

# Esopus Creek News

Esopus Creek Stream Management Plan Newsletter

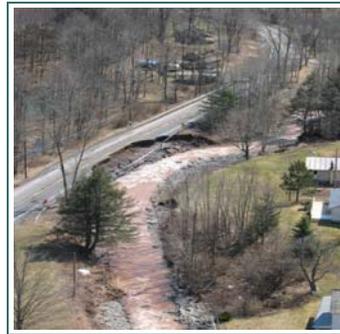
Volume I, Issue 2

Spring 2006

## What It Means To “Manage” a Stream

On behalf of Cornell Cooperative Extension of Ulster County and as Project Coordinator of the Esopus Creek Management Plan, I'd like to extend a thank you to the kind citizens of Olive and Shandaken who have welcomed us into your community. As we have sought your involvement in planning for the upper Esopus, many of you have already responded to the call by attending one of our educational events or discussion groups, coming out to chat as we walk by your section of stream, or stopping in our office at Phoenicia Plaza to show us some historical photos.

There are many “stream managers” – big and small on a stream. Every action taken by a “stream manager,” whether it be



**Erosion causes damage to Route 42**

reinforcing a private stream bank or reconstructing a public bridge, causes the stream to “react” or adjust to the changed condition. It can take months to decades for the stream to reach a new well adjusted form. The long-term goal of this project is to assist Esopus Creek in this adjustment while meeting the diverse needs placed upon its waters.

Many things upset a stream's stability; floods, landslides and changing climate are natural causes; land use, road and bridge construction, and streambank hardening are management causes. With so many management influences it's critical to understand and coordinate on the impacts we can control.

With a more stable stream as our goal, we serve the community in three capacities: 1) to *facilitate* the creation of a long-term management strategy for the upper Esopus Creek that is meaningful, practical and includes the interests of all stakeholders; 2) to *coordinate* the implementation of agreed-upon strategies and

*(Continued on page 8)*

## Panther Mountain's Mysteries

By Nathan Chronister, former Education Director, Catskill Center for Conservation & Development

In the flat desert east of Flagstaff, Arizona, right off Interstate 40, a major tourist attraction is concealed by what looks like a low, uninteresting hill. When I walked up the hill and entered the museum there about fifteen years ago, I was startled by a gigantic picture window revealing what could not be seen from the outside of the hill: a hole, as wide as the Hudson River and 600 feet deep. The hole was carved

out instantly 49,000 years ago, when a house-sized mass of solid iron (and other metals) fell from space. Moving at 40,000 miles per hour, it released more energy than an atomic bomb when it hit forming an enormous crater.

The landscape around here, where streams flow year-round at the bottom of forested slopes, is much different. As you drive from Delaware into Ulster County

along Route 28, a striking feature comes into view as you crest the ridge at Highmount. Panther Mountain, straight ahead in the distance looks low and unimpressive at first. It is only 1,800 feet higher than the road at that point, but the size of the mountain becomes apparent as Route 28, following Panther's lower shoulders, makes its way

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### Upcoming events...

- Wetlands Guided Exploration, 6/3/06 9-11 am
- Stream Talk & Walk, 6/17/06 9 am-12 pm
- Esopus Creek Interpretive Hike (a Catskill Mountain Club event) 7/8/06 10 am-3 pm
- Testing the Waters, 7/22/06 9 am-12 pm



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## Panther Mountain (con.)

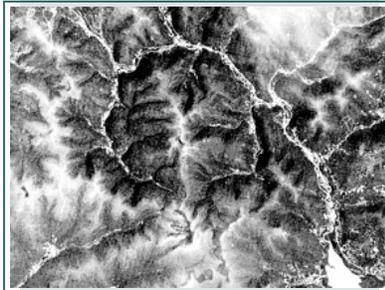
*(Continued from page 1)*

around the mountain in an arc from Big Indian to Phoenicia. Seen on a map, the mountain occupies a circle six miles in diameter, delineated by the Esopus and Woodland Valley Creeks.

The circular shape of Panther Mountain is unique in the Catskills because the mountains here, including Panther, were carved by streams from horizontal layers of rock and typically form a denritic drainage. This unusual feature attracted the attention of scientists Yngvar W. Isachsen, Stephen F. Wright, and Frank A. Revetta, who have made a good case that the mountain hides an ancient meteor impact crater about eight times the diameter of the Barringer crater in Arizona and eight thousand times older.

Gravity measurements indicate that the rock beneath Panther Mountain is less dense than the rock in surrounding areas. That, along with seismic data, suggests fracturing and disturbance deep underground as would result from an asteroid impact.

The meteorite that came down in our area roughly 400 million years ago found a much different Catskills. At that time, this area was a large river delta rapidly accumulating sediments that ran off from the high mountains to the east. By the time the Catskills rose, the crater would have been



Satellite image of Panther Mountain

buried miles deep, like a fossil preserved in stone.

The crater itself would still be buried under the sandstone and shale of the Catskills, but its presence has weakened the overlying rock around the edge of the crater, making it more vulnerable to erosion. Thus, the streams have carved out an outline of the crater even though it remains completely buried. In the exposed bedrock of the upper

Esopus Creek, one can see the closer-than-normal spacing of joints, or cracks, which has led to the formation of the circular valley.

At a recent education program sponsored by Cornell Cooperative Extension of Ulster County, Hartwick College geology professor, Dr. Bob Titus, gave an account of some of the geological phenomena of the Shandaken region, including the fascinating possibility that Panther Mountain hides a buried meteor impact. As he concluded—there is no exact proof, but the evidence makes a great story and reminds us of our region's vast history. The magnitude of such an event gives you something to contemplate when circumscribing the crater rim at the headwaters of Esopus Creek and Woodland Valley.

For a more detailed account of the Panther Mountain impact, check out the link on our website to an article from Discover Magazine.

*Adapted from an article published in Volume 27, No. 4 of the Catskill Center News.*



Zen Mountain Monastery (ZMM) archives

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*“The circular shape of Panther Mountain is unique in the Catskills...”*

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## Stream Walk & Talk!

Are you a streamside landowner, or have an interest in the Esopus? Come learn about the dynamic, sometimes complex processes behind erosion, gravel deposits, and changes in the creek's shape. These processes literally shape our backyards along the Esopus.

Here's your opportunity to learn how it works!

On Saturday, June 17<sup>th</sup> at 9 am join stream experts Doug Dekoskie, Sarah Miller and Dan Davis at our Phoenicia Plaza Office. Speakers will present some information and slides then we'll carpool to stream

sites retuning back to the office at 12 noon. Pre-registration is required – space limited to 35 people. Contact Michael Courtney – 845-340-3990 or email: [mcc55@cornell.edu](mailto:mcc55@cornell.edu)

**Sat. June 17, 2006**

## Getting to Know Our PAC

The Project Advisory Council (PAC) is a group of people guiding the development of the Esopus Creek Management plan consisting of town officials; streamside landowners; representatives of the angling and whitewater recreation community; regional non-profits; county and state agencies and universities. It began from stakeholder focus group meetings held in the spring and summer of 2004. Cornell Cooperative Extension of Ulster County, who through a contract with the NYC Department of Environmental Protection are coordinating the development of a stream management plan for the upper Esopus Creek, serve as the group's facilitator. To help you know the PAC, we'll highlight several members in each issue of our newsletter. The entire Council is

listed below, along with our first member profiles. We're going in alphabetical order – so keep an eye out for upcoming articles on your friends and neighbors serving on the PAC!

**Christine Baltz**,  
Broadstreet Hollow Landowners

**Helen Budrock**,  
Catskill Center for Conservation & Development

**Gary Capella**,  
Ulster County Soil & Water Conservation District

**Ed Cleveland**,  
local kayaker

**Virginia Craft**,  
Ulster County Dept of Planning

**Bob Cross, Jr.**,  
Town of Shandaken Supervisor

**Dan Davis**,  
NYC Dept. of Environmental Protection (NYCDEP)

**Jack Isaacs**,  
NYS Dept. of Environmental Conservation

**Harry Jameson**,  
Town Tinker Tube Rentals

**Keith Johnson**,  
Shandaken Highway Dept.

**Chester Karwatowski**,  
Trout Unlimited

**Amanda Lavalle**,  
SUNY Ulster

**Berndt Leifeld**,  
Town of Olive, Supervisor

**Ros McIntosh**,  
Zen Environmental Studies Inst.

**Glenn Miller**,  
Town of Shandaken, FP Officer

**Joe Munster**,  
Shandaken Town Board

**Joe Nalepa**,  
Ulster County Highway Dept.

**Beth Reichheld**,  
NYCDEP

**Lydia Reidy**,  
Cornell Cooperative Extension of Ulster County

**Pat Rudge**,  
local landowner

**Jennie C. Snyder**,  
Ulster County EMC

**Michelle Spark**,  
streamside landowner

**Thomas Story**, NYS Dept. of Transportation




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*“We do not own this land; we are only the stewards passing the challenge to another generation.”*

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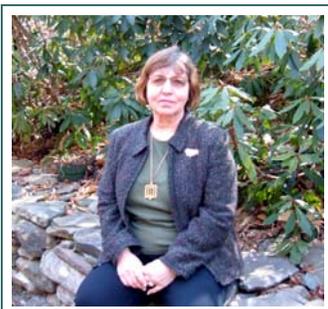
## Meet Christine Baltz & Helen Budrock

**Chris Baltz** has been an avid supporter of land and stream stewardship for as long as she can remember. Spending summers at her uncles' Allaben home since age three has given her a true love of the Catskill Mountains and of the people that call them home.

Chris is the driving force behind and coordinator of the annual Broadstreet Hollow stream clean-up. An active, engaged member of the Broadstreet Hollow Landowners Association she authored a history of the Hollow which prefaces the Hollow Stream Management Plan.

She is a member of the Catskill

Forest Association, New York Forest Owners Association and



**Christine Baltz, PAC member**

active in the Phoenicia Rotary. Chris says “I truly enjoy being educated on these subjects so I can share information with my neighbors and become informed on where to find answers for their

questions. I hope to play just a small role to help leave a legacy that the beautiful Catskill Park will be here just as magnificent as it is now, when my grand-daughter holds her first grandchild. We do not own this land; we are only the stewards passing the challenge to another generation.”

**Helen Budrock** is a certified planner with more than a dozen years of experience providing assistance to communities on a wide range of environmental, housing, and community development issues. She is Assistant Director of the Catskill

*(Continued on page 7)*

## Esopus Creek Flooding: Examining The Flood Record and Record Floods

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*“...eight of the top ten floods were spring or winter floods associated with melting snow.”*

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Flooding is one of the primary concerns of the Esopus Creek Project Advisory Council. Esopus Creek is a mountain river and all living in its valley have witnessed its power during floods.

The risks associated with floods and their powerful erosive forces can affect an individual landowner or an entire community. Last April’s flood swamped the residents of lower Fox Hollow and was powerful enough to move houses (photo below). This is the first in a series of articles addressing the issue of flooding.

We are fortunate to have several U.S. Geological Survey (USGS) stream gages in the Upper Esopus Creek watershed. There are two gages on Esopus Creek (see map on page 7) and eight gages in the tributaries. A stream gage measures the stage (elevation) of water and relates it to a “discharge” or rate of flow. Anyone with internet access can view the current discharge and stage for over 200 stream gages in NY (there is a link on our website – [www.esopuscreek.org](http://www.esopuscreek.org)).

Seventy-three years of measurements recorded by the Esopus Creek at Cold Brook gage in Boiceville allow some interesting observations to be made about local floods. The most common questions about Esopus Creek’s flood history are: What is the largest flood for this time period, or what is the “flood of record?” What time of year is the highest flow probably going to occur? And, has there been a pattern to the flooding?

Considering the highest stream flow recorded for each year, or “annual peak flow,” two simple ways to answer these questions are: (1) rank the flows and identify the flood of record; and (2) determine when these floods are most likely to occur.

The table below lists the top 10 floods recorded at the Cold Brook gage.

The flood of record (ie: record flood) was on March 21, 1980. An amazing 65,300 cubic feet per second (cfs) was recorded. Last year’s flood on April 3 peaked at 55,300 cfs and was the third highest flood recorded.

*(Continued on page 5)*

Top Ten Esopus Creek Floods	
Date	Peak Flow (cfs)
March 21, 1980	65,300
March 30, 1951	59,600
April 3, 2005	55,300
August 24, 1933	55,000
October 15, 1955	54,000
January 19, 1996	53,600
April 4, 1987	51,700
December 21, 1957	46,900
March 12, 1936	38,500
April 5, 1984	37,400



ZMM archives



House falls into Bushnellsville Creek as a result of April 3, 2005 flood

## Esopus Creek Flooding: Examining The Flood Record and Record Floods (con.)

The pie cart below identifies when these peak floods are most likely to occur. Most flooding occurs with heavy rainfall on a melting snow-pack. In fact, eight of the top ten floods were spring or winter floods associated with melting snow. 59% of the annual peak flows occur from December through early April (and March has the most of any month).

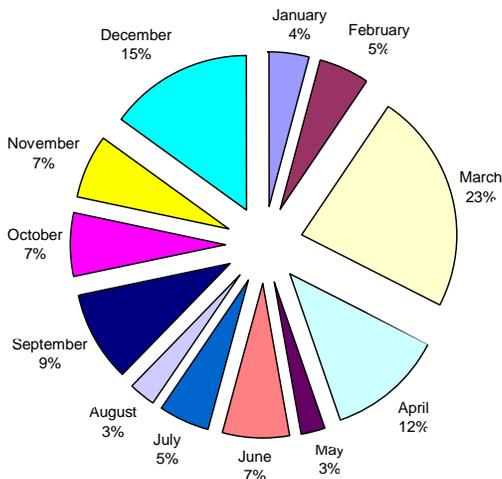
If we look at the 73-year flood record as a hydrograph – a graph of stream flows over time - we see that there are periods of more frequent flooding and periods of relatively dry conditions. During the 1930's, the 1950's and throughout the 1980's there were several big floods. The 1960's were a notably dry period.

There are of course important exceptions as there were years of drought during the generally wet periods. This can be seen by examining the data from 2002 when the “drought of record” occurred followed by three relatively wet years. It is difficult to discern a trend since the 1990's though we have had two of the top ten floods in that period and it seems we are in an increasingly wet time.



Damage caused by April 2005 flood

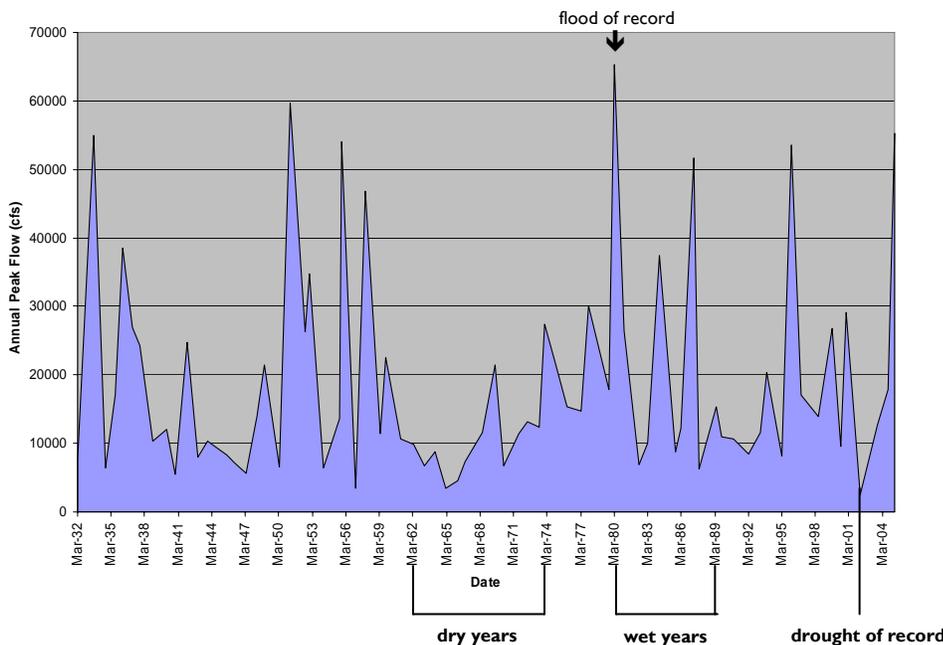
Annual Peak Flow Frequency by Month for the Esopus Creek at Cold Brook USGS Stream Gage



What will this year bring? Looking at the Cold Brook gage record it is hard to say. Since the 1980's we had a major flood at least every nine years (five of the top ten floods have occurred since 1980), but we have also experienced a few small dry spells. This year has started off very dry and as of late March there is no snowpack to cause the classic snowmelt flooding. We'll keep our fingers crossed and hope for a much needed average year.

“59% of the annual peak flows occur from December through early April...”

Esopus Creek at Cold Brook Annual Peak Flow for 73 Years



## Project Advisory Committee (PAC) Members

**Broadstreet Hollow Landowners Association**

**Catskill Center for Conservation & Development**

**Catskill Mountain Rail Road**

**Natural Resources Conservation Service**

**New York City DEP**

**New York State DEC, Region 3**

**New York State DOT Region 8**

**SUNY Ulster**

**Town of Olive**

**Town of Shandaken**

**Town Tinker Tube Rentals**

**Trout Unlimited**

**Ulster County Highway Department**

**Ulster County Dept. of Planning**

**Ulster County EMC**

**Ulster County Soil & Water Conservation District**

**Zen Environmental Studies Institute**

**Cornell Cooperative Extension of Ulster County—Facilitator**

## Calendar of Events



Join us for these upcoming events!

Contact Michael Courtney via email (mcc55@cornell.edu) or by calling 688-5496 or 340-3990 to let us know you will be attending.

**Sat., June 3 9 - 11 am**  
**Wetlands Guided Exploration – Zen Environmental Studies Institute, South Plank Rd, Mount Tremper**

Why is this wetland important in our watershed? Who lives here? An ardent naturalist and ecologist, Spider Barbour will answer these and other questions on this guided tour of the Zen Environmental Studies Institute wetland on the Esopus. Experience the diverse and

abundant life found in this wetland.

**Sat., June 17 9 am - 12 pm**  
**“Stream Talk & Walk” with Doug Dekoski, Sarah Miller & Dan Davis – Phoenicia Plaza Office**

Ever wonder why some rivers stay muddy and some clear up quickly or why gravel bars build up in particular spots? Come hear from stream specialists how streams change and react over time. After a presentation we’ll carpool to a few stream sites to see the principles we learned about in action.

Reservations are required for this event — space is limited!

**Sat., July 8, 10 am-3 pm**  
**Esopus Creek Interpretative Hike (a Catskill Mountain Club event) – Phoenicia Plaza Office**

Join NYC DEP geologist Dan Davis

and staff of the Catskill Center for Conservation & Development for a brief presentation on the upper Esopus Creek watershed, and then carpool to a trailhead in the upper reaches of the Esopus for a hike rated moderately difficult. Please bring a packed lunch. To attend contact Dan Davis, 845-340-7535 or Chris Olney, 845-586-2611.

**Sat., July 22 9 am - 12 pm**  
**Testing the Waters – Zen Environmental Studies Institute, South Plank Rd, Mount Tremper**

An introduction to simple water quality tests that tell about the river’s ability to support life with Ros McIntosh. Reservations are required for this event — space is limited! Adults only, please. Call 688-7993 to reserve a seat.

## Taking the First Step: Assessing the Esopus Creek

In order to address recurrent problems in a stream, assessing the stream’s current condition is the first step. There are many ways stream assessments can be done from very simple, non-scientific observations to quite complex scientific investigations.

Given the size of the upper Esopus Creek, we need an approach efficient enough to characterize the stream as a whole, while still getting enough information to make justified recommendations. The Esopus Creek project team is using a three-phased approach to optimize the efficiency of data collection and analysis.

Phase I is a watershed-scale investigation that uses various

maps, aerial photos, previous studies, and limited field observations to characterize the stream in its valley setting. The primary goal of this phase is to separate the stream into “reaches,” or sections, of relatively uniform stream characteristics for further study. In 2004, DEP completed this study phase and a copy of the final report (without appendices) is available upon request in pdf format.

Computer geographic information system (GIS) is used for several elements of phase I, including: analyze the average slope and width of the stream channel, define a river “corridor,” identify adjacent land use and streamside vegetation

conditions, and existing stream bank stabilization measures such as rip-rap. From this information, a first-cut assessment of stream condition is made for each of the 23 reaches identified. The map on the next page shows the river corridor and the reach divisions. This is the starting point for getting our feet wet.

Phase 2 is a reach scale reconnaissance and further investigation. Starting in the summer of 2005 DEP and the US Army Corp Engineer Research and Development Center (ERDC) began two efforts to further characterize the stream: (1) a walkover of the stream with a GPS unit; and (2) collecting stream sediment samples

## Taking the First Step: Assessing the Esopus Creek (con.)

By Dan Davis, Project Manager, NYC DEP  
Stream Management Program

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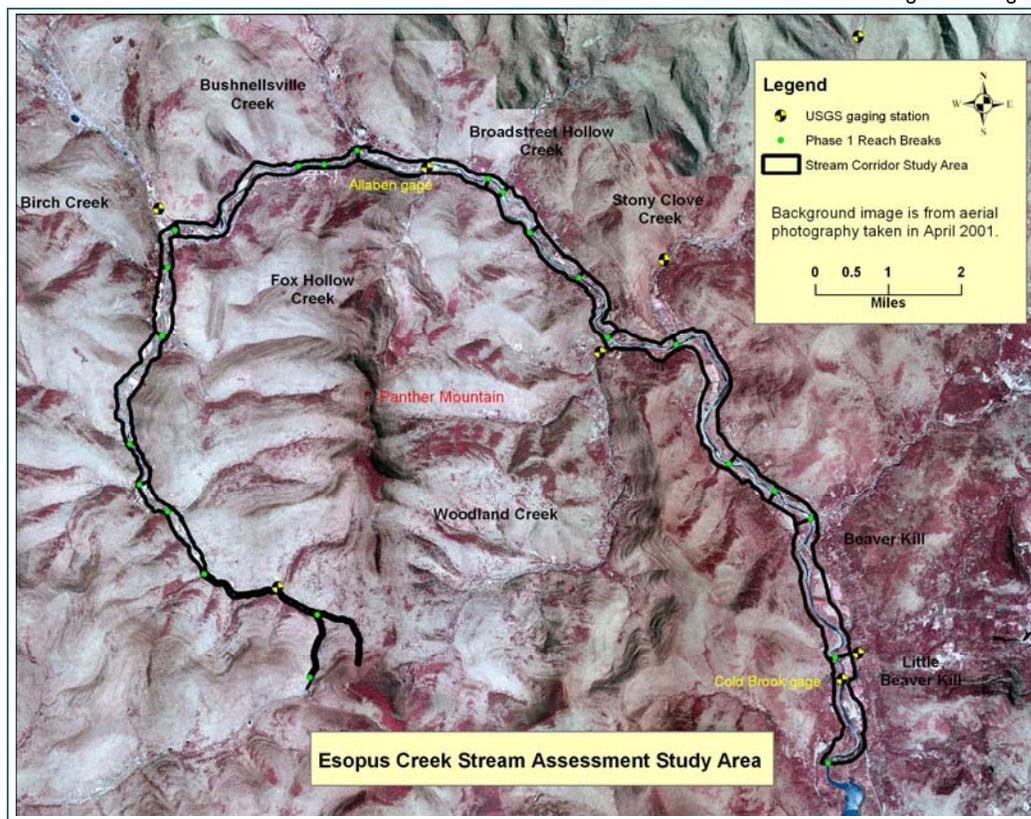
for a sediment budget study that will look at how sediment makes its way downstream. We have mapped occurrences of stream bank erosion, sources of suspended sediment, problem riparian plants such as Japanese knotweed, past management practices, stormwater inputs, large woody debris jams, and much more. This is the phase that will identify the existing condition and make recommendations for further study in Phase 3. When we finish this phase we should be able to produce useful maps such as flood erosion hazard areas and sites that need some form of management assistance.

Phase 3, scheduled to start in late spring of 2006 is the most intensive investigation. It is used only where necessary to find additional information for representative long-term monitoring locations; problem sections that need management intervention; and for reaches that

function ideally and provide reference conditions for comparison. This phase will involve detailed topographic surveys, further sediment sampling, and hydraulic modeling. If the site is one that needs intervention, conceptual designs for best

management practices will be developed.

This three-phased approach, while time consuming, will yield a scientific-based and defensible set of recommendations for the Esopus Creek Stream Management Plan.



## Meet Two Members of Our PAC (con.)

(Continued from page 3)

Center for Conservation and Development, a regionally-based nonprofit organization dedicated to environmental conservation and sustainable development in the Catskill Mountains. Helen has a Masters in Urban Planning from NYU's Robert F. Wagner Graduate School of Public Service. She joined the Catskill Center in 1996 after working as a planner in the private sector.

"I was interested in being a part of the PAC because the Esopus Creek Stream Management Plan seemed to be the most exciting compared to other stream management plans." She cited issues such as community development along the Esopus, multiple recreational uses, and the turbidity as the most important, and sees this as an opportunity to be a part of the planning process from beginning to end.

According to Helen "I come at things from a slightly different angle – from a community development perspective. I'm always looking at, for example, places like downtown Phoenicia. How do you balance the business needs with environmental needs and address flood hazard mitigation at the same time? There is a potential solution that could be a win-win for local businesses and environmental interests."



**Helen presents a plan at a recent Town Board meeting for a proposed river walk on the Creek.**



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We're on the web!  
[www.esopuscreek.org](http://www.esopuscreek.org)

## What It Means to Manage a Stream

*(Continued from page 1)*

recommendations; and 3) to educate creek-side property owners, other "stream managers" and the community on practices that would lead to a healthier Esopus Creek.

Our Project Advisory Council, which helps guide this process, represents a diversity of interests along the stream corridor. It is composed of various levels of "stream managers" including: landowners who own and manage property alongside a stream; town officials who guide land-use decisions and carry out town policies; highway departments who perform the routine and emergency repair work on roads and bridges;

permitting and resource management agencies such as the DEC and DEP; angling and whitewater recreation users; and non-profits that serve the community through education or other means (see the article on page 3). In addition to representing a broad spectrum of the community, our PAC members also represent a broad spectrum of stream managers who will implement the final recommendations of the management plan.

2006 is an assessment year. We are studying the historical and current conditions of the Esopus Creek, its riparian (vegetative) buffer, and aquatic habitat. We'll be continuing to reach out to the

community to understand ways that the stream can be managed for maximum community benefit. Through our advisory council, this combination of science and community input will shape our management recommendations. Final recommendations are expected to be presented to the public some time this fall. In the interim, stay tuned and please check in with us.



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