

River and floodplain restoration – natural water retention for combined outcomes

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CEDEX



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MINISTERIO DE FOMENTO

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

CEDEX
CENTRO DE ESTUDIOS Y EXPERIMENTACIÓN DE OBRAS PÚBLICAS

Overview

- i. Why integrating NWRMs in River Basin Management?
- ii. How can river and floodplain restoration contribute to natural water retention?
- iii. RR and NWRMs: combined outcomes in Mediterranean case studies
- iv. Conclusions and proposals for action



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i. Why integrating NWRMs in River Basin Management?

- NWRMs are essential to fully integrate WFD, FRD, BHD and other related Directives
- Blueprint Communication states NWRMs may reduce the EU's vulnerability to floods and droughts, support biodiversity and soil fertility and improve the status of waters
- GES, ESS, and other relevant concepts are all advancing in parallel paths, but have to be adequately inter-connected through NWRMs
- Mediterranean Basins need NWRMs to avoid collapse (desertification, CC, anthropogenic impacts)



ii. How can river and floodplain restoration contribute to natural water retention?

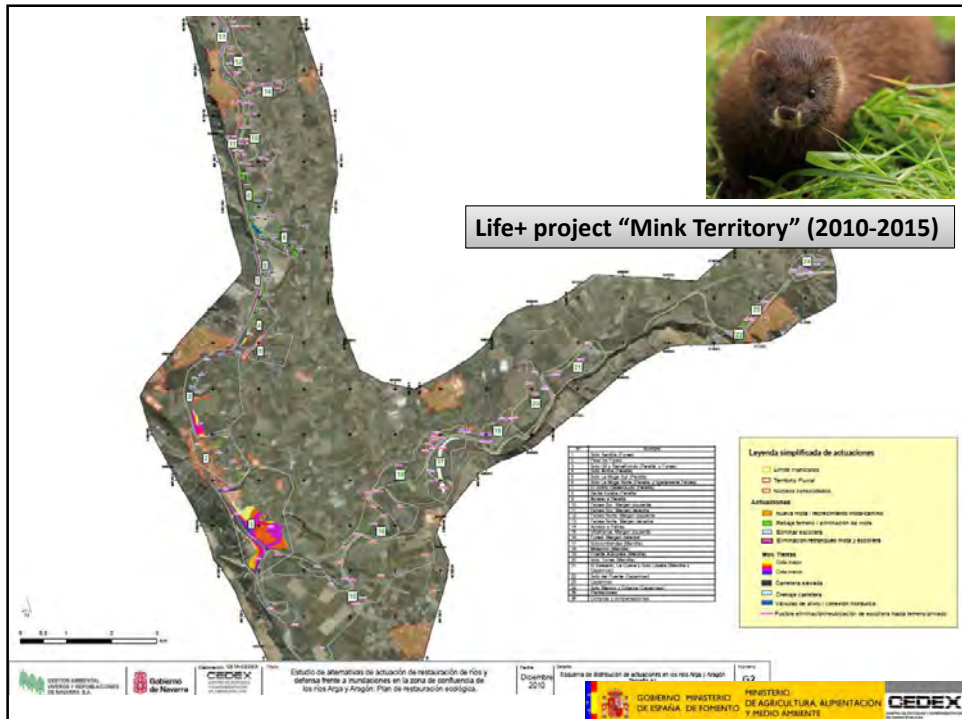
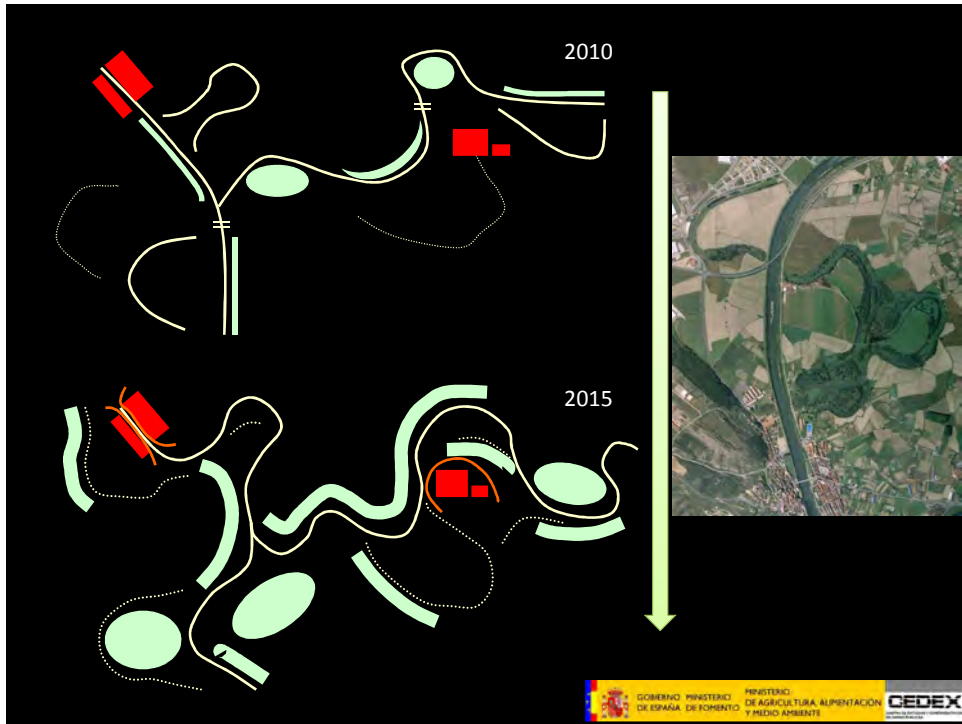
- Improving (3D) ecohydrological connectivity
- Increasing heterogeneity of river environments
- Enhancing the role of natural habitats as traps for water and sediments
- Improving the functionality of the flow regime to contribute to good status of rivers and floodplains
- Supporting public awareness about the vital role of natural water retention for people

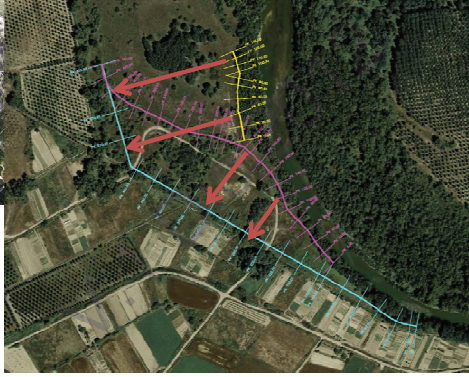



iii. RR and NWRMs: combined outcomes in Mediterranean case studies

Restoration of the Arga-Aragón system (Ebro Basin) – 2008/2015




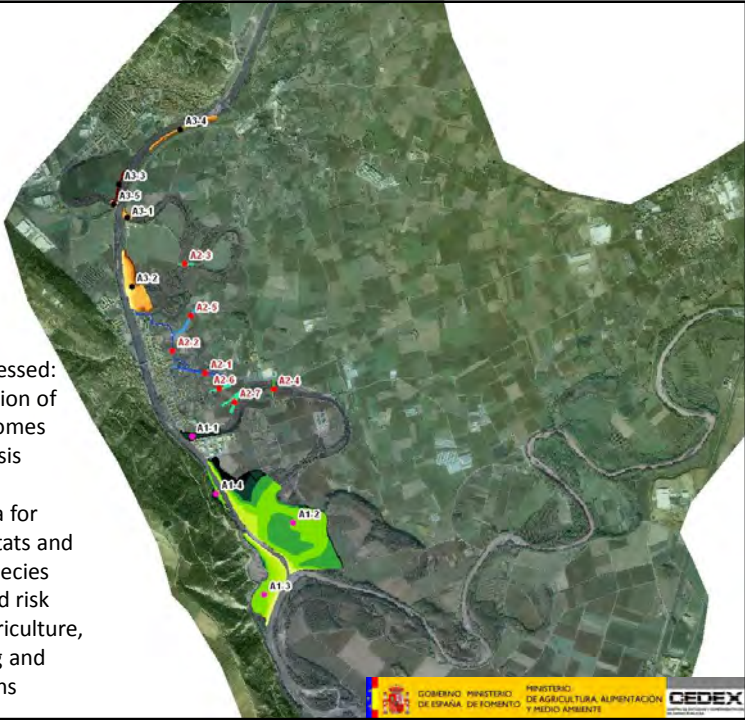


- Restoration of riverbeds, riparian woodlands, floodplains, meanders and wetlands – Over 40 km
- Flood risk reduction
- SCI improvement
- Agents: Government of Navarre, Ebro Basin Agency, Ministry of the Environment, Municipalities

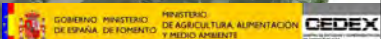
Source: Government of Navarre

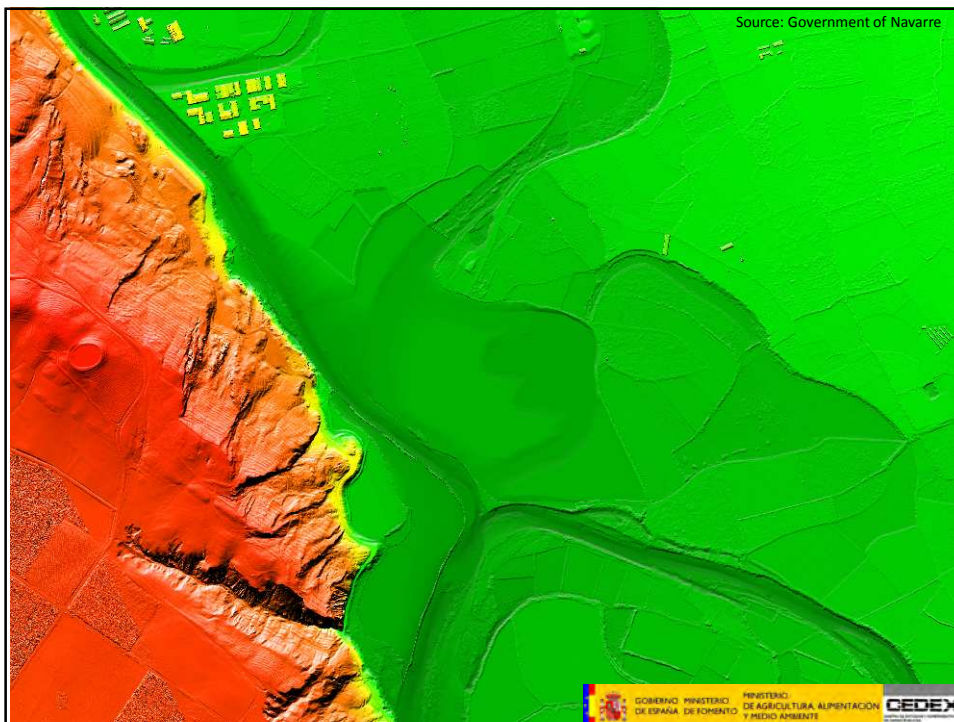
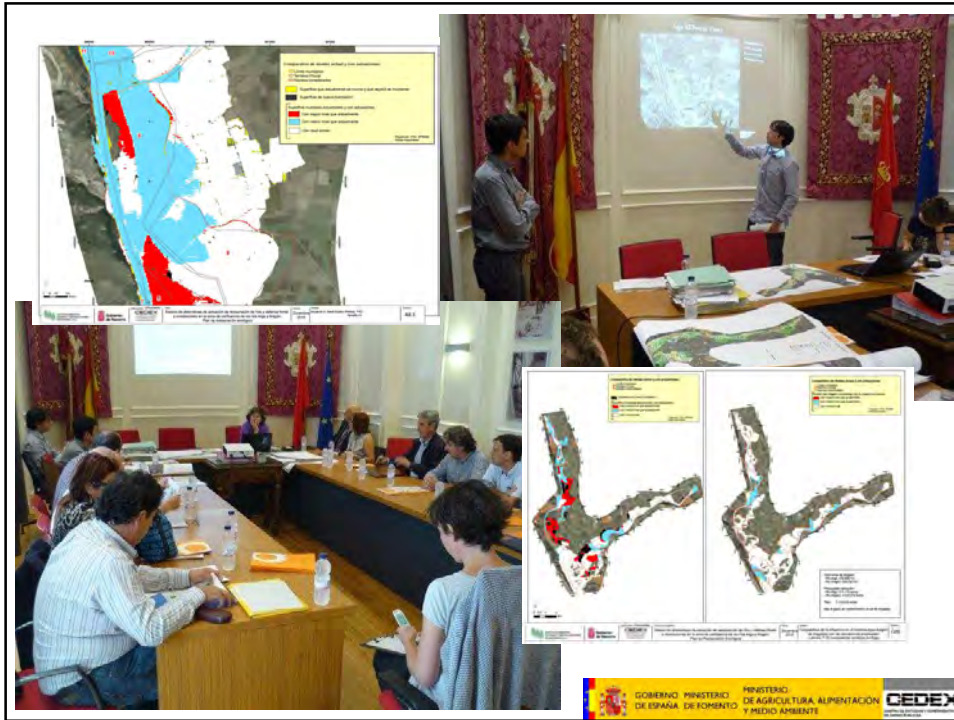




Key questions addressed:

- Multiple combination of measures and outcomes
- Cost-benefit analysis regarding:
 - Potential area for priority habitats and endangered species
 - Levels of flood risk
 - Impact on agriculture, urban planning and communications



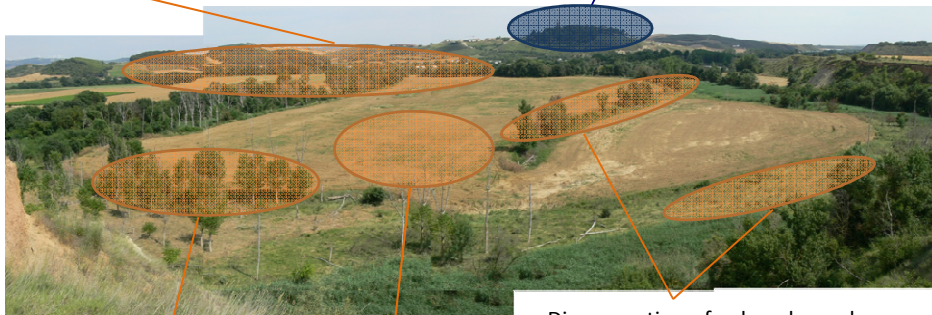


Other related projects in the Arga-Aragón river system to promote NWRMs



Loss of connectivity between river and floodplains

Lack of awareness about the actual river functioning and its socio-economical effects



Colonization by alien species

Disconnection of paleo-channels

Large reduction of ecological and landscape heterogeneity







iii. RR and NWRMs: combined outcomes in Mediterranean case studies



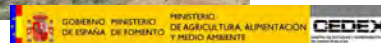
- Designed for floods under T10
 - E.g., Flooding area in Novillas: 3.3 hm³, and 315 ha
- The first 4 projects, 7.1 hm³ and 4.4 M€
- Covered by National Plan of Agro-insurances
- The Ebro Basin Agency proposes creating over 20 areas, connected by a network of gates. Total storage: 40 hm³.

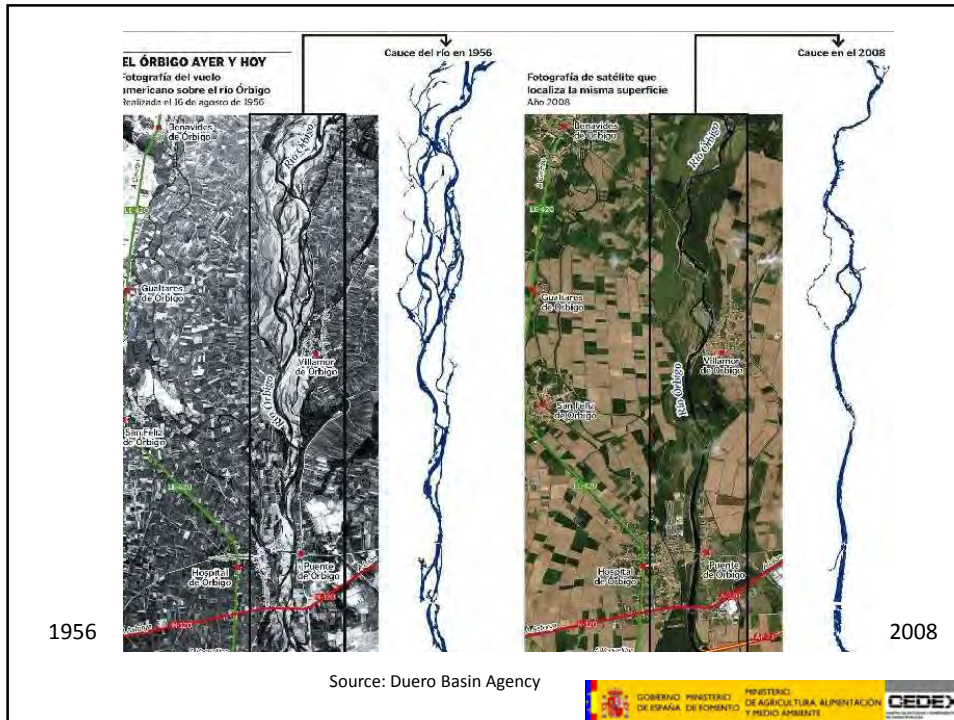


Source: Ebro Basin Agency



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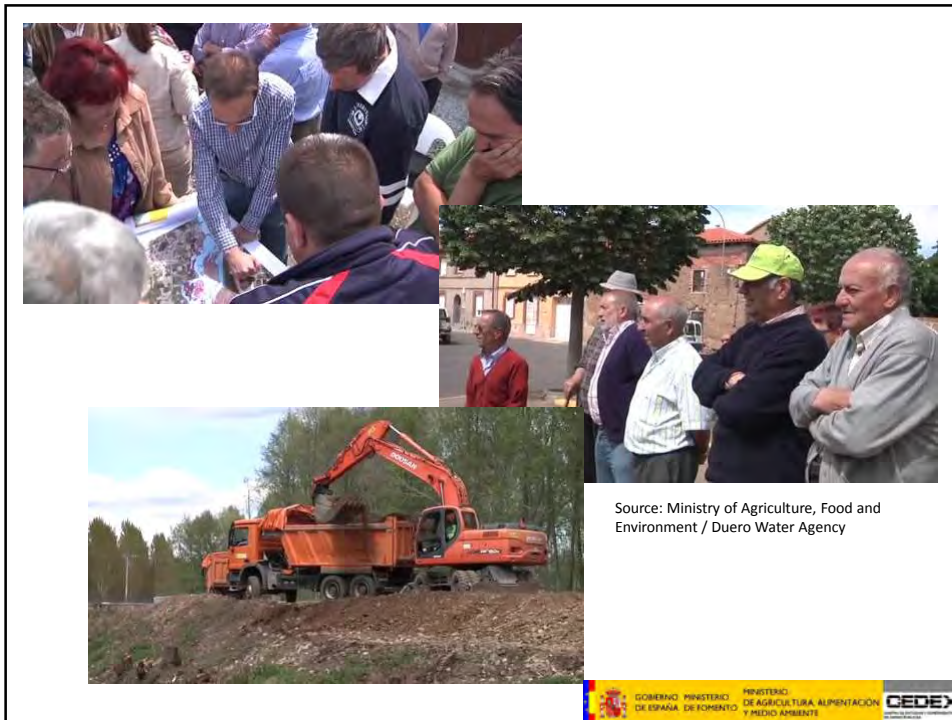




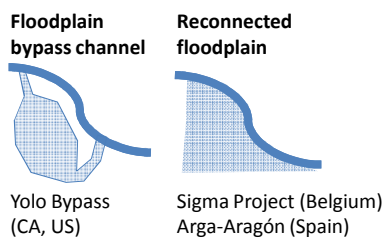
- Floodplain reconnection, improvement of hydrogeomorphic processes
- Flood risk reduction
- Intense public participation
- Agents: Duero Basin Agency, Ministry of the Environment, Municipalities

Source: Ministry of Agriculture, Food and Environment / Duero Water Agency

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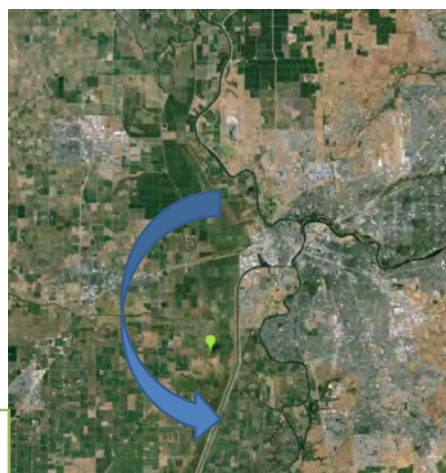


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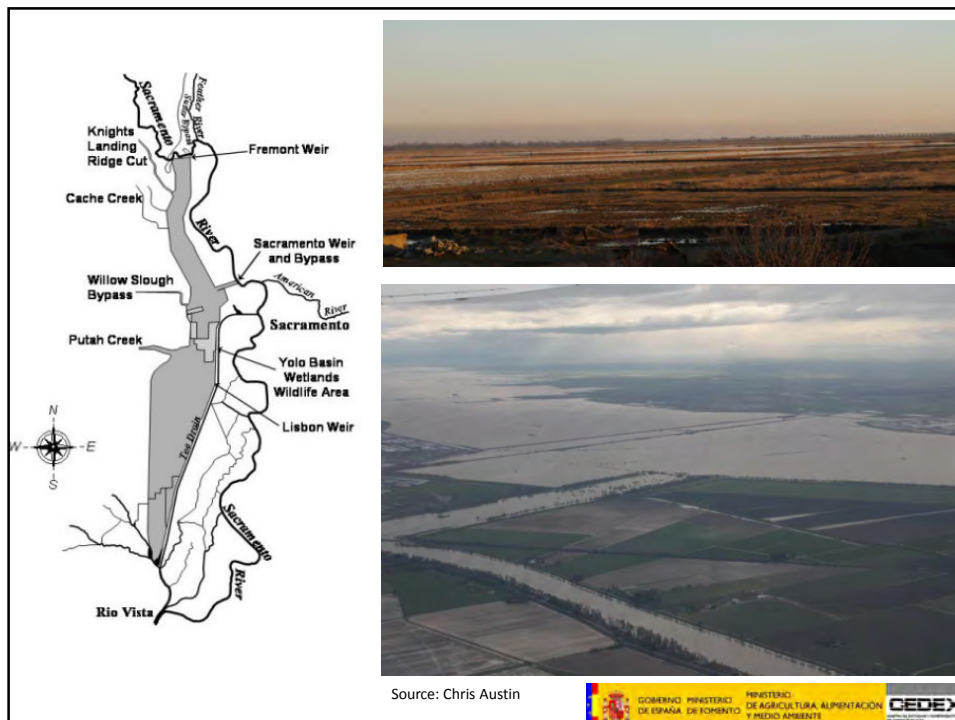


- Residence time ----->
- Ecological benefit ----->
- Land requirements ----->

Construction of Yolo Bypass (California) – 1917 and on



Source: Serra, A., Kondolf, M., Magdaleno, F. 2013



iv. Conclusions and proposals for action

- Med-rivers need intensive hydrogeomorphological restoration to support natural water retention
- Cost-benefit analyses commonly drive to NWRMs, but have to be developed on a truly scientific basis
- NWRMs require active public participation and best possible coordination
- NWRMs help people and ecosystems, while committing legislation and optimizing our natural heritage

