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Supporting diadromous species populations in the Adour-Garonne basin: a variety of objectives and tools

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REVE

Shad'EAUNA

Interreg Atlantic Area
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DiadES

LOCAL AND GLOBAL INITIATIVES:

HOW SCIENCE SUPPORTS MANAGEMENT ACTIONS ON DIADROMOUS FISH

All actions are in planning documents:

- Local Diadromous Fish Management Plans 2022-2027:
  - Garonne-Dordogne-Charente-Seudre-Leyre basin
  - Adour and Coastal rivers basin

→

- French Eel Management Plan
  - Council Regulation for the recovery of the stock of European eel
- French Atlantic salmon Plan
  - International Convention NASCO

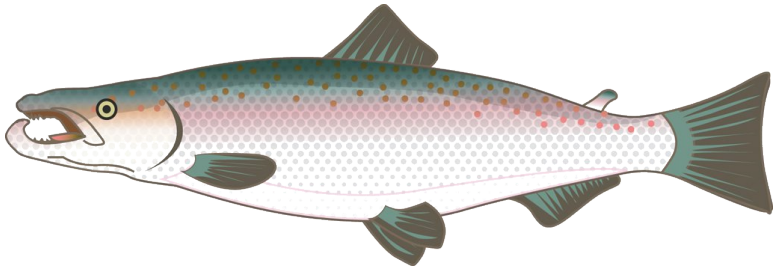
- French National Action Plan for European Sturgeon 2020-2029

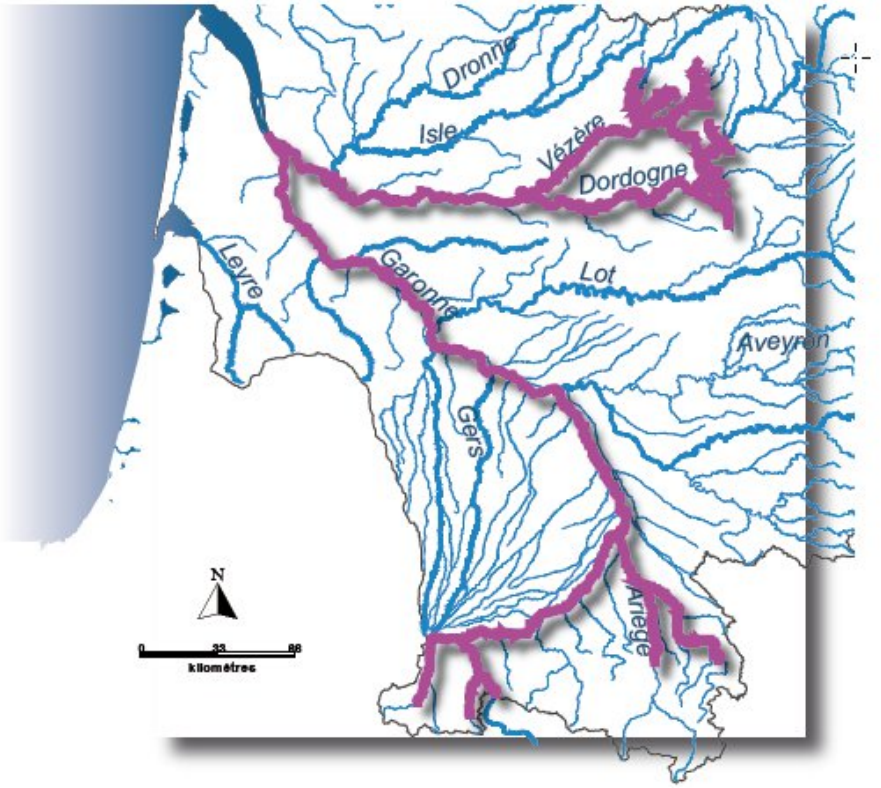
→

- Pan-European Action Plan for the conservation of the sturgeon
  - Bern Convention

Salmon in Garonne-Dordogne

Restoring an Extirpated Population





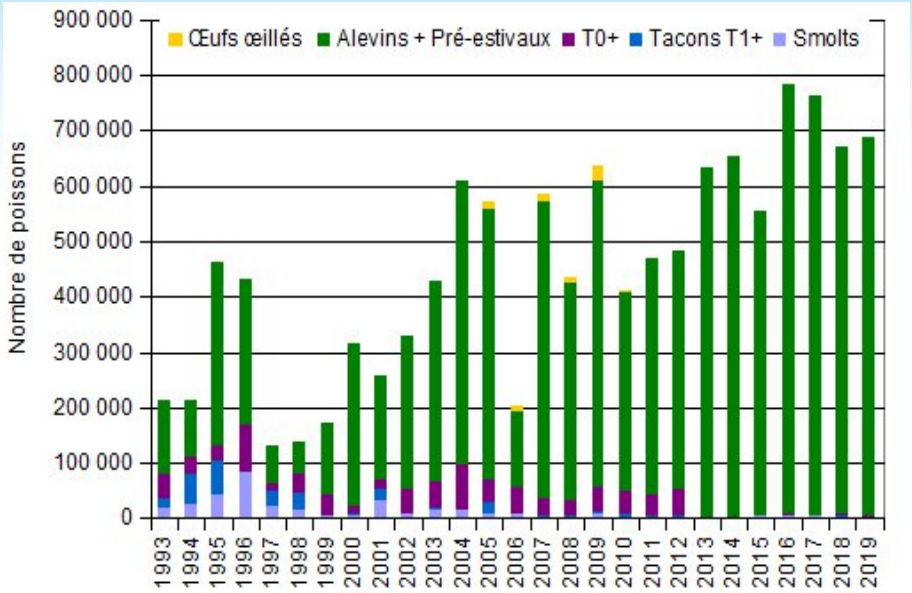
Objective: to restore an extirpated salmon population in the Garonne and Dordogne basins

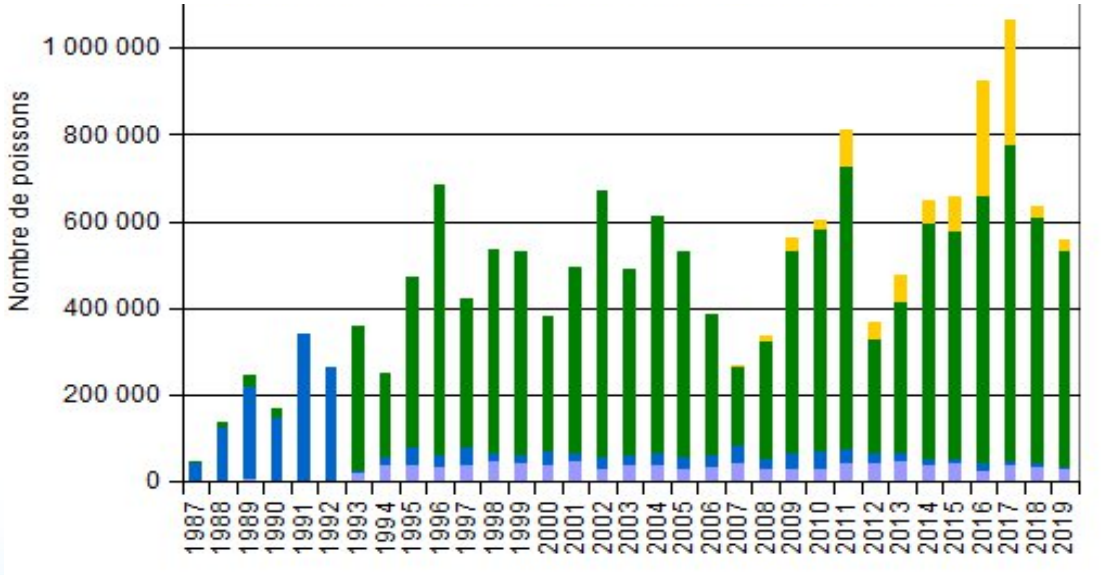
- Salmon disappeared from the basin at the end of the nineteenth beginning of the twentieth century
- Reintroduction Strategy:
  - initiated with strains from Canada, Scotland and Norway
  - continued with strains of Loire-Allier and Adour-Gaves
  - Since 1995: salmon trapped in the Garonne and Dordogne acclimatized
- Assessment:
  - Juveniles: estimation of natural densities
  - Spawners: Return Count
  - Origin: Markings (color; adipose fin removal); genetics (parentage assignment)
  - spawning grounds: counting nests


MIGADO

releases : numbers et stage

- Garonne (per year): 676,000 fry
  - 2/3 in the Neste river and upstream Garonne
  - 1/3 in the Ariège river
    - +
- Dordogne (per year): 110,000 eggs
- 604,000 fry
- 9,000 parrs
- 27,000 smolts

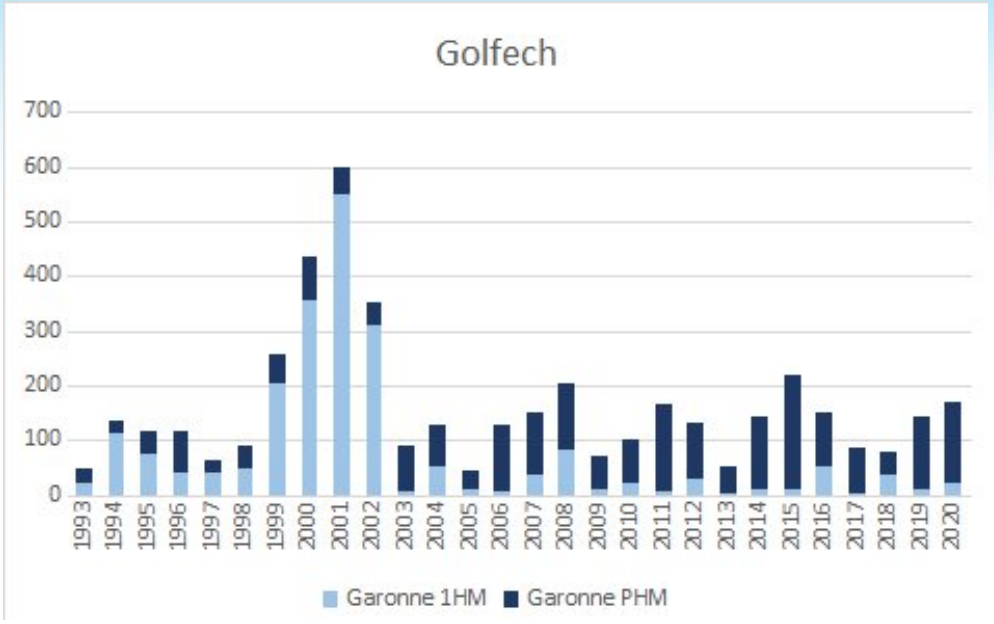


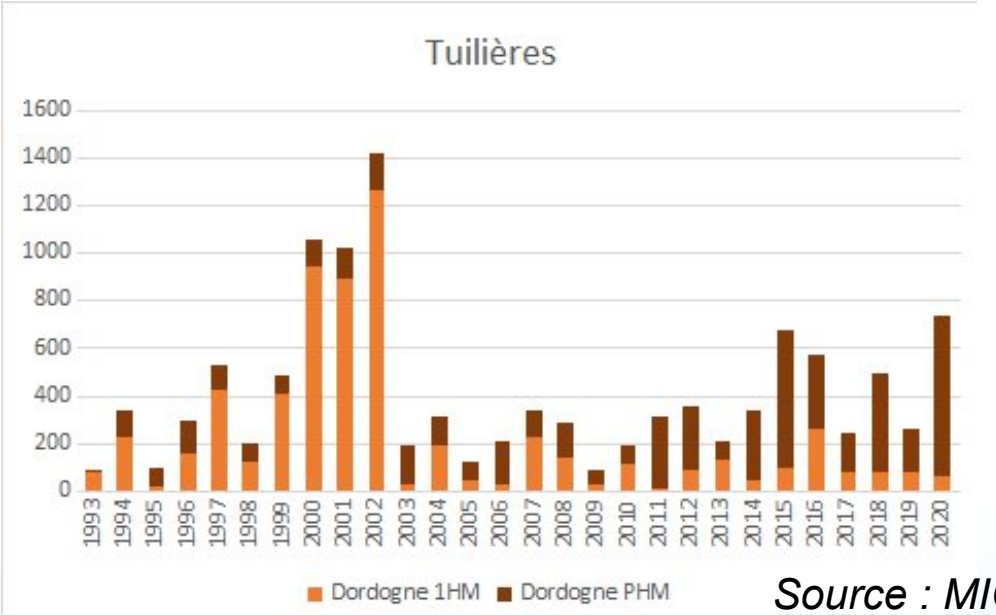


Source : MIGADO

Returns of Spawners

- Yearly mean since 2015
  - Garonne :
    140 salmons /year
    20% wild born
    25 % upstream of Toulouse
  - Dordogne :
    500 salmons /year
    36% wild born
  - 30% upstream of Mauzac dam
  - 80 % Multi Sea Winter salmons





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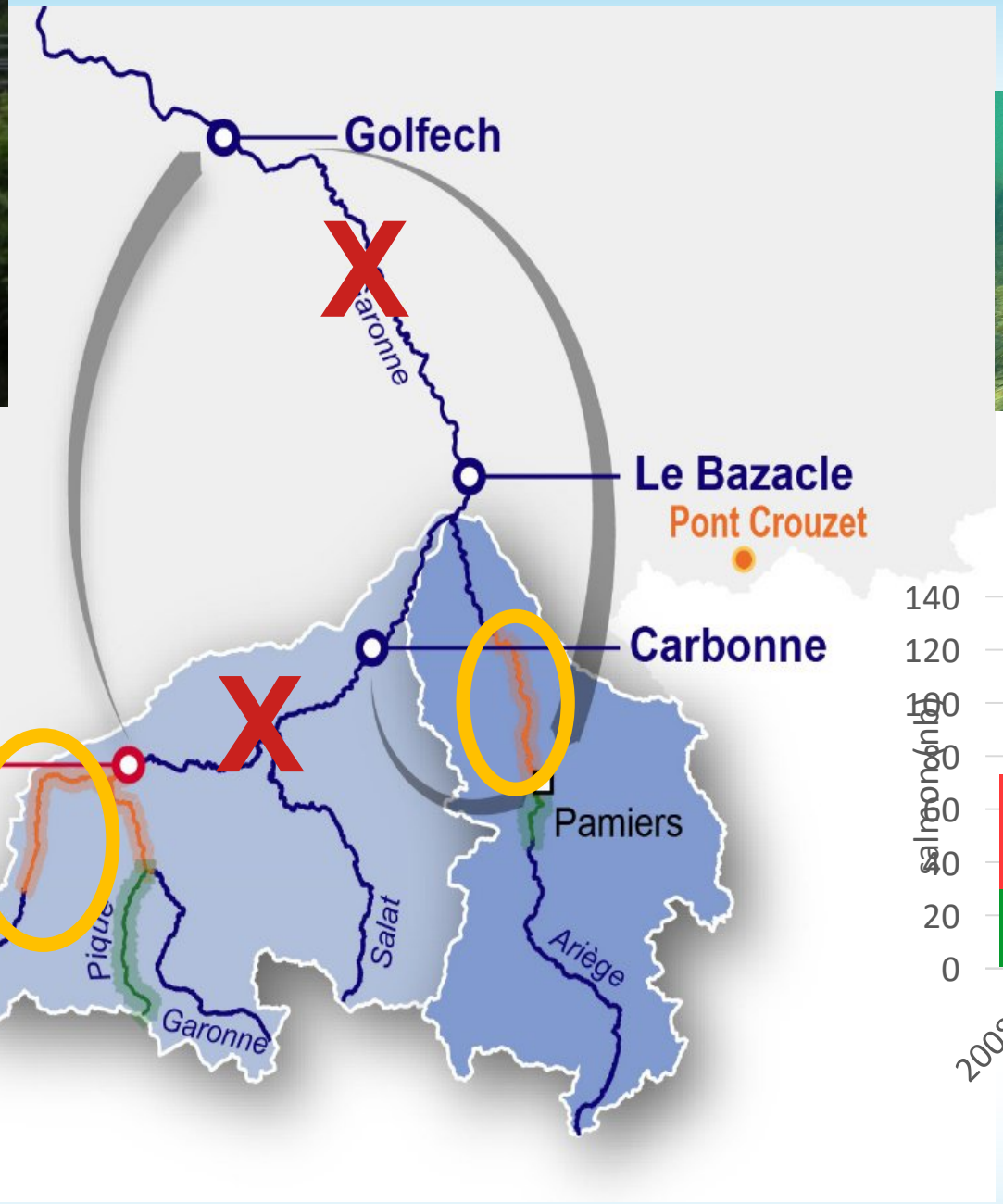
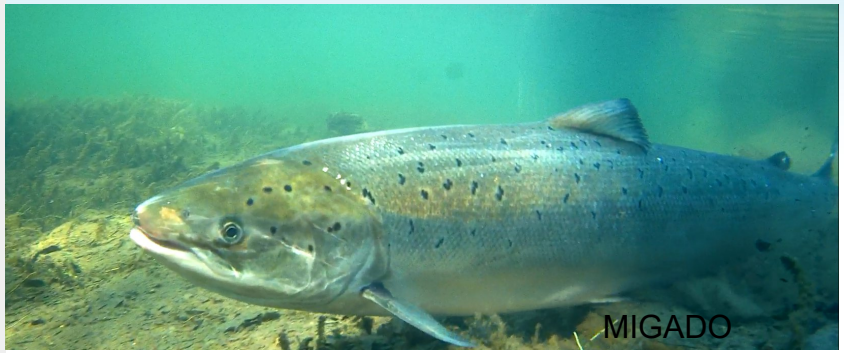
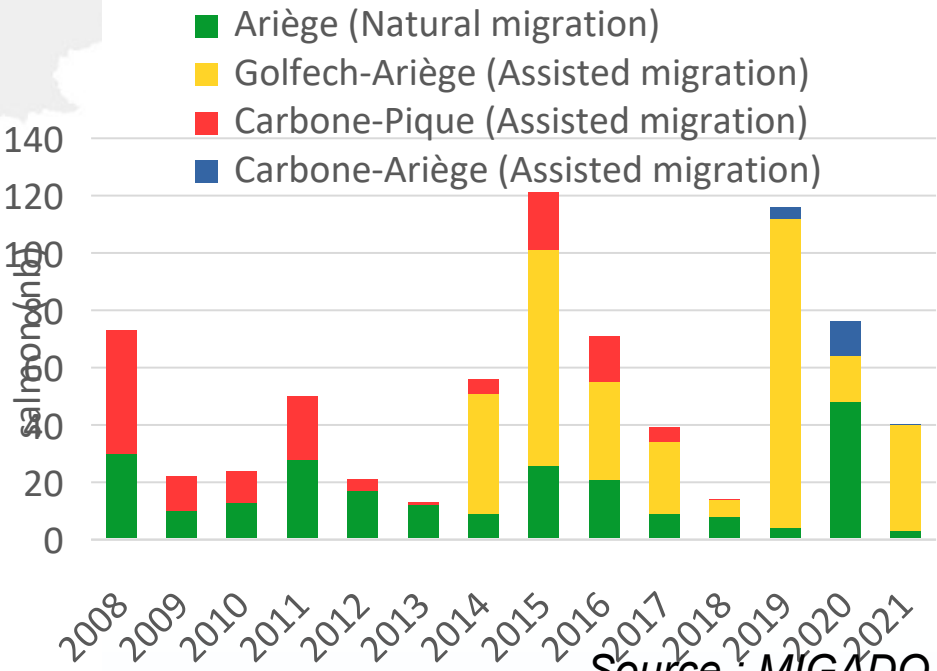
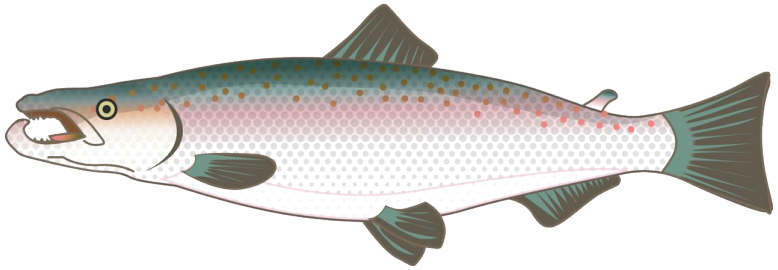


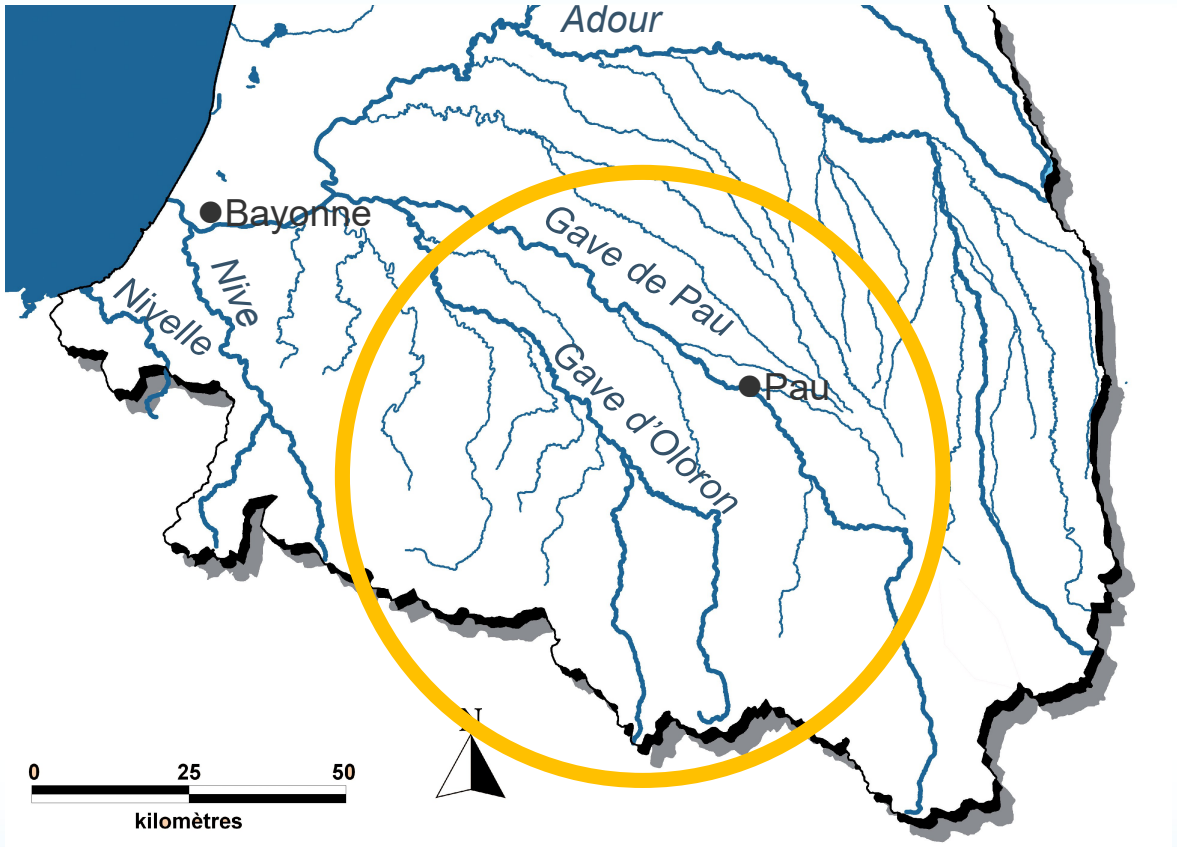




Source : MIGADO

Salmon in Adour-Gaves basin:
Strengthen an existing population





Objective: Support the strengthening of an existing population in newly accessible areas

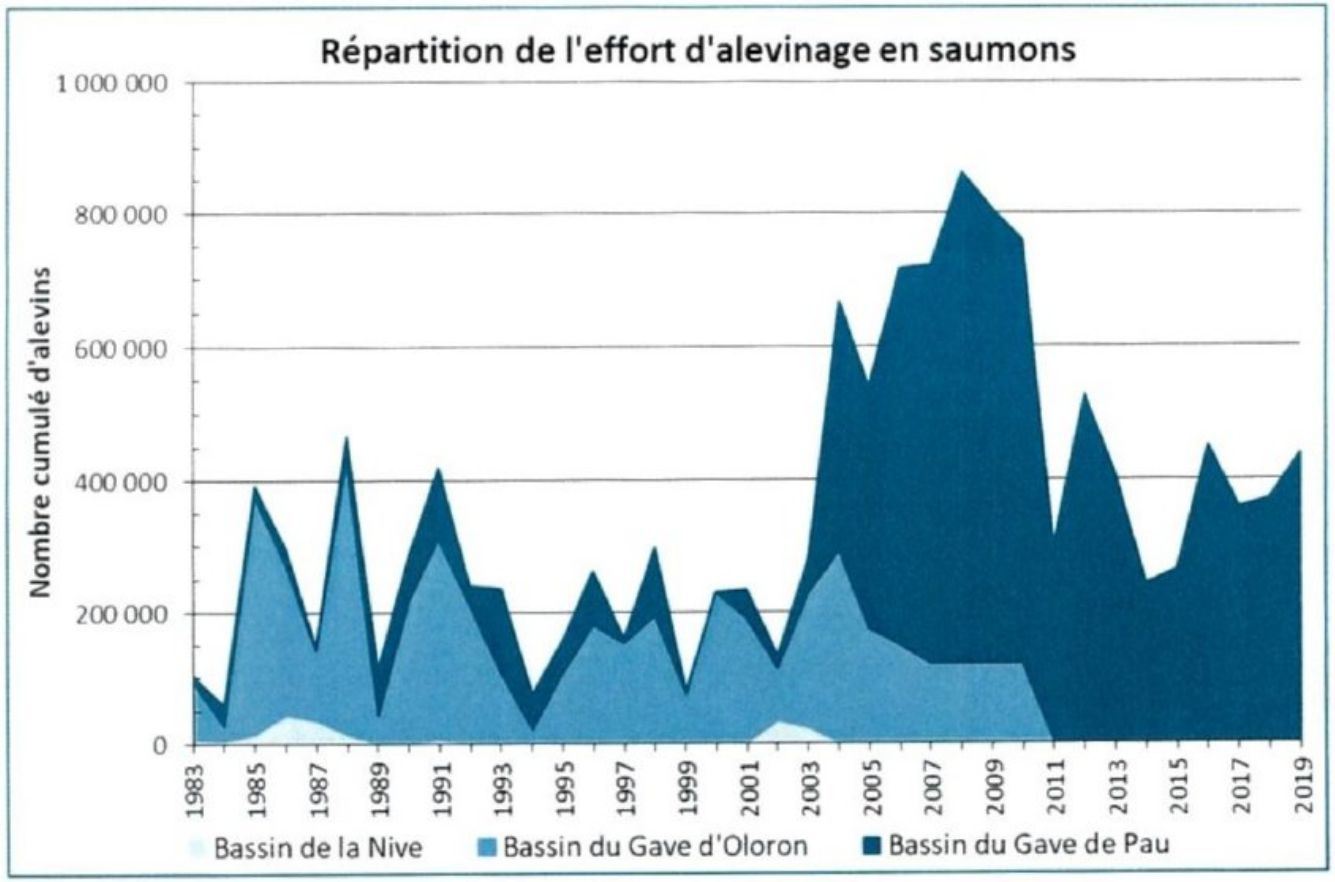
The Adour basin salmon population:

- Restricted in a part of the basin Gave d'Oloron - Saison
- Subject to commercial and recreational fisheries
- Access to new areas: restoration of the ecological continuity of the Gave de Pau

Releases

- targeted on newly accessible areas
- committed for a limited period (a few years)

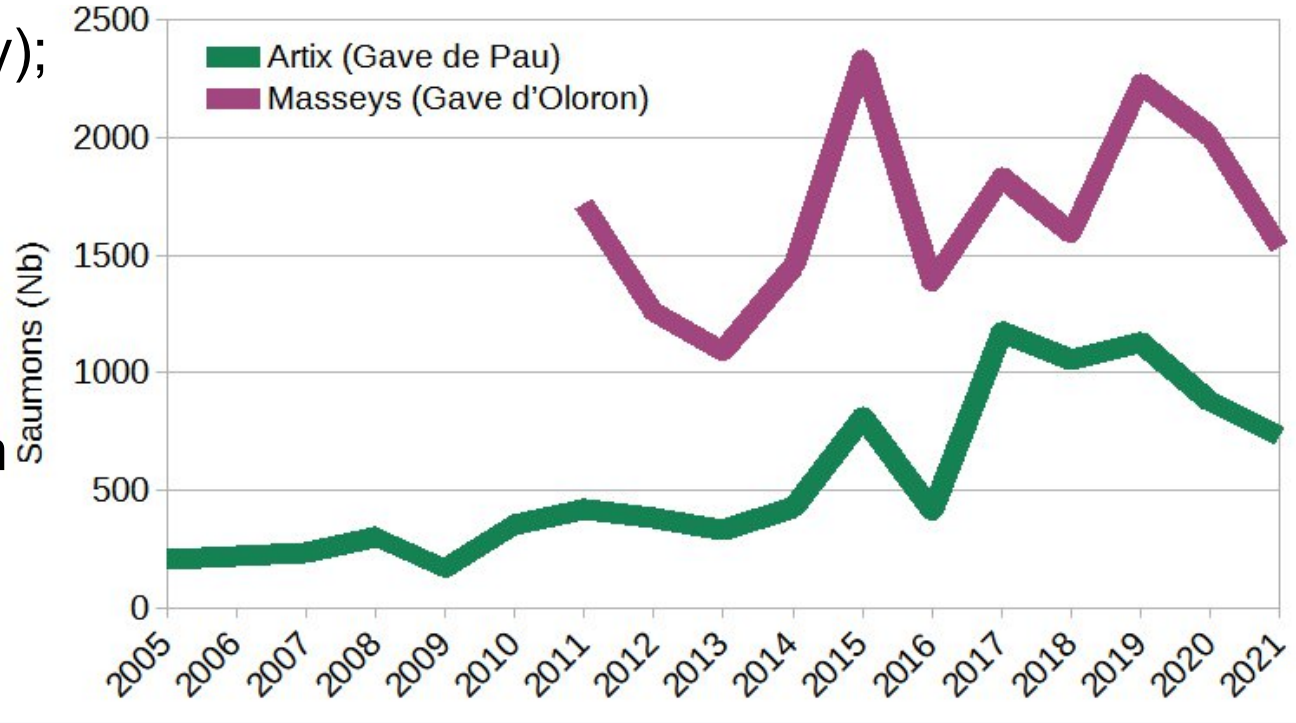
- Current distribution :
  - 300,000 précoces
  - 200,000 pré-estivaux et estivaux
  - 80% Gave de Pau
  - 20% Ouzom



Source : MIGRADOUR

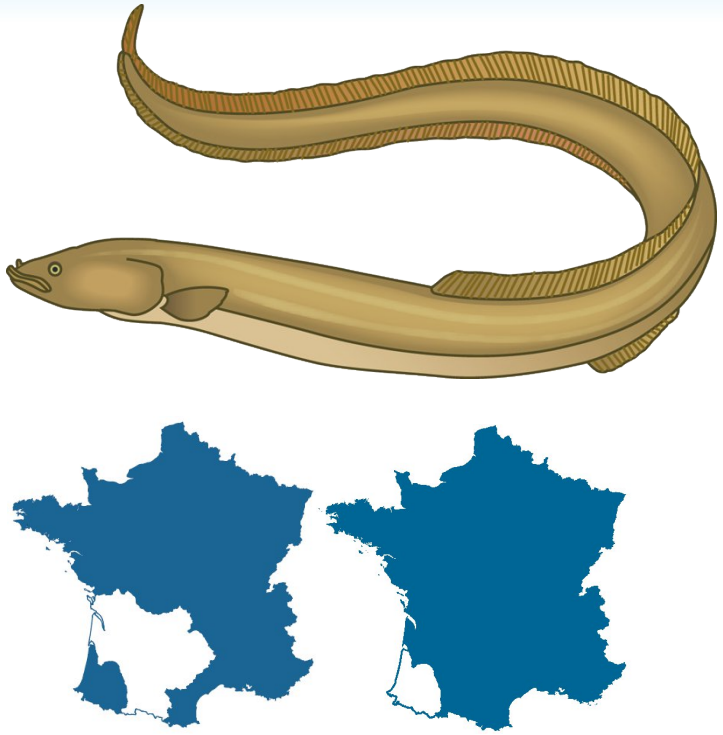
Assessment based on monitoring:

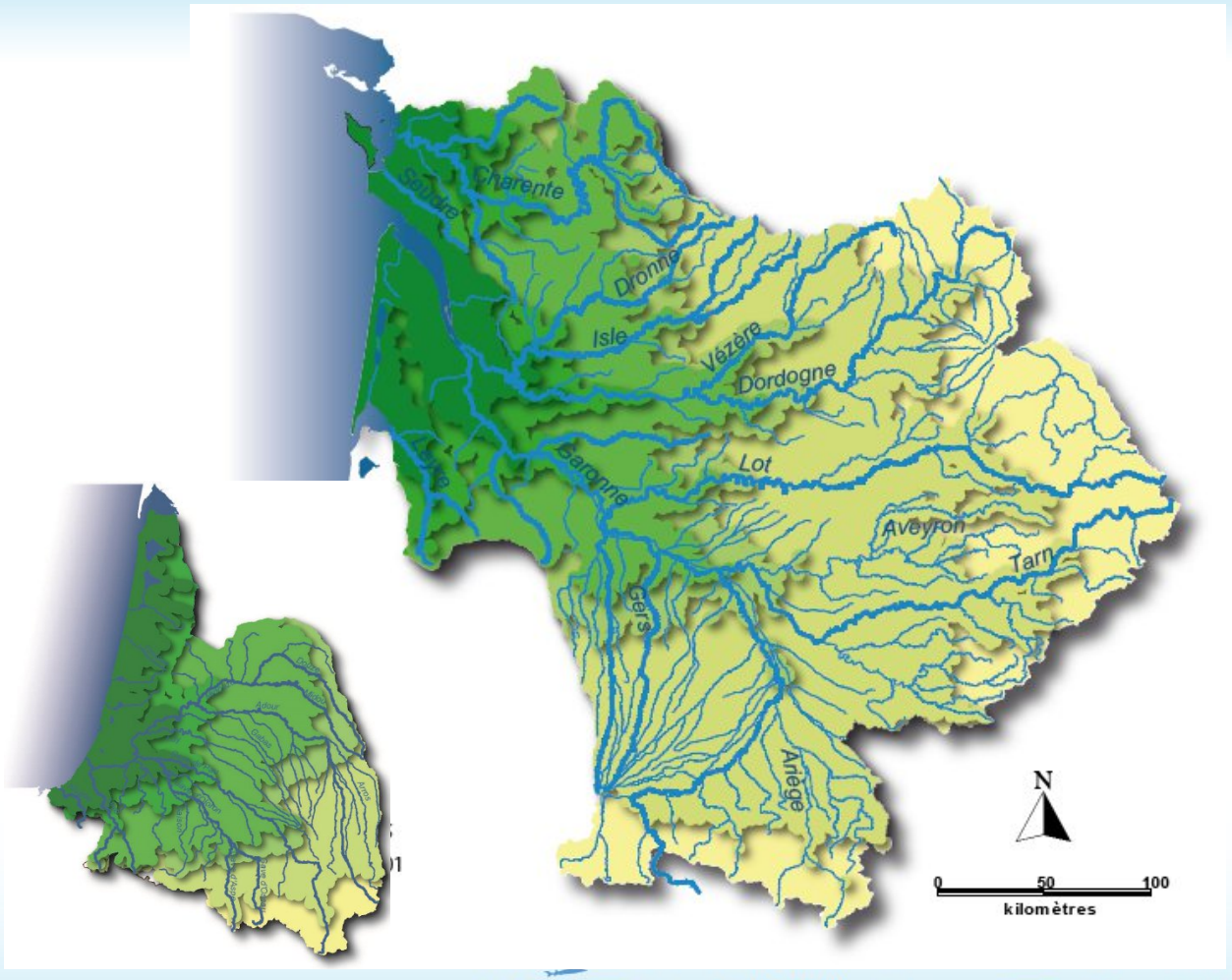
- survival of released fry
- returns of spawners from fry releases (fin removal + otolithic microchemistry);
- observation of nests in the wild



Evolution = numerous causes:
fisheries, ecological continuity, survival in fresh water or at sea, ...

Eel in Adour and Garonne basins :
Preserve young specimens in suitable areas.



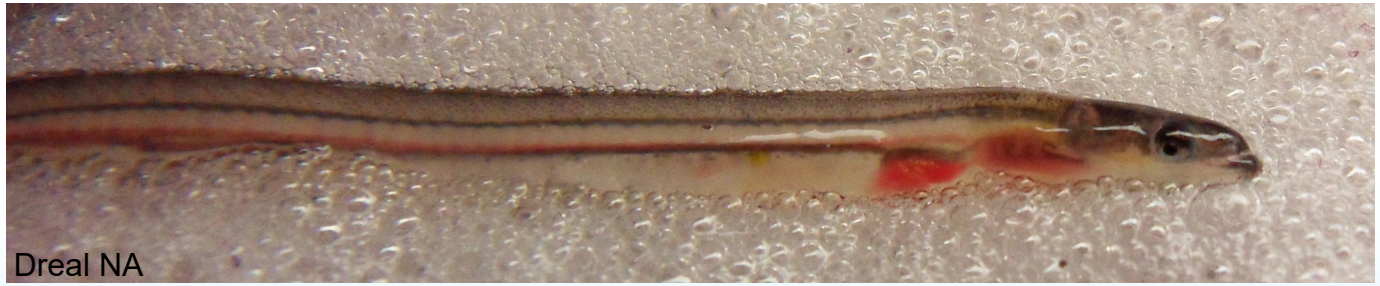


Objective: Contribute to increase the number of silver eels returning to the ocean

Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel

In France: “Restocking” included in the eel management plan

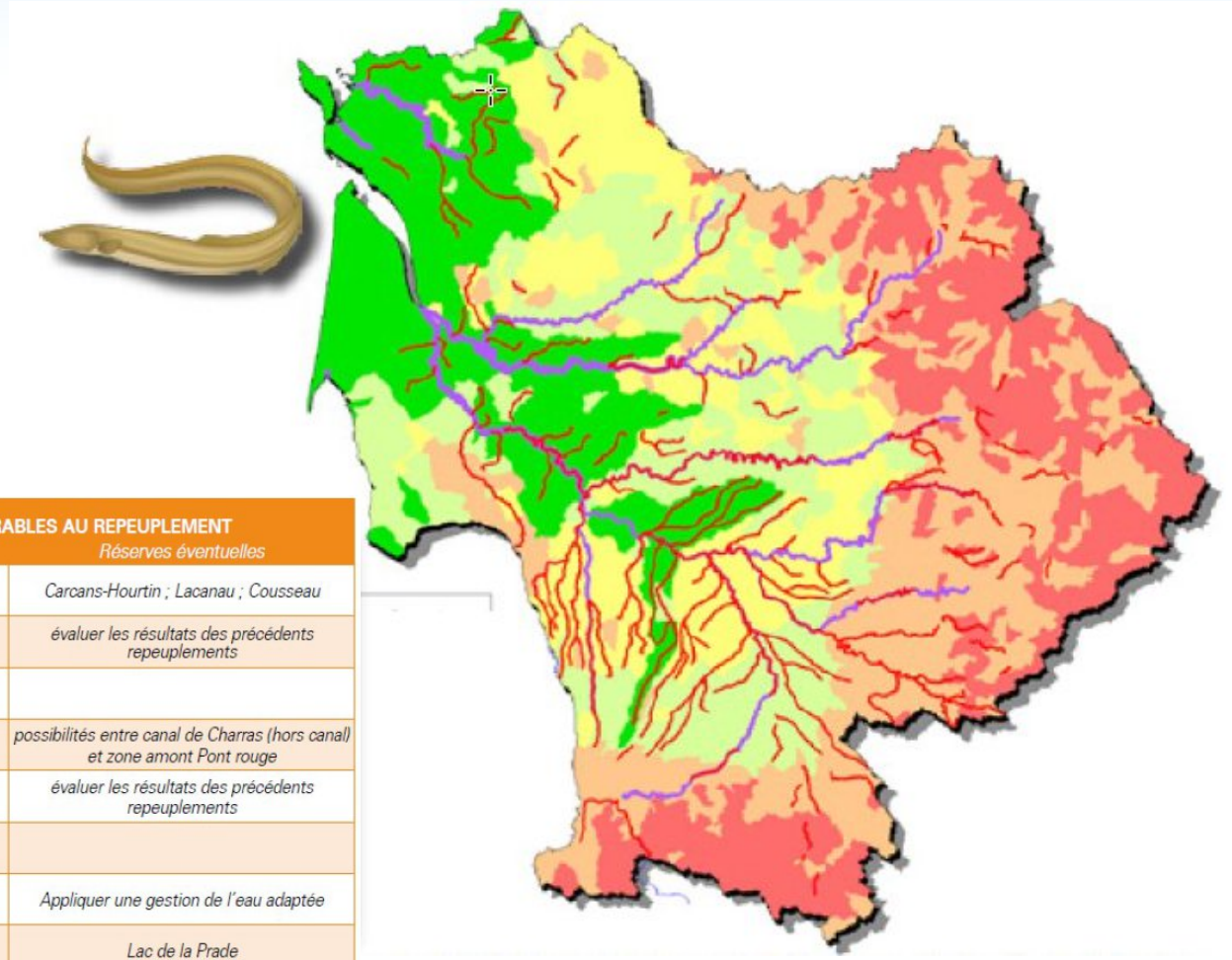
- Transfer of 5-10% of glass-eels captured each year
- Allow maximum survival
- Associate health controls (viruses - parasites)
- Experimental approach with scientific and technical assessment



Dreal NA

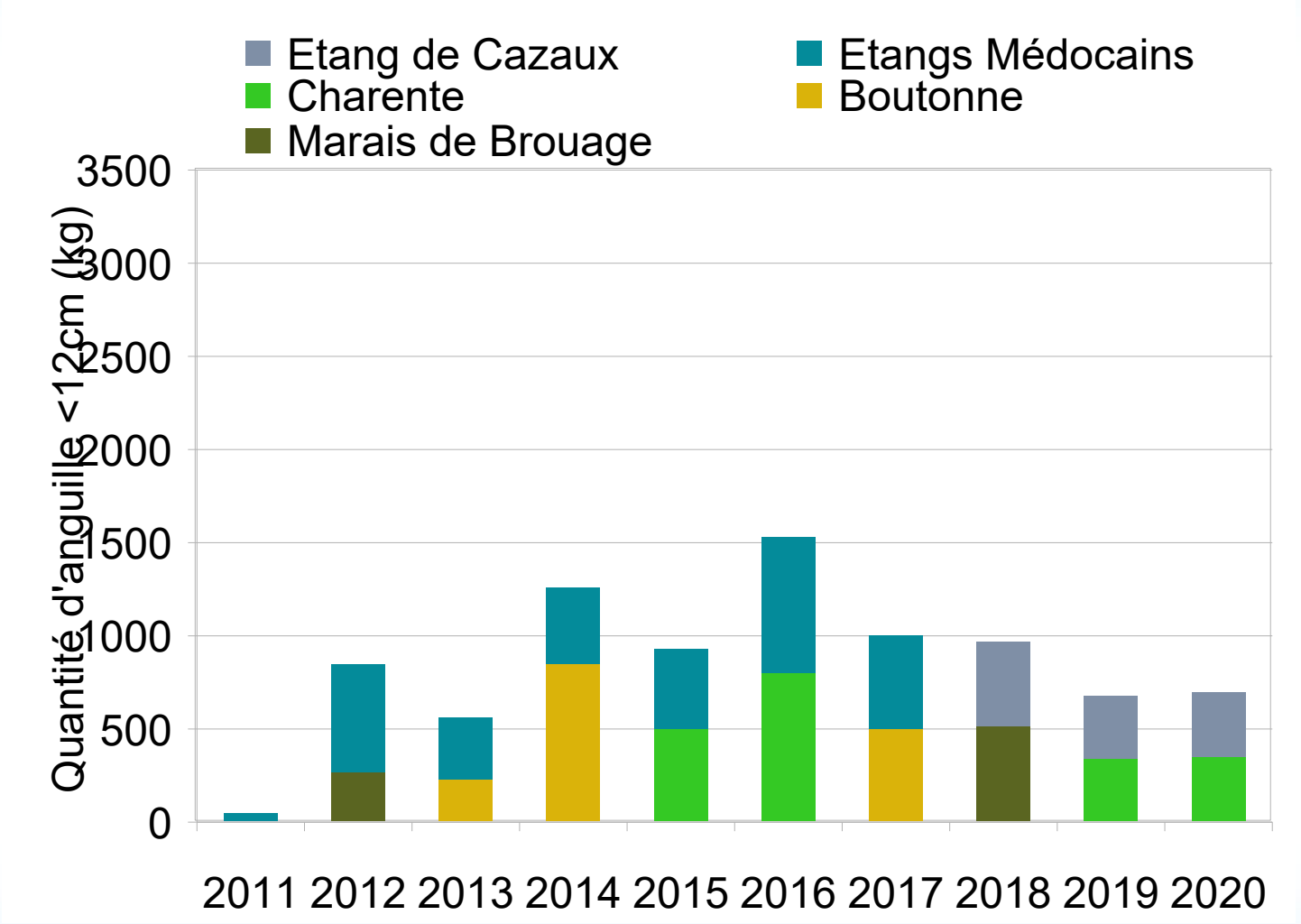
- Site selection - exclusion criteria:
  - Poor water quality
  - Intermittent streams
  - Presence of hydroelectric turbines without fish protection
  - Presence of fisheries
  - Presence of high eel densities
  - ...


Dreal NA



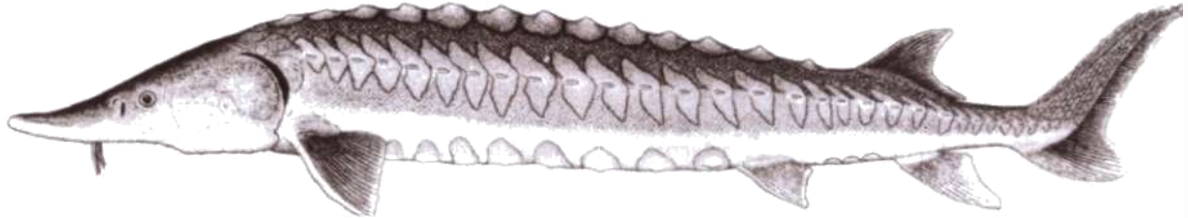
SITES FAVORABLES AU REPEUPLEMENT	*Réserves éventuelles*
Grands lacs médocains	*Carcans-Hourtin ; Lacanau ; Cousseau*
Boutonne	*évaluer les résultats des précédents repeuplements*
Arnoult et Bruant	
Marais de Rochefort	*possibilités entre canal de Charras (hors canal) et zone amont Pont rouge*
Marais de Brouage	*évaluer les résultats des précédents repeuplements*
Lary	
Réserve de Bruges	*Appliquer une gestion de l'eau adaptée*
Le Beuve	*Lac de la Prade*
Charente	*possibilité sur secteurs aval, à l'amont du barrage de Saint Savinien*
Lac de Bordeaux	*vérifier les possibilités de libre circulation*
Lac de Cazeau-Sanguinet	*vérifier la compatibilité avec le plan national de gestion de l'anguille*


Dreal NA


Etang de Cazaux
Etangs Médocains
Charente
Boutonne
Marais de Brouage
Quantité d'anguille <12cm (kg)
3500
3000
2500
2000
1500
1000
500
0
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

European sturgeon

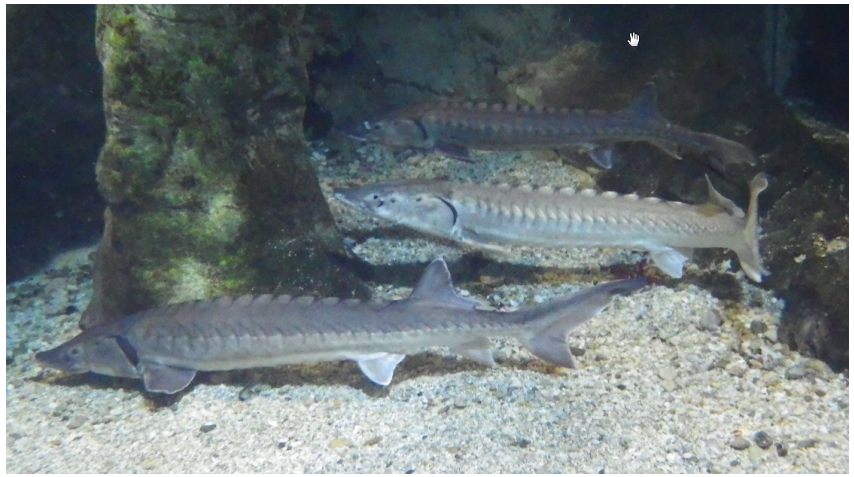
To protect endangered species



Objective: To increase the number of endangered European sturgeon from an ex-situ conservation stock of the species

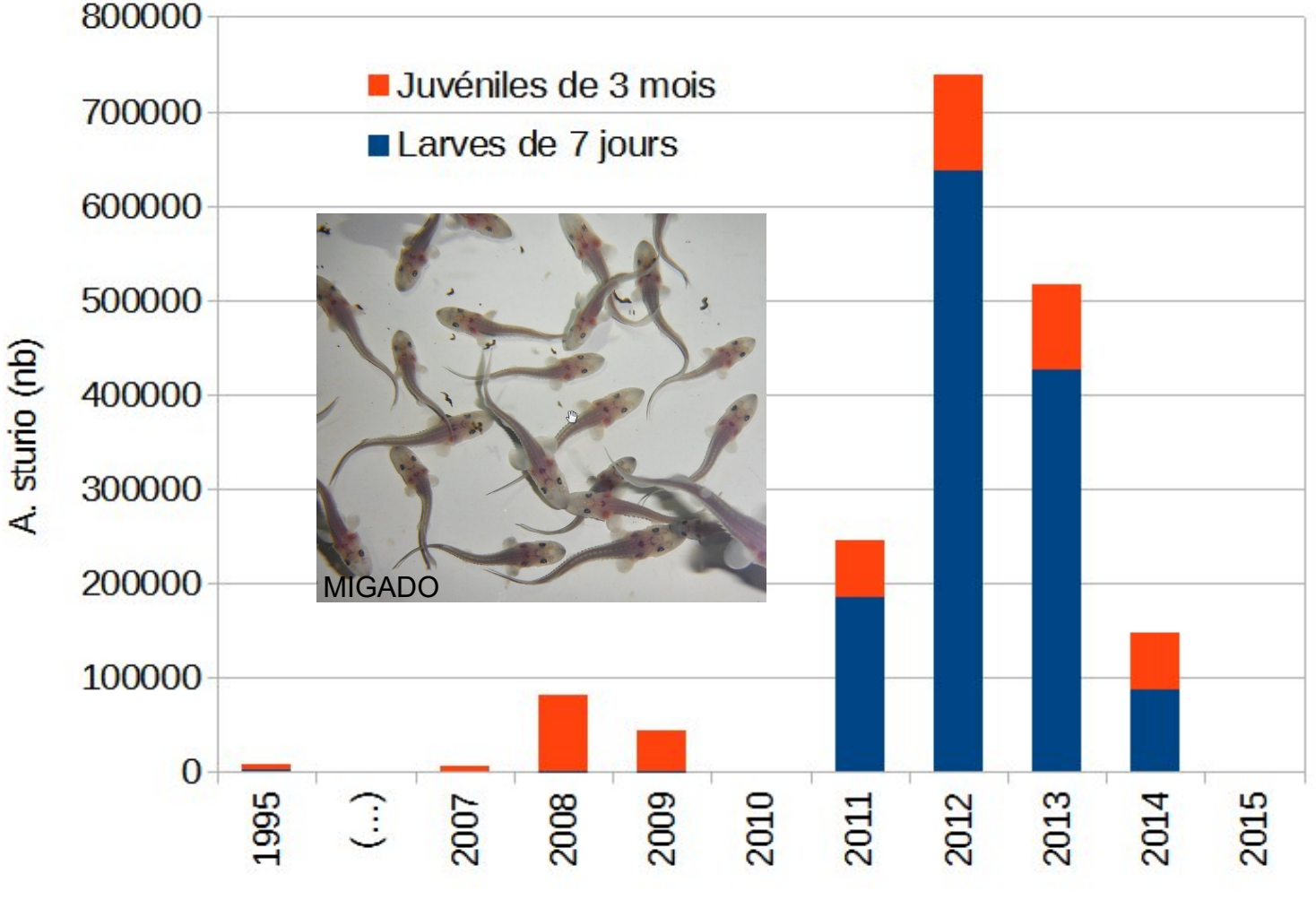
Establishment of a sturgeon ex-situ stock:

- from specimens, born between 1970 and 1995, captured in the wild
- stock supplemented with captive-born individuals
  - Development of captive breeding methods
  - Patience and persistence: 15 years to sexual maturity
- Today : 26 adults (18♂ + 9♀)
  145 juveniles (25♂ + 32♀ + 88)



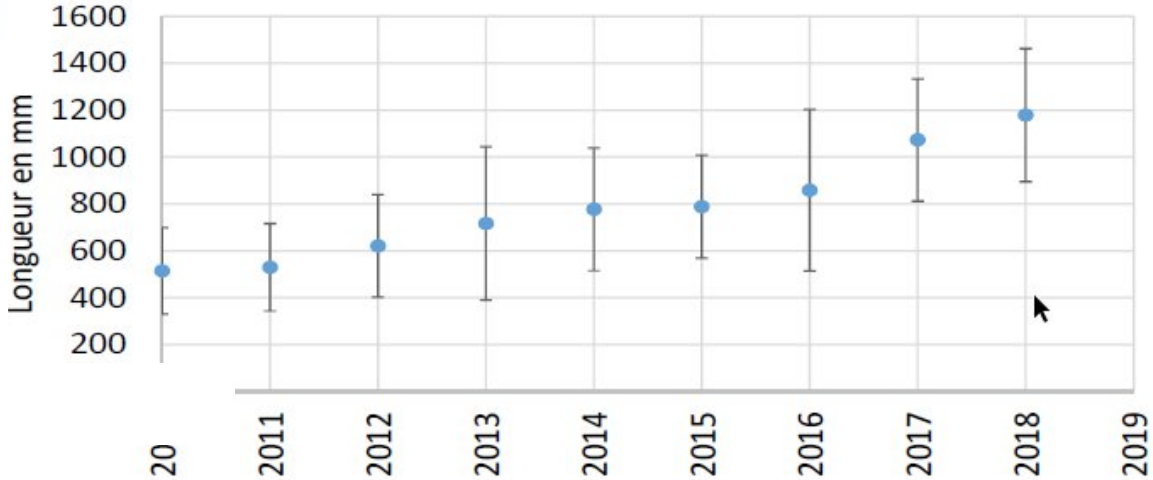
- 1st success in 1995
- Releases
  - Massive 2011-2014
  - 1.3M : 7 days old ;
  - 453,000 : 3 months old
  - 2,577 : 1 year old
  - 853 : 2 years old and more

- 2022 new successful reproduction

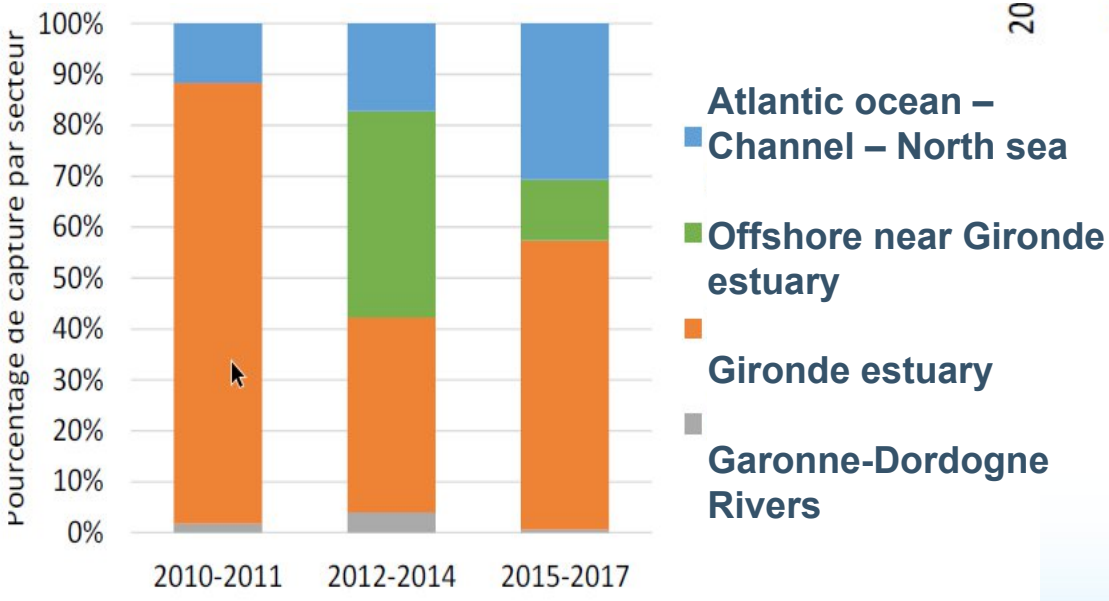


Source : INRAE-MIGADO

Lenght of european sturgeons observed in the Wild

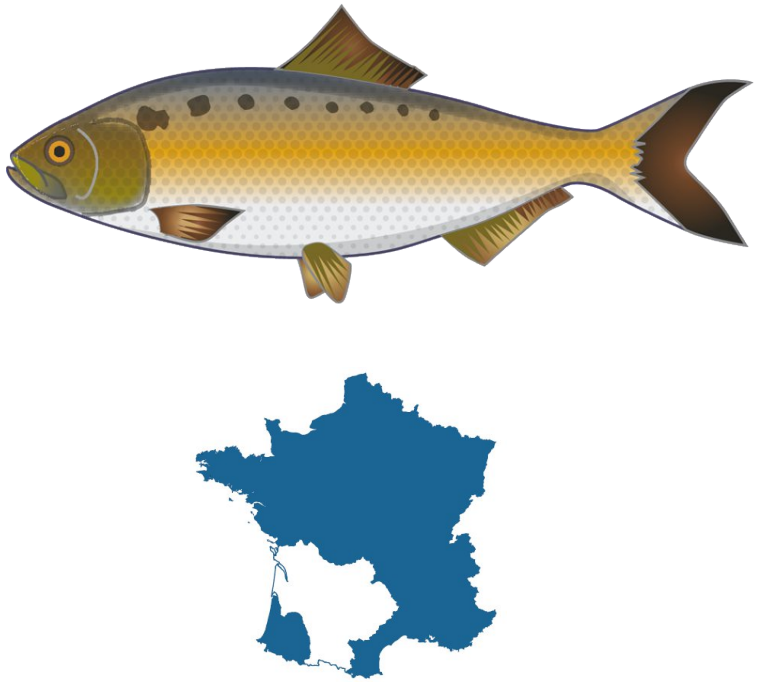


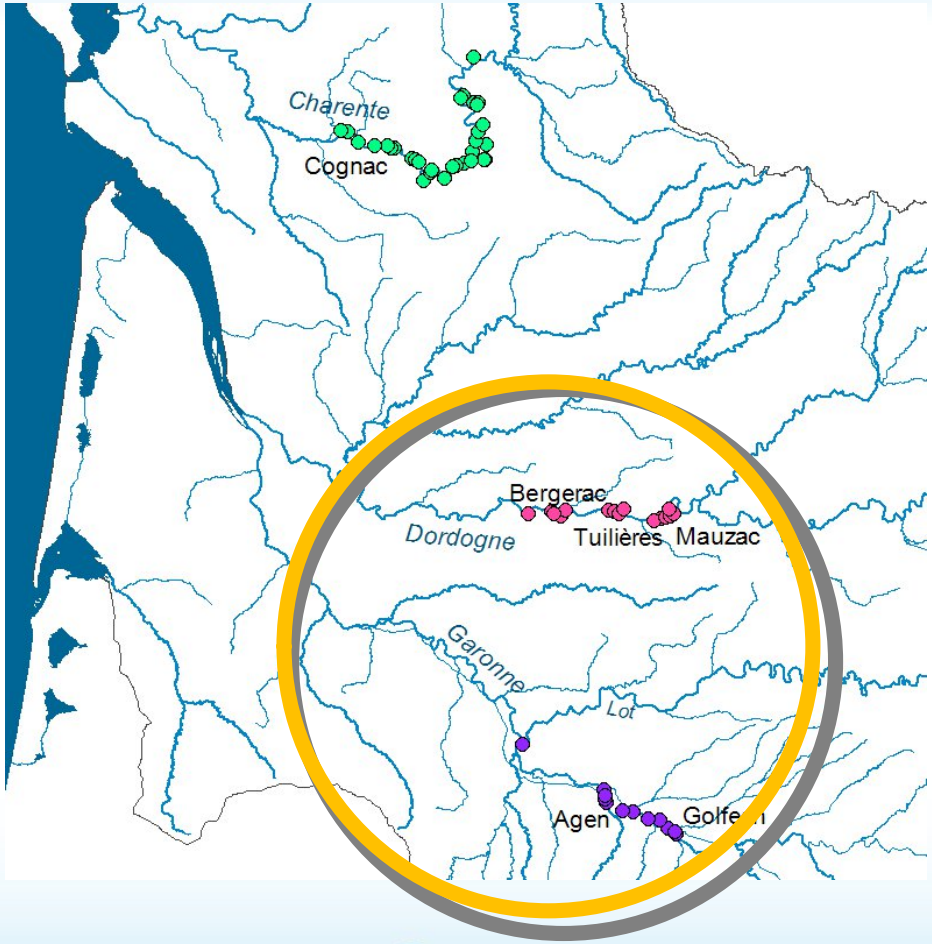
Geographical distribution (%)



Source : INRAE-CNPMEM-MIGADO

Allis shad in Garonne-Dordogne basin:
Understanding the difficulties of the species





Objective: To understand the causes of the decrease in allis shad in the Garonne-Dordogne basin

Test the hypothesis of a survival problem at the earliest stages

= compare survival rates, at the juvenile stage, between the wild fraction and the fraction from captive breeding

2 - 6 days

spawning grounds

Ex-situ

120 days max

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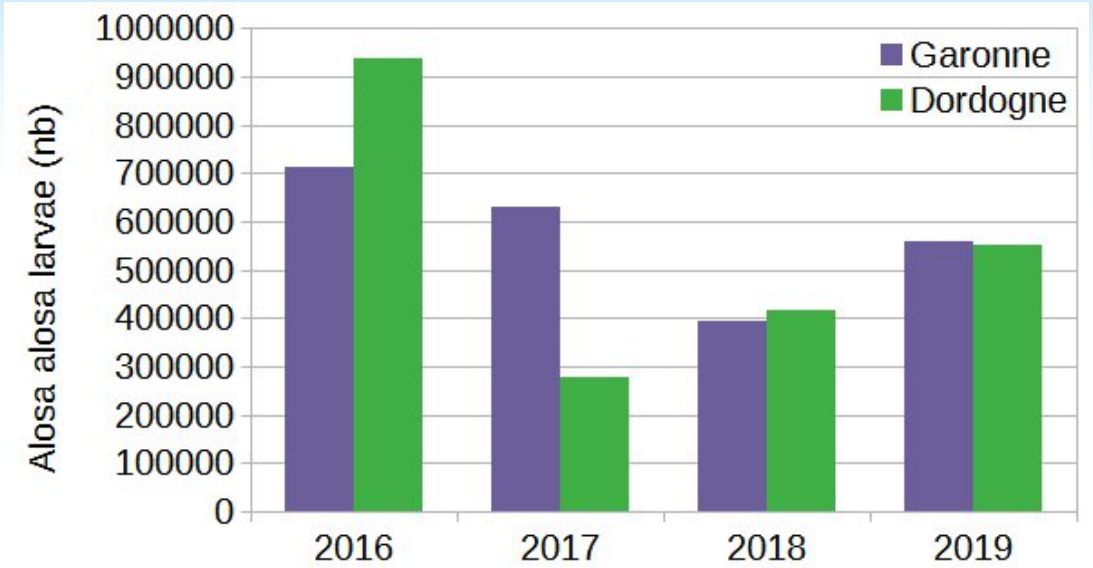
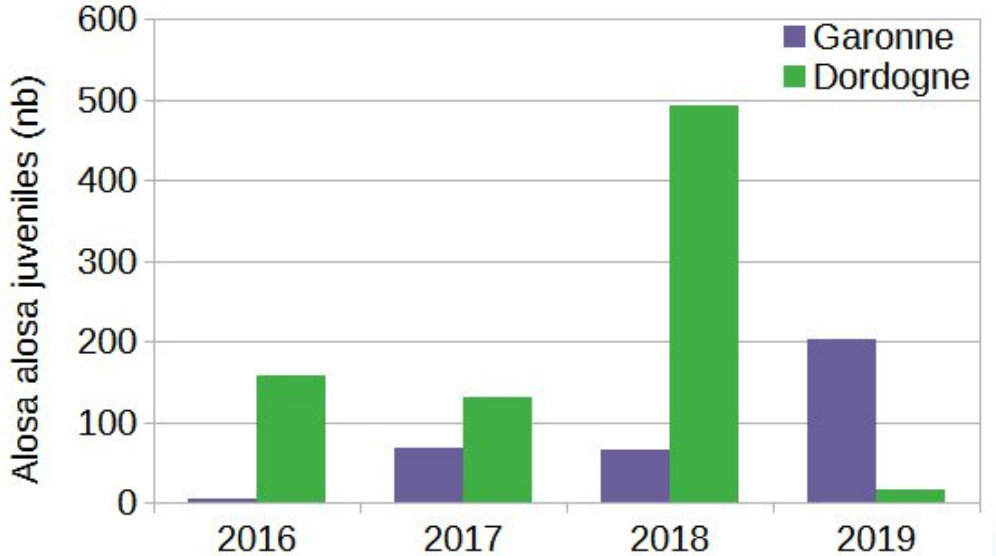
Requires the development of methods:

- Marking of larvae (vital staining)
- Juvenile Stage Inventory Fisheries

- In 4 years:
  - 4.5M larvae released
  - 164 nights seine hauling

- Per year :
  - 280 juveniles captured
  - 0.2 to 8.5 juvenile per seine haul
  - including 0-28% from releases

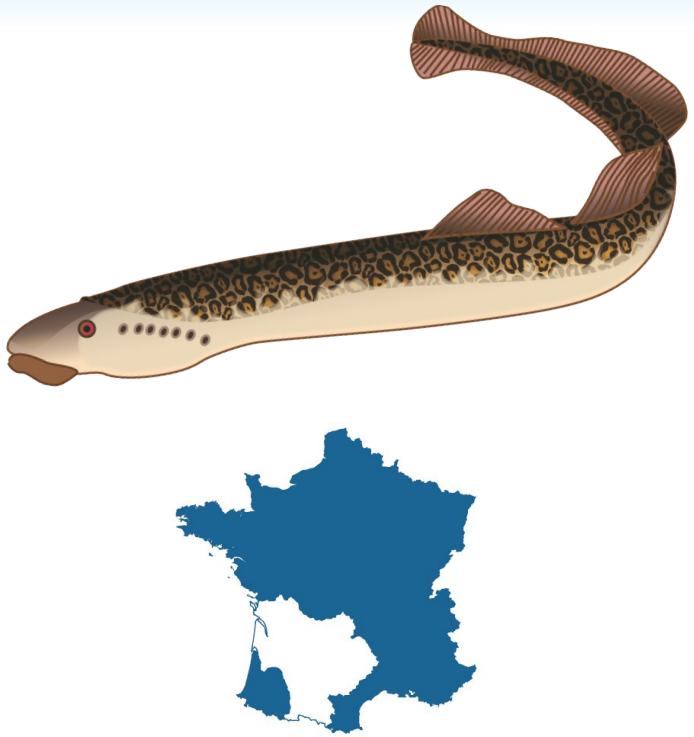


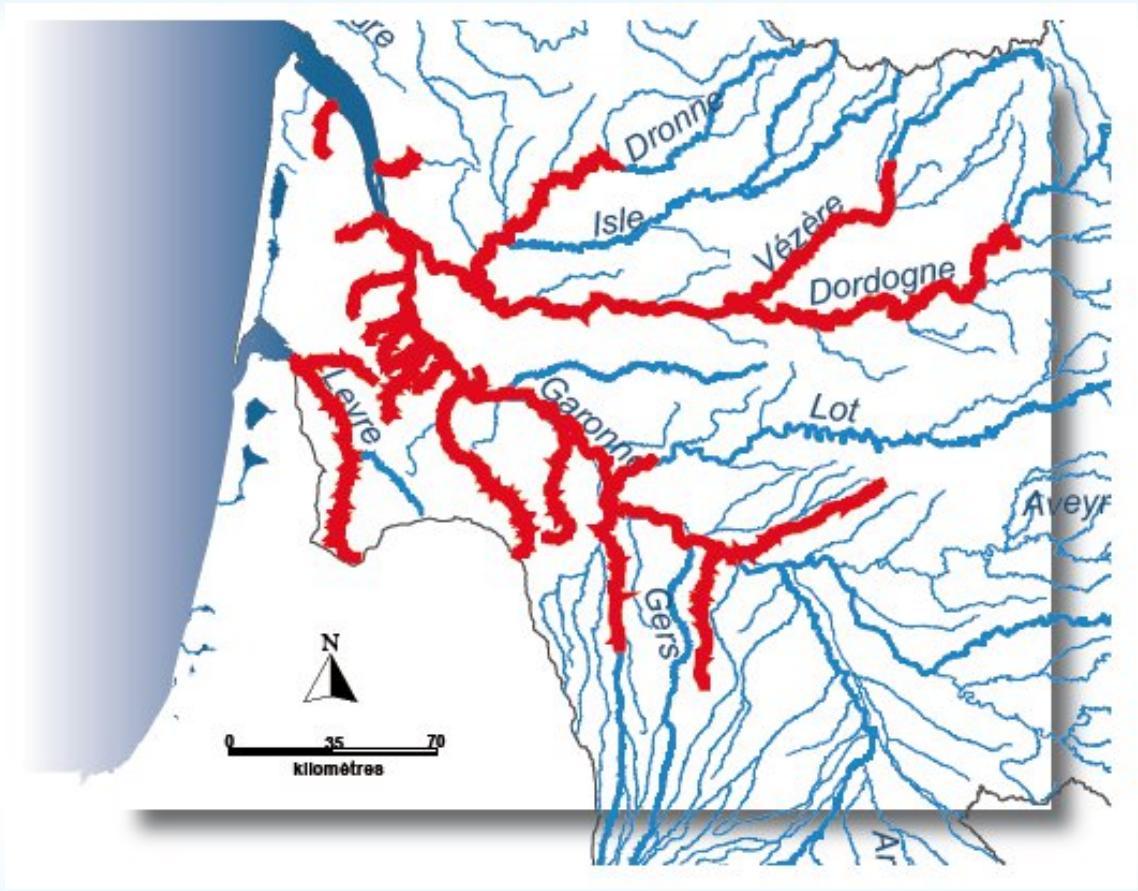


Source : MIGADO

Sea lamprey in Garonne-Dordogne

Preserving adults in continental water





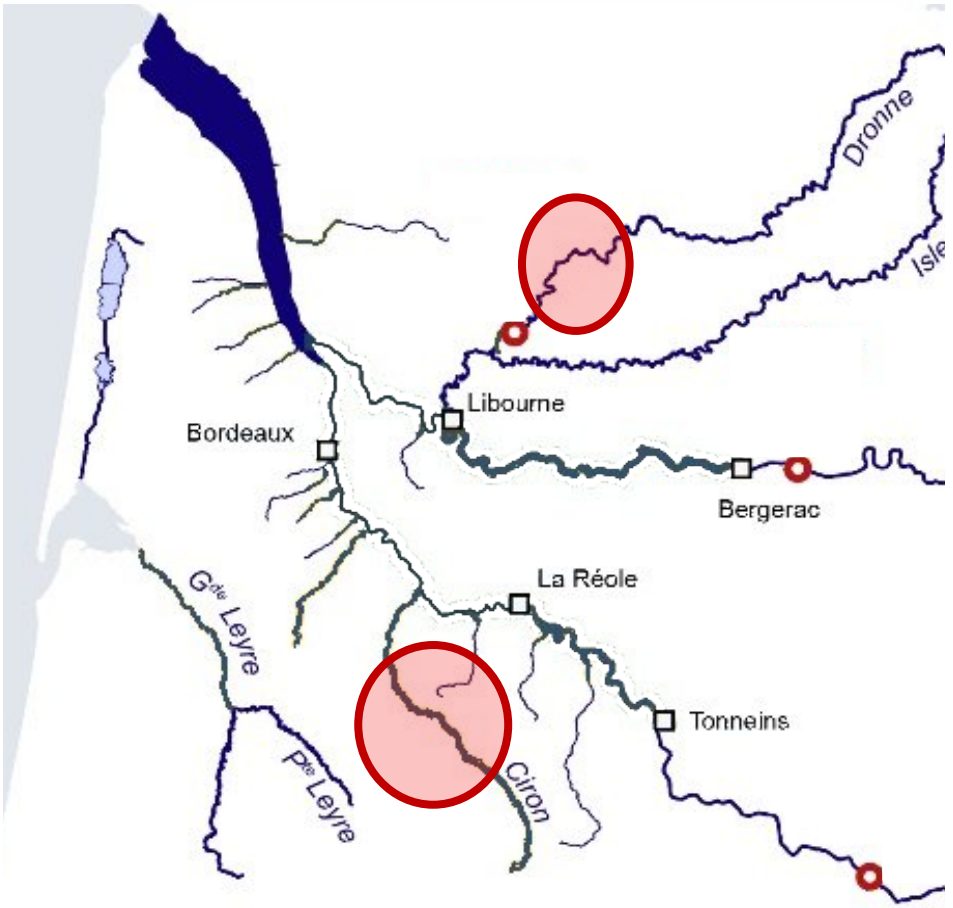
Objective: Contribute to the conservation of sea lamprey under new pressures

- Finding: species in difficulty
  - protection plan decided in 2021 taking into account the impact of the wels catfish
  - Transfer of downstream spawners to tributaries protected from the presence of the predators: Dronne and Ciron
- Assessment of the project
  - Monitoring of transferred spawners (behaviour, reproduction)
  - Monitoring larval densities (cohorts)


MIGADO

Spawner from downstream commercial fisheries, transferred to:

- The Dronne river: 2000
- The Ciron river: 1000
- Each year : 2021 and 2022



- the Behavior of spawners conforms
- Reproduction
  - Number of nests in the Ciron river

    x3 in 2021

    x4 in 2022
- larvae stages :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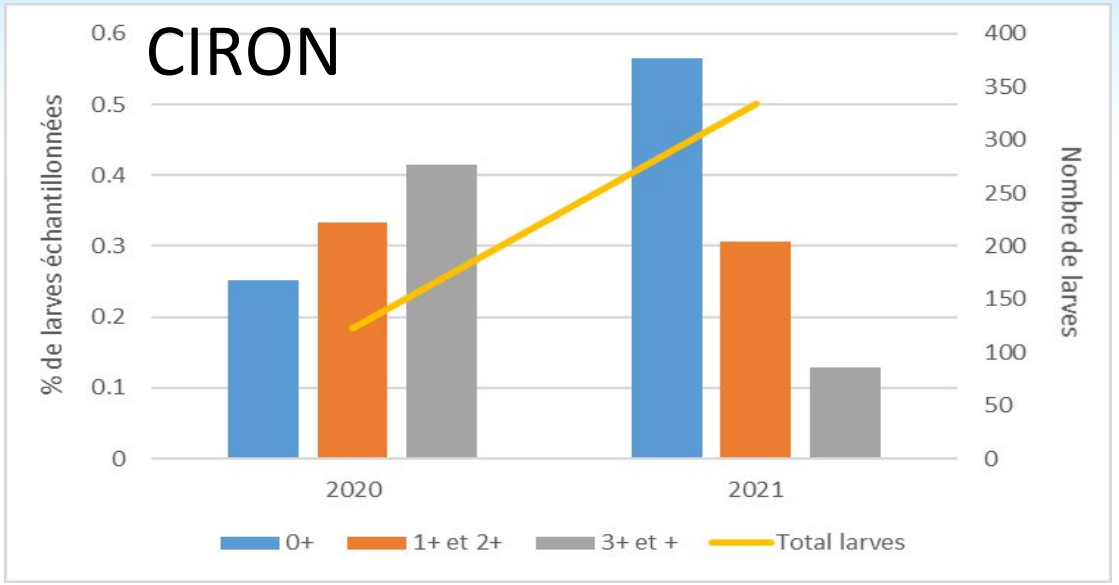
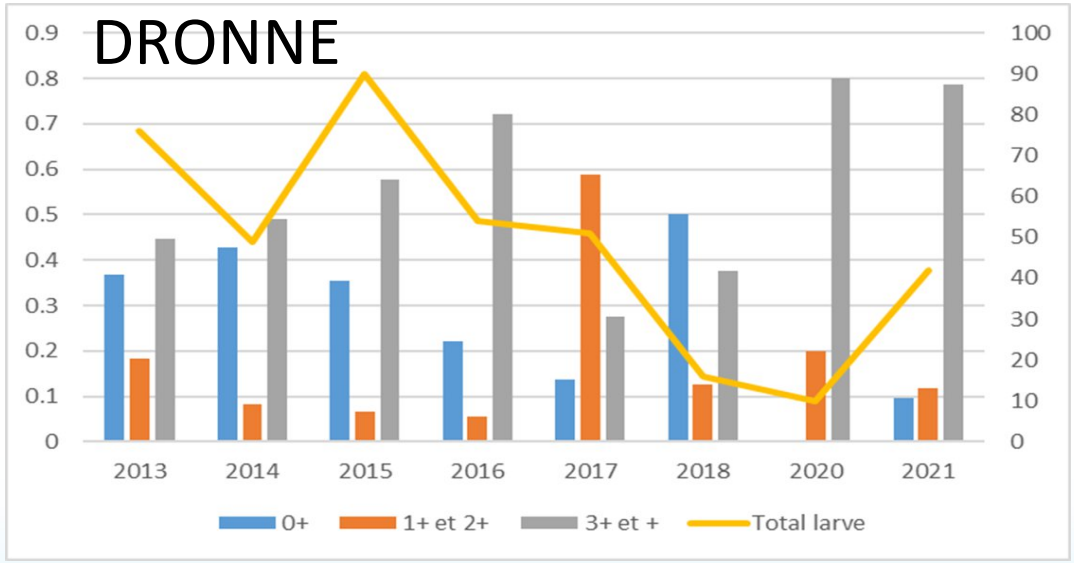




Source : MIGADO

In summary: the operations leading to the release of fish in the natural environment are numerous in the Adour Garonne basin

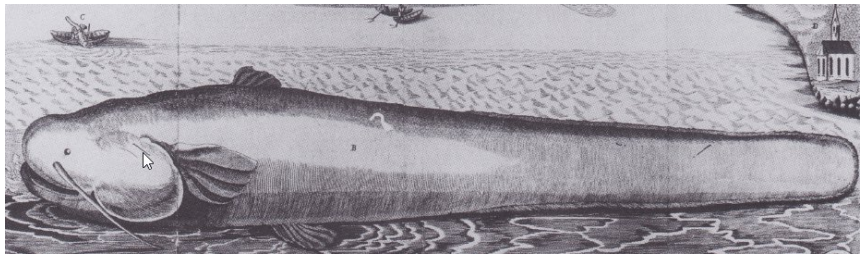
- Species concerned: Salmon, Eel, Allis Shad, Sea Lamprey
- Objectives :
  - Reintroduction of an extirpated population
  - Increase in the size of an existing population
  - Study of population dynamics
  - protection of fish individuals
  - Migration assistance

- The evaluation uses also a variety of methods:
  - Already proven or to be developed
  - Short or long term

not covered here

- Releases of trout : sea trout

- Releases of wels catfish



- Exotic sturgeon escapement

A lot of questions about these actions

1) Yes or no?
2) Which parents
3) What stages of life?
4) Where?

5) What negative effects ?

- Should we initiate or stop releases?
- Choice of genetic crossings?
- Embryos, larvae, juveniles?
- Choice of basin? Of tributary?
- Habitat knowledge !
- Genetic ; pathogens ?

Assessment and evaluation

1) Is it effective?

INRAE

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Sportvisserij Nederland

A.A.D.P.P.E.D Gironde

FÉDÉRATION NATIONALE PÊCHE

MIGRADOUR
Poissons Migrateurs

MIGADO
Migrateurs Garonne Dordogne Charente Seudre

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