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Esopus Creek News

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Rosgen from p. I
flows resulting in too much deposition and more instability. Dr. Rosgen also showed photos of how expensive attempts to straighten stream channels have resulted in major flood damage when the stream eventually reclaimed its natural curves in large flood events.

The presentation was part of a five day training class sponsored by NYC DEP and Cornell Cooperative Extension of Ulster County. Forty-five professionals were trained to better understand how streams are likely to respond to changes that they make to stream channels and floodplains. Participants included staff from Town Highway Departments, Soil and Water Conservation Districts, Department of

Environmental Conservation, Department of Transportation, Ulster County, and local engineers.

Staff from p. I
the Beaver Kill, coordinating with local highway departments and meeting with individual landowners. Cory plans to defend his master's degree thesis in watershed science and policy from California State University this year.

Jake Wedemeyer, a resident of Glenford with eight years of experience as a District Technician, works in the Ashokan Program Office two days a week. Jake currently works on completing the Beaver Kill assessment and organizing our GIS computer database. Jake also raises heifers and hay locally and has

a master's degree in geography with an emphasis in GIS. Our newest staff member, Adam Doan, is the local coordinator for the Catskill Streams Buffer Initiative.

Adam previously worked with New York City Parks and Recreation as an aquatic ecologist and has a Bachelor's Degree in Natural Resource Management.

The Catskill Streams Buffer Initiative supports landowners who need enhanced vegetation to protect their streamside property and do not qualify for other existing programs.

Please call us at (845) 688-3047 if you would like to learn more about our programs or seek assistance with conserving streamside property.

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 - Beaverville - Little Beaverville - Peck - Bushnellsville - Bush Kill

International Stream Expert Comes to Mt. Tremper

Cornell Cooperative Extension of Ulster County's Ashokan Watershed Stream Management Program and NYC DEP hosted world-renowned stream restoration consultant and hydrologist Dr. David Rosgen for a public talk about stream restoration entitled, "Stream Projects: The Good, the Bad & the Ugly" on October 7th. Dr. Rosgen discussed examples of stream restoration projects that were installed with good intentions, but failed. He then illustrated ways to improve stream



Hydrologist, Dr. David Rosgen

projects by using a "natural channel design" approach to stream restoration.

Natural channel design is an approach to restoring stream stability by mimicking the dimensions, shapes, and patterns found in stable

streams that are not damaged by flood events. The method assumes that, if allowed, streams will develop a stable form to handle a wide range of stream flows. If a stream section is being "restored" after a major flood, it needs a channel that is properly sized to convey the range of water flow and sediment delivered to it from upstream. Dr. Rosgen showed how well-intentioned attempts to "clean out" channels have left overwidened channels with slower

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Soil and Water Conservation District Staff Join Ashokan Office

The Ashokan Watershed Stream Management Program Office has been humming with new activity now that staff members from Ulster County Soil and Water Conservation District have joined

the office. The District, which also has a contract with New York City DEP, coordinates the technical aspects of the stream management program such as designing and constructing stream projects and conducting stream assessments. Based in Highland, some of the important roles



SWCD staff members: Cory Ritz and Jake Wedemeyer

played by the District in the county include working with farmers and watershed groups, completing stormwater projects, assisting individual landowners and running the Emergency Watershed Protection Program.

District staff members in the Ashokan Office currently

include a Project Coordinator, a part time technician and a Coordinator for the Catskill Streams Buffer Initiative. Starting this winter a part time engineer will also be available to the Ashokan watershed.

Cory Ritz, hired in July as Project Coordinator for the SWCD Ashokan team, organizes and plans stream management projects and stream assessments. This fall, Cory has primarily been focused on completing an assessment of

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

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ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

NEW YORK CITY DEPARTMENT OF
ENVIRONMENTAL PROTECTION

ULSTER COUNTY
SOIL & WATER
Conservation District



Ecological Study Begins on Esopus Creek



Interns from Ulster County Community College assisted with the study.

Photos Courtesy of Mark Loete

A long-standing question in the Ashokan Watershed has been whether or not waters from the Shandaken Tunnel or "portal" have a positive or negative ecological impact on the Upper Esopus Creek. The Shandaken Tunnel transfers water from the Schoharie Reservoir for 18 underground miles to the Esopus Creek, which then carries the

water another 11 miles to the Ashokan Reservoir. Although many parties have disputed impacts of the sometimes turbid portal flows on Esopus Creek ecosystems for decades, to date, no scientific studies have been completed to document the tunnel's effects on the health and behavior of local fish species as a result of altered temperature, turbidity, and flow from the tunnel.

Turbid or "muddy" water has been shown in other streams to adversely affect growth and survival of fish, stream dwelling insects (benthic macroinvertebrates) and the health of their natural communities. Turbidity also impairs water quality because it is aesthetically unpleasing and reduces effectiveness of drinking water disinfection. In the Schoharie and Ashokan watersheds, turbidity is primarily caused by suspension of silt and clay eroded from glacial till and lake deposits exposed along stream channels and hill slopes. Once this fine sediment is incorporated into the stream bed it is easily re-suspended during flood events.

Although turbid waters from the portal have been speculated by many to have adverse ecological impacts on Esopus Creek, these waters may also have some ecological benefits. The tunnel flows are often cooler than the Esopus during warm summer months and thus can provide beneficial oxygen-rich cold water for trout during thermally stressful periods.

Turbid waters from the portal are also only one of several threats to water quality and ecosystems in the Upper Esopus Creek watershed. Examples of other ecosystem stressors include climate change, terrestrial invasive species, nutrient pollution from increased development and failing septic systems, and recent blooms by the algae *Didymosphenia geminata* (rock snot).



A brown trout's length is measured.



Fish are stunned with electrodes and captured in nets for weighing and measuring.

This past summer, a partnership of groups and agencies began three multi-disciplinary studies to investigate important ecological questions in Upper Esopus Creek. Objectives of these studies are to characterize differences (and variability) in fish, macroinvertebrate and periphyton (attached algae) communities; primary production and nutritional quality of periphyton communities; and behavior, growth, and survival of hatchery or native trout at sites located upstream and downstream of the portal. Results from these studies will provide baseline environmental conditions and help agencies make better management decisions regarding portal flows, fisheries and other stream resources. Study partners include the New York State Department of Environmental Conservation, United States



A transmitter is inserted to track a trout's movement in the watershed.



A Rainbow trout is weighed.

(Photos Courtesy of Mark Loete)

Geological Survey, New York City Department of Environmental Protection, Trout Unlimited, Cornell Cooperative Extension of Ulster County, Ulster County Community College, and Cornell University.

As part of the first study, fish-community and habitat surveys were conducted at 18 study sites in the main stem Upper Esopus Creek and its major tributaries. At each site, an electrofishing backpack, with positive and negative electrodes, is used to pass DC current through the water. The charge temporarily stuns nearby fish which are collected with long-handled dip nets (see photo). Blocking seines are used to keep fish from moving into or out of the sample reach. All stunned fish are kept in water-filled coolers with aerators while individuals are identified, counted, and their lengths and weights are measured and recorded. The fish are then returned to the stream. Species population and community indices are calculated using sampled area and provide a relative measure of the ecological health of each study reach.

Also part of the first study, samples of stream insects and periphyton were taken at 20 mainstem and tributary sites to assess the impacts from stream stressors (including the portal) on parts of the food chain. These periphyton samples also provide data for a second study that quantifies primary productivity (the rate of biomass produced by photosynthesis) and nutritional quality of

periphyton assemblages. Automated water samplers and data loggers were also placed at 13 sites to record discharge and water temperature, and to collect water samples for chemical analyses. Adverse effects on the lower levels of the food chain could cause cascading impacts at higher levels, including trout. Conversely, the lack of a serious impact on periphyton would indicate that species, higher in the food web, could be healthy and the entire local ecosystem may be functioning normally.

In the third study, scientists studied the question, do waters from the portal effect trout behavior (daily movement and use of cold water refuges), growth, and apparent survival during warm summer months? Study teams implanted location and temperature transmitters into 45 native and hatchery-reared brown trout and several native rainbow trout. The teams created a field-based trout surgery unit to implant the transmitters.

The locations and body temperature of trout were logged several days each week during June, July, and August, 2009 using a portable radio receiver. Tracking continued until the unique transmitter signals for each fish were either lost, the transmitters were returned by fishermen or found during dedicated searches, or the signal indicated the fish was no longer moving (and was likely dead). Preliminary results from these studies will be analyzed and interpreted over the next several months, and additional work will continue for another one to two years. So stay tuned for the results of this study and other research articles in future issues of Esopus Creek News. For more information on this study contact Barry P. Baldigo (518) 285-5605, bbaldigo@usgs.gov or Alexander J. Smith (518) 285-5627, ajsmith@gw.dec.state.ny.us.

Join the Ashokan Watershed 4-H Youth Internship Program!

For GRADES 7 – 12

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