More…Stream Restoration

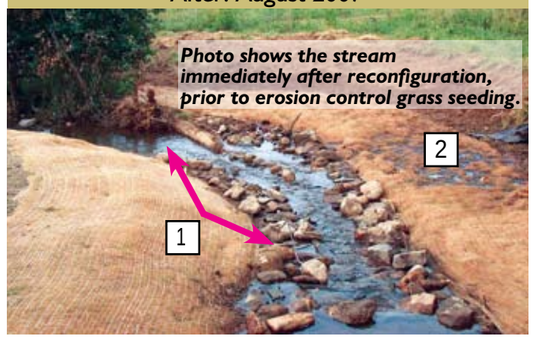
We completed the second phase of our stream and watershed restoration project on Purlear Creek at Rendezvous Mountain Educational State Forest in Wilkes County. This phase included realigning, restoring and reconfiguring 1,825 feet of Purlear Creek. In some sections, a brand new stream channel was excavated. Along other sections, within the existing channel, rocks were installed by hand to help slow down the water flow. Tree seedlings will be planted during the winter of 2007-2008.

Design, Engineering & Construction Oversight	Project Funding	Restoration & Construction
NC State University BAE	cleanwater Management Trust Fund	North State Environmental, Inc.

Before: March 2005

1. Stream was artificially straightened and deepened, making it appear and function more like a drainage ditch instead of a stream. The water flowed too fast and did not meander.
2. Steeply under-cut stream banks were eroding and caving in. The stream flow was disconnected from its natural floodplain, which reduces riparian wetland function.

After: August 2007



1. Curves are added to the channel to mimic natural flows. Rocks are placed to slow down stream flow and provide a foundation for aquatic insect habitat, which is needed to support fish. Small settling pool areas are also added.
2. A terraced floodplain reduces undercutting and cave-ins, allowing the stream to develop a riparian wetland zone.

Smokey's Helpers...

2007 was a busy year for wildfires due to the prolonged drought. We assisted with fires in-state, and helped our colleagues across the country:

- Cascade Fire Complex and Poe Cabin Fire, both in Idaho.
- Robeson-Longbranch Fire Complex in Robeson county, NC.
- Stag Road Fire in Pender county, NC.
- Sweat Farm Road Fire Complex and other associated fires across Georgia/Florida.
- Brush Creek Fire in Montana.
- Salt Creek Fire Complex in Utah.

Additional Partners and Cooperators in 2007

Albemarle - Pamlico National Estuary Program

N.C. Department of Agriculture & Consumer Services
Research Stations Division

NC State University
Department of Forestry and Environmental Resources
NC State University

PRO Logger Safety

USDA - Forest Service
Southern Research Station
Southern Global Change Program

We can't wait for '08!

- Deliver a full-color, photo illustrated BMP Field Guide to loggers and foresters across North Carolina
- Complete the 1st year of baseline data collection and water quality sampling on the BMP Effectiveness Monitoring Watershed Study
- Purchase additional bridgemats to fill out our inventory statewide so we can maintain our ability to protect stream crossings
- Produce our 4th BMP training video for use in the ProLogger Program, to discuss the topic of post-harvest site rehabilitation and stabilization

NCDENR

For updates, visit the 'Water Quality Newsdesk' on our Web site: www.dfr.state.nc.us where you can also sign up on the Forestry NPS e-mail list.

1000 copies of this public document were printed at a cost of $885.26 or 0.88 each.
WQ-02-07 12/07

2007 YEAR IN REVIEW

Success Stories & Accomplishments

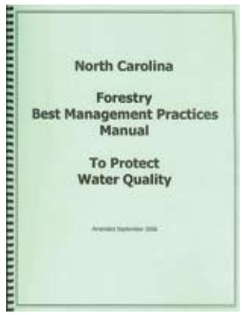
North Carolina Forest Service

North Carolina Division of Forest Resources Non-Point Source and Water Quality Programs

Things to Do: in '07

- ☑ Introduce a new and revised Forestry Best Management Practices (BMP) Manual for North Carolina.
- ☑ Complete 1,825 feet of stream restoration for trout habitat in Wilkes Co.
- ☑ Stabilize and restore 600 feet of river bank along the Little River at Hooker Falls on DuPont State Forest near Brevard.
- ☑ Complete design and construction of an educational pavilion and observation deck at Clemmons Educational State Forest.
- ☑ Install stream monitoring equipment to begin our multi-year forest watershed assessment and BMP effectiveness study.
- ☑ Complete BMP demonstration exhibit trails and self-guided interpretive signage at two state forests.

Why is this track-hoe sitting in a river?! Find out inside>>>



New Forestry Best Management Practices (BMP) Manual

- Completed first revision to North Carolina's forestry BMPs since 1989.
- Product of a 4-year, multi-disciplinary technical advisory committee and peer-reviews from state, federal and private participants.
- Enhanced recommendations for preharvest planning, erosion control practices, installing stream crossings, and much more.
- Includes summaries of applicable state and federal water quality rules.
- Free copies are available from our statewide offices or from our web site.

NONPOINT SOURCE
MANAGEMENT PROGRAM
Section 319(h) of the Clean Water Act
319 GRANT

forestry nps

www.dfr.state.nc.us

Division of Water Quality

North Carolina
Non-point Source Program

We are committed to protecting the state's forest resources so they can continue to produce the best quality water for the benefit of our health, environment and economy.

The Division of Forest Resources Water Quality and Non-Point Source programs work together with our partners to protect and restore water quality while educating citizens about how we all can meet society's needs for healthy forests.

Education & Technical Assistance

Information, Education and Outreach Events

- American Tree Farm System's Field Day in New Bern
- Biennial "Carolina Log'n Demo" in Candor
- Forest Landowner Working Lands Summit in Concord
- Forestry Day at the Legislature in Raleigh
- NCFA ProLogger Program's annual training module video
- Society of American Foresters' annual meeting in Balsam
- Southern Farm Show in Raleigh
- Southern Ideal Home Show in Raleigh

WATERS Technical Assistance

Through our Water Resources Assessment and Technical Response Support process (known as WATERS), we:

- Assessed stream and wetland restoration opportunities at Claridge State Forest Tree Nursery in Goldsboro, in partnership with the N.C. Department of Transportation and N.C. Ecosystem Enhancement Program.
- Assisted with wastewater treatment staff training and reporting needs at Mountain Training Facility in Crossnore.
- Continued collecting information from our field offices for updating the Division's Petroleum Displacement Plan.
- Contributed forestry information to the Coastal Habitat Protection Plan (CHPP) Implementation Plan.

Non-Point Source Education & Training Pavilion and Riverbasin Observation Deck

- Designed and constructed an open-air pavilion for nonpoint source (NPS) pollution education programs.
- Built a companion riverbasin observation deck.
- Located at Clemmons State Forest in Clayton, where Rangers host upwards of 5,000 students each year!
- Structures will be ready for use by early 2008.

The Lowe's Home Improvement Charitable and Educational Foundation provided a generous donation towards construction of the riverbasin deck (below) and NPS pavilion, shown at left still under construction.

LOWE'S
Let's Build Something Together™

BMP Effectiveness Monitoring Watershed Study

- Installed stream flow monitoring and gauging equipment.
- Began baseline period of data collection and water quality sampling prior to timber harvest.
- Water quality samples will be taken on a regular schedule over the next 5 to 6 years and analyzed.

Stream flow will funnel out through the narrow V-shaped notch in this gauging box, allowing us to accurately measure the volume and speed of the water flowing in the stream.

Bridgemat Education and Protection Project*

- Portable timber or steel panels are loaned out to loggers for protecting water quality at stream and ditch crossings.
- Our bridgemats protected 70 crossings during 59 loan events, accessing an estimated 2,260 acres of timber.

A set of our bridgemats in Caldwell Co., July 2007. Photo by Water Quality Forester Roger Miller.

Water Quality Foresters and Field Staff

The Division's 10 Water Quality Foresters assist loggers, landowners and our statewide personnel with planning and recommending Best Management Practices (BMPs) to supplement the work required to meet the performance standards outlined in the state water quality rules, Forest Practices Guidelines Related to Water Quality (FPGs).

In February 2007, water quality foresters got a lesson from a USDA-Forest Service hydrologist about stream restoration at Bent Creek Experimental Forest near Asheville as part of the Division's annual water quality meeting.

Some of our most recent water quality program accomplishments:*

- 4,183 FPG inspections of forestry sites statewide.
- 96% FPG compliance.
- 10 referrals for enforcement.
- 125 preharvest plans and site rehabilitation plans developed.
- 257,000 acres in which BMPs were implemented, recommended, or observed by Division personnel.

** Figures cited are for state FY07 (July 2006 through June 2007*

Restoration

So…, why was that track-hoe sitting in the river at DuPont State Forest?

That piece of heavy equipment was used to strategically place boulders alongside the river bank. Dozens of boulders were carefully arranged to create three different water deflection and flow control structures. These structures were installed to repair the river bank, control erosion and keep the river from washing away its banks, as well to enhance fish habitat.

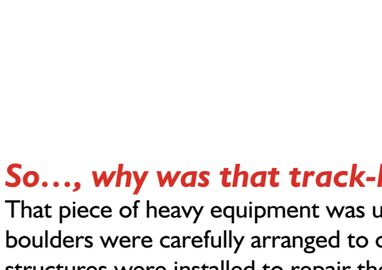
In May, we restored, stabilized and enhanced the Little River near Hooker Falls at DuPont State Forest thanks to these cooperators:

Design, Engineering & Construction Oversight	Project Funding	Restoration & Construction
MULKEY ENGINEERS & CONSULTANTS	NCDENR Division of Water Resources; DWQ Division of Water Quality	FluvialSolutions Incorporated

While the planning and permitting for this restoration project took almost 2.5 years, the heavy construction work only took about 1 week to complete. This quick timetable of on-site activity minimized inconvenience to the hundreds of visitors that DuPont State Forest hosts each day, since we had to close off public access to the Hooker Falls area. This restoration accomplished:

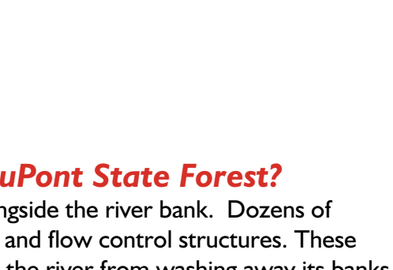
- Installation of three large boulder structures in the Little River to protect the river banks from further scouring and erosion.
- Greatly improved public access to the waters of the Little River, which is a "Delayed Harvest" trout fishery stocked by the N.C. Wildlife Resources Commission. This section of the Little River is also a favored waterway for kayaking and canoeing downstream of the waterfalls.
- Enhanced erosion and sediment control along the river bank that will be supplemented with the planting of several-hundred tree seedlings during the winter of 2007-2008 acquired from our Claridge Forest Tree Nursery.

Before… **…During…** **… and After!**



Floods had scoured away tons of soil. The river was slowing eating into its own bank and limiting public access.

A water deflection structure of open cells, made up of boulders, re-establishes the river bank. Crushed stone will fill the cells.



Topsoil is added atop the crushed stone, grass seed and mulch are applied, and a pathway allows visitors to view the falls!

The right bank of the Little River had become very unstable, washing away soil each time the river flooded.

The restored river's edge keeps intense flooding from eroding the bank while also enhancing public safety and aesthetics.