The State Of The Trees

Madison Square Park
2023
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In August of 2023, Madison Square Park Conservancy began to move its tree database into the i-Tree urban forestry software, revealing some interesting data about the sustainability benefits of our small urban forest.

164 trees were analyzed for their contributions to environmental quality using models developed by the US Forest Service Northern Research Station.

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**I-TREE REPORT**

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- Acres: 3.052
- Oxygen Production: 6.817 tons/yr
- Most Common Trees: London Plane, Ginkgo, & Pin Oak
- Carbon Sequestration: 169 tons
- Pollution Removal: 141 lbs/yr
- Avoided Runoff: 50,430 gal/year
- Carbon Storage: 2.55 tons
- Percentage of Trees Less Than 6 Inches in Diameter (Young Trees): 15.5%
SUSTAINABILITY BENEFITS

Trees in Madison Square Park are great at removing pollution, most notably particulate matter less than 2.5 microns, ozone, and nitrogen dioxide. Trees reduce the amount of carbon in the atmosphere by sequestering carbon in new growth each year. The amount of carbon annually sequestered increases with the size and health of the trees. This is one of the many reasons why Madison Square Park Conservancy is a member of the Forest for All Coalition, a group of parks, green industry professionals, and citizens in support of a healthy and stable 30% New York City forest canopy cover. Trees in Madison Square Park are estimated to store 170 tons of carbon with a gross annual sequestration of 2.55 tons in 2023. London plane trees (*Platanus × acerifolia*) are currently the greatest at storing carbon in the park due to their age and good health. London plane trees make up 38.8% of all carbon stored and 36.4% of carbon sequestered.

Surface runoff has been a climate challenge in many urban areas and has become an increasing issue of concern in New York City since Hurricane Sandy. This past fall, Brooklyn had significant flooding due to stormwater runoff. Trees can help mitigate these precipitation events by reducing the amount of surface runoff. It’s estimated that Madison Square Park’s trees reduced runoff by an estimated 50.4 thousand gallons this year.

37% of the trees inventoried were native to North America with 28% of the total being local to New York State. By conducting this inventory, we were able to review what species could be added to our arboretum to increase the benefit to wildlife.
THREATS

Climate change and global trade have brought a myriad of pests and diseases to our trees. By continuing to diversify our tree canopy, we can help mitigate the risk of losing significant canopy cover due to pests and disease. The species most at risk to pests and disease include Elms, Oaks, Apples, and Lindens.

Those of most concern include:

- **Asian Longhorned Beetle**: poses a threat to 42.7% of Madison Square Park’s Urban Forest. This threat is currently being monitored and inspected throughout New York State.

- **Dutch Elm Disease**: has been a long-term issue with Elm trees since the 1930s. Madison Square Park’s historic Elms require inoculations against this pathogen every two years.

- **Spongy Moth** (previously known as gypsy moth): is a defoliator that feeds on leaves in major outbreaks. In Madison Square Park, these are removed by staff members when seen. This pest threatens 25% of the overstory.

- **Oak Wilt**: is caused by a fungus and threatens 15% of the tree canopy.
CHANGES TO THE TREES IN 2023:

Trees removed: 2
- Tree of Heaven (*Ailanthus altissima*) due to structural defects and invasive nature
- Black Locust (*Robinia pseudoacacia*) due to structural defects

Trees planted: 6
- Sassafras tree (*Sassafras albidum*)
- Northern Catalpa (*Catalpa speciosa*)
- Fire King Musclewood (*Carpinus caroliniana* ‘Fire King’)
- Kindred Spirit Hybrid Oak (*Quercus* ‘Nadler’)
- Prairie Sentinel Hackberry (*Celtis occidentalis* ‘Prairie Sentinel’)
- Espresso Kentucky Coffeetree (*Gymnocladus dioicus* ‘Espresso’)
# COMMON NAME | BOTANICAL NAME
---|---
6A | Japanese katsura  
Cercidiphyllum japonicum
23B | Japanese snowbell  
Styrax japonicus
23D | Cornelian cherry  
Cornus mas
26A | Persian ironwood  
Parrotia persica
29A | Redbud  
Cercis canadensis ‘Floating Clouds’
33 | Kwanzan cherry  
Prunus serrulata ‘Kwanzan’
37 | Swamp white oak  
Quercus bicolor
40 | Wych elm  
Ulmus glabra
44 | Pegoda tree  
Styphnolobium japonicum
52 | English elm  
Ulmus procera
63C | Carolina silverbell  
Halesia carolina ‘UC Conn Wedding Bells’
64 | Pin oak  
Quercus palustris
68A | Red buckeye  
Aesculus pavia
81 | English elm  
Ulmus procera
82 | Horse chestnut  
Aesculus hippocastanum
86 | Ginkgo  
Ginkgo biloba
94A | Yellowwood  
Cladrastis kentukea
95 | Chinese elm  
Ulmus parvifolia
107 | London plane  
Platanus × acerifolia
12B | Red oak  
Quercus rubra
141 | Hackberry  
 Celtis occidentalis
158 | Littleleaf linden  
Tilia cordata
167A | Dove tree  
Davidia involucrata ‘Sonoma’
167B | Japanese apricot  
Prunus mume ‘Peggy Clarke’
172 | Downy hawthorn  
Crataegus mollis
176 | Washington hawthorn  
Crataegus phaenopyrum
196A | Kousa dogwood  
Cornus kousa
208 | Weeping tupelo  
Nyssa sylvatica ‘Autumn Cascade’
209 | Sweet gum  
Liquidambar styraciflua ‘Slender Silhouette’
210A | Redbud  
Cercis canadensis ‘JN16’
211 | Chinese fringe tree  
Chionanthus retusus ‘Tokyo Tower’
212 | Musclewood  
Carpinus caroliniana ‘JN. Globe’
214 | Southern magnolia  
Magnolia grandiflora
216 | Chinese ironwood  
Parrotia subaequalis
217 | Serviceberry  
Amelanchier × grandiflora ‘Autumn Brilliance’
218 | Chinese fringe tree  
Chionanthus retusus ‘China Snow’
219 | Fringe tree  
Chionanthus virginicus
221 | American basswood  
Tilia americana ‘McK Sentry’
222 | Red maple  
Acer rubrum ‘PNI 0268’
224 | Redbud  
Cercis canadensis ‘NC2016-2’
225 | Crabapple  
Malus ‘Donald Wyman’
228 | Black locust  
Robinia pseudoacacia ‘Purple Robe’
229 | Musclewood  
Carpinus caroliniana
230 | Silver linden  
Tilia tomentosa ‘PNI 6051’