

REWETTING WETLANDS IN ITALY

**Policy insights from the Gussola oxbow lake
for integrating fluvial rewetting into river
basin management**



CONTEXT AND CURRENT POLICY LANDSCAPE

Wetlands in Italy have been heavily degraded by drainage, river regulation, agriculture and urbanisation, leaving many systems fragmented and disconnected from natural hydrology. Italy has a solid policy foundation grounded in the EU Water Framework Directive, the Flood Directive, the National Biodiversity Strategy, River Basin Manage-

ment Plans, Flood Risk Management Plans, and climate adaptation policies. EU funding instruments such as LIFE and structural funds have enabled many restoration projects. However, implementation and restoration outcomes still vary across regions due to differences in governance arrangements, institutional capacity, funding continuity and local priorities.

Responsibilities are shared among national, regional and local authorities, making effective coordination essential. Where planning, technical expertise and financial resources are successfully combined, restoration projects have demonstrated significant improvements in ecosystem functioning while generating broader environmental and climate benefits.

WHY IS RESTORATION HARD TO SCALE?

Barriers to effective wetland restoration

Fragmented governance

Responsibilities are shared across multiple institutions, making coordination and decision-making more complex and less effective.

Insufficient long-term funding

Financial resources are often limited to individual projects and do not always support long-term management and monitoring.

Regulatory complexity

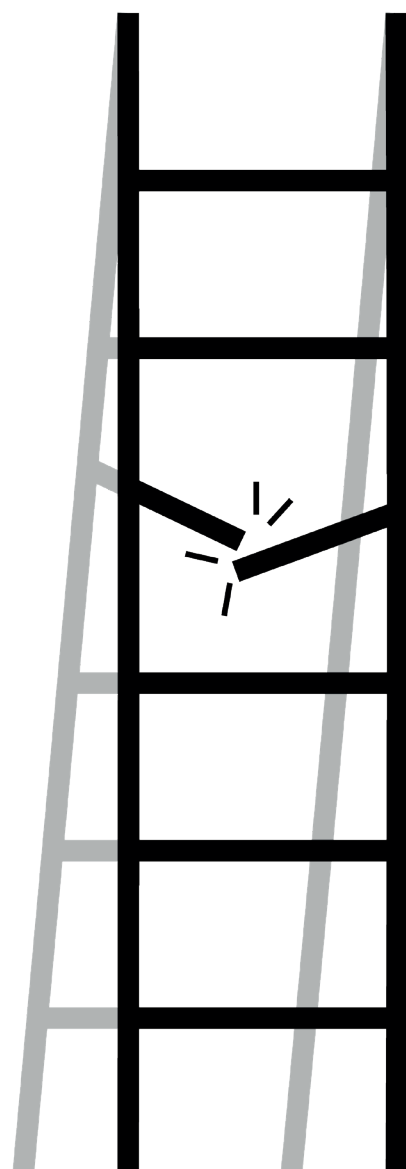
Multiple planning and permitting procedures can slow down restoration initiatives.

Limited long-term monitoring

Insufficient monitoring reduces the evidence available to evaluate outcomes and support adaptive management.

Competing land uses

Agricultural production, urbanisation, infrastructure and other land uses continue to limit restoration opportunities.



PRIORITY POLICY MEASURES

Integrate river restoration into river basin management

Shift from isolated restoration projects to catchment-scale approaches that restore natural river processes and reconnect river with their floodplain. Nature-based solutions, including the reconnection of oxbow lakes, where appropriate, the adaptation of existing river infrastructures, can:

- Improve hydrological processes.
- Improve water quality.
- Enhance habitat diversity and biodiversity.
- Reduce flood risks.
- Contribute to climate change mitigation and adaptation.

River restoration should become a **standard component of river basin planning rather than an ad hoc intervention.**



EVIDENCE FROM PRACTICE

Lanca di Gussola

The Gussola oxbow lake project restored lateral connectivity between an oxbow lake and the main channel of the Po River through the lowering of a navigation groyne. The interventions significantly reduced the hydraulic threshold required to reactivate the connection, increasing the frequency of water exchanges between the river and the floodplain wetland.

Beyond the engineering intervention itself, the site became one of the first integrated pre- and post-restoration monitoring experiences along the Po River, combining hydromorphological, ecological and social investigations to assess restoration outcomes and support the planning of future river restoration and monitoring interventions.

Biodiversity impacts

- Improved ecological conditions.
- Increased habitat diversity.
- Early signs of species recovery linked to more dynamic water regimes.

Climate impacts

- Initial monitoring indicates conditions that may enhance carbon storage and greenhouse gas regulation.
- Continued long-term monitoring will be essential to quantify full effects of climate change.



WHAT DOES THIS CASE SHOW?

The Gussola experience demonstrated that restoring hydrological connectivity significantly improves ecosystem functioning. Even relatively small structural interventions can increase water exchange, enhance habitat diversity, and support biodiversity recovery.

Early monitoring indicates that restoring connectivity leads to more dynamic hydrological systems and improved ecological conditions. These results also highlight the importance of integrating hydrology, sediment processes, and ecological objectives in restoration design.

POLICY PROPOSALS

Make fluvial rewetting a standard component of river basin planning.

- Improvement river restoration into River Basin Management Plans and Flood Risk Management Plans.
- Restore river–floodplain connectivity as a nature-based solution.
- Embed rewetting within existing water management frameworks.
- Align hydrological, water quality, biodiversity and climate objectives.

HOW TO SCALE AND ACCELERATE?

- Secure long-term funding beyond project cycles.
- Strengthen coordination between basin authorities, regions and research institutions.
- Develop common monitoring protocols and technical guidance to support adaptive management.
- Use pilot projects to generate evidence for larger restoration programmes.
- Replicate successful approaches across river basins.

The Italian experience shows that restoration of riverine wetland can be effectively integrated into river basin management. The Gussola project has already provided technical knowledge and monitoring of broader restoration initiatives along the Po River, including intervention implemented under the National Recovery and Resilience Plan.





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