

Chapter 6

Silvicultural Activities in Forested Wetlands

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NOTE: You are encouraged to read all parts of this chapter if you are interested in wetland topics. There is information in the earlier parts that help to explain the information provided in later parts.

This chapter includes discussions about laws, rules, regulations, and guidance documents as well as direct quotes:

- All direct quotes from laws, regulations, or guidance documents are cited according to the method described in *How To Use This Manual*.
- Guidance from regulatory agencies provides additional information on specific regulations and how to implement them. Such guidance should be followed unless a regulatory agency representative provides an exemption from that guidance.

Technical Assistance

An important purpose of this chapter is to offer background information and recommendations to assist you in meeting the requirements of federal and state regulatory programs that can affect forestry operations. Representatives of service agencies often can offer technical assistance and recommendations, but may not have authority to make final determinations. That authority is held by the regulatory agency that oversees a specific rule.

Regulatory agencies that are most frequently involved with forestry:

- N.C. Division of Energy, Mineral and Land Resources
- N.C. Division of Water Resources
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency

Service agencies that are often involved with forestry:

- N.C. Forest Service
- USDA Natural Resources Conservation Service
- N.C. Soil & Water Conservation Districts
- N.C. Cooperative Extension Service

Steps for Knowing the Rules

1. Read the recommendations in this manual. They are written to help you implement effective systems of BMPs and understand the regulations.
2. Discuss applicability of the BMPs for your site-specific situation, as needed, with the appropriate service agency and/or regulatory agency.
3. Check the literature and Web resources for the most recent versions or interpretations of regulations and regulatory guidance.

The rest of this Chapter briefly highlights regulations, guidance documents, requirements ('mandatory BMPs') and voluntary BMPs related to forestry operations in wetlands of North Carolina. Supporting citations of these regulations are in Appendix 1.

The information and recommendations contained in this chapter are not formal regulatory guidance from any federal or state regulatory agency and do not constitute a legal document.

Did You Know?

The BMPs for forested wetlands in this manual are designed to meet the general requirements of the Clean Water Act (CWA) Section 404, (discussed later) and the specific requirements of the silviculture exemption to CWA Section 404.

Part 1 -- Introduction to Forested Wetlands

For Forest Owners:

Forested wetlands include complex soil and hydrologic conditions that often require additional attention when planning and conducting forestry operations.

Foresters usually consider soil drainage class, rather than wetland conditions, in developing forest management plans.

Silvicultural prescriptions often are based first on soil conditions that influence production of the desired forest resources and site operability, after which consideration is made on whether the site may be subject to the federal or state wetland regulations.

Knowing the soils and hydrology of your site can help you address:

- Harvest scheduling
- Equipment types
- Flooding potential
- Reforestation options

Forested wetlands provide important water quality and ecological functions. Because of the value of these functions, several federal and state regulations have been implemented over the years to make sure land-use practices in wetlands are done in a way to minimize degradation of the wetland.

Agencies that Regulate Wetlands

Wetlands are regulated at both the federal and state level. The U.S. Environmental Protection Agency and U.S. Army Corps of Engineers (USACE or Corps) are the two lead agencies regarding most wetland regulations. The Corps is delegated the authority by the U.S. EPA to administer the wetland regulations that most commonly effect forestry.

In North Carolina, the Division of Water Quality and Division of Coastal Management also have authority to regulate wetlands that do not necessarily fall under the authority of the federal agencies.

Primary Federal Agency: U.S. Army Corps of Engineers
Contact: Wilmington District, Regulatory Division
Web site: <http://www.saw.usace.army.mil/Wetlands/>

Primary State Agency: N.C. Division of Water Resources
Contact: Wetlands and Stormwater Branch
Web site: <http://portal.ncdenr.org/web/wq/ws>

BMP Objectives

The objectives of the BMPs recommended in this chapter include:

- Addressing the provisions of the U.S. EPA and Corps regulations related to the Clean Water Act-Section 404 and policy guidance from the Corps' Wilmington District Regulatory Division.
- Addressing provisions of state of North Carolina wetland rules that affect forestry operations.
- Minimizing adverse impacts on water quality, both onsite and offsite.
- Protecting hydrologic functions of forested wetlands that are being managed for timber or other forest resources.
- Protecting soil physical properties that could impact hydrologic functions.
- Complement the BMPs described in other chapters of this manual.

Assessing Your Site for Wetlands

Also Refer To...

The Corps' Wetlands Delineation Manual (USACE 1987) outlines methods for identifying and delineating wetlands subject to Section 404 regulation. A jurisdictional determination of a wetland's presence is often abbreviated as a 'JD'.

For Forest Owners:

The Seven Common Types of Forested Wetlands are described in Appendix 11. They are:

- Depressional Wetlands.*
- Lacustrine Fringe Wetlands.*
- Mineral Flat Wetlands.*
- Organic Flat Wetlands.*
- Riverine Wetlands.*
- Slope Wetlands.*
- Tidal Fringe Wetlands.*

However, past hydrologic alterations that altered flooding regimes may have caused wetland areas to become wetter or drier. Examples include large reservoirs in river bottomlands, stream channelization that limited flooding on small streams, and land drainage that altered water table regimes.

In such situations, the soil condition may be different than described in the county soil survey.

Onsite assessment of wetland condition should consider the effects of historical hydrologic alterations.

When planning a forestry activity, you should assess your site to see if the regulations and BMPs associated with forested wetlands apply to your operation(s).

To be considered a 'jurisdictional' wetland, a site must exhibit positive evidence of wetland hydrology, hydric soils and hydrophytic vegetation. Consider using the following steps when assessing your site:

1. Review the most recent county soil survey map

Review the area and the soils mapped on your site to determine the possible extent of hydric soils. A soil-mapping unit named as a hydric soil series is likely to be a predominantly hydric soil, and therefore may be a wetland.

When a determination of a jurisdictional wetland is performed, if it is needed, there must be an on-site field investigation as part of the process. The investigator cannot rely solely upon maps, soil surveys or photos. If a final determination is needed, only the U.S. Army Corps of Engineers has the authority to conduct and make that determination.

2. Examine the hydrology and vegetation on the site

Wetland hydrology occurs when there is a water table or soil saturation at or near the surface at a frequency sufficient to have an overriding influence on the vegetation and soils due to anaerobic and reducing conditions (typically at least 5 percent of the growing season at least one out of every two years, on average). Consider asking these questions:

- Does the site have frequent, long duration periods of flooding or soil saturation at the surface?
- Does the water table on the site commonly decline well below the surface in late summer or early fall, and, as a result, provide a window of good soil conditions for forestry operations?

Examining the site for the presence of hydrophytic vegetation will also assist you in making an assessment. Hydrophytic vegetation includes woody and herbaceous plants that are adapted to living in soils that are saturated for extended periods in the rooting zone.

3. Obtain technical assistance

If you think there is a need to have a determination of wetlands on your site, seek technical assistance to conduct an assessment. Qualified personnel from agencies such as the NCFS, NCDRCM, or USDA-NRCS personnel can make an initial assessment and determine whether a U.S. Army Corps of Engineers' representative should be contacted to make a wetland determination.

When a jurisdictional wetland determination is performed, it should be done by an experienced or trained wetland delineator in accordance with procedures of the U.S. Army Corps of Engineers' Wetlands Delineation Manual of 1987.

A Note on Wetland Size and Status

Did You Know?

Small wetlands, particularly isolated depressions that serve as breeding habitat for amphibians, have high ecological value in addition to the hydrologic and water quality functions addressed by federal and state regulations.

It is important to understand that the provisions of CWA Section 404 apply to all jurisdictional wetlands regardless of size.

FPG **The North Carolina water quality standards and the FPGs apply equally to all wetlands, regardless of size or status.**

Small areas of wetland that do not appear as hydric soil mapping units on soil survey maps are often present in forest stands in which the predominant condition is non-wetland.

In such cases, silvicultural plans should take note of these small wetlands and specify appropriate BMPs for activities that could impact these wetland areas.

Part 2 -- Regulations, Terms and Concepts

Clean Water Act

Did You Know?

Activities that result in the degradation of waters of the U.S. are subject to regulation under the Clean Water Act (CWA).

The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (CWA) establishes federal authority for regulating activities effecting the chemical, physical and biological integrity of the nation's waters. The CWA has several sections with each explaining certain aspects of the regulation. The three sections most commonly of interest to the forestry community are noted below:

Section 301 of the CWA specifies that discharges of pollutants (including sand, rock and other fill materials) into the nation's waters is unlawful except if it is in compliance with the provisions of the Clean Water Act.

Section 401 of the CWA requires that any applicant for a permit to discharge into waters of the U.S. under the provisions of the CWA must receive certification from the state in which the discharge will occur. The N.C. Division of Water Resources administers the provisions of Section 401.

Section 404 of the CWA outlines the procedures for permitting discharges of dredged or fill material into waters of the U.S. and provides information on those activities for which no permit is required.

Effect on Forestry: Forestry or 'silvicultural' activities are exempted from having to secure permits for discharging dredged or fill material, as cited within Section 404. However, there are several requirements that forestry activities must comply with in order to maintain this exemption.

Section 404 responsibilities have been delegated to the U.S. Army Corps of Engineers. In North Carolina, the Wilmington District of the Corps administers the provisions of Section 404.

**CWA Section 404
Historical Impact &
Phase - In Dates:**

On July 25, 1975, the Corps published regulations identifying a phase-in schedule to implement the permit requirements of S.404

Effective on that date, a S.404 permit was required for discharges of dredged or fill material into navigable waters of the U.S. and wetlands adjacent to these waters.

Effective September 1, 1976, permit requirements were expanded to include discharges into primary tributaries of navigable waters of the U.S. and adjacent wetlands, as well as natural lakes greater than five acres in surface area.

Effective July 1, 1977, permit requirements were expanded to include all waters of the U.S.

On July 19, 1977, the Corps issued Nationwide Permits authorizing all activities occurring prior to these phase-in dates. Silvicultural activities occurring in wetlands prior to these phase-in dates were thus permitted and, unless the activities are modified, require no further permitting.

Such areas that were sufficiently drained to convert a wetland to a non-wetland, and which remain in that drained condition, are not now jurisdictional wetlands and are not subject to Section 404.

The specific phase-in dates are described in 33 CFR 330 Nationwide Permits - Section 330.3 Activities Occurring Before Specific Dates.

Definition of Waters and Wetlands

The Section 404 regulations apply to ‘waters of the United States’ as defined in the current U.S. Army Corps of Engineers regulations *Title 33 Code of Federal Regulations Part 328 (33 CFR Part 328)*, provided in Appendix 1.

NOTE: On June 29, 2015 the USEPA and USACE published a new rule that re-defines “waters of the US”. This new rule is effective August 28, 2015. Refer to Appendix 1.13.1, or the USEPA website for the new rule: <http://www2.epa.gov/cleanwaterrule/documents-related-clean-water-rule>.

A Note on Federal and State ‘Waters’

For regulatory purposes, the federal government and the states have established definitions of ‘waters of the U.S.’ and ‘waters of the state’ respectively. In both cases, ‘waters’ also includes most ‘wetlands’ and streams.

The federal definitions stem from the Clean Water Act and related regulations. North Carolina’s definitions are found in N.C.G.S. Ch.143 Sec.212(6) and 15A NCAC 02B .0202 (71) and 15A NCAC 02H .0506 (c)(2).

‘Waters of the U.S.’ and ‘waters of the state’ may not be synonymous in certain situations, so site specific questions should be directed to the appropriate agency.

Federal Wetland Definition

For the purposes of the Corps’ regulatory program, ‘wetlands’ are defined in 33 CFR 328.3(c)(4) and this definition is cited below for your reference:

<start citation>

“The term wetland means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” <end citation>

North Carolina Wetland Definition

The N.C. Environmental Management Commission adopted the U.S. EPA / Corps’ definition of wetlands (with a slight revision in wording), as cited below from [15A NCAC 2B .0202 (64)]. <start citation>

“Wetlands are ‘waters’ as defined by G.S. 143-212(6) and are areas that are inundated or saturated by an accumulation of surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands classified as ‘waters of the state’ are restricted to ‘waters of the United States’ as defined by 33 CFR 328 and 40 CFR 230.” <end citation>

Federal Clean Water Act Silviculture Exemption (Section 404)

Typically, normal and ongoing farming, ranching, and silviculture activities are exempt from the permit requirements of Section 404 of the CWA.

Section 404 of the CWA describes the permitting process and lists activities under Section 404(f) that are exempt from permit requirements.

Section 404(f)(1) lists activities which are exempt from CWA permit requirements. This list includes two activity types commonly practiced in forest management, which are commonly referred to as the 'silviculture exemption':

- Normal farming, silviculture, and ranching activities.
- Construction or maintenance of farm roads or forest roads.

FPG Silvicultural activities that may be conducted in jurisdictional wetlands in accordance with the silviculture exemption must also be conducted in accordance with the FPGs.

To retain the silviculture exemption of Section 404, the Corps regulations require that forestry operators:

1. Must not convert an area of the waters of the US into a use to which it was not previously subject.
2. Must conduct all forestry operations in a manner that:
 - Does not result in the immediate or gradual conversion of a jurisdictional wetland to a non-wetland and that;
 - Does not impair the flow or circulation or reduce the reach of waters of the U.S.
3. Conduct site preparation activities for establishment of pine plantations in accordance with specific BMPs that limit soil disturbance and hydrologic alterations.
4. Must comply with all BMPs required by regulation for the specific activity.

Also Refer To...

The site prep BMPs mentioned here are explained in Part 5 of this Chapter.

Also Refer To...

Minor drainage is explained in more detail in part 6 of this chapter.

Minor drainage

Minor drainage allowed under the Section 404 silviculture exemption must be conducted in a manner that does not result in:

- The immediate or gradual conversion of a wetland to a non-wetland, or
- The conversion from one wetland use to another, or
- Draining or significantly modifying an area of waters of the U.S.

State of North Carolina Wetland Regulations

Water Quality Standards

The state regulations for wetlands outline a series of wetland uses and water quality standards designed to assure the maintenance or enhancement of the existing uses of wetlands.

Effect on Forestry: State rules specify certain soil disturbing activities related to normal silviculture that are deemed to be in compliance with the North Carolina Wetland Standards. The state rule essentially repeats the main elements of the federal silviculture exemption of Section 404 with some additional references to state rules.

Two compliance criteria are provided in the rule (15A NCAC 02B .0231):

1. The silvicultural activities must comply with the most current versions of the U.S. EPA and Corps regulations to implement Section 404(f);
2. The silvicultural activities must be conducted in accordance with the North Carolina FPGs.

The North Carolina ‘Dredge and Fill Law’

North Carolina G.S. 113-229 is commonly referred to as the North Carolina dredge and fill law, and requires permits to dredge or fill in or about estuarine waters or state-owned lakes. The N.C. Division of Coastal Management issues these permits and administers this law.

Effect on Forestry: Forestry related activities (such as road construction, minor drainage, or other activities) that create discharges of dredged or fill material in estuarine waters, tidelands, marshlands, or state-owned lakes **will require a permit** from the N.C. Division of Coastal Management.

As cited within N.C. General Statute 113-229(n): *<start citation>*

“(1) State-owned lakes include man-made as well as natural lakes.

(2) ‘Estuarine waters’ means all the waters of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers, and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters agreed upon by the Department and the Wildlife Resources Commission, within the meaning of G.S. 113-129.

(3) ‘Marshland’ means any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tidewaters reach the marshland areas through natural or artificial watercourses), provided this shall not include hurricane or tropical storm tides. Salt marshland or other marsh shall be those areas upon which grow some, but not necessarily all, of the following salt marsh and marsh plant species:

Smooth or salt water Cordgrass (*Spartina alterniflora*), Black Needlerush (*Juncus roemerianus*), Glasswort (*Salicornia* spp.), Salt Grass (*Distichlis spicata*), Sea Lavender (*Limonium* spp.), Bulrush (*Scirpus* spp.), Saw Grass (*Cladium jamaicense*), Cattail (*Typha* spp.), Salt-Meadow Grass (*Spartina patens*), and Salt Reed-Grass (*Spartina cynosuroides*).” <end citation>

Also Refer To...

CAMA regulations are cited in N.C. General Statute 113A-103(5)b.4

Also Refer To...

The summary of CAMA rules on this page is excerpted and adapted from the N.C. Division of Coastal Management Web site: <http://dcm2.enr.state.nc.us/>

Helpful Hints:

As noted on the NC-DCM Web site:

“Development” includes activities such as dredging or filling coastal wetlands or waters, and construction of marinas, piers, docks, bulkheads, oceanfront structures and roads.

North Carolina Coastal Area Management Act (CAMA) and Areas of Environmental Concern (AEC)

The North Carolina CAMA sets regulations related to development activities within 20 coastal counties of the state, as noted in Table 6-1 (next page).

The CAMA requires permits for development in Areas of Environmental Concern (AEC). An AEC is an area of natural importance: It may be easily destroyed by erosion or flooding or it may have environmental, social, economic or aesthetic values that make it valuable to North Carolina.

You must obtain a CAMA permit for your project if it meets all of the following conditions: (see ‘Also Refer To...’)

- It is in one of the 20 counties covered by CAMA;
- It is considered ‘development’ under CAMA; (see ‘Helpful Hints’)
- It is in, or it affects, an Area of Environmental Concern established by the N.C. Coastal Resources Commission;
- It doesn't qualify for an exemption. (see ‘Permit Exemptions’ below)

You are probably in an AEC if your project is:

- In or on navigable waters within the 20 CAMA counties.
- On a marsh or wetland.
- Within 75 feet of the mean high water line along an estuarine shoreline.
- Near the ocean beach.
- Near an inlet.
- Within 30 feet of the normal high water level of areas designated as inland fishing waters by the N.C. Marine Fisheries Commission.
- Near a public water supply.

For Forest Owners:

In addition, CAMA allows the Coastal Resources Commission to exempt some types of minor maintenance and improvements.

These types of projects are those with successful track records in protecting the resources around them.

For assistance in determining whether or not your project qualifies for an exemption, you can contact the NC-DCM.

North Carolina CAMA Permit Exemptions

Section 103(5)(b) of the CAMA exempts the following activities from permitting requirements:

- Road maintenance within a public right-of-way.
- Utility maintenance on projects that already have CAMA permits.
- Energy facilities covered by other laws or N.C. Utilities Commission rules.
- Agricultural or forestry production that does not involve the excavation or filling of estuarine or navigable waters or coastal marshland (*Note: The activities noted in this bullet are not exempt from permitting requirements under the N.C. Dredge and Fill Law*).
- Agricultural or forestry ditches less than 6 feet wide and 4 feet deep.
- Emergency maintenance and repairs when life and property are in danger.
- The construction of an accessory building usually found with an existing structure, if no filling of estuarine or navigable waters or coastal marshland is involved.

Table 6-1: The 20 coastal zone CAMA counties in North Carolina

Beaufort	Carteret	Dare	New Hanover	Pender
Bertie	Chowan	Gates	Onslow	Perquimans
Brunswick	Craven	Hertford	Pamlico	Tyrrell
Camden	Currituck	Hyde	Pasquotank	Washington

Did You Know?

A key concept of 'normal silviculture' is the use of effective practices that minimize adverse impacts on soil and water resources.

Normal Silviculture and Forestry Operations on Wetlands

Normal silviculture is considered to be the collection of silvicultural practices commonly used for forest management on jurisdictional wetlands for the purpose of producing timber and other resources of the forest.

The U.S. EPA and Corps regulations and guidance for implementation of Section 404 address five elements of normal silviculture on forested wetlands:

1 - Forest Product Harvesting [as cited from 33 CFR 323.4(a)(1)(iii)(B)]

<start citation> “Harvesting means physical measures employed directly upon farm, forest, or ranch crops within established agricultural and silvicultural lands to bring about their removal from farm, forest, or ranch land, but does not include the construction of farm, forest, or ranch roads.”
<end citation>

2 - Site Preparation [as cited from 33 CFR 323.4(a)(1)(iii)(D)]

Components of the site preparation system that involve soil disturbance are included in the definitions of plowing: <start citation>
“Plowing means all forms of primary tillage, including moldboard, chisel, or wide-blade plowing, discing, harrowing, and similar physical means utilized on farm, forest, or ranch land for the breaking up, cutting, turning over, or stirring of soil to prepare it for the planting of crops. The term does not include the redistribution of soil, rock, sand, or other surficial materials in a manner which changes any area of the waters of the United States to dry land.” <end citation>

3 - Bedding and Planting of Seedlings [as cited from 33 CFR 323.4 (a)(1)(iii)(E)]

<start citation> “Seeding means the sowing of seed and placement of seedlings to produce farm, ranch, or forest crops and includes the placement of soil beds for seeds or seedlings on established farm and forest lands.” <end citation>

4 - Construction and Maintenance of Forest Roads [33 CFR 323.4(a)(6)]

Fifteen (15) mandatory BMPs are described in the regulations. In addition, the Corps prepared specific information regarding compliance with Section 404 for the construction of forest roads within wetlands in North Carolina in 2004. This information document is in the Appendix. Forest roads are further discussed in Part 4 of this chapter.

5 - Minor Drainage [as cited in 33 CFR 323.4(a)(1)(iii)(C)(1)(ii)]

<start citation> “Minor drainage means the discharge of dredged or fill material for the purpose of installing ditching or other such water control facilities incidental to planting, cultivating, protecting, or harvesting of rice, cranberries, or other wetland crop species, where these activities and the discharge occur in waters of the United States which are in established use for such agricultural and silvicultural wetland crop production.”
<end citation>. Minor drainage is explained in Part 6 of this chapter.

Helpful Hints:

As an example, raking and piling woody debris into windrows or large piles when accompanied by significant movement of surface soil into the windrows or piles, or significant blockage of surface flows, may not be considered an exempt silvicultural activity.

Watch Out!

Mechanized land clearing for purposes other than production of forest products is not considered a 'normal' part of a silvicultural operation and would therefore not be exempt from S.404 regulation.

For Forest Owners:

Normal silviculture on a managed forest involves long periods of relative inactivity on specific stands. Continuous forest management refers to the forest as a whole.

Remember - - - - -
Normal silviculture activities must not immediately or gradually convert a wetland to a non-wetland.

Any forestry activity resulting in the conversion of a wetland to a non-wetland would not be considered exempt from Section 404 permit requirements.

Remember:

Silvicultural activities in all wetlands, regardless of size, should be conducted in a manner that minimizes adverse impacts on the unique hydrologic and ecological functions of those ecosystems.

Forestry operations in wetlands:

- Must limit both water quality degradation and hydrologic alterations in accordance with Section 404 of the Clean Water Act as specifically described by the Corps; *and*
- Must limit water quality degradation in accordance with the state water quality standards and the FPGs; *and*
- Follow the provisions of the state wetlands standards.

A Note on Corps Interpretation of Normal Silviculture

Historical interpretations from the Corps on one aspect of normal silviculture are noted in a Regulatory Guidance Letter *RGL 96-02. Subject: Applicability of Exemptions under Section 404(f) to 'Deep Ripping' Activities in Wetlands*, which is included in the Appendix. Two key points are made in RGL 96-02:

1. Normal silvicultural activities subject to the exemption are limited to those named in Section 404(f)(1)(A) and the Corps' regulation and other activities of essentially the same character as those named.
2. Deep ripping (interpreted as greater than 16 inches deep) is not an exempt activity if it is required to establish silviculture for the first time or if it breaks-up a restrictive soil layer resulting in significant drainage that immediately or gradually converts a wetland to a non-wetland.

Established and Ongoing Silviculture

The requirement of an established and ongoing silvicultural operation is generally considered to be met when:

- There is a forest management plan for the forest property, *and*
- There is documented and on-site evidence that the land has been managed continuously for silvicultural purposes, *and*
- The landowner intends to continue forest management.

Note: Under [33CFR323.4(a)(ii)] an operation ceases to be 'established' when the area on which it was conducted has been converted to another use or has lain idle so long that modifications to the hydrological regime are necessary to resume operations.

Therefore, a forest site on which an existing drainage system has not been maintained for a long time such that the drainage system no longer provides effective drainage may no longer be considered 'ongoing.'

Part 3 -- BMPs for Timber Harvesting

Harvesting of timber is considered a normal silvicultural activity, as noted earlier from [33CFR323.4(a)(1)(iii)(B)]. The bulleted items in this part 3 are general BMPs to consider when harvesting timber within forested wetlands.

- Recognize the soil and hydrology conditions on the site. Plan your harvest to minimize activity in sensitive areas that could be wetter than normal, or in areas near waterbodies:
 - Consider sharing this information with the heavy equipment operators so they understand what areas are sensitive and may need to be protected.
 - Consider marking these areas for high visibility and awareness.
- Operate equipment during periods of relatively dry surface soils if possible. Minimize activity on saturated soils and near waterbodies.
- Use appropriate harvesting equipment, methods and/or techniques that minimize significant alterations to the soil structure:
 - Consider constructing a shovel-mat trail of logging debris for primary skid trails and pathways. This debris will help keep equipment off of the soil surface. If a shovel-mat trail is used, remove this debris as soon as possible once you are finished using the trail.
- Concentrate heavy equipment use to the primary skid trails and decks. Avoid randomly dispersed equipment traffic on the site:
 - Consider ceasing operations or choosing a better harvest method if a single pass of equipment produces ruts deeper than six inches across a significant area of the site beyond the primary skid trails and decks.
- Limit heavy equipment use along the edge of ditches to the extent that the structural integrity of the ditchbank is protected and sediment transport within the ditch is prevented.
- Avoid crossing streams when possible. Portable bridgemats are a preferred method for crossing streams and ditches. Pole crossings may be suitable in certain cases. Refer to chapter 5, part 5 for BMPs on stream and ditch crossings.
- On areas that show signs of significant or intensive soil disturbance that may adversely affect the site hydrology or water quality, it is recommended to rehabilitate the soil structure by ripping or tilling:
 - Tillage must not convert a wetland to a non-wetland.
 - Soil tillage should be done when the soil is relatively dry.
 - Till or rip the soil through the bottoms of ruts, as long as doing so does not convert the wetland to a non-wetland.



For Forest Owners:

Prior to undertaking any deep ripping in jurisdictional wetlands, you should refer to the Corps' Regulatory Guidance Letter RGL 96-02, in Appendix 1.

For Forest Owners:

In the section of the regulations related to roads or skid trails for logging in wetlands, the phrases 'forestry activities' or 'forestry purposes' are interpreted by USEPA and the Corps to mean operations and activities necessary for production of forest products.

While a road can be used for multiple purposes, its primary use must be for forestry activities, and the road dimensions and extent should be limited to that necessary for the forest activity.

Therefore, roads constructed primarily for hunting or recreational access would require a permit.

Refer to the November 2004 Corps information document about forest roads in wetlands of N.C., provided in Appendix 1.

If you plan to conduct forest operations, including roadwork, in jurisdictional wetlands which may exceed the recommendations provided in this 2004 information paper, you should be prepared to justify the need for the additional road construction and are encouraged to contact appropriate natural resources agency staff prior to starting work to ensure the intended discharge is not prohibited by, or otherwise subject to, regulation under CWA Section 404.

Part 4 -- Requirements and BMPs for Forest Roads

Temporary and permanent roads constructed for forestry purposes in wetlands are exempt from CWA Section 404 permitting requirements as long as they are constructed in accordance with the mandatory 15 best management practices prescribed in the Corps' regulations:

- These 15 mandatory BMPs are described later in part 4.
- FPG** -- Roadwork must also remain in compliance with the North Carolina FPGs and other applicable state regulations.
- You are encouraged to read and understand the information prepared by the Corps in 2004 regarding road construction.

Regulatory Statement

The regulation pertaining to forest roads in wetlands is cited from 33 CFR 323.4(a)(6)(i) and requires that: <start citation> "Permanent roads (for farming or forestry activities), temporary access roads (for mining, forestry, or farm purposes) and skid trails (for logging) in waters of the U.S. shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific farming, silvicultural or mining operations, and local topographic and climatic conditions." <end citation>

U.S. Army Corps of Engineers Forest Road Information

In November 2004, the Corps' Wilmington District prepared an information paper on road system planning and design that provides general specifications for road lengths, widths, spacing and height of fill above the ground surface.

This road information document is in the Appendix, and is entitled *Information Regarding Compliance with the Federal Clean Water Act Section 404(f)(1) Provisions for the Construction of Forest Roads Within Wetlands, in North Carolina*. (See sidebar)

Also, the Corps' Wilmington District currently maintains that, to be considered exempt from Section 404 permit requirements, borrow ditches dug to obtain fill for forest road construction must not be connected to an outlet. The District holds that such connection would adversely affect flows and circulation patterns within the wetland and would result in the conversion of land adjacent to the borrow ditch to a non-wetland.

Road Crossings of 'Waters of U.S.'

Note that the regulatory guidelines of 33 CFR 324.4(a)(6) apply to the waters of the U.S., not just wetlands. Therefore:

Forest road crossings of tributaries of Waters of the US are subject to the Corps' 15 mandatory BMPs.

Corps' 15 Mandatory BMPs for Forest Roads in Wetlands

For an access road to be exempt from federal permitting requirements, any forest road constructed within or across waters of the U.S. must be necessitated by timber production activities and may be constructed only to the minimum standards necessary for the forestry activity.

NOTE: Construction of forest roads in jurisdictional wetlands for production of forest products does not require a permit as long as these 15 [(i) through (xv)] BMPs are followed.

The portion of the regulation that deals with forest roads is cited for reference: <start citation>

“(a) General.

Except as specified in paragraphs (b) and (c) of this section, any discharge of dredged or fill material that may result from any of the following activities is not prohibited by or otherwise subject to regulation under section 404:

(6) Construction or maintenance of farm roads, forest roads, or temporary roads for moving mining equipment, where such roads are constructed and maintained in accordance with best management practices (BMPs) to assure that flow and circulation patterns and chemical and biological characteristics of waters of the United States are not impaired, that the reach of the waters of the United States is not reduced, and that any adverse effect on the aquatic environment will be otherwise minimized. These BMPs which must be applied to satisfy this provision shall include those detailed BMPs described in the state's approved program description pursuant to the requirements of 40 CFR Part 233.22(i), and shall also include the following baseline provisions:

(i) Permanent roads (for farming or forestry activities), temporary access roads (for mining, forestry, or farm purposes) and skid trails (for logging) in waters of the U.S. shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific farming, silvicultural or mining operations, and local topographic and climatic conditions;

(ii) All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions of such roads which must cross water bodies) to minimize discharges of dredged or fill material into waters of the U.S.;

(iii) The road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows;

(iv) The fill shall be properly stabilized and maintained during and following construction to prevent erosion;

(v) Discharges of dredged or fill material into waters of the United States to construct a road fill shall be made in a manner that minimizes the encroachment of trucks, tractors, bulldozers, or other heavy equipment within waters of the United States (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself;

(vi) In designing, constructing, and maintaining roads, vegetative disturbance in the waters of the U.S. shall be kept to a minimum;

(vii) The design, construction and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body;

(viii) Borrow material shall be taken from upland sources whenever feasible;

(ix) The discharge shall not take, or jeopardize the continued existence of, a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species;

(x) Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands shall be avoided if practical alternatives exist;

(xi) The discharge shall not be located in the proximity of a public water supply intake;

(xii) The discharge shall not occur in areas of concentrated shellfish production;

(xiii) The discharge shall not occur in a component of the National Wild and Scenic River System;

(xiv) The discharge of material shall consist of suitable material free from toxic pollutants in toxic amounts; and

(xv) All temporary fills shall be removed in their entirety and the area restored to its original elevation.” <end citation>

Helpful Hints, for (x):

Impacts to wetlands should be avoided if practical alternatives exist, as cited in 33 CFR 323.4(a)(6)(x).

You should not only consider whether the impacts to wetlands could be avoided by locating roads in upland areas, but also whether the need for road construction could be avoided by conducting the forest operation during drier periods.

Helpful Hints, for (xiii):

National Wild and Scenic River Systems:
As of March 2012, there are segments of five designated National Wild and Scenic River Systems in N.C.:

- Chattooga River
- Horsepasture River
- New River
- Lumber River
- Wilson Creek

Specific river sections and location information is available on the Web site www.rivers.gov

Types of Forest Roads Commonly used in Wetlands

The descriptions provided below may also apply to non-wetland areas. The section that follows provides specific BMPs for forest roads in wetlands.

Permanent roads

Roads that provide year-round, all-weather access for silvicultural operations and fire protection. Such roads are maintained on a regular basis and become a permanent part of the forested landscape.

Temporary roads

Roads that provide access into a specific area for a specific operation. Once that operation is complete, temporary roads are closed, structures are removed, the road is restored to original grade and, if necessary, the disturbed soils are stabilized to prevent accelerated erosion.

Flat roads

Roads that are graded atop the ground surface, sometimes with a small, shallow grader ditch on one or both sides. No fill material is added which might build the road elevation above the adjacent land surface.

Such roads minimize adverse impacts on wetlands and are often used:

- As permanent access where all-weather use is not necessary and the road can be temporarily closed when inundated or the soils are very wet.
- For temporary access when constructed and used during periods of relatively dry soils.
- For crossing nonwetland areas as part of a larger road system that traverses both wetland and non-wetland forest areas.

Fill roads

Roads that are most usually permanent and where year-round, all-weather use is required. The road is built upon fill material situated above the adjacent land surface to provide for drainage of the roadbed and road surface sufficient to maintain a stable and usable road.

Recommended BMPs for Forest Roads in Wetlands

- Plan and implement road designs, locations, alignments and water management devices as needed to minimize hydrologic alterations.
- Construct roads during periods of relatively dry soils when possible.
- Minimize the lateral extent of wetland disturbance during construction
- Maintain a daylight corridor to allow more rapid drying of the road if doing so provides better control of surface runoff.

Helpful Hints:

If fill material must be placed next to the road, use small piles adjacent to the road that are separated by openings so surface water flow is not blocked by the piles.

**Helpful Hints:**

Think of each 'floodway' as a dry ford crossing where water can run during heavy flows.

- If fill material is generated by the road construction process, place suitable mineral soil fill on the road surface or remove it from the wetland to a non-wetland area, if feasible.
- After construction is completed, stabilize disturbed areas of the roadbed with vegetation if accelerated erosion and transport of sediment to a receiving stream is likely.
- Establish and maintain groundcover vegetation along road shoulders to capture sediment that may come from the road surface.
- On frequently used roads that are regularly graded, apply gravel or other suitable stabilizing material on areas where erosion and sedimentation may occur.
- On lightly used roads, establish and maintain vegetative groundcover or other suitable stabilizing materials upon the road surface.
- If culverts are needed for stream crossings or for cross-drainage:
 - Install culverts of adequate number and/or capacity to handle floodwaters. The spacing between culverts is site-specific.
 - Construct the crossing in a way that prevents floodwaters from flowing over the road at the culvert. Build up the road elevation atop the culvert and create a gradual hump over the culvert.
 - Create shallow depressions in the road on each approach to the culvert. These depressions should act as a floodway for heavy water flow to go around the pipe, and reduce the risk of the culvert blowing out.
- As needed, apply stabilizing materials atop the culvert crossing, on each culvert headwall, and within each crossing approach floodway.

Additional BMPs for Flat Roads

- Keep the grade of the road as close to the normal land surface grade as practical, to minimize the chances of blocking surface water flow.
- Install water turnouts, sediment pits, or other suitable water control structures within the roadside grader ditch to prevent sediment runoff into streams or other waterbodies.
- On places where surface water flows are expected to cross the road, stabilize and/or harden the road surface with suitable materials. This is especially important in riverine wetlands.
- Establish and maintain a grader ditch if needed to control runoff.

Watch Out!

Even the best laid-out and constructed fill roads can act as an unintentional barrier to surface (or near-surface) water flow.

This is why it's important to allow ample cross - drainage, and minimize the use and extent of fill roads in wetlands.

For Forest Owners:

Most of the drainage systems for silviculture that were constructed in the 1960's and 1970's use the roadside ditch as a collector and transport ditch as part of the overall drainage system.

This arrangement may allow the transport of sediment from the roadside collector ditch to a drainage outlet, unless measures are put in place to restrict sediment transport.

Additional BMPs for Fill Roads

- When possible, conduct construction work in dry periods and in advance of when you need to use the road. This allows the road to settle and not contribute excessive amounts of sedimentation that can result during wet conditions.
- Use appropriate fill material from nearby or adjacent non-wetland areas where practical:
 - Minimize the amount of excavation and disturbance in the wetland.
 - Minimize the amount of organic matter within the fill, since this will retain moisture and not allow the road to rapidly drain or dry out.
- Provide ample cross-drainage within the road structure for surface water flow. This includes culverts, bridges, fords or some combination of each. Refer to the BMPs noted above related to culvert installations and the creation of floodways for heavy water flows.
- Build up a slight, stabilized berm along each roadside edge that can collect surface runoff and help capture sediment. Create stabilized gaps in the berm periodically for runoff to drain from the road surface.
- If borrow ditches are used to obtain fill material:
 - Only excavate as much material as needed to construct the road. Minimize the depth, width and length of the borrow ditch.
 - Do not connect the borrow ditch to an outlet.
 - Place unsuitable fill material in small piles adjacent to the borrow ditch and provide openings for surface water flow.

Additional BMPs for Maintaining Fill Roads that are Adjacent to Existing Roadside Collector Ditches

- Where feasible, maintain a grader ditch, roadside berm and/or vegetative groundcover alongside the road edges to control and capture the runoff before it flows into the roadside collector ditch.
- Maintain a crowned road surface or use other appropriate BMPs to control runoff and allow adequate drying of the road surface.
- For roadside ditches that are connected to an outlet, protect or maintain groundcover at least 4 to 5 feet wide adjacent to the ditch (on the side opposite the road) during soil disturbing silviculture operations.
- Where ditch erosion or sediment transport are occurring, install flow control devices within the roadside collector ditch to manage the water flow speed and volume (see sidebar ‘Did You Know?’).

Did You Know?

One common example of a flow control device is a flashboard riser.

Flow control devices may also help:

- Sediment to settle out in the ditch water before it reaches the outlet.*
- Manage nutrient or bacteria contributions from natural runoff.*
- Temporarily store water in the ditch for wildfire control.*

For Forest Owners:

It is important to recognize that intensive management for pines, and the associated site prep work often needed, (including bedding) is only appropriate on certain wetland sites.

Not all wetland areas are suitable for mechanical site prep and/or pine management.

Consult a forestry and/or natural resources professional that can help you determine the correct species for your site, and decide the best methods for managing those species in a productive and low-impact manner.

While it is not the intention of this manual to advocate the use of site prep for pine management in wetlands, there are BMPs provided in this chapter for those situations where these activities are undertaken.

Also see chapter 10.

Part 5 -- Requirements and BMPs for Site Prep

Site Preparation (site prep) is the term used to describe activities undertaken to prepare a site's conditions for forest tree regeneration that may occur either by manual methods or natural processes.

While site prep is generally considered a normal silviculture activity in jurisdictional wetlands, there are requirements defined by the U.S. EPA and Corps for mechanical site prep work in wetlands when that work is done for the regeneration of pine species in the wetlands.

These six requirements are outlined in a *Memorandum to the Field* dated November 28, 1995, that was issued jointly by the U.S. EPA and Corps. This memorandum is provided in Appendix 1 for reference.

When a Permit is Required

The guidance in that memorandum specifies that a Section 404 permit is required to conduct mechanical site preparation for the establishment of pine plantations on nine types of forested jurisdictional wetlands in the Southeast. These nine wetland types that require a permit are:

1. Permanently flooded, intermittently exposed, and semi-permanently flooded wetlands.
2. Riverine Bottomland Hardwood wetlands.
3. White Cedar Swamps.
4. Carolina Bay wetlands.
5. Non-riverine Forest wetlands.
6. Low Pocosin wetlands.
7. Wet Marl Forests.
8. Tidal Freshwater Marshes.
9. Maritime Grasslands, Shrub Swamps, and Swamp Forests.

A Note on Stump Removal

As the regulations are written, the removal of underground vegetation, including stumps, may not be an exempt activity under Section 404.

Minimizing the amount of debris that is pushed during site prep will help reduce the likelihood of removing stumps, which could then require a permit from the U.S. Army Corps of Engineers.

USEPA/Corps' 6 Mandatory BMPs for Site Prep

In addition, the above noted U.S. EPA / Corps memorandum prescribes six mandatory best management practices for all mechanical site preparation activities undertaken for pine plantation establishment on jurisdictional wetlands.

It is implied that these six mandatory practices must be implemented in order to retain the silviculture (Section 404) exemption for that activity.

These six mandatory BMP requirements are cited below for reference:

<start citation> “.....The following forested wetlands BMPs are designed to minimize the impacts associated with mechanical silvicultural site preparation activities in circumstances where these activities do not require a permit (authorization from the Corps is necessary for discharges associated with silvicultural site preparation in wetlands described above as requiring a permit.) The BMPs include, at a minimum, the following:

- 1) position shear blades or rakes at or near the soil surface and windrow, pile, and otherwise move logs and logging debris by methods that minimize dragging or pushing through the soil to minimize soil disturbance associated with shearing, raking, and moving trees, stumps, brush, and other unwanted vegetation;
- 2) conduct activities in such a manner as to avoid excessive soil compaction and maintain soil tilth;
- 3) arrange windrows in such a manner as to limit erosion, overland flow, and runoff;
- 4) prevent disposal or storage of logs or logging debris in streamside management zones -- defined areas adjacent to streams, lakes, and other waterbodies -- to protect water quality;
- 5) maintain the natural contour of the site and ensure that activities do not immediately or gradually convert the wetland to a non-wetland; and
- 6) conduct activities with appropriate water management mechanisms to minimize off-site water quality impacts.” *<end citation>*

Additional BMPs for Site Prep

- Recognize the soil and hydrology conditions on the site. Plan your work to minimize activity in sensitive areas that could be wetter than normal, or in areas nearb waterbodies.
- Operate equipment during periods of relatively dry surface soils where possible. Minimize activity on saturated soils and near waterbodies.
- Minimize soil movement when shearing, piling, bedding, or conducting other soil tillage operations.
- Use appropriate equipment, methods and/or techniques that avoid movement of soil or debris into wet, depressional areas.

Watch Out!

Prior to undertaking any deep ripping in jurisdictional wetlands, you should refer to the Corps' Regulatory Guidance Letter RGL 96-02, in the Appendix

- Limit heavy equipment use along the edge of ditches to the extent that the structural integrity of the ditchbank is protected and sediment transport within the ditch is prevented.
- Avoid crossing streams when possible:
 - Portable bridgemats are a preferred method for crossing streams and ditches. Pole crossings may be suitable in certain cases. Refer to Chapter 5, Part 5 for more BMPs on stream and ditch crossings.
- On areas that show signs of significant or intensive soil disturbance that may adversely affect the site hydrology or water quality, it is recommended to rehabilitate the soil structure by ripping or tilling:
 - Tillage must not convert a wetland to a non-wetland.
 - Soil tillage should be done when the soil is relatively dry.
 - Till or rip the soil through the bottoms of ruts, as long as doing so does not convert the wetland to a non-wetland.
- Implement additional BMPs that are appropriate for your site:
 - Suggested options are provided in Chapter 10 of this manual, including recommendations for bedding activities.

For Forest Owners:

Water management practices include minor drainage, flow control devices, and certain silvicultural practices.

Such practices are commonly utilized in low relief Mineral Flat wetlands, large Carolina Bays, and Organic Flat wetlands.

*Minor drainage **should not be installed** in Riverine Wetlands (floodplain) because the ditch systems may alter the reach and flow of floodwaters.*

Part 6 -- Requirements and BMPs for Water Management

Water management provides temporary surface storage during and after large rainfall events. This is accomplished by means of minor drainage.

If the requirements as prescribed within the silviculture exemption in Section 404 are met on a forestry operation, then a formal jurisdictional determination is not necessary. If questions arise as to whether or not the Section 404 exemption applies to a specific site or activity, then a jurisdictional determination can help determine exactly where wetland regulations apply.

Effect on Forestry: It is recommended to follow the Section 404 requirements whenever conducting forestry operations upon poorly drained or very poorly drained soils as a conservative approach to meeting the specifications under the silviculture exemption in Section 404.

Objectives of Water Management

Water management, as it applies to forestry, is the implementation of normal silvicultural practices that may control water infiltration, absorption, transport and/or surface-water storage on the site. Water management on forested wetland areas can influence water cycling between the vegetation and soil, water infiltration, water storage and movement of water. Common objectives of water management are noted below.

Did You Know?

Other wetland-adapted tree species, such as cypress and Atlantic White Cedar, have shown to respond well in their seedling stage to the same intensive silviculture practices used for pine growth.

Improve the survival of seedlings

Trees regenerated on wetland areas require at least some aerated soil to ensure survival of seedlings after germination. Newly established seedlings cannot survive long periods of inundation or soil saturation at the surface.

Improve the growth of young trees

Water management improves the early growth rates of planted pine trees and shortens the length of time to a commercial harvest.

Improve soil trafficability and minimize soil disturbance

Water management can lengthen the ‘operating window’ of the time during which heavy equipment used for timber harvesting or site prep can be used without causing intensive soil disturbance. By providing a longer period of drier soils, the equipment is less likely to operate in saturated or near-saturated soil conditions.

Limit the degree of drainage

Successfully managing the site’s water resources can be valuable to assure an adequate supply of water. Having too much drainage capacity can be detrimental to optimizing tree growth because plant-available soil moisture is typically limiting in many wetland soils during the summer and fall.

Maintain wetland hydrology and hydrologic functions

Silvicultural practices that assist in maintaining or enhancing soil water storage and surface retention storage, and limiting rates of drainage outflow all contribute to maintenance of wetland hydrology.

Other objectives of water management:

Minimize adverse impacts on water quality, both onsite and offsite.
Establish a supply of water within the ditch for use in wildfire suppression.

Minor Drainage

Minor drainage, when used for silviculture, is usually seen on very poorly drained soils and some poorly drained soils, most of which are hydric types, and many of which are jurisdictional wetlands.

The drainage of water should occur by subsurface flow into the ditch. The objective often is to lower the average water table level in the soil between successive ditches during periods of the year when a high water table is normally expected, usually the late winter and early spring.

In practice, minor drainage means the minimal and temporary drainage needed to harvest and successfully regenerate a forest tree stand.

Watch Out!

Do not rely upon past activities in wetlands as an indicator of today’s appropriate practices.

You are encouraged to be familiar with current U.S. EPA and Corps interpretations if conducting minor drainage activities.

Therefore, to continue the Section 404 silviculture exemption on an intensively managed forest stand that has minor drainage (on a site that was jurisdictional wetland prior to installation of the minor drainage), that site must continue to meet the vegetation, hydric soils, and hydrology criteria for a jurisdictional wetland.

Helpful Hints:

The key to having minor drainage fall within the Section 404 exemption is whether the drainage system has the potential to significantly alter the hydrology of the site.

Effect on Forestry: To be considered exempt from Section 404 permit requirements, minor drainage systems installed within jurisdictional wetlands after 1977:

- Must not result in the immediate or gradual conversion of the wetland to a non-wetland; *and*
- Should not include the construction of any canal, ditch, dike or other waterway or structure which drains or otherwise significantly modifies a wetland or any other water of the U.S.

Establishment of minor drainage is a normal silvicultural activity on forested wetlands and is exempt from Section 404 permitting if:

- It is part of an established and ongoing silvicultural operation; *and*
- It does not drain (convert from wetland to non-wetland) or significantly modify a stream, lake, swamp, bog or any other wetland or any other water of the U.S.

Recapture Provision

Of importance related to minor drainage are the recapture provisions defined at 33 CFR 323.4 (b) and (c). Recapture means that the Section 404 silviculture exemption is lost and the site becomes subject to all the permitting requirements of federal rule 33 CFR Part 323.

According to these provisions, ‘recapture’ can be implemented:

- If a discharge of dredged or fill material occurring in the course of normal agriculture or silviculture activities contains a toxic pollutant, *or*
- If the purpose of such discharge is to convert an area of the waters of the U.S. into a use to which it was not previously subject, *or*
- Where the flow or circulation of waters of the US may be impaired or the reach of such waters reduced.

Ditch Definitions

Different types of generic ditch terms are commonly used in the course of normal silviculture on forested wetlands in North Carolina. For the purposes of this manual, the following definitions are used.

Borrow Ditch

A borrow ditch retains water that either seeps in from groundwater sources, and/or runs off from the surface as a nonpoint source. Borrow ditches are usually excavated with a backhoe or similar equipment and often are located alongside roadways, so that the spoil material from the borrow ditch can be used to construct or maintain a road. A borrow ditch does not have an outlet to a natural waterway.

The Corps' Wilmington District currently holds that to be considered exempt from Section 404 permit requirements, borrow ditches dug to obtain fill for forest road construction must not be connected to an outlet due to the potential for wetland drainage.

Grader Ditch (or grader ditchline)

Grader ditch is the name given to a shallow, angled trench that is excavated into the roadway surface along the roadside edge, usually no more than 3 to 6 inches deep, and most often created by using the end of the blade on a motor grader, bulldozer or similar blade. The purpose of the grader ditch is to control surface runoff from a roadway.

Hydrologically-Connected Ditch

A hydrologically-connected ditch has an outlet to a stream network, within which sediment and other nonpoint source pollution may enter that stream network unless appropriate BMPs or other measures are implemented to prevent this action from occurring.

Did You Know?

Other names often used for a minor drainage ditch may include:

- lateral ditch.*
- field ditch.*
- silvicultural ditch.*

Minor Drainage Ditch

A minor drainage ditch is one constructed to provide minor drainage for normal silviculture and is connected to an outlet.

Such ditches should be constructed at the maximum spacing and minimum depth that will achieve the minor drainage objective. These ditches also should have flow control devices at appropriate locations in the ditch network.

The Corps considers discharges of fill material associated with construction of minor drainage ditches within jurisdictional wetlands exempt from Section 404 permit requirements provided:

- The activity is incidental to planting, cultivating, protecting or harvesting of a wetland crop species, *and*
- The activity occurs in an area which is in established use for silvicultural production, *and*
- The activity does not result in the immediate or gradual conversion of a wetland to a non-wetland, *and*

- The activity does not drain or otherwise significantly modify a stream, lake, swamp, bog or any other wetland or aquatic area constituting waters of the U.S.

Helpful Hints:

The historical note is only offered here as a historical reference so that you can be aware of what you may encounter on a job site.

The installation of these types of ditches and drainage systems most likely do not meet the current U.S. EPA and Corps interpretations of exempted drainage.

However, maintenance of these types of historical ditches and systems installed prior to July 19, 1977 would be considered exempt, because their construction was not at that time a violation of the CWA.

A Historical Note on Past Drainage Practices

A number of ditch systems in a large portion of the drained forest stands under management today in North Carolina were constructed in the 1960's and 1970's prior to those sites coming under CWA/Corps jurisdiction.

Standard practice at that time was to use roadside borrow ditches as multifunction channels. Historically, roadside ditches adjacent to permanent roads were often called collector ditches and served multiple functions:

- Provided a hydraulic gradient from the lateral ditches to promote drainage.
- Transported drainage discharge to an outlet.
- Provided fill for building up the base of the road above the ground surface.
- Drained the roadbed to facilitate all weather use.

In addition, there were two common designs of drainage systems:

- 1) Prescription drainage systems: These systems had no standard pattern of ditch arrangement or spacing and usually can be found on sites with a mix of hydric and non-hydric soil units.
- 2) Pattern drainage systems: These systems included regularly spaced parallel ditches and are commonly found on large, low-relief sites dominated by hydric soils where drainage is needed throughout the site.

For Forest Owners:

Given your management objectives, consider whether or not minor drainage is practical or necessary on your site for conducting silvicultural work.

Where practical, use a silvicultural plan that does not require the need for minor drainage.

If minor drainage is necessary, you are encouraged to document the jurisdictional status of the wetland area, and seek technical assistance for planning these activities.

BMPs for Water Management

- Water management activities, including minor drainage, must not convert a wetland to a non-wetland, in order to maintain normal silviculture status under the Section 404 exemption clause.
- Limit the depth, width and length of new minor drainage ditches to only that which is needed to provide effective minor drainage for silvicultural activities on the given soil type of the site. Plan the system with the maximum effective distance between lateral ditches. *Refer to Figure 6A on the next page for a design example.*
- A drainage system should be designed, constructed, and maintained in a way to minimize surface runoff from entering into the ditch(es).
- Conduct excavation and other operations during periods of relatively dry soils, if conditions allow.
- Start excavation near the discharge end while leaving a plug of soil in place to serve as a temporary dam within the newly excavated ditch. This soil plug allows settling out of suspended sediments before connecting the new ditch with an existing drainage.

Technical assistance is available from public and private forestry or natural resources professionals.

- For initial construction or maintenance, deposit excavated material (spoil) atop existing roads or on top of old spoil locations, if possible. Removal of the spoil from the site is also an option:
 - If piling is necessary, use small piles with frequent gaps between them to minimize blockage of surface water flow during flood events.
 - Stabilize the spoil material as needed to minimize sedimentation into nearby waterbodies.
- Install and maintain flow control devices as needed to manage water velocity and volume. These devices can help you to meet your water management objectives, as described earlier in this Part 6.
- Once flow control devices are no longer needed and your forestry objectives can still be met, consider re-filling or plugging the minor drainage ditch(es).

Caption:

A generic layout design is provided here, as an example.

Position the lateral ditches in blocks parallel to roads, and discharge them into a central collector ditch perpendicular to the road.

By doing this, one water/flow control device at the outlet end of the collector ditch can control drainage outflow from that block without interfering with flow in the next collector ditch where discharge capacity may be needed for temporary minor drainage in another part of the forest.

Figure 6A: Example diagram of block layout for ditches

