

Chapter 7

Forestry and Water Quality

Forestry and Water Quality Impacts Overview

Forests are an ideal land use for water quality protection because they stabilize soil and filter stormwater runoff from adjoining, non-forested areas. In order to sustain a forest's ability to protect water quality, some degree of management is often required. Timber harvesting is part of the forest renewal cycle and is usually the most intensive forest management activity that requires special attention to assure water quality is protected. Inappropriate management practices can impact water quality by destabilizing streambanks, reducing riparian vegetation and removing tree canopies. Any one of these impacts can alter the interface of the aquatic and terrestrial ecosystem, influence downstream flooding and change watershed functions. Sedimentation is the most common water pollution agent that may result from forestry activities. Potential sources of sedimentation include stream crossings, forest roads, skid trails and log decks. As a result, the majority of regulations and erosion control recommendations pertaining to forestry focus on these four main areas.

FORESTLAND OWNERSHIP*

Approximately 75% of the forestland in the basin is privately-owned by individuals. An estimated 20% of the forestland is owned by forest-industry, forest-investment companies or conservation groups, with the remaining 5% in public ownership, including Lumber River State Park and Lake Waccamaw State Park. It should be noted that since the most recent ownership data was compiled by the USDA-Forest Service, a significant shift in ownership occurred with the sale of large parcels of forestland within the basin by International Paper Company, largely in the Green Swamp. Some parcels of land were acquired by various forestland investment companies, while other parcels were acquired by conservation groups for the purposes of land conservation and possible eventual transfer into public ownership.

* The ownership estimates come from the most recent data published by the USDA-Forest Service ("Forest Statistics for North Carolina, 2002." Brown, Mark J. Southern Research Station Resource Bulletin SRS-88. January 2004).

Forest Practices Guidelines Related to Water Quality

Forestry operations in North Carolina are subject to regulation under the Sedimentation Pollution Control Act of 1973 (GS Ch.113A Art.4 referred to as "SPCA"). However, forestry operations may be exempted from the permit and plan requirements of the SPCA, if the operations meet the compliance standards outlined in the Forest Practices Guidelines Related to Water Quality (15A NCAC 1I .0100 - .0209, referred to as "FPGs") and General Statutes regarding stream and ditch obstructions (GS 77-13 and GS 77-14).

The North Carolina Division of Forest Resources (DFR) is delegated the authority to monitor and evaluate forestry operations for compliance with these aforementioned laws and/or rules. In addition, the DFR works to resolve identified FPG compliance questions brought to its attention through citizen complaints. Violations of the FPG performance standards that cannot be resolved by the DFR are referred to the appropriate State agency for enforcement action.

During the period January 1, 2003 through December 31, 2006, the DFR conducted 1,003 FPG inspections of forestry-related activities in the basin; 97% of the sites inspected were in compliance.

Other Water Quality Regulations

In addition to the State regulations noted above, DFR monitors the implementation of the following Federal rules relating to water quality and forestry operations:

- The Section 404 silviculture exemption under the Clean Water Act
- The federally mandated 15 best management practices (BMPs) related to road construction in wetlands
- The federally mandated BMPs for mechanical site preparation activities for the establishment of pine plantations in wetlands of the southeastern U.S.

Water Quality Foresters

The majority of the Lumber River basin falls within the coverage area of a DFR Water Quality Forester, with the exception of Hoke and Robeson counties. Statewide, there is a Water Quality Forester position in 10 of DFR's 13 Districts. Water Quality Foresters conduct FPG inspections, survey BMP implementation, develop pre-harvest plans, and provide training opportunities for landowners, loggers and the public regarding water quality issues related to forestry. These foresters also assist County Rangers on follow-up site inspections and provide enhanced technical assistance to local DFR staff.

Forestry Best Management Practices

Implementing forestry Best Management Practices (BMPs) is strongly encouraged to efficiently and effectively protect the water resources of North Carolina. In 2006, the first ever revision to the North Carolina forestry BMP manual was completed. This comprehensive update to the forestry BMP manual is the result of nearly four years of effort by the DFR and a DENR-appointed Technical Advisory Committee consisting of multiple sector stakeholders, supported by two technical peer-reviews. The forestry BMP manual describes measures that may be implemented to help comply with the forestry regulations while protecting water quality. A significant addition to this revised manual is a description of wetland-related regulations and specific BMPs to consider when operating in wetlands. Copies of the new forestry BMP manual can be obtained at a County Ranger or District Forester office. The new BMP manual is also available at <http://dfr.nc.gov/> within the 'Water Quality' portion.

In the basin during this period, the DFR assisted or observed greater than 1,000 forestry activities in which BMPs were either implemented or recommended, encompassing a total area of over 46,000 acres. Additional BMP, water quality, and nonpoint source program accomplishments are highlighted in the DFR's annual "Year In Review" 4-page color brochure available at <http://dfr.nc.gov/>.

From March 2000 through March 2003, the DFR conducted a statewide BMP Implementation Survey on 565 active forest harvest operations to evaluate the usage of forestry BMPs. This survey evaluated 35 sites in the basin, with a resulting BMP implementation rate of 86%. The problems most often cited in this survey across the state relate to stream crossings, skid trails and site rehabilitation. This and subsequent surveys will serve as a basis for focused efforts in the forestry community to address water quality concerns through better and more effective BMP implementation and training. A copy of this survey report is available from the DFR Central Office or <http://dfr.nc.gov/>.

Protecting Stream Crossings with Bridgemats

The DFR provides bridgemats on loan to loggers for establishing temporary stream crossings during harvest activities in an effort to educate loggers about the benefits of installing crossings in this manner. Temporary bridges can be a very effective solution for stream crossings, since the equipment and logs stay completely clear of the water channel. Since late-2003 all District Offices in the basin have had steel bridgemats available for loan-out. While exact figures specific to the Lumber River basin are not recorded, the three District Offices that cover the basin participated in 38 loan-events between 2003 and 2006, which protected 45 stream crossings and accessed over 1,600 acres of timber. More information about bridgemats is available at <http://dfr.nc.gov/>.

Forest Management

Over 21,000 acres of land were established or regenerated with forest trees across the basin from January 1, 2003 through December 31, 2006. During this same time period the DFR provided over 1,700 individual forest plans for landowners that encompassed almost 71,500 acres in the basin.

Bottomland Hardwood/Cypress Swamps

Across the Lumber River basin, (and elsewhere in North Carolina) there are prime examples of high-quality and highly productive bottomland hardwood/cypress swamps. These swamps have provided a sustainable source of wood fiber for well over 200 years, and served as the foundation for the creation of the forest products industry in eastern North Carolina. Since the settlement of North Carolina in colonial times, our forests have been harvested multiple times, including these hard-to-access swamps. Practically-speaking, it is inconceivable that any “old growth” or “virgin” timber remain in this region. A diversity of forest tree species are adapted to grow in these bottomland swamps, some regenerating by seed and others primarily by sprouting from severed stumps. Nearly all swamp-adapted tree species require full sunlight to adequately regenerate, thus necessitating a removal of the shading overstory. Due to the cyclic nature of the hydrology in a specific swamp, fluctuations in the water table, and the obvious difficulty of site access, the planting of trees to regenerate a swamp after a timber harvest is not commonly observed as a suitable or viable silviculture practice. Management of a bottomland/cypress swamp forest is relatively passive when compared with pine or upland hardwood forest areas. Once the new stand of trees has successfully regenerated, there is usually little need to conduct intermediate stand treatments that might otherwise be suitable on pine or upland hardwood forests. Implementing a silviculturally-sound swamp timber harvest in a manner that minimizes soil and water impacts has shown to be the practical and viable prescription for forest management in bottomland/cypress swamps.

Stream & Watershed Restoration

The N.C. Clean Water Management Trust Fund and the U.S. EPA Nonpoint Source Section 319 Grant jointly provide overall funding, with technical oversight provided by the NCSU Department of Biological & Agricultural Engineering. Progress of the work can be followed from the DFR Web site in the ‘Water Quality’ portion: www.dfr.state.nc.us.

Locating and Contacting Your District

The Lumber River basin contains portions of three North Carolina Division of Forest Resource districts including districts three, six, and eight (Figure 7-1). Districts 3 and 6 are in region two while district eight is in region one. Forestry contacts for the Lumber River Basin are provided in Table 7-1.

TABLE 7-1: FORESTRY CONTACTS

OFFICE LOCATION	CONTACT PERSON	PHONE	ADDRESS
District 3 - Rockingham	Water Quality Forester	(910) 997-9220	1163 North US Hwy 1, Rockingham, NC 28379-8513
District 6 - Fayetteville	Water Quality Forester	(910) 437-2620	221 Airport Road, Fayetteville, NC 28301-9202
District 8 - Whiteville	Water Quality Forester	(910) 642-5093	1413 Chadbourn Hwy., Whiteville, NC 28472-2053
Region 1	Asst. Regional Forester	(252) 520-2402	2958 Rouse Road Extension, Kinston, NC 28504-7320
Region 2	Asst. Regional Forester	(919) 542-1515	3490 Big Woods Road Chapel Hill, NC 27517-7652
Raleigh Central Office (Statewide)	Nonpoint Source Unit Forest Hydrologist	(919) 857-4856	1616 Mail Service Center, Raleigh, NC 27699-1616
Griffiths Forestry Center (Statewide)	Water Quality and Wetlands Forester	(919) 553-6178 Ext. 230	2411 Old Hwy 70 West, Clayton, NC 27520

**FIGURE 7-1: NC DIVISION OF FOREST RESOURCES DISTRICTS
IN THE LUMBER BASIN**

