Borough of Woodcliff Lake

Tree Inventory and Survey

Sterling Consultants L.L.C.

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EXECUTIVE SUMMARY

An urban forest is a visible reflection of the community in which it grows. A healthy verdant urban forest almost always exists in a healthy verdant community. And the value of the trees is not only in their beauty, but also because of a wealth of tangible benefits. For example, they scrub the air of pollutants, slow the release of stormwater runoff into the watershed, filter stormwater, provide oxygen, reduce energy costs, provide shade, and offer habitat and food for wildlife. Trees in urban environments not only contribute services to the area, but also provide residents with invaluable green space and health benefits. Research has shown that proximity to green space is linked to better mental health, as well as increases in social connections, and physical well-being.

Achieving a healthy and sustainable urban forest hinges on factors such as species and age diversity, proper tree maintenance, risk management, and community support, which can all be facilitated through the implementation of a community forest management plan. The data presented in this report is provided to guide future maintenance and management policies, and to better plan for the health and longevity of Woodcliff Lake's urban forest. Understanding the value and benefits of the urban forest will also engender support within the community, support that is essential when planning how critical resources are secured and deployed. Accessing accurate data about the value of Woodcliff Lake trees is essential for making decisions on the community's future.

Woodcliff Lake train station, Woodcliff Ave at Broadway

**Cover photo Woodcliff Lake Reservoir August 2024*

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1 - Community overview

Character of Woodcliff Lake

From the Woodcliff Lake Municipal website:
"The Borough of Woodcliff Lake is nestled in the northwest portion of Bergen County, New Jersey. It occupies an area of approximately 2,300 acres, equivalent to 3.6 square miles. It is part of an area generally referred to as the Pascack Valley.

There are two large recreational areas in the borough. Wood Dale Park (a County Park) occupies 55 acres in the eastern portion of the Borough and has a large pond, walking paths, children's playground and tennis courts. The Old Mill Complex is the other site and is located on the west side of town. It contains a large swimming area, tennis courts and full-size athletic fields for a variety of sports. Throughout the year, community celebrations are held in both these areas in a festive atmosphere that all families enjoy. The town has a diverse program of recreational sports for both youth and adults."

Following the development of Tice Farms and Van Riper's Farms in the 1990's, few significant undeveloped areas remained in the borough, with the notable exception of the areas mentioned above (municipal pool, tennis courts, and arboretum), the area bordering the Garden State Parkway, and the site of the Galaxy Gardens at Werimus Road and Woodcliff Lake Avenue (now being developed as a municipal park).

The Woodcliff Lake tree canopy and urban forest is currently healthy, diverse, and vibrant. The report that follows will illuminate its current condition and help inform long-term planning.

Woodcliff Ave. Centennial Causeway dedicated 1994

Van Riper's farm 1963

Woodcliff Lake Schools

2 - INVENTORY PROCESS

Methodology and approach

The inventory data were compiled and analyzed utilizing the software ARBORPRO © (https://app.arborprousa.com/) to determine the state, characteristics, and trends of the borough's urban forest. Analyses and summaries were completed for the inventoried trees to determine the health and diversity of all trees within the inspected areas. The 2024 survey began with a baseline from a 2015 survey completed by Richview Consulting and expanded in several key ways;

- Individual trees were surveyed, inspected, and catalogued within the ROW (Right-of-Way) usually within 10' of each street and roadway. Most trees growing in this Right of Way area (ROW) greater than 2" DBH were included in the survey. Additionally, trees smaller than 2" were included if they were planted by the Shade Tree Committee or they were planted as a privacy screen within the ROW (e.g. arborvitae, spruce)
- Additionally, individual trees were surveyed, inspected, and catalogued in public areas; Borough Hall property, DPW property, Arboretum and adjacent park property.
- Excluded areas: private property, commercial property, public school property, GSP highway property, CXS property, water company property, and county parks.

Each tree was inspected and assessed for 5 key elements:

1. Location (street address and GPS coordinates)
2. Species type (common and scientific name)
3. Exact size (DBH, height, crown spread)
4. Overall tree condition (narrative on relative health, structural flaws, noting if pests or disease are present, and other data)
5. Recommended maintenance

Each tree was photographed with all data added to the online database. This database is accessible for ongoing maintenance, to monitor and track the condition and health of the tree over time, and to provide a baseline record for ongoing and future assessments.

The data includes 5,456 trees, inventoried by Certified Arborists accredited by the NJ Board of Tree Experts, and analyzed for site quality, health observations, and structural defects among other data points.

3 - Why the Inventory Matters

What an accurate accounting provides

A comprehensive inventory provides an accurate, insightful profile of the species and size (age) composition of the community forest.

which

Reveals planting needs and suggests priorities to ensure balance and diversity.

and

Identifies hazard trees that should be treated or removed, thereby preventing damage and costly litigation

which

Determines tree maintenance needs, providing a sound basis for how many people are needed to do the work, and how much it will cost.

and

Provides information for defensible budget requests that compare in accuracy and sophistication with those from other municipal departments.

which

Establishes the monetary value of community trees and convincingly shows the effects of budgeting and management on the resource value.

thereby

Locating trees that are special because of their large size, unusual form, or connections with history. By pinpointing such specimens, special care can be provided, and they can be included in educational materials.

which

Allows keeping records of work performed to be used for:

Reporting to the administration and elected officials,
Better planning of time and crew size needed for tree maintenance,
Ensuring systematic care of all trees, and Continuity of information when personnel changes occur

which

Enables quick and intelligent responses to property owner questions and requests.

which

Provides factual data for coordination with other departments, such as planning and streets.

which is

Useful for monitoring planting success and growth of trees to enable evaluation of nursery sources.

and very significantly ENGENDERS PUBLIC SUPPORT

4 - Inventory Analysis: Overall report and what it means

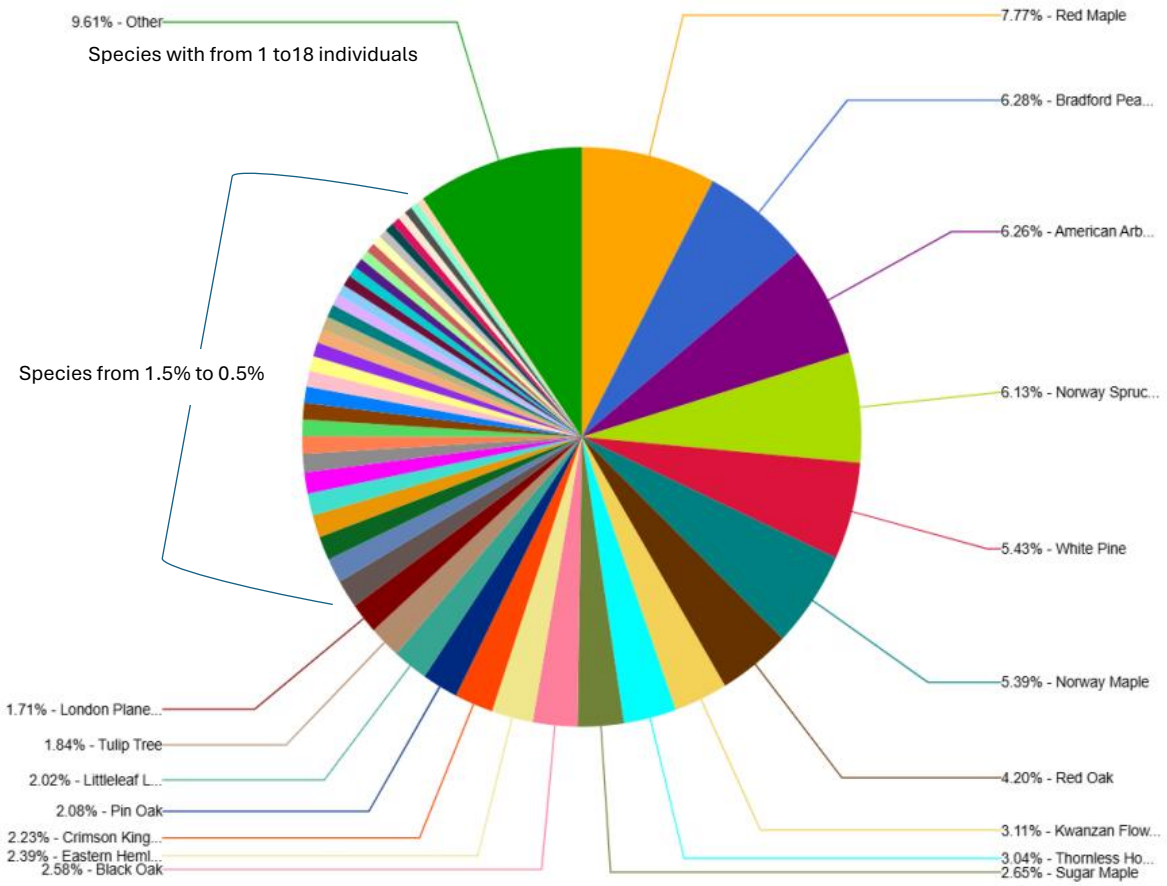
By the numbers

REPORTS

All trees - 5,434 individuals

A - Trees by species / 147 distinct varieties

- Diversity and variety are key ways to promote health and vitality of a community. Diversity means more disease resistance and more support for wildlife (birds and insects as well as reptiles and mammals). Diversity of species also means trees fill different niches – shade cover, water retention, and aesthetics for flower and leaf display. *No one tree species exceeds 8% of inventory (red maple is 7.77%)*.



- Note – species diversity for Woodcliff Lake overall is quite exceptional, some streets and locations do have single species/monoculture bias. These areas may benefit from future diverse plantings.
- Genus diversity is also important. Woodcliff Lake has good genus diversity, with maple (acer) being the largest genus represented at 21%. The next most common genus being Oak (quercus) at 11%, with spruce

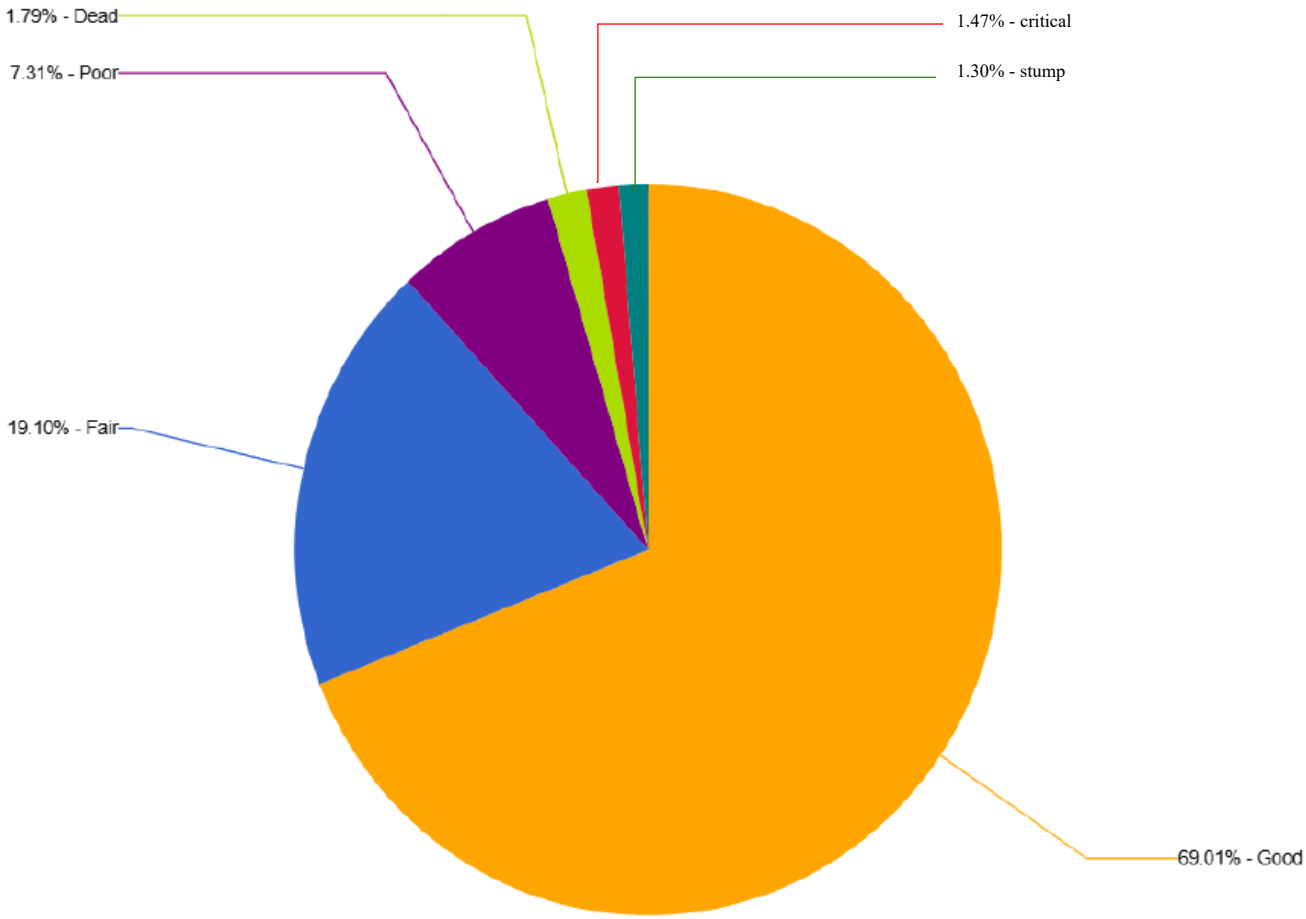
(picea), pine (pinus), pear (pyrus), and arborvitae all about 6% of the total population.

Weeping blue atlas cedar

Kwanzan flowering cherry

b - Trees by Health

- A clear representation of tree health is in canopy condition, presence or absence of structural defects, and presence or absence of pests or disease, and in overall vigor. In this regard the Woodcliff Lake forest population is doing quite well, with over 88% of the inventory being in good or fair condition.



Each tree was observed with a narrative about the tree health and condition and ranked;

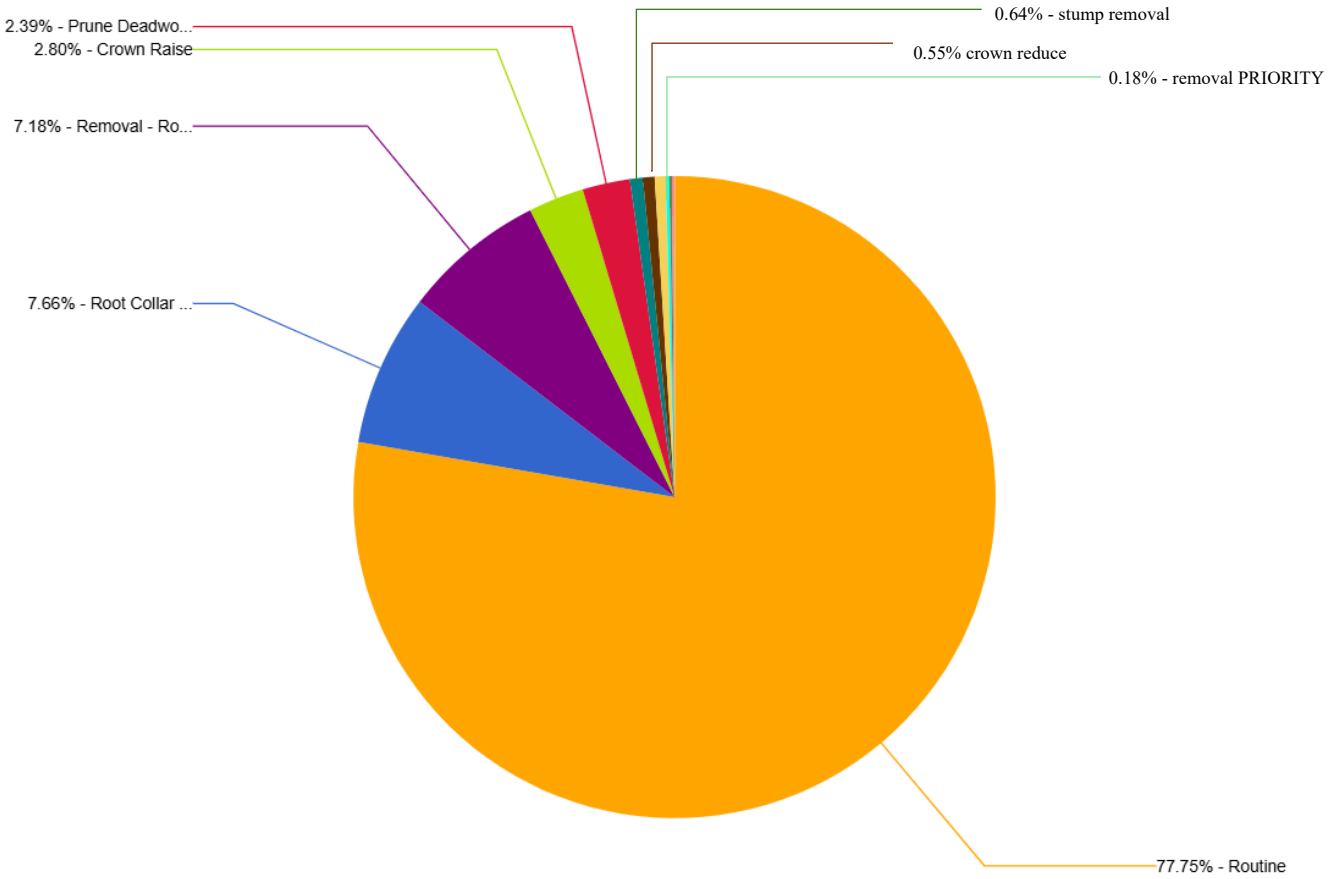
- **GOOD** – Tree was in the expected condition for its species, age, and size, with no critical issues. Additionally, the long-term health and growth was positive.
- **Fair** – Tree was observed to be less than ideal for its species. It may have some deadwood, poor crown vigor, or other elements of stress. Long term health will benefit from attention to the observed issues.
- **Poor** – Tree exhibits issues like presence of deadwood, pests or disease, structural defects, poor crown vigor, or other issues. Trees should be monitored for improvement or for continued declining health and should be removed in the future.
- **Critical** – Tree exhibits signs of severe decline, structural flaws, or other issues. Most trees in this category should be removed.
- **Dead** – Trees were noted to be standing trunks with varying amounts of dead limbs. All these trees should be removed, either as a priority because there is a target (roadway, sidewalk, structure. etc.) or through routine maintenance.
- **Stump** – Some stumps need not be removed while some can be removed for new tree plantings.

NOTE: A report can be generated for each individual tree showing its condition and maintenance recommendations along with photos and other information.

Red maple, the most common tree in the borough

c - Trees by Maintenance requirements

- A vital element of the tree inventory survey was to identify trees that might pose an elevated or unacceptable risk. Trees, as living and growing organisms, require maintenance and care through their life cycle. A tree of any size or condition might fail due to extreme weather conditions, weakness from disease, instability from soil moisture or lack of moisture, from mechanical defects or injury, or for reasons that are not observable. Inspections of every tree in the survey revealed those conditions that require attention and actions that can reduce the risk of failure. Among those actions are; pruning, removal of deadwood, removal of tree stress like excessive mulch, treatment for pests or disease, or entire removal of the tree.



- **Routine** – ANSI standard pruning practices for shade trees: remove dead and crossed/rubbing branches, make proper pruning cuts, do not remove greater than 25% foliage, do not top the tree, etc.
- **Root Collar Excavation** – remove excess mulch and soil from around the base of the tree to expose root collar.
- **Removal Routine** – those trees that are dead or in decline but not an elevated risk. Removal can follow normal maintenance schedules.
- **Crown Raise** – prune limbs that may impede pedestrian or car traffic or otherwise cause obstructions.

- **Prune Deadwood** – observation of excess deadwood in crown that requires specific attention.
- **Stump Removal** – Not all stumps require removal, but those locations that would benefit from stump removal were noted.
- **Crown Reduce** – prune limbs within the crown that may be causing an obstruction with light fixtures, buildings, or for other reasons.
- **Removal PRIORITY** – those trees that represent an elevated and unacceptable risk of failure. Areas with a fixed target or pedestrian or car traffic are of particular concern.

NOTE – Trees identified as Removal-Routine may have that status due to the health of the tree and not because of elevated risk. Smaller ornamental trees like callery pear trees are some that had a higher incidence of recommended removal but posed little elevated risk to property of the community.

Only a single tree of the 5,434 observed required immediate attention. The DPW was alerted and removed the tree within hours of being reported.
A list of trees that are PRIORITY REMOVAL follows at the end of this report.

d - Existing and potential future species issues that should be monitored (ash, pear, and future beech issues)

- Disease within a species can have a devastating effect on a tree community. Historic issues like chestnut blight and Dutch elm disease caused great harm to tree populations and to those communities that saw a loss of a great percentage of their mature shade trees. That is why diversity is so important when managing an urban forest. Reliance of a single species or genus can leave the community vulnerable to a great loss. While Woodcliff Lake has not suffered from the loss of chestnut trees or American elm trees, the impact on the ash population due to emerald ash borer did have an effect. Because of the 2015 inventory we were able to see the real-world impact that this pest had on the community.
  - ASH (Fraxinus) inventory = 145 trees. Many of these were treated in a program arranged by the Shade tree Committee and administered by Bartlet Tree Service. The results after a 9-year period revealed:
    - 145 trees in 2015
    - 76 trees in 2024. (69 trees were likely removed with no remaining evidence). Of the observed trees,
      - 26 are in good or fair condition.
      - 21 are dead (Removal – routine)
      - 27 are poor/critical (Removal – routine)
      - 2 stumps were observed.
  - Net result of the ash tree treatment yielded a success rate of 17%. While it is unclear if all ash trees were treated, those that were directly observed to have received the treatment did not survive. The 26 healthy trees vary in size/age from new growth (6" DBH) to older mature trees (20"-35"

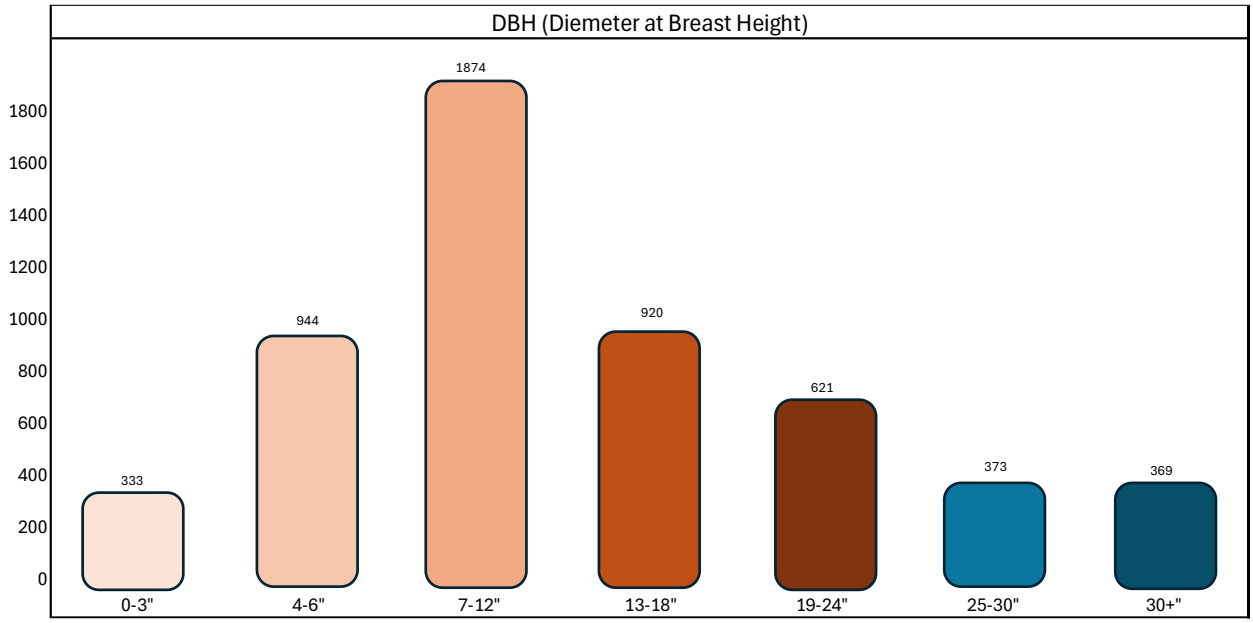
DBH). A deeper analysis of the treatment regimen and the health of this population may yield mor insight. The data does indicate that resources and effort need to be targeted to yield the best results.

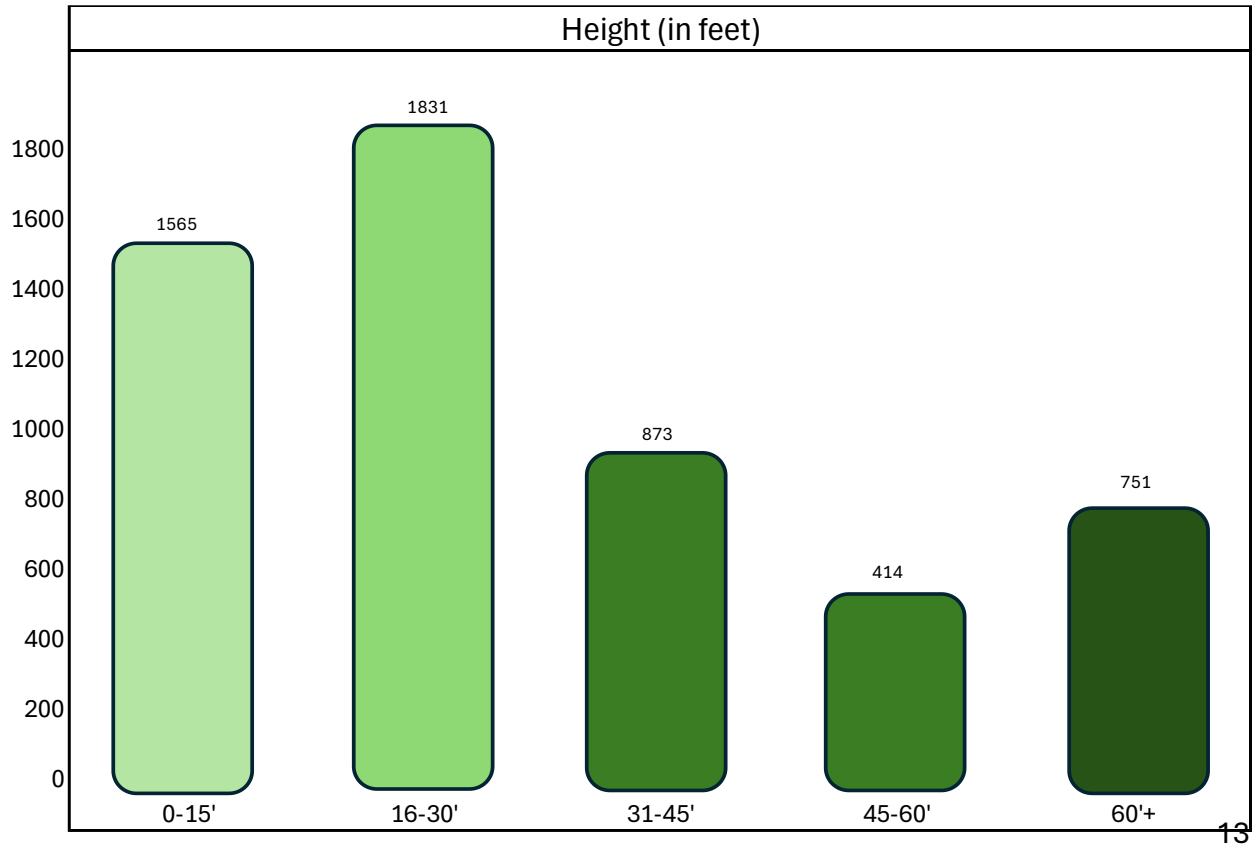
- Decisions on treatment to protect Woodcliff Lake trees from emerging diseases will be informed by their impact on the known population. Diseases such as *beech leaf disease* can be managed based on the existing beech population. There are 39 beech trees in the borough. Cost and impact will be much more clearly understood as a result of this inventory data.

Black oak, at 66" DBH it is the largest, and likely oldest, tree in Woodcliff Lake

e - Trees by size/age

Another aspect of forest health is the size distribution and relative size/age of the trees. Diversity of age and size is just as important as diversity of species. Having trees of varying ages across the community will reduce the risk of loss too many older trees, will balance resources for maintenance since younger /smaller trees tend to be easier to prune and maintain. And having trees across a wide spectrum of ages and sizes allows for a more regulated tree planting program.





f - Trees by Location

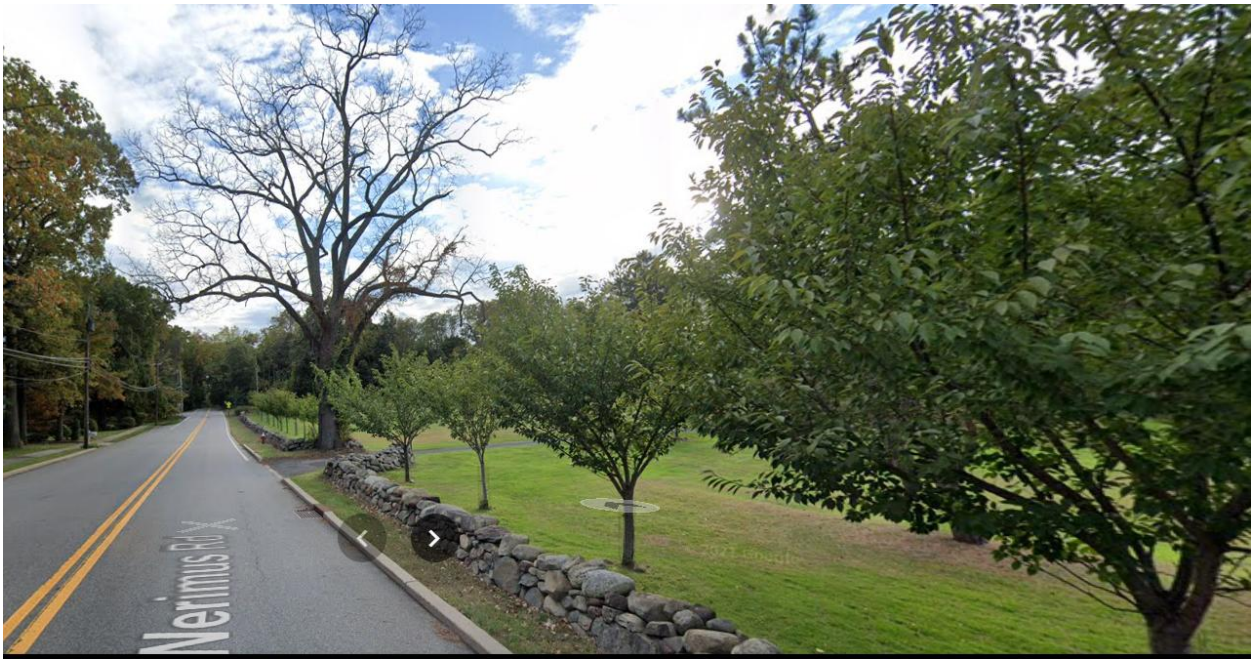
An aspect of community health is the way trees are distributed within the community. Because trees represent a vital element of the health and wellbeing of the residents, having trees well distributed means that the people in the community will benefit. From the data we see that Woodcliff Lake trees are quite well distributed across the entirety of the borough.

5 - Notable statistics:

- Large trees – age and relative value
    - Largest tree in the Borough: Black oak 66” DBH, 100’ height, ~160 years old
    - 369 trees greater than 30” DBH
    - 33 different species log in over 30” DBH
    - Ornamental trees are also on this list (cherry, pear)
- Mix of species
    - 147 distinct species, including some unique trees like; umbrella pine, Hungarian oak, bristlecone pine, Deodar cedar, Kentucky coffee tree
- Notable pests and disease
    - Emerald ash borer has reduced the ash population from 145 to 26 viable trees in just 9 years.
    - Pear rust is pervasive among pear trees.
    - Anthracnose is prevalent but not lethal.
    - Spotted lantern fly is present and utilizing maple and other trees as host in addition to Tree of Heaven.
    - Beech leaf disease is present and although the beech population is only 39 trees it could be a serious risk.
- Invasive and less desirable species
    - Tree of Heaven represents only 47 trees
    - Norway maple is an overplanted street tree but not as desirable as other maples. There are 293 Norway maples in the borough.
    - Callery pear is an overplanted street tree with hardiness issues. There are 341 Callery pears in the borough.
    - Arborvitae is a viable street tree but overplanted as a privacy screen. There are 340 arborvitae in the borough.

6 – Arboretum and Tree Farm

The Woodcliff Lake Arboretum is a jewel in the community, showcasing special tree species and providing an example of the diversity that makes a community healthy and vibrant. The Arboretum is situated on Werimus Road adjacent to the tennis courts and open fields. The Shade Tree committee planted over two dozen rare and interesting species with room for additional plantings. The passive park adjacent to the tennis courts is lined with Kwanzan cherry trees, mature horsechestnut trees, and mature black walnut trees, one of which is among the largest in the state. This park property is also home to the Woodcliff Lake Community Garden and Tree Farm managed by the Shade Tree Committee.



7 - Management of tree inventory

The value of the tree inventory and the ArborPro software application allows for ready access of the data for a host of reasons.

- The software is dynamic – updates and amendments can be made at any time by any authorized user.
- Online databases allow for visibility in the field or from the desktop.
- The visual record of each tree is recorded on a specific date, providing a baseline to track the health of a tree over time as well as the health of the community forest over time.

By using the software you will be able to manage these valuable aspects of the Woodcliff Lake forest

a - Worklists –

- Identify maintenance requirements and rank them based on work priority, from immediate care to routine maintenance. This will allow resources to be targeted where they are most needed and make the most efficient use of maintenance budgets.

b - Community notifications –

- Inventory reports can be shared with specific homeowners that may require targeted actions, and to engage the public to promote the overall tree value to the community.

c - Natural and extraordinary event planning –

- Flooding
- Hurricane
- Wildfires
- Road closure risks
- Other weather events

Disaster planning for extraordinary events is a critical component of municipal management. This tool provides a valuable component of that planning. By having a complete inventory of the borough trees, it will be easier to see where there may be risks of fallen trees that could cause road blockage or power outage. Resources can be deployed in a more systematic fashion where they are most needed. Advance planning can be done if areas of the borough are at elevated risk of flooding or fire. Recovery efforts can be targeted more effectively. And the loss of trees can be calculated following an extraordinary event. Planting goals can be targeted based on known losses.

8 - New Planting sites

- Suitability of planting site (overhead utilities, size of planting location, diversity of species, what tree may be desired in the neighborhood, and which trees may complement existing species)
- Hardiness of new trees (pest/disease resistant, structural integrity)
- Cost (apply limited budget in ways that have the largest impact on the community)
- Target areas for biggest impact –
    - Underserved areas: Anton Ct., Clinton Pl., west end of Woodcliff Ave.,
    - high visibility / high traffic areas: Chestnut Ridge Rd, Broadway, west end of Highview, Prospect Ave., and others.
    - Biggest environmental impact – storm water mitigation, soil erosion mitigation, reduce heat island effects.
        - By planting in areas around Woodcliff Lake reservoir, (Pascack Rd, east end of Woodcliff Ave. Ackerman Ave, etc.) new trees will meet many of these objectives.

Planting the right tree in the right location is essential, and providing trees in areas where they are welcomed by the community will increase the likelihood of long-term success.

Dawn redwood 'Gold Rush'
Large trees should be planted away from overhead utilities

Norway maple 'Crimson King'
Large trees are preferred where overhead utilities are not present

9 – Planting Recommendations

Large Shade Trees

- American Sycamore (Platinus occidentalis) – native; very tall & wide, showy peeling bark.
- Black Tupelo (Nyssa sylvatica) - native; tolerates wet soil & when grown in sun has great red fall color.
- Lindens: American linden/Basswood (Tilia americana) - native; very fragrant small flowers in June.
- Maples: Sugar maple (Acer saccharum) & Red maple (A. rubrum) – native; excellent fall color.
- Oaks: (Quercus + species) - Sawtooth, Shingle, Swamp White, Willow & White oak; all native; Willow oak has smallest acorns.
- Sweetgum (Liquidambar) – native; excellent fall color; the cultivar 'Rotundiloba' has very few seeds.
- Tuliptree, Tulip poplar (Liriodendron) – native; a tall straight trunk, showy tulip-like flowers high up in canopy are easy to miss; can be messy; good gold color in the fall.
- Yellowwood (Cladrastis lutea) – native with fragrant clusters of cream flowers & gold fall color.

Medium Ornamental Trees

- Dogwoods (Cornus florida & C.'Steller' series) - native & hybrid trees with showy "flowers" (bracts) of white or pink followed by red fruit and red fall foliage.
- Goldenrain Tree (Koelreutia paniculata) –non-native; yellow showy summer flowers
- American Hophornbeam, Ironwood (Ostrya virginiana) - native; interesting bark, tolerates shade.
- Serviceberry (Amelanchier canadensis, A. arborea) – native; white spring flowers, edible blue fruit, red fall color.

Small Flowering or Ornamental Trees

- American hornbeam (Carpinus caroliniana) – native; tolerates shade, sinewy/muscle like bark, gold fall color.
- Carolina Silverbell (Halesia carolina) – native understory (shade-tolerant) tree with white flowers.
- Cornelian cherry (Cornus mas) – non-native; late winter small yellow flowers; red fruits; showy bark.
- Magnolias: Sweetbay magnolia (M. virginiana) – native; fragrant white flowers; tolerates wet soil, light shade.
- Red Buckeye (Aesculus pavia) – native; bright red bottle-brush flowers, yellow fall foliage.
- Redbud (Cercis canadensis) – native; tiny pink flowers put on a show before leaves appear.

- Smoke tree (Cotinus obovatus) –native with smoke-like puffs of bloom and wonderful fall color.
- Winter King Hawthorn (Crataegus viridis 'Winter King') - native; fall color; showy red berries in winter.

Evergreen Trees

- American Holly (Ilex opaca) – a native species with dark green glossy leaves; berries on female trees only if pollinated by a male tree in the neighborhood. (Ilex species have separate male and female plants.)
- Bald Cypress (Taxodium distichum) - native; flat, soft needles that turn rusty orange in fall and drop: a deciduous conifer. Reaches 50 to 70 feet tall. Tolerates very wet soils.
- Eastern Red Cedar (Juniperus virginiana) – native Juniper that grows fast; naturalized; many are growing from seeds dispersed by wind and animals. Junipers have separate male/female trees; female Eastern Red Cedars have tiny aromatic blue fruits that birds eat.

Trees to Avoid

- *Ash* – do not plant until further notice. All Ash species are under threat by EAB (Emerald ash borer).
- *Bradford & Callery pear* (Pyrus species) – invasive; weak wood.
- *Fringetree* – do not plant until further notice; vulnerable to EAB (Emerald ash borer).
- Norway maple – a non-native which has become extremely invasive in the northeast.
- Zelkova – a non-native which has been over-planted in NJ, and which has become invasive.

10 - Conclusion

Woodcliff Lake has a healthy, vibrant, and verdant urban forest. There is a diversity of species that enhances overall forest health and in turn enhances community health. A vital component of street tree viability is to pay attention to planting location; the right tree belongs in the right place. There are very few conflicts with the wrong tree in a too-small planting location. There are some conflicts with larger trees and overhead utilities, but this issue is relatively minor and has been responsibly managed for the most part. The 5000+ trees are healthy with good prospects on the horizon. With continued proper maintenance and a commitment to new tree plantings Woodcliff Lake will have a forest of trees it should be proud of.

ii – ArborPro Software

This inventory was built on the industry leading software from ArborPro Inc. The online software program is an essential tool for managing the Woodcliff Lake tree inventory. The program utilizes the latest GIS (Geographic Information System) technology to provide the user with an immediate visual representation of all the trees in the Urban Forest. It is a simple program that has intuitive features that allow for;

- Customizable tree reports.
- Community Viewer – Share a read-only map view of your inventory to your residents. Advanced search capabilities; species, size, condition, address, etc.
- Tailored tree detail fields – Customize tree details to align with your unique requirements.
- Work order – Generate work orders directly within the system for swift task management.
- Personalized map preferences – customize map settings to suit your needs. Mobile App – Used for offline or online editing of tree data and to update maintenance records.
- Unlimited online training and support.
- Unlimited Data Entry – No limit to the number of trees, attachments, and photos in your database.
- Ability to upload GIS layers – Add custom aerials, parcel layers, and centerline data.

The entirety of the tree inventory, including photographs, observations, and recommendations, is available online. This information can be shared with borough administrators, officials, Shade Tree Committee members, and the general public. The database is live, allowing for updates and notes.

https://app.arborprousa.com/