

Prepared for: \_\_\_\_\_

Prepared by: \_\_\_\_\_

Farm: \_\_\_\_\_ Tract: \_\_\_\_\_ Date: \_\_\_\_\_



## DEFINITION

An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.

## PURPOSE

- Reduce excess amounts of sediment, organic material, nutrients and pesticides in surface runoff.
- Reduce excess nutrients and other chemicals in shallow ground water flow.
- Create shade to lower or maintain water temperatures to improve habitat for aquatic organisms.
- Create or improve habitat for riparian dependent wildlife and provide a source of detritus and large woody debris to the water body for aquatic organisms.
- Increase carbon storage in plant biomass and soils.
- Reduce risk of airborne pesticide drift entering the water body.

## CONDITIONS WHERE PRACTICE APPLIES

Buffers are applied on stable areas adjacent to permanent or intermittent streams, rivers, lakes, ponds, and wetlands that flood or pond.

## CRITERIA

In all circumstances, the practice shall be at least 35 feet wide. The width is measured horizontally on a line perpendicular to the top of the bank for streams and rivers, or the normal water line for other water bodies.

Buffers will consist of a Zone 1 and Zone 2 meeting or exceeding the following criteria:

ZONE 1	ZONE 2
- 15 ft., closest to water	- 20 ft., up-slope of Zone 1
- 2 species deciduous tree or shrub	- 1 specie of tree or shrub

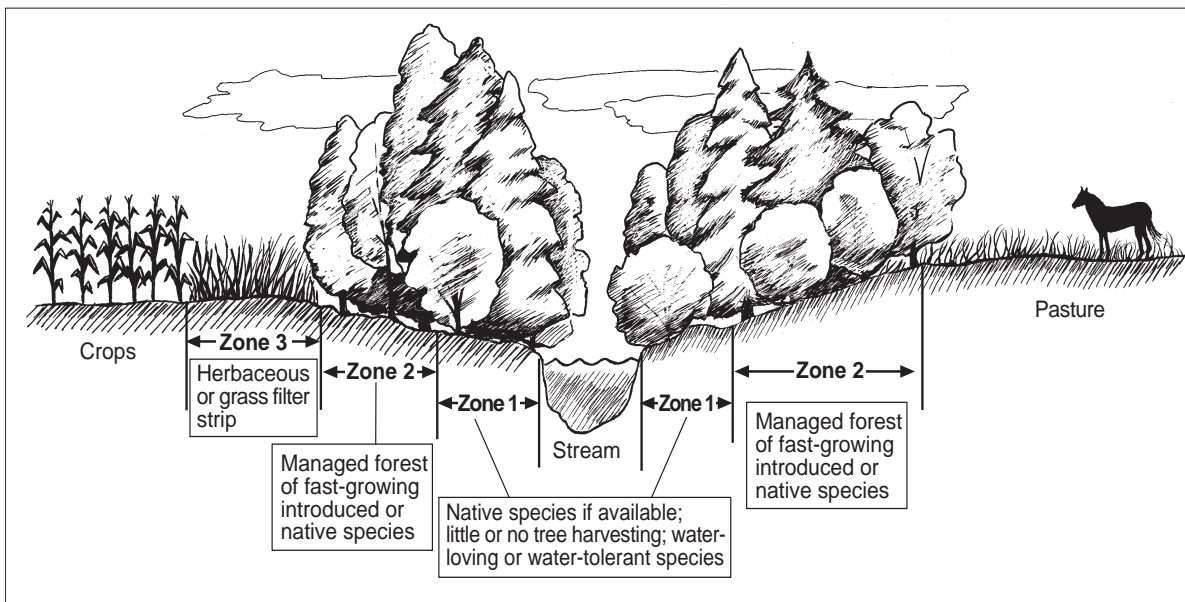
Overland flow moving through the buffer shall be maintained as sheet (non-channelized) flow to the greatest extent possible. Unavoidable concentrated surface flows (for example ditches and streams) passing through the buffer shall be conveyed through stable (non-eroding) paths.

Erosion shall be controlled up-gradient of Zone 2, to the extent that sediment is not likely to damage the buffer's understory vegetation.

Trees and shrubs specified shall be native and adapted to the site conditions.

Trees and shrubs may be already established, naturally regenerated, planted, or seeded according to the NRCS-NC Tree/Shrub Establishment (612) practice. An on-site technical determination is required to verify the seed source of desired trees is adequate for natural regeneration.

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A riparian forest buffer includes a zone 1, the area closest to the stream or waterbody, and a zone 2, the area adjacent to and up gradient of zone 1. Trees and shrubs in zone 1 provide important wildlife habitat, litter fall for aquatic organisms, large wood that can fall into the stream or waterbody, and shading to lower water temperature. This zone helps stabilize streambanks and shorelines. Trees and shrubs in zone 2 (along with zone 1) intercept sediment, nutrients, pesticides, and other pollutants in surface and subsurface water flows. Zone 2 can be managed to provide timber, wood fiber, and horticultural products. A third zone, zone 3, is established if periodic and excessive water flows, erosion, and sediment from upslope fields or tracts are anticipated. Zone 3 generally consists of herbaceous plants or grass and a diversion or terrace, if needed. This zone provides a “first line of defense” to assure proper functioning of zones 1 and 2.

Site preparation shall be done according to NRCS-NC Tree/Shrub Site Preparation (490) practice.

Soil protecting cover shall be conserved or planted while the practice is being established.

A perennial grass Zone 3, which shall have a 20' minimum width, is required when the purpose of the practice is to reduce contaminants in surface runoff.

### CONSIDERATIONS

Complimentary wildlife management actions in the buffer may include managing wildlife openings in Zone 2 (see standard).

If beaver activity is observed in the buffer vicinity, specify reasonable protective measures for water table control structures.

Consider specified plant materials' tolerance to herbicides used in the adjacent field or pasture.

Discourage black walnut establishment close to the water's edge. Black walnut produces a chemical that suppresses growth of other vegetation.

Avoid specification of tree and shrub species that may be hosts to undesirable pests.

### OPERATION AND MAINTENANCE

- Replace dead seedlings to maintain at least 75% survival for two years after planting.
- Use directed sprays and management strategies to control drift as specified by Pest Management Practice Standard 595 and NC DFR Forest Practice Guidelines.
- Livestock access to buffer shall be managed to ensure no damage to soil, water, or plants occurs in the buffer.
- Inspect buffer periodically to repair damage from traffic, pest infestations, and erosion.
- Harvesting or management of forest products must not compromise the buffer's ability to address the specified purpose(s). See Forest Stand Improvement Standard (666).

### SPECIFICATIONS

Specifications for applying this practice will be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan or other acceptable documentation.

Landowner \_\_\_\_\_ Field number \_\_\_\_\_

<b>Purpose (check all that apply)</b>				
<input type="checkbox"/> Create shade to lower or maintain water temperature/improve aquatic habitat.			<input type="checkbox"/> Reduce risk of airborne pesticide drift entering water body.	
<input type="checkbox"/> Provide detritus/large woody debris for aquatic/terrestrial organisms.			<input type="checkbox"/> Increase carbon storage in plant biomass and soils.	
<input type="checkbox"/> Create or improve wildlife habitat and establish wildlife corridors.			<input type="checkbox"/> Reduce excess sediment, organic material, nutrients, pesticides in surface runoff and excess nutrients/chemicals in shallow groundwater flow.	
<b>Layout</b>				
Water body/course type and name, other:				
Minimum buffer zone widths (ft) – specify left and right of stream [facing upstream/downstream (check appropriate one)] for a two-side buffer; use left only for water bodies, such as lakes and ponds; include herbaceous species in Zone 3 notes or refer to other jobs sheets.				
<b>Zone 1</b>		<b>Zone 2</b>		<b>Zone 3</b>
<input type="checkbox"/> Left:	<input type="checkbox"/> Right:	<input type="checkbox"/> Left:	<input type="checkbox"/> Right:	<input type="checkbox"/> Left: <input type="checkbox"/> Right:
Notes:		Notes:		Notes (refer to other job sheets):
Buffer zone length (ft):				
Additional location and layout requirements:				
<b>Woody Plant Materials Information</b>				
Species/cultivars:	Plants/acre:	Kind of stock <sup>1</sup> :	Planting dates:	Avg. Spacing <sup>2</sup> :
<i>Zone # 1</i>				
1				
2				
3				
4				
<i>Zone # 2</i>				
1				
2				
3				
4				
<small><sup>1</sup>Bareroot, <sup>2</sup>Container, <sup>3</sup>Cutting, <sup>4</sup>Seed; include size, caliper, height, and age as applicable. <sup>5</sup>Spacing between plants to achieve plants/acre.</small>				
<b>Temporary Storage Instructions</b>				
<i>Planting stock that is dormant may be stored temporarily in a cooler or protected area. For stock that is expected to begin growth before planting, dig a V-shaped trench (heeling-in-bed) sufficiently deep and bury seedlings so that all roots are covered by soil. Pack the soil firmly and water thoroughly. Additional requirements:</i>				
<b>Site Preparation</b>				
<i>Remove debris and control competing vegetation to allow enough spots or sites for planting and planting equipment. Additional requirements:</i>				
<b>Planting Methods</b>				
<i>For container and bareroot stock, plant stock to a depth even with the root collar in holes deep and wide enough to fully extend the roots. Pack the soil firmly around each plant. Cuttings are inserted in moist soil with at least 2 to 3 buds showing above ground. Additional requirements:</i>				
<b>Operation and Maintenance</b>				
<i>The buffer must be inspected periodically and protected from damage so proper function is maintained. Replace dead or dying tree/shrub stock and continue control of competing vegetation to allow proper establishment. Periodic harvesting of trees and shrubs in zones 1 and 2 may be necessary to maintain the health and vigor of mature stands. Keep large dead and dying trees for cavity nesting birds and a source of large wood in aquatic habitats. Additional requirements:</i>				

**LANDOWNER/OPERATOR’S ACKNOWLEDGEMENT:**

The landowner/operator acknowledges that:

- a. He/she has received a copy of the drawings and specifications, and that he/she has an understanding of the contents, and the requirements.
- b. He/she has obtained all the necessary permits. (IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO OBTAIN ALL NECESSARY PERMITS AND /OR RIGHTS AND TO COMPLY WITH ALL ORDINANCES AND LAWS PERTAINING TO THIS INSTALLATION.)
- c. No changes will be made in the installation of the job without prior concurrence of the NRCS.
- d. Maintenance of the installed work is necessary for proper performance during the project life.

**PRACTICE COMPLETION:**

I have made an on site inspection of the site (or I am accepting owner/contractor documentation), and have determined that the job as installed does conform to the drawings and practice specifications.

Completion Certification by:

Planner \_\_\_\_\_ Date \_\_\_\_\_

I have reviewed this plan and agree to install as designed.

Cooperator \_\_\_\_\_ Date \_\_\_\_\_

<b>Additional Specifications and Notes:</b>
Protect seedlings from fire, grazing and wildlife damage. Mow and apply herbicides as needed to control grasses and weeds. Inspect after heavy storms.