

USDA



Riparian Forest Buffer

Alabama Guide Sheet No. AL 391A



Definition

A riparian forest buffer is an area of trees and/or shrubs located adjacent to streams, lakes, ponds, and wetlands. The purpose of a riparian buffer is to reduce excess amounts of sediment, nutrients, pesticides, and other materials in surface runoff and to reduce nutrients and other pollutants in shallow subsurface water flow.

Benefits

The woody vegetation in buffers provides food and cover for wildlife, creates shade which lowers the temperature of the water, and slows shoreline erosion. The vegetation closest to the waterbody also provides litter fall and large woody debris, which are important to aquatic organisms. Wildlife benefits are increased when riparian forest buffers connect adjacent forest land.

Site Preparation

Site preparation should be done at a time and manner that ensures survival and growth of the selected species. Types of acceptable site preparation may include mowing, disking, subsoiling, prescribed burning, and/or herbicide application. See Guidesheet AL 490 - Forest Site Preparation for Trees on Open Land.

Species Selection

Select native species that are adapted to the site. Hardwood species should be the predominant species in riparian buffers where wildlife is a primary objective. Seventy-five percent of the hardwood species should be oak species. A pine component of up to 20 percent

may be included in the buffer. Select species that have multiple values such as those suited for timber, biomass, nuts, fruit, browse, nesting, aesthetics, and tolerance to locally used herbicides. Where water quality is the primary objective, up to 50 percent of the buffer may be planted to pine species if the soils are suitable for growing pine. Species suitable for buffers are:

Oak Species (In order of adaptability to wet sites)

Overcup Oak
Nuttall Oak
Willow Oak
Water Oak
Swamp Chestnut Oak
Shumard Oak
Cherrybark Oak
White Oak

Other Species (In order of adaptability to wet sites)

Baldcypress
Tupelo Gums
Green Ash
Sweetgum
American Sycamore
Persimmon
Yellow-Poplar
Black Walnut
Eastern Redbud
Flowering Dogwood

Pine Species (Plant in outer rows of buffer)

Loblolly
Longleaf
Slash (use only in south Alabama - south of Hwy 84)
Virginia

Shrubs (Plant in outer rows of buffer)

Waxmyrtle

Southern Crab Apple

Chickasaw Plum

Spacing and Arrangement

Riparian forest buffers may have up to three zones:

Zone 1

Zone 1 begins at the normal water level or at the top of the streambank. This zone should be at least 15 feet wide. Tree planting should begin five feet from the top of the streambank. Zone 1 should always be planted to hardwood species.

Zone 2

Zone 2 begins at the edge of zone 1 and should be at least 20 feet wide. The minimum combined width of zones 1 and 2 should be 100 feet or 30 percent of the flood plain, whichever is less, but not less than 35 feet. In areas where flooding is occasional or frequent, the width of the buffer may be up to 300 feet. Hardwood species should be planted at a spacing of 300 to 400 trees per acre and pines should be planted at a spacing of 500 to 600 trees per acre. Shrubs should be established at a spacing of 300 to 1,200 shrubs per acre. See Guidesheet AL 612 - Tree Planting. Trees in alternate rows should be spaced between trees in adjacent rows.

Zone 3

Zone 3 is only necessary when severe erosion problems from cropland or pastures occur. This zone consists entirely of grass. Existing grass may be suitable.

Maintenance/Management

The vegetation in zone 1 should remain undisturbed except for the removal of trees that are hazardous to streambank stability, or individual trees of high value. Periodic harvesting of trees is permitted in zone 2 where trees reach merchantable size, as long as the harvest practices minimize soil disturbance and loss of vegetation. Mechanical site preparation, with the exception of subsoiling and mowing, should not be applied within 35 feet of the top of the streambank. Pesticides may be used if label directions are strictly followed. Livestock must be excluded from riparian forest buffers.

References

USDA-NRCS Alabama Conservation Practice Standard 391A - Riparian Forest Buffer. March 2025.

USDA-NRCS Conservation Practice Job Sheet 391 - Riparian Forest Buffer. January 1998.

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