



# 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 of a feller buncher crossing a bridgemat stream crossing at Bladen Lakes State Forest. This temporary stream crossing provides adequate strength to support heavy vehicle traffic while allowing water to pass through at normal levels. If a significant rainfall is expected, the bridgemats and curb logs can quickly and easily be removed. Curb logs set parallel to bridgemats expand the useful width of the crossing. Although these curb logs are not directly driven over, they help keep skidded treetops from being dragged through the stream channel.*

## Celebrating 50 Years Since the Adoption of the Clean Water Act

On Oct. 18, 1972, Congress voted to pass the Federal Pollution Control Act, better known as the Clean Water Act (CWA). Since then, the quality of waters in the U.S. has improved and become some of the best waters in the world. Forestry has contributed to that success.

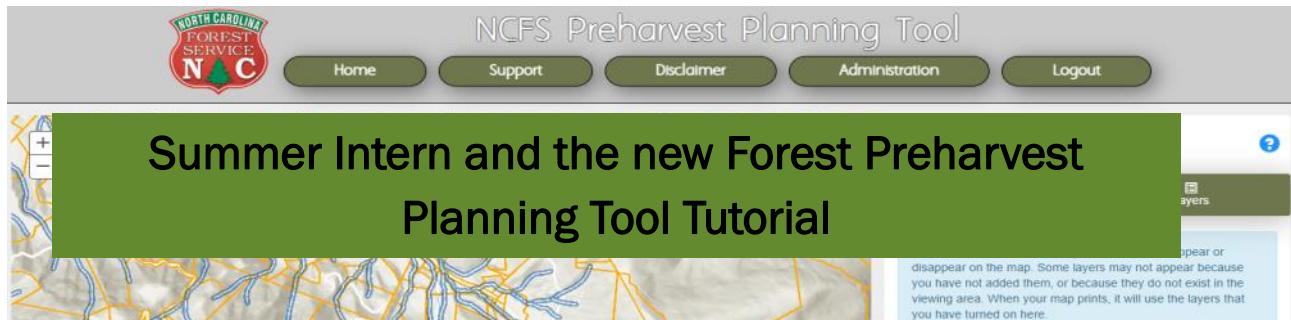
The objective of the CWA is to maintain the physical, biological and chemical integrity of our nation's waters. Most recognize the CWA as the legislation that imposed permitting and other rules limiting point source pollutants. However, the nonregulatory aspects of the CWA, such as managing nonpoint source pollutants from agriculture and forestry, have greatly contributed to improved water quality. These nonregulatory approaches formalized the development and monitoring of voluntary BMPs, and eventually led to the adoption and widespread use of BMPs.

The concept of developing voluntary, self-governed BMPs to control nonpoint source pollution has evolved over the past 50 years. Early efforts to convince loggers to implement BMPs were slow to gain traction, but eventually progressed quickly as operators recognized improved efficiency in their businesses. Today, the 'voluntary' measures are commonly viewed as standard operating procedures for wise business practices. Dedicated training, assistance and monitoring programs conducted by the state forestry agencies and partners have contributed greatly to BMP adoption. Additionally, third party, market-based, independently audited forest certification programs provided incentives to operators to implement sustainable harvesting practices, which inherently includes BMPs. Today, many of the nation's largest paper, lumber and timber companies subscribe to a forest certification program.

The CWA redefined the nation's expectations and recalibrated everyone's awareness of the importance of keeping our waters drinkable, fishable and swimmable. Forestry nonpoint source pollution management has successfully delivered results in a cooperative approach between federal, state and private sector constituents through the creation, development, delivery and monitoring of forestry BMPs.

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The Water Resources Branch hosted Larry Roberson, the Forest Management and Development intern, for a month during the summer. Larry graduated from N.C. State University in May 2022 with a bachelor's degree in forest management. The combination of work experience, education and interest in pursuing a career with the N.C. Forest Service made him a great fit for the program.

The internship program is unique since it allows interns to rotate monthly through multiple branches at the central office. Larry began his internship with the Water Resources Branch and we took him on a whirlwind tour of our branch activities by highlighting their benefits to water quality, and demonstrating how we manage and implement programs to promote BMPs and compliance with the Forest Practice Guidelines Related to Water Quality. He gained field experience doing a mock BMP survey and working on fireline rehabilitation for the Grindstone Fire at Pilot Mountain State Park. He also joined us at educational events such as ProLogger, herbicide training and NCFS ranger training.



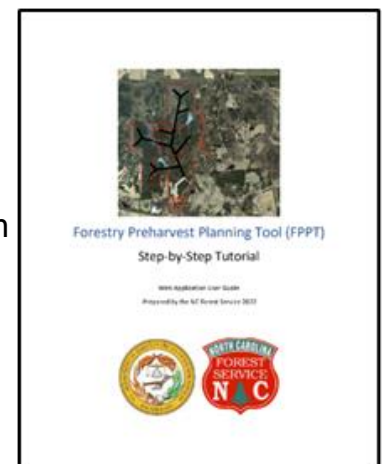
*Larry speaking with a Future Farmers of America student about his experience as a forestry student and internship with NCFS.*

When he wasn't in the field, Larry took the initiative by improving our supporting documentation for the Forest Preharvest Planning Tool (FPPT). He saw an opportunity for improvement in the form of a step-by-step tutorial. Although a user's guide currently exists, a tutorial may improve accessibility and reduce frustration for new users trying to get started. The tutorial is intentionally designed to guide users through the process of planning forestry operations on their desired tract. Once complete, users can have a detailed map, soils report and site summary report. The FPPT allows landowners, foresters and loggers to plan ahead and maximize potential through forest operations while using forestry BMPs. We hope this tutorial will open the door for more users to start using the tool and capitalize on its potential.

Follow the link to access the tool: [https://ncforestservice.gov/water\\_quality/pdf/FPPT\\_Step-by-Step\\_Tutorial.pdf](https://ncforestservice.gov/water_quality/pdf/FPPT_Step-by-Step_Tutorial.pdf)

For questions about the FPPT, or for an in-person or virtual demonstration (for groups of 25 or more), please email [Maria.Polizzi@ncagr.gov](mailto:Maria.Polizzi@ncagr.gov) to plan.

Lastly, we congratulate Larry on accomplishing his goal of landing a permanent position with the N.C. Forest Service! He began his role as a service forester in District 10 on Aug. 1. We look forward to continuing to work with Larry!



## The Challenges of Fighting and Rehabilitating Ground Fire

As wildfires become more prevalent throughout the country, people are becoming more familiar with some basics of wildland firefighting. We've seen videos of suppressant drops, heard terms such as fireline or firebreak, and can easily render an image of a full-blown crown fire like we see in headlines. A lesser known term however, is ground fire. Although they can appear like a typical forest fire with burning trees and shrubs, the complicating factor is that (as the name suggests) the ground is also on fire. This type of fire is less common as it only occurs in certain locations but it poses different challenges than a typical forest fire.



So, why does the ground catch fire in some places? To answer that, we need a brief lesson in soil science. The earth below our feet is made up of four components: air, water, minerals (in the form of sand, silt, clay, and larger particles like gravel), and organic material. Proportions of each vary across the landscape but a typical soil would be approximately 45% minerals, 25% water, 25% air and 5% organic. However, there are some soils called Histosols that contain a minimum of 12% to 18% organic material near the surface. They form in swamps, bogs or other wetlands where water inundates the

land and slows decomposition of plant matter. Because of the accumulated carbon content, some countries have burned peat (a type of organic soil) at powerplants for energy production. During droughts, water tables recede and the organic soil can dry. The dried plant material is highly susceptible to fire until moisture returns.

To combat a ground fire, tactics must be revised since the typical fireline installation doesn't have the same effect. The purpose of a fireline is to remove burnable fuels from the fire's path. Grasses, shrubs and other vegetation are removed, as well as topsoil since this layer has the highest organic content for most soils. Mineral soil (sand, silt and clay) is not a fuel source. For peat soils you might have to dig 8 to 10 feet down or further to reach mineral soil. Therefore, firelines aren't an option in many cases. They can still be used to slow the fire at the surface by removing the vegetation, but the main strategy in these cases is to regain hydrology by saturating the soils as thoroughly as possible. This requires significant pumping operations and ditch plug installations to hold water in place. Careful monitoring using drones equipped with infrared sensors can help determine hotspot locations and keeps firefighters well informed.



## The Challenges of Fighting and Rehabilitating Ground Fire Continued...

Firefighters must take extra precautions in these situations as working in wetlands can be logistically tricky as well as uniquely regulated. Wetlands have exceptional functions and values such as filtering water to improve its quality, storing water to reduce flooding impacts and accumulating carbon. Many wetlands have highly productive ecosystems and biodiversity comparable to rainforests and coral reefs. State and federal agencies have regulations that must be followed. Since firefighting is an essential service for the purpose of public safety and resource conservation, the N.C. Forest Service has certain permissions that allow us to do our jobs, while ensuring certain standards are adhered to, and rehabilitation is completed once the fire is out.



Rehabilitation is a standard practice in the wildland fire world but looks a bit different for ground fires. These fires often occur during a period of drought, but to preserve the peat or wetland soil for the future, it is important that hydrology is restored to pre-fire conditions. This can mean removing ditch plugs that were installed, filling any newly dug ditches and stabilizing bare soil areas. BMPs are an essential part of these operations (see the NCFS BMP Manual Chapter 9, Part 3 for fire management BMP recommendations). Efforts to return wetland soils displaced by fire suppression are attempted to the extent feasible. Since topography and hydrology are interconnected, it's critical that elevation levels that significantly influence site hydrology are returned to pre-fire conditions. Due to high ecosystem productivity, regeneration of native species is generally quick and successful with thriving re-establishment documented on previous ground fires.



The Ferebee Road Fire in Hyde County is an example of a recent ground fire. It burned 1,938 acres for more than a month while 31 NCFS personnel worked to contain and extinguish the fire. A restoration plan has been developed by the N.C. Forest Service and efforts are underway to restore the site to its prior conditions as much as possible. Frequent communication and coordination with landowners and other state and federal agencies allow this work to be done swiftly and efficiently.

## Rolled Erosion Control Products

Rolled erosion control products (RECP) consist of prefabricated blankets, wattles or netting made of natural and/or synthetic material. Install them according to manufacture specifications for best results. Many RECP can be left in place as they will break down over time. Avoiding RECP that has plastic mesh can help prevent wildlife entanglement. More details on proper use and installation of RECP is available on the [NCDOT website](#) and in chapter 5 of the [BMP manual](#).



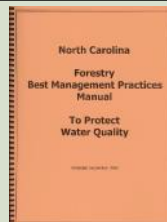
*A series of coir fiber check dams (circled above) and straw matting along a gravelled road.*

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.ncforestservation.gov/water\\_quality/water\\_quality.htm](http://www.ncforestservation.gov/water_quality/water_quality.htm)

**Healthy Trees, Healthy Lives**

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WATER RESOURCES BRANCH

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