Fall-winter 2010

Esopus Creek News

Ashokan Watershed Stream Management Program Newsletter

A quarterly publication of Cornell Cooperative Extension Ulster County

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

Fall Floods 2010

If there is one thing that's predictable in the Catskill Mountain river valleys, it's regular and occasionally catastrophic flooding. On Friday, October 1st, many residents in the watershed were woken up in the middle of the night as local streams crested at about the 10 to 20 year flood level. Approximately 5 to 7 ¾ inches of rain fell in the Ashokan watershed over two days. According to Art Snyder, Director of the Ulster County Emergency Management, the flood caused over $1.1 million in damages across the county, just to public infrastructure.

Brown Road in Oliverea, damaged by flood water by McKinley Hollow Bridge

In response to the flood, the Ashokan Watershed Stream Management Program has played a strong role in providing technical assistance and coordinating with town governments and other agencies related to public infrastructure damage. The Program's work has been to coordinate resources and ensure that post-flood restoration is done in ways that maintain stream stability. Program staff visited damaged sites with representatives from the Federal Emergency Management Agency (FEMA), Department of Environmental Conservation (DEC), and towns. Engineering designs were provided by the program to the Town of Shandaken to restore damaged stream reaches such as Woodland Creek across from the Roxmoor Inn, and the relocation of the Esopus Creek to its pre-flood stream channel at Brown Road in Oliverea. The program also designed and will help to replace a washed out culvert in Trevor Hollow, which staff had identified as a problem culvert before the flood. Luckily, a streambank protection project near Fawn Hill Rd. was completed before the flood, as the eroding bank was an imminent threat to Woodland Valley Rd (see article pg. 2). After the flood, a second site, by the Roxmoor Inn, became an imminent threat to Woodland Valley Road. Fortunately, the Roxmoor site is already funded for protection by the same FEMA grant that funded the streambank protection project near Fawn Hill Rd.

With all of this local damage, many people may be wondering if a federal disaster declaration will be declared, in which case FEMA would provide individual or public assistance funds to help cover some damages. Unfortunately, at the time of this writing, it is very unlikely a federal disaster declaration will occur. To be eligible for a federal disaster declaration, damages must exceed both $600,000 at the

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

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ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

NYC Environmental Protection

SOIL & WATER Conservation District

Woodland Valley Road Protected from Erosion

In Woodland Valley, just downstream of Fawn Hill Road, Woodland Creek was eroding the bottom of a steep, 30 foot tall bank, undercutting the hillside and endangering the road and utility service. Because the road and stream are so close together, there was concern that without intervention, a flood would block access to the top of Woodland Valley.

Rock is placed at the toe of the eroding slope on Woodland Creek. Large sand bags prevent construction runoff into the stream

The identification and prioritization of this project for the Ashokan Watershed Stream Management Program was the result of collaboration among local town highway superintendents and the Ashokan Watershed Stream Management Program (AWSMP) staff. This Highway Managers Working Group has identified locations where intervention or improved practices could protect both public infrastructure and water quality. Staff from Ulster County Soil and Water Conservation District (UCSWCD), USDA Natural Resource Conservation Service (NRCS), Cornell Cooperative Extension and New York City Department of Environmental Protection, and Shandaken Highway Superintendent Eric Hoffmeister worked together over the last year to design, fund and implement a solution for the Woodland Valley Creek site. The engineered design includes a stacked rock wall, a bioengineered hillslope, drainage, and riparian tree plantings to mitigate this community hazard. Funding for this project is coming from a FEMA Hazard Mitigation Grant received by the town and a grant from the Ashokan Watershed Stream Management Program Implementation Fund.

Rock walls, in combination with bioengineering, are useful tools when it is imperative to protect infrastructure or buildings from stream erosion. To be durable over time, they must be designed and built according to best practices. NRCS designs all stream bank protection projects to withstand at least a 25 year flood, with elements of the project designed to withstand up to a 50 year flood. If you are considering construction of a rock wall, seek technical assistance and ask contractors

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October 1st Flood 2010 *(Continued from cover)*

county level and $25 million at the state level. While the Ulster County Office of Emergency Management has assessed well over $1.1 million in damages for Ulster County, only $5.1 million in damages have been reported at the state level.

However, FEMA disaster funding should not be confused with flood insurance. Residents with flood insurance can file claims based on their existing insurance policy coverage. Flood insurance is required on all properties with mortgages located in flood zones with a 1% chance per year of flooding (the 100 year floodplain). However, anyone can buy flood insurance. Even if you are in a moderate risk flood area, you should consider getting flood insurance as 25% of claims are in moderate to low-risk areas. To learn more about the National Flood Insurance Program, go to www.floodsmart.gov.

To learn about other ways to protect yourself and your property from future floods, see our flood preparedness brochure at www.ashokanstreams.org under "Resources for Landowners."

Flooding on Main St. Phoenicia on Oct. 1, 2010

**** At press time for this issue, the December 1st flood occurred, with similar damages reported.****

Woodland Valley Road Protected from Erosion *(Continued from page 2)*

Drainage pipe placed before construction of the wall.

> ***A 25 year flood event is the height of flooding based on a measure of chance, not necessarily how often a level of flood occurs. A 25-year flood has a 1 in 25 chance of occurring each year. A 100-year flood has a 1 in 100 chance of occurring each year and so on. Two 100 year floods can occur in the same year, but it's not very likely. It would be like winning a 1 in 100 lottery drawing twice in a row.***

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what level of flood it is designed to withstand.

A significant design aspect to this project is that the rocks are fit tightly, pinned together and pinned to bedrock with rebar, making the wall act as a single unit. "The excavator is almost like an artist, finding the right rock and fitting it in just the right place," said Jake Wedermeyer, staff for UCSWCD. Where bedrock is not available for a foundation, a footing trench can be used.

Another important feature is the use of keyways on the upstream and downstream end of the wall. Keyways are perpendicular extensions of the wall, anchored 15 feet back into the bank. The keyways are pinned to the rest of the wall, anchoring it to the bank as a single unit. This will prevent eddies of water from eroding behind the wall at the ends, undermining the wall. "Keyways are the essential element that locks the entire wall into the bank. You don't want a free-standing wall," Wedermeyer stated.

The rock size is selected to be heavy enough to not be picked up by severe flood events. Even though they are pinned together, rocks can actually slide up along the rebar during high velocity flows. In this case, the stones are approximately the size of a small desk and weigh hundreds of pounds to prevent such movement.

Above the rock wall, bioengineering begins. Bioengineering is the combination of an engineered hillslope shape with the use of plants. Tightly rooting plants like shrub willows and dogwoods are used to help stabilize a slope. A variety of methods can be used in bioengineering, but the method for this steep slope will be a Vegetated Reinforced Soil Slope (VRSS). VRSS involves using layers of soil, wrapped in geotextile fabric to create a series of two-foot, lip-like steps up the slope. Between each layer, live willow and dogwood stakes are placed using 20 cuttings for every foot of VRSS. These cuttings will grow dense roots that have strong holding strength to keep soil in place. You can see an example of VRSS at the Esopus Creek restoration demonstration site located at the confluence of Woodland Creek with Esopus Creek. Check out the kiosk for details. The bioengineering on this site will be done in

Rocks pinned to bedrock with steel rebar

November, after willows go dormant. One advantage of bioengineering is that even if it gets damaged, it can grow back. Similar vegetation cuttings will also be used in between the rocks in the rock wall to give the wall a more natural appearance, provide some additional stability, and shade the rocks to prevent heating the water. Inter-planting vegetation and using rock walls combined with bioengineering can protect and maybe increase habitat.

Fortunately, the rock wall was completed just prior to the October 1st flood thanks to approval of FEMA funding and completion of the engineering design over the summer. It held up very well, even without the bio-engineering. According to Hoffmesiter and others, had the project not started this year there is a good chance that that flood would have taken out Woodland Valley Road.

For more information about this project, contact Cory Ritz, Ulster County Soil and Water Conservation District at 688-3047. Information about proper installation of rock walls and a variety of stream management options, go online to www.catskillstreams.org and click on "stream stewardship" and select "Instream."

Large Woody Debris Plays an Important Role in Ashokan Streams

If you live near the Esopus Creek and its tributaries, you know that trees are frequently found in the streams. Stream managers refer to trees in streams as large woody debris. Large woody debris is essential to aquatic ecology and to maintaining the long-term stability of the stream. According to Dr. Clifford Kraft of Cornell University, the streams in our region historically had even more woody debris than they do today. This article explores the role woody debris plays in streams, data that has been gathered in Woodland Creek, and some practices for managing woody debris on private property.

Stream channel responses tend to occur around the more stable, or persistent woody debris jams. Stable woody debris jams can significantly affect streams by changing the channel shape, trapping additional woody material, shifting erosion or deposition, and changing the speed of water flow. The effects of woody debris vary. It can scour a hole in one spot while filling in a pool at another location. As a part of the changing nature of streams, large woody debris regularly enters and leaves stream channels all along their course.

The stability of large woody debris is a function of two main factors: the size of the tree, and the size of the stream. Research shows that a general rule for determining the stability of large woody debris is if the tree is longer than the channel width, it is much less likely to be moved by regular flood flows.

Bank erosion from trees that were not cut before falling into the stream

By monitoring locations of large woody debris that are stable or persistent over time, we can see whether the debris will have major effects on the stream, and in what situations the effects might be either positive or negative. To learn more about the stability of large woody

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Jack Isaacs Retires from DEC

After 30 years of service in the New York State Department of Environmental Conservation (DEC) Habitat Protection Unit of Region 3, Jack Isaacs has retired. As the person responsible for granting stream disturbance permits, Jack has had a lasting legacy on the protection of streams in the Esopus Creek watershed and throughout the region.

Jack was willing to work with and educate contractors, town officials, and landowners on improving the durability and cost effectiveness of their proposed stream project designs. Whether one agreed with Jack or not, he earned one's respect through his straight forward manner and spirit of friendly dissent. Jack maintained a clear policy of preventing or limiting past practices in stream management such as gravel mining, dredging out streams, or poor quality streambank protection which have historically destabilized streams and degraded habitat.

In 2004, Jack was integral to the success of the original Esopus Creek Focus Group that developed a coordinated and collaborative approach to stream management in the Esopus Creek corridor. His leadership and respect in the field of stream management lent credibility to the Esopus Creek Focus Group. His active support continued into the broader Ashokan Watershed Stream Management Program.

For all of us who have worked in the Esopus Creek watershed it has been a privilege to work with Jack. The DEP and AWSMP program staff wish him a fantastic retirement.

Large Woody Debris *(Continued from previous page)*

debris on local streams, Ashokan Watershed Stream Management Program intern Jenine Tobey began looking at some of the characteristics of large woody debris in Woodland Creek this summer.

Tobey focused her study on Woodland Creek in Woodland Valley so her results could be compared to mapping of woody debris in a 2008 assessment of Woodland Creek. In 2008, 91 large woody debris sites were recorded. Two years later, in 2010, 73 sites still had some form of large woody debris. At each of the 73 sites, the length and diameter of trees were measured. By

Cantilevered trees that can be cut above the rootwad to help maintain bank stability

collecting this data over several years, we could potentially find which factors are more likely to lead to the stability of large woody debris and in what situations large woody debris becomes problematic. After the recent October 1 flood, initial field investigations revealed that the debris jams predicted to be more stable had collected even more woody debris. Smaller woody debris was predictably moved downstream by the flood.

If you're a streamside landowner or a highway manager, you probably want to know when and how to manage large woody debris. Since large woody debris is an integral part of a stream, best management practices encourage leaving it in the stream when possible. Here are some cases when large woody debris should be left in place:

· Stumps on the bank, unless severely undercut

· Large woody debris structures, such as embedded logs, which are retaining sediments and acting as a grade control

· Large woody debris that is naturally providing bank protection

· Large woody debris structures that are directly creating stream habitat.

Ultimately, large woody debris should only be removed from streams in circumstances when buildings or infrastructure is threatened. One of the easiest management practices that a landowner can do to protect their stream bank is to cut up and remove trees likely to fall into the channel within the next year, but leave the rootwad intact in the stream bank. Large woody debris that is perpendicular to the stream channel can be moved to an angle between a 20˚ and 40˚ to the bank (with the open angle downstream). This makes it less likely to have an erosive effect on the stream bank.

For more information about woody debris management, go online to: www.ashokanstreams.org and click "Resources for Landowners."

Channel-spanning large woody debris that is unlikely to be moved during most large floods

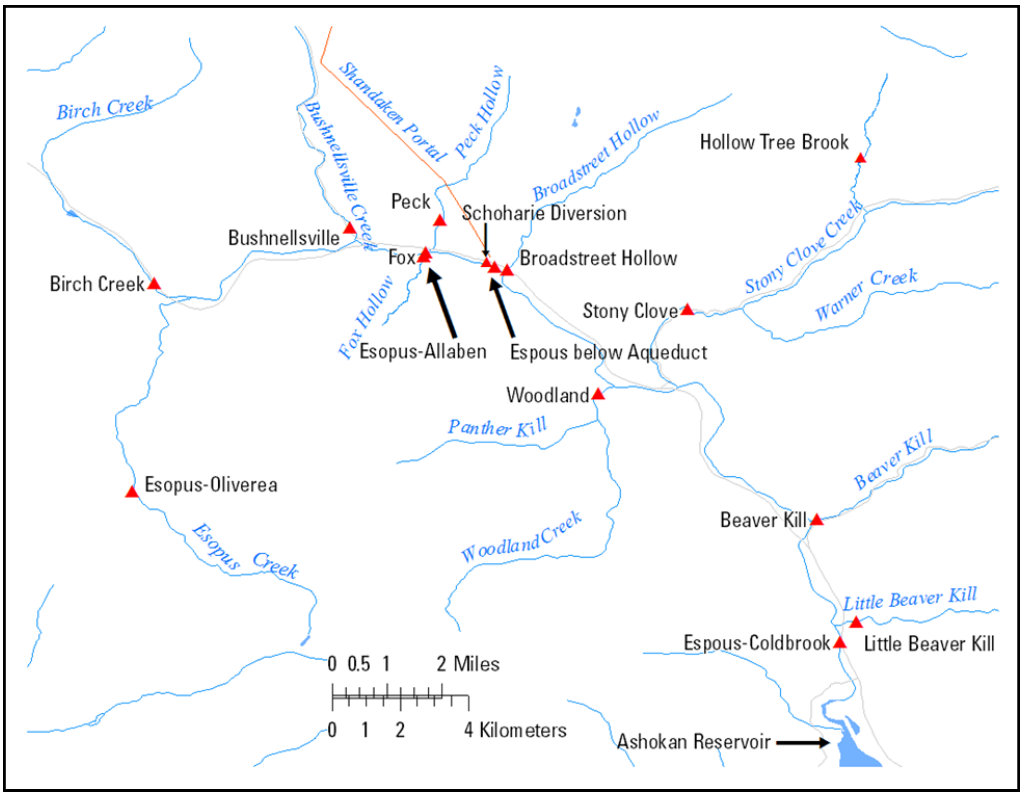
Embedded log holding sediment and acting as a grade control

Woody Debris can cause damage to bridges if not removed or there is not enough space for the debris to pass under the bridge

USGS Streamgages Provide Valuable Information

Did you know that the stage (water level) of many streams in the United States is measured every fifteen minutes? U.S. Geological Survey (USGS) streamgaging networks provide valuable, objective information for a variety of uses that is freely shared. The USGS gage data are critical for flood prediction, but also have many other uses. The data are used to design highways and bridges, map floodplains, monitor environmental conditions (e.g., acid rain), protect aquatic habitats, and monitor stream conditions for recreational uses. Streamgages that have long historical records of stream flow and water-quality are particularly valuable because these data can be used to help identify changes in stream hydrology, long-term climate trends, and the effects of land use changes (USGS 1999).

In the Esopus Creek Watershed, water-quality data is being collected in addition to the regular flow measurements at all 15 USGS streamgages in the watershed.



Locations of USGS streamgages in the Esopus Creek Watershed

USGS Streamgages in the Esopus Creek Basin ***http://waterdata.usgs.gov/ny/nwis/rt/***	
USGS Station #	Station Name
Stations with real-time streamflow data	
13621955	Birch Creek at Big Indian
1362200	Esopus Creek at Allaben
136230002	Woodland Creek above mouth at Phoenicia
1362370	Stony Clove below Ox clove at Chichester
1362497	Little Beaver Kill at Beechford near Mt. Tremper
1362500	Esopus Creek at Coldbrook
1362342	Hollow Tree Brook at Lanesville
1362230	Diversion from Schoharie Reservoir
Stations with water-quality data	
136219203	Esopus Creek above Elk Bushkill at Oliverea
1362197	Bushnellsville Creek at Shandaken
1362199	Fox Hollow Trib to Esopus Creek at Allaben
1362215	Esopus Creek Trib at Peck Hollow Rd. at Allaben
136223005	Esopus Creek below Aqueduct (650 ft) at Allaben
1362232	Broadstreet Hollow Brook at Rt. 28 at Allaben
1362487	Beaver Kill at Mount Tremper

This data will be used to help understand how the amount, source, and timing of turbidity in the Upper Esopus Creek affects water quality, fish, and stream dwelling insects (see Esopus Creek News Fall, 2009 and Summer, 2010). This fall, continuous turbidity monitoring will begin at most of these streamgages so that the relationship between turbidity and suspended sediment can be better understood. Limited water-quality data is available online, but the final results of these investigations will be published in reports available at http://ny.cf.er.usgs.gov/biblio/joysearch_biblio_helper.cfm. Funding for this effort is provided by the Ashokan Watershed Stream Management Program Implementation Fund, NYC DEP and USGS.

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Stream Stewards and Creek Week 2010

The Ashokan Watershed Stream Stewards were active during the first annual Ulster County Creek Week this year from September 6 – 19. Six public events were held in the Ashokan Watershed for Creek Week ranging from Learn to Fish Day, Native Plant Walk, Environmental Film Night, Rain Barrel Workshop, Crummy Culverts Contest, Photo Contest and Streamside Restoration Planting. Everyone had a great time and we can't wait for Creek Week next year!

Streamside Restoration Project
On September 18, Stream Stewards helped plant our first Catskill Streams Buffer Initiative (CSBI) site. The program helps streamside landowners who need their riparian (streamside) areas restored with vegetation. Landowners apply for the program and are expected to provide some in-kind contribution and provide ongoing maintenance of their vegetated buffer.

Learn to Fish Day
Stream Steward Volunteer Bill Colograndе (in the green hat, right) volunteered his skills as a licensed fishing guide to help young people (as well as some of their parents) learn to fish at Kenneth Wilson State Park on Sept. 18. Fishing is a great way to learn about stream habitat and to get involved at an early age in streams.

Get Involved in the Fun! Join the Stream Stewards
Look for our upcoming events at: www.ashokanstreams.org
Or just call us at 845-688-3047

USGS Streamgages

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You can view real-time stream flow data online for 8 of the 15 USGS streamgages in the Esopus Creek Basin and more than 200 other USGS streamgages throughout New York State. Go online to: http://waterdata.usgs.gov/ny/nwis/rt/ and click on "Statewide Streamflow Table" and scroll down to the gages in the Hudson River Basin for local streams. Continuous recordings of stage at these sites are transmitted by satellite every one to four hours and displayed on the web page along with a calculation of streamflow.

USGS streamgages are the primary source of data for the National Weather Service (NWS). NWS has a flood prediction website at http://www.erh.noaa.gov/er/nerfc/, which shows how close the current stage is to flood stage for a few USGS streamgage locations, such as the Esopus Creek at Cold Brook streamgage near Boiceville. You can monitor the streamgages online to be aware of potential flood dangers during heavy rain events, along with listening to National Weather Service announcements, local media, and signing up for NY Alert messages online at: http://nyalert.gov/.

REFERENCE

U.S. Geological Survey (1999). Streamflow Information for the Next Century—A Plan for the National Streamflow Information Program of the United States Geological Survey. U.S. Geological Survey Open-File Report 99–456, _13 p.

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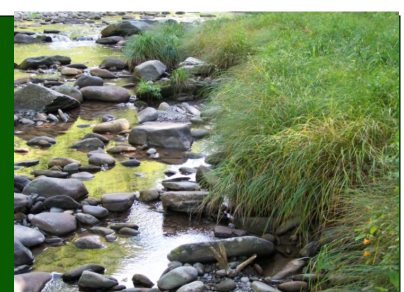

Save the Date!

2nd Annual Ashokan Watershed Conference

Saturday, April 9th Onteora High School

Workshops for streamside landowners, municipal officials, and other interested community members

Enter to win a poster sized aerial photo of your home!
Fill out our Newsletter Survey at www.ashokanstreams.org