



BMP Newsletter

Best Management Practices for Water Quality & Soil Conservation



This edition's cover photo is of the Rattlesnake plantain, *Goodyera pubescens*. A native to North Carolina, this evergreen perennial orchid is commonly found on wooded slopes and ravines. In the mountains and piedmont, they are a dry upland species. However, in the coastal plain, this species is known to occur in wetlands. ([UT Austin Plant Data Base, 2023](#)).

Inside this issue:

How much water should a water bar hold if a water bar should hold water?	1
Straw bale BMPs	2
Historical in-woods ditch	3
BMP outreach at the 2024 Sustainable Forestry	4
NCFCS water quality forester areas	4

How much water should a water bar hold if a water bar should hold water?

Answer: little to none!

Water bars should not trap or pond water! They are constructed on roads, skid trails and decks to divert accumulating volumes of runoff into more stable areas. Ideally, runoff is diverted frequently enough to keep excessive erosion at bay. Puddling of runoff behind a water bar indicates that maintenance is needed. The puddled area allows for some sediment to settle out of suspension, but may further block the outlet to the point where the runoff begins to overtop the earthen mound. When runoff is not diverted and continues flowing downhill, it gains more erosion potential.



Water bar with ponded water.

When installing water bars, assess the following:

- Frequency— Select the frequency of water bars according to slope steepness.
- Area— Look upslope, how much area will drain to your water bar?
- Location— Place water bars in areas that allow runoff to move away from the trail or road. Avoid placing water bars in low areas where the water has no escape.
- Size— How tall should the mound be to allow water to move off the trail or road. A shallow trench on the uphill edge can be helpful.
- Life/maintenance— Will this last long enough for the trail to stabilize or will maintenance be necessary? Plan accordingly. Lifespan will depend on the intensity and duration of rainfall, soil erodibility and traffic impacts. Increases in these factors require larger or more frequent water bars, or an entirely different set of BMPs!



Water bar with an open outlet.



Straw bale BMPs

Straw bales can be a low cost, effective tool to slow runoff and capture sediment. Bales can conform to the ground surface and be placed along the perimeter of a small area with exposed soil or across the pathway of anticipated runoff flow. Bales may be helpful along the edges of a deck and across stream crossing approaches. They aren't sufficient on sites with large drainage areas or steep slopes. In high flow conditions, water will flow around a straw bale barrier or undercut spaces between the bales (see photos below). Proper installation of straw bales ensures contact with the ground surface beneath. Straw bales are natural fibers and will eventually decompose and breakdown. Therefore, they should be used for temporary runoff capture and control. It is wise practice to use other runoff control BMPs in conjunction with straw bales.



A closed skid trail shortly after a rain event where straw bales were used to help reduce sedimentation at two different stream crossings.

What happened and how could this be improved?

In both pictures, straw bales were placed at the edge of stream crossings to slow and filter sediment laden runoff. The photo above left illustrates where runoff had ponded behind the bales and some sediment settled out of suspension. As the ponded area grew, runoff skirted around the side of the straw bale. The photo above right is of another skid trail stream crossing where runoff broke through a straw bale. Both situations now have limited BMP effectiveness.

In both scenarios, runoff could be diverted further upslope to decrease the amount that reaches the bales. The bales could be placed so that the joints of the bales are staggered (like laying bricks).

See page 55 of the [N.C. Forestry BMP Manual](#) for further recommendations for straw bales.

Historical in-woods ditch drainage

Adapted from the N.C. BMP Manual page 102

Many ditches from drained pine plantations that are under management today in coastal North Carolina were constructed from the 1950s through the 1980s, before they came under the protection of the Clean Water Act and/or state wetland protection rules. What you may see in the woods today may be a legacy of past impacts.

Historically, roadside ditches next to permanent roads were often called collector ditches and served multiple functions. They:

- provided fill for building the road.
- provided a hydraulic gradient from the lateral in-woods ditches to promote drainage.
- transported drainage discharge to a stream outlet.
- drained the roadbed to facilitate all weather use.



Example of a collector ditch.

Historically, there were many methods employed to drain a site:

Stream channelization: Streams were dug deeper, straighter and wider to drain the land faster. Today, these channelized streams may look like ditches but they are still considered streams and therefore require protection such as establishing a streamside management zone and/or a river basin and watershed riparian buffer rule zone.



Example of a 'ditchified' stream or stream channelization.

Pattern drainage: Ditches were installed in a regularly spaced parallel, block grid or herringbone style pattern. They were commonly installed upon large areas of very flat terrain containing hydric soils such as broad interstream divides, wet pine flats/pine flatwoods and some pocosins.



Example of a ring ditch.

Ring (perimeter) ditch: A ditch would be dug around the perimeter of a tract and connected to an outlet.

Tulloch ditch: Ditches were dug and the spoil material was removed offsite.

Today, these historical practices may not comply with current regulatory interpretations of exempted minor drainage under Section 404 of the Clean Water Act.

N.C. Forest Service urges land managers to consult with the [U.S. Army Corps of Engineers](#) on such practices in wetlands.

BMP outreach at the 2024 Sustainable Forestry Teachers Experience

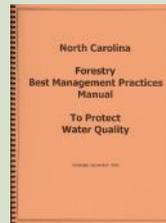
This summer, the N.C. Forest Service (NCFS) participated in the 2024 Sustainable Forestry Teachers Experience hosted by the North Carolina Forestry Association. More than 60 educators participated in the experience, learning about sustainable forest management and the forest industry in North Carolina. The NCFS Water Resources Branch presented on forest water quality, best management practices for sustainable forestry and went out with the teachers on a field experience to witness BMP's "in the wild".



Right: Teachers visiting an active logging job as part of the 2024 Sustainable Forestry Teachers Experience

For recorded and live webinars related to forestry and/or erosion control, check out:

- [The Forestry & Natural Resources Webinar Portal](#)
- [How the River Flows Podcast](#)
- [N.C. Forest Service BMP Videos](#)



Contact your local [N.C. Forest Service county office](#) for a copy of the 2021 updated BMP manual!

N.C. Forest Service - Water Quality

www.ncforestsservice.gov/water_quality/water_quality.htm

Healthy trees, healthy lives

www.healthytreeshealthy lives.org

North Carolina Forest Service

WATER RESOURCES BRANCH

1616 Mail Service Center. Raleigh, NC. 27699-1600

Protect, manage and grow Your Forest
www.ncforestsservice.gov

NCDA&CS Agricultural Services
www.ncagr.gov

Go out and learn in the forest
www.ncesf.org

Purchase NCFS forest tree seedlings
www.buynctrees.com

Keep your home safe from wildfire
www.resistwildfire.org

Locate North Carolina farm products
www.ncfarmfresh.com
www.gottobenc.com

