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WETLANDS

Restoration of wetlands to minimise emissions and maximise carbon uptake.

A strategy for long-term climate mitigation.

Seven Open Labs.

One European restoration journey.

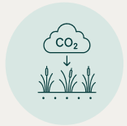
Restoring wetlands across Europe

Wetlands are among Europe's most valuable ecosystems. They store carbon, regulate water, support biodiversity and provide benefits for society. Yet, centuries of drainage, river regulation, peat extraction and land conversion have degraded many of these landscapes.

Across Europe, growing efforts are now underway to restore these ecosystems. But wetland restoration is far from straightforward. Recovery is a slow process, and every wetland responds differently depending on its hydrology, climate, soils and surrounding land use. As a result, restoration outcomes remain uncertain, making long-term monitoring and scientific evidence essential to understand what works, where, and why.

Through seven Open Labs across Europe, REWET has shown how nature-based restoration can help wetlands recover their ecological functions while generating the evidence needed to guide future restoration efforts. Together, these sites represent a wide range of climates, landscapes, ecological conditions, social contexts and restoration approaches, providing practical knowledge that can be adapted and applied across Europe.

Why wetlands matter



Climate

Healthy wetlands store carbon and help reduce greenhouse gas emissions.

Water

Wetlands act as natural sponges, storing, filtering and slowly releasing water. This helps reduce floods, improve water quality and maintain water supplies during dry periods.

Biodiversity

Wetlands provide the conditions needed for a rich diversity of life. They offer habitat for many specialised species found nowhere else.

Communities

Wetlands support livelihoods and recreation, strengthen resilience to climate change, and contribute to people's health and well-being.

OPEN LAB
01
Weerribben-Wieden National Park
Netherlands

The challenge

Centuries of peat extraction and traditional reed cutting created a unique wetland landscape. However, intensive agriculture and water management placed increasing pressure on peatland habitats and threatened their long-term ecological condition.

Restoration actions

- Autumn flooding using nutrient-poor surface water
- Water level management
- Low-intensity grazing
- Vegetation management
- Targeted topsoil removal

Monitoring

- Greenhouse gases
- Water table
- Water quality
- Biodiversity

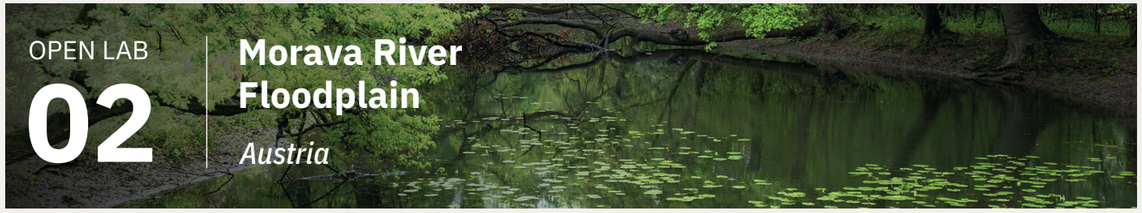
What changed?

Fen vegetation has expanded, nutrient conditions have improved, and water levels have become more stable. Colourful species-rich grasslands are gradually replacing previously degraded meadows, demonstrating the long-term recovery of the ecosystem.

Key takeaway

Restoring natural hydrology, removing the excess nutrients from previous agricultural activities, using low-intensity mowing and sheep grazing can gradually recover valuable fen habitats while improving long-term carbon storage.

Watch the story



OPEN LAB
02
Morava River Floodplain
Austria

The challenge

River regulation disconnected side channels, reduced natural flooding and weakened one of Central Europe's most important floodplain ecosystems.

Restoration actions

- Side-channel reconnection
- River restoration
- Barrier lowering

Monitoring

- Greenhouse gases
- Hydrology
- Biodiversity

What changed?

Reconnected floodplains now support more natural water dynamics, improved habitat quality and increased biodiversity. Targeted livestock grazing has replaced traditional mechanical mowing as a more sustainable way to maintain diverse plant communities. Long-term monitoring is also generating new evidence on the climate benefits of floodplain restoration.

Key takeaway

Restoring river connectivity and using targeted livestock grazing can deliver benefits for biodiversity, flood resilience and climate mitigation.

Watch the story

OPEN LAB

03 Ylpässuo Mire

Finland

The challenge

Historical forest drainage lowered water tables and altered peatland vegetation, increasing carbon losses from this boreal mire.

Restoration actions

- Passive restoration
- Strict protection
- Natural hydrological recovery

Monitoring

- Greenhouse gases
- Water table
- Biodiversity

What changed?

Recovery is taking place naturally as water tables gradually rise. Native peat-forming vegetation is stabilising, and the ecosystem is progressively regaining its natural functions.

Key takeaway

Sometimes the best restoration strategy is allowing natural processes to recover.

Watch the story

OPEN LAB

04 Ess-soo

Estonia

The challenge

Former peat extraction transformed this landscape from a natural carbon sink into a significant source of greenhouse gas emissions. With little vegetation able to recover and persistently low water tables exposing the peat to oxygen, the stored carbon began to decompose and be released into the atmosphere.

Restoration actions

- Ditch blocking
- Rewetting
- Sphagnum transplantation

Monitoring

- Greenhouse gases
- Water table
- Biodiversity

What changed?

Water levels have stabilised, vegetation is returning and peat-forming species are becoming established. The restored peatland is following a positive trajectory towards recovering its carbon sink function.

Key takeaway

Restoring heavily degraded peat extraction sites takes time. Rewetting, combined with vegetation establishment, can help set these ecosystems on a path towards recovering their ecological functions and climate regulation capacity.

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05 Haute Ardennes Region

Belgium

The challenge

Drainage and spruce plantations reduced biodiversity and accelerated runoff, contributing to downstream flooding and summer droughts.

Restoration actions

- Forest conversion
- Ditch blocking
- Hydrological restoration

Monitoring

- Biodiversity
- Soil carbon
- Hydrology

What changed?

Artificial drainage channels were blocked to restore the natural water regime of the peatland. While ecosystem recovery takes time, monitoring is already recording the return of wetland vegetation and beetle communities, alongside increasing organic matter accumulation.

Key takeaway

Restoring upstream wetlands improves both biodiversity and climate resilience for downstream communities.

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OPEN LAB

06 Gussola Oxbow Lake

Italy

The challenge

River engineering and excessive in-stream excavation had significantly altered the river morphology and caused channel incision. This channel degradation had progressively disconnected the Gussola oxbow lake from the Po River, reducing water exchange and thereby resulting in stagnant, low-oxygen conditions.

Restoration actions

- River reconnection via the lowering of a navigational groyne
- Hydrological restoration
- Habitat enhancement

Monitoring

- Water quality
- Biodiversity
- Hydrology
- Greenhouse gases

What changed?

Improved river connectivity has resulted in more frequent exchanges between the river and the oxbow lake, improving not only ecological and hydromorphological conditions but also supporting the recovery biodiversity and ecosystem functions.

Key takeaway

Restoring lateral river connectivity can rapidly aid in reactivating natural processes, thereby supporting long-term ecological recovery in floodplain wetlands.
The Gussola experience demonstrates how restoration combined with integrated monitoring can support future river restoration strategies.

Watch the story

OPEN LAB

07

Paul da Gouxa

Portugal

The challenge

This rare Mediterranean peatland was affected by quarry extraction and illegal dumping, threatening deep peat deposits and their capacity to store carbon.

Restoration actions

- Water management
- Habitat restoration
- Protection of deep peat

Monitoring

- Greenhouse gases
- Water levels
- Biodiversity

What changed?

Permanent water bodies have become important refuges for wildlife, supporting the return of otters, water birds and other wetland species.
Maintaining high water levels also helps prevent the oxidation of deep peat layers during extreme Mediterranean heatwaves, preserving their carbon storage function.

Key takeaway

Restoring and maintaining permanent water bodies can rapidly create suitable conditions for biodiversity.

Watch the story

THE REWET LEGACY

Restoring wetlands is a long-term commitment

One of the most important lessons emerging from REWET is that ecosystem restoration requires patience, long-term monitoring and adaptive management.

Early monitoring results do not always tell the full story. Wetland ecosystems recover over years. For example, rewetting may temporarily increase methane emissions as natural waterlogged conditions return, but long-term monitoring shows that these short-term changes are outweighed by sustained reductions in carbon dioxide emissions and the gradual recovery of wetland carbon sinks.

Wetlands are complex living systems where water, soils, vegetation, wildlife and people are all interconnected. Restoring a single process, such as the natural water regime, triggers a cascade of changes that gradually allows other ecosystem functions to recover.

The seven Open Labs show that there is no single recipe for wetland restoration. Every ecosystem responds differently. But they all share one lesson: when we restore the conditions that wetlands need, nature can begin to recover.

And when wetlands recover, so do the benefits they provide to us: cleaner water, greater resilience to floods and droughts, a more stable climate and richer biodiversity. After all, **humans are not separate from nature; we are part of it. Protecting wetlands means protecting the natural systems that sustain us all.**

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