Alzette river restoration in the "Am Brill" nature reserve, Luxembourg

Year of issue

2025

Summary

The Alzette river restoration at “Am Brill” (Schifflange) reversed earlier channelisation that had uniformised the river and impoverished habitats. The project re-meandered the channel (+140 m length), raised and widened the bed (summer/winter profiles), and removed an artificial dyke to reconnect the river to existing ponds; a new pond was also created. Works were delivered in 2000 over ~600–700 m as part of the LIFE-Nature project “Ecological valorisation of the upper Alzette.” Reported outcomes include ≈30 cm reduction of high-water levels, ~20,000 m³ of floodplain storage, a delayed flood peak (~15 min) and shorter peak duration (42→24 min), together with improved self-purification capacity and habitat diversity. Since completion, the site has been opened to the public via a 3 km interpretive nature trail (2005), and in 2024 it was incorporated into the nationally protected “Brill – Am Pudel” reserve, confirming its long-term conservation status and management.

Photo Gallery





Location

49.509026, 6.007891

Project

NWRM

National ID

Lux_03

Sector

Hydromorphology

Installation Date

2000-2001

Implementation status

Completed

Overview

Location of the project

The project area extends between the bridge providing access to the motorway and the pedestrian bridge downstream of the ARBED railway in the locality "Am Brill" in Schifflange.

Country

Luxembourg

NUTS2 Code

Luxembourg

Sponge measures implemented in the case study

Re-meandering

Reconnection of oxbow lakes and similar features

Objectives

Restore natural planform and floodplain, reconnect ponds, enhance habitats for farmland/wetland birds; locally +140 m river length, ~20,000 m³ flood storage, ~30 cm reduction in peak stage; part of a corridor where 41 ha were purchased and >5 km restored by 2006.

Involved partners

Authority type	Authority name	Authority role	Authority responsibility

Local water authority	Municipal council of Schifflange	Initiation of the measure	Responsible
National water authority	Ministry of the Interior - Water Management Services	Implementation	Responsible
National water authority	Ministry of the Environment - Nature Conservation Service	Initiation of the measure	Responsible
Architects / Engineers	Micha Bunusevac design office	Determination of design details of the measure	Responsible

Site Information

Climate Zone

Cool temperate moist

Precipitation

853.00 mm

Temperature (°C)

9.20 °C

Elevation range

285 m

Vegetation class

Restored wet meadows (6510, 6410 Molinia meadows), alluvial alder/ash riparian forest (91E0), and hydrophilous tall-herb fringes (6430), with ponds/oxbows. Extensive grazing is used for management.

WFD Ecological status

Bad

WFD Chemical status

Failing to achieve good

Water quality status

Historic channelisation, urban/industrial pressures and wastewater/CSO impacts; locally the Alzette was “relatively polluted,” hence ponds are connected only during floods to avoid low-flow contamination.

Design and Implementation

Project scale

Micro

Project scale specifications

Single, site-specific reach at Schifflange (~700 m between the motorway access bridge and the footbridge below the ARBED railway), with local hydromorphological works and pond reconnection.

Size

700.00

Size unit

m

Constraints

No main constrain identified.

Financing

Total cost

700.00 €

Total cost information

The investments were essentialy dedicated to filling and clearing works.

Costs investment

600000.00 €

Costs investment information

The investments were essentialy dedicated to filling and clearing works.

Costs operation maintenance information

No information available

Financing authorities

Authority name	Type of funding	Comments	Financing share
European Union	EU-funds: LIFE+	8,400,000 LUF ≈ €208,231	30%
—	National funds	—	70%

Policy and Governance

Policy description

A flood in Schifflange happened in 1998. A proposition for a project was elaborated afterwards. The main objective was to restore the natural reserve "Am Brill" and to prevent flooding.

Land ownership

Mixed ownership: communal (Schifflange) plus other owners; parcels were also acquired by Fondation Hëllef fir d’Natur under the LIFE Alzette project; the area is now a national nature reserve (“Brill–Am Pudel”).

Policy targets

Peak-flow reduction

Improved Biodiversity

Target remarks

The sponge measure tackles floodplain disconnection, flood risk at Bestgen Mill, and ecological impoverishment from channelisation.

Part of a wider plan

No

Public consultation

No

Has contractual arrangements

No

Impacts and Monitoring

Impact Assessment Methodology

Performance impact assessment method

Unknown

Socio-economic Impacts

Direct benefits information

No information available

Ancillary benefits information

No information available

Biophysical impacts: Hydrology

Retained water

60000.00

Retained water unit

m3/day

Information on retained water

The water storage restoration contributed to 15 mintutes delay of the peak flow. The maximal flow duration were reduced frome 42 to 24 minutes. Documented: increased storage (~20,000 m³), ~30 cm decrease in high-water levels locally, slower velocities, later/shorter flood peaks downstream, +140 m channel length and reconnection of ponds to the flood regime.

Increased water storage

20000.00

Increased water storage unit

m3/year

Reducing flood risks quantity change

Lowering of the high water level by approximately 30 cm. Flood delay and shortening of the duration of maximum flow downstream.

Information on peak delay effects

Significant. The peak flow is delayed by 15 minutes.

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

Biodiversity improvement was expected.

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

Positive impact-WQ improvement

Information on water quality overall

Positive effects on water quality are expected due to the restoration of the ecosystem self-purification, but no assessment has been realised yet.

Soil quality overall improvements

N/A info

Biophysical impacts: Others

Ecosystem impact climate regulation

No information available

Lessons Learned

Key lessons

The Alzette river restoration project aimed at erasing the effect of the river chanelling, which caused the river uniformisation and an ecological impoverishment.
The project consisted in a remeandering, increase of the base level of the river, widening of the riverbed, reconnection of the river to existing ponds and creation of a new pond. The project contributed to restore the flood plain, to prevent flooding and erosion, to restore the natural functionning of the river, to improve the self purification capacity, to improve biodiversity and to intergrate the river in the natural landscape.
Its success lead to further renaturation for the river, for example in the city Steinsel (Alzette and its tributary river Pétrusse) in 2023.

Drivers

Driver type	Driver role	Comments
Past flooding events	Main driver	A flood event occurred in Schifflange in 1998.

Transferability

Highly transferable to channelised lowland rivers with floodplain space and off-line ponds. Key enablers: land purchase/exchange, multi-benefit design, public access. Cautions: stakeholder/landowner negotiations can be complex; ensure water-quality is considered in (dis)connecting wetlands.

Sources

Sources

Renaturation de l'Alzette au lieu-dit "Am Brill" à Schifflange

Renaturation des cours d'eau - Restauration des habitats humides

Renaturation de l’Alzette à Esch et Schifflange

Projet LIFE-nature - Revalorsation écologique de la vallée de l'Alzette à Schifflange

Présentation de la convention portant sur la «Renaturation de l’Alzette»