The State of Our Trees: The Status and Health of the Street Trees of Washington, DC

PRELIMINARY FINDINGS

CASEY TREES ENDOWMENT FUND
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SUITE 1050
WASHINGTON, DC 20005

Casey Trees
ENDOWMENT
WASHINGTON DC

ABOUT THE
CASEY TREES ENDOWMENT FUND

The Casey Trees Endowment Fund ("Casey Trees") was established in May 2001 with a $50 million grant from the Eugene B. Casey Foundation to the Garden Club of America (GCA). Originally administered by the GCA, the grant was used to establish an endowment that provides the continuing funds to support the programs and activities of Casey Trees.

A Washington Post Article November 17, 1999 inspired Ms. Betty Brown Casey to give this generous grant. The Post article featured dramatic color satellite photos, analyzed by American Forests, which illustrated a 64% loss of heavy tree cover over the District of Columbia between 1973 and 1997. That article also cited the extensive work of the Committee of 100 for the Federal City's 1999 report entitled "Re-Greening Washington" which outlined both the extent and causes of the loss of the many street trees in our city. This information, combined with the science and software to calculate the value of the ecosystem services trees provide, showed a good return to DC from Ms. Casey's grant.

The mission of Casey Trees is to restore, enhance, and protect the tree canopy of the District of Columbia in cooperation with DC Government, Community, and Federal Agencies. To accomplish this goal, Casey Trees has completed an inventory of the street trees of Washington, D.C. and is developing a "Citizen Forester" program to train volunteers in the planting, care, and maintenance of trees in the District.

Information about the street tree inventory, the Citizen Forester Program, and other initiatives of the Casey Trees Endowment Fund can be found on our website at www.caseytrees.org or by contacting our offices at:

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A COMMITMENT TO THE WASHINGTON DC COMMUNITY FROM THE CASEY TREES ENDOWMENT FUND

The information presented here about the street trees of Washington, D.C. is the most detailed ever assembled. The findings come from careful measurements and observations made and digitally recorded in the field last summer by nearly 500 trained volunteers, students and Casey Trees staff who canvassed the existing trees and empty planting spaces along 955 miles of city streets. The findings represent conditions at the completion of the inventory on August 15, 2002.

The good news is that there are trees in four of every five spaces where there could be trees along our city streets. Seventy-one percent (seven of 10) of these trees are in good or excellent condition.

The more challenging news is that four of every 10 street tree sites (55,252, or 42% of the roughly 131,000 sites) require serious attention.

These include 25,424 tree spaces that have no living trees and another 29,828 sites where the trees are in poor or fair condition.

During the recent tree-planting season from October 2002 – April 2003, the city planted 3,000 trees and removed 870 dead or diseased trees. We now estimate that there are as many as 23,000 empty but plantable tree spaces along our city streets.

To regreen the City of Trees we will work with city officials, neighborhood groups, businesses, and citizens in every community and in every ward of the city to ensure that this deficit of 23,000 trees is fully overcome within 10 years.

To better inform and involve residents in developing our overall regreening plan, we will hold 19 neighborhood forums from May 13 to July 1, 2003. From these neighborhood meetings will come community-based strategies that will help the District restore and protect the health and longevity of our trees.

James R. Lyons
Executive Director
April 26, 2003

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KEY FINDINGS

The Casey Trees Endowment's 2002 block-by-block, tree-by-tree inventory of the street trees of Washington, D.C., found that as of August 15, 2002:

- There are 131,338 locations for street trees in Washington, D.C. This is the maximum number of street trees that could be growing on city-managed property.
- A total of 25,424 of these spaces (19%) were empty or contained dead trees or stumps.
- Of the 105,914 street trees in the city, 32% are in excellent condition, 39% are in good condition, 19% are in fair condition and 10% are in poor condition.
- Maples make up 38% of the street trees, oaks 31%, and elms 10%.
- About 71% of the trees require pruning; at least 5,358 of these are priority cases.
- Tree grates around 385 trees are unacceptably close to the trunk (closer than 2 inches) and should be enlarged or removed before fatally strangling those trees.
- The health of existing street trees varies remarkably little across the city: the highest percentage of trees in good or excellent health is 74% in Ward 4, contrasted with 68% in Ward 8, the lowest in the city. However, there is a greater disparity in the location of empty tree spaces.
- Wards 7 and 8, the area east of the Anacostia River, have vacancy rates of 30% compared to 11% in Ward 2, 14% in Ward 1 and 15% in Ward 6. (After an early assessment of inventory field data, the city planted 34 % of 3,000 trees planted since October 2002 in areas east of the river.)
- Trees with trunk diameters of 35 inches or greater (measured 4 ½ feet above the ground) comprise 3% of the city's street trees (3,386). The biggest tree in the city, by diameter, is a silver maple (62 inches) in Ward 3. The tallest street tree is a 90-foot Black Oak found in Ward 7.

The State of Our Trees: The Status and Health Of the Street Trees Of Washington DC

BACKGROUND

Studies of the tree cover of Washington, D.C., conducted in recent years using satellite images and aerial photography show serious problems and concerns over the condition of our urban forest. American Forests' study of November 1999 showed a 64 % loss of areas with heavy tree cover between 1973 and 1997. A report from the Committee of 100 on the Federal City released at the same time found that the city had lost 25-30 % of its street trees due to years of neglect and budget shortfalls and that 4,000 to 5,000 trees were dying each year.

As part of our mission to reverse this trend and improve the city's urban forest, Casey Trees determined that our first step would be to help city officials, the public and our organization better understand the current condition of our trees and develop strategies to 1) stop their decline and 2) restore and maintain a healthy, green environment in each of our neighborhoods.

Street trees are a critically important component of the green infrastructure for urban neighborhoods, providing cooling shade, reducing storm water runoff, improving water quality (for the Anacostia River, Rock Creek, the Potomac and the Chesapeake Bay), filtering air pollutants, and producing oxygen. Trees also reduce stress, add character and peace to neighborhoods, and increase property values. They are the front-line buffer between the harsh, hot pavement of city streets and the spaces where we walk, play, live and work. We have learned from natural disasters such as hurricanes, tornadoes and ice storms and from tree-killing diseases such as Dutch Elm Disease that the loss of trees can have a dramatic impact on communities.

Street trees are under the most stress of any trees in the city and on average live only 7-10 years. Urban stresses affecting these trees include injury by vehicles, limited root space in planting areas that are too small, lack of water and nutrients, poor soils and drainage, disease, vandalism and other practices that inflict injury or impair healthy growth.

While Casey Trees is devoted to all of the trees that make up the urban forest – including those on residential and commercial property, in parks and on federal land – street trees remain a key indicator of the overall health of the urban forest, of our green infrastructure, and of the environmental health of our city and neighborhoods.

For these reasons, Casey Trees' inventory and first tree-planting initiative are focused on understanding and growing more and healthier street trees.

To that end, the Urban Forestry Administration (UFA) needed a better information system and database for making day-to-day management and

operations decisions affecting the city's street trees. This would require a Geographic Information System tree cover layer for the District of Columbia.

To compile this information, Casey Trees conducted an unprecedented citizen-based inventory in the summer of 2002 of each and every street tree in the District of Columbia. The inventory covered 955 miles of the 1140 miles of streets in the city.

Information collected about the street trees included both location information and descriptive information about the tree and tree space including:

Tree Space information

- Tree space measurements
- Mulching
- Tree grate
- Curb
- Sidewalk
- Overhead wires
- Condition: e.g. plantable or not
- Site notes

Tree information

- Species identification
- DBH
- Tree measurements
- Insects
- Diseases
- Condition notes
- Condition rating
- Maintenance
- Tree notes

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A Summary of Results

Street Tree Sites Status

Along the 955 miles of streets managed by the city, the inventory identified 131,338 locations for street trees. This is the maximum number of street trees that could be growing on city-managed property.

As illustrated in Figure 1, a total of 22,225 of these spaces were empty. Dead trees or stumps were found in 3,199 of the spaces surveyed. Of the empty spaces, it is estimated that as many as 10% of these may not be suitable for planting because trees there would block traffic signs and street lights, and are too close to driveways and fire hydrants.

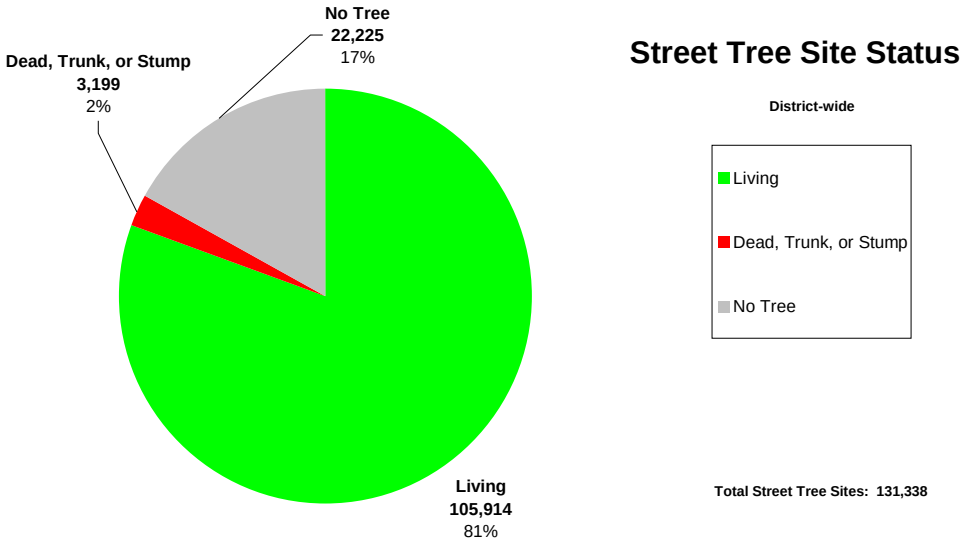


Figure 1

A comparison of street tree sites by wards (Figure 2) showed that Wards 7 and 8, the area east of the Anacostia River, have vacancy rates of 30% compared to 11% in Ward 2, 14% in Ward 1 and 14% in Ward 6. As a result, the Urban Forestry Administration planted over 1/3 of all newly planted trees or over 1,000 trees in Wards 7 and 8 this planting season from October 2002 to April 2003.

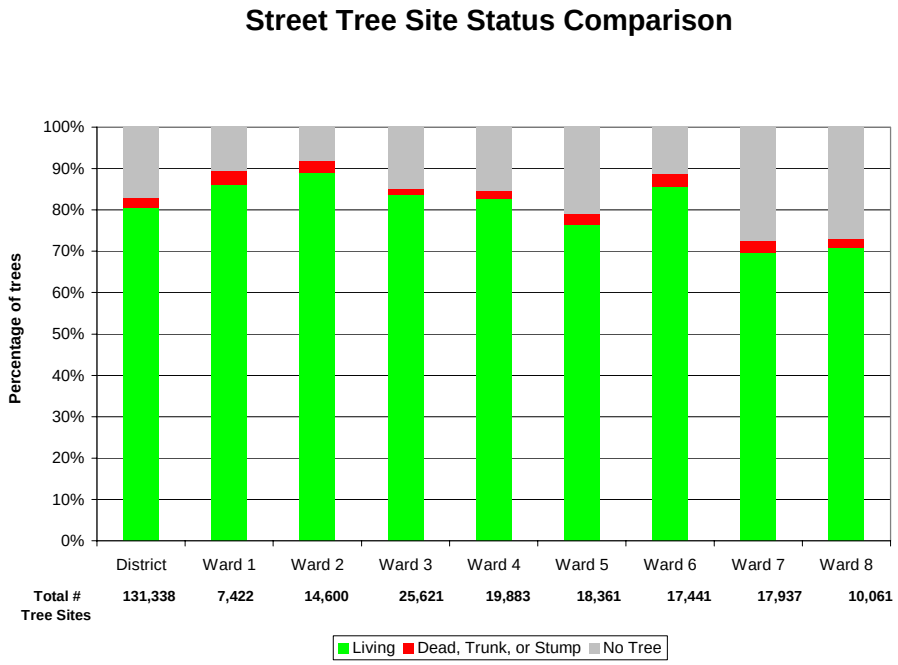
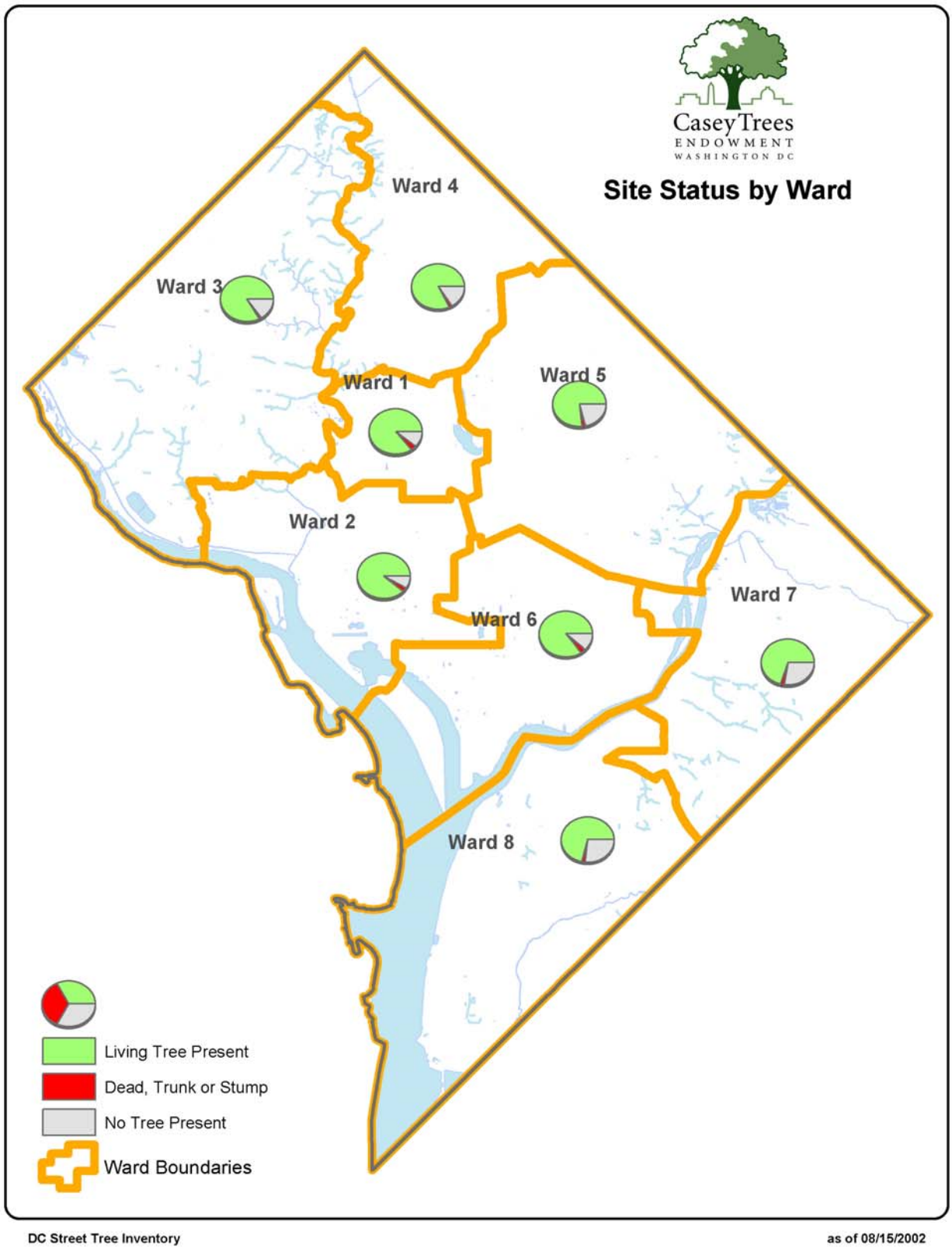


Figure 2


Casey Trees
ENDOWMENT
WASHINGTON DC
Site Status by Ward
Ward 4
Ward 3
Ward 1
Ward 5
Ward 2
Ward 7
Ward 6
Ward 8
Living Tree Present
Dead, Trunk or Stump
No Tree Present
Ward Boundaries
DC Street Tree Inventory
as of 08/15/2002

Living Street Tree Condition

Of the 105,914 street trees in the city, 32% are in excellent condition, 39% are in good condition, 19% are in fair condition and 10% are in poor condition.

Trees rated in excellent condition had robust crowns with little or no deadwood, were structurally sound, and had no lean, cracks, or damage to the trunk or signs of insects and disease.

Trees in poor condition can indicate the decline of the tree's life. The most prevalent condition noted in poorly rated trees is included bark, which accounted for 32 percent of the trees in poor condition. Included bark is a weak branching union between the branch of the tree and the trunk, and makes limbs much more susceptible to fail during storms and from other stress.

Advanced decay was found in 29 percent of trees rated in poor condition, and health-threatening wounds occurred for 16 percent of the trees. More than one of these severe conditions was found in 10 percent of the trees in poor condition. Other conditions noted were conks at the base of the trunk, girdling roots, deadwood, and cracks.

The overall health of existing street trees varies remarkably little across the city: The highest percentage of trees in good or excellent health is 74% in Ward 4, contrasted with 68% in Ward 8, the lowest in the city.

The overall health of existing street trees varies remarkably little across the city: The highest percentage of trees in good or excellent health is 74% in Ward 4, contrasted with 68% in Ward 8, the lowest in the city (see Figure 4).

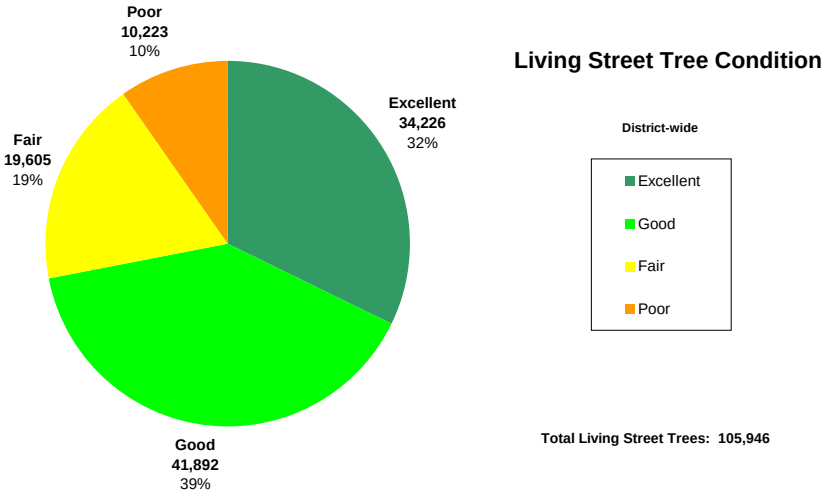


Figure 3

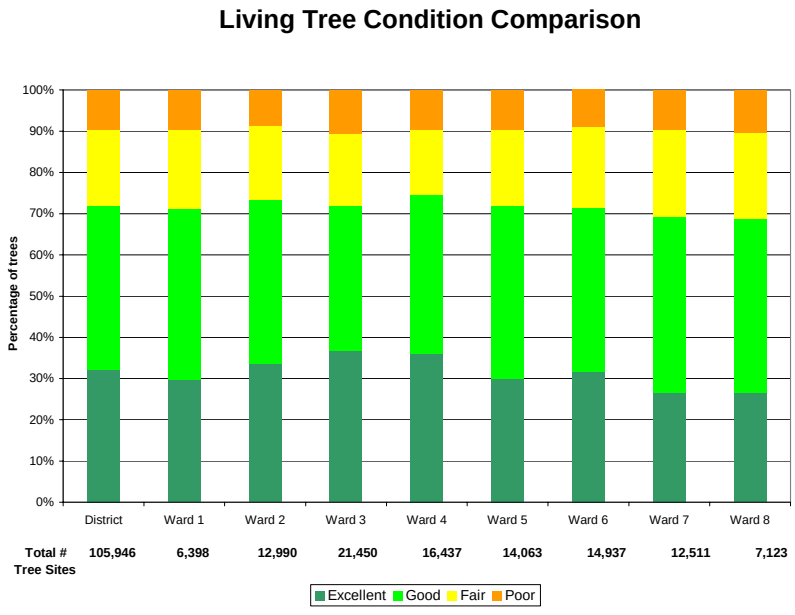


Figure 4

Street Tree Species

As illustrated in figure 5, three species dominate eighty percent of the city's living street. These are maple (38%), oak (31%), and elm (10%). The remaining 20% consists of 63 different tree species. Maple trees include Red Maple (32%), Norway Maple (30%), and Sugar Maple (28%). The oak trees include Pin Oak (37%), Red Oak (26%), and Willow Oak (23%).

Casey Trees and UFA are working to specify street trees which increase biodiversity, perform well in street conditions, are native to the area, and maintain the desired character as specified in the District's street tree planting plan. The 3,000 trees UFA planted since the inventory comprise 32 species, with many chosen for planting under power lines and overhead wires.

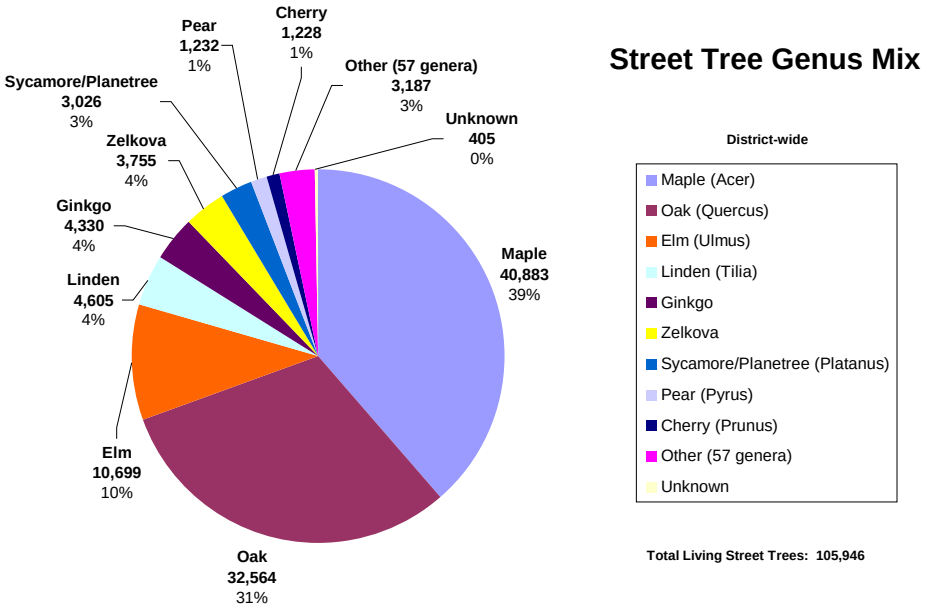


Figure 5

Street Tree Size

The size of trees is generally measured by the diameter of the trunk at 4 ½ feet from the ground (Diameter at Breast Height or DBH). At maturity, the crown radius of most street trees reaches 20 feet on average. Street trees with no overhead wires above are therefore planted 20 feet apart so that at maturity their canopies converge to provide continuous overhead cover and shade. Tree height is another way to indicate the size of a tree.

The inventory showed just over half of all the city's street trees are between 3- 15 inches DBH with an average of 10.7 inches DBH (figure 6). Twelve percent of the living trees are less than 3 inches DBH indicating newly planted trees. The largest tree, in diameter, is 62 inches and more than 5 feet around. Fourteen of the top 24 trees with DBH measurements greater than 52 inches are located in Ward 3. The average crown radius of all street trees is 11.1 feet. The tallest tree is a 90-foot Black Oak found in Ward 7 along Anacostia Road between Loud Place and Massachusetts Avenue.

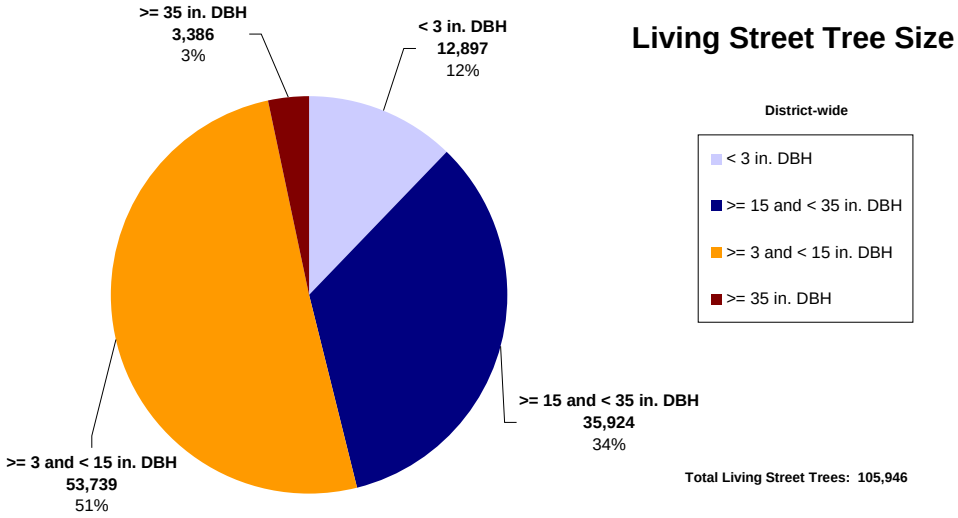
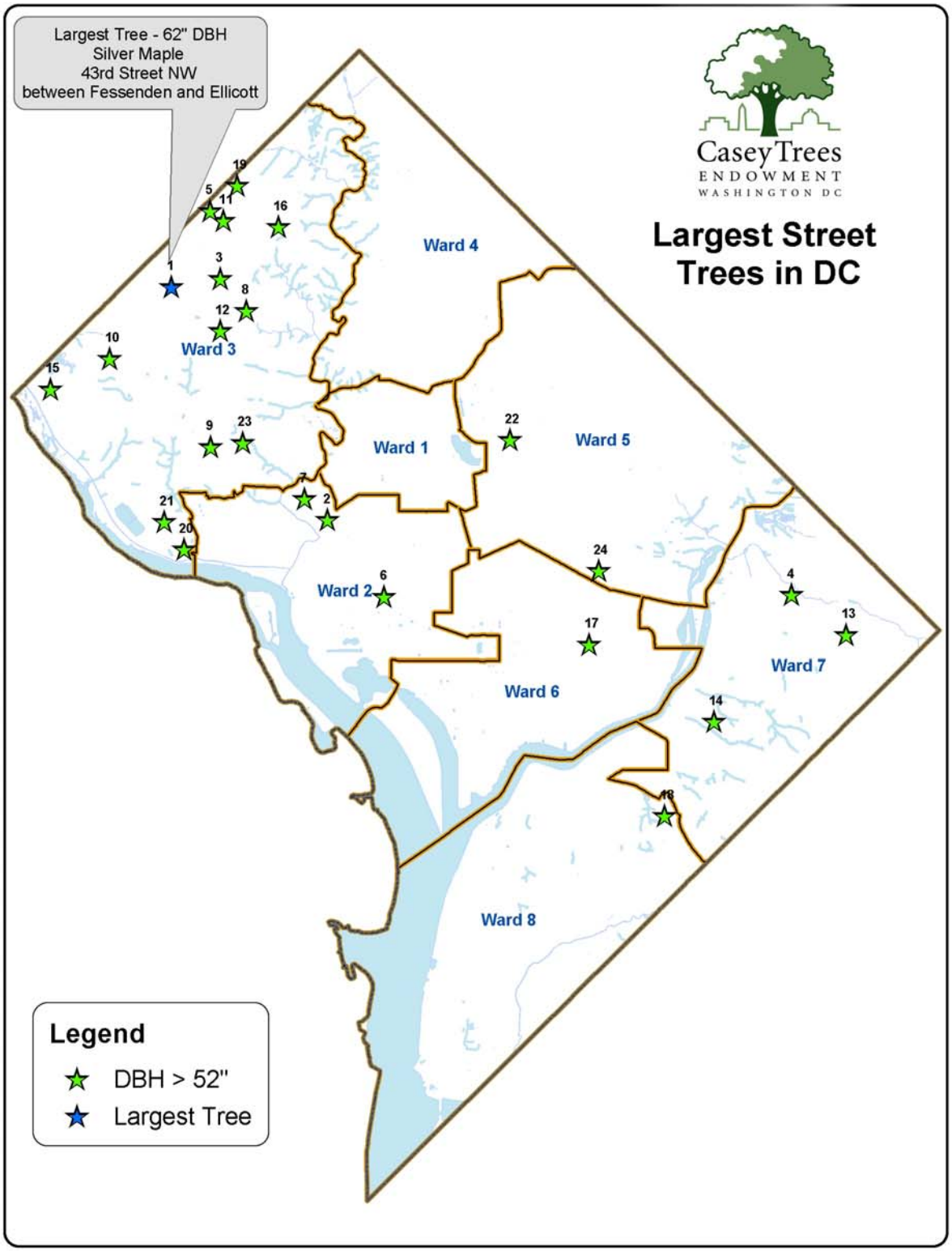


Figure 6


Largest Tree - 62" DBH
Silver Maple
43rd Street NW
between Fessenden and Ellicott
Casey Trees
ENDOWMENT
WASHINGTON DC
Largest Street Trees in DC
Ward 1
Ward 2
Ward 3
Ward 4
Ward 5
Ward 6
Ward 7
Ward 8
Legend
DBH > 52"
Largest Tree
DC Street Tree Inventory
As of 08/15/02

Maintenance

About 71 percent of the city's street trees require pruning (See figure 7.). Almost two thirds of all living trees required routine pruning and at least 5,358 are considered priority cases.

Unlike trees in a forest, pruning is critical for street trees because of their proximity to people and property. Existing trees were assessed for maintenance as either a routine prune (remove small amounts of deadwood or trim the lower branches for clearance) or priority prune (large amounts of deadwood or large pieces of deadwood).

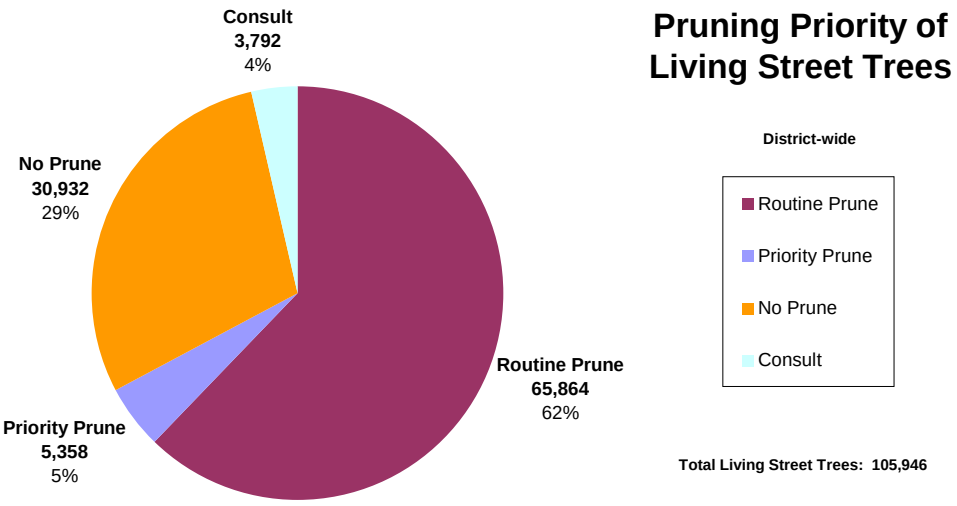


Figure 7

Overhead Wire Status of Street Tree Sites

One third of all street tree sites are located under existing power lines and overhead wires which limit tree growth and impact tree health. Tree and wire conflicts also increase maintenance costs, risk of personal and property damage, and power outages.
Casey Trees and the UFA are working on strategies to minimize tree and overhead wire conflicts. As a result, the UFA is planting shorter growing trees under overhead wires and has reduced the space between the shorter trees to 25' to maintain canopy cover.

Tree Grates

Tree grates are lattice-like grids of steel or iron that are placed around trees in high pedestrian traffic areas to eliminate soil compaction. Tree grates also serve as ornamental elements to enhance a streetscape.
As trees grow, their trunks expand in diameter. Unless the grate is pulled back from the expanding trunk, the grate will girdle, or wound and strangle a tree. This could ultimately lead to the death of the tree.

The inventory identified a total of 1,021 street trees with tree grates. Of these, 385 (or 38%) have openings that are unacceptably close to the trunks. These grates are currently injuring trees or will be doing so very soon. The other grates – 636 of them -- currently provide acceptable growing space of more than two inches around the trunks, but these will eventually need to be enlarged or removed as the tree continues to grow.

Mulching Status of Living Street Trees

All street trees should be mulched. Mulch is made from shredded bark or hardwood and applied over topsoil around trees. It provides a protective layer over the soil to store water for the tree and minimize soil erosion when it rains.

Inventory findings indicated that 83% of all living trees had no mulching. Another 4% of tree sites were mulched improperly by applying too much mulch. Mulch that covers the root flare or base of the trunk, inhibits air flow to the roots, and can provide a breeding ground from insects and diseases.

Dutch Elm Disease

The American Elm is well suited for street tree conditions except for the incidence of Dutch Elm Disease (DED). The inventory found 4% of the 8,626 American Elm street trees were infected with DED. This is approximately twice the national rate and four times the rate for the elm trees on the Mall which are cared for by the National Park Service.

The National Park Service removes all infected elm trees to limit the spread of disease. Casey Trees, UFA, and the USDA Forest Service are cooperating to develop a research strategy to reduce the infection rate of DED for the city's street trees that would evaluate different strategies for treating trees to limit the spread of the disease and save them from removal

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NEXT STEPS

Preliminary findings from the street tree inventory make clear that the city faces a substantial challenge in restoring its tree canopy cover. It is not clear that the extensive forest canopy that covered the District three decades ago can ever be restored, given the growth and changes that have occurred in the city since that time. Nevertheless, it is clear that opportunities exist to restore much of what has been lost of the trees of Washington, especially the trees that line the nearly 1000 miles of streets in the city.

Casey Trees in committed to regreening Washington DC. A logical place to begin is with the street trees that are missing, dead, or dying. An estimate of the currently vacant plantable spaces for street trees in the District is 22,000. In addition, the street tree survey revealed that an additional 3000 plantable spaces were currently occupied by dead trees, trunks, or stumps. Of this total of 25,000 planting opportunities along the city's streets, the Urban Forestry Administration has already removed some of the dead trees and replanted a number of these spaces and other plantable sites. Therefore, we conservatively estimate that some 23,000 plantable sites remain.

It is important to note that of the approximately 106,000 live street trees in Washington, nearly one-third are in fair or poor condition. One can assume that a number of these trees will die each year, continually adding to the backlog of trees in need of replacement. For this reason, it is important that the Urban Forestry Administration continue its aggressive efforts to maintain and protect existing trees, while continuing to remove those trees that die and replacing them with new, healthy trees appropriate to the urban environment.

In May and June 2003, Casey Trees will convene nineteen ***Neighborhood Meetings*** to share the street tree inventory information with the communities of Washington. Street tree inventory information is available for every community and street in the District (as illustrated by the accompanying maps). One important part of this effort is to build awareness of the importance of trees to the neighborhoods and communities of the District. Another is to encourage citizens across the city to take an active role in replanting the trees that have been lost and in protecting those live trees that remain. To do this, the Neighborhood Meetings will serve as the basis for developing community-based strategies for this citywide regreening effort.

A second element in the strategy to regreen Washington is to develop an army of citizen volunteers who can provide leadership throughout the city in this regreening campaign. To achieve this, Casey Trees has created its ***Citizen Forester*** program, designed to provide classroom and on-the-ground training in tree identification and inventory, tree planting, and tree maintenance. Through the Citizen Forester program, residents of the District from every community, neighborhood, and ward will lead the regreening effort and learn to be better stewards of their environment. Casey Trees will soon announce the dates and locations for Citizen Forester training.

A third element of the Casey Trees campaign to regreen Washington is an aggressive ***Tree Planting Program***. Beginning fall 2003 and spring 2004, Casey Trees initiated tree plantings in every ward of the city. The focus of this tree planting effort and the priorities set within each community will be driven by the communities, through participation in the Neighborhood Meetings and a continuing dialogue with Casey Trees and the Urban Forestry Administration. The street tree inventory will be an important tool to use in identifying opportunities and setting priorities for tree planting. As citizens gain experience and confidence in their ability to plant and maintain their street trees additional tree plantings will be planned. Our objective is to have a continuous schedule of community-based tree plantings every spring and fall until our goal of 23,000 trees is attained.

The final element of the Casey Trees program is to involve the next generation of urban foresters and conservationists in the campaign to regreen Washington. Through a ***Summer Intern Program*** for DC students and associated education programs, Casey Trees will provide city youths with new skills, associated with tree planting and maintenance. Hopefully, this experience will lead to new enthusiasm for protecting the city's trees and improving our environment.

Inventory, Information, Education, and Action are the key components of the Casey Trees' strategy to regreen Washington DC over the next decade.

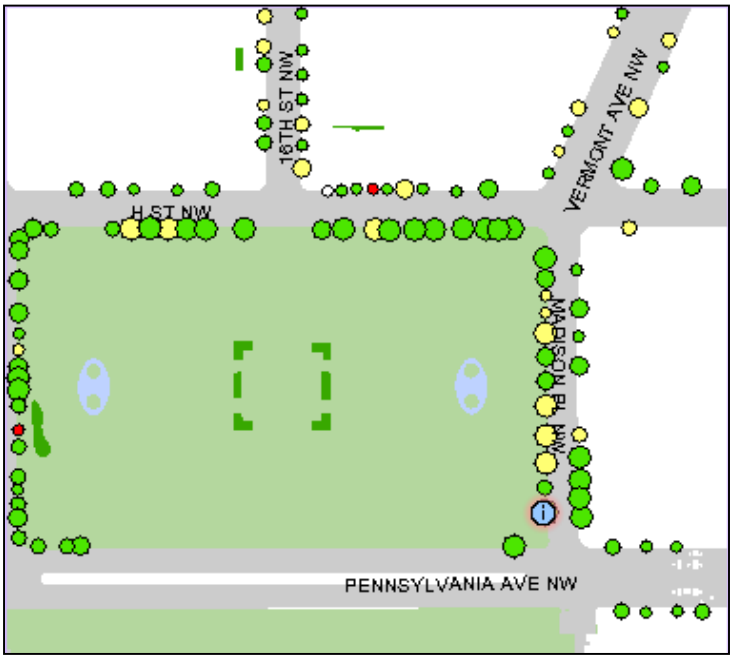
None of this will be possible unless every community in the District participates in and benefits from the regreening effort. To do so will require strong partnerships between city government, the city council, civic associations, neighborhood groups, businesses, and individuals in each and every community in the District.

Casey Trees' commitment to the City of Trees is to work with our partners, to empower our neighbors, and to encourage a shared vision of what a greener Washington can look like. If we succeed, then the quality of life for our citizens, the value of our homes and our communities, and the health of each and every one of us who lives and works in this great city will grow – like the trees we will plant together. It is only is this way that the City of Trees can live up to its name.

MAP YOUR STREET TREE NEW!

The condition, value, and ecological benefits of each of the District's 106,000 street trees is now available online at Casey Trees new interactive **TreeMap**. Visit it at: www.caseytrees.org. Make your own neighborhood map. Zoom in to identify individual trees, their species, size and condition, calculations of the amount and value of air pollutants the tree removes, and its value to a tree appraiser.

This unique interactive mapping site was created with the assistance of NYPIRG's Community Mapping Assistance Project, CMAP and includes data collected through August 15, 2002. Pollution values were calculated using the USDA Forest Service Urban Forest Effects Model (UFORE).



The largest diameter American elm street tree (blue dot on the map) in the District is found at the southeast corner of Lafayette Square across from the White House. It has a diameter of 59 inches, stands 80 feet high, has an appraised value of $35,174, stores 6000 kg of carbon, and removes 1570 grams of ozone from the air each year.

This is one example of the wealth of information on each of the 106,000 trees available on the site. So map your street tree today!

Legend

- Excellent/Good Condition (1-2)
- Fair/Poor Condition (3-4)
- Dead Tree
- No Tree