# Planting NYC's Urban Forest

*Jennifer Greenfeld, Assistant Commissioner*
*Forestry, Horticulture & Natural Resources*

## Metro Hort Group Monthly Meeting
**September 22, 2020**

FIGURE 2

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



**Built**
**59.5%**
114,200 ACRES

**Landscaped**
**28.9%**
55,360 ACRES

**Natural**
**11.6%**
22,220 ACRES

Source: Natural Areas Conservancy Ecological Covertype Map[7]

FIGURE 3

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



**Forests**
**10,500**
ACRES

**Grasslands**
**5,700**
ACRES

**Wetlands**
**4,800**
ACRES

: Natural Areas Conservancy Ecological Covertype Map[8]

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# New York Parks

## We Manage:

- Half of all natural areas (10,000 acres)

  - 7,300 acres forest
  - 2,200 acres wetlands
  - 66 miles stream

- 12% of all landscapes

- Half of all Trees

In New York City

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LANDSCAPED **28.9%**
55,360 Acres

NATURAL
11.6%
22,220 Acres

GREEN 40.5%

# NYC Parks' Urban Forest



**FOREST**
3.3 million
80%

**STREET**
666,134
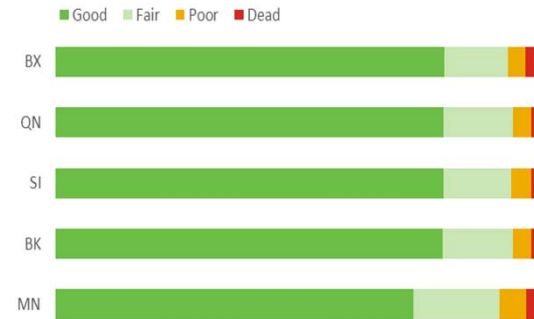16%

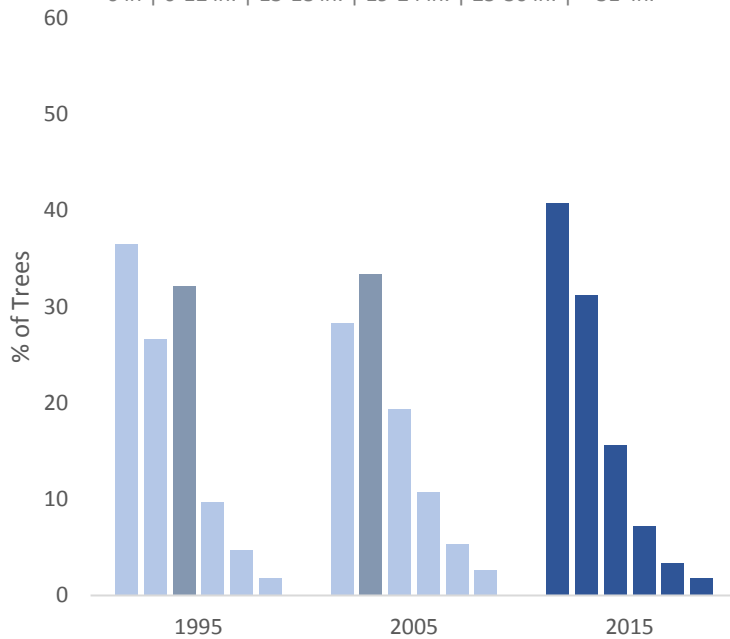**PARK**
156,625
4%

**NON-FOREST**
822,759
20%

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# Street Tree Census Results

**Citywide:** Tree Condition

Legend: ■ Good ■ Fair ■ Poor ■ Dead



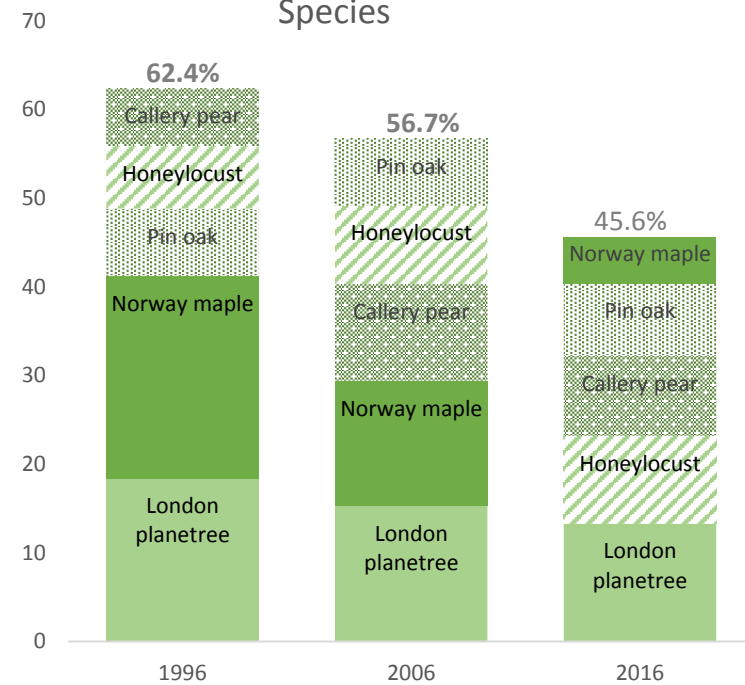### Size Class Distribution Manhattan

<6 in | 6-12 in. | 13-18 in. | 19-24 in. | 25-30 in. | > 31 in.
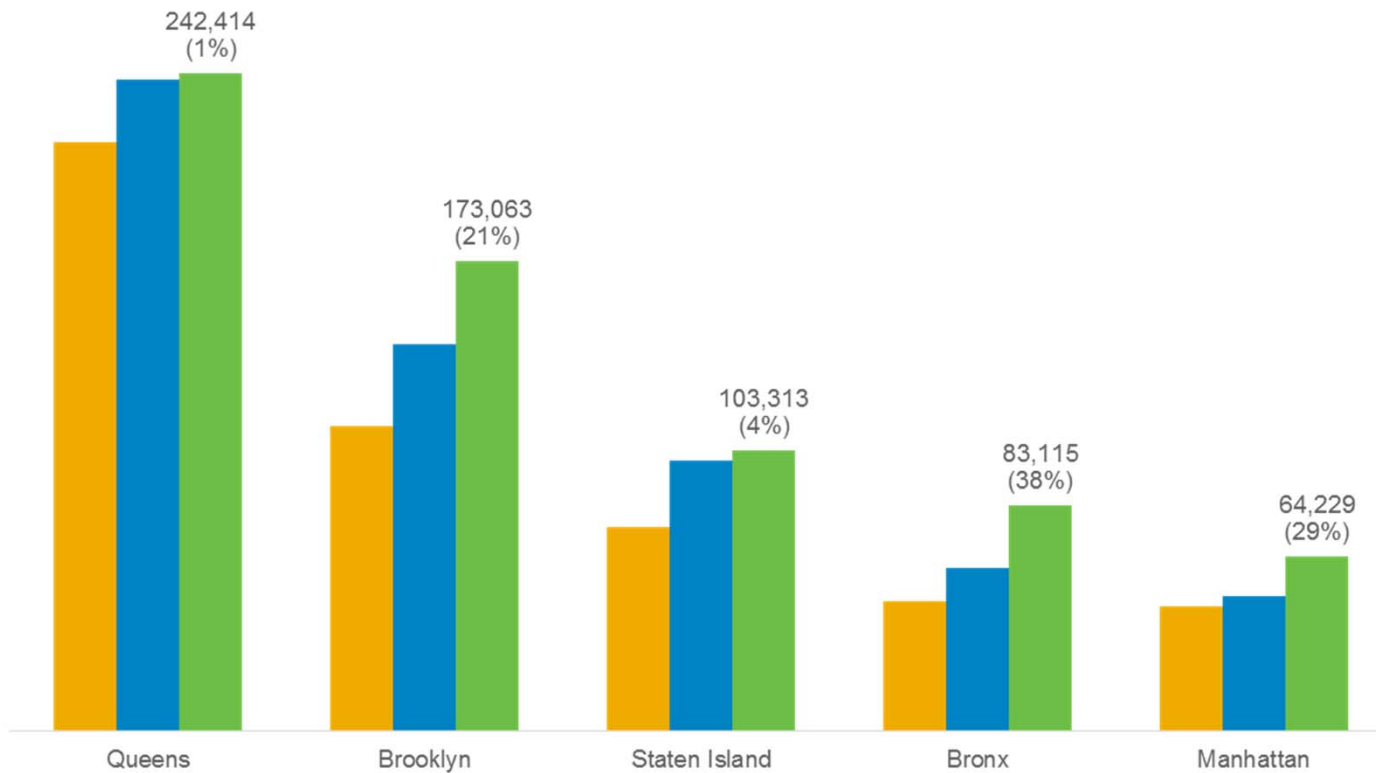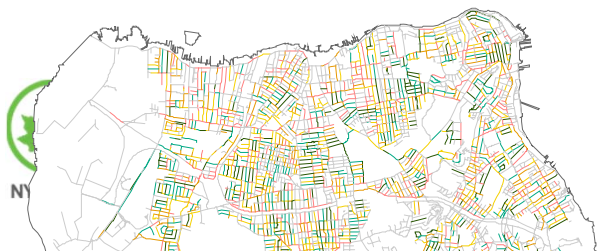


### Structural Dominance Citywide Top 5 Species



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# Street Tree Stem Count
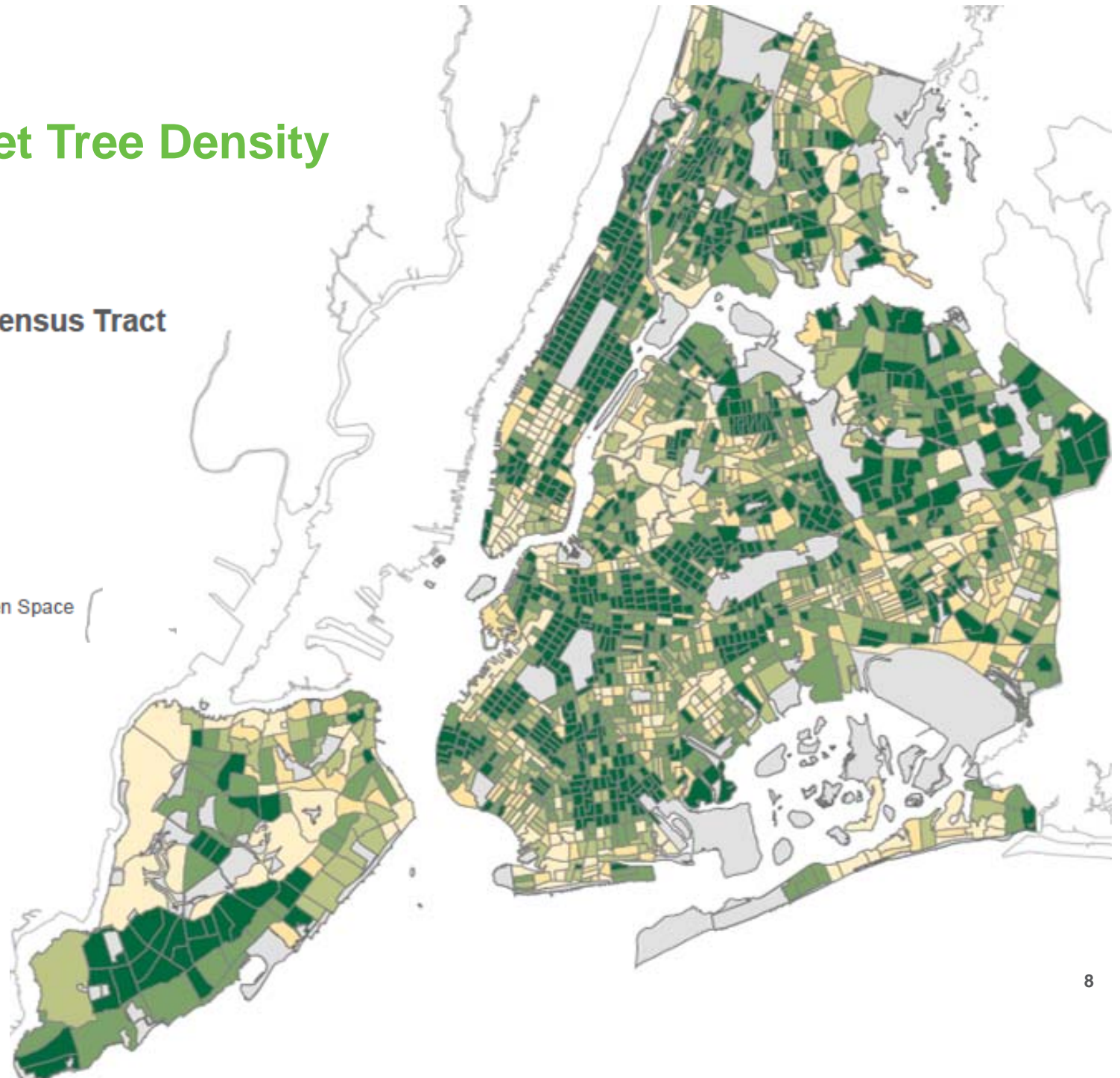
**Street trees counted in 1996, 2006, and 2016 by borough (% increase)**



242,414
(1%)

173,063
(21%)

103,313
(4%)

83,115
(38%)

64,229
(29%)

Queens   Brooklyn   Staten Island   Bronx   Manhattan

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# Leafiest Blocks

# 2015 Street Tree Density



**Density by Census Tract**
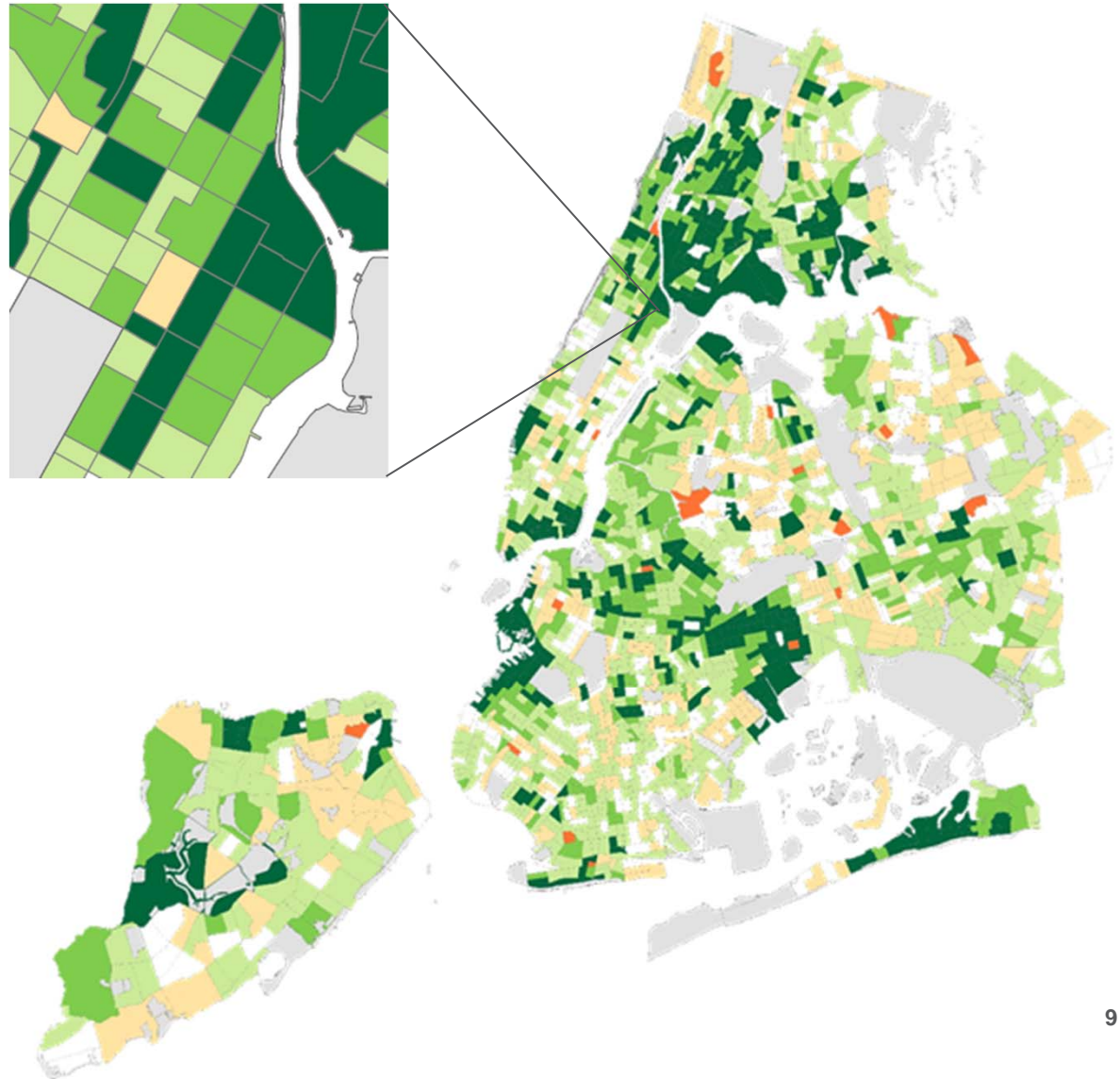
- Low
- Medium
- High
- Parks and Open Space

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8
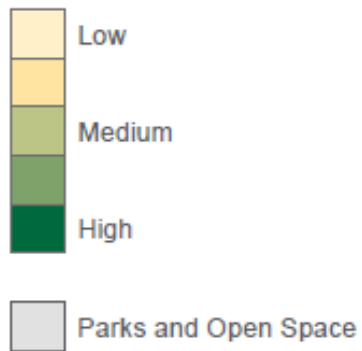
# Change from 2006--Tree Count



**Percent Change in Stem Count per Census Tract**

- >100%
- 50% to 100%
- 6% to 49%
- no change*
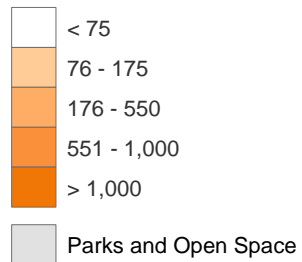- -6% to -49%
- -50% to -100%
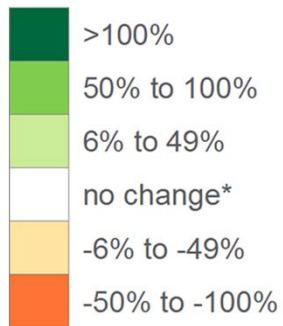
Parks and Open Space

* indicates change within +/- 5%

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# Street Tree Planting Potential

**New Tree Potential
by Census Tract**

| | |
|---|---|
| ☐ | < 75 |
| ☐ | 76 - 175 |
| ☐ | 176 - 550 |
| ☐ | 551 - 1,000 |
| ☐ | > 1,000 |
| ☐ | Parks and Open Space |

| | |
|---|---|
| Bronx | 30,000 |
| Brooklyn | 60,000 |
| Manhattan | 18,000 |
| Queens | 94,000 |
| Staten Island | 38,000 |
| **Total** | **240,000** |
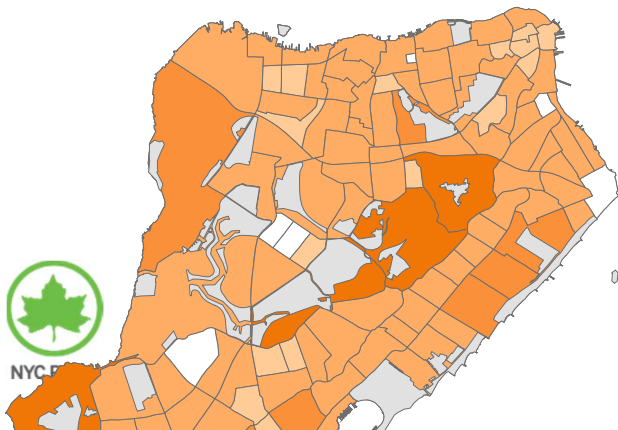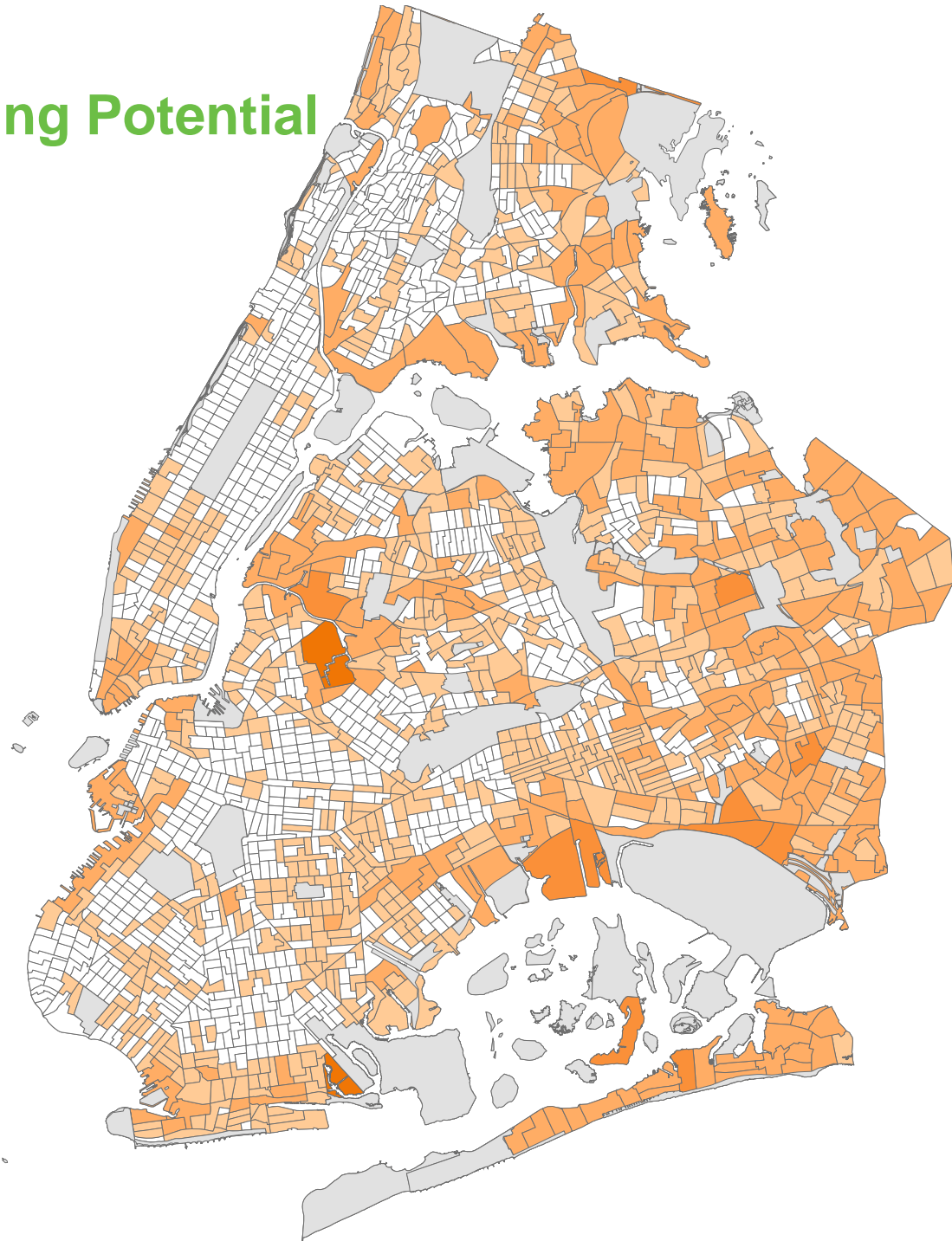
# What Drives Where We Plant?
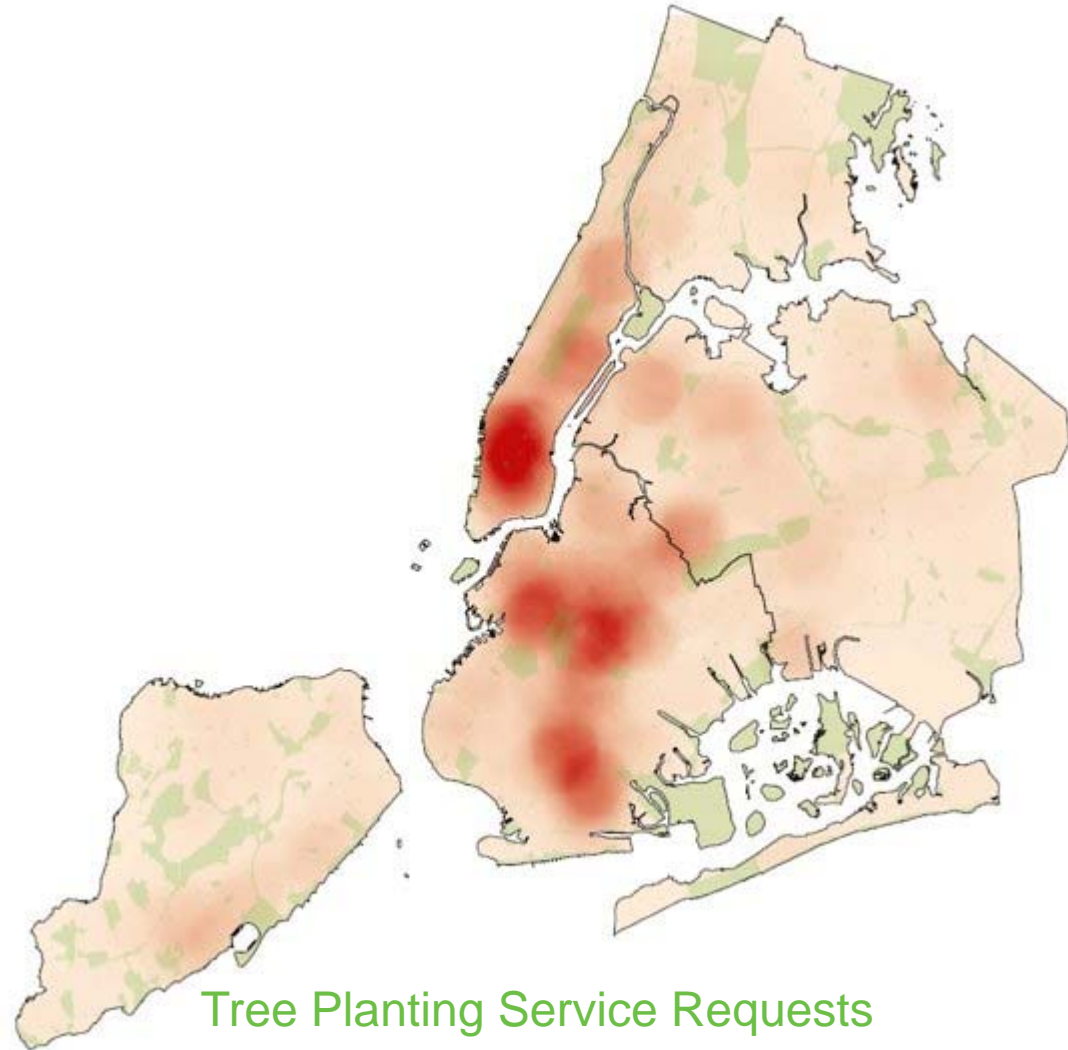


Tree Planting Service Requests

# What Drives Where We Plant?

- 311 Service Requests (~18,000/ year)

- Permitted Removal Replacements

- Electeds' Directed Funding

- Zoning requirements

- Natural Disasters

- Pest Infestations



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# What Drives Where We Plant?
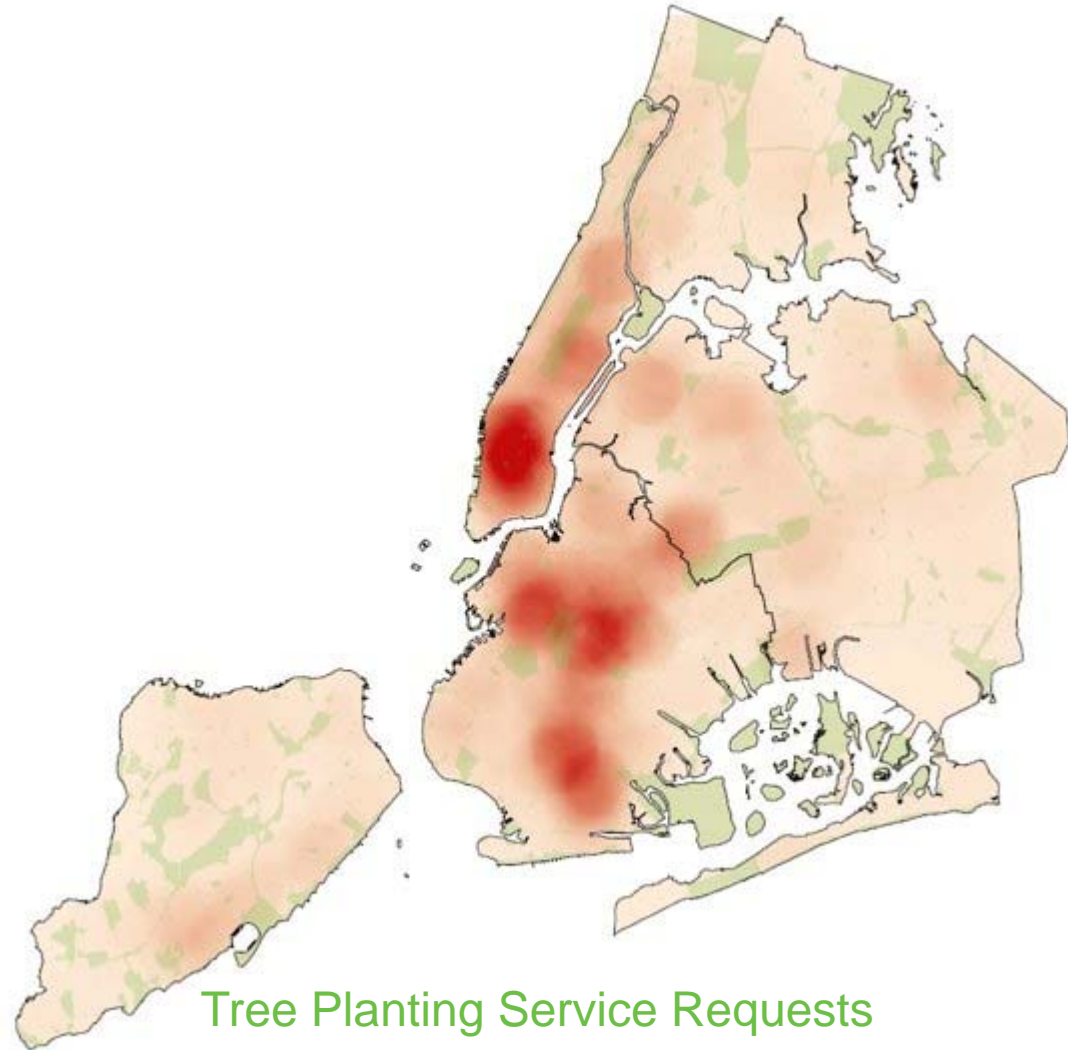


Tree Planting Service Requests

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# 2007- 2017 Trees for Public Health (TPH) Neighborhoods



Hunts Point/Morrisania

East Harlem

East New York

Stapleton
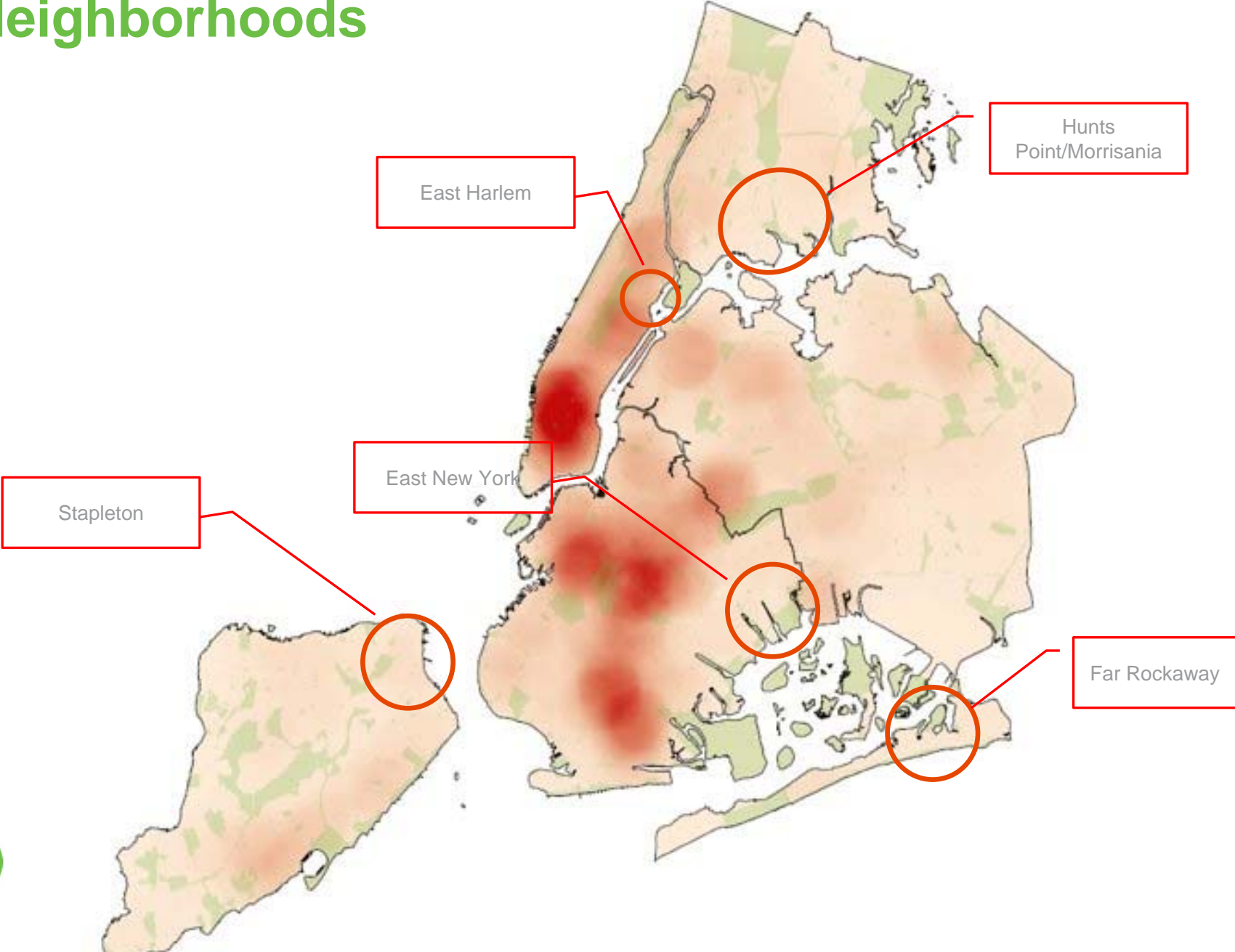
Far Rockaway

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# Cool Neighborhoods

The Heat Vulnerability Index (HVI) is the average of all census tracts for each community board. The estimated number displayed on each community board represents the required plantings to reach full stocking.

**HVI and Estimated Trees Needed to Achieve Full Stocking, by Community District**

**Heat Vulnerability Index**

- Low Vulnerability
- Medium Vulnerability
- High Vulnerability
- Parks and Open Space

N

Miles
0    1.5    3
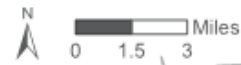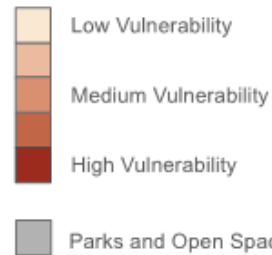
Prepared by Forestry, Horticulture and Natural Resources
October 27, 2016
Data Source: HVI- DOHMH; DCP Census Tracts 2010
2015-2016 Street Tree Census Data, NYC Forestry
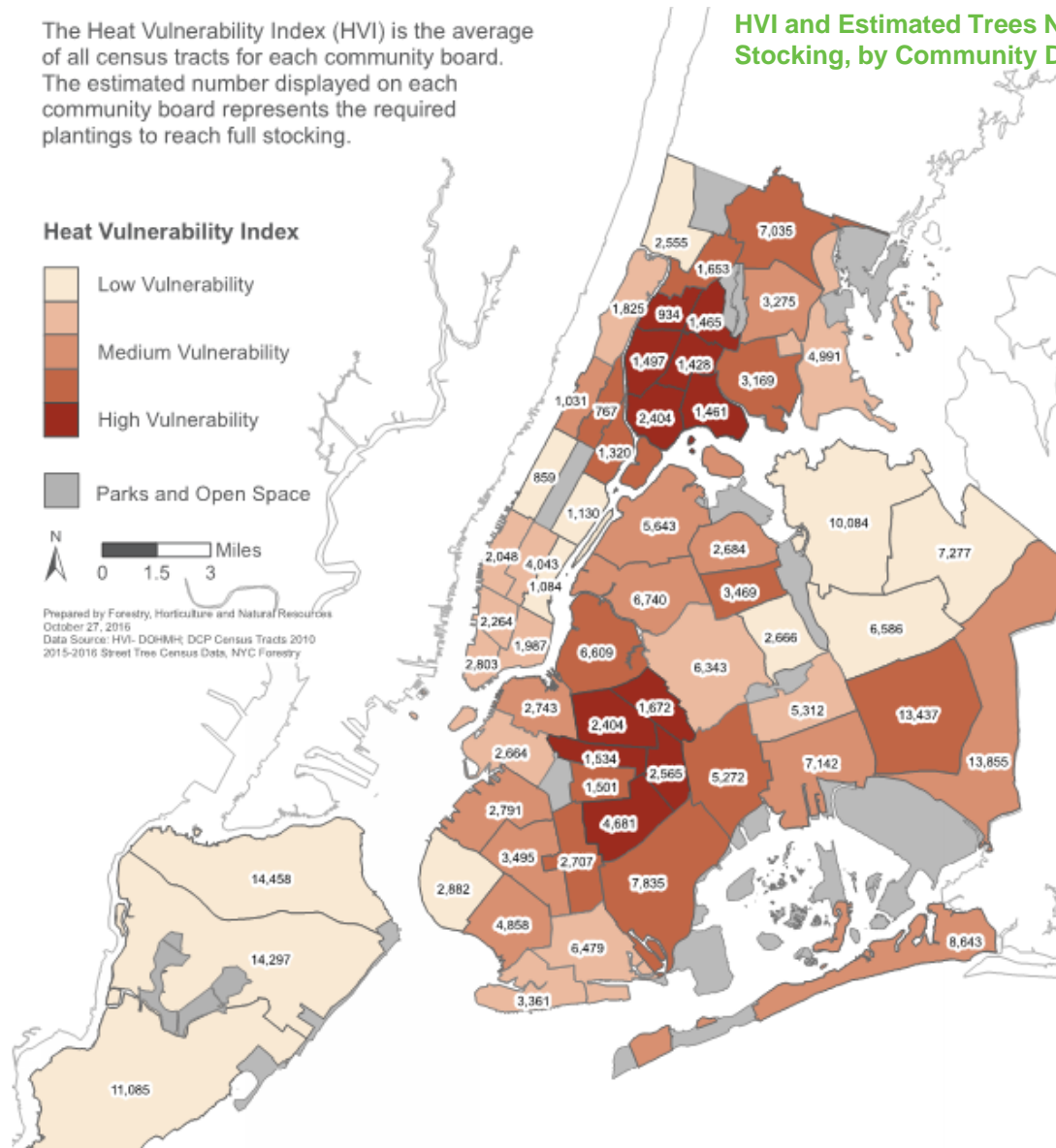
# Cool Neighborhoods Tree Planting Progress

| | **Fiscal Year** | | | |
|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **TOTAL PROGRESS TO-DATE** |
| **Borough** | | | | |
| Bronx | 772 | 625 | 760 | **2,157** |
| Brooklyn | 803 | 727 | 1,868 | **3,398** |
| Manhattan | 98 | 184 | 45 | **327** |
| Queens | 132 | 299 | 74 | **505** |
| **Total** | **1,805** | **1,835** | **2,747** | **6,387** |

# The Bronx



NTA

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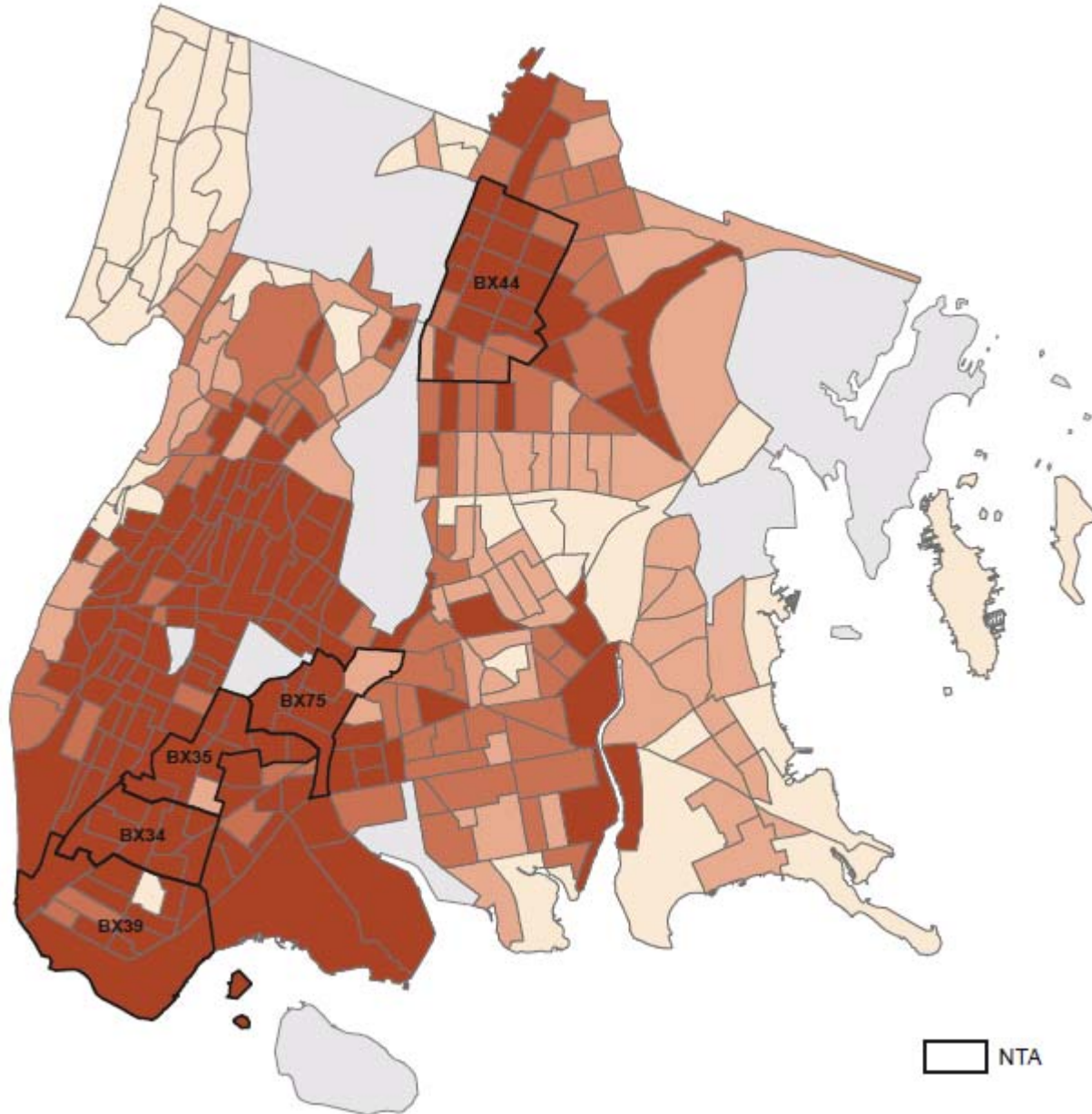
# Brooklyn

NTA

# Manhattan
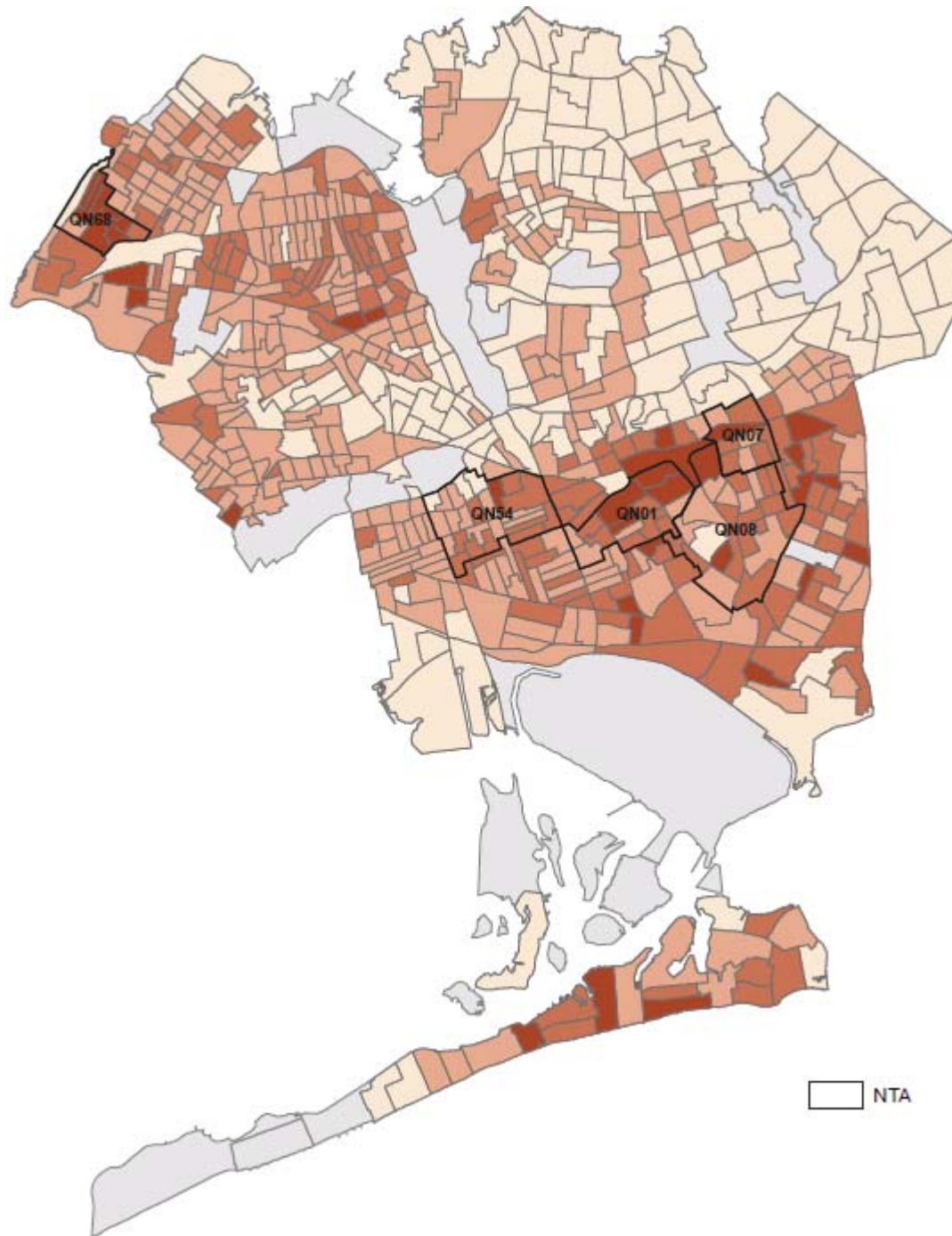


NTA

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# Queens

# What Drives Where We Plant?

- 311 Service Requests (~18,000/ year)

- Permitted Removal Replacements

- Electeds' Directed Funding

- Zoning requirements

- Natural Disasters

- Pest Infestations

- **Administration Priorities**



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# Tree Supply



**grow**

Sure supply of bespoke trees grown for NYC Parks under long term contracts with two nurseries

**care**

High quality, selective, and diverse pallet of species cultivated and shaped for urban life

**dig**

Special equipment, and protective wrapping, and gentle handling maximizes root retention

**deliver**

Tree planting contractor "accepts" trees from nursery for planting on the streets of NYC

# Trees Diversity

- ## Greater Diversity

- ## Higher Quality

238 ● Street Trees Species
(includes Cultivars)

143

127

121

111

91

57 ● Forest Tree Species

52

17

**Nursery Contract Year**

0  1  2  3  4  5  6  7  8  9

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STOP SIGN - at least 30' from trunk

BUS STOP - no trees at curb
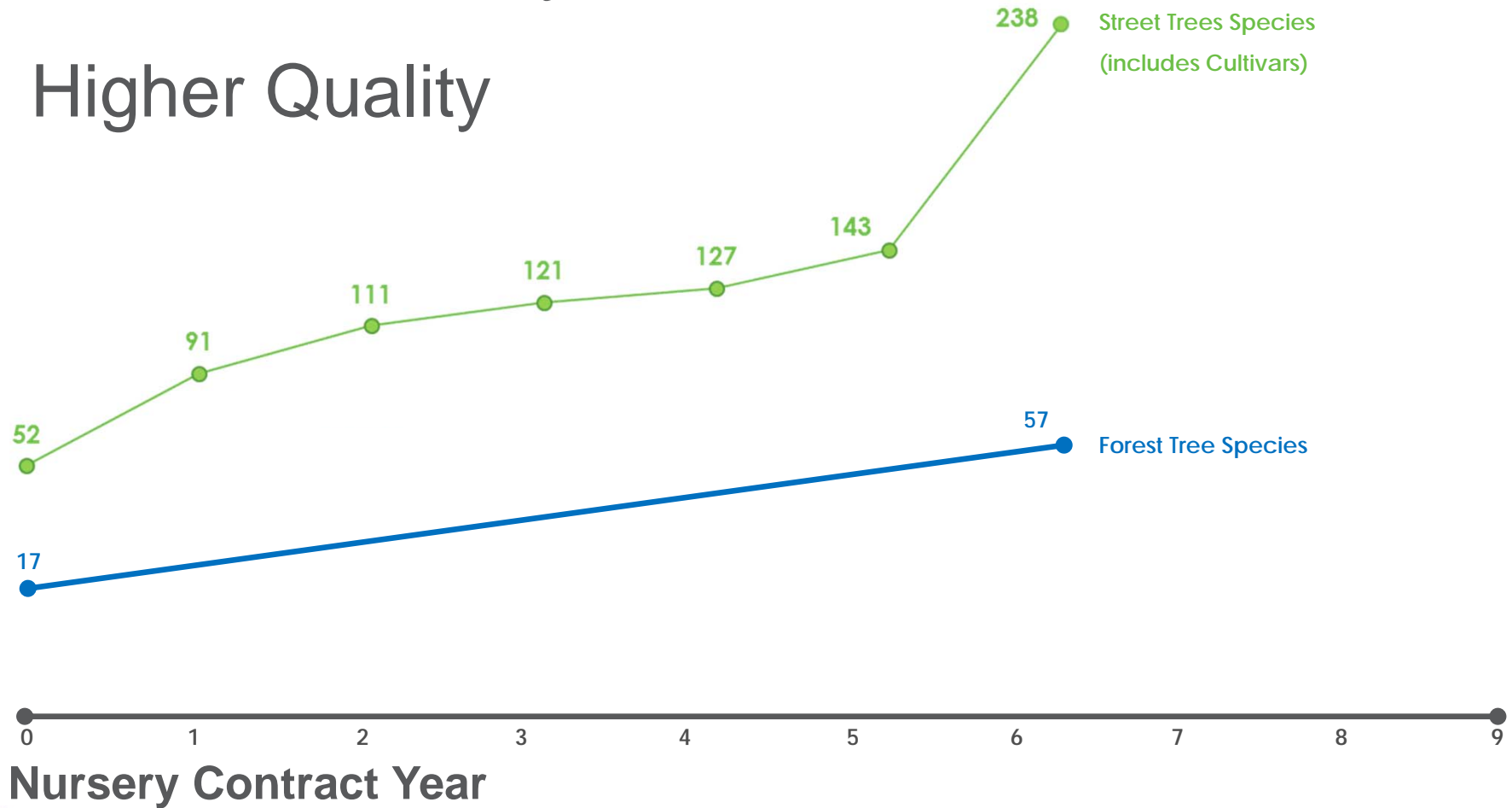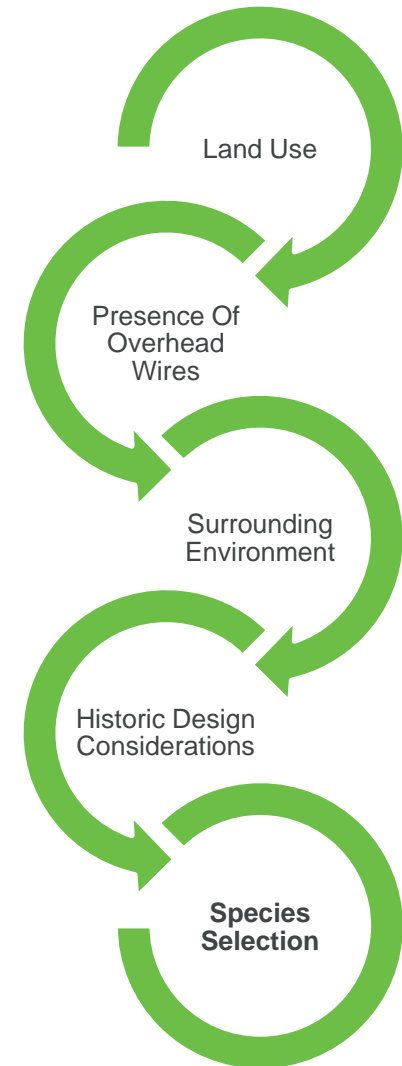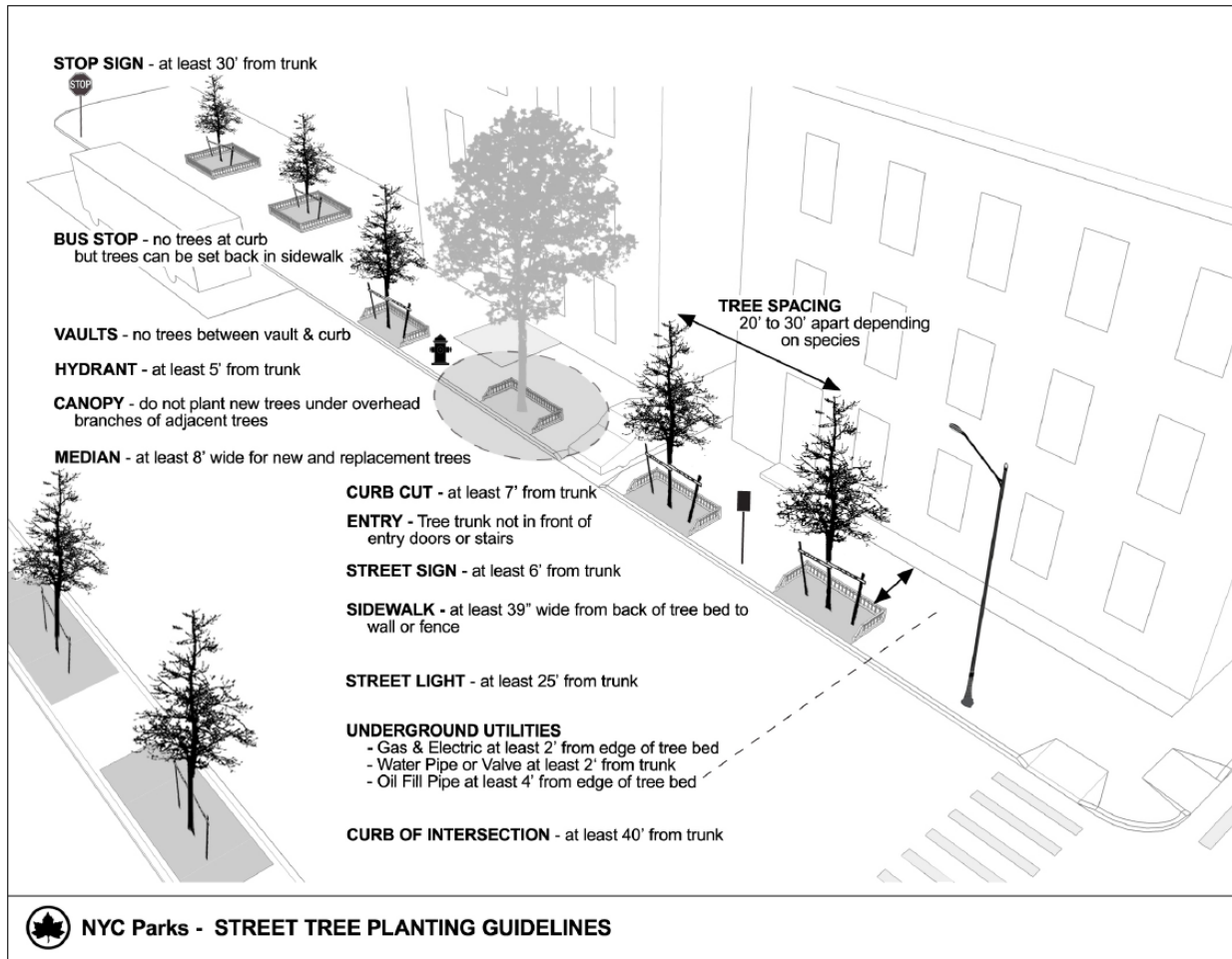  but trees can be set back in sidewalk

VAULTS - no trees between vault & curb

HYDRANT - at least 5' from trunk

CANOPY - do not plant new trees under overhead
  branches of adjacent trees

MEDIAN - at least 8' wide for new and replacement trees

TREE SPACING
20' to 30' apart depending
on species

CURB CUT - at least 7' from trunk

ENTRY - Tree trunk not in front of
  entry doors or stairs

STREET SIGN - at least 6' from trunk

SIDEWALK - at least 39" wide from back of tree bed to
  wall or fence

STREET LIGHT - at least 25' from trunk

UNDERGROUND UTILITIES
  - Gas & Electric at least 2' from edge of tree bed
  - Water Pipe or Valve at least 2' from trunk
  - Oil Fill Pipe at least 4' from edge of tree bed

CURB OF INTERSECTION - at least 40' from trunk

NYC Parks - STREET TREE PLANTING GUIDELINES

Land Use

Presence Of Overhead Wires

Surrounding Environment

Historic Design Considerations

**Species Selection**

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# Planting

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# Establishment and Guarantee

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# NYC Parks' Urban Forest



**FOREST**
3.3 million
80%

**STREET**
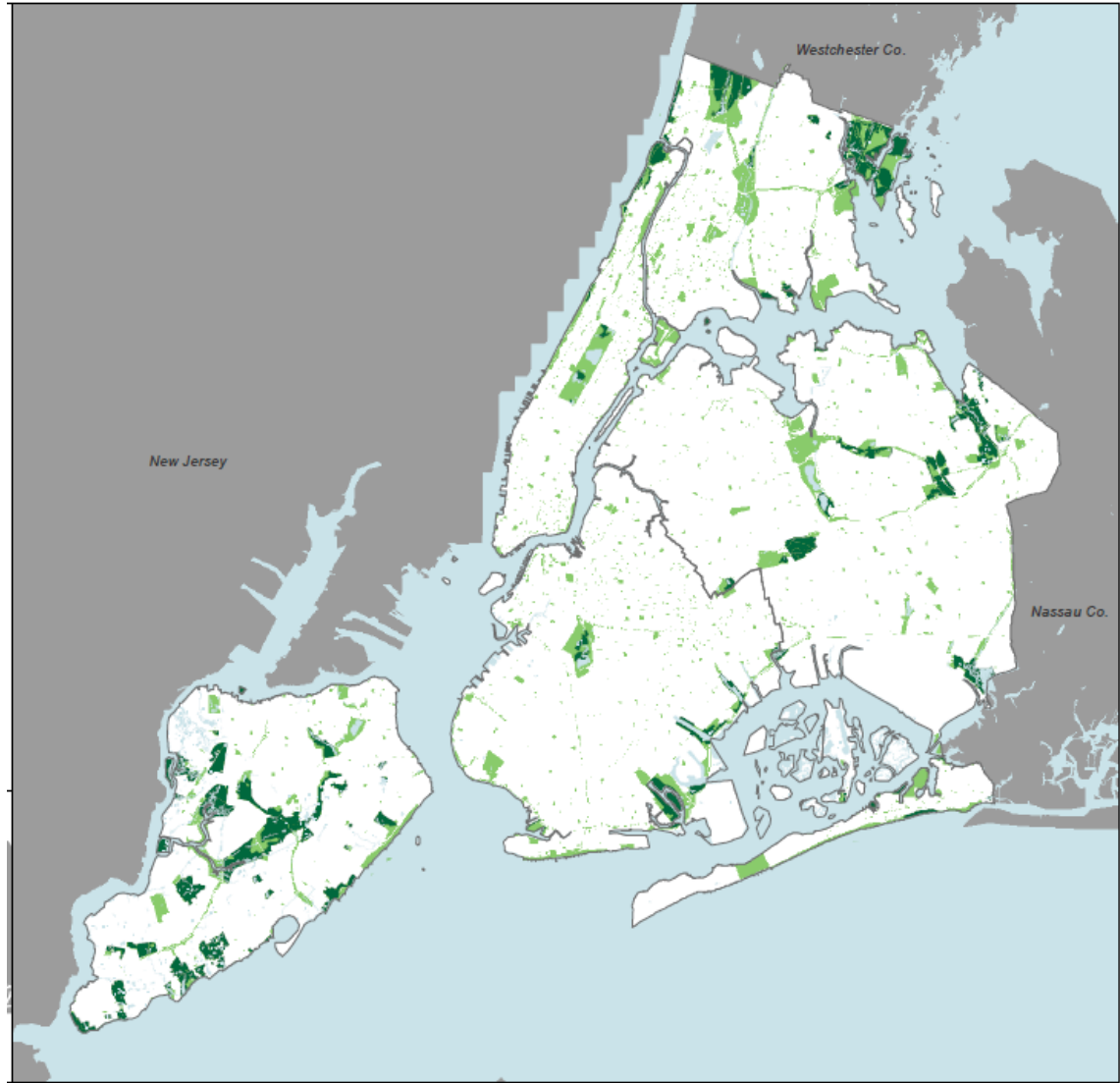666,134
16%

**PARK**
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4%

**NON-FOREST**
822,759
20%

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# New York City Natural Area Forests



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# New York City Forests

# Ecological Assessment

- Partnership with Natural Areas Conservancy

- Ecological Assessment conducted in 2013-14 in natural areas citywide in over 1,200 plots.

- Collected data on abundance, composition and structure of native and invasive species

- Forest Management Framework

- Management sites prioritized and organized into potential for intensive restoration, management and long term maintenance



Forest Management Framework for New York City

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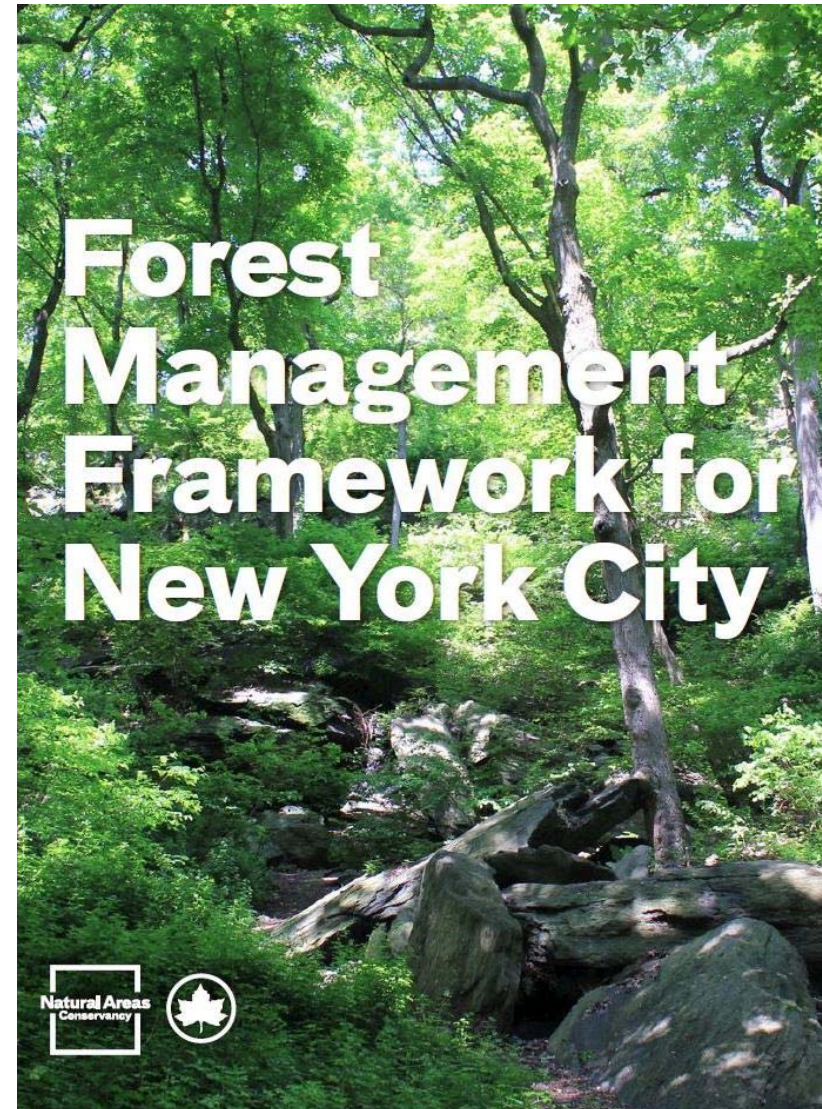
# Set Targets



URBAN MULTI-STORY FOREST

Animals

Environmental
Factors

People

CANOPY

UNDERSTORY

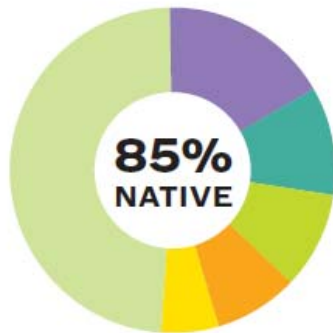SHRUB & HERBACEOUS LAYER

FOREST FLOOR

SOIL

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.
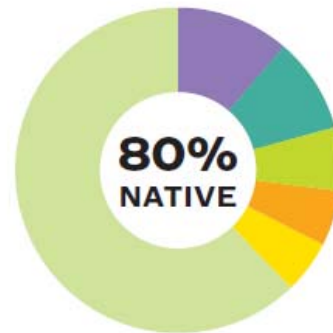
### Midstory

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.

**85% NATIVE**

**80% NATIVE**

**48% NATIVE**

**Top 5 Species**
- Sweetgum
- Northern Red Oak
- Black Cherry
- Red Maple
- Sassafras
- All Other

**Top 5 Species**
- Spicebush
- Black Cherry
- Sassafras
- Sweetgum
- Red Maple
- All Other
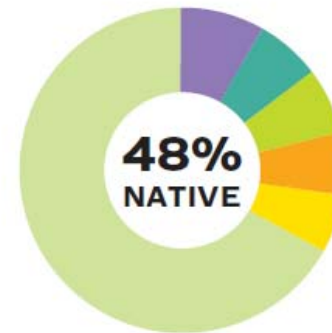
**Top 5 Species**
- Poison Ivy
- Mugwort*
- Japanese Honeysuckle*
- Multiflora Rose*
- Virginia Creeper
- All Other

* Invasive non-native species

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# Invasive Species



Porcelainberry

Asiatic Bittersweet

Mugwort

Japanese Honeysuckle

Multiflora Rose

Japanese Knotweed

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# Restoration techniques

- Mechanical

- Chemical

- Biological

- Cultural



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# Restoration

- Native planting following 2-3 years of invasive species removal

- 1 gallon shrubs and 2 gallon trees

- Most often performed by volunteers

- Contractors, in-house crews too



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# Tree Planting

## Collect Local Seed

Find ecotypical sources and follow strict collection protocols

## Store Properly

For short term and long - term use

## Propogate

Be persistent in producing difficult species not commercially available

## Grow to Size

Partner with local nurseries

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# Native Species Planting Guide – 3<sup>rd</sup> Edition

**Updates**

- Table of Contents
- Ecosystems of New York City
- Forever Wild Maps
- Stormwater Tolerant Plants
- Urban Plant Communities / Planting in the Built Environment
- Wetland indicator status
- RTE species

**Additions**

- Planting Near Natural Areas
- Problematic Species
- Species Least Preferred by Deer



Native Species Planting Guide for New York City
3rd Edition

# THANK YOU

*Jennifer Greenfeld, Assistant Commissioner*
*Forestry, Horticulture & Natural Resources*

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**September 22, 2020**