



North Carolina
Forest Service

FORESTRY Leaflets

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WQ-4

Explaining a Streamside Management Zone (SMZ)

On forestry-related, land-disturbing activities in North Carolina, **state rules require a protective Streamside Management Zone (SMZ) along any intermittent stream, any perennial stream, and any perennial waterbody:**

- It does not matter if that stream or waterbody appears on a soil survey or topographic map.
- If that stream or waterbody exists on-the-ground, then a SMZ is required!

Important Terms

The North Carolina rules for forestry activities are called the *Forest Practices Guidelines Related to Water Quality*, abbreviated as FPGs, cited in 02 NCAC 60C .0100 - .0209. Take note of these terms defined in the FPGs:

Streamside Management Zone (SMZ): An area along both sides of intermittent streams and perennial streams and along the margins of perennial waterbodies where extra precaution is used in carrying out forestry-related, land-disturbing activities in order to protect water quality.

Intermittent Stream: A stream that flows only during wet periods of the year (30% to 90% of the time) and flows in a continuous well-defined channel.

Perennial Stream: A stream that flows throughout a majority of the year (greater than 90% of the time) and flows in a well-defined channel.

Waterbody: A natural or man-made basin that stores water, not including jurisdictional wetlands or beaver ponds.

FPG Rule 02 NCAC 60C .0201, SMZ Requirements

- "(a) *A streamside management zone (SMZ) shall be established and maintained along the margins of intermittent streams, perennial streams and perennial waterbodies. The SMZ shall confine visible sediment resulting from accelerated erosion.*
- (b) *Ground cover, or best management practices, within the SMZ shall restrain accelerated erosion.*
- (c) *Access roads, skid trails, except as provided in Rule .0203 of this Section, logging decks and mill sites shall be placed outside of SMZs. When barriers such as property lines or limiting land features prohibit the location of any of these outside of SMZs, they can be located within the SMZs. When located within SMZs, there shall be effective erosion control and sediment control structures or measures installed to restrain accelerated erosion and prevent visible sediment from entering intermittent streams, perennial streams or perennial waterbodies."*

Timber may be harvested from the SMZ, but extra care must be taken to minimize soil disturbance, prevent accelerated erosion, and keep visible sediment from entering the stream or waterbody.

FPG Rule 02 NCAC 60C .0208, Perennial Stream Temperature

"Shade within SMZs associated with natural perennial streams shall be retained to protect those streams from temperature fluctuations that result in a violation of a water quality standard of the Environmental Management Commission as contained in Rule 15A NCAC 02B .0211 - Fresh Surface Water Classifications and Standards which is incorporated by reference including subsequent amendments..."

Rule FPG .0208 applies to any natural perennial stream in North Carolina. Shade can come from any vegetation along the stream, as long as the stream water is not exposed to more sunlight than before harvesting.

How Wide is Your SMZ?

The state FPG rules do not include a minimum distance of how wide the SMZ must be.

The SMZ must be wide enough to "*confine visible sediment resulting from accelerated erosion*" and also comply with the other standards spelled-out in the FPGs.

North Carolina's Forestry Best Management Practices (BMPs) include recommendations for SMZs. Research studies from across the southeastern U.S. have shown that an **un-disturbed SMZ that is 50-feet wide** (on each side of the stream) most often is adequate to control erosion & sedimentation.

The site factors below may require a SMZ that is wider than normal, while also meeting your management goals:

- Steep slopes, or long continuous slopes, leading down to the stream (including old erosion gullies).
- Highly erodible soils (such as clay, silt or loam); or the ephemeral stream transition area is actively eroding.
- Bare soil in the SMZ with little natural groundcover (often seen in bottomland areas).
- Intensive soil disturbance nearby the SMZ (rutted/compacted soil, a skid trail, or road).
- Specially-designated waters such as: trout; water supply; nutrient sensitive; wild & scenic; T&E habitat.
- Areas that have a history of, or are susceptible to, tree blow-down from frequent wind storms.

Laying Out Your SMZ

The easiest method is to leave the SMZ un-disturbed. But, if timber will be harvested, work with a forester to designate which trees to cut. Avoid leaving wide gaps in the SMZ, generally less than 1 tree-height of distance.

Mark the outer perimeter edge of each SMZ. Use high visibility flagging tape or paint.

It is usually best to mark any trees inside the SMZ that will be harvested, leaving all the rest alone.



LEFT: Orange, pink, or blue flagging tape is often used to mark the SMZ.



RIGHT: Paint can be used to mark the SMZ along with, or instead of, flagging. Make sure the logger can see the color.

Considerations for Pine Forest Management

If you will be planting genetically-improved pine tree seedlings in the harvested area afterwards, you may want to ask the logger to cut & remove as many pine trees from the SMZ as is allowable during the timber harvest, to avoid natural pine seedlings from interfering with your planted seedlings later.

If cutting them is not possible, you might be able to girdle the pines later, so they die-off slowly. This will create dead standing snags for wildlife and keep the trees from casting seed into your new crop of pine seedlings.

Extra Benefits from a SMZ

The SMZ is your last-line-of-defense to maintain stream health. Do not rely only on the SMZ to protect water quality. Use a full range of forestry BMPs for erosion & sedimentation control; and maintain BMPs to keep them functioning.

In addition to protecting water quality, a robust and well-maintained SMZ can provide many benefits:

Wildlife

- Dead snags provide perching platforms for birds, and nesting habitat for small animals.
- Consider leaving trees that bear fruits or nuts: oak, hickory, beech, black cherry, persimmon, mulberry, red cedar.
- Support pollinators by leaving native flowering trees: dogwood, redbud, sourwood, yellow poplar, blackgum.
- Protect 'Critical Habitat' for federally Threatened & Endangered aquatic life.

Aesthetics

If the harvest area is visible from your home or a public road, the SMZ can act as a visual screen to soften the harsh appearance of the cutover area. Retaining flowering trees (redbud, dogwood, magnolia) or trees that show bright fall leaf color (sweetgum, sourwood, blackgum, maple, yellow poplar) can enhance the aesthetics.

Seed Source Diversity

When harvesting in a bottomland swamp, the SMZ can provide a long-lasting source of seed to help regenerate the cutover. Favor leaving cypress, oak, Atlantic White Cedar, and swamp tupelo/blackgum in the SMZ to cast seed.

Managing Your SMZ

Like the rest of your woodland, the SMZ may require monitoring and periodic maintenance to avoid problems.

Non-Native Invasive Plants

Many invasive plants thrive along stream corridors and SMZs. Work with a trained professional to examine your site for invasive plants. Be proactive to control them and prevent their spread. Selective herbicide treatments, plant removal, and/or prescribed fire may control invasive vegetation and promote native plant growth. An online reference for native plants is available from the NCSU Cooperative Extension Service: www.ncsu.edu/goingnative.

Prescribed Fire

Low-intensity fire is a natural element of North Carolina's forests, including many stream riparian zones. However, when a fireline is plowed or bladed along the SMZ, there is increased erosion & sedimentation risks. Also, a deep fireline can disrupt movement of small wildlife between the uplands and the stream corridor.

Work with a prescribed fire professional to consider using the stream as a natural fire break and allowing fire to burn through the SMZ without disturbing soil.

If a fireline is needed in the SMZ, then use rakes, shovels, or other hand-tools to install the line. Promptly repair the fireline afterwards. Another low-impact option is to disk or mow a fireline beyond the SMZ edge, instead of plowing or blading. Flush-out any birds or wildlife ahead of the tractor before making each pass.



ABOVE: This prescribed fire was allowed to burn through the SMZ, using the stream channel as a fire break.

⚠ Be Aware of Other Stream Buffer Rules ⚠

There are additional Riparian Buffer Rules for certain streams and waterbodies in the following areas of NC:

- Catawba River frontage and shoreline of its Lakes
- Randleman Lake watershed
- Goose Creek watershed (Mecklenburg and Union counties)
- Jordan Lake watershed
- Neuse River basin
- Tar-Pamlico River basin

These Riparian Buffer Rules are **in-addition-to the SMZ requirements** outlined in the statewide FPG rules. Both sets of rules must be in-compliance if your stream is subject to protection under each set of rules.

The N.C. Forest Service can help to identify the streams on your woodlands, and which rule(s) apply.

Stay updated on rule changes through the NCFS website:

www.ncforestservice.gov >> Programs & Services >> Water Quality >> Regulations.

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