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North Carolina Forest Service
An agency of the N.C. Department of Agriculture & Consumer Services

BMP Newsletter

Best Management Practices for Water Quality & Soil Conservation

This issue's cover photo was taken in the Piedmont during one of the detail site examinations conducted by NCFS for the BMP implementation assessment. Tracked feller-bunchers can be used to selectively harvest trees in a streamside management zone (SMZ). This type of felling is generally safer than hand felling and tends to have lesser ground disturbance near streams because of its ability to extend the felling arm into the SMZ.

Inside this issue:

An Assessment of Forestry BMPs in North Carolina

The third cycle of a state-wide forestry BMP Implementation Assessment is complete and products posted to the web. Between 2012 and 2016 North Carolina Forest Service (NCFS) staff visited 204 timber harvesting sites in 94 of North Carolina's 100 counties. These detailed site assessments are an integral part of the agency's effort to evaluate BMP implementation, identify patterns in BMP use, and promote BMPs for the protection of soil and water resources.

During these site visits, evaluators assessed whether BMPs were implemented according to the recommendations and specification provided in North Carolina's 2006 BMP Manual. Additionally, evaluators recorded the frequency of risks to water quality during these assessments.

Overall BMP implementation was 84 percent statewide.

Note: Not implementing a BMP or not implementing a BMP correctly and effectively does not automatically mean a water quality risk occurred or is imminent.

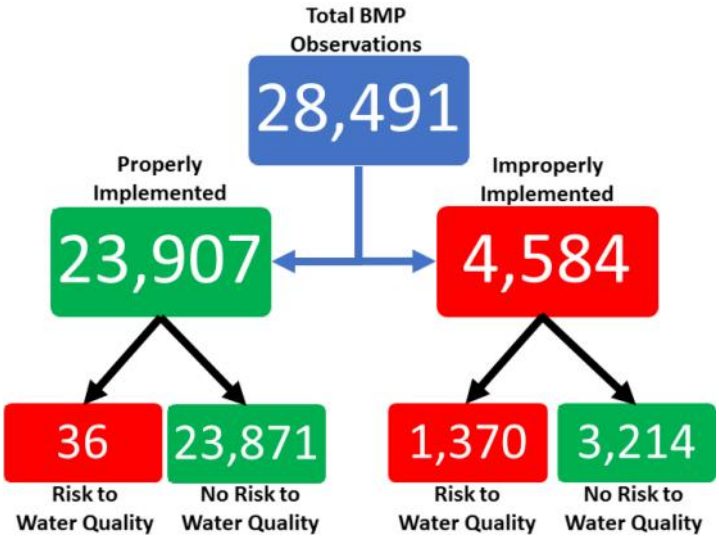


Figure above: Number of statewide BMP observations in North Carolina's 2012-2016 BMP Implementation Assessment categorized by proper and improper BMP implementation and by risk & no risk to water quality.

What constituted a risk to water quality?

After reading the front page you may be wondering what the NCFS considered to be a "risk to water quality"...Good question. When NCFS assessed an operation component and decided a risk to water quality, one or more than one of the following was **true**:

- Visible sediment was actively reaching *or* could potentially reach a stream subject to the Forest Practice Guidelines Related to Water Quality (intermittent/perennial stream or perennial waterbody) due to accelerated erosion;
- Water flow and/or water quality was visibly inhibited or degraded by debris in a stream subject to the Forest Practice Guidelines Related to Water Quality;
- Inadequate stream shading appeared likely to cause large fluctuations in expected stream water temperatures and/or increases expected water temperature to above water quality standards;

- Vehicle fluids, pesticides, herbicides, fertilizers, or other chemicals/wastes reached (or could potentially reach) a stream subject to the Forest Practice Guidelines Related to Water Quality;
- Site activities (e.g., ditching, deep-ripping) were extensive enough that they threatened dewatering of wetlands and created potential for converting them to non-wetlands.

Examples of water quality risks. Visible sediment (above); Water flow inhibited by debris (left); Chemicals that could potentially leach to groundwater (below).

Note that these particular risks were addressed and resolved following NCFS policy and procedures.

While a risk to water quality may be recorded, there is no standard methodology to take the next step and assess 'how much sediment' is associated with a risk. Researchers at Virginia Tech have a partially-funded project that will investigate this question at a regional scale. If fully funded, state agencies across the southeastern U.S. will have information to compare BMP implementation to sediment delivery. See the Sustainable Forestry Initiative news announcement for more information:

http://www.sfiprogram.org/archives/conservation-community-partnerships-grant-program/active-grants1/virginia-tech-2018grant/

For more information on the 2012-2016 Assessment of North Carolina's Forest BMPs, visit:

http://ncforestservice.gov/water_quality/wq_bmp_studies.htm

Western Region Focus

Regionally Based Results of Water Quality Risks during the BMP Implementation Assessment

The highest BMP implementation rates in the Mountain ecoregion were for the logging system selection and road and access categories (89 Percent). The area with the most room for improvement was at stream crossings. Evaluators noted water quality risks at stream crossings stemming from a lack of stabilization on approaches and stream channel rehab for temporary culverts.

The steep terrain in this ecoregion lends itself to a greater stream frequency (more streams per unit area) compared to all other regions in North Carolina. Subsequently, more stream crossings on average may occur. During the BMP implementation assessment, evaluators observed 37 stream crossings on 16 sites. This gives the mountain region the highest rate of crossings and subsequently an increased number of opportunities for water quality risks compared to other regions.

Upcoming Events

Apr 10 Online,
2018 National Watershed and Stormwater Conference

Apr 16-18 @ Asheville,
Southeastern Lake Management Conference

Apr 18 @ Online,
Storm Water Solutions Virtual Expo Online Event

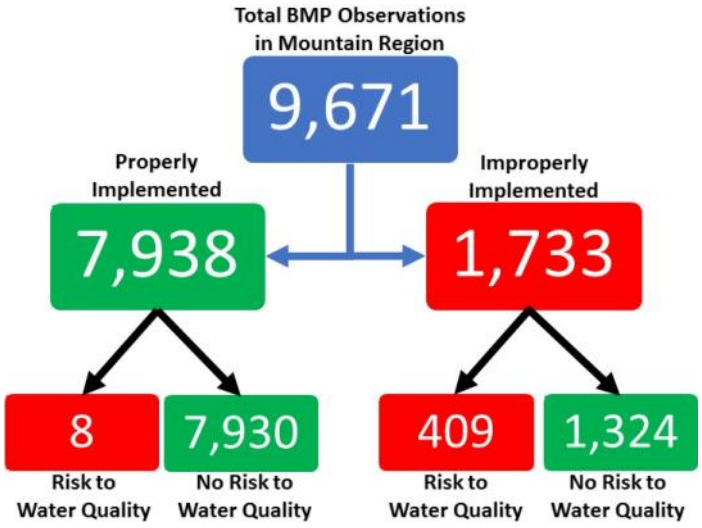
May 8-9 @ Columbia, SC
SAF Forest Technology Workshop

Jun 9-12 @ Asheville,
Association of Consulting Foresters National Conference

In the assessment, BMP implementation rates associated with bridgemat crossing were greater than culverts and fords and had fewer risks to water quality. Evaluators recommend increased use of portable bridgemats in this region when feasible.

The total number of BMP observations, broken down by properly and improperly implemented and further by risk and no risk to water quality, is pictured on the right.

Overall BMP implementation rate in the mountain region was 82 percent. About 4 percent of those observation were categorized as a potential risk to water quality. Note that when properly implemented, risks to water quality were less than **0.1 percent.**



Piedmont Region Focus

Regionally Based Results of Water Quality Risks during the BMP Implementation Assessment

The highest BMP implementation rates in the Piedmont ecoregion were for the logging system selection and decking categories (93 percent). The area with the most room for improvement was rehabilitating the project site. In several cases, evaluators noted logging debris in stream channels and a need for re-contouring streambank edges and approaches at stream crossings to match natural/pre-existing conditions.

The rolling terrain of the Piedmont has a unique land use history and geology that creates challenges for controlling runoff, establishing vegetation, and road location. It is suspected that the challenges associated with legacy roads lead to more seemingly avoidable stream crossings. During the BMP implementation assessment, evaluators observed avoidable stream crossings on 36 sites. This gives the Piedmont region the highest number of avoidable crossings compared to all regions in North Carolina.

Upcoming Events

Apr 3 @ Sanford, NCFS Water Quality 101

Apr 10 Online, 2018 National Watershed and Stormwater Conference

May 8-9 @ Columbia, SC SAF Forest Technology Workshop

May 17 @ Raleigh, Forestry Day in the Legislature

May 24-25 @ Greensboro, 2018 NC Ag Export Seminar

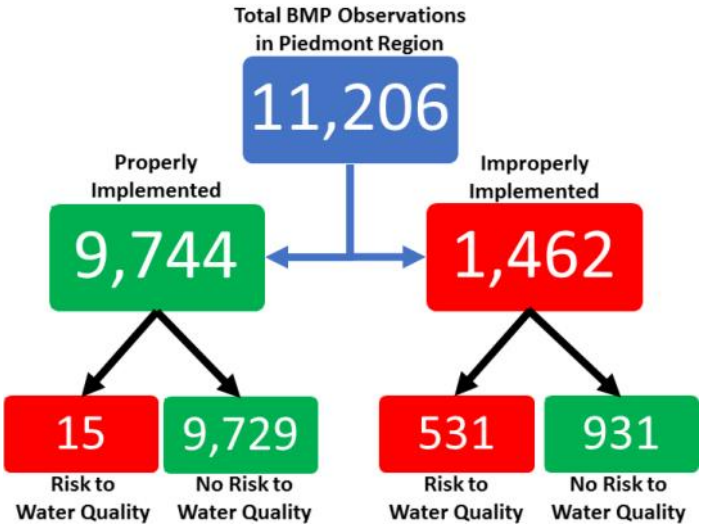
May 30-31 @ Troy, ProLogger Base Course

Jun 18-21 @ Raleigh Nutrient Removal & Recovery Conference

An evaluation of legacy roads should be conducted during the preharvest planning stage. In some cases, legacy roads need to be retired and new access installed that meets modern BMP standards. In other cases where multiple legacy access roads exist, consider only using what is necessary for the operation and take action to rehabilitate and retire roads that are no longer needed.

The total number of BMP observations, broken down by properly and improperly implemented and further by risk and no risk to water quality, is pictured on the right.

Overall BMP implementation rate in the Piedmont was 87 percent. About 5 percent of those observation were categorized as a potential risk to water quality. Note that when properly implemented, risks to water quality were less than **0.2 percent**.



Eastern Region Focus

Regional Based Results of the BMP Implementation Assessment

The highest BMP implementation rates in the Southeastern Plains and Lower Coastal Plains ecoregions was site preparation and reforestation (100 percent). A category with room for improvement in both regions was rehabilitation of the project site. Evaluators noted water quality risks at stream crossings stemming from a lack of stabilization on approaches.

The gentle terrain in much of this ecoregion can be deceiving. BMPs for distributing runoff volume are still needed on approaches in both ecoregions. While the speed of runoff tends to be slower, the increased runoff volumes can result in elevated soil erosion rates. Due to the lack of relief, breaking up runoff volume is one of the more difficult challenges in these regions. Taking advantage of existing relief and using maps to plan road and skid trail locations are important for reducing risks to water quality.

Upcoming Events

Apr 10 Online,
2018 National Watershed and Stormwater Conference

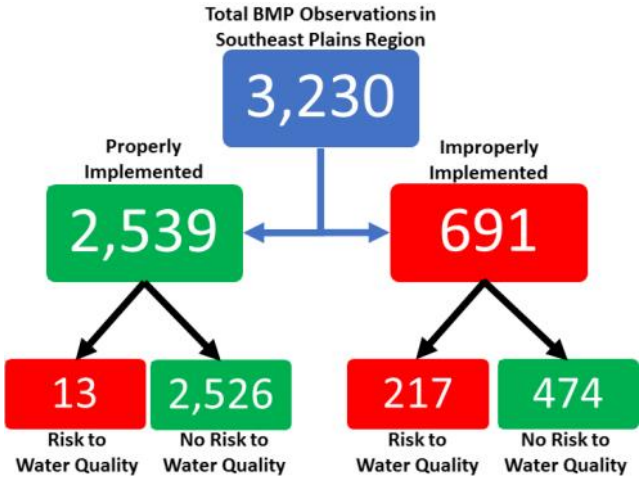
Apr 15 @ Port of Wilmington, Waccamaw SAF Chapter Meeting

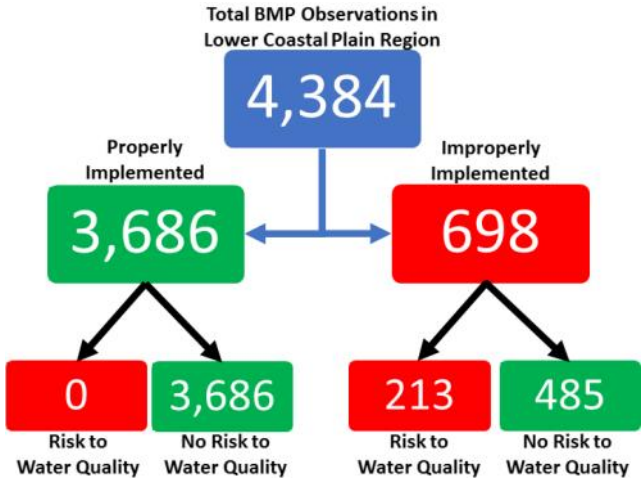
May 8-9 @ Columbia, SC
SAF Forest Technology Workshop

May 23 @ Wilmington
Cape Fear River Assembly Annual Meeting

Jun 6-8 @ New Bern
NC Division of SAF Summer Meeting

The total number of BMP observations broken down by properly and improperly implemented and further by risk and no risk to water quality is pictured below. Overall BMP implementation rate was 79 percent in the Southeast Plains and 84 percent in the Lower Coastal Plains. About 7 percent and 5 percent of observation were categorized as a potential risk to water quality in the Southeast Plains and Lower Coastal Plains, respectively. Note that when properly implemented, risks to water quality were less than **0.6 percent** in the Southeast Plains region and **0 percent** in the Lower Coastal Plain region.





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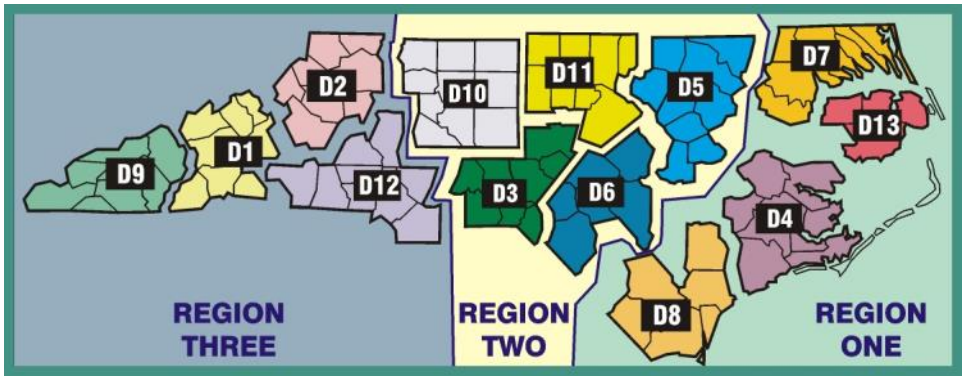

Western Region

Western Mountains (D9, D1):
John Williams : 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 (D7, D13, +Beaufort and Pitt):
Cathy Gilkeson: 252-286-0881

Southern Coastal Plain (D4 [-Beaufort and Pitt], D8):
Paul Mowrey: 252-286-0862

River Basin Deck at Clemmons Educational State Forest Returns!

The River Basin Deck has returned to the suite of Water Quality exhibits and displays at Clemmons Educational State Forest. First constructed in 2007-2008, the river basin deck was a hot commodity for school groups learning about forests and water. Over time, the failing deck boards were replaced and the display removed. During the month of February, 2018, NCFS staff and volunteers worked to install and paint the deck back to its former glory. The deck displays the major watershed boundaries and rivers within North Carolina. Many thanks to those involved in this project!