Dam Removal goes Alps 2021

Dam removal at the Duero River in Spain

Programme on Friday, 7 May 2021: Political frameworks and financing

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INTRODUCTION

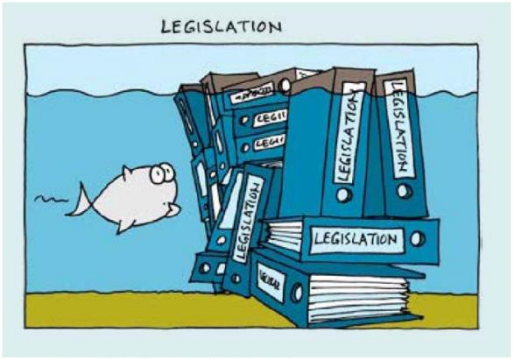
The River Basin Duero Authority is a public body in charge of the control and management of the water bodies considered in Spain "*public domain*"

Obviously, our framework is the **LAW**

On one side, the River Basin Duero Authority is owner of some of the biggest dams in our basin for irrigation and supply drinking water, and some other hydraulic infrastructures. On the other, we are in charge of the control of the compliance of the water rights conditions, the implement of water policy, the assessment and authorization of likely new water rights, the monitoring and control of the water ecological flows, the improvement of the ecological state of the water bodies etc.

Therefore, we play this double role, however, I insist the framework is always the **LAW** with all the environmental constraints that currently exist and might be in the future.

LEGISLATION



(From sea to source. International guidance for the restoration of fish migration higways. 2012)

Directive 92/73/EEC on the conservation of natural habitats and of wild fauna and flora

Article 10

Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence af the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

Article 22

In implementing the provisions of this Directive, Member States shall:

(a) study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation, provided that an investigation, also taking into account experience in other Member States or elsewhere, has established that such re-introduction contributes effectively to re-establishing these species at a favourable conservation status and that it takes place only after proper consultation of the public concerned;

(b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction. The results of the assessment undertaken shall be forwarded to the committee for information;

(c) promote education and general information on the need to protect species of wild fauna and flora and to conserve their habitats and natural habitats.

LEGISLATION

Water Framework Directive (2000/60 / EC)

Hydromorphological quality elements

Element	High status	Good status	Moderate status
Hydrological regime	The quantity and dynamics of flow, and the resultant connection to groundwaters, reflect totally, or nearly totally, undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
River continuity	The continuity of the river is not disturbed by anthropogenic activities and allows undisturbed migration of aquatic organisms and sediment transport.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.
Morphological conditions	Channel patterns, width and depth variations, flow velocities, substrate conditions and both the structure and condition of the riparian zones correspond totally or nearly totally to undisturbed conditions.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.

Element	High status	Good status	Moderate status
Fish fauna	Species composition and abundance correspond totally or nearly totally to undisturbed conditions. All the type-specific sensitive species are present. The age structures of the fish communities show little sign of anthropogenic disturbance and are not indicative of a failure in the reproduction or development of a particular species.	There are slight changes in species composition and abundance from the type-specific communities attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements. The age structures of the fish communities show signs of disturbance attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements, and, in a few instances, are indicative of a failure in the reproduction or development of a particular species, to the extent that some age classes may be missing.	The composition and abundance of fish species differ moderately from the type-specific communities attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements. The age structure of the fish communities shows major signs of disturbance, attributable to anthropogenic impacts on physico-chemical or hydromorphological quality elements, to the extent that a moderate proportion of the type specific species are absent or of very low abundance.

LEGISLATION

Spanish Water Law

Art. 126 bis Regulation of the Public Hydraulic Domain

1. The River Basin Authority shall promote **respect for the longitudinal and lateral continuity of the rivers**, making it compatible with the current uses of water and the hydraulic infrastructures included in the hydrological planning.

2. In the conditions of the new concessions and authorizations or of the modification or revision of the existing ones, which include transversal works in the riverbed, the River Basin Authority will demand the **installation and adequate conservation of fish passages** that guarantee their franchise by the autochthonous ichthyofauna. The same requirement will apply to existing works of this type, linked to concessions and authorizations that include this obligation in their conditions or that must incorporate such devices in application of current legislation.

These passages may be temporarily dispensed with due to environmental criteria or technical infeasibility, to be adequately justified in each case. Depending on the environmental evolution of the section or the improvement of techniques, the basin authority may require its installation when conditions so advise.

LEGISLATION

3. In the works and in the processing of water rights that correspond to defense works against floods, the River Basin Authority will take into account the possible effects on the state of the water bodies. Except in exceptional cases, they may only be built defense works raised laterally to the rivers in the preferential flow zone when protecting populations and existing public infrastructures.

4. The River Basin Authority **will promote the elimination of infrastructures** that, within the public hydraulic domain**, are abandoned without fulfilling any function related to the use of water,** taking into consideration the safety of people and property and assessing the environmental and economic of each action.

5. For the granting of new authorizations or concessions for cross-channel works, which due to their nature and dimensions may significantly affect sediment transport, an evaluation of the impact of said works on the channel sediment transport regime will be required. In the exploitation of these works, measures will be adopted to minimize said impact.

! THIS IS OUR FRAMEWORK !

ALTERNATIVES OF ACTION: STEP BY STEP

1. If a dam or any other barrier is abandoned or out of use (> 3 years), we are allow to start processing the expiration of the water right (permit).

2. Once the water right is expired, all the infrastructures within the “hydraulic public domain” returns to the state, that is, belongs to the River Basin Authority as the competent administration.

3. The prefer option is always the dam demolition according to the art. 126 bis, since it is the best alternative to restore the original conditions. However, the are many factors to be considered in the assessment of the final option (heritage, environmental obligations, safety, presence of invasive species, economical and technical issues, social aspects etc.)

4. If it is in use, the law enforces to have a passage device to guarantee the longitudinal connectivity

Current situation in the River Basin Duero

Number of barriers: 4,000 (last inventory)

Barriers removed: 176

Passages devices constructed: 225

DEMONSTRATIVE CASES

1. Demolition of the Gotera Dam in the Bernesga River (september 2011)

This dam was and old hydropower plant that finished the period of exploitation (100 years) and the River Basin Duero Authority, because environmental reasons, decided to remove the dam rather than extend the water permit as the company demanded.

https://www.youtube.com/watch?v=Gvr4WXH9Sd0

DEMONSTRATIVE CASES

2. Demolition of the Retuerta Dam in the Aravalle River (February of 2013)

This dam constructed in the 70´s for drinking water supply was out of use. Water right expired.

https://www.youtube.com/watch?v=OnxMQwcMgjQ

DEMONSTRATIVE CASES

3. Demolition of the Villaviciosa Dam in the Arroyo Garganta Honda (July of 2015)

This dam constructed in 1992 for drinking water supply was out of use. Water permit expired.

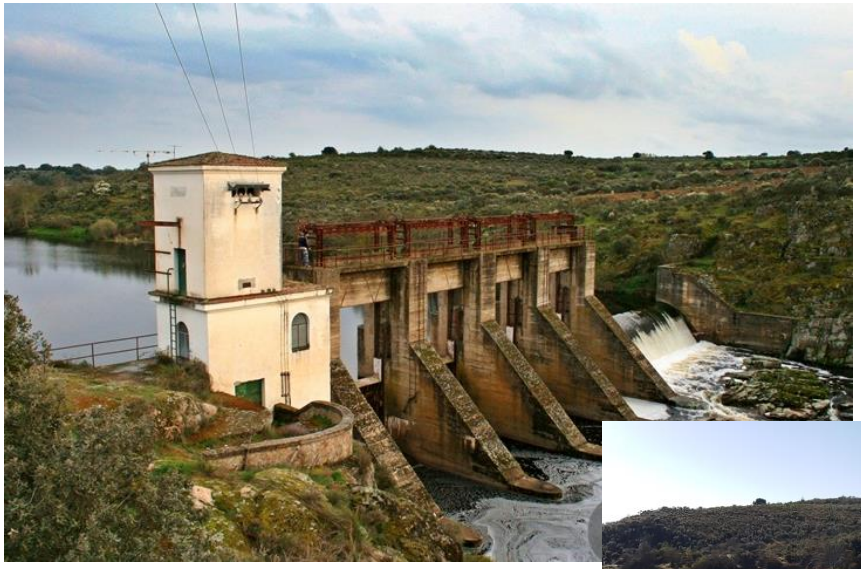
15 meters high and 115 meters wide

DEMONSTRATIVE CASES

3. Demolition of the Yecla de Yeltes Dam in the Huebra river (July of 2015)

This dam constructed in the 70´s for drinking water supply was out of use. Water permit expired. Safety reasons.

https://www.youtube.com/watch?v=imD-4yZ41EU



DEMONSTRATIVE CASES

4. Construction of fish passages

In those weirds in use or abandoned but where it is possible the removal of the dam (e.g. old mills with heritage value).

LIFE CIPRIBER

Dam for drinking water supply to Morasverdes Village (5 meters High)

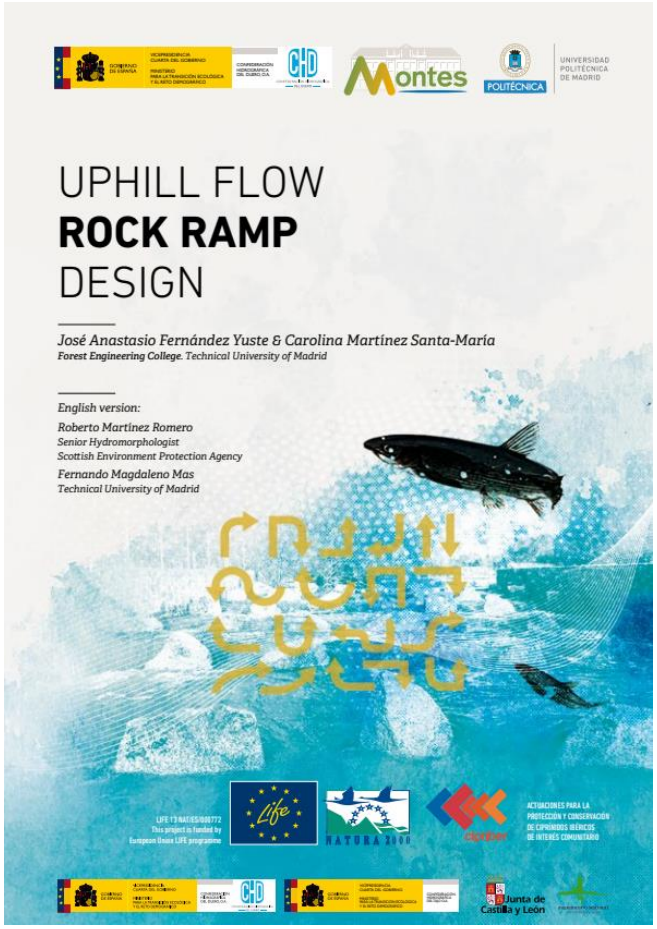
Old mill

DEMONSTRATIVE CASES

4. ¿It is possible to construct fish passages for big dams?

Santa Lucía Dam in use for irrigation in the Endrinal River: 29 meters high
https://www.youtube.com/watch?v=k17L60Uhw2k

HOW TO DESIGN NATURAL FISH PASSAGES



The River Basin Duero Authority in collaboration with the superior technical school of engineering of mountains, forest and natural environment of Madrid has published a manual for the design of natural fish passages, including App for calculations. These natural fish passages are designed making the best of the **UPHILL FLOWS** created within the ramp.

According to our experience the **BEST** option for fish passages. It is free download in CHD web!

https://www.chduero.es/documents/20126/427605/UphillFlowRockRampDesign.pdf

Empirically tested

Monitoring campaign for the estimation of depths and velocities

HOW TO ASSESS THE FUNCIONALITY OF FISH LADDERS

The River Basin Duero Authority in collaboration with the ITAGRA has published a manual for assess the functionality of fish ladders.

It is free download in CHD web

https://www.chduero.es/documents/20126/427605/ManualEvaluacionPasosPecesEstanquesSucesivos.pdf/b80d4307-b04d-3251-9c3a-062e5a25a114?t=1592810609775

WHAT WE HAVE NEXT?

Removal of the weird of the Mill of Álvaro de Luna at Adaja River in Arévalo (Ávila). This is an old mill out of use. The water right is expired. Works will start in June 2021

THANKS

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