



LIFE rivière Dordogne

A pilot project for the restoration of large waterways

The LIFE project initiated by EPIDOR, the public territorial organisation for the Dordogne river basin, is implementing an action program on an unprecedented scale to restore the natural aquatic and alluvial habitats of the Dordogne river. This experience is feeding into a national debate led by the OFB on hydro-morphological river management strategies.

Hydro-morphological problems

The hydro-morphological restoration of watercourses is presently a course of action widely encouraged by public policy. However, while there is an increasing number of projects on small and medium-sized rivers, there are still very few on larger rivers, due to technical difficulties, complex usage issues and the considerable resources required.

The hydro-morphological balance of the Dordogne has been largely affected by the exploitation of river resources and the intensification of development since the middle of the 20th century. These transformations have had a significant impact on certain natural habitats and biodiversity.

As with many other French and European rivers, morpho-dynamic dysfunctions on the Dordogne are the consequence of past uses and current developments. The large hydroelectric dams on the upper Dordogne have altered hydrological regimes, and the frequency of morphogenic floods has fallen sharply. These events, which used to occur every two years, now only occur every ten years. The dams also block the flow of sediment from the upper basin.

Historical extraction of aggregates in the minor riverbed has caused the bed to sink by up to 4 metres in places. Some extraction pits, which have still not been filled in, continue to act as pebble traps, altering sediment transit. The installation of stabilising structures on riverbanks reduces transverse mobility and sediment remobilisation, thus slowing down the rebalancing processes.

As a result, over the last fifty years, the fluvial forms of the Dordogne river have been transformed, both longitudinally and altitudinally. The disruption of sediment transit and the reduction in the thickness of the alluvial mattress have caused the bed to sink by an average of

60 cm. The active channel belt width has been reduced by around 30 meters, with a tendency towards single channelisation (deepening of the bed, increased water velocity).

The disruption of sediment transit and the widespread incision of the Dordogne riverbed are causing profound changes for species and habitats of national and European interest. The blockage of coarse materials by large hydro-electric dams has severely degraded the breeding conditions of several migratory fish species of Community Interest.

Gravels, essential for the reproduction of lithophilic fish such as salmon, are progressively washed away by floods and are no longer replenished by large dams upstream. As a result, areas suitable for reproduction are shrinking. For shad and sea lamprey, the main repro-

duction sites are forced spawning grounds downstream of the Bergerac dams. These areas are suffering from gravel deficits, which are increasing and as a result reducing the survival of deposited eggs.

Widespread bed incision is leading to the disconnection of hydraulic annexes. These environments, normally home to a wide variety of interwoven habitats distributed in mosaics organized by river dynamics, are tending to become commonplace. Plant and animal biodiversity is declining, and species of heritage interest, often protected, are becoming more rare: Michel's nutsedge, false sedge, kingfisher, agile frog, otter, Aquitaine pike, to name but a few. Pioneer habitats such as willow shrublands are replaced by hardwood formations (ash-alder stands, black poplars, etc.), and aggradations are fixed by rapid vegetation growth.



FIGURE 1 *Degraded habitats* © EPIDOR

Restoration work and land management

To reduce morphological alterations caused by river development, the LIFE rivière Dordogne project aims to restore sites with high ecological potential. It comprises a total of around thirty projects. Part of the action plan concerns spawning grounds for migratory fish: on the upstream section, a dozen salmon spawning grounds will be restored through targeted injections of pebbles and gravel.

Feedback on this method has been satisfactory, and suggests that the surface area usable by fish could be doubled. For shad and sea lam-

prey, a pilot project is planned at the Mauzac hydroelectric dam, to transfer some of the sediment stored in the reservoir to forced spawning grounds located downstream.

A second set of works is aimed at the ecological restoration of ten dead-arms, two sections of riprap bank and four former gravel pits, now abandoned. The principles employed are mainly topographical reconfiguration through cut and fill, to restore a better hydraulic connection with the riverbed. The earthworks recreate natural, diversified river forms, conducive to the development of a variety of habitats. To help restore the river's sediment balance and minimize the carbon footprint of the works, the excavated sediment is reinjected as close as pos-

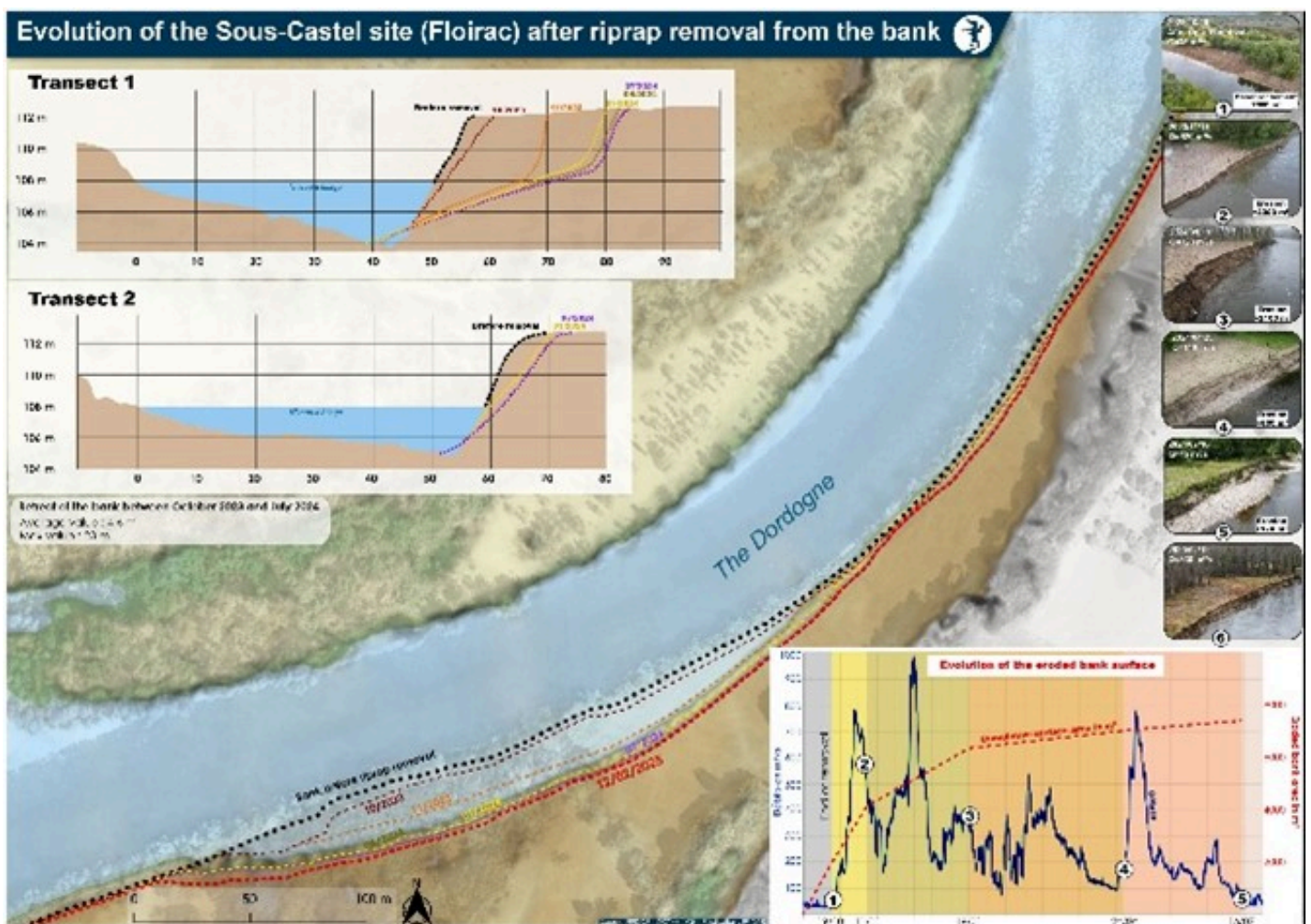


FIGURE 2 Evolution after rip rap removal © EPIDOR

sible to the riverbed. Particular attention is paid to invasive species, which are treated on site whenever possible. Results objectives and monitoring indicators are based on biological states and characteristic species.



FIGURE 3 *Floirac reconstruction works* © EPIDOR

On the Maison-Neuve alluvial plain (municipalities of Saint-Chamassy and le Buisson-de-Cadouin), for almost two centuries, various phases of exploitation and development have progressively reduced the spaces where the flora and fauna characteristic of alluvial environments could develop. Once frequently visited by water, the plain has been reshaped, becoming an ecologically very homogenous area with little connection to the river. In 2024, major work was carried out under the LIFE rivière Dordogne program, coordinated by EPIDOR, to restore 22 ha of alluvial environments.

Once renatured, the former Maison-Neuve gravel pit should be home to a greater number and diversity of plant and animal species. Benefits for the environment are also expected. These include improving the quality of natural areas. The reconnection of a wetland on the site to the Dordogne will make it more functional when the river overflows. This newly renatured area should provide favorable benefits for human activities, thanks in particular to:

- a 22-hectare flood control area;
- an area for self-purification of the water resource, with avoided denitrification costs estimated at 200,000 to 250,000 euros.
- maintenance of agricultural activity on the alluvial plain in the form of late-mown meadows.

To ensure better conservation and facilitate restoration work along the river continuum, the LIFE project aims to acquire land bordering the public river domain. The land targeted for acquisition is located alongside the river and contains habitats in a good state of conservation, or with potential for ecological restoration.



FIGURE 4 *Dordogne former Maison-Neuve gravel pit (1)* © EPIDOR



FIGURE 5 *Dordogne former Maison-Neuve gravel pit (2)* © EPIDOR

Initially, land acquisitions are carried out on sites concerned by restoration work, or in response to opportunities. In the longer term, a strategy involving the various players involved in land and nature conservation (local authorities, EPCIs, Conservatoire d'espaces naturels, Safer, départements, fishing and hunting federations) will make it possible to ensure the long-term viability of land actions.

Expected impacts and experiences

The LIFE project aims not only to improve the ecological status of natural environments, but also to push forward river-related planning and management policies. It is thus planned, in conjunction with government departments, to revise various regulatory measures in the light of the lessons learned from the LIFE project: biotope protection decrees, regulations gov-

erning hydroelectric works, directives concerning the restoration of alluvial gravel pits, etc.

All the French and European partners involved in the LIFE Dordogne project see it as an opportunity to develop a broader reflection on the technical and strategic aspects of river management. Coordinated by the OFB and its waterways resource centre, and fed by exchange sessions led by ANEB, this reflection will give rise to the drafting of a practical guide, in French and English, aimed at institutions concerned by this issue. Similar exchanges on a European scale with ECRR will be promoted in the form of a seminar organized in the Dordogne basin, as well as an international symposium.

For more information on the project: www.life-dordogne.eu.

Views and opinions expressed in the article are those of the author only and do not necessarily reflect those of the European Union or the beneficiaries of the project. Neither the European Union nor the beneficiaries can be held responsible for them.



FIGURE 6 Floirac a while after the reconstruction works © EPIDOR