Esopus Creek News

Cornell Cooperative Extension of Ulster County
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Kingston, NY 12401

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ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

Cornell University Cooperative Extension Ulster County

SOIL & WATER Conservation District

NYC Environmental Protection

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Phoenicia, NY 12464
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Free to residents by request.

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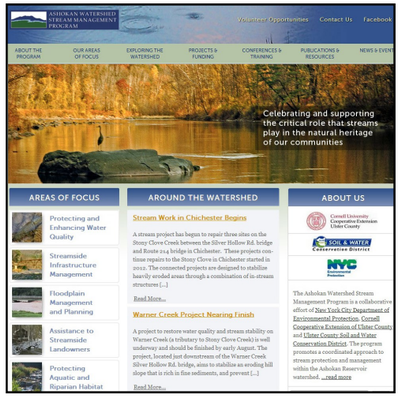
Announcements: AWSMP Launches New Website

After months of anticipation, AWSMP is pleased to announce a newly revised and updated website at www.ashokanstreams.org. The public can check the website for news and upcoming events, or to enroll in volunteer opportunities.

The new website features a section called "Exploring the Watershed" that describes the upper Esopus Creek and each of the tributary streams that fill the reservoir. Other sections provide information on the program's primary focus areas: water quality, streamside infrastructure, floodplain management, assistance to streamside landowners, improving aquatic habitats, and recreational access to streams. "News and Events" items are updated periodically to keep watershed residents aware of upcoming programs, stream restoration projects, or other noteworthy happenings.

The website's designer was Chichester business owner Stephanie Blackman who used photos taken by local photographer Mark Loete. Website content was developed by staff of the AWSMP.



Above: *A screen shot of the new website homepage.*

AWSMP looks forward to adding more content and more interactive features in the coming months and years and hope all of our friends and neighbors enjoy and utilize the website as much as we do.

Cornell University Cooperative Extension Ulster County

Summer-Fall 2013

Esopus Creek News

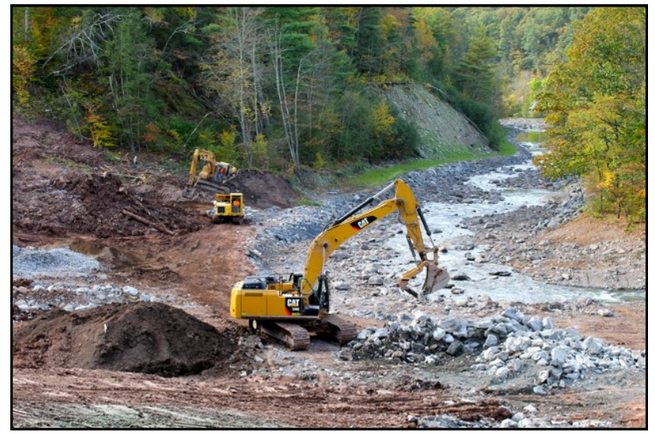
Ashokan Watershed Stream Management Program Newsletter

A quarterly publication of Cornell Cooperative Extension Ulster County

Esopus - Broadstreet Hollow - Woodland Valley - Stony Clove - Fox Hollow - Birch Creek - Beaverkill - Little Beaverkill - Peck Hollow- Bushnellsville - Bush Kill

Two Stream Restoration Projects Completed

This summer you may have noticed a lot of construction in the Stony Clove Creek watershed. The Ashokan Watershed Stream Management Program and its partners completed two stream restoration and stabilization projects in the Chichester and Silver Hollow area. When completed, these projects are expected to help improve water quality and protect public and private infrastructure from erosion.



Above: *Rocks are placed along the toe of a large hillslope along the Stony Clove Creek in Chichester. The project treated one of the largest sources of suspended sediment in the Upper Esopus Creek system.*

A project to improve water quality and stream stability on Warner Creek (a tributary to the Stony Clove Creek) began early in the summer season. The project site is located just downstream of the Silver Hollow Road bridge. The goal of the project was to stabilize an eroding streambank rich in glacial clay and to prevent further slumping of Silver Hollow Road.

When groundwater leached out of the streambank, or when fast flowing water came into contact with the bank, clays were flushed into the stream causing it to turn muddy brown. Stream management at this site included realigning the channel and using in-stream rock structures to direct water away from the streambank. To reduce groundwater leaching through the streambank, a complex buried drainage system was installed to redirect and filter groundwater. The bank was also graded and reseeded to help prevent erosion. The Ulster County Soil and Water Conservation District planted willows and other native trees and shrubs to further stabilize the streambank.

Not far downstream from the Warner Creek project, a large construction project on the Stony Clove Creek sought to reduce one of the largest sources of chronic turbidity in the Ashokan Watershed. This work expanded on repair work completed last year (see Esopus Creek News Fall-Winter 2012 at ashokanstreams.org). The project was designed to stabilize heavily eroded areas through a combination of channel realignment and resizing, in-stream structures, hillslope regrading, and streambank stabilization.

A recent study by the USGS found that the Stony Clove Creek contributed more suspended sediment to the Esopus Creek than other major tributaries during 2010 and 2011. Previous monitoring and assessment identified the Chichester reach of the Stony Clove as a significant source of sediment in

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Inside this Issue

We're on the web!
www.ashokanstreams.org

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...Steam Work continued from page 1

the watershed. The creek has been altered over many decades through the Chichester area, going back to modifications made in the early 1800s. These alterations probably contributed to channel instability in recent years. The project was designed to improve the channel's ability to transport water and sediment at multiple flow levels without eroding. As much as possible, the channel was reconnected with its floodplain to carry water at high flows. Rocks inter-planted with shrub willows were used to secure the channel margins. Additional revegetation of the project site is planned this fall.

Both projects were sponsored by the Town of Shandaken and completed in partnership with the Ulster County Soil and Water Conservation District (UCSWCD) and the NYC Department of Environmental Protection. The Natural Resources Conservation Services and UCSWCD completed engineering for the Warner Creek project. Hubbell, Inc. was the construction contractor. For the Stony Clove Creek Project, the engineering firm Milone & McBroom, Inc. completed the site design, and Fastracs, Inc. the construction.

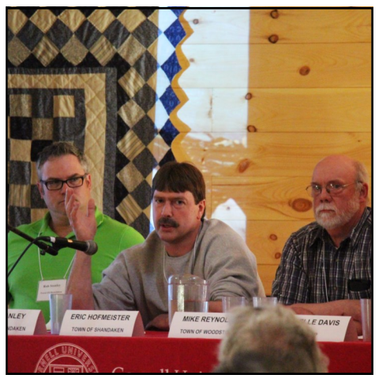
Although these projects alone are not expected to "cure" all the erosion and turbidity problems in the Stony Clove Creek watershed, it is hoped they will go a long way toward a long-term solution to instability and water quality issues in this part of the watershed.

Featured Stream Steward: Eric Hofmeister

In this issue of the *Esopus Creek News*, our featured Stream Steward is Eric Hofmeister, the Town of Shandaken Highway Superintendent. Eric has been selected as this issue's Stream Steward because of his dedication to good stream management in the Town of Shandaken and for his willingness to utilize alternative approaches when working with streamside infrastructure.

Eric and his family moved to the Town of Shandaken when he was eight years old and he has lived here ever since. In 2007 he was elected Superintendent of Highways in the Town and quickly became aware of flooding and erosion problems related to undersized bridges and culverts, and with the roads and streams being in close proximity to one another. Initially, Eric believed that the best way to manage streams was to clean out as much of the debris as possible. Then in 2009, he attended a training sponsored by AWSMP that brought stream geomorphologist Dave Rosgen to the Catskills. Following this training, Eric came away understanding that the best way to manage streams and infrastructure in harmony would be to keep the stream in the most natural state possible, including allowing debris to deposit on floodplains and ensuring that the stream has space to move and meander, if appropriate. Dave Rosgen's concept of a reference reach really changed Eric's thinking. A reference reach is an area, usually upstream of a stream project site that is in a natural condition that is used as an example for the project area. Reference reaches, because they are stable and natural, help project managers determine vital facts about the stream, including its dimensions as well as the natural stream features that should go into an engineered project. After the training Eric began utilizing reference reaches on stream projects and began including natural features in any stream work that he began.

Besides lending stability to streams, natural features, whether they be rock or wood, also provide excellent habitat for aquatic organisms. Because of his work improving not only infrastructure but also natural habitat, Trout Unlimited awarded Eric their Silver Trout award. Eric has been a key partner for AWSMP and has utilized our resources to help with many Town infrastructure projects. We look forward to working with Eric and the rest of the Town of Shandaken on the many future stream projects that we have before us.



Left: *Eric Hofmeister (center) speaks during a panel discussion at the 2013 Ashokan Watershed Conference held at the Ashokan Center in Olivebridge, NY on the topic of community resilience in the face of increasingly large flood events.*

Right: *Eric operates equipment during construction of the stream project along the Stony Clove at the Main Street Bridge in Phoenicia in the days following Tropical Storm Irene.*

ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

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Upcoming Events

November

On November 9, the Shandaken and Hardenburgh Community Revitalization Committee will have an open house at Belleayre Mountain Ski Center (upper lodge). This committee is part of the NY Rising program that funds projects to help mitigate flooding in hard hit New York State communities. Please check the Town of Shandaken and AWSMP website and facebook pages for additional information.

AWSMP's sister program, the Rondout-Neversink Stream Management Program is hosting two programs with ecologist and author Tom Wessels. On November 7 at 7:00pm Mr. Wessels will discuss how the laws of sustainability function in the complex systems of the natural world and the implications this has for small Catskill communities. This event will be held at the Town of Neversink Town Hall in Grahamsville, NY.

On November 8, starting at 9:00 am Mr. Wessels will lead a woods walk starting at the DEC Denning trailhead in the Town of Denning. During the walk Mr. Wessels will talk show examples of historical land use in the Catskills. Pre-registration is required. Please call 845-985-2581 or email info@rondoutneversink.org to register or for more information.

December

CCE Ulster County will have an open house this month. Time/Date TBA.

Go to our website www.ashokanstreams.org for more information about events and programs, or follow us on Facebook!

AWSMP Program Updates

AWSMP STAFF ANNOUNCEMENTS

AWSMP bids a fond farewell to our long-time Administrative Assistant/Community Educator **Gretchen Rae**, who has moved to New Hampshire to be closer to family. Gretchen was often the first person you saw when walking into our office and the first person you heard when you called. Besides the often mundane yet important work of keeping track of our database and preparing quarterly reconciliation reports, Gretchen also spearheaded AWSMP's volunteer and community events program. She is responsible for bringing the ever popular Family Fun & Fish Day to the watershed that continues to grow and flourish with each passing year. She has also been indispensable during the planning of the AWSMP Annual Conference as well as the Catskill Environmental Research and Monitoring (CERM) Conference, neither of which would have been possible without her tremendous efforts. Very often Gretchen was the public face of our program because of her interaction with so many residents, municipal officials, and other stakeholders. Even though we will miss her tremendously, we all wish Gretchen the very best in all her future endeavors.

AWSMP is pleased to welcome **Heather Eckardt** who joins us as our Sr. Administrative Assistant picking up much of the duties that Gretchen had. Heather comes to the program with 15 years of office and administrative experience and a strong interest in environmental conservation. Heather is currently pursuing a B.S. degree in Horticulture at Oregon State University and earned an A.S. in Business, Management, and Economics from SUNY Empire State College. As the Sr. Administrative Assistant, Heather will be working on accounting, grant administration, conference and meeting support, volunteer engagement, contracting, public engagement, and general office management for our increasingly busy office.

AWSMP would like to introduce **Elyse Clifford**, our six month SCA intern who has spent the summer assessing streams in the watershed and working with the CSBI program. Elyse is from Massachusetts but has done conservation work in Hawaii and Alaska, including conducting culvert assessments for fish passage and collecting baseline data for pristine river ecosystems in Alaska. She graduated from a Master's program in the Environmental Conservation department at UMass Amherst this past May, focusing on Water Sustainability. Both Elyse and fellow SCA intern Christina Appleby will be working with our program until the end of November. The AWSMP program thanks both 2013 SCA interns for contributing high level skills and excellent service that benefited our program and advanced stream conservation in the watershed.

CSBI Program Updates

The CSBI Program is currently accepting applications for riparian buffer planting assistance from interested landowners. For more information, or to obtain an application please contact Bobby Taylor at bobby.taylor@ashokanstreams.org or call our office at (845) 688-3047.

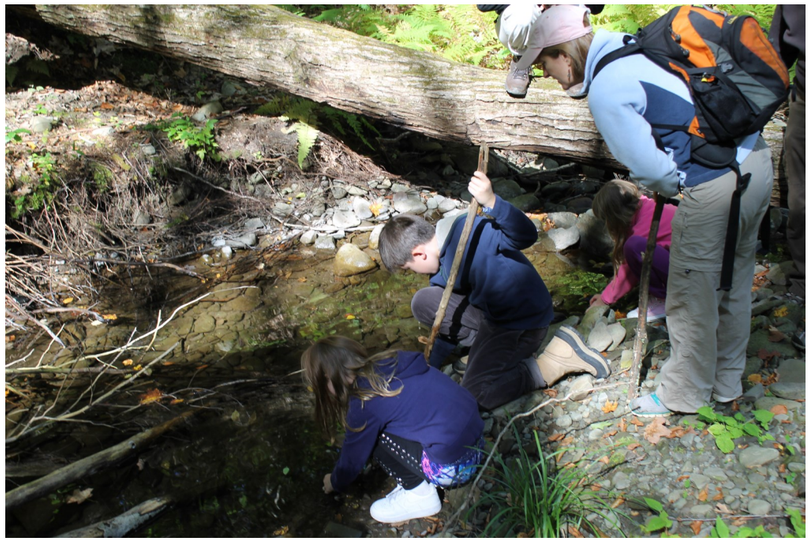
Recreation in the Watershed: Kanape Brook

Located along Watson Hollow/Peekamoose Road (Ulster County Route 42) in the Town of Olive, Kanape Brook is a popular and accessible recreation site for area residents and visitors. In addition to being easily accessible, it is a good example of a healthy and relatively stable stream in our watershed, which is a rare thing to find these days.

Kanape Brook is located on NYS Forest Preserve land and is open to the public year round for a wide variety of activities from hiking and camping to fishing and snowshoeing. Kanape Brook and the surrounding environs are a part of the 30,100-acre Sundown Wild Forest which encompasses multiple towns in both Sullivan and Ulster counties. The Sundown Wild Forest has a varied topography and an impressive mix of natural features, such as mountains, waterfalls, valleys and rivers including many rich trout streams.

Kanape Brook flows between Ashokan High Point and the Mombaccus and Little Rocky Mountains. The trail to the Ashokan High Point closely parallels the stream. The trail is actually an old woods road that was built in 1835 as a public highway. It was used mostly by bark peelers who at the time were seeking out the Catskill region's expansive stands of hemlock trees. The bark of hemlock trees was used in the region's many tanneries. Historical records indicate that a tannery was in operation in that area in the early 19th Century. In addition, if you explore around the stream you can still see remnants of a dam that was likely used for a sawmill, also from that period. Following the heydays of the tanneries the road was mostly abandoned. Today it is maintained by the NYSDEC as part of the Catskill Park.

The trail begins by crossing a newly installed bridge that was washed away during Tropical Storm Irene in 2011. As one progresses up the trail and upstream they can notice that the stream changes form in a few locations. Near the bridge it has a step-pool type system that is typical of many mountain streams. Just a short way upstream the gradient becomes more level and enters into a riffle-pool type stream before becoming a step-pool stream further up above that. Ample evidence of Tropical Storm Irene and other historic floods can be found on the stream's undeveloped floodplain. Gravel and cobble from those flood flows were deposited extensively on the floodplain. Tree trunks and other large woody debris have become entangled in many locations that has diverted water flow in new directions. Woody debris has also served the purpose of providing grade control for the stream, helping to keep it in a natural and healthy equilibrium. Many standing pools provide habitat for wildlife and channel bars have healthy growths of native riparian vegetation such as jewelweed.



Above: *Children on the Kanape Brook Stream Walk, held September 28, experiment with jewelweed (Impatiens capensis) a native riparian plant that turns an iridescent silvery color when submerged in water.*

The top of the trail ends near Ashokan High Point with an elevation of 3,080 feet. There have been a number of historical forest fires, which in addition to creating some excellent views of the nearby Rocky-Balsam Cap-Friday Mountain range, have created good habitat for wild blueberry bushes abundant on the ridge. Certain areas near the high point offer good views of the Ashokan Reservoir. The entire trail is approximately seven miles round-trip and is great for families or the solo adventurer.

More information on Kanape Brook and the rest of the Sundown Wild Forest can be found on the NYSDEC website at http://www.dec.ny.gov/lands/75346.html. More detailed information on forest and land-use history can be discerned from the wonderful book *The Catskill Forest: A History* by Michael Kudish, professor emeritus Paul Smith's College and Arkville resident.

Recent Public Events in the Ashokan Watershed

June

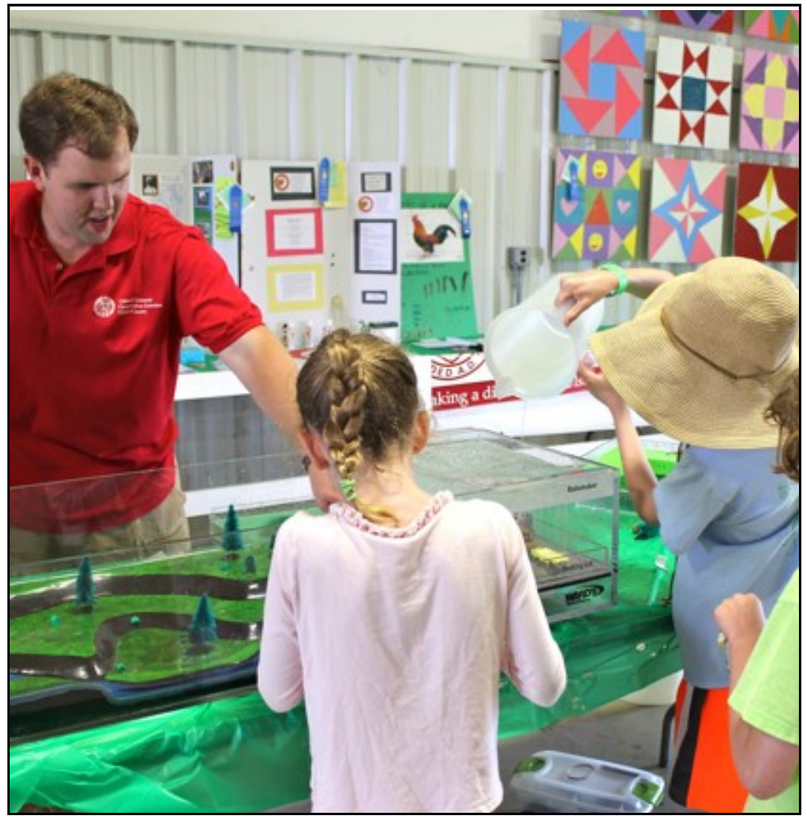
CCE staff were at the **Cornell Cooperative Extension 100th Anniversary Celebration** which was held at the Kingston Plaza on June 1. The day was filled with music, food, and educational programming including a stream table demonstration.

AWSMP staff attended **Bennett Elementary Earth Day** at Bennett Elementary School in Boiceville, NY on June 7. This yearly event brings professionals and educators from around the region to speak to elementary school students about different environmental topics and the importance of environmental conservation. AWSMP staff held a macroinvertebrate identification class for the students. The event was created and is administered by Matt Savatgy, who is the school's Scientist-in-Residence. AWSMP gave Mr. Savatgy a grant for his Watershed Detectives Program which teaches elementary aged students the importance of stream science.

AWSMP also hosted the 2nd **Annual Family Fun and Fish Day** at Kenneth Wilson State Park on June 8. This popular event provides supplies and instruction for anyone young or old who wants to learn how to fish. An environmentally themed arts and crafts table was also available as well as a BBQ. Special thanks to NYSDEC for providing fishing poles and other supplies and to members of the local chapters of Trout Unlimited who came out to show people how to fish.

July

On July 24, AWSMP hosted an **information and educational session on changes to the National Flood Insurance Program (NFIP)**. As a result of the Biggert-Waters Flood Insurance Reform Act of 2012 flood insurance premiums for many policyholders will rise to actuarial rates. AWSMP partnered with NYSDEC, NYCDEP, Ulster County Planning Department and Department of the Environment and the Rondout-Neversink Stream Management Program to educate over 40 municipal officials about how the NFIP changes will affect their communities.



Above: *CCE Educator, Brent Gotsch, uses a floodplain model to show youth how improper development can exacerbate flood levels downstream at the 2013 Ulster County Fair.*

August

Staff from Ulster County CCE participated in the **Ulster County Fair** on August 2. Staff set-up a floodplain model borrowed from the New York State Floodplain and Stormwater Managers Association which shows how different types of development affect the landscape.

CCE staff also participated in this year's **Shandaken Day** festivities on August 24. This year's Shandaken Day was held in Mount Tremper at the site of the future Catskill Interpretative Center.

September

On September 21, CCE staff participated in the **2nd Annual Hudson Valley Harvest Festival** at the fairgrounds in New Paltz. This annual event is run jointly by Cornell Cooperative Extension of Ulster County and Family of Woodstock and seeks to promote appreciation of agriculture and natural resources in the Hudson Valley.

Bobby Taylor from Ulster County Soil and Water Conservation District led an **educational stream walk on Kanape Brook** in the Town of Olive on September 28. Approximately 20 adults and youth joined Bobby as he explained local geology and how historical land use shaped how the stream is today. Support for this program was provided by Cornell Cooperative Extension Educator Brent Gotsch.

Featured Stream: Broadstreet Hollow

Broadstreet Hollow Creek begins as a series of steep rivulets running over West Kill Mountain and North Dome Mountain in Greene County. From there, small streams flow through side valleys and merge into the four-mile main channel that meanders toward the Esopus Creek in Ulster County.

Most of Broadstreet Hollow's small streams flow year-round, branching tree-like up the mountainsides. There are no stream gages measuring flow levels in Broadstreet Hollow, but instruments on the nearby Esopus Creek and Bushnellsville Creek indicate the largest flows in Broadstreet Hollow usually result from rapid spring snowmelt. There have been large summer and fall floods associated with tropical storms, most recently in 2011, but also in the mid-1950s. It was a flood in January 1996 that spurred interest in developing a management plan for the Broadstreet Hollow Creek. The 1996 flood caused damage to homes and roads and changed something in the stream. Small eroding banks became larger failures and the stream began to run muddy even during dry months. The Ulster County Soil and Water Conservation District (UCSWCD) formed a Project Advisory Committee to guide development of management strategies in 2001, with funding and technical support from the NYC Dept. of Environmental Protection (NYCDEP).

In the early 2000s, about half of Broadstreet Hollow residents lived there full-time and half were summer residents or weekenders. At one time, the most numerous residents of the hollow may have been sheep and cattle. Stone quarries were scattered throughout the valley by the early 1900s. Remnant pastures with their falling stone walls are still easy to find. A one-room schoolhouse served most of the Hollow's children. Originally the valley may have been named "Bradstreet" after Major Bradstreet, a

Above: *Broadstreet Hollow Creek.*

commissioned officer in the Kings Army of the mid-1700s. Much later, a street sign named "Bradstreet Hollow" was knocked down during an auto accident and replaced with the name "Broadstreet Hollow." Area families have ancestors that were born, lived, and died in the Broadstreet Hollow valley, including the Riseleys, Osterhoudts, Storeys, Longyears, Fords, Bathers, Burkes, Mohls, Steins, and Holzers.

Underlying the imprints of human settlement are landforms left by glaciers that occupied these mountains 22,000 to 12,000 years ago. High terraces and hill-like moraines line the valley's bedrock walls, causing the creek to flow around them in a meandering pattern through the lower sections of the creek. Another legacy of the ice ages is thick layers of sediment deposited by melting glaciers. The silt and clay deposits are the primary source of stream turbidity, or muddy water.

The January 1996 flood and some emergency repair work done afterward, removed the thin cobble and boulder layer covering the erodible clays left by glaciers. The stream swiftly cut downward into the clays pulling streambanks and hillslopes down with them. Once suspended in water, the clays traveled downstream to the Esopus Creek and the Ashokan Reservoir. One section of the Broadstreet Hollow Creek north of Timberlake Road eroded laterally over 30 feet.

This section of the stream continued to degrade after Tropical Storm Floyd in 1999. A high bank collapsed and caused pressurized ground water to pump clay into the stream. It emerged in a bubbling pool called a "mudboil." The mudboil was temporarily depressurized through a stream restoration project completed in 2000. Relief wells were installed to drain water from the hillslope. The Greene County Soil and Water Conservation District and the NYCDEP worked to redirect the channel that was undercutting several homes. The stream was reconnected with its floodplain and riparian buffers were planted with hundreds of willows and trees.

Although the channel remains stable, the relief wells partially failed after an April 2005 flood. The project was repaired, but a smaller version of the mudboil has sporadically returned. The site might be treated again in the future with improved techniques and new sources of funding.

In the meantime, the UCSWCD continues to make site visits at the request of Broadstreet Hollow landowners to discuss bank stabilization options and riparian buffer restoration. Streamside landowners can request a consultation by calling (845) 688-3047. Stream management recommendations for the Broadstreet Hollow Creek can be found in the Broadstreet Hollow Stream Management Plan available online at: http://ashokanstreams.org/exploring-the-watershed/broadstreet-hollow-creek/.

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ASHOKAN WATERSHED
STREAM MANAGEMENT
PROGRAM

Stream Assessment in the Ashokan Watershed

Stream management plans are one of the most valuable resources that AWSMP creates for local communities in the Ashokan Watershed. These documents consist of detailed information and recommendations that can help streamside landowners, municipalities, and resource managers to maintain their property in a sustainable way. The strategies outlined in a stream management plan focus on effectively addressing flood hazards, stream bank erosion, and water quality threats. Rigorous study and field survey is needed to help managers predict future conditions and develop management recommendations. A team of AWSMP employees collaborate on this multi-step process.

Before any recommendations can be made, the AWSMP assessment team must gather and analyze information about the physical condition of the stream. This assessment process is two-fold. The first step focuses on organizing the pre-existing, digital data and studying it using computer programs such as geographic information systems (GIS). The AWSMP team uses remotely sensed data, including historical and recent aerial photographs, topographic and elevation models, and land use data in order to understand what underlying factors control a stream's behavior. Flow data from USGS gaging stations, geologic maps, and soil surveys are also consulted during this initial phase of assessment.

The second step of gathering data consists of physically walking the stream from end to end in order to make first-hand observations and verify remotely collected, digital information. During a stream "walkover," the AWSMP assessment team evaluates the stream system's stability and identifies the areas of potential flooding, stream erosion, threatened infrastructure or property, and impaired stream health and threats to water quality. The assessment team does this by using a global positioning system (GPS) to inventory the exact location and dimensions of the key stream features within the stream corridor that may affect the function of the stream. Commonly recorded features include: eroding banks, fine sediment sources, berms, revetment, bridges and culverts, invasive species, large woody debris jams,

Above: *The 2013 AWSMP stream assessment crew.*

impaired riparian vegetation, headcuts, and bedrock grade control. From the data collected, useful statistics can be generated to quantify which sections of stream have the most eroding banks, the longest sections of exposed clay, the greatest concentration of revetment, or the longest sections of unstable streams.

In addition to providing useful information about current stream condition, walking the stream also allows the AWSMP team to speak with landowners in person and gain an even greater understanding of changes that have occurred over time. Many long-time, streamside residents are an invaluable source of knowledge and can share their observations through stories and photographs. In return, the stream assessment team can supply information about available AWSMP resources that would be specifically useful to a particular landowner. AWSMP is always grateful to landowners who are able to provide these first-hand observations and appreciates the opportunity to exchange new insights.

With the knowledge gained from our assessments, the AWSMP team can identify where stream instabilities are threatening infrastructure or homes, what may be the cause of the instabilities, and where stream restoration efforts will be the most effective. These assessments not only provide knowledge of current conditions and immediate concerns, but also provide a set of base line data that can be used for future comparison. Over time, the AWSMP team's goal is to repeatedly assess the same streams using the identical methods to track the changes and trends in stream conditions. To date, AWSMP has assessed Birch Creek, Broadstreet Hollow Creek, Bush Kill, Bushnellsville Creek, Esopus Creek, and Woodland Valley Creek once, and assessed Beaver Kill, Stony Clove Creek, and Warner Creek multiple times. During 2013, the AWSMP assessment team finished the walkover of Bushnellsville Creek from Deep Notch to the Esopus Creek confluence and completed a second walkover of Stony Clove Creek from Notch Inn Road to the Esopus Creek confluence.

Digital copies of the completed stream management plans are available on the AWSMP website at: http://ashokanstreams.org/publications-resources/resources-for-streamside-living/ . If landowners or other members of the public have questions about, or information for these plans, please contact the AWSMP office.

Article written by Allison Lent and Christina Appleby.