SEGURA RIVERLINK

LIFE12 ENV/ES/1140 - INFORME LAYMAN





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THE PROBLEM

The southeast of the Iberian Peninsula is

an arid region, crossed by rivers extremely regulated from remote times, in which they have used the water resources for the irrigation and as a driving force for Energy production

mainly. These uses that they use weirs for the derivation of water, prevent movements migratory of fish.

This circumstance is known as a "barrier effect", has caused the disappearance of some species of Spanish waters (sturgeon, eel, shad, savor, salmon, lampreys, ...) or its threat (trout, barbo, boga, chub, ...)..



In this second case, the limitation of movement prevent him from colonizing new territories, loss of habitat upstream, decrease in genetic diversity (isolation of populations), etc.

In the Segura basin and in the section of the project the Andalusian barbel (only

native that we have left) is a kind very threatened by other exotic fish.

HOW DO WE SOLVE IT?

To avoid this impact on the river, they carry out infrastructures called "Fish ladders" that facilitate rise of the fish, solving this way the migratory problem. The solution, has

to ensure functionality with a minimum economic cost and it has not interfere in any way in the working of the dam.



WHO ARE WE?

The project coordinator is the Confederación Hidrográfica del Segura (CHS), participating as partners: the University of Murcia (UMU), the Center Agricultural Technology and Agrifood from the University of Valladolid (ITAGRA.CT), the General Directorate of Environment of the Region of Murcia (CARM) and the Association of Naturalists of the Southeast (ANSE).



SEGURA RIVER

HOW LONG WE HAVE WORKED?

This project has lasted of 4 years, starting on August 1 from 2013 until last July 30 of 2017, date on which it ended.



WHERE WE ACT?

The scope of action of this The action is located in the high Segura river, in a stretch of river Safe of approximately 54 km long and in the final stretch from the Moratalla river to its confluence with the Segura River (T.M. Archena, Abarán, Cieza, Calasparra and Moratalla). In this stretch we find 8 azudes insurmountable for fish. Within the section where acted, there are some areas of great ecological interest and environmental that belong to the Natura 2000 network.



OURS OBJECTIVES

The general objective of the project is the construction of 8 devices step or scales for fish in the fluvial obstacles that constitute the existing weirs in the section of the Safe river included among the Municipalities of Archena and Calasparra (Region of Murcia). Apart from the construction of the scales is They intend to achieve the following specific objectives:

- Recover connectivity longitudinal section of the river Safe through the execution of scales or steps of fish.
- Demolition of a disused dam.
- Elimination of the cane in the sections of action and revegetation with arboreal and shrubby vegetation.
- indigenous herbaceous to recover the original riverbank forest with object of favoring the creation of a green infrastructure forconnect the different ecosystems.
- Comply with the requirements of the Water Framework Directive whereby it is intended to achieve "good ecological state » of the masses of Water.
- Make the restoration of the river with the uses of the territory and use recreational of its banks, encouraging the establishment of its natural vegetation.
- Create a custody network territory, where they are involved in the care of the river owners adjoining.
- Improvement of aquatic habitats and Riverside.



HOW ARE THE "FISH LADERS"?

ARTIFICIAL RAMP

They are devices built in the form of a ramp that they are located after the obstacle, immediately downstream of it. With the use of these systems on a slope aims to eliminate the waterfall by distributing it to the along the entire length of the ramp.

They present an inclined plane with a slope always ≤ 10%, in which blocks of stone of considerable size. The main advantage with respect to other postage devices is that when installed on the bed of the bed itself make it easily locatable by the species migratory in addition to integrating more effective and natural within the fluvial ecosystem.

ARTIFICIAL RIVER

It is a lateral channel (a bypass) with a small slope from 3 to 5% divided into sections separated by backwaters of water that offers a alternative way to fish by one of the margins of the river to overcome the obstacle. In its bed is placed breakwater stone disposed of irregular or orderly manner, with the mission to stop the hydraulic power of the current and offer I rest and shelter the fish.

WEIR LADDERS

They are "fish ladders" most used. Is about infrastructures with successive ponds, whose basic principle is to divide the height of the weir that you want to save in successive jumps or falls, forming a series of ponds communicated between Yes by landfills.

This infrastructure is less selective than others Postage devices, that is, offers better conditions when there are several species migrators in the river course. In addition, it is about works that are "adaptable" with relative ease to the existing hydraulic works. There are several types of "fish ladders" and in each case will be chosen ccording to the advantages of each. In this project we have used, stone ramps, artificial rivers and weir ladders.



RESULTS OBTAINED

Weir ladders

- 8 ladders of three have been built different types, with collaboration of the concessionaires.
- More than 10,000 fish have already used weir ladders (barbels, gobies, bogas and alburnos) mainly.
- The results indicate that all steps are being operative.
- Data on weir ladders indicate that more than 80% of fish that try to ascend by weir ladders get it and more than 50% of these, perform it in less than half an hour.

Demolition of the weir

• In Spain, more than 200 small dams prey in disused or without concession. The eliminated in the Moratalla river is the first that takes place in the basin of the Segura.









ELIMINATION OF REEDBED

In the vicinity of the "fish ladders" they Have been eliminated 65,000 m2 of reedbed, with different techniques, substituting it for vegetation from shore. The results obtained, from the elimination of cane, have been ifferent depending on the area and technique used, In addition to the involvement of the owners of plots adjacent to these areas.

Many of these owners have signed Custody agreements to commit, together with the custody entities, to the conservation of these regenerated territories, with the illusion of having a river alive again and They remembered from their childhood.



THE CANE AN INVASIVE EXOTIC SPECIES

LThe cane is an allochthonous, invasive and opportunist that comes from Asia and has been used traditionally in agriculture and in orchards for support the structure of various crops, and in the building. It is one of the 100 species invasive aliens of the world according to the Group of Invasive Species of the Union specialists International for the Conservation of Nature.

The problem of this species, is that in those places where it appears, it's very difficult eradicate it as it quickly rebounds from the rhizome and prevents and diminishes biodiversity in those places where it appears



"Arundo donax"



Plantations





REGENERATING THE FOREST OF RIBERA



During the execution of the project, planted more than 2,200 trees and 4,800 shrubs, selecting the species by zones, according to the UMU and CARM criteria, which together with the Manual of Restoration of Ribera of the CHS, have been fundamental for the best choice. These plantations has been possible among other things thanks to the partition of a large number of volunteers and owners. The species with the greatest success has been elm, cottonwood and poplars, willows, oleanders, mastic trees and reeds.

A correct execution of the plantations, the good size of holes, the choice of place where each of the species and the time must go of plantation are decisive for obtaining best results. The survival rate exceeds 70%, all a success, due to the maintenance and the involvement of "Custodians", main protagonists of the Custody of the Territory.

WHAT IS CUSTODY OF THE TERRITORY?

The custody of the territory is a set of strategies or legal techniques through the which involve the owners and users of the territory in conservation and use of natural values and resources, cultural and landscape. River custody is a form of territorial custody applied to rivers, whose main objective is improve the fluvial ecosystem and in which acquires a special relevance the environmental volunteering to be one of the main channels of participation of the society.



FLUVIAL CUSTODY

One of the main results of the project is the awareness of the problem in the riverside municipalities. He have signed 15 agreements fluvial custody between owners and entities custody, with a total of 75 ha Of surface. Each time they are more the owners and users that they join custody to improve and conserve the banks of the Segura.

A custody agreement is a voluntary procedure between a owner and an entity of custody to agree on the mode of conserve and manage

MONITORING THE BIODIVERSITY

In this project we have worked hard in measure the results of it, being a piece key to the proper functioning of it:

 Nearly 3000 fish have been tagged, different methods. Anchor-Tag (small tags with the fish code), VIE-Tag (small brands with elastomers of colors), Alpha-Tag (alphanumeric labels), PIT-Tag (small transmitters implanted) and with radiolabelling to know at all times if the "fish ladders" worked or not.

10,265 captured specimens of 11 species inside of the fish bypasses.

- • All parameters have been analyzed hydraulic scales (speed, height, etc), to check the use of the "fish ladders".
- The fauna associated with the river have been sampled (Galapagos, dragonflies, birds, etc.). They have captured some 371 leprous terrapins, ringed over 600 birds, identified 24 species of odonatos and the localized otter throughout the project section.
- The ecological status has been analyzed before and after the fish bypasses showing a clear improvement.











VOLUNTEERING AND DISCLOSURE

- The project has had great visibility, os we point out some data:
- More than 4,700 students have passed through the exhibition of the Segura Riverlink
- 45 activities have been carried out volunteering of all kinds from plantations, until contest of paintings, of paellas, samplings of turtles, etc., with more than 1,000 participants and more than 16 entities collaborators that we have to thank your help
- The website (www.segurariverlink.eu) has received more than 40,000 visits.
- We have many videos hanging, if you you can see us in the channel Youtube del Segura Riverlink.
- We are also on Facebook and Twitter, with more than 1000 followers ...



Socioeconomic effects

• When the riparian forest is mature more than 7,500 tons of CO2 will be captured per year.

• Likewise the saving of the evapotranspiration of riverbank forest in front of the cane when the forest is mature is estimated at more than 3 million meters cubic per year, the consumption of a population of about 30,000 inhabitants

+ 1000 participants and16 Associates





SUMMARIZING

During the last years, the improvement of the chemical quality of the rivers in Spain has been very large, but to others ecological aspects have not been given as much importance. The implementation of the Water Framework Directive obliges us not to only to have clean rivers but have a good ecological status.

The construction of the fish bypasses are a tool for this, which has been used a lot in rivers of the North of Spain. In the Mediterranean rivers just we are starting but the construction results of these first scales is very encouraging. The fish they use and are expected to be seen in the coming years changes for the better in fish communities.

On the other hand part another basic tool is the ecological restoration of the riverbanks, where the forest of ribera with the collaboration of our "custodians" begins to develop against the invasion of exotic, especially the cane, which makes the river lose all its splendor.







We continue!!!



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