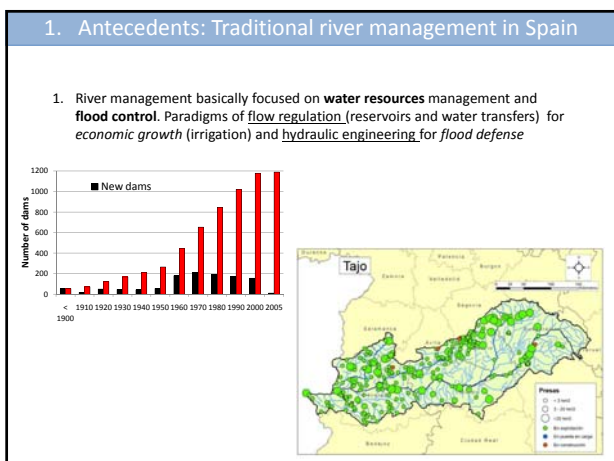


CONTENT

1. Antecedents: Traditional river management in Spain
2. The National Strategy of River Restoration
3. Main constraints of Spanish rivers for improving their ecological status
4. Practicing river restoration in Spain
5. Conclusions and learned lessons for transferring Spanish experiences



1. Antecedents: Traditional river management in Spain

- River management basically focused on water resources management and flood control. Flow regulation (reservoirs and water transfers) Paradigm
- Administrative management by large Basins (*Confederaciones Hidrográficas*)
 - Main competences:
 - Water resources caption and distribution (infrastructure erection and maintenance)
 - Environmental surveillance of water bodies (superficial and groundwaters), mainly addressed to water quality
 - Main constraints:
 - Scarce transdisciplinarity
 - Sectorial management without a territorial vision
 - Reduced staff for river surveillance
- Decision making dominated by technical (civil engineering) staff, with **no much experience on ecological concepts, stakeholder involvement or public participation**
- Reduced information** of hydrological data, little control of groundwater abstraction, flood-prone areas occupation, etc.

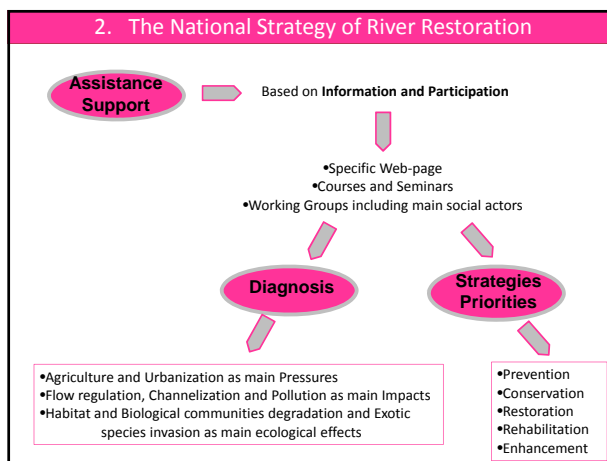
2. The National Strategy of River Restoration

Promoted by the Spanish Ministry of the Environment with the scientific assistance of the Universidad Politécnica de Madrid (2006-2007)

Adressed to *Facilitate the application of the WFD* and improve the ecological status of Spanish rivers.

MAIN OBJECTIVES:

- To improve the **ecological background of river managers** and to unify ecological restoration concepts, terminology and goals
- To **initiate river restoration** works under unified criteria and scientific assessment
- To promote an **interdisciplinary approach** integrating the restoration and conservation activities in the traditional water resources management, flood-defence works, land-use planning and rural development programmes
- To encourage **public participation and stakeholder involvement** in the management of water resources, ecological restoration and landscape planning.





2. The National Strategy of River Restoration

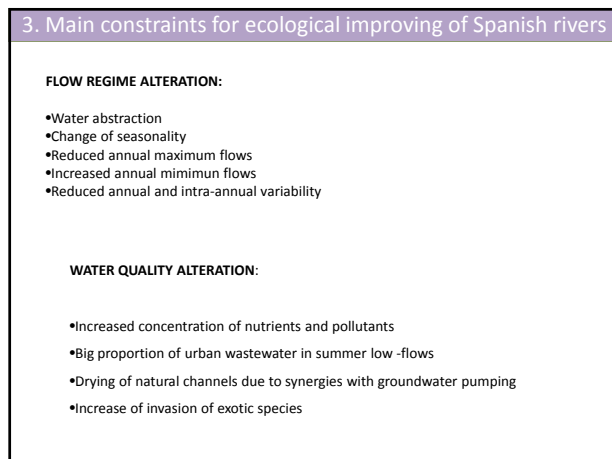
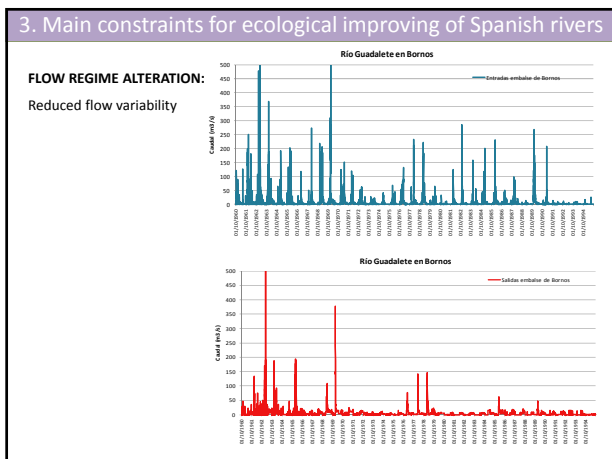
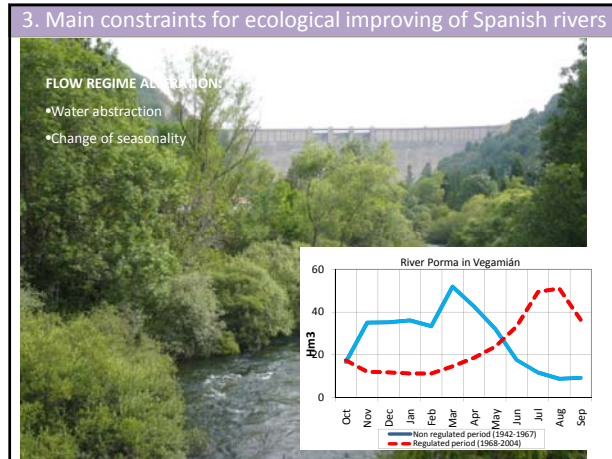
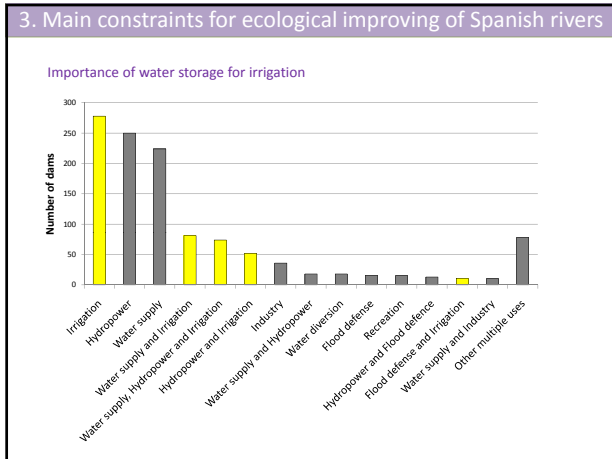
Evaluation

ELEMENTS	VARIABLES
BIOLOGICAL INDICATORS	Fish communities composition, abundance and age distribution Macroinvertebrate community diversity Number of exotic species Natural regeneration of native riparian forest
HYDRO-MORPHOLOGICAL INDICATORS	Environmental flow regime: Minimum flows magnitude, Flood magnitude and frequency, annual inter- and intra- variability Mobility and Naturalness of river channels Width dimensions of riparian and flood-prone areas
ADMINISTRATIVE AND MANAGEMENT CONTEXT	Interdisciplinarity in river management, ecological background of river managers, administrative coordination, river restoration/conservation priorities in urban and landscape planning, use of non-engineered measures for flood control
COMMUNICATION AND PUBLIC PARTICIPATION	Data availability, communication mechanisms and networks, cooperation between institutions, web-pages up-dating, administrative structures for public participation, open meetings and public attendance
PROJECT DESIGN	Stakeholder involvement, scientific assistance, spatial and temporal scales, roles and responsibilities, consistency and financial security, institutional support, maintenance and monitoring, post-project appraisals, flexibility and adaptability, transparency
VALUES AND PERCEPTIONS	River values and environmental services appreciation, awareness of environmental problems, perception of flow regulation effects, understanding of fluvial processes, appreciation of Mediterranean peculiarities, perception of river identity, ownership of problems and perception of solutions
SOCIAL OUTCOMES	Perception of public health and safety, recreation use of rivers, social values of river sites, social organizations and implication in river management, public trust in river restoration, social pressure for river conservation, volunteer implication in river studies and works, social learning

3. Main constraints for ecological improving of Spanish rivers

1º. Quantity and Quality of Water (Integrated River Basin Management Plans)

Water District / Region	Natural Runoff Hm3/y	Runoff Coef.	Water Storage in reservoirs		Water Demands (Hm3)					Total Water demand / Natural Runoff %	Agriculture Demand / Natural Runoff %	Agriculture Demand / Water Storage %	
			Hm3	% Natural runoff	Urban	Agriculture	Industry	Other	Total				
Miño-Sil	12689	0,56	3040	23,96	114	306	15	1	436	3,44	2,41	10,07	
Cantabrico	13881	0,57	559	4,03	260	54	504	3	821	5,91	0,39	9,66	
Duero	13660	0,28	7667	56,13	329	4501	46	8	4884	35,75	32,95	58,71	
Tajo	10883	0,3	11135	102,32	599	1712	284	0	2595	23,84	15,73	15,37	
Guadiana	4414	0,16	8843	200,34	222	2907	24	0	3153	71,43	65,86	32,87	
Guadalquivir	8601	0,23	8867	103,09	444	3490	83	0	4017	46,70	40,58	39,36	
Ebro	17967	0,31	7702	42,87	506	6310	250	0	7066	39,33	35,12	81,93	
Catalunya	2787	0,23	772	27,70	592	388	150	8	1138	40,83	13,92	50,26	
Jucar	3432	0,16	3349	97,58	721	2789	147	0	3657	106,56	81,26	83,28	
Segura	803	0,11	1223	152,30	143	1662	46	30	1881	234,25	206,97	135,90	
Sur	2351	0,25	1319	56,10	390	1159	72	0	1621	68,95	49,30	87,87	
TOTAL	91468		54476		4320	25278	1621	50	31269				
%					59,56	13,82	80,84	5,18	0,16	100,00			



4. SPANISH EXPERIENCES ON RIVER RESTORATION

Before the National Strategy of River Restoration:

- Big effort on ameliorating **water quality** and **groundwater abstraction control**:
 - Programa Nacional de Calidad de aguas (Depuración de aguas urbanas)
 - Programa Alberca

During and After the National Strategy of River Restoration:

- Relatively important Investments to **ameliorate morphological and biological conditions**, with different succes:
 - Fish passes and check-dams demolition
 - Riparian vegetation treatments and planting
 - Recreational facilities inside the fluvial system
- Very little improvement of regulated flow regimes

FORECASTER Research Project (2008-2010) Hydromorphology & Ecology of European rivers

60 case studies:

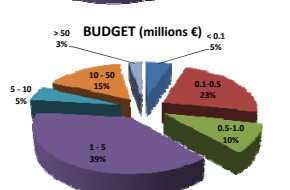
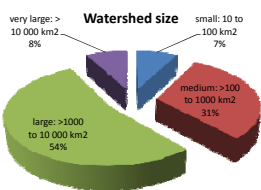
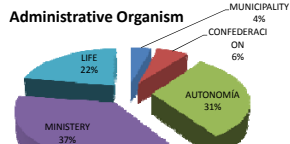
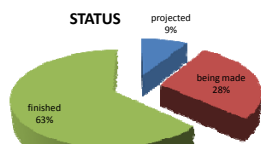


- Ecological improvement
- Riparian habitat improvement
- Connecting wetlands
- Removal of weirs
- Biodiversity & Species Conservation
- Sustainable uses
- Channel stabilization
- Fish passes



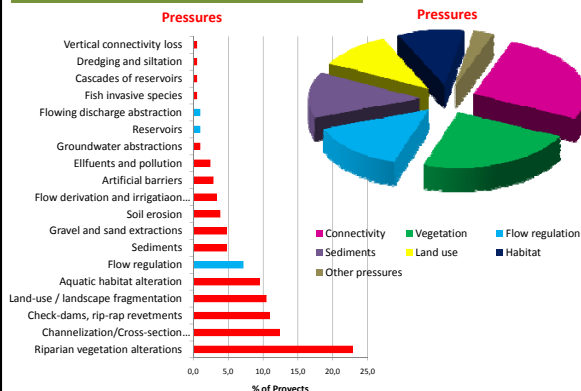
FORECASTER Research Project (2008-2010) Hydromorphology & Ecology of European rivers

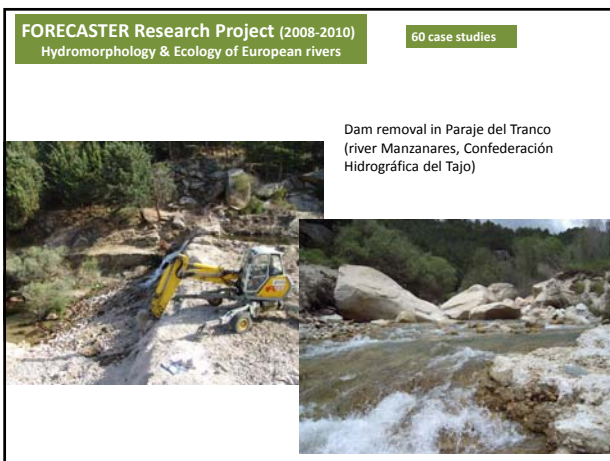
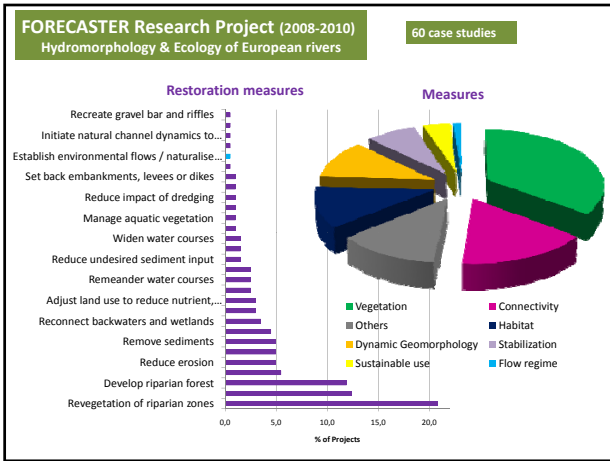
60 case studies



FORECASTER Research Project (2008-2010) Hydromorphology & Ecology of European rivers

60 case studies





60 case studies: Mejora ambiental del río Anzur en Aldea del Nacimiento

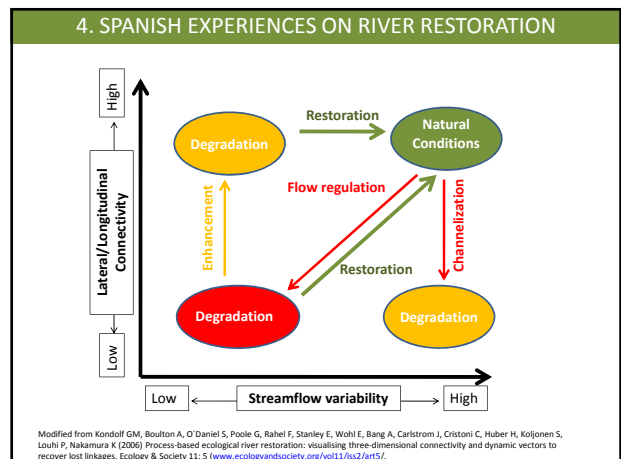
FORECASTER Research Project (2008-2010) Hydromorphology & Ecology of European rivers **60 case studies**

Riparian vegetation improvement in Llobregat and Cardener rivers (Agencia Catalana del Agua)

Before and after *Arundo donax* removal and native species plantations in Llobregat river, Sant Fruitós

FORECASTER Research Project (2008-2010) Hydromorphology & Ecology of European rivers **60 case studies**

Bank stabilization by bio-engineering technics in Libardón river (Confederación Hidrográfica del Norte)



CONCLUSIONES - LECCIONES APRENDIDAS

1º. **Importancia de las Directivas Europeas** (ej. WFD) para mejorar el estado ecológico de los ríos, ante una escasa tradición en la consideración de valores ambientales, y casi nula participación pública.

2º. **Prioridad de la formación académica y técnica** de los gestores y consultores para mejorar los proyectos

3º.- Necesidad de **unificar criterios** de actuación y metodologías de redacción de proyectos para su evaluación

CONCLUSIONES - LECCIONES APRENDIDAS

4º. **Confusa identificación de problemas** de los ríos, aludiendo a deficiencias de su estructura actual, y no a las de su funcionamiento.

5º. **Excesiva importancia concedida a la vegetación de ribera**

6º.- En la mayoría de los casos, **medidas enfocadas a aumentar la estabilidad** del cauce y **la vegetación** de las riberas, sin resolver el problema de caudales o dinámica fluvial

CONCLUSIONES - LECCIONES APRENDIDAS

7º. Existencia de **graves problemas estructurales** de usos del suelo y demandas hídricas, que dificultan la mejora ecológica de los ríos. Urgencia de resolver las limitaciones de cantidad y calidad de las aguas de los ríos.

8º. Fuerte **resistencia social** y timidez política a la implantación de caudales "ecológicos". Necesidad de alcanzar **acuerdos** con los agentes sociales con **voluntad** política para ello.

La restauración de los ríos pasa de ser una cuestión "técnica" a ser una cuestión "socio-económica"

CONCLUSIONES - LECCIONES APRENDIDAS

9º. La restauración de los ríos exige una **visión territorial ligada a la gestión de los recursos hídricos**.

Necesidad de abordar esta restauración desde la planificación del uso del suelo y desarrollo rural, combinando las demandas ambientales con los requerimientos de las actividades humanas

10º. **Importancia de los análisis coste-beneficio** de la restauración fluvial, haciendo intervenir los costes ambientales del uso actual del agua, con externalidades negativas no imputadas a los causantes, y los beneficios ambientales de la recuperación de los bienes y servicios ambientales, hoy día tampoco contabilizados.