Preservation of floodplain forests, Slovakia

Year of issue

2025

Summary

DANUBE FORESTS, coordinated by BROZ and funded by the LIFE programme, preserves the remaining floodplain forests of the Slovak Danube inland delta and introduces sound, sustainable forest management. Since then, a wider EU-LIFE effort has reconnected side-arms and restored wetlands while agreeing a new operational water regime: over 75 ha of wetlands and 18.5 km of tributaries have been brought back to life, supported by an operational manual that integrates Natura 2000 needs into water-management decisions.

Controlled “simulated floods” are now released via the Dobrohošť inlet, with flows up to 120 m^3/s tested in 2023 and implemented again in spring 2024 to refresh the inland delta. In 2024 the Vojčianske side arm was reopened and in 2025 the Foki arm in the old Danube bed was restored, improving connectivity, habitats and local water retention. Further actions continue under Dynamic LIFE Lines Danube (AT–SK) and LIFE RESISTANCE, which also tackles invasive plants. Several areas proposed by DANUBE FORESTS have since been formally protected (e.g., Foráš PR, Pečniansky les protected area, Ostrovné lúčky).

Photo Gallery



Location

48.06638, 17.2038

Project

NWRM

National ID

Slovakia_7

Sector

Forest

Installation Date

2007-03

Implementation status

Ongoing

Contact

REC

Overview

Location of the project

Within the Dunajské luhy Protected Landscape Area (the Slovak Danube inland delta) south-east of Bratislava, around the villages of Dobrohošť, Vojka nad Dunajom and Kyselica.

Country

Slovakia

NUTS2 Code

Bratislavský kraj

Sponge measures implemented in the case study

Forest riparian buffers

Floodplain restoration and management

Afforestation

Objectives

Preserve the last remaining natural floodplain forests in the Slovak Danube inland delta and introduce sound, sustainable forest management.
Prepare a Sustainable Forest Management Framework Strategy for the whole area and update forest management plans for the project forests
Designate and enlarge protected areas in key sites of Dunajské luhy; the initial plan targeted ~549 ha of new protected areas
Apply close-to-natural forestry on selected stands: control/eliminate invasive plants, promote natural regeneration, and use selective cutting instead of clear-cuts.
Build capacity and awareness: training of State Forest Administration and State Nature Conservancy staff; study visits (CZ Morava–Dyje, AT Donau-Auen), outreach materials and public excursions/seminars.
Inventory local genetic seed sources for afforestation to support native species use.

Involved partners

Authority type	Authority name	Authority role
NGO	BROZ - Regional Association for Nature Conservation and Sustainable Development	Initiation of the measure
National water authority	State Nature Conservancy of Slovak Republic	—
Local water authority	National park Donauauen (Austria)	—

Site Information

Climate Zone

Warm temperate moist

Precipitation

600.00 mm

Temperature (°C)

10.00 °C

Runoff coefficient

0.20

Elevation range

129

Vegetation class

Floodplain riparian forest: softwood willow–poplar galleries and hardwood alluvial forests (oak, ash, elm), with associated wetlands/meadows; recent restoration also used native Salix alba and Populus nigra stock.

WFD Ecological status

Moderate

WFD Chemical status

Failing to achieve good

Design and Implementation

Project scale

Meso

Project scale specifications

River-reach / regional: actions span multiple side-arms and wetlands of the Slovak inland delta (e.g., 9.57 km of branches restored; simulated floods influenced ~1,805 ha in 2024), coordinated across agencies and used to manage a connected river-branch system.

Project area

12450

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

12450.00 ha

Financing

Total cost

570000.00 €

Financing authorities

Authority name	Type of funding	Comments	Financing share
European Union	EU-funds: LIFE+	LIFE03 NAT/SK/000097 €370,500	65 %

Compensations

Non

Policy and Governance

Policy description

The building of the Gabcikovo dam and canal strongly affected this inland river delta; forest management, as pursued in the 1990s, was not sustainable and did not take the potential natural forest into consideration; and pollution, eutrophication and increasing intensification of the nearby agricultural environment were also having a negative effect on fauna and flora.

Land ownership

Mixed ownership. BROZ purchased ~30 ha and leased ~300 ha (25–30-year leases) across several cadastres (Čunovo, Číčov, Veľké Kosihy, Zlatná na Ostrove).

Policy targets

Improved Biodiversity

Part of a wider plan

Oui

Wider plan

Wider plan type	Wider plan focus	Name
Project based	Forestry	Sustainable Forest Management Framework Strategy

Public consultation

Oui

Consultation activities

Activity type	Comments
Dissemination activities	tickers, posters, postcards, information panels and a website (in Slovak and English) and organising field excursions and training seminars

Has contractual arrangements

Oui

Contractual arrangements

Arrangement type	Responsibility	Name	Role	Comments
Contractual agreement	25–30-year leases	Land leasing	~300 ha leased by BROZ	Čunovo, Číčov, Veľké Kosihy, Zlatná na Ostrove

Impacts and Monitoring

Monitoring System

Monitoring requirements

Maintain hydromorphological and biological monitoring (probes, flows, sediments, fish/amphibians/vegetation) and use the results each year to set spring/summer simulated-flood discharges and durations.

Monitoring parameters

Surface- and groundwater levels from installed probes (with public data), discharge and flow velocity, profile surveys, bed and suspended sediment sampling, and water-level surveying. Biotic monitoring covers fish (rheophilic species response to barrier removal and higher velocities), amphibians (e.g., Bombina bombina, Triturus dobrogicus; timing/duration of simulated floods adjusted to breeding), molluscs (e.g., Vertigo moulinsiana, Valvata macrostoma), vegetation and invasive plants, pollinators, and general biotic observations; additional vegetation/eDNA checks are ongoing on nearby Danube-lowland sites managed by BROZ.

Maintenance

Maintenance requirements

After-LIFE plans : routine operation of the structures (weirs/sluice gates) to run the simulated floods, plus ongoing treatment of pollard willows, invasive-alien-species control, and upkeep of floodplain forest stands, pastures and hay meadows.

Socio-economic Impacts

Direct benefits information

New forest management plans were elaborated and approved for LHC Rusovce, Samorin, Gabcikovo and Calovo. These plans cover the whole project site area , include principal requirements for conservation and management of the Annex I habitats - residual alluvial forests and mixed oak-elm-ashforests.
The Gajc nature reserve was enlarged from 0.84 to 62.72 ha and a new 76.7 ha nature reserve, Stary haj, was designated. Proposals to designate two further areas (Foras and Gabcikovske luhy) as nature reserves and one (Pecniansky les)as a protected site were submitted to the competent authorities, along with proposals to enlarge the existing nature reserves at Ostrovne lucky and Cicovskemrtve rameno. The total area of the new proposed protected areas is 1 935.68 ha,substantially exceeding the original project plan of 549 ha.

Public backing: a petition “For Water for the Life of the Danube Inland Delta” gathered 11,603 signatures (2020), helping reopen negotiations on the water-regime.
Events & audiences: 19 school presentations (648 participants) and 15 public talks (1,450 participants); six annual Family Days reached ~3,000 visitors; 11 information boards installed; children’s summer camps ran repeatedly.
Land secured for conservation/management: 67.07 ha purchased and 349.22 ha leased (15–30 yrs) to guarantee long-term stewardship.
Traditional grazing reintroduced with local cooperatives: 8.1 ha (Bodíky), 22.04 ha (Veľký Lél), 28.5 ha (Apálsky ostrov); 23 ha of wet arable converted back to grassland near Číčov.

Biophysical impacts: Hydrology

Information on retained water

Side-arm reconnection and wetland works have restored >75 ha of wetlands, 18.5 km of free-flowing tributaries, and 225 m of riverbanks, improving hydraulic continuity and habitat access.
“Simulated floods” now re-water the branch system via the Dobrohošť inlet. In spring 2024 the flood ran 25 days with a 120 m^3/s peak for 15 days; a summer 2024 flood ran 21 days with 60 m^3/s for 18 days.
The Vojčianske side arm was reopened (Aug 2023–Jan 2024): 3.7 km of continuity restored, ~12,000 m^3 of sediment removed, culverts upsized; post-works monitoring is in place.
In spring 2025 the simulated flood lasted 34 days but reportedly did not exceed ~30 m^3/s, lower than 2024’s 120 m^3/s peak.

Biophysical impacts: Biodiversity

Improved biodiversity

Oui

Information on improved biodiversity

The improved conservation status of forest habitats has had a positive impact on a number of Annex II species, including Cerambyx cerdo, Lucanus cervus, Osmoderma eremita, Myotis myotis, Barbastella barbastellus, Myotis dasycneme and Myotis bechsteini. It has also benefited a number of species listed in the annexes of the Birds Directive, such as Dryocopus martius, Dendrocopos syriacus, Dendrocopos medius, Ciconia nigra, Haliaeetus albicilla, Milvus milvus, Milvus migrans and many others.

Information on increased permanent biomass

Tree restoration is ongoing. BROZ reports >30,000 native trees planted in 2020/21; the AT–SK Dynamic LIFE Lines Danube project notes 31,350 alluvial trees planted (and ongoing) in 2025 activities that include the Slovak sector near Gabčíkovo.

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

N/A info

Soil quality overall improvements

N/A info

Biophysical impacts: Others

Ecosystem impact climate regulation

Not relevant for the specific application

Lessons Learned

Key lessons

Management plans created in environmentla projects have the chance to enlarge Nature reserves and other protected areas.

Restoring flow in a regulated system required governance first, then earthworks. The team had to renegotiate operating rules and coordinate conservationists, water managers and energy companies before bringing back larger, regular “simulated floods”; only after that did side-arm dredging, culvert upgrades and weir reconstructions deliver full benefits.

Operations must follow ecology. Amphibian monitoring showed that timing and magnitude matter (e.g., early-spring floods and testing 120 m^3/s), and results were fed back into how floods are scheduled. Remote probes and an operations app now link ecological and hydraulic responses in near-real time.

Physical constraints and legacy pressures are real barriers. Decades of siltation and dozens of small barriers had degraded branches; in addition, buildings in the intended inundation zone capped flows for safety reasons until authorities addressed them. These constraints shaped what could be achieved, and when.

Public support helps unlock decisions. A 2020 petition and sustained outreach underpinned the agreement to resume and upscale simulated floods, and the project’s consensus-building was recognised at EU level.

Barriers

Barrier type	Barrier role	Comments
Other	Main barrier	Initial problems with land purchases
Lacking coordination between authorities	Main barrier	Administrative complexity that initially delayed or downsized floods.

Success factors

Success factor type	Success factor role	Comments
Successful coordination between authorities	Main factor	Formalised, multi-actor operating regime for floods (negotiations + updated rules).
Public participation	Main factor	Broad stakeholder and public backing (petition; EU Natura 2000 Award finalist for conflict resolution).

Transferability

Transferable to many regulated lowland rivers with floodplain forests, if governance and hydraulics align. Key checks: ability to release managed floods; feasibility to reopen side-arms; land tenure and safety of inundation zones; sediment and barrier loads; hydropower/navigation constraints; permits and funding; and an adaptive monitoring plan to tune timing, magnitude and duration.

Sources

Sources

DANUBE FORESTS - Conservation and management of Danube floodplain forests

Komplexná obnova dunajských lužných biotopov a podpora ich odolnosti voči inváznym druhom rastlín

Prehľad cieľov a opatrení (Dynamic LIFE Lines Danube – SK)

Obnova konektivity bočných ramien Dunaja: Gabčíkovo-Sap-Dolný Istragov

Final Report - Restoration and management of Danube floodplain habitats – LIFE Danube Floodplains (LIFE14 NAT/SK/001306)

Novinky (News)

Restoring Floodplain Forests - Along the Danube, Slovakia