

CHAPTER THREE: AGRICULTURAL LAND PRESERVATION AND OTHER LAND PRESERVATION PROGRAMS

OVERVIEW

Established in 1659, Baltimore County, Maryland is 376,000 acres in size and is one of the oldest Counties in Maryland. It has a rich heritage in settlement and rural economies including agriculture. The County's excellent soils and typical rainfall patterns are conducive to productive agriculture. It has a prime agricultural location by virtue of being in the middle of a large agricultural production area that stretches from Lancaster County, Pennsylvania to Virginia and its proximity to major markets of Baltimore, Washington and Philadelphia.

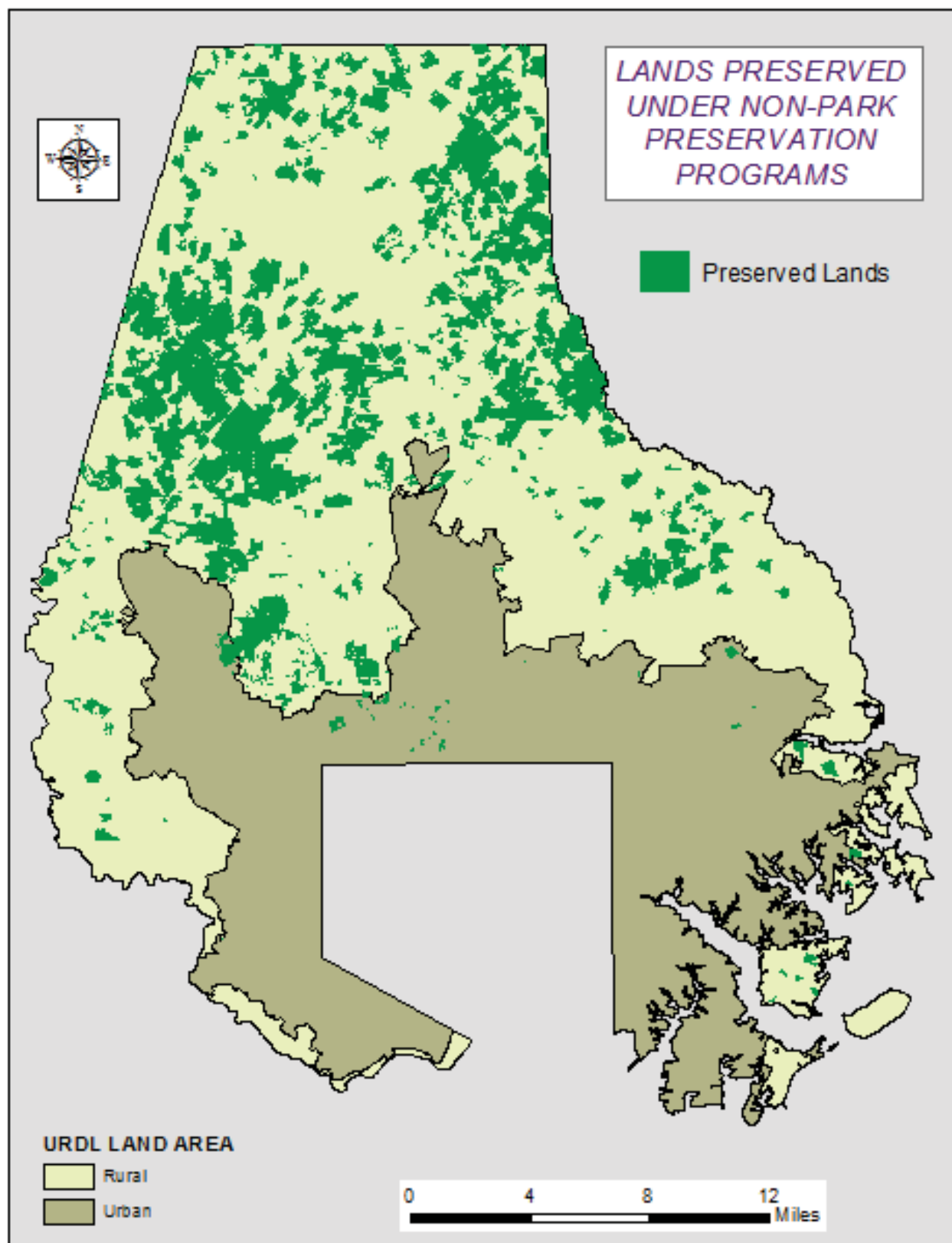
The County through its land management tools, citizen participation and land preservation programs has a deliberate strategy and long term commitment to maintaining agricultural land and fostering the agricultural industry. The evidence of the success of these efforts is in the amount of land preserved, the viability of the agricultural industry and the other benefits from this strategy.

Land management tools adopted by the County include guidance from the County's Master Plan 2020, maintaining an urban growth boundary that limits the extent of public water and sewer services, protective agricultural zoning, and the State mandated Growth Tiers. These elements work together to direct development away from productive farmland to more appropriate locations.

Through a variety of land preservation programs landowners have placed nearly 64,000 acres in permanent land preservation within a larger context of land preservation. These programs include Maryland Agricultural Land Preservation Foundation, Maryland Environmental Trust, Baltimore County Agricultural Land Preservation Program, Rural Legacy, and Local Land Trust Programs. Furthermore, the preserved farmland is within a larger 355,000 acre preservation area stretching across Baltimore, Harford and Carroll Counties in Maryland and Adams, York and Lancaster in Pennsylvania. This acreage is critical for maintaining the agricultural support industries such as equipment supply, distribution centers and specialty operations.

The County agricultural industry is diverse and robust, with over \$76 million in conventional agriculture products sold (US Ag Census 2012) approximately \$150 million in horticultural products sold (Maryland Horticulture Industry Economic Profile 2007). Baltimore County's equine heritage remains strong, with the total equine population of 8,950 being the largest of any county, as is the nearly \$930 million in equine assets and inventory value (Maryland Horse Industry Board 2010). Production of traditional crops such as corn, soybeans, wheat, and hay have remained strong and to add to these there has been a significant expansion of local farm production operations such as wineries, breweries, organic vegetables, and truck crops. Nursery operations have reduced in number but increased in production. The equine sector, like the dairy sector, has diminished due to larger issues involving market trends and economies of scale.

The other public benefits from maintaining agricultural lands are numerous. They include the critical function of protecting the water supply source for the Baltimore Metropolitan District drinking water system that serves over 1.8 million people. Other rural amenities include: open space protection, soil conservation, biodiversity, wildlife habitat, recreation (such as hiking, walking, biking, and canoeing), scenic vistas, flood control, groundwater recharge, rural economies, diversified economy, historic preservation, farm communities, and cultural heritage.



As would be expected, the majority of lands preserved through other means than park acquisition, including vast amounts of farmland, is situated within the rural portion of the County

Baltimore County is a Certified County. As a Certified County it is subject to the Sec. 5-408 of Maryland Annotated Code which requires that the County meets certain spending requirements, demonstrates a successful program, maintains conditions for continued success, evaluates program and provides strategies to meet program goals. The State most recently recertified the County on July 15, 2015.

The table below provides a snapshot of the County's agricultural land preservation accomplishments to date.

Land Preservation Accomplishments Summary 2016

Program Type	Count Per Type	Acres
County Agriculture	78	5018.483
Federal Farm and Ranch Protection	25	2504.663
Local Land Trust	296	3993.555
MALPF Agriculture	373	21466.47
MET	485	14736.49
RC4	180	4021.743
RC6 Primary	2	12.64628
RC6 Secondary	2	17.06815
Rural Legacy	248	11405.07
Transportation Enhancement Program	6	579.3099

AGRICULTURAL LAND PRESERVATION GOALS AND PROGRESS

State Goals

The State of Maryland has established a goal of preserving 1,030,000 acres of productive agricultural land statewide by 2022. This principal goal is supported by the following additional statewide goals:

- ❖ Permanently preserve agricultural land capable of supporting a diversity of agricultural production.
- ❖ Protect natural, forestry, and historic resources and the rural character of the landscape associated with Maryland's farmland.
- ❖ To the greatest degree possible, concentrate preserved land in large, relatively contiguous blocks to effectively support long-term protection of resources and resource-based industries.
- ❖ Limit the intrusion of development and its impacts on rural resources and resource-based industries.
- ❖ Ensure good return on public investment by concentrating State agricultural land preservation funds in areas where the investment is reasonably well supported by both local investment and land use management programs.
- ❖ Work with local governments to:

- Establish preservation areas, goals, and strategies through local comprehensive planning processes that address and complement State goals;
- In each area designated for preservation, develop a shared understanding of goals and the strategy to achieve them among rural landowners, the public at large, and State and local government officials;
- Protect the equity interests of rural landowners in preservation areas by ensuring sufficient public commitment and investment in preservation through easement acquisition and incentive programs;
- Use local land use management authority effectively to protect public investment in preservation by managing development in rural preservation areas; and
- Establish effective measures to support profitable agriculture, including assistance in production, marketing, and the practice of stewardship, so that farming remains a desirable way of life for both the farmer and the public.

County Goals and Associated Progress

The County's agricultural land preservation goals are presented below, in the form of individual "strategies." The associated progress and status of these efforts is listed for each of the strategies.

Strategy 1 - Preserve sufficient land to protect agricultural resources for future generations

Progress:

Acreage Reported in 2005 LPRP (FY03)	Acreage Preserved in 2010 LPRP (FY11)	Accomplishment
41,979	59,753	17,774 ac/8 years- 2,221.75/year

Commentary: The County has continued to progress towards its goal of preserving at least 80,000 acres. The rate of preservation fell below the goal stated in 2005 LPRP of 3,000 acres a year. This was primarily due to the significant drop off of State funding for Rural Legacy and MALPF. The rate of preservation of County easements increased over this period.

Strategy 2 - Incorporate stewardship into all aspects of the land preservation programs

Progress: All land preservation easements are monitored and inspected but at different intervals by different organizations. The County maintains records of the inspections on all County co-held easements. The County monitors and inspects all Maryland Agricultural Land Preservation Foundation (MALPF) on a 10 year interval in coordination with MALPF staff. All Federal easements are inspected annually with records kept by the County. The County inspects and monitors all County easements on a three year interval. The Land Trusts monitor and inspect all County Rural Legacy easements in coordination with the County. The inspections confirm that the conditions of the easements are being maintained including having a Soil Conservation and Water Quality Plan and/or Forest Stewardship Plan for the management of soil and forest resources.

Strategy 3 - Use land management tools to ensure temporary protection of lands not under permanent protection

Progress:

Single Family Occupancy Permits within APPA 2008 to 2011	Single Family Occupancy Permits Outside APPA 2008 to 2011	Percentage of Single Family Permits Outside APPA 2008 to 2011
141	698	6%

Commentary: The Agricultural Priority Preservation Area (APPA) is approximately 141,480 acres within the 2/3 of the County that is outside the PFAs (URDL). If this area was to receive its “fair” share of single family dwelling as determined strictly by percentage of the County it would have had 38% of Occupancy Permits. The 6%, while reflecting continued development, clearly shows that the County’s land management tools are directing single family dwellings out of the APPAs.

Strategy 4: Foster the agricultural industry

Progress: The County completed construction of the Baltimore County Center for Maryland Agriculture (Agricultural Center) which serves to provide at one location the institutions providing services to agriculture and to foster agriculture through a citizen board. The County’s Economic Development Commission continued its commitment to the Agricultural economy through maintaining a full time position to assist agriculture and the provision of loans/grants to farms.



Master Gardeners area at the Baltimore County Center for MD Agriculture & Farm Park

Strategy 5. Foster regional cooperation to foster agriculture

Progress: Efforts continued to work with land preservation administrators in Carroll and Harford County to preserve properties that were adjacent to those counties.

Strategy 6. Perform a study to analyze the 80,000 goal and identify strategies to reach the goal

Progress: This study was completed and project reports are available detailing its results. The study concluded that there was more than enough qualifying farmland available for the County to meet its goal of 80,000 acres. An optimization tool was developed to select properties for easement acquisition that have the best qualities at the least price.

CHAPTER FOUR: NATURAL RESOURCE CONSERVATION

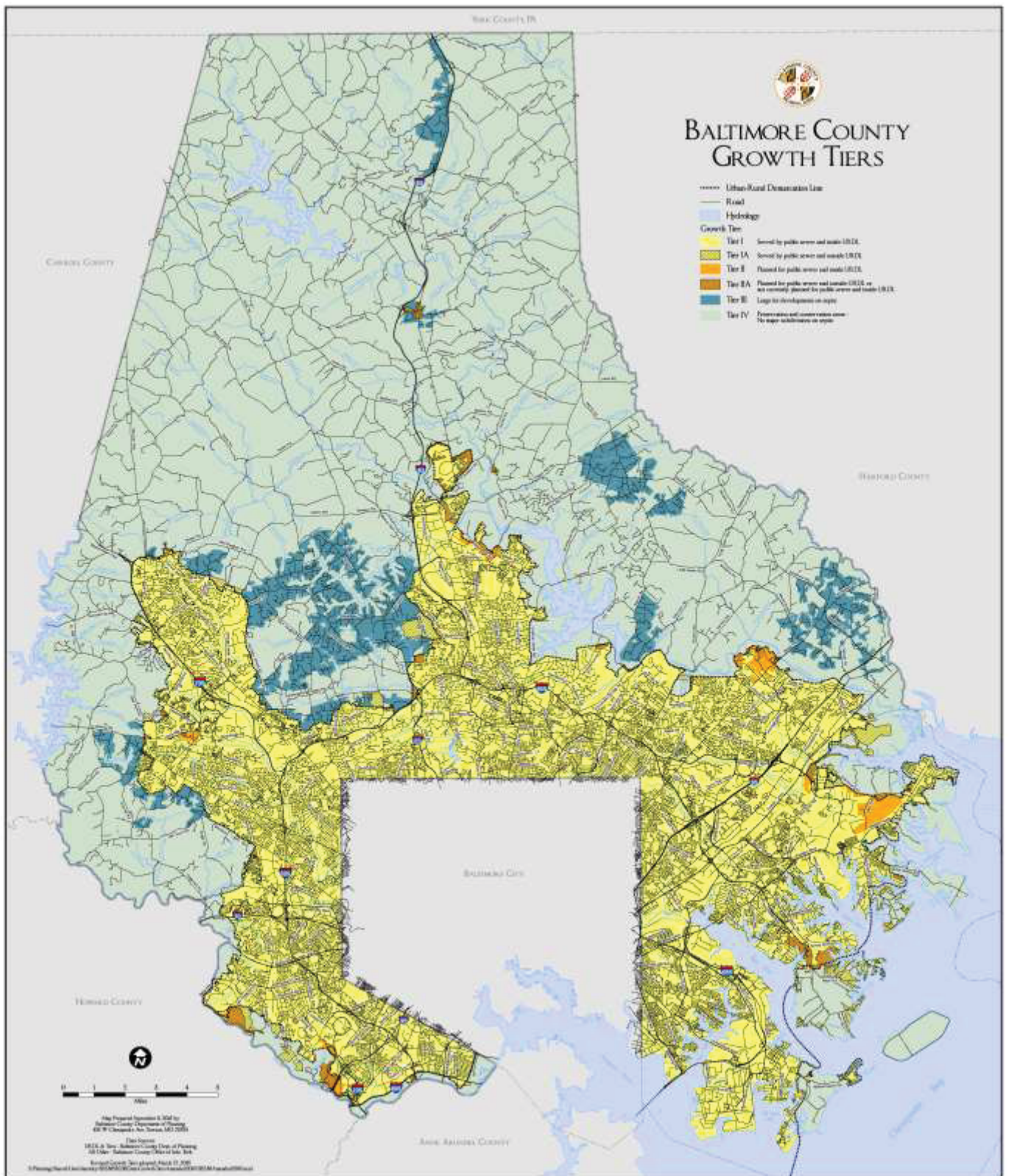
OVERVIEW

Baltimore County utilizes a wide range of tools to protect the natural environment and preserve natural resources and environmentally sensitive areas. These tools include both laws and regulations, and programs and policies. The County's proximity to the Chesapeake Bay emphasizes the need for Baltimore County to be a stalwart defender of the Bay and its ecosystem, from its coastal resources, to the forests, wetlands, and landlocked water resources both atop the ground (e.g. streams and rivers) and underground (groundwater).

The Baltimore County Urban-Rural Demarcation Line (URDL) was one of the first growth management tools to be employed within the State of Maryland, and has long served as the County's "dividing line" between areas where growth would be most concentrated, and where growth would be more limited in order to protect and preserve the rural character of the County. Many means for protecting and preserving natural resources apply both within the urban and rural areas—environmental regulations such as those associated with stormwater management, protecting stream through forest buffer requirements, and wetlands, for instance. Others are entirely or more closely associated with one area or the other. For instance, agricultural land preservation efforts are nearly entirely concentrated within the rural portions of the County, whereas the majority of capital resources for parks and other public infrastructure (public utilities, fire and police service, senior centers, libraries, and so on) are directed to the urban portions of the County where the majority of the population resides. Land use zoning is one of the most effective tools utilized by the County to maintain the separation of the urban and rural parts of the County. Within the urban area the residential zones tend to allow for a larger number of residential units per acre of land, resulting in higher residential density than in the vast majority of lands in the rural parts of the County. The urban area also features the vast majority of commercially and industrially-zoned lands. Meanwhile, the rural lands "outside" of the URDL feature vast areas of resource conservation zoning that greatly limits permitted uses and ensures that the rural character of the areas is preserved. Commercial and industrial areas are very limited within the rural area, and residential density is intentionally low.

A more recent State law, the Sustainable Growth and Agricultural Preservation Act of 2012, is another growth management tool that helps to protect natural resources—specifically water resources and the Bay. The Act mandated the establishment of "growth tiers" that dictate where public sewer service is appropriate and permissible, versus where the use of septic systems is permitted. The County's associated implementation program is heavily based on the URDL, which corresponds closely to Baltimore County's public water and sewer service area mapping. A compressed version of the County's growth tier map is displayed on the following page. A scalable version of the map is available online at:

<http://resources.baltimorecountymd.gov/Documents/Planning/sb236/SB236Amended2015Poster.pdf>



Being a coastal County, the Chesapeake Bay Critical Area and associated regulations and policies play an important role within Baltimore County, and impact growth management policy along the County's shorelines. Additional information on the critical area is included later in this chapter.

Since 1987, Baltimore County has had a nationally recognized watershed improvement program that supports natural resource land conservation through stream restoration, shoreline enhancement and stabilization, reforestation, storm water runoff and best management (BMP) projects. Under this program, Baltimore County has completed 70 stream restoration projects, 26 shoreline stabilization and enhancement projects, and converted 63 stormwater management ponds. In addition, 30 waterways have been dredged and the FY'18 budget includes \$4.5 million for the dredging of Bird River. Over 230 acres of non-mitigation reforestations were planted, with many such planting projects taking place at the County's parks. Challenges to this program include strengthening the protection of high-function forest cover and increasing our environmental education and outreach efforts to effectively target the various demographics of Baltimore County. Additional accomplishments and program improvements are discussed below under Progress & Recommended Program Improvements.

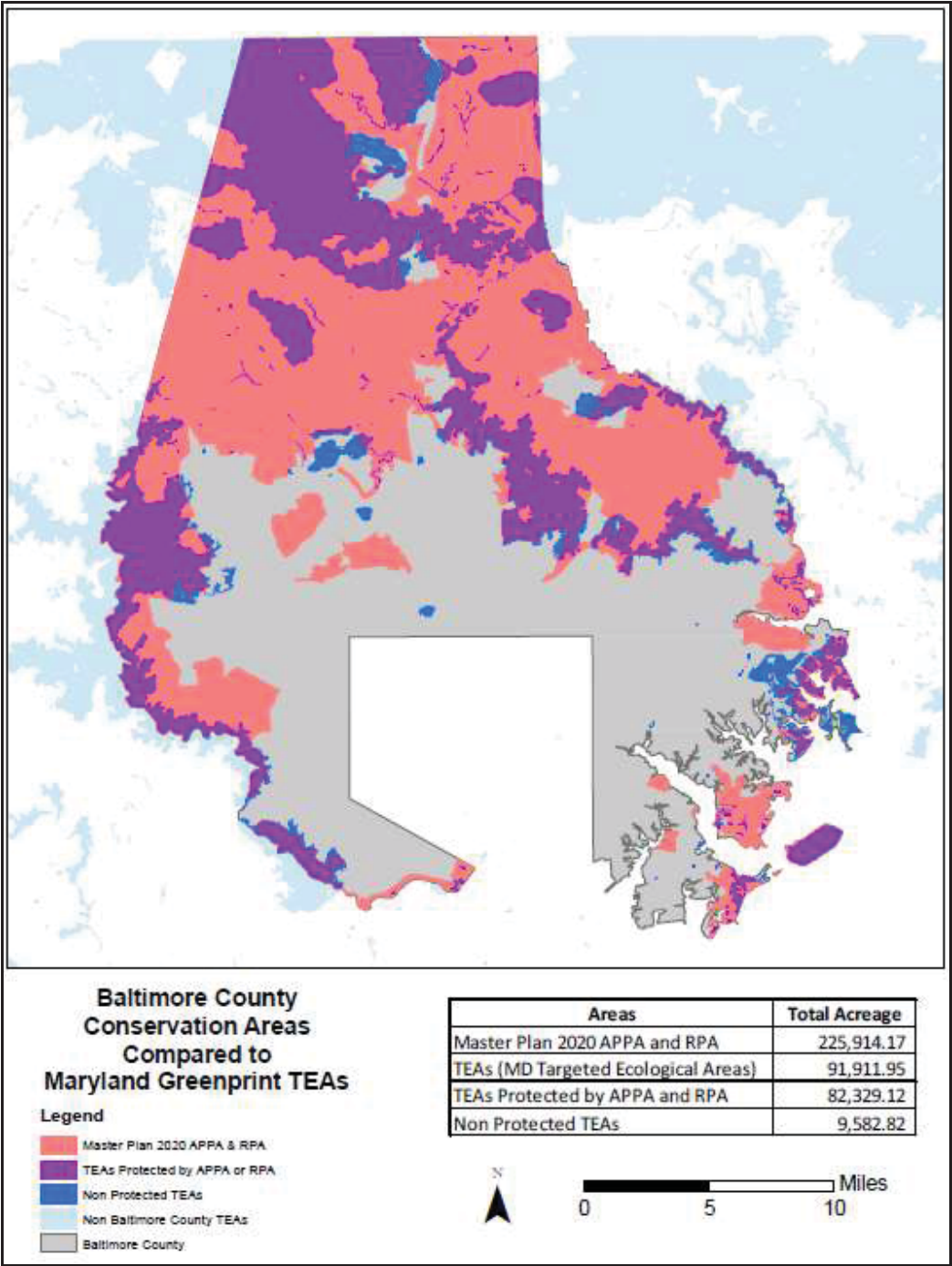
Natural resource lands in the County and throughout the State of Maryland not only conserve and protect the environment, but provide invaluable natural resource-based recreational opportunities. Such opportunities are a hallmark of the State's park system, where the public is offered opportunities to enjoy such nature-focused activities as camping, hiking, mountain biking, picnicking, swimming, fishing, and hunting. DNR's Dundee Creek Marina in the Chase area of eastern Baltimore County likewise provides boating opportunities. A number of these same activities are supported at the City-owned but County-situated reservoir watershed properties. Numerous Baltimore County parks supplement these natural resource-based opportunities, at sites ranging from nature centers and parks (e.g., Marshy Point Park, Cromwell Valley Park, Oregon Ridge Park, Lake Roland) to the waterfront parks with boat ramps providing access to the Bay and its tributaries. Such parks and recreational opportunities support numerous natural resource conservation goals, implementation programs, policies, and initiatives.

PRIORITY PRESERVATION AND CONSERVATION AREAS

Baltimore County has identified a vast geographic area for targeted/priority natural resource preservation and conservation. The map on the following page displays the relationship between Baltimore County's combined agricultural priority preservation areas (APPAs) and resource preservation areas (RPAs), and the State of Maryland's designated "GreenPrint" targeted ecological areas (TEAs). The largest areas of overlap (purple shading), which indicates areas which are preservation/ conservation priorities to both the County and State, are predominantly in and around the reservoirs and certain state parks. A substantial part of northernmost Baltimore County, which includes lands in and around Prettyboy Reservoir and Gunpowder Falls State Park, as well as prime agricultural lands, is likewise a mutual priority area.

Baltimore County has identified extensive priority preservation/conservation areas that are not designated as GreenPrint TEAs. These areas, which are shaded pink/salmon on the map, include substantial resource conservation (RC) zoned lands in the designated rural section of the County.

Noteworthy are a number of areas along the coastal portions of the County, including the North Point, Back River Neck, Carroll Island, and other peninsulas. Large portions of these coastal areas have been targeted by the County for preservation and land conservation, including through the Rural Legacy Program. Numerous large county and state parks are situated within those coastal areas, including North Point State Park, portions of Gunpowder Falls State Park, Hart-Miller Island State Park, Marshy Point Park, Rocky Point Park, and Fort Howard Park. While restrictive, low-density zoning is the key mechanism for land conservation in these areas, the County also employs land preservation and conservation through fee-simple and easement acquisition.



The limited number and extent of GreenPrint TEAs not overlaid by County APPAs and RPAs (just under 9,600 acres, slightly over 10% of the total designated TEAs) are shaded blue on the map. In some cases the County has not specifically mapped land areas as conservation priorities because they are sufficiently protected under another mechanism that will ensure that they do not get developed. An example of this would be greenways and forest buffers associated with streams. Under the County's development regulations such areas may not be developed, and so the County has displayed such lands within its preservation/conservation priority mapping. In other cases the lands are already preserved within an existing park, as is the case with Lake Roland Park, the Maple Avenue Park Site in the Catonsville area, the Red Run Greenway Park and Trail in the Owings Mills area, Cromwell Valley Park in the Loch Raven area, and Eastern Regional Park in the Chase area.

In summary, the County's extensive land conservation approach, which includes zoning, regulatory mechanisms, and targeted land and easement acquisition, goes above and beyond what has been targeted by the State for Baltimore County through the GreenPrint program. This approach has made the County a recognized state and national leader in land conservation.

NATURAL RESOURCE CONSERVATION GOALS

The County's resource conservation goals and associated strategies support the State of Maryland's natural resource conservation goals, which were identified in the last State Land Preservation and Recreation Plan, but since revised to be:

- ❖ Identify, protect, and restore lands and waterways in Maryland that support important aquatic and terrestrial natural resources and ecological functions, through combined use of the following techniques:
 - Public land acquisition and stewardship;
 - Private land conservation easements and stewardship practices through purchased or donated easement programs;
 - Local land use management plans and procedures that conserve natural resources and environmentally sensitive areas and minimize impacts to resource lands when development occurs;
 - Support incentives for resource-based economies that increase the retention of forests, wetlands or agricultural lands;
 - Avoidance of impacts on natural resources by publicly funded infrastructure development projects; and
 - Appropriate mitigation response, commensurate with the value of the affected resource.
- ❖ Conserve and restore habitat types of Species of Greatest Conservation Need listed in the 2015-2025 Maryland State Wildlife Action Plan that may fall outside of designated green infrastructure (examples include: rock outcrops, karst systems, caves, shale barren communities, grasslands, shoreline beach and dune systems, mud flats, non-forested islands, etc.).
- ❖ Develop a more comprehensive inventory of natural resource lands and environmentally sensitive areas to assist state and local implementation programs.
- ❖ Establish measurable objectives for natural resource conservation and integrated state/local strategy to achieve them through state and local implementation programs.
- ❖ Assess the combined ability of state and local programs to achieve the following:

- Expand and connect forests, farmland and other natural lands as a network of contiguous green infrastructure;
- Protect critical terrestrial and aquatic habitats, biological communities and populations;
- Manage watersheds in ways that protect, conserve and restore stream corridors, riparian forest buffers, wetlands, floodplains and aquatic recharge areas and their associated hydrologic and water quality functions;
- Adopt coordinated land and watershed management strategies that recognize the critical links between growth management and aquatic biodiversity and fisheries production; and
- Support a productive forestland base and forest resource industry, emphasizing the economic viability of privately owned forestland.

The County's *Master Plan 2010* established the following more generalized environmental goals for Baltimore County:

- ❖ Protect the County's remaining natural resources and promote the conservation of biological diversity,
- ❖ Restore lost or degraded ecosystem functions, particularly those related to watersheds and reservoirs,
- ❖ Foster environmental stewardship among county residents, and within the region.

These policies are implemented through programs of multiple County agencies, including the Department of Environmental Protection and Sustainability (EPS), Department of Public Works (DPW), and Department of Recreation and Parks (DRP). These are discussed in depth in this chapter.

IMPLEMENTATION PROGRAMS

Following are descriptions of the majority of the County's natural resource conservation implementation programs, summarized by topic, followed by various program evaluations.

IMPLEMENTATION PROGRAM OVERVIEW

Protect, Restore, and Manage Forest Resources: There are roughly 132,500 acres of forests in Baltimore County, representing approximately one-third of the County's total land area. Of this forest acreage, about 25% is under public ownership. The largest forest blocks are located in the three City-owned drinking water reservoir reservations, the Gunpowder Falls and Patapsco State Parks, Soldiers Delight Natural Environment Area, Lake Roland, Oregon Ridge, Dundee Saltpeter Parks, and Back River Neck. The remaining forest acreage is privately owned, with an average forest patch size of 14.6 acres. This is significant from an ecosystem function standpoint because larger forest patches are more resistant to environmental and human-made stresses than smaller forest fragments.

An early historical pattern of clearing forests for agriculture and development, coupled with massive cutting for fuel wood and timber, made significant changes in both the amount of forest area (from

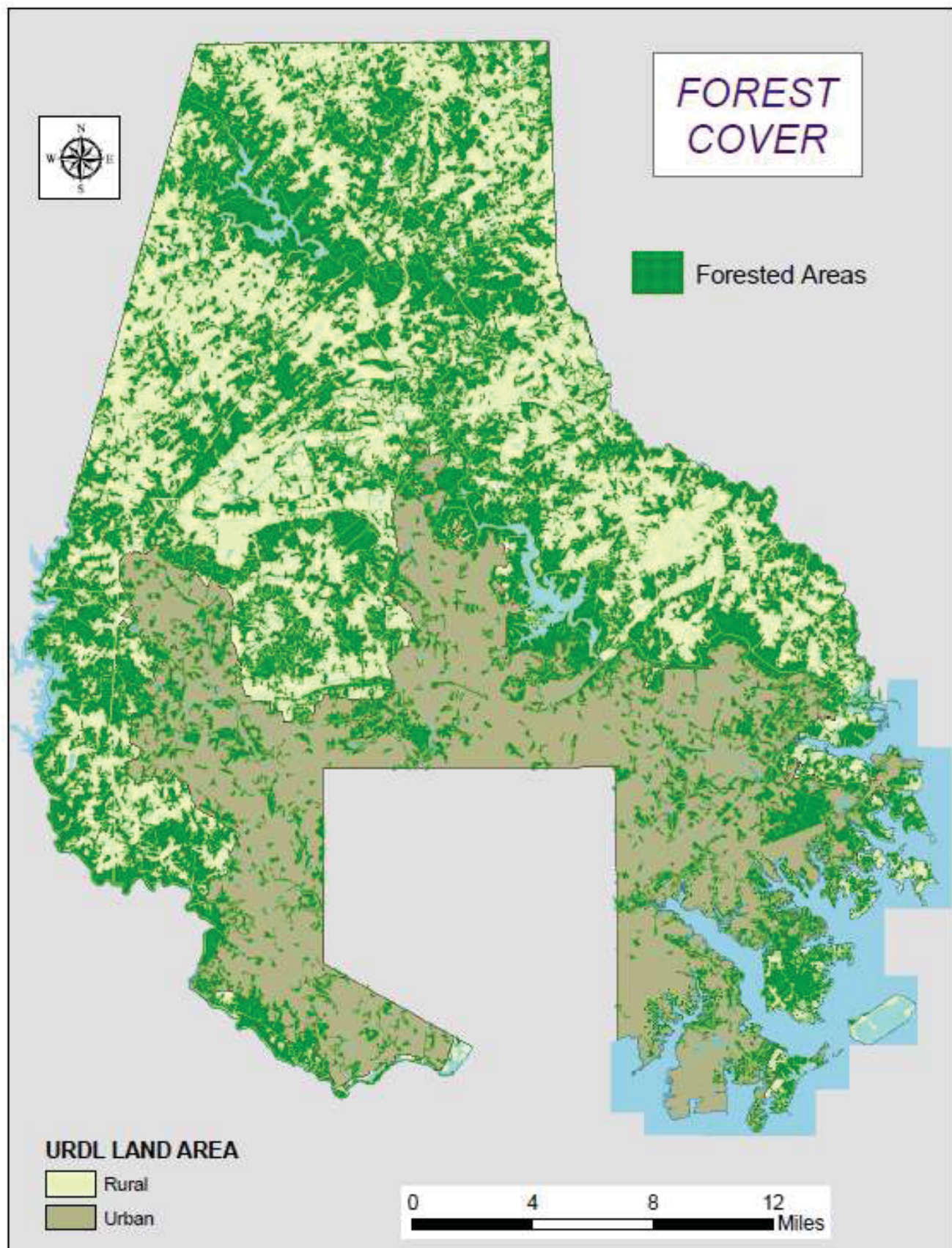
95% to as low as 15% in the region by 1870) and the health and vigor of the remaining forest patches. Although forest regeneration has increased the overall cover to the present 35% in the county, forest health and the sustainability of ecosystem functions is threatened by a pattern of parcelization of wooded properties and the subsequent fragmentation of the remaining forest patches by new developments and roads.

Forests provide a range of free ecological services and socio-economic benefits. In forested watersheds, trees play a major role in moisture and nutrient recycling, while the entire forest ecosystem controls flooding and soil erosion. These functions, which protect both aquatic and terrestrial habitats for forest-dependent plants and animals from degradation, also maintain water quality and stream stability. They likewise provide the social benefits of peaceful open spaces in which to walk and observe wildlife, and support the range of forest products available for the needs of the human community. Forest openings and gaps from early forest fragmentation patterns made conditions favorable for the proliferation of deer and the incursion of exotic, invasive plant species into forest patches. Fragmentation has exacerbated these problems.

EPS recognizes the need to broadly assess the current health and condition of the County's forest patches, to assess the types and degree of stresses on the forests. These assessments culminate in the preparation of management plans to assure healthy and resilient forests for the future and restore, to the greatest extent possible, their multiple beneficial ecological functions. To that end, EPS continues to work cooperatively with state and federal agencies and environmental organizations.

Summary of Programs:

1. Continue to implement the local Forest Conservation Act as required by the Maryland Forest Conservation Act of 1991, and evaluate its effectiveness,
2. Continue to implement the broad range of initiatives first identified in 2003 through the Linking Communities to the Montreal Process Criteria and Indicators" project for forest sustainability,
3. Continue the Community Reforestation Program that provides for the reforestation of riparian forest buffers and of other priority forest corridors and gaps through forest banks, development process, land acquisitions, and easements,
4. Continue efforts to assess forest health and to facilitate the implementation of sustainable management practices for forest health,
5. Develop and ensure inclusion of reforestation policies in community plans and community conservation efforts,
6. Continue to implement reforestation projects in support of the County's water quality mandates by conducting parcel level GIS-analysis of reforestation opportunities throughout the County to increase the County's green infrastructure. The analysis pinpoints specific properties where reforestation can help connect existing green infrastructure and restore and improve water quality and wildlife habitat.



Protecting Plant and Animal Habitats (Biological Diversity): Many of the issues related to protecting plant and animal habitats have been discussed as important components of stream and forest preservation. Traditionally, another important habitat issue is the protection of rare, threatened, or endangered plant and animal species. EPS takes a broad view in habitat protection, including not only the safeguarding of rare or significant species, but also ecological processes and functions that sustain habitats for upland, forest, riparian, wetland and aquatic plants and animals. This broader concept includes all ecosystem processes in the conservation of biological diversity.

EPS has worked with the Maryland Department of Natural Resources to verify the presence of the limited number of threatened or endangered species and their habitats that exist in the County. Many of the habitats for these sensitive species are protected through public ownership of wild lands and other environmental management areas such as Soldiers Delight, and through the public drinking water reservoir reservations and large state-owned lands along the Patapsco River and Gunpowder Falls systems. Any threats to sensitive plant or animal species elsewhere from land development are addressed through regulatory protection of the stream systems and priority forest retention areas.

Program actions:

1. Continue to ensure that significant habitats are identified on development plans and continue to seek cooperation in protecting them through modification of site designs.
2. Seek to increase plant and animal habitat in conjunction with capital improvement projects for shore erosion control, stream restoration, wetland creation, and reforestation.
3. Work in cooperation with governmental and non-profit agencies to assess, protect, restore, and create habitats.

Protection of Forest Buffers: One of the County's most important regulatory programs is the comprehensive stream buffer regulation. Baltimore County's stream buffer requirements date back to the Water Quality Policy of 1986, which required 50-foot stream buffers. More protective buffers were recommended by the County's Water Quality Steering Committee in 1988. In June 1989, an Executive Order was issued that began a pilot for the revised buffer code that was adopted by the County Council in 1991. The County's regulations have been cited by the State of Maryland and the Chesapeake Bay Program as a model for local stream protection. Features of the stream buffer regulations include that they (1) apply to all land development projects; (2) apply to all perennial and intermittent streams (field determined stream limits); (3) have variable widths, including minimum 75' for non-trout waters and 100' for trout streams, or 25' beyond greater extent of 100-year floodplains, non-tidal wetlands, or steep/erodible slopes within 150' of the stream; (4) are surveyed and recorded on Record Plats; and (5) require restrictive covenants designed to prevent disturbance of vegetation.

Protecting The Reservoirs: The regional reservoir system, including the Prettyboy, Liberty, and Loch Raven Reservoirs, provides a large and dependable drinking water supply for the 1.8 million people in the Baltimore metropolitan region. A new multi-jurisdictional watershed agreement was signed in 2005. Although Baltimore City owns and maintains the reservoirs and drinking water system, Baltimore County has a special responsibility for the protection of the reservoir watersheds, two-thirds of which are located in Baltimore County. Baltimore City manages 17,200 acres of land surrounding the reservoirs, but this land comprises only 6% of the total reservoir watershed.

Protection of drinking water quality is the primary purpose of these publicly-owned reservations; however, limited active recreational use is also accommodated, including fishing, boating, golf, a shooting range, and hiking/biking. Public concern about impacts of recreational use on water quality have resulted in the formation of public and citizen advisory groups and revised regulations governing recreational use. Careful management of the entire watershed area for the three reservoirs is important for maintaining the water quality of the reservoirs.

The continuing water quality monitoring program conducted by the City of Baltimore since 1985 indicates that the reservoirs continue to be impacted by nutrient over-enrichment. In particular, phosphorus from sewage treatment plants, agriculture, and urban development is contributing to the excessive growth of nuisance algae. The monitoring program is under review for improvements. All three reservoirs have TMDLs for phosphorus, while only Loch Raven and Liberty reservoirs have TMDLs for sediment. The County participates in the Reservoir Technical Group of the Baltimore Metropolitan Council to provide technical oversight and tracking for the implementation of water quality programs to control phosphorus and sediment loading to the reservoirs. These activities are part of an adopted Action Strategy developed in conjunction with the 1984 Reservoir Watershed Management Agreement. Substantial progress has been made to protect the regional reservoirs, as documented in the 1998 Action Report. The Agreement also contains several zoning policies to maintain agricultural and conservation zoning and to not increase urban development zoning in the reservoir watersheds. Baltimore County has continued to honor its commitments to the Agreement, especially during the quadrennial Comprehensive Zoning Map Process, wherein zoning changes can be proposed by citizens.

Program Actions:

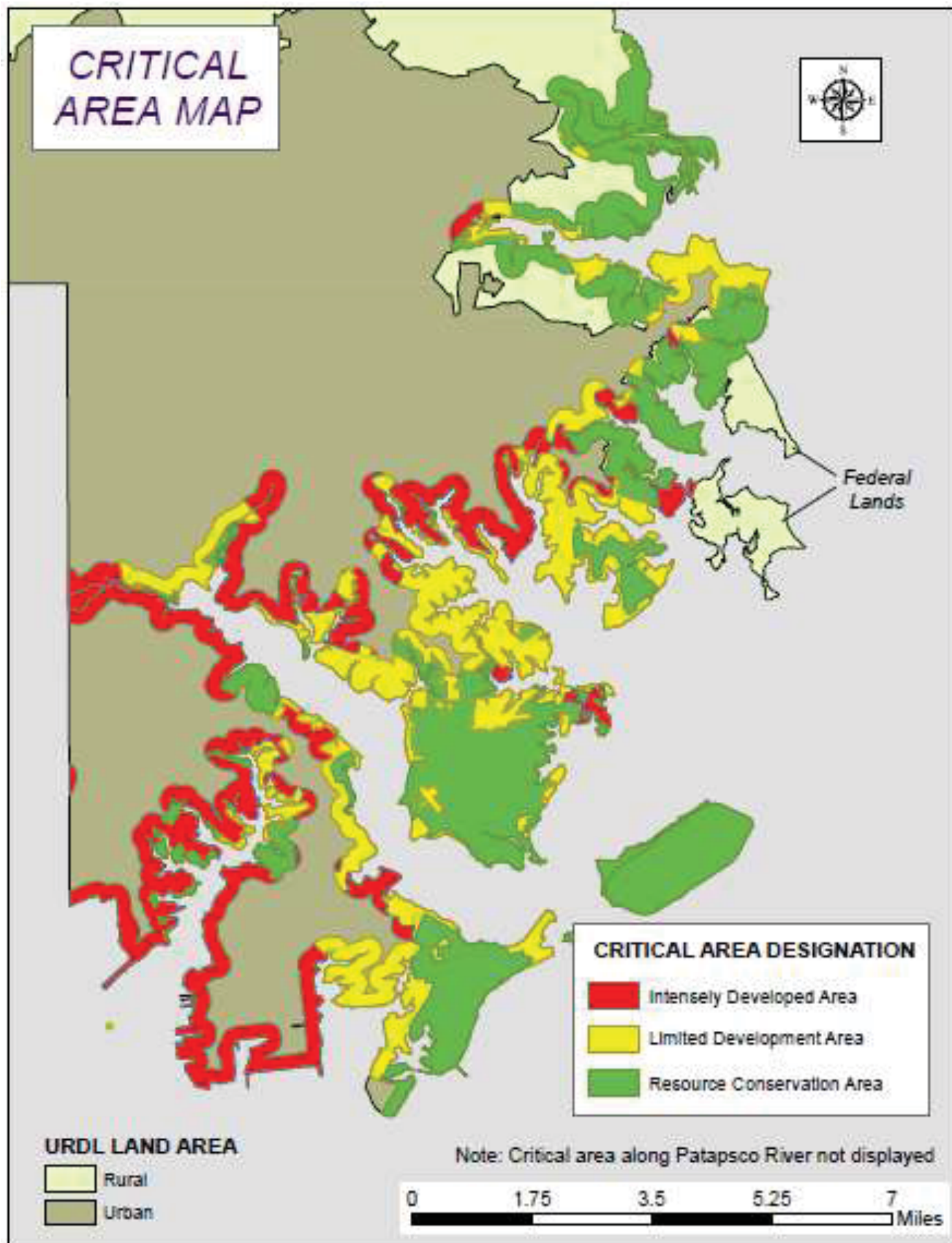
1. Continue to participate with other area jurisdictions in the cooperative regional Reservoir Watershed Management Program, including participation in the Reservoir Technical Group for coordination of program implementation under the adopted Action Strategies and preparation of progress reports.
2. Continue commitments to restrict development in the reservoir watersheds.
3. Continue to implement non-point pollution control, stream restoration projects, and sewerage improvements.
4. Continue to prioritize implementation of projects to establish riparian forest buffers along stream systems in the reservoir watersheds in cooperation with private organizations and other public agencies.

Implementing Agricultural Best Management Practices: It is critical that farmers implement best management practices (BMP's) on all the lands they farm, whether owned or leased. Landowners with properties within various conservation easement programs are required to have plans, as are farms within the Critical Areas. Through the use of BMPs they can reduce soil erosion and protect the water quality of the County's streams and groundwater. The County will continue to assist the agricultural industry through the Baltimore County Soil Conservation District in implementing soil conservation, water quality, and nutrient management plans that protect the soil and water resources of the County. The County and Land Trusts will continue to monitor conservation easements to assure that landowners have required plans. The State Department of Agriculture requires and

enforces the requirement that all farms in the County that meet certain acreage and animal unit thresholds must have a Nutrient Management Plan.

Storm Drain Inlet Cleaning: The Department of Public Works conducts storm drain inlet cleaning across the urbanized areas of the County. This is accomplished with the use of three large-capacity vacuum trucks that have been in service since 1992. EPS determines the amount of nutrients, sediment, and trash removed through this maintenance. Because road surfaces typically contain the highest concentrations of water pollutants, the program contributes significantly to water quality, which is important to aesthetic and recreation uses of streams.

Chesapeake and Atlantic Coastal Bays Critical Area Program: Land development proposals are reviewed for compliance with the Chesapeake and Atlantic Coastal Bays Critical Area Program. Baltimore County's program was enacted in 1988, following the passage of the Maryland Chesapeake Bay Critical Area Act in 1984 and the publishing of the regulations in 1986. This program encompasses all of the land within 1,000 feet of tidal waters and most of the southeastern peninsulas. Development and redevelopment of properties within these areas must address the amount of lot coverage permitted on the site, the amount of trees and forest on the property, and the controls on storm water runoff. Tidal and nontidal wetlands are required to have naturally vegetated buffers, which filter the sediments and nutrients in runoff. A Modified Buffer Area Program, adopted by the County and updated in 2015 to include non-residential areas, allows the continuation of maintenance activities and limited improvements within the first 100 feet of shoreline, known as the Critical Area Buffer, in mapped Modified Buffer Areas. This has relieved property owners of the burden of obtaining variances from the Critical Area criteria for minor development and redevelopment proposals. A map of the majority of the County's critical area appears on the following page.



Education and Citizen Participation Program: EPS has developed several education programs for water pollution control and has worked with non-profit organizations, schools, and watershed associations to foster environmental stewardship and involve citizens in restoration activities. EPS has recently hired a contractor to improve and target its environmental education programs and measure behavioral change. Further information on education and citizen participation programs is available within the County's *National Pollutant Discharge Elimination System (NPDES) 2016 Annual Report* (<http://www.baltimorecountymd.gov/Agencies/environment/npdes/>).

Maryland Water Monitoring Council: Serves as a statewide collaborative body for public agencies and private sector organizations to help achieve effective collection, interpretation, and dissemination of environmental data related to issues, policies, and resource management involving physical, chemical, and biological water monitoring.

Informational Outreach: The Department has developed a set of brochures for education of the public about environmental and natural resource protection. One of the most recent brochures is "*From my Backyard to Our Bay.*" It provides helpful advice for landowners on actions that they can take to foster better protection of water quality and natural resources

Managing Groundwater: In Baltimore County, favorable geological conditions and plentiful precipitation combine to provide a valuable supply of quality groundwater that is used for agricultural, residential, commercial, and industrial uses. About 10% of the County's population relies on groundwater as the primary source of drinking water. Approximately 30,000 wells are used to withdraw water for this use. In addition, there are currently 16 community well supplies in the County that each serves 25 or more users. The agricultural community also relies heavily on groundwater for domestic, livestock, and irrigation purposes. Industrial and commercial uses depend on groundwater to a more limited extent.

Demand for groundwater by well users occurs mainly in the northern half of the County in areas beyond the service area of the metropolitan water supply system. In order to protect the public health, it is essential to protect groundwater resources from contamination by petroleum products, septic systems, fertilizers, pesticides, road salts, and industrial wastes. Under state regulations, the County is responsible for review of all well permits for residential, commercial and institutional construction. Standards exist to assure that all proposed drinking water wells provide a sufficient quantity of water and are below thresholds for bacterial and nitrate contamination. Proposed on-site sewage disposal systems are regulated to assure that wastes will be adequately remediated in the soil and that they are located at appropriate distances from wells.

The current standards for drinking water wells and on-site sewage disposal systems are considered to be effective in protecting public health and groundwater resources. Failing septic systems occur primarily in areas that were developed prior to the establishment of these standards. In such cases, the County conducts sanitary surveys; if community health threats are documented in areas that are accessible to the metropolitan district, extension of public water and/or sewerage is provided on a long-term financing basis. In areas that cannot access the water and sewer service area, problems with private water and sewage disposal in small communities are hard to correct. Many rural areas, including the rural commercial centers of Hereford, Kingsville and Jacksonville, have limitations such as marginal soil conditions, small property sizes, area requirements for stormwater

management, and zoning issues that impede improvements of sanitary facilities. Other groundwater contamination problems involve specific point sources of contamination, such as petroleum spills from gas stations. Federal regulations have resulted in a program whereby all service stations have replaced older tanks with new tanks that have enhanced protection and containment.

Over the past four years, the County has participated with the Maryland and U.S. Geological Surveys in the first comprehensive study of Piedmont groundwater quality in Baltimore County. The study detected pesticides at 70% of the tested sites, with 75% of the sites containing two or more pesticides. Fortunately, all pesticides were at very low levels and were not considered to prevent any health concerns. Chloride levels in drinking water wells were found to be elevated above background levels in many wells, but were below the secondary maximum contaminant level. Most of the trace elements with known adverse health effects (arsenic, antimony, cadmium, and cyanide) were not detected. Elevated nitrate levels were attributed mostly to agricultural sources such as fertilizers and manure. Elevated levels of naturally occurring radionuclides (primarily radium) above drinking water standards have been detected in approximately 10% of the wells tested in the Baltimore and Setters Gneiss formations. Baltimore County requires that new wells being put into domestic use in these areas be tested for radionuclide.

Program Actions:

1. Continue review of development proposals to assure the proper siting of drinking water wells and the location of on-site sewage disposal systems in accordance with the *Code of Maryland Regulations*.
2. Continue implementation of the 1993 Ground Water Management and Protection Strategy.

Waterway Improvement Program

Since 1987, Baltimore County has implemented a Waterway Improvement Program (WIP), a multifaceted initiative to protect and enhance surface waters in adherence to the directives of the Clean Water Act. Within the WIP are initiatives dedicated to Watershed Management and Monitoring, Watershed Restoration and Forestry Management. Each of these initiatives provide unique functions that collectively work to protect and enhance the County's waterways and associated landscapes.

This program is supported through the six year Capital Improvement Budget. Further information is available within the County's *National Pollutant Discharge Elimination System (NPDES) 2015 Annual Report*.

Watershed Restoration: The primary function of the Watershed Restoration Section (WRS) is to design and construct projects including: stormwater management facility retrofitting, best management practices implementation, stream restoration, shoreline erosion control, and dredging of navigable waters to protect and ensure resource quality of coastal and stream-side communities, and ultimately the Chesapeake Bay. These efforts are accomplished by reestablishing stream corridors, upland areas and shorelines with techniques that replicate and/or produce results similar to the

function of natural ecosystems in order to reduce sediment, attenuate pollutants, and protect against erosive forces.

Surface water quality is a product of the water flowing in stream channels, surrounding land-use practices, and existing plant and animal communities. Surface water quality is affected by both non-point (pollutants carried by runoff, particularly from impervious surfaces) and point (direct discharges) sources. Non-point source pollution is varied and includes anything on the land that can be carried away by runoff: nutrients, sediments, metals, pesticides, oil and grease, salts, and other particulate and dissolved matter. Point-source pollution, such as from wastewater treatment plants, industries, and other sources with a direct, piped discharge, is regulated by the state.

Stormwater Management/Water Quality Improvement Initiatives: Stormwater management regulations are in place to attenuate impacts that development has on the County's landscape and surface water. In recent years, increased attention has been directed to the impact of stormwater management on stream systems. These regulations are updated periodically to reflect the improved understanding of the effects of urbanization on the environment and the need for greater protection from the impacts of on-going development. Developed initially to protect downstream areas from flooding as a result of upstream runoff, stormwater management can also erode stream channels when the stored runoff volume is discharged at a sustained level over a period of time. Responses to this problem include:

1. planned revisions to the state's storm water management regulations to manage the discharge of more frequent storm events and provide better protection to stream channels;
2. re-incorporation of the natural flood function into stream restoration projects where access to floodplains for the river are possible and where no downstream areas are susceptible to flooding damage; and
3. Low Impact Development (LID) approaches wherein development is designed so as to increase the travel time and infiltration of runoff and to reduce the amount of impervious surfaces.

Baltimore County maintains approximately 1,500 stormwater management facilities, many of which were constructed prior to current stormwater management regulations. Even more problematic, much of the County's storm sewer networks bypass stormwater management facilities and drain directly to surface water channels resulting in increased stress on natural streams. Personnel within WRS combat the pressures of urbanization on the County's waterways by identifying, designing and implementing retrofit projects that improve water quality within existing stormwater management facilities and at the end-of-pipe of storm drain infrastructure. These initiatives include converting dry ponds to extended detention facilities, creating baffling within SWM facilities, incorporating vegetation, and installing Best Management Practices (BMPs). These practices attenuate pollution and improve water quality by:

- increasing retention time and allowing more contaminants and sediment to settle out of the water column,
- attenuate nutrients by vegetative uptake, and
- regulating flows to downstream receiving waters which reduces volume and velocity that degrade natural stream channels.

To date, EPS has completed 40 SWM retrofit facilities (installed ponds were previously none existed) and converted another 65 SWM facilities to improve ecological function.

Streams and Non-Tidal Wetlands: Natural streams everywhere are being degraded by land use changes in their surrounding watersheds. Baltimore County has more than 2,100 miles of non-tidal streams and rivers, including more than 1,000 miles of streams that flow into three reservoirs that supply the Baltimore Metropolitan area with drinking water. Additionally, the County has rivers and streams such as the Gunpowder Falls and its tributaries that are recognized as among the highest quality recreational fishery resources in the eastern United States. These streams and waterways are being degraded by the increase in impervious surface due to urbanization, channelization, building of infrastructure within the stream valley, floodplain encroachment, draining and filling of wetlands, removal of riparian vegetation, and development and agricultural practices such as regrading landscapes and forest clearing.

Over the past 25 years, WRS staff has developed expertise in the restoration of destabilized stream channels using a modified natural channel design approach. While generally unable to return a stream to its historical, unaltered condition, WRS implements projects that restore ecological functionality to the system. This is accomplished by modeling runoff from the existing and ultimate buildout of the drainage area, and designing a channel that conveys base flow and can withstand a variety of storm event flows. Strategically placed structures made of natural materials and native vegetation stabilize stream bed and –banks, and protect infrastructure. Reconstruction of channels employing the concepts of natural channel stability is a cost-effective and attractive means to achieve physical stability, ecological function, and habitat to degraded channels. The County has completed 59 projects to date with an additional 17 projects currently under design.



Redhouse Run, before and after one of the County's stream restoration projects

A stream system consists of a stream and its associated floodplain, wetlands, and springs. Stream-side non-tidal wetlands and riparian areas are essential to the maintenance of stream flow, to the removal of pollutants, and to the quality of aquatic and terrestrial habitat. Riparian vegetation plays an essential role in the natural functioning of a stream system, including maintaining base flow, regulating water temperature, attenuating pollution, and providing habitat. Other recreational uses of stream and wetland systems include nature activities such as camping, hiking, bird-watching, and

photography. Not only does the County need to protect the good-quality streams, it is imperative that degraded systems are restored to an ecologically-functional resource.

Tidal Areas:

The County's waterfront includes several large tributaries to the Chesapeake Bay, including the Patapsco River, Back River, Middle River, Gunpowder River, and Bird River. The County's waterfront includes 26 County- and two State-owned waterfront parks. Some of the County's oldest communities are located along the shoreline; historical patterns of development resulted in the shoreline being divided into multiple, small acreage lots. Most of the County's Chesapeake Bay shoreline is privately owned. This limits bay access to individual lot owners and impacts the shoreline with a non-cohesive assortment of piers, bulkheads, and other manmade structures. The desire for access to the Bay is continuing and has increased development pressures along the shoreline.

Baltimore County implements shore erosion control projects, which stabilize eroding shoreline with vegetated marshes and/or structural protection measures to attenuate erosive wave energy. With the use of natural vegetation for stabilization, the County is demonstrating to citizens an alternative shoreline protection measure from the typical "hard" practices such as rock armoring or wood bulkheads. This technique requires minimal maintenance and performs better as time progresses and vegetation multiplies, therefore it tends to provide a long-term, ecologically functional solution. The County has completed 30 shore erosion control projects to date, including many located in waterfront parks. An additional 10 projects are in planning and design stages.

Recreational boating contributes over \$200 million a year to the County's economy. The County recognizes the importance of boating and is committed to providing a safe and clean environment. One component is a dredging program for the maintenance of existing boat channels in creeks and boat access "spurs" from these channels to individual waterfront properties. Baltimore County encourages the use of group piers as an alternative to private piers. A single point of access to the water can serve multiple households, thereby minimizing disruption of the shoreline.

Dredging permits require that the County implement controls to help prevent future runoff of sediment and nutrients to the dredged channels. Because submerged aquatic vegetation (SAV) is considered a key indicator of the general health of a waterway, Baltimore County collects SAV data for all creeks that have been or are proposed to be dredged. SAV growth has rebounded in many of the County's waterways; the County has been documenting and mapping these trends since 1989. This data provides necessary information to satisfy State and Federal permit requirements and to better understand SAV growth and limiting factors.

Climate Resilience:

Maryland DNR describes resilience as "the ability to adapt to changing conditions and withstand—and rapidly recover from—disruption due to emergencies. In other words, it means bouncing back after something bad happens. This ability to overcome, or bounce back, is a concept that applies to individuals, to communities large and small, to our infrastructure, and to the environment." Much attention is being given to climate resilience, which pertains to preparing for and addressing

potentially damaging situations and scenarios brought about by general climatological changes and natural disasters. A particular segment of climate resilience is coastal resilience, which is of special significance to jurisdictions such as Baltimore County that have extensive shorelines and coastal areas. Hurricanes, tropical storms, “nor’easters,” and storm surges experienced over the past fifty years have provided reminders of the vulnerability of low-lying coastal areas along the County’s shorelines.

There are myriad complexities associated with climate resilience, and a multi-tier approach is required to protect lives, livelihoods, and both public and private property. Regulatory mechanisms, such as those associated with the Chesapeake Bay Critical Area, restrictive zoning, growth tiers, forest and wetland buffers, stormwater management, forest conservation, and flood zone construction requirements, help to ensure that the built environment is constructed/developed in a manner that makes it less vulnerable to natural disasters. Additionally, numerous County capital programs associated with infrastructure have been created to enhance climate and coastal resilience, including stream and shoreline restoration, storm drain, stormwater management and general drainage, sanitary retrofit, and reforestation/afforestation programs. Preservation efforts within the County’s Coastal Rural Legacy Area have protected vast areas of natural resources and the forest ecosystems that play an invaluable role in water filtration and drainage. Finally, Baltimore County has crafted an updated “Hazards Mitigation Plan”

(http://resources.baltimorecountymd.gov/Documents/Emergency_Op/hazardmitigationplanupdate.pdf) and “Emergency Operations Plan” (http://resources.baltimorecountymd.gov/Documents/Emergency_Op/eop11.pdf) in order to most effectively respond to various types of adverse situations including natural disasters.

EVALUATION OF IMPLEMENTATION PROGRAMS

Following is a general evaluation of the various implementation programs.

Evaluation of Forest Resources

The County prepares annual reports to the County Council that evaluates the implementation of the Forest Conservation Regulations. Results of the most recently available report for Fiscal Year 2015 indicated that in that year for the development projects that involved 218 acres of forest, 77.3% of the forest was retained and protected in Forest Conservation Easements. In cases where forest was not retained, 14.8 acres of afforestation were required and 9.1 acres of mitigation banking were required. On 17 developments, fees-in-lieu were required totaling \$483,560.40. Fees-in-lieu are used to plant and maintain mitigation reforestations throughout the County, typically on public land. This information and a more extensive examination of the County’s Forest Resources were examined and evaluated through the Forest Sustainability Project (See the County’s Forest Sustainability Report).

Evaluation of Watershed Management Strategy

Baltimore County shall continue the systematic assessment of water quality within all of its urban watersheds. As part of this process, Baltimore County shall prioritize restoration projects within watersheds where opportunities for significant water quality improvement exist and prior stormwater management efforts have been insufficient to meet goals established by the County. Projects shall be based on detailed water quality analyses and designed to control stormwater discharges to the maximum extent practicable. The overall goal of the activities listed below is to maximize water

quality in selected areas where restoration projects are definable and the effects of which are measurable. The details of this program are contained in the *NPDES-MS4 Annual Report*: (<http://www.baltimorecountymd.gov/Agencies/environment/npdes/>).

Evaluation of Education and Citizen Participation Program

Baltimore County has fully developed and implemented its extensive and highly successful education programs for reducing the use of pesticides, herbicides and fertilizers, controlling of stormwater pollutants, and disposing of toxic wastes. Its initiatives and programs are multifaceted and developed for flexibility so that the message may be easily adapted to a variety of educational settings involving school children, homeowners, community groups, watershed coalitions, faith communities, and businesses in geographic settings around the county and region. A number of important new components and materials have been developed or enhanced in order to better reach certain target audiences. Through the *Jones Falls Institutional Stewardship Initiative*, the *MD Green Schools/Green Centers* initiatives, and the *Security Boulevard/Woodlawn HS initiative*, new emphasis has been placed on institutional landscape design, maintenance, and conservation landscaping concepts such as the benefits of native plants, integrated pest management (IPM), and removal of impervious surfaces. Pet waste, grass clippings, improper application of fertilizer, and other sources of nutrients in urban and suburban neighborhoods have been highlighted. EPS recently contracted with a consultant to develop targeted environmental education and outreach programs, measure their effectiveness through measuring behavioral change and pollutant reductions as a result of implementing the new programs.

Evaluation of Stormwater Protection Strategies

Baltimore County operates a comprehensive stormwater management program. EPS has always taken a firm stand on requiring water quality treatment even when quantity management was not required. With the implementation of the new stormwater regulations EPS continues to require all projects to explore and implement methods for water quality treatment. EPS now has the option to accept a fee-in-lieu payment documentation has been developed. It is more fully described and evaluated in the NPDES Municipal Stormwater Discharge Permit, the 2016 Annual Report.

Evaluation of Other Regulatory/ Management Strategies

Protection of Forest Buffers: The County has hired additional staff to dedicate four people to investigate citizen complaints, complete inspections, and monitor Forest Buffers. The staff has created a tracking database in order to better protect the protected resources. While it is clear that this program is highly successful in keeping development out of the most critical areas adjacent to waterways, better tracking and monitoring of these buffers will provide data to better evaluate the program.

Protecting the Reservoirs: The U.S. Environmental Protection Agency presented the 2005 Source Water Protection award to Baltimore County. The award was for consistently demonstrating commitment to leadership and innovation in drinking water protection. The county's aggressive land preservation programs, restrictive zoning, educational outreach, and water quality monitoring and enforcement programs were all elements in receiving this distinction.

Implementing Agricultural Best Management Practices: The Baltimore County Soil Conservation District in cooperation with Baltimore County is evaluating the effectiveness of its programs in providing conservation planning to the landowners in the County. This effort is ongoing.

Preliminary results have indicated a significant backlog in the development and updating of conservation plans, trend for more non-commodity farm operations (small equine operations) with special needs, and reduction in State support for staff positions. With respect to the evaluation of the implementation of nutrient management plans, private consultants and farm operators primarily develop the plans. This effort is supported by one field person and training assistance from the University of Maryland Cooperative Extension, Baltimore County. Deadlines have been set for either having a plan or having a letter of intent.

Chesapeake and Atlantic Coastal Bays Critical Area Program: The County prepares quarterly reports to the Critical Area Commission for the Chesapeake and Atlantic Coastal Bays on the evaluation of the Critical Area regulations. These reports are available at EPS.

Storm Drain Inlet Cleaning: See NPDES- Municipal Stormwater Discharge Permit, 2016 Annual Report.

Storm Water Management Facilities: See NPDES- Municipal Stormwater Discharge Permit, 2016 Annual Report.

Illicit Connections: See NPDES- Municipal Stormwater Discharge Permit, 2016 Annual Report.

PROGRESS & RECOMMENDED PROGRAM IMPROVEMENTS

1. PROGRESS ACHIEVED

Following are updates on the progress that has been achieved in the various areas of natural resource conservation. In some instances the goals have been revised to better reflect current policies and practices.

Protecting Plant and Animal Habitats

GOAL: Cooperate with nonprofits and agencies to assess, protect, restore, and create habitats.

PROGRESS: Since adoption of its Policy and Guidelines for Community Tree Planting Projects in fall, 2012, the Sustainability & Forest Management section of EPS worked with citizen organizations to review and approve dozens of proposals for planting trees on County-owned land. The Guidelines help assure that projects are well designed and maintained to assure long-term survival and to provide meaningful ecosystem and community benefits.

GOAL: Identify significant habitats on development plans and protect through modification of site designs.

PROGRESS: This is an ongoing task. The Environmental Impact Review Section continues to evaluate development plans and require modifications, where necessary, to protect significant plant and wildlife habitats.

GOAL: Cooperate with nonprofits and agencies to assess, protect, restore, and create habitats.

PROGRESS: The County has worked with citizen organizations to review and approve dozens of proposals for planting trees on County-owned land to create meaningful ecosystem and community benefits.

Managing Baltimore County's Watersheds

GOAL: Participate in the cooperative regional Reservoir Watershed Management Program that coordinates implementation of the adopted Action Strategies and preparation of progress reports.

PROGRESS: The Dept. of Environmental Protection & Sustainability continued to participate in the regional reservoir protection program. A new Reservoir Watershed Protection Agreement and Action Strategy were approved in 2005 to update water quality issues of concern and to outline actions needed to implement new water quality commitments.

GOAL: Continue commitments to restrict development in the reservoir watersheds.

PROGRESS: Through cooperative review of zoning reclassification petitions for the 2008 and 2012

Comprehensive Zoning Map Process (CZMP), the regional Reservoir Technical Group made recommendations to maintain protective agricultural and conservation zoning to protect water quality in the reservoir watersheds.

GOAL: Continue to implement non-point pollution control, restoration projects, and sewerage improvements.

PROGRESS: The County continues to implement urban non-point controls and restoration projects as reported in the NPDES - MS4 Annual Report. See:

<http://www.baltimorecountymd.gov/Agencies/environment/npdes/>

Agricultural non-point source controls are reported through the State Department of Agriculture.

See http://mda.maryland.gov/resource_conservation/Pages/wip.aspx?countname=Baltimore.

Baltimore County continues to comply with the sanitary sewer Consent Decree. See:

<http://www.baltimorecountymd.gov/Agencies/publicworks/engineering/>

GOAL: Continue to participate in the Comprehensive Gunpowder River Watershed Study and continue to address watershed management issues.

PROGRESS: The Gunpowder River Watershed Study was completed in 2000. The County continues to participate in the Baltimore Metropolitan Council - Reservoir Technical Group (RTG). Currently the County is working with the RTG to develop and implement a comprehensive reservoir watershed monitoring plan. Watershed management issues are addressed through a Small Watershed Action Plan (SWAP) planning process. See:

<http://www.baltimorecountymd.gov/Agencies/environment/watersheds/swap.html>

GOAL: Cooperate with citizen organizations to continue to implement an ambient biological stream-monitoring program.

PROGRESS: The citizen based ambient biological stream-monitoring program was suspended in 2000. It has been replaced with a Stream Watch Program that is implemented by local watershed associations supported by grant funding from the County.

GOAL: Develop a pollution reduction-tracking system.

PROGRESS: The County has developed pollution reduction-tracking processes for each of the pollution reduction types. These are detailed in the annual NPDES - MS4 report in Section 9. The report is on-line at: <http://www.baltimorecountymd.gov/Agencies/environment/npdes/>

GOAL: Develop a database for recording acres of impervious area.

PROGRESS: Acres of impervious area are available through the County GIS. The data layers are updated on a regular schedule.

GOAL: Select subwatersheds to be restored.

PROGRESS: The SWAP planning process prioritizes subwatersheds for restoration in each planning area.

See: <http://www.baltimorecountymd.gov/Agencies/environment/watersheds/swap.html>

GOAL: Monitor and control upland sources of sediment and other water pollutants carried to waterways as storm water runoff.

PROGRESS: Baltimore County maintains a monitoring program to meet compliance with NPDES - MS4 Permit requirements. In addition, stormwater controls are tracking, along with various restoration practices. For Monitoring see Section 10, for SWM practices see Section 3 and for restoration Section 9 of the NPDES - MS4 Annual Report:

<http://www.baltimorecountymd.gov/Agencies/environment/npdes/>

Waterway Improvement and Stream Restoration

GOAL: Continue to use watershed based approach to restore degraded stream systems to improve morphology, ecological function, water quality and aquatic habitat.

PROGRESS: 70 stream restoration projects have been completed to date.

GOAL: Continue efforts to protect shorelines from erosion, improve the water quality and improve habitat value of tidal wetlands.

PROGRESS: 26 shoreline stabilization and enhancement projects have been completed to date.

GOAL: Implement Best Management Practices (BMP) in the County's Watersheds to meet local and Chesapeake Bay TMDLs.

PROGRESS: 25 BMPs have been formulated to date.

GOAL: Initiate condition surveys to monitor the County's navigation channels and apply for dredging grants accordingly.

PROGRESS: 30 waterways have been dredged to date.

GOAL: Continue to monitor submerged aquatic vegetation.

PROGRESS: 31 waterways are surveyed biannually.

GOAL: Implement stormwater management pond conversions, retrofits and repairs to meet local and Chesapeake Bay TMDLs.

PROGRESS: 63 stormwater management ponds have been converted to date.

GOAL: Continue marsh monitoring/maintenance and examine potential tidal marsh restoration/creation projects.

PROGRESS: 2 tidal marshes are monitored and maintained.

GOAL: Explore beneficial uses of dredge spoil disposal including shoreline stabilization projects and tidal marsh creation.

PROGRESS: This effort is ongoing.

GOAL: Improve implementation procedures of the Chesapeake and Atlantic Coastal Bays Program while maintaining the high level of water quality and habitat standards.

PROGRESS: This effort is ongoing.

GOAL: Survey the tidal creeks and rivers of the County and remove hazards to navigation and waterway debris from the shorelines and shallow waters from May to October.

PROGRESS: This effort is ongoing, with removal of hazards and debris when reported or following surveys of the waterways.

Managing Groundwater

GOAL: Evaluate the concept of a rural sanitary district.

PROGRESS: The County is no longer pursuing this strategy.

GOAL: Continue review of development proposals to assure the proper siting of drinking water wells and the location of on-site sewage disposal systems.

PROGRESS: Ongoing as part of the County's development review process.

GOAL: Continue implementation of the 1993 Ground Water Management and Protection Strategy.

PROGRESS: This effort is ongoing.

GOAL: Administering the BRF grant program to upgrade septic system to BATs and connecting existing houses on septic to sewer when feasible.

PROGRESS: The County has upgraded/connected 50 systems since 2010. Prior to that the State upgraded/connected 150 systems.

2. RECOMMENDED IMPROVEMENTS

Following are recommended steps for improving the County's natural resource conservation program.

A. Summary of Needed Improvements to the Green Infrastructure

- Improve the differentiation between the procedures for the protection of environmental greenways versus recreational greenways.
- Review the State Green Infrastructure Plan and identify any deficiencies in the ability of programs and program funding to provide the level of protection sought.
- Determine a system of evaluation for the progress of the program. Consider use of techniques used for evaluating the success of the Agricultural Preservation Program.
- Integration of the data from different programs that protect green infrastructure.
- Assist in efforts to identify green infrastructure priorities through the Greater Baltimore Wilderness Coalition, a voluntary alliance of public agencies, non-governmental organizations, professional associations, and conservation coalitions that supports the vision of expanding a connected and protected green infrastructure network in populous central Maryland from the Chesapeake Bay to the Piedmont.

B. Summary of Needed Improvements for Forest Resources

- Determine the vulnerability of existing forest resources to conversion (non-forest cover).
- Determine the change in forest cover since the last mapping in 2007 and determine implication for the County's Tree Canopy goals and the regulatory program for Chesapeake Bay restoration.
- Strengthen the protection of high-function forest cover through existing conservation easement programs.
- Continue existing and innovative programs to increase tree canopy through reforestation on public and private lands.
- Continue development of cooperative watershed stewardship models for reforestation and forest health management.



Sizeable forested tracts may be found at many County parks. Pictured is Honeygo Run Regional Park, which features paved paths around its ball fields, and natural surface nature trails through its wooded area

C. Summary of Needed Improvements for Watershed Management

- Continue to develop TMDL Implementation Plans for TMDLs approved by EPA.
- Using Adaptive Management review SWAPs and TMDL Implementation plans on a five year cycle to incorporate new science and determine the effectiveness of the actions.

D. Summary of Needed Improvements to Other Regulatory/Management Programs

Protecting the Reservoirs: We need to maintain the level of protection; this means that we need to stay on target with all of the programs such as the land preservation programs, water quality monitoring, and enforcement programs that contribute to the protection of our reservoirs.

Implementing Agricultural Best Management Practices: Improvements needed for the best management practices are:

- Increase the efforts in developing and updating conservation plans to ensure the effectiveness of the program,
- Assure standards and specifications are identified and details provided for Agricultural Exemptions granted by the District,
- Modify the program so that it can fulfill the needs of all agricultural land owners,
- Increase the support in the program so that it can be used to aid with the protection of the County's agricultural resources.

E. Summary of Needed Improvements to Education and Citizen Participation Programs

- Target environmental education and outreach efforts to the various demographics of Baltimore County and tailor both the message and the media to the various demographics to be most effective.
- Measure the effectiveness of both new and existing environmental education and outreach efforts in changing behavior and reducing pollution.

F. Summary of Needed Improvements for Restoration Programs

No improvements identified.

G. Summary of Needed Improvements for Stormwater Management

- Develop verification procedures to meet the new State and federal requirements to verify that facilities and restoration projects continue to function over time.