



North Carolina Forest Service



A Division of the N.C. Department of Agriculture and Consumer Services

Steve Troxler, Commissioner

BMP Newsletter

Best Management Practices for Water Quality & Soil Conservation



This issue's cover photo is a patch of Jewelweed (*Impatiens capensis*) in bloom along the Linville River in Crossnore, North Carolina. This plant is native to this area and tends to grow well along the margins of streams. Its attractive flower and often aggressive seeding is a welcomed component of stabilization following stream restorations. According to US Department of Agriculture Natural Resource Conservation Service (USDA NRCS) plant database, jewelweed is a facultative wetland species. That means it usually occurs in wetlands, but may also occur in non-wetland areas. Learn more about Jewelweed and Wetland plants through the [USDA NRCS plant database online](#).

Linville River Restoration is Underway!

The restoration of the Linville River at Gill State Forest in Crossnore, North Carolina is underway (pictured below). This 2,400-foot section of stream was degraded due to historic channelization and sedimentation. Over time, the channel widened and became disconnected with its floodplain, which lowered the quality of in-stream habitat. Restoration efforts will improve habitat for aquatic insects, amphibians, and fish. Continue reading about this project on page 2.



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The 152nd N.C. State Fair is set to take place October 17-27 this year. Come on out and enjoy the festivities. Be sure to stop by the NCFS exhibit to visit Smokey Bear, see some of our fire fighting equipment, learn about forestry from a N.C. Forest Service Ranger, and MORE!

Linville River Restoration is Underway! Continued

This project started in 2013 when N.C. Forest Service staff began pursuing grant funds. Project funding was completed in 2016 from the [N.C. Division of Water Resources](#) and the [Clean Water Management Trust Fund](#). The N.C. Forest Service partnered with Resource Institute, a non-profit organization that specializes in stream and river restoration, and began the in-stream restoration in September 2019. Some neat features of this restoration (pictured below) include (A) amphibian ponds on both stream banks, (B) riffle-pool glide sequences, (C) alder salvage plantings, (D) and log-boulder J-hooks.



The N.C. Forest Service anticipates the long-term benefits to include:

- Stable stream banks and improved water energy and directional flow
- Improved fishery (trout and other fish species)
- Improved amphibian habitat
- Established fishing/hiking trails and informational signs

Learn more about this project at our webpage:

<https://www.ncforestservice.gov/LinvilleRiverRestoration/>

Follow us on FaceBook and Twitter: <https://>

www.facebook.com/NCForestService and <https://twitter.com/ncforestservice>



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Jennings
Environmental

Why Restore a Stream? What's Wrong with it Anyway?

Stream channel formation is affected by activities within its watershed. Increased human activities (road construction, agricultural fields, building homes, etc.) within a watershed influence the routing of water and subsequently erosional and sediment delivery processes. These additional sediment inputs and alterations to the routing and timing of water influence stream channel and floodplain formation. Although streams and floodplains naturally change over time, humans can speed up the process or simply change how a stream is able to age. Stream restoration represents an opportunity to modify channels and floodplains to compensate for previous land alterations and poor implementation of erosion control measures within a watershed. Take the Claridge Nursery stream restoration for example.



Prior to the restoration (pictured left), the stream channel was straight and disconnected from its floodplain during light to moderate rain events. Notice the depth of the channel relative to the elevation of the adjacent field.

After restoration (pictured right), stream flows could more easily access the newly created floodplain. The fields in the picture above became the secondary floodplain. Also, notice the curviness of the channel. This is called sinuosity. Sinuosity decreases the speed of waterflow allowing sediment to more readily come out of suspension.



Why Restore a Stream? What's Wrong with it Anyway? Continued.

Another reason to restore a stream and its riparian zone is due to a chronic source of sediment inputs. For example, a stream for Lake Julia outfall was created in the 1960's in the now DuPont State Recreational Forest. Poorly located, this stream meandered into an embankment causing mass failures. A section of the 600-foot long embankment being undercut is pictured on the right.



Restoration efforts involved moving the entire channel. Note that sinuosity was lost with this design, but the in-channel boulder vanes, log vanes and brush toes created a stable pool-riffle system typically seen in headwater streams of this area.



Boulder vanes were an excellent option for this restoration because they are long-lasting and focus the flow and energy of the stream towards the channel center, which can protect the banks from scour.

Learn more about this restoration here:

https://www.ncforestservation.gov/water_quality/wq_streamrestoration.htm

Is Your Stream Washing Away?



- ⊗ Runoff from the pasture/field is uncontrolled.
- ⊗ Stream banks are unstable and eroding.
- ⊗ Soil is more likely to wash into the stream.
- ⊗ Productive land can be lost.
- ⊗ Minimal habitat for wildlife.

Desired conditions:

- ⇒ Stream banks are stable.
- ⇒ Tree roots bind the soil to keep it from washing away.
- ⇒ Research has shown that trees, shrubs or natural grass along streams can filter-out sediment and excess nutrients.
- ⇒ Birds, wildlife and pollinators have shelter, nesting and food.
- ⇒ Even a narrow conservation strip along the stream will help.



- ⇒ The N.C. Forest Service cultivates and sells a diversity of seedlings that are native to North Carolina including:
 - Pines, hardwoods, cypress, cedar, and bunch grasses.
- ⇒ Ask us about our [Riparian & Wetland Tree Planting Pocket Guide for North Carolina](#).
- ⇒ The N.C. Forest Service can loan tree planting tools and demonstrate correct planting methods.
- ⇒ The N.C. Forest Service can provide you with information on tree planting contractors.

Upcoming Events:

Western Region Events

Nov 2 @ Hanging Rock State Park in Danbury,
[Fire on the Mountain Event](#)

Piedmont Region Events

Oct 17-27 @ Raleigh,
[N.C. State Fair](#)

Dec 3 @ Raleigh,
[Innovative Erosion & Sediment Control Design Workshop](#)

Dec 10+11 @ Chapel Hill,
[Stormwater Finance Course](#)

Eastern Region Events

Oct 21 @ Holly Ridge,
[Fire Management in Organic Soils Workshop](#)

Nov 12+13 @ Wrightsville Beach,
[NC Beach Inlet & Waterway Assoc. Conference](#)

Oct 30 to Nov 3 @ Louisville Kentucky
[Society of American Foresters National Convention](#)

North Carolina Forest Service

WATER RESOURCES BRANCH
1616 Mail Service Center. Raleigh, NC. 27699-1600



Protect, Manage and Grow Your Forest

www.ncforestservice.gov

Purchase NCFS Forest Tree Seedlings

www.buynctrees.com

NCDA&CS Agricultural Services

www.ncagr.gov

Keep Your Home Safe From Wildfire

www.ncfirewise.org

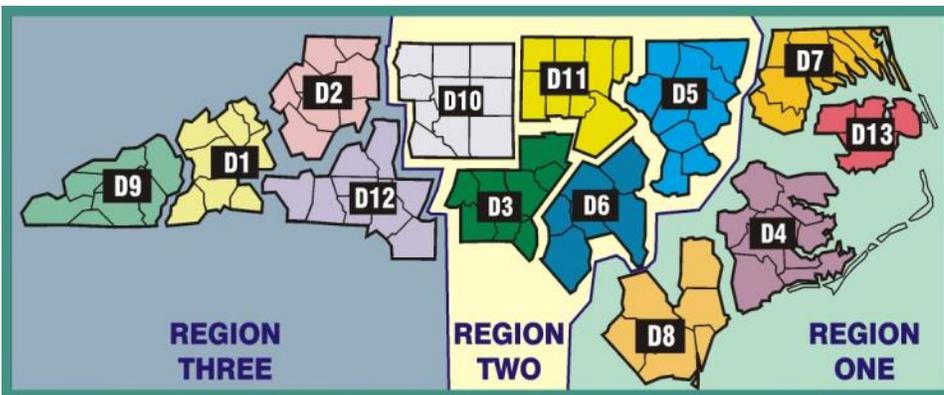
Go Out and Learn in the Forest

www.ncesf.org

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Western Region

Western Mountains (D9, D1)

Joe Moore: 828-774-8362

Foothills (D2, D12)

Richard Cockerham: 704-616-0747

Piedmont Region

Northern Piedmont (D5, D10, D11 [North of I-40])

Nancy Blackwood: 336-500-3661

Southern Piedmont (D3, D6, D10 [South of I-40])

Matt Vincett: 910-334-0025

Eastern Region

Northern Coastal Plain (North of the Neuse River)

Cathy Gilkeson: 252-286-0881

Southern Coastal Plain (South of the Neuse River):

Paul Mowrey: 252-286-0862