



Alley Pond Park's Future Forest

Kip Stein

Director of Natural Areas Management

NYC Parks

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Alley Pond Park's Future Forest

- **NRG's Approach to Forest Restoration**
- **History of Alley Pond Park**
- **Project Phasing**
 - **Phase I**
 - **Phase II**
 - **Phase III**
 - **Phase IV**
- **Takeaways**



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Forest Restoration in New York City



Forest management in New York City



- NRG established in 1984
- 700 non-overlapping acres restored (planted) since 1991
- 1,000+ acres managed by staff and volunteers each year
- 715,000 native trees and shrubs planted since spring 2007

Forest Management Framework for NYC

Released in April 2018

25-year management plan for a healthy forest that is fully supported socially and financially.

Goal: 100% Active Management

Forest Management Framework for New York City



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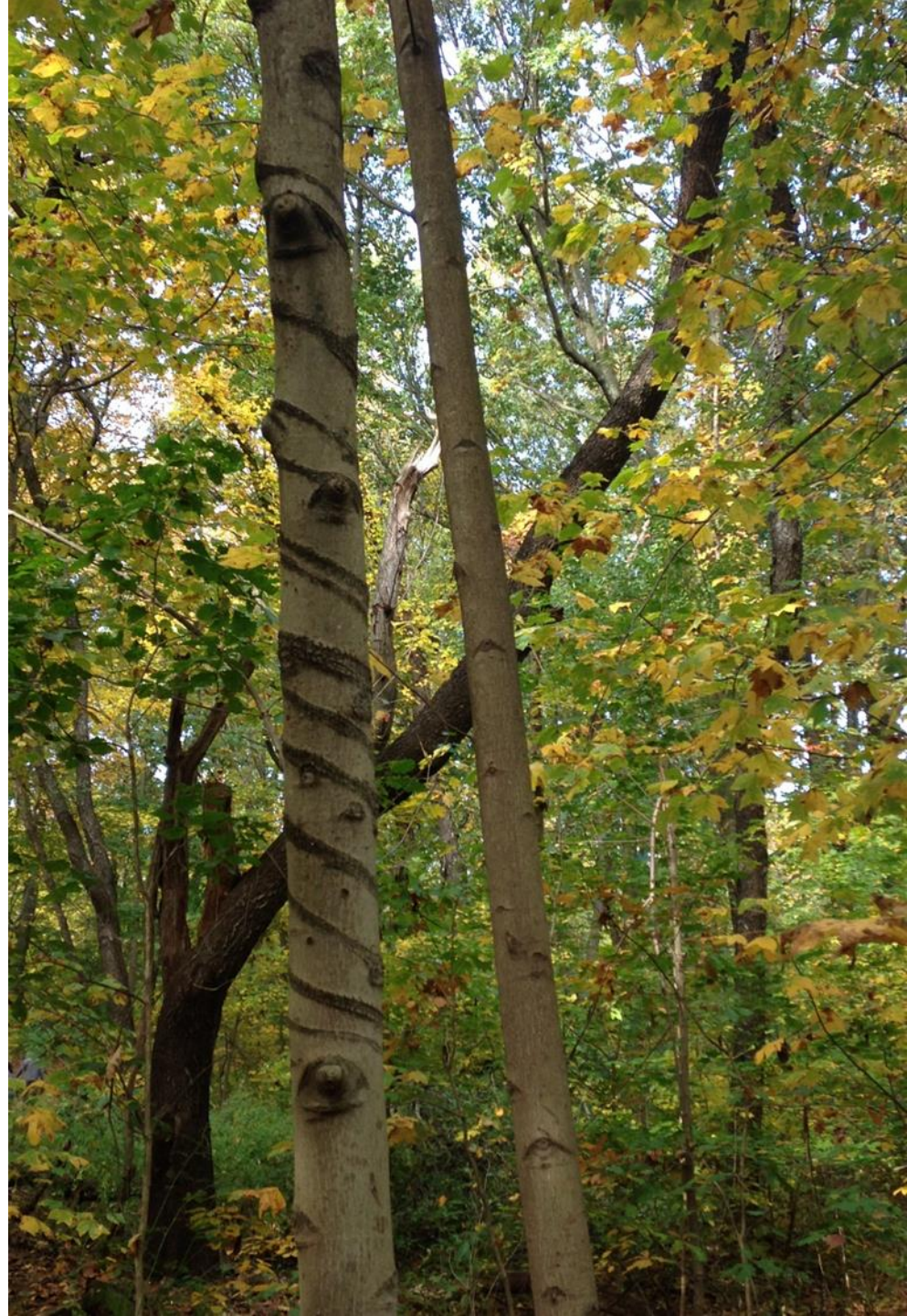
Developing a Matrix for Forest Health and Threat

Health

- Native trees in the canopy, midstory, and seedling layers
- Native herbaceous cover
- Native species richness

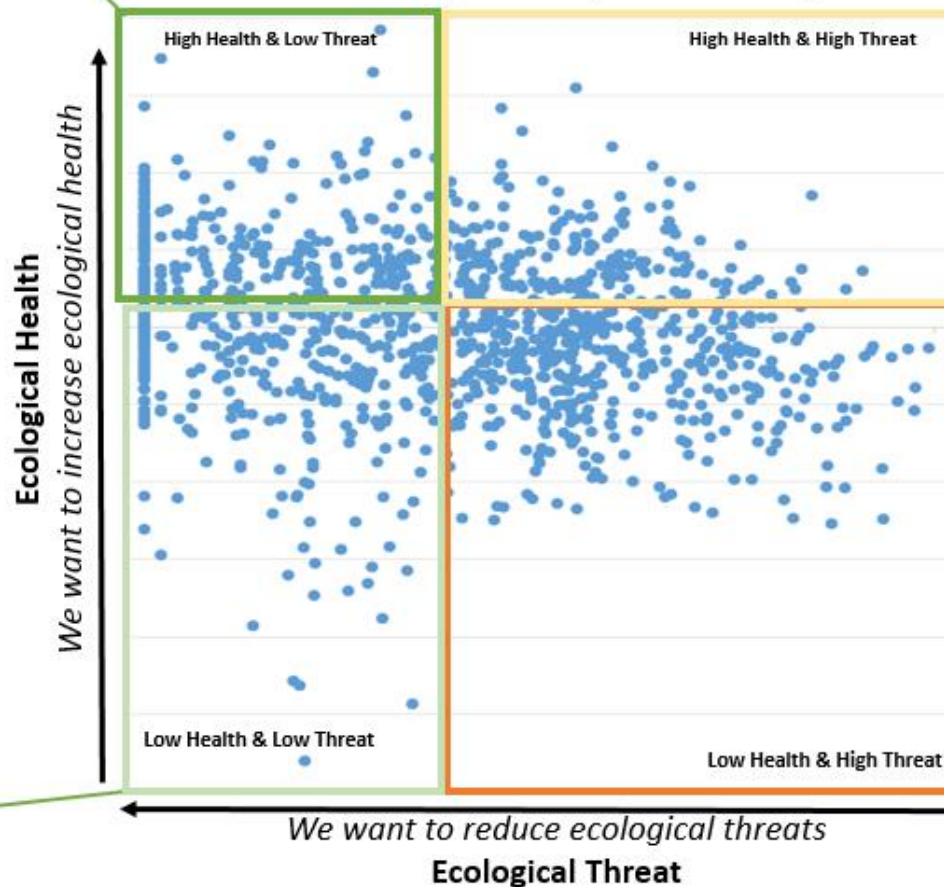
Threats

- Cover of problem herbaceous species in the understory
- Problem woody seedlings, midstory, and canopy trees.
- Vines climbing on trees



Forest Condition Matrix

Using an index for ecological health and ecological threat we represent the condition of NYC's forest along a gradient so that they can be understood and compared to one another. Each point in the matrix below represents a single plot point where data was collected in the field. The data was combined into an index that represents ecological health and ecological threat.



Forests in this category are the highest quality. Monitoring is required to ensure that quality remains high and we protect them.



Forests in this category have minimal threats but desired health attributes such as 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 also result in improved health.



Forests in this category contain many of the attributes of a high quality forest, for example native canopy, but at the same time also contain many of the attributes of a highly threatened forest, for example invasive understorey. Management intervention of these forests could be critical to ensure invasive species don't overcome the healthy components of these forests.



Example from Alley Pond Park in Queens

Forests in this category are the most degraded in NYC. They are categorized as high threat and are likely dominated by invasive non-native species. Intensive management interventions are needed.



Example from Alley Pond Park in Queens



Healthy, but declining forests

A dynamic system - 76% of forest canopy is native, 63% of midstory and 71% of all tree seedlings

A diverse community – Over 750 plant species and 62 unique vegetation associations

Threatened by deer browse observed in 53% of plots citywide and in 81% of all plots in Staten Island

Impacted by trash – Estimated 273 acres of trash in our forest

Regeneration is varied - 20% of Northern Hardwood stands have no native seedlings and 36% of Successional stands have no native seedlings

Problem plants are prevalent - 80% of our forests have at least one problem plant

Sweetgum and Black Cherry are among the dominant canopy trees of the over 40,000 trees we measured (~12,000 overstory)



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1924

**Historically marsh and floodplain.
along Alley Creek**



1951

**Cross Island Parkway completed in 1940.
Drainage channels dug into marsh.**



1996

De facto upland created from construction fill.



2022

**Over 20 acres of trees planted.
Remaining uplands vegetated by pioneer species.**

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Phase I Breaking New Ground

- 10.5 acres
- 2010-2013
- Funded by Capital dollars for Millions Trees PlaNYC
- Project Manager Rayna Coletta



























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Phase I Breaking New Ground

- Final Planting Areas



Phase I, Breaking New Ground

Trees

Shrubs

Phase I:

14,000

3,600

Over 100 different species of trees and shrubs
mainly decided by professional judgement and site knowledge:

<i>Acer negundo</i>	<i>Cornus sericea</i>	<i>Photinia pyrifolia</i>	<i>Rhus aromatica</i>
<i>Acer rubrum</i>	<i>Crataegus crus-galli</i>	<i>Pinus echinata</i>	<i>Rhus copallina</i>
<i>Acer saccharinum</i>	<i>Diospyros virginiana</i>	<i>Pinus rigida</i>	<i>Rhus glabra</i>
<i>Acer saccharum</i>	<i>Eubotrys racemosa</i>	<i>Pinus strobus</i>	<i>Rhus typhina</i>
<i>Alnus serrulata</i>	<i>Euonymus americana</i>	<i>Pinus virginiana</i>	<i>Rosa carolina</i>
<i>Amelanchier arborea</i>	<i>Fagus grandifolia</i>	<i>Platanus occidentalis</i>	<i>Rosa palustris</i>
<i>Amelanchier canadensis</i>	<i>Gaylussacia baccata</i>	<i>Populus deltoides</i>	<i>Rosa virginiana</i>
<i>Aronia melanocarpa</i>	<i>Hamamelis virginiana</i>	<i>Populus grandidentata</i>	<i>Rubus flagellaris</i>
<i>Aronia prunifolia</i>	<i>Ilex glabra</i>	<i>Populus tremuloides</i>	<i>Rubus occidentalis</i>
<i>Baccharis halimifolia</i>	<i>Ilex opaca</i>	<i>Prunus maritima</i>	<i>Rubus pensilvanicus</i>
<i>Betula alleghaniensis</i>	<i>Ilex verticillata</i>	<i>Prunus serotina</i>	<i>Rubus pensylvanica</i>
<i>Betula lenta</i>	<i>Juglans nigra</i>	<i>Quercus alba</i>	<i>Salix humilis</i>
<i>Betula populifolia</i>	<i>Juniperus virginiana</i>	<i>Quercus bicolor</i>	<i>Salix nigra</i>
<i>Carpinus caroliniana</i>	<i>Lindera benzoin</i>	<i>Quercus coccinea</i>	<i>Sambucus canadensis</i>
<i>Carya cordiformis</i>	<i>Liquidambar styraciflua</i>	<i>Quercus ilicifolia</i>	<i>Sassafras albidum</i>
<i>Carya glabra</i>	<i>Liriodendron tulipifera</i>	<i>Quercus macrocarpa</i>	<i>Spiraea alba</i>
<i>Carya ovata</i>	<i>Lyonia ligustrina</i>	<i>Quercus marilandica</i>	<i>Staphylea trifolia</i>
<i>Carya tomentosa</i>	<i>Lyonia mariana</i>	<i>Quercus muehlenbergii</i>	<i>Tilia americana</i>
<i>Celtis occidentalis</i>	<i>Maclura pomifera</i>	<i>Quercus palustris</i>	<i>Ulmus americana</i>
<i>Cephalanthus occidentalis</i>	<i>Magnolia virginiana</i>	<i>Quercus phellos</i>	<i>Vaccinium angustifolium</i>
<i>Cercis canadensis</i>	<i>Morella pensylvanica</i>	<i>Quercus prinus</i>	<i>Vaccinium corymbosum</i>
<i>Clethra alnifolia</i>	<i>Nyssa sylvatica</i>	<i>Quercus rubra</i>	<i>Vaccinium pallidum</i>
<i>Cornus amomum</i>	<i>Ostrya virginiana</i>	<i>Quercus stellata</i>	<i>Viburnum acerifolium</i>
<i>Cornus florida</i>	<i>Photinia floribunda</i>	<i>Quercus velutina</i>	<i>Viburnum dentatum</i>
<i>Cornus racemosa</i>	<i>Photinia melanocarpa</i>	<i>Rhododendron viscosum</i>	<i>Viburnum prunifolium</i>

Phase II Upping the Ante

- 10.6 acres
- 2013-2015
- Funded by Capital dollars for Millions Trees PlaNYC
- Project Manager
Christina Perdos









Special Restrictions
in Progress

Please Do Not Disturb
the Rehabilitation Area

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT











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Preservation Project

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Preservation Project









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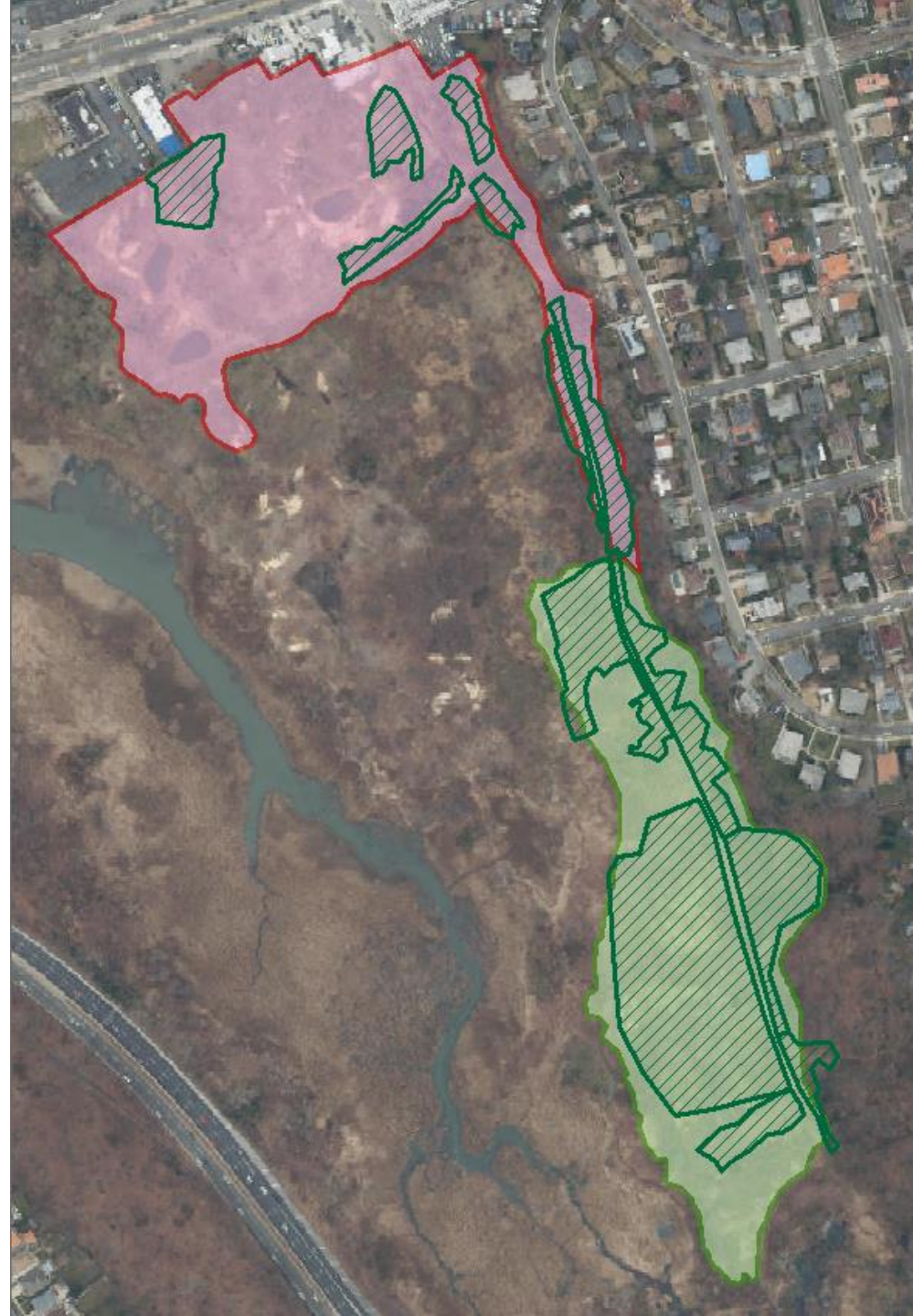






Phase II Upping the Ante

- Planting Sites



Phase II, Upping the Ante

	Trees	Shrubs
Phase I:	14,000	3,600
Phase II:	3,600	1,150

Species palette still largely informed by personal observations and site history

Phase III Expanding the Scope

- 15.7 acres
- 2016-2019
- Funded by Capital dollars for Millions Trees PlaNYC
- Project Manager Annie Weinmayr



Phase III, Expanding the Scope











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2016



2018



2018



2020



2022



2023

Phase III Expanding the Scope

- Planting Areas



Phase III, Expanding the Scope

	Trees	Shrubs
Phase I:	14,000	3600
Phase II:	3,600	1,150
Phase III:	3,900	2,100



Phase III, Expanding the Scope

- Until this point, plant species palette had been decided by professional judgement and site knowledge
- Phase III's planted species were determined by:
 - Onsite ecological data collection
[Upland and Forest Ecological Assessment Protocol for New York City](#)
 - Nationally classified ecotypes
[Classification of Natural Areas Conservancy's Ecological Assessment Plots](#)

CEGL006125	Oak-tulip tree forest
CEGL006185	Floodplain forest (<i>Quercus palustris</i>)
CEGL006125	Oak-tulip tree forest
 - Climate adapted plant palettes
[NAC's Forest Identification and Restoration Selection Tool](#)

Phase III, Expanding the Scope



Phase IV Tying It All Together

- 38.8 acres
- 2021-2023
- Funded by Mayoral Capital dollars for Forest Management Framework
- Project Manager Courtney Rose

























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Phase IV Tying It All Together

- Planting Areas



Phase IV, Tying It All Together

	Trees	Shrubs
Phase I:	14,000	3,600
Phase II:	3,600	1,150
Phase III:	3,900	2,100
Phase IV:	3,400	1,200
Total:	21,900	8050

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Takeaways

Establishing new forests isn't cheap.

	Contract Site Prep	Plant Material
Phase I:	\$744,000	\$324,000
Phase II:	\$721,000	\$116,000
Phase III:	\$944,000	\$49,000
Phase IV:	\$1,082,000	\$44,000
Total:	\$3,491,000	\$533,000



Takeaways

Or is it?

Alley Pond Environmental Center Reconstruction: \$28,079,000



Takeaways

Establishing new forests takes a long time

- 13 years of site preparation and planting.
- Thousands of hours of contractor, staff and volunteer work time.

Or *does it?*

- In the grand scheme, trees will live decades and forests will persist much longer.



Takeaways

Soils matter.

- Phase II had a higher concentration of construction debris, concrete, metal, garbage, etc.
- Staff and volunteers removed ~30 CY of debris in spring 2015.
- Plantings and seeding were not as quick to establish as those in Phase I and III.
- *Maybe...* non-native pioneer species contributed to increase in organic matter content in decades after marsh fill-in, helping to make the site more favorable to native species.

Takeaways

The goal is not always to bring back historic conditions.

- Bringing back historic habitats is not always feasible or desirable.
- This entire project area was once tidal wetland before large scale filling in mid 20th century.
- Salt marsh and tidal habitats are valuable, but the new upland can also provide ecosystem services to meet our needs.
- Future disturbances will bring on more such decisions points.





Thank you!

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