

# Riparian Buffer Restoration

## A DOI Nature-Based Solutions Roadmap Fact Sheet



**Riparian buffers** are vegetated areas adjacent to a waterway managed to protect the waterway from the impacts of surrounding land uses. Consisting of a combination of trees, shrubs, and grasses extending parallel to the banks of the waterway, riparian buffers prevent excess sediment, nutrients, and pollutants from entering the water.<sup>1</sup> Riparian buffers are often degraded by invasive species, overgrazing, conversion to agricultural or urban land uses, stream channelization, and wildfires.<sup>2</sup> Restoring riparian buffers involves regrading stream banks, installing grade control structures, removing invasive species, and planting native species.

### TECHNICAL APPROACH

Restoring riparian buffers involves remediating changes to the soil, hydrology, and geomorphology:

- Restoring the hydromorphic properties of the streambanks or riverbanks by regrading banks to create a shallower slope<sup>3</sup>, installing grade control structures to prevent erosion<sup>4</sup>, and reconfiguring channels to natural shapes.<sup>5</sup> Natural materials such as boulders and wood can be placed along the banks to prevent erosion and provide wildlife habitat. Invasive species should also be removed if present.<sup>6</sup>
- Vegetative restoration with native species. Establishing vegetation can be challenging due to the slopes; wattle fences, live palisades, and live gravel bar staking help to stabilize the bank while roots develop.<sup>7-8</sup>

### BENEFITS

#### Climate Threat Reduction

- Reduced flooding
- Heat mitigation
- Drought mitigation
- Carbon storage and sequestration

#### Social and Economic

- Reduced erosion
- Mental health and well-being
- Cultural values
- Jobs
- Agriculture and timber yields
- Resilient fisheries
- Increased property values

#### Ecological

- Improved water quality
- Enhanced biodiversity
- Supports wildlife
- Increased habitat connectivity

## SITE SUITABILITY FACTORS

- ✓ Adjacent to sources of nutrient pollution
- ✓ Water table depth within 3-4 feet of the surface
- ✓ Sparse or absent woody vegetation
- ✓ Near frequently flooded body of water
- ✓ Banks experiencing significant erosion
- ✗ Adjacent land constrained by other uses
- ✗ Significant grazing pressure
- ✗ Site only receives small amounts of runoff
- ✗ Artificial channel substrate that won't be removed
- ✗ Slope greater than 6% that won't be regraded

## EXAMPLE PROJECT

The Dolores River Restoration Partnership, comprised of more than 20 partners including Bureau of Land Management and Bureau of Reclamation, is working to remove invasive tamarisk and revegetate with native species in the Dolores River riparian zone.<sup>9</sup> Project goals include enhancing wildlife habitat, providing recreational opportunities, and improving water quality.



Scouting restoration sites on the Dolores River. Photo credit: Dolores River Restoration Partnership.

## REFERENCES

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## CITATION

Warnell, K., Mason, S., Siegle, A., Merritt, M., & Olander, L. 2023. "Fact Sheet: Riparian Buffer Restoration." *NBS Roadmap Project*. Durham, NC: Nicholas Institute for Energy, Environment & Sustainability, Duke University. [www.nicholasinstitute.duke.edu/roadmap](http://www.nicholasinstitute.duke.edu/roadmap).

## KEY RESOURCES

Title and Link	Site Suitability	Design and Construction	Monitoring Guidance	Example Projects
<a href="#">Riparian Restoration (US Forest Service)</a>	✓	✓	✓	—
<a href="#">Case Studies of Riparian and Watershed Restoration in the Southwestern United States (USGS)</a>	✓	✓	—	✓

## LEARN MORE

Visit the DOI Nature-Based Solutions Roadmap for more information on riparian buffer restoration, other nature-based solutions, and principles and considerations broadly relevant for nature-based solutions projects. The riparian buffer restoration summary includes additional details on each section included in this fact sheet, plus information on operations and maintenance, common barriers, and more resources and example projects.

### Explore the Roadmap



Full Roadmap Document



Riparian Buffer Section

[www.nicholasinstitute.duke.edu/roadmap](http://www.nicholasinstitute.duke.edu/roadmap)