Photo courtesy of DC Dept. of Transportation, Urban Forestry Administration

A tree-lined street in Washington, DC several decades ago. The city's Urban Forestry Administration and Casey Trees are working to return Washington to its former leafy status

Revisiting Washington's Status as the "City of Trees"

By Melanie Choukas-Bradley

Northeasterly breezes have broken the summer heat, and neighbors of Capitol Hill's Lincoln Park have come out on a Saturday evening to celebrate. Children pedal tiny two-wheelers around the park's statues of Abraham Lincoln and educator Mary McLeod Bethune. The park is filled with neighborhood dogs, many of them off-leash and exuberantly chasing one another.

Jean Godwin and Craig Steinberg, who live on opposite sides of the park, share a bench, while their dogs Buster and Mel chew on sticks at their feet. "This is where the neighborhood meets," says Godwin. "It's everybody's backyard. My kids, now teenagers, learned to ride their bikes here and my son learned to play ball over there, under those trees."

She points to a grove of willow oaks across the park's central square. The trees in this park are, for the most part, massive and healthy. Large Japanese pagoda trees drop fragrant yellow-green flowers on the grass and sidewalk. Chinese chestnuts and the acorns of saw-toothed oaks are ripening. You can easily picture the park in autumn with the foliage blazing, in winter with a dusting of snow on the hollies, and in early spring, when the Asian magnolias will bloom. At this moment in time, a late summer evening, the scene is stunningly idyllic.

Tree-lined streets and avenues, flanked by generous sidewalks filled with walkers and cyclists, radiate from every angle of Lincoln Park. The most impressive of these is East Capitol Street. Framed by a canopy of American elms, the white dome of the Capitol seems to float above it. The limbs of the vase-shaped elms touch in the middle of the street, forming a tunnel like the ones so many of us remember from childhood, before Dutch elm disease came calling. James R. Lyons, Undersecretary of Agriculture for Natural Resources and Environment during the Clinton administration, drives through this green tunnel on his way to his K Street office, where he currently serves as executive director of the Casey Trees Endowment Fund.

During his work day, Lyons holds the verdant image of East Capitol Street in his mind for inspiration. Because, despite appearances in and around Lincoln Park, all is not well in the "City of Trees." Satellite images reveal that between 1973 and 1999, the District of Columbia lost roughly half its trees, according to Gary Moll, senior vice president of the Urban Forest Center at American Forests, a conservation organization.

Based on these images and other evidence of a declining canopy in the District, Maryland philanthropist Betty Brown Casey took dramatic action. By May of 2001, the nonprofit Casey Trees Endowment Fund was formed with a $50 million grant from the Eugene B. Casey Foundation. Its mission: "to restore, enhance, and protect the tree canopy of the District of Columbia in cooperation with local and federal government agencies, community groups, and individual citizens."

Many recent studies have demonstrated that urban trees contribute far more than aesthetics. Healthy trees remove carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, and particulate matter from the air. Trees combat the so-called urban heat island effect, increase residential and commercial property values, and decrease the rate of asthma in children (DC's rate is one of the nation's highest). They provide food and shelter for birds and animals. They help to protect our water systems by absorbing stormwater runoff, which overwhelms Washington's sewage system during heavy rains and has increased dramatically due to development and resultant tree-loss. Runoff is a major factor contributing to the pollution of the Anacostia and Potomac rivers and the decline of the Chesapeake Bay.

Photo by Melanie Choukas-Bradley

Having fun in Lincoln Park

The Casey Trees Endowment Fund and American Forests see trees as the answer, or partial answer, to many ills in Washington, DC and other cities. Barbara Deutsch, who has been with Casey Trees almost since it opened its doors and currently serves as senior director for programs and research, explains: "Our cities are in crisis and we're not meeting our air and water quality standards. Each municipality is looking at millions of dollars in improvements. We're saying, 'Hey, wait a minute, there are other solutions.' If we look at the city holistically, our 'green infrastructure' can work with the existing gray infrastructure to help solve our city air and water quality problems."

American Forests has taken this one step further. "Since 1996, when we put our first software together [to map and evaluate urban trees], our focus has been to try to put a dollar value on trees for air and water and energy," says Moll. "Trees have a tremendous value. If a city manager is balancing a budget, you'll find that you ought to have a substantial tree canopy."

Trees have always been central to the quality of life in Washington, but the city's trees have had something of a boom or bust history. George Washington, founder of the nation's capital, would probably be called a tree-hugger today, as would Thomas Jefferson and several other past American presidents. When Washington hired Major Pierre Charles L'Enfant to design the federal city, the two made sure that it would be a verdant capital, blessed with green space and bountiful groves of trees. But their vision floundered badly in the 19th century.

Thomas Jefferson, who personally designed the city's first street-tree planting, was forced to witness the widespread felling of trees for fuel and profit during his administration in the early 1800s. He even expressed a fleeting wish for despotic powers to "save the noble, the beautiful trees that are daily falling sacrifices to the cupidity of their owners or the necessity of the poor," and he remarked: "The unnecessary felling of a tree seems to me a crime little short of murder; it pains me to an unspeakable degree."

By the mid-1800s, the haphazard cutting of trees—combined with a casual attitude toward sewage disposal—had rendered summer in Washington a life-threatening proposition. Presidents were forced to leave the White House for fear they would fall

victim to disease, including the malaria emanating from the Potomac marshes. With much of the native timber gone, Washingtonians who couldn't evacuate suffered the dog days bereft of the mercy of shade.

But in the 1870s, Alexander ("Boss") Shepherd radically changed the fortunes of the city and its trees. The second and last governor of DC, Shepherd planted 60,000 trees along the streets of Washington before being hounded out of office for running the District into debt. Unlike his political fortunes, his trees flourished and Washington became known as the "City of Trees" where, in those pre-air conditioned days, it's trees were worshipped as veritable temples of comfort. Planting and caring for trees became a city-wide passion and source of civic pride. Washington residents imported trees from around the world, and the capital was soon revered as a botanical showcase.

Mayor Anthony A. Williams sounds every bit as passionate as Boss Shepherd when he speaks of his desire to revitalize the "City of Trees," and he has increased the budget and staff of the city's Urban Forestry Administration, which had been drastically cut in the years immediately prior to his time in office. Chief Forester Ainsley Caldwell, who manages the $7 million District budget, with an additional half-million in federal dollars, currently heads up a staff of 27, including eight full-time certified arborists. Caldwell plans to increase the staff in the near future but his administration is responsible for the city's street trees only, while trees in city and federal parklands are under the jurisdiction of the DC Department of Parks and Recreation and the National Park Service. And with more than 1,000 miles of streets, with many acres of city and federal parkland, and with so many of the trees in dire and hazardous condition, once again—as in the 19th century—the city needs the help of its citizens.

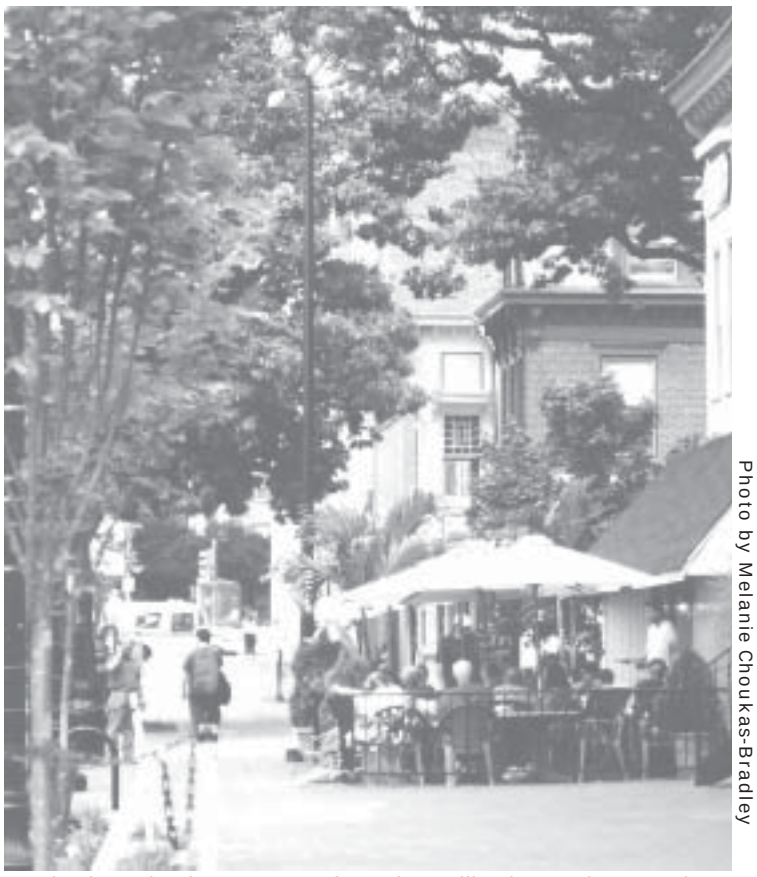

Photo by Melanie Choukas-Bradley

Newly-planted Princeton American elms will enhance the recently refurbished historic business district on 8th St. SE.

The board and staff of Casey Trees really seem to understand this part of the District's urban tree equation, and they have spent considerable time and resources building liaisons with neighborhood civic and business groups, and training citizen volunteers. Revitalizing the city's historic link between trees and citizens underlies the mission of Casey Trees. In Jim Lyons' words: "Our mission obstensibly is to regreen Washington. In the context of doing that, we are also growing communities. In maintaining, protecting, and restoring the green infrastructure of DC, we are using state-of-the-art technology and old-fashioned community commitment and volunteerism."

Casey Trees arrived in the nick of time. As author of the book *City of Trees*, first published in 1981, I had taken great pleasure in Washington's leafy streets and avenues, despite the loss of many American elms. When Casey Trees opened its doors in 2001, I walked some downtown streets with Barbara Shea, president of the board. I was shocked to see the numbers of dead, dying, and missing street trees. A modern street tree has a tough life, I found out. Inadequate root space, poor soils and drainage, injury by vandals and vehicles, and general neglect due to years of budget shortfalls, among other challenges, had reduced the average life of a newly planted street tree to 7 to10 years, according to Casey Trees. It's hard to create or sustain a rich green canopy with those building blocks.

Casey Trees received $50 million to help restore the District's canopy, but planting thousands of trees right off the bat was not the solution they chose. They chose instead to educate, to enlist community support, and to gather scientific data. In the summer of 2002, Casey Trees hired 35 college interns from across the country and around the world. Graduate and undergraduate students of environmental science, landscape architecture, urban forestry, and related fields were brought to the District to head up teams of citizen

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Innovative "Green Tech Program" to pilot in five schools this year

By Melanie Choukas-Bradley

This school year hundreds of D.C. public high school students will get a chance to participate in an innovative program offered jointly by Casey Trees and American Forests. The so-called "GreenTech Program" will pilot in five schools, teaching students how to identify and inventory trees in their school yards and surrounding neighborhoods. Casey Trees citizen foresters will assist with the program in the classroom and in the field.

Photo by Melanie Choukas-Bradley

Learning to use CITYgreen software for the innovative GreenTech program

Information gleaned during autumn surveys will be plugged into "CITYgreen," geographic information system (GIS) software developed by American Forests, and during the winter, students will use the software to evaluate their trees and come up with landscaping and planting plans for spring. The CITYgreen program will help participating high school students determine how their trees are contributing to air quality and mitigating stormwater runoff, and allow them to run various scenarios to improve the aesthetics and ecological track records of their school yards and surrounding neighborhoods. The program puts a dollar value on the ecological contribution of an individual tree—current local users include residents of Chevy Chase, Maryland and an urban forester in Leesburg, Virgina, who are employing CITYgreen software to analyze local ecosystems and illustrate the value of trees to community planners and developers involved in suburban development projects.

The GreenTech training will reach across many academic disciplines. Daniel Gohl, principal of the newly renovated McKinley Technology High School that occupies part of a 24½-acre site overlooking the Capitol, the Library of Congress, and the Washington Monument, comments: "I envision that the training will permeate all content areas." McKinley students will be inventorying mature trees and six young Princeton American elms planted by Casey Trees in honor of the school's reopening.

Views of McKinley Technology High School: Left, with Capitol in background; above, teacher Gary Miller, next to a young Princeton American elm.

Photos by Melanie Choukas-Bradley

Teachers are enthused. Gary Miller, a former Prince George's County teacher, is looking forward to integrating the GreenTech program into his 9th grade physical science curriculum at McKinley, while Reiss Allen, a former accountant who now teaches 10th grade algebra and geometry at Bell Multicultural High School, sees the program as "an authentic context to teach geometry skills. We are always looking for ways to bring the community into the classroom and students into the community," he said. He looks forward to applying basic geometry skills to mapping and inventorying trees in the neighborhood.

City of Trees

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volunteers in a street tree inventory of unprecedented ambition. Over the course of the summer, the interns, with the help of nearly 500 local volunteers, would examine virtually every tree along roughly 1,000 miles of city streets. Each tree would be identified, measured, and given a health checkup—and its stats would go into a comprehensive data base that would be at the fingertips of city officials. Today, that data is available not only to the city government, but to every user of the Internet. Pull up www.caseytrees.org and click on the tree map. If you live in the District, you can zoom in on the street you live on and the trees along that street—and find out almost everything you might want to know about those trees, including their species, size, health, and how much pollution they are removing from the air. Updates of the 2002 data are in the works.

Olivia Watts (center) helps Sujey Chopin (left) and Alicia Thomas (right) determine the DBH (diameter at breast height) of a black locust tree during UFORE survey

Olivia Watts helps Alicia Thomas measure the crown width of a black locust tree (UFORE Survey)

Photos by Melanie Choukas-Bradley

At the time, then Executive Director Sheila Hogan told me: "We could have hired professional arborists to do the inventory, but chose to educate interns and volunteers in order to build community support for our city's trees." When all the data was compiled for the 131,338 street tree spaces in the District, Casey Trees concluded that 19% were empty or contained dead trees or stumps. Of the living trees, 32% were in excellent condition, 39% in good condition, 19% in fair condition, and 10% in poor condition. The data base was turned over to the city's Urban Forestry Administration, where it is currently being integrated with data layers for the District's streets, streams, utility poles, buildings, and Ward boundaries. By the end of September or so, the city's arborists will be able to download and update the data about individual street trees and their health on electronic clipboards in the field, according to Ainsley Caldwell.

Between October of 2003 and April of 2004, Caldwell's Urban Forestry Administration planted 4,500 street trees in the District and will plant an additional 4,700 in the planting season beginning next month and ending in the spring of 2005. More trees are being planted in Wards 7 and 8 than in other areas of the city because the data shows that a higher percentage of trees were missing or doing poorly east of the Anacostia. Caldwell chooses street trees able to withstand the rigors of the urban environment—including certain species of oak, maple, linden, and ginkgo. Trees of smaller stature, such as redbud, the smaller maples, and cherries, are now planted under utility wires, where they are spaced closer together than the larger shade trees. Although most—but not all—street tree species planted today are native, all current choices are considered non-invasive, according to Caldwell.

Casey Trees has been concentrating on planting the American elm cultivar known as the Princeton elm, which is resistant to Dutch elm disease and retains the vase-shaped growth habit of the beloved American elm. In riparian environments along the Anacostia, the city and Casey Trees have joined forces with Americorps*NCCC, the Chesapeake Bay Foundation, and the National Park Service to plant native trees suited to riverbanks—sycamore, green ash, swamp white oak, and sweetgum, for example.

Casey Trees sees educating and enlisting DC's youngest citizens in the regreening of the city as another central aspect of its mission. Lyons says: "We have had high school kids from every ward of the city involved this summer." These paid interns alternated between participating in maintenance and taking a tree inventory for the Urban Forest Effects Survey (UFORE), designed to evaluate the city's tree canopy for its contributions to a healthy environment.

Sujey Chopin measures the DBH of a tulip tree on Jenifer St., NW

Olivia Watts uses a clinometer to determine a tree's height

On a recent summer morning I joined one of the UFORE teams in the field. Olivia Watts, a 20-year-old forestry major at Virginia Tech, was one of three college interns Casey had hired to head up UFORE teams during the summer. The UFORE survey involved two hundred 37½-foot-radius plots throughout the city, including both public and private land of every sort of land use. Each plot was visited by a UFORE team that studied the overall health of the site and measured each tree so it could be documented for its contribution to air quality and cooling. The data collected goes into a USDA Forest Service computer model so that researchers can measure and evaluate DC's urban forest for temperature reduction, removal of air pollutants, energy effects, and stormwater runoff.

On this particular day, Watts was working with 16-year-old Alicia Thomas, a rising sophomore at Eastern Senior High School in northeast DC, and 18-year- old Sujey Chopin, who was born in El Salvador and will be a senior at Roosevelt Senior High in northwest DC The internship was the first real job for both high school girls and they said it was hard work, particularly on the non-UFORE days when they would go out with the maintenance crews to water, stake and mulch Casey's young trees.

We rode a Metro train and bus to northwest DC and then walked to Jenifer Street, where the trio would survey the first plot of the day. A German shepherd barked when Watts knocked on a townhouse door, but prior written permission from the property owners had already been obtained, and the team was soon through the wooden gates and into the two backyards and alleyway that made up the survey plot.

After putting a central yellow stake in the ground, Watts and the girls began determining the radius and circumference of the plot. They then estimated areas of shrub cover, impervious surface, herbaceous plant and woody vine cover, and duff/mulch. "Remember that one percent of the plot is about the size of a queen size mattress," prompted Watts.

The lion's share of the work involved measuring each tree in the townhouse backyards and along the alley. Watts easily identified the species, which included a tulip tree and a black locust. She then helped the girls use the tools of the trade: a large tape measure to determine DBH (diameter at breast height), crown width, and distance of each tree from residences; a hand-held range finder; and a clinometer for determining the trees' bole height (height of the trunk) and total height. When the electronic range finder failed, as it often did, the team relied on the old-fashioned clinometer. Watts entered all the information into her hand-held computer.

Many tree plantings in the city are accomplished with the help of a Citizen Forester program, initiated by Casey Trees and supported by Mayor Williams and the Urban Forestry Administration, the National Park Service, University of the District of Columbia, the USDA Forest Service, and the National Arboretum. Citizen foresters participate in three training modules and put in a specified number of volunteer hours. During the first module they learn

Learn more about how you can help restore our urban forest!

To learn about the Casey Trees Endowment Fund and its opportunities for citizen volunteers, go to www.caseytrees.org. This month and next, Casey Trees will offer three class sessions and two field sessions of Citizen Forester Module II. Although priority will be given to participants who have already completed Module I, Casey Trees director of education and training, Heather Langford, says that ANS members and friends are welcome to take any unfilled slots. For information on tree planting dates inviting citizen participation, and tours of the new green roof at 1425 K Street, NW, consult the Casey Trees website. To learn about American Forests and CITYgreen software, go to www.americanforests.org and click on "Urban Forests." To learn about the District's Urban Forestry Administration and the Urban Forest Preservation Act, go to ddot.dc.gov/ufa/index.shtm.

Casey Trees ENDOWMENT WASHINGTON DC

about tree identification and biology, and how to measure trees and evaluate their health. The second module teaches citizen foresters how to plant and care for trees (see preceding page). Casey Trees has begun planting trees in earnest, and during spring and fall tree-planting sessions the foresters work with other local volunteers who come out on tree planting days to help plant and learn about tree care in their communities.
The third module teaches urban ecology, environmental stewardship, and community outreach.

Citizen foresters have helped plant more than 1,000 trees, and they have been vital contributors to three major tree inventories: the 2002 summer street tree inventory; a 2003-2004 survey of National Park lands around the Mall and some city parks—a Casey Trees collaboration with the National Park Service; and this past summer's "Urban Forest Effects" (UFORE) survey—a joint project with Casey Trees, the National Park Service and the USDA Forest Service.

Claudine Lebeau is a citizen forester, one of 45 who have been trained in all three modules (in effect, Casey Trees' first graduating class). Born and raised in France, a mother of two who is employed by GEICO, Lebeau volunteers for Casey Trees whenever she can. Her favorite aspect of volunteering involves the inventories. "I joined to understand trees and to be closer to trees," she says. "When you spend 15-20 minutes with each tree, you feel like you are discovering nature." She also says, "I am impressed with the technology [for measuring trees and recording data]. Using it properly takes a lot of experience."

Will East Capitol Street's "tunnel of trees" be the wave of the future? We hope so!

Lebeau participates in planting sessions two Saturdays a month during spring and fall. "Planting is a festive event," she says. "Volunteers come from all over the city and we have coffee and bagels. It's great for people in the neighborhoods who are gregarious. They are paired with experienced planters." She also describes it as hard work, "especially when digging in compacted soil," a job young Americorps volunteers often assist with. Newly planted trees are mulched and watered. "Getting water can be quite a challenge," she says. It is often hauled in buckets from residential faucets by the citizen foresters and other volunteers.

As I explore the streets and parks of Washington myself, preparing to write a new edition of *City of Trees*, I see many streets with dead and dying trees, and I know that the capital is not as green as it was just 27 years ago when I first moved to the city. But my heart is lightened by the high-tech career and volunteer arborists of the 21st century, and their passion to restore the urban canopy. Not far from the leafy elm tunnel of East Capitol Street lies 8th Street, SE or "Barracks Row," a newly refurbished historic business district near Eastern Market with wide brick sidewalks and young Princeton American elms planted by Mayor Williams, District business and community leaders, Casey Trees and its volunteers, during a snowfall last December. I look into the future and imagine the vase-shaped branches of these disease-resistant American elms touching in the middle of the street, forming a green tunnel that will cool a hot summer day.

As the Casey Trees Endowment Fund opined in a recent report titled *The State of Our Trees: The Status and Health of the Street Trees of Washington DC*: "Trees…reduce stress, add character and peace to neighborhoods…They are the front-line buffer between the harsh, hot pavement of city streets and the spaces where we walk, play, live and work."

As long as current trends continue, and the trees of Washington have the ongoing support of the District and federal governments, organizations such as Casey Trees and American Forests, and the committed green thumbs of its citizens, the forecast looks promising.

Free–lance writer Melanie Choukas-Bradley is at work on a revision of City of Trees: The Complete Field Guide to the Trees of Washington, DC*, illustrated by Polly Alexander. She is also the author of two books about Sugarloaf Mountain, illustrated by Tina Thième Brown and published by the University of Virginia Press, as well as a number of articles published in* The Washington Post. *Melanie and Tina will lead an ANS field trip to Sugarloaf on November 13th. To register, call 301-652-9188 x 16 or 14.*

More encouraging signs for the City of Trees

By Melanie Choukas-Bradley

Recent legislation known as the Urban Forest Preservation Act (often called simply the "DC tree bill") was passed by Congress in April of 2003. It provides a legislative framework for protecting city trees on public and private land. Regulations have been proposed that are currently in the public comment phase. According to Casey Trees: "After a comment period and approval by the [City] Council, a permit will be needed before a property owner removes a non-hazardous tree with a circumference larger than 55 inches (at a height of 4.5 feet). The owner will be required to pay a fee of $35 per inch of circumference into a tree fund or plant saplings equal in circumference to the removed tree." The Urban Forestry Administration will administer the law and issue the permits.

And there are other hopeful signs on the horizon. Casey Trees' tireless programs and research director Barbara Deutsch refuses to be held hostage to the ecological limitations of the street. She takes me to the top of their headquarters building (owned by Blake Real Estate) at 1425 K Street, NW to show off their new "green roof." A joint venture of DC Greenworks, Casey Trees, and Blake Real Estate (with support from the National Fish and Wildlife Foundation, DC Department of Health, EPA, and others), the roof has just been planted with thousands of tiny sedum plants that have already begun the important work of absorbing stormwater runoff, reducing heat island effects, and improving air quality.

Roof with a view—overlooking the White House from the Casey Trees offices

Casey Trees' Barbara Deutsch pulls a weed from carefully-spaced rows of young sedum plants on the building's green roof

Deutsch laughs, reaches between the carefully spaced green and red sedum plants, and pulls up a hunk of grass from the green roof. "This is the seventh weed I've pulled," she proclaims. As we look out over McPherson Square and Lafayette Park to the White House, trees along K Street and Vermont Avenue look tiny—and predominant from this vantage point are the tall buildings with their empty roofs. "If 80% of these rooftops were greened," says Deutsch, "we could reduce storm runoff by 56% in the downtown area." Bob Ryan's 4-Winds Program at WRC-TV has contributed to the cost of monitoring equipment and his weather forecasts will soon include reports from this vertical frontier, according to Deutsch. Perhaps we'll have to amend our moniker: "City of Trees and Green Roofs."