

The Stream Line



Greene County Soil & Water Conservation District Newsletter

Winter 2023/24

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SMIP Grants Over \$100K to Local Initiatives

As we close out Cycle 3 of the Stream Management Implementation Program (SMIP), we enthusiastically share the impactful initiatives that will be moving forward with support from this competitive cost-reimbursement grant opportunity!

Round 27 (March 2023) awarded a total of \$88,000 through the Local Flood Analysis (LFA) category. The project that received this funding was:

- **County Route 23C Culvert Replacement Design in Jewett:** \$88,000 awarded to the Greene County Highway Department
Through this project, SMIP funding will support engineering services and design for a culvert that will replace two existing culverts that convey the flow of Town House Brook as well as stormwater runoff under County Route 23C. The upsizing of these culverts addresses recommendations in the Town of Jewett's LFA that was completed in 2022.

Round 28 (September 2023) awarded a total of \$14,441 through the Education and Outreach and Planning and Assessment categories. The two projects that received this funding were:

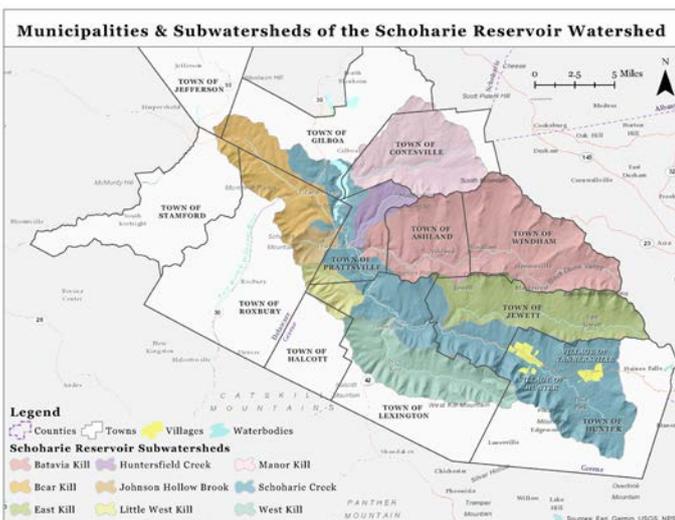
- **Schoharie Reservoir Paddling Program:** \$4,478 awarded to the Education & Outreach Subcommittee of the Schoharie Watershed Advisory Committee
Through this project, SMIP funding will support the implementation of a kayaking program at the Schoharie Reservoir. This program will provide education while engaging the Watershed community in outdoor recreation.
- **Prattsville Streambank Willow-Knotweed Pilot Project:** \$9,963 awarded to the Media Collective
Through this project, SMIP funding will support the implementation of a project that is designed to address the ecological degradation caused by invasive Japanese knotweed while simultaneously promoting the rejuvenation of native willow along a scenic stretch of Schoharie Creek.

Established in 2008, the SMIP is administered through the Schoharie Watershed Stream Management Program (SWSMP) at GCSWCD, in partnership with the New York City Department of Environmental Protection (DEP).

The SMIP operates on a 5-year cycle and offers funding twice a year to implement projects, programs, or

management efforts that serve to protect water quality within the Schoharie Reservoir watershed (Watershed). Funding is offered under the following categories: Education & Outreach, Highway & Infrastructure, Stream Restoration, Habitat & Recreation, Planning & Assessment, and Local Flood Analysis. Currently in Cycle 3, funds remain in all but the Highway & Infrastructure category, and there is very limited funding in the Stream Restoration category.

To date, 122 SMIP grants have been awarded – bringing over \$5.5 million dollars to the Mountaintop's government agencies, individual property owners, schools, and 501(c)(3) organizations in support of flood resilience, water resource improvements, and watershed-related programming. Applications are due by March 15th and September 15th every year.



Erosion Monitoring for Watershed Resilience



BEMS project team conducting a topographic survey of the stream cross section using a Leica total station.



BEMS project team processing sediment for a bar sample.

Taking advantage of some of the more forgiving weather offered during the 2023 field season, Schoharie Watershed Stream Management Program (SWSMP) staff at GCSWCD worked with the Watershed Conservation Corps and other program partners to tackle the task of conducting a comprehensive Bank Erosion Monitoring Study (BEMS) within the Schoharie Reservoir watershed. The study brought the crew to sixteen sites around Greene County and the larger Watershed. All study sites had previously been identified as locations where significant streambank erosion warranted further monitoring. Twelve of these sites were identified during Stream Feature Inventories (SFIs) and other watershed assessments that were completed between 2020 and 2022; and included sections of the Bear Kill, Johnson Hollow Brook, and Manor Kill. The remaining four BEMS sites were identified by the SWSMP as locations for potential treatment projects within the next 4-5 years. These included stretches along the East Kill, Schoharie Creek, and West Kill.

The BEMS included extensive assessments and topographic surveys that are used to characterize the morphology (size, shape, and structure) of the eroding hillslope and

streambed. Following standardized bank erosion assessment protocols developed by esteemed hydrologist, Dave Rosgen, the team completed:

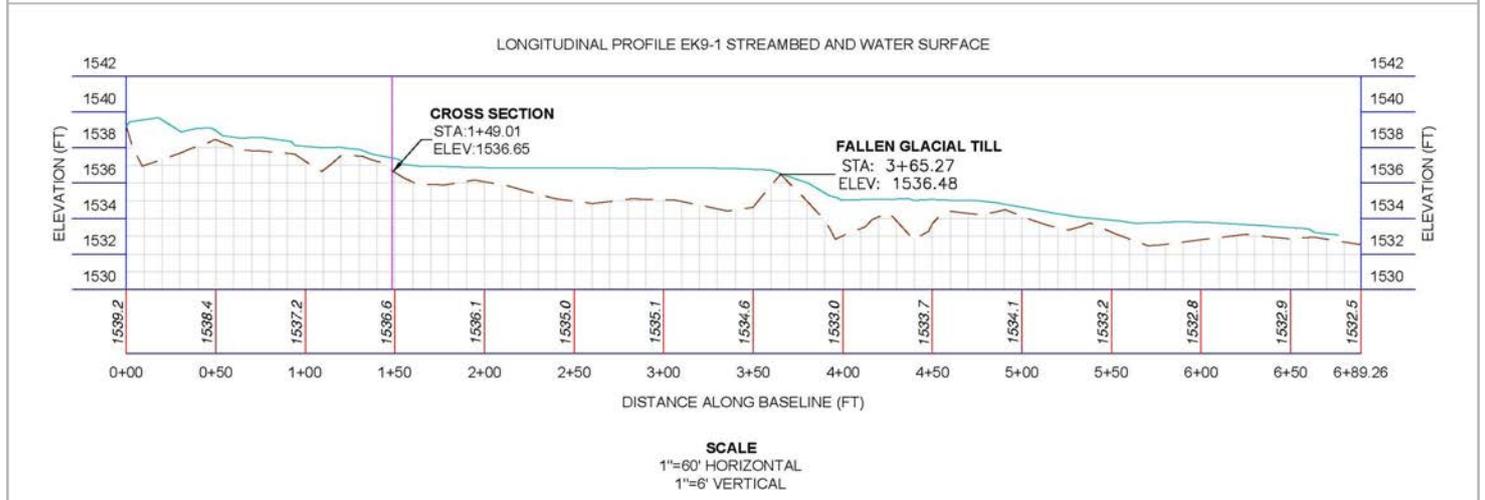
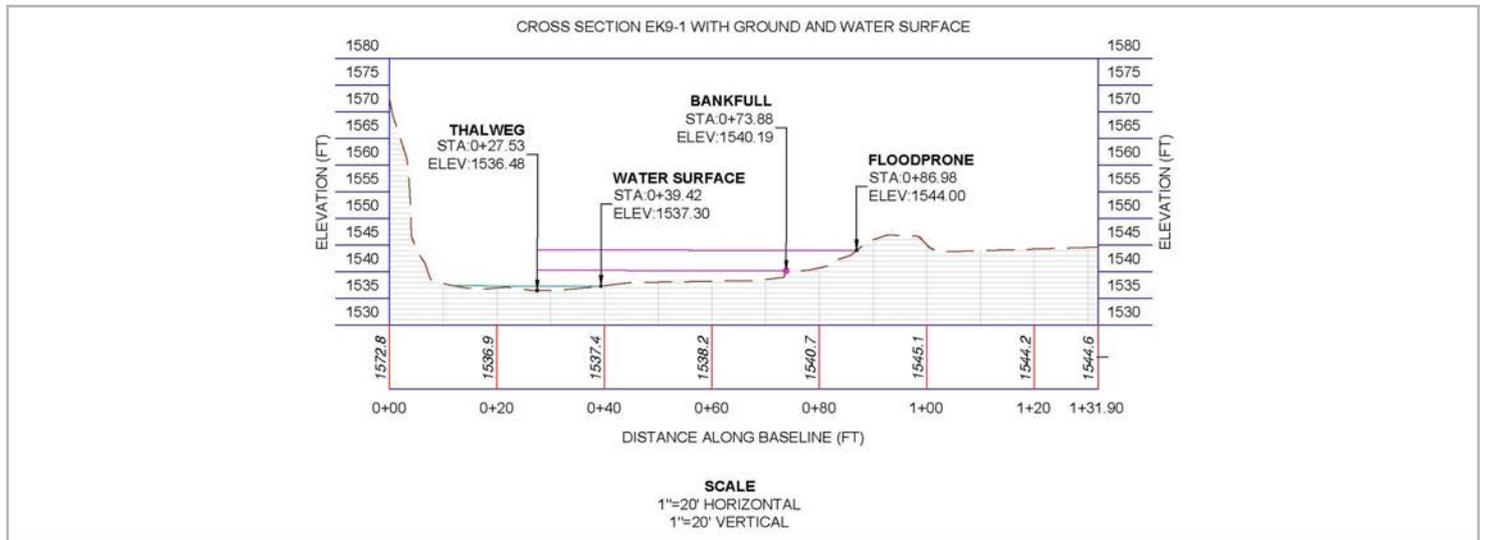
- **Longitudinal profile surveys:** topographic surveys conducted along the length of a stream (from upstream to downstream) that capture the slope of the streambed and water surface.
- **Cross-section surveys:** topographic surveys conducted across the stream channel (from one bank to the other) that produce graphical representations of channel dimensions (i.e. shape, width, and depth).
- **Pebble counts:** part of the sediment analysis; the method of counting and measuring representative samples of streambed material (i.e. gravel, cobbles, and boulders).
- **Bar samples:** part of the sediment analysis; the method of determining the composition (size and weight of particles) of the underlying streambed.
- **Photo monitoring:** photographic documentation of representative points throughout the study area that is accompanied by GPS data

collection to ensure consistency in future monitoring efforts.

- **Assessments of stream condition and departure from potential:** an assessment that includes a series of desktop analyses and the completion of worksheets that have been developed by Dave Rosgen.

The evaluations completed at BEMS sites are part the SWSMP's continued planning and implementation efforts in the Watershed. The information gathered at each site will be used to assign severity ratings to the observed conditions, characterize the streambank erosion hazards, and help prioritize stream restoration efforts in the future.

The SWSMP at GCSWCD is the stream management program for the Schoharie Reservoir watershed and is one of four reservoir-basin stream management teams working within the New York City Catskill/Delaware Water Supply watershed. The SWSMP works collaboratively with local municipalities and landowners to provide these services for local communities, while also providing for the protection of the public drinking water supply that reaches a larger population within New York State.



The graphs presented above are real-life examples of how we visualize the topographic data that are collected at each BEMS site. The dashed line shows us the elevation of the stream bed, while the blue line shows us the elevation of the water surface. Additional points of interest such as the thalweg (deepest point), bankfull (elevation at which the water has filled the primary channel) height, and large blocks of fallen stream bank material are also included.

Turbidity Reduction on the West Kill

Initially observed in the 2004 West Kill Stream Feature Inventory (SFI), a major eroding bank on the West Kill - in the Town of Lexington - was established as a Bank Erosion Monitoring Site in 2005. Then, riprap that had been placed at the base of the 80 ft high hillslope was washed out from the severe flooding of Tropical Storm Irene in 2011. This allowed a headcut (an erosional feature that presents as an abrupt vertical drop in the stream bed) to move up the channel leading to increased erosion into glacial till and clay deposits in the streambed and bank. A second SFI in 2018 identified continued erosion and that the energy of the flowing water was being directed toward the toe of the hillslope, destabilizing the ground above it and contributing to its failure.

The design process began in 2020 with a goal to halt channel incision (downcutting) and reduce turbidity (cloudiness of the water created by suspended clay particles) contribution from the hillslope failure. The repair length was approximately 750 linear feet and included channel re-alignment, construction of a stable floodplain bench along the failing slope, installation of grade control to halt incision and rock revetment to armor the stream bank and base of hillslope. In-stream and site construction were completed this past August and bioengineering measures were completed in November.



Shoreline Assessments to Support Village LWRP



A view of developed areas along the Catskill Creek shoreline, looking upstream from the Bridge St. bridge.

In 2023, GCSWCD set out to assist the Village of Catskill with an assessment of the conditions of the shorelines of the Catskill Creek within the Village. Prior to beginning the fieldwork portion of the project, a desktop analysis of land cover within the Creek's watershed was conducted using the 2021 National Land Cover Database (NLCD). This analysis showed that 8% of the entire 414 mi² Catskill Creek watershed is classified as "developed" (areas with constructed materials and impervious surfaces). 34% of this developed land lies within the Village of Catskill with much of that development being located on the shores of the Catskill Creek near its confluence with the Hudson River.

In late August, the project team took to the Creek to collect relevant data from the northwestern limits of the Village (approximately a quarter mile upstream of the 9W bridge), down to the mouth of the Creek. The field evaluation lasted four days using both motorized and non-motorized boats. During this time, natural and manmade features that influence the stability of the shoreline were documented. Natural features included any shoreline erosion and visible bedrock exposures in the

streambed or along the stream banks. Manmade features included engineered shoreline stabilization measures.

Historically, three forms of shoreline stabilization measures have been used to address shoreline erosion along the Catskill Creek in the Village of Catskill, including bulkheads, revetments, and abutments. In this assessment, these measures have been defined as follows:

- Bulkhead – a vertical retaining wall that is installed parallel to the shoreline and intended to hold soil in place.

Note: within the project extent, bulkheads composed of poured concrete, log cribbing, sheet piling, or other materials were observed.

- Revetment – material that is installed to lay over the slope of a shoreline and intended to protect the slope from erosion.

Note: within the project extent, revetment structures were primarily composed of rip-rap; however, a unique application of concrete slabs, as well as bioengineering

techniques have also been implemented.

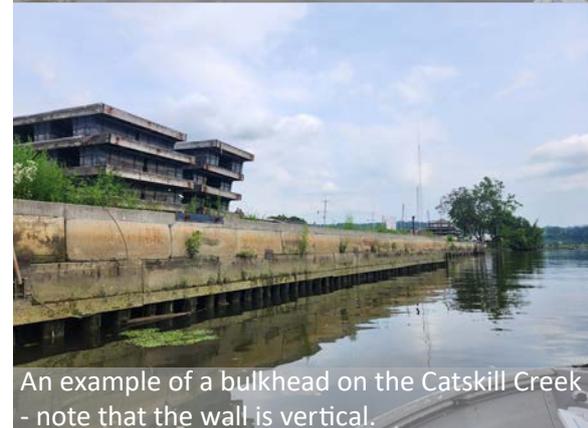
- Abutment – a structure constructed at either end of a bridge crossing that is intended to retain the embankment, and to carry the load from the span of the bridge to the foundation.

Note: within the project extent, all abutments were composed of mortared stone.

Currently, shoreline protection measures are present along approximately 7,613 linear feet – or 70% - of the Creek within the project extent. Of this total, these modifications appear along 5,928 linear feet of the left shoreline and 1,685 of the right shoreline. Bulkheads were present along 4,176 feet of the modified shoreline (55%) and are the dominant stabilization technique. Revetment has been applied to 3,278 linear feet (43%), and abutments represent 159 linear feet (2%).



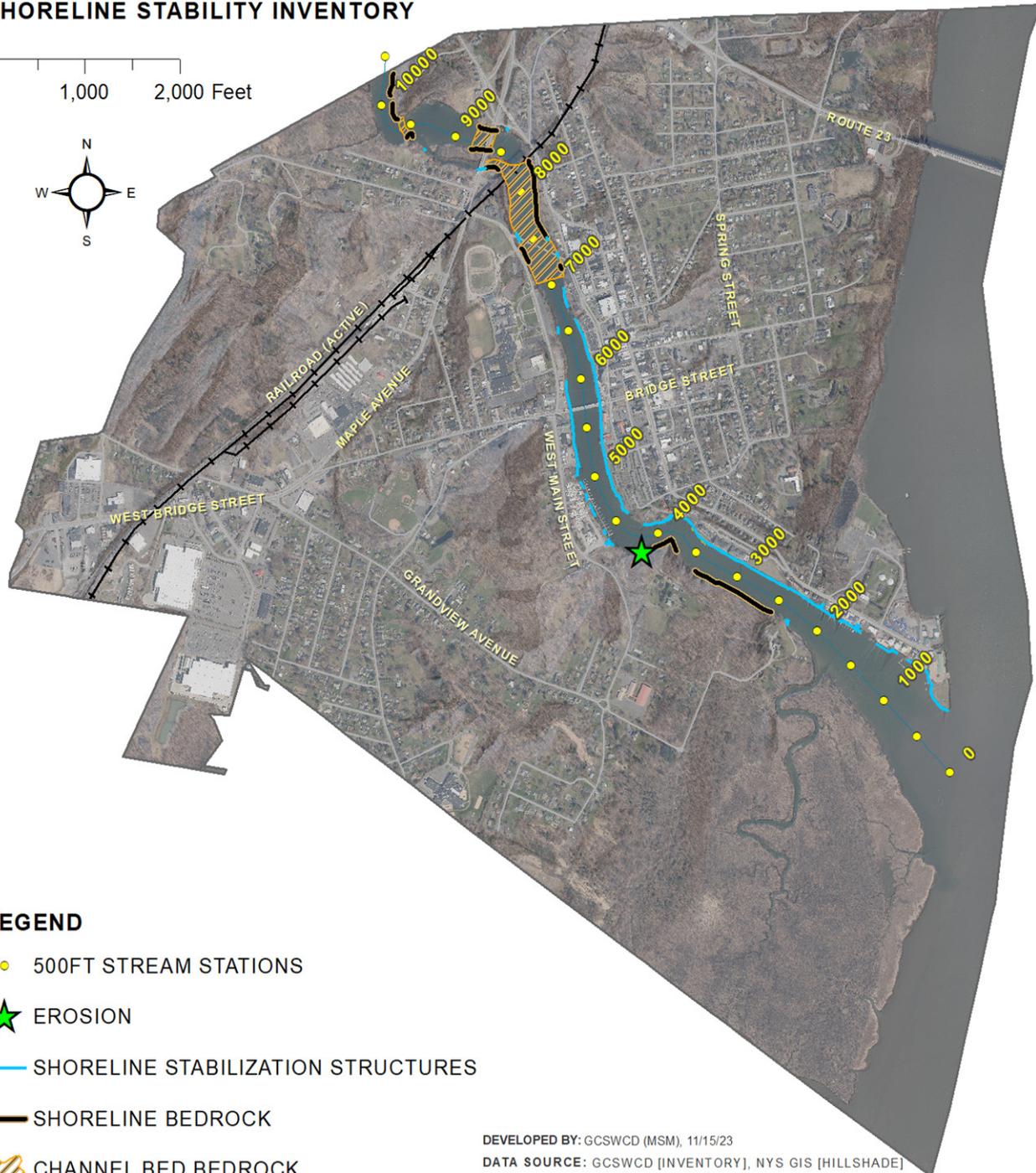
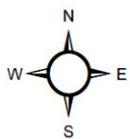
An example of revetment on the Catskill Creek - note that the stone follows the slope of the shoreline down toward the bed of the Creek.



An example of a bulkhead on the Catskill Creek - note that the wall is vertical.

SHORELINE STABILITY INVENTORY

0 1,000 2,000 Feet



LEGEND

- 500FT STREAM STATIONS
- ★ EROSION
- SHORELINE STABILIZATION STRUCTURES
- SHORELINE BEDROCK
- CHANNEL BED BEDROCK

DEVELOPED BY: GCSWCD (MSM), 11/15/23
 DATA SOURCE: GCSWCD [INVENTORY], NYS GIS [HILLSHADE]
 DISCLAIMER: GIS DATA ARE APPROXIMATE ACCORDING TO THEIR SCALE AND RESOLUTION.

Spatial distribution of the bedrock, erosion, and shoreline stability structures observed during the 2023 field evaluation.

The functional and structural condition of each structure was evaluated. The functional assessment provides information about the ability for the structure to protect the shoreline from hydraulic erosion, while the structural assessment speaks to the integrity and potential for impending degradation of the bulkhead, revetment, or abutment. An overall status of protective, threatened, or non-functional was assigned to each structure. Based on the conditions observed during the field evaluation, it was determined that 716 linear feet – or 9% – of shoreline modification structures were not functional. Approximately 3,080 linear feet – or 40% – of all installed structures were considered threatened based on structural and functional condition, along with the presence – or lack – of scour protection (armoring at the toe of the shoreline that provides protection from flowing water).

This project was identified as an action item in the Village of Catskill’s Local Waterfront Revitalization Program (LWRP) Master Plan. The LWRP serves as the Office of Planning and Development’s primary program for working in partnership with waterfront communities across New York State to address local and regional waterway issues. After the shoreline evaluation was completed, an inventory report was developed by the District. The next steps in the project, as mentioned in the Village’s LWRP Master Plan, include producing repair or replacement scenarios for non-functional or threatened structures, coordinating with regulatory agencies to go through the permitting process, and determining the need for management of the shoreline.



Planning Board Overview workshop at the Schoharie Watershed Summit.



Community members searching for fungi at the Mountain Top BioBlitz mushroom walk.



Our youngest planting day volunteer helping his dad, GCSWCD District Technician, Brandon Terrill, transport materials around the planting site.



Arm-of-the-Sea Theater performs *Riparian Rhapsody* at the Hunter Elementary School.

SWM's Strong Return

Following a brief hiatus, we welcomed the return of Schoharie Watershed Month (SWM) back in May. The festivities included the:

- Watershed Wednesdays Webinar Series – a weekly virtual program featuring a variety of speakers on the following range of topics:
 - » *The Hidden Native History of the Catskill Mountains* with Justin Wexler of Wild Hudson Valley
 - » *What Could Stream Management in the Catskills Look Like in 50 Years?* with Mark Vian, Restoration Ecologist
 - » *Reading the Forested Landscape* with Tom Wessels, Terrestrial Ecologist
 - » *Mental Health in the Age of Compounding Disasters* with Andrew O'Meara of Institute for Disaster Mental Health
 - » *Understanding the Impact of Climate Change on Forests: Tools You Can Use* with Danielle Shannon of the Northern Forests Climate Hub
- Schoharie Watershed Summit - a one-day conference that serves as a forum that brings a diverse set of Watershed stakeholders together to network, learn from, and share interests with one another.
- Mountain Top BioBlitz - a biodiversity hunt at the Mountain Top Arboretum that provided fun for the whole family by offering the opportunity to connect with the environment and local community. The BioBlitz was a full day of presentations and walks led by environmental professionals where attendees were encouraged to document all plants, animals, and fungi they encountered.
- Arm-of-the-Sea Theater's performance of *A Riparian Rhapsody: How the Forest Sings to the Stream* – a puppet extravaganza that dives into Catskill ecology to reveal the intricate interactions between forests and streams, and lyrically makes the case for protective streamside buffer zones.
- Volunteer Tree Planting – a day of planting over 400 trees along a stretch of the Bear Kill. Volunteers had the opportunity to work with GCSWCD staff to learn proper tree planting techniques, gather with community, and reflect on the importance of riparian buffers while making a difference.

SWM is a month-long series of events that celebrate and raise awareness of the waterways that flow across the Schoharie Basin, as well as the 315 square miles of land that feed them. All land on Earth is part of a watershed, and how we choose to use that land impacts the health of our water. To that end, the series offers a diverse range of experiences that will help participants gain a more holistic understanding of the role they play in the health of this living resource. Stay tuned to learn about the events we have in store for SWM 2024!

MFRBs Offer Diverse Range of Benefits

Among the many exciting projects completed by the Catskill Streams Buffer Initiative (CSBI) at GCSWCD this past fall was the installation of a multifunctional riparian buffer (MFRB) on the Schoharie Creek.

As with all riparian restoration plantings, MFRBs support stream health and water quality by:

- controlling water temperature by providing shade,
- improving aquatic habitat by contributing organic matter,
- strengthening streambank materials with their dense, deep networks of roots,
- reducing erosion through protection offered by the above-ground plant material, and
- creating pollinator and wildlife habitat.

Many MFRBs include native trees and shrubs that produce native edible fruit and nuts, as well as flowers that provide pollen and nectar, and therefore provide an even greater variety of ecosystem services. In designing these projects, landowner goals and conservation objectives can both be addressed.

Another notable feature of this project was the incorporation of three strategies to minimize deer browse: tree tubes, temporary fencing, and planting taller containerized trees that are already above the browse line (the height at which the lower branches of trees can be browsed by local wildlife). We will now monitor tree growth annually to determine the success of these efforts.



GCSWCD staff working together to plant over 350 plants at the MFRB.



One of the newly installed 30'x40' hoop houses, with some of the freshly-potted plugs.

New Shelters for Plant Growth

Improvements to GCSWCD's Plant Material Center this year included the installation of three 30'x40' hoop houses. Despite the relatively simple design, hoop greenhouses offer significant benefits to young plants including protection from adverse weather conditions and enhanced temperature regulation. The new shelters are currently holding over 5,000 native tree and shrub plugs that will eventually be used in our restoration efforts.

Plant "plugs" are small seedlings that are grown in large quantities and started in trays. These plugs come from the Greenbelt Native Plant Center – a facility of the NYC Dept. of Parks & Recreation on Staten Island. Through funding from NYCDEP, this 13-acre greenhouse, nursery, and seed bank propagates native seed harvested from the Catskills for the CSBI program.

A Warm Thank You to Adrienne

Meet Adrienne Thackery, the Student Conservation Association (SCA) member who joined us as our Stream Stewardship Assistant intern for the 2023 term. Adrienne came to us from Wofford College in Spartanburg, South Carolina where she graduated with a Bachelor of Science in Environmental Studies. During her term, she organized an Earth Day volunteer potting up event, mapped over 1,000 acres of the Schoharie Reservoir watershed, worked on six CSBI planting projects, and helped conduct nine of the Bank Erosion Monitoring Site studies.

Before leaving for her next SCA internship as a forest technician at Piedmont National Wildlife Refuge in SC, Adrienne said, "It's been a dream to have a job where I can stand in creeks, get my hands in the dirt, and look at mountains all day! I am proud of the work I have done with streams in the Schoharie Reservoir watershed, and to have contributed to their conservation. I am thankful for all that my colleagues and the Catskills landscape have taught me."

Thank you for everything, Adrienne!



Adrienne with two thumbs up at the Earth Day event that she organized.

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For this and past issues on the web,
scan below:



Upcoming Events

January 20, 2024: Streamside Snowshoe Stroll
at Bearpen Mountain Sports

May 2024: Schoharie Watershed Month -
Stay tuned for announcements

District Reminders

•Agricultural Assistance•

GCSWCD has a renewed Agriculture program, and are currently looking to enroll farms in the AEM Program and provide assistance as needed. The goal is to be able to assess farms in the county and link them to potential funding sources to make improvements. The link to the program can be found here: <https://agriculture.ny.gov/soil-and-water/agricultural-environmental-management>

For more information, please call: (518) 589-6871 or email alex@gcswcd.com

•Classroom Visits•

GCSWCD is committed to providing educational programs that raise awareness about our local watersheds. To that end, GCSWCD staff are available to provide free classroom or after-school visits to schools within Greene County and the Schoharie Reservoir watershed.

We have three scientific models available for demonstration: the Augmented Reality Sandbox, EnviroScape Watershed, and Ward's Science Stormwater Floodplain models. Programs can be designed to suit class needs and can be adapted for all students, grades K-12.

To schedule a visit, please call (518) 622-3620 or email amanda@gcswcd.com

•Funding Opportunity•

GCSWCD and the Schoharie Watershed Advisory Committee (SWAC), in conjunction with the NYC DEP, are seeking qualified applications for the Stream Management Implementation Program (SMIP). The SMIP is a reimbursement-based grant opportunity that offers funding to implement projects and programs that serve to protect water quality within the Schoharie Reservoir watershed.

Applications are due March 15th! All applicants are encouraged to contact SWSMP staff to discuss project ideas prior to submission. For more information visit: www.gcswcd.com/swp/smp/smip or email smip@gcswcd.com or (518) 622-3620.

•Restored Buffers•

Landowners with streamside property located within the Schoharie Reservoir watershed can request a site visit to have a streamside assessment and learn more about restoration opportunities through the Catskill Streams Buffer Initiative (CSBI). Participants of this program work with GCSWCD to develop a planting plan to enhance or restore their riparian buffer with native trees and flowering shrubs along the stream to improve wildlife habitat and help protect streambanks from erosion during future storm events. For more information visit: www.gcswcd.com/csbi or email laura@gcswcd.com