District Department of Transportation

District of Columbia
Assessment
of Urban Forest Resources and Strategy

Urban Forestry Administration
District Department of Transportation
Government of the District of Columbia

Acknowledgements

Urban Forestry Administration
District Department of Transportation

Government of the District of Columbia

Adrian Fenty, Mayor
Gabe Klein, Director
John Thomas, Associate Director
Monica Lear, Ph.D., State Forester

Recognition is given to all the people who offered technical support and assistance to this project. Special recognition is given to Jody Davin and Ian Leahy.

District of Columbia
Assessment of Urban Forest Resources

June 2010

Contents

List of Figures

List of Tables

Appendices

Executive Summary

The 2008 Farm Bill amended the Cooperative Forestry Assistance Act (CFAA) by requiring States to complete a statewide assessment of forest resource conditions and a long-term statewide forest resource strategy. The new requirements are intended to ensure that Federal and State programs are targeting shared management priorities and achieving meaningful outcomes. For the State to be eligible to receive CFAA funding, State Assessments and Strategies must be completed by June 2010 and updated every 5 years thereafter. The District of Columbia Assessment of Urban Forest Resources and Strategy is submitted to the Northeastern Area State and Private Forestry Program for the Government of the District of Columbia by the Urban Forestry Administration in the District Department of Transportation.

Washington, District of Columbia is unique among the 20 states in the Northeastern Area of the USDA Forest Service. The District is a large urban center with an increasing population. This figure increases by approximately 661,251 people who travel primarily from Maryland and Virginia each work day in support of the federal government and other employers (46). There are several federally managed large green spaces but the city consists primarily of urban forest. Tree canopy currently covers approximately 35% of the city. In the District of Columbia, the Urban Forestry Administration (UFA) is the governmental agency responsible for managing the urban forest in District public space. UFA's duties include planting, pruning, removing, and maintaining the health of the District of Columbia's tree canopy, specifically approximately 144,000 street trees and additional trees on District parkland and recreational properties. The mission of the Urban Forestry Administration is to manage and increase the District's street trees and to maintain healthy trees that provide: improved air quality; increased ground water retention that minimizes runoff and flooding; temperature moderation; aesthetics, recycled wood products and other benefits to the community.

The Assessment of Urban Forest Resources provides information regarding the background conditions and trends that are present in the District. This includes transportation, water, wildlife, land assessment, geography and soils, population and demographics, and climate change and weather patterns. Urban forest status is presented as data not only on street trees and trees on other DC public spaces but as information on all aspects of the urban forest as it exists in federal and private ownerships. Two natural resource plans, the District of Columbia Wildlife Action Plan and the CapitalSpace Parks and Open Space plan are reviewed and summarized.

States were asked to develop priority issues that relate to these State and Private Forestry priorities: conserve and manage working forest landscapes for multiple uses and values, to protect forests from threats and to enhance public benefits from trees. The priority issues identified in the District of Columbia are Urban Forest Improvement, Maintenance and Health and Multi-State Priority Areas. Priority Issue One has four sub-issues: to increase urban tree canopy across all ownerships, to protect and improve water quality, to protect and improve air and water quality and to build Urban and Community Forestry program capacity. Priority Issue

Two has two sub-issues. They are the Chesapeake Bay Watershed and the Interstate - 95 Corridor northeast and mid-Atlantic megaregion.

The purpose of the District of Columbia Urban Forest Strategy is to coordinate Forest Service State and Private Forestry resources provided through the Chesapeake Bay, Urban and Community Forestry, and Cooperative Forest Health programs to achieve clear and unified objectives. The Strategy outlines three priority issues: Priority Issue 1: Increase urban canopy across all District ownerships, Priority Issue 2: Protect and improve air and water quality and Priority Issue 3: Build UCF program capacity in Washington, DC.

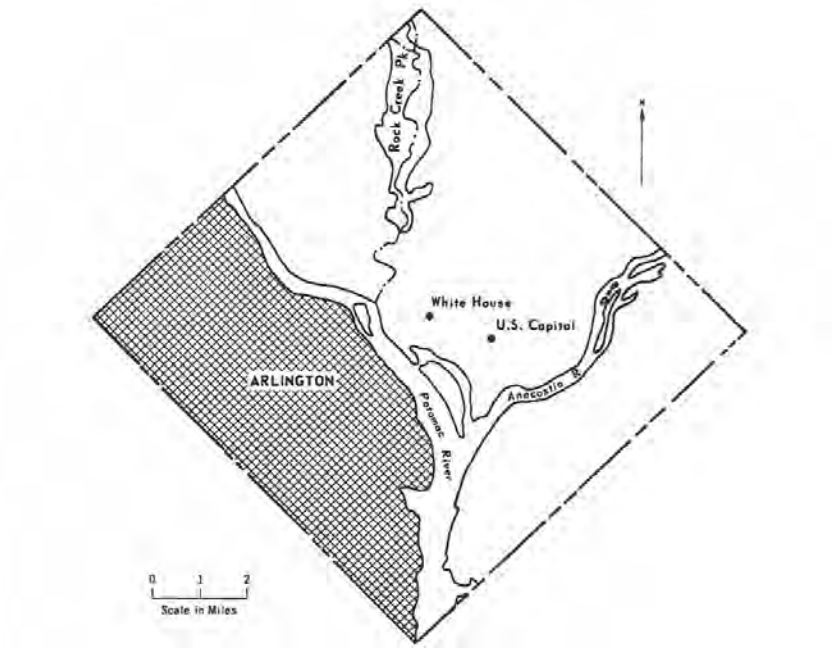
Conditions and Trends

Background Conditions

Washington, District of Columbia is unique among the states in the Northeastern Area of the USDA Forest Service. It is a federal city housing the executive, legislative and judicial branches of the United States of America. It is also a large urban center with 582,049 residents according to the 2000 adjusted census. This figure increases by 400,000 each work day in support of the federal government. There are several federally managed large green spaces but the city consists primarily of urban forest.

The District of Columbia is surrounded by the states of Virginia on its western side and Maryland on its southeastern, northeastern and northwestern sides. The Potomac River as it passes Washington is almost entirely within the District of Columbia border because of colonial riparian rights between Maryland and Virginia as shown in Figure 1.

Figure 1: The original area of the District of Columbia



The District of Columbia has a history of planting, enhancing and maintaining its urban forest. In 1872, the Governor of the District of Columbia, Alexander Shepherd directed the systematic planting of 60,000 street trees in an effort to improve the quality of life in the Nation's capitol. Originally several poplar and maple species were planted in an effort to increase tree growth quickly. Eventually, after problems with soft wooded species and insect infestations of some

maple species, they were replaced with American elm, American linden, pin oak, red oak, Norway maple, sugar maple, Oriental plane, and ginkgo. Based on Shepherd's actions, Washington, DC gained the unofficial title of The City of Trees. In 1889, Harper's Magazine proclaimed (16):

"*The city of Washington, the capital of the nation, exceeds in beauty any city of the world. The grand conception of the plan of its broad streets and avenues paved with asphalt, smooth as marble, and its hundreds of palatial residences erected in the highest style of art, but above all, its magnificent trees, make it without peer.*"

From that time to the present, there has been a municipal agency responsible for maintaining trees in the city public space. Presently, the agency responsible for planting and maintaining trees on the public space is the Urban Forestry Administration (UFA), which is a part of the District Department of Transportation. The state forester is housed in this administration. UFA administers two federal Forest Service programs in the District of Columbia: Urban and Community Forestry and Cooperative Forest Health.

Transportation

Several major local, state and federal highways transect the city. Among these are the Baltimore-Washington, the George Washington Memorial and Suitland Parkways and U.S. Routes 1, 29, 50 and DC-295 and Interstates 66, 295, 395, and 695 (the Southeast Freeway).

Water Supply

Water for the District of Columbia comes from the Potomac River. In the District of Columbia, one Federal and two local agencies are responsible for managing the surface-water resources. The U.S. Army Corps of Engineers is responsible for developing and maintaining the water-supply source for the District. The DC Water and Sewer Authority (WASA), newly named DC Water, is responsible for delivering and metering supplies to users and repairing the distribution system. The District of Columbia Department of the Environment (DDOE) regulates permits for withdrawals and disposal of wastewaters, monitors water quality, and handles chemical spills that might adversely affect water supplies.

Wildlife

The District of Columbia exhibits a diverse fauna for an area that is principally urban in character. Approximately 35 species of mammals and 175 species of birds occur within its boundaries throughout the year. There does not appear to be substantial geographic differentiation in animal populations. The major determinant of wildlife abundance and distribution is the presence of parklands, specifically Rock Creek Park, Palisades Parkway, the C & O Canal National Historical Park and Anacostia Park among others.

District of Columbia Land Assessment

District of Columbia Ecoregions

There are two ecoregions within the District of Columbia as defined by the Environmental Protection Agency (EPA) Level III and IV Ecoregions (50). They are the Northern Piedmont and Southeastern Plains ecoregions.

Figure 2: District of Columbia Ecoregions

Northern Piedmont

The Northern Piedmont ecoregion trends northeast to southwest, covering approximately 30,120 km^2 (11,629 mi^2) in New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, and Virginia (2). The ecoregion is a transition zone between topographically flatter coastal areas to the east and more mountainous regions to the west and north. The climate includes moderate winters and warm, humid summers, with more than 1,000 mm (40 in.) of precipitation falling in an average year. Based on U.S. Census data, the ecoregion's population grew (using aggregated county-level data) by nearly 2 million people between 1970 and 2000 to reach 11,434,000, with population density typically decreasing from east to west across the ecoregion. Land use varies, ranging from busy urban and suburban areas, to intensely farmed and thickly settled locales, to relatively quiet pastoral places.

Southeastern Plains

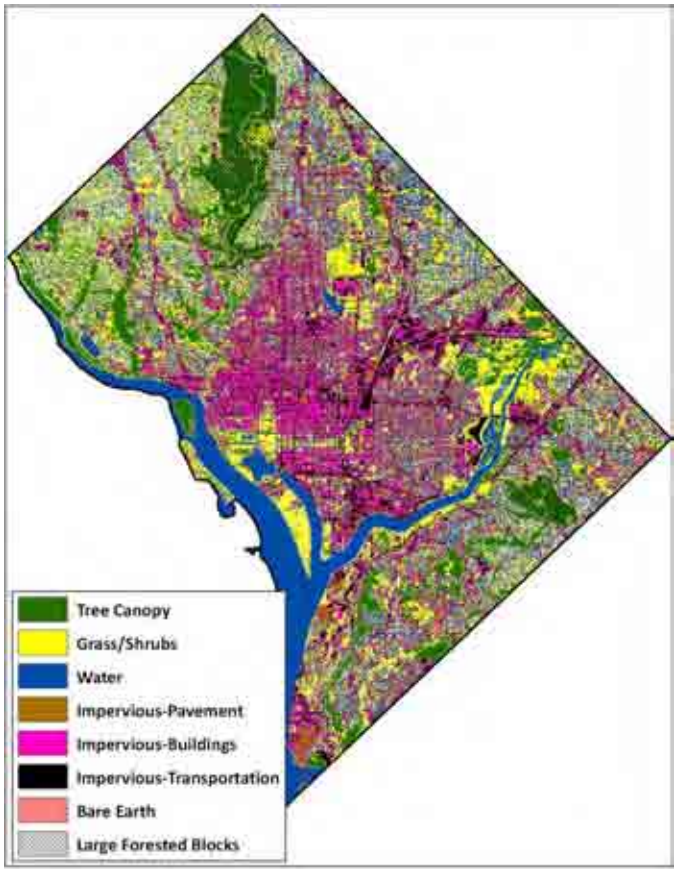
The Southeastern Plains is the largest ecoregion in the East, covering approximately 336,000 km^2 (130,000 mi^2) and extending from near the Gulf of Mexico in the south to Maryland in the north (37). The irregular, relatively flat plains of the ecoregion are covered by a mosaic of cropland, pasture, forest, and wetland. The ecoregion is characterized by long growing seasons and abundant rainfall, but the relatively poor sandy soils found in much of the ecoregion limit agricultural competitiveness with many other regions. Natural forests of pine, hickory, and oak once covered most of the ecoregion, but much of the natural forest cover has been replaced by heavily managed timberlands. Only one significant urban center (population >100,000) is found within the interior of the ecoregion (Montgomery), with several others scattered on or near the ecoregion boundaries (Baltimore, Washington, D.C., Alexandria, Richmond, Columbus, Columbia, Macon, and Tallahassee).

District of Columbia Land Area Usage

As a team member of a multi-state redesign project funded by the United States Department of Agriculture Forest Service, the District of Columbia Department of Transportation and the DC Office of the Chief Technology Officer commissioned an urban tree canopy analysis of the District of Columbia. The analysis was performed by the Spatial Analysis Laboratory of the University of Vermont's Rubenstein School of the Environment and Natural Resources.

The analysis of Washington, D.C.'s urban tree canopy in 2009 based on high-resolution satellite imagery data from 2006 found that 35% (13,673 ac) of the land area in the city is covered by tree canopy (28). Thirty-three percent (13,102 ac) of the land area is unsuited to planting trees and consists of buildings, roads, railroads and other types of permanent developed features. The remaining 32% (12,508 ac) of the land area may possibly be improved to support urban tree canopy. One of the products of the analysis was a land cover GIS layer for the District of Columbia (Figure 3).

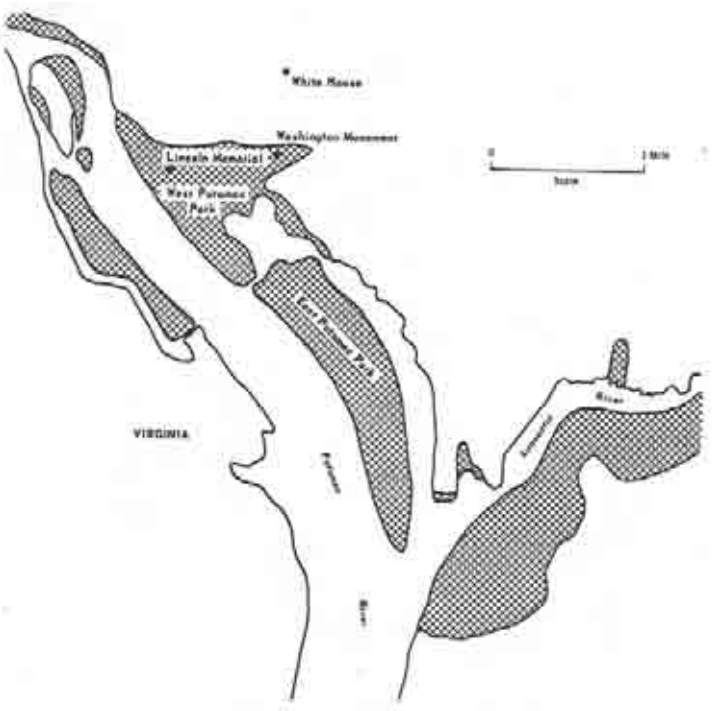
Figure 3: Land Cover Map of Washington, D.C.



Geography and the Soils of the District of Columbia

The District of Columbia was originally laid out as a square 10 miles by 10 miles (38). It extended across the Potomac and included areas ceded in 1791 by Virginia and Maryland. The land given to the District by Virginia was returned to the state in 1846 so the District has since comprised only the former Maryland territory on the North bank of the Potomac River. In 1882, a project to improve navigation of the Potomac River transformed marshes and tidal flats into 600 acres of riverside recreational areas (Figure 4) (15). The geographic center of the District of Columbia is located near 4th Street NW, L Street NW and New York Avenue NW. According to the United States Census Bureau, the city has a total area of 68.3 square miles (177.0 km²). Water makes up 10.16% which is equivalent to 6.9 square miles (18.0 km²) and 61.4 square miles (159.0 km²) is land.

Figure 4: Created Recreational Areas on the National Mall



Original Vegetation

The District of Columbia straddles the boundary between the unconsolidated sediment of the Atlantic Coastal Plain in the Southeast and the rocks of the Piedmont in the northwest (38). This boundary is called the Fall Line and in the District it runs north to south through Northwest Washington along Rock Creek Park. The Piedmont consists of gently rolling and level uplands strongly dissected by streams that have steep valley walls. The Coastal Plain is gently rolling to

level at the margin where it joins the Piedmont area and on the southeast side of the Anacostia River.

The dominant native vegetation on most of the well drained loamy soils of the Piedmont was a deciduous forest (36, 57). The major species were chestnut, black oak, white oak, chestnut oak, scarlet oak, mockernut hickory and pignut hickory. In moderately or poorly drained soils, beech, red maple, bitternut hickory, yellow poplar, black walnut and black gum were present. The understory on the Piedmont consisted of dogwoods, holly, laurel, and rhododendron with swamp oak, river birch, white ash, white willow and hornbeam present in floodplains.
The native vegetation of most of the Coastal Plain in the District consisted of stands of hardwoods with softwoods scattered throughout. In well-drained areas, chestnut oak, white oak, black oak, blackjack oak, sassafras and Virginia pine were dominant. In moderately or poorly drained soils, the dominant species were sweet gum, ash, elm, birch, sycamores, black gum, hickory and willow oak, yellow poplar and beech. The plants that made up much of the understory were holly, dogwood, laurel, red cedar, persimmon, sassafras and sumac with birch, elm, alder, willow, swamp maple, sycamore and beech present in the floodplains. The relatively undisturbed park areas such as Rock Creek and Fort Dupont are a few areas where a number of species that were part of the native vegetation still grow.

Soils of the District of Columbia

Smith (38) noted that most of the soils in the District of Columbia have been altered by urbanization and other activities of man. A large part of the District is made up of soils that formed in parent material that has been deposited or highly disturbed by man. Soils in the downtown corridor are largely manmade. Along the Potomac and the Anacostia Rivers, many of the soils have been created from river dredgings (6). They are alluvial in nature and are relatively fertile. In the downtown corridor, much of the soil material has been imported from other areas (31) and may be highly compacted and very dry.

The Natural Resources Conservation Service (48) reports that the 44,160 acres of land that comprise the District of Columbia consist of 128 soil types. The predominate soils are the Christiana-Urban land complex, Manor loam, Manor-Urban land complex, Sassafras-Urban land complex, Urban land-Sassafras complex, Sunnyside-Urban land complex, Udorthents and Urban Land. Urban Land and Udorthents make up the majority of the acreage of the above listed predominant soil types in the District of Columbia. The Udorthents mapping unit is comprised of heterogeneous earth fill materials that have been deposited on poorly drained to somewhat excessively drained soils. They are comprised of approximately 80% earthy material and 20% other matter. They are a mixture of sandy, gravelly, clayey, silty and micaeous soil particles. The other matter may include bricks, trash, wire, metal, boards, cinders, industrial wastes, incinerator ash, and pieces of concrete and stone. The Urban Land mapping unit can be described as areas where more than 80% of the surface is covered by asphalt, concrete, buildings or other impervious surfaces. It includes large areas of miscellaneous fill, often placed over streams, swamps, floodplains, and tidal marshes.

Status of the Urban Forest

In the District of Columbia, the Urban Forestry Administration (UFA) is the governmental agency responsible for managing the urban forest in public space. UFA's duties include planting, pruning, removing, and maintaining the health of the District of Columbia's tree canopy, specifically approximately 144,000 street trees and additional trees on District parkland and recreational properties. UFA is organizationally located within the District Department of Transportation (DDOT), in the Government of the District of Columbia. The mission of the Urban Forestry Administration is to manage and increase the population of the District's street trees and to maintain healthy trees that provide: improved air quality; increased ground water retention that minimizes runoff and flooding; temperature moderation; aesthetics, recycled wood products and other benefits to the community.

Although UFA's primary function within DDOT is tree management, UFA has also extended its reach into serving other sectors of the District government and its citizens. In supporting this growth, the need for outside technical support and funding is necessary. Northeastern Area Forest Service Urban and Community Forestry (UCF) program funds enable UFA to continue to expand its capacity by offering more comprehensive services to our stakeholders. These funds also allow UFA to continue to affect public policy relating to trees, increase outreach activities, build public awareness about urban forestry and the importance of trees to the environment, work to improve the overall health of the urban forest and augment the number of trees planted each year by the District Department of Transportation. Using Urban and Community Forestry program funds, we maintain current relationships and build connections with other agencies and partners that are performing conservation and environmental education, environmental services and urban tree canopy restoration.

Since 2009, the Urban Forestry Administration also has in place a Cooperative Forest Health Protection Program (CFHP) in cooperation with the USDA Forest Service Northeastern Area State and Private Forestry programs. The purpose of the urban health program is to monitor, protect, and improve the health of the District's forest resources including street trees and parks, and providing technical assistance to landowners and managers.

Urban Forest Health

The forest resource in the District is primarily urban in nature. Factors that affect urban forest health are very different as compared to those affecting native forests. They include lack of short-term and long-term care and maintenance, improper planting, poor species and site selection, poor species diversity and uniform age of trees in the stand (32). Factors unique to urban forest growing conditions are environmental stressors such as soil compaction, poor soil quality, population density, and street, curb and sidewalk reconstruction damage.

Insect and disease pests of interest in the District of Columbia are:

Diseases	Insects
Dutch elm disease	Emerald Ash Borer
Bacterial leaf scorch	Asian Longhorned Beetle
Elm Yellows	Gypsy Moth
Canker Stain Decline	Fall Cankerworm
	Hemlock Woolly Adelgid

Most of the pests in the table occur close to Washington, DC with possible or current infestations in either Maryland or Virginia. However, the District's street tree population has had occurrences of Dutch elm disease in the American elm population; we monitor those trees and treat as appropriate. In 2009, the District conducted a Bacterial Leaf Scorch survey with the Morgantown Field Office, Northeastern Area staff; preliminary results show a 68% positive result occurring in some maple, sycamore, elm and oak species sampled. Management of a large Bacterial Leaf Scorch infestation could prove problematic in Washington, DC and other urban areas.

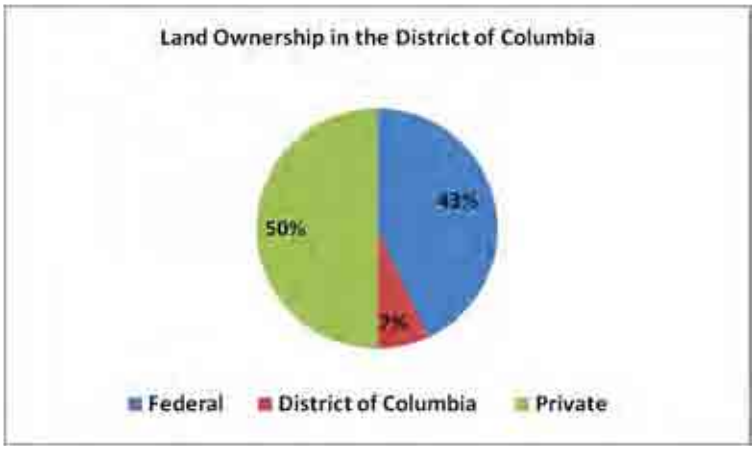
Emerald Ash Borer has been found geographically close to the District in Prince George's County and Brandywine, MD and in a few locations in Northern Virginia. Ash species are in small numbers in the street tree population but do occur on private property and in riparian zones in the District. The Northeastern Area State and Private Forestry Program office in Morgantown, WV regularly conducts aerial detection surveys for gypsy moth defoliation in the District, specifically on USDA, Smithsonian and Department of Interior properties. There have been occasional occurrences of gypsy moth populations and foliar damage large enough to require treatment in the past but not often.

The Urban Forestry Administration sees a clear need for federal cooperative forest health programs specifically targeting those factors that affect urban forest health. Presently, there are monitoring and treatment programs in place but there is a lack of research in this area.

Status of District of Columbia Street Trees

According to land use data derived from the 2008 District of Columbia Urban Tree Canopy Assessment (28), land ownership is divided in the following way:

Figure 5: Major Landowners in the District of Columbia



Before considering the status of Urban Tree Canopy (UTC) in Washington, DC it is important to understand the land ownership distribution. Each category of land ownership has unique management objectives, administrative organizations and regulatory constraints. This unique ownership in the District provides necessary context as we look at UTC distribution throughout the city as a whole.

According to the National Capital Planning Commission (22), parkland comprises approximately 20 percent of Washington's land. Almost 90 percent of parkland –more than 6,900 acres, including Rock Creek Park, the National Mall, Anacostia Park, and the Fort Circle Parks – is under the National Park Service's jurisdiction. Another ten percent is owned and managed by the government of the District of Columbia's Department of Parks and Recreation. The remaining 1,500 acres of open space, including the National Zoo, National Arboretum, public school playfields, and cemeteries, are owned and managed by various federal and local agencies. UFA's responsibility, street trees, is approximately 9 percent of total tree canopy (28).

As stated previously, the Urban Forestry Administration is responsible for planting, pruning, removing, and maintaining the health of the District of Columbia's tree canopy, specifically 144,000 street trees and additional trees on District parkland and recreational properties. In 2002, DDOT invested in a computer based work management system that allows us to track all work and our most important asset, street trees. The following figures characterize the street tree population in the District.

Figure 6: Condition Ratings of Street Trees in Washington, DC

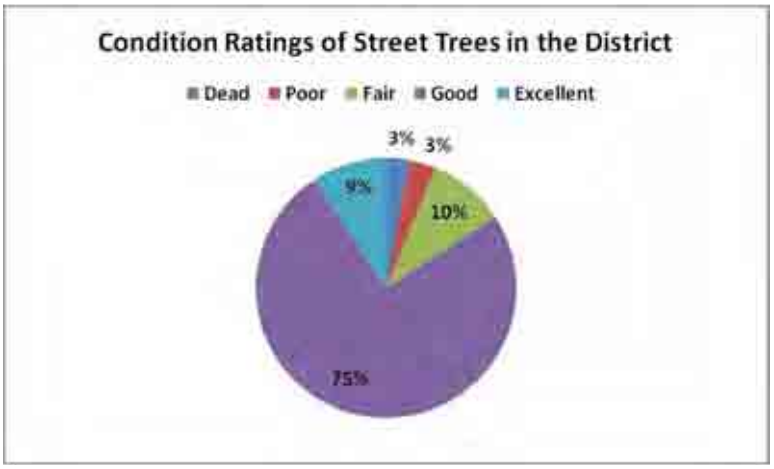


Figure 7: Diameter at Breast Height Measurement of the District's Street Trees

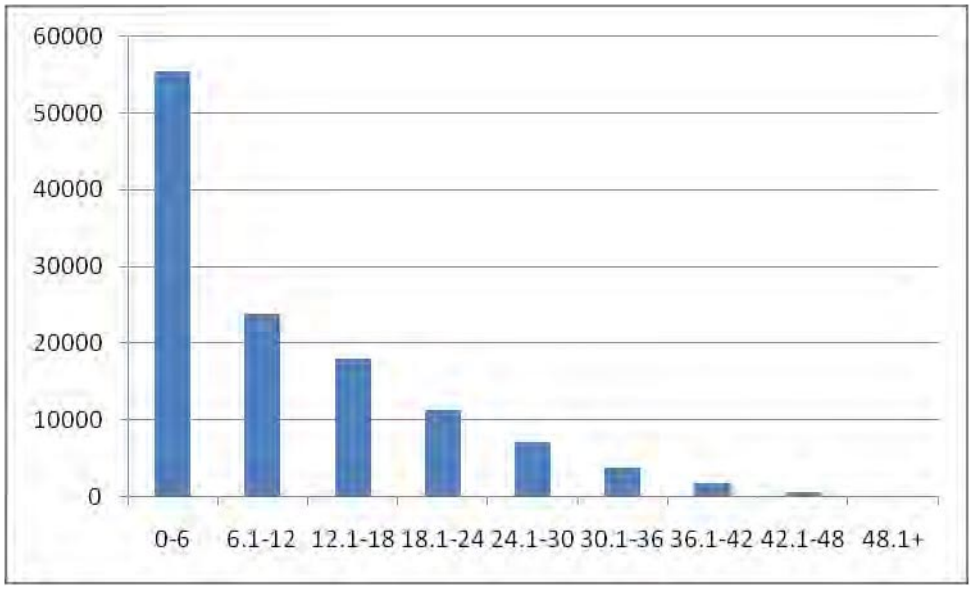


Table 1: Species Distribution in Street Trees

Species	Percentage of Total Population
Acer rubrum	18.8
Quercus palustris	14.4
Acer saccharum	13.52
Acer platanoides	11.33
Quercus phellos	11.29
Ulmus americana	10.15
Zelkova serrata	6.36
Quercus rubra	6.22
Platanus x acerifolia	4.05
Tilia cordata	3.87
Other	6.37
	100

Overall Urban Tree Canopy Analysis

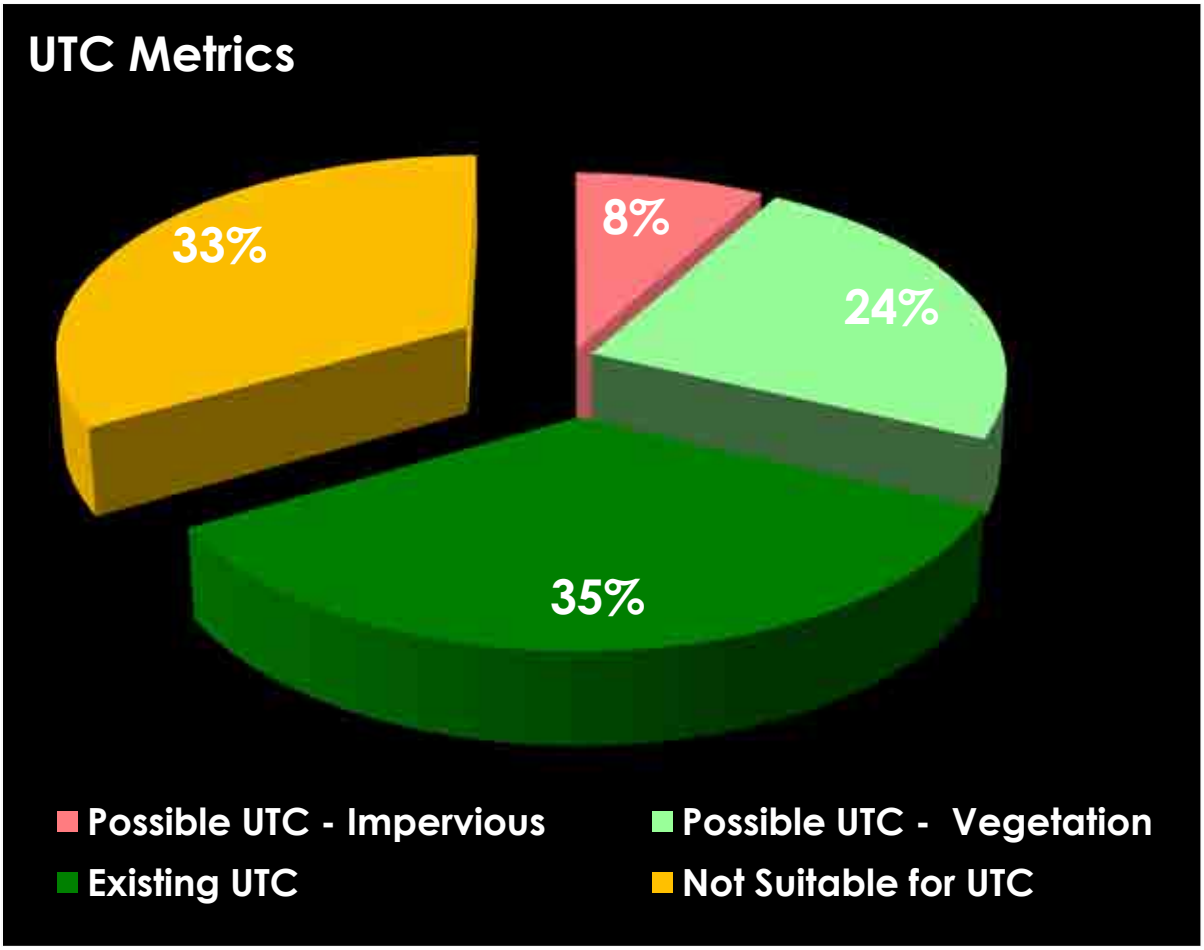
UFA has been working with a diverse group of stakeholders since 2008 to increase and enhance urban tree canopy in all ownerships in the District of Columbia. We have been a part of several meetings sponsored by the Metropolitan Washington Council of Governments (COG) designed to bring together federal, municipal, university, non-profit and citizen partners; these forums have helped us determine that the plan for increasing canopy in DC needs to be approached differently and divided into private lands, federal lands and public lands segments. We continued this conversation at a tree summit this year sponsored by COG and Casey Trees. Partners that have been a part of these meetings include COG, GSA, NRCS, USDA FS, many local and a few national non-profits and many District of Columbia government agencies including DDOT – UFA and IPMA, DDOE, DCOP, UDC and DCOZ. Because of the progress we made in talking with all partners, UFA submitted a redesign grant with four northeastern states to do a satellite-imagery based urban tree analysis and prioritized planting plan for each state. This grant was awarded in 2008 and is described in later in this section. The some of the products of the grant are available to these partners listed above via the DC GIS website and we will be continuing to work in the future toward the implementation of the Mayor's urban tree canopy goal of 40% in fifteen years.

In late 2008, the District of Columbia and four northeastern state partners (Connecticut, Massachusetts, Rhode Island and Vermont) were awarded a Northeastern Area State and Private Forestry Redesign Competitive Grant for a project, *Urban Tree Canopy Tool Development and Assessment, Goal Setting, and Implementation*. The total award was $823,245 and will impact 13 communities in these states and the District of Columbia. This project involves several comparable cities and it links the study together by using a common assessment method, using high resolution satellite data, upon which these cities will base the

subsequent planning and implementation of their local urban forestry efforts to demonstrate that this assessment method is consistent, replicable and effective and that it will yield results that are valuable at the local and regional level for planning purposes, for promoting efficient local urban forest management and, ultimately, for maximizing benefits from the urban forest for urban populations.

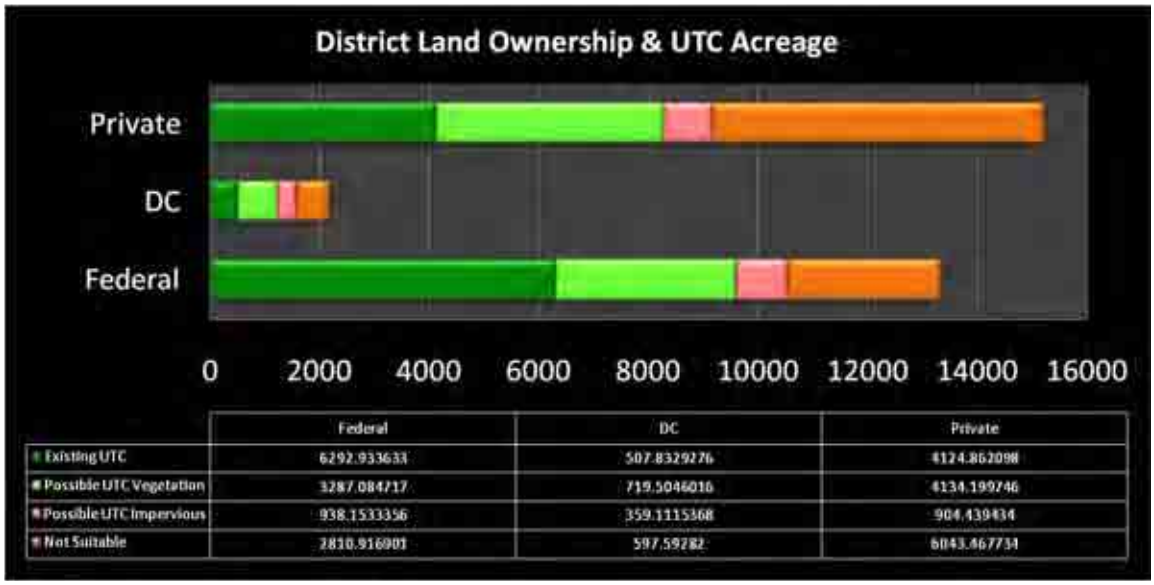
Urban tree canopy (UTC) is defined as layer of leaves, branches, and stems of trees that cover the ground when viewed from above (28). Washington's UTC provides many environmental and social benefits, including reducing storm-water runoff and the city's carbon footprint, improving air quality, providing habitat for wildlife, contributing to savings on energy bills, increasing property values, and enhancing quality of life. UTC also facilitates social and educational opportunities and provides aesthetic benefits to city residents. The District of Columbia UTC report, A Report on Washington, DC's Tree Canopy, was released in early 2010.

Figure 8: UTC Metrics for Washington, District of Columbia



The UTC report for the District of Columbia found 35% existing UTC, 33% not suitable for UTC, 24% possible UTC – Vegetation and 8% possible UTC – Impervious. The report showed that the UTC cover in the District of Columbia is 35 percent. Existing UTC is that area presently covered in tree canopy. Not suitable for UTC are those areas containing buildings, local and federal roads, railroads, permanent developed features and water. Possible UTC – Vegetation are those areas containing non-canopy vegetation such as grass and shrubs and may include military bases, athletic fields, community gardens, residential lawns and federal and city parks and upon review may not present good opportunities for planting to increase UTC. Possible UTC – Impervious includes areas containing paved surfaces that might be reviewed or modified to increase UTC. The last two examples require an on the ground review of the land area to determine if tree planting opportunities truly exist.

Figure 9: District Land Owners and UTC Acreage



	Federal	DC	Private
Existing UTC	6292.933633	507.8329276	4124.862098
Possible UTC Vegetation	3287.084717	719.5046016	4134.199746
Possible UTC Impervious	938.1533356	359.1115368	904.439434
Not Suitable	2810.916901	597.59282	6043.467734

In April 2009, Mayor Adrian Fenty agreed to support an Urban Tree Canopy Goal of 40% by 2035 for Washington, DC. To increase the canopy 5%, we will have to plant trees in each ownership category but specifically in the private ownership category. UFA will work with our sister agency DDOE and non-profit and community partners to encourage planting of trees on private property and by homeowners. UFA will be planting trees on District owned properties that are currently planted only in turf grass. Not only will UFA be able to increase the number of trees we can plant but we will also provide increased wildlife habitat in our urban city. The urban tree canopy level in the Federal ownership category is currently 47%, which exceeds the 40% goal. Federal properties may have the least amount of flexibility because of the long term plans associated with such properties.

Urban Forest Effects (UFORE) Analysis of the District of Columbia

Nowak et al (27) completed a national assessment of national urban forests in 2000 that urban areas contain an estimated 3.8 billion trees with an average tree canopy cover of 27 percent.

Using UFORE, a computer model that calculates structure, environmental effects and values of urban forest, Nowak and Greenfield (25) determined in the District of Columbia tree canopy cover averages 16.0 percent, with 41.1 percent impervious surface cover and 27.2 percent of the total green space covered by tree canopy cover by using 30 m resolution Landsat satellite imagery. A field survey assessment of the urban forest was conducted in 2004 and the UFORE model determined that the District of Columbia had an estimated 1.9 million trees, which store about 474,000 metric tons of carbon ($10.8 million), and annually remove about 14,600 metric tons of carbon ($334,000) and 490 metric tons of air pollution ($3.7 million).

Table 2: District of Columbia Species Distribution based on UFORE data

Common Name	Percentage of Total Population
American Beech	14.1
Red Maple	6.4
Box Elder	5.5
Tulip Tree	5.2
Black Cherry	3.5
Northern Red Oak	3.3
White Oak	3.1
White Mulberry	1.9
Willow oak	1.5
American sycamore	0.6

Urban Tree Benefits

The following forest attributes are estimated for the District of Columbia (26) from UFORE analysis:

- 1.9 million trees
- 474,000 metric tons of C stored ($10.8 million value)
- 14,600 metric tons/year of C sequestered ($334,000 value)
- 490 metric tons/year total pollution removal ($3.7 million value)
- 23 metric tons/year of CO removed ($32,000 value)
- 65 metric tons/year NO2 removed ($645,000 value)
- 196 metric tons/year of O3 removed ($1.9 million value)
- 66 metric tons/year of SO2 removed ($160,000 value)
- 140 metric tons/year of PM10 removed ($928,000 value)

Classified Land-cover Characteristics

The District of Columbia's land cover is dominated by developed land with urban land comprising 98.5 of the land area.

The characteristics as a percent of the total land area in the District of Columbia are:

- Developed – 83.5 percent
- Forested – 11.7 percent
- Agricultural – 3.7 percent
- Barren – 0.6 percent
- Wetland – 0.6 percent

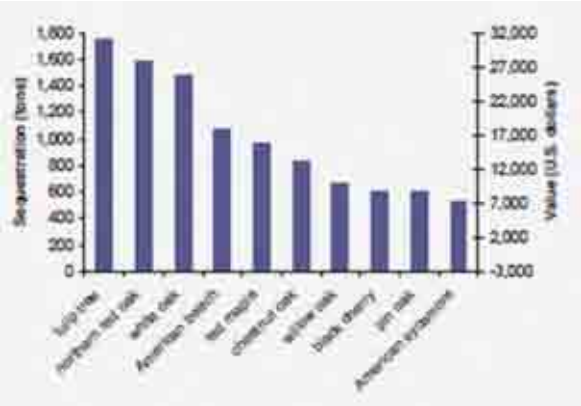
Global temperatures have increased since the late 19th century and human activity primarily fossil-fuel consumption since the industrial revolution, has simultaneously increased greenhouse gases in the atmosphere. Current research suggests that the increase in temperatures can be attributed in large part to the increase in greenhouse gases. As one of many tools, the trees that comprise urban forests have been recognized as important storage sites for carbon dioxide (CO_2), the primary greenhouse gas.

Trees sequester atmospheric carbon dioxide in two ways:

- They consume and retain CO_2 in their stems and leaves as a necessary part of their growth cycles
- Trees that are strategically placed near buildings can reduce demand for heating and cooling systems, thereby reducing emissions from electricity production

To capture the value of trees as carbon sinks, private markets focused on reducing CO_2 emissions are emerging. Currently, carbon credits trade for up to $18 / ton. For every $18 spent on a tree planting project in Arizona, one ton of atmospheric CO_2 was removed. As these markets become more established and the value increases for a ton of CO_2, healthy and mature urban forests will emerge as significant sources of revenue. Regional variations in climate and the mix of fuels that produce energy affect the value of a region's urban forest in this emerging market. The Northeast region has a relatively high average emission rate (1,062 lb CO2 / kWh) due to energy production being 29% coal and 10% oil. (19) In contrast, the Pacific Northwest's primary reliance on hydroelectric energy produces only 308 lb CO2 / kWh.

Figure 10: Carbon Sequestration and Value in the District of Columbia



Population and Demographics

Overview

The District of Columbia has undergone significant changes with regard to population and demographics over the past decade. Its population has increased by 4.8% since 2000, from 572,055 to 599,657 in 2009, and is expected to continue growing. The District's overall population density stands at 9,316.4 persons per square mile across the 61.4 square miles of land. When considered in its unique position as a federal district in relation to states, it remains the densest by far, with New Jersey second at 1,138 persons per square mile (46). In comparison to other cities, however, the District of Columbia is the eleventh densest metro area in the United States and the forty-ninth densest city, just below Providence, Rhode Island and above Compton, California (8). Approximately 54 percent (54.4%) of District residents identify as African American (Black), 40.1% as European American (White), 3.4% of Asian descent, 8.6% as Hispanic or Latino, and .4% as American Indian as of 2008. Since 2000, the White population has increased as a percentage of the expanding population by 9.2% and the Black population has decreased as an overall percentage of the population by 5.6%. By choice or necessity, 35.5% of residents do not have access to a vehicle, 43.3% have access to one, 16.5% have access to two vehicles, and only 4.1% access three or more (44).

Housing and Income

The District averages 4,476.1 houses per square mile. The majority, 88.1%, of all houses are occupied and 11.9% vacant, about the same as the U.S. average of 12% vacant houses. The most prevalent type of housing is buildings with twenty or more units, accounting for 32.3% of total housing units, followed by one-unit attached (26.6%) and one-unit detached homes (12.7%) (43).

Table 3: Building Types in the District of Columbia

	Number of Residents	Percent of total population
1 unit, attached	75,548	26.6%
1 unit, detached	36,069	12.7%
2 units	8,651	3%
3-4 units	21,924	7.7%
5-9 units	18,059	6.4%
10-19 units	31,602	11.1%
20+ units	91,863	32.3%
Mobile home	87	0%
Boat / RV/ Van	230	.1%

A majority of owner-occupied housing is single-unit, attached (49,956 or 49.4% of all owner-occupied housing). A distant second is single unit, detached (29,577 or 29.2%) followed by 5 units or more in a building (18,136 or 17.9%). In sharp contrast, renter-occupied housing leans most heavily toward buildings with 50 units or more (48,882 or 33.2% of all renter-occupied

housing), followed by 10 to 19 unit buildings (22,864 or 15.5%). Single-unit, attached housing, while accounting for nearly half of owner occupied housing accounts for only 11.5% of rental occupancies. (16,882).

Washington, DC is an expensive city for housing. The average value of a District home is $453,900, significantly above the $192,400 national average. In contrast, the average household income is $58,553, only $6,524 above the national average. Thirty-three and a half percent of all homes fall between $300,000 and $499,000 in value, with homes between $500,000 and $999,999 close behind at 32.7%. Homes valued between $200,000 and $299,999 and those valued over $1,000,000 account for 14.4% and 10.7%, respectively.

Incidents of poverty are above average in the District, with 14.5% of families living in poverty (9.6% nationally) as well as 17.8% of individuals (13.2% nationally). Six thousand seven hundred forty seven owner-occupied households live below the poverty level - 38.6% of which have a householder 65 years and over. For all residents 65 years and over, 29,380 (58.4%) own their homes, 9,164 (18.2%) live below the poverty line, 21,670 (43.1%) have no vehicle available, and 826 (1.6%) lack home telephone service (43).

Table 4: Income Per Capita of District of Columbia Residents

Income per Year	Percent of Overall Population
<$10,000	11.2
$10,000 - $14,999	4.6
$15,000 - $24,999	8.5
$25,000 - $34,999	8.6
$35,000 - $49,999	12.2
$50,000 - $74,999	15.4
$75,000 - $99,999	10.8
$100,000 – 149,999	12.6
$150,000 – 199,999	6.8
$200,000+	9.3

Table 5: Percentage of Income Used on Housing Costs

Percent of Income on Housing	Owner Costs as % of Income	Renter Costs as % of Income
Greater than 35%	30.2	39.4
30 – 34.9%	7.9	8.3
25 – 29.9%	11.6	12.5
20-24.9%	15.1	13.5
<20%	35.2	26.2

Education Levels

Washington, DC is one of the most educated cities in the country; however, there are certain demographics that rank amongst the least formally educated. Nearly half - 47.2% - of adult residents possess a Bachelor's degree or higher (20.2 points higher than the national average of 27.4%). Of those, 26% possess a graduate / professional degree as their highest level and 21.3% a Bachelor's degree, 3.4% of adult residents have earned an Associate's degree as their highest, 14% have some college education without a degree, 20.7% have earned a high school diploma or its equivalent as their highest, 9% have reached ninth through twelfth grade education with no diploma, and 5.7% have reached less than 9th grade. Overall, 85.3% of the District's population possesses a high school diploma, which is slightly higher than the national average of 84.5% (44)

Breakdown by Ward

The District's eight wards, while purposely possessing approximately the same population size, often represent starkly different socioeconomic demographics (10).

Table 4: Demographic Breakdown of District of Columbia Wards

	Total Population	Pop. Density persons / sq. mile	% change in population 1990-2000	% Owner Occupied	Average Household Income	% change in avg. family income 1990-2000
Ward 1	74,135	n/a	+1.0%	29.1	$60,636	+21%
Ward 2	71,785	7,453	+4.9%	31.7	$91,942	+18%
Ward 3	73,464	6,896	+1.5%	50.69	$134,889	+13%
Ward 4	74,889	8,242	-3.9%	60.7	$76,906	+6.1%
Ward 5	69,970	6,980	-14%	49.4	$52,206	-1.9%
Ward 6	63,663	n/a	-6.1%	42.4	$66,580	+2.3%
Ward 7	70,918	n/a	-11%	41.7	$45,407	-4.2%
Ward 8	68,846	n/a	-15%	20.9	$38,754	-4.8%

Commuter population

The District has a large population of commuters daily. Figures from the 2000 Census show the number of commuters from the District, Maryland and Virginia to be 661,251 (46). The majority of the commuters come from Southern Maryland and Northern Virginia but also commuters from further distances like West Virginia, Southern Virginia and Pennsylvania. They use automobiles, METRO and commuter buses, METRO and commuter trains, carpools and bicycles to travel in to work (45). Washington, DC has the second highest percentage of public transit commuters in the United States behind New York City.

Table 7: Number of Workday Commuters

Jurisdiction	Number of Workday Commuters
District of Columbia	190,566
Maryland	279,479
Virginia	191,206
Total	661,251

Climate Change and Weather

Overview
The District of Columbia's climate is relatively mild in relation to much of the United States, possessing neither the extreme cold of the Northeast and Midwest nor the extreme heat of the Southeast and Southwest. It is also often buffered from the full brunt of coastal weather patterns due to it being slightly more inland than most East Coast cities (18). It does, however, experience high and low temperatures, as well as destructive winter and summer storms.

Temperature
The District lies in the Mid-Atlantic piedmont region of the eastern United States, with an average annual temperature of 66 degrees Fahrenheit, broken down seasonally as (24):

Average winter temperature	37 degrees Fahrenheit
Average spring temperature	56 degrees Fahrenheit
Average summer temperature	77 degrees Fahrenheit
Average fall temperature	60 degrees Fahrenheit

Precipitation
The District of Columbia averages 40.24 inches of precipitation a year, placing it just below Baltimore, Maryland (40.76 in) and just above South Bend, Indiana (39.14 in) amongst U.S. cities (56). Most precipitation falls in May in the form of rain, with annual snowfall averaging 16.6 inches per year (18).

Storm Events
Washington, DC is generally affected by four types of storm events: Alberta clippers, systems moving from west to east, nor'easters, and hurricanes / tropical storms. By far, the most intense storms to affect the District emerge from nor'easters and tropical storms (5). A normal Atlantic hurricane season typically brings eight to eleven tropical storms, of which five to seven reach hurricane strength, with two to three classified as major. A major hurricane packs sustained winds greater than 110 mph and is classified at Category 3 or above on the Saffir-Simpson Hurricane Scale. Seasons with normal hurricane activity average one to two land-falling hurricanes in the United States (35).

Of those that do make landfall, Washington, DC is somewhat buffered from the most significant force due to the weakening of storms by the time they track inland and because the Mid-Atlantic in general is buffered from hurricanes to some degree by the Outer Banks. Nevertheless, the most intense storms to affect the District of Columbia between June and November come in the form of summer Atlantic hurricanes or tropical storms. On rare occasion, the District is significantly impacted by Pacific storm events that track from Mexico or across the continent (40). Fifty-five hurricanes, tropical storms, and tropical depressions affected the Washington, DC/Maryland region between 1980 and 2008 (9).
From October through April, the "Nor'easter" weather systems cause high winds and heavy snowfall throughout the Washington region, as they often stall over the Mid-Atlantic region. In

this region they are considered more threatening than hurricanes because they occur more frequently, last longer, and can impact a larger area. While typically only reaching 30 – 40 mile per hour winds, they strike more often and carry significant power because they often form further inland than tropical storms. Nor'easters are defined as a low pressure area whose center of rotation is just off the East Coast of the United States. The name exists because the leading winds in the left forward quadrant rotate onto land from the northeast (23). The DC / Maryland region typically experiences three to five nor'easters per year (21).

Expected Changes

Antonio Buscalacchi, meteorologist at the University of Maryland, predicts that there will be an increase in category 4 or 5 hurricanes (14). Whether these storms reach Washington, DC will depend on individual weather patterns.

Overall, however, as Larry Atkinson, oceanographer at Old Dominion University states, there is a slow warming trend in the air and waters of the Mid-Atlantic region (11). The region is expected to withstand major economic impacts of climate changes due to its robust, globally-connected economy that has little dependence on climate-sensitive economic sectors such as agriculture and forestry (each accounting for only 1% of the region's gross output). The region's ecosystems, however, are already showing signs of stress.

Whether forests are managed for watershed protection, saw timber, or aesthetics, resource managers report increased operating costs when extreme weather events occur. If extreme weather becomes more intense, as expected, such costs are expected to increase. Higher temperatures and changes in precipitation will affect tree growth and survival rates. For example, higher concentrations of CO_2 may fertilize trees and allow them to use water more efficiently.

As such, climate change is likely to reduce the dominance of maple-beech-birch forests and increase oak-hickory forests in the region. A relatively rapid shift in dominant forest types might foster invasive species and decrease biodiversity in the Mid-Atlantic region's forests, as well as reduce the ability of forests to moderate and filter water runoff. Relatively little is known about how changes might impact recreational opportunities associated with the region's forests.

Review of State Natural Resource Plans

Parks and Open Space - CapitalSpace

Background

According to land use data derived from the 2008 District of Columbia Urban Tree Canopy Assessment (28), land ownership is divided in the following way:

Owner	Percentage
Federal Agency	43
District of Columbia	7
Private	50

According to the National Capital Planning Commission (22), parkland comprises approximately 20 percent of Washington's land. Almost 90 percent of parkland – more than 6,900 acres, including Rock Creek Park, the National Mall, Anacostia Park, and the Fort Circle Parks – is under the National Park Service's jurisdiction. Another ten percent is owned and managed by the government of the District of Columbia's Department of Parks and Recreation (DPR). The remaining 1,500 acres of open space, including the National Zoo, National Arboretum, public school playfields, and cemeteries, are owned and managed by various federal and local agencies. UFA's responsibility, street trees, is approximately 9 percent (28).

The Urban Forestry Administration is presently responsible for street tree planting, pruning and maintenance. We also respond to maintenance and other tree related work on Department of Real Estate Services and DPR properties. Working together with other administrations in DDOT, we participate in the planning and permitting process and provide advice on tree species, locations and protection on large street, sidewalk and curb projects. DCPS does its own tree work on its properties and sometimes works with non-profits to help with tree plantings on school sites. We feel it is important to coordinate, at a minimum, district agency response and resources so we can maximize our efforts to increase and maintain urban tree canopy on District public properties. We will also continue our efforts to coordinate with and support federal and private tree planting and maintenance efforts.

A split of ownerships in a city is not generally unusual but is important here in Washington because the municipal government is the minority landowner. While it doesn't matter on the surface, it is problematic when coordinating management of these properties.

The L'Enfant Plan

The layout of the city of Washington was designed in 1791 by Pierre L'Enfant and mapped the following year by Andrew Ellicott (49) and the plan conceived by L'Enfant is little changed today.

After requesting the job of creating the plan from George Washington, L'Enfant surveyed the site with the help of Andrew Ellicott and Benjamin Banneker. L'Enfant then developed a Baroque plan that features ceremonial spaces and grand radial avenues while respecting the natural contours of the land. His plan features a system of intersecting diagonal avenues superimposed over a grid system. L'Enfant directed that the avenues were to be wide, grand, lined with trees, and situated in a manner that would visually connect ideal topographical sites throughout the city, where important structures, monuments, and fountains were to be erected in the future. On the plan, L'Enfant shaded and numbered 15 large open spaces at the intersections of the avenues; these avenues would later be named for the states. He also planned that each reservation would feature statues and memorials to honor worthy citizens. He felt that the open spaces were as integral to the capital as the buildings to be erected around them. L'Enfant opposed selling land prematurely and refused to furnish his map to the city commissioners in time for the sale. As a result of his actions, he was reluctantly relieved of his duties by George Washington. Andrew Ellicott was then engaged to produce a map and reproduced Pierre L'Enfant's plan from memory.

The L'Enfant plan was revisited by the McMillan Commission in 1901. The committee lamented the fragmented Mall marred by a railroad station and focused upon restoring it to the uninterrupted greensward envisioned by L'Enfant. Plans made by the McMillan Commission in the early 1900's called for re-landscaping the ceremonial core, consisting of the Capitol Grounds and Mall and new extensions west and south of the Washington Monument, consolidating city railways and alleviating at-grade crossings, clearing slums, designing a coordinated municipal office complex in the triangle formed by Pennsylvania Avenue, 15th Street, and the Mall (the John A. Wilson Building), and establishing a comprehensive recreation and park system that would preserve the ring of Civil War fortifications around the city. L'Enfant's plan was further expanded during the early decades of the 20th century with the reclamation of land for waterfront parks, parkways, an improved Mall and new monuments and vistas (22).

CapitalSpace

The District of Columbia Department of Parks and Recreation (DPR), District of Columbia Office of Planning (DCOP), National Park Service (NPS), and National Capital Planning Commission (NCPC) formed CapitalSpace in 2006. It is a coalition working together to coordinate existing management plans, maximize limited resources, and create a stronger park system for the city. Since the initial creation of the partnership, several additional agencies have participated, including the District of Columbia's Department of Transportation (DDOT), Department of the Environment (DDOE), and Public Schools (DCPS), as well as the U.S. Commission of Fine Arts.

The District's primary recreation provider is DPR, whose mission is to maintain the city's parks and open spaces and provide diverse recreational opportunities to residents and visitors. Other District agencies, including the DCOP, DDOT, and DDOE, play key roles in planning, building, and maintaining parks and open space through broader community development and maintenance strategies. The National Park Service, whose mission is to preserve the Nation's natural and cultural resources for the enjoyment, education, and inspiration of all generations, is responsible for managing nearly 90 percent of the city's parkland—including major park areas such as Rock Creek Park, the National Mall, Anacostia Park, and the Fort Circle Parks. The National Capital Planning Commission and the U.S. Commission of Fine Arts plan for and review proposed development that may impact federal interests within Washington's parks and open spaces. The CapitalSpace partners work closely with DCPS, which provides 30 percent of the city's playgrounds and fields.

The CapitalSpace coalition is also interested in the maintenance, connectivity, accessibility, and overall quality of the green space in the District, developing spaces for new uses such as skateboarding and dog parks and continuing traditional uses for commemoration and public events as the Nation's capital.

Following an initial assessment of available local and federal parks, CapitalSpace proposed six Big Ideas that will be achieved with the help of partner agencies working in concert to maximize existing assets, address current and future needs and work with existing opportunities. The Big Ideas were explored using detailed analyses and include ideas for new planning and development policies, additional physical improvements and alternative uses and approaches to operation and maintenance. They are:

1. **Link the Fort Circle Parks** by implementing a greenway and making the parks destinations.
    - Promote the fort parks as national historic, cultural, and recreational treasures and provide opportunities for residents and visitors to explore, interpret, and visualize their history.
    - Increase public access to the Fort Circle Parks by connecting them to other parks, schools, and other destinations.
    - Activate the fort parks and greenways through selective park uses that draw residents and visitors to their rich natural environment and cultural history.
    - Protect and celebrate the diverse and significant natural resources of the fort parks.

2. **Improve public schoolyards** to help relieve pressure on nearby parks and better connect children with the environment.
    - Develop a comprehensive schoolyard improvement strategy that assesses needs, provides standards for improvements, prioritizes projects, and is coordinated with the District's school modernization process.
    - Preserve schoolyards for community recreation space and improve public access.
    - Develop guidelines for schoolyard planning including establishing safe and secure play environments, active recreation components, low-impact development opportunities, and environmental education curricula.
    - Clarify agency responsibilities for general schoolyard maintenance and develop partnerships to provide for enhancements.

3. **Enhance urban natural areas** and better connect residents to encourage urban stewardship for natural resources.
    - Coordinate future research and share environmental data among federal and local agencies and their partners.
    - Protect park natural resources.
    - Adopt clear, consistent, and shared goals and guidelines among responsible agencies and adjacent jurisdictions for long-term park and natural resource management.
    - Build a green infrastructure network within natural areas to perform many of the same services as drainage pipes and spillways.

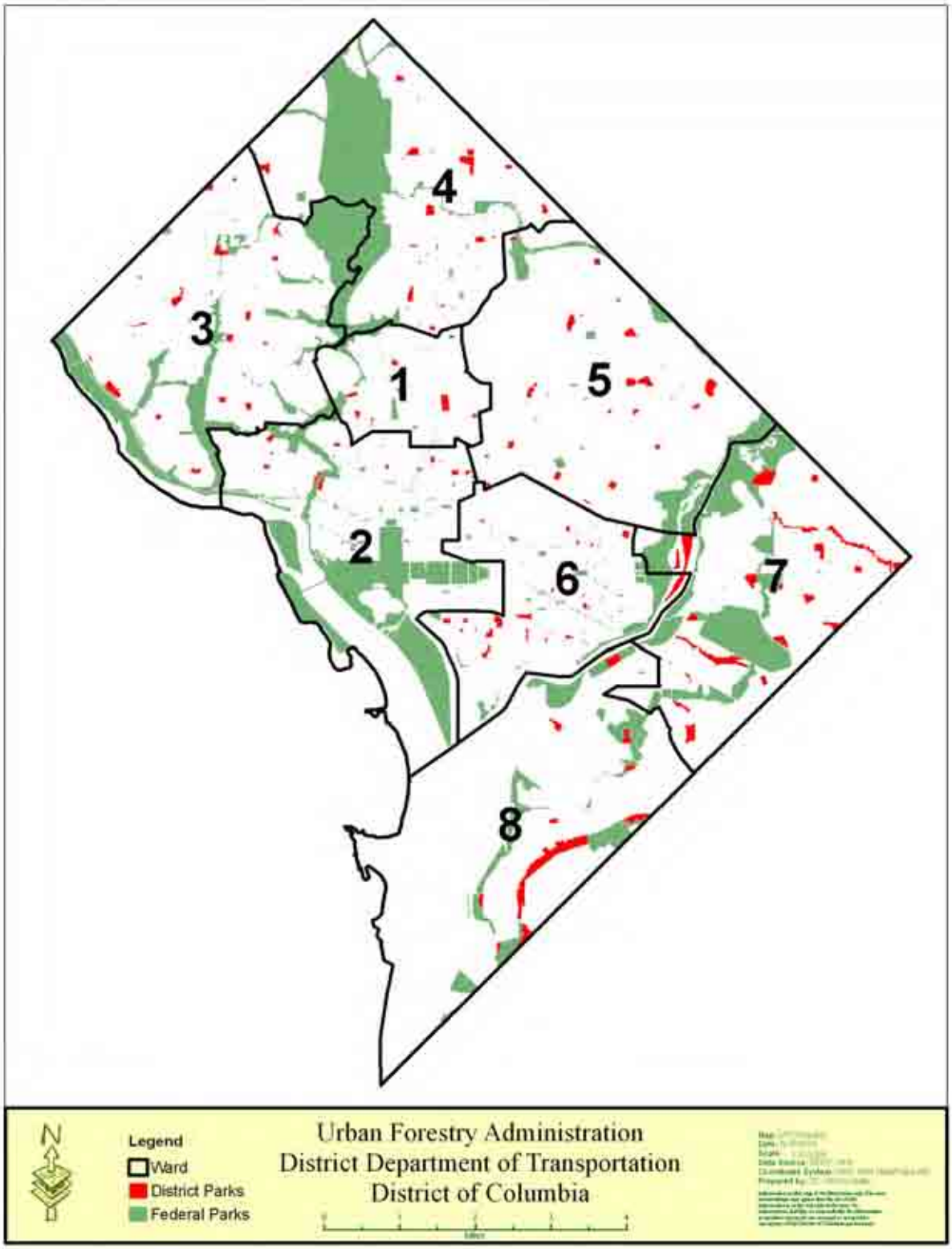
4. **Improve playfields** to meet the needs of residents, workers, and visitors.
    - Maintain or expand the current level of service for recreation facilities.
    - Increase capacity through field assessments, use, improvement plans, and capital programs coordinated among responsible agencies.
    - Simplify the permitting process between NPS, DPR, and DCPS and coordinate fees, signage, and enforcement.

5. **Enhance Center City parks** and open space to support a vibrant downtown.
    - Increase park use by improving quality, quantity, access, and connections.
    - Build and strengthen park constituency support through formal partnerships with individuals, businesses, and organizations.
    - Create unique places for neighborhoods, strengthen the overall identity of parks, and use public spaces around parks to expand programs and amenities.

6. **Transform small parks** into successful public spaces, forming a cohesive urban network of green spaces.
    - Organize small parks into clusters, where appropriate, to coordinate their uses and physical improvements.
    - Coordinate planning and management of small parks among the various park and planning agencies for efficiency and promote investments across all small park resources.
    - Provide neighborhood-oriented programming and improvements for small parks to ensure they are clean and safe to enhance neighborhood livability.
    - Leverage related investments and tap into funding unique to small parks.

The final draft plan will be put forward for public comments and adoption by summer 2010.

Figure 11 – District and Federal Parks



District of Columbia Wildlife Action Plan

A federal city performing the functions of a state, the District of Columbia is a predominately urban jurisdiction in the country required by federal law to manage its fisheries and wildlife resources. This unique responsibility is undertaken by the Fisheries and Wildlife Division of the District Department of the Environment. The Fisheries and Wildlife Division consists of three branches: the Fisheries Research Branch, Wildlife Research Branch and the Aquatic Education Branch. Collectively these components serve to conserve the District's aquatic and wildlife resources for the use of DC residents and wildlife. They are the federal mandated state wildlife agency. Staff members from UFA have been in contact with staff from Fisheries and Wildlife Division in order to develop a plan that will increase urban tree canopy and enhance endangered urban landscape habitat. We will be working together to develop a list of DDOE approved native species for planting and prioritize locations that connect to the DDOE scientific staff identified wildlife corridors that are currently monitored. This plan will allow us to maximize the federal dollars from USDA and USDI to enhance District of Columbia wildlife habitat and increase urban tree canopy. The partnership is also important because DDOE staff may work on private lands with permission that is not generally available to UFA.

In 2006, the Fisheries and Wildlife Division led in the development and implementation of a Wildlife Action Plan (WAP). Key partners in this process were the National Park Service, U.S. Geological Survey, Maryland Department of Natural Resources, U.S. Fish and Wildlife Service, U.S. Department of Agriculture, Natural Heritage Program, the Nature Conservancy, Maryland-DC and DC Audubon chapters, Association of Fish and Wildlife Agencies, Defenders of Wildlife and Howard University. Surveys conducted in association with this plan identified the presence of over 500 species of birds, fish, mammals, reptiles, and amphibians in the District, and an unknown number of invertebrate species that researchers believe to number in the thousands. The District has an interesting dynamic in terms of the interface between humans and wildlife. It is home to both a bustling metropolis as well as a retreat for wildlife and recreationalists. Today, the District boasts more than 900 acres of city parks and more than 6,700 acres of national parkland (22). While it can be difficult for humans and wildlife to coexist within the borders of one city, the District actually has an unexpectedly wide diversity of wildlife and habitats. This coexistence between humans and wildlife can improve and thrive with comprehensive strategic planning.

The goals of the District's WAP included the following:

- to identify species of greatest conservation need and implement conservation actions
- to improve understanding of species through research
- to foster partnerships
- to engage the general public
- strengthen existing conservation actions and regulations.

Funding for wildlife management is primarily provided through District funds, partners and federal resources authorized by the Wildlife Conservation and Restoration Program and State

Wildlife Grants Program through the United States Department of the Interior. These federal programs supplement other resources and target conservation efforts for the 149 species and habitats determined by the Fish and Wildlife Division to be at high risk.

Many of the District's species of greatest conservation share one of the following population status and/or trends:

Imperiled, vulnerable or declining
Stable, but habitat is at risk
Imperiled, vulnerable or declining in surrounding region, but undetermined within the District
Stable in surrounding region, but undetermined within the District
Undetermined within the District, but subjectively determined of greatest conservation need by resident expert

The Urban landscapes habitat in the District is home to at least 10 species of greatest conservation need. In the future, more species are expected to be found living in and using this habitat. Urban landscapes include both built and natural areas that are managed for human use. Generally these areas are mowed, trimmed, experience a great deal of foot traffic, and are exposed to wind because they are cleared open spaces. These areas consist of the remaining land not identified under the other twelve habitats listed in this WAP, including golf courses, school campuses, backyards, cemeteries, land surrounding memorials and monuments, and non-vegetated areas such as roads, residential and commercial buildings, and parking lots. These areas are divided among the District's eight wards, which would be equivalent to counties in a state.

Table 8: Habitat Types, Species Inhabiting Those and Acreages

Rank	Habitat Type	Number of Species	Acreage
1	Rivers and Streams	62	4645
2	Hardwood Forests	45	6864
3	Emergent Non-tidal Wetlands	40	<500
4	Grasslands/Managed Meadows	23	<1000
5	Forested Wetlands/Riparian Woodlands/Floodplains	22	<1000
6	Early Successional/Shrub-scrub/ Edge	19	<15,000
7	Emergent Tidal Wetlands	12	<2000
8	Urban Landscapes	10	24,000
9	Tidal Mudflats	10	<600
10	Springs and Seeps	10	<100
11	Submerged Aquatic Vegetation	8	<1000

While many of our urban landscapes habitats are built space, they still provide habitat for wildlife and are important areas for conservation planning. Within our extremely urbanized setting, the natural areas could provide important wildlife habitat and migratory corridors. There are several options for transforming urban landscapes into habitat, including using native plants in landscaping, strategic mowing, limiting pesticides, turning off lights in buildings and educating the public as to keeping pets inside and as to the value of wildlife (7). DDOE states that because the District has a large acreage of urban landscapes, it has a responsibility to conserving species that specialize in urban habitats.

The District is home to two rivers—the Potomac and Anacostia—and several streams. They provide habitat for 62 species of greatest conservation need, making it the highest priority habitat. All wildlife taxa utilize the rivers and streams in some way. They form natural corridors that connect otherwise isolated habitats and they connect the neighboring states to the District's habitats. They carry sediment and pollution downstream across borders. They are important for recreational activities such as fishing, swimming, wildlife observation, and boating and are aesthetic amenities for residential development and public open space. Drainage conveys urban waste and runoff from the land, especially during floods. The reliance on rivers and streams as conduits for stormwater and wastewater, as well as stream channelization and the alteration of the streams watershed, has greatly diminished their ability to perform their functions. As a result, this habitat faces erosion, degraded water quality and frequent flooding (7).

Other major threats to wildlife within the District are invasive and alien species, recreation, fragmentation, dumping, contamination, sedimentation, changes to hydrologic regimes, storm water erosion and pollution. While UFA cannot influence urban canopy increases federal or private property, our efforts to mitigate storm water runoff and increase canopy cover on District properties include identifying large wildlife habitat sinks where there is, for example, little foot traffic and only grass. Planting trees in such locations fosters both canopy expansion and new wildlife habitat creation.

Priority Issues

Priority Issue 1:

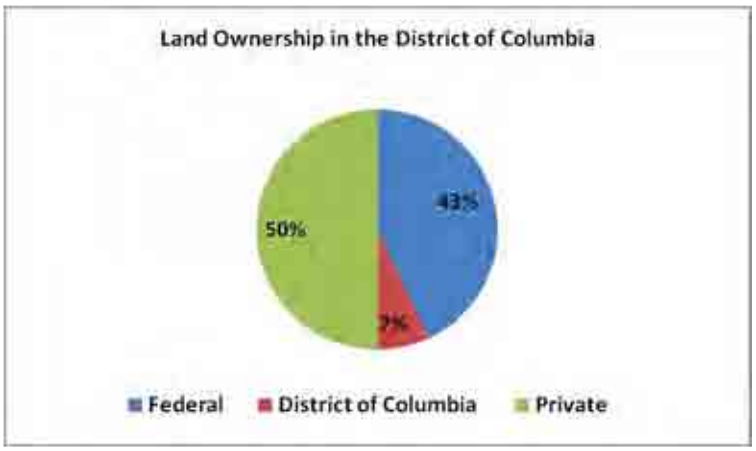
Sub-Issue 1: Increase Urban Tree Canopy in all Ownerships

The benefits that trees provide to urban areas have been well studied and reported and form the basis of livability in many urban municipalities. Communities are able to enjoy multiple social, economic, ecosystem and health benefits directly attributed to growing trees. But as populations expand, often the places trees grow are impacted and places for them to grow decline. It may become a challenge for municipal tree agencies and public works departments to plant and maintain existing tree canopy appropriately as budgets are cut.

Trees growing in cities face a myriad of unique challenges to their existence. They may be trampled upon by people and heavy equipment, reducing pore space in root zones. Soils are often poor and mineral deficient; water may be hard to come by. People deface trees by stapling or nailing signs and notices into trunks or girdling them in creative ways. Many residents love and protect trees on municipal and private property, but some do everything they can to kill trees. They may be knocked down by cars, trucks, construction equipment or emergency vehicles. The most daunting challenge is development. Cities need to solicit and encourage new development as they protect exist urban canopy by having strong tree protection ordinances in place; however, they may not have the staff to properly enforce and adjudicate those violations.

In the District of Columbia, the Urban Forestry Administration (UFA) is the governmental agency responsible for managing the urban forest in public space. UFA's duties include planting, pruning, removing, and maintaining the health of the District of Columbia's tree canopy, specifically approximately 144,000 street trees and additional trees on District parkland and recreational properties.

In Washington, DC, it is important to understand the land ownership distribution. Each category of land ownership has unique management objectives, administrative organizations and regulatory constraints. This unique ownership in the District provides necessary context as we look at UTC distribution throughout the city as a whole.



According to the National Capital Planning Commission (22), parkland comprises approximately 20 percent of Washington's land. Almost 90 percent of parkland –more than 6,900 acres, including Rock Creek Park, the National Mall, Anacostia Park, and the Fort Circle Parks – is under the National Park Service's jurisdiction. Another ten percent is owned and managed by the government of the District of Columbia's Department of Parks and Recreation. The remaining 1,500 acres of open space, including the National Zoo, National Arboretum, public school playfields, and cemeteries, are owned and managed by various federal and local agencies. UFA's responsibility, street trees, is approximately 9 percent of total tree canopy (28).

In April 2009, District Mayor Adrian Fenty signed an Urban Tree Canopy Goal for Washington, DC. The goal will increase the percentage of urban tree canopy in the District from the present 35% to 40% by 2035. Given the division of land ownership in the District, it will be impossible to achieve the goal if all entities are not working together in an organized fashion to plant new trees each year and maintain existing trees in each ownership category.

Sub-Issue 2: Protect and Improve Water Quality

Background

Water DC, formally called, the District of Columbia Water and Sewer Authority (DC WASA) operates a wastewater collection system comprised of separate and combined sewers. The separate systems are comprised of two independent piping systems: one system for sanitary sewage and one system for storm water. Approximately two-thirds of the District of Columbia is served by separate sewer systems. The remaining one-third of the District of Columbia is served by a combined sewer system (CSS) that conveys sanitary sewage and stormwater in one system, which was developed before 1900. The mid-Atlantic region has a high concentration of these systems.

During normal dry weather conditions, sanitary wastes collected in the combined sewer system are diverted to the Blue Plains Advanced Wastewater Treatment Plant in SW Washington. The sanitary wastes are diverted at facilities called regulators. During periods of significant rainfall, the capacity of a combined sewer may be exceeded. When this occurs, regulators are designed to let the excess flow, which is a mixture of storm water and sanitary wastes, to be discharged directly into the Anacostia River, Rock Creek, the Potomac River, or District tributary waters. This excess flow is called Combined Sewer Overflow (CSO). There are 53 CSO outfalls listed in the existing National Pollutant Discharge Elimination System permit from the United States Environmental Protection Agency (Figures 12, 13).

Figure 12: The Combined Sewer Area in the District of Columbia

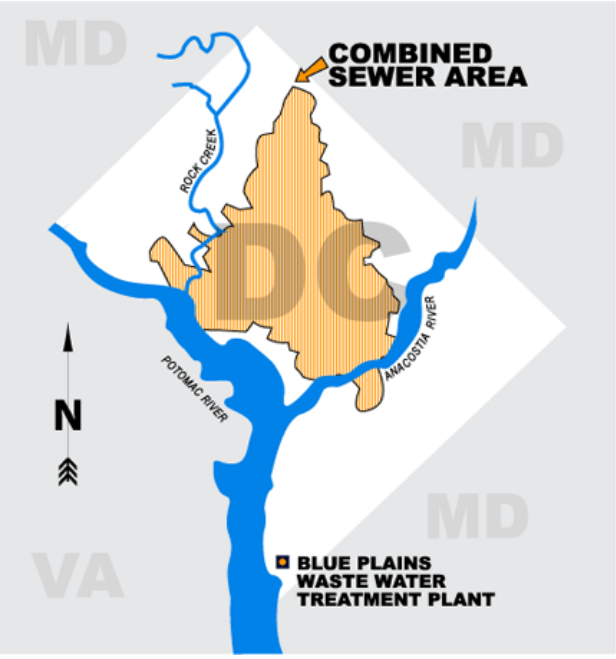
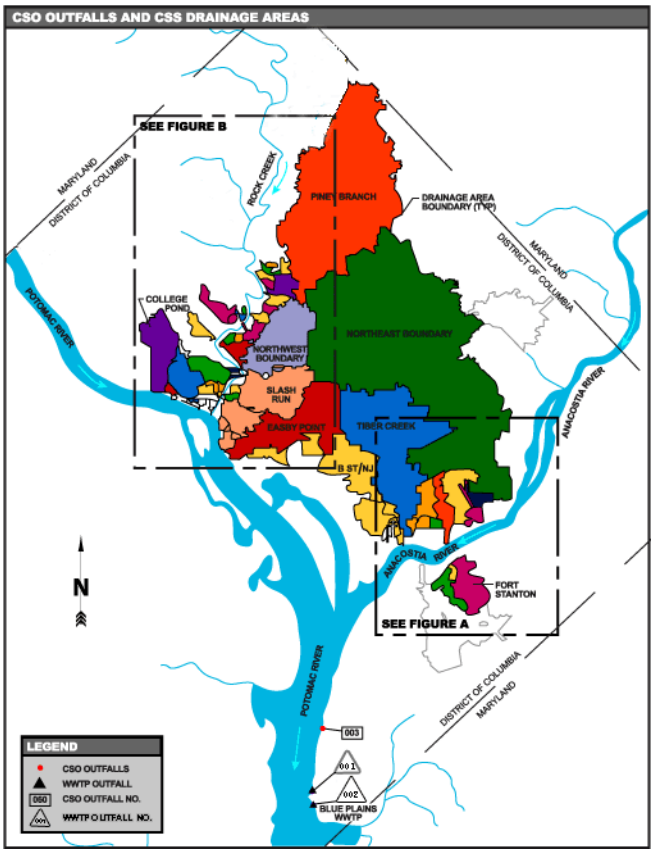


Figure 13: Map of CSO Outfalls and Combined Sewer System Drainage Areas



District of Columbia Stormwater (MS4) Tree Canopy Agreement

The Government of the District of Columbia owns and operates its own MS4 (Municipal Separate Storm Sewer System), which discharges stormwater during wet weather events into 53 CSO outfall locations throughout the District into its waterways. The District Department of the Environment (DDOE) is the municipal agency responsible for the natural and indoor environments in the District of Columbia. DDOE's work includes direct assistance to residents and businesses, policymaking, monitoring, and enforcement.

The District and EPA reached a two-party agreement on a series of enhancements to the 2004 MS4 Permit in 2007. These enhancements include a series of actions, deliverables, commitments, and deadlines for the District's MS4 program on a range of topics, including: tree canopy, implementation of Low Impact Development (LID) practices, green roofs, and enhanced street sweeping. Each of these activities was expected to contribute directly to improvements in the way that stormwater is managed and water quality issues are addressed within the District's urban environment. The commitments in the District of Columbia DDOE letter to the Environmental Protection Agency required significant new activities, which emphasized the shifting nature of the MS4 program within the District from planning to implementation of the plans with specific objectives and measurable benchmarks. The August 19, 2004 permit expired on August 18, 2009 and has been administratively temporarily extended. The District and EPA are currently working on a MS-4 draft document which contains language that establishes minimum performance measures for green technology stormwater management practices as follows:

Tree canopy	4,150 trees planted annually
Green roofs	120,000 square feet annually
Impervious surface	13,500,000 square feet over Permit term
Highway projects	Enhanced street sweeping frequency

The District's urban tree canopy reduces stormwater runoff, particularly during the smaller rains that are most frequent and often carry high concentrations of pollutants. Based on current models, trees that overlap impervious areas tend to have greater ability to mitigate stormwater; this highlights the importance of planting and maintaining the street tree canopy. Urban tree canopy also has the benefit of modifying microclimates to decrease air temperatures which improve air quality. Presently, the street trees that the DDOT/Urban Forestry Administration plant each year is the primary source of tree canopy; these numbers help to meet the requirements of the District's MS-4 permit. Increasing urban tree canopy can be done in many ways, for example, planting street trees, greenways, pocket, large urban parks and schoolyards, and implemented in different ways across an already developed landscape.

Sub-Issue 3: Protect and Improve Air Quality

Washington, DC's urban heat island

Urban heat islands (51) refer to the elevated temperatures in developed areas compared to more rural surroundings. Urban heat islands can also be influenced by reduced vegetation in urban areas, properties of materials used, dimensions and spacing of buildings, heat produced by human activities and weather and location. Environmental impacts of urban heat islands include:

Increased energy consumption
Elevated emissions of air pollutants and greenhouse gases
Compromised human health and comfort
Impaired water quality

Trees help to reduce air temperatures through shading and evapotranspiration (52). Leaves and branches reduce the amount of solar radiation that reach the area below the canopy of a tree or plant and this will vary based on species. Evapotranspiration cools the air by using heat from the air to evaporate water. Evapotranspiration alone or in combination with shading, can help reduce peak summer air temperatures. Reduction in peak summer air temperatures can be directly related to reduced utility costs and usage, helping people to conserve energy.

Reduction of elevated emissions of air pollutants and greenhouse gases

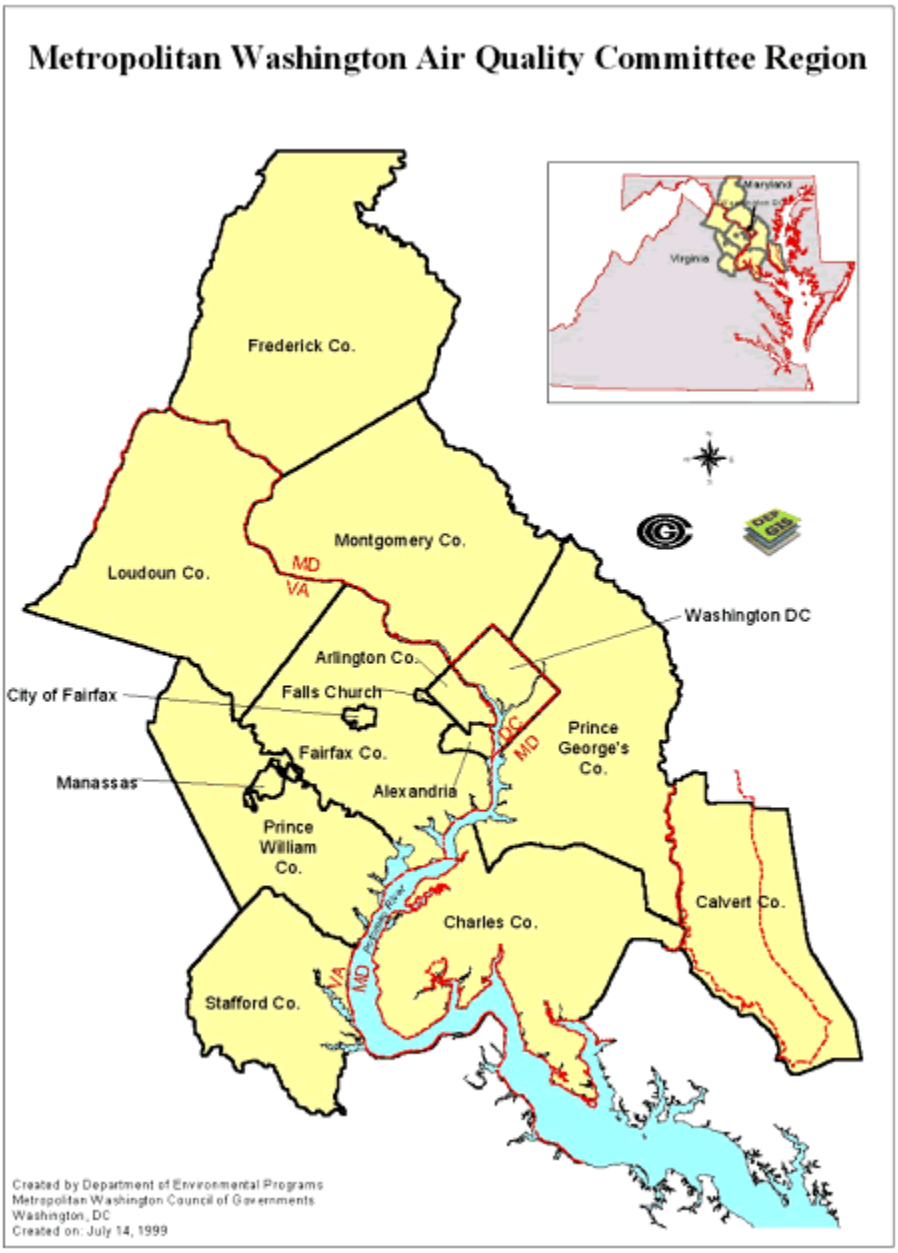
Air pollutants

The Washington DC Metro region is a non-attainment area for ground-level ozone and $PM_{2.5}$ (defined as fine particles in the (ambient) air 2.5 micrometers or less in size) according to federal health standards (20). The Metropolitan Washington Air Quality Committee (MWAQC) is the entity certified by the mayor of the District of Columbia and the governors of Maryland and Virginia to prepare an air quality plan for the DC-MD-VA Metropolitan Statistical Area under Section 174 of the federal Clean Air Act Amendments of 1990.

EPA designated the metropolitan Washington DC Metro region as moderate nonattainment for the 8-hour ozone standard in April 2004. The region had a deadline of June 15, 2010, to meet the 8-hour ozone standard. The geographic scope of the region includes the Metropolitan Washington Region defined as follows: Montgomery, Prince George's, Frederick, Charles and Calvert Counties in Maryland; Fairfax, Arlington, Loudoun and Prince William Counties in Virginia, City of Alexandria, City of Falls Church, City of Fairfax, City of Manassas and City of Manassas Park in Virginia; and the District of Columbia (20) (Figure 1). The State Implementation Plan (SIP) prepared for the region includes strategic tree planting, tree canopy conservation and management as voluntary measures. To achieve reductions in ground-level ozone, government agencies, volunteer organizations and private landowners must make long term commitments to conserving existing canopy and planting significant numbers of trees. The SIP adopted strategy by local governments in the metropolitan nonattainment area requires the entity to measure existing resources and track changes, implement programs to enhance

and increase benefits from trees, initiate public outreach, develop a regional canopy management plan, carefully select tree species and monitor programs (1).

Figure 14: Metropolitan Washington DC-MD-VA Region for the SIP



Greenhouse Gas Emissions Status in the District

The District Department of the Environment, in partnership with International Council for Local Environmental Initiatives (ICLEI) and sister agencies in District government, completed a District Greenhouse Gas Emissions Inventory in January 2010 (13). Also known as a "carbon footprint," the Inventory estimates the total amount of carbon dioxide and other greenhouse gas emissions released into the atmosphere as a result of energy consumption, vehicle use and other activities in the District of Columbia. The Inventory estimates emissions attributed to both government operations and broader community activities within the District during calendar year 2006 (selected as the baseline year because of superior data quality and accuracy). The community inventory includes estimated greenhouse gas emissions from all building energy use, vehicles fuel use and transportation, and emissions from waste streams. The government operations inventory, which is a subset of the community inventory, provides a much more in-depth analysis of emissions from the District Government, including government-operated facilities and streetlights, vehicle fleet and off-road equipment, and waste generated by government operations.

Figure 15: 2006 District Community Emissions by Sector

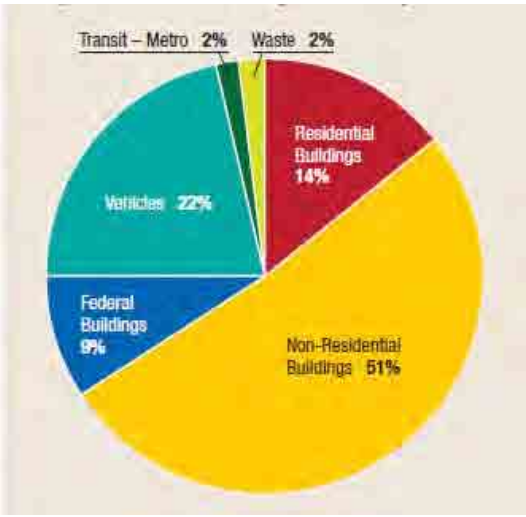


Figure 16: 2006 District Community Emissions by Source

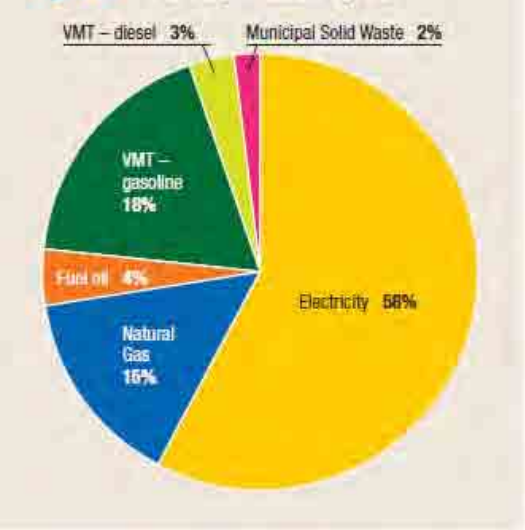
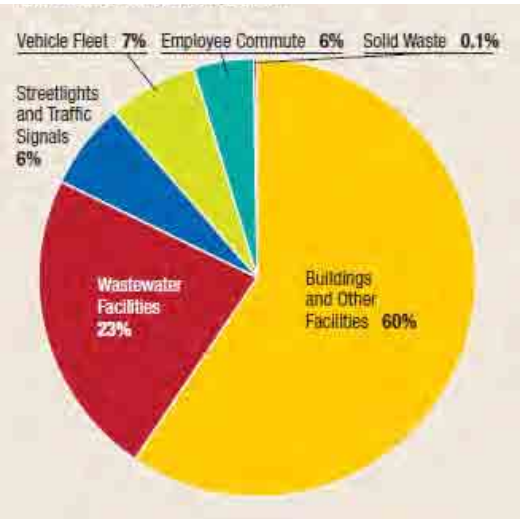


Figure 17: District Government Operations Emissions by Sector



The District Government is pursuing a number of progressive initiatives to mitigate greenhouse emissions, including urban tree canopy. This plan focuses on the high-impact efforts that will allow the District of Columbia to meet government operations emissions reduction targets of 20 percent by 2012, 30 percent by 2020, and 80 percent by 2050. The Draft Climate Action Plan includes a combination of existing policies and programs and new ideas based on best practices from around the country. They are divided into five categories: buildings, transportation, street lighting, water and wastewater and solid waste.

Sub-Issue 4: Build U&CF Program Capacity

As a municipal agency simultaneously performing the functions of a state, the role of the State agency in building local capacity occurs on a much smaller and more hands-on scale in DC. Rather than building the capacity of cities and towns, UFA works to build the capacity of people, business districts, neighborhoods and wards. While UFA's responsibility extends only to street trees, the same basic objective remains as state agencies increase the capacity of individuals and organizations working on the community level to better manage their local urban forests. In order to effectively manage the forest where people live and work, it is critical to engage all demographics in the District. Engaging underserved communities is a particular challenge, but the role trees play in revitalizing and sustaining communities is fundamental to their well-being. UFA pursues this goal through volunteer opportunities, technical training, and federal grants focused on developing an urban forestry workforce, fostering urban forestry projects, and building capacity of new organizations.

Citizens

Providing a consistent line of communication with all residents and providing opportunities to become active participants in managing DC's urban forest is fundamental to building local capacity. There are significant opportunities to improve UFA's communication with the public by engaging various audiences with tools targeted to each; from the most community oriented to the most technologically savvy.

Multi-State Partners

As a federal district, the District of Columbia is uniquely positioned to harness the power of federal and multi-state collaborations as a means of building neighborhood and business district capacity in ways that other municipalities cannot. UFA currently provides federal grants to non-profits and community groups to fulfill various goals of urban forestry, ranging from building public awareness to increasing workforce capacity. In addition, the District's predominately urban canopy, with professional staff in the field every day and a database of all street trees, positions UFA to become an incubator of innovative operation, policy, outreach, and research efforts that can be transferred to other states and municipalities and also harness resources from other state and federal entities for the benefit of the District.

One of the hurdles the District faces in this regard is that the metropolitan region is divided into the USDA Forest Service's Northeastern Area (DC and Maryland) and Southern Region (Virginia), making it difficult to partner on regional grants and projects. However, with a strong regional motivation for collaboration across political boundaries and the Metropolitan Washington Council of Governments as a close partner, the District's position as the center of the region can drive such multi-state initiatives.

Local Non-profits
Primary non-profit partners include all of the Business Improvement Districts, Casey Trees, Earth Conservation Corps, the Metropolitan Council of Governments, and Washington Parks and People. Each has received federal grants and / or technical training from UFA staff to expand DC's urban forestry workforce and landscape restoration projects. Through our U.S. Forest Service Green Grants program, outreach programs, and technical trainings, UFA continues to identify and support emerging non-profits and community groups, particularly in communities where community forestry representation is lacking.

District Agencies
To date, there has been little active tree management by other District agencies on their own properties. Although only responsible for maintaining public street trees, UFA is pursuing opportunities to expand working relationships with other agencies through collaboration and technical assistance focused on helping participating agencies better manage the trees on their properties. Targeted District agencies include: Department of Consumer and Regulatory Affairs, public libraries, Department of Health, Office of Planning, Office of Zoning, Department of Real Estate Services, District Department of the Environment, DC Department of Parks and Recreation and DC Public Schools.

District of Columbia Public Schools
Public schools, in particular, provide unique opportunities to actively maintain the existing canopy coverage on school properties and to work with students to expand DC's urban forestry workforce. While UFA has no legal oversight over managing trees on these properties, we are expanding collaboration with public and public charter schools to:

1. Train custodial and maintenance staff to undertake basic tree maintenance on school grounds
2. Expose students to the field of urban forestry and establish relationships in communities

District Department of Transportation (DDOT)
UFA's unique position within the Department of Transportation provides opportunities to:

1. Demonstrate the critical role trees play in building a multi-modal transportation system that attracts users
2. Ensure trees are a fundamental aspect of transportation and infrastructure project planning

Collaboration with other DDOT agencies has improved in the past several years, most notably with the Infrastructure Project Management Administration (IPMA), Progressive Transportation Services Administration (PTSA) and Transportation Operations Administration's (TOA) Street and Bridge divisions. There remains however, opportunities to streamline internal collaboration and build capacity of DDOT to maximize the value of the forest canopy in transportation by ensuring UFA is engaged in project planning throughout the process.

Issue 2: Multi-State Priority Areas

Sub-Issue 1: Chesapeake Bay Watershed

Background

The Chesapeake Bay is the largest and most productive estuary in North America. More than 64,000 square miles of land drain into the Chesapeake Bay, including parts of six states – New York, Pennsylvania, Maryland, Delaware, West Virginia, and Virginia -- and the District of Columbia. It is home to over 3,600 species of plants, fish and wildlife. The Bay has struggled for more than 100 years against pressures such as pollutants, overfishing, and development. But it is the way in which humans use the land that is the primary threat to the water quality and healthy functioning of the Chesapeake watershed.

As a result of climate change, by the end of this century, the water level in the Bay region may rise between 21 and 48 inches, about double the predicted global average (58). In the coming decades, water will cover many valuable low-lying areas—including islands, forests, wetlands, and beaches—that were not submerged before. Erosion will claim others. Land managers must modify land protection strategies, possibly by conserving areas that will support the upward migration of tidal wetlands and habitats. With these major forces at work, many of the Bay region's most important landscapes may soon be irreversibly altered or lost.

Value of Watershed Forests

Forests are the most abundant, and the most beneficial land cover to the health of the Bay. Currently, 58% of the watershed is forested, down from 95% prior to European settlement. Between 1982 and 1997, the Bay watershed lost over 750,000 acres of forestland to development—a rate of about 100 acres per day (4). From 1997-2006, forests have continued to be subject to the highest land use conversion.

Forests are most valued because of the suite of ecological services they provide to human communities—by protecting the quality and quantity of our drinking water; promoting air quality; combating climate change; and reducing the pollution, erosion, and flood events related to stormwater runoff. Essentially, forests mitigate the effects of development, and give back in many ways:

- Forests yield high-quality, clean water, with streams from forested watersheds averaging less than 1 mg/l of nitrate (3)
- A 10% loss of forest land disproportionately increases the loading of nutrients discharged into the Bay by 40% (30)
- Forests retain more than 85% of the atmospheric N deposited (29)
- Riparian forest buffers reduce N from upland uses by 70-90% (17)
- The majority of the population relies on surface reservoirs for drinking water, and cleaner water means lower treatment costs
- Forests are a water quality BMP that offer gains in effectiveness for decades

The best indicator of watershed health is impervious cover--- the healthiest watersheds have less than 4%. The next best land use indicator is the amount of forest cover and the amount of riparian forest (12). The following geographic features help maintain forest water quality functions over time:

- porous soils
- vegetation height (taller is better)
- shallow soils and flatter slopes (entire floodplain and land that is at or near water table should be forested)
- contiguous forests

Importance of Location

While all forests are valuable to water quality, some forests are more valuable than others. Assessing the location and condition of forests in the watershed allows for meaningful priorities and defined results. These locations often combine habitat value with significant value to people providing essential watershed services such as flood control, stormwater management, base flow, carbon sinks, and water quality treatment (17). Notable examples are:

- forested areas of contiguous natural habitat with significant interior size
- low-lying landscapes such as forested wetlands and riparian habitat
- areas close to drinking water sources and/or containing headwater streams
- landscapes of ecological and social importance sometimes referred to as "green infrastructure" by virtue of the crucial ecosystem services they provide for human wildlife communities.

Because forests are the most beneficial land cover for watershed services, if these landscapes are not forested, they should be priority areas for reforestation and conservation wherever possible. This prioritization was the focus of the Chesapeake Forest Conservation Directive (http://www.chesapeakebay.net/content/publications/cbp_27761.pdf).

Urban Forests

With over 17 million citizens, the Chesapeake watershed is heavily populated, especially along the Baltimore-Washington-Richmond (I-95) corridor. Urban forestry is a vital component to livable, well-planned communities, which are also important to open space conservation. The District of Columbia is primarily an urban forest.

An urban tree canopy reduces stormwater runoff, particularly during the smaller rains that are most frequent and often carry high concentrations of pollutants. Based on current models, trees that overlap impervious areas tend to have greater ability to mitigate stormwater. Urban tree canopy also has the side benefit of decreasing air temperatures to improve air quality. Increasing urban tree canopy includes a variety of techniques from street trees, greenways to pocket and large urban parks and schoolyards, and can be practiced in different ways across even an already developed landscape. These may be more appealing and cost-effective than other stormwater retrofits presently used in the District. Forestry in urban areas is a priority because of politics and more people will reap the benefits of work done in urban areas.

Ultimately the urban forest is a green infrastructure that provides environmental benefits and a livability factor to citizens.

Chesapeake Urban Forest Health Issues

- White-tailed deer have become one of the greatest threats to many of the Bay watershed's urban forests and natural area. Locally high deer populations:
  - Eat large amounts of tree seedlings and young trees, keeping forests from regenerating
  - Selectively browse for food, which changes forest composition and depletes species diversity

- Porcelain berry, Multiflora rose, Oriental bittersweet and mile-a-minute weed and other invasive plants to name a few have become permanent residents of Chesapeake forests. Invasive plants:
  - Grow and reproduce rapidly, killing and out-competing other species in the process
  - Lower the quality of food and shelter for wildlife
  - Eliminate host plants of insects
  - Compete with native plants for pollinators

- Invasive pests and diseases have also altered forest conditions in the District. Some, such as gypsy moth and Dutch elm disease, have had long-term, devastating impacts. Others, such as emerald ash borer, Asian longhorn beetle and bacterial leaf scorch also have potential to further and severely degrade urban forest ecosystems.

Collaborative Opportunities

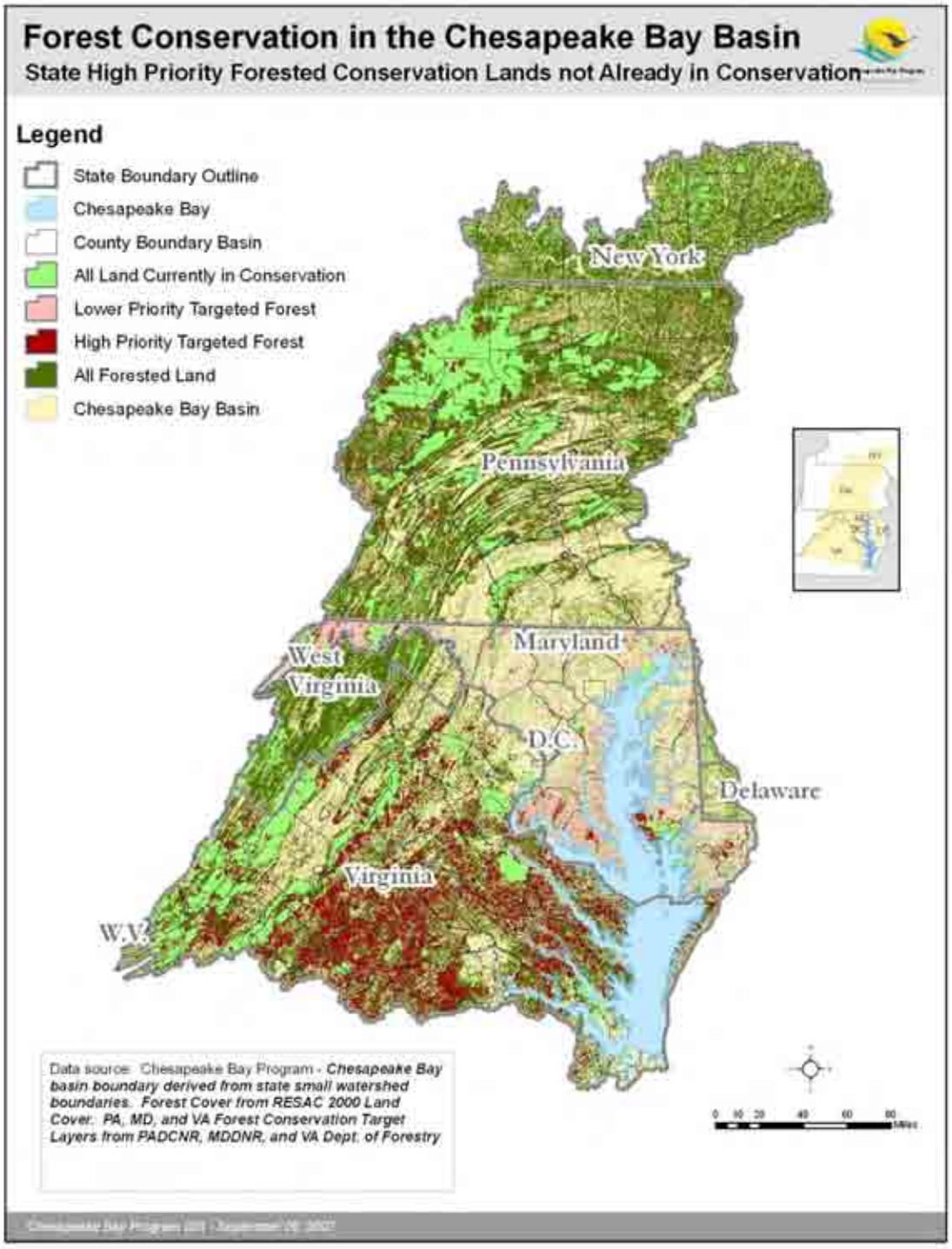
1) Link urban forests, stormwater, and water supply through Comprehensive Plan elements like Sensitive Areas, Water Resources, and Land Protection Plans, and new requirements for prioritized environmental site design for stormwater

2) Support dedicated land conservation funding through local municipal measures

3) Work with other federal, state, and local organizations to improve technical assistance provided to forest landowners

4) Invest in ongoing conservation education, outreach, and technical assistance to local jurisdiction planners, landowners and schools to improve urban forest conservation and management

Figure 18: Forest Conservation in the Chesapeake Bay Basin



Sub-Issue 2: The Interstate-95 Corridor Northeast and Mid-Atlantic Megaregion

Background

The Interstate-95 (I-95) corridor, running through ten Northeastern Area States and the District of Columbia, is the most dense and most richly connected network of metropolitan areas in the nation (34). Its larger support area, encompassing fourteen Northeastern states, contains the unique natural landscapes and estuaries that provide the drinking water, food and fiber production, wildlife habitat, carbon sinks, and recreational amenities that support life along the corridor. But the I-95 corridor's environmental assets are increasingly threatened by rapid growth at the metropolitan fringe, which consumes open space and fragments forests. The goal of protecting critical landscapes along the I-95 corridor is also challenged by the multiplicity of local governments, counties, and states, all with different land use policies and regulations, and a public often unaware of the many values these landscapes bring to their communities.

Context

The development patterns of the five metropolitan regions making up the I-95 corridor are pretty well understood; less well understood are the new patterns formed where such metro areas tend to blend together into larger complexes. These complexes have recently been labeled as megaregions (34, 55). Many of the environmental and economic challenges faced by the five major metro areas within the I-95 corridor megaregion – Boston, New York, Philadelphia, Baltimore, and Washington, D.C. – are not unique to each region but derived from their common experience of geography, history, culture, and global economic change. Taken as a whole, these areas comprise the critical landscapes that help shape and define the megaregion and supply the natural resources on which its large population depends (34, 41). Commuting patterns offer compelling evidence that the I-95 corridor megaregion States and DC continue to cohere, with major implications for their transportation systems. In 2000, 8.5 percent of all commuters in the Northeast megaregion crossed state lines on the way to their workplaces in other parts of the megaregion (42). From 1990 to 2000, the number of people who worked in the Northeast, but outside their metro area of residence, increased by 19 percent. This is more than twice the rate of increase in total number of workers (54).

Landscape Character

The University of Pennsylvania's ***Planning for America in a Global Economy: City Planning Studio Report***, provides a two-tiered definition of the Northeast megaregion, consisting of an urban core and a much larger support zone of farmland and forests, reaching north to the Northern Forests, west to the Appalachian Highlands, and south to the start of the Piedmont mountain range. Using this definition, the I-95 corridor connects diverse waterways, extensive shorelines, and a varied landscape where weather and physical climate vary dramatically. The contrasts, from mountain vistas and extensive forests to one of the most densely populated corridors in the US, are noteworthy. The Northeast includes the largest financial market in the world (New York City), the nation's most productive non-irrigated agricultural county (Lancaster, PA), and the largest estuarine region (the Chesapeake Bay) in the United States. The Northeast is dominated by managed vegetation, with much of the landscape covered by a mosaic of farmland and forest (33). The majority of the population is concentrated in the

coastal plain and piedmont regions, and within major urban areas. Over the next generation, the Northeast will add 1 million new residents (34). This population growth will demand infrastructure investments and economic growth to accommodate these new residents while preserving critical ecosystem services and quality of life.

Economic Importance

The I-95 corridor is a densely populated powerhouse of economic output, producing 20 percent of the nation's Gross Domestic Product with 18 percent of the population and only two percent of the nation's land area. Today, the megaregion has a largely service-based economy, specializing in sectors such as education, health care, and professional services (34). The economic activities along the corridor range from agriculture to resource extraction (forestry, fisheries, and mining), to major service industries highly dependent on communication and travel, to recreation and tourism, to manufacturing and transportation of industrial goods and materials (33).

Challenges

The rate of land consumption in the Northeast continues to accelerate, endangering natural systems like watersheds and estuaries, wiping out agricultural land and open space, and compounding congestion (34). Overriding trends in population growth, land use, and economic specialization, along with common threats like the high cost of housing, income inequalities, and climate change, affect the health and future prosperity of the entire corridor.

In the coming years, the states within the I-95 corridor will need to work together to address common challenges that threaten the megaregion's prosperity, environment and quality of life 39,53) Certain challenges – watershed management and impacts of climate change, require coordinated action to address ecosystem services, infrastructure, and economies that span multiple states. Other challenges – increasing canopy cover in center cities – can benefit from common strategies and approaches to shared challenges. The assumption made here is that the sum ecosystem benefits for the states in the I-95 corridor working together is greater than them working apart.

Possible Collaborative Opportunities along the I-95 Corridor

Build broad support across public and private sectors for a shared vision of conserving the Northeast's critical landscapes. Promote understanding among these parties of the economic, environmental, and cultural/historic benefits that will result from the integrated landscape scale conservation planning.

- Link local open space and resource management efforts to broader megaregional conservation goals with meetings and research materials designed to build an understanding of larger, megaregional issues and trends

- Link the conservation of critical landscapes and forests to broader public policy goals including reducing greenhouse gas emissions, protecting drinking water, and improving water quality in the Northeast

- Enhance best practices and coordination across jurisdictional boundaries by convening and promoting partnerships between local, state and federal government agencies and other land use decision makers and natural resource managers

- Expand conservation education programs across the region commensurate with the magnitude of the benefits, issues and trade-offs related to forest conservation. The ultimate outcome is greater integration of the benefits of forest cover, forestry (including urban forests), and natural resource conservation into public education and public policy decisions

- Facilitate easier and simpler funding opportunities to multi-city and multi-state that reside in different Forest Service regions

District of Columbia Urban Forestry Strategy

Priority Issues in the District of Columbia and Long-term strategies to address threats to forest resources in the state

Please see individual sub-issue narratives for a description of the priority landscape areas and issues in the District of Columbia.

Priority Issue 1: Increase Urban Tree Canopy across all District Ownerships
Long-term Strategies:

1. Protect and enhance urban tree canopy cover
   Actions:
   - Work with NGO's and DDOE to increase tree planting on private property
   - Work with DCPS and DPR to encourage targeted tree planting and maintenance on District properties and creation of outdoor classrooms
   - Encourage greater coordination with Federal agencies for tree planting and maintenance
   - Plant street tree boxes to full stocking levels
   - Increase District property tree planting diversity

2. Manage and protect urban forests in urban growth and development areas
   Actions:
   - Change District law to provide automatic penalty for harming or removing any tree
   - Provide special incentives to developers to protect existing canopy and planting new canopy on new site
   - Improve standards for tree preservation in coordination with street, sidewalk and utility installation or repair

3. Identify and manage threats to the DC urban forest - exotic invasive pest species
   Actions:
   - UFA Staff and citizen education
   - Open District of Columbia marshalling yard to manage wood wastes from outbreaks

4. Detect, monitor and evaluate forest pests and forest health conditions
   Actions:
   - Link maintenance to urban forest health status

5. Represent forest entomology and pathology expertise in the District
   Actions:
   - Continue staff development and training

Work closely with Morgantown Field Office staff to further develop the District's urban forest health program

6. Develop a response plan to emerging situations that threaten forest health

Actions:

Update SDAP for Washington, DC
Bring all District property representatives to the table to develop a response plan
Strongly encourage USDA FS to increase funding for research on managing urban forests and protocols and advice for managing pests and disease outbreaks in the urban forest
Partner with FEMA to develop a plan to help urban forest managers quickly recoup costs

Priority Issue 2: Protect and Improve Air and Water Quality

Long-term Strategies:

7. Protect and enhance impaired watersheds in Washington, DC

Actions:

Support riparian zone planting programs
Use of the urban forest to support the Chesapeake Bay
Continuing planting trees in the CSO

8. Protect, conserve and enhance wildlife and fish habitat

Actions:

Conserve impaired Hardwood Forests and Urban Landscapes habitat ecosystems
Provide funding support for urban riparian zone retrofitting
Increase the District property tree planting diversity

9. Active management and planning of the urban forest for stormwater management and carbon sequestration

Actions:

Use green infrastructure techniques to assist storm water mitigation
Make stormwater credits available to developers for inclusion of tree canopy in projects
Implement the use of porous asphalt and sidewalks around street trees
Update the UTC assessment of the District by 2013 to assess progress

10. Encourage the use of LID and other green techniques to mitigate water quality issues

Actions:

Improve tree box standards
Enhance urban and ultra urban soils to support tree growth and increase water percolation

11. Improve air quality and reduce the urban heat island in the District and the DC Metro Area

Actions:

- Targeted tree planting in the CSO
- Remove impervious surfaces between tree boxes whenever possible
- Encourage the US EPA to update the heat island study of Washington, DC and offer new suggestions for mitigation

Priority Issue 3: **Build UCF Program Capacity in Washington, DC**

Long-term Strategies:

12. Educate citizens on the importance of urban forestry and its multiple benefits

Actions:

- Promote the use of trees to provide energy conservation on private property
- Outdoor classrooms on park, recreation or school properties
- Attendance at Advisory Neighborhood Commission meetings and other community meetings
- Use social networking as an innovative communications method
  - Twitter, Facebook, etc.
- Increase outreach to non-English speaking audiences in ways that matter to the target community

13. Support and enhance green jobs

Actions:

- Provide financial assistance to local and regional NGO's who are working with target populations
- Possible future target jobs for green jobs training:
  - Tree planting and maintenance
  - Landscape design and maintenance
  - Watershed Forestry
  - Urban timber wood product utilization
  - LID site maintenance

14. Increase the number of open green spaces available for citizen uses
15. Governmental relationships

Actions:

- Continue intra-district and Federal partnerships

Regional Priority Issues: I-95 Megaregion
Chesapeake Bay Watershed

Regional Long-term Strategies:

The actions in the priority issues above will impact each regional priority.

List of other plans consulted in statewide assessment and strategy

1. District of Columbia Wildlife Action Plan
2. CapitalSpace, A Park System for the Nation's Capital, Ideas to Achieve the Full Potential of Washington's Parks and Open Space (draft)
3. 2007 District of Columbia Urban and Community Program 5 Year Plan
4. Climate of Opportunity: A Climate Action Plan for the District of Columbia (draft).

Plans omitted:

1. Community wildfire protection plans
   Washington, DC is a large, metropolitan urban city. Most of the fires in the city are residential in nature, handled by DC Fire and Emergency Management and do not generally impact the urban forest. There are two large tracts of forested land in the District (Rock Creek Park and Fort Dupont Park) owned and managed by Federal governmental agencies. Neither of these urban parks has a written wildfire protection plan; however, Rock Creek Park will allow campfires unless high fire danger has been declared and public notice given that fires are banned within the park. There are residential neighborhoods that border one side of the park.

Stakeholder Groups Coordinated with for the Statewide Assessment and Strategy

The Urban Forestry Administration is currently participating in three USDA Forest Service Programs, Urban and Community Forestry, Cooperative Forest Health and the Chesapeake Bay Program. We do not have Forest Stewardship or Forest Legacy Programs in the District of Columbia.

Plans Omitted:

1. State Technical Committee –NRCS does not fund projects and programs in urban areas. Presently the District does not have a state technical committee; we do have an employee hired by NRCS who works in and with the District Department of the Environment.

2. State Forest Stewardship Coordinating Committee – We do not have Forest Stewardship programs in the District of Columbia.

3. Lead agency for the Forest Legacy Program – We do not have Forest Legacy programs in the District of Columbia.

4. Applicable Federal land management agencies – We do not have BLM programs in the District of Columbia; we have invited all applicable federal agencies that manage land in the District to be a part of our urban tree canopy baseline assessment; only two participated, NPS – Rock Creek Park and General Services Administration.

Glossary of terms and acronyms

Resources
LF - Local Funds
FF - Federal Funds
NGO's - Non-Governmental Organizational Support
OG - Other Grants

Programs
UCF - Urban and Community Forestry Programs - UCF
CFH - Cooperative Forest Health Programs - CFH
CBP Chesapeake Bay Program – Forest Stewardship

Partners
ANC - Advisory Neighborhood Councils
APHIS - USDA, Animal and Plant Health Inspection Service
DCCC - District of Columbia City Council
DCOP - District Office of Planning
DCPS - District of Columbia Public Schools
DDOE - District Department of the Environment
DPR - District Parks and Recreation
EPA - Environmental Protection Agency
FEMA – Federal Emergency Management Agency
FHA - Federal Highway Administration
FS - USDA, Forest Service
FWS - USDOI, Fish and Wildlife Service
IPMA - DDOT – Infrastructure Project Management Administration
NIFA - USDA, National Institute of Food and Agriculture
NPR - USDOI, National Park Service
NRCS - USDA, National Resource Conservation Service
PEPCO - Potomac Electric Power Company
PPSA - DDOT – Policy, Planning and Sustainability Administration
SPF - USDA, Forest Service, State and Private Forestry
UDC - University of the District of Columbia Extension Service
WASA - District of Columbia Water and Sewer Authority (DC Water)

GSA – General Services Administration
WO - Watershed Organizations
NO - Neighborhood Organizations
RO - Regional Organizations
UF - Urban Forestry Organizations

National Objectives

1. Conserve and Manage Working Forest Landscapes for Multiple Values and Uses
   - 1.1 Identify and conserve high priority forest ecosystems and landscapes
   - 1.2 Actively and sustainable manage forests
2. Protect Forests From Threats
   - 2.1 Restore fire-adapted lands and/or reduce risk of wildfire impacts
   - 2.2 Identify, manage and reduce threats to forests and ecosystem health
3. Enhance Public Benefits from Trees and Forests
   - 3.1 Protect and enhance water quality and quantity
   - 3.2 Improve air quality and conserve energy
   - 3.3 Assist communities in planning for and reducing forest health risks
   - 3.4 Maintain and enhance the economic benefits and values of trees and forests
   - 3.5 Protect, conserve, and enhance wildlife and fish habitat
   - 3.6 Connect people to trees and forests, engage them in environmental stewardship activities

3.7 Manage trees and forests to mitigate and adapt to global climate change

District of Columbia Urban Forestry Strategy Matrix

District of Columbia Issue 1: Increase Urban Tree Canopy across all District ownerships

Long-Term Strategy	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required to Implement	Supports National Objective
1	UCF, CBP	DCPS, DPR, NGO, NO, DDOE, DCOP	FF, LF, NGO, OG	1.1, 1.2, 3.4, 3.6, 3.7
2	UCP	ANC, DCCC, DCOP, IPMA, PEPCO	LF	1.1, 1.2, 3.4, 3.7
3	CFH	SPF, APHIS, UDC	FF, LF	2.2, 3.3
4	CBP,CFH, UCP	SPF, APHIS	FF, LF	2.2, 3.3
5	CFH, UCF	SPF, APHIS, NIFA, UDC	FF, LF	1.2, 3.3
6	CFH, UCF	SPF, GSA, NPR, DDOE, WO, APHIS	FF, LF	2.2, 3.3, 3.4

District of Columbia Issue 2: Protect and Improve Air and Water Quality in Washington, DC

Long-Term Strategy	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required to Implement	Supports National Objective
7	CBP, UCF	NGO, GSA, NPR, FHA, DDOE, WO, FWS, UF, WASA, NRCS	FF, LF, NGO	1.1, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7
8	CBP, UCF	DDOE, FWS, WO, RO	FF, LF	2.2, 3.1, 3.4, 3.5, 3.6, 3.7
9	CBP, UCF	IPMA, DCOP, DDOE	FF, LF	1.1, 3.1, 3.4, 3.5, 3.7
10	CBP, UCF	DCOP, DDOE, IPMA, FHA, GSA, NPR	FF, LF	1.1, 1.2, 3.1, 3.5, 3.7
11	CBP, UCF	DDOE, DPR, UDC, WO, NO, ANC, FHA, IPMA, NGO	FF, LF	2.2, 3.2, 3.4, 3.5, 3.7

District of Columbia Issue 3: Build UCF Program Capacity in Washington, DC

Long-Term Strategy	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required to Implement	Supports National Objective
12	CBP, CFH, UCF	UDC, NGO, SPF, NO, ANC, WO, PEPCO, NIFA	FF, LF, OG	1.1, 3.2, 3.6
13	CBP, UCF	DDOE, DCCC, DPR, UDC, WASA, NGO	FF, LF, OG	3.4, 3.6
14	CBP, UCF	PPSA, DPR, IPMA, ANC, NPR, DCOP	FF, LF	1.1, 3.6
15	CBP, UCF	DCCC, GSA, NPR, FHA, EPA	FF, LF	1.1, 1.2, 3.4, 3.7

References

1. Allen, Gary. 2008. Tracking, monitoring and reporting procedures for the tree planting and canopy expansion measure in the adopted Washington Regional Air Quality Plan (SIP). Center of Chesapeake Communities. Annapolis, MD.

2. Auch, R. F. 2010. Land Cover Trends Project – Northern Piedmont Ecoregion Report. http://landcovertrends.usgs.gov/east/eco64Report.html. United States Geological Survey.

3. Binkley, D., G.G. Ice, J. Kaye, and C.A. Williams. 2004. Nitrogen and phosphorus concentrations in forest streams of the United States. Journal of the American Water Resources Association 40(5): 1277-1291.

4. Cappiella, K., T. Schueler, and T. Wright. 2005. Urban Watershed Forestry Manual, Part 1: Methods for Increasing Forest Cover in a Watershed. United States Department of Agriculture Forest Service NA State and Private Forestry Publication NA-TP-04-05. Newtown Square, PA.

5. Carey, Curtis. 2001. Hurricane forecasters expect normal Atlantic storm activity in 2001. National Oceanic and Atmospheric Administration, National Weather Service.

6. Chapell, Gordon. 1973. Historic resource study, East and West Potomac Parks: a history. United States Department of the Interior, National Park Service.

7. Chicago Region Biodiversity Council. 1999. Biodiversity recovery plan. Chicago, IL.

8. Cox, Wendell. 2001. 2000 Census: United States municipalities over 50,000: ranked by 2000 density. Wendell Cox Consultancy. Belleville, IL.

9. Davis, Robert E. and R. Dolan. 1993. Nor'easters. American Scientist (54): 428-439.

10. District of Columbia Office of Planning and State Data Center. 2000. Profile of selected demographic and socio-economic characteristics: Census 2000.

11. Fisher, Ann. 2000. Preliminary findings from the Mid-Atlantic regional assessment. Climate Research 14: 261-269.

12. Goetz, S.J., R.K. Wright, A.J. Smith, E. Zinecker, and E. Schaub. 2003. IKONOS imagery for resource management: Tree cover, impervious surfaces, and riparian buffer analyses in the mid-Atlantic region. Remote Sensing of the Environment 88:195-208.

13. Government of the District of Columbia, District Department of the Environment. 2010. Climate of Opportunity: A Climate Action Plan for the District of Columbia (draft).

14. Harper, Scott. 2009. Higher tides affecting East Coast, especially mid-Atlantic. The Virginian-Pilot. July 18, 2009.

15. James, R. W., Jr. 1999. Maryland and the District of Columbia: Surface Water Resources. United States Geological Survey Water Supply Paper 2300.

16. Lanham, C. 1926. The Tree System of Washington. Washington, DC. 19 pp.

17. Mayer, P.M., S.K. Reynolds, Jr., M.D. McCutchen, and T.J. Canfield. 2005. Riparian buffer width, vegetative cover, and nitrogen removal effectiveness: A review of current science and regulations. US EPA NRMRL EPA/600/R-05/118. Cincinnati, OH.

18. McNaught Watson, Barbara. 2005. Washington area winters: Snow, wind, ice and cold. National Oceanic and Atmospheric Administration, National Weather Service, Sterling, VA.

19. McPherson, Gregory E., et al. 2007. Northeast Community Tree Guide: Benefits, Costs, and Strategic Planting. United States Department of Agriculture Forest Service Pacific Southwest Research Station. Albany, CA.

20. Metropolitan Washington Council of Governments. 2007. Plan To Improve Air Quality In The Washington, DC-MD-VA Region. State Implementation Plan (SIP) for 8-Hour Ozone Standard Prepared for: District of Columbia Department of Environment, Maryland Department of the Environment and Virginia Department of Environmental Quality.

21. Millinger, Alexa. 2005. Local scientists discuss D.C. weather patterns. The George Washington University Hatchet.

22. National Capital Planning Commission, Government of the District of Columbia and the National Park Service. 2010. CapitalSpace, A Park System for the Nation's Capital, Ideas to Achieve the Full Potential of Washington's Parks and Open Space, Draft Plan.

23. National Oceanic and Atmospheric Administration, Hurricane Research Division. 2008. Chronological list of all hurricanes which affected the continental United States: 1851-2007.

24. National Oceanic and Atmospheric Administration, National Weather Service Forecast Office. 2010. Index of reports from Washington National Airport.

25. Nowak, David J. and E. Greenfield. 2009. Urban and Community Forests of the Southern Atlantic region: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia. Gen. Tech. Rep. NRS-50. United States Department of Agriculture, Forest Service, Northern Research Station. Newtown Square, PA. 85 pp.

26. Nowak, David J., R. Hoehn, D. E. Crane, J. C. Stevens and J. T. Walton. 2006. Assessing urban forest effects and values: Washington D.C.'s urban forest. Resour. Bull. NRS-1. United States Department of Agriculture, Forest Service, Northern Research Station. Newtown Square, PA. 24 pp.

27. Nowak, David J., M.H. Noble, S. M. Sisinni, and J. F. Dwyer. 2001. People and Trees: assessing the U.S. urban forest resource. Journal of Forestry 99(3): 37-42.

28. O'Neil-Dunne, Jarlath et al. 2010. A Report on Washington, DC's Urban Tree Canopy. USDA Forest Service, Northeastern Area Research Station. Newtown Square, PA.

29. Pan, Y. J. Hom, R. Birdsey, and K. McCullough. 2004. Impacts of rising nitrogen deposition on N exports from forests to surface waters in the Chesapeake Bay watershed. Environmental Management 33(4):120-131.

30. Pan. Y. et al. 2005. Forest productivity and effects of nitrogen deposition on water quality. USDA Forest Service, Northeastern Area Research Station. Newtown Square, PA.

31. Patterson, J. C. 1975. Enrichment of urban soils with composted sludge and leaf mold-Constitution Gardens. Compost Sci. Proc. 16(3): 18-22.

32. Porkorny, J.D. 1998. Urban Forest Health Needs Assessment Survey: Results and Recommendations. USDA Forest Service. Northeastern Area State and Private Forestry, St. Paul, MN.

33. Regional Plan Association. 2006. America 2050: A Prospectus**.** New York, NY.

34. Regional Plan Association. 2007**.** Northeast Megaregion 2050: A Common Future**.** New York, NY. www.america2050.org.

35. Roth, David. 2010. Tropical cyclone rainfall in the Mid-Atlantic. National Oceanic and Atmospheric Administration Hydrometeorological Prediction Center.

36. Shreve, Forest, M.A. Chrysler, F. H. Blodgett and F.W. Besley. 1910. The plant life of Maryland. Maryland Weather Service. 533 pp.

37. Sohl, T. L. 2010. Land Cover Trends Project – Southeastern Plains Ecoregion Report. http://landcovertrends.usgus.gov/east/eco65Report.html . United States Geological Survey.

38. Smith, Horace. 1976. Soil Survey of the District of Columbia. United States Department of Agriculture, Soil Conservation Service, in cooperation with the United States Department of the Interior, National Park Service, National Capital Parks.

39. Texas Transportation Institute. 2005. Urban Mobility Report, National Congestion Tables: Table 4: Trends– Annual Delay per Traveler, 1982-2003

40. Tropical Prediction Center. 2004. Atlantic tropical storm tracking by year. Unisys Corporation.

41. United States Census Bureau, Population Division, Projections Branch. 2004. United States interim population projections by age, sex, race and Hispanic origin. www.census.gov/ipc/www/usinterimproj/

42. United States Census. 2000. Transportation Planning Package.

43. United States Census Bureau. 2008. District of Columbia S2501. Occupancy characteristics.

44. United States Census Bureau. 2008. Washington City, District of Columbia: Selected social characteristics in the United States: 2006-2008.

45. United States Census Bureau American Community Survey. 2008. District of Columbia 2006-2008 American community survey 3-Year estimates.

46. United States Census Bureau. 2000. County to County Worker Flow Files.

47. United States Census Bureau. 2000. United States population, housing units, area, and density: 2000.

48. United States Department of Agriculture. 2008. Natural Resources Conservation Service. District of Columbia Representative Soil Circular.

49. United States Department of the Interior. National Park Service. Washington, D.C.: A National Register of Historic Places. The L'Enfant and McMillan Plans. www.nps.gov.

50. United States Environmental Protection Agency. 1997. Descriptions of level III ecological regions for the CEC report on ecological regions of North America.

51. United States Environmental Protection Agency. 2007. Reducing Urban Heat Islands: Compendium of Strategies, Trees and Vegetation.

52. United States Environmental Protection Agency. 2007. Reducing Urban Heat Islands: Compendium of Strategies, Urban Heat Island Basics.

53. United States Federal Highway Administration. 2005. State Freight Transportation Profiles.

54. United States Department of Transportation, Bureau of Transportation Statistics. 2004. State Transportation Statistics.

55. University of Pennsylvania School of Design. 2004. Planning for America in a Global Economy: City Planning Studio Report. Philadelphia, PA.

56. University of Washington. Average Monthly Precipitation for Selected Cities (inches). Department of Mathematics.

57. Ward, Lester F. 1881. Guide to the flora of Washington and vicinity. United States National Museum Publication. No. 22, 264 pp.

58. Wu, S.Y., R Najjar, and J. Siewert. 2009. Potential impacts of sea-level rise on the Mid- and Upper-Atlantic Region of the United States: Climatic Change 95: 121-138.

Appendices

Appendix A - Federal Parks and Monuments

Northeastern Washington

Anacostia Park and Kenilworth and Aquatic Gardens – 1,200 acres

Northwestern Washington

Carter G. Woodson Home National Historic Site
Chesapeake & Ohio Canal National Historic Site – 19,586 acres and 184.5 miles total
Meridian Hill Park – 12 acres
Rock Creek Park – 3,100 acres
    Peirce Mill

Southeastern Washington

Capitol Hill Parks – 38.45 acres
    This includes all parks between 2nd Sts NE and SE and the Anacostia River. In this group are Folgers, Lincoln, and Marion parks, the Maryland Avenue Triangles, the Pennsylvania Avenue medians, Seward Square, Twining Square, Stanton Park and 59 other inner-city triangles and squares.
Fort Dupont Park – 376 acres
Frederick Douglass National Historic Site - 8.53 acres

National Mall – 1.9 miles in length

Constitution Gardens – 50 acres
Franklin Delano Roosevelt Memorial – 7.5 acres
George Mason Memorial
John Ericsson National Memorial
Korean War Veterans Memorial – 2.2 acres
Lincoln Memorial – 107 acres
Pennsylvania Avenue National Historic Site
    Pennsylvania Avenue is among the world's truly famous streets. It is known the world over as the heart of the Nation's Capital. America's history has marched, paraded, promenaded, and protested its way along the Avenue. It is no wonder that Pennsylvania Avenue is called "America's Main Street." The Avenue is more than just another city street; it is, rather, America's Ceremonial Way.
President's Park (White House) – 18 acres
    The Presidents of the United States and their families live in a national park! This park, called President's Park, has been a part of the national park system since 1933. President's Park also includes The Ellipse, Lafayette Park, Sherman Park and the 1st Division Monument.
The Old Stone House
Thomas Jefferson Memorial – 18.36 acres
Vietnam Veterans Memorial – 2 acres
Washington Monument – 106 acres
World War II Memorial – 7.4 acres

Other Sites

Chesapeake Bay Gateways Network - Chesapeake Bay Watershed, DC, MD, NY, PA, VA, WV – 180 miles total
    Experience the diversity of the Chesapeake Bay through the Chesapeake Bay Gateways Network - a system of over 160 parks, refuges, museums, historic communities and water trails in the Bay watershed. Each of these sites tells a piece of the vast Chesapeake story.
Civil War Defenses of Washington – Washington, DC – 12.2 miles
    On forested hills surrounding the nation's capital are the remnants of a complex system of Civil War fortifications. Built by Union forces, these strategic buttresses transformed the young capital into one of the world's most fortified cities. These forts remain as windows into the past in the midst of D.C.'s urban green space, offering recreational, cultural, and natural experiences.

George Washington Memorial Parkway - DC, MD, VA -7,200 acres total

This is the "Road to Adventure" - originally designed as a grand gateway and greenway to the Nation's Capital. Here, you can learn about the First President and the development of America. As an oasis amid urban development, the Parkway has a variety of park sites that provide opportunities for everything from quiet contemplation to nature exploration to active recreation.

Appendix B - District of Columbia Owned Park and Recreational Properties

Large Parks

Ward	Facility Name/Address	Address
7	Kingman and Heritage Islands	Benning and Oklahoma Roads NE.
7	Marvin Gaye Park (formerly Watts Branch)	Division Ave. and Foote St., NE
7	Pope Branch Park	M Street, Fairlawn Avenue to Carpenter Street, SE
8	Oxon Run Park	Mississippi and Southern Avenues, SE

Triangle Parks

Ward	Facility Name/Address
1	14th Street, Oak and Ogden Streets, NW
1	19th Street and Park Road, NW
1	1st Street and New Hampshire Avenue, NW
1	22nd and Decatur Streets, NW
1	3004 Central Avenue, NW
1	5th Street and Hobart Place, NW
1	Biltmore and 20th Streets, NW
1	Columbia Road, 19th Street and Kalorama Road, NW
1	Columbia Road, 19th Street and Wyoming Avenue, NW
1	Columbia Road, 20th Street, and Wyoming Avenue, NW
1	Georgia Avenue and Kenyon Street, NW
1	Georgia Avenue, Harvard Street, NW, SE Corner
1	Lamont Street, Adams Mill Road and Walbridge Street, NW
1	Lanier Place and Quarry Road, NW
1	Mt. Pleasant Street and Park Road, NW
1	Mt. Pleasant, Lamont and 17th Streets, NW
1	New Hampshire Avenue, 17th and S Streets, NW
1	New Hampshire Avenue, 17th and T Streets, NW
1	New Hampshire Avenue, and S Street, NW
1	New Hampshire, Sherman Avenue and Park Place, NW
1	Oak Street Cul De Sac, NW

1	Oakwood Terrace Cul De Sac, NW
1	Park Road, Cul De Sac
1	Perry and Spring Places, NW
1	T and 3rd Streets, NW
1	Warder Street and Columbia Road, NW
2	16th Street and Eastern Avenue
2	1st and M Streets, SW
2	22nd Street and New Hampshire Avenue, NW
2	23rd and E Streets, NW
2	24th Street and New Hampshire Avenue, NW
2	2nd and Canal Streets to C Street, SW
2	7th and N Streets, NW
2	8th and T Streets, NW
2	8th Street, E to F Streets, NW
2	Banneker Circle to Main Avenue, SW
2	Banneker Circle to Maine Avenue, SW
2	Dupont Circle, Mass Avenue & P Street, NW
2	E Street and Virginia Avenue, NW
2	F Street, 12th to 14th Streets, NW
2	F Street, 7th to 9th Streets, NW
2	G Street, 9th to 10th Streets, NW
2	Independence Avenue and 9th Street, NW
2	Independence Avenue and 9th Street, SW
2	M Street and Delaware Avenue
2	M Street and Delaware Avenue, SW
2	Mass Avenue, 1st and 2nd Streets, NW
2	Mass Avenue, 2nd and I Streets, NW
2	Mass Avenue, 3rd and H Streets, NW
2	Mass Avenue, 3rd and H Streets, NW (E)
2	Mass Avenue, 3rd and H Streets, NW (E)
2	Mass Avenue, 3rd and H Streets, NW (W)
2	Mass Avenue, 4th and H Streets, NW

2	New Hampshire Avenue and 24th Street, NW
2	New Hampshire Avenue, 18th and Cochran Streets, NW
2	New Hampshire Avenue, 18th and Corcoran Streets, NW
2	New Hampshire Avenue, 18th and O Streets, NW
2	New Hampshire Avenue, 20th and O Streets, NW
2	New Hampshire Avenue, 21st and M Streets, NW
2	New Hampshire Avenue, 24th and I Streets, NW
2	Penn Avenue, K and 22nd Streets, NW
2	Rhode Island Avenue, 10th to 11th Streets, NW
2	Rhode Island Avenue, 11th and 12th Streets, NW
2	Rhode Island Avenue, 11th and Q Streets, NW
2	Rhode Island Avenue, 12th to 13th Streets, NW
2	Rhode Island Avenue, 6th and R Streets, NW
2	Rhode Island Avenue, 7th to 9th Streets, NW
2	Rhode Island Avenue, 9th and Q Streets, NW
2	Rhode Island, 6th to 7th Streets, NW
2	VA Ave., between 27th St. & New Hampshire Ave., NW
2	Virginia Avenue and 25th Street, NW
2	Virginia Avenue and E Street, NW
2	Virginia Avenue, 21st and E Streets, NW
2	Virginia Avenue, 6th and D Streets, SW
3	29th Street Cul De Sac
3	30th and Fessenden Street Cul De Sac, NW
3	31st Street Cul De Sac
3	33rd Place Cul De Sac
3	35th Street and Mass Ave, NW
3	36th Street and Mass Ave, NW
3	39th and Edmunds Streets, NW
3	39th Street and Tunlaw Road, NW
3	42nd Street and Belt Road, NW
3	42nd Street and Wisconsin Ave, NW
3	6th and Calvert Streets, NW

3	Allendale Place Cul De Sac, NW
3	Broadbranch Road and Brandywine Street, NW
3	Canal and Foxhall Roads, NW
3	Canal and Foxhall Roads, NW
3	Charleston Terrace and Indian Road Terrace
3	Chesapeake Street Cul De Sac
3	Chesterfield Place Cul De Sac, NW
3	Chevy Chase Parkway and Oliver Street, NW
3	Chevy Chase Parkway and Patterson Street, NW
3	Connecticut Ave, 36th and Everett Streets, NW
3	Connecticut Ave, 36th and Fessenden Streets, NW
3	Dexter Place and Dexter Street
3	Foxhall and Reservoir Roads, NW
3	Foxhall Road and 44th Street, NW
3	Foxhall Road and MacArthur Boulevard, NW
3	Foxhall Road to 44th Street, NW
3	Garfield Terrace Cul De Sac, NW
3	Glenbrook Road and Rockwood Parkway
3	Harrison Street, NW Cul De Sac
3	Idaho Avenue and Porter Street, NW
3	Kenmore Drive and Charleston Terrace, #1 CulDe Sac
3	Kenmore Drive and Charleston Terrace, #2 Cul De Sac
3	Mass Ave, 36th and Garfield Streets, NW
3	Mass Ave, 47th and Upton Streets, NW
3	Mass Ave, 49th and Yuma Streets, NW
3	Mass Avenue at Wesley Circle
3	Massachusetts, Wisconsin and Cathedral Avenues, NW
3	Nebraska and Oregon Avenues, NW
3	Nebraska Ave, 45th and Newark Streets, NW
3	Nebraska Avenue and Brandywine Street, NW
3	Nebraska Avenue and Chesapeake Street, NW
3	Nebraska Avenue, 32nd and Morrison Streets, NW

3	Nevada Ave, Chapel and Broadbranch Roads, NW
3	New Mexico Ave, 44th and Macomb Streets, NW
3	New Mexico Ave, 44th and Macomb Streets, NW
3	Overlook Land Cul De Sac
3	Palisade Land Cul De Sac
3	Partridge Land Cul De Sac
3	Q Place Cul De Sac
3	Reno and Military Roads, NW
3	Reno Road, 34th and Ordway Streets, NW
3	Reno Road, 38th and Huntington Streets, NW
3	Reno Road, 39th and Jenifer Streets, NW
3	Reno Road, Fessenden Street and Chevy Chase Parkway
3	River Road, 44th and Ellicott Streets, NW
3	River Road, Brandywine and 42nd Streets, NW
3	Stuyvesant Place Cul De Sac
3	Thompson Circle and Woodland Drive, NW
3	Tilden Street and Reno Road, NW
3	Tilden Street, Connecticut Avenue to Sedgwick, NW
3	Utah Avenue and Tennyson Street, NW
3	Western Ave and Pinehurst Circle, NW
3	Western Avenue and Ellicott Street, NW
3	Western Avenue and Military Road, NW
3	Wisconsin Ave, 39th and Veazy Streets, NW
3	Wisconsin Ave, Ellicott and 42nd Streets, NW
3	Wisconsin Avenue and 41st Street, NW
3	Woodley Road and 29th Street, NW
3	Woodley Road, 32nd Street and Kling Road, NW
3	Yuma Street and Mass Ave, NW
4	13th Street and Alaska Avenue, NW
4	13th Street and Illinois Avenue, NW
4	13th Street and Iowa Avenue, NW
4	14th Street and Luzon Avenue, NW

4	14th Street, C/M, Longfellow to Montague Streets, NW
4	15th Place Cul De Sac
4	16th Street and Arkansas Avenue, NW
4	17th Street and Kalmia Road, NW
4	18th and Argyle Streets, NW
4	24th Street and Arkansas Avenue, NW
4	9th and Underwood Streets, NW
4	9th Street and Kansas Avenue, NW
4	Allison Street, Argyle Terrace and 18th Street, NW
4	Arkansas Ave, Farragut Street and Georgia Avenue, NW
4	Arkansas Avenue and Decatur Street, NW
4	Arkansas Avenue and Emerson Street, NW
4	Blagden Ave, 17th and Decatur Streets, NW
4	Blair Road, 3rd and Whittier Streets, NW
4	Blair Road, Madison and North Capitol Streets, NW
4	Burch Drive and Redwood Terrace, NW
4	Colorado Ave, 13th and Nicholson Streets, NW
4	Colorado Ave, 14th and Kennedy Streets, NW
4	East Beach and North Portal Drives, NW
4	East Beach and Portal Drives, NW
4	Georgia Ave, 9th and Upshur Streets, NW
4	Georgia Ave, Kansas Avenue and Varnum Street, NW
4	Georgia Avenue and Longfellow Street, NW
4	Harewood Road and Taylor
4	Illinois Ave and Shepherd Street, NW
4	Illinois Ave, 9th and Gallatin Streets, NW
4	Illinois Ave, 9th and Ingraham Streets, NW
4	Illinois Ave, Randolph and Rock Creek Church Roads, NW
4	Illinois Avenue, 4th and Randolph Streets, NW
4	Kansas Ave and Spring Road, NW
4	Kansas Ave, 13th and Quincy Streets, NW
4	Kansas Ave, 2nd and Longfellow Streets, NW

4	Kansas Ave, 3rd and Ingraham Streets, NW
4	Kansas Ave, 4th and Gallatin Streets, NW
4	Kansas Ave, 5th and Emerson Streets, NW
4	Military Road, 13th to 16th Street, NW
4	Missouri Ave, 2nd and Kennedy Streets, NW
4	Missouri Ave, 3rd and Longfellow Streets, NW
4	Missouri Ave, 7th and Madison Streets, NW
4	New Hampshire Ave, 1st and Ingraham Streets, NW
4	New Hampshire Ave, 4th and Buchanan Streets, NW
4	New Hampshire Ave, 7th and Taylor Streets, NW
4	New Hampshire Ave, 8th and Randolph Streets, NW
4	New Hampshire Ave, Longfellow and North Capitol Streets
4	New Hampshire Ave, North Capitol and Kennedy Streets, N
4	New Hampshire Avenue and Allison Street, NW
4	New Hampshire Avenue and Decatur Street, NW
4	New Hampshire Avenue and Oglethorpe Street, NW
4	Peabody Street, Chillum Place and 1st Street, NE
4	Piney Branch Road between Aspen and Butternut Streets,
4	Piney Branch Road between Aspen and Whittier Streets, N
4	Piney Branch Road between Van Buren Street and Venable
4	Piney Branch Road between Venable Place and Whittier St
4	Piney Branch Road North of Underwood Street, NW
4	Piney Branch Road South of Underwood Street, NW
4	Piney Branch Road South of Van Buren Street, NW
4	Plymouth Circle, NW
4	Plymouth Street and Sudbury Lane, NW
4	Rock Creek Church Road and Allison Street, NW
4	Rock Creek Church Road and Park Place, NW
4	Rock Creek Church Road and Quincy Street, NW
4	Rock Creek Church Road and Shepherd Street, NW
4	Rock Creek Church Road and Upshur Street, NW
4	Rock Creek Church Road and Webster Street, NW

4	Sudbury Place Cul De Sac
4	Western Avenue and Chestnut Street, NW
5	10th Street and Michigan Avenue, NE
5	18th and Upshur Streets, NW
5	4th and Franklin Streets, NW
5	8th Street and Rhode Island Avenue, NE
5	Adams Street, 18th Street and Montana Avenue, NE
5	Adams Street, 18th Street and Montana Avenue, NE
5	Bladensburg Road, 28th and Douglas Streets, NE
5	Bladensburg Road, 30th and Douglas Streets, NE
5	Bladensburg Road, 30th and Evart Streets, NE
5	Eastern Ave, 6th and Peabody Streets, NE
5	Eastern Ave, 6th and Peabody Streets, NE
5	Edgewood Street, 6th and Evart Streets, NE
5	First Street and Florida Avenue, NW
5	Florida Ave, 12th and K Streets, NE
5	Girard Street, 16th Street and Brentwood Road, NE
5	Lincoln Road and Franklin Street, NE
5	Lincoln Road, 2nd and Channing Streets, NE
5	Maryland Ave, Bladensburg Road and Morrison Street, NE
5	Maryland Avenue and Benning Road, NE
5	Michigan Ave, 12th and Randolph Streets, NE
5	Michigan Ave, 12th and Shepherd Streets, NE
5	Michigan Avenue and Franklin Street, NE
5	Michigan Avenue and Monroe Street, NE
5	New York and Florida Avenues and O Street, NE
5	New York and Montana and West Virginia Avenues, NE
5	Queens Chapel Road, 21st Street and Channing Place, NE
5	Rhode Island Ave and U Street, NE
5	Rhode Island Ave, 12th Street and Saratoga Avenue,NE
5	Rhode Island Ave, 14th Street and Brentwood Road, NE
5	Rhode Island Ave, 15th and Franklin Streets, NE

5	Rhode Island Ave, 17th and Girard Streets, NE
5	Rhode Island Ave, 18th and Hamlin Streets, NE
5	Rhode Island Ave, 1st and North Capitol Streets, NW
5	Rhode Island Ave, 1st to 2nd Streets, NW
5	Rhode Island Ave, 2nd and V Streets, NE
5	Rhode Island Ave, 2nd to 3rd Streets, NE
5	Rhode Island Ave, 2nd to 3rd Streets, NW
5	Rhode Island Ave, 3rd to 5th Streets, NE
5	Rhode Island Ave, Douglas and Brentwood Roads, NE
5	Rhode Island Ave, First and T Streets, NW
5	Rhode Island Ave, Hamlin Street and Queens Chapel Road,
5	Rhode Island Ave, Lincoln Road to V Street, NE
5	Rhode Island Ave, New Jersey Avenue and S Street, NW
5	Rhode Island Ave, North Capitol Street to Lincoln Road,
5	Rhode Island Avenue and Irving Street, NE
5	Rhode Island Avenue and Jackson Street, NE
5	Rhode Island Avenue and Newton Street, NE
5	Rhode Island Avenue and T Street, NW
5	Rhode Island Avenue and U Street, NW
5	Rhode Island Avenue and V Street, NE
5	Rhode Island Avenue and W Street, NE
5	Rhode Island Ave, Hamlin Street and Queens Chapel Road,
5	Riggs Road and Oglethorpe Streets at 6th Street, NE
5	South Dakota Ave, 12th and Crittenden Streets, NE
5	South Dakota Ave, 12th and Decatur Streets, NE
5	South Dakota Ave, 19th and Randolph Streets, NE
5	South Dakota Ave, 20th and Otis Streets, NE
5	South Dakota Ave, 22nd and Newton Streets, NE
5	South Dakota Ave, 26th and Irving Streets, NE
5	South Dakota Ave, Bladensburg Road and Franklin Street,
5	South Dakota Ave, Sergeant and Crittenden Streets, NE
5	South Dakota Ave, Sergeant Road and Buchanan Street, NE

6	13th Street and Kent Avenue, SE
6	13th Street and Tennessee Avenue, NE
6	14th Street and Kent Ave, SE
6	14th Street and Kent Avenue, SE
6	14th Street C/M, U Street to V Street, SE
6	15th Street and Kent Avenue, SE
6	15th Street and North Carolina Avenue, NE
6	16th Street and Kent Ave, SE
6	9th Street and Massachusetts Avenue, NE
6	Kent and Independence Avenues, SE
6	Kent Ave, 13th Street and Independence Avenue, SE
6	Kent Ave, 15th and G Streets
6	Mass Ave, 17th and C Streets, SE
6	Mass Ave, 18th and C Streets, SE
6	Mass Ave, 7th Street and Constitution Avenue, NE
6	Mass Ave, 8th Street and Constitution Avenue, NE
6	Mass Ave, 9th and A Streets, NE
6	Massachusetts Ave, 14th Street and Independence Avenue,
6	Massachusetts Ave, 15th Street and South Carolina Avenue
6	Massachusetts Avenue and A Street, SE
6	Minnesota Ave, 16th and S Streets, SE
6	Minnesota Ave, 16th and T Streets, SE
6	Minnesota Ave, 17th and S Streets, SE
6	Minnesota Ave, 22nd and Q Street
6	Minnesota Ave, 22nd Street and Naylor Road, SE
6	Minnesota Avenue and Good Hope Road, SE
6	North Carolina Ave, 14th Street and Constitution Avenue
6	North Carolina Ave, 16th and C Streets
6	North Carolina Ave, 7th Street and Independence Avenue,
6	North Carolina Ave, 8th Street and Independence Avenue,
6	North Carolina Ave, 8th Street and Independence Avenue,
6	North Carolina Ave, 9th and A Streets, NE

6	North Carolina Avenue and A Street, NE
6	North Carolina Avenue and A Street, SE
6	North Carolina Avenue and E Street, SE
6	North Carolina Avenue and E Street, SE
6	Oklahoma Ave, 21st and D Streets, NE
6	Potomac Ave, 13th and I Streets, SE
6	Potomac Ave, 15th and G Streets, SE
6	Potomac Ave, 16th and G Streets, SE
6	Potomac Ave, 17th and E Streets, SE
6	Potomac Avenue and E Street, SE
6	Potomac Avenue and K Street
6	South Carolina Avenue and C Street, SE N/S
6	T Street and T Place, SE
6	Tennessee Ave, 14th and D Streets
6	Tennessee Ave, 14th and E Streets, NE
6	Tennessee Avenue and F Street, NE
6	West Virginia Ave, 8th and K Streets
7	34th Street and Highview Terrace, SE
7	38th Street Cul De Sac (1500 Block)
7	49th and East Capitol Streets
7	49th Street and Nannie Helen Burroughs Avenue, NE
7	63rd Street and Eastern Avenue, NE
7	Alabama Ave, Burns Street and Bowen Road, SE
7	Anacostia Road and Ames Street, NE
7	Anacostia Road, Cul De Sac, SE
7	Banks Place, 63rd Street and Southern Avenue
7	Branch Ave, Southern Avenue and Erie Street, SE
7	Brooks Street, Blaine Street and Division Avenue, SE
7	Burns Place Cul De Sac, SE
7	C Street and Burns Place, SE
7	Central Ave, 51st Street and Ayers Place, SE
7	Central Ave, 54th Street and Astor Place, SE

7	East Capitol Street, 49th Street to Southern Avenue
7	East Capitol Street, 61st Street to Southern Avenue, NE
7	East Capitol Street, Benning Road to 49th Street, SE
7	Good Hope Road and Alabama Avenue, SE
7	H Street, 46th Street and Hanna Place, SE
7	Highview Terrace and Denver Street, SE
7	Highwood Drive, 3600 Block Cul De Sac, SE
7	Hill Top Terrace Cul De Sac, SE
7	Mass Ave, 31st and K Streets, SE
7	Minnesota Ave and Randle Circle, SE
7	Minnesota Ave, 28th and N Streets, SE
7	Minnesota Ave, 34th and D Streets, SE
7	Minnesota Ave, 36th Street and Croffut Place, SE
7	Minnesota Avenue and Ames Street, NE
7	Nash Place, 24th and Pope Streets, SE
7	Naylor Road, 25th and S Streets, SE
7	Naylor Road, 25th Street and Good Hope Road, SE
7	Pennsylvania and Southern Avenues
7	Pennsylvania and Southern Avenues, SE
7	Pennsylvania Ave, 29th and P Streets, SE
7	Texas and Massachusetts Avenues, SE
7	Texas Avenue and Benning Road, SE
7	Texas Avenue and East Capitol Street, SE
8	14th Place and Cul De Sac
8	15th Place Cul De Sac
8	25th Street and Alabama Avenue, SE
8	4th Street and Livingston Terrace, SE
8	4th Street and Mississippi Avenue, SE
8	Bellevue Street Cul De Sac
8	Galveston Street, 4th and 6th Streets, SE
8	Joliet Street, Irvington and Giesboro Place, SW
8	Martin Luther King Ave, 5th Street and Alabama Avenue,

8	North Dakota Ave, 2nd and Quackenbos Streets, NW
8	South Capitol Street and Howard Road, SE
8	South Capitol Street and Livingston Road, SE
8	South Capitol Street and Martin Luther King Avenue, SE
8	South Capitol Street and Southern Avenue, SE

Unstaffed Parks

Ward	Facility Name/Address	Address
1	Unity Park	Columbia Road, Euclid Street and Champlain Street, NW
1	Walter Pierce Park	Adams Mill & Ontario Rds, NW
2	11th and Monroe	11th and Monroe
2	14th and Euclid, NW	14th and Euclid, NW
2	Amidon Park	400 I Street, SW
2	Bundy Park	425 O Street, NW
2	Francis	2400 N Street, NW
2	Galliger Park	2200 F Street, NW
2	Garfield Park	200 F Street, SE
2	Jefferson	700 I Street, SW
2	Lansburg Park	K Street and Delaware Avenue, SW
3	39th and Newark	39th and Newark
3	Book Hill Park	Wisconsin Avenue and Reservoir Street, NW
3	Carolina Playground	Macomb and Carolina, NW
3	Forest Hills Park	3200 Chesapeake Street, NW
3	Foxhall Playground	4800 Ashbury Street, NW
3	Foxhall/W Street Park	
3	Spring Valley Park	4900 Fordham Street, NW
3	Tunlaw Park	3900 Tunlaw Street, NW
4	Kansas Ave, 5th and Farragut Streets, NW	Kansas Ave, 5th and Farragut Streets, NW
4	Riggs-LaSalle	Riggs Road and Madison Street, NW
4	Shepherd Park	1400 Kalmia Road, NW
4	Twin Oaks	1400 Taylor Street, NW

5	18th and Michigan	18th and Michigan
5	1st and Florida, NE	1st and Florida, NE
5	Brentwood Park	600 Brentwood Parkway, NE
5	Dakota Playground	3100 Adams Street, NE
5	Dunbar	New Jersey Avenue and N Street, NW
5	Loomis Park	2000 Bryant Street, NW
5	Noyes	1000 Franklin Street, NE
6	Logan Playground	200 F Street, NE
6	Potomac Gardens	700 12th Street, SE
7	Fort Chaplin Park	Texas Avenue and C Street, SE
7	Randal Highlands	3000 R Street, SE
7	Sousa-Kimball Park	Minnesota Avenue and Ely Place, SE
7	Woodson	
8	Atlantic Richfield	
8	Malcolm X	Alabama Avenue and Congress Street, SE
8	Woodland Terrace	2310 Ainger Place, SE

District of Columbia Recreation Centers

Ward 1

Name of Center	Address
Banneker Community Center	2500 Georgia Ave., NW
Columbia Heights Community Center	1480 Girard Street, NW
Harrison Recreation Center	1330 V St., NW
Kalorama Recreation Center	1875 Columbia Road, NW
Marie Reed Recreation Center	2200 Champlain St., NW
Parkview Community Center	693 Otis Pl., NW

Ward 2

Name of Center	Address
Kennedy Recreation Center	1401 7th St., NW
Mitchell Park Recreation Center	1801 23rd St., NW
Stead Recreation Center	1625 P St., NW
Volta Park Recreation Center (formerly Georgetown)	1555 34th St., NW

Ward 3

Name of Center	Address
Chevy Chase Community Center	5601 Connecticut Ave., NW
Chevy Chase Playground and Recreation Center	5500 41st St., NW
Friendship Recreation Center	4500 Van Ness St., NW
Guy Mason Recreation Center	3600 Calvert St., NW
Hardy Recreation Center	4500 Q St., NW
Hearst Recreation Center	3600 Tilden St., NW
Macomb Recreation Center	3409 Macomb St., NW
Palisades Community Center	5200 Sherrier Pl., NW

Ward 4

Name of Center	Address
Emery Recreation Center	5801 Georgia Ave., NW
Fort Stevens Recreation Center	1327 Van Buren St., NW
Hamilton Recreation Center	1340 Hamilton St., NW
Lafayette Recreation Center	5900 33rd St., NW
Lamond Recreation Center	20 Tuckerman St., NE
Petworth Recreation Center	801 Taylor St., NW
Raymond Recreation Center	915 Spring Rd., NW
Riggs LaSalle Community Center	501 Riggs Rd., NE
Takoma Community Center	300 Van Buren St., NW
Upshur Recreation Center	4300 Arkansas Ave., NW

Ward 5

Name of Center	Address
Arboretum Recreation Center	2412 Rand Pl., NE
Brentwood Recreation Center	2311 14th St., NE
Edgewood Recreation Center	Third and Evarts Streets, NE
Harry Thomas, Sr. Community Center	1743 Lincoln Road, NE
Joseph H. Cole Recreation Center	1200 Morse St., NE
Langdon Park Community Center	2901 20th St., NE
North Michigan Park Recreation Center	1333 Emerson St., NE
Theodore R. Hagans, Jr. Cultural Center	3201 Fort Lincoln Drive, NE
Thurgood Marshall Recreation Center (fmr. Fort Lincoln)	at the Marshall Education Center 3100 Fort Lincoln Dr., NE
Trinidad Recreation Center	1310 Childress St., NE
Turkey Thicket Recreation Center	1100 Michigan Ave., NE

Ward 6

Name of Center	Address
King Greenleaf Recreation Center	201 N St., SW
Rosedale Recreation Center	at the Old Gibbs Elementary School 500 19th St., NE

Sherwood Recreation Center	640 10th St., NE
Watkins Recreation Center	420 12th St., SE

Ward 7

Name of Center	Address
Benning Park Community Center	Southern Ave. and Fable St., SE
Benning Stoddert Community Center	100 Stoddert Pl., SE
DC Center for Therapeutic Recreation	3030 G St., SE
Fort Davis Community Center	1400 41st St., SE
Hillcrest Recreation Center	3100 Denver St., SE
Kelly Miller Recreation Center	301 49th Street, NE
Kenilworth-Parkside Recreation Center	at Kenilworth Elementary School 1300 44th Street, NE
Ridge Road Recreation Center	810 Ridge Rd., SE
Watts Branch Recreation Center	6201 Banks Pl., NE

Ward 8

Name of Center	Address
Anacostia Fitness Center	1800 Anacostia Dr., SE
Bald Eagle Recreation Center	100 Joliet St., SW
Barry Farms Recreation Center	1230 Sumner Rd., SE
Congress Heights Recreation Center	Alabama Ave. and Randle Pl., SE
Douglass Community Center	Frederick Douglass Ct. and Stanton Ter., SE
Ferebee Hope Recreation Center	3999 8th St., SE
Fort Stanton Community Center	1812 Erie St., SE
Malcolm X Recreation Center	1351 Alabama Ave., SE
Southeast Tennis and Learning Center	701 Mississippi Avenue, SE

Appendix C: Location of Priority Habitats in the District of Columbia

Terrestrial Habitats

Hardwood Forests

Glover Archibald Park
National Arboretum
Kenilworth Park (River Trail)
Shepherd Parkway
St. Elizabeth Hospital
Catholic University
Oxon Cove Park
Rock Creek Park
Fort Circle Parks
Oxon Run Parkway
Suitland Parkway
Veterans Hospital
National Zoo
Lincoln Wetland Complex (between Nat. Arboretum & Anacostia Park)

Grasslands / Managed Meadows

Anacostia Park
Fort Circle Parks
Kenilworth Park
National Arboretum
Oxon Cove
Oxon Run Parkway
Poplar Point
Rock Creek Park
Veterans Hospital area

Early Successional / Shrub-scrub/ Edge

Kingman Island
Poplar Point
Fort Dupont (along Old Golf Course Fairways)
Fort Lincoln
National Arboretum
Kenilworth Aquatic Gardens
Rights of Ways
Anacostia Park (East Bank)

Urban Landscapes

The National Mall
Anacostia Park
National Arboretum
Hains Point Golf Course
Cemeteries
School campuses
Langston Golf Course
Wards 1-8

Aquatic Habitats

Rivers and Streams

Potomac River
Anacostia River
Rock Creek and tributaries
Oxon Run
Hickey Run
Fort Dupont
Pope's Branch
Watts Branch

Emergent Non-tidal Wetlands

Poplar Point
Lincoln Wetland Complex
National Arboretum
Kenilworth Aquatic Gardens
Oxon Run Parkway
Fort Dupont
C&O Canal

Forested Wetlands / Riparian Woodlands / Floodplains

Watts Branch
Oxon Run Parkway
Oxon Cove
Kenilworth Aquatic Gardens
Rock Creek Park
Lincoln Wetland Complex
Kingman Island
National Arboretum
Anacostia Park
C&O Canal
Theodore Roosevelt Island

Emergent Tidal Wetlands

Anacostia River
Kenilworth Aquatic Gardens
Kingman Island
Theodore Roosevelt Island

Tidal Mudflats

Anacostia Park
Kenilworth Marsh
Kingman Island
Oxon Cove
Theodore Roosevelt Island

Springs and Seeps

Rock Creek Park
Oxon Run Parkway
Fort Circle Parks
National Arboretum

Submerged Aquatic Vegetation

Potomac River
Anacostia River
Kenilworth Aquatic Gardens

Vernal Pools

Kenilworth Aquatic Gardens
Fort Dupont
National Arboretum
Rock Creek Park
Oxon Run Parkway
Heritage Island
C&O Canal

Ponds and Pools

McMillan Reservoir
Kenilworth Aquatic Gardens
National Arboretum
Soldiers/ Veterans home
Constitution Gardens
Lincoln Wetland Complex
Rock Creek Cemetery
Dalecarlia Reservoir
Langston Golf Course