



Layman's Report

LIFE+ MIGRATOEBRE

Recovering Migratory Fish and
Improving the Management of the
Lower Course of the Ebro River



Definition

The construction of weirs and dams has obstructed the upstream migration of fish.

The construction of weirs and dams has obstructed the upstream migration of fish and limited the areas where they can reproduce. Combined with the intensification of fishing over the last century, this has hurt populations of migratory fish.

The LIFE MigratoEbre project in the lower Ebro River hopes to serve as an example that can be applied to the lower courses of other European rivers.

To this end, a series of mitigation measures will be used to help improve the hydromorphology of the river, enhancing its ecological connectivity for migratory fish.



Project goals

- Recover healthy, sustainable populations of **anadromous fish species** —those whose life cycle takes place in both the sea and fresh water— and **endangered migratory species**.
- Significantly improve the **ecological connectivity of the lower Ebro River** by adapting all the obstacles that currently exist.
- Engage the local population and create a **network of land managers**.
- Serve as an **example** on both a local and a European level.

Planned actions

- A1. Pilot project for the reintroduction of sturgeon
- A2. Installation of new fishways
- A3. Communication campaign
- A4. Creation of a volunteer network

Expected results

- The presence of reproducing **European sturgeon** in the area within 20-30 years.
- Four years after the implementation of ecological connectivity measures, the presence of **twait shad** and **lamprey** upstream of the main river obstacles during spawning season.
- A tenfold increase in the number of **eels** present upstream.
- A more than tenfold increase in the **spawning area for European sturgeon, twait shad and lamprey**, with 64 km of new river habitat in 4 years.
- **Over 10,000 people reached** through the project's different communication and outreach activities.
- The creation of a **permanent group of at least 10 volunteers** who work together

on the recovery of migratory fish and the improvement of environmental management in the lower course of the Ebro River.

- Annual participation in **World Fish Migration Day** with the organization of events.
- The organization of a **final conference** on the conservation of fish migration and the restoration of the river's ecological connectivity, with the participation of at least 50 national and international researchers and managers.



Areas of action

The scope of the project is the lower course of the Ebro River, the Ebro Delta and the marine coast of the Delta.

The Ebro River, the Iberian Peninsula's largest river in terms of volume, covers one-sixth of the area of the peninsula (88,835 km²) and has the fourth-largest delta in the Mediterranean (350 km²). It is worth noting its great value to humanity as a source of fresh water and fertile land, and the great wealth of flora, fish and birds it holds.

More specifically, the scope of the project is the lower course of the Ebro River, the Ebro Delta and the marine coast of the Delta.

The main areas of action are:

- 1 Xerta weir
- 2 Ascó weir
- 3 Flix dam



Base map: Cartographic and Geological Institute of Catalonia
Prepared by: LaTaula.coop

Species benefited

The project focuses on four species of migratory (anadromous) fish in the Ebro River basin:

- European sturgeon (*Acipenser sturio*)
- European eel (*Anguilla anguilla*)
- Twait shad (*Alosa fallax*)
- Sea lamprey (*Petromizon marinus*)

Some other anadromous fish will also benefit from this project, as will river molluscs like Spencer's freshwater mussel.



Twait shad
(*Alosa fallax*)



Sea lamprey
(*Petromizon marinus*)



European sturgeon
(*Acipenser sturio*)



European eel
(*Anguilla anguilla*)

01

Recovery of healthy and sustainable populations

The LIFE MigratoEbre project carried out a pilot reintroduction of 44 European sturgeons into the lower course of the Ebro River.

Currently, the only wild population of European sturgeon lives in the estuary of the Garonne and Dordogne rivers in France. From there, specimens have been released into the Rhine in the Netherlands and the Elbe in Germany. The last sturgeon caught in the Ebro was a juvenile in 1970.

With the goal of restoring a healthy and viable population of European sturgeon in the medium to long term, the LIFE MigratoEbre project obtained 44 sturgeons born in captivity. This was made possible through the collaboration of the French government, the Nouvelle-Aquitaine region, the MIGADO association and the French National Research Institute for Agriculture, Food and the Environment (IRSTEA).

In 2023, 44 juvenile specimens of European sturgeon were released downstream from the weir in Xerta-Tivenys (Baix Ebre) with implanted ultrasonic transmitters. These specimens were transported

from the Saint Seurin-sur-l'Isle Experimental Station (Nouvelle Aquitaine) to the IRTA Aquiculture Centre in La Ràpita (Ebro Delta).

Each sturgeon carried an external tag with contact information to report accidental captures. To evaluate the viability of the pilot release of sturgeon, 14 acoustic receivers were attached to concrete blocks, and 2 more were placed at the sea exit of the main lagoons in the Ebro Delta.

These actions were accompanied by a communication and outreach campaign targeting the public and, more specifically, sports fishers and professional fishing guilds.

Relevant results

- Of the **44 sturgeons released**, 41 were detected downriver. No record was obtained of the remaining 3, which may have fallen victim to poachers or predators.
- The large majority of **individuals detected (66 %)** reached La Gola —where the last receiver on the river is located— in 2 or 3 days, and they then headed out to sea. **15 %** spent 2–10 days at the mouth of the river before heading out to sea.
- Finally, upon reaching La Gola, **19 % of individuals** headed back upriver to La Cava, with a few even reaching Sapinya Island. They headed out to sea in early February, coinciding with a sudden surge in the river. The area around La Cava has all the habitat characteristics that juveniles prefer (salinity, water speed, temperature, and abundance of food).
- The **reintroduction of sturgeon** is a complex process and, in the long term, will take a minimum estimated period of 30–50 years due to the species' characteristics and current situation. The individuals' behaviour could be related to the stress caused by being released into an unknown habitat; this often causes them to seek refuge by heading rapidly out to sea.



Visit to IRSTEA's facilities in Gironde, Nouvelle-Aquitaine, France, where a cooperation agreement for the provision of sturgeon for the Ebro River was reached on March 26, 2015.



Ultrasonic transmitters and receivers used to facilitate the data collection from tagged specimens.



Underwater receivers installed in late October 2023 in the lower course of the Ebro River to track the movements of the sturgeons.



Release of 44 sturgeons in the Ebro River on December 21, 2023, specifically at the Tivenys river beach.

02

Improving ecological connectivity

The LIFE MigratoEbre project carried out a series of actions to facilitate fish migration in the Ebro, as well as to identify fish populations on the lower course of the river.

For almost a decade, IDECE and other members of the LIFE MigratoEbre project have carried out a range of actions to facilitate upstream and downstream fish migration:

- **Construction of a fishway at the Ascó weir.** After completing the legal, administrative and technical processes needed to build a fishway at Ascó, construction began in November 2017. The fishway has a minimum depth of 50 centimetres, a 3.5 % slope, a length of 50 metres and a width of 10 metres. A chip-reading antenna was installed to monitor the individuals using the fishway. So far, specimens of carp, Ebro barbel, Catalan chub, and eel —among other species— have been detected.
- **Construction of a fishway at the Xerta weir.** In this case, the necessary permits were not obtained until April 2022, and the fishway became operational at the end of the LIFE MigratoEbre project. The result was the installation of the largest fishway in Catalonia: 236 metres long, with an 8-metre-wide usable path and a 2.7 % slope. Two antennas were installed to monitor individuals using the fishway.
- **Improving the management of the Xerta navigation lock for use by fish.** Management of the navigation lock at Xerta was improved. This allowed the lock to be opened and closed several times a day to encourage the passage of fish. Furthermore, 6 cameras were installed to record the passing fish. The images, which are analysed by CERM (UVIC-UCC), show a large number of Ebro barbel and Catalan chub entering the lock, passing through it, and heading upstream.

Water quality study

In addition to these actions, the project also collected all the available information on the physicochemical and biological quality of the water, as well as the aquatic habitats in the lower course of the Ebro, its delta and bays. These data were provided principally by organizations from the river basin (especially the Catalan Water Agency and the Ebro Hydrographic Confederation), and it has been used to analyse its potential relationship to the state of the fish.

Study of fish populations

The project team has worked to get to know the fish populations in the area and to evaluate the migratory species being studied, as well as to define the use of the delta estuary by these species. To this end, specific sampling campaigns were carried out. Due to the need to evaluate the status of less abundant species, historical data from studies and monitoring by the Ebro Delta Nature Park were also collected. Finally, marking campaigns using transmitters and PIT tags were carried out to monitor migratory behaviour.

Construction of the fishway at Ascó weir to facilitate fish migration, improve the ecological connectivity of the Ebro, and allow the passage of kayaks and pirogues.





Inauguration of the fishway at Ascó weir on June 15, 2018.



Fishway at Xerta weir.
Source: ACN (2024). [El Life MigratoEbre acaba la rampa de peixos de Xerta i els esturions arriben al litoral. Marfanta.](#)



Checking to see if there are any remaining juvenile lamprey populations in the lower course of the Ebro. This was the work of LIFE MigratoEbre technicians and a research team from the University of Santiago de Compostela in September 2018.



Placement of radio receivers for tracking tagged migratory fish and monitoring their movements in the Ebro River. This action took place in May 2017.



Release of adult eels after they were captured and tagged with radio transmitters to monitor their movements in the Ebro River. This action took place in November 2017.



Lower course of the Ebro in good ecological condition (2020).

Relevant results

- Water quality studies showed that the habitat quality in the lower course of the Ebro was **good or very good**. Although the riparian forest along the main course of the river could be improved, tributaries like the Siurana or the Asmat have well-consolidated riparian forests. Nevertheless, high levels of salts, chlorides, nitrogen compounds and heavy metals were detected in fish at the Flix dam—slightly higher than what is recommended for human consumption.
- The study of fish populations in the area identified **28 of the 37 species of fish known** to exist there. This section of the river has the greatest variety of species and fish biomass in the Ebro basin and in Iberian inland waters in general. It has been determined to be the main penetration route for fish from the marine environment.
- Fish like the Catalan chub and the Ebro barbel were detected, along with a notable population of species that are **tolerant** to the different levels of salinity found in coastal wetlands and the lower courses of well-preserved rivers. Exotic, sedentary freshwater fish made up slightly more than half of the total of identified species. As for the native fish detected, only 3 are freshwater species; the rest are marine species with different migratory strategies and levels of salinity tolerance.
- Regarding the **migratory species studied**, the status of these populations and their use of the river habitat were noted:
 - **Lamprey**. None were detected either in delta waters or in the lower course of the river. The last specimen was caught at El Fangar beach in 2010.
 - **Shad**. There has been a slight recovery among populations in the Ebro, with specimens captured both in the river itself and in irrigation networks.
 - **Eel**. Present in all aquatic habitats of the Delta and the lower course of the Ebro, with a preference for coastal lagoons, marshes and drainage channels. It is in significant decline, raising concerns for the species' long-term viability.
- After considering the results of the study, **four sections of river** were established according to how the fish population there is structured:
 - Between **Ascó** and **Xerta**. Freshwater species with the area's largest proportion of exotic species.
 - Between **Xerta** and **Amposta**. Transitional sector, with the codominance of freshwater and migratory species of marine origin.
 - Between **Amposta** and **Deltebre**. Transitional sector, with freshwater species and a larger presence of species of marine origin.
 - Between **Deltebre** and the **mouth of the river**. Predominance of marine species.

03

Involvement of the local population

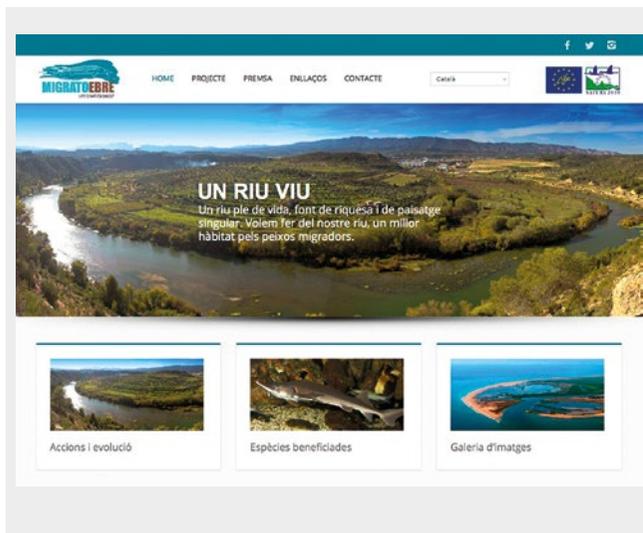
The LIFE MigratoEbre project has used various communication initiatives and outreach events to engage the local population and reach as many people as possible.

Several initiatives were used to ensure the involvement of the local community and put as many people as possible in contact with the project:

- **Communication efforts** included the design of a graphic identity and a website for the project, the creation of a full-scale model of a European sturgeon and other migratory fish, and the development of other outreach materials.
- **An informative panel was installed** next to the Ascó fishway to explain its purpose. Two more panels at the Xerta weir and in Flix explain the LIFE MigratoEbre project's work protecting migratory fish.
- **A travelling exhibit was created** on the fish and connectivity of the Ebro River. This exhibit was inaugurated at the Museu de les Terres de l'Ebre in July 2016. It has travelled to different locations in the Ebro Delta, the Museu del Ter in Manlleu, and El Pont de Suert.
- **Educational materials were prepared** for school trips to the Museu de les Terres de l'Ebre, along with a catalogue of exhibits for the general public.
- **The project has taken part in a range of events** such as World Fish Migration Day, with the involvement of educational spaces like the Museu del Ter in Manlleu, MónNatura Delta de l'Ebre in Amposta, Sebes Nature Reserve, Museu del Mar in La Ràpita, and Ecomuseu del Delta. The project was also presented and promoted at the 2015 and 2018 editions of the *Fish Passage Conference*.
- **A public closing event** took place on June 18th, 2024 at the seat of the Institut Català de les Terres de l'Ebre in Tortosa.

Inauguration of the project's traveling exhibit at the Museu de les Terres de l'Ebre in Amposta. July 21st, 2016.





Screenshot of the LIFE MigratoEbre website, where information on the project and its initiatives can be found.



Creation of a life-sized model of a female common sturgeon by sculptor Paco Ventura.



Design and installation of an informational panel at the Ascó fishway.



Inauguration of the project's travelling exhibit at the Museu del Ter in Manlleu. This was the first time it was displayed outside the Ebro Lands. March 8th, 2018.



School visit to the travelling exhibit on the LIFE MigratoEbre project in September 2016. The visit was enhanced with educational materials made specifically for the project.



Participation in the Fish Passage Conference in Albury, Australia, on December 10th, 2018. The first results of the project's assessments of fish movements were presented.

04

An exemplary project on a local level

In the digital realm, the LIFE MigratoEbre project has used social networks to generate interest in the project and foster public involvement in the conservation of the species being studied.

This project has worked to become an example of best practice on a local level. In addition to the initiatives mentioned above, it has implemented a social media campaign and has created a network of volunteers associated with the reintroduction and improvement of sustainable populations of common sturgeon and other native species of migratory fish.

As for communications strategies, profiles were created on the principal social networks (Facebook, Instagram, X and YouTube). These profiles gained large numbers of followers during the project and significantly reinforced other outreach initiatives.

Within the framework of the project, the Catalunya La Pedrera Foundation signed an agreement with Grup de Natura Freixe to create the **Ebro Volun-**

teer Network. This initiative launched in 2015 seeks to raise awareness of the LIFE MigratoEbre project among people in the Ebro region by participating in fairs, local festivities and other events, and by meeting with professional fishing guilds.

During this period, a model of a sturgeon was also put on display at different events like the river-themed festivals in Riba Roja, Móra d'Ebre and Tortosa, the agricultural fair in Móra d'Ebre, and the Fira de Mostres in Amposta.

About **20 of these actions** were carried out each year, reaching over **100,000 people.**



Promotional materials to engage, inform and raise awareness of the LIFE MigratoEbre project among different audiences.



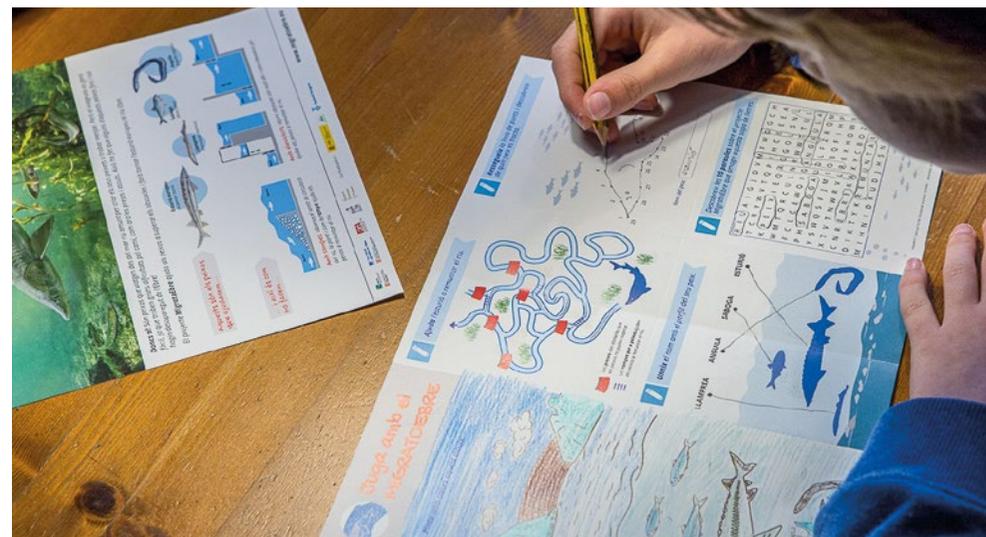
The model of a sturgeon on display at Ampostà's town festival from August 13–25, 2015.



The models of fish, promotional materials and a small exhibit on the project at the Fira Firebre in Benifallet. July 1st, 2017.



The models of fish, promotional materials and a small exhibit on the project at the Festa dels Menuts at MónNatura Delta. June 30th, 2018.



Promotional materials to engage, inform and raise awareness of the LIFE MigratoEbre project among different audiences.

Conclusions

A living river without barriers: with the construction of new infrastructure, the project has achieved its goal of improving the river's ecological connectivity to favour existing species.

The construction of two fishways and the improvement of the Xerta navigation lock was a watershed moment for fish migration in the lower Ebro River. These initiatives will significantly increase the breeding areas and general habitat for sturgeon, lamprey and shad, and will also boost the eel population in the lower course of the river.

Lessons

The project's initiatives have led to valuable lessons that go far beyond the project itself:

- It has been observed that fish bred in captivity have enough adaptational capacity for a reintroduction program to be established in the western Mediterranean, starting with the Ebro

River and the coast of its delta. This knowledge is based on the high survival rate achieved during the LIFE MigratoEbre project and the exploratory behaviours observed.

- To determine whether species spread beyond coastal areas of the Ebro Delta or stay in the area, we propose the installation of ultrasonic receivers for future releases.
- To avoid surges and low temperatures, and to get species to spend more time in the river before heading out to sea, we believe it is important to free them a few months earlier than was done this time.
- A detailed analysis of the fish population provided relevant information on the problem of exotic species, which make up half of species present in the area. Only 3 native species are freshwater fish. The remaining 10 are of marine origin, and 8 of those are migratory.
- A study of water quality in the Ebro highlighted the fact that the lower course of the river is the main fluvial body in Catalonia and on the Mediterranean coast of the Iberian Peninsula. This stretch of the river is noteworthy both due to its significance and the diversity of its fish population.
- It has been determined that the exhibit was one of the most effective tools in promoting the LIFE MigratoEbre project and explaining the concept of migratory fish and the connectivity of the Ebro River. Furthermore, communication campaigns through social media and the creation of a volunteer network helped to get the public involved in conserving the areas studied.



Next steps

The project is completed, but efforts to conserve and improve the lower course of the Ebro continue. Below are the next steps in the ongoing work begun by the project and its promoting organizations:

- After the pilot release of sturgeon in the lower course of the Ebro, a plan for reintroducing this species can be drafted based on the *Action Plan for Conservation and Restoration of European Sturgeon* and the technical guidelines for the reintroduction of wild species in Spain.
- If the stock of captive sturgeon in France allows it, there is a medium-term plan to regularly release large numbers of sturgeon larvae, since they have a higher chance of returning to the river as adults due to imprinting during the first few months of their life.
- All municipalities, nautical clubs and fishing associations involved in the project have signed a commitment to report observations of migratory fish linked to the LIFE MigratoEbre project, and to continue spreading this information to their members and the public in general.



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- Institute of Agrifood Research and Technology (IRTA)



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