DRAFT – JULY 2013

Metropolitan Washington Regional Tree Canopy Strategy Report

Executive Summary

PREPARED BY

MWCOG REGIONAL TREE CANOPY WORKGROUP

JULY 24, 2013

Purpose

The Regional Tree Canopy Workgroup (RTCW) is an ad-hoc committee formed to develop strategies, tactics and recommendations that can be used to conserve and manage regional tree and forest resources in support of environmental, land use planning, regulatory and socio-economic goals.

RTCW was convened in 2012 to continue working on local government commitments to provide the control strategies identified in the "Urban Heat Island Mitigation/Tree Planting/Canopy Conservation and Management" measure that was included in the 2007 Metropolitan Washington State Implementation Plan (SIP) for 8-Hour Ozone Standard. These control strategies include:

- Measure Existing Resources and Track Changes
- Programs to Enhance and Increase Benefits from Trees
- Public Outreach
- Regional Canopy Management Plan
- Species Selection
- Monitoring Programs

Initially RTCW discussions centered on the development of a credited tree canopy measure for future air quality plans; however, RTCW's focus was soon expanded to developing strategies and recommendations that would support a broader set of goals and objectives. One of the most significant control measures identified in the 2007 SIP was for local governments to collaborate in the development of

"a long range plan to enhance tree conservation and planting, and to establish goals for increasing tree canopy coverage between 2010 and 2030 that could lead to lower levels of ground-level ozone pollution."

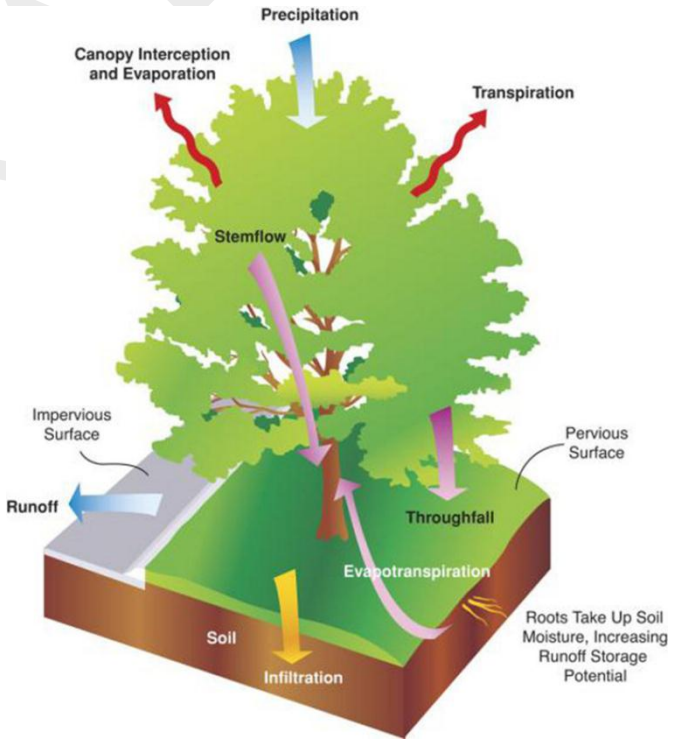
Building on this work, RTCW examined the feasibility of developing a regional tree canopy management plan and reached a consensus that a such a plan would prove beneficial to air quality management and many other environmental concerns; however, such an undertaking would require several years of work and a considerable amount of resources to complete. As a practical alternative to generating a fully developed regional plan, RTCW elected to generate this report to communicate a set of preliminary strategies and recommendations for air and water quality that may be used within Metropolitan Washington region. Furthermore, this report is intended to help build interest, support and a strong foundation for local, state and regional governments to provide the resources needed to ultimately develop a fully developed regional canopy management plan.

Forests and Trees

Forests and trees have long been associated with human civilization and habitation. On the physical level trees have presented humans with a means to provide homes, fuel, food, tools, paper and basic forms of transportation. Mankind's reliance on this resource and its cultural and psychological importance is widely acknowledged though a long history of mythological and religious symbolism. Today, the gleam of modern technology may make it more difficult for modern humans to perceive and appreciate the services provided by trees; but they are still there working for us in the background, and it is arguable that they provide more value to our quality of life than ever before.

The urban forests of the Washington Metropolitan Region are an important component of natural and societal processes that underlie our region's ecological, environmental, cultural and economic vitality. Conserving and managing this resource is critical to efforts to sustain the quality of life experienced by our residents. Some of the key services provided by forests and trees include:

- Forest cover represent the most effective land cover for improving water quality;
- Forest and tree canopy intercepts and slows stormwater runoff and reduces the need for expensive stormwater facilities;
- Forests and trees filter air pollution and improve air quality;
- Forests and trees reduce energy use in our homes and buildings;
- Forests and trees improve human physical health via recreational opportunities, aesthetics and general well-being;



Urban Forest Benefits and Costs

Forests and trees have long been associated with human civilization and habitation. On the physical level trees have presented humans with a means to provide homes, fuel, food, tools, paper and basic forms of transportation. Mankind's reliance on this resource and its cultural and psychological importance is widely acknowledged though a long history of mythological and religious symbolism. Today, the gleam of modern technology may make it more difficult for modern humans to perceive and appreciate the services provided by trees; but they are still there working for us in the background, and it is arguable that they provide more value to our quality of life than ever before.

The urban forests of the Washington Metropolitan Region are an important component of natural and societal processes that underlie our region's ecological, environmental, cultural and economic vitality. Conserving and managing this resource is critical to efforts to sustain the quality of life experienced by our residents. Some of the key services provided by forests and trees include:

- Forest cover represent the most effective land cover for improving water quality;
- Forest and tree canopy intercepts and slows stormwater runoff and reduces the need for expensive stormwater facilities;
- Forests and trees filter air pollution and improve air quality;
- Forests and trees reduce energy use in our homes and buildings;
- Forests and trees improve human physical health via recreational opportunities, aesthetics and general well-being;

The urban forest is a multifunctional entity that provides a myriad of services as outlined in Table 1 below

Table 1

✓ Reduced Heating & Cooling Costs	✓ Carbon Dioxide & Oxygen Exchange
✓ Increased Property Values	✓ Reduction of Greenhouse Gases
✓ Air Pollution Control	✓ Non-Point Source Pollution Control
✓ Noise Abatement	✓ Biological Diversity
✓ Wind Breaks	✓ Wildlife Habitat
✓ Stormwater Runoff Reduction	✓ Groundwater Recharge

The past thirty years has produced a wealth of research on the bio-physical nature of trees and their contributions to broad environmental processes. This research has led to the ability to quantify and communicate specific impacts of forests and trees on certain facets of environmental health and quality of life. The USDA Forest Service has developed a suite of software tools called iTree that communities can use to quantify urban forest services and values. The services are presented in meaningful units (such tons of air pollution absorbed) along with monetary value of the services provided. This report provides examples of services and values quantified by iTree.

The environmental, social and economic benefits of urban forests come with a price tag. In addition to tree planting, maintenance, removal and disposal costs associated with municipal tree maintenance budgets, trees cause damage to public and privately owned infrastructure. Tree roots can damage underground sewer and stormwater pipes that are cracked or otherwise susceptible to invasion. Leaf litter can clog sewers, dry wells, and other elements of flood-control systems which can result in property damage caused by localized flooding. Although infrequent, extreme weather events incur clean-up costs, as do conflicts between trees and overhead power lines which are reflected in higher electric rates.

Although monetary costs associated with forests and trees can up to substantial amounts at the community level, research indicates that stormwater mitigation, increased property values, reductions in energy use and carbon sequestration services alone are sufficient to offset the combined costs of damages and conflicts. A 2006 study by the USDA Forest Service examined the benefit–cost ratios associated with Piedmont tree planting programs and associated these with an average benefits-costs ratio of 3.74:1 over a 40 year period.

The following list of tree services and values are typical of levels found at the community level within our region:

- Trees in Falls Church's urban forest are estimated to store 21,100 tons of carbon, which is valued at $388,000
- Fairfax County's urban forest is estimated to reduce energy related costs from residential buildings by $11.9 million each year
- Alexandria's 7,565 street trees alone intercept about 15 million gallons of rainfall a year
- Fairfax County's urban forests are estimated to remove 4,670 tons of air pollution a year with an associated value of $21.7 million
- The trees of Tanglewood Park in northern Prince George's County, removes over 3,500 pounds of ozone-forming pollutants per year which represents $16,000 in avoided costs
- The trees of Rock Creek Park remove 63,500 pounds of ozone at a value of $285,000 dollars each year

Potential of Forests to Address Regulatory Requirements

Although the region's forests and urban tree canopy has a great capacity to address various social, economic, environmental and regulatory concerns, our region has yet to achieve a unified effort to realize their potential. Current urban forestry programs in our region vary greatly in terms of their scope, purpose, and efficacy. Below are some of the current requirements in the regulatory framework where tree cover can play a role in achieving necessary reductions in the region's stormwater and air pollution.

TMDL - Total Maximum Daily Load (TMDL), dubbed a comprehensive bay-wide "pollution diet", contains rigorous accountability measures to initiate reductions from major sources of nitrogen, phosphorus and sediment and sets pollution limits necessary to meet water quality standards in the region's streams, creeks and rivers and the Chesapeake Bay. EPA has also committed to reducing air deposition of nitrogen to the tidal waters of the Bay from 17.9 to 15.7 million pounds per year through federal air regulations during the coming years.

WIP's - Watershed Implementation Plans are being developed by states in partnership with federal and local governments to achieve and maintain water quality standards for the Chesapeake Bay. These plans will provide better data to reinforce the federally required TMDL reductions of nitrogen, phosphorus and sediment.

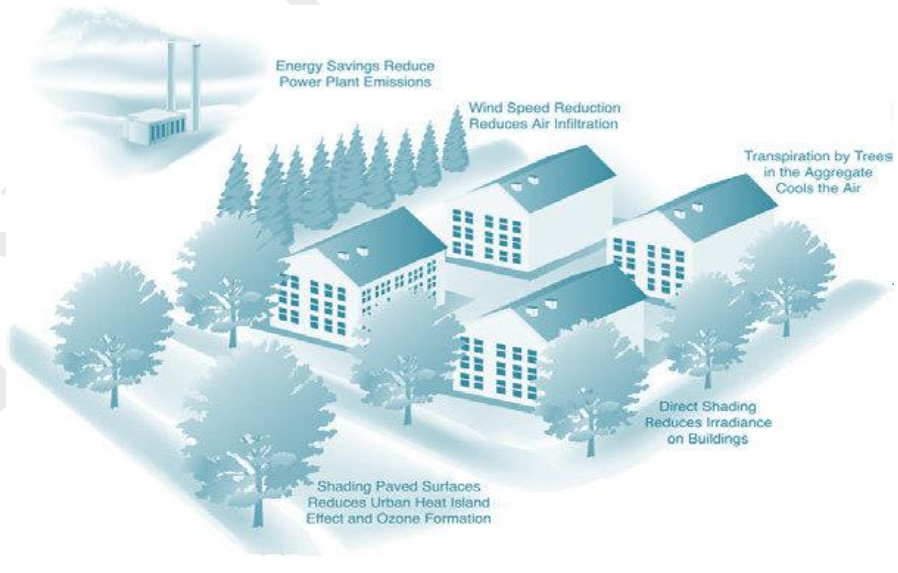
MS4 - Municipal Separate Storm Sewer Systems contain polluted stormwater runoff transported and discharged untreated into local waterbodies. An MS4 permits require the development of a stormwater management program in these areas under the NPDES Permitting Program (National Pollution Discharge Elimination System).

Air Quality SIP - (State Implementation Plans) requires states to develop a "master plan" to implement ozone reduction strategies for attaining and maintaining the National Ambient Air Quality Standards (NAAQS).

Air quality benefits associated with trees and their shade result from lowering summertime air temperatures and from actual pollutant absorption and contact removal from the trees themselves.

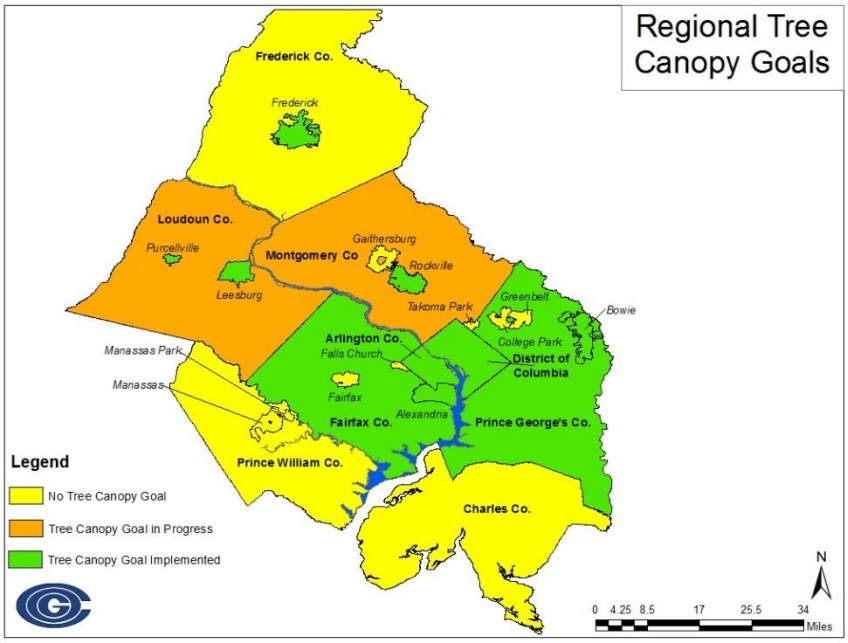
Adopting an area-wide comprehensive tree canopy conservation and planting is reducing the negative effects of urban heat islands (the rise in temperatures due to an increased number of buildings and impermeable surface areas retaining heat) can provide the following benefits.

- Slow the temperature-dependent reaction that forms ground-level ozone;
- Reduce evaporative emissions, primarily VOCs (precursors to ground-level ozone) from sources such as vehicles; and
- Reduce the amount of electricity generated for cooling, thereby reducing air pollutant emissions including ground-level ozone precursors, from power plants.



Regional Trends

Our nation's forests are currently under significant stress due to the impacts of various insects, herbivores, diseases, invasive plant species and abiotic factors such as air pollution, extreme weather events, climate change, improper fire management, over-harvesting and fragmentation. Urban Forests are subject to most of these same influences; however, the primary impacts of land development, fragmentation and forest degradation; and, the impacts of invasive plants and deer browse that often follow are particularly severe on the forests remnants found in urban/suburban/ex urban environments.

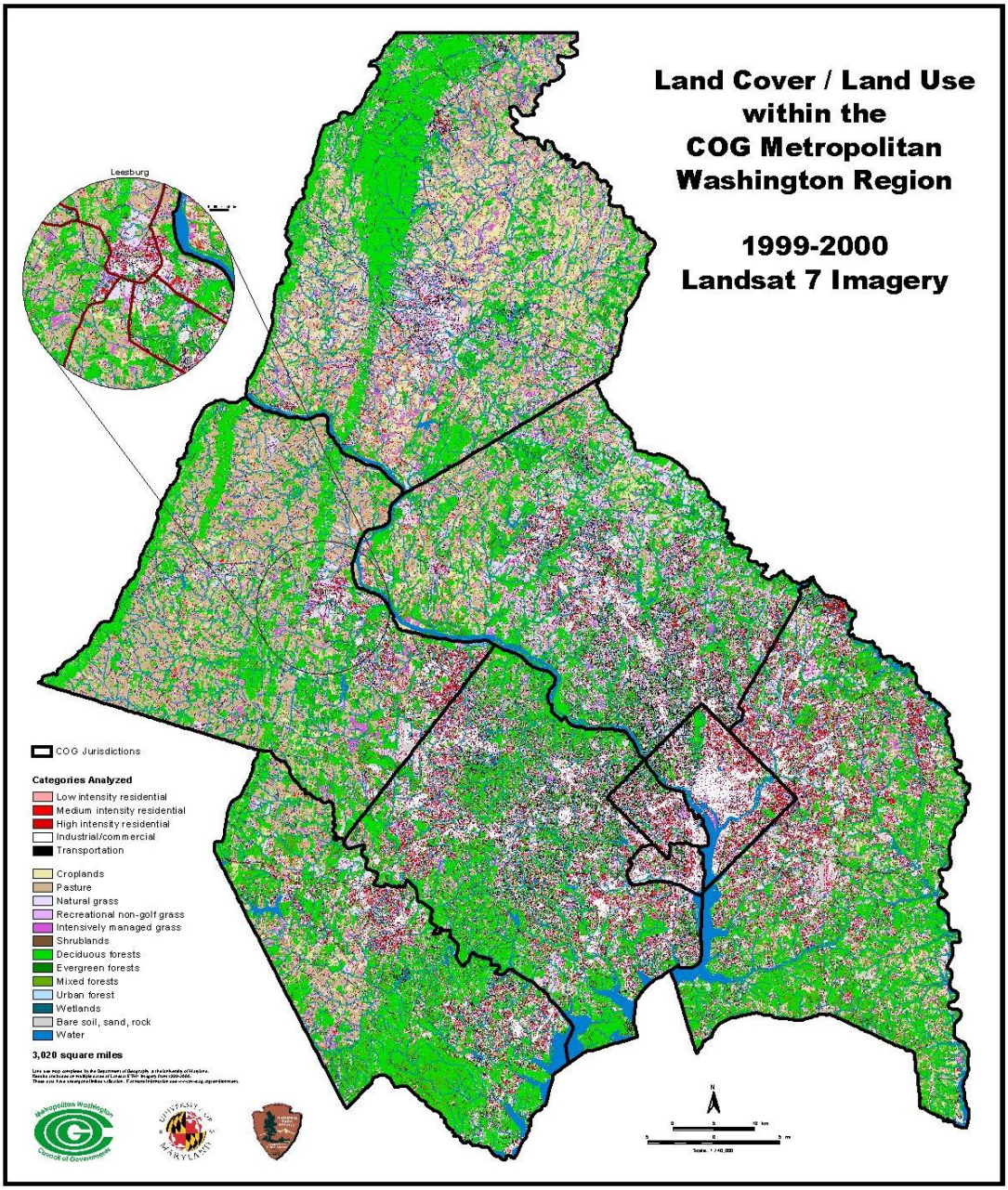


Nationally, 75% of the human population lives in the urban/suburban environment and these areas are expanding at a rate of over 100 acres per day. [1] The most conservative estimates calculate that the Metro Region is losing at least 28 acres per day or (16 mi^2/yr) of open space.[2] In general, the rate of tree removal exceeds planting. During the period between 1973 and 1997, forest cover in the Baltimore-Washington region dropped from 820,569 acres to 555,090 – a decline of 32% mostly as a result of urban sprawl (American Forests). As population growth in the Metropolitan Washington region is projected to grow 24% from 4.5 to 5.6 million by 2030 *(COG)*, planning for protection of our urban forests is critical. Moreover, forest loss represents a significant reduction in the air quality and water quality benefits for the region that the trees provide.[3]

There are more reasons than ever to compel communities to develop a plan to manage their urban forests and remaining natural lands and open space. Forests and trees are dynamic entities. Although intact forest ecosystems in rural areas may require very little human intervention to remain viable, their urban counterparts

must receive periodic intervention in order to retain their environmental functionality and the perception of being assets by the human community.

Below is a regional land cover map of the metropolitan Washington region compiled from 1999-2000 Landsat imagery. Light green areas represent forest cover; white, red and pinkish hues correlate to populated areas and pale yellow to agricultural areas. Though this is a broad scale approach to land cover assessment, it does provide an insight into the impact of population growth on natural land cover and highlights forest preservation areas but also how most forestland is fragmented or largely absent particularly in areas of intense development. An update to this map on 2011 data will be forthcoming in 2013.



Opportunities and Challenges of Regional Collaboration

Regional collaboration could present efficiencies and economies of scale not found at the jurisdictional level; however, a lack of urban forestry programs in key localities, coupled with divergent political perspectives and community values could make regional collaboration very challenging. After much deliberation RTCW reached consensus that the potential opportunities outweigh the challenges and strongly recommends that our region optimize the impact of local urban forestry programs through and inter jurisdictional dialogue, mutual support and community partnerships.

Regional collaboration represents potential to:

- Increase the effectiveness of local and regional planning efforts
- Increase the effectiveness of local programs through economies of scale and resource sharing
- Develop common outreach and marketing programs
- Strengthen local ability to manage forest pests, invasive plants and climate change
- Assist other state, regional and national efforts to protect forests and other natural resources
- Incorporate urban forestry practices into regional regulatory processes

Primary Goals and Recommendations

The following goals and recommendations are offered to encourage regional collaboration and to develop a consistent and effective approach to protecting and enhancing the region's urban forest.

Goal 1: Protect, manage and expand urban forest assets in order to maximize our region's environmental health and quality of life

Recommendation: Harness the capacity of forests and trees to mitigate climate change and to address clean air, water quality and stormwater management concerns

Goal 2: Optimize the impact of local urban forestry programs through and inter-jurisdictional dialogue, support and collaboration

Recommendation: Establish a forest policy and planning committee to support and guide regional collaboration and encourage all COG jurisdictions to adopt effective and consistent programs, policies, and practices

Goal 3: Develop a regional urban forest management plan and canopy goals

Recommendation: Develop strategies to keep forested lands forest, intact and ecologically functional; and, to increase the extent and vitality of urban tree canopy while minimizing the potential risks and conflicts

Recommendation: Develop quantitative and qualitative metrics to measure the success of local and regional efforts and canopy goals

Goal 4: Inspire the community to take ownership of efforts to protect and expand urban forests

Recommendation: Encourage public participation in the development of goals, strategies and a common vision to protect and manage urban forests

Recommendation: Lead by example: Conserve plant and maintain tree canopy on public properties

Recommendation: Build synergistic partnerships with environmental groups, green industry associations, schools and universities, youth groups, and state and federal agencies.

Goal 5: Integrate urban forests and Region Forward

Recommendation: Integrate urban forestry goals and metrics with those of Region Forward.

RTCW Next Steps

These are the initial steps needed to develop the foundation for a regional tree canopy management plan:

- Finalize the Regional Tree Canopy Strategy Report (Winter 2014)

- Propose a structure and composition of a permanent Regional Forest Policy and Planning Committee (Fall 2013)

Summary of Report Content

This report is divided into nine sections in the following thematic areas to examine:

1. The Overarching Goals Of Urban Forestry
2. The Nature Of Our Urban Forest
3. The Ecological Services Provided By Forests And Trees,
4. The Risks & Negative Impacts Associated With Forests & Trees
5. Threats To The Long-Term Sustainably Of The Urban Forest
6. Essential Tools To Conserve And Manage Urban Forests & Integrate Forestry Into Policy, Planning & Decision-Making
7. Metrics To Gauge Success Of Urban Forestry Efforts and Methods To Building And Sustain Community Support
8. Building and Sustaining Community Support
9. The Opportunities & Challenges Of Collaborative Stewardship

Special effort is made to relate the goals, objectives and practices of urban forestry to goals of Region Forward.