River basin management of the Ill, France

Year of issue

2025

Summary

Along the Ill between Colmar and Strasbourg, a basin-wide programme combines classical flood protection (dykes, optimisation/automation of barrages) with NWRM (riparian forest restoration, oxbow reconnections, stream re-naturalisation) to lower flood peaks, increase storage, curb erosion and enhance biodiversity. Initiated by the former Alsace Region, delivery today is ensured by the mixed association now called “Rivières de Haute-Alsace” (created in 2017; name adopted in 2020). The 2014–2024 Ill management scheme (~€19 m) included major works at Erstein’s Steinsau barrage: full refurbishment with a fish pass equipped for video-counting and six fish-friendly Archimedean screws for hydropower; Steinsau and nearby Boeschey are presented locally as multi-functional (flood safety, ecology, leisure, energy). The strategic framework continues in cycle-2 planning: the 2022–2027 Flood Risk Management Plan for Rhin-Meuse keeps priority on risk reduction, nature-based retention and space for rivers, while the SAGE “Ill–Nappe–Rhin” remains the operational reference (CLE renewed by prefectural order on 16 May 2024). Natura 2000 objectives in the Grand Ried also support reconnection and management of side arms to sustain floodplain habitats and functions.

Photo Gallery



Location

48.583148, 7.747882

Project

NWRM

National ID

France 05 light

Sector

Agriculture

Implementation status

Completed

Contact

Sabine Tutte, ACTeon

Overview

Location of the project

Ill floodplain between Colmar and Strasbourg (Grand Ried), e.g., around Erstein’s Steinsau barrage near the A35 corridor

Country

France

NUTS2 Code

Alsace

Sponge measures implemented in the case study

Meadows and pastures

Forest riparian buffers

Stream bed re-naturalisation

Reconnection of oxbow lakes and similar features

Removal of dams and other longitudinal barriers

Objectives

The mobility of the river shall be preserved without encouraging further erosion. Therefore a land allocation process starts, alluvial forests are planted (68 km) and where possible barrages and bank stabilisations are deconstructed. Moreover, 15 hydraulic annexes are reconnected to the river in order to improve water storage capacity and solve water distribution problems. A discharge rill is constructed to the forest near Colmar in order to inundate the wood during flood events and protect fields and communities.

Involved partners

Authority type	Authority name	Authority role	Comments	Authority responsibility
Other	Region of Alsace	Initiation of the measure	Original initiator of the measures, the region was also responsible for financing.	—

Authority type	Authority name	Authority role	Comments	Authority responsibility
Regional / sub-national water authority	AERM (Agence de l'eau Rhin-Meuse)	Financing	One of the main project financers	Supporting
Other	Conseils Généraux du Bas et Haut Rhin	Financing	Touristic development	Supporting
Other	ADEME (Environment and Energy Agency)	Financing	Financial support of hydropower projects (deconstruction off barrages, installation of fish passes...)	—
Other	Municipalities	Other	Maintenance/ development of touristic activities and communal hydropower stations	—
Local water authority	Syndicat Mixte du Bassin de l'Ill aux Rivières de Haute Alsace	Implementation	Current project owner and responsible organization for river basin management in the area.	Responsible

Site Information

Climate Zone

Cool temperate dry

Precipitation

550.00 mm

Temperature (°C)

10.00 °C

Runoff

58.00 mm

Elevation range

151 m

Vegetation class

Alluvial riparian forests and floodplain meadows/roselières of the Grand Ried; ongoing riparian planting and side-arm reconnections are policy objectives.

WFD Ecological status

Bad

WFD Chemical status

Failing to achieve good

Water quality status

Agricultural nutrients/pesticides, hydromorphological alteration by structures, and groundwater stress; several surface-water bodies in the Upper Rhine sector show significant “substances” pressures.

Design and Implementation

Project scale

Meso

Project scale specifications

River-reach/basin management between Colmar and Strasbourg, coordinating barrages, dyke works, riparian forests, and reconnection of multiple side arms across many communes.

Project area

12000

Principles

Multifunctionality (flood safety + ecology + recreation + energy); restoration/reconnection of floodplain units; automatisation/optimisation of barrages; fish passage. The Steinsau fishway has 8 pools (15 cm drops); hydropower via six Archimedean screws (~1 GWh/yr). No design storm or storage volumes are published in the sources.

Factor constraints

Very low-gradient alluvial plain (Grand Ried) with high, near-surface Rhine aquifer; wide floodplain enables reconnections but silting can reclog side arms in 10–15 years; mixed ownership mosaic.

Constraints

Partly dams have to be constructed or reinforced, otherwise the risk of severe inundation would not be justifiable. In order to maintain the natural mobility of the river, land of farmers has to be reallocated.

Financing

Total cost

25500000.00 €

Total cost information

19 to 32 million Euros: Next to NWRMs, construction costs for dykes and improvement of barrages and facilities appear. Moreover, the touristic branch is supported by several projects, and hydropower is encouraged as well.

Costs investment

12500000.00 €

Costs investment information

10 to 15 million Euros: plantation of forests, land acquisition, dyke renovation.

Costs operation maintenance information

No data available

Economic costs additional

300000.00 €

Information on Economic costs additional

Total costs for publicity

Administrative annual costs

340000.00 €

Administrative annual cost information

Installation of counting stations on fish passes.

Financing authorities

Type of funding	Comments
EU-funds: Rural development funds	Support of sustainable farming (crop rotation, green cover...).
Local funds	Renovation of dykes, touristic development.
National funds	Support of hydropower projects.
Sub-national funds	Renovation of barrages, NWRM, Agro-environmental measures.
Sub-national funds	Publicity, support of hydropower, touristic development.

Compensations annual

2000000.00 €

Compensations annual information

Support of farmers by agro-environmental measures (encouragement of green cover, pastures, meadows, crop rotation).

Compensations scheme information

The agricultural compensations made in the context of EU CAP Pillar 2.

Policy and Governance

Policy description

The flood protection of commuities and fields is partly unsufficient. Due to erosion there is a remarkable loss of usable agricultural surface. Barrages and hydropower plants disturb the sediment transport of the river and are not passable for fish and boats. A natural alluvial forest is often missing and shall be restored for water quality improvement and fight against invasive species.

Land ownership

The Ill is state public river from Colmar to Strasbourg; key barrages (Steinsau, Boeschey, Kraft) are owned/managed by Région Grand Est. Floodplain forests in the Grand Ried are mostly public (state & communal), with some private parcels.

Policy targets

Peak-flow reduction

Increase Water Storage

Erosion Control

Improved Biodiversity

Oher Societal Benefits

Pressure remarks

The flood protection for some communities is missing, barrages and hydropower plants are not passable for fish and boats.

Part of a wider plan

No

Public consultation

No

Consultation activities

Activity stage	Activity type	Key issues
Implementation phase	Guide "rights and duties of riparians"	This is foreseen in project planning in order to educate the public.

Has contractual arrangements

No

Contractual arrangements

Comments
The project has to pass the autorisation steps of the French Water Law. Moreover it has to be proven that the project is of public utility and of public interest in order to mobilize national funds

Impacts and Monitoring

Monitoring System

Monitoring parameters

Stations for counting fish are installed next to barrages and hydropower plants.

Socio-economic Impacts

Direct benefits information

During the project the tourism branch is supported by improved water/ terrestrial trekking ways, better recreational spaces (bivouacs, camping, hotel restaurant access).

Ancillary benefits information

Without the management plan, 6.1 - 8 Mio € per year have to be foreseen as costs for floods.

Biophysical impacts: Hydrology

Information on retained water

By reconnecting hydraulic annexes, installing discharge rills to flood forests and reallocation of land neighboring the river, the water retention capacity gets increased.

Information on runoff reduction

This shall be achieved by natural bank stabilisation and deconstruction of old barrages. By purchasing land a "mobility space" for the river shall be guaranteed.

Information on Restoring hydraulic connection

Connections are restored.

Biophysical impacts: Biodiversity

Information on improved biodiversity

Control campaigns for Himalayan Balsam and Japanese Knotweed; plantation of alluvial forests (high species diversity due to diverse habitats).

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

N/A info

Information on water quality overall

This shall be achieved by restoring 68 km of alluvial forests next to the Ill.

Soil quality overall improvements

N/A info

Biophysical impacts: Others

Information on ecosystem impact climate regulation

No information available

Lessons Learned

Key lessons

This management plan combines classical flood protection measures (construction of dykes, automatisation/optimization of barrages) with NWRM. It is difficult to have information on success (especially quantitative data) and monitoring. However, ecosystem services are taken into account to justify the measures.

The Ill basin management is still ongoing, with frequent subprojects. For example a 2019 flood plain reconnexion was carried out (with €850,000 funding from AERM) along with the creation of 0.75 ha of wetlands, 4.2 ha of woods, 3.5 ha of other vegetalized space). In 2023, a natural bank protection was carried out in Réguisheim for a total cost of €50,000.

Barriers

Barrier type	Barrier role
Attitude of decision makers	Secondary barrier

Drivers

Driver type	Driver role	Comments
Legal obligations	Main driver	The good ecological status of the Ill has to be achieved.
Past flooding events	Main driver	Due to regular floods in winter and spring there are severe damages on pastures and fields. Valuable agricultural land is lost (approx. 150 ha in 10 years). Agriculture is a very important economic branch with a gross margin of 16 million €
Public pressure	Main driver	Flood protection is partly missing for entire villages (Kogenheim 1000 inhabitants). Dykes have weak points and need to be renovated.
Balancing different objectives	Secondary driver	Water and terrestrial hiking pathways are missing. Barrages are not passable, and dangerous due to a lack of signalisation. Fishing associations wish a better accessibility to the river.

Success factors

Success factor type	Success factor role	Comments
Financing possibilities	Main factor	Since the project is in the implementation phase, there is no sufficient information.

Transferability

High to other lowland rivers with levees/dams—requires strong basin governance, land re-allocation capacity, and long-term O&M; watch for side-arm silting that may close reconnections within 10–15 years.

Sources

Sources

Vers un schéma de gestion globale de l'Ill domaniale entre Colmar et Strasbourg, Synd'Ill Huttenheim

Etude diagnostic et élaboration d'un schéma de gestion globale de l'ill domaniale et ses lits mineur et majeur

Annexe 12 - Planning Schéma de gestion de l'ill 2014-2024

Retrospective of the River Syndicates’ Work in Haut-Rhin, 2002–2022

Rivieres de Haute Alsace 2023 Activity Report