

Nontidal Wetland Restoration

A DOI Nature-Based Solutions Roadmap Fact Sheet



Nontidal wetland restoration is the rehabilitation of a degraded wetland that is not inundated by tidal waters. The goal is to restore the wetland's hydrology, vegetation, and ecological processes, to the extent possible, to the original natural condition prior to modification.¹ Specific restoration activities depend on the type of wetland and how it has been modified. Frequently, degraded wetlands have been drained for agriculture; removing or blocking drainage infrastructure is a primary restoration method.² Riparian zone restoration and invasive species removal are often needed as well.

TECHNICAL APPROACH

Three steps are generally used to restore the wetland's structure and function to a more natural state:

- Site preparation, including removal of debris and invasive species and modifying topography as necessary to ensure the wetland is lower than the surrounding landscape.³⁻⁴
- Hydrologic restoration such as filling ditches or removing tile drains from drained wetlands.⁵ Arid wetlands often benefit from rock detention structures or log dams to slow water following intense precipitation.⁶⁻⁷
- Revegetation, either allowing the area to revegetate naturally or planting with an appropriate species.⁸ It is important to plan for invasive species control, especially if using natural revegetation.

BENEFITS

Climate Threat Reduction

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

Social and Economic

- Recreational opportunities
- Jobs
- Mental health and well-being
- Cultural values
- Scientific research
- Aquifer recharge
- Reduced erosion

Ecological

- Improved water quality
- Supports wildlife
- Increased primary productivity
- Enhanced biodiversity

SITE SUITABILITY FACTORS

- ✓ Near existing wetlands
- ✓ Low-lying, frequently flooded agricultural areas
- ✓ Hydric soils still present
- ✓ Depressions in landscape with clay soil
- ✓ Soils containing sulfidic material
- ✗ Near a brownfield or landfill
- ✗ Slopes greater than 3°
- ✗ Near existing infrastructure
- ✗ Area experiences heavy grazing
- ✗ Salinity content greater than 0.5 ppt

EXAMPLE PROJECT

The Proctor Valley Vernal Pool Restoration project, a collaboration between the City of San Diego, US Fish and Wildlife Service, and Chaparral Conservancy, is restoring vernal pools degraded by offroad vehicle use and invasive species.⁹ Invasive species removal, restoring shallow depressions in the landscape, and revegetation with native plants are the primary techniques, along with restriction of vehicle access.



Monitoring a restored vernal pool in Proctor Valley. Photo credit: [The Chaparral Lands Conservancy](#).

REFERENCES

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KEY RESOURCES

Title and Link	Site Suitability	Design and Construction	Monitoring Guidance	Example Projects
USDA Part 650 Engineering Field Handbook, Chapter 13: Wetland Restoration, Enhancement, or Creation (USDA – NRCS)	✓	✓	✓	–
Dryland Watershed Restoration with Rock Detention Structures (Gooden & Pritzlaff)	✓	–	–	✓

LEARN MORE

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



Nontidal Wetland Section

www.nicholasinstitute.duke.edu/roadmap