

## Section 4: SMZs and Waterways

The general recommendation for SMZ width is 50 feet along each side of intermittent streams, perennial streams and perennial waterbodies.

**FPG** The FPGs require SMZs on these streams.

**RULE** Some areas of the state require a fixed-width buffer plus the mandatory SMZ requirement.

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

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- Steep slopes adjacent to the stream.
- Long, continuous slopes leading towards a stream.
- Highly erodible soils.
- Soil areas with little or minimal groundcover nearby the waterbody.
- Areas of intensive soil disturbance nearby the SMZ.
- Special waterbodies (ex: trout, water supply, nutrient sensitive, shellfish areas).

**SMZs narrower than 50 feet may be suitable on sites that have one or more of these conditions:**

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- Flat terrain within or adjacent to the stream.
- Short slopes leading toward the stream.
- Stable or undisturbed soils.
- Soils with enough groundcover or vegetation to promote surface flow and/or water infiltration.
- Stable streambank.

## Range of options for SMZ width on forestry operations in North Carolina

Objectives of SMZ	Range of Suggested Widths (Ft)	Factors to Consider in Selecting SMZ Width
Sediment Control	30 - 150	Slope, Soil Groundcover Sediment Load Waterbody Use
Nutrient Management	15 - 200	Hydrology, Soils Vegetation, Nutrients
Streambank Stabilization	25 - 55	Vegetation, Soils Streamflow
Wildlife & Aquatic Life	25 - 300	Specific to each Species

**Remember:** *The SMZ width should continue and wrap around the head of the stream, where the ephemeral(s) transitions into the stream channel.*



# SMZs and Waterways



*The SMZs on this harvest are well laid out.*



*Looking outward from stream channel: SMZ is flagged for operators to see. Trees were felled or carried away from the SMZ. Harvest was done when soil was dry and stable.*

## Timber Harvest in SMZ

- Know the rules. **FPG RULE**
  - Mark the SMZ for equipment operators to see.
  - If skid trails or decks must be located in the SMZ, keep them at least 10 feet from the stream.
  - Minimize heavy equipment use within 10 feet of the streambank edge.
  - Maintain approximately one-half of the preharvest shade canopy cover within the SMZ.
  - Keep bare soil area to no more than 20 percent.
  - Fell and remove trees away from the SMZ.
  - Service equipment outside of the SMZ.
- ⊗ ***Never use a stream channel as a skid trail.***
  - ⊗ ***Minimize gouging the soil when skidding logs.***
  - ⊗ ***Do not use the SMZ as a de-limbing gate.***



*Equipment usage was minimized. No trees were felled into the SMZ. Soil disturbance is kept to a minimum. Trees and shrubs are left intact to provide shade.*



*SMZ laid out and marked for operators to see. Cleanly harvested site has minimal soil disturbance. Trees and shrubs left in SMZ provide shade.*



*No effort to mark the SMZ. Bare soil is exposed directly next to the stream. Inadequate shade. Debris in stream needs to be removed. Stream bank may become unstable and erode sediment into the water.*



*SMZ has shade even after timber harvesting. Soil disturbance is minimized. Stream bank remains stable. Trees were cut and felled away from the SMZ.*

*Only partial shade exists since no trees remain on the left side of the stream. Bare soil is exposed. There is debris in the stream.*





# SMZs and Waterways



*Stream channel with 50-foot SMZ. Remaining trees should give enough shade once their leaves come out in the growing season. Equipment usage was minimized. Trees were cut and felled away from the stream.*



*No functioning SMZ. Bare soil is exposed on the streambank. Debris is in the stream. No shade is retained. Skid trail is set too close to the stream.*

## Ephemeral Streams

Ephemeral streams (hollows, gullies, sloughs) drain areas where runoff starts to collect and funnel downslope.

- Minimize disturbance to the soil and groundcover.
- Minimize the number, area and usage of skid trails, roads and decks.
- Include the ephemeral(s) transition area when wrapping a SMZ around the head of a stream.



*SMZ wraps around the head of the stream.*

### Forest Roads in SMZ

- Know the rules **FPG RULE**
- If roads must be placed in the SMZ:
  - Stay at least 10 feet from the stream edge.
  - Keep roads to the minimum width and number.
  - Minimize bare soil exposure.
  - Control runoff and capture sediment.
  - Stabilize the road as soon as possible.



# SMZs and Waterways



*BMPs on this SMZ road crossing include: sediment pit, silt fencing, broad-based dip, seed and mulch. The road area is kept to the minimum needed through the SMZ.*

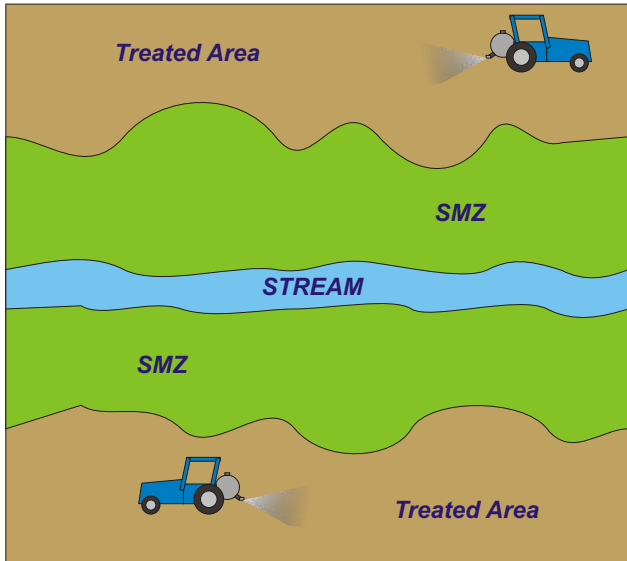


*Soil can wash down the hill, into the stream crossing (located behind the log trailer).  
BMP solutions:  
turnouts, broad-based dips, stone surfacing or road mats.*

## Site Prep in SMZ

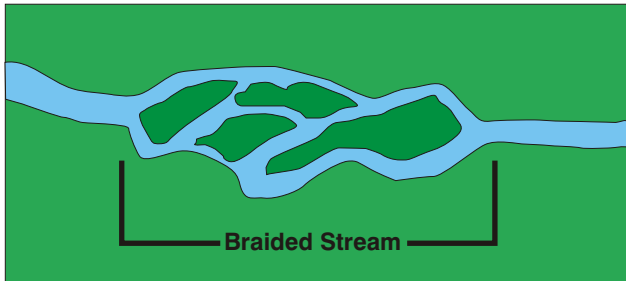
- Minimize soil exposure and heavy equipment use.
- Service equipment outside of the SMZ.
- Promptly rehab firelines that may be installed.
- Apply herbicides according to the product label and applicable laws or regulations. Minimize herbicide usage alongside waterways.

**X** *Avoid high intensity prescribed burns.*



## **Braided Streams**

- Locate and identify braided stream areas during normal flow. If the site is flooded or if it's totally dry, you will not be able to see where exactly the braided channels are located.
- Conduct operations during dry soil conditions whenever possible.
- Use matting systems for road or skid trail access and crossings.



## **Ditches With Outlets**

- Limit heavy equipment usage along the ditch edge to the extent that the structural integrity of the ditch bank is protected and sediment is not transported within the ditch.
- If crossings are needed, establish them in a way that protects water quality while not obstructing water flow in the ditch.