ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

Winter 2017

Esopus Creek NEWS

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

IN THIS ISSUE

Building a sustainable future

IN 2016, sites around the Northeast U.S. averaged in their top 20 warmest years on record and northern Ulster County ended the year in a moderate drought. On October 23, stream flows in the Esopus Creek were only 10 cubic ft. per second at Allaben, prompting the NYS Dept. of Environmental Conservation to temporarily ban fishing in the Esopus Creek between the Shandaken Tunnel and Ashokan Reservoir. The last time flows were this low was summer 2010. By the end of 2016, streamflow had rebounded to near or slightly below normal.

At the other extreme of climate, researchers at the City University of New York's Hunter College have confirmed that the period from 1996-2011 was uniquely wet. The 1930s, 1950s (especially 1955) and to a lesser extent the 1970s were also extreme periods.

Globally, climate-related events, and flooding in particular, have caused more economic losses and fatalities than other types of disasters. Smaller disasters isolated in time can have a relatively modest impact on output and growth that generally disappears quickly. But severe disasters or multiple events can have long-term negative impacts on local economies. The good news is the negative impacts of disasters can be blunted by the adoption of risk reduction measures.

As a result, communities in the Catskills are asking and exploring the question — *How do we prepare for extreme weather events and what are the implications for the local economy?*

The upcoming Ashokan Watershed Conference on April 29, 2017 will explore this question. The conference features a panel of local leaders addressing steps that communities can take to achieve economic sustainability. Afternoon sessions will discuss sustainable use of Catskill recreational assets, how to prevent the spread of invasive species and create resilient landscapes, and the status of the Esopus Creek fishery and its ability to withstand change. A special session delivered by the Pace University Land Use Law Center will focus on planning tools for building sustainable communities. The session is offered for continuing education credit to local decisionmakers.

The conference runs from 9:00-4:15 at the Ashokan Center in Olivebridge, NY. Families with children ages 8-14 are encouraged to attend and enroll their children in a "Stream Explorers" youth conference happening at the same time on the Ashokan Center campus. Educators from Cornell Cooperative Extension of Ulster County will lead fun outdoor learning activities if the weather permits, and indoors if not. Children will join their parents or guardians for lunch.

Conference registration begins in mid-March. The cost is $10 for adults and children attend for free. Check the conference website for registration information at: http://ashokanstreams.org.

Sources: Northeast Regional Climate Center online, accessed January 9, 2017; Allan Frei, Dept. of Geography Hunter College, CUNY Institute for Sustainable Cities. Presentation at the CERM Conference, Belleayre Ski Center, Highmount, NY, October 27-28, 2016; Carolyn Klousky, 2014, Informing climate adaptation: A review of the economic costs of natural disasters. *Energy Economics* 46 (576-592).

Studies target change

STUDIES are underway or about to begin in the Ashokan Watershed that will help to monitor and understand the effects of a changing climate. One is a long-term fish community survey by the U.S. Geological Survey (USGS) with partial funding from the AWSMP. Surveys began in 2009 and will continue through at least 2018 at six sites in the Ashokan Watershed.

A new study by SUNY New Paltz researchers and students will begin assessing fluctuations in stream water temperature in the Esopus Creek watershed. The study should reveal "hot and cold" streams and how water temperatures fluctuate during the year. Streams that are cooler than might be predicted from air temperature and exposure to sunlight alone, should be more resilient to climate warming and serve as coldwater refuges for trout. The study will also identify if some stream sections become too warm for fish to thrive or survive during the year.

At the same time, assessment and monitoring of the physical condition of streams continues at several scales. The AWSMP is working to assess the condition of tributary streams draining into the Esopus Creek using established methods. The USGS in partnership with the NYC Department of Environmental Protection, is monitoring suspended sediment within the entire Esopus Creek system and how it changes over time. Sediment monitoring has begun above and below future stream restoration sites to evaluate the effectiveness of restoration methods at reducing fine sediments that impair water quality.

The fact that stream systems are dynamically responding to a changing climate means assessments aren't a once and done deal, and will need to be repeated at intervals that match the pace of change. The studies above will provide a window into stream response to both climate-induced disturbances and active stream management.

Stream buffers: What to plant and where

Protecting streamside property from erosion and degradation can be difficult. Among the many options available to landowners is planting and protecting vegetation along a stream channel. Plants "buffer" the stream from adjacent uses, and also protect lawns, gardens, and structures from the stream. Buffers provide important bank stabilization, are critical habitat for wildlife, and help to maintain water quality.

When choosing how to manage your streamside area, it helps to understand how growing conditions change as you move from the stream's edge to higher ground. The streamside area can be classified into zones with different land cover and topography, flooding regimes, and unique and diverse plant and animal communities. These zones do not have discrete start and end points and may vary in width depending on local conditions. Still, looking at the streamside areas in zones provides a good guide for management.

The overbank zone

Zone 1 is directly adjacent to the stream channel. These areas are very wet and prone to flooding and erosion. Plants in this zone provide excellent bank stabilization in various ways. Deep root systems hold soil together and plant stems add roughness that slows water down, helping to limit erosion and destructive flows. Shrubs have multiple flexible stems, which give the plant a better chance of survival if one stem breaks. Shrub stems bend over when under swift water and protect the top soil by blanketing it. Roughness in this zone captures sediment and nutrients after a flood event. In addition, shrubs in this zone provide shading that cools water temperatures, ideal for fish and aquatic insects, and enhance habitat by adding leaf litter into the stream.

How to manage Zone 1: Maintain this zone as a no-mow and no-cut area, populated with native shrubs and herbaceous (non-woody) plants. Identify and remove invasive species before planting native flood-tolerant shrubs with flexible stems. Invasive plants can overrun an area and outcompete native species.

The overbank zone (Zone 1) immediately after being planted with native shrubs and herbaceous plants.

At the same site as above — lush growth has occurred in the overbank zone three years after planting.

Riparian plant zones indicate where riparian plant species should be planted

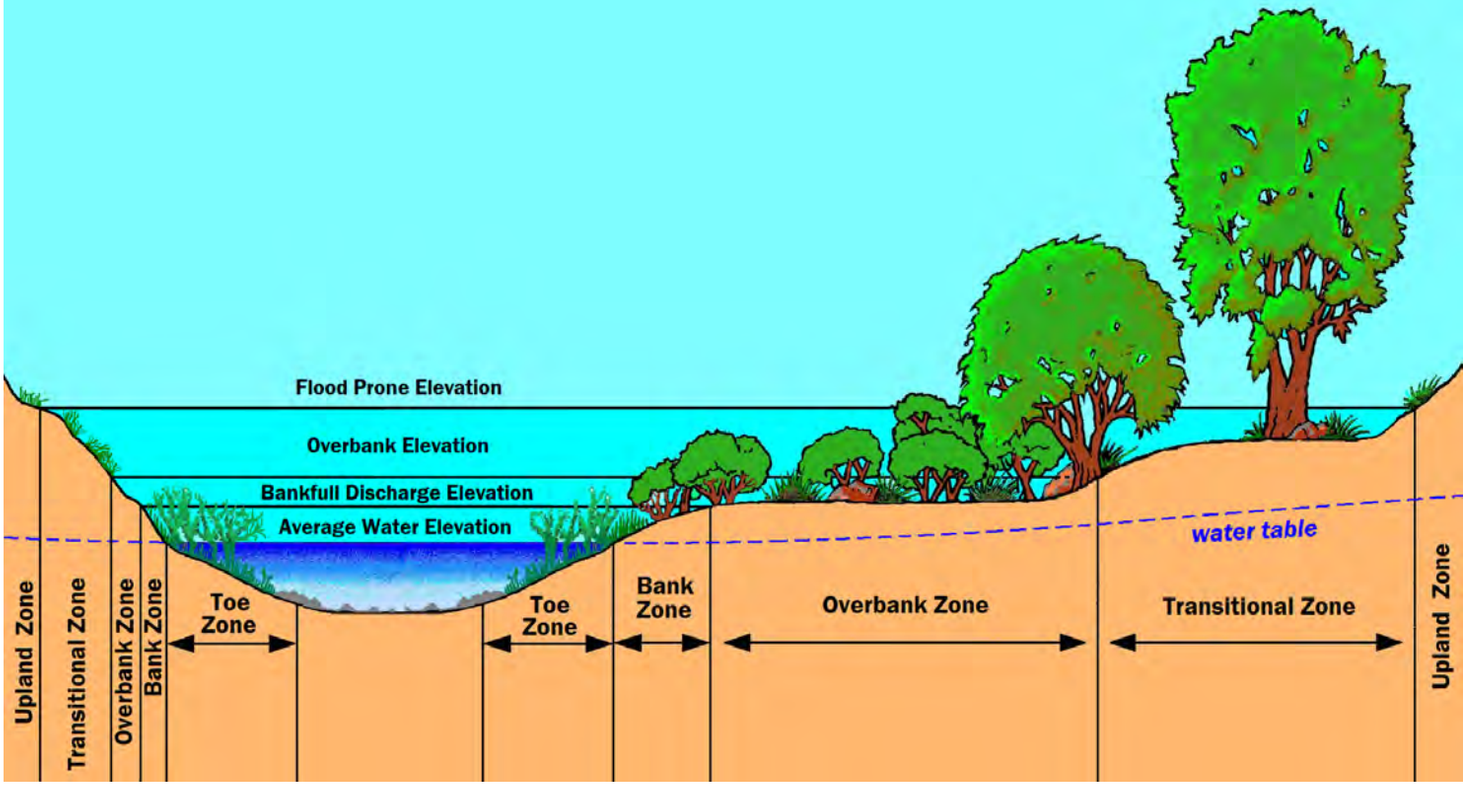


Image courtesy of Chris Hoag, Hoag Riparian & Wetland Restoration, LLC

The transitional zone

Zone 2 is not in constant contact with water and flooding is not as frequent as in Zone 1. Depending on its elevation, this zone may be disconnected from the water table. This may happen when streambed sediment is eroded by unstable stream conditions up or downstream, by human removal of sediment, or during widespread drought conditions. This area is made up of larger trees that are able to withstand dry conditions and shade-tolerant shrubs. The plants provide bank stabilization by adding additional roughness and protection from erosion.

How to manage Zone 2: Identify and remove invasive species and follow by planting with shade and drought tolerant native trees. As in Zone 1, maintain this zone as a no-mow and no-cut area.

The upland zone

Zone 3 is not prone to flooding. However, it is susceptible to wind erosion, and can be impacted by human activities such as logging and construction.

How to manage Zone 3: Re-establish or allow large native upland trees to grow in this zone. They limit pollution from entering the stream and slow the fast-flowing runoff from paved areas and buildings. Widths of 300' or more from the stream's edge provide critical habitat for forest songbirds and other wildlife.

Grasses and flowering non-woody (herbaceous) plants are important throughout all of these zones. These plants help to slow water, filter sediment, and stop additional pollutants from entering the stream system. Grasses and flowering herbs provide excellent habitat for native pollinators and other wildlife and are a beautiful addition to a streamside property (see photos at right).

The Ulster Soil & Water District's Catskill Streams Buffer Initiative (CSBI) program is a great resource for landowners who are looking for assistance in managing their streamside buffers. For more information call the AWSMP office at (845) 688-3047, ext. 6, or email CSBI Coordinator Bobby Taylor at bobby.taylor@ashokanstreams.org.

Sources: Vermont Trees for Streams Resources Guide (http://winooskinrcd.org/wp-content/uploads/Riparian-Planting-Guide-Trees-For-Streams1.pdf); Riparian Buffers for Wildlife - Pennsylvania Wildlife No. 16 (http://extension.psu.edu/natural-resources/wildlife/habitat-management/pa-wildlife-16-riparian-buffers-for-wildlife/extension_publication_file); *USDA NRCS National Engineering Handbook Part 654, 21-VI-NEH August 2007.*

Stream Management Implementation Program Funds

EVERY FIVE YEARS the Ashokan Watershed Stream Management Program (AWSMP) distributes at least $2 million to fund local stream management implementation projects. Eligible applicants include local, county, state or federal government agencies, 501c(3) organizations, and secondary school districts, colleges, or universities. On a limited basis for specific research or flood hazard mitigation projects, private consulting firms may be eligible to apply.

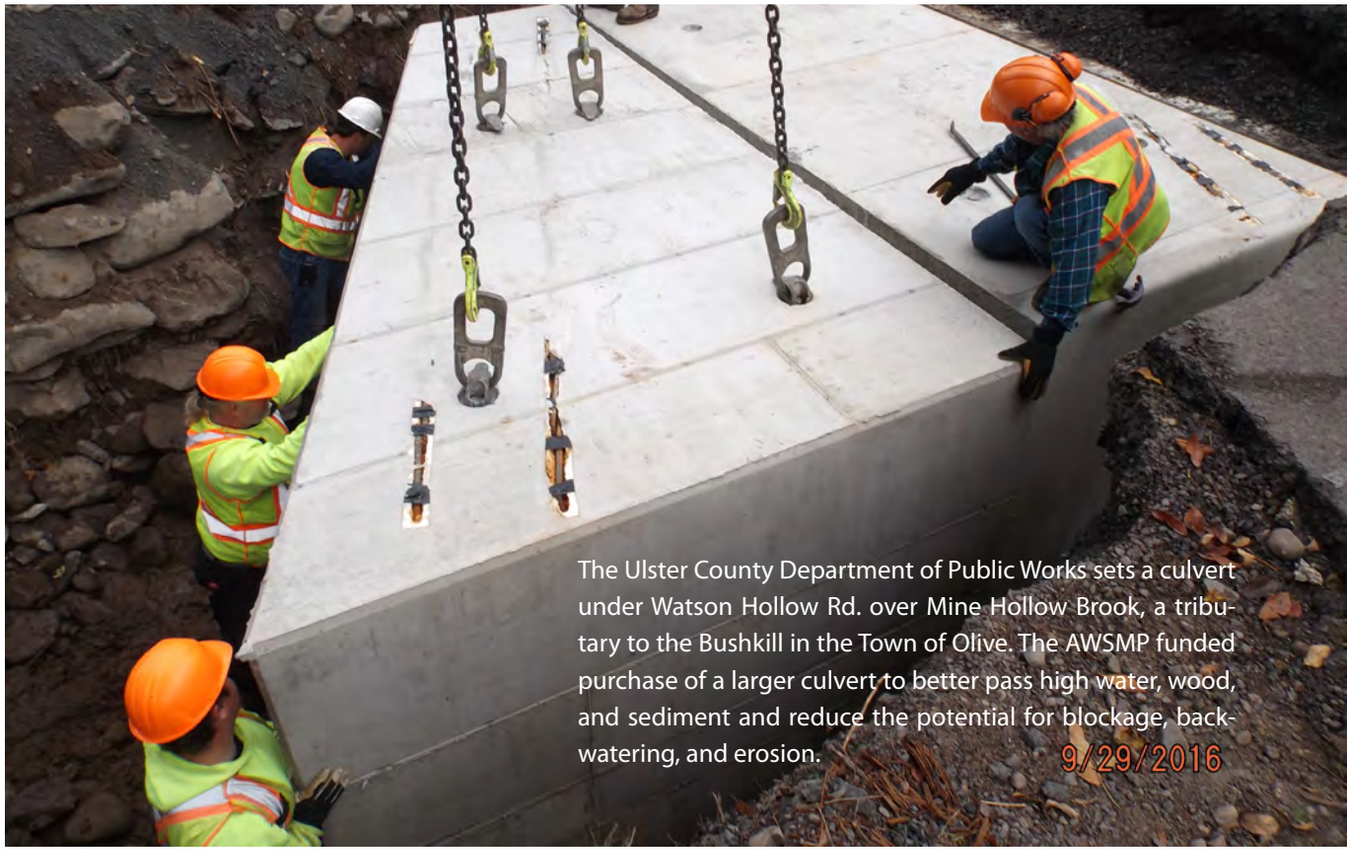
The funding supports projects to improve water quality and stream stability, protect or improve highway infrastructure through stream and floodplain management, enhance stream access and recreation, identify and mitigate flood hazards, carry out stream research and monitoring, and deliver education and training on stream stewardship.

The bulk of stream restoration and infrastructure improvement funding has been distributed to the Ashokan Watershed Towns of Shandaken, Olive, and Woodstock, and to the Ulster County Department of Public Works.

Implementation funding is provided by the NYC Department of Environmental Protection to the AWSMP, and administered by Cornell Cooperative Extension of Ulster County. The Ulster County Soil & Water Conservation District provides technical assistance to applicants. Funding is awarded on a competitive basis, and funding decisions are reviewed by the AWSMP Stakeholder Council.

Implementation funds are distributed twice per year in the spring and fall. For more information on the funding program, see: http://ashokanstreams.org/projects-funding/

$3 million awarded for 77 implementation projects since 2007



The Ulster County Department of Public Works sets a culvert under Watson Hollow Rd. over Mine Hollow Brook, a tributary to the Bushkill in the Town of Olive. The AWSMP funded purchase of a larger culvert to better pass high water, wood, and sediment and reduce the potential for blockage, backwatering, and erosion.

Why streams don't freeze in winter

Maxine Sprague, a 5th grader at Bennett Intermediate School, has been a member of the educational Watershed Detectives Club for two years. The Club actively explores the stream and woods behind the school even during the winter. We asked Maxine to share what the Watershed Detectives have been learning about lately.

"Have you ever wondered exactly how water works? Well that's basically what we do in Watershed Club. Watershed Club is a fun-filled afterschool activity at Bennett Intermediate School hosted by Mr. Matt Savatgy. One of the most recent activities we've done is we went outside to the stream and used thermometers to see the temperature of the water. All the kids put on boots that are provided for us. We love going outside and exploring. We all get partners and spread out along the stream.

Usually if the water temperature is below the freezing point of water, it would be frozen. But, some of the kids found the stream water temperature below the freezing point and it was not frozen. This was because the water was moving. There was still energy flowing through the water, therefore it would not freeze. That was only one of the many fun and educational activities we do in this after-school club."

FEMA letters are in the mail

NATIONAL FLOOD INSURANCE PROGRAM

Considering buying or rebuilding near a stream? See the FEMA fact sheet: ***Changes in the Flood Insurance Program: Preliminary Considerations before Rebuilding*** at:

http://www.dec.ny.gov/docs/water_pdf/fpmfemacfip.pdf

IN 2014, the Homeowner Flood Insurance Affordability Act (HFIAA) was signed into law. Among other things, this law changed the way flood insurance policies are rated. The HFIAA legislation also required FEMA to communicate to individual property owners their level of flood risk and where they are located within a floodplain.

FEMA is currently reviewing every National Flood Insurance Program (NFIP) flood insurance policy and will be sending letters to all policy holders to explain the current risk level for their property. Starting in January 2017, policy holders began receiving letters from FEMA approximately two months prior to their policy renewals. FEMA will mail a letter at each subsequent renewal.

As mentioned above, the flood insurance policies for most "Pre-FIRM" buildings will increase anywhere from 5% to 15% each year until actuarial rates are achieved.

Pre-FIRM buildings are those constructed prior to the adoption of a community's first set of Flood Insurance Rate Maps (or FIRMs). Before HFIAA was passed, flood insurance rates for pre-FIRM structures were subsidized by the federal government. With the move to actuarial rates, flood insurance policy holders potentially could see significant increases in insurance rates.

The NFIP has identified seven categories of policyholders to receive unique information based on their risk and current premium rates. To read more about what each category means and if it applies to you, visit this FEMA website: https://www.fema.gov/cost-of-flood.

If you have questions about Flood Insurance Rate Maps (FIRMs) or how flood insurance is rated, you can call the AWSMP at 845-688-3047 x3. For specific questions about your insurance policy or rates, contact your insurance agent directly.

How do you know where to start fixing a stream? That's the question the Town of Olive set out to answer this year for the Maltby Hollow Brook, a small stream that drains into the Bushkill near the intersection of Moonhaw Rd. and Watson Hollow Rd.

develop a scheme for prioritizing restoration work in the watershed.

With funding from the AWSMP, the Town of Olive hired consulting firm Barton & Loguidice to complete a stream feature inventory

Maltby Hollow Gets a Thorough Look

Maltby Hollow Brook starts high on the sides of several mountains (Wittenberg, Cornell, Friday, and Balsam Cap), runs steep and cold through a series of falls and pools, and then transitions to a flatter more meandering channel below the upper Moonhaw Rd. bridge.

Residents noticed big changes in the stream corridor after Tropical Storm Irene swept through in 2011. New accumulations of sediment and large wood appeared, and the stream channel in several locations took a new course toward homes and the road. The Town applied to the AWSMP for funding to investigate stream conditions, characterize the state of eroding stream banks, and

and bank erosion assessment of Maltby Hollow Brook. Environmental Scientist Shaun McAdams led a two-member crew that walked 4.2 miles of stream, and mapped every feature of management interest in the stream corridor. That included areas of accumulated sediment, erosion, large wood, breaks in streamside vegetation, culvert outfalls, and more. The crew spent time capturing detailed information at every eroding bank, measuring the bank length, height, angle, and noting dominant materials that composed the bank. In all, 64 streambank erosion sites were mapped and assessed.

The Maltby Hollow Brook assessment is part of the Town of Olive's overall effort to reduce

Watching for tadpoles as part of stream and wetland ecosystem study.

the amount of sediment reaching the lower Bushkill. The AWSMP completed a stream assessment of the Bushkill in 2012, and the two sets of data combined will help the Town prioritize stream restoration projects with the most return on investment.

McAdams presented the assessment findings to Maltby Hollow residents and the Olive Flood Advisory Committee on December 19, 2016. His presentation focused on the causes of streambank erosion and what actions will restore stream stability.

In the headwaters and mid-sections of the watershed, the major problem is rapid down-cutting of the channel. The stream bed is eroding to a lower elevation, and at points along the channel the bed is lower than the root zone of adjacent vegetation. When the water flows against these undercut banks the result can be planar landslides, or hillslope failures. A good deal of sediment slides into the stream channel and is eroded downstream through this mechanism. Plus, the downward cutting of the channel itself produces sediment that is washed downstream.

That sediment goes somewhere and somewhere is the less steep portions of the watershed. Water carries the sediment until it drops onto the floodplain, or into the channel itself. If the sediment supply exceeds the channel's ability to transport and distribute the sediment, it accumulates. If accumulations form mid-channel, water may be forced to split or braid around the sediment pile, and push against the banks. Streams can handle a gradual input of sediment from the watershed above. At natural rates, the stream holds its form and elevation while it moves the sediment downstream without excessive erosion. But when a storm like Irene comes through, this natural process of erosion is accelerated.

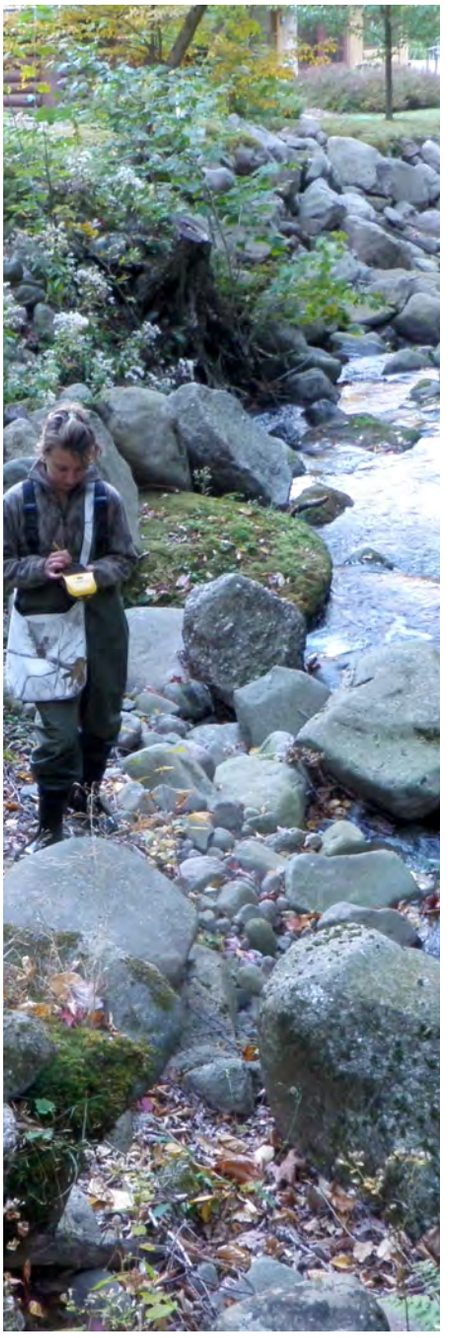
Humans also do things that lower the stream's capacity to move sediment, or that accelerate erosion. But the opposite is true as well. McAdams explained that a goal of stream management is to restore the channel's natural capacity to handle sediment and water flows without a lot of erosion. McAdams recommended restoring the proper elevation of the Maltby Hollow Brook channel in places where the channel has down-cut and is undermining banks. A well-designed project to halt erosion would mimic the channel width and depth of a similarly sized, but stable stream in a comparable watershed setting.

Raising the stream bed to an elevation that connects with the elevation of adjacent upstream and downstream sections also helps to stabilize the channel. Large wood from fallen trees can aide in that process. Catskill streams naturally maintain their grade, or elevations, where sediment or wood accumulates in repeatable patterns in the channel. Examples are logs that fall across streams to form "steps," and rock riffles. These features resist down-cutting and "control" the stream's grade. Active stream management could restore these features, or mimic them, to re-establish grade control at high priority sites throughout the watershed.

When asked to explain exactly what a grade control project might look like, McAdams gave an example of one technique where a rock "vane" is constructed across the stream. Rocks are placed at a very specific depth and width and anchored in place. The rock vane acts as a low sill that begins to accumulate sediment behind it and rebuild the elevation of the stream channel. A project like this could incorporate large pieces of wood, but in high energy, high gradient streams like Maltby Hollow Brook, the wood might need to be anchored with rock.

The AWSMP is available to consult with landowners on whether a solution involves engineering to restore channel stability, or whether a streamside planting could work to stabilize eroding stream banks. Any project that creates a disturbance within the stream channel is likely to need a permit from the NYS Department of Environmental Conservation and the Army Corps of Engineers. Landowners can call the AWSMP office at (845) 688-3047 for more information.

The Town of Olive plans to release the final report on the Maltby Hollow Brook assessment when available in 2017.



Photos of the Maltby Hollow Stream Feature Inventory and Bank Erosion Assessment courtesy of Shaun McAdams of Barton & Loguidice.

Esopus Creek News

AWSMP UPCOMING EVENTS

Join us for Family Fun & Fish Day on May 20.

Saturday, April 29

Ashokan Watershed Conference

Learn more about sustaining the watershed and communities as the environment changes. Registration required. http://ashokanstreams.org/conferences-training/watershed-conference/

Saturday, May 20

Family Fun & Fish Day!

Learn to fish and bring the entire family to Kenneth Wilson State Park, Mount Tremper. $6 admission to park. All other activities are free. Registration required.

Call the AWSMP at (845) 688-3047 to register, or for more information

Ashokan Watershed Stream Management Program

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Soil and Water Conservation District

NYC Environmental Protection

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