

Understanding Turbidity as it Relates to Logging in Swamps and Bottomland Areas of North Carolina

The Issue

Bottomland swamps, wetlands and other flood-prone areas can be productive for timber management in North Carolina. However, when logging in these areas, advanced planning and extra precautions should be implemented to protect the water quality within the harvested area and to reduce off-site water quality impacts that may occur. This is especially important when these areas get flooded, since water is more likely to make direct contact with areas of disturbed soil that may result from logging.

Turbidity

Turbidity refers to the ‘cloudy water’ we observe when an extremely fine powder of sediment particles is suspended in the water. This sediment is often microscopic in size, but collectively it can make the appearance of water look muddy, murky or cloudy. The photo at right illustrates different turbidity levels (“NTU” is the abbreviation for the unit-of-measure of turbidity). North Carolina regulations establish maximum standards on the allowable turbidity.

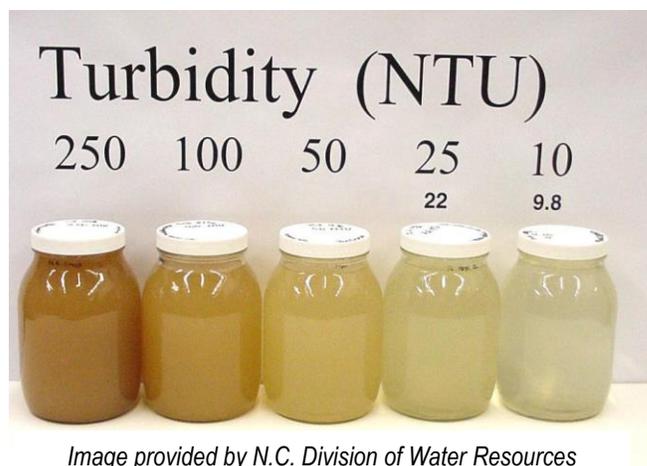


Image provided by N.C. Division of Water Resources

There is no forestry exemption related to turbidity.

The [N.C. Forest Practice Guideline Related to Water \(FPG\) rules](#) are not intended to restrain or curb turbidity. The state’s turbidity standards are governed under a different set of rules.

The Regulations

Wetlands Regulations

In most cases, swamps or bottomlands are also considered to be wetlands. While timber harvesting and other ongoing forestry (silviculture) activities are exempt from having to obtain a federal water quality permit under Section 404 of the Clean Water Act, there are additional measures that must be implemented to maintain this exemption.

- Reference [Chapter 2 of the N.C. Forestry BMP Manual](#) to understand the overall forestry water quality regulations that apply in North Carolina, including the FPGs.
- Reference [Chapter 6 of the N.C. Forestry BMP Manual](#) to understand the specific regulations and Best Management Practices when working in wetlands.

State Turbidity Standards

A section of North Carolina's water quality turbidity standards that apply to most bodies of water in the state is summarized below [from rule 15A NCAC 02B .0211(3)(k)]. As you read each bullet point, compare the NTU standard of the rule with the photo on the previous page:

- In streams, lakes or reservoirs designated as trout waters, turbidity shall not exceed 10 NTU.
- For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU.
- For streams not designated as trout streams, the turbidity shall not exceed 50 NTU.
- If turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. Compliance with this turbidity standard can be met when land management activities employ recommended Best Management Practices. The BMPs must be in full compliance with all specifications governing their proper design, installation, operation and maintenance.

The Recommendations

In addition to complying with the FPGs and implementing forestry BMPs, consider these recommendations to manage turbidity when logging in swampy, low-lying, and flood-prone areas.

- ✓ Avoid and/or stop logging, site prep, or other soil-disturbing activities during flooded conditions or when the soil is saturated.
 - Remember: If the watershed area upstream from your site gets a lot of rain during a storm, then that runoff could take days to flow downstream and reach your location, and may cause flooding long after the storm is over, even if your site received little rainfall.
- ✓ Harvest timber during the growing season when the soil is often drier, the water levels are often lower, and flooding duration is often shorter.
- ✓ Use shovel-logging (also called mat-logging) methods which may minimize the soil disturbance.
- ✓ Establish log decks and roads on upland areas that are less prone to flooding.
- ✓ Prior to, or immediately upon the start of logging, completely cover the logging deck with natural fiber or woody material. The purpose is to prevent direct contact between floodwaters and exposed soil on the log deck. Materials could include logging slash, wood chips, bark, straw/hay, jute matting, or other natural fiber. Maintain groundcover on exposed soil as the logging work continues. Promptly establish groundcover vegetation on the deck, truck turnaround areas, and low-lying roadbeds when they are no longer needed.
- ✓ Consider installing turbidity curtains to help restrain turbidity from moving off-site or downstream.
 - These are not the same as silt fence. Do not install silt fence across a stream or wetland.
- ✓ Take photographs of the water quality conditions upstream, on the site, and downstream; to document the natural background turbidity conditions before, during and after harvesting.

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