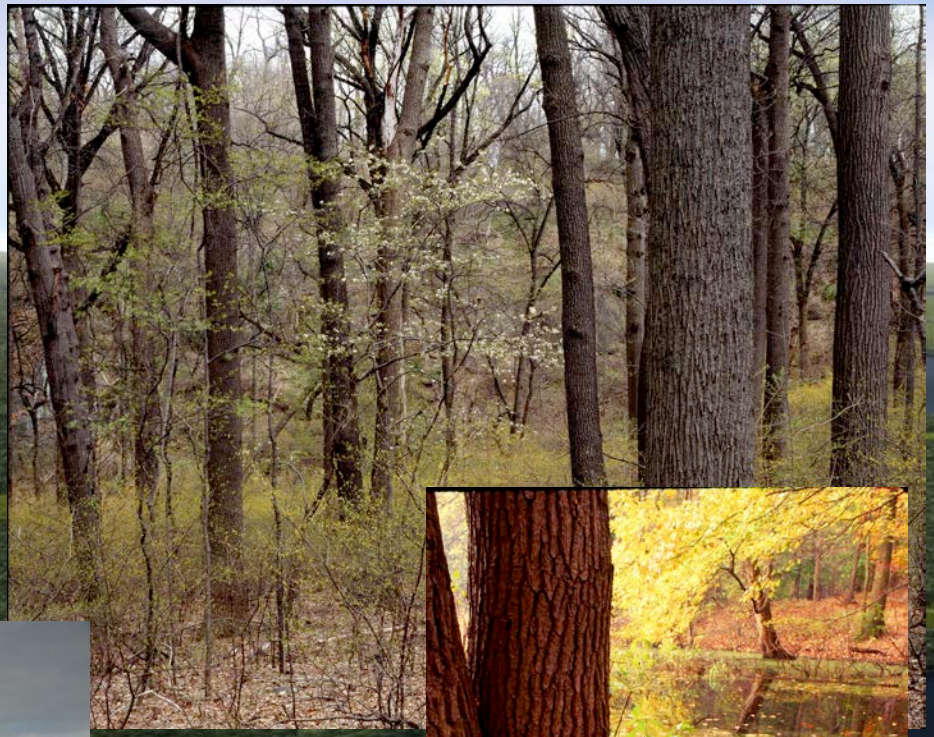
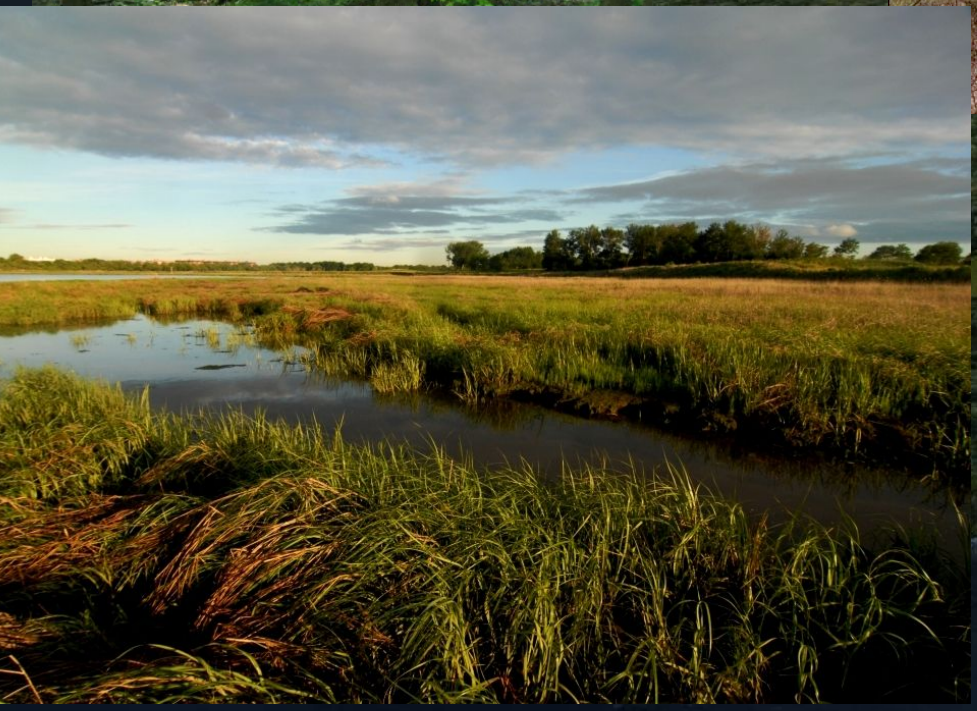

Forest Restoration in
New York City -
28 years of lessons learned
Parks


Forest?


KUBOTA
HARTER EQUIPMENT
Vermeer
Angle Blade
BC123
2012/08/01





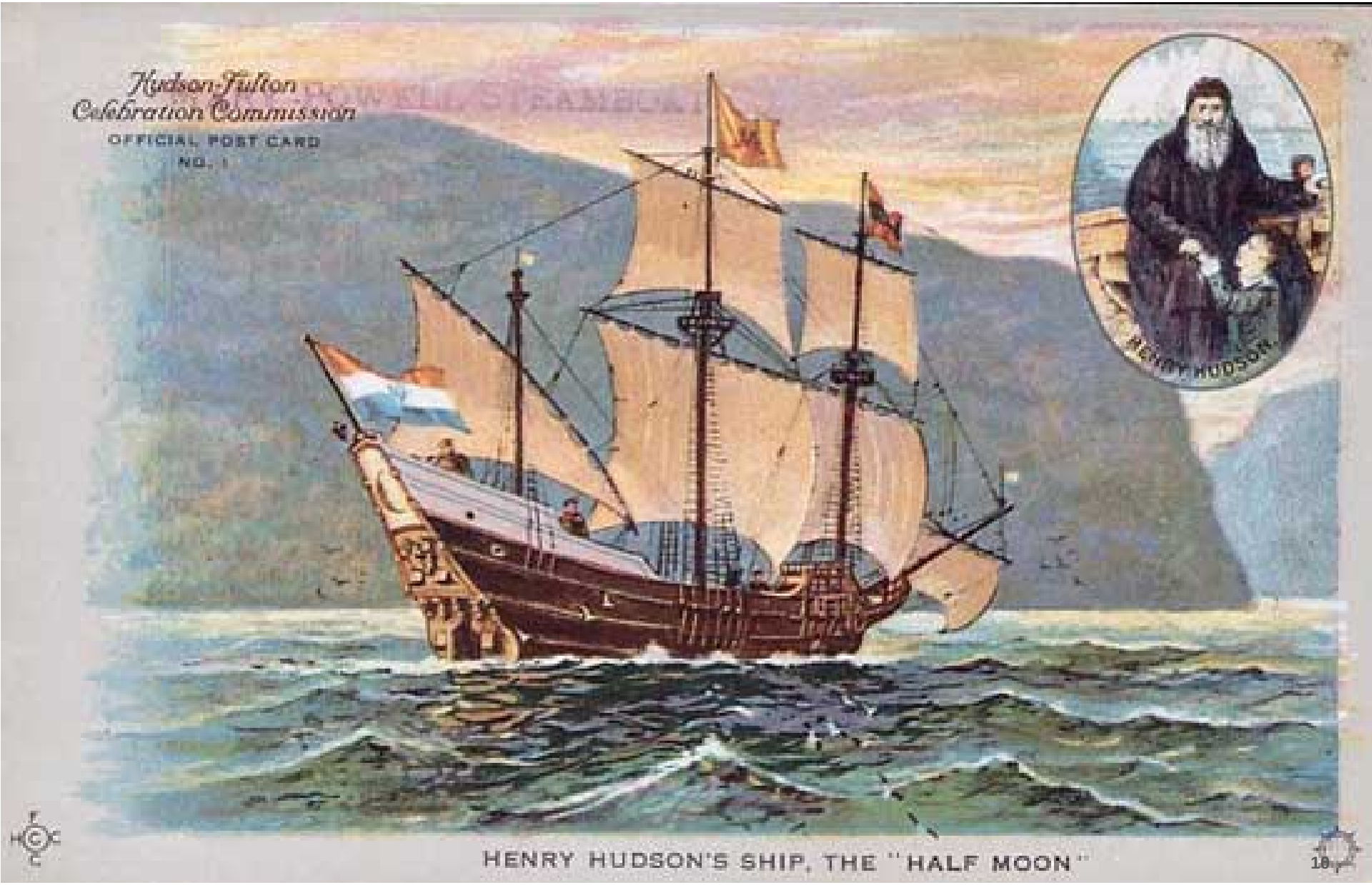
MULTI-STORY FOREST

CANOPY

UNDERSTORY

SHRUB & HERBACEOUS LAYER

FOREST FLOOR



HENRY HUDSON'S SHIP, THE "HALF MOON"

Quercus bicolor

FORM: ovoid
Size: large canopy - 22.5 to 30 m (75 to 100 ft)
Spread: wide - 15 to 22.5 m (50 to 75 ft), 2/3 that of height
Mass: moderate

BRANCHING: short trunk, lower limbs descending, upper crown ascending, medium texture
Twig: moderately stout, pale raised lenticels, red brown
Bud: clustered blunt globular end buds, light chestnut brown
Bark: young trees shedding in ragged papery flakes, adult deeply furrowed; dark gray-brown

FOLIAGE: alternate, simple, obovate-oblong obovate, shallow lobed to wavy margin, medium coarse texture
Surface: dull, leathery appearance, pale grayish green beneath and tomentose
Color: spring - purplish green; summer - dark green; autumn - golden yellow brown
Season: deciduous; emergence - early May, drop - early November

FLOWER: male in pendulous catkins, 5 to 7.5 cm (2 to 3 in) long
Color: yellow green
Season: early through mid May, with or soon after leaf emergence
Sex: monoecious

FRUIT: acorn, 19 to 38 mm (3/4 to 1 1/2 in) long, cap enclosing 1/3 to 1/2 length, long stem, usually in pairs
Color: tan brown
Season: September through early October
Wildlife Value: very high; man, water birds, upland ground birds, songbirds, small mammals, hoofed browsers

HABITAT: formation - forest; region - central; gradient - lowland wet and wet-mesic; second bottoms, alluvial flats, border of small streams, lake margin
Shade Tolerance: intermediate; index range 4.0-5.9
Flood Tolerance: tolerant

SOIL; Texture: medium to fine; stiff hard pan clay, silty clay, fine sandy clays, fine sandy loams
Drainage: moderately poor to very poor
Moisture: demands wet to moist
Reaction: neutral, pH 6.0-6.5

HARDINESS: zone 4a
Rate: medium to fast - one of faster growing oaks, 46 to 60 cm (1 1/2 to 2 ft) per year, slowing with maturity
Longevity: medium - generally mature in 125 to 175 years

SUSCEPTIBILITY; Physiological: frequent - severe iron chlorosis, requires acid soils
Disease: infrequent - oak wilt, Anthracnose, canker, Phomopsis canker, Coniothyrium dieback
Insect: infrequent
Wind-Ice: infrequent

URBAN TOLERANCE; Pollution:
Lighting:
Salt: resistant
Drought-Heat: resistant
Soil Compaction: resistant
Mine Spoils: resistant
Root Pattern: shallow fibrous; transplant readily B&B in early spring or late autumn

SPECIES; Associate: Black Ash, Red Maple, Silver Maple, Tuliptree, American Sweetgum, River Birch, Pecan, Boxelder, American Planetree, Green Ash, Shingle Oak, Bur Oak, Pin Oak
Similar: Pin Oak exhibits comparable cultural requirements, shape and branching form
Cultivars: none available commercially

292

Hightshoe
1988

Species List –
Wolfe's Pond Park (wet-mesic forest)

- Red maple
- Sugar maple
- Silver maple
- Serviceberry
- Grey birch – pioneer, dry upland soils
- American hornbeam – shade loving, moderate moisture
- Flowering dogwood
- Grey dogwood
- American beech
- Witchhazel
- Sweet gum
- Tuliptree
- Red oak
- Elderberry
- Arrowwood
- Blackhaw – well-drained soil

1,600 acres of freshwater wetland
80 acres restored

1,500 acres of salt marsh
90 acres restored

Alley Pond, Queens

Gerritsen Creek, Queens

15% Restored

Pelham Bay Park, Bronx

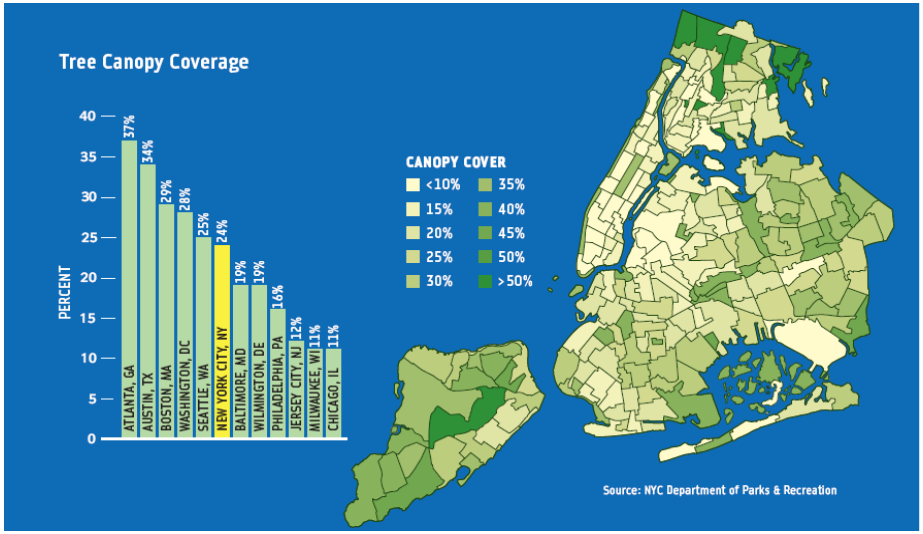
Van Cortlandt Park, Bronx

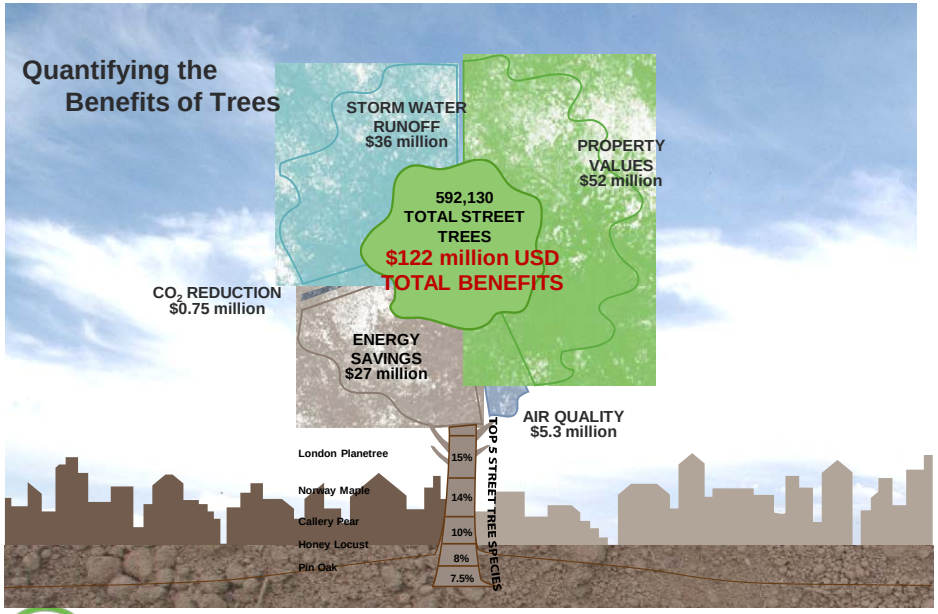
1,600 acres of grassland
150 acres restored

5,300 acres of forest
1,300 acres restored

NYC Parks

New York City's Urban Forest





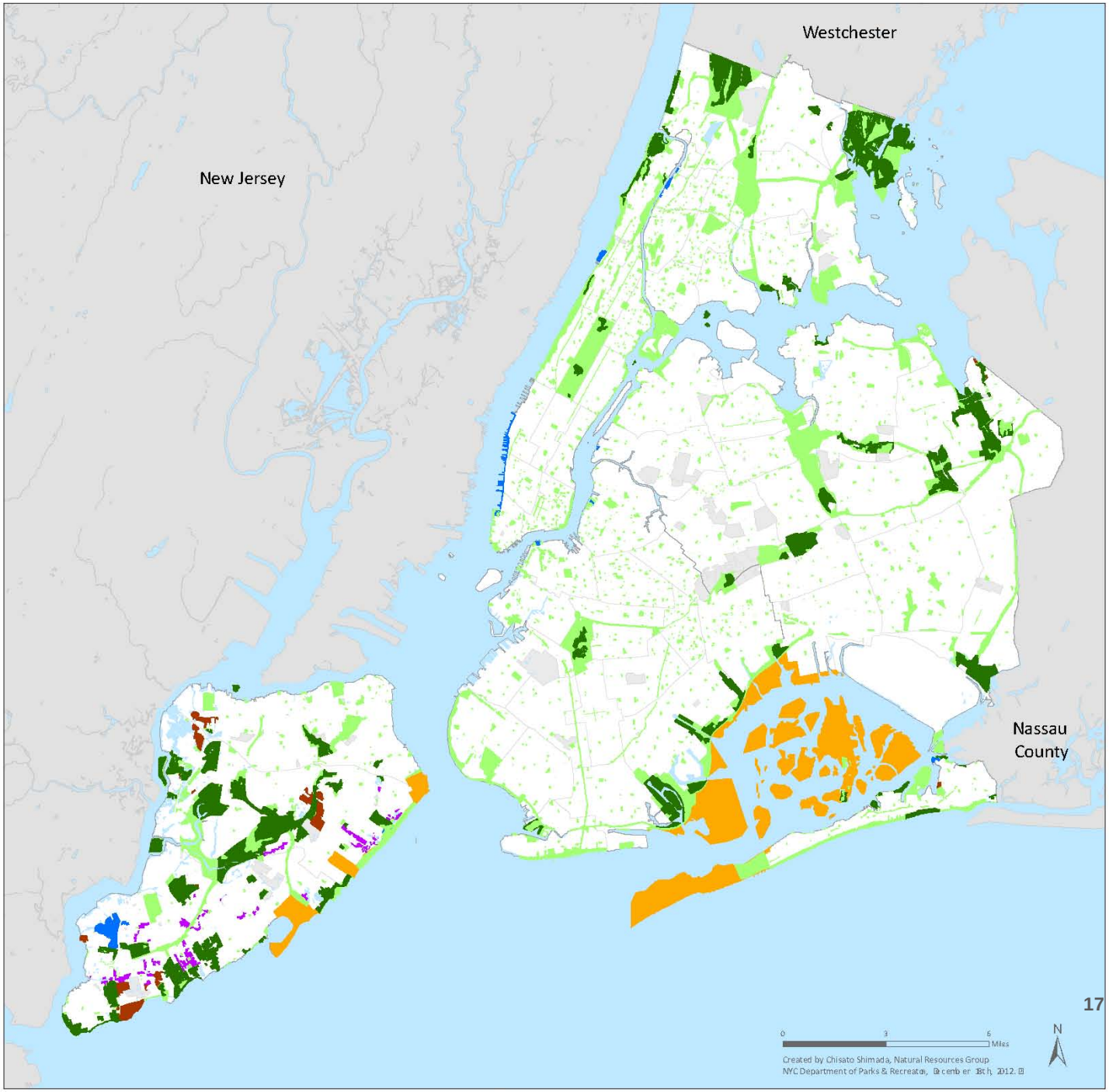
The rest of the forest?

NYC Parks

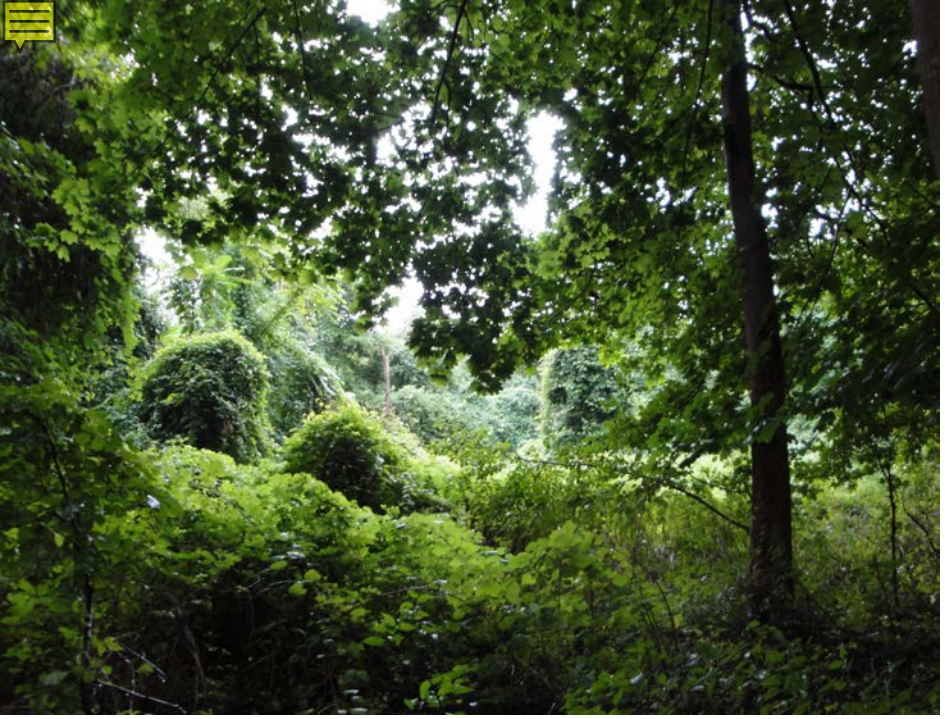
NYC Parkland

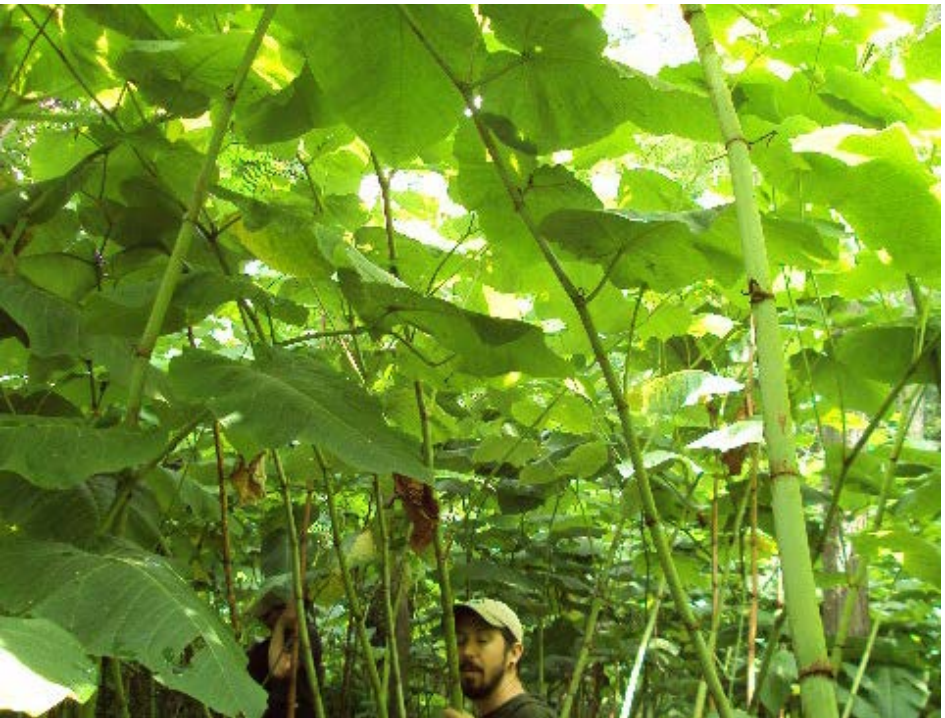
City, State and Federal

- NYC Parks
- NYC Parks Natural Areas
- NYC DEP Bluebelt
- NY State Parks
- NYS DEC Property
- National Park Service

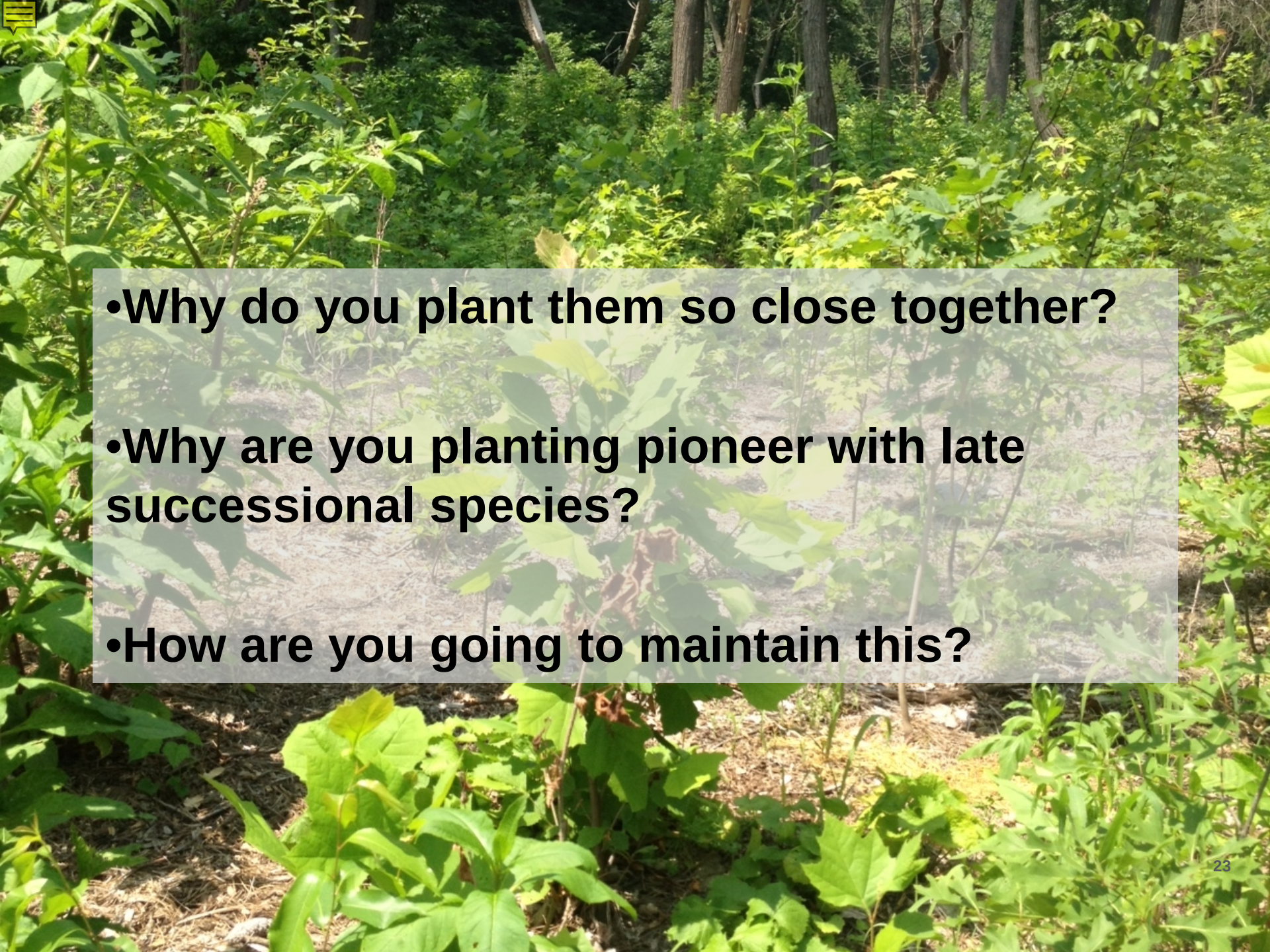


City of New York Parks & Recreation
Michael R. Bloomberg, Mayor
Veronica M. White, Commissioner
NYC Parks

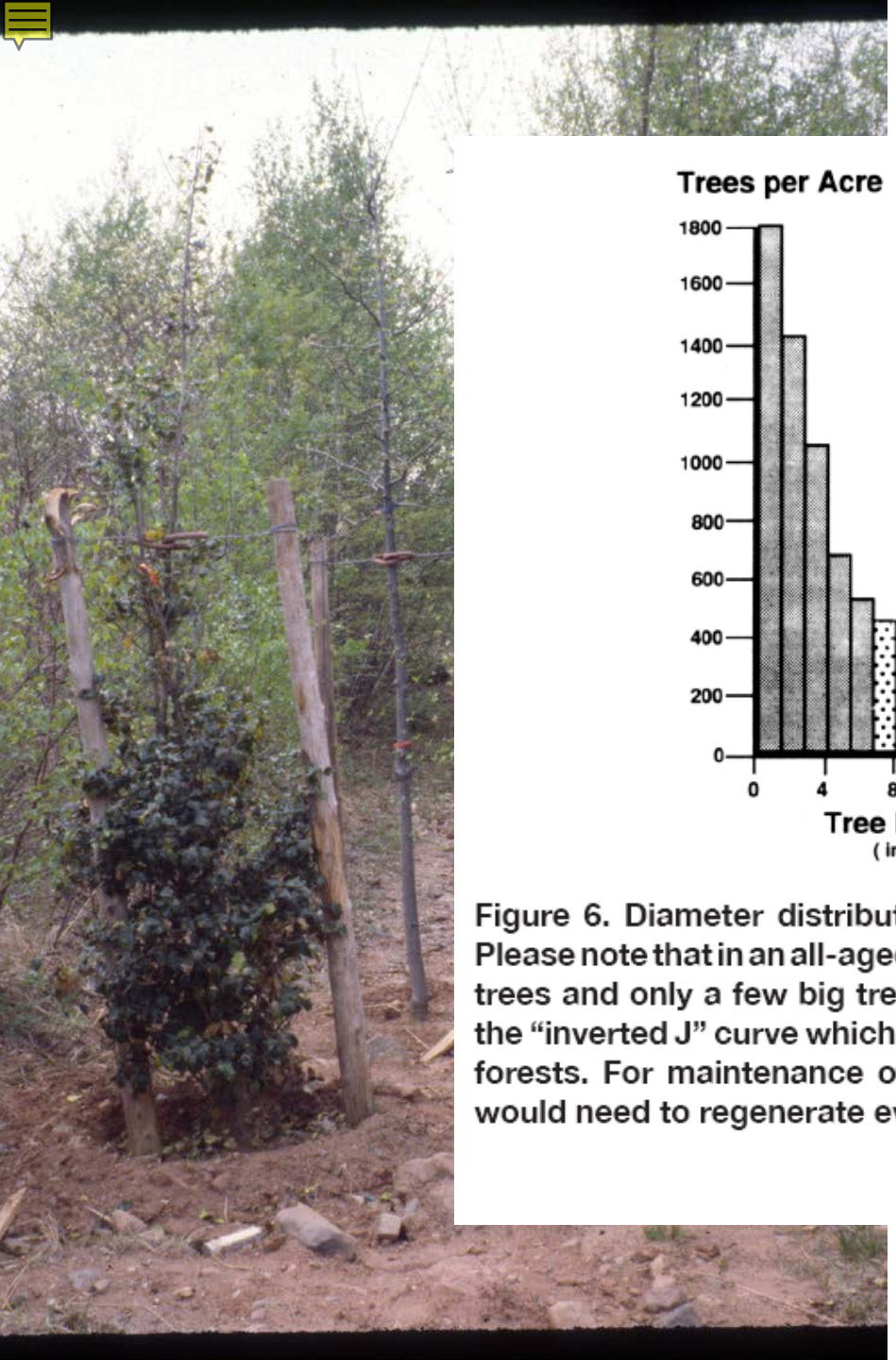


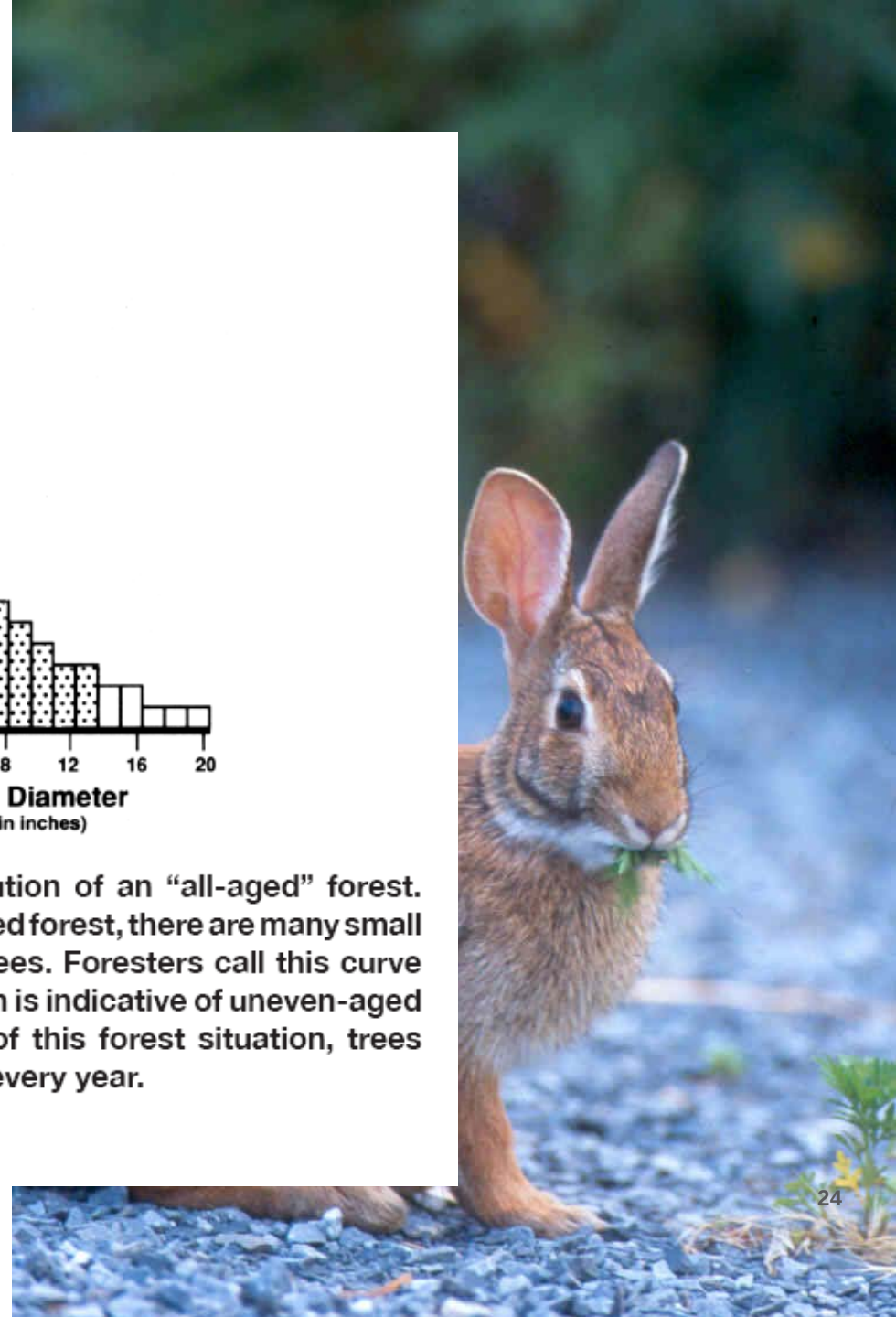



SPLIT ROCK



- Why do you plant them so close together?
- Why are you planting pioneer with late successional species?
- How are you going to maintain this?





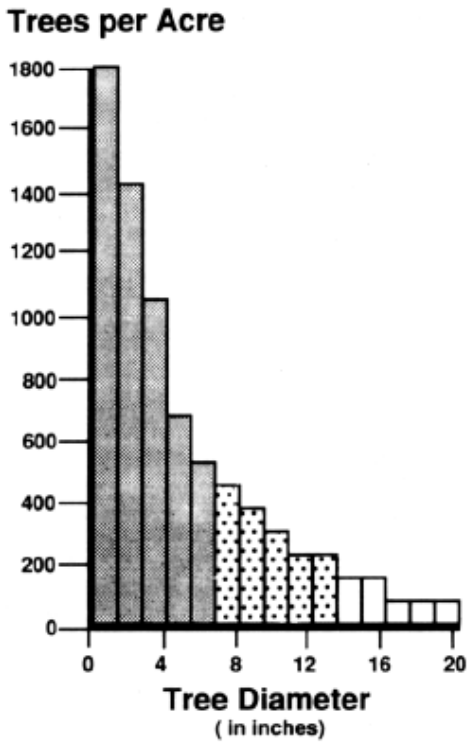
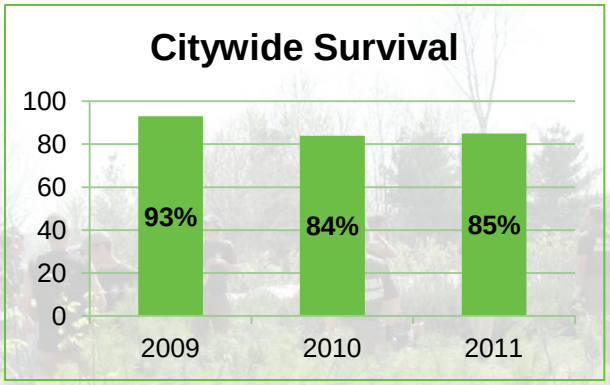
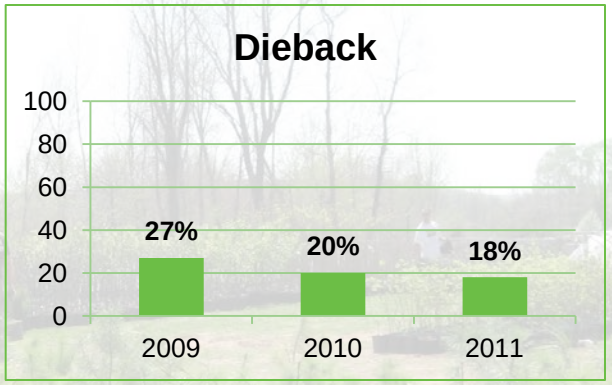
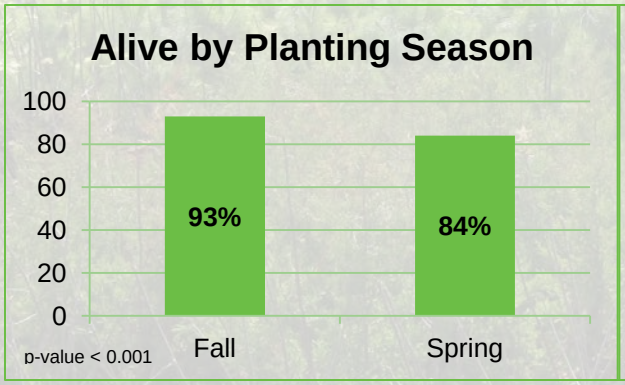
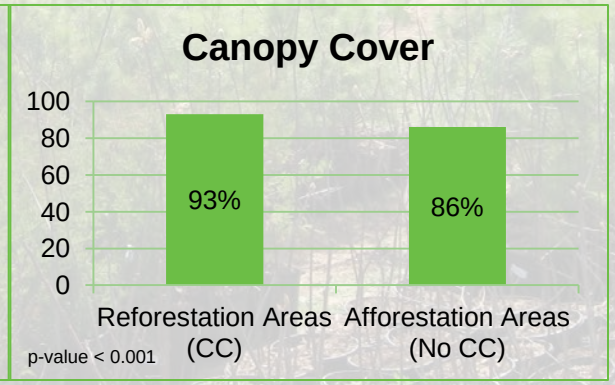


Figure 6. Diameter distribution of an "all-aged" forest. Please note that in an all-aged forest, there are many small trees and only a few big trees. Foresters call this curve the "inverted J" curve which is indicative of uneven-aged forests. For maintenance of this forest situation, trees would need to regenerate every year.



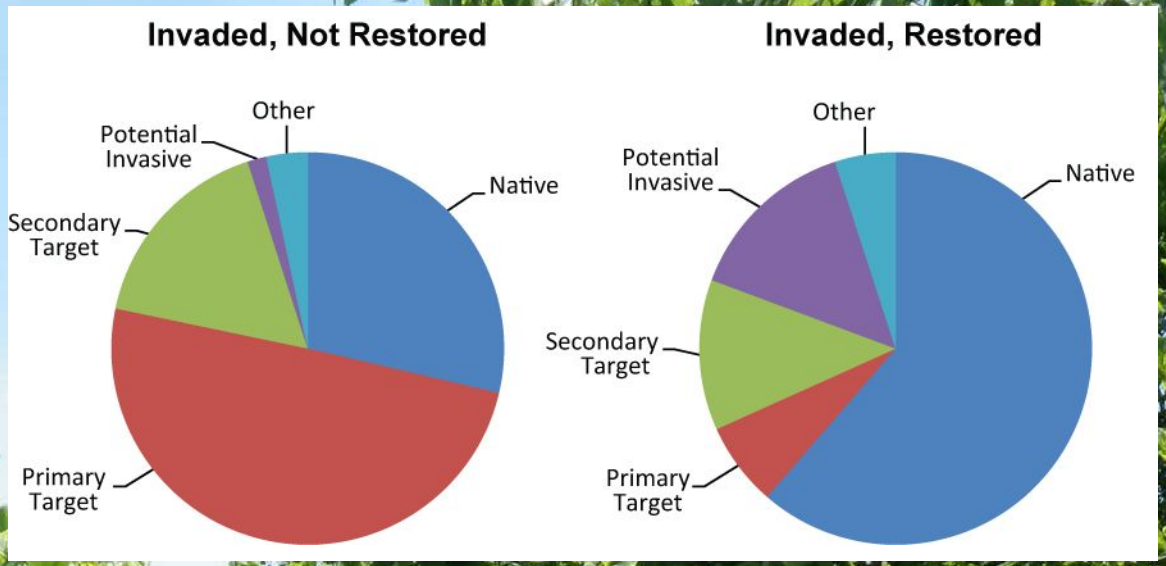


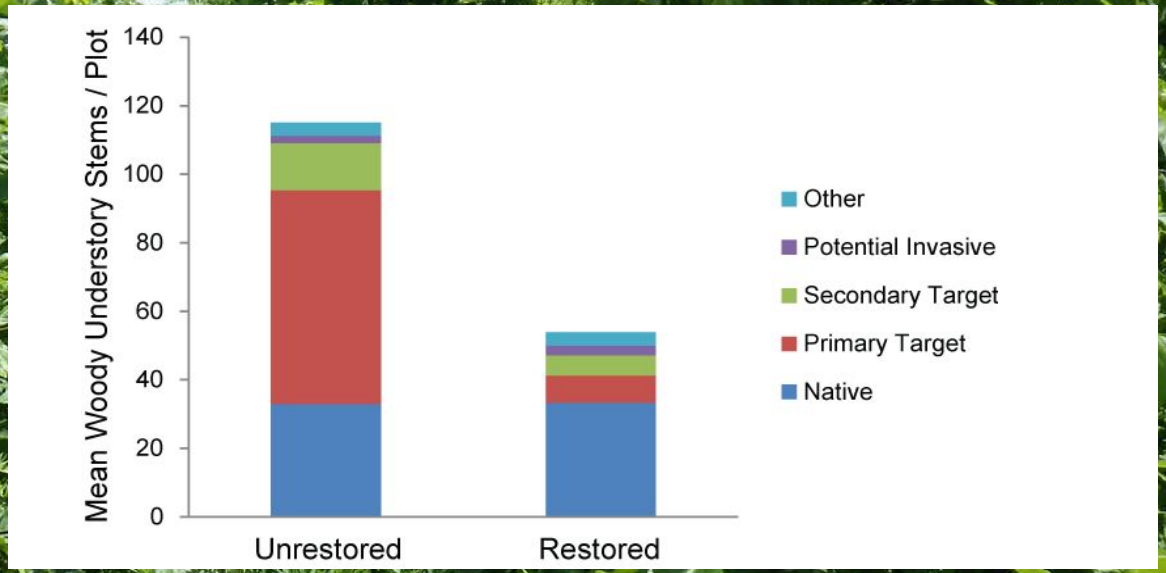




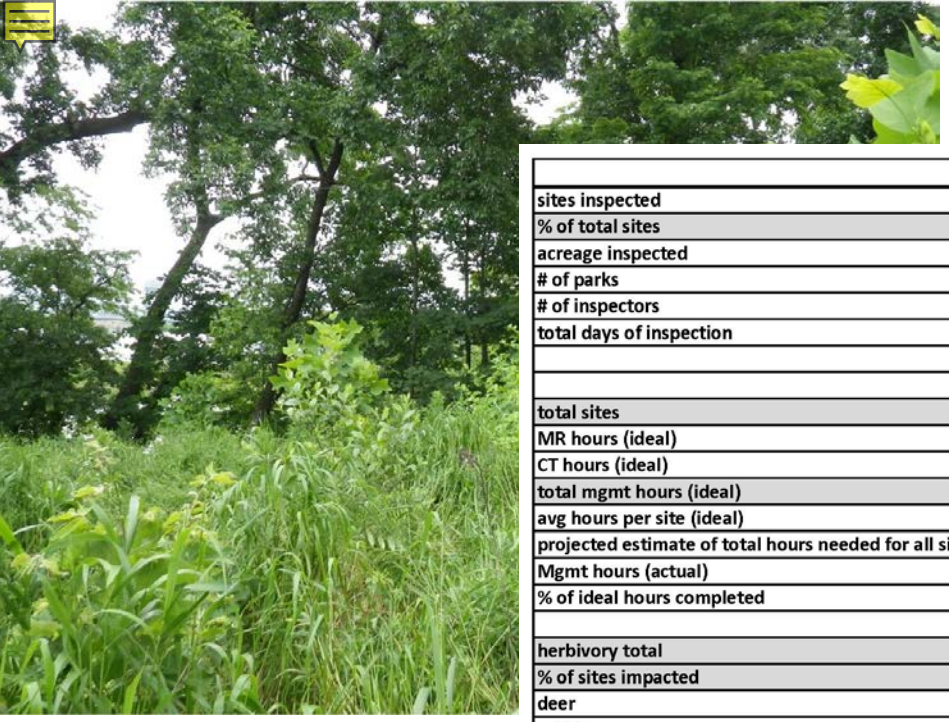
- Trees sampled from 2009 (n=1869), 2010 (n=1081), and 2011 (n=1493) were planted from Fall 2007 to Spring 2010. The seasonal and canopy cover data only includes trees from the 2009 and 2010 sampling periods.

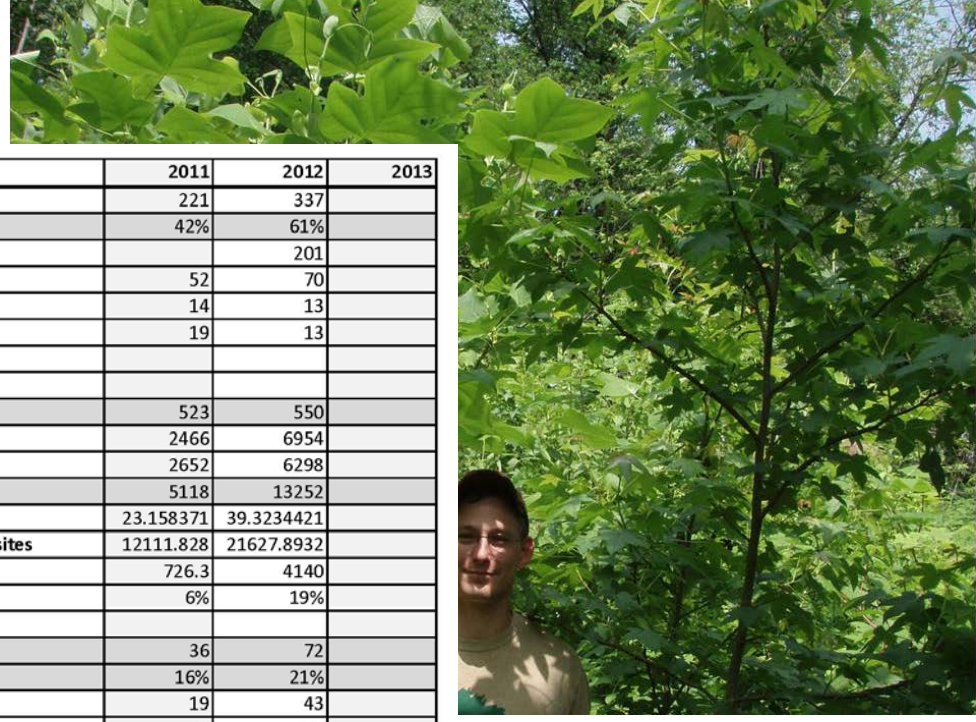
- Simmons, B. (n.d.). *MillionTreesNYC: Reforestation Survival Study*. Unpublished raw data, NYC Urban Field Station, New York, NY.



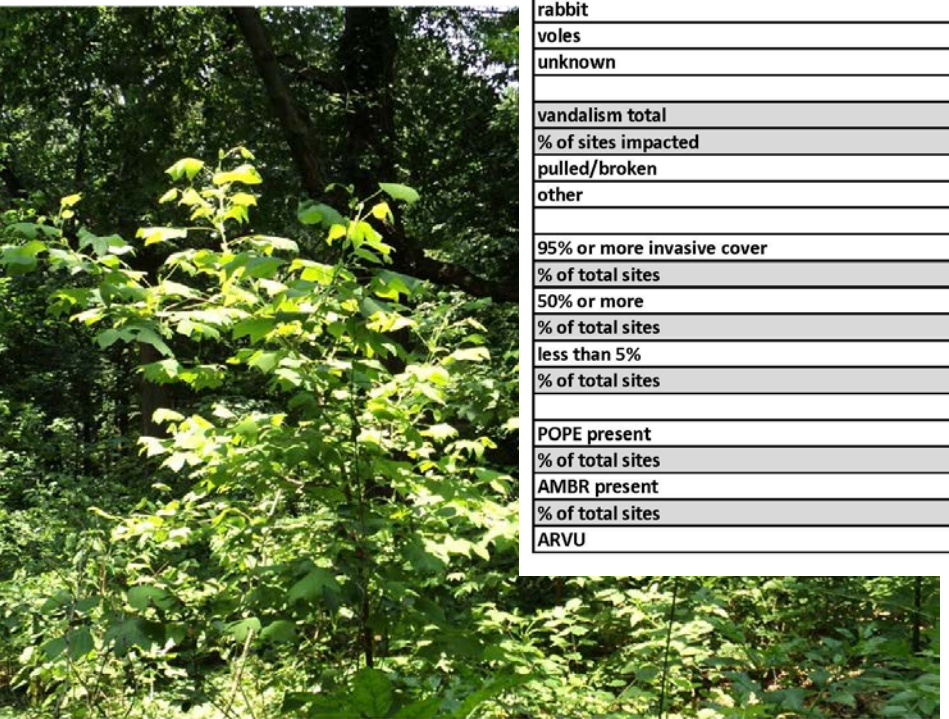


Lea Johnson 2013



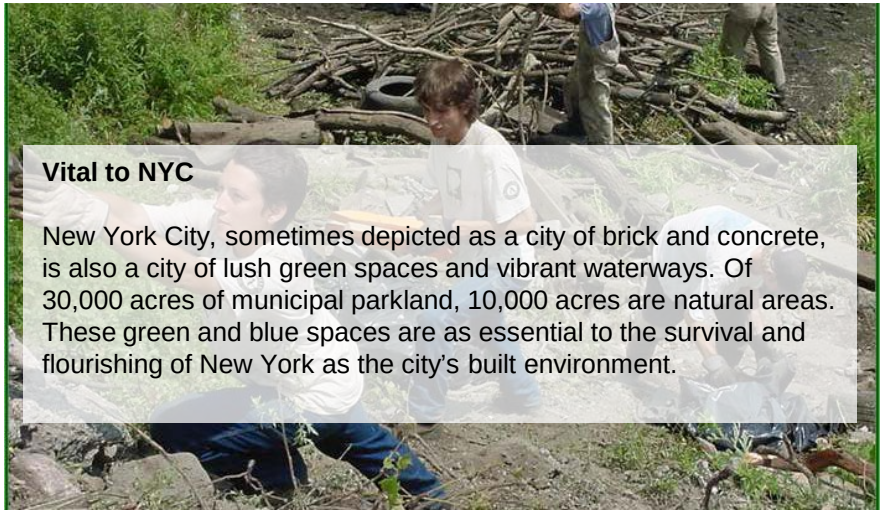


	2011	2012	2013
sites inspected	221	337	
% of total sites	42%	61%	
acreage inspected		201	
# of parks	52	70	
# of inspectors	14	13	
total days of inspection	19	13	
total sites	523	550	
MR hours (ideal)	2466	6954	
CT hours (ideal)	2652	6298	
total mgmt hours (ideal)	5118	13252	
avg hours per site (ideal)	23.158371	39.3234421	
projected estimate of total hours needed for all sites	12111.828	21627.8932	
Mgmt hours (actual)	726.3	4140	
% of ideal hours completed	6%	19%	
herbivory total	36	72	
% of sites impacted	16%	21%	
deer	19	43	
rabbit	9	18	
voles	3	11	
unknown	5		
vandalism total	26	48	
% of sites impacted	12%	14%	
pulled/broken		26	
other		22	
95% or more invasive cover	25	20	
% of total sites	11%	6%	
50% or more	158	167	
% of total sites	71%	50%	
less than 5%	55	70	
% of total sites	25%	21%	
POPE present	8	13	
% of total sites	4%	4%	
AMBR present	12	147	
% of total sites	5%	44%	
ARVU	85	180	



The Natural Areas Conservancy

The Natural Areas Conservancy will restore, protect, manage, and expand a network of green and blue space that promotes a healthy, livable, and diverse New York City.



Vital to NYC

New York City, sometimes depicted as a city of brick and concrete, is also a city of lush green spaces and vibrant waterways. Of 30,000 acres of municipal parkland, 10,000 acres are natural areas. These green and blue spaces are as essential to the survival and flourishing of New York as the city's built environment.

A Unique Public-Private Partnership

The Natural Areas Conservancy (NAC) is a new organization working in partnership with the NYC Department of Parks & Recreation (Parks) toward the protection, management, and restoration of the City's 10,000 acres of forests, wetlands, and grasslands in all five boroughs of NYC.

Initial Projects

- Citywide Ecological Assessment
- Natural Areas Stewardship
- Mid-Atlantic Regional Seed Bank
- Propagation of Plants for Post-Sandy Restoration
- Wetlands Restoration

For more information:
Bram Gunther, President, 718-760-6800, bram.gunther@parks.nyc.gov
Sarah Charlop-Powers, Vice President, 212-360-1407, sarah.charlop-powers@parks.nyc.gov

NYC Parks

Questions?

Acknowledgements

Emmerich, Tony. *Forest Conservation in the City*. City Parks Foundation, Urban Forest & Education Program.

Johnson, Lea R. 2013. *Long-term outcomes of ecological restoration and management in urban forests*. PhD Thesis, Rutgers University, New Brunswick, NJ. In preparation.

Simmons, B. (n.d.). *MillionTreesNYC: Reforestation Survival Study*. Unpublished raw data, NYC Urban Field Station, New York, NY.

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