

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

RIPARIAN FOREST BUFFER

**(Ac.)
Code 391**

DEFINITION

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

PURPOSE

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

CONDITIONS WHERE PRACTICE APPLIES

Riparian forest buffers are applied on areas adjacent to permanent or intermittent streams, lakes, ponds, and wetlands. They are not applied to stabilize stream banks or shorelines. For areas with unstable banks, refer to Stream Bank and Shoreline Protection, Code 580.

CRITERIA

General Criteria Applicable to All Purposes

The location, width, layout and density of the riparian forest buffer will accomplish the intended purposes and function and should compliment natural features. Avoid layouts and locations that would concentrate flows or return flows. Low, flexible-stemmed shrubs will minimize obstruction of local flood flows.

Overland flow through the riparian area will be maintained as sheet flow. Excessive sheet-rill and concentrated-flow erosion will be controlled in the areas immediately adjacent and up-gradient of the buffer site and for sites to be regenerated or planted. Consider the need for a vegetated filter strip when ephemeral, concentrated flows or sheet and rill erosion and sedimentation are a concern up-gradient of planned woody buffer.

The riparian forest buffer shall consist of an area that begins at the top of the bank and extends a minimum of 15 feet. The minimum width may be wider than 15 feet to achieve the desired purpose(s).

Select species that are native. Where establishment of native species is not feasible, select non-invasive species observed in areas with similar site characteristics. Site characteristics to consider are soil types, rainfall, elevation, and land forms.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office.
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All plantings shall consist of a mixture of two or more species to achieve greater diversity. Favor tree and shrub species that have multiple values such as those suited for biomass, nuts, fruit, nesting, aesthetics and tolerance to locally used herbicides.

Plant types and species shall be selected based on their compatibility in growth rates and shade tolerance. Consider the effects of shading on adjacent fields, and the tolerance of selected species to herbicides used. Avoid introducing species that readily spread, or are considered weedy; also avoid species, which may attract undesirable pests.

Periodic removal of some forest products such as high value trees, medicinal herbs, nuts, and fruits is permitted provided the intended purpose is not compromised by the loss of vegetation or harvesting disturbance.

Necessary site preparation and planting shall be done at a time and manner to insure survival and growth of selected species for achieving the intended purpose(s).

Species selection should be based on plant suitability and adaptability for the site and intended purpose. Refer to Riparian Forest Buffer Specification for tree species commonly associated with and suited to riparian areas.

Natural regeneration may be used to establish a buffer if the following conditions are met: (1) there is an adequate natural seed source of desired species in adjacent areas; (2) site conditions are favorable for establishing the desired number and distribution of seedlings within a specified time period; and, (3) noxious or invasive species are not likely to jeopardize the stand.

Livestock shall be controlled or excluded as necessary to achieve the intended purpose. Refer to the standards Prescribed Grazing, 528, and/or Use Exclusion, 472, as applicable. Fencing to control access to riparian areas should be constructed a minimum of 15 feet from the top of the bank; greater distance is required where the bank is eroding.

Harmful plant and animal pests present on the site will be controlled or eliminated as necessary to achieve and maintain the

intended purpose. If pesticides are used, refer to the standard Pest Management, 595.

Additional Criteria to Reduce Excess Amounts of Sediment, Organic Material, Nutrients and Pesticides in Surface Runoff and Reduce Excess Nutrients and Other Chemicals in Shallow Ground Water Flow

The minimum width shall be at least 35 feet measured horizontally on a line perpendicular to the water body beginning at the top of the bank.

The width will be extended in high nutrient, sediment, and animal waste application areas, where the contributing area is not adequately treated or where an additional level of protection is needed. In areas where an excess amount of sediment is a concern, herbaceous filter strip must be planted at least 15 feet wide and up-gradient of the tree planting. Refer to Riparian Forest Buffer Specification for herbaceous vegetation.

Existing, functional underground drains through the riparian area will pass pollutants directly to the outlet. To filter such pollutants, drains can be plugged, removed or replaced with perforated pipe/end plugs to allow passage and filtration of drain water through the riparian forest root zone. Before plugging, removing or replacing any pipe, it must be confirmed that it is part of the drainage not another type of discharge that has gone through some regulatory action. Caution is advised that saturated conditions in the riparian and adjacent areas may limit existing land use and management.

Additional Criteria to Create or improve riparian habitat and provide a source of detritus and large woody debris.

The width will be extended to meet the minimum habitat requirements of the wildlife or aquatic species of concern. Greater width is likely to result in more desirable habitat for most species.

Forested stream banks provide shelter, travel corridors, and refuge for many birds, reptiles and amphibians; while helping keep water temperatures cooler for fish and shrimp.

The minimum width shall be at least 20 feet measured horizontally on a line perpendicular

to the water body beginning at the top of the bank.

Existing functional underground drains shall be replaced with non-perforated pipe under the buffer area to alleviate root intrusion and to sustain the drains functionality. Before replacing any pipe, it must be confirmed that it is part of the drainage not another type of discharge that has gone through some regulatory action. Alternatively, a regulating valve or structure may be installed on the drain to control drain outflow.

Criteria for creation of wildlife habitat and riparian corridors will focus on stream adjacent lands and the selection of species which promote the wildlife of the area.

Trees and shrubs selected for this purpose must provide food, nesting sites and/or shelter for various wildlife species being promoted including birds.

Additional Criteria for Increasing Carbon Storage in Biomass and Soils

Maximize width and length of the riparian forest buffer.

Select plants that have higher rates of carbon sequestration in soils and plant biomass and are adapted to the site to assure strong health and vigor. Plant the appropriate stocking rate for the site.

CONSIDERATIONS

Tree and shrub species, which may be alternate hosts to undesirable pests, should be avoided. Species diversity should be considered to avoid loss of function due to species-specific pests.

Allelopathic impacts of plants should be considered.

The location, layout, and density of the buffer should complement natural features and mimic natural riparian forests.

For sites where continued function of drains is desired, woody root penetration may

eventually plug the underground structure. In these cases, a setback of woody vegetation planted over the drain maintained in herbaceous cover or using rigid, non-perforated pipe will minimize woody root penetration.

Maximize widths, lengths, and connectivity of riparian forest buffers.

The species and plant communities that attain biomass more quickly will sequester carbon faster. The rate of carbon sequestration is enhanced as riparian plants mature and soil organic matter increases.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall 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.

OPERATION AND MAINTENANCE

The riparian forest buffer will be inspected periodically and protected from adverse impacts such as excessive vehicular and pedestrian traffic, pest infestations, concentrated flows, pesticides, livestock or wildlife damage, and fire.

Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is, or will progress to, a fully functional condition.

Any manipulation of species composition, stand structure and stocking by cutting or killing selected trees and understory vegetation shall sustain the intended purpose(s). Refer to the standard Forest Stand Improvement, 666.

Control or exclusion of livestock and harmful wildlife shall continue.

Fertilizers, pesticides, and other chemicals used to maintain buffer function shall not impact water quality.