Reconstruction within the Sur Fen Nature Reserve, Slovakia

Year of issue

2025

Summary

Reconstruction of dams and sluice gates, blocking of drainage ditches and creation of a hydrological network to route water from the Little Carpathians through the Šúr Fen National Nature Reserve (near Svätý Jur), funded by the LIFE programme (LIFE03 NAT/SK/000096). The works were prepared and initiated in 2003–2007 and complemented the intake built in 2001 on the Šúrsky Canal (rkm 10.197), which diverts water into the reserve when canal flow exceeds Q5 (up to ~7.4 m^3/s). The Danube Flood Risk Management Plan (2015) describes a system of inverted siphons, canals and an aqueduct enabling year-round supply and water level management inside the fen. Project materials detail the refurbishment of control structures (e.g. on the Blahutov Canal), conversion of a drainage canal to irrigation, and raising water levels in the Čierna Voda to limit peat drawdown; interpretation and a nature trail were also delivered.

Since 2017–2018, management has reintroduced wood-pasture grazing in the Panónsky háj (southern part of the reserve) with local partners. Recent monitoring (2023–2024) reports marked increases in wild bee abundance in restored areas, indicating positive ecological response.

Photo Gallery







Location

48.2394, 17.2261

Project

NWRM

National ID

Slovakia_05

Sector

Hydromorphology

Installation Date

2007-01

Implementation status

Completed

Contact

REC

Overview

Location of the project

Šúr Fen National Nature Reserve sits between the towns of Svätý Jur, Vajnory (Bratislava) and Chorvátsky Grob, NE of Bratislava

Country

Slovakia

NUTS2 Code

Bratislavský kraj

Sponge measures implemented in the case study

Wetland restoration and management

Check dams

Objectives

Restore the natural hydrology of Šúr Fen and reach favourable conservation status for its wetland habitats (incl. alder swamp woods).
Prepare key planning tools: elaborate a Rescue & Management Plan with management prescriptions, and enlarge the reserve (zoning/boundary update).
Rebuild and build water-control works to route Carpathian water through the reserve: reconstruction of dams/sluice gates, blocking drainage ditches, and creation of a hydrological network (incl. inverted siphons, an aqueduct, gates, supply canals and culverts).
Provide year-round water supply to internal habitats by complementing the Šúrsky Canal intake (rkm 10.197), which releases water into the reserve when canal flow exceeds Q5 (technically allowing up to ~7.4 m^3/s).
Raise awareness and support acceptance: produce information/education materials, set up an exhibition, and build a nature trail.

Involved partners

Authority type	Authority name
NGO	APOP Association of Indutry and Nature Conservation
Local water authority	Municipality of Svaty Jur
—	Slovak Water Managemtn enterprise SVP-OZ
—	Slovak Land Fund SPF
—	State nature Conservancy of the Slovak republic SOP SR

Site Information

Climate Zone

Warm temperate moist

Precipitation

600.00 mm

Temperature (°C)

10.00 °C

Runoff coefficient

0.25

Elevation range

113

Groundwater level

~0–2.7 m below surface

Vegetation class

Fen alder carr (wet woodland; Carici elongatae–Alnetum) is the core and most extensive habitat, fringed by swamp/wet meadows; “Pannonian grove” (thermophilous oak) occurs locally. Predominant class: wet woodland (alder carr).

WFD Ecological status

Unknown

WFD Chemical status

Good

Water quality status

Overall high/very high; some streams show higher NO_3^-; the Čierna Voda had the lowest quality (higher SO_4^{2-}, NO_3^-, dissolved solids, Ca). Reported pH 6.89–7.56 in streams (groundwater 7.51–8.30); conductivity 228–966 $\mu S \cdot cm^{-1}$.

Design and Implementation

Project scale

Micro

Project scale specifications

This is a site-level restoration confined to the Šúr Fen National Nature Reserve (between Svätý Jur and Chorvátsky Grob) and a short reach of the Šúrsky Canal: it reconstructs small water-control structures and reconfigures local ditches/canals (e.g., Blahutov, Chlebnický) to route water through the reserve.

Project area

1100

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

991.00 ha

Constraints

Antrophogenic impacts: Drainage of streams out of Sur, illegal dumps, massive urbanization, weak management (results of botanic and zoology research never applied in strategy documents), weak enforcement of legislation, no compensation of landowners, no transparent financing of restoration activities and absence of public awareness campaigns.

Favourable preconditions

The locality is designated a national nature reserve

Financing

Total cost

400000.00 €

Total cost information

LIFE03 NAT/SK/000096 Total eligible budget

Financing authorities

Authority name	Type of funding	Comments	Financing share
European Union	EU-funds: LIFE+	€300,000 LIFE03 NAT/SK/000096	75 %
Municipality of Svätý Jur	Local funds	Part of €300,000	25 %
State Nature Conservancy	National funds	Part of €300,000	25 %

Compensations

Non

Policy and Governance

Policy description

Lack of water, dry-up forest, threat and extinction of protected species and loss of function of wetland (flood protection,retain water in the landscape)

Land ownership

Mixed ownership. Municipalities (318.3 ha), the Slovak state (268.3 ha) and private owners hold only 0.07 ha

Policy targets

Improved Biodiversity

Increase Water Storage

Peak-flow reduction

Part of a wider plan

Non

Public consultation

Oui

Consultation activities

Activity type	Comments
Publications	APOP has published postcards, leaflets, stickers and posters arround the municipal information centers
Education trail	The main purpose is to show the treasure of the Sur

Has contractual arrangements

Non

Impacts and Monitoring

Monitoring System

Monitoring requirements

Ongoing hydrological monitoring on the Šúrsky Canal is run by the Slovak Hydrometeorological Institute, while biological monitoring has been carried out through targeted studies rather than a site-wide, long-term program specific to Šúr.

Monitoring parameters

Šúrsky Canal : water level (cm) and water temperature (°C)
entomological survey (Coleoptera) in 2021 assessed effects of grazing, and a Within the reserve’s pasture-forest : an entomological survey (Coleoptera) in 2021 and a 2023 study on ant communities evaluated response to restoration management - tracking species composition, richness and assemblage changes as performance indicators.

Maintenance

Maintenance requirements

Water-control structures are operated by the SVP, and the pasture-forest is actively maintained through clearing of self-seeded trees and seasonal grazing led by BROZ with the City of Svätý Jur and CHKO Malé Karpaty (and a local farmer).

Socio-economic Impacts

Direct benefits information

Threats regarding the inappropriate use of non-forest land in the Nature 2000 site and the lack of awareness of the public were mitigated.
A marked nature trail (built 2006 under LIFE) provides 4.1 km/6 stops and is explicitly meant to regulate visitation and support field teaching; it’s promoted by the Bratislava Region’s tourism board. Some panels have suffered wear, with plans for renewal.
Traditional livelihoods reintroduced. From 2017, partners restarted cattle grazing in the Panónsky háj with a local farmer (Vladimír Pažitný) - a visible return of a historic silvopastoral practice that also underpins ongoing site management.
Risk reduction for adjacent land. Project materials state the right bank of the Čierna Voda was lowered/strengthened so surplus water would not endanger surrounding parcels - a local safety benefit.

Biophysical impacts: Hydrology

Information on retained water

Controlled inundation / flood buffering enabled. Since 2001 an outlet in the left dike of the Šúrsky Canal (rkm 10.197) diverts water into the reserve when canal discharge exceeds Q5 (capacity up to 7.4 m^3/s).

Biophysical impacts: Biodiversity

Improved biodiversity

Oui

Information on improved biodiversity

After clearing and re-introducing grazing (2017–2018 onward), an ant community study (2015 vs 2021) recorded a +111.95% increase in epigeic activity and a +64.71% increase in detected ant species, with 58 species documented in total across Šúr (incl. several rarities).
A conservation bulletin notes more beetle species and significantly more individuals of bark beetles on the grazed site compared with ungrazed reference, indicating a rapid assemblage shift after management restart. Quantitative counts are not provided.

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

Not relevant for this application

Information on water quality overall

SHMÚ data compiled in an EIA summary show pH 7.79–8.38, conductivity 52–78 mS/m, dissolved oxygen 6.7–13.2 mg/L at “Čierna voda – Čierna voda”. These are contextual, not “impact” metrics for the project.

Soil quality overall improvements

Not relevant for this application

Biophysical impacts: Others

Ecosystem impact climate regulation

Not relevant for the specific application

Lessons Learned

Key lessons

Land-use planning must be built into implementation. In Šúr, urbanisation pressures and fragmented ownership collided with wetland goals; the case explicitly concludes that “land use planning should be a significant component in the implementation plan.”

Planning must analyse cross-sector consequences. The case stresses that water decisions affect other economic sectors and that these interactions should be assessed during planning—another stated lesson from the original case documentation.

Stakeholders need to know each other to align concepts and expectations. Early opposition and low acceptance were linked to weak public involvement; the case warns that initiatives without active engagement risk failure.

Technically, piggybacking on existing hydraulic infrastructure and clarifying operations helped. The outlet on the Šúrsky Canal (built 2001) and the LIFE measures (2003–2007) were later described as implemented and operated by the Slovak Water Management Enterprise—showing the value of integrating new works with existing assets and duty holders.

Communication matters. An interpretation trail and brochure were created to channel visitors and build understanding - simple tools that supported awareness and acceptance over time.

Hydrology alone is not enough; long-term habitat management is required. Re-introducing grazing in the Panónsky háj from 2018 onward illustrates how ecological outcomes depend on sustained, locally supported management partnerships.

Monitoring should serve both ecology and spatial development. The EIA recommended a robust groundwater monitoring system to inform decisions on urban expansion; in parallel, hydrometric monitoring of the Šúrsky Canal (water level and temperature) provides operational data for water management.

Barriers

Barrier type	Barrier role	Comments
Expected maintenance needs	Main barrier	Lack of maintenance
Other	Secondary barrier	4 000 new houses will be built in the direct vicinity of the site. It is planned that by 2010, the 1 700 inhabitants of the southern part of the reserve will increase to as many as 20 000 inhabitants. Consequently substantial effects on the immediately adjacent Nature 2000 site may be expected.
Lacking financing sources	Secondary barrier	Despite the fact that the locality is designated a national nature reserve, the protection and management is not adequate due to low public awareness and insufficient financial and technical maintenance.

Drivers

Driver type	Driver role
Organisation committed to it	Main driver

Success factors

Success factor type	Success factor role	Comments
Successful coordination between authorities	—	The proposed zoning of the Sur Fen National Nature Reserve and identification of conservation measures in each protected zone and buffer zones provides a solid basis for transparent determination of competencies of public institutions and private landowners as well.
—	Main factor	—

Sources

Sources

SUR FEN NATURE RESERVE - Restoration of Water Regime in Sur Fen Nature Reserve

Guide to Sur - Restoration of Water Regime in National Nature Reserve Sur

Restoration of Wetland Sur: Conflict between urban planning and water planning

Information Sheet on Ramsar Wetlands (Šúr / Ramsar Site No. 498)

Spoločenstvá mravcov Národnej prírodnej rezervácie Šúr a ich reakcia na obnovný manažment pastevného lesa v časti Panónsky háj

Vodomerné stanice – Svätý Jur – Šúrsky kanál (ID 5170)

Ochrana prírody / Nature Conservation 39/2022

Stará pastva, nová nádej: Panónsky háj opäť ožíva

Restoration of water regime in Sur Fen Nature Reserve (LIFE03 NAT/SK/000096)

Sprievodca Šúrom: Obnova vodného režimu v národnej prírodnej rezervácii Šúr

Ochrana a obnova území NATURA 2000 v cezhraničnom regióne Bratislavy (LIFE10 NAT/SK/080)

Slovakia: Urbanisation and wetland restoration: Conflict or Concord