Wetland Restoration in Europe – Four approaches

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The global climate goal is to reach net-zero greenhouse gas emissions by 2050, and the EU targets at least a 55% reduction by 2030. Achieving these ambitions requires new mitigation actions across land-use sectors, where wetlands, carbon-rich ecosystems, offer powerful climate benefits alongside gains for biodiversity and water-related ecosystem services.

Peatlands, floodplains, freshwater and coastal wetlands have been degraded for centuries, primarily by large-scale drainage for agriculture, forestry, mining, and peat extraction, releasing vast stored carbon as greenhouse gases. Restoration is one of the most effective strategies to curb emissions from wetlands and to re-establish wetlands as carbon sinks, while also supporting sustainable land use, local livelihoods, and regional wellbeing. In 2022, four Horizon Europe funded projects (ALFAwetlands, WET HORIZONS, REWET, RESTORE4Cs) were launched to address this challenge and advance solutions at the science–policy–society interface:

ALFAwetlands 2022-2026, Wetland restoration for the future (www.alfawetlands.eu) is coordinated by Natural Resources Institute Finland, Luke and carried out at local to EU levels with 15 partners across Europe. The goal of ALFAwetlands is to improve the geospatial knowledge base of wetlands, to evaluate the pathways of wetland restoration that incorporate a co-creation process and to provide information and indicators for sustainability to maximise climate change mitigation, biodiversity and other benefits.

Lettosuo, Finland (photo. L. Ukonmaanaho)

Higlights of the project:
- ✓ Updated European level wetland map (jointly with WET HORIZONS) https://zenodo.org/records/14745285
- ✓ Harmonized methods for field analyses in wetlands
- ✓ Handbook for co-creation process
- ✓ Recommendations for wetland restoration
- ✓ GIS dataset of past wetland restoration projects

WET HORIZONS 2022-2026 (www.wethorizons.eu) is coordinated by Aarhus University, Denmark and has 14 partners around Europe. It will improve wetland restoration through a holistic approach, increasing key knowledge and developing tools to support faster large-scale action. The project will improve data from pristine, drained, and rewetted peatlands, floodplains and coastal wetlands, model common restoration measures under varying conditions, and assess socioeconomic impacts, delivering guidelines and best management practices.

Torronsuo, Finland (photo: H. Mustonen)

Highlights of the project:
- ✓ Updated European level wetland map (jointly with ALFAwetlands)
- ✓ A meta-analysis: peatland restoration reduces CO_2 emissions and raises water tables, but region-specific approaches are needed
- ✓ Comparison of restoration cost and ecosystem services in selected wetlands in Europe
- ✓ Study of phosphorus (P) leaching during rewetting – generally low, but varies a lot

REWET 2022-2026, Sustainable restoration and conservation of terrestrial wetlands (www.rewet-he.eu) is coordinated by Idener, Spain. The aim of the project is to facilitate sustainable restoration and conservation of terrestrial wetlands, including freshwater wetlands, peatlands, and floodplains, by applying fit-for-purpose technologies to monitor greenhouse gas emissions, biodiversity, meteorological events and social aspects of sustainability.


Ylpässuo, Finland (photo: E. Oksanen)

Highlights of the project:
- ✓ 3 research pillars: GHG, biodiversity, water & soil
- ✓ Monitor GHG measurements using Eddy Covariance and contribute results to FLUXNET.
- ✓ Established Wetlands multi-stakeholder platform: A Hup for collaboration, knowledge-sharing, and innovation in the restoration and sustainable conservation of terrestrial wetlands (https://www.stakeholders.rewet-he.eu/)
- ✓ WETSET to centralize all existing databases related to terrestrial wetlands.

RESTORE4Cs 2023-2025, Modelling restoration of wetlands for carbon pathways, climate change mitigation and adaptation, ecosystem services, and biodiversity co-benefits (www.restore4cs.eu) was coordinated by University of Aveiro, Portugal with 15 partners across Europe. The project evaluated how restoration actions affect the ability of coastal wetlands to mitigate climate change, improve ecosystem services, and support biodiversity. RESTORE4Cs gathered data from 6 pilot sites across Europe and extended modelling tools to wider ecological and geographical contexts.
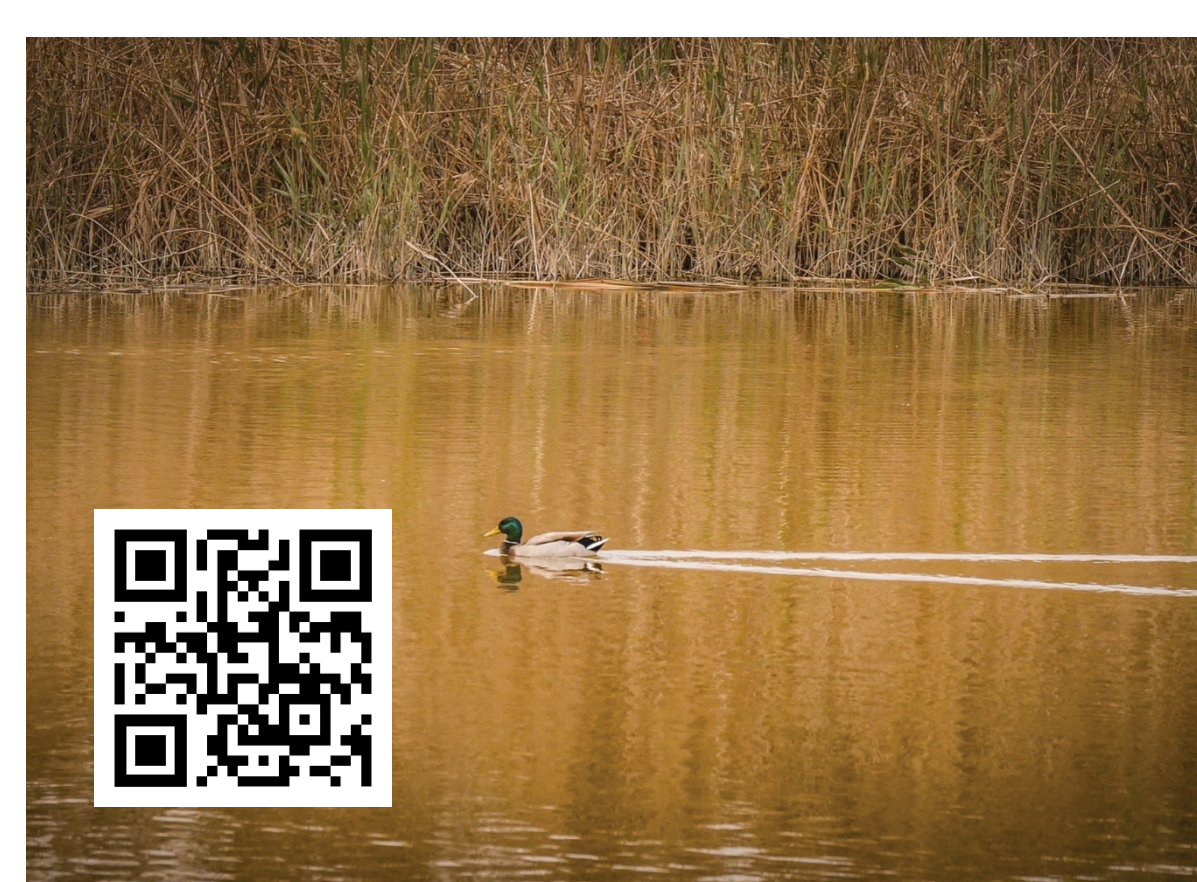
Coastal wetland (RESTORE4cs www-page)

Highlights of the project:
- ✓ Produced 11 policy briefs in 7 languages.
- ✓ Produced the European Community of Practice (ECoP) and its online hub.
- ✓ Produced harmonised methods for GHG flux monitoring across 6 pilot sites.
- ✓ Produced a Decision-Support Toolbox (DSS) using an interactive platform to compare and prioritise restoration options. (European Coastal Wetlands Interactive platform)

Luke   WETLANDS Restoration for the future www.alfawetlands.eu   WET HORIZONS   rewet   RESTORE4Cs   Funded by the European Union