Wetland biodiversity protection in Kamanos Strict Nature Reserve, Lithuania

Year of issue

2025

Summary

Kamanos Strict Nature Reserve is the largest raised bog (2,434 ha) in the northern Lithuania region (a farming region) with ridge–pool complexes, numerous small lakes (over 120 pools each less than 2 ha in area) and surrounding wet forests. In 65 ha of selected bogs and meadows restored with 18.5 km of ditches dammed Kamanos Strict Nature Reserve. The measures were implemented in the frame of a larger UNDP-GEF project in 2004–2010. Further hydrological restoration was carried out under the LIFE WETLIFE2 project (2014–2018), blocking 37 km of drainage ditches and improving water conditions over 670 ha. These actions supported bog habitats and species like the Aquatic Warbler. The site is now part of the eLTER network, with ongoing ecological monitoring and climate data collection.

Photo Gallery



Location

56.280151, 22.662279

Project

NWRM

National ID

Lithuania_03

Sector

Hydromorphology

Installation Date

2010

Implementation status

Ongoing

Overview

Location of the project

The Kamanos Strict Nature Reserve lies in the Akmenė District of Šiauliai County, northwestern Lithuania (approx. 56°16.3′ N, 22°47.3′ E), situated just a few kilometres west of Ašvėnai village. While surrounded by cultivated lands and forest, it is accessible only via local roads leading to the visitor centre in Akmenė II.

Country

Lithuania

NUTS2 Code

Latvija

Sponge measures implemented in the case study

Wetland restoration and management

Removal of dams and other longitudinal barriers

Forest riparian buffers

Objectives

Objective 1: Demonstrate improved in-situ wetland management at five globally significant wetland sites in Lithuania including Kamanos, addressing degradation threats such as drainage, overgrowth of meadows, and unsustainable land use.
Objective 2: Institutionalize best practices through a multisectoral mechanism (the "Multisectoral Wetlands Working Group") to replicate lessons learned across other wetland sites in Lithuania and integrate conservation principles into relevant sectoral policies (e.g., agriculture, forestry, tourism) for sustainable wetland management.

Involved partners

Authority type	Authority name	Authority role	Comments	Authority responsibility
NGO	Nature Heritage Fund	Initiation of the measure	—	—
Nature park	Kamanos Srict Nature Reserve	Implementation	Strict Nature Reserve is an institution for the protection of Kamanos bog and neighbouring areas of conservative importance	—

Authority type	Authority name	Authority role	Comments	Authority responsibility
National water authority	Ministry of Environment of Lithuania	Initiation of the measure	—	Supporting

Site Information

Climate Zone

Warm temperate moist

Precipitation

585.00 mm

Temperature (°C)

6.74 °C

Elevation range

111

Groundwater level

In central (pristine) bog : 4.5 cm to 30 cm below the surface. In actively drained zones, fluctuations ranged from 8 cm to 51 cm.

Vegetation class

Sphagnum mosses

WFD Ecological status

Poor

WFD Chemical status

Failing to achieve good

Water quality status

This is water bosies status around the reserve, there is no info about the Kamanos reserve's waterbodies themselves.

Design and Implementation

Project scale

Micro

Project scale specifications

The restoration and conservation actions in the Kamanos Strict Nature Reserve focus on a clearly defined protected area (2,434 ha), involving localised hydrological interventions such as ditch blocking, habitat restoration, and biodiversity monitoring. All measures are site-specific and confined to the boundaries of the reserve, making this a typical micro-scale project.

Project area

1283

Area subject to Land use change or Management/Practice change (ha)

1218.00 ha

Size

18.50

Size unit

km

Financing

Total cost information

€1,520,701 for LIFE WETLIFE 2 (LIFE13 NAT/LT/000084) (2014-2018) Restoration of 670 ha of bog habitats; 37 km of ditches blocked; 300 dams built; monitoring and public awareness activities.

US $13,865,400 for UNDP-GEF (2004-2010) “Conservation of Inland Wetland Biodiversity in Lithuania”, Restoration of 65 ha of bogs and meadows; 18.5 km of drainage ditches blocked; development of reserve management plans.

Compensations

No

Policy and Governance

Policy description

Extensive drainage of the bog for agriculture and forestry, loss of biodiversity, change f habitat

Land ownership

The core area of the Kamanos Strict Nature Reserve is entirely state-owned, while its buffer zone includes both state-owned and privately owned parcels.

Policy targets

Runoff control

Increase Water Storage

Improved Biodiversity

Oher Societal Benefits

Part of a wider plan

Yes

Wider plan

Name	Comments
Conservation of Inland Wetland Biodiversity in Lithuania’	National project

Public consultation

Yes

Consultation activities

Activity stage	Activity type	Comments
Design phase	WETLIFE 2 project seminars	14 seminars and volunteer-based actions aimed at: Raising awareness of the importance of peatland ecosystems and the problems caused by drainage. Engaging local stakeholders directly in conservation activities.

Has contractual arrangements

No

Impacts and Monitoring

Monitoring System

Monitoring parameters

Groundwater/hydrological levels (post-restoration). As part of the WETLIFE 2 project, the reserve organized 14 seminars and volunteer-based maintenance or monitoring actions, contributing to active stakeholder engagement and localized stewardship.

Maintenance

Maintenance requirements

Maintenance is carried out by the Kamanos Reserve Directorate and includes regular inspection of water level control structures (e.g., dams) and ongoing hydrological monitoring to ensure restoration effectiveness.

Impact Assessment Methodology

Performance impact assessment method

Catchment outlet

Performance impact estimation information

Change of water table level in the bog

Socio-economic Impacts

Direct benefits

For all Lithuania's peatlands combined : Rewetting peatlands → ~€170M annual savings; drainage → ~€309M annual losses (6.6% of GDP)

Biophysical impacts: Hydrology

Information on increased groundwater level

Groundwater level rise: After damming drainage ditches (1–1.2 m deep), the groundwater table increased by 9.8 to 12.2 cm, with the effect detectable up to 980 m from the ditch. In extensively drained areas, water levels matched undrained (control) plots within 4 years; in more intensively drained zones, recovery to control levels is projected within 12 years

Information on Restoring hydraulic connection

Restored hydrological conditions (WETLIFE 2 project): 37 km of ditches were blocked, leading to restoration of 40 ha of bog lag zones, benefiting 670 ha of mire habitat

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

The sphagnum community is beginning to recover in places where it had been negatively impacted before. Mire habitats supporting species such as Eurasian golden plover (Pluvialis apricaria), wood sandpiper (Tringa glareola), black grouse (Tetrao tetrix), and woodpeckers (Dendrocopos leucotos, D. medius) are expected to benefit.

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

N/A info

Soil quality overall improvements

N/A info

Biophysical impacts: Others

Information on ecosystem impact climate regulation

Improved storage of GHG in peatland.

Lessons Learned

Key lessons

• Mid-Term Evaluations should have stringent timing requirements.
All GEF projects should mandate that mid-term evaluations occur at a specific date in the project cycle. This should include recruitment of international expertise at least six months prior to the planned MTE date.

• Relatively small management teams can produce big results.
Successful implementation project with a relatively small full-time technical and management staff is an indication of the project benefiting from a contemporary, strategic approach; authentic stakeholders buy-in; an implementation environment with relatively good capacity; and capable, motivated leadership. The team also showed a willingness to identify and recruit necessary technical assistance.

• Valuable indicators measure impact and quality, not just production.
Projects should benefit from carefully designed indicators that provide an accurate measurement of the delivery of outputs but, more importantly, measure the impact delivery has on objective conservation values.

• Projects may benefit from continuity between PDF-B and implementation teams.
This project benefited from having the same strong team working from the beginning of the project through to implementation. Capacity, team building, partnerships, and project “historical perspective” were all enhanced with this consistency.

Barriers

Barrier type	Barrier role	Comments
Lacking financing sources	Secondary barrier	No financing for further implementation (building more dams)

Drivers

Driver type	Comments
Other	The goal should have been reached in the most cost effective measure. Small dams made of plastic were the best option. Construction costs were minimised, since no outsourcing was needed and SNR staff was able to build it.

Success factors

Success factor type	Success factor role	Comments
Attitude of decision makers	Main factor	—

Success factor type	Success factor role	Comments
Financing possibilities	Main factor	EU funding was a big help.
Available support tools	Main factor	During the MOMENT project, it was possible to gain knowledge about the similar retention ponds in Sweden. As this was one of the first (pilot) retention ponds in Lithuania, therefore, knowhow was very usefull.
Legal obligations	Main factor	—

Transferability

The measure is highly transferable to other degraded peatlands with similar ecological conditions. Its success depends on prior drainage intensity, local hydrology, and land ownership. Careful assessment of groundwater response, long-term maintenance needs, and stakeholder support is essential. Monitoring should go beyond water levels to include biodiversity and climate impacts.

Sources

Sources

Effect of drain-blocking and meteorological factors on groundwater table fluctuations in Kamanos mire

Kamanos Strict Nature Reserve – BirdLife Data Zone

Kamanos State Strict Nature Reserve celebrates 45th anniversary

Conservation of Inland Wetland Biodiversity in Lithuania – Project Document

WETLIFE2 Infoletter

After-LIFE Conservation Plan – WETLIFE2

Rewetting Lithuania’s peatland forests could save millions of euros

Restoration of proper hydrological conditions in Amalva and Kamanos bogs – LIFE project