecologists
collecting forest data in the
Staten Island Greenbelt

Implementing the Management Framework

The Forest Management Framework offers a systems approach to forest management. Ecological assessment of all forested natural areas has allowed the NAC to sort forest acreage according to health and threat (see Figure 10). The framework focuses on reducing threats, most notably removing invasive species that are the general underlying cause of poor forest health. It is easier to control threats than to directly improve baseline forest health. For example, we know how to remove invasive species, clear dumped material, and protect against browsing deer, but less straightforward actions are needed to increase leaf-litter depth or the basal area of native canopy trees. Other interventions do impact forest health directly, most notably the planting of native trees, which can increase the overall proportion of native seedlings.

The intensity of forest management strategies varies in relation to site condition as described by the ecological assessment; the most degraded sites require the most intensive form of work, usually “forest restoration,” while sites that require less intensive work but need hands-on attention fall into the category of “forest management” (see Figure 11). We use our knowledge about condition to tailor the management approach to specific conditions. Below, we describe the primary strategies.

Forest Restoration (Contractor)

This strategy can include site clearing, invasive plant removal, soil de-compaction, soil and compost amendment, and other activities. Contractors can use heavy machinery and work in difficult-to-access areas that are steep, wetland-adjacent, or otherwise impenetrable. Historically, NYC Parks has applied this tactic to the most difficult-to-manage areas, such as vinelands or former landfill sites that have few intact functional elements that might be damaged in the process of their work.

Forest Restoration (In-House)

This strategy involves the assignment of in-house field crews to difficult restoration projects that are generally smaller in size than those assigned to contractors and are unlikely to require the use of heavy machinery or specialized techniques. The primary work here includes significant invasive plant removal and re-vegetating the site by planting native species. In-house crews are a great resource when working in or around areas of mixed native and invasive species.

Forest Management (In-House)

These sites have a lower proportion of invasive plant cover than restoration sites and do not require full replacement of the vegetation community by planting. This strategy is applied in areas that were previously restored. The primary activity in management sites is invasive species removal, with a focus on

protecting existing native plants. This work can be performed by skilled professionals but also by volunteer participants with appropriate supervision.

Forest Management (Volunteer)

Forest management sites that are easily accessible and do not require detailed training are appropriate for volunteers. A high staff-to-volunteer ratio during engagement events and outreach makes volunteer participation more expensive than other practices. However, volunteer opportunities are an investment in the future of NYC communities: volunteering gives New Yorkers valuable interactive experiences, improves long-term stewardship, and increases the constituency for the management of these spaces.

Forest Monitoring and Maintenance (In-House and Volunteer)

Before and after conducting restoration and management, staff will use the Rapid Site Assessment Checklist (Appendix E) to conduct monitoring to document conditions. After management work is complete, maintenance entails periodic “sweeps” of large tracts of forest that are in generally good condition to check for invasive species in the understory. Regular monitoring and maintenance are critical to safeguarding the health of the highest-quality forests. For example, if a storm or other type of large disturbance were to impact an area, regular visits would identify threats so the area’s condition could be re-categorized and a more intensive management strategy applied.

Planting (In-House, Contractor, and Volunteer)

This strategy can be combined with any of the above. Just as management is customized to forest condition, so is planting. Most intensive planting is for only those acres where native regeneration is failing.

Staffing Vision

Comprehensive forest management requires sufficient staffing of qualified professionals. The framework’s vision for a team of forest management professionals includes field crews, contract managers, monitoring experts, and experts in volunteer engagement (see Figure 12).

Management over Time

Forests are dynamic, and the framework reflects the need to adapt management strategies over time. The reduction of threats will eventually call for less intensive management strategies, reducing investment levels while resulting in an improvement in forest health that can be tracked through time.



Volunteers plant trees at Marine Park, Brooklyn

Who Takes Care of Urban Landscapes?

The Stewardship Mapping and Assessment Project (STEW-MAP) aims to answer this question.

STEW-MAP surveys civic groups of two or more people who work to conserve, manage, monitor, transform, educate on, or advocate for the local environment. The STEW-MAP survey collects data across three categories: organizational characteristics (including year founded, mission, and budget); stewardship turf, or the area where each group works; and social networks, the other groups that serve as partners, members, and collaborators.

STEW-MAP databases and interactive maps enable the public, municipal agencies, and nonprofits to visualize where and how hundreds of civic environmental stewardship groups are working throughout a city or region. This tool highlights existing stewardship gaps and overlaps in order to strengthen organizational capacities, promote broader civic engagement with on-the-ground environmental projects, and build effective partnerships among stakeholders involved in urban sustainability and resilience. The map and database have facilitated collaborations, helped to connect previously siloed groups, and enabled groups to get recognition, resources, and power. STEW-MAP is critical to identifying and nurturing groups as they help care for these essential resources.

To learn more about STEW-MAP in NYC, visit www.nrs.fs.fed.us/stewmap.

FIGURE 11

Forest Condition Drives Mangement Strategy

The assessed condition of the forest determines the management strategy, resources needed, and costs estimated.



Forest Restoration



Forest Management



Forest Monitoring and Maintenance

		High Threat	Medium Threat	Low Threat	Very Low Threat
Acreage	Total Acres in Category	519	2,527	3,090	1,184

Ecological Conditions	Percent Invasive Herbaceous Cover	≥ 70%	40–70%	10–40%	≤ 10%
	Invasive Vines	> 50% of trees have invasive vines	20–50% of trees have invasive vines	1–20% of trees have invasive vines	No vines on trees
	Invasive Canopy Basal Area (m ² /ha)	> 10	4–10	.1–4	0
	Invasive Midstory (stem count/hectare)	> 500	100–500	1–100	0
	Native Tree Seedlings (stem count/hectare)	< 5,000	< 5,000	< 5,000	> 5,000
	Native Midstory (stem count/hectare)	NA	NA	< 100	> 100
	Native Herb Species Richness	NA	NA	≤ 6	> 6

Work Type and Cost	Work Type	Forest Restoration (Contractor)	Forest Restoration (In-House)	Forest Management	Forest Monitoring & Maintenance
	Average Cost per Acre	\$42,076	\$6,078	\$2,074 (in-house) \$28,500 (volunteer)	\$1,037

FIGURE 12

Staffing Vision

Comprehensive forest management requires sufficient staffing of qualified professionals. The framework's vision for a team of forest management professionals includes NYC Parks publicly funded staff and NAC privately funded staff. Current positions as of April 2018. Proposed positions are the projected total needed to implement this plan.

Crew / Team	Type of Work	Current Positions	Proposed Positions
Natural Resource Management In-House (NYC Parks)	Director of Natural Resources	1	1
	Gardener I	10	40
	Gardener II (Supervising Gardener)	5	10
	Field Crew Manager	2	5
Contractor Restoration Supervision (NYC Parks)	Forester II	3	3
	Senior Forester	1	1
Public Access Formalization (NYC Parks)	Community Associate (Crew Member)	0	4
	Trail Crew Leader	1	1
Volunteer Engagement (NYC Parks)	Community Associate (Volunteer Coordinator)	3	3
	Stewardship Crew Manager	4	4
Assessment and Monitoring (NYC Parks)	Assessment Field Staff	1	4
	Ecologist (Assessment Crew Manager)	0	1
	Data and Analytics Manager	1	1
Natural Areas Conservancy	Executive Director	1	1
	Senior Ecologist	1	1
	GIS Analyst	1	1
	Project Manager	1	1
	Trail Program Manager	1	1
Total		36	82



Aligning Forest Management across NYC—Conservancy Engagement Program

As a component strategy of the Forest Management Framework, the NAC is sponsoring a citywide Conservancy Engagement Program in 2018 and 2019. This free program will be available through a competitive application process to four nonprofit organizations who conduct forest management in NYC Parks' natural areas.

NAC ecologists will communicate the process, steps, recommendations, best practices, and goals for forest management developed by the framework directly to these organizations. The chosen conservancies will receive scientific support, training, data tools, resources, and management recommendations from the NAC during an intensive three-month period. The iterative process of presentations, discussions, and trainings will culminate in specific management plans for each conservancy.

This important part of the framework will begin to create alignment of conservation efforts across the city and allow practitioners to track their management and stewardship activities over time. Working within the framework will also allow easy access to information on natural areas to plan forest restoration within existing conservancy programs and to engender future program support.

Climate-Adapted Planting Palettes

Due to the heat-island effect in large cities, urban forests are experiencing the extremes of regional climate trends before surrounding rural areas. Climate change forecasts indicate that future weather conditions in NYC could be less suitable for some of its native tree species. At the same time, other native tree species that are more tolerant of heat and drought are predicted to thrive.

In order to ensure the health and resilience of our native forests, the NAC and NYC Parks have created climate-adapted planting palettes (lists) for forest restoration sites. These palettes are based on the kind of forest community the plantings will occur in and predicted resilience of individual tree species to future climate conditions. The quantities of less climate-adapted species will be reduced in future plantings while the more resilient tree species will be maximized. Strategies will also incorporate using local ecotypes and planting more genetically diverse populations to promote adaptation.

The tools created for this project can help guide practitioners of forest restoration through future plantings: from identifying the type of forest community the project is taking place in, to selecting tree species for planting that are appropriate for the site both now and in the future.





Measuring forest carbon in
Van Cortlandt Park, the Bronx

Conclusion

We value what we measure.

Investment in and focus on NYC's forested natural areas has fluctuated over the past three-and-a-half decades. But the time is right to adopt a proactive approach to managing these valuable but historically underresourced areas for the decades to come.

Focused on improving the data and expertise available for conservation, the vision and tools in the NAC's Forest Management Framework create a foundation for a new long-term approach that will keep these wonderful places thriving. The framework celebrates the importance of our forests for expanded and meaningful recreation and enhanced community cohesion while also recognizing them as essential to protecting and restoring biodiversity and buffering the impacts of climate change.

In addition to guiding the work of the NAC and NYC Parks' Natural Resources Group, the framework creates the ability to incorporate natural forests into a broad range of future planning. In 2018, the NAC launched a conservancy engagement program, providing technical support to nonprofits that manage forested parkland.

If we commit to activating the full breadth of the Forest Management Framework today, the next 25 years will bring more effective capital investments, more professional opportunities, more meaningful public engagement, and more sustainable healthy forests.



Mature sweetgum forest in
Wolfe's Pond Park, Staten Island

Appendices

APPENDIX A

Key Ecological Attributes of Healthy Urban Forests

Attributes, Indicators and Field Measurements Used in NAC Forest Assessment

Attributes	Indicators	Field Measurements (10m radius plot, 4 1m x 1m subplots)
Forest Canopy Dominated by Native Species	Relative basal area (m ² /ha) of native tree species	All trees ≥ 10cm DBH: species and DBH
Canopy Closure >50% to Help Limit Invasive Plant Growth	% canopy closure	Analysis of canopy photos and visual estimate of % canopy closure in fixed-area plot (4 photos/plot)
Healthy Forest Canopy	Proportion of trees with a healthy canopy	Dieback, discoloration of foliage, defoliation, and vigor class estimations of trees >10cm DBH
Complex Vertical Structure	Vegetation lifeforms in the understory, midstory, and overstory	Abundance and size class for woody plants (< 2cm DBH were sampled in 1m x 1m subplots)
Forest Understory Dominated by Native Species	Diversity and relative cover of native herbaceous species	% cover of all herbaceous plants and woody plants < 2cm DBH (1m x 1m subplots)
Soil Quality and Chemistry Suitable for Supporting Native Plants	Healthy range of pH, organic matter, macro- and micronutrients, limited heavy metals	Soil sample collected at each forest plot
Structure in Forest Floor	Leaf litter and downed woody material present on the forest floor	Leaf litter and duff depth measurements; % cover forest floor substrate; volume of fine, medium, and coarse woody material; decay class of coarse woody material
Limited Pest Damage to Plants	Browse on vegetation (deer), missing leaf tissue (insect defoliation)	% herbivory classes for understory plants and trees/shrubs (2–10cm DBH)
Native Tree Regeneration	Tree seedlings present in the understory	Seedling % cover and individual count (1m x 1m subplot)
Limited Encroachment and Anthropogenic Alterations	Dumping piles, desire lines, vandalism, trash	% cover of any infrastructure, evident environmental modification, or trash by category
No Invasive Vines Overtaking the Forest Canopy	Species and stage class invasive vines in the understory, tree trunk, and tree canopy	Vine presence on trees and stage (1, 2, 3)

APPENDIX B

NYC Forest Management Budget

	Restoration		Planting			Management	
	In-House Restoration Acres	Contractor Restoration Acres	In-House Planting	Contractor Planting	Volunteer Planting	In-House Management	Volunteer Management
Cost/Acre	\$6,078	\$42,076	\$75,543	\$162,041	\$99,177	\$2,075	\$28,534
Year	Acres in Worktype						
1	63	89	26	0	9	140	16
2	126	178	26	0	9	140	16
3	126	178	44	22	22	276	31
4	126	178	44	22	22	289	32
5	126	178	44	22	22	291	32
6	126	178	44	22	22	317	35
7	126	178	44	22	22	209	23
8	126	178	44	22	22	185	21
9	126	178	44	22	22	185	21
10	149	155	44	22	22	185	21
11	174	130	44	22	22	185	21
12	179	125	44	22	22	185	21
13	183	121	48	24	24	193	21
14	187	117	48	24	24	194	22
15	191	113	49	24	24	194	22
16	195	109	49	25	25	195	22
17	199	105	50	25	25	196	22
18	204	100	50	25	25	197	22
19	208	96	50	25	25	198	22
20	212	92	51	25	25	199	22
21	217	87	34	17	17	60	7
22	—	83	34	17	17	61	7
23	—	79	9	4	4	15	2
24	—	74	9	5	5	16	2
25	—	71	10	5	5	17	2

*Capital costs increase by 3% per year

*Expense costs increase by 1% per year

Monitoring					
Maintenance	Conservation (Monitoring)				
\$1,037	\$35		Capital Funding	Expense Funding	Total Funding
		Year	Budget by Funding Type		
0	685	1	\$3,744,764	\$3,970,545	\$7,715,309
0	685	2	\$3,857,107	\$4,010,251	\$7,867,358
155	685	3	\$7,711,847	\$7,610,110	\$15,321,957
155	840	4	\$7,943,203	\$7,759,896	\$15,703,098
307	995	5	\$8,181,499	\$8,016,989	\$16,198,488
321	1302	6	\$8,426,944	\$8,267,600	\$16,694,544
323	1623	7	\$8,679,752	\$7,763,044	\$16,442,797
352	1946	8	\$8,940,145	\$7,753,440	\$16,693,585
232	2298	9	\$9,208,349	\$7,709,565	\$16,917,914
206	2530	10	\$8,223,006	\$7,918,811	\$16,141,817
206	2736	11	\$8,338,508	\$8,021,539	\$16,360,047
206	2942	12	\$8,468,682	\$8,123,768	\$16,592,450
206	3148	13	\$9,061,226	\$8,833,801	\$17,895,027
206	3354	14	\$9,265,266	\$9,021,173	\$18,286,439
214	3560	15	\$9,473,394	\$9,220,945	\$18,694,338
215	3774	16	\$9,685,670	\$9,415,707	\$19,101,377
216	3989	17	\$9,896,755	\$9,614,055	\$19,510,810
217	4205	18	\$10,044,135	\$9,741,444	\$19,785,579
218	4422	19	\$10,259,701	\$9,945,372	\$20,205,073
219	4640	20	\$10,478,424	\$10,152,520	\$20,630,943
220	4859	21	\$8,139,465	\$6,798,098	\$14,937,563
221	5079	22	\$8,287,590	\$6,976,174	\$15,263,765
67	5300	23	\$4,400,136	\$2,602,038	\$7,002,175
68	5367	24	\$4,428,571	\$2,733,787	\$7,162,359
17	5435	25	\$4,586,471	\$2,787,602	\$7,374,073
		Total	\$199,730,611	\$184,768,273	\$384,498,883

APPENDIX C

NYC Parks in City Council Districts

Borough	District	Parkland Acreage	Natural Area Acreage	Forested Natural Area Acreage	NYC Parks with Natural Areas
Manhattan	5	40	3	0	Mill Rock Park
Manhattan	6	1,089	74	68	Central Park, Riverside Park
Manhattan	7	192	13	12	Fort Washington Park, Riverside Park
Manhattan	10	610	220	156	Fort Tryon Park, Fort Washington Park, Harlem River Park, Inwood Hill Park, Sherman Creek
Bronx	11	1,509	695	562	Bronx Park, Raoul Wallenberg Forest, Riverdale Park, Seton Park, Spuyten Duyvil Shorefront Park, Van Cortlandt Park
Bronx	12	137	74	43	Givans Creek Woods, Pelham Bay Park, Seton Falls Park
Bronx	13	3,353	1,505	668	City Island Wetlands, Pelham Bay Park
Bronx	17	272	26	14	North Brother Island, South Brother Island
Bronx	18	434	134	17	Castle Hill Park, Harding Park Beautification Project, Pugsley Creek Park, Soundview Park
Queens	19	1,060	332	56	Alley Pond Park, Flushing Meadows Corona Park, Powell's Cove Park, Udall's Park Preserve
Queens	20	410	124	38	Flushing Meadows Corona Park, Kissena Corridor Park, Kissena Park
Queens	23	1,166	626	532	Alley Pond Park, Cunningham Park, Kissena Corridor Park
Queens	24	472	106	7	Flushing Meadows Corona Park
Queens	30	705	328	300	Forest Park, Highland Park
Queens	31	1,563	501	36	Brant Point Wildlife Sanctuary, Brookville Park, Dubos Point Wildlife Sanctuary, Hook Creek Park, Idlewild Park, Jamaica Bay Park, Rockaway Beach and Boardwalk, Seagirt Ave. Wetlands, Vernam Barbadoes Peninsula
Queens	32	869	62	7	Broad Channel American Park, Spring Creek Park, Spring Creek Park Addition, Sunset Cove Park
Brooklyn	39	528	110	75	Prospect Park
Brooklyn	42	265	92	6	Fresh Creek Nature Preserve, Spring Creek Park
Brooklyn	43	558	40	0	Calvert Vaux Park
Brooklyn	46	1,460	788	87	Canarsie Park, Four Sparrow Marsh, Fresh Creek Nature Preserve, Marine Park, McGuire Fields, Paerdegat Basin Park
Staten Island	49	847	175	105	Clove Lakes Park, Eibs Pond Park, Graniteville Swamp Park, Shooters Island
Staten Island	50	3,537	2,000	1,208	Blood Root Valley, Bradys Pond Park, Deere Park, Freshkills Park, Great Kills Park, Greenbelt Native Plant Center, High Rock Park, Last Chance Pond Park, LaTourette Park, Meredith Woods, Ocean Breeze Park, Pralls Island, Reed's Basket Willow Swamp Park, Richmond Parkway, Saw Mill Creek Marsh, Staten Island Industrial Park, Willowbrook Park
Staten Island	51	2,832	1,824	1,235	Arden Woods, Bloomingdale Park, Blue Heron Park, Bunker Ponds Park, Conference House Park, Crescent Beach Park, Fairview Park, Freshkills Park, Great Kills Park, Hybrid Oak Woods Park, Isle of Meadows, Kingfisher Park, LaTourette Park, Lemon Creek Park, Long Pond Park, Richmond Parkway, Siedenburg Park, Wolfe's Pond Park

APPENDIX D

City Council Districts for NYC Forested Parks

Park Name	City Council Districts
Alley Pond Park	19, 23
Arden Woods	51
Blood Root Valley	50
Bloomingdale Park	51
Blue Heron Park	51
Brady's Pond Park	50
Brant Point Wildlife Sanctuary	31
Broad Channel American Park	32
Bronx Park	11, 15
Brookville Park	31
Bunker Ponds Park	51
Calvert Vaux Park	43, 47
Canarsie Park	42, 46
Central Park	6
City Island Wetlands	13
Clove Lakes Park	49
Conference House Park	51
Crescent Beach Park	51
Cunningham Park	23
Deere Park	50
Douglaston Park Golf Course	23
Dubos Point Wildlife Sanctuary	31
Eibs Pond Park	49
Fairview Park	51
Flushing Meadows Corona Park	19, 20, 21, 24
Forest Park	29, 30
Fort Tryon Park	10
Fort Washington Park	7, 10
Four Sparrow Marsh	46
Fresh Creek Nature Preserve	42, 46
Freshkills Park	50, 51
Givans Creek Woods	12
Grand Central Parkway	23, 24
Graniteville Swamp Park	49
Great Kills Park	50, 51
High Rock Park	50
Highland Park	30
Hook Creek Park	31
Hybrid Oak Woods Park	51
Idlewild Park	31
Inwood Hill Park	10
Isle of Meadows	51
Jamaica Bay Park	31
Kingfisher Park	51
Kissena Corridor Park	20, 23
Kissena Park	20
Last Chance Pond Park	50
LaTourette Park & Golf Course	50, 51
Lemon Creek Park	51
Long Pond Park	51

Park Name	City Council Districts
Marine Park	46
Meredith Woods	50
Mill Rock Park	5
North Brother Island	17
Ocean Breeze Park	50
Paerdegat Basin Park	46
Pelham Bay Park	12, 13
Powell's Cove Park	19
Pralls Island	50
Prospect Park	39
Pugsley Creek Park	18
Raoul Wallenberg Forest	11
Reed's Basket Willow Swamp Park	50
Richmond Parkway	50, 51
Riverdale Park	6, 7, 11
Rockaway Beach and Boardwalk	31, 32
Saw Mill Creek Marsh	50
Seagirt Ave. Wetlands	31
Seton Falls Park	12
Sherman Creek	10
Shooters Island	49
Siedenburg Park	51
Soundview Park	18
South Brother Island	17
Spring Creek Park Addition	32, 42
Spuyten Duyvil Shorefront Park	11
Staten Island Industrial Park	50
Udall's Park Preserve	19
Van Cortlandt Park	11
Vernam Barbadoes Peninsula	31
Willowbrook Park	50
Wolfe's Pond Park	51

Rapid Site Assessment Checklist

This checklist is used for forest monitoring to align management within the Forest Management Framework by measuring pre- and post-management conditions and evaluating success. Analysis of the checklist data feeds into the health and threat indices for NYC forests.

Site ID: _____ **Park Name:** _____ **Date:** _____

Staff Initials: _____ **Start Time:** _____ **End Time:** _____

Site Impacts	<5%	5-25%	26-50%	51-75%	76-100%	Comments/Suggested Work & General Site Notes:
Dumping/Trash						
Coarse Woody Debris						
Deer Evidence (scat, trails, rubs, herbivory) <input type="checkbox"/> High <input type="checkbox"/> Low						
Wetland Features <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, what kind of feature? _____						
Impervious Surface <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: _____%						
Social Use (party, hang-out vandalism, trails, desire lines) <input type="checkbox"/> Yes <input type="checkbox"/> No						
ATV, Motorized or Un-Motorized Biking <input type="checkbox"/> Yes <input type="checkbox"/> No						

Site: List all species and estimate coverage for each species in the entire site (check one box).

Species Name (Scientific Name)	<1%	1-10%	11-25%	26-50%	51-75%	76-100%	Notes:

Observation Points: All Woody Species

Observation Point #	Species Name (Scientific Name)	< 2cm (Seedling) Tally	MIDSTORY 2-9cm DBH	Invasive Vines Present on MIDSTORY (Tally)	OVERSTORY 10-30cm DBH	31-50cm DBH	51-75cm DBH	>75cm DBH	Invasive Vines Present on OVERSTORY (Tally)



Trail in Marine Park, Brooklyn,
running through one of two remaining
maritime forests in NYC

Notes

1. "How many people reside in urban or rural areas for the 2010 census?," Frequently Asked Questions, United States Census Bureau, accessed April 26, 2016, <http://ask.census.gov>.
2. F. Thomas Juster, et al., *Changing Times of American Youth: 1981–2003* (Ann Arbor: Institute for Social Research, University of Michigan, November 2004).
3. Louise Chawla, "Benefits of Nature Contact for Children," *Journal of Planning Literature* 30, no. 4 (November 2015): 433–52.
4. Netta Weinstein, et al., "Seeing Community for the Trees: The Links among Contact with Natural Environments, Community Cohesion, and Crime," *BioScience* 65, no. 12 (December 2015): 1141–53.
5. "Using Trees and Vegetation to Reduce Heat Islands," United States Environmental Protection Agency, accessed January 30, 2018, <https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands>.
6. David J. Nowak, "Institutionalizing Urban Forestry as a 'Biotechnology' to Improve Environmental Quality," *Urban Forestry & Urban Greening* 5, no. 2 (2006): 93–100, <https://doi.org/10.1016/j.ufug.2006.04.002>.
7. J. P. M. O'Neil-Dunne, S. W. MacFaden, H. M. Forgione, and J. W. T. Lu, *Urban Ecological Land-Cover Mapping for New York City: Final Report to the Natural Areas Conservancy* (Spatial Informatics Group, University of Vermont, Natural Areas Conservancy, and New York City Department of Parks & Recreation, 2014), http://naturalareasnyc.org/in-print/research/urbanecologicalmap_newyorkcity_report_2014.pdf.
8. O'Neil-Dunne, et al., *Urban Ecological Land-Cover Mapping*.
9. O'Neil-Dunne, et al., *Urban Ecological Land-Cover Mapping*.
10. Gregory J. Edinger, Timothy G. Howard, and Matthew D. Schlesinger, *Classification of Natural Areas Conservancy's Ecological Assessment Plots* (Albany: New York Natural Heritage Program, 2016), http://naturalareasnyc.org/in-print/research/nynhp_classification_of_nac_plots.pdf.
11. Helen M. Forgione, et al., "Advancing Urban Ecosystem Governance in New York City: Shifting Towards a Unified Perspective for Conservation Management," *Environmental Science & Policy* 62 (2016): 127–32, <http://naturalareasnyc.org/content/3-in-print/2-research/esp.article.pdf>.
12. D. S. Novem Auyeung, et al., *Reading the Landscape: Citywide Social Assessment of New York City Parks and Natural Areas in 2013–2014* (New York: New York City Urban Field Station, March 2016), https://www.fs.fed.us/nrs/pubs/jrnl/2016/nrs_2016_auyeung_001.pdf.



Successional sweetgum forest
in Alley Pond Park, Queens



Tulip-tree seedlings propagated
at the Greenbelt Native Plant Center,
Staten Island

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Lands and Forests

625 Broadway, 5th Floor, Albany, New York 12233-4250

P: (518) 402-9405 | F: (518) 402-9028 | Landsforests@dec.ny.gov

www.dec.ny.gov

FOR THE RECORD

October 25, 2018

RE: Letter of Support for implementation of the "The Forest Management Framework for New York City"

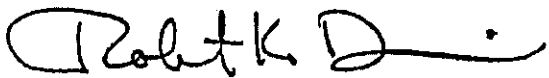
The New York State Department of Environmental Conservation (DEC) is committed to preserving and managing forests throughout the State, including within New York City, where it owns and manages over 100 acres of forest habitat. It also invests approximately \$2.2 million annually to the establishment and maintenance of urban forests.

Throughout the years DEC has also worked very closely with the New York City Department of Parks and Recreation (NYCDPR), the Natural Areas Conservancy (NAC), and other partners to preserve and restore many other natural lands, including forests.

Our urban forests make the City a better place in which to live. They cool the environment, clean the air, capture stormwater, provide homes for thousands of species of plants and animals, and provide quiet, natural spaces for the City's residents to enjoy.

Therefore, we would like to offer support for implementation of *The Forest Management Framework for New York City*, developed by NYCDPR and the NAC, to help ensure the short and long term preservation of the City's forested areas. We especially encourage the plan's call for commitment to science-based management of our urban forests that will ensure high-quality natural spaces for all New Yorkers.

Sincerely,



Robert K. Davies
Director, Division of Lands & Forests
New York State Forester



**New York City Council Committee on Parks & Recreation
Oversight Hearing on Ensuring the Short and Long Term
Preservation of the City's Natural Forest
October 25, 2018
Lynn Kelly, Executive Director**

Good afternoon, my name is Lynn Kelly, and I am the Executive Director for New Yorkers for Parks (NY4P). I would like to thank the City Council Committee on Parks and Recreation for inviting us to speak on this important issue today.

Representing one quarter of our entire City parks system, our 7,300 acres of natural forests provide a critical resource for New Yorkers seeking respite, a connection to nature, and opportunities for active and passive recreation among some of our most precious landscapes. New York's natural forests provide us with a view of our city that predates our dense, urban environment, and for this reason, they also provide us with a vitally important ecological buffer against some of the worst impacts of climate change. We believe the City should ensure the long-term care and preservation of these landscapes, and we are glad to see the Council Parks Committee examining the issue today.

We want to reiterate that the Forest Management Framework, as put forth by the Natural Areas Conservancy and the Natural Resources Group at NYC Parks, has created a clear and concise vision for the conservation and maintenance of these open spaces. We believe the Council and Administration should adopt this framework, and ensure that the 25-year funding plan is incorporated into our City Budget each fiscal year until the funding has been fully allocated. The \$385 million needed to implement the Framework over the coming years may seem like a large investment, but is one that we believe will pay dividends in ecological and public benefits.

With the U.N.'s recent report on climate change, it is clear that our planet, and our city, is at a tipping point. This is a moment, and an opportunity, for today's local leaders to cement a legacy of ensuring the long-term protection of our environment and our residents, and the future New Yorkers yet to come. Our natural forests, if properly maintained and protected, provide ample ecological benefits, from protecting native species of flora and fauna, absorbing storm water, cooling our neighborhoods, and cleaning our air. These benefits can only be provided on the condition that these spaces are able to be properly maintained, and as it stands now, that is not a threshold that the City is able to meet.

Many acres of natural forest are currently struggling with the presence of invasive species, issues of illegal dumping, and poorly maintained trails. Without adequate investment, conditions will

further deteriorate, making these spaces unsafe for public access. There are thousands of acres of natural forests that are located in parks within some of the City's low- and moderate-income communities, and we believe the proactive maintenance of these trails and natural areas constitutes an equity mandate. As an example, for residents of Cypress Hills and Highland Park in Brooklyn's District 37, Highland Park itself represents the only sizeable open space in their neighborhoods, and their Council District. If the natural forests in Highland Park aren't kept clean, safe, and well-maintained, it becomes a barrier to public use, effectively cutting off neighborhood access to the only large park they have.

As this Committee knows, NY4P has repeatedly called on the City to properly invest in its maintenance workforce for our parks. We believe that robust, sustained investments in the funding of essential maintenance and operations positions is an investment toward not only the essential infrastructure of our parks, but our people as well. As such, committed funding to provide for the staff lines needed to implement the Forest Management Framework must not get lost in the larger conversation around parks maintenance funding. Additionally, the ongoing care of these spaces represents an opportunity for partners from parks conservancies citywide to contribute to the implementation of the Framework, as many acres of our natural forests occur in some of our City parks that benefit from the management of a nonprofit conservancy.

We again want to thank the Council for taking the opportunity to examine the state of our natural forests and how they are maintained. This is a crucial step in recognizing the budgetary needs that will keep these spaces held to the highest standard of care - a standard that is science-based, and thoughtful in its approach. Our natural forests are some of the most incredible places in the City, and now is the time to invest in the long-term care and conservation of them.

Thank you very much for the opportunity to speak and I welcome any questions you may have.

###

For over 100 years, New Yorkers for Parks (NY4P) has built, protected, and promoted parks and open spaces in New York City. Today, NY4P is the citywide independent organization championing quality parks and open spaces for all New Yorkers in all neighborhoods. www.ny4p.org

NYBG

New York City Council Committee on Parks and Recreation Oversight Hearing

ENSURING THE SHORT AND LONG TERM PRESERVATION OF THE CITY'S NATURAL FOREST

October 25, 2018

1:00 p.m.

Good afternoon, my name is Todd Forrest, Arthur Ross Vice President for Horticulture & Living Collections at The New York Botanical Garden. I would like to thank the Committee for giving me the opportunity to offer testimony today. The Garden shares Parks' and the Natural Areas Conservancy's commitment to preserving and restoring forests in New York City.

The New York Botanical Garden is a conservation organization and museum of plants with a three-part mission of science, education, and horticulture. The Garden's location in the Bronx was chosen primarily for its 50-acre old-growth forest—the largest remnant of old-growth forest in New York City, long considered by many to be New York City's most remarkable natural area. The Garden has strived to be the best possible steward of this extraordinary natural landscape since the late 19th Century. Today, the Thain Family Forest is an outdoor laboratory where scientists study the impacts of environmental change on forested ecosystems; a living classroom where students of all ages come to learn about forest ecology and ecological restoration; and an oasis for countless New Yorkers who crave a quiet and wholesome connection to nature.

The Garden's long commitment to documenting and preserving local biodiversity began with the first inventory of the flora of the Forest in the late 1890s and continues today with many collaborative and outward-looking projects. Since 2007, we have engaged citizen scientists in regular phenology walks in the Forest in an effort to establish a baseline against which we can compare the impacts of climate change on our native flora. The Forest served as the training and pilot location for NYBG's New York City EcoFlora project, a collaboration among NYBG botanists, colleagues in sister institutions and government agencies, including Parks and the NAC, and citizen scientists to document the complex relationships between New York's plants and the vast array of birds, insects, and other living things that depend on them for survival.

NYBG's Forest is not just a haven for wild plants, birds, mammals, and insects. It has become an invaluable outdoor classroom where New York City school children learn about science and discover the joys of nature. Each year, more than 18,000 students, predominantly from public schools in the Bronx, and more than 1,800 New York City teachers use the Forest for everything from self-guided ecology tours to in-depth curriculum-driven programs. Students participate in several citizen scientist activities including water quality monitoring, surveys of emerging invasive species, and recording plant phenology. Regional high school and university students have partnered with NYBG staff to use the Forest and other natural landscapes at the Garden for more in-depth ecological studies on subjects ranging from assessments of snapping turtle and breeding bird populations to the monitoring of forest canopy gaps and soil seedbanks.

We know from our own research, from the scientific literature, and from our personal experience that even the smallest remnant forest in New York City is an oxygen-producing, storm water-filtering, wildlife-sustaining, soul-lifting miracle that should be protected, restored, and celebrated. Therefore, The New York Botanical Garden wholeheartedly endorses Parks' and the Natural Areas Conservancy in their efforts to secure the resources required for the short and long-term preservation of natural forests in New York City.

Thank you again for this opportunity to testify today.

Contact Information:

Aaron Bouska
Vice President for Government and Community Relations
The New York Botanical Garden
2900 Southern Blvd.
Bronx, NY 10458
(718) 817-8542
abouska@nybg.org
www.nybg.org

Testimony Submitted by
Patricia S. Rafferty, Chief of Resource Stewardship
Gateway National Recreation Area
National Park Service

Oversight Hearing on
Ensuring the Short and Long Term Preservation of the City's Natural Forests

Before the Committee on Parks and Recreation
The Council of the City of New York

October 25, 2018

Good afternoon, I am Patti Rafferty, Chief of Resource Stewardship at Gateway National Recreation Area (Gateway), one of 417 units of the U. S. Department of the Interior's National Park System. Gateway encompasses more than 26,000 acres of recreational lands, woodlands, wetlands and other significant natural and cultural areas. In New York City, Gateway includes the Jamaica Bay and Staten Island Units. Jamaica Bay (in Brooklyn and Queens) is well known as an estuary that provides important habitat for finfish, shellfish, crabs and other marine species. Perhaps less well known are the Jamaica Bay uplands and coastal forests that provide critical foraging and nesting habitat for migrating species of birds along the Atlantic flyway. To date within the Jamaica Bay Wildlife Refuge (the sole wildlife refuge under National Park Service stewardship), NPS has recorded 331 species of the approximately 750 species of birds that occur within the North American continent. These forested uplands are an integral component of the habitat diversity within the estuary. The Staten Island Unit (Richmond County) contains a remnant Swamp White Oak Forest (at Miller Field), as well as substantial forested and shrub-scrub plant communities at Great Kills. The total area of maritime coastal forest

within Gateway's Jamaica Bay and Staten Island Units is approximately 3,500 acres, or 50 percent of the combined upland area of the two units.

I am here to offer the following comments on behalf of Gateway National Recreation Area and its role as natural resource steward of the forested areas of Jamaica Bay and Staten Island Units of the Park, as well as the extensive forested areas under the stewardship the New York City Department of Parks and Recreation and the Natural Areas Conservancy. As a representative of the National Park Service, Gateway National Recreation Area appreciates the opportunity to testify today to support increased investment for the restoration, conservation and management of the City's forests.

New York City Department of Parks and Recreation and the Natural Areas Conservancy are critical partners that have worked with Gateway National Recreation Area for the restoration and management of Gateway's forested habitat. The Million Trees program has been extremely valuable to the National Park Service and served as a catalyst for the restoration of degraded woodlands within Gateway. Through interagency collaboration, common stewardship goals, and combined expertise, New York City Parks, the Natural Areas Conservancy and NPS have developed forest restoration projects that total of about 30 acres at Floyd Bennett Field and Canarsie Pier, Brooklyn; Jamaica Bay Wildlife Refuge, Queens; and Crooke's Point, Staten Island. We view the overall goals of restoring, sustaining, and connecting woodlands as critical to supporting the ecological integrity of the Gateway's vegetative communities. Sustainable woodland habitat is

among our highest priorities to support diverse native wildlife and provide visitor enjoyment.

In addition to ecological values, forests provide important ecosystem services. . Our forests provide an oasis for retreat from the hustle and bustle of the city and an opportunity to observe and engage with nature. Forest also provide oxygen, sequester carbon and reduce local and regional temperatures.

While our forests contribute to human health and wellness, the health of our forests is at risk. In 2016, the Natural Areas Conservancy assessed 1495 acres of grassland and woodland within Gateway at Floyd Bennett Field (Brooklyn) and Fort Tilden (Queens). This study mirrored work that NAC previously completed on 10,000 acres of City parkland. At the NPS sites, 75% of the sampled plots contained invasive vines and dumping was found in 69% of the plots. Two of the five most common understory species were found to be the highly invasive Asiatic Bittersweet (*Celastrus orbiculatus*) and Japanese Honeysuckle (*Lonicera japonica*). The non-native tree of heaven (*Ailanthus altissima*) was found to be one of the five most abundant trees surveyed during this assessment. Information from this assessment is crucial for science-based management of Gateway's grassland and woodland habitats. More recently, Natural Areas Conservancy and NYC Parks have released the "Forest Management Framework" to provide a strategic and comprehensive plan for conservation and management. NPS supports the vision presented in the plan as well as implementation of the plan to improve and protect

the City's forests. Investment in forest management is an investment in the wellbeing of the City's residents.

Gateway National Recreation Area is greatly appreciates the work, foresight and support of New York City Council's Committee on Parks and Recreation, New York City Department of Parks and Recreation, and the Natural Areas Conservancy. We look forward to continued support from the Council and collaboration with many partners involved in the stewardship of our collective forested lands, as well as other important natural park areas.

Thank you for the opportunity to submit this testimony to the Committee.

FOR THE RECORD**Public Testimony****October 25, 2018****New York City Council, Parks Committee****Re: Oversight - Ensuring the Short and Long Term Preservation of the City's Natural Forest****Submitted by Kate Boicourt, Director of Resilience
Waterfront Alliance**

Waterfront Alliance is a non-profit civic organization and coalition of more than 1,000 community and recreational groups, educational institutions, businesses, and other stakeholders. Our mission is to inspire and enable resilient, revitalized and accessible coastlines for all communities. The Natural Areas Conservancy and New York City Parks have been great partners of the Waterfront Alliance. Recently, staff provided important insight on best available science and practices to inform the Waterfront Edge Design Guidelines (WEDG). Further, we have worked together to provide and improve public access to and from NYC's waterfront in all five boroughs.

Investing in our natural resources

"New York City's natural areas – from forests to wetlands and one fourth of the holdings under the jurisdiction of New York City Parks, are critical components of our city's infrastructure. They provide benefits to human health and wellbeing, are home to our city's wildlife, clean our water, reduce urban heat, store greenhouse gases, and reduce risks caused by sea level rise and climate change. Investing in their management and restoration is increasingly important in our growing city in light of these pressures. Up-front investments in ongoing maintenance are an agreed-upon best practice that the Waterfront Alliance supports, and that can not only lead to healthier and more productive natural resources, but to cost savings over time.

Challenges

Our natural areas face a number of challenges that can be solved through targeted investments and sound management. Currently, the agency's natural areas are insufficiently managed due to lack of resources, which are not equitably distributed. This means that people, particularly in low and moderate income neighborhoods, are denied access to opportunities to recreate and support their mental, physical, and emotional wellbeing. These important resources are in need of support and investment soon or they will face decline.

A path forward

Thanks to the Work of the Natural Areas Conservancy and New York City Parks to develop “The Forest Management Framework for New York City,” we now have a clear long-term plan for how to best manage and improve our great natural areas. We encourage you to join in supporting the Natural Areas Conservancy and New York City Parks in asking the City to commit to:

- Investing \$385 million over 25 years for the ongoing restoration, conservation, and science-based management of these important resources
- Supporting the implementation of “The Forest Management Framework for NYC,” the first-ever comprehensive plan for this critical resource, which sets ecological and social targets for all 7,300 acres of NYC’s urban natural forests



Ex Officio
Bill de Blasio
Mayor
City of New York

Melinda Katz
Queens Borough President

Rafael L. Espinal
Council Member

Robert Holden
Council Member

Karen Koslowitz
Council Member

Dorothy Lewandowski
Queens Borough Commissioner
Parks & Recreation

Portia Dyrenforth
Administrator
Forest & Highland Park

Board of Directors

Officers
Michael Palermo
Maspeth Federal Savings
President

Nash Roe
City Underwriting Agency
Secretary

Ivan Mrakovic
Rand Engineering & Architecture
Treasurer

Dr. Rev. David Benke
St. Peter's Lutheran Church
Compliance Officer

Trustees

Salvatore Crifasi
Crifasi Real Estate

Chris Downes
O'Dwyer & Bernstein, LLP.

Diana Gaitan
Campbell and Dawes, Ltd.

Michael Gogtidze
Sterling National Bank

Jeffrey D. Lebowitz
Jaspen Schlesinger LLP.

Joseph Schiltz
Boys Scouts of America

Rodolfo Garcia
TD Bank

October 25, 2018

This testimony is on behalf of the Forest Park Trust, Inc.

We would like to thank the Parks Committee for taking the time to hold this hearing about NYC's forest.

The Forest Park Trust, Inc. is a non-profit organization founded in 1998. We partner with NYC Parks and the community to support, maintain and program Forest and Highland Parks.

You will hear about the ecological importance of healthy urban forests, but what about their effects on our citizens? From Richard Louv's Last Child in the Woods, researchers believe that the loss of natural habitat, or the disconnection from nature has enormous implications for human health and child development. An individual's connection to nature can improve their interpersonal relationships and emotional wellbeing."

In Forest Park, we have 274 acres of "Forever Wild" natural areas to connect to. Sixty four percent of our patrons use our natural areas, compared to the 57% citywide. Visitors are attracted to the park's numerous amenities, such as the Carousel and Golf Course, however, our identity is in the majestic towering oaks, tulip and hickory trees in our beautiful forest.

Up until the early 1990's, our natural areas were plagued with illegal dumping, an unmanaged trail system, erosion, and illegal activities. We also had a plethora of invasive exotic plants creating monocultures and inhibiting native plant regeneration.

(1)

For the last 20 years, The Forest Park Trust, partnering with NYC Parks, procured 1/2 million dollars in grants and council discretionary funding to work on these issues. These funds supported summer staff, research, management guides and maintenance supplies. We have treated 100 acres of forest, created a hiking trail system, planted 16,000 native trees and shrubs and mobilized over 5,000 volunteers.

Permanent staff and funds are needed to keep our forest healthy. Only consistent, year round management is effective in reducing invasive plants and encouraging native plant regeneration. Without treatment, areas can turn into overgrown vine lands, compromising the health of mature native trees.

Council Member Eric Ulrich immediately saw the value of Forest Park's natural areas. Over the last 6 years, with discretionary funds, he helped support a summer forest crew. Most recently he funded the restoration of our historic 1914 pine grove. With his allocation, we were able save this deteriorating forest, restoring and preserving it for future generations to come.

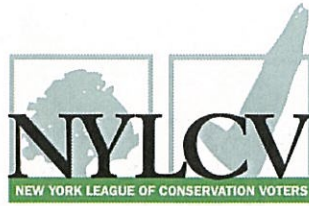
Working with the "Forest Management Framework" program, we have learned that Forest Park is at the tipping point on the forest health scale. The Trust, fully agrees with the NAC assessment and recommendations. We are confident the Forestry Framework protocol will preserve, sustain and improve our forest.

We hope the City Council will support the long term preservation of our urban forests for the city's future, so citizens can experience the full benefits of connecting to a forest in their own backyard.

Thank you.

Sincerely,

Portia Dyrenforth
Ex Officio
The Forest Park Trust, Inc



**Statement of Adriana Espinoza
New York City Program Director
New York League of Conservation Voters
City Council Hearing of the Committee on Parks
October 25th, 2018**

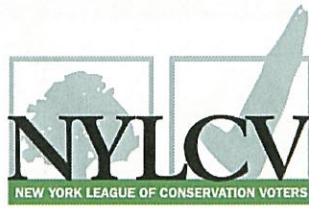
Good afternoon. My name is Adriana Espinoza, and I'm the Director of the New York City Program at the New York League of Conservation Voters (NYLCV). NYLCV represents over 30,000 members in New York City and we are committed to advancing a sustainability agenda that will make our people, our neighborhoods, and our economy healthier and more resilient. I would like to thank Chair Grodenchik for the opportunity to testify before the Committee on Parks and Recreation.

New York City has over 77,701 acres of green space making it approximately 41% green. Nearly 10% of this green space, or 7,300 acres, are under the jurisdiction of NYC Parks. There are over 5 million trees made up of hundreds of species in our natural forests. NYC's forests--one of our city's most valuable environmental assets--provide enormous public benefits. They mitigate climate change, provide clean air, and contribute to the well-being of residents. To illustrate:

- Tree cover can cool down a city by 2 to 8 degrees Celsius.
- When planted near buildings, trees can cut air conditioning use by 30%, and reduce heating energy use by a further 20-50%.
- A single mature tree can absorb 331 pounds of carbon dioxide a year and filter some of the harmful airborne pollutants. On the whole, NYC's trees remove 1,300 tons of pollutants from the atmosphere each year.

Trees are also very valuable to our city's economy. New York City Department of Parks and Recreation measured the economic impact of its trees to be \$120 million a year. Each year, NYC's canopy captures 1.97 billion gallons of stormwater runoff and stores 1.2 million tons of carbon per year.

However, NYC's natural forests are at a critical juncture. Without concerted efforts across the board, it can be challenging to preserve and protect our urban forestry. Between 1984 and 2002 alone, New York City lost 9,000 acres of green open space to competing land uses. Our forests are also under threat as a result of lack of proper maintenance, illegal dumping and invasive species. Investment is needed *now* to ensure we do not find our forests in a crisis. Pushing this investment down the road only guarantees that the work will cost exponentially more and create a generations-long backlog of work. Just like other critical city infrastructure, it's imperative that our forests are kept in a state of good repair. To achieve this, the City should invest \$385 million over 25 years for the ongoing restoration, conservation, and management of our forests.



**Statement of Adriana Espinoza
New York City Program Director
New York League of Conservation Voters
City Council Hearing of the Committee on Parks
October 25th, 2018**

In New York City, the Natural Areas Conservancy is on the forefront of researching our urban forest. This April, NAC and NYC Parks released their Forest Management Framework for NYC--a 25 year roadmap and funding plan for the management of our city's forests. It is the first-ever comprehensive plan for this critical natural resource, and is the result of years of data-driven and science-based research.

NYLCV strongly supports the NAC's efforts to restore and preserve our forests, and urge the City to implement the Forest Management Framework for NYC. We also believe this framework should be adopted as part of the City's OneNYC plan, as it's benefits contribute to the plans existing goals of sustainability, resiliency, and equity. Implementation of the Forest Management Framework is a top priority to NYLCV, and will continue to be a major focus of our advocacy in the coming years.

I'd like to thank Chair Grodenchik and the Committee on Parks and Recreation for their attention to this issue, and look forward to working with you all closely to move ensure NYC has a healthy, thriving forest for generations to come.



FOR THE RECORD

WE ACT celebrates 30 years

Empowering communities to Power Change

Founders

Vernice Miller-Travis
Peggy M. Shepard
Chuck Sutton

October 25, 2018

Board of Directors

Chair
Gregory Anderson

Secretary
Marianne Engelman Lado

Treasurer
Patricia Terry

Members

Charles H. Allison, Jr.
Dennis Derryck, Ph.D.
David Evans, Ph.D.
Eric A. Goldstein, Esq.
Al Huang
Sarangi Iyengar
Jeff Jones
Marianne Engelman Lado
Ken P. Mak
Vernice Miller-Travis
Phillip Morrow
Regina Smith
Dart Westphal

Members of the New York City Council,

WE ACT for Environmental Justice relishes the opportunity to speak on behalf of our urban forests and the residents who cherish them. Ensuring equitable and sustainable land use is a key component of WE ACT's mission, and the preservation of local wild places is a key component of our vision of thriving communities in northern Manhattan and across the five boroughs.

Urban forests combat the linkage between global climate change and urbanization. Our forests serve to blunt the worst effects of the climate crisis through runoff management, urban heat reduction, CO2 absorption, and the scrubbing of toxins from the air in the presence of rapid social and environmental change. Forests fight off dirty urban air pollution that's historical plagued our low-to-moderate income communities and communities of color.

But urban forests also represent our shared natural heritage. They remind us of our connections to the natural world, allow for space to commune with other living things, and offer the refuge of cool and calm. In northern Manhattan, urban wilds are our most cherished features, from the winding trails and hush of Inwood Hill, to the North Woods of Central Park.

Many of us are familiar with the works of conservationist John Muir, who wrote at length about the spiritual nourishment derived from time in natural settings. Muir wrote "Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and give strength to body and soul." Muir got it right, but his words don't tell the whole story. As justice advocates, we are also tasked with looking more critically at the roots of the conservation movement and the intended beneficiaries of efforts to preserve natural spaces. In practice Muir, like many of his contemporaries, held conservation as a mechanism for white supremacy, and his call for conservation coincided with policies that systematically excluded Native Americans, African Americans and women from availing themselves of wild places. We must not let our actions follow the flawed precedent of the 19th and 20th centuries.



Underfunding or neglecting places like Inwood Hill, Morningside, and Highbridge Parks reinforces the notion that nature is reserved for those who can afford to escape upstate. That nature is a luxury and not a right. That it's benefit is for the few. Championing our urban forests shows a commitment to just and equitable conservation principles. It keeps these spaces open for people of all races and income levels to coexist with other living things, relax, and be inspired. It properly recognizes wild places as a human necessity.

For these reasons, we advocate for the City Council and administration hold a strong commitment to just and equitable conservation principles by investing \$385 million to urban forests over the next 25 years.

We thank you for the opportunity to testify, and look forward to engaging with the city council on this crucial issue moving forward.

Sincerely,

Stephan Roundtree

Cynthia Herrera

Environmental Policy & Advocacy Coordinator(s)

WE ACT for Environmental Justice

**West Harlem Environmental Action (WE ACT for Environmental Justice) is a 501(c)(3) nonprofit organization.*

**New York, NY Office: 1854 Amsterdam Avenue, 2nd Floor | New York, NY 10031 | Phone: (212) 961-1000 | Fax: (212) 961-1015
Washington, DC Office: 50 F Street, NW, 8th Floor | Washington, DC 20001 | Phone: (202) 495-3036 | Fax: (202) 547-6009
www.weact.org**

New York City Council
Parks Oversight Committee
Oct. 25, 2018

Dear Councilmembers:

I am the Vice-President of Protectors of Pine Oak Woods, a land conservation organization on Staten Island, and am therefore very familiar with parks and natural areas in that place. However, although I believe our members would endorse my viewpoints, the comments I make below are personal observations, and do not necessarily represent the viewpoints of that organization. I was unaware of this meeting until last night, so please forgive the sketchy nature of my comments.

Although a Brooklyn resident, I have hiked and ambled through natural areas on Staten Island for more than fifteen years. Moreover, for twelve years I have been a trail maintainer on Staten Island and have been involved in the monthly Forest Restoration activities of Protectors, which consist primarily of removing alien woody twining vines from the woodlands.

During that time I have noted considerable improvements in those natural areas, especially in the cleanliness of the trails and attempts to reforest abused areas. At the same time it was obvious that invasive species have overall not been checked, despite a variety of attempts to do so.

In my own mind, I do not believe that the invasion of alien species can be halted, but I do believe that we can and must make the attempt if we are to preserve any variety in the number of native plants that still exist in our woodlands.

On Staten Island my first impression was that alien vines strangling shrubs and saplings were one of the largest problems. Then I observed the invasion of White-tail Deer and the overshadowing spread of Japanese Angelica Trees, both highly destructive of the understory of the forest and the growth of new trees. Then I became alarmed at how Japanese Stiltgrass was spreading along trails in the woodlands, suppressing native growth and in places becoming a meadow-like monoculture.

All these you well know to be serious and as yet unsolved problems. The

Staten Island deer population is one of the worst. I realize that in this case the City is caught between "a rock and a hard place:" between the opinion of a large segment of the public that believes it unethical to harm them and the knowledge that unchecked they do irreparable harm to the diversity of the ecosystem. I have doubts about the ultimate success of the current sterilization program (a large percentage of the young bucks I've seen this year were not tagged), but see it as the only hope for the present and knowing that spring weather was a setback to this year's program, urge that it be continued.

The plethora of invasive plants is I believe far beyond the capacity of volunteers to control, although without continued volunteer participation I see no future hope of success. I urge that more volunteers continue to be recruited and trained to remove invasive plants from the woodlands. The Park Steward program should if possible be emphasized and expanded. My opinion is that had this been started many years ago we could have stopped the spread of plants such as Japanese Stiltgrass and Japanese Angelica Tree that are now out of control.

I suggest that commercial landscapers could be employed to work more generally on controlling invasive plants, not just on specific projects. Trained workers (and I emphasize the word "trained") could range the woodlands year-round employing spot treatment of herbicides in the spring and fall, cutting or pulling Japanese Stiltgrass and Mile-a-minute vine in the summer, and cutting and uprooting twining vines in the winter.

I urge that especial attention be paid to recognizing and eliminating emerging invasive plants before they become an established and expensive problem as have Oriental Bittersweet, Japanese Honeysuckle, Chinese Wisteria, and Japanese Stiltgrass (etc. etc. etc.). And regarding the established invasive plants, I urge that attempts to control them especially focus on eliminating new-found infestations and existing infestations that are small and likely to expand.

I thank the Committee for soliciting my comments and ask that they be included in the record.

Donald F. Recklies



NEW YORK CITY AUDUBON

71 West 23rd St
Suite 1523
New York, NY 10010
www.NYCAudubon.org
212.691.7483

OFFICERS

Jeffrey Kimball
President
Robert Bate
Executive Vice President
Richard H. Fried, VMD
Catherine Schragis Heller
Sarah Jeffords
Lawrence Levine
Vice Presidents
Fredric Spar
Treasurer
Alexander Ewing
Secretary
Harrison D. Maas*
Immediate Past President

DIRECTORS

Seth Ausubel
Karen Benfield
Dianne Benner
César A. Castillo
Christian Cooper
Tatiana Kaletsch
Deborah Laurel
Jenny Maritz
Rachel Quiñones
John Shemilt
Alan Steel
Michael Tannen
Richard Veit, PhD

ADVISORY COUNCIL

Marcia T. Fowle*
James R. Sheffield
Co-Chairs
Oakes Ames*
Richard T. Andrias
Sarah Grimké Aucoin
Claude Bloch, MD
Marsilia A. Boyle
David Burg*
Albert K. Butzel
Cliff Case
Rebekah Creshkoff
Andrew Darrell
Joseph H. Ellis
Andrew Farnsworth, PhD
Lynne Hertzog
Mary Jane Kaplan
Robert J. Kimtis
Lauren Klingsberg
Kimberly Kriger
Janice Laneve
Pamela Manice
Peter Rhoades Mott*
Dorothy Peteet, PhD
Don Riepe
Lewis Rosenberg
David Speiser
Tom Stephenson

*Past President

Kathryn Heintz
Executive Director

Susan Elbin, PhD
*Director of
Conservation & Science*

TESTIMONY TO THE NYC Parks Council Oversight Committee

Kathryn Heintz

Executive Director, New York City Audubon

October 25, 2018

Thank you Council Committee Chairperson Grodenchik and esteemed members of the Committee on Parks and Recreation for holding this important hearing concerning Ensuring the Short and Long Term Preservation of the City's Natural Forest.

My name is Kathryn Heintz, and I am the Executive Director of New York City Audubon. We are a science-based conservation organization whose mission is to protect wild native birds and their habitats across New York City, improving the quality of life for all New Yorkers. We represent 3,000 direct members and supporters. We are an affiliated chapter of the National Audubon Society, and as such, represent an additional 7,000 of its members residing in the five boroughs.

Wild birds representing more than 350 species—almost a third of all the species in North America—live in or pass through New York City each year. NYC Audubon was founded 40 years ago to protect these birds and the fragile natural areas on which they depend. For the past four decades we have actively supported the acquisition, conservation, management and maintenance of forest, often in collaboration with the New York City Department of Parks & Recreation and other government and private not-for-profit stakeholders.

Based on habitat needs for avian species of conservation concern, New York City Audubon strongly supports Ensuring the Short and Long Term Preservation of the City's Natural Forest.

About fifty years after their extirpation from the region and near extinction from North America colonial wading birds returned in the 1970s to nest on forested islands in New York Harbor. Audubon has been tracking the success of these birds in the city annually since 1980 and promoted the acquisition and conservation of the rookeries. NYC Audubon's 1990 Harbor Heron Report and 2001 An Islanded Nature: Natural Area Conservation and Restoration in Western Staten Island, Including the Harbor Herons Region, written with the Trust for Public Land resulted in the identification and acquisition of more than 600 acres of habitat critical to sustaining the population of colonial wading birds.

Another prominent category of birds that is conspicuous in NY City forests is the neotropical migrant songbirds. The arrival by the millions of these birds in our area beginning in April, peaking in mid-May, is met by birdwatchers with eager anticipation. During this period, almost any forested area in the city be can good for observing migrants, but the Ramble in Manhattan's Central Park and much of Brooklyn's Prospect Park are world-class birding hot spots. Hundred of birders show up in these parks with the expectation of seeing 30 or more species. Some of the birds - the Parula, Canada, Bay-breasted, Chestnut-sided, and Black-throated Green Warblers, among others, are exquisite, like colorful tropical fish schooling on a coral reef. Most of these birds are en route between their wintering habitat in South American rain forest and the Caribbean to breeding grounds in northern coniferous forest. New York City contains some forests that are large enough and of sufficient quality that some of the migrants – Scarlet Tanager, Northern Redstart, Red-eyed Vireo, and Eastern Wood Peewee, for example – stay and breed. These include Inwood Hill Park in Manhattan; Alley Pond, Cunningham, and Forest parks in Queens; Pelham Bay, Van Cortlandt, and Riverdale Parks in the Bronx; and Wolfes Pond, Highrock, Bloomingdale, and Arden Heights Woods Parks in Staten Island.

The neotropical migratory songbirds are more than objects of bird-watchers' admiration. They constitute an ecological factor of global significance. The warblers and vireos are formidable predators of forest leaf-eating insects. Western Hemisphere populations of these birds have been declining. Tropical rain forest destruction is implicated as one cause of songbird decline. Another is heavy timber cutting in Canadian forests. Either way, the birds need forests to breed in, forests to winter in, and forests to feed in while migrating. New York City forests provide a vital link in this global ecological process. Wildlife Conservation Society researchers compared the increase of body fat of five species of warblers during stopovers in urban forests in The Bronx Zoo, The New York Botanical Garden, Prospect Park, and Inwood Hill Park with the same species visiting larger more pristine forests in Marshlands Conservancy and Ward Pound Ridge Reservation in Westchester County. Weight gains in urban city parks were comparable to weight gains in rural county parks.

Likewise, colonial wading birds: the Great and Snowy egrets, Black-crowned and Yellow-crowned Night-Heron, Little Blue and Tri-colored Heron, Glossy Ibis, and Double-crested Cormorant nesting in coastal forests around the New York Harbor are big, beautiful, charismatic birds that excite and inspire many New Yorker to notice the nature around them for the first time. The colonial wading birds nesting in the Harbor Herons complex in New York City constitute forty percent of the entire population of these birds in the region including northern New Jersey, Long Island, and Western Connecticut. And as we speak the wading birds are on their way to southern sunny climes where they will spend the winter in the southeast, Gulf of Mexico, Caribbean, and northern South America.

By conserving, restoring, and managing our forests we are not just following the conservation ethos to “act local, think global”; We are also acting locally, regionally, and globally.

References

Appleton, A. and D. Tiemann. 1987. Buffer the Bay. Report for The Trust for Public Land and New York City Audubon.

Blanchard, P.P. and D. Burg. 1992. Buffer the Bay Revisited. Report for The Trust for Public Land and New York City Audubon.

Blanchard, P.P., P. Kerlinger, and M.J. Stein. 2001. An Islanded Nature: Natural Area Conservation and Restoration in Western Staten Island, including the Harbor Herons Region. Published by The Trust for Public Land and New York City Audubon. 224 pp.

Bounds, K. M.J. Feller, J.Greenfeld, M. Heaviland, C. Pregitzer, and T. Wenskus. 2014. Guidelines for Urban Forest Restoration. City of NY Department of Parks & Recreation

Bricklin, R.B., E.M. Thomas, J.D. Lewis, and J.A. Clark. 2016. Foraging Birds during Migratory Stopovers in the New York Metropolitan Area: Associations with Native and Non-native Plants. *Urban Naturalist* 11:1-16.

Feller, M.J. 1994. Forests of New York City. City of NY Department of Parks & Recreation.

Parsons, K.C. 1991. Aquatic Birds of the New York Harbor. 1991 Management Report. New York City Audubon.

Seewagen, C.L., C. Sheppard, E.J. Slayton, and C.G. Guglielmo. 2011. Plasma Metabolites and Mass Changes of Migratory Landbirds Indicate Adequate Stopover Refueling in a Heavily Urbanized Landscape. *The Condor*, Vol. 113, No. 2 (May 2011), pp. 284-297

Seewagen, C.L. and E.J. Slayton. 2008. Mass Changes of Migratory Landbirds during Stopovers in a New York City Park. *The Wilson Journal of Ornithology*, Vol. 120, No. 2 (Jun., 2008), pp. 296-303

Winston, T. 2017. New York City Audubon's Harbor Herons Project: 2017 Nesting Survey Report. New York City Audubon, New York, NY.

**Testimony to the New York City Council Committee on Parks
Hearing on Natural Forest in New York City
October 25, 2018
Mk Moore**

Good Afternoon. My name is Mk Moore and I am the Chairperson for the New York New Jersey Trail Conference, Metro Region.

Since 1920, the New York-New Jersey Trail Conference has partnered with parks to create, protect, and promote a network of over 2,150 miles of public trails and is the leader of the NYS Lower Hudson Partnership for Regional Invasive Species Management (LH-PRISM), of which New York City Parks is one of about 45 participating agencies.

The Trail Conference actively encourages volunteering, preserving and enjoying the 100+ miles of forest trails in NYC Parks throughout all five boroughs. We have encouraged volunteers and participated in NYC Parks events for over 3800 hours in 2018.

I cannot emphasize enough the importance of the care and maintenance of our forests in NYC, and the benefit New Yorkers like myself enjoy because of these beautiful forests.

As a volunteer, I conduct numerous nature hikes every year in our Parks' forests for students, scouts, organizations and average citizens. Our volunteers assist Parks in maintaining trails, removing invasive species and educating the communities about forests and how they enrich our lives.

I have benefited greatly from the research and outreach conducted by the Natural Areas Conservancy and have attended their presentations throughout the City. Their informed approach to NYC Parks' forests and their long-term plans to ensure their City treasures endure for future generations cannot be stated strongly enough.

I have included in my written testimony, photos we have taken of our volunteers at work, nature tours and fun events in our beautiful forests. Often the children in our nature hikes are experiencing the City's forests for the first time and that experience will stay with them for a very long time. All our City's children and adults should never be deprived of the opportunity to experience and enjoy a beautiful and healthy forest in their own City. The next generation of children should be guaranteed City forests.

The health benefits of our forest cannot truly be measured even though the Nature Area Conservancy has comprised a vast amount of empirical data. You can only attempt to quantify the long-term life benefits of the clean air our citizens breathe, the joy and knowledge they gain, and the peace derived from walking from a busy City street into a healthy and invigorating urban forest.

Through my volunteering efforts, I work closely with the fantastic and dedicated men and women of NYC Parks. I have come to know these men and women beyond the person you see in the Park when you go for your walk. I have come to know dedicated professionals that care for our forests beyond their job. I have come to know and appreciate their deep commitment to preserving our forests and parks and making the experience all the more enjoyable for all the citizens of New York. I have come to know their frustration at the volume of work needed to maintain these forests and the limited resources with which they must accomplish this very important work.

Our volunteers are happy to spend their hours working to make the parks a better place for all New Yorkers. However, our common complaint is that we all only have so little time to devote to this passion. Without the great work by the NYC Parks employees to help us, train us and direct us in our volunteering we would not be able to achieve the results that we do. The knowledge shared by all of NYC Parks' partners like the Nature Area Conservancy and then disseminated by NYC Parks, directly affects the volunteer work that we do. I have been in New York City's forests and with the Nature Area Conservancy and seen the truth of their studies with my own eyes.

I am not here today to ask the NYC Council to increase spending for the day to day park activities, **although it is needed**. I am not here today to ask the NYC Council to increase the budget of the NYC Parks, **although it is needed**. I am here today to ask the NYC Council to invest in the long-term future of this City. Invest in the forests of NYC Parks so future generations can enjoy the beauty that we all live with today. Take the long view towards forests and parks in NYC. **Invest today**, once this valuable resource is gone, there is no recovery.

"The Forest Management Framework for New York City"—a 25-year roadmap and funding plan for the management of our city's forests is something everyone here should read and understand. This is not a speculative projection but an informed and factually based plan to preserve, for future generations, what we all enjoy today.

The children and grand-children of these children we take into our City forests today:

- deserve to take the same hikes
- appreciate our forests' natural beauty
- enjoy and benefit from the same experiences
- should not have to learn about our City forests at the Museum of Natural History.

I ask you, the New York City Council, to commit to and invest in science-based management that will save money, and ensure high-quality natural spaces for all New Yorkers.

Volunteers and visitors to NYC Parks' Forests



Elementary school children take a nature tour through the forest.



City Scouts learn about the forest and wildlife and impacts on the environment



Volunteers close desire lines and help preserve our City's forests.



Scouts tour a City Forest and learn about nature.



Volunteers remove invasives, close desire lines and work in the forest.



Tree identification class in a City forest



Volunteers work to restore City forests.



Volunteers working to remove invasive plants and restore damaged trails



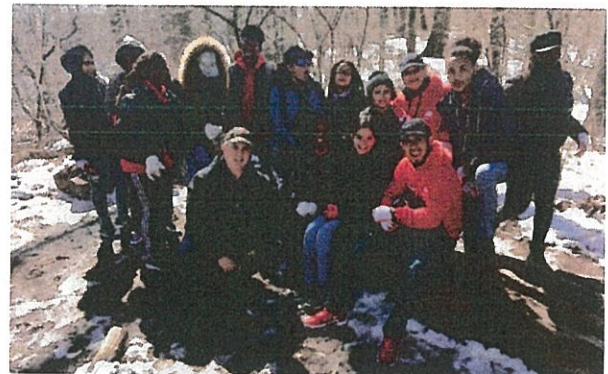
NYC Parks Employees planting trees in a City Forest.



Native plant hike in a City forest



Volunteers closing desire lines and preserving City forests.



Winter hike and trail restoration



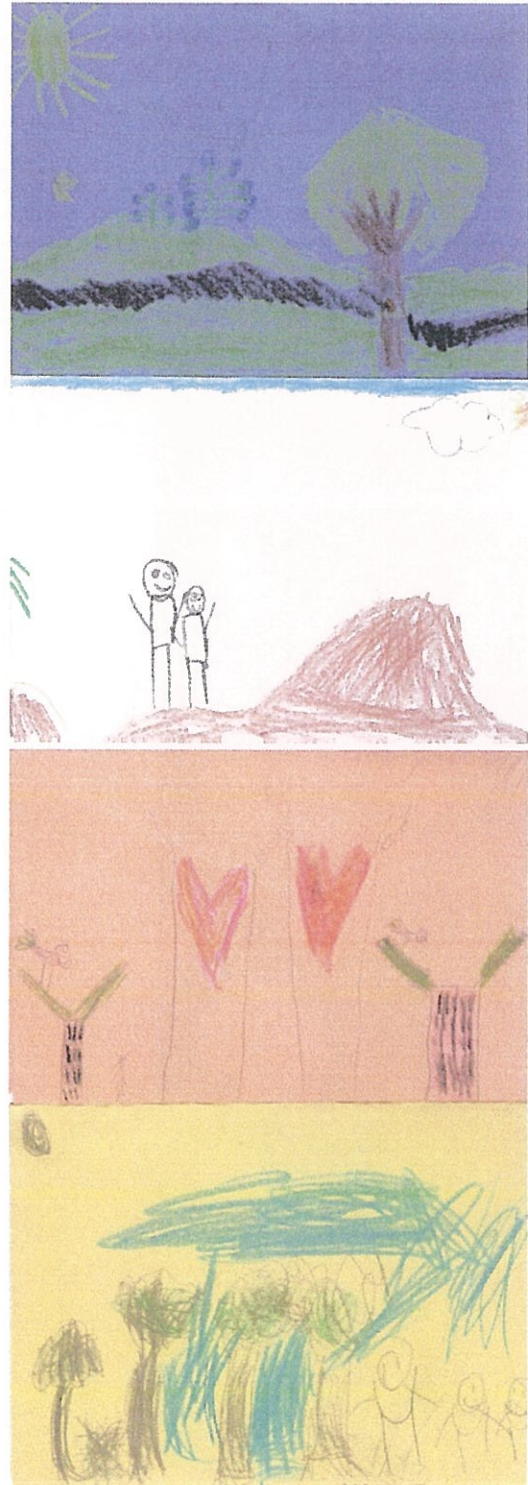
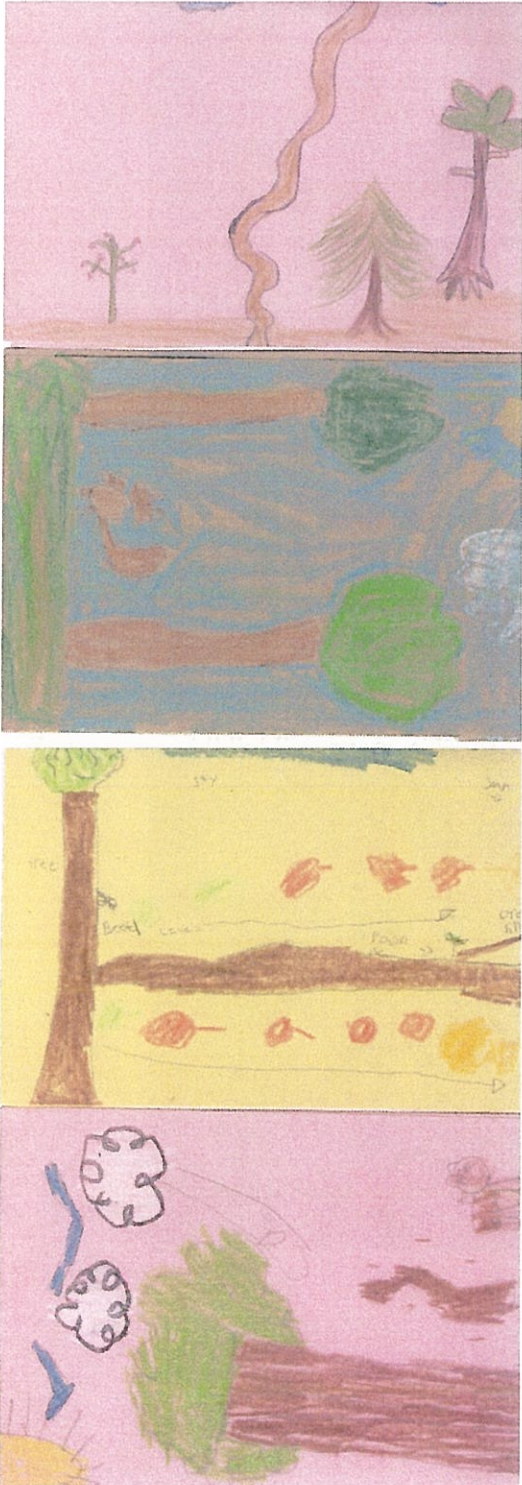
Nature hike in a City forest

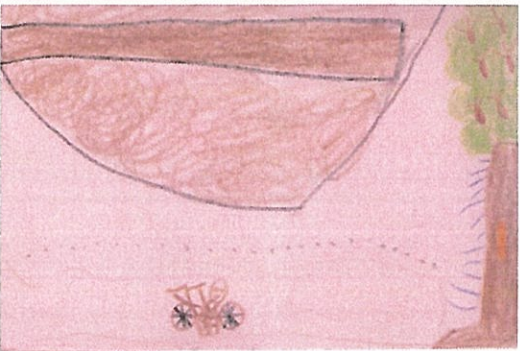


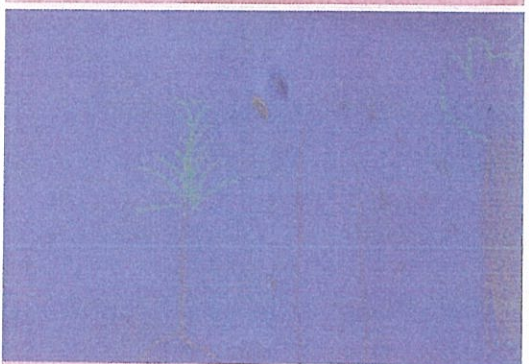
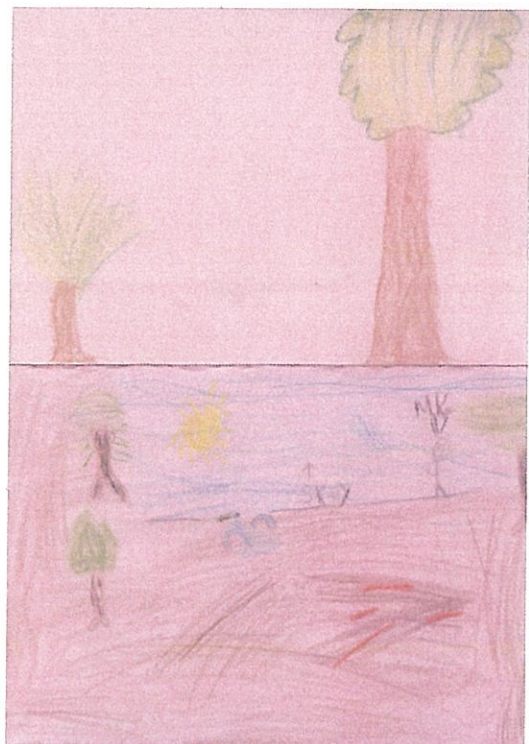
Volunteers mulching trails

The following pages are drawings made by elementary school children after their first hike in a forest. These children did not travel outside the city for this experience, they took a short bus ride to a New York City Park and experienced nature in a way that it should be experienced by school children.

These children were able to draw the forest, because they were in it. All New Yorkers should be concerned that future generations have the opportunity to experience nature in just this way.







My name is Amy Turner. I am the executive director of the NYC Climate Action Alliance, a growing coalition of New Yorkers committed to helping New York City achieve its goal to reduce greenhouse gas emissions 80% by 2050.

Thank you to the New York City Council members who are here today for the opportunity to participate in this important public hearing, and to the Natural Areas Conservancy and the New York City Parks Department for their crucial work in advocating for and protecting New York City's forested areas.

I am here today to express my support for the implementation of all recommendations set forth in the *Forest Management Framework for New York City* released by the Natural Areas Conservancy and the New York City Parks Department in April 2018.

New York City's forested areas are hugely important in mitigating the impacts of climate change. We know that the world is warming, with 17 of the 18 hottest years on record having occurred since 2001. New York City, with its susceptibility to urban heat island effect, will continue to see record high temperatures during the summer. This puts at risk the health and lives of already vulnerable populations. A robust tree canopy is one of the most effective ways to mitigate the urban heat island effect, with data showing that urban forested areas can lower the surrounding air temperature by up to nine degrees, helping protect New Yorkers from the dangerous and potentially fatal impacts of extremely hot temperatures.

In addition, the changing climate nearly ensures that we will continue to experience stronger, wetter and more devastating storms than were previously seen in New York City. Urban planted and forested areas can capture millions of gallons of stormwater each year, filtering pollutants and minimizing the impact on our water treatment system when current infrastructure is overwhelmed by intense storm events.

Furthermore, live trees and plants sequester carbon dioxide from the atmosphere. The 7,300 acres of forested natural areas in New York City parks have the potential to sequester thousands of tons of carbon dioxide each year. Maintaining them is crucial to offsetting some of the carbon dioxide released each year and to mitigating the impacts of climate change. On the other hand, disturbance of these natural areas from neglect or failure to maintain a healthy forest ecosystem would cause the release of large amounts of carbon dioxide currently stored in the forests' trees and plants, further exacerbating the effects of climate change.

While New York City's trees can help protect New Yorkers from the impacts of climate change, I must note that they are also suffering from extreme temperatures and changing weather conditions. The recommendations in the *Forest Management Framework for New York City* include integrating climate-adapted planting palettes into forested areas. Given the many benefits to New Yorkers of urban forested areas – not only those related to climate change but the many others highlighted in testimony today – the City should take all necessary steps needed to protect urban forested areas from the impacts of climate change.

New York City has set laudable goals to reduce the City's greenhouse gas emissions 80% by 2050, to do its part to limit warming to 1.5 degree Celsius over pre-industrial levels, and to grow and develop the City in a way that is resilient and equitable. The role of urban forested areas in achieving each of these goals cannot be overstated. Protecting them is crucial to mitigating climate change and adapting New York City in the face of continuing impacts. The recommendations set forth in the *Forest Management Framework for New York City*, including those to protect urban forests from the impacts of climate change, should be implemented in their totality.

Thank you.



80 VAN CORTLANDT PK S.
Suite E1
BRONX, NY 10463
Tel: 718-601-1460
Fax: 718-601-1574

WEBSITE:
www.vancortlandt.org
EMAIL:
info@vancortlandt.org

Hon. Barry S. Grodenchik, Chair
NYC Council Committee on Parks & Recreation
Councilmembers: Brannan, Borelli, Cohen, Constantinides, Gjonaj, King, Koo,
Moya, Ulrich and Van Bramer

CHAIR
CHRISTOPHER RIZZO

VICE CHAIR
TERESA GRANT STOETH

October 25th, 2018

TREASURER
JESSICA LOESER

Dear Chairperson and Council Members of the Committee on Parks and Recreation

SECRETARY
TOM CAREY

**Re: Testimony for the NYC City Council Parks Committee Hearing:
Oversight- Ensuring the Short and Long Term Preservation of the City's
Natural Forest**

MARCIA ALLINA
SUSAN BALDWIN
ROBERT BARON
HILARY BAUM
PAULA LURIA CAPLAN
PETER KOHLMANN
KAREL LITTMAN
FELICITY NITZ
CAROL SAMOL
WENDY SCHMIDT
ERIC A. SEIFF
DORIS SPENCER
HOWIE WALDMAN
STACEY WIEDER

Thank you for allowing me to testify today on behalf of the Friends of Van Cortlandt Park. My name is Christina Taylor and I am the Executive Director of the Friends and have been working in the Natural Areas of Van Cortlandt Park since 2000. The Friends is an independent community based organization which actively promotes the conservation and improvement of Van Cortlandt Park through environmental education and restoration and enhancement of the Park, its forests and trails. The Friends of Van Cortlandt Park focus the majority of our efforts on the natural areas of Van Cortlandt Park. This focus has evolved over time as we realized that this was not a priority for the New York City Department of Parks and Recreation. We do not blame NYC Parks for not making the Natural Areas a priority as we understand that they have to focus their limited staff and budget on areas such as sporting fields, playgrounds and the perimeter of the Park. However, there is a definite need to make the natural areas more of a priority.

ADVISORY
FRANCES BEINECKE
DENNIS BURNS
ELIZABETH COOKE-LEVY
JON DEVEAUX
MARGOT GURALNICK
HOLLY LEICHT
SUSAN MORGENTHAU
CAROL ROBLES-ROMAN
JANE SOKOLOW
DART WESTPHAL

Van Cortlandt Park is the 3rd largest park in New York City with 1,146 acres. Approximately half of the park is comprised of natural areas with over 500 acres of forest. Unfortunately, the forest of Van Cortlandt Park are not very healthy especially with three highways cutting through the Park segmenting and disturbing the forest. According to the Master Plan for Van Cortlandt Park which was released earlier this year: "At the current rate of expansion without increased management, Norway Maples will dominate another 50 acres by 2032, killing the understory and preventing the succession of the native forests." Norway Maple are non-native species of trees that currently dominate 130 acres of our forests. In addition, the Master Plan states that "At the current rate of expansion without increased management, 30 acres of forest will be killed by invasive vines by 2032". Both these statements are cause for alarm and need to be addressed.

EX-OFFICIO
HON. ANDREW COHEN
HON. RUBEN DIAZ, JR.
HON. JEFFREY DINOWITZ
HON. ELIOT ENGEL
HON. JEFFREY KLEIN
IRIS RODRIGUEZ-ROSA

In total, there are 7,300 acres of natural forests under the jurisdiction of NYC Parks which represents $\frac{1}{4}$ of the agency's holdings. Natural forests are important for many reasons- they cool our city, clean our air, capture stormwater, provide habitat for wildlife and provide a place for New Yorkers to connect with nature.

The Friends of Van Cortlandt Park work closely with NYC Parks and the Natural Areas Conservancy to help maintain the natural areas of our park. We know that many other park conservancies, partners and volunteers contribute to the management of forests in individual parks. However, even with this extra support, NYC's natural forests are insufficiently managed due to lack of funding for NYC Parks and its partners. We are joining with New Yorkers for Parks to ask the City to invest \$385 million over the next 25 years for the ongoing restoration, conservation and management of our forests. The City should implement "The Forest Management Framework for NYC" that was recently developed by Parks and the Natural Areas Conservancy.

Our natural areas are at a tipping point. They are threatened by invasive plants, garbage dumping and lack of management. They need continual investment or they will decline in quality. New York City's forests are at risk of losing diversity that, once lost, can never be regained.

We are committed to doing what we can to improve and conserve the forests of Van Cortlandt Park but we need the City to step up what it is doing because we cannot do it alone.

Sincerely,

Christina A. Taylor

Christina Taylor

Executive Director

Thank you Chairperson Grodenchik and Committee members for holding this important hearing for ensuring the Short and Long Term Preservation of the City's Natural Forest.

I am Margot Perron, President of Van Cortlandt Park Conservancy and Van Cortlandt Park Administrator for New York City Parks & Recreation.

Van Cortlandt Park Conservancy's mission is to sustain and enhance the park as a vibrant destination for recreation, leisure, and the enjoyment of natural landscapes. We provide educational and cultural programming as well as staffing to enhance the park's forests, fields, and ball fields.

Just a subway, bus, or bike ride away for millions of New Yorkers lies a dense hilly forest containing 150 year old trees. Wildlife recorded on this site include red fox, eastern coyote, southern flying squirrel, great-horned owl, red backed salamanders and wild turkey. At 1,146 acres Van Cortlandt is the third largest city park. Over half of that area – approximately 600 acres – is forest with an estimated 80,000 trees. Plant and animal diversity here is especially high because it is attached to the mainland with numerous ecological corridors – Henry Hudson and Sawmill Parkways, The Croton Aqueduct, Tibbets Brook, and the old Putnam Railroad line –that all reach like tendrils to less urban areas to the north.

One of the beneficial ecosystem services I'd like to discuss is Experience.

- Hundreds of thousands of high school and college athletes come to Van Cortlandt Park every year to run on its undulating, sylvan, hundred-year-old landmark cross country trail. (If you didn't run in this forest, you probably know of someone who did.)
- Started in 2012, Urban Ecology Teen Internship is a year-round paid internship program for students from Bronx-area public and parochial schools. The program provides local underserved high school students the opportunity to succeed in their first college experience while concurrently working in the field alongside the park's natural resource management professionals.
- On Saturday mornings NYC Audubon experts lead walks for birders of all levels of experience exploring 30 miles of trails. Over 200 species of birds make their homes in Van Cortlandt Park and we want you to see them all!

These are all great experiences to be had in Van Cortlandt Park.

There is a growing body of medical research providing quantified evidence of the physical health benefits derived from time spent in the forest. Hiking, sauntering, or even just sitting in the forest – sometimes referred to as “forest bathing” – provides the following measurable health benefits:

- Lower blood pressure;
- Decreased dopamine and adrenalin associated with fight or flight response;

- Diminished negative mood states e.g. anxiety, anger, depression;
- Decreased rates of asthma, heart disease, stroke and diabetes;
- Increased blood levels of Natural Killer cells (these are white blood cells that provide the first order immune system rapid response); and
- Increased attention

What's unique to Van Cortlandt is that in 2006, when 35 acres of parkland were converted for the construction of a water filtration plant mitigation funding made possible the creation of the Croton Forest Management Program, including a Van Cortlandt Forest Restoration Crew. This funding from NYC Depart. of Environmental Protection, provided an invaluable opportunity to create a management plan for the park's natural areas.

The basis of the plan is a 20-year comparative study, the first of its kind in the nation, that surveyed the entire park to obtain information about how its natural areas have fared since a 1986 study. One positive discovery was that the forests had matured and further closed their canopies. Negative trends also became apparent. The acreage covered by invasive vines such as Oriental bittersweet and porcelainberry and the presence and dominance of the invasive Norway maple tree increased throughout the park, and other invasive species, such as garlic mustard and mile-a-minute vine, arrived and have been spreading rapidly. Additional problems such as soil compaction and degradation have also worsened. Initial funding for the forest restoration crew was critical for the efforts to stem and reverse the trajectory of decline and to document changes, but that funding expired in Summer of 2015.

Sustainable urban natural areas require a healthy ecology as well as healthy financial support. New sources of support are needed to complete the task of reversing forest decline, and for necessary ongoing maintenance into the future.

Thank you for this hearing and the opportunity to testify on the broad and essential benefits of forests in the urban setting.

**Testimony for NYC Council Parks Committee Oversight Hearing
Ensuring the Short and Long Term Preservation of the City's Natural Forest
Emily Nobel Maxwell, NYC Program Director, The Nature Conservancy in New York
October 25, 2018**

Good afternoon, Chairperson Grodenchik, and members of the Committee on Parks & Recreation. My name is Emily Nobel Maxwell and I am the director of The Nature Conservancy's New York City program. Since 1951 our more than 600 scientists, located in all 50 U.S. states and more than 70 countries have been working to conserve the lands and waters on which all life depends. Here in New York City, we have over 35,000 members and have had an active local program for five years. The Nature Conservancy's New York City Program promotes nature and environmental solutions to enhance the quality of life for all New Yorkers. We advance strategies that create a healthy, resilient, and sustainable urban environment and are committed to improving New York City's air, land, and waters that sustain and support the people and nature of this great city. I am here today to discuss the critical need for ongoing investments in the care, management and restoration of NYC's natural forests.

In the last 4 years, The Nature Conservancy has planted over 30,000 trees in our coastal maritime forests in collaboration with Natural Areas Conservancy, National Park Service, and Jamaica Bay-Rockaway Parks Conservancy at Jamaica Bay Wildlife Refuge (Federal property) and Marine Park to enhance climate resilience, recreational access and wildlife habitat. We also are increasingly involved in activities to protect and steward neighborhood trees, namely in Gowanus.

Trees play a crucial role in the life of NYC. Forests are essential for adapting and building resilience in a climate changing world. They capture carbon, thus helping the city advance greenhouse gas emissions reduction targets. Trees also mitigate urban heat island impacts by cooling and shading our communities and they absorb stormwater. Thus, they help our residents endure extreme weather events including heat waves and rain events, which are increasing in both number and intensity. In the coming decades, this role is even more significant. By 2080, the frequency of heat waves is expected to triple and we expect 1.5 times more extreme precipitation events. Surfaces shaded by trees may be 20-45 degrees cooler than peak temperatures of unshaded lands.

Intact forest systems also provide valuable habitat for species of all kinds, including migrating birds, which in turn makes the experience of a sense of wonder possible for those who may enjoy these forests. Natural forests, if well-managed for access, provide important opportunities for New Yorkers to experience nature locally for both education and recreation, which contributes to the health and wellbeing of our communities. Nature provides quantifiable health benefits, reducing levels of asthma and heat-related illness. Importantly, trees measurably enhance mental health and wellbeing. Studies show that access to green space improves educational outcomes in schoolchildren, reduces anxiety and depression, and enhances social cohesion. Limited management of forests and support for trails denies people—many in low and moderate-income neighborhoods—new forms of recreation and opportunities for physical wellbeing. Improved opportunities for the enjoyment of nature contribute to mental and emotional wellbeing and should be made available to all New Yorkers.

While today we are talking about City-owned natural forests, it should be noted that this asset sits in a larger context. Nationwide, urban forests and all their benefits are literally losing ground. Here in



New York Office
322 8th Avenue
16th Floor
New York, NY 10001

Tel (212) 997-1880
Fax (212) 997-8451

nature.org/ny

New York City, although the past decade saw an unprecedented and laudable investment of public and private funds in trees through the now-completed *MillionTreesNYC*, municipal planting and maintenance budgets are forecast to drop in 2021. Per an analysis conducted for The Nature Conservancy by HR&A Advisors, after 2021, annual tree-related capital commitments may drop from \$21 million to \$7 million. With the end of *MillionTreesNYC*, the City's capital commitments to tree-related projects (\$20 million per year) were set to decrease drastically in fiscal year 2018. In June 2017, the de Blasio Administration launched the commendable *Cool Neighborhoods* initiative, which commits \$106 million to tree-related projects to reduce heat vulnerabilities primarily in the South Bronx, Northern Manhattan, and Central Brooklyn. This additional funding is set to expire in 2021, after which capital commitments for trees may return to a baseline of \$7 million per year. These circumstances could put NYC's trees at risk.

Without ongoing vision, commitment, a strategic plan, and an active constituency, all of which require dedicated, long-term resources, recent gains in the size, health, and distribution of NYC's urban forest could be squandered. And many neighborhoods will continue to lack trees and the benefits that trees provide, such as stormwater management, heat mitigation, and improved wellbeing and mental health. The Forest Management Framework for NYC's natural forests serves as this vision for one critical component of our urban forest, City-owned natural forests, and we recommend that it be adopted now while a complementary plan for the whole of the forest in NYC must also be developed.

In 2012, the Natural Areas Conservancy (NAC) was founded to protect, restore and manage these vital lands in collaboration with The Department of Parks and Recreation (DPR) and other city stakeholders. Their commendable efforts, alongside many partners and other conservancies, help improve the 7,300 acres of natural forests, containing more than 5 million trees, which comprise ¼ of DPR's holdings. In April 2018, the NAC and DPR released "The Forest Management Framework for New York City"—a 25-year roadmap and funding plan for the management of our city's forests (naturalareasnyc.org/forests). This important, science-based report highlights the fact that NYC's natural forests are at a tipping point, threatened by invasive plants, garbage dumping and lack of management. Dedicated, long-term investments are needed now in order to ensure that we do not find our forests and subject them to a costly, generational backlog of work. Without these investments, New York City's forests are at risk of losing diversity that, once lost, cannot be regained.

The Nature Conservancy supports the City investing \$385 million over 25 years for the ongoing restoration, conservation, and management of our natural forests. This investment in science-based management will save money, leverage private investments, and ensure high-quality natural spaces for New Yorkers. It will also ensure that NYC remains a global leader in the field, modeling the way for other cities to follow at a time when municipal leadership is more important than ever.

In closing, The Nature Conservancy supports the implementation "The Forest Management Framework for NYC" developed by NAC and DPR as the first-ever comprehensive plan for this Parks Department owned natural forests. It sets ecological and social targets and a clear course of action for this critical asset that contributes to climate change resiliency, quality of life, and recreational benefits for communities. Thank you for the opportunity to testify.



United States
Department of
Agriculture

Forest
Service

New York City
Urban Field Station
Fort Totten

Mailing address:
290 Broadway, 26th Floor
New York, NY 10007

October 25, 2018

New York City Council
Parks Committee Oversight Hearing
Barry Grodenchik, Chair
250 Broadway, 14th Floor Committee Room
New York, NY 10001

Re: Testimony on 'Ensuring the Short and Long Term Preservation of the City's Natural Forest'

Dear Parks Committee Members,

We are writing on behalf of the USDA Forest Service as research scientists working out of the New York City Urban Field Station. As such, we would like to acknowledge the critical work that NYC Parks and the Natural Areas Conservancy (NAC) do each and every day on behalf of the city's natural areas and our communities.

The USDA Forest Service is a multi-faceted agency that manages and protects 154 national forests and 20 grasslands in 43 states and Puerto Rico. The agency's mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. Today, as the U.S. population is over 80% urban, we find that urban landscapes are in need of the same stewardship and restoration, and our calling to care for the land and to serve the people applies just as strongly in urban areas.

In New York City, we have been fortunate in our long-standing partnership with NYC Parks and the NAC. Our partnership embodies a shared belief in conducting resource management based on sound information and in collaboration with local land managers, stewardship groups, and residents. Over the years, we have worked with NYC Parks and the NAC to assess the ecological condition and social value of the city's natural forests and to create STEW-MAP, a citywide stewardship map of all the civic groups that are involved in caring for the environment. STEW-MAP demonstrates the crucial role of both public agencies like NYC Parks, as well as private nonprofit organizations like the NAC, and hundreds of grassroots civic groups in managing urban ecosystems – including natural forests. We commend NYC Parks for their collaboration with the NAC and recognize the work that the NAC is doing to enhance the capacity of other conservancies and “friends of” park groups citywide. This work is truly strengthening the network of environmental stewards.

Our work as Forest Service research scientists builds on a legacy of studying recreational use and forest ecosystem dynamics in our national forests. The city's natural forests are often like their rural cousins, but there are distinct differences. The natural forests of New York City require different management and care than the city's street and park trees. The city's natural forests are valuable, not because of the products we can extract from them but for the ecosystem services –including cultural ecosystem services, such as aesthetics and recreation they provide the city's residents. Proper care and management of these forests in the city is essential to preserve the social value of these places. Healthy, well-managed forests provide more and better ecosystem services, are more accessible to visitors, and are more beautiful.

New York City's natural forests are an important type of greenspace providing unique nature benefits within the urban context including supporting local flora and fauna, nature-based recreation and opportunities, and specific human health benefits linked to spending time in nature. In NYC there are more than 10,500 acres of natural forest which represent 5% of total land area, nearly 25% of all parkland, and more than 70% of total natural area in the city. These forests provide a disproportionate amount of the ecosystem services to the city. Of the estimated 6.9 million trees in NYC, approximately 3.3 million are found in the city's natural forests.



Caring for the Land and Serving People

Printed on Recycled Paper



In a recent social assessment of natural forests, we found that these areas are highly social spaces that support an important number and range of activities that are beneficial to human beings. Specifically, we observed not only walking, hiking, and nature recreation, but also other practices that strengthen well-being through artistic expression, personal reflection, memorialization, and spirituality. Particularly in natural areas, visitors cited the importance of connecting with nature and the outdoors and experiencing refuge from the harsher elements of the city. These parks and forests are crucial local environmental assets that are integrated into New Yorkers' daily lives; our social assessment found that 69% of park users studied visited these sites on a daily or weekly basis. For many New Yorkers, their nearby natural forest amounts to their only nature experience; 19.8% of NYC park users interviewed said that they go "nowhere else" to recreate in the outdoors.

The recently released forest management framework is based on a comprehensive ecological assessment of the city's natural forests. Prior to this assessment we lacked systematic knowledge about these forests, their health, condition, and management needs. We now know that 82% of the mature trees are native but only half of the young trees that will replace them are native. This suggests a need for intervention to ensure that these forests are not taken over by exotic invasive species.

The ecological assessment has shown that the city's natural forests harbor high biodiversity and provide habitat for native flora and fauna, but that they are also vulnerable to the many stressors of an urban landscape. Urban environments have altered temperatures and precipitation, invasive flora and fauna, environmental contamination, both atmospheric and terrestrial (e.g. elevated CO₂, ozone, N-deposition, heavy metal loads), as well as direct and indirect human activity, all of which can alter the function and structure of the forest. While these drivers are not unique, they are exacerbated in urban systems. In combination, these factors necessitate targeted management frameworks to enhance the resilience, health, and productivity of New York City's natural forests.

For the first time in its history, New York City has the information to make comprehensive, science-based management decisions about its natural forests. This information is just as detailed and rigorous as the information we use to manage our national forests. The forest management framework takes advantage of this new knowledge and outlines a plan that will ensure that the city's natural forests will continue to cool the city, absorb storm water, reach their potential to absorb greenhouse gases, and provide access to nature for the people in the city.

Through this work, we've found that sound land management can achieve more than a healthy and vibrant urban forest but can result in improving the health and well-being for city residents. We applaud the tremendous work that NYC Parks and the NAC have already accomplished in producing a forest management framework for the city's natural forests. We stand committed to continuing our collaboration with the city's natural resource managers, policy-makers, researchers, and residents. We look forward to working 'shoulder to shoulder' with our colleagues to improve the health of the city's forested areas as a benefit to the larger ecology of our region and the well-being of local residents.

Please do not hesitate to contact us for more information.

Sincerely,

Richard A. Hallett, PhD
Research Ecologist
rhallett@fs.fed.us

Michelle L. Johnson, PhD
Research Ecologist
michellejohnson@fs.fed.us

Lindsay K. Campbell, PhD
Research Social Scientist
lindsaycampbell@fs.fed.us

Erika S. Svendsen, PhD
Research Social Scientist
Team Leader, NYC Urban Field Station
esvendsen@fs.fed.us



New York City Council
Committee on Parks and Recreation
Hearing – October 25, 2018
“Ensuring the Short and Long Term Preservation of the City’s Natural Forest”

New York Restoration Project:

New York Restoration Project (NYRP) applauds NYC Parks and the Natural Areas Conservancy for undertaking such rigorous and timely analysis of our city’s forests. We are deeply excited and motivated by the vision outlined in the *Forest Management Framework* and hope that the City will do everything within its power to support NYC Parks and other practitioners in delivering the steps outlined to achieve optimal ecological and recreational outcomes in our city’s forests.

While the *Forest Management* report highlights the remarkable natural resources of our urban forest, it also acknowledges that there is an impending crisis in the quality of our forests, which will only be compounded by growing threats from climate change and invasive species. Between 1979 and 2000 the Eastern U.S. net loss of forest was greater than 3.7 million hectares, an area larger than the state of Maryland, while recent research suggests that, on average, U.S. cities lose about 36 million trees each year because of changes in land use. This dramatic loss of forest is partially driven by rapid urbanization, and creates an opportunity for New York City to demonstrate that forests can be protected and integrated into urban ecosystems.

NYRP has been working to restore neglected natural areas in New York City since our founding in 1995 and has seen first-hand the transformative impact safe and well-managed forests can have on communities. We were very pleased to see the NAC and NYC Parks approach this framework from both an ecological and social lens because we have long believed that any approach to land management in New York City must center on both physical and social resilience. When managed effectively, our forests provide environmental and public health benefits including cooling our neighborhoods, supporting biodiversity, sequestering carbon, and improving storm water management. Critically, a well-managed forest is safer and more inviting, creating opportunities for environmental stewardship, education, and recreation; opportunities that NYRP believes are the right of every New Yorker.

NYRP sees many opportunities for our city’s active conservancy network to help apply the framework as part of our parks management processes. For example, the Framework calls for reducing the proportion of invasive species down to under 10% in natural areas and for promoting ‘healthy natural regeneration and biodiversity and the growth of native trees.’ For over 20 years, NYRP has been working in close collaboration with NYC Parks to remove invasive species in Highbridge Park, and restore native species such as the American Chestnut. The framework provides groups such as NYRP an important set of tools for planning and evaluating our work in concert with forest managers across the city.

The Framework also calls for increased focus on programming, volunteer stewardship, environmental education, and workforce training - all of which are central to NYRP’s approach to land management.



NYRP's community volunteering programs in Northern Manhattan and the South Bronx have been hugely popular and could certainly be extended to other networks. Last year, we reached over 10,000 young people through our *Nature in My Neighborhood* program, which exposes students to six different ecosystems along the Harlem River. This landscape has also been the foundation for a 20-year AmeriCorps program, which has added so many locally connected experts to our City's land management workforce. We see a great and growing appetite for community programming that combines environmental education and cultural activities. These programs forge profoundly strong connections between neighbors and their natural spaces.

While this report give tremendous insight on our city's natural areas, we also feel it is important for this Committee to continue exploring ways to improve the ecology and connectivity of our neighborhoods. MillionTreesNYC was an incredible step in the right direction, but we need to continue investing in our urban tree canopy, green infrastructure, and coastal resilience. NYRP continues an active program of Tree Giveaways each year as a legacy of Million Trees and we see great opportunities to continue that work in order to support environmental engagement and grassroots stewardship.

NYRP thanks our leaders at NYC Parks and the NAC, particularly Commissioner Silver and Sarah Charlop-Powers, and of course, our dedicated Committee members. We stand ready to support this vision in whatever way we can.

Testimony of Eric W. Sanderson, Ph.D. (Ecology)
New York City Council's Committee on Parks and Recreation
Hearing: "Ensuring the Short and Long Term Preservation of the City's Natural Forest"
October 25, 2018

Grodenski
Good afternoon, and thank you to Chairman ~~Grodenski~~ and to the committee for holding this hearing.

My name is Eric Sanderson. I'm a senior scientist at the Wildlife Conservation Society, a board member of the Natural Areas Conservancy, and the author of "Mannahatta: A Natural History of New York City." I'm also a resident of City Island, in the Bronx. (Hello Councilman Gjonaj.) I came here to give testimony about the historical ecology of New York City as it bears on our modern efforts to conserve and manage the city's natural forests.



Lower Manhattan in 2009 and 1609, Mannahatta: A Natural History of New York City (Abrams, 2009)

I would like to make three brief points. First, though we think today of forests being embedded within the city, I would like to suggest that rather we see **our city as embedded in a forest**. We are a forest city, a city of trees as much as buildings, streets, and people, and have long been so (Sanderson 2009; Peteet et al. 1994).

As the images shown here indicate, for most of the last 10,000 years, since the retreat of the glaciers, this landscape has been forested. Forests created the soil under our feet. Forests created habitat for the Native Americans who lived here for 8,000 years before Henry Hudson arrived, and for the animals that the Dutch colonizers came to exploit. Forests created the freshwater streams, 66 miles of which once coursed through Manhattan, and the 514 miles that existed city-wide. Forests as much as Dutch

chutzpah or nineteenth century industrial might, made the city. I think we owe a bit back in how we take care of the remnant forests we have left.

Second, at the time of Henry Hudson's arrival in 1609, there were seven different kinds of forests on Manhattan, including the forest of City Hall: previously a sterling example of Coastal Appalachian Oak-Hickory-Chestnut forest. Our research through the Welikia Project suggests that city-wide there may have been as many as 20 different forest types 400 years ago.

I find it useful to imagine these forest types as a kind of neighborhood, as distinct from one and another as Astoria is from the South Bronx, or Riverdale is from Canarsie. Each forest had its own cast of characters – plants and animals – and each one held a unique and indelible place within the landscape of the city. **We need to conserve them with this diversity in mind.** This is the idea behind the concept of ecological representation, which is a fundamental idea in biological conservation (Akçakaya et al. 2018; Olson et al. 2001).

Third, a critical reason we need to conserve forests in the city is to maintain these natural examples of strength, diversity, and resilience. **Nature gives us clear, locally-adapted, inspiring examples** to teach from, to reflect upon, and to give us hope. Forests may or may not make anybody any money, but they do make life worth living.

These values are recognized in the New York City Nature Goals that some of my colleagues have mentioned today. Conserving natural forests hits targets related to managing natural areas, providing safe access to nature, and engaging the city's young and old in learning about and caring for our city (NAC et al. 2016). Forests provide value that can be shared by all for generations to come.

References cited

- Akçakaya, H. R., Bennett, E. L., Brooks, T. M., Grace, M. K., Heath, A., Hedges, S., ... Young, R. P. (2018). Quantifying species recovery and conservation success to develop an IUCN Green List of Species. *Conservation Biology*, <https://doi.org/10.1111/cobi.13112>
- Olson, D. M., et al. (2001). Terrestrial Ecoregions of the World: A New Map of Life on Earth. *BioScience*, 51(11), 933–938. [https://doi.org/10.1641/0006-3568\(2001\)051\[0933:TEOTWA\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2)
- Natural Areas Conservancy et al. (2016). New York City Nature Goals 2050. New York City: Natural Areas Conservancy, New York. <http://www.naturalareasnyc.org/goals>
- Peteet, D. M., Daniels, R., Heusser, L. E., Vogel, J. S., Southon, J. R., & Nelson, D. E. (1994). Wisconsinan Late-glacial environmental change in southern New England: A regional synthesis. *Journal of Quaternary Science*, 9(2), 151–154. <https://doi.org/10.1002/jqs.3390090209>
- Sanderson, E. W. (2009). *Mannahatta: A Natural History of New York City*. New York: Abrams. Illustrations by Markley Boyer.

New York City Council Committee on Parks and Recreation
October 25, 2018 Hearing on Ensuring the Short and Long Term Preservation of the City's Natural Forest
Statement of Elizabeth W. Smith, President & CEO of the Central Park Conservancy

Thank you to the Committee and its steadfast Chair, Councilman Grodenchik, for the opportunity to add our voice on this important subject.

We know that great cities need great parkland, and that great parkland needs great management. This is true whether that parkland is entirely manmade like Central Park, or the natural areas that are being discussed today.

That is why we are so excited to see "The Forest Management Framework for NYC" that the Natural Areas Conservancy and NYC Parks have produced. This Framework provides the first comprehensive roadmap for the 7,300 acres of New York City's urban natural forests. It sets specific targets and suggests costs and possible funding sources for each. It will allow the City to bring more of its parkland up to a state of good repair and increase opportunities for natural recreation in neighborhoods that need it most. By moving from a model of targeted interventions to a more science-based and holistic approach, the Framework can help to ensure that the work undertaken is done with as much economic efficiency and social impact as possible.

At the Conservancy, we have seen first hand the value of this sort of strategic approach to parkland management. Since our original Management and Restoration plan in the 1980s, we have invested more than \$1 billion in restoring and enhancing Central Park. Now that the restoration of the Park has been largely completed, we must turn to its sustainability – the return on investment of that restoration. Our focus is on the ongoing costs of maintenance, and, most saliently, the quality of the experience of the Park for all users. Ensuring that the Park is managed so that everyone can safely enjoy this iconic public space is critical to the Conservancy's mission and Central Park's future. That is why, each day, we rededicate ourselves to the role of providing, as Central Park designer Frederick Law Olmsted envisioned, a "tranquilizing and restorative" antidote to the ever-intensifying pressures of urban life.

At a time when city populations are rising, and opportunities for escape and respite are vanishing, we can ill afford to let any of our parks – manmade or natural – go unsupported, unused or, most importantly, unmanaged. I thank you for dedicating time to this vital topic and urge you to invest in further action.



Friends of the High School for environmental Studies

444 West 56th St, NY, NY 10019

212-262-8113 ext 4320

To the Members of the City Council Parks Committee,

I am a teacher at the High School for Environmental Studies (HSES) in Manhattan and a board member of the Friends of the High School for Environmental Studies. At HSES we have been training urban environmental leaders since 1992. Central to this mission is instilling in our students an understanding of the ecology of New York City, including both the built and natural environment. For the past 26 years our students have worked with the Natural Resources division of the Parks Dept to play an active role in studying and maintaining parks around the city, including especially the natural forests in parks like Inwood Hill Park and Van Cortlandt Park. Many others will testify today on the environmental benefits of urban forests, which are significant, but I want to highlight the critical educational role that these forests play for thousands of students in New York every year. In order to study forest ecosystems, and how these ecosystems interact with our more familiar urban landscape, we can simply take a walk or take a subway. We can develop in our students a lifelong understanding of ecology and sense of belonging in a natural area by taking simple field trips to parks around the city.

Many of our graduates have gone on to work in environmental fields as a result of the educational experiences they first had at HSES. The city should be doing everything possible to properly maintain the existing forests in our parks. If a significant investment isn't made we will lose an invaluable part of our city and future generations of students will lose the opportunity to learn from and experience urban forests. I strongly support the call for the city to invest \$385 million over the next 25 years to properly restore, converse and manage our forests.

Thank you,

Sean Abbott-Klafter

Teacher, High School for Environmental Studies

10/25/18

Adam Martinek

NYC COUNCIL PARKS COMMITTEE OVERSIGHT HEARING

My name is Adam Martinek. I am a resident of the Inwood neighborhood in northern Manhattan, an activist, and founder of the Inwood Hill Park Conservancy, a group of residents and scientists organizing a sustainable management plan for Inwood's natural forests.

I am here to testify in support of the "Forest Management Framework for NYC" developed by the Natural Areas Conservancy and NYC Parks, which I believe will begin to lay an important foundation in response to several decades of insufficient funding for natural forests.

I would like to take a few moments to highlight what I find to be some of the innumerable benefits natural forests bestow upon park-goers as well as the impact of a well-funded—robust forest management plan.

Trees play a vital role in keeping our city cool. Natural forests reduce the urban heat island effect, absorbing much of the heat admitted by asphalt and other dark flat surfaces that permeate heat within a city. A single hanging tree branch over the sidewalk can reduce summer heat temperatures by between 33* and 41* F. Between 2007 and 2015, NYC Parks partnered with NYRP, organizing *50,000 volunteers across the city to plant 500,000 trees*. This amazing feat of botanical engineering has allowed dozens of city parks to feel the cooling benefits of their hard work.

Natural forests have been statically proven to boost the immune system, lower blood pressure, reduce stress, accelerate rate of recovery from surgery or illness, increase energy and generally improve a person's mood. Shinrin-yoku, or 'forest bathing' is the most cost-effective, drug free method to improve mental health.

New York City is home to nearly 600 species of that live within our urban wilderness. Natural Forests are comprised of complex ecological niche communities that provide refuge to migratory fowl, owls, raccoons, and possums. In areas such as Pelham Bay Park, Van Courtlandt Park, and Inwood Hill Park—home to some of the largest contiguous natural forests in the city—white tail deer, coyotes and bald eagles can be found.

Natural forests make excellent classrooms. Children and young adults and enthusiasts benefit from guided tours that inform on the ecosystem of a given park. Identifying species allows for observers to gain an empirical experience into what makes a forest so special. Moreover, educating children and young adults within nature provides the best insurance against vandalism and pollution in the future. It is difficult harm something you have come to understand and respect.

The NYC Parks Division of Forestry, Horticulture and Natural Recourses has managed the 7,300 acres forests within the city park system for over 25 years. It has done amazing work to preserve and protect our cityscape. What the city needs now is a restoration plan that addresses the



Testimony
October 25, 2018

NYC COUNCIL PARKS COMMITTEE OVERSIGHT HEARING
Oversight – Ensuring the Short and Long Term Preservation of the City’s Natural Forest

Gowanus Canal Conservancy (GCC) advocates for and stewards ecologically sustainable parks and public spaces in the Gowanus lowlands, by engaging those who live, work and play here. We envision a Gowanus Canal and surrounding environment that is clean, resilient, diverse and alive. Since 2006, we have served as the environmental steward for the neighborhood through leading grassroots volunteer projects; educating students on environmental issues; and working with agencies, elected officials, and the community to advocate for, build, and maintain innovative green infrastructure around the Gowanus Canal. We are also a participant of NYC Nature Goals, of which we support their overarching goal of increased equity and access to nature in NYC.

The Gowanus Canal and surrounding lowland neighborhoods have endured over a century of environmental injustices, from industrial dumping to sewage overflows to heat island impacts. Urban forests, specifically street trees, are an essential component of the emerging network of equitable and resilient parks and public spaces in the Gowanus lowlands. Through restitution plantings and neighborhood development, we anticipate about 800 new street tree plantings in Gowanus over the next 5 years. These young trees have the capacity to provide critical ecosystem services, from stormwater management to habitat corridor to increased shade and cooling. However, they will only reach this capacity if they are cared for along the way – the every day actions of watering, weeding, soil aeration and pruning are just as important to tree survival as the one-time action of planting.

As Volunteer Program Manager at Gowanus Canal Conservancy, I have first-hand experience in how much care young street trees need. Over the past 10 years, we have worked with the NYC Parks Department to inventory our street trees and draft a tree management plan that identifies challenges and strategies for caring for our growing urban forest. Every year, we engage 110 volunteers in caring for street trees. Thanks in part to City Council’s Parks Equity and Greener NYC Initiatives, we have grown this stewardship into programs that support long-term engagement throughout the neighborhood. Our Gowanus Tree Network is made up of neighbors working together to build a network of tree stewards on their blocks – in 2018 two Tree Network blocks placed in the Greenest Block in Brooklyn competition. Neighbors came together over a shared goal of caring for the valuable open space on their blocks. On the job training side, our Gowanus Green Team high school apprentices become licensed Citizen Pruners, and learn about environmental careers in green infrastructure, urban conservation and design, building the next generation of engaged environmental leaders.

We are committed to working closely with the Parks department to care for the Gowanus urban forest by cultivating community stewardship of street trees, but our maintenance capacity will be challenged by the sheer number of new trees planted at once. In neighborhoods across the city, the Parks department needs more funding to provide direct maintenance and to support conservancies that amplify the agency’s efforts through stewardship.

As the effects of climate change worsen, there is more need than ever to invest in natural areas. Urban forests mitigate extreme heat, absorb greenhouse gases, and are an effective form of Green Infrastructure to reduce flooding and sewage overflow. As the Gowanus Canal undergoes a comprehensive clean-up, there is a tremendous opportunity to restore natural areas along the shoreline, which can buffer storm surge and reduce flooding. The city needs to invest now in the ongoing restoration, conservation, and management of our forests and natural areas, in order to protect and grow a vibrant city for generations to come.



Ensuring the Short and Long Term Preservation of the City's Natural Forest

**Committee on Parks and Recreation
New York City Council
October 25, 2018**

Good afternoon Chair Grodenchik, my name is Lynda Tower and I am the Vice President of Park Operations at Riverside Park Conservancy. As you know – because we have been delighted to host you in our park not just once, *but twice* since you took the helm of this Committee -- we are a non-profit organization that provides about half of the operating budget for Riverside Park each year. We work alongside the NYC Parks Department and community volunteers to maintain nearly 400 acres of waterfront parkland in one of the densest urban environments in the world. Our mission is to help restore, maintain, and improve Riverside Park and parts of Ft Washington Park, in partnership with the City of New York, for the enjoyment and benefit of all New Yorkers.

We view Riverside Park – and all urban green spaces – as essential New York City infrastructure. Providing adequate, ongoing care helps ensure the ecological and social health of not only our local community, but also of the city as a whole. I am here today to explain what the Conservancy is doing in Riverside Park specifically, and how that fits in a larger framework of forest management in New York City. I then have three suggestions for how the local government can take real, tangible steps to better support the City's forested areas.

Riverside Park is almost entirely a built environment, thus the natural areas occurring there face unique pressures. Our park is unique in its history, topography, and diversity. Spanning six miles along the Hudson River waterfront, the 400 acres of park land contain large sweeps of natural habitat, and includes 60 of the 7,300 acres of forested natural areas in New York City.

Our restoration goals focus on establishing essential forest functions such as supporting water quality, adding habitat value, and educating our community to be active stewards of the park. The Conservancy team has evaluated the best opportunities for forest and habitat restoration in Riverside Park, and has created a set of goals that guide our work:

1. **Support water quality of the Hudson River** by addressing erosion, revegetating denuded slopes, and strategically planting areas to more efficiently capture runoff from city streets and park paths.
2. **Improve habitat for migratory birds** traveling along the Hudson River by creating and sustaining needed forage and cover at appropriate times of year.
3. **Increase ecological diversity** by controlling and replacing invasive plant species with plant material that can support regional forest health.
4. **Educating and enabling our community** to be active stewards of natural areas by providing experiential learning opportunities for school groups, youth internship programs such as our Teen Corps Program, and through more than 40,000 hours of hands-on volunteer involvement for people of all ages and backgrounds every year.

The Riverside Park Conservancy considers the ongoing restoration and maintenance of Riverside Park's natural areas to be one of the organization's top priorities. This past year, the Conservancy hired a full-time Woodland Caretaker who is tasked with improving the overall health of this precious natural area. In tandem with these on-the-ground improvements, the Conservancy facilitates direct involvement with the community. Volunteers take part in large-scale projects like invasive removal and planting.

We are always returning to the bigger picture context of our work. NYC's forested areas are at a critical tipping point, constantly threatened by invasive plants, garbage dumping, and environmental pollution. There are hundreds of underutilized, neglected acres -- even including overlooked spaces along exit ramps or near train tracks -- that should be improved and utilized to create valuable connections between fragmented habitats and neighborhoods. There is great potential for all urban green spaces to function as an interconnected network of different natural habitats that will support one another in vital ways. Riverside Park's 60 acres of forested area is just one piece of this puzzle.

It is widely accepted that there are tangible social benefits resulting from equitable, safe access to forested areas for passive recreation. We strongly support the Natural Areas Conservancy's *Forest Management Framework for NYC*, released this year, which concludes that time spent in natural areas improves cognitive and emotional well-being, reduces crime, and fortifies social cohesion.

As noted in the report, 25% of NYC's parkland is insufficiently managed due to a lack of funding; year after year, the NYC Parks Department's operating budget is less than one half of 1% of the City's total annual budget. That means all of the parkland throughout all five boroughs must share less than 1% of the overall budget; and that is insufficient to protect all our natural areas. With greater support, much of the unmanaged areas could be transformed into functioning habitat and valuable public oases for passive recreation, fostering a more sustainable, equitable, and ultimately resilient City.

I conclude by asking three things of our local government. First, I ask the City Council to recognize our forests for the essential functions they provide to New York City while understanding that they are not self-perpetuating systems. Given the harsh urban conditions they exist in – compounded by the reality of climate change – urban forests need to be re-conceptualized as a crucial investment in terms of both 21st Century infrastructure and public health.

Second, in order to provide the long term preservation desired, the City Council needs to provide ongoing support for other organizations positioned to provide long-term stewardship of restored forests.

The third necessary step for the City Council to take is to actively prioritize implementation of the Natural Areas Conservancy's *Forest Management Framework for NYC* by providing funding and additional outreach support for NYC Parks and its partners. To facilitate the success of this strategy, a comprehensive and equitable funding plan for the ongoing management of all our City's forests must be established sooner rather than later.

Thank you for the opportunity to testify today, and I am happy to answer any questions.

New York City Council Committee on Parks and Recreation

October 25, 2018 Hearing on Ensuring the Short and Long Term Preservation of the City's Natural Forest
Statement of Elizabeth W. Smith, President & CEO of the Central Park Conservancy

Thank you to the Committee and its steadfast Chair, Councilman Grodenchik, for the opportunity to add our voice on this important subject.

We know that great cities need great parkland, and that great parkland needs great management. This is true whether that parkland is entirely manmade like Central Park, or the natural areas that are being discussed today.

That is why we are so excited to see “The Forest Management Framework for NYC” that the Natural Areas Conservancy and NYC Parks have produced. This Framework provides the first comprehensive roadmap for the 7,300 acres of New York City's urban natural forests. It sets specific targets and suggests costs and possible funding sources for each. It will allow the City to bring more of its parkland up to a state of good repair and increase opportunities for natural recreation in neighborhoods that need it most. By moving from a model of targeted interventions to a more science-based and holistic approach, the Framework can help to ensure that the work undertaken is done with as much economic efficiency and social impact as possible.

At the Conservancy, we have seen first hand the value of this sort of strategic approach to parkland management. Since our original Management and Restoration plan in the 1980s, we have invested more than \$1 billion in restoring and enhancing Central Park. Now that the restoration of the Park has been largely completed, we must turn to its sustainability – the return on investment of that restoration. Our focus is on the ongoing costs of maintenance, and, most saliently, the quality of the experience of the Park for all users. Ensuring that the Park is managed so that everyone can safely enjoy this iconic public space is critical to the Conservancy's mission and Central Park's future. That is why, each day, we rededicate ourselves to the role of providing, as Central Park designer Frederick Law Olmsted envisioned, a “tranquilizing and restorative” antidote to the ever-intensifying pressures of urban life.

At a time when city populations are rising, and opportunities for escape and respite are vanishing, we can ill afford to let any of our parks – manmade or natural – go unsupported, unused or, most importantly, unmanaged. I thank you for dedicating time to this vital topic and urge you to invest in further action.



New York City Council Committee on Parks & Recreation

Testimony by Susan Donoghue

Prospect Park Administrator & Prospect Park Alliance President

October 25, 2018

Good afternoon Council Member Barry Grodenchik and members of the Parks Committee. My name is Susan Donoghue and I serve as both the Administrator of Prospect Park and the President of the Prospect Park Alliance. It is my pleasure to submit this testimony today.

The Prospect Park Alliance

As you may know, the Prospect Park Alliance is a not-for-profit that partners with the Parks Department and the community to foster stewardship of Prospect Park. Established in 1987, the Alliance helps to care for the natural environment, preserve the Park's historic design, provide facilities, oversee more than 25,000 permitted events (mainly consisting of small birthday parties and family picnics), and host programs and activities throughout the year for all New Yorkers.

Over the past 26 years, the Prospect Park Alliance has played a vital role in restoring the Park to its original glory. During this time, we have worked very closely with local elected officials, the Parks Department, and the surrounding communities, to identify, prioritize, design, and complete approximately 50 restoration projects over close to 120 acres of the Park and 5,100 linear feet of our watercourse.

At the heart of all our work for the past 26 years has been the restoration of the 250 acres of woodlands, reversing decades of soil erosion and compaction. The Alliance has replaced over 10,000 overstory and understory trees. The results are substantial and Prospect Park's woodlands once again offer visitors a place to connect with the natural environment and Prospect Park is now a major anchor of the northeast bird migration. As the oldest standing forest in Brooklyn, these 250 acres serve as the lungs of the borough and are a vital amenity for the public health and well being of its residents.

Prospect Park

Covering 585 acres in the heart of Brooklyn, Prospect Park is more than just a neighborhood Park – it is a borough-wide amenity. With its access to great subway service and wide array of activities, Prospect Park is a magnet for all of Brooklyn's diverse and ever-changing population.

Fredrick Law Olmsted and Calvert Vaux designed the park to be a place of respite and relaxation, as well as a place for people to come together to participate in various types of activities. They envisioned Prospect Park as a place where people would come to be renewed by the 90-acre Long Meadow, 250-acres of Woodlands, or 60-acre Lake. Today, Prospect Park has over 10 million visits each year. Olmsted and Vaux envisioned families from every neighborhood in Brooklyn coming to Prospect Park; and they did from the day it opened, as they do today, to picnic, barbeque, to participate in our public education programs, to play on one or more of the hundreds of athletic teams at the Parade Grounds and ballfields, to volunteer to help keep the Park clean, or to attend one of our regular events – such as the Annual Halloween Haunted Walk and Carnival..

Since the formation of the Natural Areas Conservancy, the Alliance has benefitted from a productive relationship, from advising our staff on best planting practices to helping us better understand the impact of climate change on Prospect Park. More specifically, in partnership with the NAC, we studied 102 acres of our forest and were able to identify 80 acres dominated by native forest community trees and 20 acres dominated by invasive trees. This allowed us to begin developing priority management actions for existing and emerging invasive species. Also through this collaboration we were able to gain a deeper understanding of different forest structural and compositional issues such as regeneration planting, seeding, midstory invasive removal and more. The NAC provides a tremendous amount of research and assistance to many park conservancies, partners, and volunteers around the City that help in managing the over 7,300 acres of natural forests in NYC. We know that, from cooling our city and cleaning our air to capturing stormwater and providing habitat for thousands of species of plants and animals, our natural forests are a vital part of NYC's vibrancy.

With over 30,000 trees across Prospect Park we feel and see the benefits of having a healthy and diverse natural forest daily. We recently completed a tree inventory of just under half – 12,414 – of our trees in Prospect Park and have been able to quantify the benefits received:

- greenhouse gas benefits
 - 2,428,265.84 lbs CO₂ avoided
 - 2,027,259.38 lbs CO₂ sequestered
- water benefits
 - 17,520,977.43 gallons saved
- energy benefits
 - 1,014,747.89 kWh saved
 - 367,373.11 Therms saved
- air quality benefits
 - 16,366.05 lbs pollutants saved

However, NYC's parkland and natural forests are under constant threat from the impacts of climate change and need constant care and maintenance. One quarter of NYC's parkland is

insufficiently managed due to a lack of funding for NYC Parks and its partners. This underfunding forces many areas of the forests and trails to be left in disrepair, often creating access barriers that routinely deny low and moderate income neighborhoods access to recreation and opportunities for physical, mental, and emotional wellbeing. NYC's forests are one of the first lines of defense in mitigating extreme heat, capturing stormwater to reduce flooding and absorbing greenhouse gases. However, our forests today are under attack, by invasive plants and species, devastating storms, increased litter and lack of adequate management resources.

We need significant investment and civic commitment for the improvement of NYC's natural areas, or risk losing their diversity that, once lost, can never be regained.

Conclusion

We strongly believe the City should invest \$385 million over 25 years for the ongoing restoration, conservation, and management of our forests. In addition, the City should commit to and invest in science-based management that will save money and ensure high-quality natural spaces for New Yorkers. We have seen the direct benefits of this approach in Prospect Park and have only scratched the surface in terms of addressing the maintenance and restoration needs of our woodlands. We also believe that the City should implement "The Forest Management Framework for NYC" developed by the NAC and NYC Parks as the first-ever comprehensive plan for this critical resource. It sets ecological and social targets for all 7,300 acres of NYC's urban natural forests. Lastly, we would support an initiative that would allow for the leveraging of private investment through coordination with non-profit and conservancy partners.

I thank you for the opportunity to offer testimony to this important issue today.

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Jennifer Greenfeld

Address: 1234 5th Ave. New York, NY

I represent: NYC Parks

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Matt Dray

Address: 830 Fifth Ave.

I represent: NYC Parks

Address: 830 Fifth Ave.

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Karen Murphy

Address: NYC

I represent: NYC Parks

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Sarah Charlton Powers

Address: NYC Parks / NAC

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 27th Precinct Res. No. NAC / NYC PMS

☒ in favor ☐ in opposition

Date: 10/25/2018

(PLEASE PRINT)

Name: Adam M. Martinez

Address: 25 Indian Rd apt 2C New York, NY 10034

I represent: Throver Hill Park Conservancy + NAC + NY412

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Adriana Espinoza

Address: _____

I represent: NYLCV

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____
☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Richard Hallett
Address: 18 Colony Cove Road, Parkton, MD 03824
I represent: USDA Forest Service
Address: 29C Broadway 26th Floor NY, NY 10007

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____
☒ in favor ☐ in opposition

Date: 10/25/2018

(PLEASE PRINT)

Name: DONALD RECKLIES
Address: 420 4TH AVE #1 BKLYN, 11215
I represent: _____
Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____
☒ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: TODD FURNESS
Address: THE NEW YORK BOTANICAL GARDEN, BRONX, NY
I represent: _____
Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☐ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Christina Taylor

Address: 800 KPS Bx NY

I represent: Friends of Van Cortlandt Park

Address: 800 KPS Bx NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☐ in favor ☐ in opposition

Date: 10.25.18

(PLEASE PRINT)

Name: Lynn Kelly

Address: 55 Broad St, 23rd Fl.

I represent: New Yorkers for Parks

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☒ in favor ☐ in opposition

Date: 10/25/2018

(PLEASE PRINT)

Name: Eric Sanderson

Address: 75 Schafeld St. Bronx NY 10464

I represent: wildlife Conservation Society

Address: 2300 Southern Blvd. Bronx NY 10460

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Margot Perron

Address: 1 Bronx River Pkway

I represent: Van Cortlandt Park Conservancy

Address: 1 Bronx River Parkway 10462

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☒ in favor ☐ in opposition

Date: 10/25/18

(PLEASE PRINT)

Name: Kathryn Heintz, N.Y.C. Audubon

Address: 71 W 23rd St, NY NY 10010

I represent: N.Y.C. Audubon

Address: 71 W. 23rd St NY NY 10010

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Jason Smith

Address: _____

I represent: New York Restoration Project

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Amy Turner

Address: 560 Lexington Ave, 15th Fl, NY, NY 10022

I represent: NYC Climate Action Alliance

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 3025 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Mike Moore

Address: 83-19 116TH ST KUNEN 11418

I represent: NYNJTC

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Lynda Tower

Address: 111

I represent: Riverside Park Conservancy

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☒ in favor ☐ in opposition

Date: 10/26

(PLEASE PRINT)

Name: JOSEPHINE A. SCALIA

Address: _____

I represent: FOREST PARK TRUST NYC PARK

Address: One Forest Park
Woodhaver LI 11421

▶ Please complete this card and return to the Sergeant-at-Arms ◀

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Portia Dyrenforth

Address: _____

I represent: Forest Park Trust

Address: 1 Forest Park, 11421

▶ Please complete this card and return to the Sergeant-at-Arms ◀

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____
☐ in favor ☐ in opposition

Date: 25 October 2018

Name: Natasia Sidarta (PLEASE PRINT)

Address: 543 Union St #1E, Brooklyn NY 11215

I represent: Gowanus Canal Conservancy

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____
☐ in favor ☐ in opposition

Date: _____

Name: Patti Raftery (PLEASE PRINT)

Address: _____

I represent: National Park Service

Address: 210 New York Ave
Staten Island NY 10306

Please complete this card and return to the Sergeant-at-Arms