

Restoring the natural dynamics of the upper Adour

The operation

Category	Restoration
Type of operation	Removal of riverbank protection or river embankments
Type of environment	Intermediate river zone
Issues at stake (water, biodiversity, climate)	Good habitat status, control of invasive species
Start of operation	1997
End of operation	2004
Length of river affected by the works	12,100 m

River in the restored sector

Name	Adour river
Distance from the source (at upstream end of works section)	25 km
Mean width	Single channel: 9 to 15 m Braided channel: 15 to 50 m
Mean gradient	Single channel: 17‰ Braided channel: 10‰
Mean discharge	9.57 m ³ /s

Aims of the project owner

- Restore the physical quality of the river.
- Improve its ecological functions.
- Dissipate flood flows.

Environment and pressures

The Adour River in Southwest France spans a basin covering 17 000 km². It flows a total of 309 kilometres before it enters the Atlantic Ocean (Bay of Biscay). The river is a passageway for migratory fish and the river stretch around Bagnères-de-Bigorre is of importance for salmonid reproduction. Over the first 6.2 kilometres, the river bed naturally forms a single channel, then a braided channel over the remaining 5.6 kilometres of the section affected by the works. In this sector are a number of alluvial bars and more or less connected secondary channels. The substrate consists essentially of stones and pebbles. The area is covered by a biotope-protection decree for brown trout and the Pyrenean desman. Very little land along the river is cultivated and the alluvial forest still exists.

The location

Country	France
River basin	Adour - Garonne
Region(s)	Midi-Pyrénées
Department(s)	Hautes-Pyrénées
Commune(s)	Bagnères-de-Bigorre, Pouzac, Ordizan, Montgaillard, Hiis



Regulatory context	Prefectoral decree for biotope protection
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European directive references

Water-body ref.:	FRFR236 and FRFR237B
Natura 2000 site ref.:	Not applicable



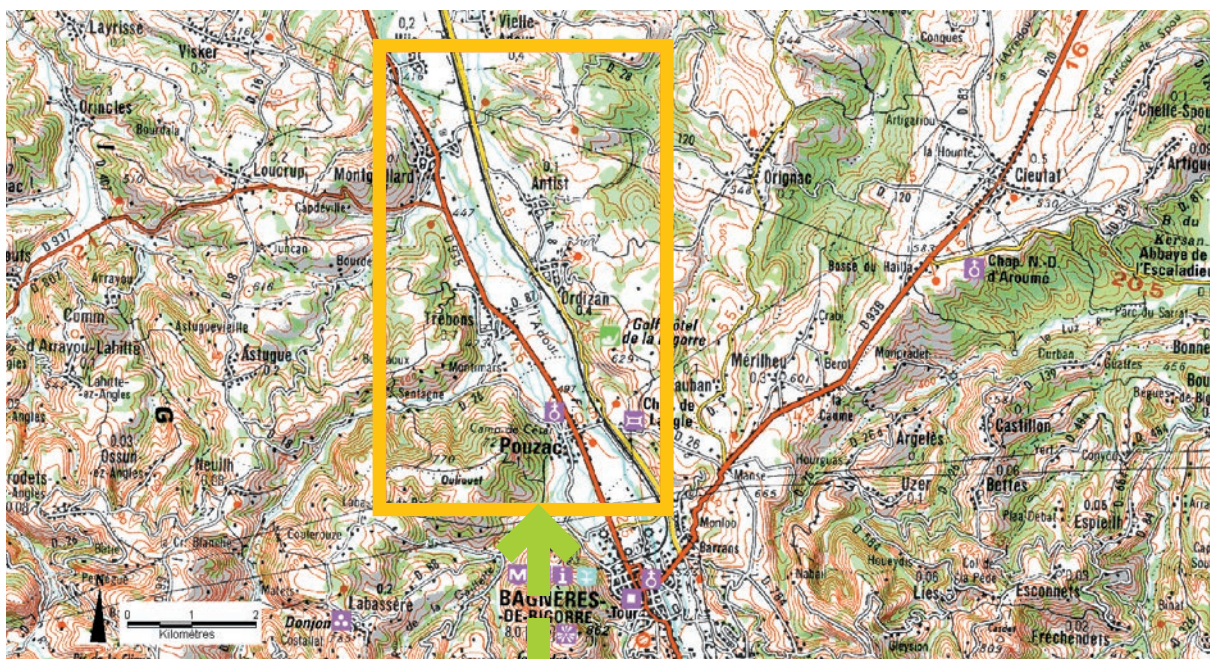
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An alluvial bar on the upper Adour before (above) and after (opposite) the works.



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The upper Adour has not been confronted with a major flood for the past 50 years. The flood representing the highest level recorded in this section of the river took place in June 1879. But in order to protect nearby land and homes from flooding, work was regularly done on the river with the main objective being to narrow the river bed and to create a single channel. In the process, alluvial bars along the entire upstream section were systematically removed and the resulting sediment was spread along the banks



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to form bunds. This contributed to incision of the river bed and disconnection of side channels from the main channel. It also resulted in significantly destabilising the river banks.

■ Opportunities to act

Confronted with these problems, the elected officials of the “Haute Bigorre” intermunicipal association decided as early as 1997 to modify the river-management policy and to adopt an ecological approach. The restoration works were conducted in the framework of the river contract for the upper Adour.

■ Works and developments

The works consisted of removing the bunds by re-grading the banks and modifying the management techniques for accumulated debris and dead wood. The side channels that had been cut off were restored and a network of secondary channels was created to manage flooding. Bank-protection systems were installed only as needed and exclusively using bio-engineering or mixed techniques. Sectors with sparse vegetation were planted. Finally, efforts were made to counter the development of Japanese knotweed, an invasive species.

■ Regulatory approach

The work was authorised in accordance with the Water law.

3.1.2.0: Modification of the riverbed long profile or cross profile, or creating a bypass

■ Post-restoration management

A track parallel to the banks, at least ten metres from the river in the riparian vegetation and open only to maintenance personnel and local land owners, was created to facilitate maintenance and provide access to the river in the event urgent action is required during a flood. Vegetation is cut on a very selective basis in order to preserve the habitats of the animals that depend on the aquatic environments. Management of accumulated debris and jams is kept to a minimum. An assessment now determines whether debris and jams constitute an effective obstacle to the flow of water and only the “risky” situations are managed by removing any vegetation and raking the sediment to a depth of 80 cm.

The upper Adour with a treated left bank



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Costs

In euros ex. VAT

Studies	Not known
Purchase of land	Not applicable
Works and developments 2001-2006:	794,000 €
	<i>Including: restoration works</i>
	185,000 €
	<i>maintenance</i>
	596,000 €
	<i>management of Japanese knotweed</i>
	13,000 €
	<i>total cost per linear metre:</i>
	66 €
Promotion	Not applicable
Total cost of project	794,000 €

Financial partners and funding:

Restoration works: Water agency (50%), Departmental council (10%), Regional council (20%)

Maintenance works: Water agency (50%), Regional council (20%)

Technical partners:

Not applicable

Monitoring

A pre-works survey showing the hydro-geomorphological functioning of the Adour was carried out. It was based on expert opinion and observations of the river's morphological characteristics (flow pattern, erosion zones, disconnected secondary channels) and any changes over time. Since the end of the works, no specific monitoring has been carried out, with the exception of regular observations in the field.

Outcome of the project and outlook

The restoration works diversified the flow pattern and habitats, making possible salmonid reproduction. An immediate effect of reconnecting the side channels was an increase in the mobility space of the river and a decrease in flooding risks (greater dissipation of energy, a reduction in vertical and lateral erosion processes, stabilisation of banks, etc.).

The awareness on the part of the elected officials of the need to protect biodiversity and the creation of a comprehensive, integrated and pragmatic approach to river management, in close contact with the local population, guarantee the success of the project.

The guiding principles behind the restoration and maintenance works have now been adopted by the towns downstream.

The intermunicipal association has also made significant financial savings thanks to the halt of the previous large-scale and expensive work programmes.

Promotion of the project

A number of press articles have been published and information provided to anglers.



Project owner	"Haute Bigorre" intermunicipal association
	
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