



2017-2018 Biennial Report

Implementation of the *Patuxent River Policy Plan*



Executive Summary

The Patuxent River is one of eight major tributaries into the Chesapeake Bay. It is Maryland’s longest and deepest river; the length and width are contained entirely within Maryland. It flows 110 miles and stretches more than one mile across at its entrance to the bay, with a maximum depth of about 175 feet. Its watershed covers 937 square miles, or about one-tenth of Maryland’s land mass. The influence of the Patuxent extends into multiple jurisdictions within the state, including seven counties in the Baltimore/ Washington D.C. metropolitan area, two of Maryland’s largest cities (Laurel and Bowie), and one of the largest unincorporated areas (Columbia).

With incidents of heavy rain becoming more common and the 2025 deadline for achieving the Total Maximum Daily Load (TMDL) cap for nitrogen, phosphorus, and sediment, the health of the Patuxent River is more important than ever.

Almost 40 years ago, the state recognized the importance of protecting the ecological, recreational, historical, and cultural resources of the Patuxent River and its tributaries. The Patuxent River Watershed Act, adopted in 1980, directed the establishment of the Patuxent River Policy Plan (Policy Plan) and the Patuxent River Commission (PRC). The Policy Plan serves as a guide for local jurisdictions and state agencies in carrying out their actions and regulatory programs in the watershed, while the PRC is charged with assisting in coordinating and facilitating the work of state and local governments in implementing the Policy Plan.

The original 1984 Policy Plan, signed by all seven counties within the Patuxent watershed and later approved by the City of Laurel, identified 20 goals and 10 recommendations to improve the Patuxent River. The 2015 Policy Plan, adopted in 2014 by all of the local governments represented on the PRC, and in 2016 by the Maryland General Assembly, replaces the original 1984 Policy Plan.

The 2015 Policy Plan

The 2015 Policy Plan contains three general policies (Preservation, Advocacy and eXcitement, or PAX for the Patuxent River) to guide the work of the local jurisdictions and the state within the Patuxent River watershed:

Preservation. Local jurisdictions and the state will work toward the preservation of the Patuxent River and the land within its watersheds, and the restoration of the ecological and economic functions of the river.

Advocacy. Local jurisdictions and the state will advocate for the Patuxent River by raising awareness among the general public and elected and appointed officials of the challenges the river faces and also to make recommendations for improvements.

eXcitement. Local jurisdictions and the state will create excitement about the Patuxent River and its value as a natural, scientific, economic, cultural and educational resource.



Preservation
Advocacy
eXcitement

Patuxent River Policy Plan:
2015 Update



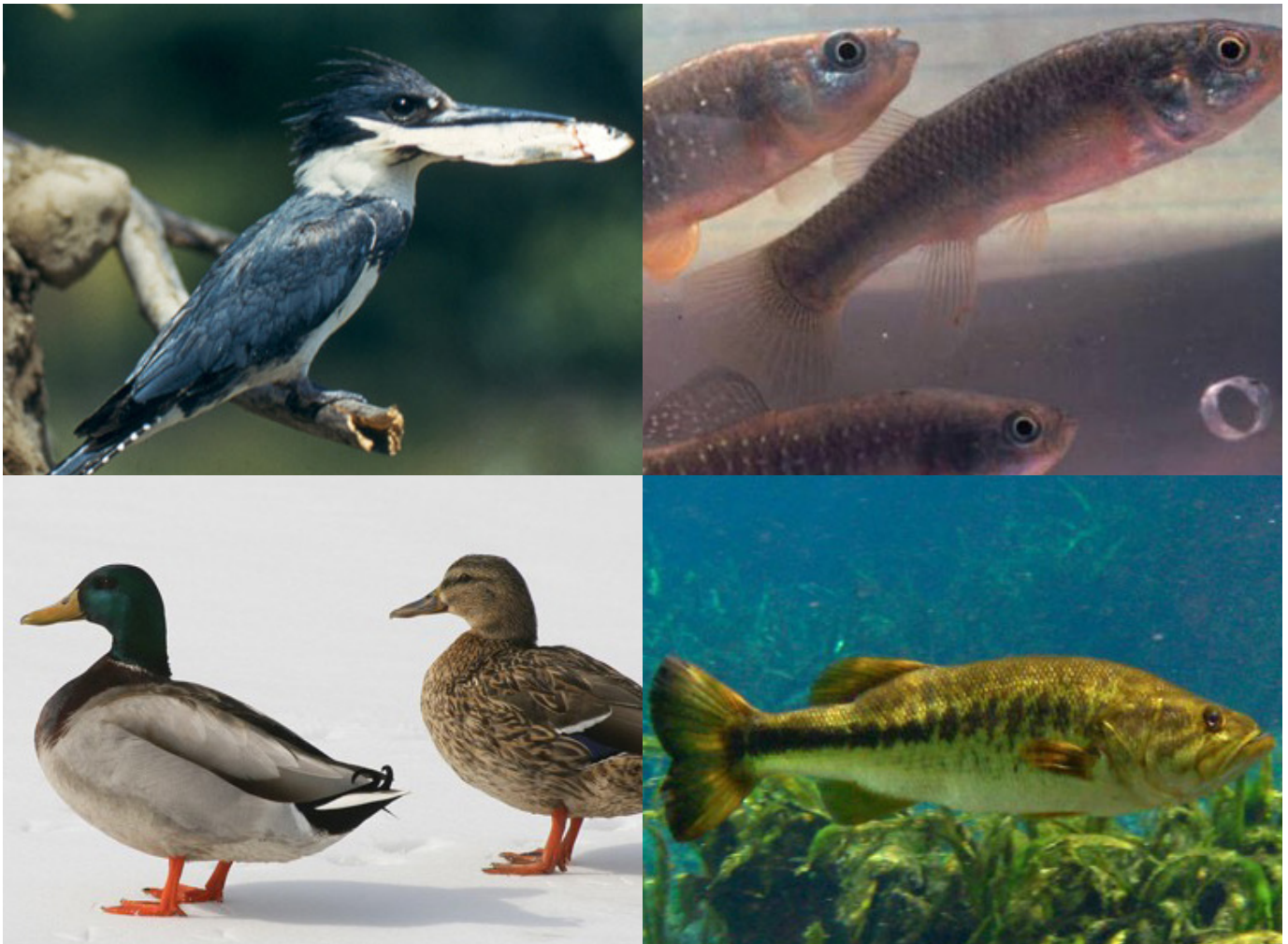
Adopted by the Patuxent River Commission on May 14, 2014

2017-2018 Biennial Report

The Maryland Department of Planning (Planning) submits a report biennially to the General Assembly on the implementation of the Patuxent River Policy Plan and the status of the Patuxent River and its watershed. This report describes the work of the local governments and state agencies performed during 2017 and 2018 in support of the Policy Plan, along with PRC activities that support implementation of the plan.

The main areas for action described in the Policy Plan are: Preservation of the river; Advocacy for the river; and eXcitement about the river.

A number of regulatory protocols require Patuxent watershed counties to reduce pollution entering the Patuxent, including: Municipal Separate Storm Sewer System permits (MS4), issued under the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System; Total Maximum Daily Loads (TMDLs) for local waters, required by the Clean Water Act of 1972 and also administered by EPA, but without a deadline for implementation; and the TMDL required by the EPA to clean up the Chesapeake Bay by 2025 and implemented through Watershed Implementation Plans (WIPs). The counties reported progress in fulfilling these obligations by installing new measures to treat stormwater from 20 percent of the counties' previously untreated impervious surface and to reduce the loading of nutrients, bacteria and even Polychlorinated Biphenyls (PCB's) into the Patuxent. The Maryland Department of Transportation/State Highway Administration (MDOT SHA) and the Washington Suburban Sanitary Commission also are subject to local TMDLs. Additionally, MDOT/SHA must comply with an MS4 permit though both agencies reported progress. The Maryland Department of the Environment (MDE) develops TMDLs and reported the approval of three during 2017 and 2018



Columbia, Maryland, is not an incorporated jurisdiction; however, the Columbia Association, which controls many environmental activities, reported numerous best management practices to control stormwater, and provided the PRC a tour in 2017.

State agencies reported fewer but nonetheless important activities related to Advocacy and eXcitement. MDE and PRC's Sewage Spill Notification Workgroup, which was staffed by Planning, concluded their efforts, culminating in the development of new guidelines for implementing MDE's sewage spill regulations. These cover several activities, including notification of sewage spills and the posting of hazard or closure notices along the Patuxent in the aftermath of spills. The PRC reviewed many proposed bills from the 2017 and 2018 session of the Maryland General Assembly that affected the Patuxent River and wrote the legislature to support or oppose a few.

PRC's Tourism Workgroup initiated the Patuxent River Challenge, which has increased recreation on and appreciation of the Patuxent River, covering cultural and recreational amenities in all seven counties and Laurel. Also, the City of Laurel reported plans to extend its trails along the river while St. Mary's County acquired a large parcel along the river for recreation. By preventing development of the land, the park will also help protect water quality.

Overall, local governments, state agencies and the PRC have completed numerous significant preservation, restoration, planning, advocacy, education, and tourism-related activities over the last two years to support restoration and the economic vitality of the Patuxent River. The report describes these activities in detail, reporting first on Preservation and restoration activities, next on Advocacy work, and last on activities that generate eXcitement for the river.

In addition to coordinating the preparation of this document, Planning's primary role in support of the Policy Plan is to serve as lead staff to the PRC and to facilitate collaboration and coordination of the operations of its members. Planning also provides administrative, communications, research, analysis and planning support for the PRC and its workgroups



2017-2018 Biennial Report: Implementation of the Patuxent River Policy Plan

Background

Section 5-809 of the State Finance and Procurement Article requires the Maryland Department of Planning (Planning) to submit a report every other year to the General Assembly on the implementation of the Patuxent River Policy Plan (Policy Plan) and the status of the Patuxent River and its watershed. This report describes the work completed in 2017 and 2018 by local governments and state agencies that are represented on the PRC in support of the Policy Plan. These include (from north to south in the watershed) Montgomery, Howard, Prince George's, Anne Arundel, Charles, Calvert, and St. Mary's counties as well as the City of Laurel, Planning, the Maryland Department of Natural Resources (DNR), Maryland Department of Environment (MDE), Maryland Department of Transportation (MDOT), and Maryland Department of Agriculture (MDA).

Planning serves as the lead staff to the PRC, providing administrative, communication, research, analysis, planning and coordination support for the Commission and its workgroups. Planning provided the PRC with a draft of this report Jan. 29, 2019, and requested comments through Feb. 4, 2019. No comments were received.

To narrow the focus and guide the work of the commission's stakeholders, the PRC approved annual action plans in both 2017 and 2018. The plans identify specific tasks that would support implementation of particular Policy Plan strategies. To help guide these strategies several workgroups (Sewage Spill Notification, Tourism, Preservation and Restoration, Scientific) convened periodically between regular meetings.

As required by statute, this report includes recommendations (at the conclusion of the report) from Planning concerning implementation of the Policy Plan. Overview of the 2015 Patuxent River Policy Plan

The 2015 Patuxent River Policy Plan guides the actions of the state, the seven Patuxent counties, and the City of Laurel in their efforts to restore the Patuxent River.



Overview of the 2015 Patuxent River Policy Plan

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Strategies

The Policy Plan’s implementing strategies for each of the general policies include:

Preservation

- P1. Maintain and improve the health of the Patuxent River so it can support sustainable commercial and recreational fishing and seafood harvesting.
- P2. Identify preservation and conservation priorities for the critical natural resources within the Patuxent River watershed in county and municipal land use documents.
- P3. Embrace smart growth and smart conservation practices in the counties and municipalities in the Patuxent River watershed to reduce sprawl and preserve irreplaceable resources.
- P4. Restore the health of the river by actions such as encouraging acquisition of properties or easements in sensitive resource areas, planting stream buffers, controlling invasive plants, focusing on stream buffers.
- P5. Preserve the Patuxent River headwaters as a permanent and reliable source of drinking water, and improve and restore water quality in the tributaries feeding the reservoirs.
- P6. Support the work of local jurisdictions and the state in meeting their respective water quality goals as stated in approved plans and permits.
- P7. Preserve and restore the movement of water, fish, and wildlife through identifying and removing barriers.



Advocacy

- A1. Keep abreast of issues facing the river in communities within the Patuxent River watershed and share experiences and challenges with the PRC.
- A2. Pursue resolution of pollution concerns for communities within the Patuxent River watershed.
- A3. Keep elected and appointed officials aware of the issues and opportunities facing the river and seek their support when appropriate.
- A4. Recommend changes to policies, programs, legislation and/or regulations to improve and restore water quality in the river and its watershed.



eXcitement

- X1. Maintain, create and encourage opportunities for river-related economic activities in appropriate locations.
- X2. Ensure and encourage public access to the river, its tributaries and recreational opportunities within the watershed.
- X3. Support economic and scientific research projects on the river and seek or support funding where possible.
- X4. Create and support educational and stewardship opportunities for all communities within the watershed.
- X5. Protect valuable cultural resources and historical properties within the watershed.



Preservation
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Adopted by the Patuxent River Commission on May 14, 2014

Status of the Patuxent River

In 2015, the overall health index of the tidal portion of the Patuxent was 32. After rising to 38 in 2016, it fell to 30 in 2017 (Figure 1).

In 2017, the score for nitrogen was 37, below the highest rating of 54 in 2002, but above the 32 score of 2015 (Figure 2). In 2016, phosphorous registered its best score, 69, since tracking started in 1986; in 2017, it dropped to 28.

Although the percentages for reduction achieved for nitrogen and phosphorus have fluctuated over the past 30 years the trend is moving in a positive direction (Figures 2 and 3).¹

Figure 1.

TRENDS | Patuxent River

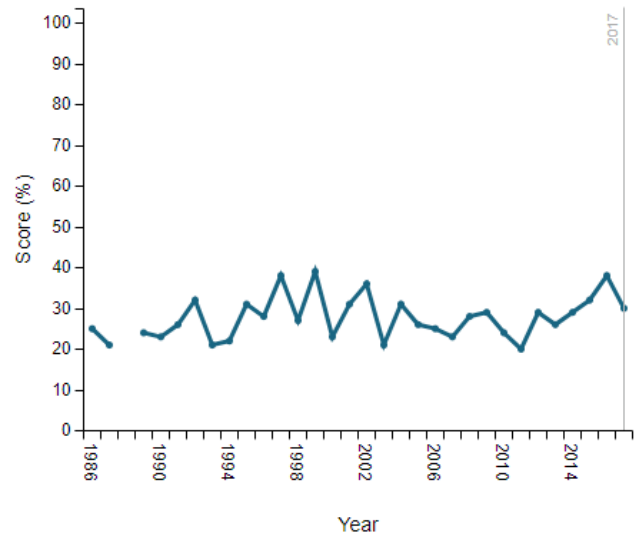


Figure 2. Nitrogen Scoring

TRENDS | Patuxent River

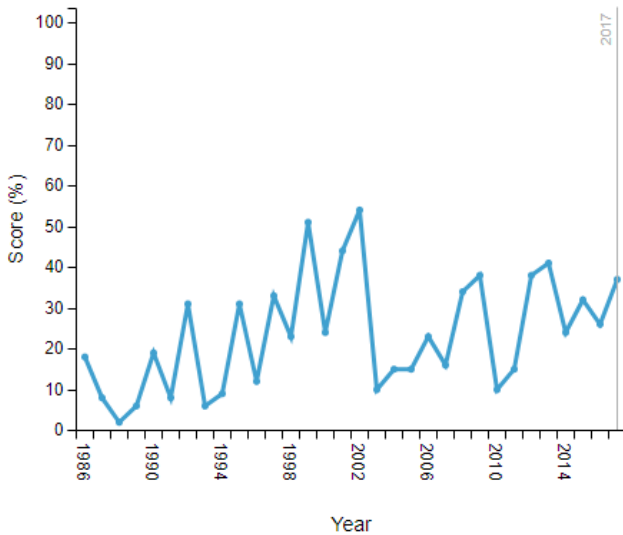
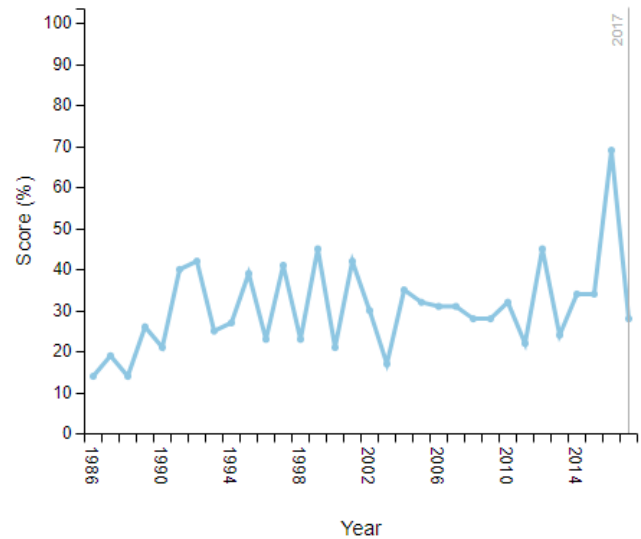


Figure 3. Phosphorus Scoring

TRENDS | Patuxent River



In the nontidal portion of the Patuxent River, long-term (1985-2016) and short-term (2007-2016) nitrogen and phosphorus trends are also improving. Measures of suspended sediment in the nontidal portion of the Patuxent River are improving in the long term (1985-2016) but degrading in the short term (2007-2016).²

¹ Eco Health Report Card. University of Maryland's Center for Environmental Science. <http://ecoreportcard.org/report-cards/chesapeake-bay/health/>. Accessed October 2018.

² Summary of Nitrogen, Phosphorus, and Suspended-Sediment Loads and Trends Measured at the Chesapeake Bay Nontidal Network Stations: Water Year 2016 Update. Prepared by Douglas L. Moyer and Joel D. Blomquist, U.S. Geological Survey, December 13, 2017.

Preservation Strategy Implementation: 2017-2018

During 2017 and 2018, the local jurisdictions, state agencies and PRC completed several tasks that support the Policy Plan’s Preservation strategies:

PRC Preservation and Restoration Workgroup

In 2017 the Preservation and Restoration workgroup represented the PRC at the Patuxent River Conference. The conference focused on making the leap from information to application. The workgroup reported back to the PRC on the lessons learned regarding stream restoration and monitoring at the Smithsonian Environmental Research Center, as well as presentations on stormwater management by Anne Arundel County’s PRC representative Erik Michelsen.



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The workgroup also coordinated and led two restoration project site visits. In October 2017, the Commission took a tour of bioretention sites in Columbia. Led by Commissioners John McCoy and Mary Kay Sigaty, the itinerary featured a variety of projects:

- A cluster of rain gardens installed in residential backyards through the Columbia Association’s Rain Garden Cost Share Program. So far, 337 rain gardens have been designed by Master Gardeners and installed by Village Gardeners.
- A bioretention facility at the YMCA of Central Maryland. The approximately 600 square feet. in-line facility can store and filter approximately 13,000 gallons of parking lot runoff. The project was designed by the Howard Soil Conservation District/NRCS and built by the Columbia Association.
- Lake Elkhorn Dock includes a 2,500 square foot in-line facility that treats approximately 50,000 gallons of parking lot runoff. This project was also designed by the Howard Soil Conservation District/NRCS and built by the Columbia Association.
- The Howard Hughes Corporation’s stream restoration project along Merriweather Drive, designed by Biohabitats.
- The Metropolitan apartments in Columbia, which included an innovative bioretention approach.

In 2018, the workgroup coordinated the site visit to the Cattail Creek stream restoration project on one of the few remaining dairy farms in Howard County. Mary Kay Sigaty, at the time a PRC Commissioner and Howard County Council Member, helped explain the details of the project, including realignment and reconstruction of the stream channel, creation of vernal pools and planting of the floodplain. The project involved the collaboration of many local and state agencies, including the Washington Suburban Sanitary Commission, which expected the improvement to enhance the region's water supply within the Patuxent reservoirs.



The Metropolitan at Columbia: Stormwater management in action and being taught. <https://mdaiaawards.secure-platform.com/a/gallery/rounds/20/details/20543>

The workgroup also brought some of the strategy goals from the PRC's Policy Plan to the forefront for fellow commissioners, by inviting county representatives and other stakeholders to give presentations on implementation of local Total Maximum Daily Loads (TMDLs), erosion and sediment control requirements, and stormwater management rules.

Maryland Department of Planning

Our department provides administrative, policy and technical assistance to local governments and state agencies in two areas: programs and projects that support development and reinvestment in our current growth areas, which reduces development pressure on the Patuxent River watershed's forests and farmland; and programs and projects that support local and state resource conservation efforts.



The department's work in support of development and reinvestment in our current growth areas include: helping jurisdictions identify obstacles and solutions to reinvestment, assisting in the development of plans in support of local growth areas, and administering the Heritage Structure Rehabilitation Tax Credit Program to support redevelopment and reuse of historic Maryland properties for residential and commercial purposes.

Planning's work in support of local and state resource conservation efforts includes developing a forest planning resources webpage to provide local jurisdictions with guidelines, recommendations, and technical assistance on policies and standards to protect forests and trees as lands are developed; administering the subcommittees of the Rural Economies Workgroup (Sustainable Forestry Subcommittee, Land Preservation Subcommittee, Food Policy Subcommittee) of the Maryland Sustainable Growth Commission to help protect the resources that support our rural economy; and providing analysis and policy support for Maryland's agricultural preservation programs.



MDP is a member of the Board of the Maryland Agricultural Land Preservation Foundation (MALPF) and partners to certify county land preservation programs. Certified counties in the Patuxent watershed include Anne Arundel, Calvert, Montgomery, Prince George's, and St. Mary's. Also, Planning is a member of the Rural Legacy Board, which makes final decisions on annual land preservation grants and proposals for the creation and expansion of Rural Legacy Areas. All of the Patuxent Counties include at least one Rural Legacy Area.

Charles County

Charles County's watershed planning efforts from January 2017 through December 2018 support the implementation of the 2015 Patuxent River Policy Plan Update.

A shoreline restoration project was recently completed in Benedict, which is included in the 20 percent impervious surface restoration requirement of the county's Phase I Municipal Separate Storm Sewer System (MS4) permit. An easement was placed on the restored shoreline to ensure that maintenance and inspections can occur in the future. This project coincides with the eXcitement strategies of the 2015 Patuxent River Policy Plan Update since the project enhances public access and accessibility to the Patuxent River.



The EPA approved a sediment TMDL July 2, 2018 for the Indian Creek watershed, a sub-watershed of the Patuxent River. The county's restoration plan to address the sediment TMDL is due to MDE by July 2, 2019. The county continues to have a fecal coliform bacteria TMDL. As part of the outreach efforts of the MS4 program, the county continues to air public service announcement (PSA) commercials encouraging citizens to help protect water quality and reduce nutrient pollution. One of the PSAs focuses on responsible pet ownership by asking pet owners to scoop up waste and dispose of it properly, rather than allowing the bacteria to impact water quality. The PSA is broadcast to Comcast and Verizon cable customers, and to digital media via Comcast Spotlight. The PSA can be viewed here: [youtube.com/watch?time_continue=4&v=0eoGok53veY](https://www.youtube.com/watch?time_continue=4&v=0eoGok53veY)

Consistent with the county's Phase II Watershed Implementation Plan (WIP) Strategy Two-Year milestones, the county continues to implement programs to reduce nutrient loading to the Patuxent River and other tributaries. The county continues to offer the Septic Pump-Out Reimbursement Program, which incentivizes owners of septic systems to regularly pump their septic tanks. The program has continued to succeed and helps reduce potential nutrient leaching and water contamination from unmaintained tanks. The County Commissioners passed new legislation in October 2018, which requires new development on septic systems to install risers on the systems to ease access to tank caps for pumping. The legislation also provides a reimbursement incentive for existing homeowners who choose to install risers. The Charles County Health Department continues to implement the septic Best Available Technology (BAT) installation program, but since septic failures in the Indian Creek watershed are relatively low, only three BAT systems have been installed since the beginning of the program.

Anne Arundel County

Implementation of the Anne Arundel County's current NPDES MS4 Permit continued in 2017 and 2018. Major accomplishments between January 2017 and December 2018 include the completion of a comprehensive review and update of the County's historic stormwater Best Management Practices database and the completion of watershed assessments for the Middle and Lower Patuxent Watersheds. Dialogue and negotiation continued between the County and MDE on the requirements of the County's next MS4 permit, which will be issued following expiration of its current permit in February 2019.



In addition to the Sediment TMDLs that were approved for the Little and Upper Patuxent watersheds in 2011, individual Sediment TMDLs were approved for the Middle and Lower Patuxent in 2018. Sediment TMDL Restoration Plans for the Middle and Lower Patuxent are currently under development and are due to MDE by July 2, 2019. TMDL restoration plans were previously developed for the Little and Upper Patuxent watersheds in 2016. Progress Assessments for these plans were submitted to MDE with the county's 2017 Annual NPDES MS4 report. MDE formally approved these plans in May 2018.

EPA approved a Bacteria TMDL for the Upper Patuxent watershed in 2011. The TMDL restoration for this watershed is addressed in a TMDL restoration plan that addresses all 19 subwatersheds in the county with approved bacteria TMDLs. The plan was formally approved by MDE in May 2018. An annual progress assessment was submitted in 2017, and will be submitted in February 2019 with the county's NPDES MS4 Annual Report.

Finally, a PCB TMDL was approved by EPA in September 2017 for the Patuxent River Mesohaline, Oligohaline, and Tidal Fresh portions of the Patuxent River. The restoration plan for this TMDL will be submitted with the county's Fiscal Year 2018 NPDES MS4 report in February 2019.

Enhanced Nutrient Removal upgrades for major wastewater treatment plants in the Patuxent watershed were completed prior to January 2017.

Phase II WIP implementation focused on the septic and stormwater source sectors. The county convened a Septics Task Force that worked through 2017 and 2018 to assist in the development of a septic conversion program by identifying near and long-term strategies and identifying areas requiring additional investigation. The Task Force completed its work in June 2018 and issued a final report, which can be accessed at: aacounty.org/departments/public-works/septic-task-force/Ver%206%20Final%20Task%20Force%20Report%2006-14-18.pdf.

Anne Arundel County has a robust biological monitoring program, which has been in existence since 2004. All the major watersheds in the county, which are broken up into primary sampling units (PSUs), are assessed in a five-year round of sampling. Two such rounds have been completed and Round 3, begun in 2017, is now underway. The program uses benthic macroinvertebrates and fish to measure overall stream health. A mix of random and targeted sampling procedures are employed. Since 2017, only one Patuxent River PSU, Stocketts Run, has been sampled. The average BIBI (basin-wide index of biotic integrity for stream macroinvertebrates) observed for Stocketts Run was 3.11, which is in the Fair category while the average FIBI was 2.67, which is in the Poor category. Additionally, five targeted sites were sampled to collect baseline data before commencement of stream restoration work. These sites, located in the Upper Patuxent and Little Patuxent, had an average BIBI in the Poor range, at 2.71. The remainder of the Patuxent River watershed will be sampled over the next three years.

During the 2017-2018 time period, a total of 271 acres of land were preserved by the county through land acquisition and easements. These acquisitions/easements include 17 acres acquired by the Department of Recreation and Parks in the Little Patuxent watershed and 254 acres of agricultural land preserved in the Middle Patuxent watershed through the county's agriculture preservation program, MALPF, and Rural Legacy.

Anne Arundel is updating or has completed updates to a number of its plans. An update to the County's Water and Sewer Master Plan was approved in December 2017, and amended in April 2018. The county's General Development Plan, which will include an update to the Water Resources Element and a Growth Tier Map, is in progress. An update to the county's 2002 Greenways Plan has been drafted but not yet approved.

The county has numerous projects under design in the Patuxent watershed including 12,950 linear feet of stream restoration, 16 proposed step pool conveyance system restorations and three pond retrofits. The county completed the construction of the stormwater management pond retrofit at the Crofton Library during this reporting period.



Howard County

Approximately 75 percent of Howard County lies within the Patuxent River watershed, and this portion of the county contains a variety of land uses. Approximately 62 percent of the watershed is in the rural west, which is predominantly low density residential, agriculture and forest. The remainder of the watershed is within the county’s Planned Service Area for public water and sewer, and has more intensive residential and commercial development, including Columbia.



Howard County’s Water Resources Element (WRE) was adopted in April 2010 as an Amendment to General Plan 2000, and subsequently incorporated by reference into PlanHoward 2030, the county’s current general plan. The WRE contains recommended policies and actions to help the county manage water resources more sustainably to ensure that as the county grows, its water resources will be conserved, protected and restored to health.

Howard County received its fourth NPDES MS4 Discharge Permit in December 2014. This permit requires the county to do the following: provide water quality treatment for 20 percent of its untreated impervious area by the end of the permit term in December 2019; and develop plans to achieve stormwater pollutant load reductions for each local TMDL by December 2015. In response, the county completed an initial Countywide Implementation Strategy (CIS) in December 2015 and a revised CIS in 2017. The CIS determined the county’s 20 percent impervious surface treatment goal and demonstrated the means to achieve local stormwater TMDLs.

The NPDES permit also requires that the county develop watershed assessments and restoration plans to address stormwater pollutant load reductions for each watershed in the county by the end of the permit term. The county completed watershed assessments and restoration plans for the Middle Patuxent River and Little Patuxent River watersheds in 2015, and for the Patuxent River mainstem watershed in 2017.

The watershed assessments and restoration plans measure current environmental conditions and identify opportunities for restoration projects to be included in the capital budget. These projects will improve water quality in the county’s streams and rivers, as well as the Chesapeake Bay. Potential projects include stream restoration, reforestation, adding water quality treatment to existing stormwater management ponds, constructing new stormwater management facilities and stabilizing existing storm drain pipe outfalls.

The following table presents a summary of restoration projects completed in the Patuxent River watershed from January 2017 to June 2018. These projects are not all funded by the county – many are voluntary or paid for with grants – and this table includes only those projects which were reported to the county. There are other organizations, such as the Columbia Association, and individual residents who have voluntarily completed projects that are not reported.

Project Type	Number of Projects Completed		
	2017	2018	Total
Outfall Stabilization	10	3	13
Stream Restoration	4	4	8
New or Retrofit Structural Best Management Practices (BMPs) (mostly voluntary residential rain gardens)	181	62	243
Septic Denitrification	21	0	21
Septic Connections to WWTP	3	3	6
Tree Planting	28	12	40

The county has been conducting biological and physical assessments of the streams in each major watershed on a five-year rotating basis since 2001. The biological assessments study the benthic macro-invertebrates (bottom dwelling organisms) as an indicator of water quality and stream health. The county uses the same monitoring protocols as the Department of Natural Resources (DNR) in their Maryland Biological Stream Survey (MBSS). Within the overall Patuxent River watershed, assessments were conducted in the Cattail Creek and Brighton Dam subwatersheds in 2017, and in the Little Patuxent River subwatershed in 2018.

Howard County is a member of the 1996 Patuxent Reservoirs Watershed Protection Agreement, which is intended to protect the biological, physical and chemical integrity of the Patuxent Reservoirs watershed. The county is a member of the Technical Advisory Committee (TAC) which was created by this agreement. From 2015 to 2016, the TAC conducted an assessment of progress toward meeting sediment and phosphorus TMDLs for the reservoirs. From 2017 to 2018, the TAC revised the assessment to address MDE-recommended changes to include more agricultural data. The TAC also researched road salt related issues in the watershed and made recommendations for addressing those issues. For additional information about these efforts, please see 'The Patuxent Reservoirs Watershed Protection Group' section later in this report.

The county's goals for land preservation are contained in the 2017 Howard County Land Preservation, Parks and Recreation Plan. In the Patuxent River watershed from 2017 to 2018, the county acquired 65.6 acres of dedicated open space through the land development process, and the Howard County Agricultural Land Preservation Program purchased permanent easements on five farms for a total of 328.6 acres. Farms coming into this program must have an updated Soil Conservation and Water Quality Plan.

In 2012 Howard County completed a Green Infrastructure Network Plan. This plan defines a countywide system of hubs – large natural areas that provide important plant and wildlife habitat – and connecting corridors. The county is conducting assessments to evaluate current conditions within the network and identify needed improvements. Two of the farms that entered the county's Agricultural Land Preservation Program from 2017 to 2018, included additional protections and management measures in their easements for the Green Infrastructure Network portion of the farms, protecting 196.4 acres of the network.

Montgomery County

The Patuxent River Watershed in Montgomery County drains to the two-reservoir system maintained by Washington Suburban Sanitary System (WSSC): Triadelphia and Rocky Gorge reservoirs. There are three sub-watersheds: Upper Patuxent, Lower Patuxent, and Hawlings River. The total drainage area of these sub-watersheds is approximately 61 square miles, about seven percent of the total Patuxent River basin.

Montgomery County is operating under its 3rd generation NPDES MS4 Permit, which was issued to the county in February 16, 2010. The permit expired on Feb. 15, 2015 and was administratively continued by MDE. In April 2018, the county signed a consent decree with MDE committing to fulfill the restoration requirement by December 2020. In FY18 the County continued to make progress toward meeting the restoration goal. As of the end of FY18, the County has restored 3,603 impervious acres, an increase of 676 acres from FY17. This restored area now accounts for 95% of the permit impervious area restoration goal of 3,778 acres. Based on this progress, the County anticipated completing its consent decree restoration requirement by the end of calendar year 2018.



Montgomery County’s Department of Environmental Protection (DEP) Stormwater Management Facility Maintenance and Inspection Program oversees the triennial inspections and structural and nonstructural maintenance of all stormwater management facilities under the county’s jurisdiction. In 2018, the county inspected approximately 339 stormwater management facilities located in the Patuxent River Watershed. Maintenance activities were conducted as needed to ensure these facilities were functioning properly.

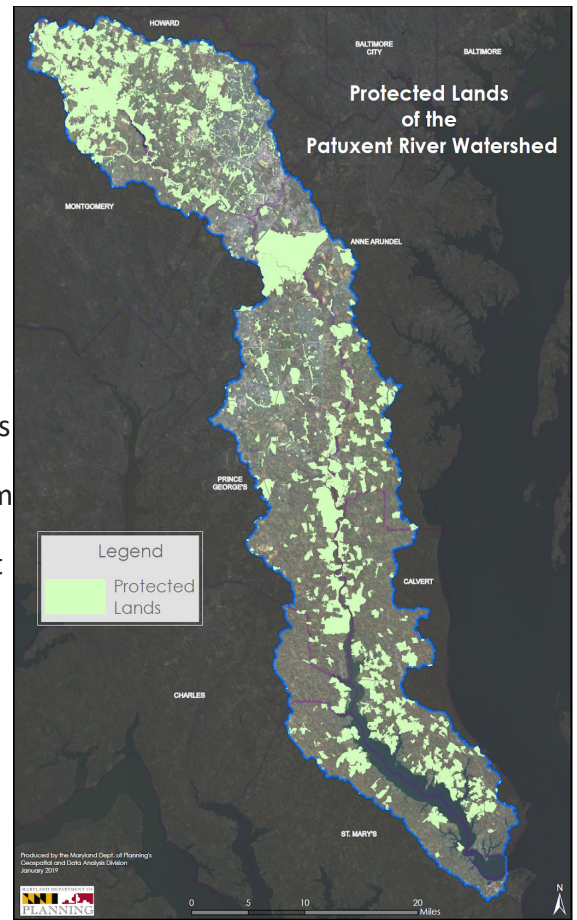
The DEP’s Stream Monitoring team monitors the biological community and stream habitat conditions in all county watersheds on a rotating basis over a five-year cycle. DEP uses a multi-metric Index of Biological Integrity (IBI) to develop narrative ratings of biological conditions in water bodies. From 2017-2018, DEP monitored 28 stations in the Patuxent River Watershed. Of those 28 stations, 32 percent were in excellent condition, 57 percent were in good condition, and 11 percent were in fair condition.

Maryland-National Capital Park and Planning Commission (M-NCPPC)—Montgomery County Environmental Activities in the Patuxent River Watershed January 2017-December 2018

During the reporting period, Montgomery County stream valley buffer reforestation efforts in the Patuxent watershed included ongoing management of about 16.5 reforested acres in the Hawlings River Watershed. In addition, about 68 reforested acres at the Oaks Landfill site continue to be managed.

Under the Department of Parks Weed Warrior Program, which coordinates volunteer efforts to remove invasive plants from natural areas, a total of 282 person-hours within the Patuxent watershed were logged within the reporting period. Some of the Weed Warrior group efforts are coordinated with other events, such as Earth Day, to draw more attention to the environmental needs of natural areas and the importance of stewardship.

The Montgomery County Department of Parks has continued to implement its Deer Management Program, which reduces the number of deer in M-NCPPC parkland, and therefore the adverse effects of deer overpopulation on forest and other ecosystems. The program focuses on large wooded areas within parkland, and along stream valley parks. Within the Patuxent River Watershed, the program has centered on Rachel Carson Park. In the reporting period, 52 deer were harvested from the park. Yearly deer harvests have resulted in a continuing declining population, with an estimated population that fluctuates between 15-30 deer per square mile through the course of the calendar year.



The Montgomery County Parks Department hosted three trash cleanups in the parks within the Patuxent River Watershed. A total of 622 person-hours were logged, for a total of 1,384 pounds of trash and 450 pounds of recyclables removed.

Calvert County



Calvert County has implemented and enforced by codification the 2015 Patuxent River Policy Plan, including the following measures: adopting a WIP, MS4 Permitting and Growth Tier Map; increasing fees and applying the proceeds to planting trees and shrubs in the Chesapeake Bay Critical Area and floodplain to offset the impacts of development; joining the Federal Emergency Management Agency's Community Rating System to reduce the detrimental effects of increasing flooding; and maintaining water monitoring and stream sampling programs to verify water quality improvement.

The Chesapeake Bay TMDL was established by the Environmental Protection Agency (EPA) in 2010, covering the six states within the Chesapeake Bay watershed and Washington, D.C., and establishing caps for nitrogen, phosphorus, and sediment entering the bay. These goals were to be achieved through state and local WIP plans, monitoring, and EPA sanctions for inadequate progress.

The Calvert County WIP has four main sectors: Stormwater; Wastewater; Agricultural Runoff; and Septic Systems. Efforts for meeting goals overall and in the individual sectors are collaborative between local, regional, and federal partners. Septic system best management practices (BMPs) are tracked by the county Health Department (Environmental Health Division), and agricultural BMPs are tracked through the Calvert Soil Conservation District. Stormwater and wastewater BMP progress are tracked through the Calvert County Department of Public Works (DPW). The Calvert County Department of Planning & Zoning (P&Z) addresses preservation and associated credits. P&Z also acts as the primary point of contact regarding the WIP.

Calvert County is currently operating under a Phase II WIP plan; however, the state is in the process of assessing and restructuring the program, which will result in a statewide Phase III WIP. A series of regional workshops combined with local level meetings between state and county staff were held in 2017 and 2018. This resulted in the development of local summaries and the gathering of information to assist in the state-level drafting of the Phase III WIP. The draft is anticipated to be available spring 2019 and is expected to provide new state and county-level goals along with defining the strategies to achieve them by 2025 and beyond. After a two-month public review all comments will be addressed with an adoption date goal of late summer 2019.

Calvert County became permitted under the MS4 program in October 2018. DPW handles these permits and presented an update to the Patuxent River Commission on Jan. 9, 2019.

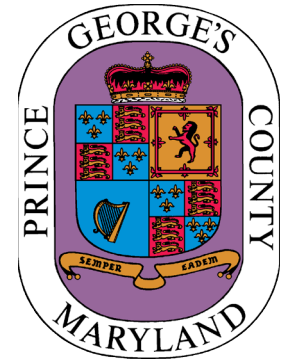
The county's Tidal Creeks Water Quality Study is currently contracted out to the University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory (CBL). CBL has historically held this contract with the county to assess the status of water quality conditions. Monitoring of Mill Creek estuarine system has been conducted since 1987 providing a 30-year period of record. In addition, three creeks in the lower Patuxent have been monitored for nine years (2009-2017), one creek in the lower Patuxent has been monitored for six years (2012-2017), three upper Patuxent creeks have been monitored for eight years (2010-2017), three Western Shore creeks have been monitored for seven years (2011-2017), and Parkers Creek has been monitored for five years (2013-2017).

A companion study covered Calvert County's non-tidal creeks. This consisted of quarterly samples in each of the county's 12-digit watersheds. This non-tidal water sampling has been ongoing since June 2010. Measurements of pollutant loadings started in 2013. All sampling was conducted by volunteers and county staff. In 2017 the contract for the non-tidal sampling was transferred to CBL. This was done to ensure consistency in sample collection and methodology.

Calvert County adopted its Growth Tier Map in April 2017. The Planning Commission and Board of County Commissioners amended the Calvert County Comprehensive Plan to incorporate the Tier Map into the plan following a joint public hearing held on Nov. 28, 2017.

Prince George's County

The Prince George's County Department of the Environment (DoE) administers the county's Municipal Separate Storm Sewer System (MS4) Discharge Permit. Prince George's County submitted its Fiscal Year 2018 Annual NPDES Report to MDE in early 2019 as per requirements in the county's current NPDES MS4 Permit issued in 2014. A copy of the county's 2018 Annual Report can be found at princegeorgescountymd.gov/293/NPDES-MS4-Permit.



As a component of the stormwater management reporting program, the county completed a major effort to update its database of stormwater BMPs through standardization of the geo-database so that its information could be utilized in the MDE Chesapeake Bay Model. The county also expanded its restoration activities to meet conditions in its MS4 Permit, key among them the county's public-private partnership with Corvias Solutions to form a Clean Water Partnership (CWP). The CWP was charged with restoring 2,000 impervious acres by FY18, thus meeting almost a third of the county's restoration requirement under its MS4 Permit. As of November 2018, CWP restored 1,403 impervious acres.

The partnership initially focused in the highly urban and degraded Anacostia watershed. The DoE's Capital Improvement Program (CIP) and CWP have made progress in the Patuxent watershed by restoring over 738 impervious acres. Restoration activities include environmental site design for stormwater BMPs, pond retrofits to enhance water quality benefits, stream restoration and outfall stabilization. Currently, efforts are underway to restore about 325 impervious acres in the Patuxent watershed. Additionally, projects restoring more than 1,000 additional acres of impervious area in the Patuxent watershed are being considered through stream restoration and pond retrofit.

The county has implemented a wide range of educational and outreach initiatives to inform the public about impacts of their daily activities on the health of their watershed such as the Rain Check Rebate Program. This program promotes installation of eligible stormwater practices that can reduce runoff from residential areas.

In 2015, the county developed comprehensive restoration plans for all watersheds that had local TMDLs. Four local TMDLs were issued within the county's portion of the Patuxent River Watershed (Rocky Gorge Reservoir – Total Phosphorus, Patuxent River Upper – Bacteria, Patuxent River Upper – Sediment, and Western Branch – Biological Oxygen Demand).

The restoration plans seek to:

- Improve watershed health, including hydrology, water quality and habitat, using a balanced approach that minimizes negative impacts;
- Support compliance with regional, state and federal regulatory requirements; and
- Increase awareness and stewardship within the watershed, including encouraging decision makers to develop policies that support a healthy watershed.

Each plan presents a strategy to manage urban stormwater and limit the amount of pollutants reaching the county's water bodies. The plans include a methodology to estimate pollutant loads from different urban land types along with anticipated pollutant load reductions from a variety of restoration activities. Additionally, the plans provide a timeline to meet the local TMDL targets that accounts for the estimated costs of implementing and maintaining restoration activities and the county's anticipated funding sources. For more information on the watershed plans, visit: pgcdoe.net/pgcountyfactsheet/Factsheet/Default.

The Water and Science Administration of MDE awarded a grant to Prince George’s DoE to develop a comprehensive watershed restoration plan for the Western Branch watershed, which was completed in December 2018.

Using the Stream Corridor Assessment and biological monitoring data, the county identified 58.4 miles of streams with erosion issues in the Western Branch watershed. With this data, several stream restoration (SR) scenarios were evaluated. The study identified stream restoration scenarios in terms of both pollutant load reductions and impervious area credited (Table 1). The load reductions were calculated using MDE guidance (MDE 2014).

The county is currently working with multiple design consultants to implement stream restoration projects in the Western Branch watershed as identified in the 2018 study.

Table 1. Summary of urban SR scenarios

SR Scenarios	Load Reductions from SR Scenarios (lbs/year)			Treatment Credit Potential (acres of impervious area credit) ²
	TN	TP	TSS	
SR 1: Restore 10% of SCA-eroded stream mi	2,311	2,095	465,293	308
Load reduction (current/planned BMPs + SR 1)	6,332	2,892	1,137,892	
Achieved % of required load reduction	18%	48%	84%	
Remaining required load reduction	28,324	3,086	224,430	
SR 2: Restore 20% of SCA-eroded stream mi	4,622	4,191	930,585	616
Load reduction (current/planned BMPs + SR 2)	8,643	4,987	1,603,185	
Achieved % of required load reduction	25%	83%	100%	
Remaining required load reduction	26,013	991	0	
SR 3: Restore 50% of SCA-eroded stream mi	11,555	10,477	2,326,463	1,541
Load reduction (current/planned BMPs + SR 3)	15,576	11,273	2,999,062	
Achieved % of required load reduction	45%	100%	100%	
Remaining required load reduction	19,080	0	0	
SR 4: Restore 100% of SCA-eroded stream mi	23,111	20,954	4,652,926	3,081
Load reduction (current/planned BMPs + SR 4)	27,131	21,750	5,325,525	
Achieved % of required load reduction	78%	100%	100%	
Remaining required load reduction	7,525	0	0	

¹Notes: lbs/year = pounds per year.
² Crediting methodology from Table 7 in MDE (2014) guidance.

Since January 2015, Prince George’s DoE has enhanced the health of the Patuxent River watershed through tree planting and litter reduction programs. Students and community groups can plant native trees in their school yards and neighborhoods through DoE’s Arbor Every Day and Tree ReLeaf programs. These trees improve water quality by intercepting stormwater runoff and reducing the amount of pollutants carried into the storm drain system. Between 2016 and June 2018 additional programs such as Right Tree - Right Place and CIP Reforestation Projects planted 15,780 trees throughout the Patuxent watershed. Based on the MDE guidance (MDE 2014) for load reduction, the tree planting during this period resulted in 60 impervious acres treated.

DoE also administers the Comprehensive Community Cleanup Program. This program is designed to revitalize, enhance, and help maintain unincorporated areas of the county through 21 concentrated cleanups each year. Through this program, DoE, the county Department of Permitting, Inspections and Enforcement and the county Department of Public Works and Transportation partner with civic and homeowner associations to provide cleanup and maintenance services during a two-week period, including bulk-trash collection, tagging and removal of abandoned vehicles, housing code/zoning ordinance violation surveys, storm drain outfall screening/ sampling, roadside litter pickup, tree trimming, and storm drain maintenance. In 2018, 426.47 tons of trash were collected through the program.



On April 6, 2017, DoE kicked off its efforts to address the problem of pet waste. DoE partnered with the Environmental Finance Center at the University of Maryland and the People for Change Coalition to increase awareness about pet waste pollution and encourage residents to pick up their pets’ waste.

St. Mary's County

In 2017 and 2018, St. Mary's County continued work on implementation and enforcement of the Lexington Park Development District (LPDD) Plan and the county's Comprehensive Plan, which provides policies and directs actions for development, specifically identifying the Patuxent River watershed and subwatersheds within the LPDD. The LPDD Plan and the Comprehensive Plan both support the protection of sensitive resources through policies to improve conservation, development and stormwater management.



In December 2018, County Commissioners placed a six-month moratorium on using commercial docks to work any new state leases for raising oysters in cages on the bottom or in floats at the surface. The county is seeking a more sustainable approach for the harvesting of oysters that aligns with other local goals and objectives.

Also in support of preservation, the county, in collaboration with the Patuxent Tidewater Land Trust is proposing to double the size of the 8,896-acre Huntersville Rural Legacy Area. Lastly, the county hired contractors to remove invasive species from Myrtle Point Park in 2018, and continues to fund projects and department programs for improving water quality and implementing the county's MS4 program.

City of Laurel

During 2017 and 2018, the Patuxent Watershed Hazard Mitigation Project continued in Laurel. Flooding from the Patuxent is Laurel's most serious potential hazard. The mitigation project involves multiple partners including the U.S. Army Corps of Engineers; Anne Arundel, Howard, and Prince George's counties; MDE; the Washington Suburban Sanitary Commission (WSSC); and the U.S. Geological Survey. The first five of nine tasks have been completed to date:



Task 1. Data collection.

Task 2. Field surveys: bridge survey, channel survey, and building survey.

Task 3. Hydrologic analysis of existing-conditions peak flows for the Patuxent River within the study area for eight flood frequencies (2, 5, 10, 25, 50, 100, 200, and 500-year flood events). Flows within the study area are controlled by the WSSC's Brighton Dam and Rocky Gorge Dam. A model from an earlier study was recalibrated.

Task 4. Hydraulic analysis, which used data from the previous tasks to update a model for stream flows, sediment transport, water quality, high water, and flood encroachment. The previous model was calibrated to Tropical Storm Agnes in 1972.

Task 5. Floodplain mapping that used the results of Task 4 to produce an updated digital flood plain map.

The tasks for completing the remainder of this project, for which \$75,000 is being sought, are the following:

Task 6. Development of Flood Risk Reduction Alternatives.

Task 7. Report Preparation and project QA/QC.

Task 8. Project management/coordination.

Task 9. Economic analysis (optional) to estimate the annualized flood damages that could occur in the study area from a Patuxent River flood. This information can be used to determine a benefit-to-cost ratio when evaluating the alternatives developed in Task 6.

The Washington Suburban Sanitary Commission and Patuxent Reservoirs Watershed Protection Group



Since 1996, the Patuxent Reservoirs Watershed Protection Group (PRWPG) has worked to protect the water quality in the Patuxent Reservoirs. This is a partnership that includes several Patuxent River Commission members (Howard County, Montgomery County, Prince George’s County, M-NCPPC, and WSSC) as well as the Howard and Montgomery soil conservation districts.

In the 2015-2016 Patuxent River Policy Plan implementation report, results of a progress evaluation were described for pollutant load reductions to the Patuxent Reservoirs over the 15-year period from 2000 (baseline year) to 2015. Deducting the progress from the Total Maximum Daily Load (TMDL) pollutant reduction goals defines the “gap” for remaining load reductions required to meet the Patuxent Reservoirs TMDLs.

MDE reviewed the 2016 report and offered comments and suggestions for its enhancement, including consideration of additional data from MDA that affected certain agricultural BMPs. The original consultant was directed, with funding provided by WSSC, to develop an amended progress evaluation and gap analysis, which was completed in 2018.

The findings of the amended Patuxent Reservoirs TMDL progress evaluation are:

	Phosphorus in Rocky Gorge	Phosphorus in Triadelphia	Sediment in Triadelphia
TMDL Pollutant Reduction Goal	48%	58%	29%
Achieved (2015)	5%	16%	19%
Remaining Gap	43%	42%	10%

The PRWPG next intends to estimate the range of timelines for meeting the TMDLs under both current and accelerated pollutant reduction rates. In addition, the cost-effectiveness of various BMPs (urban, agricultural etc.) will be examined to identify those measures that could achieve the greatest pollutant reductions.

The WSSC has removed approximately 53,000 cubic yards of sediment from the headwaters of Triadelphia Reservoir since June 2017, for the purpose of maintaining the reservoir’s storage capacity. This volume of sediment removed represents a gain of approximately 10.75 million gallons of drinking water.

The WSSC also acquired about 18 acres of land in the Patuxent Reservoirs’ watershed (surrounding Rocky Gorge Reservoir) for drinking water source protection purposes in 2017-2018.



Washington Suburban Sanitary Commission’s T. Howard Duckett Dam on Rocky Gorge Reservoir, Howard and Prince George’s Counties

Maryland Department of Transportation



In mid-May, 2018, the Maryland Department of Transportation Maryland Port Administration (MDOT MPA), along with the MDE, hosted the first North American GreenPort Congress. This international conference brought together maritime professionals from around the world to discuss environmental initiatives and developments. Conference sessions included adapting to climate change, building a sustainable logistics/supply chain, innovative techniques and technologies to support dredging and sustainability practices.

MDOT continues to comply with state and federal laws and regulations for Stormwater Management (SWM) as well as MDE permit requirements. MDOT continues to implement the practices in the 2000 Maryland Stormwater Design Manual and remains in compliance with the Stormwater Management Act of 2007, including the revised Chapter 5 of the 2000 Maryland Stormwater Design Manual, by implementing environmental site design (ESD) to the maximum extent practicable (MEP) for all new and redevelopment projects. To enhance water quality by managing stormwater, MDOT MPA has completed one underground stormwater management vault and is currently constructing a second at Dundalk Marine Terminal to help manage stormwater from extreme weather events. MDOT MPA is also implementing a stormwater program to evaluate future flooding risks and identify solutions at Dundalk Marine Terminal. The design and construction of additional marine terminal space at both the Fairfield Wet Basin and South Locust Point Fruit Slip, and construction of the new building 91C at Dundalk Marine Terminal, included increasing the elevation of the new space to enhance overall resiliency. MDOT MPA has also commenced an assessment of MPA-owned properties to identify areas for possible living shoreline projects to increase coastal resiliency.

Within the Patuxent River Watershed, MDOT's State Highway Administration (MDOT SHA) owns, operates, and maintains an extensive roadway network with significant drainage and SWM systems. The MDOT SHA Water Quality Bank was created to help ensure extra water quality credits are available for major highway, bridge and district special projects from which to debit when other MDOT SHA projects are not able to provide water quality treatment for impervious area. As of Dec. 31, 2018, there are 18.68 acres of water quality credit available for debiting in the Patuxent River Watershed.

MDOT SHA has established a Systematic Stormwater and Drainage Asset Management Program to operate and remediate permanent drainage and stormwater assets that convey and treat highway runoff. The program's goal is to provide preventive and remedial solutions for the drainage and stormwater infrastructure within MDOT SHA right-of-way (ROW) to provide required water quality treatment and protect valuable resources within the Patuxent River Watershed. The SWM inventory database is being continuously updated to include newly constructed SWM facilities. Rapid increase of the SWM inventory is expected in upcoming years with the ongoing watershed restoration efforts.

Between January 2017 and December 2018, MDOT SHA completed three bay restoration projects within the Patuxent River Watershed. The projects include a total of 7.46 acres of tree plantings throughout Anne Arundel County, which results in an impervious area treatment equivalent of 2.83 acres, and five new stormwater facilities throughout Prince George's County, which treat a total of 13.27 impervious acres. Total impervious area treatment for this period is 16.10 acres.

MDOT SHA also has an outreach program tasked with coordinating pollution reduction strategies with each of the MS4 jurisdictions and counties. The purpose is to establish a cooperative relationship and identify partnering opportunities. Memorandums of Understanding (MOUs) or agreements are being actively sought with other MS4 jurisdictions, government agencies, and private organizations with the intent to share resources in restoring local and regional waters. A summary of the MOU development MDOT SHA and each county with jurisdiction within the Patuxent River Watershed includes:

- Anne Arundel County MOU executed
- Charles County MOU executed
- Howard County MOU executed

In addition, MDOT SHA continued to implement its Integrated Roadside Vegetation Management Program, which includes the control of invasive plant species within the ROW. Particular species of note within the Patuxent River watershed were Bradford Pear, Tree of Heaven and English Ivy. In addition, MDOT SHA continues to control phragmites within its ROW and at mitigation sites.

MDOT SHA maintains compliance with Maryland's Nutrient Management Law and regulations. This has resulted in the systematic reduction of fertilizer application from 200 pounds per acre of nitrogen fertilizer to 40 pounds per acre, and from 160 pounds per acre of phosphorus fertilizer to 32 pounds per acre for areas of turfgrass and meadow establishment.

Maryland Department of Natural Resources

The Department of Natural Resources (DNR) supports the Patuxent River through a wide variety of initiatives, from research and monitoring, land preservation and restoration, to the River's fisheries.



Monitoring

DNR is partnered with the Chesapeake Bay - National Estuarine Research Reserve (CB-NERR), which oversees research, restoration and education on the Patuxent River from the sanctuary at Jug Bay. CB-NERR conducts long-term monitoring of marsh accretion, emergent vegetation, submerged aquatic vegetation and weather/water quality continuous monitoring at Jug Bay. CB-NERR is also involved in an annual wild rice restoration project, waterbird surveys and monitoring, and snakehead monitoring and eradication.

The department's Resource Assessment Service manages the Eyes on the Bay monitoring program. This program collects water quality data throughout the state, including the Patuxent River and its tributaries. In 2017 and 2018, DNR operated three continuous monitoring stations set up on the mainstem of the Patuxent River to collect data every 15 minutes. DNR also has 13 long-term fixed monthly monitoring stations located throughout the watershed. All data is made available at: eyesonthebay.dnr.maryland.gov/.

The Resource Assessment Service also administers the Maryland Biological Stream Survey (MBSS), conducting assessments of stream health throughout Maryland based on biota found in the streams. The sites are chosen throughout the state's watersheds on a rolling basis. In 2017, six sites were sampled in the Patuxent River watershed and the data published to DNR's Stream Health Website at: geodata.md.gov/streamhealth/. The MBSS group also coordinates the Maryland Stream Waders program, a volunteer effort to collect stream biological data. In 2017, six additional sites in the Patuxent watershed were surveyed by these volunteers. MBSS and Stream Waders 2018 data is not yet available.

Land Preservation and Restoration

The Rural Legacy Program funds the preservation of ecologically valuable tracts of land to protect natural resources, agricultural and forest lands. In 2017 and 2018, DNR added 626 acres of land to the program within the Patuxent River Watershed.

The department supports watershed restoration with the Chesapeake and Atlantic Coastal Bays Trust Fund. In the Patuxent River watershed, the state provided \$226,697 in FY17 and FY18. When complete, these projects will create an estimated annual nutrient reduction of 10,000 pounds of nitrogen, 2,400 pounds of phosphorus and 4,000 pounds of sediment.

Fisheries

In a briefing document entitled Status of Anadromous Fish Spawning Habitat in Patuxent River Fish Habitat and Ecosystem Program, February 2018, Jim Uphoff and Margaret McGinty developed an analysis of Patuxent River anadromous fish recruitment that indicated that spawning and larval nursery habitat of anadromous herring has deteriorated to the point that recruitment has declined. A copy of the briefing document can be found in the 2017 Annual Report - Marine and Estuarine Finfish Ecological and Habitat Investigations, Appendix 1 of Job 2 (page 164), available at: <http://dnr.maryland.gov/fisheries/Pages/FHEP/pubs.aspx>.

Maryland Department of the Environment

The Maryland Department of the Environment has approved the following TMDLs as of January 2019 (approvals during 2017-2018 are highlighted):



Maryland
Department of
the Environment

Title of TMDL	Date Approved
Sediment in the Non-Tidal Patuxent River Middle Watershed, Anne Arundel, Calvert and Prince George's counties	July 2, 2018
Sediment in the Non-Tidal Patuxent River Lower Watershed, Anne Arundel, Calvert, Charles, Prince George's and St. Mary's counties	July 2, 2018
Polychlorinated Biphenyls in the Patuxent River Mesohaline, Oligohaline and Tidal Fresh Chesapeake Bay Segments	September 19, 2017
Sediment in the Patuxent River Upper Watershed, Howard, Anne Arundel, and Prince George's counties	September 30, 2011
Sediment in the Little Patuxent River Watershed, Howard and Anne Arundel counties	September 30, 2011
Fecal Bacteria for the Patuxent River Upper Basin in Anne Arundel and Prince George's counties	August 9, 2011
Mercury to Cash Lake, Prince George's County	March 18, 2011
Fecal Coliform for the Restricted Shellfish Harvesting Area in Mill Creek of Lower Patuxent River Basin in Charles County	August 20, 2009
Phosphorus and Sediments for Triadelphia Reservoir (Brighton Dam) and Phosphorus for Rocky Gorge Reservoir, Howard, Montgomery, and Prince George's counties	November 24, 2008
Fecal Coliform for Restricted Shellfish Harvesting Areas in Solomons Island Harbor, Washington and Persimmon creeks, and Cuckold Creek of the Patuxent River Lower Basin in Calvert and St. Mary's counties	September 27, 2005
Island Creek, Town Creek, Trent Hall Creek, St. Thomas Creek, Harper and Pearson Creeks, Goose Creek and Indian Creek and a Water Quality Analysis for Battle Creek of Fecal Coliform for Restricted Shellfish Harvesting Areas in the Lower Patuxent River Basin in Calvert, Charles, and St. Mary's counties	May 25, 2005
Mercury to Lake Lariat, Calvert County	January 27, 2004
Sediments and Phosphorus to Centennial Lake, Howard County	April 24, 2002
Biochemical Oxygen Demand (BOD) for the Western Branch of the Patuxent River, Prince George's County	June 6, 2000

Advocacy Strategy Implementation: 2017-2018

In 2017 and 2018, the local jurisdictions and PRC completed the following tasks in support of the advocacy strategies in the Policy Plan:

Sewage Spill Notification Workgroup

In 2014, after a significant sewage spill overflow into the Western Branch of the Patuxent River, the PRC created the Sewage Spill Notification Workgroup to develop recommendations to MDE on updating state regulations or regulatory guidance on sewage spill notification (written before the advent of fast, modern communication technologies) and also when to lift warning signs on the river.

State regulations (COMAR 26.08.10.08.D) require that a “public advisory shall remain in effect until the Department of Health and Mental Hygiene, local health department, environmental health director, or a designee determines that sampling data for the receiving water shows return to normal or prior background levels.” One of the problems identified by the workgroup is that “normal or prior background levels” for bacteria are difficult or impossible to determine.

In late 2017, in response to guidance from the Sewage Spill Notification Workgroup, MDE published draft Public Notification Guidelines for Sewage Overflows in Recreational Waters. After additional input from the Workgroup, the final Guidelines were published in the summer of 2018. Below is a summary of how the Workgroup’s recommendations were addressed in the final guidelines.

A. Changes to the 24-hour notification deadline about sewage overflows into the Patuxent River

The Commission recommended that MDE issue regulatory guidance saying that even though COMAR 26.08.10.08.B allows 24 hours for notifications, the regulation should be interpreted, except under extraordinary circumstances, as something much shorter (6 hours) with advanced communications including texting, social media, emails and local media.

Here is the text of the regulations (emphasis added):

Public notification shall be made as soon as practicable, but not later than 24 hours after the time that the owner or operator becomes aware of the event.

A notification period shorter than six hours is certainly “practicable” today, according to the new guidelines:

Rapid communication to those at risk, to include multiple media outlets, is a top priority. Other stakeholders, such as recreational user groups and environmental forums, should be notified. Be sure to consider stakeholders and whether outreach should be in other languages.

B. Notifying downstream jurisdictions of sewage overflows

TPRC recommended that MDE’s regulatory guidance direct owners and operators of Wastewater Treatment Plants (WWTP) to notify downstream jurisdictions in addition to the counties in which the spill occurs. COMAR 26.08.10.08. B.1 already mandates this action (emphasis added):

Public notification shall be made as soon as practicable, but not later than 24 hours after the time, that the owner or operator becomes aware of the event and shall be made:

(1) By a public service announcement or paid advertising in a daily newspaper, radio station, or television station serving the immediate area where the overflow occurred and *any other areas where the overflow is likely to have an adverse impact...*”

C. Additional methods of notification

The methods of public notification currently included in the regulation are “a public service announcement or paid advertising in a daily newspaper, radio station, or television station.” The existing regulation does not take advantage of virtually instantaneous notification through the internet, social media, smart phones and texting.

The Commission recommended that MDE’s regulatory guidance direct each WWTP and county to create an online system through which anybody, including officials down-stream, kayakers, fisherman, etc., can sign up for electronic notification of sewage spills, to be posted as quickly as possible. The guidelines recommended these best practices:

Communication can consist of physical postings, radio and other media announcements, and using any existing system, such as text and email alerts, as well as all other forms of social media that the county may have to reach those who may come in contact with the impacted water body.

A consistent message is essential. Communicating with other jurisdictions, wastewater plant operator, and the press should all be with the same message, and if applicable, agreed upon by potentially impacted jurisdictions. MDE and/or Maryland Department of Health (MDH) may assist the LHD (Local Health Department) in messaging. Jurisdictions with shellfish harvesting waters may need to be contacted separately. MDE and MDH should be notified to ensure consistency with the public and the media.

Message should include reason for closure, date and closure date, area affected, and agency’s name and contact information.

D. When to lift postings

The current regulations require monitoring for bacteria levels after a sewage spill overflow and postings are to be removed once background levels for bacteria are reached. Some counties use time-based approaches (i.e., lifting postings after 30 days), while others remove postings once health-based standards are reached. The Commission believed this might unnecessarily harm recreational use of the river (by unduly restricting use of the river) while also putting river users at risk (given that time-based approaches do not rely on monitoring). The Commission recommended that MDE issue regulatory guidance for a single, statewide standard for lifting sewage spill postings that both protects human health and promotes recreational use of the river.

The guidance did not recommend one standard. Instead, it offers low, medium, and high-risk scenarios based on the size of the sewage release, the characteristics of the water body, and the time of year. It recommended the following:

Avoid notifications or postings that are for arbitrary time periods, unless required by law, regulation, or local ordinance, and base the duration of notification or postings on public health risk assessment or monitoring.

The Commission decided that staff should convene a conference call with the seven local health departments within the Patuxent watershed to discuss Anne Arundel county’s strategy of testing bacteria levels in the river in order to determine when warnings should be lifted. The call was held in December 2018. Next steps include a follow-up call in 2019 among the health departments and MDE, and a status update on MDE’s proposed online sewage spill reporting tool.

Maryland Department of Planning

Planning staff coordinates and facilitates the meetings of both the Preservation/Restoration and the Sewage Spill Notification Workgroup. Our work includes drafting agendas and writing up the workgroups' findings for the PRC. Planning staff also complete research and analysis tasks to inform the workgroups' policy discussions and recommendations.



PRC Legislative Review

During each Maryland legislative session, the PRC reviews proposed legislation germane to its mission and selects priority bills to support or oppose (PRC members who represent state agencies abstain from voting). The PRC provided testimony to the legislature on several bills in 2017-2018.

Columbia Association

The Columbia Association (CA) is a nonprofit community services corporation that manages Columbia, Maryland, home to approximately 100,000 people. Columbia was founded in 1967 by James Rouse and his Howard Research and Development Company.

CA operates a portfolio of facilities for public use and maintains nearly 3,600 acres of open space as a permanent asset to the community. Neighborhood amenities include lakes, parks, tot lots, basketball and tennis courts, and 95 miles of pathways to connect residents to amenities.

During 2017 and 2018 the association continued to implement a number of programs and built several new capital projects designed to reduce and infiltrate stormwater runoff that would otherwise enter the Little or Middle Patuxent rivers.

CA developed a Rain Garden Cost Share Program in 2012 to encourage residents to become more involved in managing stormwater generated on their lots. The Rain Garden Costs Share Program splits the cost of installing a rain garden 75 percent/25 percent split with residents. The rain gardens are installed by a landscape firm under contract with CA and CA receives reimbursement for its 75 percent from grants awarded through the Chesapeake and Atlantic Coastal Bays Trust Fund, administered by Maryland Department of Natural Resources. CA's Rain Garden Cost Share Program helped residents of Columbia build 126 rain gardens in 2017 and 2018.

CA used capital funds, grant funds from the Chesapeake and Atlantic Coastal Bays Trust Fund, and a partnership with Howard County Government to build several new bioretention facilities to manage stormwater at CA facilities, retrofit a failing stormwater facility, and restore a section of stream channel above Lake Elkhorn. These projects are designed to treat impervious surfaces and are installed voluntarily by CA.

CA works with a number of local groups including the Community Ecology Institute and the Howard County Watershed Stewards Academy to engage residents and educate them about water resource issues. These partnerships provide opportunities for residents of all ages to be involved in restoration activities such as tree plantings, planting and deploying floating wetlands, wetland plantings, and collecting macroinvertebrates for the evaluation stream water quality.

eXcitement Strategy Implementation: 2017-2018

In 2017 and 2018, the local jurisdictions and PRC completed the following tasks in support of the eXcitement strategies in the Policy Plan:

The Patuxent River Commission Tourism Workgroup 2017-2018 Year in Review

The Tourism Workgroup was established to maintain, create and encourage opportunities for river-related economic activities, as well as public access to and recreational opportunities on the river and its tributaries throughout the Patuxent River watershed.

During the past two years, the workgroup focused its energy on #PatuxentChallenge, which encourages people to explore the recreational, cultural and historical features along the river. Each jurisdiction in the Commission suggested one or two sites for people to visit. By completing this challenge, the public can experience with each activity a different Patuxent River as it changes on its journey from its headwaters to the Chesapeake Bay.

MDP developed the Patuxent Challenge webpage to support and explain the project and promote the event. For more information, please visit: planning.maryland.gov/Pages/OurWork/PaxRiverComm/PatuxentChallenge.aspx

The workgroup closed the inaugural year of the Patuxent Challenge with eight people completing the challenge in 2018. There were multiple groups who posted on social media using #PatuxentChallenge, but did not submit the completed challenge picture, which indicates that there were more people who participated in the challenge but did not complete it.

One of the main goals of the challenge is for participants to visit various parts of the Patuxent watershed and discover new and unique sites. They would also experience how the Patuxent River changes in size and character along the way and hopefully become stewards of the river. Not only did participating sites receive an increase in visitation because of the challenge, the participants likely contributed to the local economy in some way while completing activities (for example, eating at a local restaurant after a hike or shopping at a nearby store).

The first winner provided the following statements about the Patuxent Challenge: “I would never have gone to the sites without the challenge”; “It raised my awareness of places to go in the area, including areas further away from where I live” and “It is a great way to teach people about the great amenities in our area and state.”

The challenge drew social media traffic. The Patuxent Wade-In counted as a challenge activity for Calvert County. The workgroup was able to obtain great prizes from participating jurisdictions and parks that can let the winners continue to enjoy the natural and cultural environment of the Patuxent. Prizes includes overnight camping at state parks from the DNR, passes from WSSC for the use of the recreational sites related to the reservoirs, as well as passes to Sotterley Plantation and the Robinson Nature Center. Water bottles from the Patuxent Riverkeeper and stickers from the Patuxent River Park were also among the prizes.

The workgroup worked with county tourism officials to publicize this event. Workgroup members were advised to pilot this activity for the first year to see if it got some traction before involving the business community. The workgroup believes that its success in 2018 puts them in the position to incorporate business and economic development opportunities in 2019. The officials will help identify and pursue business support (e.g., outfitters, bed and breakfasts, historic and cultural outlets, campsites and restaurants).

Other activities of the workgroup, in accordance with the PRC's 2018 Action Plan, include:

- Sharing knowledge of funding opportunities with tourism partner groups in the watershed when requested. Prince George's, Anne Arundel, and Calvert counties and DNR have shared funding opportunities on various projects.
- Promoting and documenting educational and stewardship opportunities for all communities within the watershed. Information has been completed at the local facility level, although comprehensive data has not been compiled.
- Promoting heritage tourism in order to protect valuable cultural resources and historical properties along the river.

City of Laurel

The City of Laurel is planning a trail extension plan along Riverfront Park. The biggest obstacle to the project is creating a passage under US 1 as well as steep slopes. In addition, the plan calls for a pedestrian bridge over the river. The trail extension would provide southside Laurel residents better access to the park and MARC station. Funding ideally would come from Maryland's Program Open Space funding and other grants. This project may take 10 to 20 years. The city presented its trail plan to the Commission in 2018 and received guidance and feedback from Commission members.



St. Mary's County

St. Mary's County purchased a large waterfront parcel (called Snow Hill) on the Patuxent River that provides beach and paddling access, natural areas for passive recreational activities, as well as active park amenities. In addition, the county continues its historic and land preservation activities with support by state and federal partners. The County Commissioners also approved a Tourism and Hospitality Master Plan and is now implementing a Tourism Regulatory Task Force, which will research opportunities to expand river-related activities and businesses.



Recommendations to Facilitate Implementation of the 2015 Patuxent River Policy Plan

State agencies and local governments continue to undertake significant projects to implement the State agencies and local governments continue to undertake significant projects to implement the adopted 2015 Patuxent River Policy Plan.

The Patuxent River Commission, which is tasked with supporting state and local implementation of the Policy Plan, should focus more narrowly on a smaller number of actions that can be accomplished during the year, in accordance with available staff resources.

The health of the Patuxent River, and its extensive and numerous tributaries throughout seven counties, although improving, is still in poor ecological condition. According to the University of Maryland Center for Environmental Science, “gains in water clarity and total nitrogen scores were offset by a poor showing in total phosphorus, dissolved oxygen, and benthic community scores” (see Patuxent River at: ecoreportcard.org/report-cards/chesapeake-bay/health/). State agencies and local governments must continue making progress implementing the strategies of the adopted 2015 Patuxent River Policy Plan.



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