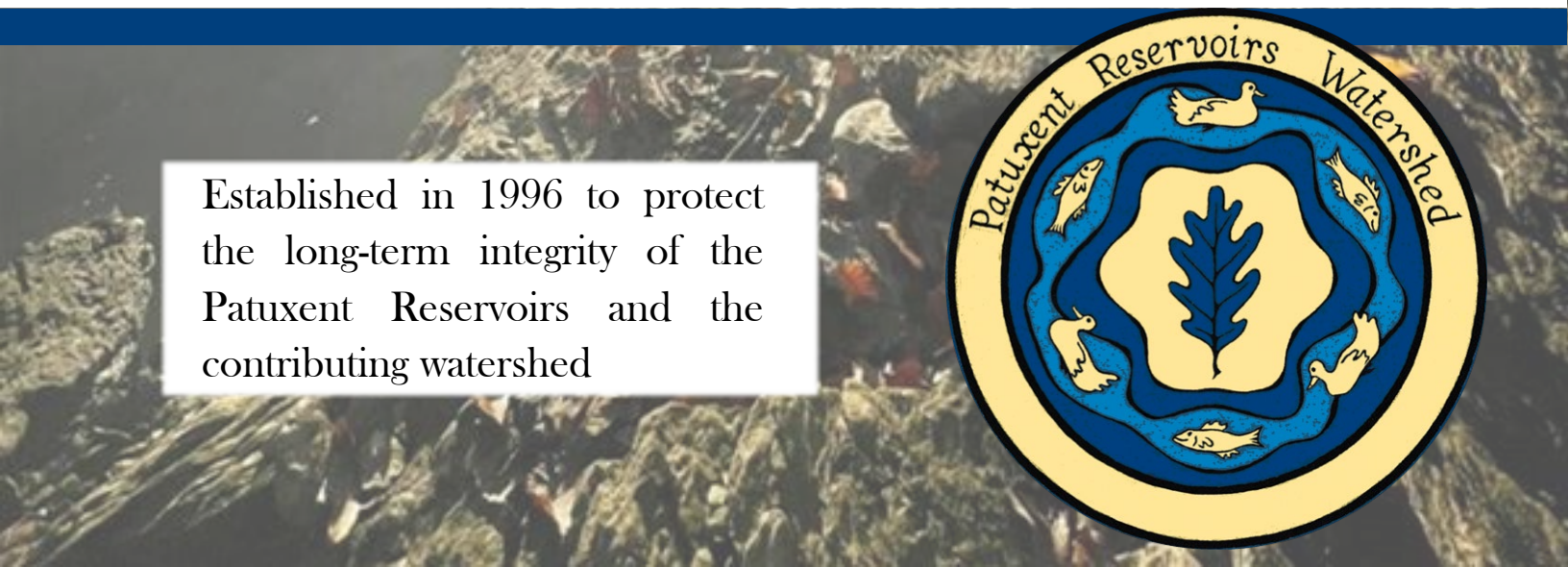
Patuxent Reservoirs Watershed Protection Group Technical Advisory Committee

2024 Annual Report



Established in 1996 to protect the long-term integrity of the Patuxent Reservoirs and the contributing watershed

Patuxent Reservoirs Watershed

MESSAGE FROM THE CHAIR

On behalf of the Patuxent Reservoirs Watershed Protection Group (PRWPG) Technical Advisory Committee (TAC), I am pleased to present our 2024 Annual Report of the TAC. It has been a distinct honor to work alongside many professionals dedicated to the protection of the natural resources within the reservoirs' watershed, ultimately resulting in further protection of the drinking water supplied by WSSC Water.

The protection of our valuable water resources is critical to the health and sustainability of our communities and the partnership between our respective jurisdictions plays a pivotal role in ensuring the protection of these resources remains of paramount importance.

The TAC priorities for 2024 included on-going efforts for refining our GIS geodatabase and mapping tool project, tracking salt related impacts to the watershed, promoting a recommendation that the Policy Board request local agencies involved with winter salt applications to designate the Patuxent Reservoirs Watershed as a Special Salt Management Area in salt management plans, strategies, and procedures,, and continuing an initiative to better understand the challenges associated with the implementation of Agricultural Best Management Practices on rented agricultural lands.

In 2024, the TAC created a new and improved Patuxent Reservoirs Watershed Protection Group GIS tool that is housed at WSSC Water. The tool went live in late October, and a training guide was completed in November. The TAC also considered data needs and enhancements to the mapping tool that would make this tool more effective for the TAC members to use on a regular basis and will periodically review and update the data layers.

During 2023, the TAC submitted a technical memorandum providing the justification for re-categorizing the Sediment TMDL for Triadelphia Reservoir to MDE. As of the printing of our annual report, the justification is still being considered by MDE and awaiting a final determination for a future *Integrated Report of Surface Water Quality in Maryland*.

The TAC also formed a subcommittee to study and better understand the challenges with implementing Agricultural Best Management Practices on rented agricultural lands. The Subcommittee completed a landowner/operator survey that will be used to help understand and illustrate the challenges. When the results of the survey are received, the goal will be to compile this information and subsequently offer a workshop that can identify avenues to increase the implementation of these practices on rented lands.

Finally, the TAC made a recommendation in 2024 that the Policy Board request local agencies involved with winter salt applications to designate the Patuxent Reservoirs Watershed as a Special Salt Management Area in salt management plans, strategies, and procedures. This request was approved by the Policy Board, and letters with the request were distributed to the appropriate agencies. The preliminary feedback from the agencies has been positive, and it is hoped that designations will be followed up with appropriate implementation strategies to reduce salt applications in the Patuxent Reservoirs watershed while maintaining public safety.

Message from the Chair

I was honored to not only serve as the TAC chair this past year, but to once again witness the collaboration and teamwork of individuals that represent the partner agencies. I would especially like to express my thanks to Laura O'Donnell and Robin Forte, TAC coordinators, for their continued support that helped the TAC stay focused and set the workgroup priorities. As we look forward to the coming year, the TAC will remain focused on the ongoing projects of 2024, as well as look at new initiatives in the upcoming year. One thing that all partner jurisdictions share is a passion for protecting our soil and water resources and through our collective efforts we remain highly focused on finding avenues and opportunities to protect and improve the Patuxent Reservoirs Watershed.

Sincerely,

Mark Symborski

2024 Chair, Technical Advisory Committee

Introduction

The two Patuxent Reservoirs are the source of drinking water to approximately 600,000 customers, most of whom are located in eastern Montgomery County and northern Prince George's County. The Patuxent Reservoirs watershed encompasses an area of about 132 square miles and is located almost entirely in Howard County (53%) and Montgomery County (46%), with the remaining drainage area (1%) located in Prince George's and Frederick Counties. The Patuxent Reservoirs' watershed boundary consists of two Maryland 8-digit watersheds: the Brighton Dam watershed, which drains into the Triadelphia Reservoir, and the Rocky Gorge Dam watershed, which drains into the T. Howard Duckett Reservoir (also referred to as Rocky Gorge Reservoir).

In 1996, the PRWPG was established to protect the long-term biological, physical, and chemical integrity of the Patuxent Reservoirs watershed. The PRWPG consists of the Policy Board and the TAC.

The Policy Board is comprised of executive and management level staff from the member agencies. The Board considers strategies and funding to address present or anticipated problems and work activities for the coming year. The TAC advises the Policy Board on issues that may affect the reservoirs and their watershed.

Since 1997, the TAC has completed an annual report for the Policy Board to summarize its accomplishments and identify funding needs to address watershed priority resource issues. This annual report provides an update of on-going efforts and those completed in 2024.

Member Agencies

- Howard County
- Howard Soil Conservation District
- Maryland-National Capital Park and Planning Commission
- Montgomery County
- Montgomery Soil Conservation District
- Prince George's County
- WSSC Water

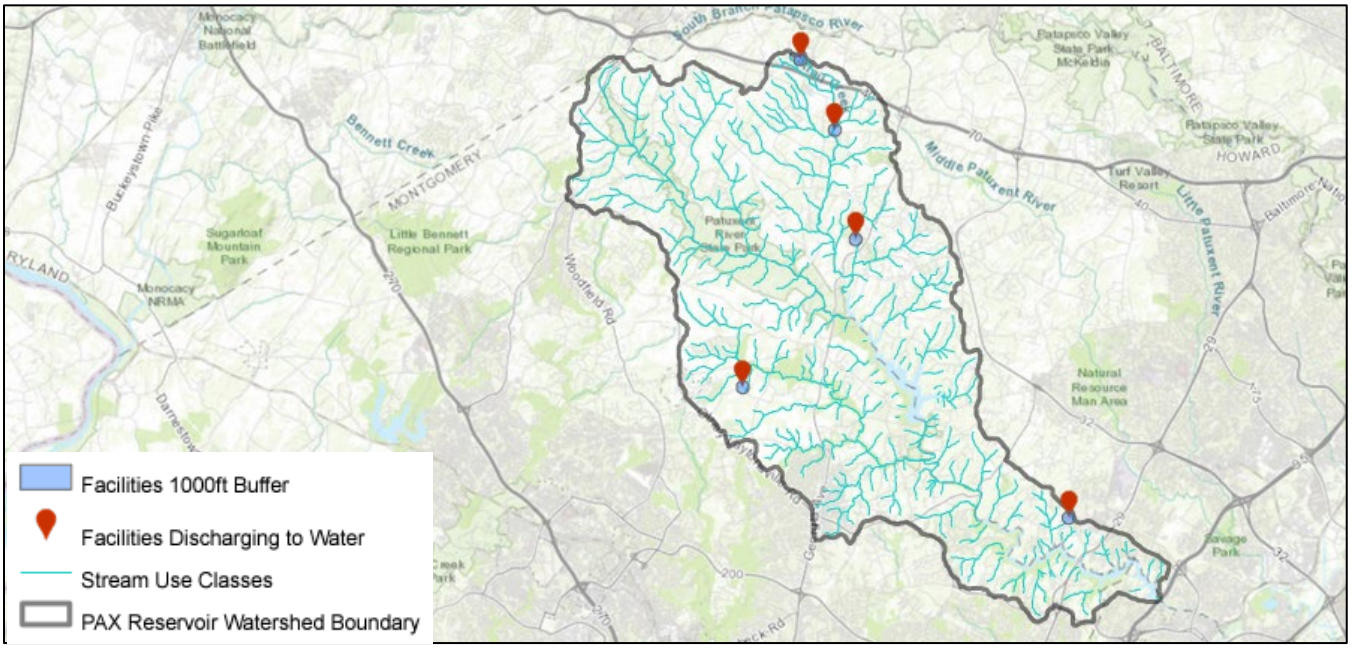
GIS Tool

Patuxent Reservoirs Watershed Protection Group GIS Tool

In 2024, the TAC deployed the Patuxent Reservoirs Watershed Protection Group GIS Tool. This GIS-based web application is housed at WSSC Water and enables TAC members to create maps, conduct analyses to track data trends in the watershed, and support more detailed modeling efforts such as the ongoing Stream Buffer Restoration Analysis. The objective was to create a watershed-wide database and geographic analysis platform that will:

- Support efforts to better understand the reservoirs and their contributing watershed, and
- Aid in developing better management options and recommendations for the Policy Board for improving the overall health and long-term protection of the reservoirs and their watershed.

The geodatabase includes a multitude of layers, such as land use, facilities discharging to water, conservation easements, etc. The following map presents an example of how the tool can be used. Using the analysis function, we created a 1,000-foot buffer around facilities that discharge to water.



The geodatabase will be periodically updated and enhanced as new data become available and new analyses are needed.

Stream Buffer Restoration Analysis

The TAC is currently conducting a GIS-based analysis on the potential for stream buffer restoration to help meet the reservoirs' TMDLs. The study will evaluate different buffer widths and types (grassed and forested) on both private and public lands. It will also identify potential stream buffer restoration sites, evaluate different implementation scenarios and timeframes for pollutant reductions towards meeting the TMDLs, and will estimate BMP implementation costs. In 2024, most of the buffer restoration scenarios that will be modeled were formulated, and a method for routing nitrogen from the Triadelphia Reservoir to the Duckett Reservoir was devised. In 2025, the TAC hopes to complete the stream buffer restoration analysis.

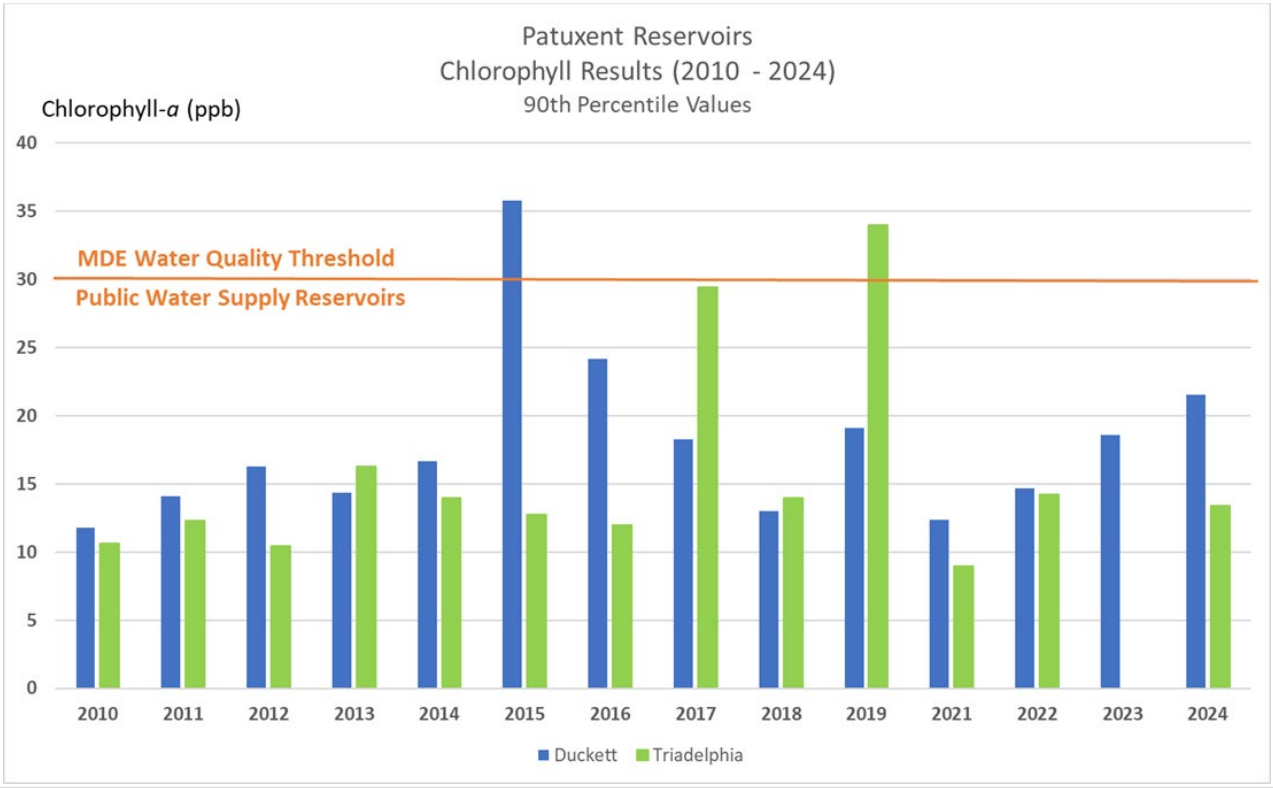
Reservoir Water Quality Monitoring

WSSC Water continues to implement its reservoir water quality monitoring program for current and long-term trend evaluation to support protection of the reservoirs and drinking water supply. The monitoring program consists of 1) collecting water samples from several locations in both reservoirs along with water quality profiles throughout the water column, 2) measuring water quality multiple times a day at each dam with a vertical profiling system, and 3) monitoring for harmful algal blooms (HABs) and toxins in both reservoirs, including recreation areas.

Reservoir Water Quality Analysis

Chlorophyll-*a* (chl-*a*) is one type of chlorophyll present in all algae, and it is often used as a surrogate for algal abundance, which serves as one indicator of reservoir water quality. For this water quality analysis, chl-*a* concentrations were compared to one of two MDE chl-*a* criteria for public water supply reservoirs: the 90th-percentile of measurements taken during the growing season may not exceed 30 µg/L.

This analysis compared results from both reservoirs with this criterion for the period 2010-2024. This criterion was exceeded once for each reservoir during this 14-year period (see figure below). Chl-*a* sampling was not conducted in 2020 due to the pandemic or from Triadelphia Reservoir in 2023 due to a dredging project. During the rehabilitation project at Brighton Dam (2017-2019), the water level of Triadelphia Reservoir was lowered to a depth well below the normal pool elevation. During 2019, algal blooms were observed in both reservoirs. The algal bloom in Triadelphia was extensive and longer lasting, which explains the elevated chl-*a* results for 2019. Also of note, the 90th percentile of chl-*a* values has increased steadily at Duckett Reservoir since 2021.

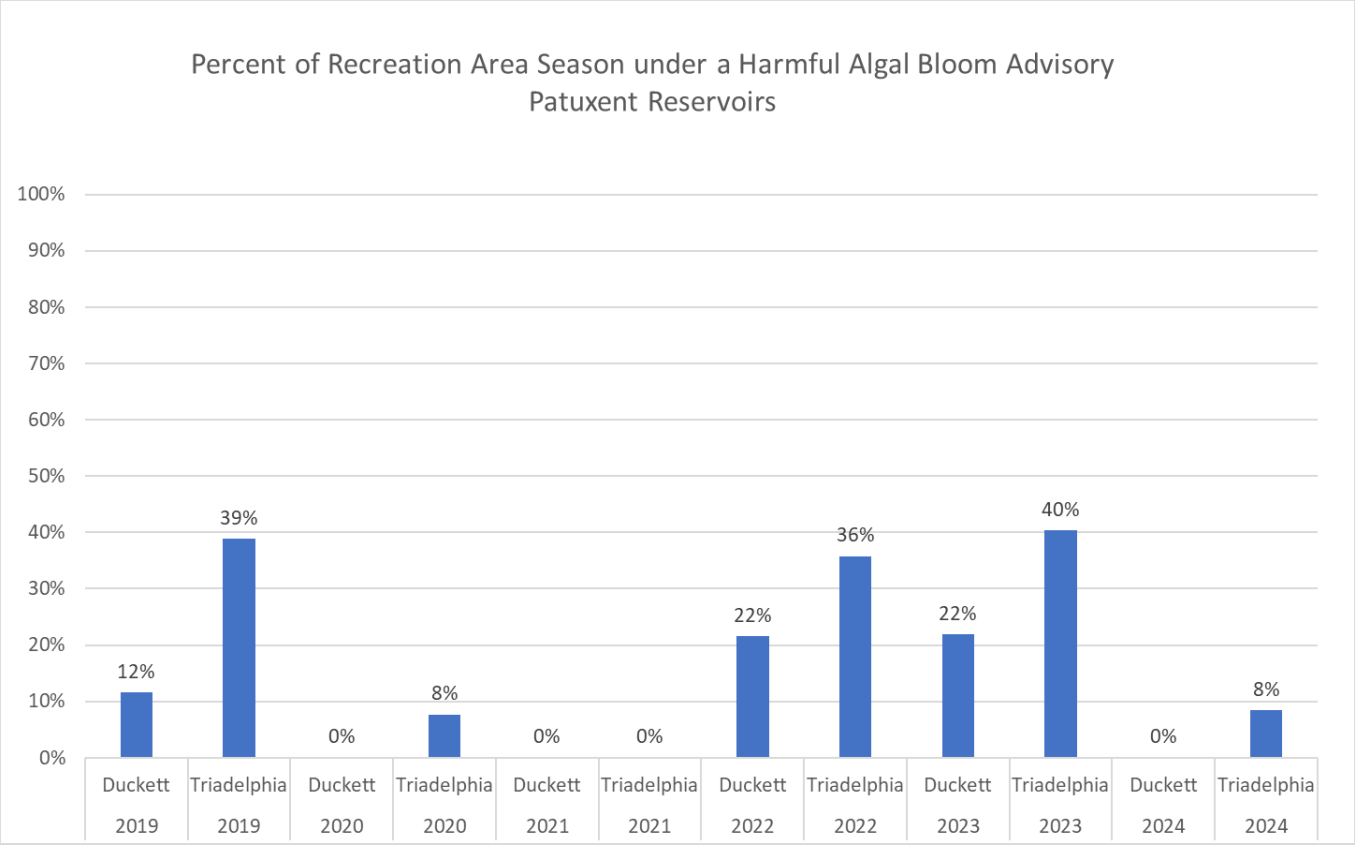


Reservoir Water Quality Monitoring

HABs Monitoring

WSSC Water continued to monitor the algal community at its public access recreation areas during 2024. This recreational monitoring effort is separate from WSSC Water's other algal monitoring efforts for drinking water purposes. Samples are collected for algae and associated algal toxins, which can proliferate during the summer months and can persist at elevated concentrations into early autumn. When this occurs, it is referred to as a harmful algal bloom or HAB because elevated algal concentrations can produce toxins and cause irritating skin reactions upon contact.

One way to assess algae's impact on recreation is to determine what percentage of the recreation season (March 15 through November) each reservoir was under a HAB advisory. During 2024, Duckett Reservoir was not under an advisory, while Triadelphia Reservoir was under an advisory for 8% of the season. All advisories continue to be initiated based solely on cell counts of cyanobacteria (or blue-green algae); no algal toxins were detected greater than their threshold values.



Winter Salt

The primary winter de-icing compound used to improve driving conditions within the Patuxent Reservoirs Watershed is composed of sodium and chloride. The current, annual average chloride concentration at the Patuxent Water Filtration Plant is about three times greater than the 1990 concentration; furthermore, the annual average sodium concentration has more than doubled since 1990 and is approaching the U.S. EPA's health advisory level for those on a sodium restricted diet. The TAC continues to address this issue by collaborating to monitor sources of these pollutants in selected streams and within the reservoirs, while advocating for reduced salt applications that still ensures the public safety.

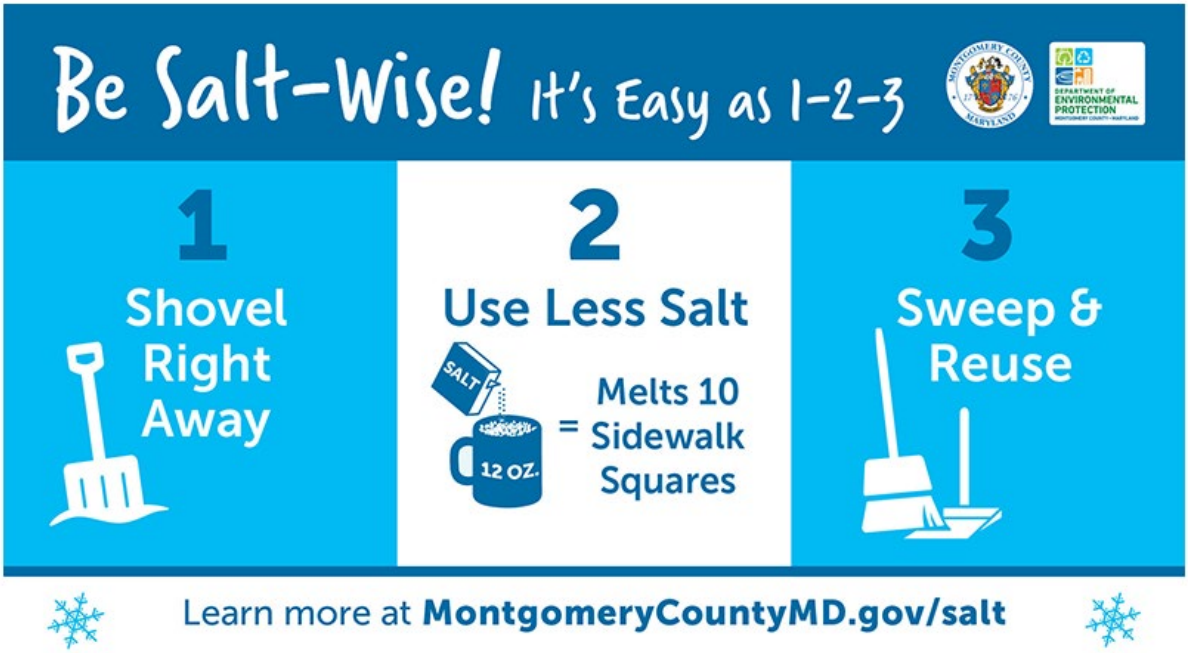
In January, WSSC Water hosted the fourth *Salt Summit*, an event created to gather local and regional experts to collaborate on how to manage salt. For this summit, there continues to be an expanding list of participants from the region and nationally focusing on technical, outreach and legislative issues related to salt management.

Special Salt Management Area Designation

In September, the Policy Board convened a mid-year meeting to discuss the TAC's request to: Designate the Patuxent Reservoirs Watershed as a Special Salt Management Area in:

- Phase 1 MS4 salt management plans in Howard, Montgomery, and Prince George's counties;
- Montgomery County DOT salt management plans; and
- WSSC-Water, Montgomery County Parks Department, and Prince George's County Department of Parks & Recreation salt application strategies and procedures.

The request was approved by the Policy Board. In October, the Policy Board sent transmittal memorandums out to all appropriate agencies.



Terrestrial Habitat

Forests provide numerous, well-documented water quality benefits, such as filtering and infiltrating runoff, stabilizing stream banks, and reducing thermal impacts to streams, as well as providing habitat for wildlife. The Counties have several programs in place that help improve the terrestrial habitat within our watershed.

Howard County

Howard County's Department of Recreation and Parks (DRP) manages both the *Stream ReLeaf* and the *Turf to Trees* programs, which plant trees on private property. Trees planted via the *Turf to Trees* program can be planted anywhere on a property, while *Stream ReLeaf* trees are planted to establish stream buffers.

In 2024, the DRP planted 1,130 trees on 12 properties in the Brighton Dam watershed and 285 trees on four properties in the Rocky Gorge Dam watershed through the Turf to Trees program. In 2023 the DRP planted 740 trees on 8 properties along 3,822 feet of stream buffer in the Brighton Dam watershed and 12 trees on one property along 150 feet of stream buffer in the Rocky Gorge Dam watershed through the Stream ReLeaf program.

Montgomery County

Montgomery County Department of Parks and Montgomery County Department of Environmental Protection manage tree planting programs. In 2024, the Maryland-National Capital Park and Planning Commission's Department of Parks planted 16.8 acres of forest and coordinated six volunteer cleanup events in the watershed, resulting in a total of 550 pounds of trash removed. The Department of Parks *Weed Warrior* program logged 394 volunteer hours in the Patuxent Reservoirs watershed, with a total of 495 trees and shrubs freed from non-native invasive vines. The Department of Environmental Protection *Tree Montgomery* program planted 234 trees within the watershed. Additionally, the Department of Parks harvested 26 deer at the Rachel Carson Park.

Prince George's County

The Department of Public Works and Transportation developed the *Right Tree Right Place* program to systematically remove and replace dead, dying, and high-risk street trees. Additionally, the program seeks to increase the urban tree canopy along County roads. Choosing the right tree for the right place safely and sustainably improves the tree canopy and transforms communities.

Stream Systems

Stream corridor management activities, such as stream channel stabilization and restoration as well as streamside BMP installation, help restore and protect the stream systems. They also improve habitat and water quality for aquatic biota and support protection of the reservoirs and water supply (i.e., minimize loss of capacity due to sedimentation).

Duckett Park Stream Restoration

In June 2024, the Prince George's County Department of the Environment (DoE) completed a stream restoration project in T.H. Duckett Park. The project area is located just east of the T. Howard Duckett Community Center, north of the intersection between Brooklyn Bridge Road and Leo James Court, in Laurel, Maryland. DoE contracted Bourn Environmental LLC to implement the stream stabilization and restoration project located on land owned by WSSC Water.

The restoration work stabilized over 1,280 linear feet of severely eroded stream channel. It raised the channel invert by between 4-6 feet, while creating a nested floodplain corridor to provide adequate flood relief and reduce future shear stresses and erosion. Woodland was cleared (1.68 acres) for construction, but 1.70 acres was planted in its place.

This project treats the runoff, from the adjacent roadways and ballfields, that then enters this unnamed tributary leading to the T. Howard Duckett Reservoir (aka Rocky Gorge) just upstream of WSSC Water's Patuxent drinking water filtration plant intake. The project is estimated to reduce sediment load to the reservoir by 323 tons/year, nitrogen load by 322 pounds (lbs)/year, and phosphorus load by 155 lbs/year. The fewer nutrients (nitrogen and phosphorus) and sediments contained in reservoir water, the easier it is for the raw water to be treated to drinking water quality by WSSC Water.

Before Restoration

After Restoration

Rural Character & Landscape

Agricultural land can adversely affect water quality due the soil-disturbing nature of farming activities and the associated impacts from sediment, nutrients, pesticides, and herbicides. The TAC Member Agencies have implemented agricultural BMP and land preservation programs that help improve the rural character and landscape within the PRW.

Soil Conservation Districts (SCDs) provide technical and financial assistance using funds from local, state, and federal programs to support farmers with the installation of agricultural BMPs. Additionally, the Maryland Department of Agriculture (MDA) conducts a verification assessment of BMPs that contribute towards the Bay TMDL goals for agriculture.

Agricultural Cost-Share Program in the PRW

The PRW Agricultural Cost Share Program was established in 1998. This cost-share program focused on implementing BMPs that would benefit nearby stream systems. In 2014, the program expanded coverage to include a broader range of BMPs to protect and improve water quality.

The Montgomery County SCD provided cost-share assistance with the implementation of four grassed waterways and two remote watering systems. Additionally, one remote water system is in the design phase. In total, the Montgomery County SCD provided $13,695 in cost-share assistance to agricultural operations for establishing 913 acres of cover crops through our local commodity cover crop program, with an additional $5,000 in cost share assistance pending. Assuming 6 - 8.5 lbs of nitrogen reduced per acre, the 913 acres of certified commodity cover crops resulted in a total reduction of 5,478 - 7,761 lbs of nitrogen within the Patuxent Reservoirs Watershed. Additionally, 1.2 acres of grassed waterways and 4 animal waste management systems (RIs) were installed by the owner/operator. The Montgomery County SCD has completed the approved design for the remote water system and has delivered the design to the operator to be completed spring/summer 2025. A total of $5,000 in local cost share assistance is allocated for this project.

The Howard SCD provided cost-share assistance with the implementation of four BMPs. The Howard SCD provided $7,843.32 in cost-share assistance for the installation of 2 watering troughs, 460 feet of livestock pipeline and 512 sq. ft. of heavy use area.

Agricultural Rented Land Survey

The TAC identified a need to engage tenants and landowners on rented agricultural land because agricultural conservation practices are less likely to be installed on rented lands. The TAC is developing a survey to ask tenants and landowners about their willingness to participate in agricultural conservation practices. This information may be used to target future implementation of agricultural conservation practices on rented lands. The TAC sent out the agricultural rented land survey in 2024 and will continue to accept surveys in 2025.

Land Preservation

In 2024, the Howard County Agricultural Land Preservation Program acquired two farms' easements in the Brighton Dam watershed, a 56-acre purchased easement and a 19.6-acre easement established through transfer of development rights.