Innovative Urban Stormwater Management in Banner Elk, NC

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North Carolina Cooperative Extension
Shawneehaw Kiosk in Banner Elk Town Park
Funding Agencies

• North Carolina Clean Water Trust Fund
• EPA 319
• NRCS Cost Share
• Tennessee Valley Authority
• Department of Environmental & Natural Resources – Division of Water Quality
Watauga Basin
Non-point Source Team

• NC State University
  • BAE – Bio & Ag Engineering
  • Water Quality Group
  • NCCE – NC Cooperative Extension
• NRCS – Natural Resource Conservation Service
• TVA - Tennessee Valley Authority
• DENR – Dept. Environmental & Natural Resources
• CWMTF – Clean Water Management Trust Fund
• WRCP- Watauga River Conservation Partners
How it all got started

See the Difference!

Today...

Tomorrow...

Master Streetscape Plan
Phase I

Help Improve Banner Elk's Appearance
Purpose:
The Banner Elk Streetscape plan is a partnership between the Town of Banner Elk and a group of community volunteers who are dedicated to the improvement of Banner Elk's overall appearance.

Needs:
Your time, labor, and funds for the project.

Call:
Banner Elk Town Hall
828.898.5398
Do you know what’s in your storm water?
Urban Stormwater Demonstration Project

• Underground Storage Vault
  &
• Constructed Wetland
Banner Elk Project Site

- Main Street East
- Shawnee Avenue South
- Elementary Way
- Elementary School
- Firehouse
- Wetland Project Site
- Bridge
- Shawnee Haw
- Trail
- Creek
- Keyosk Covered Shelter
- Amphitheatre

Site of Project Not To Scale

Banner Elk, NC Illustration Plan
Expected Maintenance

• Check the vault annually

• Clean out every 3 years
WE WOULD LIKE TO GRATEFULLY THANK AND ACKNOWLEDGE ALL THOSE WHO CONTRIBUTED AND SUPPORTED THIS WETLANDS PROJECT, SO THAT EVERYONE MIGHT ENJOY THE BEAUTY AND CONSERVATION OF THEIR ENVIRONMENT.

TOWN OFFICIALS OF BANNER ELK, NORTH CAROLINA
NORTH CAROLINA STATE UNIVERSITY
A & T STATE UNIVERSITY
COOPERATIVE EXTENSION SERVICES
avery county inspection department
Native Plant Seed / Tuber Growing Operation
Dragonfly Larvae
Native South Eastern Wetland Plants

Sagittaria latifolia

Pellandra virginica

Iris virginica

Pontederia cordata

Scirpus cyperinus

Juncus effusus
Volunteers Planting out at the Wetland

Getting students out into the field is priceless experience if they are interested in this type of work.

-Lees McRae

-ASU
Lessons Learned

- Maintenance issues
  - pipes get clogged
  - frequent cleaning
- Cost - $300,000
- Creek jumping bank during large storm events
- This was not an NCSU design
Stormwater Medallions
Environmental Education

The Enviroscape teaches about watersheds and water quality.

The Groundwater Flow Model educates people of all ages.
Volunteer Monitoring Update

On February 1, 1999, Andy Edwards replaced Jocelyn Elliott as the coordinator for the volunteer monitoring program in the Watauga River watershed project. We would like to thank Jocelyn for her contribution to the project.

On February 10, 1999, Dave Tomiljanovich, better known as TVA Dave, joined us in hosting the annual volunteer meeting with the current participants. Also in attendance was Deni Wise from NCSU. Deni is currently working on a guidebook for the Cooperative Extension Service volunteer monitoring programs. She is also processing the data we receive from the volunteers.

The main topic of discussion was the monitoring process. Volunteers are currently collecting samples to determine dissolved oxygen, pH, temperature and turbidity. We are working diligently to make sure that the tests performed are reliable and consistent.

Steve Froley, an aquatic entomologist from TVA, also gave a talk. He reviewed the protocol for macroinvertebrate sampling with the volunteers. After the meeting, several volunteers participated in a macroinvertebrate count.

Currently, we are working with new and old volunteers on an individual basis at their sites. Volunteers are observing performing their tests to maintain consistency in data collection. We are also visiting their sites to assist them in the quarterly macroinvertebrate count. This should help to keep volunteers motivated and properly equipped. We are also compiling a photographic record of each site.

A future goal is to work closely with or help form a coalition in the watershed. This coalition would include all members of the community that want to protect their watershed. Possible goals might include education and to create an educational plan to maintain good water quality. From this group we also hope to gain more volunteers to assist in the monitoring program.

We are up to 25 volunteers and growing. If you would like to be a volunteer monitor, call Andy Edwards at 264-3061.

Cooperators:
- NC Cooperative Extension Service
- North Carolina State University
- Tennessee Valley Authority
- Natural Resources Conservation Service
- Blue Ridge Resource Conservation & Development
- Avery/Watauga Soil and Water Conservation District
- Lees-McRae College
- Appalachian State University
- NC Division of Water Quality
- NC Division of Water Resources
- NC Clean Water Management Trust Fund
- NC Wetland Restoration Program

In This Issue:
- What are EPT’s
- Bug Day
- Worley Creek Project
- Foscoe Wetland
Volunteer Monitoring
“Kids in the Creek”
Goals of the Constructed Stormwater Wetland

• Education- elementary to university to community
• Final cleansing stage of the stormwater
• Serve as a model for other towns in Western NC that have similar needs for stormwater control
• Provide a diverse habitat for birds, plants, insects, and amphibians.
• Enhance the beauty of the town park
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