

Jun 22nd, 4:00 PM - 4:15 PM

Session A3: Migratory Fish Recovery and Improved Management in the Final Stretch of the Ebre River

Jordi Borràs

IDECE (Institute for the Development of the Regions of the Ebre River)

Marc Ordeix i Rigo

CERM, Center for the Study of Mediterranean Rivers - Ter River Museum

Miquel Rafa

Catalunya - La Pedrera Foundation

Enric Gisbert

IRTA's Aquaculture Centre of Sant Carles de la Ràpita

Francesc Vidal

Natural Park of the Ebre Delta

See next page for additional authors

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Presenter Information

Jordi Borràs, Marc Ordeix i Rigo, Miquel Rafa, Enric Gisbert, Francesc Vidal, and Jesús Gómez

Fish Passage Conference 2015. Gröningen (The Netherlands). 22th June 2015

LIFE MIGRATOEBRE (LIFE13 NAT/ES/000237)

Migratory fish recovery and improved management in the final stretch of the Ebre River

Jordi Borràs¹, Marc Ordeix², Miquel Rafa³, Enric Gisbert⁴ & Francesc Vidal⁵

(1) IDECE, Institute for the Development of the Regions of the Ebre River (Catalonia) jordi.borras@gencat.cat

(2) CERM, Center for the Study of Mediterranean Rivers – Ter River Museum (Manlleu, Catalonia) marc.ordeix@museudelter.cat

(3) Catalunya - La Pedrera Foundation (Catalonia) miquel.rafa@fcatalunyalapedrera.com

(4) IRTA - Sant Carles de la Rapita (Catalonia) enric.gisbert@irta.cat

(5) Natural Park of the Ebre Delta (Catalonia) fvidale@gencat.cat

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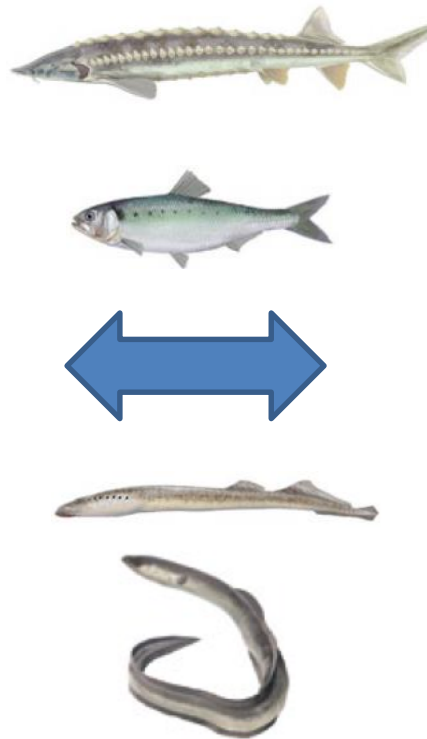
Fish Passage Conference 2015. Gröningen (The Netherlands). 22th June 2015

LIFE MIGRATOEBRE (LIFE13 NAT/ES/000237)

Migratory fish recovery and improved management in the final stretch of the Ebre River



Ebre River at Natural Reserve of Sebes (Flix).
Picture: Pere Josep Jiménez



Ebre Delta. Picture: Government of Catalonia

With the support of:





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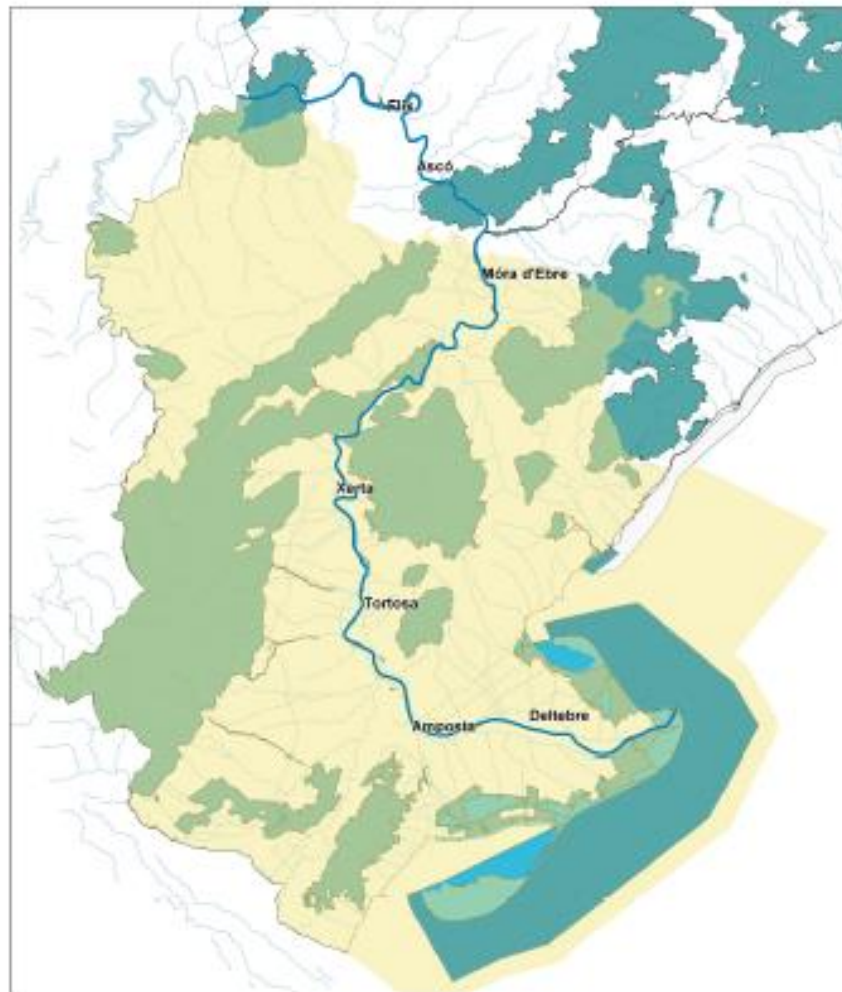
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Natural protected areas of the MIGRATOEBRE project

EbreBiosfera Terres de l'Ebre



Project area



- Ebre river
- Ebre Biosfera Terres de l'Ebre
- Natura 2000 areas (LIC+ZEPA)
- Catalan Wetlands Inventory
- PEIN areas

5 0 25 km



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It started in October 2012, with a Dutch – Catalan connection...



**Reintroduction of the
sturgeon in the Ebro**

A feasibility study



A project of
WWF the Netherlands Innofonds, the Netherlands
Foundation ARK Nature, the Netherlands
CERM, Center for the Study of Mediterranean Rivers, Catalonia
Foundation Catalunya-la Pedrera, Catalonia
LINKit consult & Wanningen Water Consult, the Netherlands



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Which sturgeon specie belongs in Ebre River?



Possible Atlantic sturgeon
(*Acipenser oxyrinchus*) from XVII-
XVIII centuries (Salvador family
collection, Botanical Institute of
Barcelona).

Picture: Marc Ordeix-CERM.

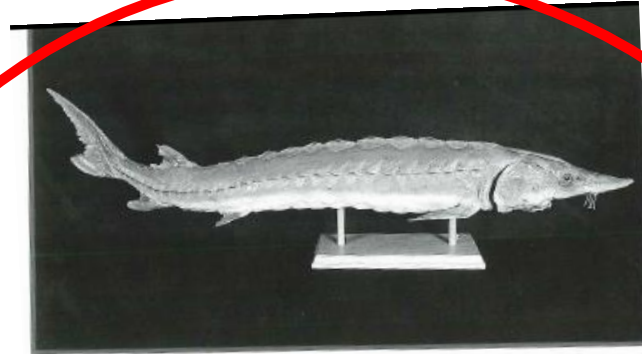


Figura 7.7. Exemplar d'esturió adult procedent de l'Ebre conservat al museu de Zoologia de Barcelona.
Autor: R. Muro. Font: *Arxiu històric de la Ciutat*.



Figura 7.8. Exemplars juvenils procedents de l'Ebre conservats al Museo Nacional de Ciencias
Naturales. Font: Museo Nacional de Ciencias Naturales.

Individuals of **European sturgeon (*Acipenser sturio*)**
from the Ebre river (from collections of natural history
museums of Barcelona and Madrid).

Pictures: Porres & Farnós in Fernández & Farnós, 1999.

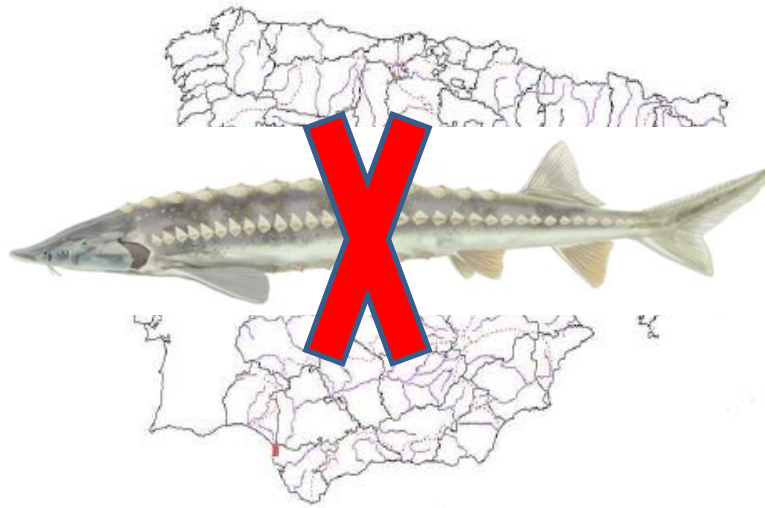


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Current and potential distribution of European sturgeon



Maps from: Doadrio, 2001; Keith *et al.*, 2011; Kottelat & Freyhof, 2007. Picture: Mariano Cebolla – LIFE MIGRATOEBRE.



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Historical situation of European sturgeon at the lower Ebre River



Picture of an sturgeon from a paper of the XIV Century deposited at the local archive of the Terres de l'Ebre (Tortosa, Catalonia). From: Farnós & Porres in Fernández & Farnós, 1999.



European sturgeon was **present in the main rivers of Catalonia**: Ebre, Llobregat, Ter, Muga and Fluvià rivers (Sostoa *et al.*, 2010).

At Ebre River, sturgeon arrived until Tudela (Navarra), 490 km upstream of the river mouth (Fernández & Farnós, 1999).



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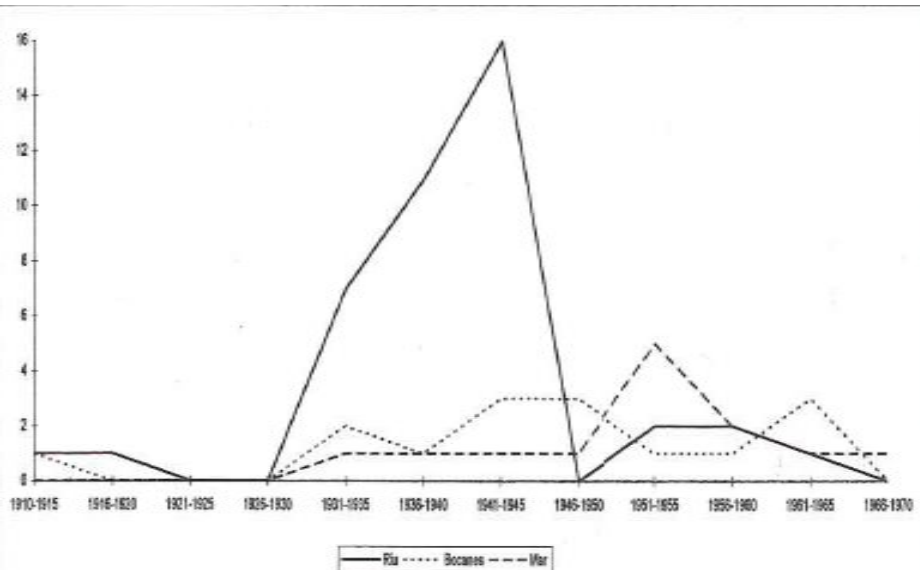
Historical situation of European sturgeon at the lower Ebre River



In **XV Cent.**, the **regrowth of the Xerta's weir** caused serious problems to migratory fish species: the sturgeon's **distribution area** in the Ebre River remains, since then, **limited to only last 58 km.**

Since 1965, there is no one capture of adults sturgeon.

The disappearance of juveniles was slightly later as one would expect, and happened after the year 1970 -it was very similar to those that occurred in the Rhone River (Brosse et al., 2011).



Catch of adults of European sturgeon (*Acipenser sturio*) relationship for years and areas (1910-1970) at the lower Ebre River. From: Porres & Farnós in Fernández & Farnós, 1999.



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Is Ebre River suitable for the sturgeon?

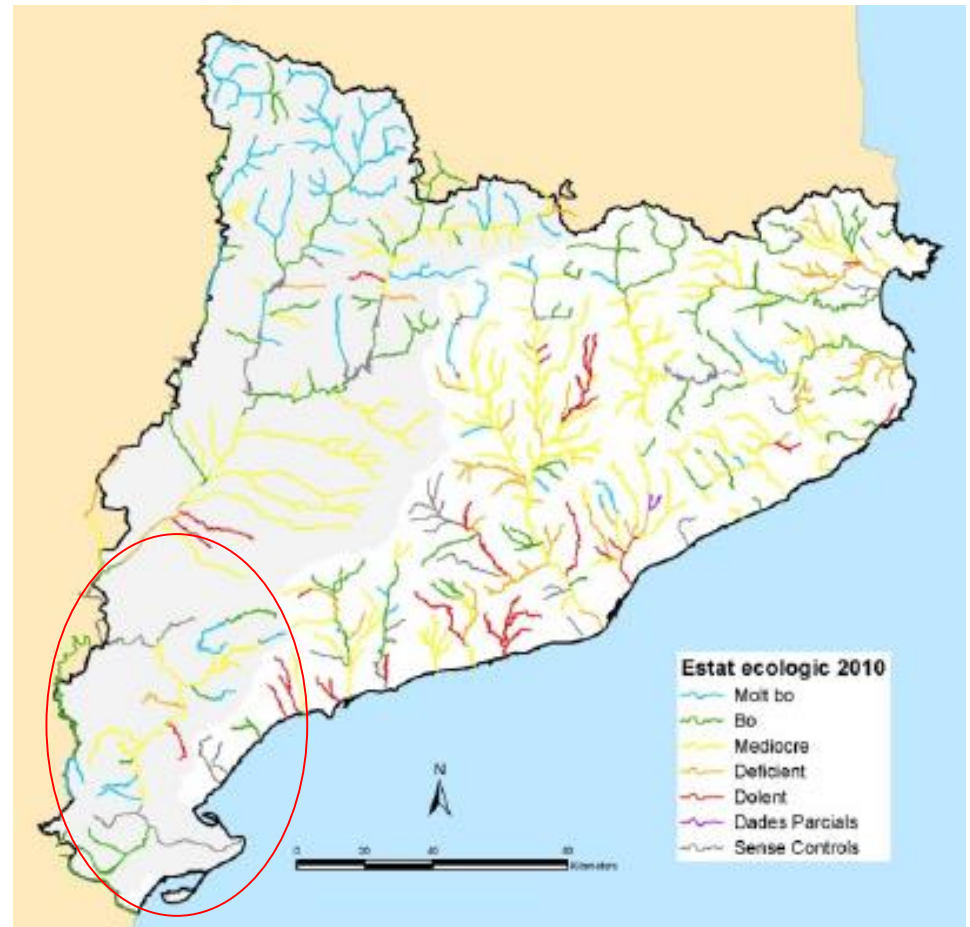
1) Physicochemical and biological water quality



Polluted
sludge
extraction
on the Flix
dam. Picture:
M. Ordeix



Mass of macrofites absolutely covering
the lower Ebre River bed. Picture: M. Ordeix.



Ecological status of rivers from Catalonia 2010.
From: Catalan Water Agency, 2011



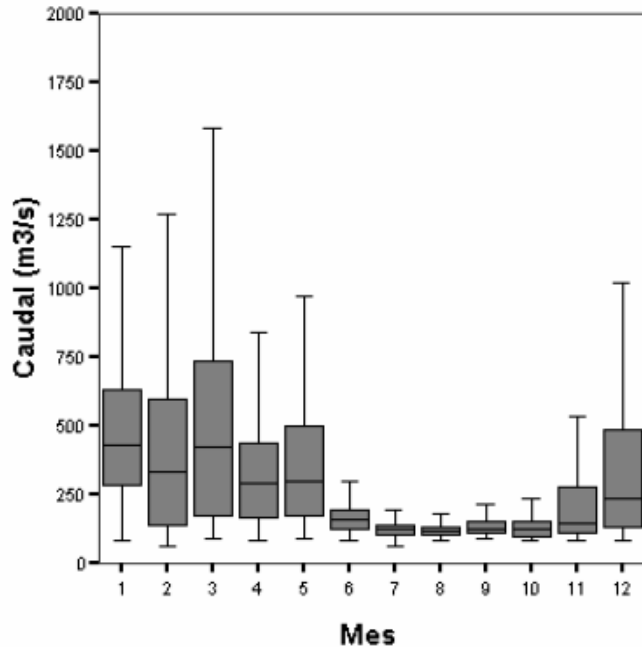
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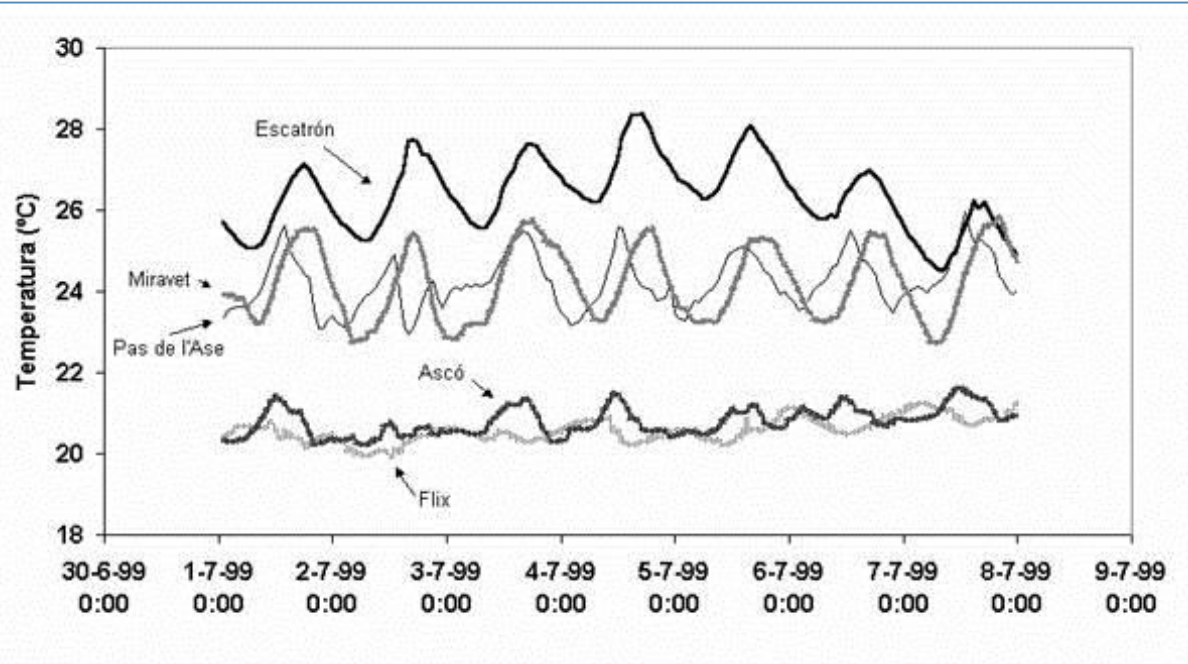


Is Ebre River suitable for the sturgeon?

2) River flow and water temperature



Flow rates measured hourly by the CHE in the years 2000-2006 at Tortosa gauging station, in the lower Ebre River, depending on the month. From: Prats *et al.*, 2012



Show of the water temperature of the Ebre River in summer: at Escatrón (at the entry to Mequinença dam), Flix, Ascó, Pas de l'Ase and Miravet –from top to down of the river tour- between 1 and 7 of July 1999. From: Prats *et al.*, 2004.

In the lower Ebre, **big dams compensate global warming, colding river water**: in spring, water temperature is close or lower than 17-20°C, considered optimal in spawning grounds for this species (Gressner & Bartel, 2000).



Is Ebre River suitable for the sturgeon?

3) River connectivity

- Flows too low during all the year
- **5 big obstacles** (weirs and dams) at the lower 152 km of the Ebre River
- No one fish pass suitable for sturgeon
- Only 58 km of free flowing river



Dams of Riba-roja and Flix at the lower Ebre River. Pictures: Hermann Wanningen.



Weir of the Nuclear plant of Ascó, at the lower Ebre River. Picture: Pere Josep Jiménez.



Weir (and fish ladder) of Xerta, at the lower Ebro River. Picture: Marc Ordeix-CERM.



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Is Ebre River suitable for the sturgeon?

4) Inner and sea fisheries



Craft fishery at the Ebre estuary and fishery with the **arts of hauling in the marine platform**, seem to be critical factors for the contemporary disappearance of sturgeon from the Ebre River (and other European rivers).



Otherwise, **alien fish** is a serious problem for the conservation of native fish species (even without climate change into account). Will sturgeon control / compete with them?


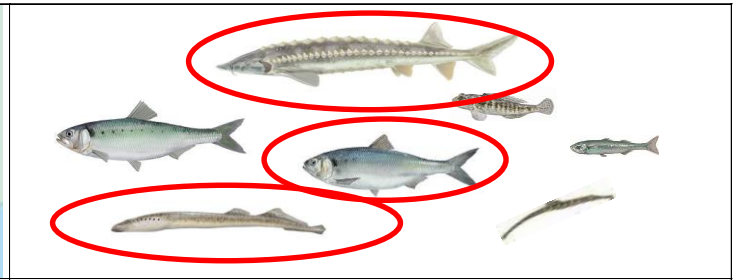

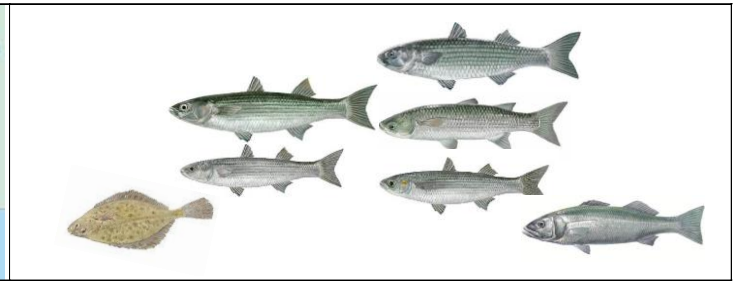




Silur from the lower Ebro River.
Picture: Mariano Cebolla.

Migrating fish in the lower Ebre River

**We can use synergies...
Sturgeon is not alone!**

Maintenance of conservation
status of many freshwater
species included in the Natura
2000 network is extremely
important...

	
<p>c) Anàdroms</p>	<p>Esturió (<i>Acipenser sturio</i>), guisado (<i>Alosa alosa</i>), saboga (<i>Alosa fallax</i>), llampresa o llamprea de mar (<i>Petromyzon marinus</i>), gòbit de sorra o burret (<i>Pomatoschistus microps</i>), agulleta de riu (<i>Syngnathus abaster</i>) i joell (<i>Atherina boyeri</i>).</p>
	
<p>d) Amfídroms</p>	<p>Gòbit de sorra o burret (<i>Pomatoschistus microps</i>), llissa llobarrera o cabeçut (<i>Mugil cephalus</i>), llissa calua (<i>Liza ramada</i>), llissa vera (<i>Chelon labrosus</i>), llissa petita o fusany (<i>Liza saliens</i>), llissa galta-roja o llissalet (<i>Liza aurata</i>), rèmol de riu (<i>Platichthys flesus</i>) i llobarro o llop (<i>Dicentrarchus labrax</i>).</p>
	
<p>b) Catàdroms</p>	<p>Anguila (<i>Anguilla anguilla</i>)</p>

Previous conservation efforts for the targeted species

a) **“Eel management Plan for Catalonia”**, especially focused in the lower Ebre River and Delta driven by the Catalan Ministry of Agriculture, Livestock, Fisheries, Food and Environment (2009).



b) **“Twaite shad (*Alosa fallax*) spawning potential habitat availability and associated environmental flows project for the lower Ebre River and its Delta”**, driven by the Catalan Ministry of Agriculture, Livestock, Fisheries, Food and Environment (IRTA – Sant Carles de la Ràpita & Forestal Catalana, Catalan Ministry of Agriculture, Livestock, Fisheries, Food and Environment 2008).



c) **“Spanish action plan for the recovery of the European sturgeon”** with the Spanish Ministry of Agriculture, Livestock, Fisheries, Food and Environment and its partners (Tragsatec). This general guidelines supports a future reintroduction plan of the sturgeon in the Ebre River (February - April 2013).



Project team

Lider:

- **IDECE, Institute for the Development of the Regions of the Ebre River** (ascribed to the Department of Planning and Sustainability of the Government of Catalonia).

Partners:

- **Catalunya - La Pedrera Foundation** (land owner in the Ebre Delta).
- **Department of Agriculture of the Government of Catalonia** (DG Fisheries and Maritime Affairs and Natural Park of the Ebre Delta).
- **IRTA - Sant Carles de la Rapita** (aquiculture area of the research institute ascribed to the Department of Agriculture of the Government of Catalonia).
- **CERM, Center for the Study of Mediterranean Rivers** (Ter River Museum).

Collaborators: local organizations, among which are the Museum of les Terres de l'Ebre (Amposta) and the Freixe Nature Group (Flix); Hidroelèctrica de Xerta and ANAV (Ascó nuclear power plant) power companies, Water Catalan Agency (ACA), Ebro River Waterboard (CHE, Government of Spain), IRSTEA-Bordeaux and MIGADO (France).



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Project team and the project management structure

Start date:

01/07/2014

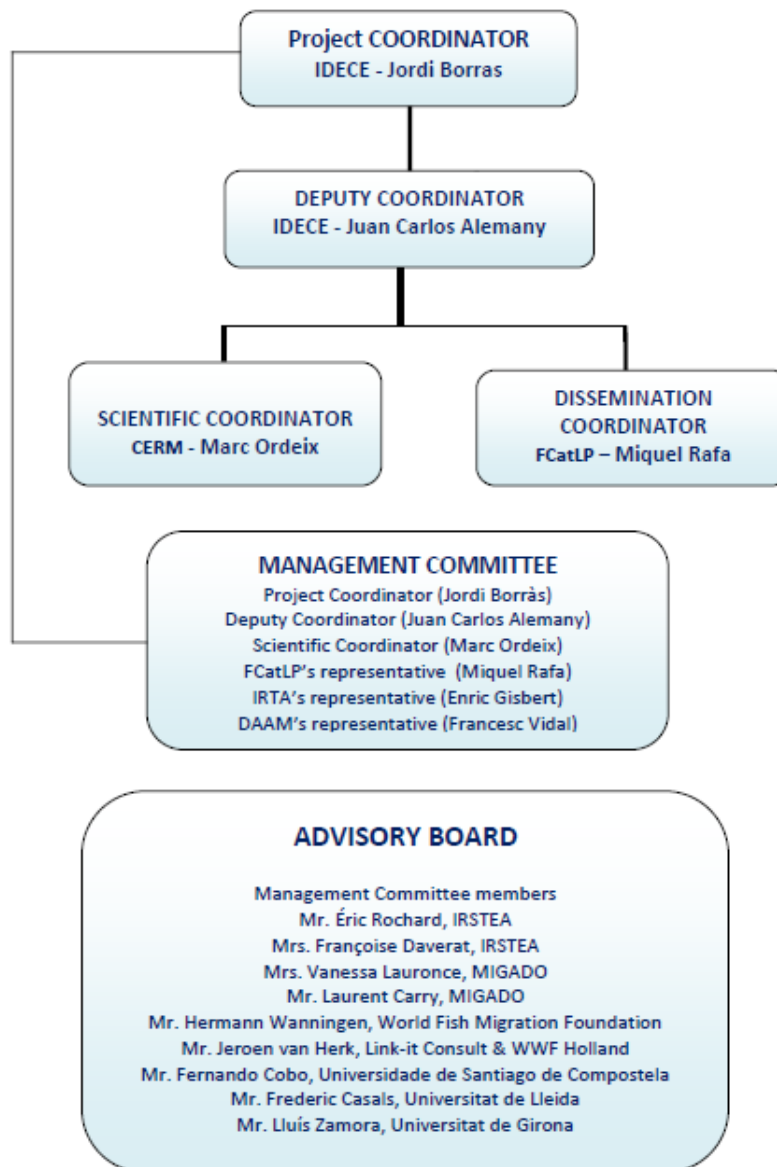
Expected end date:

30/06/2018

Total budged:

1.568.574,00 €

(50% EU financial
contribution
requested)



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Timetable



Action		2014				2015				2016				2017				2018				2019			
Action number	Name of the action	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
A. Preparatory actions, elaboration of management plans and/or of action plans:																									
A.1	Identification of potential spawning areas for sturgeon, twaite shad and sea lamprey.			■	■	■	■																		
A.2	Administrative, legal and technical procedures for the construction of a fish lift and a fish ramp			■	■	■	■																		
B. Purchase/lease of land and/or compensation payments for use rights:																									
C. Concrete conservation actions:																									
C.1	Implementation of connectivity improved measures for the targeted migratory fish species.								■	■	■	■	■												
C.2	Pilot project of sturgeon restocking									■	■	■	■	■	■	■	■								
D. Monitoring of the impact of the project actions:																									
D.1	Monitoring the pilot project of sturgeon restocking									■	■	■	■	■	■	■	■								
D.2	Monitoring the target fish population of the water bodies					■	■	■	■	■	■	■	■	■	■	■	■	■							
D.3	Ecological status monitoring of the final stretch of the Ebre River (water, biota and sediments, except fish)					■	■	■	■	■	■	■	■	■	■	■	■								
D.4	Monitoring of the ship locks improved management (at Xerta's weir and Flix dam) and the new fish passes (at Xerta's weir and Ascó's weir)									■	■	■	■	■	■	■	■								
D.5	Socio-economic impact assessment study																■								
E. Public awareness and dissemination of results:																									
E.1	General Communication activities			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							
E.2	Notice boards									■															
E.3	LIFE MIGRATOEBRE Layman's Report																■								
E.4	Exhibition on fishes and the lower Ebre river									■	■	■	■	■	■	■	■	■							
E.5	Community Awareness Campaign					■	■	■	■	■	■	■	■	■	■	■	■	■							
E.6	Network of volunteers					■	■	■	■	■	■	■	■	■	■	■	■	■							
E.7	UnderWater Hide																■	■							
E.8	Organisation and participation in conferences and related events					■	■	■	■	■	■	■	■	■	■	■	■	■							
E.9	Dissemination activities for students										■	■	■	■	■	■	■	■							
F. Overall project operation and monitoring of the project progress:																									
F.1	Project Management by IDECE			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							
F.2	Networking			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							
F.3	Audit																	■							
F.4	After-LIFE Communication Plan																	■							

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Total budget

LIFE13 NAT/ES/000237 R1 - Budget

Budget breakdown cost categories		Total cost in €	Eligible Cost in €	% of total eligible costs
1. Personnel			493,744	31.48 %
2. Travel and subsistence			39,300	2.51 %
3. External assistance			230,500	14.69 %
4. Durable goods				
4.a	Infrastructure	495,000	495,000	31.56 %
4.b	Equipment	165,300	165,300	10.54 %
4.c	Prototype	Not applicable		
5. Land purchase / long-term lease /one-off compensation payments			0	0.00 %
6. Consumables			15,000	0.96 %
7. Other Costs			31,250	1.99 %
8. Overheads			98,480	6.28 %
TOTAL		1,568,574	1,568,574	100 %

Objectives

1. To create a healthy and sustainable population of European sturgeon (*Acipenser sturio*), European eel (*Anguilla anguilla*), twaite shad (*Alosa fallax*) and sea lamprey (*Petromizon marinus*) within 10-20 years in the lower Ebre River and Delta.





Objectives

2. To improve the ecological connectivity of the lower Ebre River, adapting all the present obstacles (**Xerta's weir, Ascó's weir and Flix dam**) to allow fish migration (upstream and downstream); increasing twice the river spawning habitat availability for European sturgeon, twaite shad and sea lamprey, and the distribution (and growth) area for European eel.

Fish lift from
Tuillères dam
(France)



Ship locks from Xerta's
weir (Ebre River)





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Objectives

3. To involve community and a net of nature managers, farmers, fishermen, anglers, water managers, electric companies, tourism stakeholders, regional and local authorities working together on migratory fish recovery and improved ecological management in the final stretch of the Ebre River, on long-term sustainable investments in Natura 2000 sites and on the conservation of species and habitats targeted by Habitats Directive.





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Objectives

A broad and equilibrated partnership
is crucial to build a complex project:



**Parc Natural
del Delta de l'Ebre**



**Generalitat de Catalunya
Departament d'Agricultura, Ramaderia,
Pesca, Alimentació i Medi Natural**



**Fundació
Catalunya
La Pedrera**

JOINT FINANCER:



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN
Y MEDIO AMBIENTE



Fundación Biodiversidad



Diputació Tarragona



Other actors: students, elders, farmers,
fishermen, anglers, naturalists, rowing
clubs, electric companies, tourism
stakeholders, regional and local
authorities, general public...



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Objectives

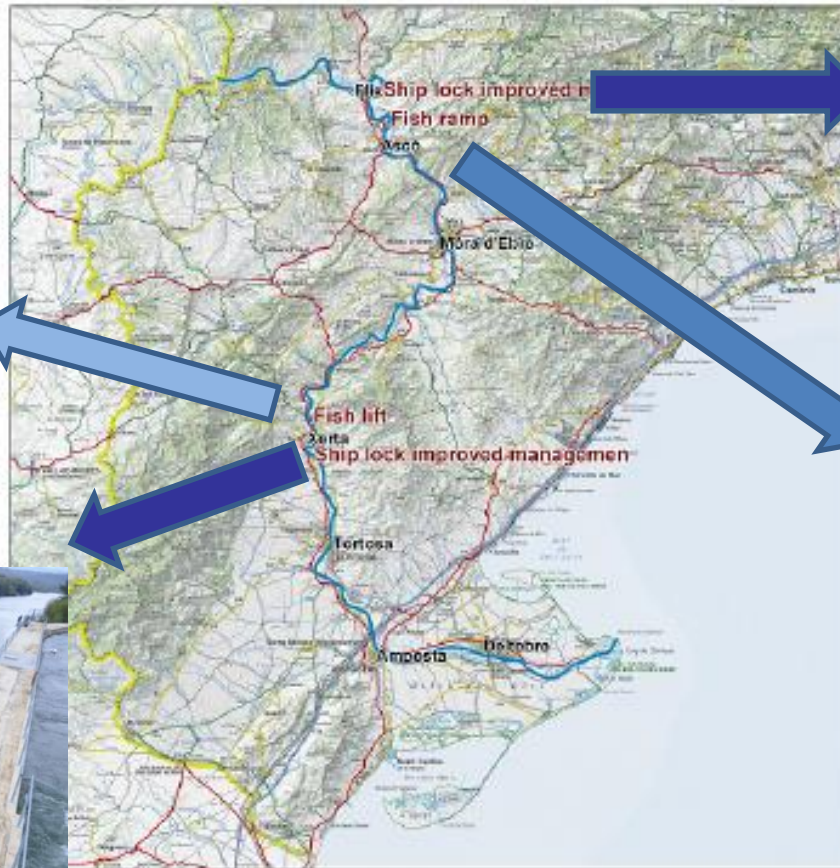
4. To be an **exemplary project at local scale**, to integrally promote the improvement of the ecological connectivity at the Ebre River basin. I. e. In a second step, at Riba-roja dam -to connect the lower Ebre with an important tributary, the Segre River- and Mequinença dam -to connect the lower Ebre with the middle Ebre basin-. **And also to become a demonstration project by other principal Iberian –Guadalquivir, Guadiana, Miño- and some European Rivers as well.**





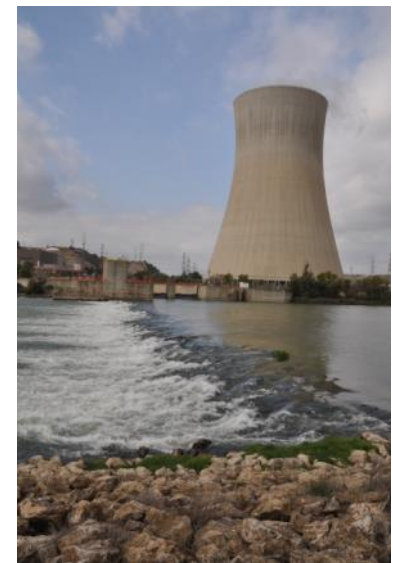
Actions

1. Ship locks improved management (at Xerta's weir and Flix dam), and new fish passes (at Xerta's weir and Ascó's weir).



● Monitoring points
— Ebre river

2 0 10 km



Actions

2. Undertake a pilot project of sturgeon restocking: experimental release in the lower Ebre (downstream of the Xerta's weir and between Flix dam and Ascó's weir as well). This will be carried out to enhance the knowledge concerning:

- Migration behaviour in the Ebre River and estuary system;
- Location of suitable habitats;
- Movement along migration barriers;
- Communication of the issue.
- Around 50 individuals (of 50 – 70 cm) –or the available number by IRSTEA - Bordeaux and MIGADO (France)- would be released with a transponder.

Campaign of marking and release of juvenile European sturgeon done by IRSTEA – Bordeaux at the Gironde Stuary (Aquitaine, France) in August 2014.

Picture: M-L. Acolas / Irstea



Actions

3. Design a communication campaign on the main project objectives for general public as well as to farmers, fishermen, anglers, among other sectors. It includes **a great temporary exhibition production and brochures**. Sturgeon, eel, twaite shad and sea lamprey could be icons, trade marks for a healthy lower Ebre River and Ebre delta. They are **flag ship species**.

4. Design and execute a community involvement plan. Creation of active groups of volunteers. Focus it partially on specific managers: youngs, families, seniors, fishermen, anglers, farmers, electric companies, tourism stakeholders, regional and local authorities. **Participation in the World Fish Migration Day** event (www.worldfishmigrationday.com) –each May-.





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Actions

5. Spread the results: **final conference on “*Fish migration conservation and river ecological connectivity restoration*”**, attended by national and international researchers and managers. Produce a final brochure, poster and video, and promote TV programs and news to the general media.



Networking

2014/10/20: 1st
Scientific Advisory
Committee. Visit to
the Aquaculture
Centre of IRTA -
Sant Carles de la
Ràpita (Ebre Delta,
Catalonia)



First works

2015/04/26: Visit to the Station
expérimentale de Saint-Seurin-sur-
l'Isle (Aquitaine, France)



2014/10/15: Visit to the fish lift of
Golfech dam (Midi-Pyrénées, France)

2015/05/20: 2nd
Scientific Advisory
Committee. Visit
to the new fish
passages sites:
Xerta's ship lock
(low Ebre River
Catalonia)





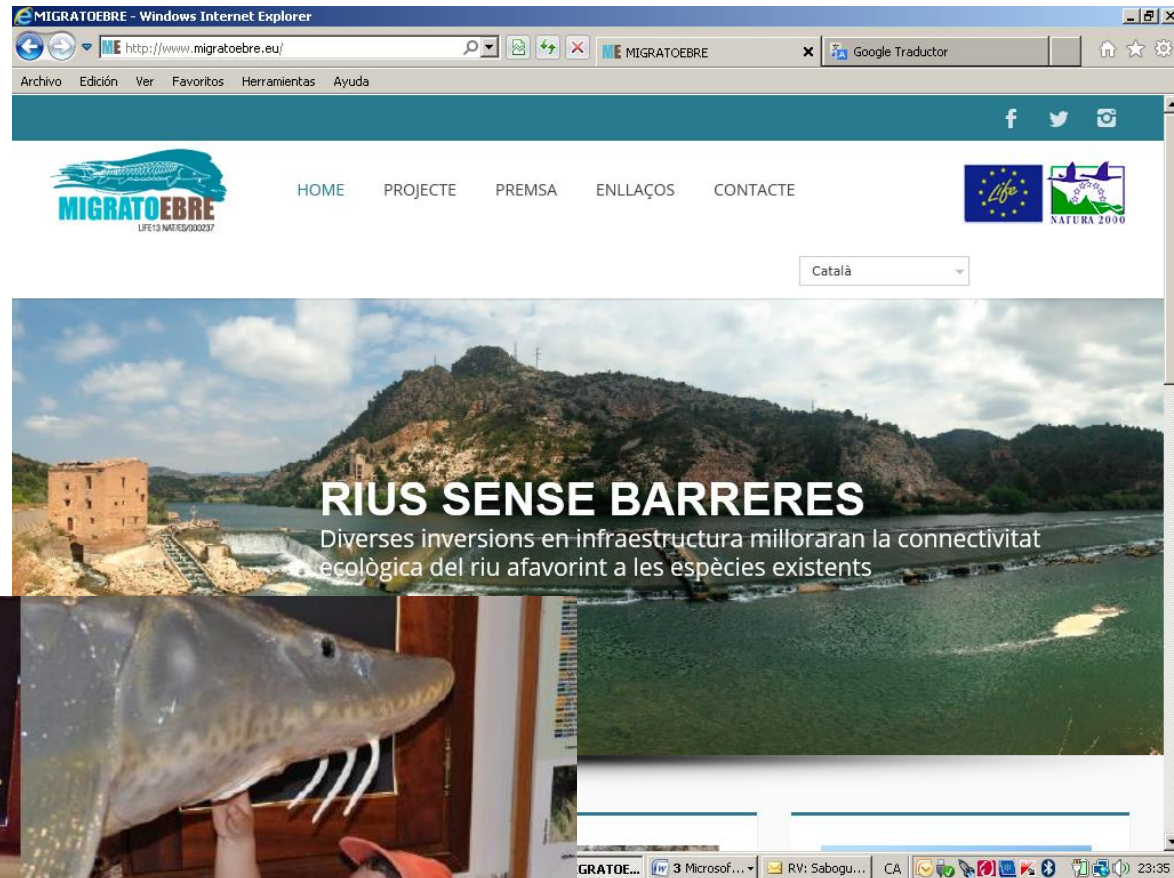
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First works

Communication: website, leaflets, exhibition...





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First works



Large events are always a good opportunity to share and build partnerships (e.g. annual canoe descent of the river)




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First works

Fish passage projects: 1. Fish friendly improved management of the Xerta's weir ship lock



<p>PROMOTOR:</p>  <p>IDECE Institut per al Desenvolupament de les Comarques de l'Ebre</p>	<p>TÍTOL DEL PROJECTE:</p> <p>PROJECTE PER A LA MILLORA CONNECTIVA DALS PEIXOS ALS PASSADIS DE INFLUÏDA DE SANTA JULIA.</p> <p>Crèdit: 1.400</p> <p>Torredà, Desembre de 2014</p>	<p>ELS AUTORS:</p> <p>Albacar, Bernal, Girona - E. Girona, Gual, i Pons càd 131 028 - E. Torredà, Gual i Pons tor 131 040 - E. Girona 0819 Torredà - E. Torredà, Gual torredà@albacar.com - Girona</p>	<p>ALBACAR ENGINEERS, S.L. C/Gran Via, 25 07100 Torredà (Tarragona) tel: 977 41 28 01</p>	<p>plànol: PLANTA ENCLUSA XERTA escala: 1/1000</p> <p>Publicació: 08 01 de 01</p>
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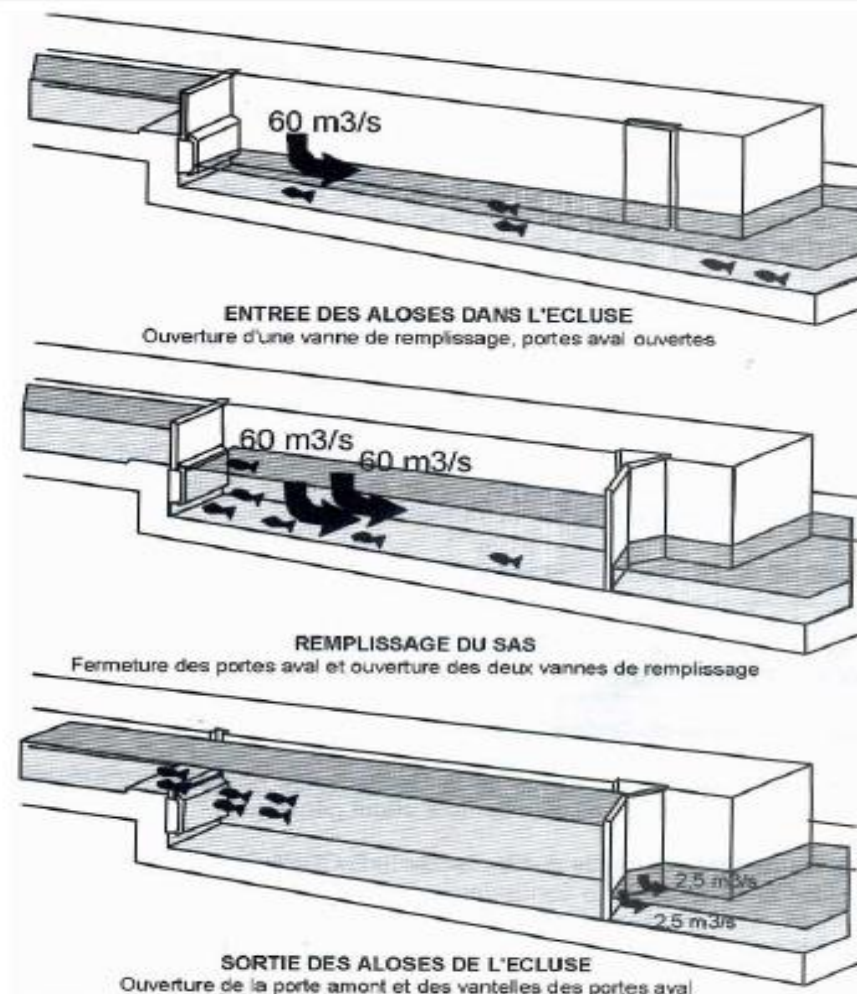
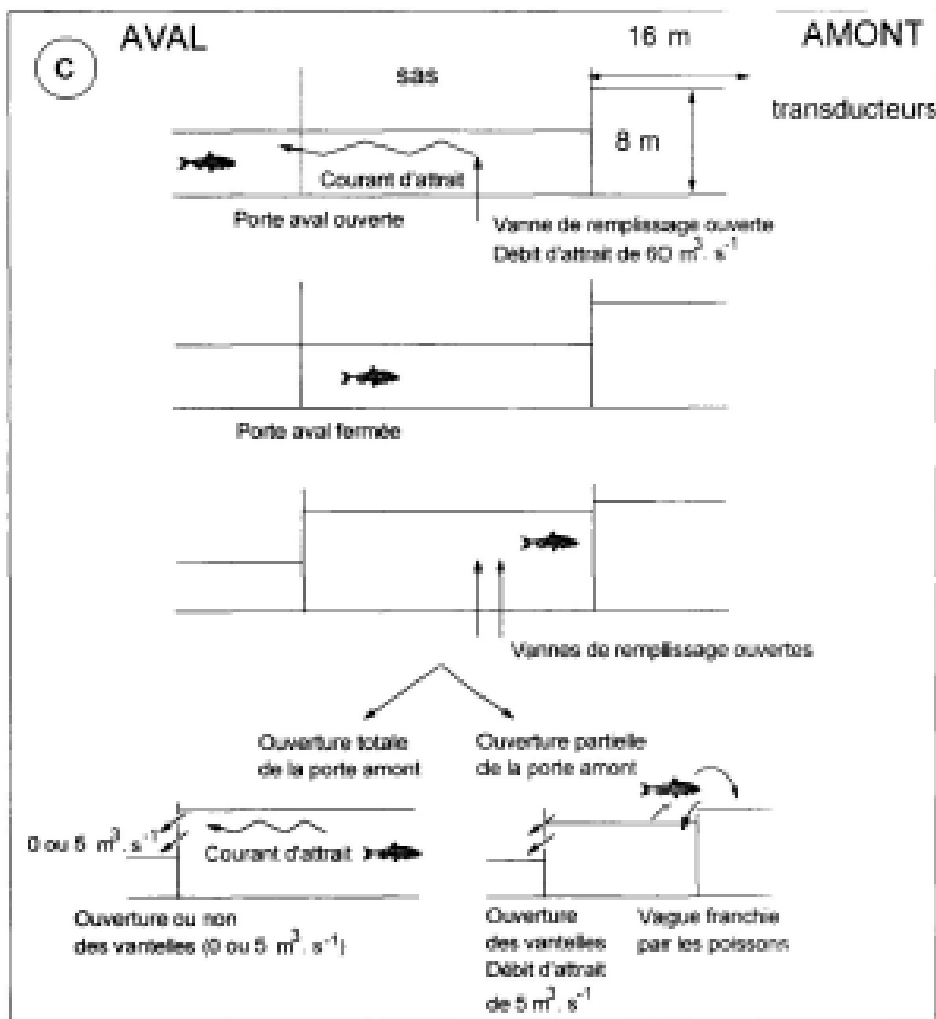
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First works

Fish passage projects: 1. Fish friendly improved management of the Xerta's weir ship lock





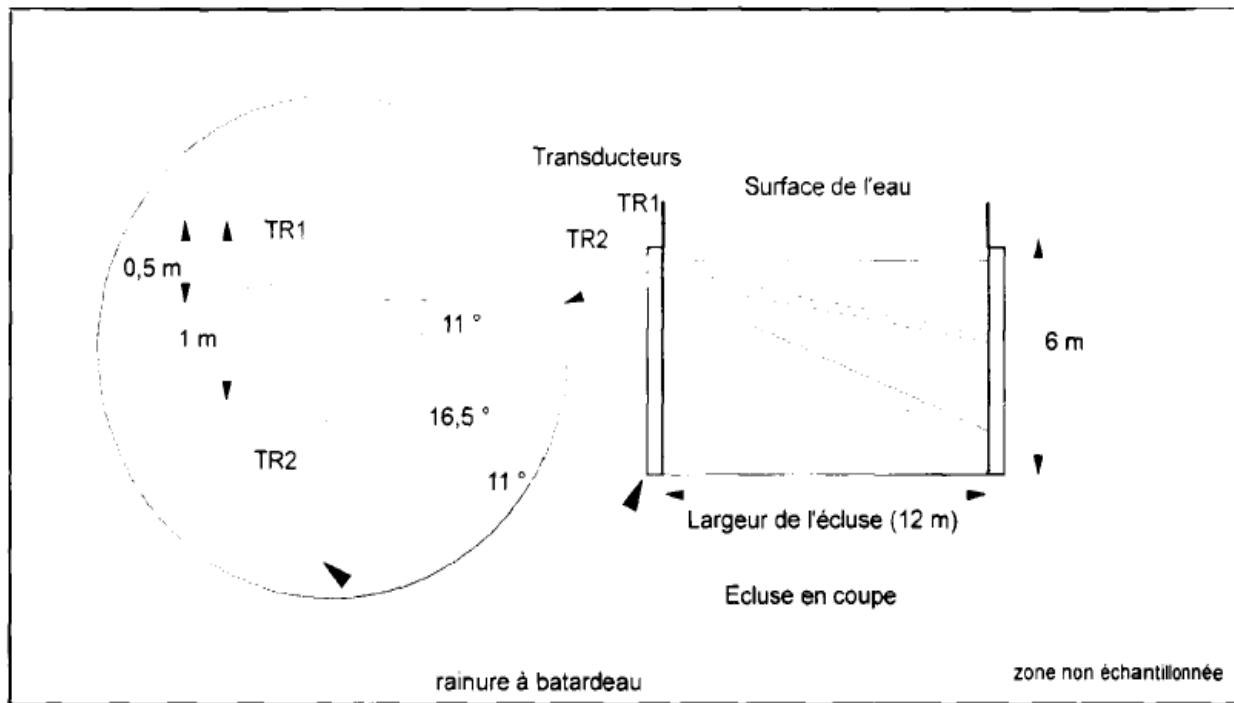
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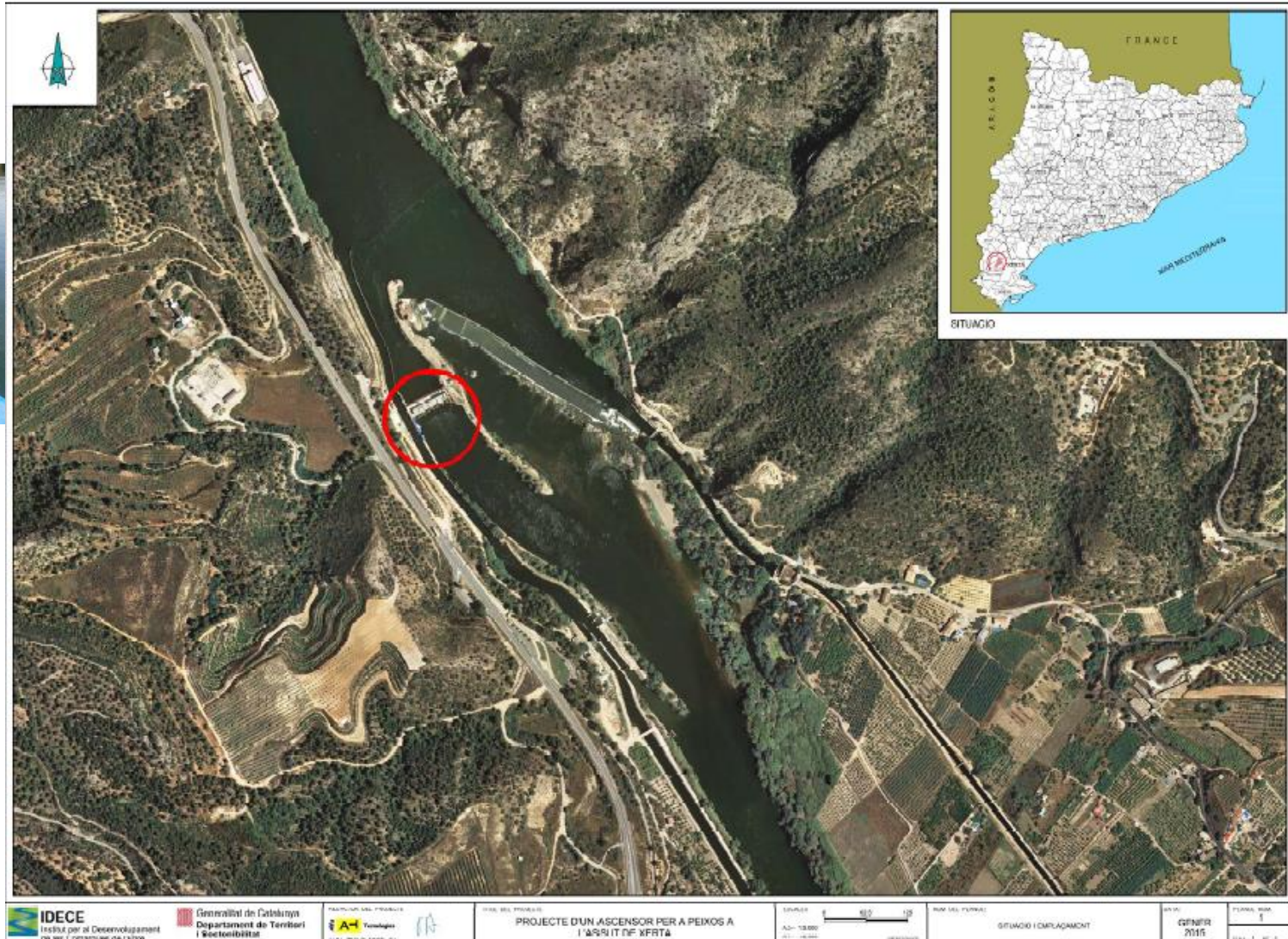
First works

Fish passage projects: 1. Fish friendly improved management of the Xerta's weir ship lock



First works

Fish passage projects: 2. Xerta's fish lock

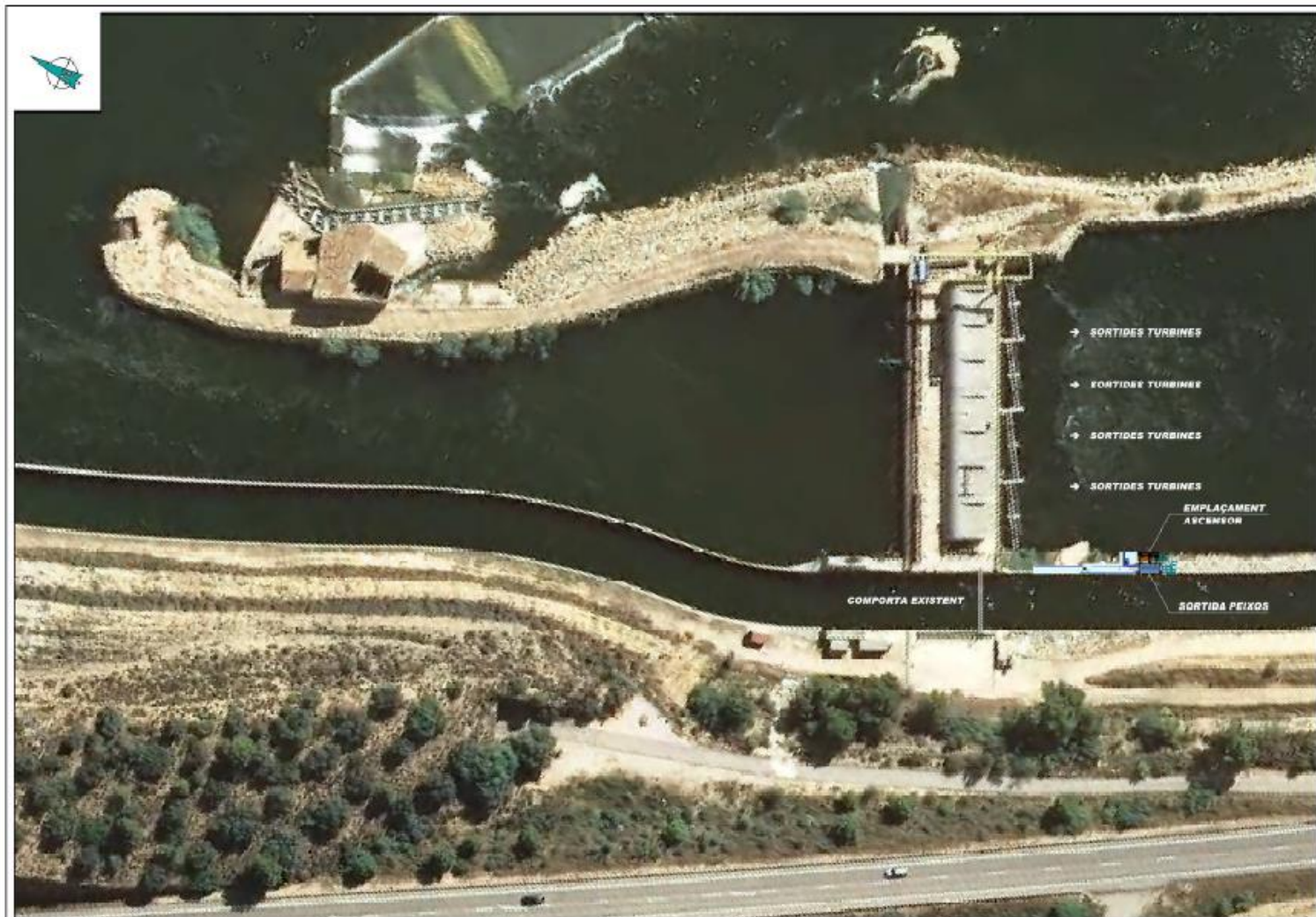


Currently, twaite shad (*Alosa fallax*) is often caught downstream of Xerta's weir. May 2014. Picture: Oriol Ribalta – Associació Catalana de Pesca Responsable.



First works

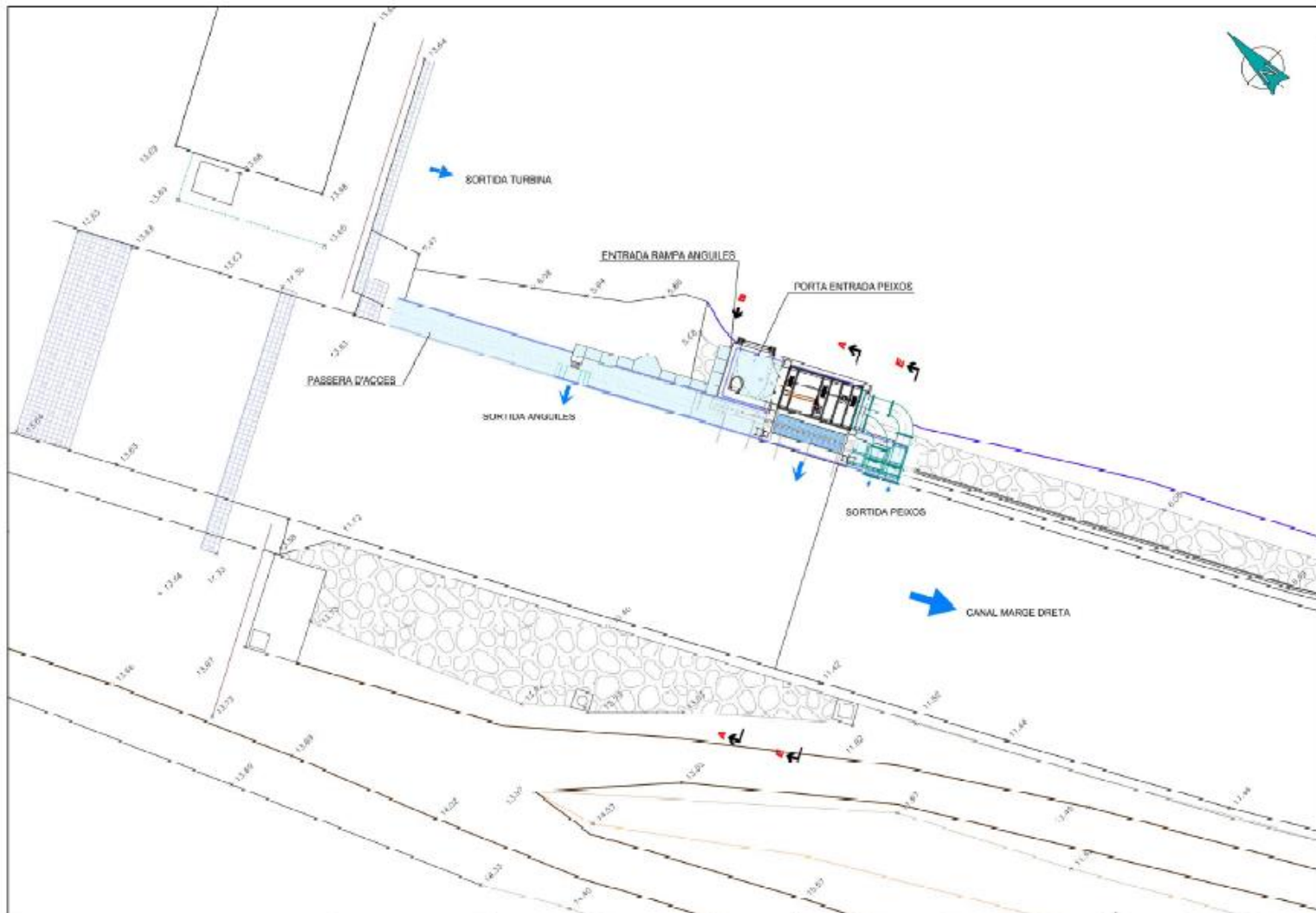
Fish passage projects: 2. Xerta's fish lock





First works

Fish passage projects: 2. Xerta's fish lock





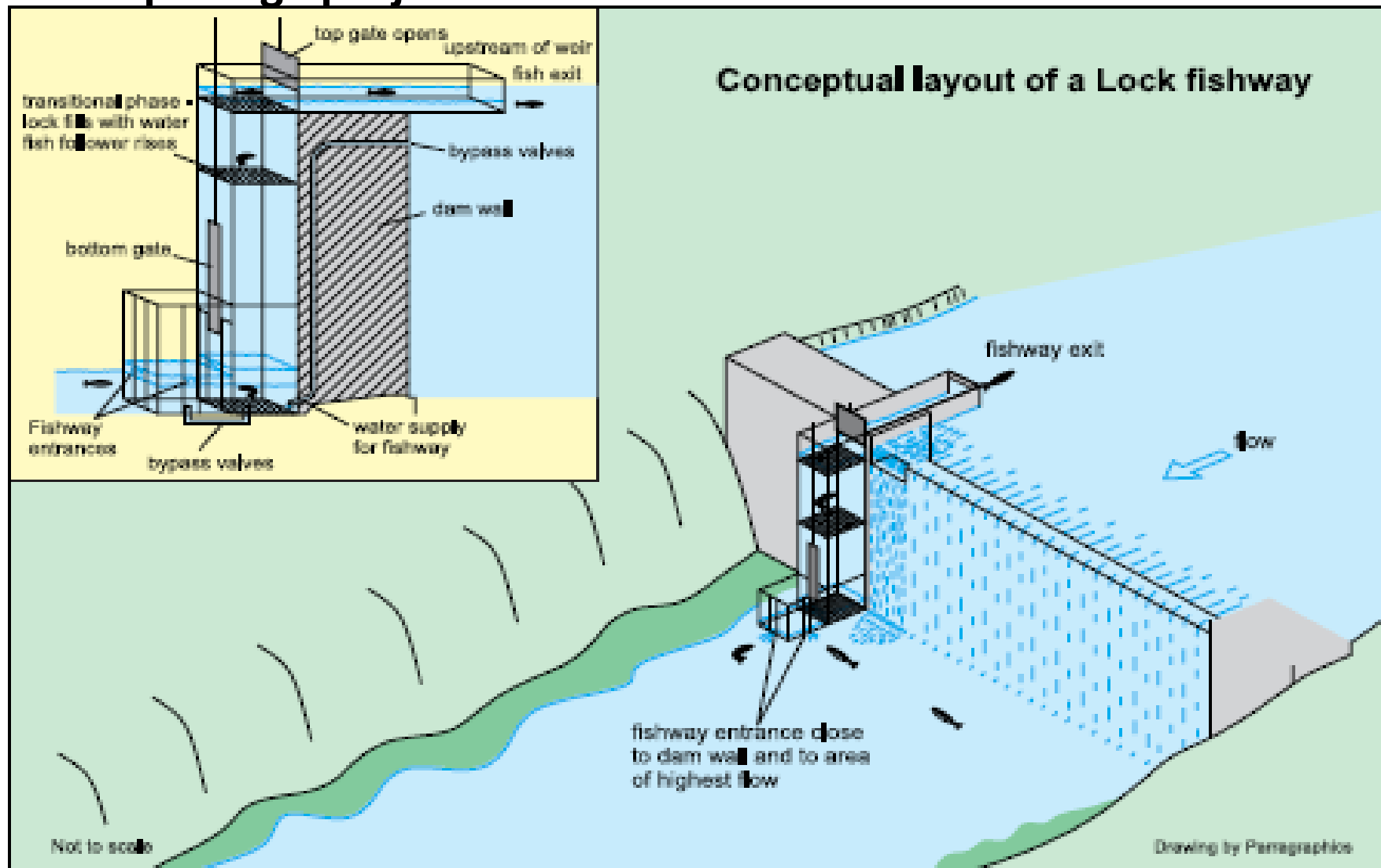
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Fish passage projects: 2. Xerta's fish lock





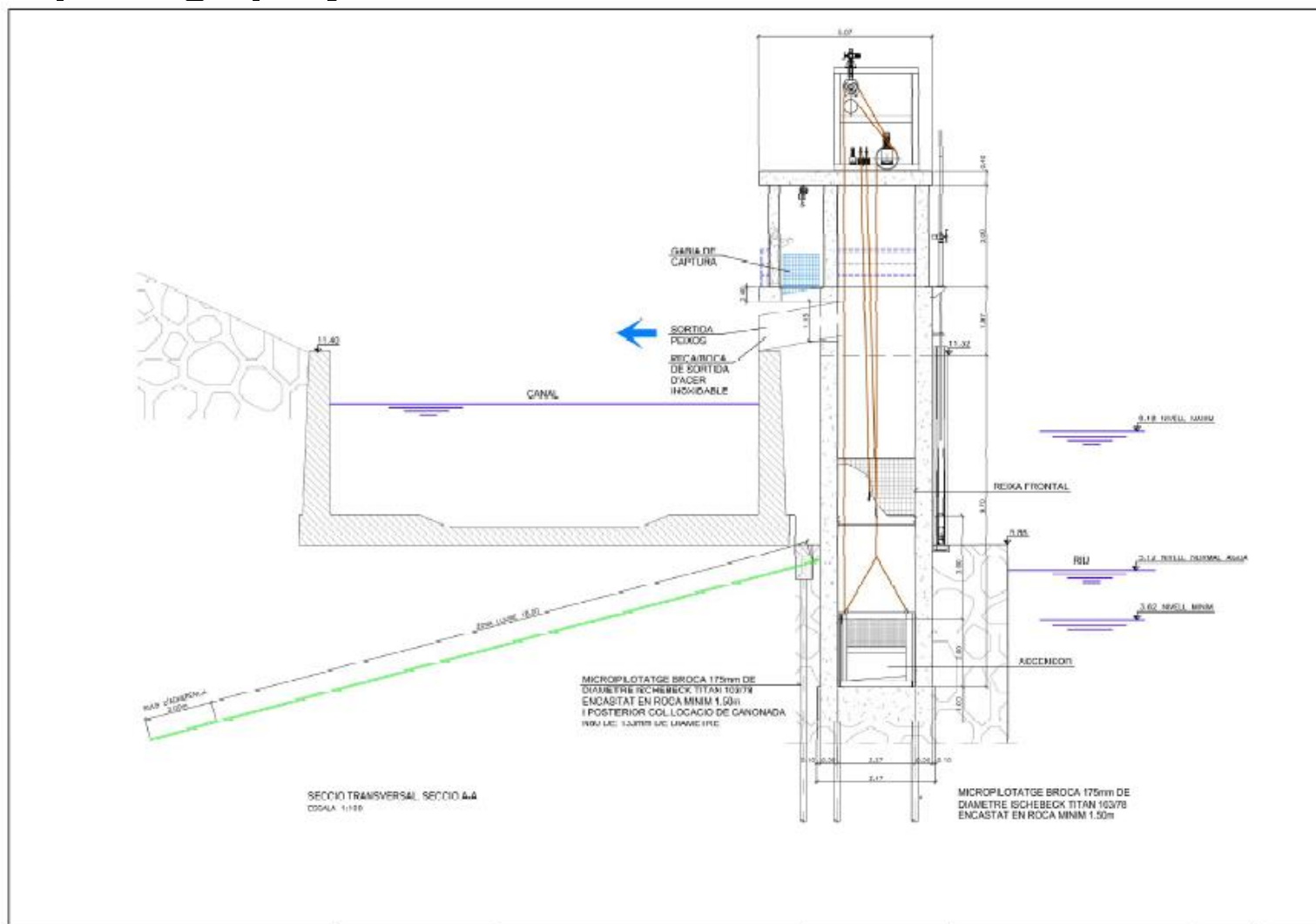
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First works

Fish passage projects: 2. Xerta's fish lock

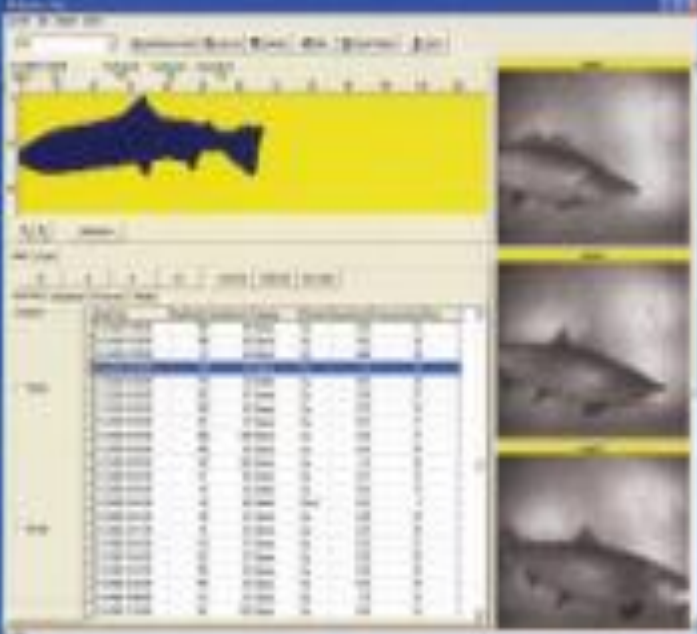




First works

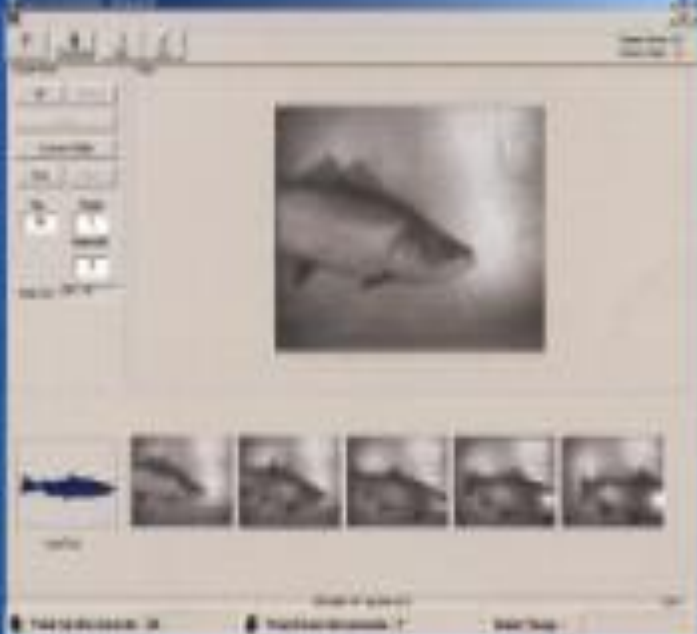
Fish passage projects: 2. Xerta's fish lock

-Fish Identification



The digital photos can then be used with other data from the Riverwatcher to sort the fish in groups according to species, sex and even in farmed or wild fish.

-Real time video



Live video from the camera can be viewed in real time at any time on the Riverwatcher computer screen.

Video camera for fish monitoring for the outlet of the fish lift. Picture: Vaki.



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Fish passage projects: 2. Xerta's fish lock



Examples of frames antennas for detecting PIT tags from migrating fish.
Pictures: Oregon RFID, 2014.

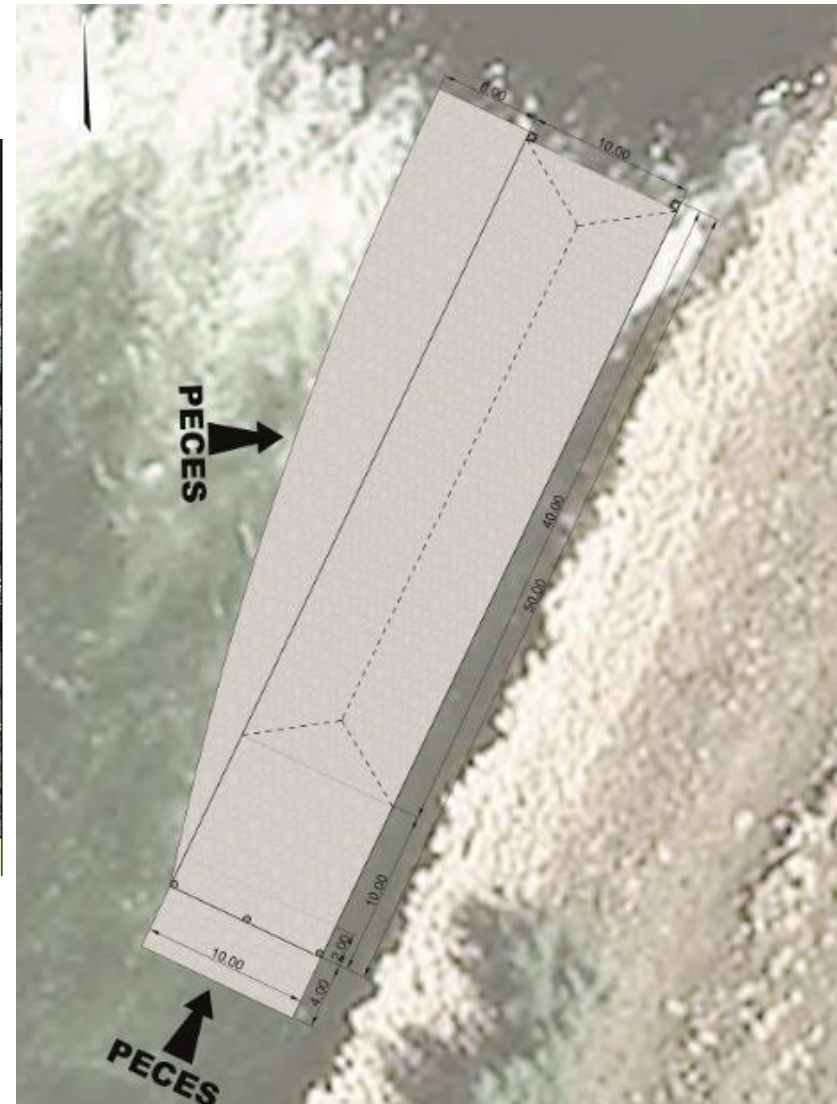
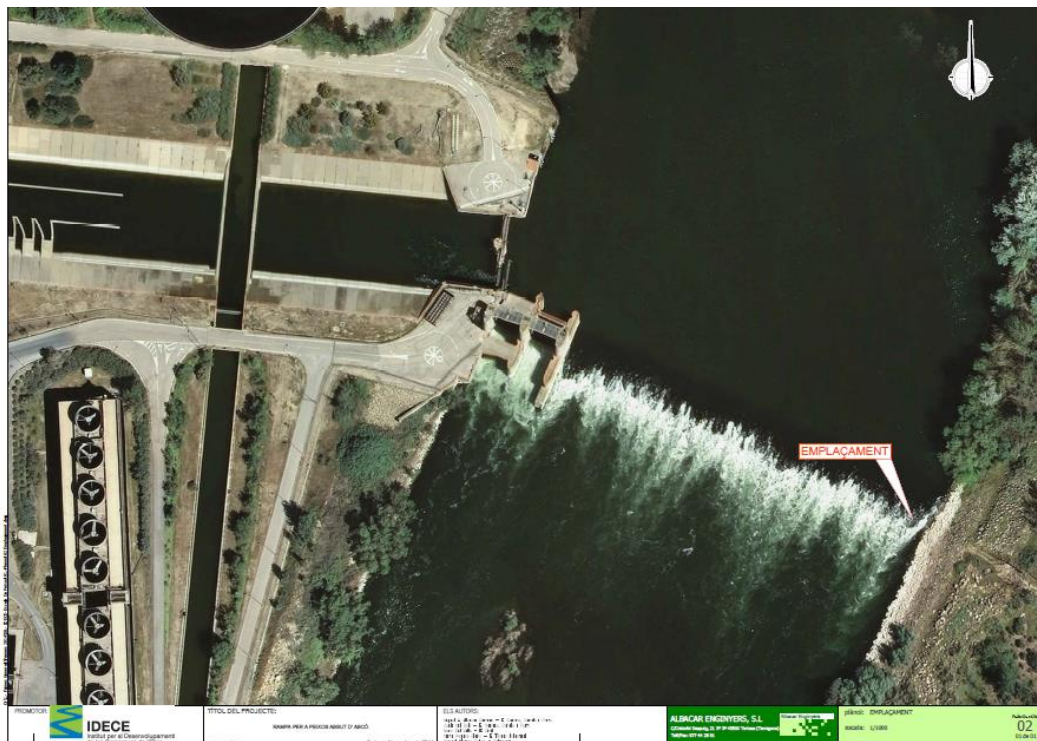


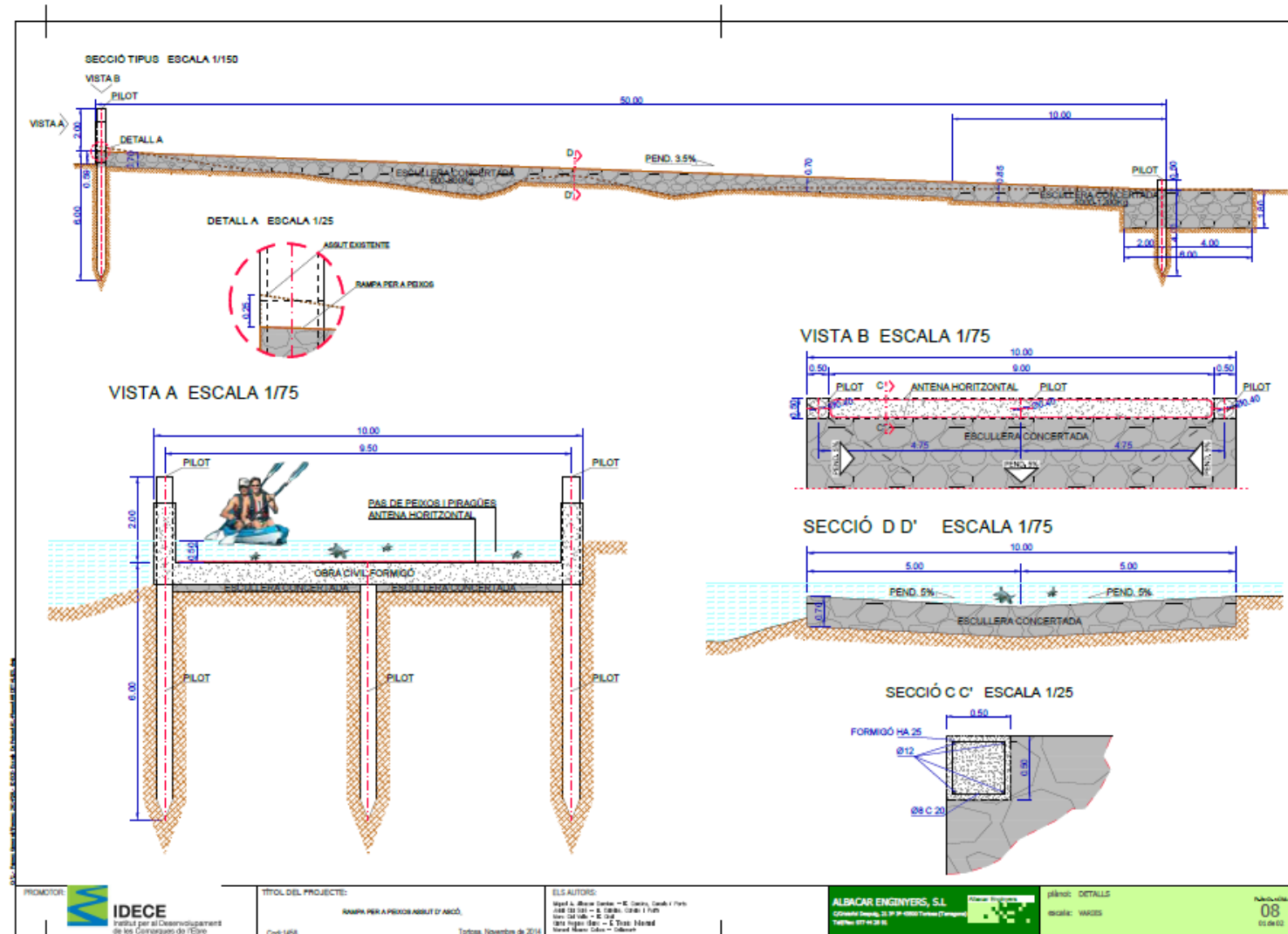
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Fish passage projects: 3. Ascó's fish ramp







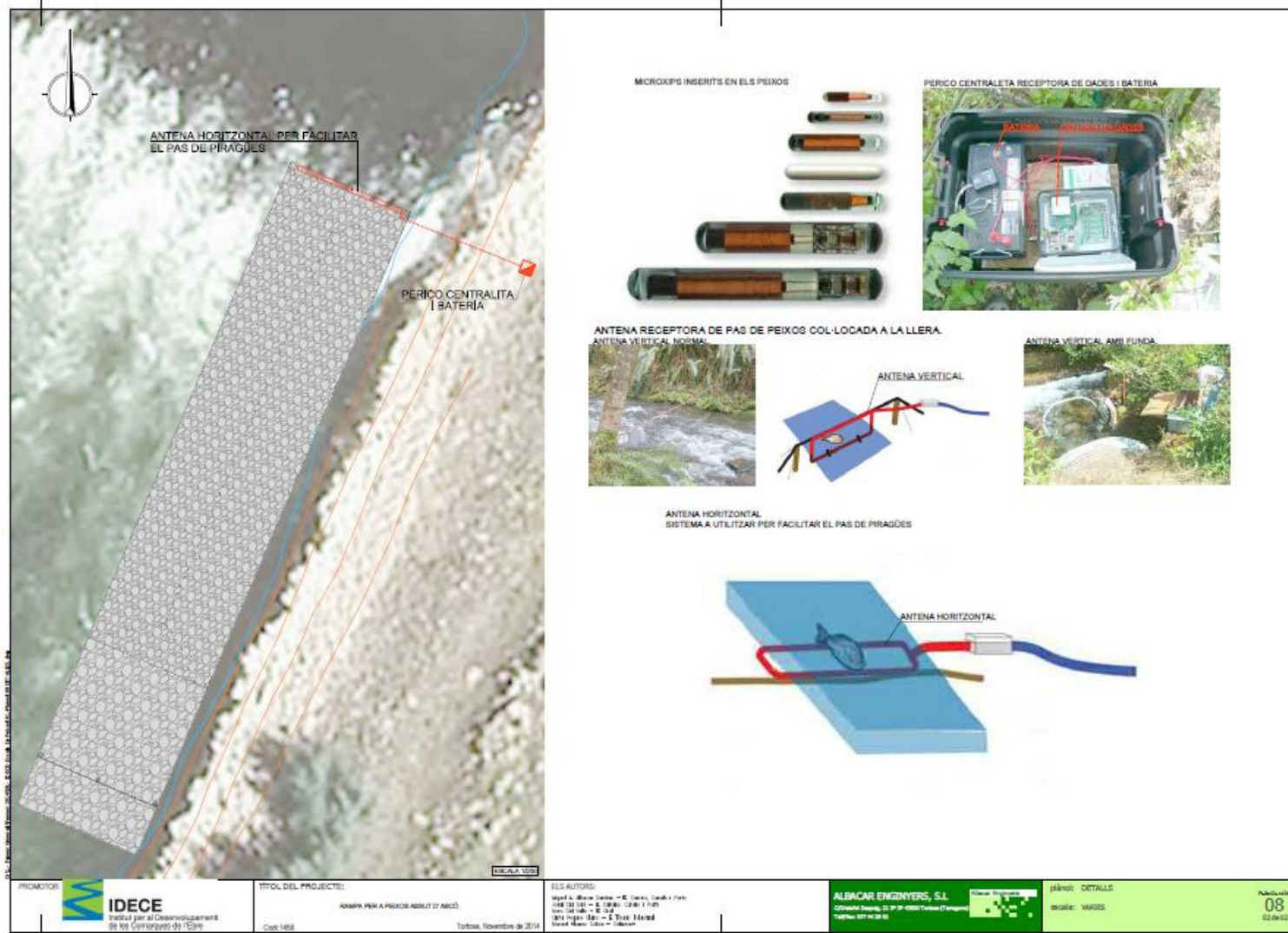
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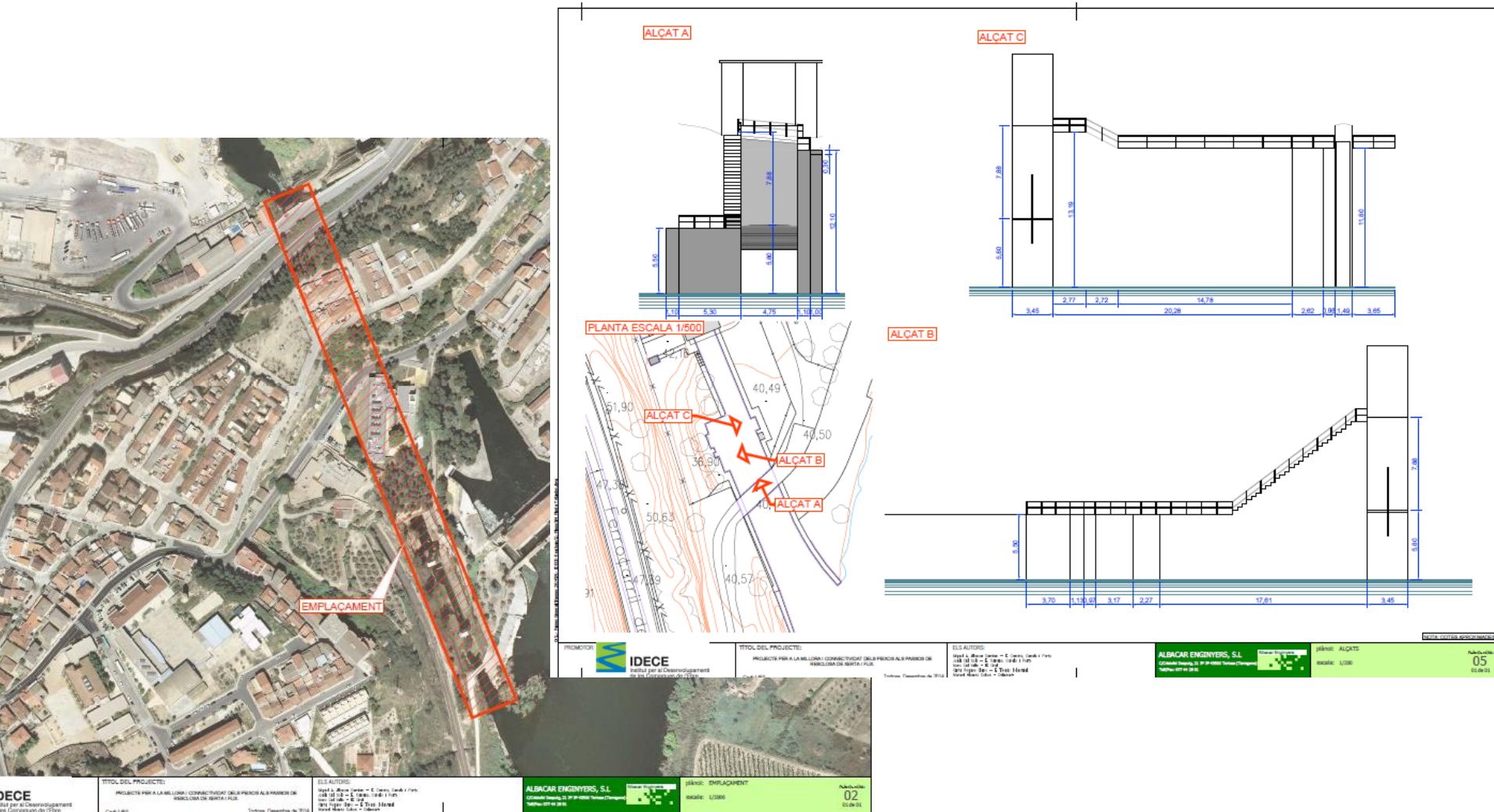
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First works

Fish passage projects: 3. Ascó's fish ramp







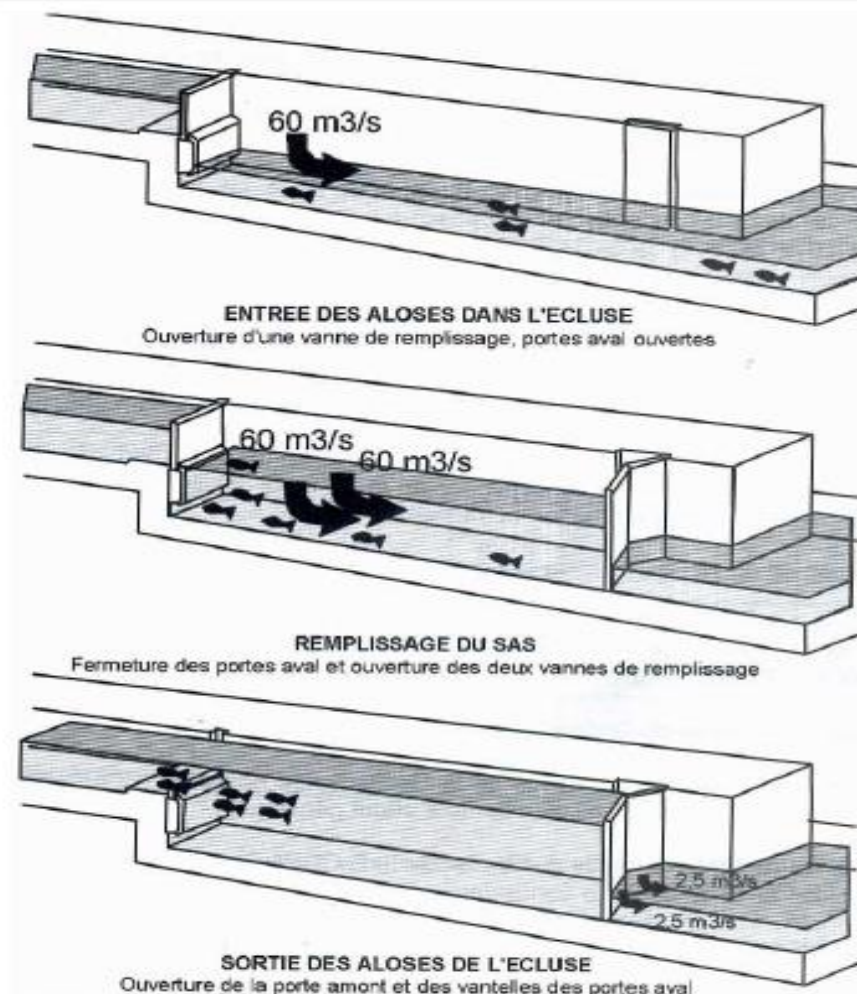
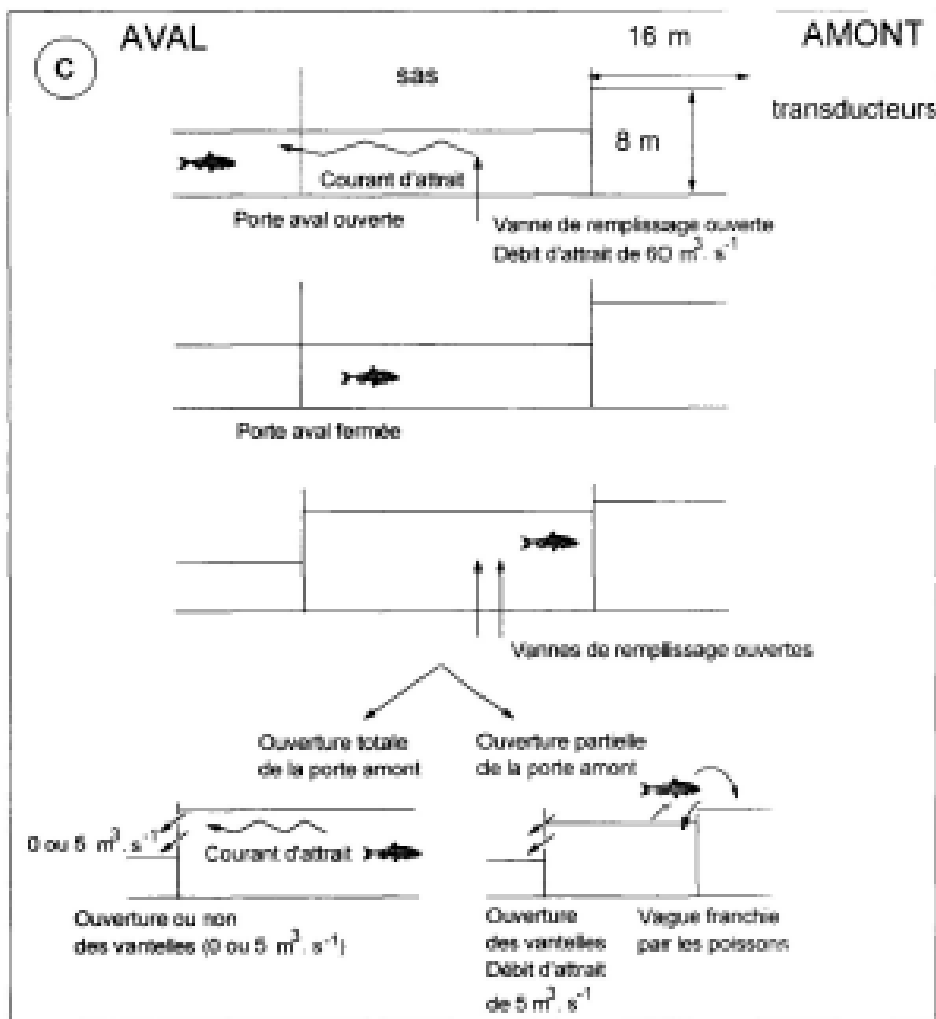
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First works

Fish passage projects: 4. Fish friendly improved management of the Flix Dam's ship lock



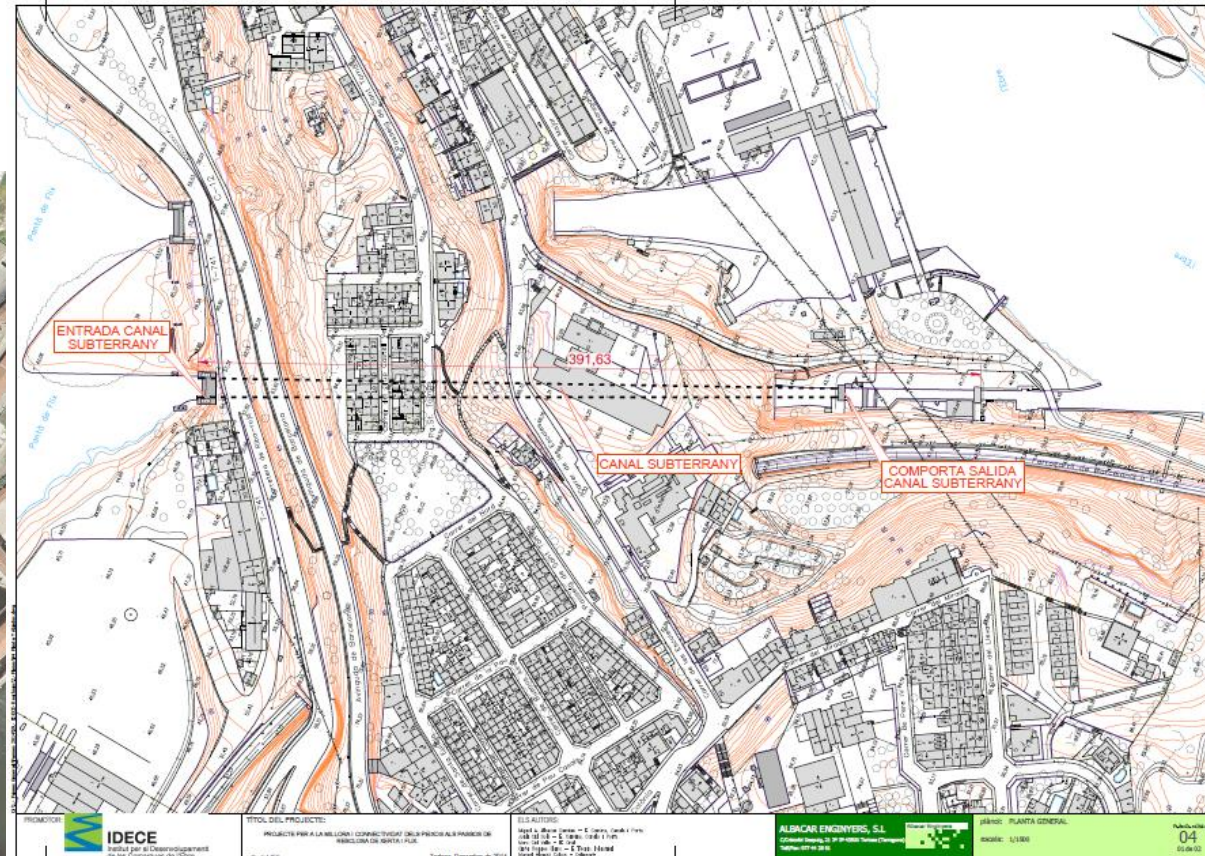


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Fish passage projects: 4. Fish friendly improved management of the Flix Dam's ship lock



Underground channel: line of
fluorescent lamps



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First works

European sturgeon recovery plan for Catalonia / Spain

Collection of information

Reintroduction of the sturgeon in the Ebro

A feasibility study

Proyecto para la recuperación y conservación del esturión
Acipenser sturio en España




Generalitat de Catalunya
Departament d'Agricultura,
Ramaderia i Pesca
Direcció General de Pesca Marítima

A project of
WWF the Netherlands Innofonds, the Netherlands
Foundation ARK Nature, the Netherlands
CERM, Center for the Study of Mediterranean Rivers, Catalonia
Foundation Catalunya-la Pedrera, Catalonia
LINKit consult & Wanningen Water Consult, the Netherlands

First works

European sturgeon recovery plan for Catalonia / Spain

Index of the 1st draft in process:

1.- Anàlisi de la situació actual de l'esturió europeu (*Acipenser sturio*)

- 1.1.- Distribució geogràfica general
- 1.2.- Distribució detallada a Catalunya
- 1.3.- Estat de les poblacions naturals de l'espècie i del seu hàbitat
- 1.4.- Amenaces
- 1.5.- Avaluació de les accions de conservació realitzades

2.- Mesures de conservació

- 2.1.- Establiment d'objectius
- 2.2.- Mesures directes de protecció de l'espècie
- 2.3.- Mesures de conservació i restauració de l'hàbitat
- 2.4.- Desenvolupament de programes d'investigació i educatius

3.- Programa d'actuacions

- 3.1.- Plans d'acció
- 3.2.- Relació amb altres administracions
- 3.3.- Instruments financers requerits

4.- Avaluació del pla

5.- Mecanismes de participació

6.- Bibliografia

Last news on fish migration in the lower Ebre River



YOY of twaite shad (*Alosa fallax*) are appearing also upstream of Xerta's weir. September 2014.
Picture: Oriol Ribalta – Associació Catalana de Pesca Responsable.



An elver (*Anguilla anguilla*) caught at Flix meander in April 2015.
Picture: Paco Ventura - Grup de Natura Freixe.

This LIFE project started in
1/07/14 and will finish in
30/06/18.

More information in:
www.migratoebre.eu

And have a look at this video:
https://www.youtube.com/watch?v=Sr6_WXynCmM&feature=youtu.be

