

Forestry Operations in N.C.: Water Quality regs, BMPs, and E&SC

WRRRI Erosion & Sedimentation Control Planning and Design Workshop

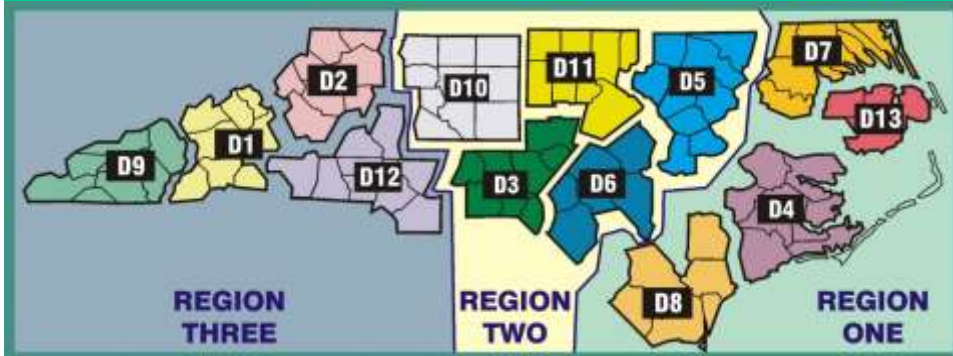
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www.ncforestservice.gov



N.C. Forest Service Organization



- NCFS, an agency of the NC Dept. of Agriculture & Consumer Services.
- Generally take a 'non regulatory' approach: *service, consultation, advice, assistance*.
- County Ranger and/or Asst. County Ranger (+/- 180).
- Water Quality Foresters (6) + other Foresters (+/- 50).
- State-Level "Central Office" Water Resources team (4).
- All field-office personnel are expected to be involved in water quality, at some degree.



NCFS Water Quality Actions

- Inspect forestry sites for compliance with state WQ regs.
 - timber harvesting, cost share, site prep, road, rehab, etc.
 - second only to wildfire response, in NCFS Policy priority
- Respond to complaints
- Assist w/ ProLogger training
- Provide BMP / Water Quality training (internal & external)
- Assist / Develop BMP demonstrations
- Provide pre-harvest planning and technical assistance
- Advise on policy matters
- Stream restoration on State Forests

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Is Forestry Regulated?

Yes! Several state & federal laws, rules and “guidance” govern forestry activities.

These regulations focus on factors related to water quality protection:

- Stream Buffers
- Erosion & Sediment Control
- Nutrient Management
- Debris and Stream/Ditch Obstruction
- Stream Temperature

Forestry (“silviculture”) is included in the Nonpoint Source (NPS) category of potential pollution contributors.

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WQ Reg's Affecting Forestry - Pt.1

Federal -----

- Clean Water Act, Sec.404: permitting not required so long as federal mandatory BMP conditions are in compliance.
 - stream crossings... roads & site prep in wetlands... ditches...
- Sec.402 NPDES:
 - General Permit for aerial application of pesticides.
 - No other stormwater permitting is required. However, USEPA is beginning to look into this, for roads.

State -----

- Forest Practices Guidelines Related to Water Quality = "FPGs"
 - Enacted under the NC Sedimentation Pollution Control Act, 1990.
 - 9 FPG performance standards must be achieved.
 - SPCA E&SC permitting not required so long as FPGs are in compliance (applies statewide).
- DWR Riverbasin & Watershed Riparian Buffer Rules (6)
- G.S. prohibiting stream or ditch obstructions.
- G.S. requiring reporting and clean-up of petroleum spills.
- CAMA & N.C. Dredge/Fill Laws (20 coastal zone counties).

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WQ Reg's Affecting Forestry - Pt.2

Local / Municipal Ordinances?

- No. Do not apply to forestry.
- This was codified in Session Law SL2005-447 (SB681), commonly known as "Right to Practice Forestry Law".
- Sustains the precedent that forestry operations are best regulated at the State or Federal level.
- Avoids a patchwork of local rules.

Temporary Road Entrances

- Under NCDOT jurisdiction – not NCFS.
- So long as the logger/operator has been trained on proper installation of temporary driveway access entrances, then NCDOT will not require a permit. Done through the NC ProLogger Program.

Are Forestry BMPs "Mandatory"?

- No, we have FPG performance standards... and federal mandatory BMPs.
- 3rd-Party independent Forest Certification programs require BMPs.
- NC Forestry BMP Manual provides design standards & recommendations.
- Available online at ncforestservation.gov, "Water Quality" section.

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“Logging” does not equal “Forestry”

Not all tree-cutting is for Forestry purposes.

The fed & state forestry regulations / exemptions only apply to “forestry-related” activities.

This is a common issue NCFS employees have to decipher:
What is the purpose for the timber cutting / logging operation?

- If it is for forestry.... then NCFS is the lead authority and forestry rules apply.
- If it is the first step for land development... then it's not forestry, it's not NCFS. It is DEMLR or local gov't authority.
- If it is clearing for converting to ag / pasture... then it's not forestry, it's not NCFS. Ag is exempt under SPCA.

Bottomline: If you're in doubt... call NCFS for advice.

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Forest Practices Guidelines - FPGs

Topics Addressed in the FPGs: (02NCAC 60C .0100 - .0209)

- .0201 – Streamside Management Zone (SMZ)
- .0202 – Prohibition Debris Entering Streams / Waterbodies
- .0203 – Access Road and Skid Trail Stream Crossings
- .0204 – Access Road Entrances
- .0205 – Prohibition Waste Entering Streams, Waterbodies and Groundwater
- .0206 – Pesticide Application
- .0207 – Fertilizer Application
- .0208 – Stream Temperature
- .0209 – Rehabilitation of Project Site

The NC Forest Service conducts thousands of FPG compliance inspections annually. Over last 10 years, annual average final compliance rate > 90%.

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Forestry BMPs for E&SC

Forestry BMPs are not intensively “structural” or “engineered” or process-based.

They are performance-based: do whatever you need to, if it works.

75 years of research has been done, validating forestry BMP effectiveness.

Each state forestry agency does recurring BMP Implementation Survey Assessments, to monitor the rate of BMP use and function.

- Most recent survey in NC (2006-2008): statewide 85% rate of use.
- High rate of use, considering BMPs are a non-regulatory approach.

Primary goals of Forestry BMPs:

- Protect Stream Quality (Streamside Management Zone = “ SMZ ”)
- Erosion & Sedimentation Control (slow it down, spread it out, cover it)

Forestry sites may appear “messy” or “ugly”, even when BMPs are fully-installed and functioning.

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Forestry BMPs



Forestry BMPs



SMZ Retained on a Logging Job

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Forestry BMPs

SMZ Retained on a Logging Job



Forestry BMPs

Leftover tree branches/limbs are matted down on the main skid trail.
Low risk of soil damage or sedimentation. Provides sufficient groundcover.



Forestry BMPs



Leftover tree branches/limbs are matted down on the main skid trail.
Low risk of soil damage or sedimentation. Provides sufficient groundcover.
Especially important on thinning / select-cut harvests to protect roots.

Forestry BMPs



Portable steel bridgemats for a stream crossing.
Ample ballast / surge rock applied for log truck road entrance.

Forestry BMPs

LEFT: Skidder stream crossing with timber bridgemats.
RIGHT: Road truck entrance with portable timber mats.



Forestry BMPs

Portable steel bridgemats, skidder stream crossing.



Forestry BMPs

Apply treetops/limbs on approachways to skid trail stream crossings.



Forestry BMPs

Log pole crossing in a dry ditch.



Ford crossing, ample ballast on each approachway and side banks grassed-over.

Forestry BMPs

Ford crossings are acceptable for roads..., when well-designed, like this one.



Forestry BMPs

LEFT: freshly graded road, with BMPs (stone, crowning, dips, daylighting).

RIGHT: freshly re-graded road, no real BMPs applied:

So What? As long as sediment is not reaching stream, or has the potential to, the FPG standards are not Out-of-Compliance.



Forestry BMPs



**Rolling Dips, Broad-Based Dips.
Slow down & control runoff from roads.
Divert runoff out into the woods.**

Broad-Based Dip.
Collect and divert runoff from forest roads.

Forestry BMPs



“Waterbar”:
Divert runoff from skid trails or abandoned roads.

Forestry BMPs



“Waterbar”:
Divert runoff from skid trails or abandoned roads.

Forestry BMPs



Forestry BMPs

**Skid trail with effective
rehab groundcover**



Skid trails with effective rehab groundcover

Forestry BMPs



Forestry BMPs

Do They Work?.... Yes.

Type of BMPs Applied (piedmont of VA)	Sediment Reduction: Bladed Skid Trails	Sediment Reduction: Overland Skid Trails
Waterbar / Control	--	--
Waterbar + Seed	77%	21%
Waterbar + Seed + Straw	98%	93%
Waterbar + Hardwood Limbs Debris	94%	92%
Waterbar + Pine Limbs Debris	96%	96%

Virginia Tech, Forest Operations Research Group. Adapted from "Skid Trail Stabilization Research and Logger Training." Forest Resources Association Technical Release 14-R-11; May 2014.

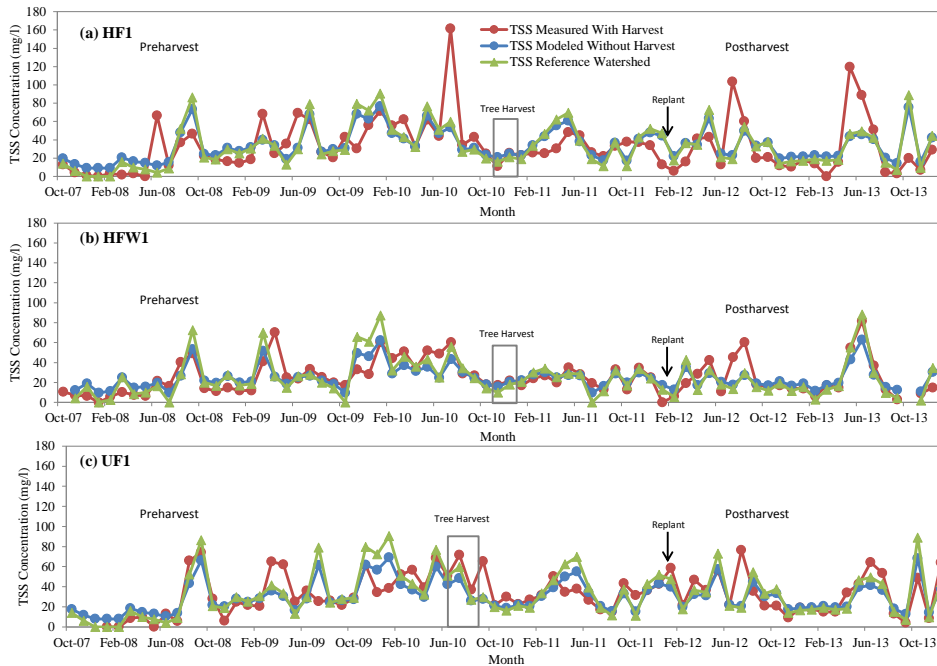
Bottomline:
Low cost methods are just as effective as more costly and time-consuming measures.

On the following slide, is a series of graphs of TSS concentrations (Total Suspended Solids, mg/L) from a paired watershed study conducted jointly by NCFs & USFS in the piedmont of NC, 2007-2013.

Water in the streams was sampled before & after a timber harvest in which BMPs were applied. No significant impacts to water quality were observed after the logging.

Adapted from: "Effects of Timber Harvest on Water Quantity and Quality in Small Watersheds in the Piedmont of North Carolina". Boggs et.al., USDA-Forest Service, 2015.

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Monthly total suspended sediment (TSS) concentration (mg/l) with harvest and modeled TSS concentration without harvest in treatment watersheds, and measured TSS concentration in reference watersheds over monitoring period (a) HF1, (b) HFW1, (c) UF1. TSS concentration without harvest is from model developed during calibration period. Rectangle indicates tree harvest period, HF1 and HFW1 were harvested 11/29/2010 to 1/19/2011 and UF1 was harvested 7/7/2010 to 9/8/2010.

Case Study: Union Co., 2016

present use tax program, management plan,
 professional consultant, timber sale contract
 Forestry – temp, low impact, trees cut at the
 stump, product utilization, tree regen
 Vs Development – perm, high impact, stump
 removal, low utilization, impervious surface
 Forestry = healthy forest/wildlife
 Vs Development = lost options, lost
 forest/wildlife habitat, fragmentation
 above average rainfall & adjoining homeowners
 didn't want the trees harvested

Forestry & Water Quality

How You Can Help:

- **If you work for a local government:**
 - Refer potential water quality / logging / forestry BMP questions or concerns to the NCFS County Ranger.
 - Educate citizens, homeowners, residents that forestry is not a bad thing. Reference the Educational State Forest nearby: www.ncesf.org.
- **If you work in private sector:**
 - Recognize your limitations; if your client has forest-management questions, seek advice from a Registered / Consulting Forester: www.ncforestservation.gov >> "Consulting Foresters".

Also Available: *"Frequently Asked Questions about Logging in NC"* on the NCFS website.

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Forestry & Water Quality

