

# Plants for Riparian Buffers

**M**any farmers and ranchers have a growing concern over lists of impaired waters, TMDLs (total maximum daily loads), and other water quality challenges confronting them.

Riparian buffers are one of the most important practices that you can use to help control nonpoint source pollution and improve water quality.

Research has shown that properly established riparian zone vegetation will remove up to 90 percent of the unused nitrogen leaving your fields.

Riparian buffers are the native grasses, trees, shrubs or other vegetation growing along streams that control erosion and help keep water clean.

Cropland fields shouldn't be planted right up to a stream's edge where the soil is generally more fragile and subject to erosion.

Shrubs and trees are a better choice and will even add a measure of safety to your operation by keeping heavy farm equipment away from potentially unstable banks.

The information contained in this brochure will help you select the best native shrubs and trees for installing riparian buffers on your farm or ranch. The plants listed are all highly recommended for use in the Western States.

We've also included tips for planning riparian buffers and areas, selecting plants, and taking dormant unrooted hardwood cuttings.



United States Department of Agriculture  
**Natural Resources Conservation Service**  
Plant Materials Centers, Idaho and Montana

### Did you know?

Riparian buffers are a proven, time-tested practice. They work!

Well designed, installed and maintained riparian buffers can help keep sediment, fertilizers, pesticides, pathogens, and other potential pollutants from streams and rivers.

Buffers help improve fish and wildlife habitat, control flooding, and create more visually pleasing landscapes.

Buffers work best when incorporated into systems that include supporting practices such as conservation tillage, nutrient management, and prescribed grazing

## Planning and Design Tips for Riparian Buffers

- Riparian buffers can be established along streams, lakes, ponds, seeps, and wetlands to improve or maintain water quality, and protect or improve fish and wildlife habitat.
- Using a diversity of native trees, shrubs, grasses, and forbs will provide shade, organic matter, and eventually woody debris to the water body.
- The type of vegetation, configuration, and maintenance regime you use will vary. It depends on site conditions, your objectives and economic concerns.
- Temporary exclusion of livestock or grazing wildlife may be required until desired vegetation is established.
- Generally, wider riparian buffers provide better wildlife cover and better fish habitat.
- The method you will use to maintain the vegetation of the riparian buffer depends on the species present and potential uses such as livestock forage or forest products.
- Timing of thinning, pruning, burning, and grazing is particularly critical during migration periods, calving, nesting or spawning.
- When possible, allow large dead and dying trees to remain for use by cavity nesters and for eventual recruitment to the stream channel.



Black Cottonwood Tree

### Recommended widths for riparian buffers

	Minimum* (feet)	Optimal (feet)
Aquatic species	35	150
Big game	35	150
General wildlife diversity	35	150
Non-game birds and mammals	10	150
Raptors		300+
Reptiles, amphibians	35	150
Upland game (pheasants)	10	75
Waterfowl	25	75

\* The minimum buffer width required in the Riparian Forest Buffer Standard is 35 feet.

## How to select plants to fit riparian planting zones

Refer to the drawing of a general riparian zone at the bottom of this page to help you determine where to plant riparian species in relation to the water line.

*Caution: Not all streams will look like this. Some zones may be absent in some locations or stream systems.*

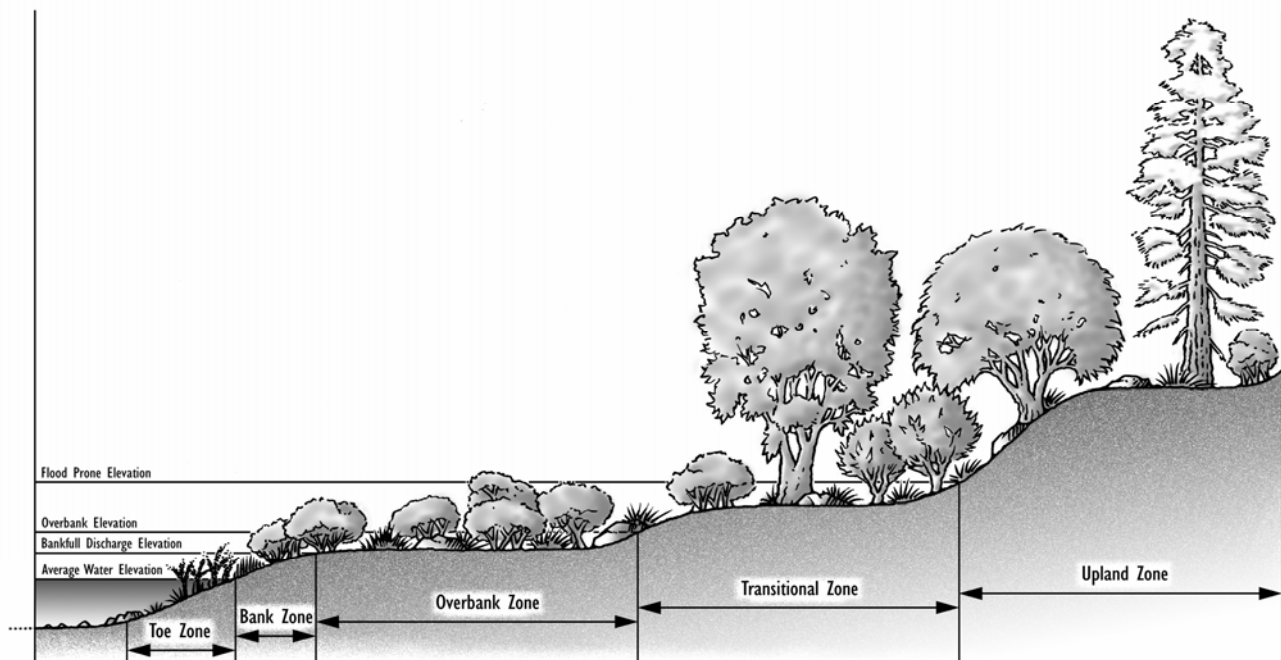
- Plants with flexible stems and rhizomatous root systems are usually located from the top of the Toe Zone through the Bank Zone.
- Most emergent aquatics are found in the Toe Zone.
- Small to medium shrubs are found in the Bank and Overbank Zones and beyond.
- Large shrubs and trees are usually found in the Transitional and Upland Zones. They should not be planted in other zones because their large stems won't give if high velocity stream flows hit them. The large stems also tend to block debris and ice that can cause bank erosion.
- Wetland herbaceous species are found throughout the streambank cross section.

## Native Shrubs and Trees

Native shrub and tree species suitable for use in riparian buffers are described in the following pages. For more detailed information, check with your local NRCS field office.

**Greenhouse propagation** can be used to produce bare root or containerized plants. It requires adequate time to grow the plants before transferring them to your project location.

**Field propagation** methods can be used to plant unrooted dormant hardwood cuttings—literally branches or stems—into the various planting zones. They will have a lower survival rate than bare root or containerized stock, but they are easy to collect and plant and capable of being planted deep enough to reach the low water level of the year. *Caution: Not all woody plant species can be propagated from unrooted cuttings.*



### Did you know?

#### Riparian buffers help increase carbon

Carbon based energy sources such as coal and oil originated from the conversion of sunlight energy by plants. The natural carbon cycle globally is out of balance due to the increased burning of these carbon sources and the conversion of grass and forested areas to other uses since the mid-1800s.

One solution for balancing the carbon cycle is to increase growth of perennial vegetation such as grasses, shrubs, and trees. *Riparian buffers can be part of the solution.* Grasses, shrubs, and trees grow rapidly in riparian zones due to favorable moisture conditions.

USDA has committed to planting two million miles of conservation buffers. If one-fourth of these buffers were 100 feet wide, carbon dioxide removal—or sequestration—would exceed 110 million metric tons.

## How to make dormant unrooted hardwood cuttings

- Take after leaves fall and before buds burst in the spring.
- The best rooting success is from cuttings that are 2 to 10 years old.
- Cutting diameter should be as large as possible, depending on the species. Best diameters are 0.75 to 3 inches.
- Cutting should be long enough to reach 8 to 12 inches into the lowest water level of the year.
- Remove the top 2 feet of the cutting to provide higher energy to the root buds.
- Remove all side branches to ensure the stored energy is used to grow roots.
- Willows have root primordia up and down the entire stem, so roots will grow out of both the nodes and internodes.
- Soak cuttings in water long enough, commonly 5 to 7 days, to allow buds to swell. Don't allow roots to emerge from the bark.
- Hormone applications aren't necessary for large volume plantings.
- Hormones may be used and are valuable for cuttings older than 10 to 12 years or cuttings that have thick rough bark.

## Technical and cost share help is available

The Natural Resources Conservation Service can help you plan, establish, and manage riparian buffers. Contact your local USDA Service Center.

USDA offers several programs that can help you install riparian buffers and other types of conservation buffers. These programs include the continuous Conservation Reserve Program (CRP) sign-up, the Environmental Quality Incentives Program (EQIP), the Wildlife Habitat Incentives Program (WHIP), and the Wetlands Reserve Program (WRP).

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