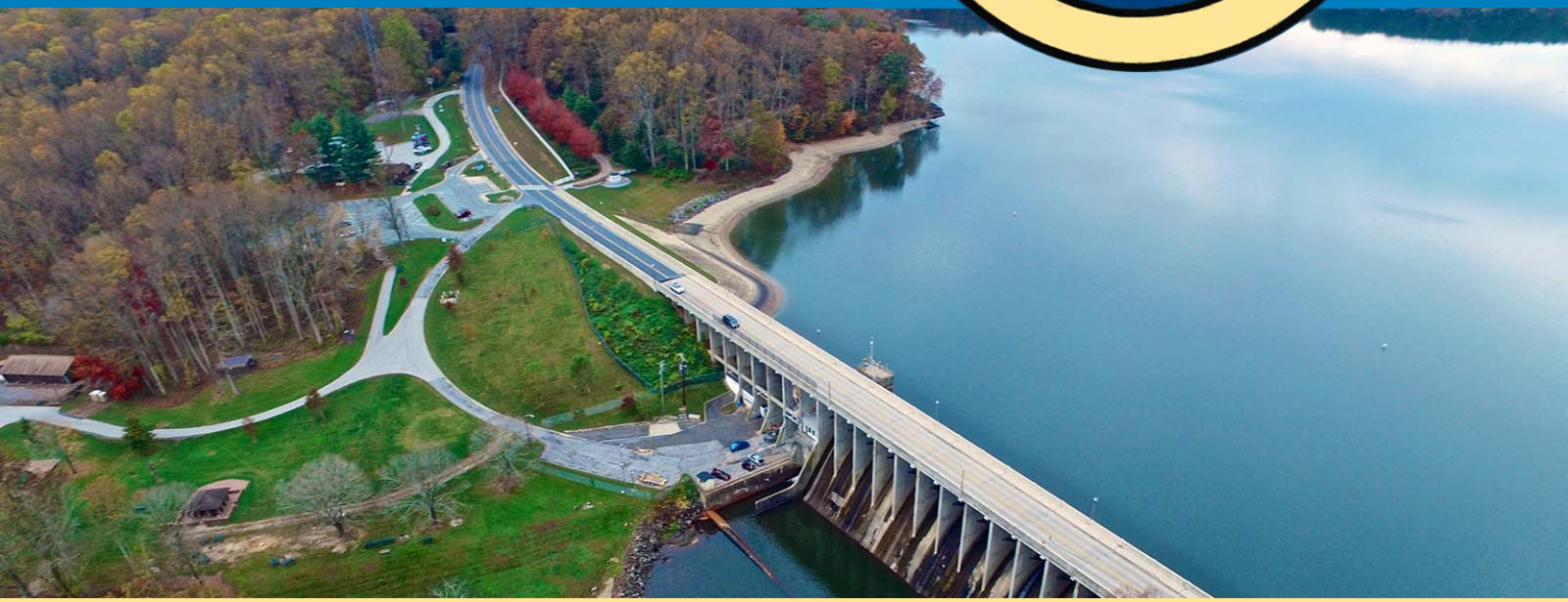
Patuxent Reservoirs Watershed Protection Group

2022 Annual Report

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



Message from the Chair

I am pleased to present, in its new format, the 2022 Annual Report of the Technical Advisory Committee (TAC). The TAC continued its ongoing efforts to protect the natural resources within the reservoirs' watershed, ultimately resulting in further protection of the drinking water supplied by WSSC Water.

The TAC priorities for 2022 included on-going efforts for the GIS geodatabase and mapping project, the stream buffer restoration analysis, salt related monitoring, and the sediment TMDL.

The GIS Mapping and Analysis tool was completed. This multi-year effort, led by Prince George's County, provides an opportunity for the TAC to analyze spatial data for the entire reservoirs' watershed for the first time. More TAC members will begin using and testing this tool during 2023 to address any concerns.

The TAC reviewed the technical memorandum that provides justification for re-categorizing the Sediment TMDL for Triadelphia Reservoir. It will be submitted during 2023 for consideration by the MDE in a future *Integrated Report of Surface Water Quality in Maryland*.

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 Steve Nelson, previous TAC coordinator, who during the coordinator transition, continued to support the TAC so that the transition was seamless, and the efforts of the TAC could be focused on the set priorities. As we look forward to the coming projects of 2023, let us not disregard the actions taken in 2022 and previous years that have propelled us forward, allowing for these future opportunities to protect and improve the Patuxent Reservoirs Watershed.

Sincerely,

Kristal McCormick

2022 Chair, Technical Advisory Committee

GIS Mapping & Analysis Tool

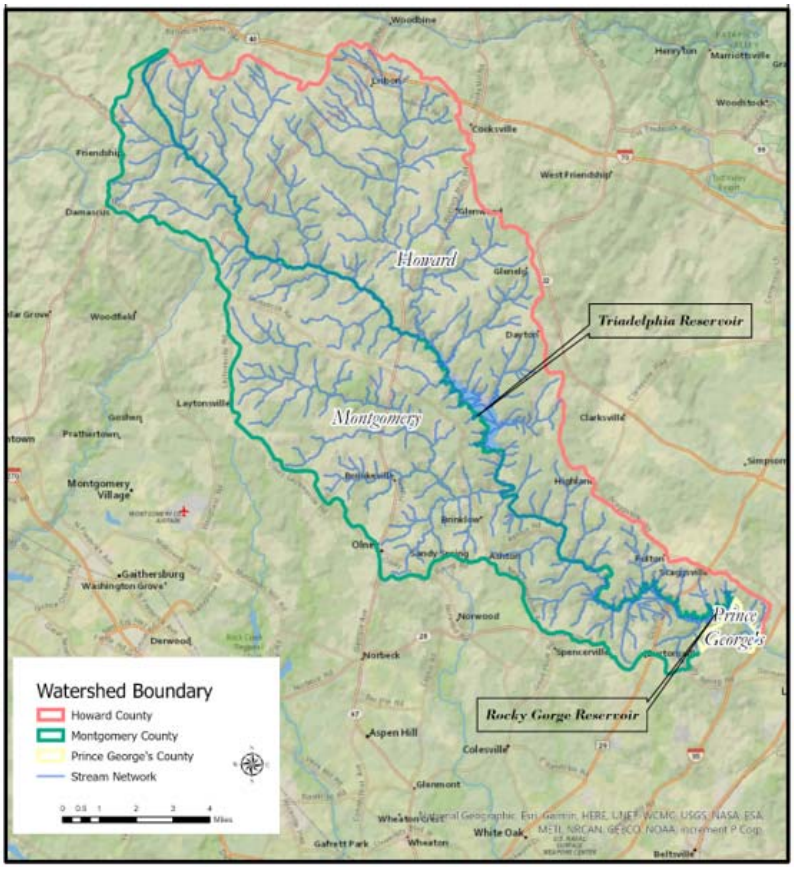
In 2022, the TAC completed the development of a web-based GIS tool that will enable TAC members to create maps, conduct analyses to track data trends in the watershed, and support more detailed modeling efforts such as the ongoing Stream Buffer Restoration Analysis. The objective was to create a watershed-wide 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.

To date, the basic data layers have been assembled and some initial maps created. The geodatabase is currently housed at WSSC Water. The web-based platform that provides users an online tool that interfaces with the data was created and is hosted by Prince George's County. The geodatabase will be periodically updated and enhanced as new data become available and analyses are needed.

Stream Buffer Restoration Analysis

Based on best management practice (BMP) cost-effectiveness information and BMP implementation opportunities in the Patuxent Reservoirs watershed, it was determined that stream buffer restoration offered the highest potential for targeting efforts to reduce pollutant loadings to the reservoirs. The TAC is currently conducting a GIS-based analysis on the potential for stream buffer restoration to meet the reservoirs' TMDLs. The study will evaluate different buffer widths and types (grassed and forested) on both private and public lands. The study will 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. To date, all the GIS data layers needed for the analysis have been assembled, and the basic analytic methodology worked out. An accurate stream hydrology layer that minimizes the inclusion of ephemeral streams was developed. Pollutant reduction factors for restored stream buffers have been compiled after consultation with MDE staff, along with estimated implementation costs per acre. In addition, initial GIS queries for the analysis have been developed. Additional data needed includes a Triadelphia Reservoir phosphorus reduction credit, which hopefully can be derived using the results of the Triadelphia and Rocky Gorge Reservoirs phosphorus analysis. A volunteer with GIS expertise will be needed to complete the study.



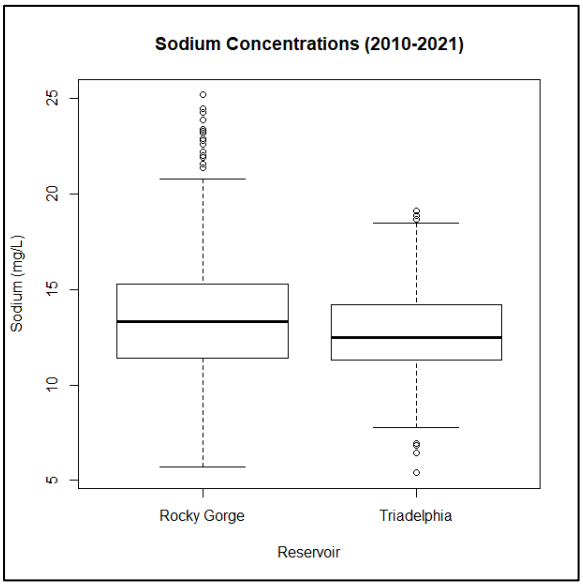
Winter Salt

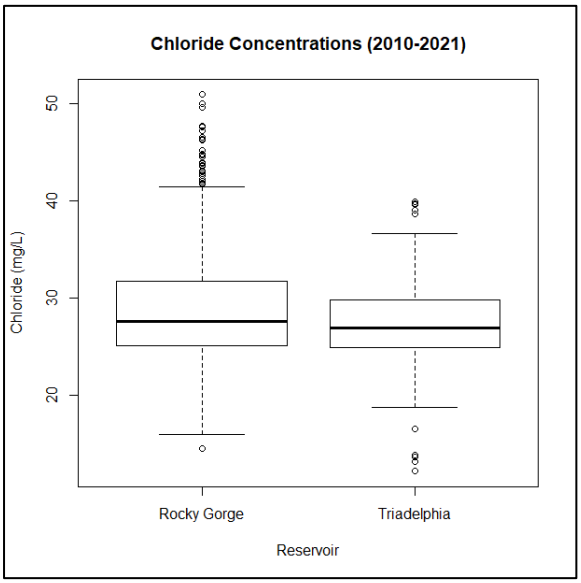
The primary winter de-icing compound used to improve driving conditions within the Patuxent Reservoirs Watershed is composed of sodium and chloride. The current, annual average chloride concentration at the Patuxent Water Filtration Plant is about three times greater than the 1990 concentration; furthermore, 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.

After a pause during the pandemic, WSSC Water hired a consultant to assist with preparing for the third *Salt Summit* (January 2023) and to help facilitate the Technical Working Group, which is one of the three workgroups that formed as a result of the first two Salt Summits. The other working groups focus on outreach and legislative issues.

Salt Content within the Patuxent Reservoirs

- Sodium and chloride concentrations have been measured approximately monthly from March through November within the reservoirs at multiple locations and depths since 2010.
- Median **sodium** concentrations for both reservoirs were similar (12-13 milligrams/liter or mg/L), while greater variability occurred within Rocky Gorge. For Rocky Gorge, the maximum value and several outliers exceeded the U.S. EPA's non-regulatory, health advisory level of 20 mg/L for those on sodium restricted diets.
- Median **chloride** concentrations for both reservoirs were also similar (27-28 mg/L), and a greater range of values occurred within Rocky Gorge.
- Minor differences in sodium and chloride concentrations were observed among monitoring locations or between surface and bottom sampling depths (figures not shown).





RESERVOIRS & WATER SUPPLY

The aim of this priority resource is to utilize raw water of the highest quality and sustainable quantity, so that the public receives a sufficient quantity of safe and high quality drinking water.

Reservoir Water Quality Monitoring

WSSC Water continued to implement its reservoir water quality monitoring program for current status 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 through the water column, 2) measuring water quality frequently at each dam with a vertical profiling system, and 3) monitoring for harmful algal blooms (HABs) in both reservoirs, including recreation areas.

Harmful Algal Bloom Monitoring

Samples are collected for a class of phytoplankton (free-floating aquatic plants) known as blue-green algae or cyanobacteria, which can proliferate during the summer months and can persist at high concentrations into early autumn. If this occurs, it is often referred to as a HAB because high concentrations of cyanobacteria can cause irritating skin reactions upon contact and potentially produce toxins.

During 2022, WSSC Water continued to monitor for HABs at its public access recreation areas. This recreational HAB monitoring effort is separate from WSSC Water's other algal toxin monitoring efforts for drinking water purposes.

- Triadelphia Reservoir – **Prolonged** Water Contact Health Advisory issued (July-Oct) based on elevated algal cell concentrations (>100,000 cells/mL). No algal toxins were detected in most samples with only one result exceeding the reporting limit at a very low concentration.
- Rocky Gorge (T. Howard Duckett) Reservoir – **Brief** Water Contact Health Advisory was also issued (Sept-Oct) based on elevated algal cell concentrations (>100,000 cells/mL). Similarly, no algal toxins were detected in most samples with a few results detected at very low concentrations.

Sediment TMDL for Triadelphia Reservoir

- A technical memorandum was completed that presents findings to support a request that the Sediment TMDL requirements have been achieved and therefore, its status should be reconsidered during the next Integrated Report for 2022-2024.

Terrestrial Habitat

The focus of this priority resource continues to be the increase, preservation and management of forested land that provides water quality benefits to the reservoirs and their tributaries. 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.

Stream Valley Buffer Reforestation

During 2022, stream valley buffer reforestation efforts in Montgomery County included:

- 1-acre tree planting project conducted by Montgomery County Department of Parks and
- 0.35 acres tree planting conducted private property owners, mostly using Reforest Montgomery coupons for purchasing trees.

In addition, the Department of Parks continues to manage approximately 16.5 reforested acres in the Hawlings River Watershed and 68 reforested acres at the Oaks Landfill site.

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 2022 the DRP planted 740 trees on five properties in the Triadelphia Reservoir watershed through the *Turf to Trees* Program. In 2022 the DRP planted 295 trees on three properties along 1,614 feet of stream buffer in the Triadelphia Reservoir watershed and 12 trees on one property along 170 feet of stream buffer in the Rocky Gorge Reservoir watershed through the *Stream ReLeaf* Program.

Stream Systems

Stream corridor management activities include stream channel stabilization and restoration, and implementing streamside BMPs, especially forested stream buffers. These activities help restore and protect the stream system, 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).

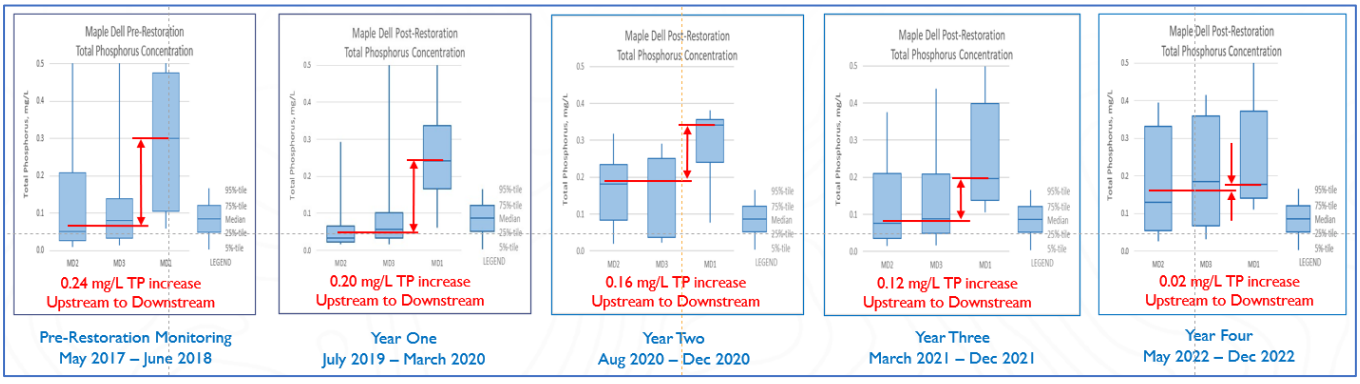
Cattail Creek Stream Restoration at Maple Dell Farm

From June 2018 - December 2019, stream restoration activities were conducted on Maple Dell Farm. The project included stream channel restoration, tree planting within the riparian easement, selective harvesting of trees to establish new pasture away from the streams, and the installation of fencing and a livestock watering system to exclude the dairy herd from the riparian easement area and restored stream.

Before restoration

After restoration

As part of the project, water quality monitoring was conducted to evaluate pre- and post-restoration pollutant concentrations and loads of nutrients and sediment. Pre-restoration monitoring (2017-2018) showed opportunities to improve water quality; nutrient and sediment concentrations downstream of the farm were greater than upstream. By the end of the monitoring project (2022), downstream phosphorus, suspended solids, and total organic carbon concentrations were similar to upstream concentrations (see phosphorus charts below for example). Moreover, biological assessments revealed rapid and sustained improvements for stream habitat and fish community and recent (2022) improvement for aquatic insect community.



Rural Character & Landscape

The aim of this priority resource is to preserve open spaces while maintaining an economically viable and environmentally protective agricultural community. Implementation items include open space and easement acquisition and increasing the implementation of agricultural BMPs.

Agricultural BMP Progress

Soil Conservation Districts (SCD) provide technical and financial assistance using funds from local, State and federal programs to support farmers with the installation of agricultural BMPs. Many BMPs were once again installed during FY22 with assistance from Howard and Montgomery SCDs. Nine BMPs were installed within the Triadelphia Reservoir watershed including almost 1,000 feet of stream fencing to exclude livestock. Thirteen BMPs were installed in the Rocky Gorge Reservoir watershed including Heavy Use Area protection to minimize erosion, livestock watering facilities (7), and nutrient management (6.8 acres). Also, about 2,500 acres of cover crops were planted to use nutrients remaining in the soil from the previous summer crop and to protect fields against wind and water erosion.

Patuxent Reservoir's Watershed Agricultural Cost-Share Program

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. During 2022, no funds were used from this funding program, but two agreements were prepared by the Howard SCD for BMPs to be installed.

Agricultural BMP Verification Assessment

The MD Department of Agriculture initiated this assessment of BMPs that contribute towards the Bay TMDL goals for agriculture.

- Assessed 67% of the BMPs in Howard County with 78% meeting design standards.
- Assessed 76% of the BMPs in Montgomery County with 77% meeting design standards.

Land Preservation

In 2022, several parcels of land were purchased by TAC stakeholders:

- The Howard County Agricultural Land Preservation Program purchased an easement on a 40.2-acre farm in the Triadelphia Reservoir watershed.
- WSSC Water purchased 6 acres of land adjacent to existing land holdings near Rocky Gorge Reservoir.

Public Awareness & Stewardship

The goal of this priority resource is to increase understanding and support for resource protection in watershed residents and resource users. The TAC agencies and other groups in the watershed continued to coordinate several public outreach and involvement initiatives during 2022.

Montgomery County

Under the Department of Parks' Weed Warrior Program, which coordinates volunteer efforts to remove invasive plants from natural areas, a total of 115.25 person-hours were logged within the Patuxent Reservoirs watershed. Weed Warriors freed 253 native trees and shrubs from non-native invasive vines. 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.

WSSC Water

- Promoted an art contest for High School students that was focused on source water protection. This was a regional contest with our water utility partners from across the DC metro area.
- Hosted groups at our watershed recreation areas to help them learn more about WSSC Water, watershed protection and water quality monitoring including:
  - AP Environmental Science students from Broadneck High School participating in a Trout in the Classroom release and Montgomery Blair High School
  - Middle school campers as part of Learning Undefeated's Young Science Explorers Program
  - Educators participating in the Chesapeake Classrooms professional development program.
  - Elementary aged students from Washington New Church School
- The Salt Summit's Outreach workgroup continues to promote the Salt Wise message across the reservoir watershed and presented on outreach efforts at the Maryland Water Monitoring Conference.

About Us

In 1996, Howard, Montgomery and Prince George's Counties, the Howard and Montgomery Soil Conservation Districts, the Maryland-National Capital Park and Planning Commission, and WSSC Water established the Patuxent Reservoirs Watershed Protection Group to protect the long-term biological, physical and chemical integrity of the Patuxent Reservoirs Watershed. This agreement established the Policy Board and the Technical Advisory Committee.

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