



# Restocking, an obligation in order to save the European Eel

France, an essential actor in restocking implementation

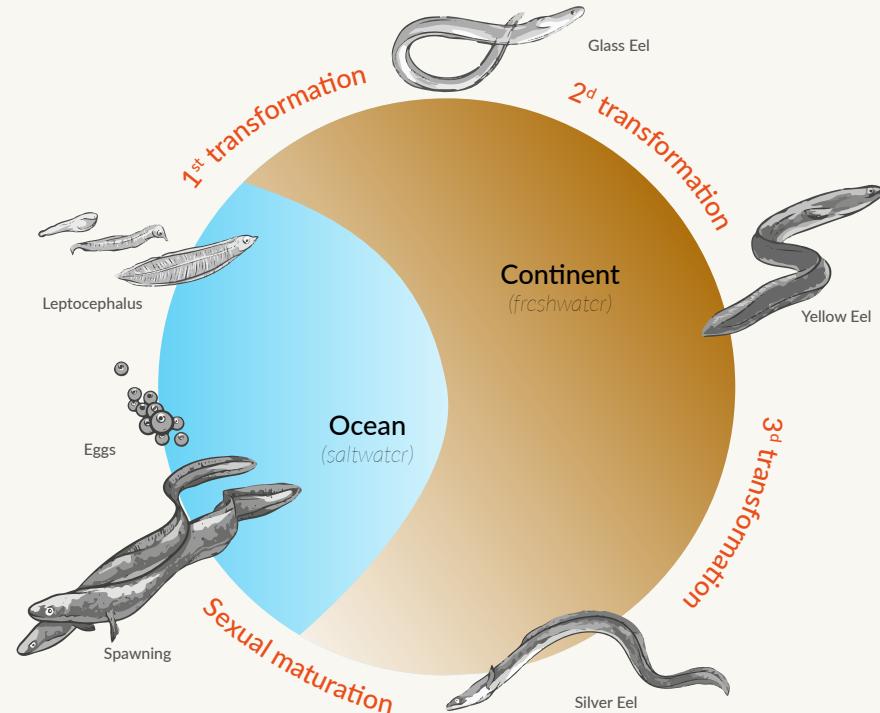


# The Eel, an extraordinary migratory fish...

**The European Eel** (*Anguilla anguilla*) is a remarkable migratory fish, with a singular life cycle that results from a 10-million-year evolution and adaptation to its environment.

Eels are a far-reaching and metamorphosing travelling species, spawning in the depths of the **Sargasso Sea, off the Bahamas**, more than 6,000 km away from our shores. The larvae issued from this spawning then drift along the Gulf Stream towards European shores

and transform into **glass eels** approaching the estuaries. Glass eels then colonise accessible areas (such as lakes, ponds, swamps, wetlands and watercourses), turning into **yellow eels**, to transform again ten to fifteen years later into **silver eels** for their journey back to the Sargasso Sea. Eels are part of our heritage and culture since time immemorial. Once very abundant, eels fed populations as well as our **literature**, as in the famous '**Roman de Renart**'.



European Eel life cycle | Source : ONEMA | 2010



- Only a single eel species exists in Europe (*Anguilla anguilla*);
- Eels are only spawning once before dying;
- European eel spawns at sea, but essentially lives in continental freshwater, unlike salmon, shads, sturgeons...
- The natural range of the European eel spreads from the Maghreb to Scandinavian countries,
- European eels can live either in saltwater, freshwater and brackish water,
- An unknown part of the eel population matures in estuarine, coastal and marine ecosystems,
- France is at the centre of the European eel colonisation area,
- European eel and its traditionally associated fishing methods are a part of our cultural heritage,
- European eels are, in diverse forms, available in many a gastronomy.

Did you know ?

## *... threatened by a multiplicity of mortality factors.*

The decline of this species, **once plentiful in every European river**, has begun in the eighties. It is linked with many mortality factors, both from saltwater and freshwater ecosystems. **Eels stocks are considered nowadays as critical and outside of their**

**biological security limits.** The European eel is classified since 2009 under Annex II of the **Washington convention (CITES)**, a convention on international trade in endangered species of wild fauna and flora.



Great EDF Chastang dam on the Dordogne

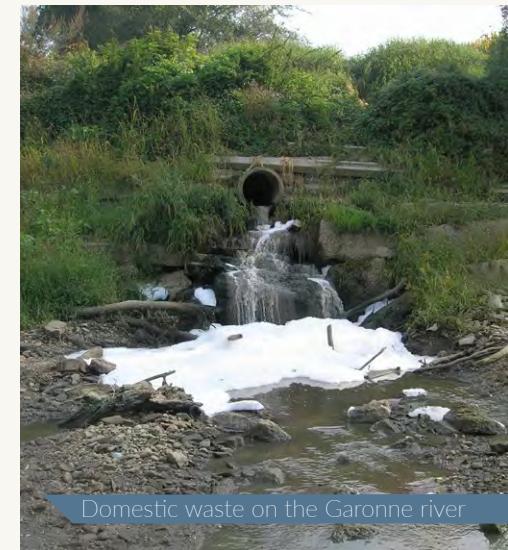
The main cause of this decline is the **fragmentation of watercourses**, the artificialization and degradation of habitats, with an acceleration during the 20th century. Dams and obstacles of every kind are more and more numerous on watercourses, especially the **great and impassable hydroelectric**

**dams** built from the 19th century onwards. These dams limit access to development areas of young eels. One might add to these causes **the progressive removal of wetlands** (prairies, swamps and coastal lagoons) in profit of urbanisation and the **modification of agricultural practices**.



Wels catfish (*Silurus glanis*)

**The continuous degradation of water quality by various chemical pollutants**, whether or not qualifying as **endocrine disruptors** (PCBs, pesticides, heavy metals), **poaching, diseases and parasitism**, as well as **professional and recreational fishing** are as many factors that weakened eels stocks. To add up to it, the presence of **wels catfish**, an introduced invasive species\* as defined by the National Museum of Natural History (MNHN), as well as climate change, that **modifies ocean currents and disrupts hydrologic and water systems**, have contributed to a **massive decline of eels population**.



Domestic waste on the Garonne river

\* [https://inpn.mnhn.fr/espece/cd\\_nom/67585/tax/statut](https://inpn.mnhn.fr/espece/cd_nom/67585/tax/statut)

## *Restocking, an emergency solution while we restore water ecosystems*

Actions have to be taken on **restoration of habitats and ecological continuity, and water quality improvement**, in agreement with the **Water Framework Directive adopted in 2000**, in an imperative and ambitious way, and in a long-term perspective. While waiting for such effective actions,

the support of the populations, with the **skills of professional fishermen, the support of scientists and the general public**, is compulsory in order to **halt the decline of the species**. With regards to restocking, the objectives of the **Eel Management Plan** have been reached (June 2015 reporting).



## *A European regulation and a French Eel Management Programme in the service of restocking*

In 2007, the **European Union** Council of Ministers adopted the **Council regulation (EC) N° 1100/2007** that open the way to **restocking measures of European eel stocks**. It requests from every Member State to elaborate a management plan.

The **French Eel Management Programme (EMP)**, approved by **Europe in 2010**, aims to act on five fronts: to fight poaching, to improve ecological continuity, to reduce fishing pressure, to reduce pollutions and **to set restocking in motion**.

## *Restocking: transferring glass eels to suitable areas*

Restocking consists in **transferring young eels**, or glass eels, from estuaries to **reception habitats that are most favourable to their growth and development**. This transfer, result of a close collaboration between **fishermen, wholesalers, scientists and state services** avoids the mortality linked with migration. Activating those reduced-mortality zones,

**restocking aims for a higher level of benefit than natural colonisation**. The ultimate goal is to contribute a higher number of spawning adults to the sea, **while waiting for improved habitats and water quality**. Restocking measures, practised for decades by northern European countries, take place **in France within a rigorous scientific framework**.





## France, an essential restocking actor

France is **the main provider of glass eels on the European scale**. 60% is reserved for restocking programmes set up by Members States. Every year, in agreement with the EMP objectives, between **5 and 10% of the national production is stocked in several suitable areas of various watersheds of**

**the French Atlantic coast**. Since 2010, **14 tons of glass eels**, representing **45 million young eels**, have been released into ten or so rivers, from the **Artois Picardie area to the Adour basin**. It represents 45 projects on **6 EMU** (Eel Management Unit) dealing with restocking actions.

## The necessity of a rigorous scientific monitoring

Under the authority of the **National Museum of Natural History**, followed by the **French National Agency for Water and Aquatic Environments (ONEMA)**, restocking actions are happening within a scientific framework. It is indeed very much needed to monitor all phases of the programme to evaluate the benefit of restocking actions. **30% of all released glass eels are marked** with an internal dye (alizarine). At regular

intervals (6 months, a year and three years following the release), eels are monitored **by electric fishing** or with **fyke nets**. Otoliths (mineral particles in the fish's inner ear) are collected on 50 eels to verify the proportion of marked ones. The first results are encouraging, for the eels that were marked were found back, and the population's characteristics (growth, scattering...) are **giving hope in the success of restocking operations**.

Further reading: April 2015 Report of the GRISAM (French Scientific Interest Group for Diadromous Fish). French programme for glass eels restocking. Assessment of the first three restocking years. Expert report.



*'For time does matter. We cannot stand by anymore. Mankind's destiny is inseparably connected to the Nature it needs to sustain itself. Without Nature, no food, no life.'*

**Jean Marie Pelt** (1933–2015), French biologist, botanist and pharmacist, president of the European Institute for Ecology.



## ARA France: a major actor to ensure restocking success.

ARA France is an **independent association under the law of 1901**, founded in 2010, **following the initiative of French glass eels and eels professional fishermen**. Its main goal is to ensure the success of restocking actions planned in the French Eel Management Plan. It ensures the **coordination of the National Programme**, verifies the compliance with the specifications, participates in the financing and yearly reporting

on restocking actions and submits adjustments and potential programme adaptations. The association consists of national and regional marine and freshwater fisheries management organisations, a recreational fishing organisation, as well as a national NGO dealing with river protection. It is open to various forms of partnerships to reach its objectives and to best achieve its missions.

## Building up an exemplary co-operation for high-quality work, in service of biodiversity.

To recover the **abundance of populations of migratory fishes** is a long-term initiative. To restore eel populations and to be successful in restocking, it is very much necessary to build collaboration between various actors dealing with water-habitat restoration and management : **the Ministry in**

**charge of ecology, the French National Agency for Water and Aquatic Environments, scientists, professional fishermen, wholesalers, industry players, patrons, NGOs.** It is in such an open-minded and responsibility-sharing spirit that ARA France wishes to work forward.



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