

DAM REMOVALS IN BASQUE COUNTRY Basque Water Agency (URA)

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BASQUE COUNTRY: MAIN FACTS



The Basque Country is in the north of the Iberian Peninsula.

It's a mountainous territory, crossed by the watershed between the Cantabrian and the Mediterranean seas.

FEATURES:

- Surface: 7.234 Km².
- Maximum height: 1.500 m.
- 209 Km of coast (Cantabrian sea).
- Population: 2.193.205 inhabitants, 85% in its north half.
 - Height population density: 301 inhabitant/Km².





In the north (Cantabrian Shed) the dominant landscapes are the meadows and the coniferous forest plantations.



Its valley bottoms are occupied by urban uses and intense industrial activity

64

Cantabrian Shed





The Mediterranean Shed, with lower slopes, the wide valleys are occupied by agricultural uses. The hillsides and mountains usually have natural forests

Mediterranean Shed



THE BASQUE WATER AGENCY

We are a PUBLIC ORGANISATION in charge of managing the **water policy in the Basque Country**.

Attached to the Environment, Territorial Planning and Housing Department of the **Basque Government**.

Main functions:

- Protection of the aquatic environment and its ecosystems
- **Promoting a sustainable use of water,** ensuring adequate management of demand and proper return to the environment
- Flood risk management to increase public safety
- Promoting and driving **technological innovation** in the field of water.









DAM REMOVALS IN BASQUE COUNTRY CURRENT PERMEABILITY IN BASQUE RIVERS





LEGAL FRAMEWORK

- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
 - Law 42/2007 on Natural Heritage and Biodiversity
 - Designation of SACs and their Management Plans Permeability of rivers as a measure of conservation
- Hydraulic Public Domain Regulation (RD 9/2008)

It promotes infrastructure-removal at rivers, as well as the longitudinal and lateral continuity of rivers

- Hydrological and flood risk management plans
 Programmed measures includes dam removals
- CONSTRAINTS
- Patrimonial value
- Current water use



Alternative options



FOLLOW-UP CONCLUSIONS

- Sediment transportation
- New morphology of the river





- Rise of fish fauna population
- Specimens found upstream the removed dam







• EXAMPLES

LIZARKOLA DAM, IN LEITZARAN RIVER



Before

After



PRESATXU DAM, IN ALTUBE RIVER



Before

After



LA SALVADORA DAM IN VILLABONA, ORIA RIVER





IBERDROLA'S DAM, IN LAPUEBLA DE LA BARCA, EBRO RIVER





• EXAMPLES

DAM, IN BAIAS RIVER



Before

After



INTURIA DAM

Built in 1913, to divert the water flow to a hydroelectric generation station.



- Concrete gravity dam
- Plant curve of 60 m length
- Original storage capacity: 300,000 m³
- Storage capacity in 2013: 70,000 m³
- Height: 12.90 m



LOCATION





LOCATION





BOLETÍN OFICIAL DEL PAÍS VASCO

miércoles 12 de junio de 2013

DISPOSICIONES GENERALES

DEPARTAMENTO DE MEDIO AMBIENTE, PLANIFICACIÓN TERRITORIAL, AGRICULTURA Y PESCA

2704

DECRETO 215/2012, de 16 de octubre, por el que se designan Zonas Especiales de Conservación catorce ríos y estuarios de la región biogeográfica atlántica y se aprueban sus medidas de conservación.

Actions and aim for the conservation of the SAC ES2120013 Leitzaran Ibaia/Río Leitzaran

	Objetivo operativo 3	Eliminar los obstáculos en el corredor acuático		
Main objetive: Inturia dam removal		Es de aplicación en particular la Directriz 5.D.2 en relación con las concesiones fuera de uso en el ámbito de la ZEC (Piscifactoría Truchas Erreka, Olloki y Presa Inturia) o fuera de él pero que pueden tener efectos significativos sobre la misma (Galgo Paper).		
		AP1 Se redactarán y ejecutarán proyectos para la permeabilización/demolición de los obstáculos asociados a las concesiones fuera de uso existentes en la ZEC (Piscifactoría liuchas Erreka, Olioki y Presa Intuna) e en sus proximidades (Galgo Paper). Destaca como objetivo prioritario la presa de Inturia, en proyecto de demolición redactado. Su ejecución sería de gran interés. Los prevectos contemplarán actuaciones de mejora morfológica de las riberas del remanso o embalsamiento en todas las obras de derribo total o parcial de azudes/obstáculos.		
	Actuaciones	Asimismo son de aplicación la Directriz 5.D.5 . (Mantenimiento en buen estado de siste- mas de control de volúmenes de agua utilizados y de las instalaciones asociadas a la concesión: escalas, rejillas), y las actuaciones 1.AC.7 . (Incorporación de pasos específi- cos para anguila), y 1.AC.8 , en relación con la evaluación de la eficacia de los sistemas de permeabilización de obstáculos en el ámbito de la ZEC, en particular para los obstácu-		

N.º 112



INTURIA DAM



- Deteriorated structure in disuse.
- High cost of maintenance.
- Fauna barrier and hydromorphological disturbances.



DEMOLITION BY PHASES

Four phases of demolition were planned:

- Allow for the river to adapt to the changes .
- Reduction of temporal negative effects.

	1 st phase	2 nd phase	3 rd phase	4 th phase
Date of the action	August 2013	August 2014	August 2015	January 2016
Execution time	28 days	31 days	12 days	11 days
Budget	79,933 €	59,800€	59,350€	58,230€
Demolition volume	313 m ³	739,4 m ³	920,7 m ³	815 m³
Height taken down	3.3 m	3.3 m	3.6 m	2.7 m





1st PHASE: AUGUST 2013





Protection of Bertxin dam



1st PHASE: AUGUST 2013



Emptying the reservoir by diverting the maximum possible flow through the canal of the hydroelectric installation.



1st PHASE: AUGUST 2013



Demoliting first at left bank

Cofferdam



1st PHASE: AUGUST 2013



Then demolishing towards the right bank

A concrete slab was built

Lowered height= 3.30 meter

Demolition volume= 313 m³



2nd PHASE: AUGUST 2014



Cofferdam and left half demolition

Right half demolition



2nd PHASE: AUGUST 2014



Lowered height= 3.30 meter Demolition volume= 739.40 m3

Concrete slab was built



3rd PHASE: AUGUST 2015



Flow-bypassing by one lateral side

Right half demolition



3rd PHASE: AUGUST 2015



Lowered Height= 3.60 meter

Demolition volume= 920.70 m3

Left half demolition



4th PHASE: JANUARY 2016



Demolition

Material removal



4th PHASE: JANUARY 2016



Lookout at the right riverbank

Lowered Height= 2.70 meter Demolition volume= 815 m3



INTURIA DAM REMOVAL





INTURIA DAM REMOVAL







<u>GEOMORPHOLOGICAL</u>: Upstream of the former backwater area, there have been significant incisions since the beginning of the demolition, but in the last two years have slowed down.

<u>SEDIMENT TRANSPORT:</u> 240,000 m3 of sediments have been released from Inturia dam. 66,600 m3 of suspended sediments have been washed downstream, 28% of which passed through the gauging station.

HABITATS (meso-habitat, section of 4.5 km fluvial): The study section corresponds to a fluvial salmonid course where it's been confirmed that the productive areas have increased in number and length after the demolition.

HAVING REMOVED THE DAM IN PHASES IS THE MAIN REASON FOR THE SATISFACTORY RESULTS ACHIEVED



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