

Creation of flood channels and restoration of exchanges between the flood plain and the low-flow channel on the Vezouze

The operation

Category	Restoration
Type of operation	Removal of river embankment or riverbank protection
Type of environment	Lowland river
Issues at stake (water, biodiversity, climate)	Water resources (quantity)
Start of operation	May 2007
End of operation	August 2007
Length of river affected by the works	1000 m

River in the restored sector

Name	La Vezouze
Distance to source	72.5 km
Mean width	20 m
Gradient	1.5%
Mean flow rate	6.8 m ³ /s

Aims of the project owner

- Reliable and sustainable management of flooding by encouraging storage in the flood plains
- Restore the river to its active floodplain
- Reduce flood risk



The Vezouze at Lunéville before restoration work.
The levee on the left bank prevents flood storage in the flood plain

Location

Country	France
River basin	Rhin-Meuse
Region(s)	Lorraine
Département(s)	Meurthe et Moselle
Commune(s)	Lunéville



Environment and pressures

The Vezouze is a 75 kilometres long classified as a second category fishery. A tributary of the Meurthe, it has a 560 km² river catchment, mainly agricultural. The Vezouze has a rain-fed system experiencing rapid impact of rainfall on its flow. This results in regular and often violent floods in the urbanised area of Lunéville. This is in fact worsened in the urban district by other factors such as reduced natural flood storage areas or poor drainage conditions. Strong urban pressure in the sector, combined with the risk of flooding, broadly encouraged bank stabilisation works of the watercourse. Thus, protective levees and rock armour protection banks had been set up and the river was regularly dredged. Consequently these developments blocked the natural dynamics of the river and reduced potential overflow of rivers into its flood storage area.

Regulatory context	Not applicable
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European directive references

Water body ref.	FRCR286
Natura 2000 site ref.	FR4100192 upstream to the work site

■ Opportunities to act

Following the major floods of 1983, 1998 and 2004, the intercommunal district of Lunéillois launched a general development programme to ensure better protection of the population against flooding. In this context, several operations were set up to create flood defences. They include works on the town's mains sewage and rainwater networks, the establishment of close flood defence systems but, in particular, the restoration of flood storage areas.

■ Works and developments

The work consisted of widening the river's middle water channel in some places. For this, a protective levee has been levelled on the left bank. Two flood channels, measuring one metre on average over 6 hectares, have been dug, involving the removal of 60,000 m³ of material. Within these flood channels, wetland environments such as ponds and side channels have been created. Trees have been planted on the banks as well as helophytes in flood channels. In addition to these actions on the environment, work on the rainwater system has also been undertaken: check valves and pumping stations have been set up.

■ Regulatory approach

Authorisation application filed under the "dossier d'autorisation" consent according to the French Water Act. The application dates back to 2006, so it was filed using the old nomenclature. Here is the correspondence with the new one:

3.1.2.0: Modification of the longitudinal or cross profile of a low-flow channel of a watercourse or diversion of a watercourse

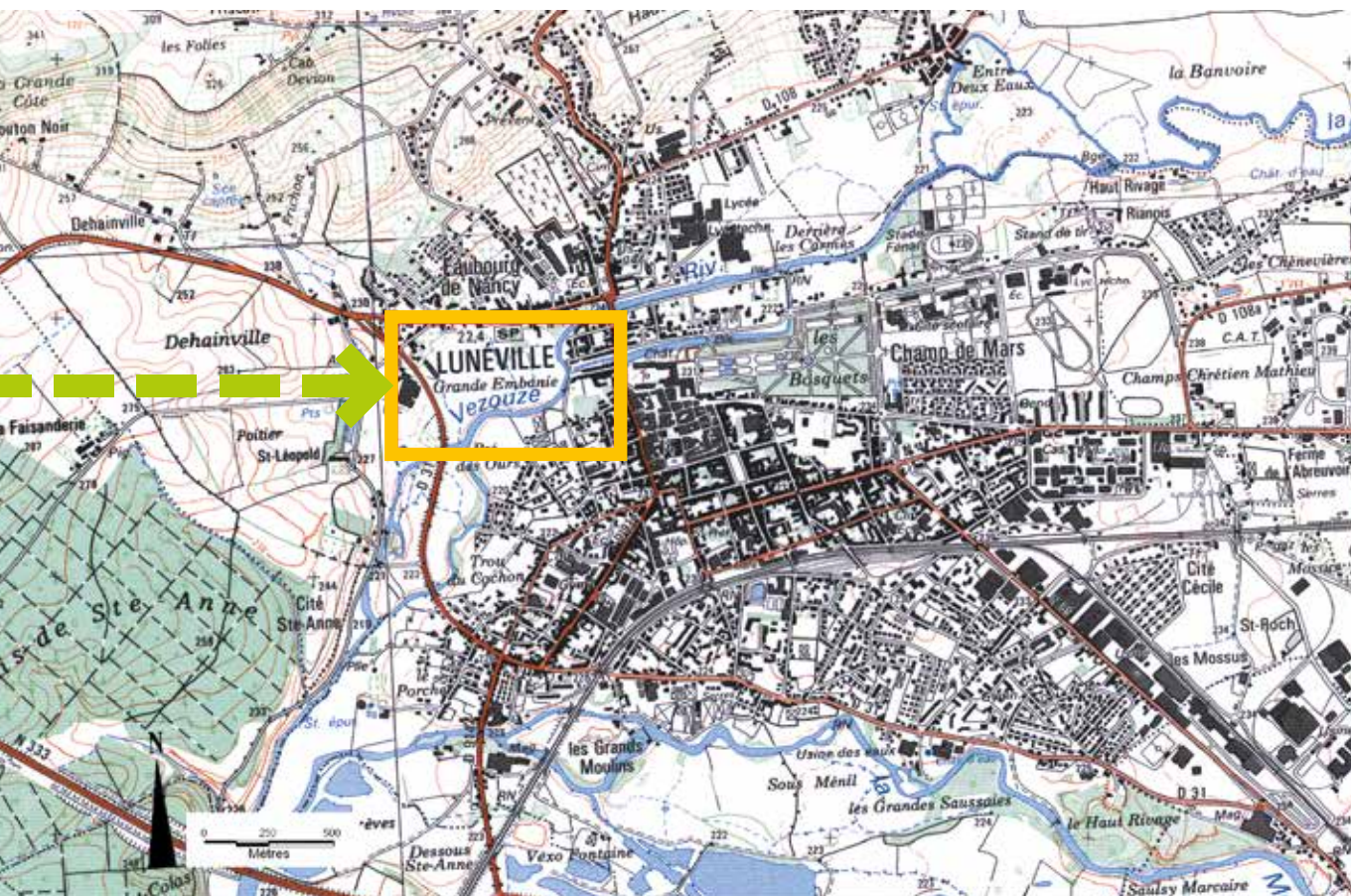
3.2.2.0: Installations, structures or embankments in the low-flow channel of a watercourse

3.1.4.0: Riverbank consolidation or protection

3.2.1.0: Maintenance of the watercourse

■ Post-restoration management

The Vezouze maintenance syndicate manages the removal of blockage and debris as required.



■ Monitoring

A pre-restoration monitoring was carried out by a consultancy in 2000 and again in 2003, 2004 and 2005 on the hydraulic component. Investigations were required to study the hydrography, hydrology, topography and geology of the land. A bibliographic study was used to describe the biological component of the aquatic environment. Post-restoration ecological monitoring (habitats, species) began in 2010 and will continue until 2014. This monitoring consists of describing the natural environment and assessing the impacts (positive and/or negative) of operations on animal and plant life, specifically targeting the restored flood plain and side channels created. The hydromorphology and biological communities living in the low-flow channel (fish, aquatic invertebrates, etc.) are however not investigated in this work.

The first results of 2010 and 2011 highlight several outstanding species for Lorraine, including insect and plant species. It will therefore be very interesting to monitor the evolution of these species on the site. Particular attention will be paid to plants receiving protected status, as these species were most likely to have been introduced during the restoration work.



Philippe Russo - Rhin-Meuse Water Agency

Flood plain of the Vezouze. Creation of a flood channel on the left bank - work phase - July 2007



Philippe Russo - Rhin-Meuse Water Agency

Flood plain of the Vezouze. Flood channel on the left bank - 6 months after the work - December 2007

Flood plain of the Vezouze. Flood channel on the left bank - 2 years after the work - May 2009



Pierre Mangeot - Rhin-Meuse Water Agency

Costs

In euros ex. VAT

Cost of studies	50.000 €
Cost of acquisitions	180.000 €
Cost of works and developments	1.700.000 €
Cost of promotion	not applicable
Total cost of the action	1.930.000 €

Financial Partners:

Regional Directorate for the Environment (DIREN): 20.5%; Water agency: 34%

Technical partners of the project:

Water agency, DIREN.

Outcome of the project and outlook

The ecological evolution of the site is very satisfactory. The results of monitoring attest to the positive effects of the work on biodiversity with the presence of wildlife characteristic of wetlands and the presence of outstanding species in terms of flora and insect life. The evolution and diversification of the side channels, which have a dense vegetation of helophyte-type plants, are also very conducive to pike reproduction (even though there is no monitoring of this aspect, side channels here show strong potential).

Hydraulically, the results are equally satisfactory. Upstream to the restored area, height and surfaces of areas flooded in Lunéville have significantly diminished.

As the primary objective of this restoration is flood defence, the explanation to elected representatives of the benefits of preserving the flood storage area and diversifying habitats in the flood plain has

led to the setting up of a project that reconciles hydraulic and ecological objectives. Cross-cutting objectives particularly motivated elected representatives who were thus able to meet the expectations of the local population in terms of safety and landscaping issues. These developments make it possible to combine flood management and improvement of the ecological status of the river.

In addition, a pedestrian path has been created in the area and its regular use reflects the renewed interest of local people for the site. Previously, they tended to avoid this unattractive, unsightly sector. The work thus helped to enhance "nature" in a peri-urban area.

Promotion of the project

A project sheet promoting these works was produced by the water agency. Other promotional actions are planned in the medium term.



Project owner

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