2040 ROCKVILLE

Comprehensive Master Plan

City of Rockville Get Into It

Environment Report 2015

It should be noted that, while the Class 100 (Dumps/Refuse) soil type is identified in Table 4 as a soil of concern in the Rockville MEL due in large part to its history as the former Gude Landfill, it is highly unlikely that the City of Rockville would annex this area into its municipal borders, thereby assuming responsibility for it.

Understanding soil infiltration, or the ability of soil to absorb water, is also critical for managing stormwater. Soil infiltration rates, which measure the rate at which water enters the soils, play a critical role in the location of stormwater management facilities that are necessary for development and redevelopment.

Table 5: Hydrologic Soil Types

	Infiltration Rate	City Boundary		Maximum Expansion Limits	
		Acres	%	Acres	%
Total City Area	-	8,670	100%	2,354	100%
A - Sandy loam to gravel	High	-	-	-	-
B - Silt loam or loam	Moderate	6,453	74%	1,025	44%
C - Moderately fine to fine textured	Low	459	5%	404	17%
D - High clay content	Very low	1,736	20%	918	39%
Not Rated (water bodies)	n/a	22	0.3%	7	0.3%
Urban land complex (treated as D Group)	Very low	831	10%	631	27%

Soils are classified by the Natural Resource Conservation Service (NRCS) into four Hydrologic Soil Groups (HSG) based on the soil's runoff potential and infiltration rate. Type A soils are sandy with high infiltration rates and the least runoff potential, Type B and C soils have less infiltration potential, whereas Type D soils have high clay content with the lowest water infiltration potential, therefore generating the greatest amount of stormwater runoff. It is important to note that the NRCS soil survey is a broad tool for assessing infiltration rates and development and impervious surfaces can significantly modify soil characteristics and reduce infiltration rates.

Figure 6 and Table 5 show the extent of hydrologic soil types in the City of Rockville and its Maximum Expansion Limits. The majority of the very-low infiltrating Type D soils are classified as Urban Land Complex soils and are located primarily along the City's commercial corridors, where the majority of the city's future land disturbance would be expected as redevelopment. As a general rule, higher infiltrating Type B soils provide greater performance for Environmental Site Design (ESD), or stormwater management techniques such as bioswales, rain gardens, and porous concrete.

Regulatory Framework and Initiatives

Highly erodible soils, steep slopes and other sensitive lands require careful management to avoid erosion problems, sediment transport to streams and storm sewer systems, unstable conditions, and costly infrastructure. Consequently, the State of Maryland provides standards to mitigate and manage development through forest conservation, sediment control, and stormwater laws. These include:

- Maryland's Forest Conservation Act (Natural Resources Article Section 5-1601 to 5-1613)
- Maryland's Erosion Control Law
- Maryland's Stormwater Management Act

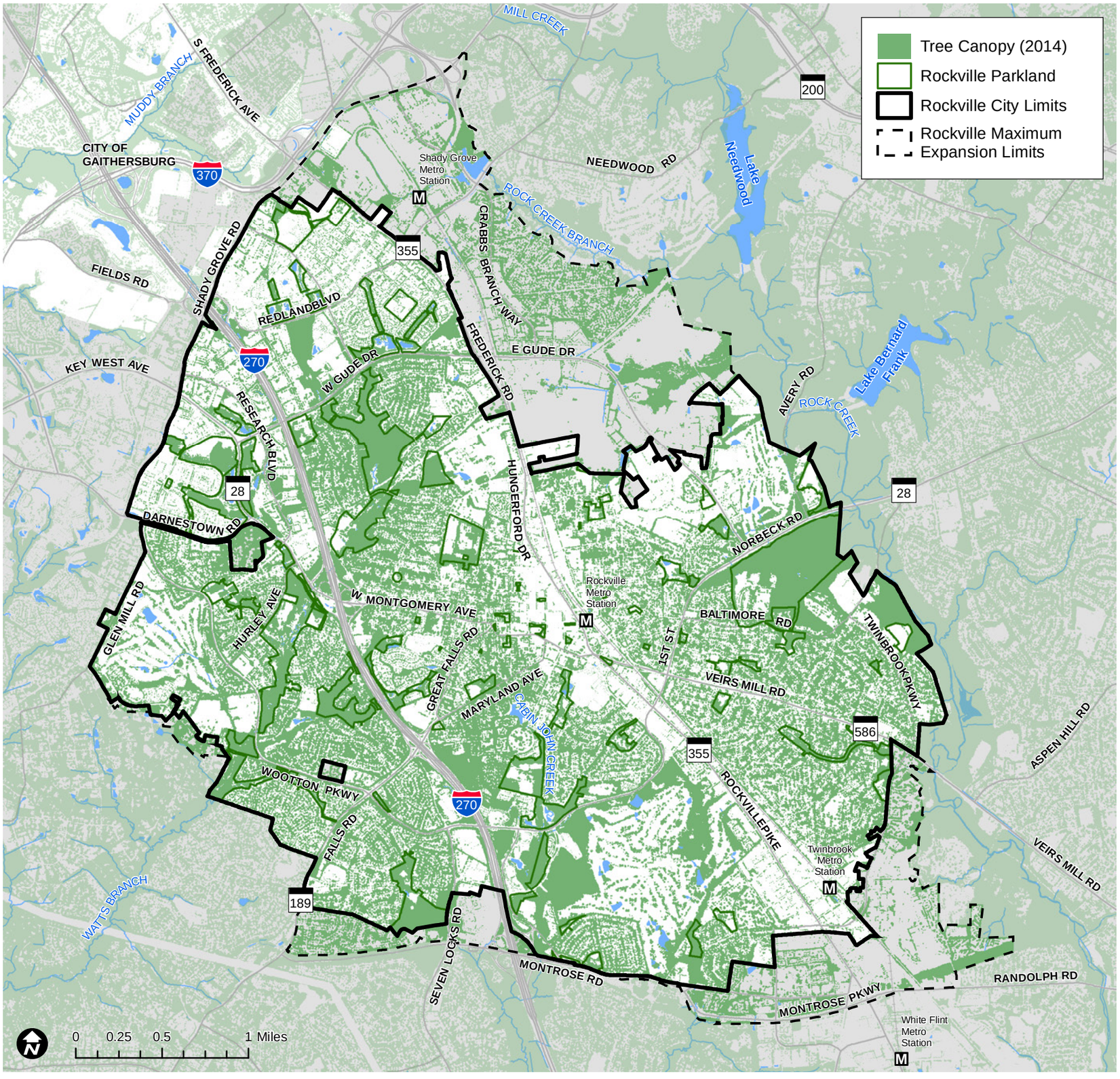
Rockville has adopted several ordinance and guidelines, occasionally with their own distinct definitions, that incorporate measures to protect highly erodible soils, hydric soils, and steep slopes during development.

- Sediment Control & Stormwater Management Ordinance (City Code Chapter 19); adopted 1978, updated 2010 and 2012
- Forest and Tree Protection Ordinance (City Code Chapter 10.5); adopted 1992, amended 2000, 2006, 2007
- Environmental Guidelines; adopted 1999

Forests and Trees Canopy

Forest and tree preservation provides several community benefits, including improving water quality, reducing air pollution, protecting stream banks from erosion, reducing stormwater runoff, cooling ambient temperatures by providing shade, removing greenhouse gases, enhancing property values, and providing wildlife habitat and aesthetic benefits. Tree preservation presents an important example as a natural resource with overlapping community goals. Locations where significant trees are desired to be maintained or added by some offer opportunities for more intensive use of land along commercial corridors or adjacent to transit stations for others.

Figure 7: Tree Canopy and City Parks



Rockville's urban tree canopy network can be understood as six general categories:

1. Forested parkland, including protected stream valleys;
2. Non-forested parkland (i.e., individual trees and landscaped areas on parkland);
3. Street trees along Rockville's public right-of-ways, roads, parkways and boulevards;
4. Trees and forest stands on other public property (such as Montgomery County public schools and other property);
5. Trees and forest stands on private property (such as residential and commercial lands, common areas within neighborhoods, stormwater management areas, cemeteries, etc.); and
6. Trees in and around public and privately-owned stormwater management facilities.

Rockville's Recreation and Parks Department is responsible for the management of the first three categories and implementating the provisions of the Forest and Tree Protection Ordinance that regulates forest and tree removal and requires tree planting on certain development sites in the fourth and fifth category.The sixth category is generally the responsibility of the Public Works Department.

Urban tree canopy (UTC) is a common measure used to assess a community's urban forestry network.[8] Existing UTC can be estimated from aerial or satellite imagery and is used to assess current conditions and track progress, as well as establish benchmarks against other communities. In the year 2000, the average UTC within the United States was 27% in urban areas and 33% in metropolitan areas.[9] American Forests, a non-profit conservation organization, recommends a target of forty (40) percent tree cover for urban areas. In 2013, Maryland established "no net forest loss" policy with a goal to maintain an average of forty (40) percent tree canopy statewide, as well.

Based on analysis from the Maryland Department of Natural Resources (DNR) and University of Vermont Spatial Analysis Laboratory, about 50% of the city's land area was covered by tree canopy during the summer of 2014, while about 33% (775 acres) of the City's MEL was covered by tree canopy. This is an increase from the estimated 43% tree canopy in the City of Rockville from an identical study conducted in 2009.[10] Table 6 and Figure 7 summarize tree canopy in the City and MEL as of 2014 while Figure 8 shows areas protected under forest preserves and forest conservation easements that coincide with this tree canopy.

Table 6: Tree Canopy and Forest Protection

	City Limits	
	Acres	%
Total Area	8,670	100%
City-owned parcels	1,094	13%
Forest Preserves	335	4%
Forest Conservation Easements	222	3%
Tree Canopy (2014)	4,301	50%
In City-owned property	759	18%
In Forest Preserves	323	7%
In Forest Conservation Easements	195	5%
All other tree canopy*	3,418	79%
*Subtotals do not add up to 100% since some tree canopy on city-owned parcels may also be counted as Preserve or Easement area		

Forest Preserves are designated areas within City-owned parkland, open space parcels, and wooded areas set aside from disturbance for the promotion of environmental and wildlife preservation and education. A Forest Preserve may comprise an entire park area or just its forested portion. Recognizing that forest areas are one of the most significant natural resources within the City, the Mayor and Council has so far designated twelve (12) Forest Preserves totaling about 335 acres, protecting approximately seven (7) percent of the City's urban tree canopy. As Figure 8 indicates, the City's forest preserves are primarily located along stream valleys of the main stem and tributaries of Watts Branch, Rock Creek, and Cabin John.

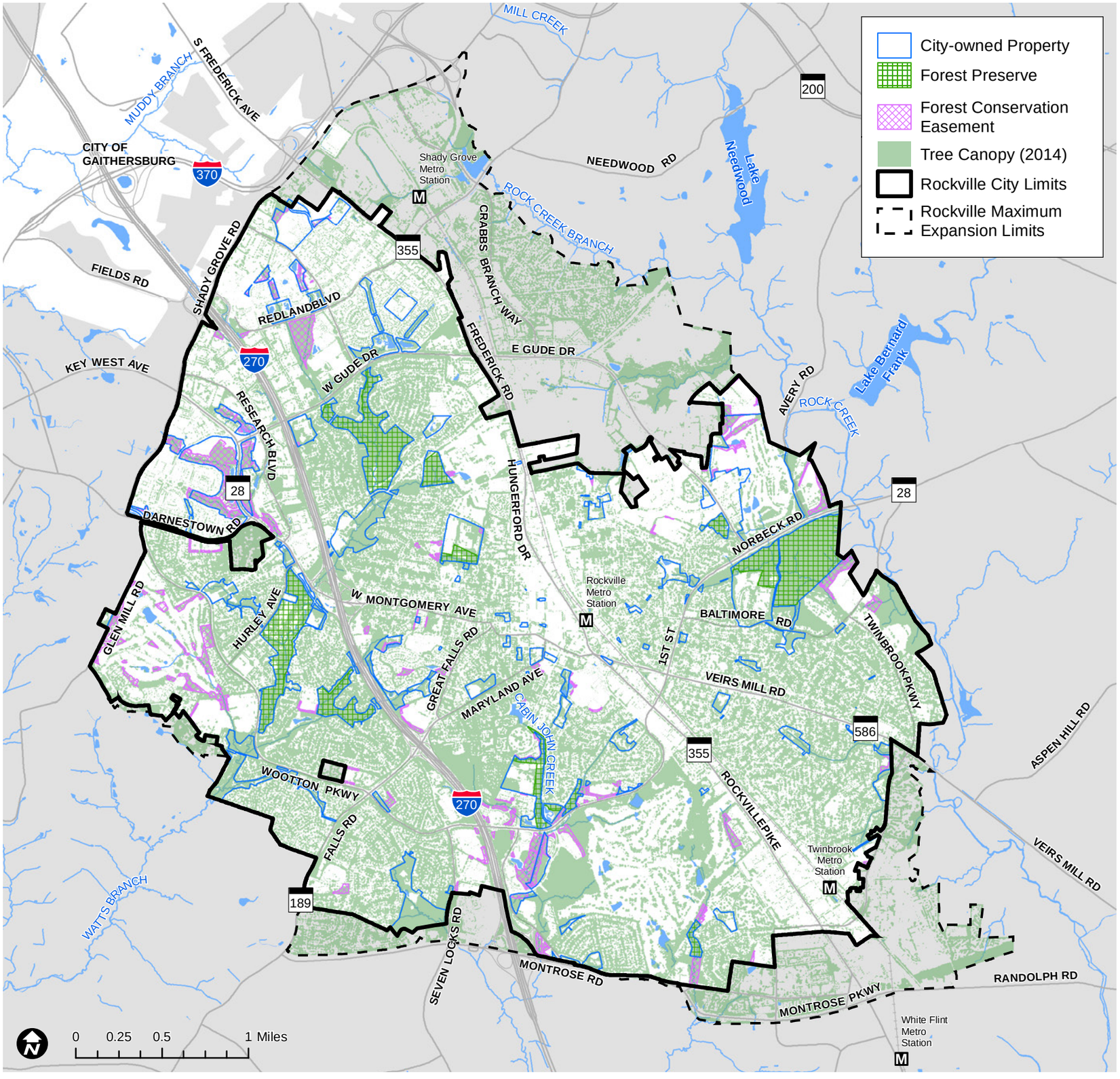
Forest Conservation Easements (FCEs) are an integral part of the City's forest and tree protection strategy that protect forests and/or trees on private land. Easements are generally created as part of a forest conservation plan required during the development approval process. The City has protected

8 UTC is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above and includes trees in all of the five tree canopy network categories.

9 USDA-Forest Service. Sustaining America's Urban Trees and Forests. 2010.

10 It should be noted that comparing the 2009 and 2014 tree canopy assessments is inexact since methodology and aerial image quality could account for some of the difference. However, within the 5-year timeframe, natural growth in tree canopy from existing trees would be expected to increase tree canopy despite the losses in individual trees due to damage, disease, development, etc.

Figure 8: Tree Canopy and Forest Protection



approximately 195 acres (or 5 percent) of the City's urban tree canopy under Forest Conservation Easements (see Figure 8). Additionally, many private properties in Rockville contain FCEs for individual trees, which are not reflected in these totals.

Privately owned trees comprise approximately 80 percent of the remaining tree canopy in Rockville. By ownership type, the largest percentage of these trees are found in single-family residential neighborhoods, where tree canopy is unprotected by any laws or easements.

Protecting and restoring tree canopy coverage along riparian buffers[11] (e.g., along streams and ponds) is a priority for improving water quality, protecting stream health, and providing wildlife habitat. In 1999, Rockville's Environmental Guidelines established special protection for riparian stream buffers that are dependent on the percent of slope and other environmental features. Stream buffer provisions are set out in the City's Water Quality Protection Ordinance (City Code Chapter 23.5) and the City's watershed studies and management plans identify more specific stream reach locations with potential riparian buffer enhancement opportunities. Tree removal is also regulated in the City of Rockville within Local Historic Districts and along known street tree corridors.

Regulatory Framework and Initiatives
The Maryland Department of Natural Resources Forest Service focuses on restoring, managing and protecting Maryland's forests and forested ecosystems. Maryland has a robust suite of laws for protecting forests, from the Forest Conservation Act, Sustainable Forestry Act of 2009, the Forest Preservation Act of 2013, to local government comprehensive plan requirements.

- Maryland's Forest Conservation Act (Natural Resources Article Section 5-1601 to 5-1613)
- Maryland's Roadside Tree Law
- Maryland's Sustainable Forestry Act of 2009
- The Forest Preservation Act of 2013
- The Chesapeake Bay Program

11 Riparian or stream buffers include land 125 feet from stream centerlines (or bank edges where available), wetlands, 25-foot wetland buffers, 40-foot wetland buffers for wetlands adjacent to 1st and 2nd order streams, steep slopes of greater than 25% within 100 feet of wetlands.

Tree preservation programs play a critical part in many facets of environmental protection including stream bank protection, erosion control, climate control, and enhancing wildlife habitat and aesthetics. The City has adopted a number of policy documents related to the protection and enhancement of Rockville's forests and trees, including, but not limited to:

- Forest and Tree Preservation Ordinance (City Code Chapter 10.5); adopted 1992, amended 2000, 2006, 2007
- Street Tree Master Plan
- Rainscape Rewards Program
- Environmental Guidelines; adopted 1999
- Landscape, Screening and Development Manual; adopted 2008, amended 2009, 2015
- Review of tree removals in Local Historic Districts

Wildlife Habitat

Although Maryland harbors a rich variety of plants, fish and wildlife, the populations of many species in the state have declined in recent years. Maintaining healthy species diversity and abundance provides a variety of benefits, and Maryland's plant, fish and wildlife resources face a number of serious threats, including human population growth, development, point and non-point source pollution, rising sea levels, habitat loss and fragmentation, and a proliferation of invasive species that may adversely affect native species.

Rockville is home to a wide array of wildlife common to urban areas, including white-tailed deer, beaver, Canada geese, raccoon, red fox, Virginia opossum, skunk, eastern cottontail rabbit, eastern gray squirrel, brown bat, and assorted bird species. Widespread habitat modifications and the lack of natural predators have created challenges with white tailed deer, beaver, Canada geese, and coyote populations. For example, overabundance of white-tailed deer have resulted in an increase in deer-auto collisions, adverse impacts to forest ecosystems, and damage to gardens and landscaping. Beaver activity has increased in stream valleys, leading to tree damage, altered stream channels, and damage and repairs to stormwater management infrastructure. Canada geese also present problems with territorial behavior, goose droppings harboring bacteria, and a decline in water quality. Monitoring and regional management of these species requires coordination with other interested State, County and third party organizations.