ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM
ESOPUS Creek

PUBLISHED BY CORNELL COOPERATIVE EXTENSION ULSTER COUNTY

Esopus • Birch • Bushnellsville • Fox Hollow • Peck Hollow • Broadstreet Hollow • Woodland Valley • Stony Clove • Beaver Kill • Little Beaver Kill • Traver Hollow • Bushkill

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A circle of water at the base of Panther Mountain formed by the Esopus and Woodland Valley creeks. Illustration provided by Evan Pritchard.

## **Ashokan Watershed Conference Recap**

In case you missed it...

The theme of this year's Ashokan Watershed Conference was "Learn Your Watershed Land." The Ashokan Watershed Stream Management Program brought together 12 experts in land and stream management for a day and a half of talks and workshops aimed at sharing information with municipal leaders and landowners on how to steward this special landscape. All the proceedings from the conference are now available on the Ashokan Watershed Conference website and below you will find some highlights.

It began on Friday, July 28th with a 4-hour training for local floodplain administrators and code enforcement officers who are tasked with the highly detailed work of enforcing both building code and floodplain regulations. It is attention to these details that helps to build community resilience to floods. Did you know it only takes three feet of water surrounding a house to collapse basement foundation walls? More than 20 local floodplain managers received training in mitigation practices for building flood resilience in their communities.



Saturday July 29th was a day for landowners to learn about best practices and resources available for managing their land and streams. AWSMP's Tim Koch and Adam Doan started the day with an Introduction to the Wild Streams of the Ashokan, the waterways that supply the reservoir and the ultimate source of nature's water-based services available to local landowners. AWSMP's Bobby Taylor, Matt Savatgy, and Heidi Emrich presented on riparian buffer assistance, outdoor youth education trends, and understanding flood risk, respectively. A surprising statistic Heidi shared is that a home within the 1% annual chance flood zone ("100year floodplain") has at least a 26% chance of flooding over a 30-year mortgage period. As climate change increases the frequency and severity of intense storms, that is expected to increase to a 71% chance in coming decades.

**Fall 2023** 

Jason Merwin, Executive Director of the Catskill Watershed Corporation, detailed some of the funding available to residents including for tank anchoring and septic system replacement. Over 6,500 septic systems have been repaired or replaced with assistance from this program! More than 1,000 of those have been in the Ashokan Watershed towns of Olive and Shandaken. Septic system upkeep and tank anchoring both protect pollutants from reaching local waterways.

The Cornell Master Gardener Program is a wellknown resource for home gardeners, but did you know Cornell also implements a Master Forest Owner (MFO) program? Shane Stevens, Natural Resource Program Coordinator with CCE Columbia-Greene and Greg Clarke, MFO *Cont. on page 2* 

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volunteer, educated attendees on what the MFO program can do for woodlot owners and how people can be trained and certified as MFO volunteers. Over 100 experienced and highly motivated MFO volunteers are ready to assist neighbor woodland owners with information for managing their forests. MFOs assist with objectives for sawtimber, wildlife management, invasive species, agroforestry, forest ecology and more.

Some readers may remember the flood of March 22, 1980. Lifelong Shandaken resident and former AWSMP Environmental Planner Aaron Bennett certainly does, as well as every flood since! New York State has experienced most of its 10 wettest years since 1970 and because of its topography, the Catskills are a bullseye for the highest precipitation in the state. Aaron's presentation is full of photos and offers tips for people living near streams that inevitably flood, advice that he developed through hard experience.

The day ended with a keynote address by Evan Pritchard, founder of the Center for Algonguin Culture. The Ashokan Reservoir watershed is the ancestral home of the Algonguin-speaking Lenni Lenape people. Evan shared the native etymology of local place names like Esopus, Peekamoose, and the story of Winnisook, the "Big Indian." Evan's talk also focused on the sacredness of springs and groundwater seeps that form the beginnings of rivers. The slopes of Panther Mountain in Shandaken are home to no less than seven such "sweetwater" springs. Additionally, the mountain is surrounded by a near perfect circle of water formed by the Esopus and Woodland Valley creeks, another sacred symbol and vet another reason for reverence of the lands and waters of the Ashokan watershed.

To learn more from the presentations, visit the Ashokan Watershed Conference website and click on the presentation tabs: <u>https://ashokanstreams.org/</u><u>ashokan-watershed-conference/</u>

#### Is Panther Mountain's shape the result of a meteor strike?

Many place names in the Ashokan Reservoir watershed and are based on native words. Does the naming of Panther Mountain suggest the Esopus Munsee (Lenape) linked Panther Mountain with a celestial event like a meteor strike? It's an intriguing guestion that Evan Pritchard, Director of the Center for Algonquin Culture, asked in his presentation at the recent Ashokan Watershed Conference. Pritchard said the Munsee word 'mamin-da-a-see' means three things: comet, panther, and spirit of war; and in effect calls a comet a "panther" because of its long, golden tail. (The name 'Tecumseh' means the same thing in Shawnee). Pritchard said it's possible that whoever named the mountain may have known about the Munsee nickname.

proposes that a large meteor struck the earth creating a crater that eventually was buried by millions of years of river sediment deposited in the late Devonian, around 375-380 million years ago. Later mountain uplifting events elevated the Catskill terrain and millions of years of streams and glaciers carved this uplifted terrain into mountains.

There are a few lines of evidence to support this theory. The circular drainage pattern formed by upper Esopus Creek and Woodland Creek may be associated with densely fractured bedrock observed in the Esopus headwaters, suggesting the presence of a buried meteor crater rim forming a zone of weakness. As the rock was uplifted, a hypothetical crater rim zone would have fractured more



The view from Giant Ledge on Panther Mountain. Photo by Dani White.

Some geologists have proposed an origin story for the unique circular drainage around the base of Panther Mountain that is linked to a meteor strike. In a 1994 paper published in the *Journal of Northeastern Geology*, Dr. Yngvar Isachson and others proposed the hypothesis that an ancient meteor impact may explain the feature. The impact would have occurred during the Devonian era, a geologic period between about 419 million and 359 million years ago. The rock that composes the Catskill Mountains is made of sedimentary rocks formed from Devonian rivers and floodplains. The hypothesis readily under the strain of the uplifting crust and would preferentially erode to form the streams that circumscribe Panther Mountain. Unfortunately, there has been little additional scientific investigation of this topic since the 1970s-1990s, so it remains a hypothesis.

Whether the circular shape of Panther Mountain is related to a meteor strike remains shrouded in the mysteries of time. But we know for sure that people have journeyed to and valued Panther Mountain for a very long time as a source for the life-giving rivers below.

#### Fall 2023

### Travels with Trout Unlimited: In Search of Genetically Unique Brook Trout

In a steep headwater tributary to the Esopus Creek, 11 individuals walked into the backcountry for a shared purpose to find genetically unique Brook Trout (also known as Catskill Heritage Brook Trout). This outing was more than a midweek fishing trip. This was part of a scientific study to investigate the genetic characteristics of wild Brook Trout (Salvelinus fontinalis), the state fish, and only native trout species of New York. Genetically unique Brook Trout are those who have not mixed genes with non-native or hatchery raised fish. Findings from this study can provide information on how to manage coldwater fisheries in a warming climate.

After nearly 150 years of stocking streams with non-native and hatchery raised trout, genetically unique Brook Trout are not easy to find. This study, and two earlier projects that looked for (and found!) genetically unique Brook Trout in Esopus Creek tributaries was spearheaded by the Ashokan-Pepacton Watershed Chapter of Trout Unlimited (APW-TU) and funded through a grant from the Ashokan Watershed Stream Management Program.

Trout Unlimited partnered with the NYS Department of Environmental Conservation (DEC) to utilize electrofishing methods to more efficiently capture fish for sampling, for the second year in a row. Electrofishing is a common and



Trout Unlimited members and NYS Department of Environmental Conservation employees after a strenuous hike out of a deeply incised valley that held many brook trout. The Ashokan-Pepacton Watershed Chapter of Trout Unlimited is running its third study to find genetically unique brook trout in the Catskills. Photos by Max Kelly.

safe method to collect fish that uses a small pulse of electricity to temporarily stun fish long enough to be collected in nets. In the past, Trout Unlimited used traditional fly-fishing techniques. While immensely enjoyable, it was a time intensive process to catch enough fish for a sufficiently diverse genetic sample. Once the fish were collected, a small piece of fin was clipped and placed in preservative. The fish were then released where they were initially collected. The samples were later sent to a lab for genetic analysis.

The accumulated knowledge and intuition of local Trout Unlimited members, who have fished these streams for decades, guided the search for genetically unique fish. The group decided on a steep Catskill stream that had plenty of fish lurking in deep pools defined by



The process of collecting genetic data was a team effort. One team collected fish from the stream while a second team recorded data on the bank. The length of each fish was recorded and paired with the fin sample.

sandstone boulders. Mark Loete, APW-TU President said, "The Catskill Mountains are often referred to as the 'Cradle of American Fly Fishing'. If you are a fly-fishing enthusiast, the Catskills are where the cradle rocks."

In 2020, DEC re-categorized the trout management status of the Esopus Creek as "Wild" (above Lost Clove bridge) and "Wild Quality" (below Lost Clove bridge). These classifications reflect the high quality and quantity of aquatic habitats in the streams of the Ashokan Reservoir watershed.

Robert Adams, an Aquatic Biologist who led the DEC electrofishing crew said, "Genetic evaluation of our remaining, remnant populations of Brook Trout in Catskill streams allows us to determine if stocked fish have altered the genetic makeup of each stream's population and, more importantly, catalogue those Catskill streams with endemic populations that need further protection." Researchers across the United States are interested in how genetically isolated populations of Brook Trout will respond to increased temperatures in the face of climate change. As we learn more about brook trout genetics through studies like these in the Ashokan watershed, we will have a better understanding of how to manage this ecologically and culturally important species.

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### **FIELD NOTES**

# It's All Fun and Games at the Stream Table!



The stream table was in operation at the Ulster County Fair this year where Stream Educators Tim Koch and Max Kelly enthralled listeners with the creation of floods and different strategies for limiting bank erosion. The stream table is a 10- by 3-foot metal box that is filled with small cohesive media that simulates soil. A pump and water flow device allow the operator to "turn up" water discharge simulating different flow events. The water carves a path through the media, and following the physical laws of the planet, forms a channel shockingly like the big, real-life versions we see on the landscape.

Educators allow observers to place small objects like tiny houses and miniature trees in the stream table to simulate actions they might take to protect property from erosion and flooding. Tim demonstrates how different approaches to bridge and culvert management can either allow stream flows to pass or block them. The table can be tilted to simulate how slope and velocity affect stream meandering. Check out the AWSMP Facebook page to find out when the stream table will next be deployed.



#### Hand-built rock dam on Woodland Creek. Brookies Make a Run for It

With abundant rain, it's been a banner summer for stream bathers and toedippers. Now that it's autumn the native Brook Trout (Salvelinus fontinalis) are making their annual journey to lay eggs in the stream bed and spawn. Stream users should now remove or create a break in any rock dams they built for swimming holes to allow migrating trout to reach their spawning beds. Brook Trout usually spawn between late September and November, the exact date depends on water temperature and stream flow. The eggs will hatch in early spring. Brook Trout love the smaller headwaters and tributaries for their cold, clear water and gravely bottoms. So, if you live on a tributary to the Esopus Creek you can give "brookies" a hand by deconstructing rock dams.

#### Rapid Bank Erosion on Hollow Tree Brook

Each year the Ulster County Soil and Water Conservation District and stream management program partners monitor bank erosion sites throughout the Ashokan watershed. The sites are monitored to determine how actively they are eroding and best management approaches. One bank erosion site jumped out during the 2023 monitoring season because it lost an area totaling 23 feet of sediment since it was last measured in 2021. The crew observed mass erosion of a 3-foot-tall block of lacustrine clay on the Hollow Tree Brook that flows into the Stony Clove Creek at Lanesville. The site is being considered for a future

#### **DIY Stream Buffer**

It's easy to start a stream buffer from cuttings of existing native shrubs and you can learn how to do it yourself in a new fact sheet. The *Landowner's Guide to Live Staking* provides step-by-step instructions with photos for obtaining and installing the cuttings called "live stakes," as well as guidance on how to care for the new shrubs that will sprout.

One of the easiest and most effective ways to reduce erosion is to maintain a vegetated strip of land immediately adjacent to a stream. The turf grass that makes up most residential lawns does not make a good buffer because it has a shallow root system. Native shrubs and trees like willows, dogwoods, and sycamores have dense, woody root systems that are far more effective at holding banks together.

Willow and dogwood shrubs can be propagated from hardwood cuttings, or "stakes." If installed properly, these "live stakes" can sprout into new shrubs, which makes live-staking an easy and affordable method for mitigating erosion risks to homes and property. The *Landowner's Guide to Live Staking* can be downloaded at https://ashokanstreams.org/publicationsresources/.



Bank erosion monitoring site on Hollow Tree Brook. stream restoration project to arrest erosion and reduce sediment inputs to the stream. This summer, District staff and a team of Watershed Conservation Corps interns surveyed 7 stream reaches, taking detailed measurements over 7,481 feet of stream length and 41 cross-sections, to record 2,079 data points. The "Wild-Quality" Esopus Creek Fishery



Photo by Ed Ostapczuk

The Esopus Creek upstream of the Ashokan Reservoir sustains one of the most renowned wild trout fisheries in southeast New York. The upper Esopus Creek supports wild populations of the native Brook Trout and introduced Brown Trout and Rainbow Trout. Some consider the Esopus Creek the best place to fish for Rainbow Trout in the Catskills. In August, the New York State Department of Environmental Conservation (NYS DEC) released an Upper Esopus Creek Fisheries Management Plan prepared by its Bureau of Fisheries. The management plan focuses on the recently designated "Wild-Quality" section of the Esopus Creek that stretches from the Ashokan Reservoir upstream to Lost Clove Road in Big Indian. This portion of the Esopus is fed by about 10 tributary streams, each with the potential to provide essential cold water, spawning, and nursery habitats that support the mainstem fishery. Nearly all the public fishing access points in the Esopus watershed are found within this reach.

The plan establishes a routine monitoring protocol to ensure the requirements for a "Wild-Quality" stream are being met, that a variety of angler opportunities are maintained, and to evaluate the factors that limit the river from an even higher-quality designation called "Wild-Premier."

Read the full NYS DEC fisheries management plan at:

https://www.dec.ny.gov/docs/fish\_marine\_pdf/upperesopuscrkplan.pdf

#### **Creature Feature: Northern Long-eared Bat**



One of the creatures you may see from dusk to dawn along a local creek is the Northern Long-eared Bat (*Myotis septentrionalis*). During the spring, summer and fall, Northern Long-eared Bats roost in dense forests and sometimes crevices before migrating exclusively to caves and mines between fall and winter to hibernate. Catskill forests are dense with trees where they can find a suitable spot to roost and hunt.

Our forests also have an abundance of streams that provide habitat for insects including macroinvertebrates - like stonefly and mayfly - that indicate a healthy stream. Bats help to regulate insect populations and promote pollination, making their presence a vital part of forest health and agriculture. Northern Long-eared Bats don't have to fly far to meet their few thousand insecta-day diet when they emerge at dusk to feed beneath forested canopies. Before entering hibernation periods, they gain an extra 40% of their bodyweight.

On January 30, 2023, the United States Fish and Wildlife Service (USFWS) reclassified the Northern Long-eared Bat from Threatened to Endangered status under the federal Endangered Species Act. The population of Northern Longeared Bat(s) has declined by 98% since the 2006 discovery of a bat colony with white-nose syndrome in a Schoharie County cave. White-nose syndrome is an invasive fungus that embeds itself into a bat's deep skin tissue utlimately leading to death.

Pete Pattavina/U.S. Fish and Wildlife Service

The New York State Department of Environmental Conservation and US Fish and Wildlife Service are actively working to develop a management approach that will aid the recovery of this species and has released conservation guidelines.

Approaches are focused on protecting known hibernation sites and limiting forest management where Northern Long-eared Bats are likely to be near. They recommend people avoid caves and mines from November through March to avoid disturbing hibernating bats. Forest management activities should be undertaken in the winter months when bats are hibernating in caves. When safe to do, property owners and forest managers are advised to leave snag and cavity trees uncut. Leaving dead and dying trees furnishes the Northern Long-eared Bats with ideal habitat to roost when they migrate back to forests. If any bats are observed flying from a tree between April and October, the local Department of Environmental Conservation office should be notified as soon as possible.

Though not guaranteed, there is a glimmer of hope for the Northern Long-eared Bat. Another species, the Little Brown Bat, is suspected to have grown resistant to the fungus through genetic evolution. We all hope to see a similar comeback for the Northern Long-eared Bat.

For more information on how to protect bats, visit <u>https://www.dec.ny.gov/</u> animals/106713.html.

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### Flood Analysis Finds Problems and Solutions for Pine Hill



Residents participated in public meetings held at the Pine Hill Community Center.

Late last year, the Town of Shandaken completed an analysis of riverine flooding for Pine Hill. A final report is now available and includes recommended actions for the town and community residents. The Ashokan Watershed Stream Management Program (AWSMP) provided a grant to complete the study and the process included three public meetings where Pine Hill residents shared experiences, asked questions and provided feedback. The flood analysis and report were developed by SLR Consulting, hired by the town, and AWSMP will now assist the community with the design and implementation of final report recommendations.

The land surrounding Pine Hill flows into the Birch Creek and then the Esopus Creek just east of the hamlet. Pine Hill hasn't experienced as much flooding as other parts of the watershed over recent decades, but did sustain flood damage in July 1973, April 1987, and January 1996. The hamlet was largely spared from flood damages during Tropical Storm Irene in August 2011. The study found the community is still vulnerable to flooding and analyzed 15 road-stream crossings for their potential to overtop during flood events.

Several bridge and culvert crossings of Birch Creek, Alton Creek and its tributaries may contribute to flooding in these locations. Undersized stream crossings cause backwatering or the ponding of water behind the structure, blocking roads for emergency access and stranding residents. Three stream crossings over Alton Creek located on Bonnie View Avenue were noted as a high priority for replacement due to mis-sized channels and limited ability to pass flood flows. The other 12 crossings were medium to low priority for replacement at this time.

All high and medium priority crossings, eight in total, were further analyzed. Solutions typically involved replacing and enlarging stream crossings combined with enhancement of the nearby floodplain and stream channels. Construction or enlargement of the floodplain is often a critical step for lowering flood elevations. Floodplains hold and convey large amounts of flood water, and by conveying water through a community efficiently, they lower the heights a flood will reach.

Floodplains effectively right-size the channel in a way that doesn't impair stability. Particularly in comparison to practices like dredging that is meant to contain flood waters by deepening and enlarging the channel at the expense of floodplains. Dredging can easily set off channel erosion that extends far off-site and is a temporary solution, as Catskill streams rapidly fill back in with sediment. Right-sizing a channel and enhancing its floodplain leads to a healthier, self-sustaining stream.

During the analysis, SLR identified several crossings over Alton Creek on Main Street and Academy Street where the channel has no floodplain and houses border the channel upstream of a culvert or bridge. In both locations, stream flow backwaters and floods the road at greater than the "10-year flood," which has a 10% chance of occuring in any given year. Detours may include other floodprone areas. At both locations, SLR recommends channel improvements and to increase the span of stream crossings to accommodate larger flows. Scour protection and maintaining fish passage are additional priorities. The next step is to complete a full hydrology and hydraulics analysis to develop crossing replacement designs.



An example of backwatering that occurs when crossings are under-sized, as happens at Main Street over the Alton Creek.

#### These projects will require the town to find substantial sources of funding and affected landowners would need to authorize the projects. While these are challenges to overcome, new flood mitigation funding is available. New York City funds for water quality protection are provided through the stream program and the Catskill Watershed Corporation making projects like this increasingly possible.

The study also identified recommendations for floodprone homes and businesses. Floodproofing may be undertaken during the rehabilitation of historic residential buildings that gualify for a New York State tax incentive. For homes mapped within, near, or bordering the Special Flood Hazard Area identified by FEMA (commonly called the "100-year floodplain") property owners may consider individual floodproofing measures. If flood risk is severe, financial assistance may also be available for buyout and relocation. The report contains a decision flowchart for property owners to follow when determining what actions to take. Mitigation actions are described further in the Homeowner's Guide to Mitigation Flood Risk fact sheet available online at https://ashokanstreams.org/ publications-resources/.

At LFA public meetings, attendees voiced concerns about erosion. One great option for protecting property from flood-induced erosion is to maintain trees and shrubs along the stream margin. Their roots stabilize stream banks and resist erosion. Contact the stream program office at (845) 688-3047, or <u>bobby.taylor@ashokanstreams.org</u> to inquire about free streamside planting plans, plants, and planting assistance.

Find the Hamlet of Pine Hill Local Flood Analysis report at: <u>https://catskillstreams.org/lfa/.</u> Wood in streams can be a management challenge for resource managers, municipalities, and private landowners because wood has the simultaneous potential for enormous ecological benefit and significant harm to property and public safety under certain circumstances.

Managing Downed Wood in Streams

Every occurrence of in-stream wood, from a single downed tree to a massive logjam, falls somewhere on a spectrum between ecological asset and potential hazard for society. On the asset side, decaying leaves and twigs serve as the foundation of the stream ecosystem food web. Wood in streams provides the building material for diverse fish habitats, from spawning and rearing to holding areas where fish can rest under cover from overhead predators like eagles (and anglers!). Wood can protect stream beds and banks from erosion. In-channel wood helps streams to heal after floods.

The same wood, if deposited in a different location or at a different orientation relative to flow, can increase the rate of bank erosion. Logjams can worsen localized flooding and threaten public infrastructure. Large wood can clog bridges and culverts with sometimes catastrophic consequences. Channel spanning logs, especially trees with submerged branches, are especially dangerous to river users. The submerged branches can catch and trap objects and people in the current.

To add further management complexity, in-stream wood's spot on the benefithazard spectrum changes over time. It also shifts in relation to seasonal flow patterns and recreational uses, and as a tree is transported downstream or as a logjam grows larger after a flood.

To address such a complex problem, good wood management is determined on a case-by-case basis. But that management style can be difficult for landowners, many of whom are unsure what to do if a tree falls in a stream on their property. Do private landowners have any obligation to manage in-stream wood on their property?

The short answer from a resource manager's perspective (and not a lawyer's), is the following with caveats:

- If the tree/jam poses no risk to you, stream users or your property, the best course of action is likely to do nothing and let nature take its course.
- If the tree/jam does pose a risk to you, stream users or your property, know there is no local, state, or federal government agency mandated to act or provide funding. It is your property; it is your responsibility.
- If the tree poses a risk and you can do so safely, the best management action is to cut the wood into 3 to 4-foot lengths and let the pieces float downstream.
- If the tree poses a risk and you cannot safely cut it, seek technical guidance from your local Soil & Water Conservation District (SWCD) or the New York State Department of Environmental Conservation.
- If the root ball of downed wood is still attached to the stream bank, leave it! It will help to prevent bank erosion.
- If you need to disturb the bed or banks of the stream to remove the wood, such as for a large logjam, you must apply for a permit from the New York State Dept. of Environmental Conservation. More info at: <u>https://tinyurl.com/2p8p672v</u>.

The Ashokan Watershed Stream Management Program (AWSMP) or your local SWCD can help assess the ecological benefits as well as any risks associated with in-stream wood on private property. The AWSMP also assists municipalities with wood management by implementing a multi-disciplinary, research-based method for assessment and decision making. Watershed residents can contact the AWSMP at info@ashokanstreams.org.

Kingston, NY Permit No. ₽AID Organization Mon-Profit



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**October 16** The aftershool program Watershed Detectives for grades 4-8 begins meeting in October on Mondays from 4:30-6:30 at the Ashokan Center in Olivebridge, NY. The hands-on education program features outdoor excursions and activities. To learn more, call us at (845) 688-3047.

Join us for a stream walk from 10am-12nn in Traver Hollow, Town of Olive. Hike a DEC trail near the stream and learn about stream ecology, wildlife, and stream features. Bring your family and enjoy an educational outing. Campfire with chocolate and smores. Space is limited. To register, visit ashokanstreams.org.







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