North Carolina Division of Forest Resources

FORESTRY Leaflets

WQ-4 December 2007

Explaining Streamside Management Zones

In North Carolina, forestry activities must establish and maintain a **streamside management zone (SMZ)** alongside certain types of streams and bodies of water. These requirements are defined within the statewide mandatory regulations called the **Forest Practices Guidelines Related to Water Quality**, or 'FPGs'. *The definition of a SMZ and the requirements related to SMZs are cited below from the FPG regulations, as a quick-reference:*

15A NCAC 01I .0102 (17) *"Stream" means a body of concentrated flowing water in a natural low area of the land surface.*

(a) "Ephemeral stream" means a stream that flows only during and for short periods following precipitation and flows in low areas that may or may not have a well-defined channel.

(b) "Intermittent stream" means a stream that flows only during wet periods of the year (30-90 percent of the time) and flows in a continuous well-defined channel.

(c) "Perennial stream" means a stream that flows throughout a majority of the year (greater than 90 percent of the time) and flows in a well-defined channel.

15A NCAC 01I .0102 (18) *"Streamside Management Zone (SMZ)" means an area along both sides of intermittent and perennial streams and perennial waterbodies where extra precaution is used in carrying out forest practices in order to protect water quality.*

15A NCAC 01I .0201 *STREAMSIDE MANAGEMENT ZONE*

(a) A streamside management zone (SMZ) shall be established and maintained along the margins of intermittent and perennial streams and perennial waterbodies. The SMZ shall be of sufficient width to confine within the SMZ visible sediment resulting from accelerated erosion.

(b) Ground cover, or other means, within the SMZ shall be sufficient to 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 they shall have effective erosion control and sediment control structures or measures installed to restrain accelerated erosion and prevent visible sediment from entering intermittent or perennial streams or perennial waterbodies.

Key Points for Planning and Managing SMZs

Look beyond the forest: A SMZ alone can't always improve water quality. Prevent pollution from reaching the streamside area in the first place. Doing so can go a long way towards maintaining good water quality.

Determine SMZ width: Establish the SMZ width according to the legal requirements. Consider following the recommended forestry BMP options for SMZ width as specified in the *North Carolina Forestry Best Management Practices Manual to Protect Water Quality,* which is available on our Web site or your local Forest Resources office.

Control surface runoff, *Slow it Down & Spread it Out*: Install measures to control, slow down and disperse the flow of runoff across the ground surface especially at stream crossings, roads, trails and field/pasture edges. Examples of these runoff control measures are found in the forestry BMP manual noted above and on *Forestry Leaflet WQ-2*.

Re-vegetate bare spots: Establish ground cover and/or vegetation on exposed soil. We offer different types of tree seedlings that are adapted to grow in streamside and wetland areas. Tree seedlings can be ordered by calling toll-free 1-888-NCTREES or from our Web site www.dfr.state.nc.us. Local staff of Cooperative Extension Service, USDA-NRCS, and the Soil & Water Conservation District can also provide advice about planting trees, shrubs and grasses.

Manage the trees and vegetation: Don't allow vegetation and trees to grow too thickly or densely together. Excessive numbers of trees can create a hazardous wildfire situation and encourage insect or disease outbreaks. Also, there may be enhanced uptake of nutrients from more vigorously growing trees than from stagnant trees.

Establishing SMZ Width

The general recommendation is for a 50-foot wide SMZ along each side of intermittent streams, perennial streams, and perennial waterbodies. The SMZ width should continue and wrap around the head of the stream, to include the ephemeral transition area.

SMZs wider than 50-feet may be needed on sites that exhibit one or more of these conditions:

- ✓ Steep slopes adjacent to the stream.
- ✓ Long, continuous slope lengths leading towards a stream.
- ✓ Highly erodible soils.
- ✓ Soil areas with little or minimal groundcover that are near the waterbody.
- ✓ Areas of intensive soil disturbance nearby the SMZ.
- ✓ Special waters, such as trout; water supply; nutrient sensitive; shellfish; outstanding resource, etc.

SMZ narrower than 50-feet may be suitable on sites that exhibit one or more these conditions:

- ✓ Flat terrain within or adjacent to the stream.
- ✓ Short slope lengths that lead towards the stream.
- ✓ Stable or undisturbed soils.
- ✓ Soils with sufficient groundcover or vegetation to allow surface flow and infiltration of runoff.
- ✓ Stable streambank.

Range of Options for SMZ Widths on Forestry Operations in North Carolina

Objective of SMZ	Range of Suggested Width (feet)	Factors to Consider in Selecting SMZ Width
Sediment Control	30 to 150	Slope, soils, groundcover, sediment load, waterbody use
Nutrient Management	15 to 200	Hydrology, vegetation, soils, nutrient load
Streambank Stabilization	25 to 55	Vegetation, soils, streamflow
Wildlife and Aquatic Organisms	25 to 300	Depends upon each species

A Managed Forest is a Healthy Forest

Either because of a lack of knowledge or a fear of doing something wrong, today some landowners and forest managers often take a 'hands-off' approach to managing SMZ areas in a misguided effort to comply with the various water quality regulations. This overly cautious approach has resulted in under-utilization of some of the most productive growing areas on many forests. The following table lists a few management options you may want to consider for your forest and SMZ.

Timber	-- Get a written forest management plan. Know the rules on SMZs and riparian buffers. -- Insist that appropriate forestry Best Management Practices (BMPs) be used when work is performed. -- Harvest trees in a way to promote growth of commercially viable, native tree species. **Avoid "high-grading" or "diameter-limit cuts";** (these types of harvest result in very poor re-generation and low quality new growth.)
Wildlife	-- Leave dead, standing trees, called 'snags', as cavity nesting trees for birds, squirrels and small mammals. -- Manage the SMZ to promote oaks, cherries, hickories, beech and other native trees that produce nuts or berries which can provide a food source for wildlife. -- Maintain a continuous tree-canopy corridor alongside the stream bank. -- Create and maintain small (1/10th to ¼-acre) meadow areas along the outer edges of the SMZ at the transition area with the uplands. These openings allow grasses and shrubs to grow, supporting many mammals and birds. -- Periodically prescribe-burn the area with a low intensity fire to re-invigorate tender vegetation growth.
Fisheries	-- Maintain adequate shade within the SMZ to protect streams from adverse temperature fluctuations. -- Allow naturally-occurring woody debris to remain in the streams, so long as the water flow is not blocked or causes flooding. This debris can be good habitat for aquatic organisms and the insects that they feed upon.
Aesthetics and Recreation	-- Promote the growth of flowering shrubs and trees. Select species that bloom in different times of the year to enhance year-round attractiveness and consider evergreen trees for winter season aesthetics. -- Create low impact foot trails made of crushed rock or other loosely packed material so water can still filter into the soil and not simply run-off. Limit the use of motor vehicles, bicycles and horses within the SMZ.