



# Healthy ecosystems as the foundation of water resilience

The Adour-Garonne Basin's Experience in Balancing Water Management and Biodiversity

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# Water and biodiversity: a shared challenge in the face of climate change

- The quality and quantity of water depend directly on the health of aquatic ecosystems. When these environments are degraded, water becomes scarcer, more vulnerable to pollution, and more difficult to manage.
- Climate change is exacerbating these vulnerabilities: droughts are becoming more severe, floods are becoming more violent, and natural habitats are being disrupted.
- In many river basins, water and biodiversity policies remain too compartmentalized, which limits their effectiveness. Conversely, restored ecosystems offer natural capacity for adaptation, filtration, storage, and protection.



# The Adour-Garonne Basin: A Territory Under Pressure but Committed to Action

- Covering 20% of France's territory and home to 8 million people spread across 26 departments and three regions, the Adour-Garonne basin faces multiple pressures: diffuse pollution, physical alterations, heavy strain on water resources, and rising temperatures.
- These challenges call for integrated governance that brings together SDAGE, SAGE, PTGE, etc. The watershed suffers from a mismatch between administrative boundaries and hydrological realities, which requires enhanced coordination to integrate water, biodiversity, and climate considerations into local decision-making.
- Nevertheless, experience in the basin shows that practical solutions can be implemented when stakeholders work together at the watershed level.



# Restoring ecological continuity: reconnecting habitats

- In the Adour-Garonne basin: numerous old structures fragment the waterways and restrict the natural movement of fish and the transport of sediment.
- The importance of structures restoration programs: removal, fish passes, and coordinated dam management.

What are the results?

- improvement of migratory populations (Atlantic salmon in the Garonne),
- improved sediment transport,
- flood mitigation through the restoration of natural floodplains,
- reopening of 750 km of fish passages (2016-2023).

*Ecological continuity is a driver of hydrological resilience, not just a conservation tool.*



# Low-flow target discharge (LFTD): ensuring a minimum flow to protect the river



The low-flow target discharge (LFTD) is intended to:

- Protecting aquatic life during periods of low water,
- Maintain acceptable water quality,
- Balancing ecological needs and human use.

In the Adour-Garonne basin, low-flow target rates are set at “key points” along the major waterways. They guide water restrictions during droughts and steer regional projects toward balanced management.

Low-flow support helps prevent river flows from falling below the target low-flow rate by releasing water stored during the winter back into the river during the summer. This safeguards the environment and ensures that essential water uses are met.

# Restoring and renaturalizing ecosystems: a key driver of resilience

**River restoration:** Meander restoration, habitat diversification, and bank restoration.

*Examples: projects carried out on the Garonne and Dordogne rivers to reconnect river tributaries and improve water flow.*

**Wetlands:** Restoring headwaters, wet meadows, and riparian forests enhances natural water storage, helps maintain low water levels, and improves water quality.

*Example: “Têtes de bassin” program → 3,000 hectares restored between 2020 and 2024, resulting in up to 30 million cubic meters of naturally stored water.*

**Urban renaturation:** Removing impervious surfaces and managing stormwater at the source reduce runoff and increase infiltration.

*Examples: pilot projects in several cities in the basin to reconnect floodplains and limit heavy runoff.*

**Coastal Areas:** Reclaiming marshes to limit saltwater intrusion and restore essential habitats.

*Examples: Restoration of the Hossegor marshes and the lower Adour River.*

# Combating invasive alien species: a challenge that involves both water and biodiversity

Invasive alien species (IAS) disrupt ecosystems and cause a loss of hydrological functions.

In the Adour-Garonne basin:

- Invasive species: water primrose, knotweed, Louisiana crayfish, ragweed.
- Impacts: siltation, disruption of water flow, increased evapotranspiration, habitat loss.
- Structured solutions incorporated into the Water Development and Management Master Plan:
  - digital mapping,
  - coordinated efforts with local communities, fishermen, and river basin management authorities,
  - feedback shared at the national level.



# Knowledge and data: the foundation for action

In the Adour-Garonne basin:

- 3,000 biological surveys per year and 100 additional monitoring sites since 2015!
- 50 million data points are available through the Adour-Garonne Basin Water Information System (SIAEG).
- Biological indicators reveal hydromorphological changes, diffuse pressures (nitrates, pesticides), and increased vulnerability during low-flow periods.
- This knowledge makes it possible to prioritize actions: identifying non-functional barriers, selecting nitrate-sensitive groundwater bodies, and choosing the areas where restoration will have the greatest impact.



# Integrating water and biodiversity: a governance imperative

- Water and biodiversity policies must be aligned to be truly effective. One of the main obstacles remains the mismatch between political boundaries and hydrological scales.
- The Adour-Garonne basin demonstrates that integration is possible when planning tools (SDAGE, SAGE, PTGE) address climate, ecological, and socioeconomic issues in a coordinated manner.
- The involvement of local communities, users, businesses, organizations, and the agricultural sector strengthens the legitimacy of decisions and facilitates their implementation.
- Integrated governance not only improves the ecological health of water bodies but also helps reduce conflicts between different water uses and anticipate future water crises.

