Restoration of the Vesselina river, Bulgaria

Year of issue

2025

Summary

WWF’s Danube-Carpathian Programme, together with residents of Mindya (Veliko Tarnovo), reconnected the Veselina River to a former meander near the village. When the bend was cut off in the past the channel incised by ~150 cm, so a low sill was built (works 2007–2008) to raise water levels and route flow back into the old course.

The reconnection now creates slower, warmer waters that support breeding habitat for fish and birds and add retention during high flows.

Project timeline: initiated 2005, works completed April 2008; total cost ≈ €76 k funded by WWF and the DOEN Foundation. The reach lies on WFD water body BG1YN130R029, classified as HMWB.

In May 2012 the site was legally designated the “River Veselina” Protected Area, announced by the Ministry of Environment and Water on the International Day for Biological Diversity; the designation explicitly includes the restored meander. The protected area covers about 98.6 ha between Kapinovo and Mindya.

Since designation, local biodiversity work has documented amphibian and reptile assemblages within the protected area, adding evidence of habitat value.

Photo Gallery








Location

43.03027, 25.8261

Project

NWRM

National ID

Bulgaria_02

Sector

Hydromorphology

Installation Date

2008-09

Implementation status

Completed

Contact

Jovanka Ignjatovic

Overview

Location of the project

Between the villages of Kapinovo and Mindya (Veliko Tarnovo Municipality). The protected site is explicitly listed by the municipality as “Reka Veselina – Kapinovo & Mindya.”

Country

Bulgaria

NUTS2 Code

Северен централен (Severen tsentralen)

Sponge measures implemented in the case study

Re-meandering

Reconnection of oxbow lakes and similar features

Objectives

Restore ecosystem functions of the Veselina near Mindya
(i) conserving/restoring biodiversity in the old riverbed;
(ii) creating conditions for recreation/tourism;
(iii) reducing flood risk;
(iv) optimizing groundwater level and reducing drought/flood impacts on terrace agriculture;
(v) reducing erosion;
(vi) increasing self-purification capacity of waters. (No numerical targets stated in the sources.)

Involved partners

Authority type	Authority name	Authority role
NGO	WWF Bulgaria	Initiation of the measure
Local water authority	Municipality Veliko Turnovo	Implementation
National water authority	Danube River Basin Directorate	Implementation
Farmers	Hunting and Fishing Association in Mindya	Implementation
NGO	Water Engineering Veliko Tarnovo	Implementation
Private property owners	Foundation DOEN	Financing

Site Information

Climate Zone

Warm temperate dry

Precipitation

500.00 mm

Temperature (°C)

11.50 °C

Runoff

2.40 mm

Runoff coefficient

0.14

Imperviousness

30.00 %

Elevation range

103 m

Slope range

10 %

Vegetation class

Riparian woodland (alder–willow–poplar–oak) with a mosaic of meadows/pastures and wetlands along the river corridor; land cover around the site is classified as Woodland + presence documented of a permanent marsh presumed to be groundwater-fed

WFD Ecological status

Good

WFD Chemical status

Good

Water quality status

Domestic sewage discharges were signaled to the authorities on the Veselina at Kapinovo.

Design and Implementation

Project scale

Micro

Project scale specifications

This is a site-specific hydromorphological intervention on a short river reach near the village of Mindya (Veliko Tarnovo), reconnecting one former meander of the Veselina via a small sill/threshold; it does not span a basin or region. Works were carried out in 2007–2008 and the meander site later fell within the “River Veselina” Protected Area (designated 2012).

Project area

700000

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

18.00 ha

Size

1300.00

Size unit

m

Constraints

The river meander was cut off back in time, thus the river dug nearly 150 cm deeper into its bed.

Favourable preconditions

Natural riparian vegetation preserved.

Financing

Total cost

76000.00 €

Total cost information

Investigation/design 10–50 k€; stakeholder engagement 1–10 k€; works & supervision 1–10 k€; post-project maintenance < 1 k€; monitoring < 1 k€.

Costs maintenance information

Less than 1000 for Post-project management and maintenance

Administrative annual cost information

Less than 1000 for Monitoring

Financing authorities

Authority name	Type of funding
WWF	Private funds
Foundation DOEN	Private funds

Compensations

No

Policy and Governance

Policy description

River bed trained and many old meanders are isolated and drying; Decline and fragmentation ofatural riparian habitats.

Land ownership

Strictly public water bodies, and mostly public land.

Policy targets

Improved Biodiversity

Peak-flow reduction

Increase Water Storage

Target remarks

Works targeted a WFD-listed water body (BG1YN130R029, classed HMWB), with explicit aims to improve hydromorphology and fish community composition.

Ecological continuity

Landscape enhancement

Pressure remarks

Channel straightening

Artificially regulated hydrology

Former meander cut-off and resulting ~150 cm incision in the active channel

Riparian development

Degraded fish assemblage

Part of a wider plan

No

Public consultation

Yes

Consultation activities

Activity type
Pressconference
Booklet
Public awareness campaign

Has contractual arrangements

No

Impacts and Monitoring

Monitoring System

Monitoring requirements

Ongoing needs are regulatory inspections by RIOSV/Basin Directorate plus periodic biodiversity checks like the 2019 herpetofaunal survey.

Monitoring parameters

Macrozoobentos, macrophytes and phytobenthos

Upstream station

BG1YN06295MS180

Downstream station

BG1YN86291MS189

Maintenance

Maintenance requirements

Routine site maintenance is municipal (protected-area managers), with only minor post-project maintenance reported in the RESTORE record.

Impact Assessment Methodology

Performance impact assessment method

Catchment outlet

Performance impact estimation information

Monitoring of the natural riparian habitats

Socio-economic Impacts

Direct benefits information

Flood-risk & drought resilience (qualitative): WWF reports the reconnection reduced flood risks and soil erosion at Mindya, and that such restorations benefit local communities by reducing the impacts of floods and droughts and improving water self-purification.

Ancillary benefits information

Favorable conditions for development of recreation and tourism in the region

Biophysical impacts: Hydrology

Information on increased water storage

Optimization of groundwater level, but no monitoring results comfirm it yet.

Information on Restoring hydraulic connection

Former meander reconnected (~1,000 m); a low sill was built after ~150 cm incision so flow could return to the old bed. Reported effects: slower waters, added flood protection, less bank erosion.
Hydraulic annex created/restored: the old meander itself (site-scale annex).

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

Fish: case record notes “improvement in species composition” (qualitative post-works result). Continuity for organisms: “no change.”
Amphibians & reptiles (2019 survey within the protected site): 12 species recorded over 10 field days; e.g., Marsh frog (303 adults), European pond turtle (38); high use of a ~1.28-acre (≈0.52 ha) permanent marsh (likely groundwater-fed). This confirms good habitat status in/around the restored reach, though it’s not a before–after study.

Biophysical impacts: Water & Soil Quality

Information on water quality overall

increase in self-purification capacity

Ecosystem erosion control

Yes

Biophysical impacts: Others

Ecosystem impact climate regulation

No specific impact

Lessons Learned

Key lessons

Small, site-specific works can unlock wide benefits. Reconnecting ~1 km of former meander (2007–2008) with a low sill to overcome ~150 cm incision restored slow-water habitat and reduced local erosion/flood risk, and it helped trigger the 2012 designation of the “River Veselina” Protected Area that includes the site.
Community leadership is pivotal. The idea and early mobilization came from local groups in Mindya, with WWF and the DOEN Foundation financing the works; afterward, municipal mayors were assigned to manage the protected area, showing how civic initiative plus NGO support can translate into formal stewardship.
Design must address root causes of degradation. Because the channel had incised, the sill was essential to re-water the old bed and reconnect floodplain hydraulics; simply opening the cutoff would not have worked.
Ecological gains can be real yet uneven. The case reports improved fish species composition and richer lentic habitats, while “continuity for organisms” remained unchanged ; reminding us that meander reconnection alone may not fix longitudinal passage.
Monitoring gaps limit evidence. Objectives included groundwater optimization and self-purification, but no site-level hydrologic or water-quality time series were published. Later biodiversity fieldwork (2019) documented 12 amphibian/reptile species and a permanent marsh, yet it wasn’t a before–after study, underscoring the need to embed quantitative monitoring from the start.
Protection is not the end of pressure. Despite the protected status, recent records note sewage issues and attempted irrigation abstractions nearby, requiring ongoing oversight by RIOSV and the Basin Directorate. Legal protection helps, but enforcement and water-use governance remain critical.

Barriers

Barrier type	Barrier role	Comments
Existing technical standards	Main barrier	Cutting the existing dyke required reliable technical solution

Drivers

Driver type	Driver role	Comments
Organisation committed to it	Main driver	WWF Bulgaria

Success factors

Success factor type	Success factor role	Comments
Financing possibilities	Secondary factor	Relatively small budget was required for implementation
Existing staff and consultant knowledge	Main factor	—
Attitude of relevant stakeholders	Secondary factor	—

Transferability

Highly transferable to small, straightened river reaches with cut-off meanders. Check incision and, if needed, include a level-raising sill; secure base flows/water rights to keep the meander wet; confirm land tenure and protected-area rules; plan enforcement against abstractions/sewage; embed hydrology-and-biodiversity monitoring; and build strong local stewardship, as in Mindya.

Sources

Sources

Case study:Restoration of Vesselina River

New protected area for Bulgaria's Vesselina River

Amphibian and Reptile Diversity in Protected Site “Reka Veselina” – Current State and Prospects for Future Conservation

Контролна дейност на РИОСВ – Велико Търново през месец ноември 2023 г.

Отхвърлиха искането за изграждане на подземен водопровод в Церова кория

Reka Veselina – Protected Area (Register entry, code 536)

More space for rivers: Restoring former meanders, wetlands and abandoned fishponds in Bulgaria (Factsheet)

Опазване и възстановяване на речните коридори

Опазваме и възстановяваме реки и влажни зони – Виж нашите успехи

Арендатор с нарушения в опит за водовземане за напояване на земеделски площи

Flood Risk Management Plan for the Danube River Basin District (1st DFRMP)

Информация за защитените територии в Община Велико Търново

New protected area for Bulgaria’s Vesselina River

България има нова защитена местност (preview)