Alzette river restoration in Dumonshaff, Luxembourg

Year of issue

2025

Summary

In the 1950s–60s, the Alzette floodplain was straightened for intensive agriculture, reducing water retention and ecological value. At Dumontshaff (Schifflange), the project set out to restore river-floodplain functioning (frequent overbanking, wetland habitat recovery) and to shift meadows to extensive management (late mowing, no fertiliser or biocides). After feasibility and land reallocation, works returned the river to its natural thalweg, widened and raised the bed, reactivated a secondary arm, and enabled floodplain and wetland restoration.

The main works on the Dumontshaff–Lameschmillen reach were completed in 2005 within a ~1.4 km section of the Alzette (plus ~600 m of the Kiemelbaach), with thalweg relocation and bed re-profiling; a dedicated project page reports a cost of ~€920k (excl. VAT). The wetland was formally designated as a National Nature Reserve in May 2023. Management now relies on year-round extensive grazing by Galloway cattle and water buffalo over >40 ha, and a nature trail (~4.4 km, 24 stations, observation tower) supports public access. Ecological outcomes include the return of Greater Spearwort (Ranunculus lingua) in 2009 and regular breeding of White Stork in the restored valley. Nearby, further renaturation on the Kiemelbaach was undertaken in 2020, while broader Alzette restoration continues upstream in separate projects.

Photo Gallery





Location

49.5057481, 6.0142918

Project

NWRM

National ID

Luxembourg_01

Sector

Hydromorphology

Installation Date

1999

Implementation status

Completed

Contact

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Overview

Location of the project

North of Schifflange, along the Alzette floodplain between Chemin de Bergem and Lameschmillen, near the A4 and Rue Denis Netgen; trailhead at Chemin de Bergem (L-4149).

Country

Luxembourg

NUTS2 Code

Luxembourg

Sponge measures implemented in the case study

Re-meandering

Meadows and pastures

Objectives

Restore frequent floodplain connectivity and wetland habitats; shift channel to thalweg, widen bed, reactivate side arm; manage meadows extensively; increase storage & slow peaks (e.g., +20,000 m^3; −30 cm at Am Brill), lengthen river corridor (+140 m).

Involved partners

Authority type	Authority name	Authority role	Comments	Authority responsibility
National water authority	Sutainable development and infrastructure ministry	Initiation of the measure	Project management and financing	Responsible
Other	Agriculture, vineyard and rural development ministry	Initiation of the measure	Project management and financing	Responsible
Farmers	Famers (Friedrich from Bertange, Friedrich from Aspelt and Witry from Bergem)	Implementation	They developed extensive agriculture and extensive grazing	—
Other	Shifflange, Bettembourg, Mondercange and Roeser municipal administrations	Implementation	Project partner. They owned a part of plantations.	Responsible
Architects / Engineers	Micha Bunusevac design office	Determination of design details of the measure	—	Supporting
Other	Acacia hotel, An der Schmedd restaurant, De Pefferkar restaurant	Other	They propose meals including meat produced in the area of the project.	—
NGO	Proactif association	Other	This association helps people remote from the labour market. They have breeding activities.	Supporting

Documents

cs-lux-01-final_version.pdf (760.18 KB)

Site Information

Climate Zone

Cool temperate moist

Precipitation

853.00 mm

Temperature (°C)

9.00 °C

Elevation range

292 m

Vegetation class

Wetland herbaceous communities dominate: reedbeds (Phragmites roselières), tall-sedge meadows (magnocariçaies/cariçaies), wet Calthion meadows, eutrophic still waters and floodplain channels; with patches of alluvial/riparian woodland. The Natura 2000 habitat set includes 3150 (eutrophic lakes), 3260 (running waters with Ranunculion fluitantis), 6430 (tall-herb fringes) among others.

WFD Ecological status

Bad

WFD Chemical status

Failing to achieve good

Water quality status

Elevated nutrients and oxygen stress near Schifflange WWTP: ortho-P ~0.20 mg/L vs 0.07 good-status threshold; low O_2 saturation episodes; plus occasional accidental pollution events (2024).

Design and Implementation

Project scale

Meso

Project scale specifications

It addresses a river reach and floodplain (Alzette + Kiemelbaach) across multiple communes, shifting planform, reactivating side arms and managing ~100+ ha of floodplain grasslands: beyond a single micro-site but not a whole basin.

Project area

40

Project area specifications

The area of the project is approximately 40 ha. The biodiversity is affected by the project in the area itself. Concerning the flood risk, it is reduced downstream, about 2 km away from the area.

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

10.00 ha

Design capacity

The project was designed to restore a natural wetland area. The dimensions were based on the original area. This information comes from old micording wetlands, swamps and bogs.litary maps re

Principles

The project was designed to restore the natural functions of the river and of its flood plain. Works were designed on this principle. Another important target was the management of the area after the project. This involved extensive agriculture and extensive grazing. The overall land planning led to enrich the landscape and its aesthetic value.

Favourable preconditions

Land was owned by farmers. The possibility to proceed to land exchange was a good opportunity; otherwise farming activities would have been a big constraint.

Financing

Total cost information

No information available

Costs investment information

No information available

Costs capital

920000.00 €

Costs operation maintenance information

No information available

Financing authorities

Authority name	Type of funding	Comments	Financing share

European Union	EU-funds: LIFE+	“Ecological valorisation of the Alzette’s upper valley” received LIFE co-funding (project LIFE99-NAT/L/006284; local NGO natur&ëmwelt coordinated).	30 %

Policy and Governance

Policy description

In the 50s and the 60s, the alluvial plain of the Alzette river was deeply modified. The river was channelized, the valley bottom was drained and dried, intensive agriculture had been developed. As a consequence, this land planning increased flood risk downstream and had a significant impact on biodiversity and landscape.

Land ownership

Mixed: c.61% private, 17% Commune(s) (Schifflange/Mondercange/Bettembourg), 17% State, 0.4% inter-municipal syndicates, 4% natur&ëmwelt – Fondation Hëllef fir d’Natur.

Policy targets

Runoff control

Peak-flow reduction

Erosion Control

Improved Biodiversity

Target remarks

Even if the flood risk mitigation was not the main project of the project, it had a real impact on it. Indeed, due to the large area concerned by the project, the impact on water retention and flood mitigation was relay important. Although, as it was not the main objective, the impact downstream was not assessed.

Policy pressure

Directive	Relevant pressure
WFD identified pressure	Physical alteration of channel/bed/riparian area/shore of water body for agriculture
Floods Directive identified pressure	Other pressure contributing to flooding /flood risk

Policy impact

Directive	Relevant impact
Floods Directive identified pressure	Protected areas

Directive	Relevant impact
Floods Directive identified pressure	Landscape
Floods Directive identified pressure	Rural Land Use
WFD identified pressure	Altered habitats due to morphological changes

Requirement directive

Requirement directive	Specification
Other EU	Habitat directive 92/43/EEC
WFD-achieving objectives for Protected areas	A bird protection area was implemented
WFD-mitigation of significant pressure	Restoration of the water course itself

Policy challenges requirements

The project targets are in line with the Luxembourg legislation. Thus, the law published the 19th January 2004 about nature protection provides conservation and restoration of ecological values.

Part of a wider plan

No

Public consultation

No

Has contractual arrangements

No

Impacts and Monitoring

Monitoring System

Monitoring parameters

A biological monitoring is realized. Animal and plant species are observed and counted.

Socio-economic Impacts

Direct benefits information

The main benefit is due to biodiversity improvement.

Ancillary benefits information

The wetland rehabilitation led to reduce flood risks downstream. The wetland also has a water purification function.

Biophysical impacts: Hydrology

Information on retained water

Flood storage & attenuation: at the adjacent Am Brill reach, ~20,000 m³ added storage and ~30 cm reduction in high-water level; Dumontshaff reach: floodplain reconnection & reactivated secondary channel (qualitative gain).

Information on runoff reduction

Wetland functions of the area were restored. The flood plain is filled by rain falls and then restitutes water. As a consequence, the project led to a reduction in runoff. However, this effect has not been quantified.

Information on peak flow reduction

The rainwater storage in the wetland shifts the peak flow and reduces it thanks to the overall vegetation and natural pounds. However, this effect has not been quantified.

Information on reducing flood risks quantity

Due to the peak flow shift and reduction, the project contributes to reduce flood risks. As it was an environmental project, this was not assessed.

Information on peak delay effects

The rainwater storage in the wetland shifts the peak flow and reduces it thanks to the overall vegetation and natural pounds.

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

The extensive grazing and the restoration of the river and of wetlands were beneficial for water quality and for the development of biodiversity (insects, birds, bats, etc.).

Biophysical impacts: Water & Soil Quality

Information on water quality overall

Wetlands have self purifying capacities. In contrast to channeled rivers, wetlands and pounds increase oxygen exchange. This oxygen allows the development of activities of micro-organisms which degrade organic matter. Wetlands are also a place of sedimentation.

Information on soil quality overall improvements

N/A

Biophysical impacts: Others

Ecosystem impact climate regulation

Increased permanent biomass

Lessons Learned

Key lessons

The Alzette restoration led to the development of extensive agriculture. The river restoration has many benefits for biological diversity and landscape beauty. It can be economically rewarding by changing the type of land-use and socio-economic settings. Although the main objective was to improve the ecological state of the area, the project has big impact on flood prevention and flood mitigation. The hydraulic effects (flood protection) and public awar ness rising are essential to increase public acceptance for such projects. Its success lead to further renaturation for the river, for example in the city Steinsel (Alzette and its tributary river Pétrusse) in 2023.

Transferability

Approach is transferable to straightened lowland rivers with available floodplain space. Critical enablers: land tenure/multi-owner agreements, room for lateral migration, and nutrient-source control upstream. National guidance stresses integrating hydraulic, habitat and water-quality goals and designing for frequent floods, not just rare extremes

Sources

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La nature mise en valeur

Renaturation de l'Alzette au "Dumontshaff"

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»