

Floodplain Reconnection

A DOI Nature-Based Solutions Roadmap Fact Sheet



Floodplains are low-lying areas adjacent to water bodies that flood during high water events.¹ Across the United States, development has resulted in disconnections between floodplains and their adjacent waterbodies, leading to flooding and water quality issues.² Disconnections can be caused by infrastructure such as dams that limit water flows into the floodplain or levees that physically cut off the floodplain from the river. Floodplain reconnection aims to reverse these anthropogenic alterations to restore a functional floodplain.³

TECHNICAL APPROACH

Specific techniques used for floodplain reconnection depend on how the floodplain has been altered. Common techniques include:

- Dam removal to restore natural water flows, nutrient cycling, and sediment deposition. Often, water is first diverted so the dam can be deconstructed under dry conditions. Alternatively, the dam can be slowly lowered over time to allow the riverine system to adjust to new water flows.⁴
- Levee removal or setback to allow the river to migrate within a wider floodplain.³
- Removing or upgrading culverts to allow better distribution of debris, sediments, nutrients, and fish throughout the floodplain.⁵
- Constructing side channels to connect ponds and wetlands in the floodplain to the primary river.³

BENEFITS

Climate Threat Reduction

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

Social and Economic

- Reduced erosion
- Property and infrastructure protection
- Agriculture and timber yields
- Mental health and well-being
- Recreational opportunities
- Jobs
- Increased property values
- Cultural values
- Resilient fisheries

Ecological

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

SITE SUITABILITY FACTORS

- ✓ Slope less than 6%
- ✓ Near-natural river flow
- ✓ Close to anthropogenic water retention infrastructure
- ✓ Ample space between infrastructure and the river
- ✓ Within 10 km of an established floodplain
- ✓ Nutrient pollution from runoff
- ✗ Significant riverbed erosion
- ✗ Close to a dam that will not be removed
- ✗ In a densely populated urban area

EXAMPLE PROJECT

The largest floodplain reconnection project in the Mississippi River Basin, led by US Fish & Wildlife Service and The Nature Conservancy, reconnected 25 miles of floodplain to the Ouachita River in Upper Ouachita National Wildlife Refuge, Louisiana.⁶ While the project was in the planning phase, the levee disconnecting the floodplain failed during a flood event. The project team widened the existing levee breaches and created new ones, then restored some of the historic wetlands within the floodplain.



Ouachita River and adjacent floodplain forest. Photo credit: [Ken Clough / USFWS](#). Public domain.

REFERENCES

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- 3 Pess, G. R., Morley, S. A., Hall, J. L., & Timm, R. K. 2006. "Chapter 6: Monitoring Floodplain Restoration". *American Fisheries Society*. <https://fisheries.org/docs/books/x55047xm/6.pdf>
- 4 American Rivers. 2023. "How Dams Are Removed". *American Rivers*. <https://www.americanrivers.org/threats-solutions/restoring-damaged-rivers/how-dams-are-removed/>
- 5 Roni, P., T. J. Beechie, R. E. Bilby, F. E. Leonetti, M. M. Pollock, and G. P. Pess. 2002. "A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in Pacific Northwest watersheds". *North American Journal of Fisheries Management* 22:1–20. <https://onlinelibrary.wiley.com/doi/abs/10.1002/wat2.1355>
- 6 "Mollicy Farms Restoration." n.d. The Nature Conservancy. <https://www.nature.org/en-us/about-us/where-we-work/united-states/louisiana/stories-in-louisiana/largest-floodplain-restoration-in-mississippi-river-basin/>.

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KEY RESOURCES

Title and Link	Site Suitability	Design and Construction	Monitoring Guidance	Example Projects
Connecting Rivers to Floodplains (American Rivers)	–	✓	–	–
Flood Resource Library (Association of State Floodplain Managers)	–	✓	✓	✓

LEARN MORE

Visit the DOI Nature-Based Solutions Roadmap for more information on floodplain reconnection, other nature-based solutions, and principles and considerations broadly relevant for nature-based solutions projects. The floodplain reconnection 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



Floodplain Reconnection Section

www.nicholasinstitute.duke.edu/roadmap