

**Natural Resources Conservation Service (NRCS)**

**Definition**

A riparian forest buffer is an area of trees and shrubs located adjacent to streams, lakes, ponds, or wetlands.

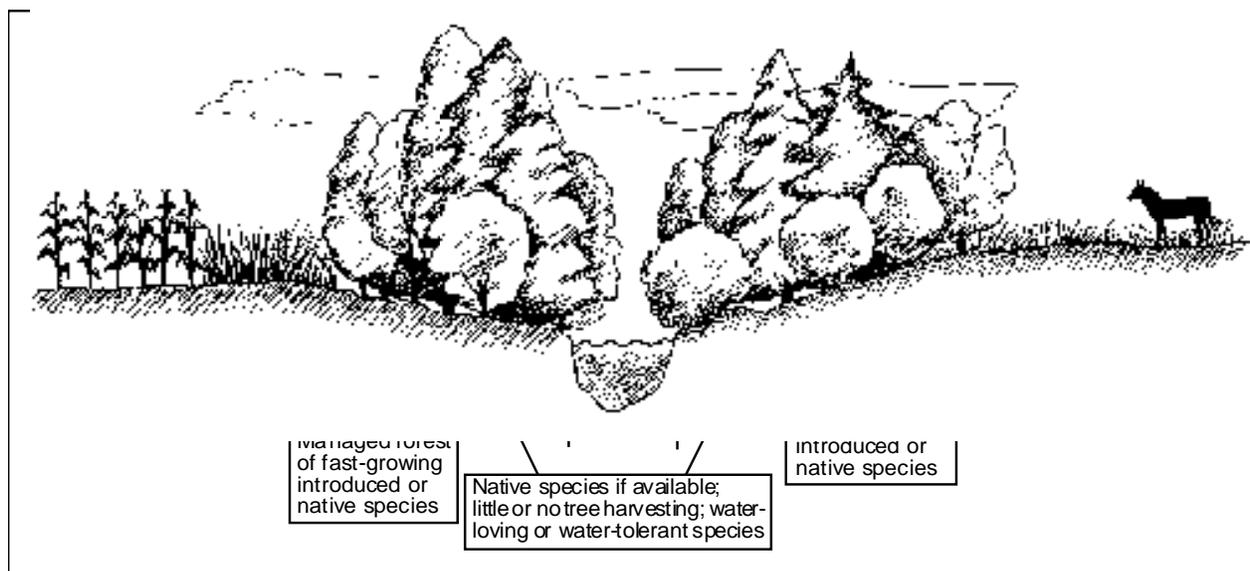
**Purpose**

Riparian forest buffers of sufficient width intercept sediment, nutrients, pesticides, and other materials in surface runoff and reduce nutrients and other pollutants in shallow subsurface water flow. Woody vegetation in buffers provides food and cover for wildlife, helps lower water temperatures by shading the stream or waterbody, and slows out-of-bank flood flows. In addition, the vegetation closest to the stream or waterbody provides litter fall and large wood important to fish and other aquatic organisms as a nutrient source and structural components to increase channel roughness and habitat complexity. Also, the woody roots increase the resistance of streambanks and shorelines to erosion caused by high water flows or waves. Some tree and shrub species in a riparian forest buffer can be managed for timber, wood fiber, and horticultural products.



Buffers are located along or around permanent or intermittent streams, lakes, ponds, wetlands, or seeps. Many of these areas feature year-round or seasonal moisture, which allows woody species to establish quickly. A new riparian forest buffer can rapidly benefit a variety of settings, such as cropland, rangeland, forest land, and urban areas.

**Where used**



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.

## Resource management system

Riparian forest buffers are normally established concurrently with other practices as part of a resource management system for a conservation management unit. For example, adjoining streambanks or shorelines must be stabilized before or in conjunction with the establishment of the buffer (streambank and shoreline protection). To maintain proper functioning of a planting, excessive water flows and erosion must be controlled upslope of the riparian forest buffer (filter strip, diversion, critical area planting, residue management). New plantings must be protected from grazing during establishment (prescribed grazing, use exclusion).

## Required management activities

To ensure continued stand vigor and health, wildlife benefits and plant diversity, management activities are required for this practice. Refer to "*Conservation Reserve Program Forest Management Activities*" for guidance on this requirement.

## Specifications

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standard Riparian Forest Buffer, code 391.

## Wildlife

Connecting riparian forest buffers with existing perennial vegetation benefits wildlife, including fish and other aquatic organisms. Existing buffers may be woodlots and wooded draws or other woody habitats such as windbreaks or shelterbelts. Select tree and shrub species and a planting pattern that benefits the wildlife species of interest and enhance local landscape aesthetics.

## Operation and maintenance

Replace dead and dying woody species in newly established plantings. Trees and shrubs in a riparian forest buffer can eventually become crowded, slowing their growth and the growth, survival, and composition of understory species. As the buffer matures, periodic harvesting of some of the overstory trees and shrubs becomes an important activity for maintaining plant health and buffer function. Some of the older trees that are dead or dying within the buffer area can serve as nesting cavities for terrestrial organisms as well as a source of large woody debris for aquatic systems.

Undesired vegetation such as grass or weed competition, noxious weeds and invasive species will be controlled through the life of the contract. In controlling undesired vegetation state regulations and

local laws will be followed. Spot treatment must be authorized by FSA during the primary nesting season for wildlife. If mechanical cultivation is used, cultivate at a shallow depth to avoid harming tree/shrub roots.

Haying and grazing of the riparian buffer is not allowed. Livestock must be excluded. Control animal damage by rodents, mice, rabbits, deer, gophers, beaver and other wildlife as needed. The contract acreage will be protected from damaging fire.

The riparian buffer will be inspected for soil erosion, gullies and sediment deposition following severe storms or at least on an annual basis. Concentrated flow must be converted to sheet flow or subsurface flow before entering Zone 2 or the buffer. Repair any areas disturbed or damaged using soil material from outside the buffer and re-vegetate areas that do not have permanent cover.

Do not use contract area for field roads, turn rows or other uses detrimental to the cover. Avoid spray drift when treating nearby or adjacent crop or pasture fields.

**Riparian Buffer – Conservation Practice Job Sheet**

**CP22**

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

| <b>Purpose (check all that apply)</b>  |
|--|
| <input type="checkbox"/> Create shade to lower water temperature to improve aquatic habitat.   |
| <input type="checkbox"/> Provide detritus and large woody debris for aquatic and terrestrial organisms.  |
| <input type="checkbox"/> Remove nutrients, sediment, organic matter, pesticides and other pollutants from surface runoff and subsurface flow to reduce pollution and protect surface water and subsurface water quality. |

| <b>Layout</b>   |   |   |
|---|---|---|
| Water body/course type and name, other:   |   |   |
| Minimum buffer zone widths (ft) – specify left and right of stream [facing upstream/downstream (circle 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.  |   |   |
| <ul style="list-style-type: none"> <li><i>The minimum acceptable width of zones 1 and 2 must be the lessor of 100 feet or 30% of the geomorphic floodplain.</i></li> <li><i>The maximum average width (zones 1-3) is 180 ft for any purpose other than protection and enhancement of water quality.</i></li> <li><i>NRCS or the TSP must document in writing to the ARC the need for a minimum design specification in excess of 180 feet (average width).</i></li> </ul> |   |   |
| <b>Zone 1 (Must be = or &gt; 15ft wide)</b>   | <b>Zone 2 (Avg. =or &gt; 20ft wide)</b> | <b>Zone3 (NTE 20 ft in width)</b>           |
| Left: _____ Right: _____  | Left: _____ Right: _____                | Left: _____ Right: _____                    |
| Notes: _____  | Notes: _____                            | Notes (or refer to other job sheets): _____ |
| Add ineligible land between the water body and eligible land to the overall width of the riparian buffer (ft):  |   |   |
| Buffer zone length (ft):  |   |   |
| Additional location and layout requirements:  |   |   |
| Additional Requirements (such as watering facilities, fencing, grazing plan, etc.):   |   |   |

| <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  |             |                              |                 |                             |
| <i>Zone # 3</i>                          |             |                              |                 |                             |
| 1  |             |                              |                 |                             |
| 2  |             |                              |                 |                             |
| 3  |             |                              |                 |                             |
| 4  |             |                              |                 |                             |

<sup>1</sup>BAreroot, COntainer, CUtting, Seed; include size, caliper, height, and age as applicable. <sup>2</sup>Spacing between plants to achieve plants/acre.

| <b>Planting Methods</b>   |
|---|
| 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:  |

| <b>Temporary Storage Instructions</b>  |
|--|
| Planting stock that is dormant may be stored temporarily in a cooler or protected area. Pack the soil firmly and water thoroughly.   |
| 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. |
| Additional Requirements:   |

| <b>Site Preparation</b>  |
|--|
| Remove debris and control competing vegetation to allow enough spots or sites for planting and planting equipment. |
| Additional Requirements:   |

| <b>Natural Regeneration</b>  |               |                             |
|--|---------------|-----------------------------|
| Document that adequate seed sources of approved tree, shrub and grass species are present in the soil at the site.           |               |                             |
| Tree Species   | Shrub Species | Grass Species (Zone 3 only) |
| 1  | 1             | 1                           |
| 2  | 2             | 2                           |
| 3  | 3             | 3                           |
| 4  | 4             | 4                           |
| Document that under normal conditions, the appropriate cover will be established within 2 years of the CRP-1 effective date: |               |                             |
| Noxious weeds, invasive species and other undesirable plants, insects and pests will be controlled.                          |               |                             |
| Additional Requirements:   |               |                             |

| <b>Required Management Activities</b>   |
|---|
| Refer to the fact sheet " <i>Conservation Reserve Program Forest Management Activities</i> " for information about required mid-contract management activities for this practice. |

| <b>Operation and Maintenance</b>  |
|---|
| The buffer will not be harvested or grazed by domestic livestock.   |
| Chemicals used to established or maintain the practice must be federally, state and locally registered and applied strictly according to authorized registered uses, directions on the lable and other Federal, or State policies and requirements. Avoid spray from adjacent fields.Do not apply manure or organic wastes. |
| Noxious weeds, invasive species and other undesirable plants, insects and pests will be controlled.   |
| The buffer will be inspected periodically and protected from damage so proper function is maintained. Concentrated flow and mass soil movement upslope from zone 2 will be graded and stabilized.   |
| Replace dead or dying trees or shrub as needed to maintain planned stocking density.  |
| 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 woody debris in aquatic habitats.  |
| Check for debris jams in riparian buffers. These may be removed if they are blocking culverts or creating dangerous hydraulic conditions.   |
| Prevent animal damage and browse by rodents, mice, rabbits, deer, gophers, beaver and other wildlife.   |
| Prevent disturbance of the cover during the primary nesting season for wildlife, as established by FSA.   |
| Do not use contract area for field roads, turn rows or other uses that will damage or destroy the cover.  |

**COST SHARE ESTIMATE**

A. Tree Planting: Acres to Plant \_\_\_\_\_ X Cost per Acre \$\_\_\_\_\_ = Project Cost Estimate \$\_\_\_\_\_

B. Fencing: Amount (feet) \_\_\_\_\_ X Cost per Foot \$\_\_\_\_\_ = Project Cost Estimate\$\_\_\_\_\_

C. Livestock Watering Facility: Number of facilities \_\_\_\_\_ X Cost per facility \$\_\_\_\_\_

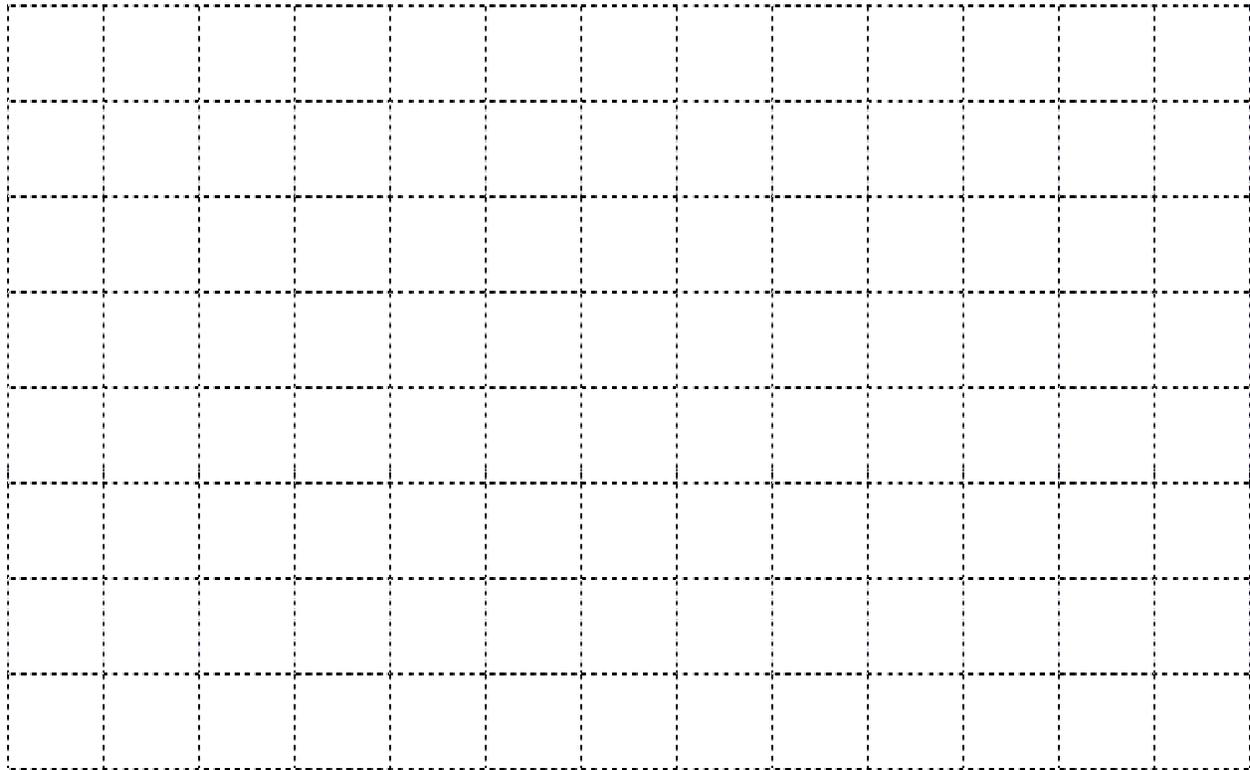
=Project Cost Estimate \$\_\_\_\_\_

D. Total Project Cost = A+B+C + \$\_\_\_\_\_

E. Cost Share Estimate = Total Project Cost \$\_\_\_\_\_ X Cost Share Rate \$\_\_\_\_\_ = \$\_\_\_\_\_

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"=\_\_\_\_\_ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



| <b>Additional Specifications and Notes:</b> |
|---|
|   |
|   |
|   |
|   |
|   |
|   |

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications (202) 720-2791.

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.