

LIFE DIVAQUA

Improving Aquatic Diversity in Picos de Europa

LIFE18 NAT/ES/000121

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Speed presentations – ARC Platform Meeting – 22nd May –
Santander, Spain

Improving Aquatic Diversity in Picos de Europa

DIVAQUA
MEJORANDO LA
DIVERSIDAD ACUÁTICA
EN PICOS DE EUROPA



Located in **Picos de Europa National park**
and Sella and Deva-Cares basins
Three CCAA: Principado de Asturias,
Cantabria y Castilla y León.

Total budget: 2.361.506 €.

Coordinating Beneficiary

Associated Beneficiary



Co-financers



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Objectives

DIVAQUA aims at restoring lotic and lentic aquatic ecosystems of the Natura 2000 network in the Picos de Europa National Park and the surrounded areas (Deva-Cares and Sella basins).

Objectives

- **Develop new tools and approaches** to improve the characterization, monitoring, assessment and management of DIVAQUA species and habitats
- **Reduce the anthropogenic pressure** on biological diversity, and increasing ecosystem service provisioning
- **Promote sustainability** of productive, educational-cultural and touristic activities minimizing their effects on the aquatic ecosystems

Improve the conservation status of the aquatic habitats and species of CI

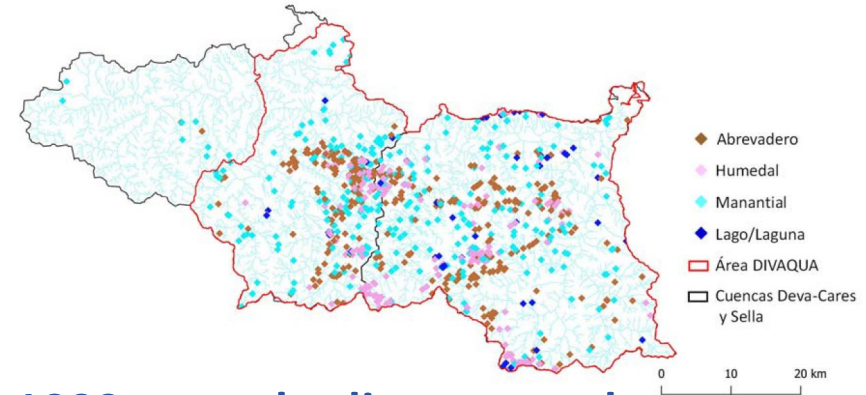


Developing new tools and approaches



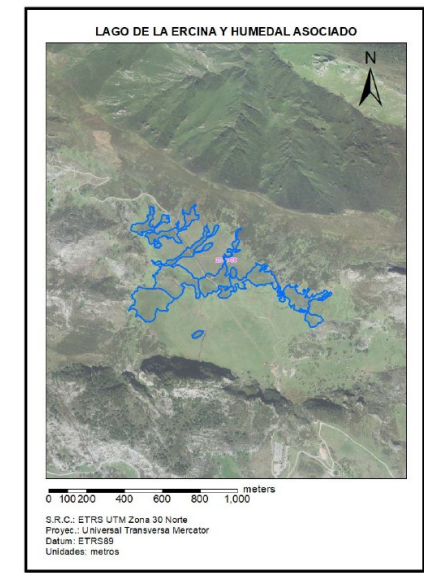
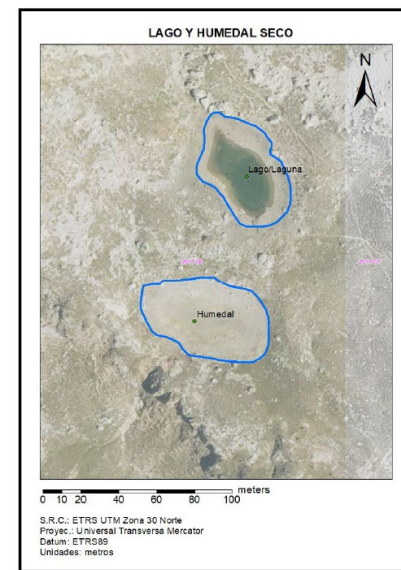
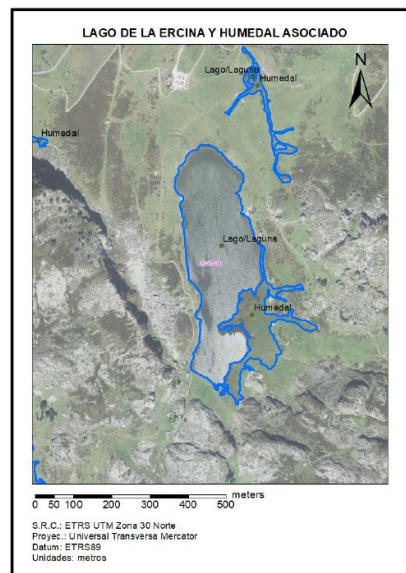
Updated cartography of lentic habitats

- PNPE database
- Water bodies catalogue from the Hydrographic Confederation
- Ad hoc created database from the National Topographic Map – (CNIG)
- In situ verification/PNOA verification



+ 1000 water bodies mapped

1. Drinking trough
2. Wetland
3. Spring
4. Lake/Lagoon



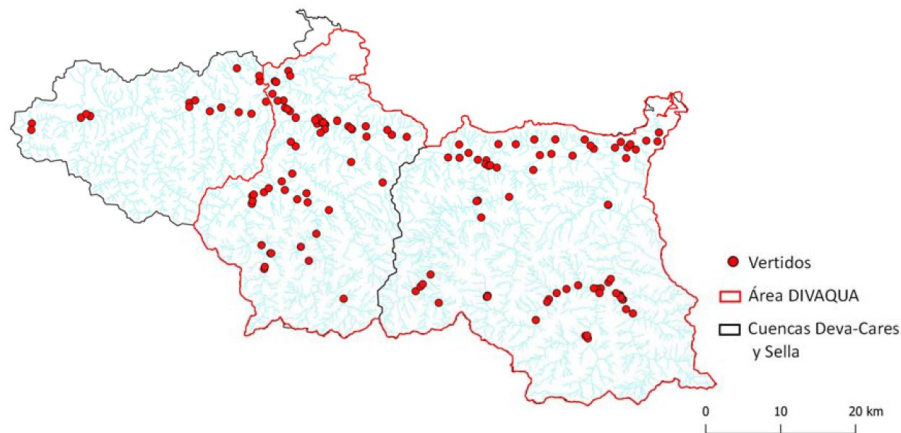
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Images obtained from National Plan of Ortho-photographs – PNOA. Image resolution of 25 cm

Developing new tools and approaches



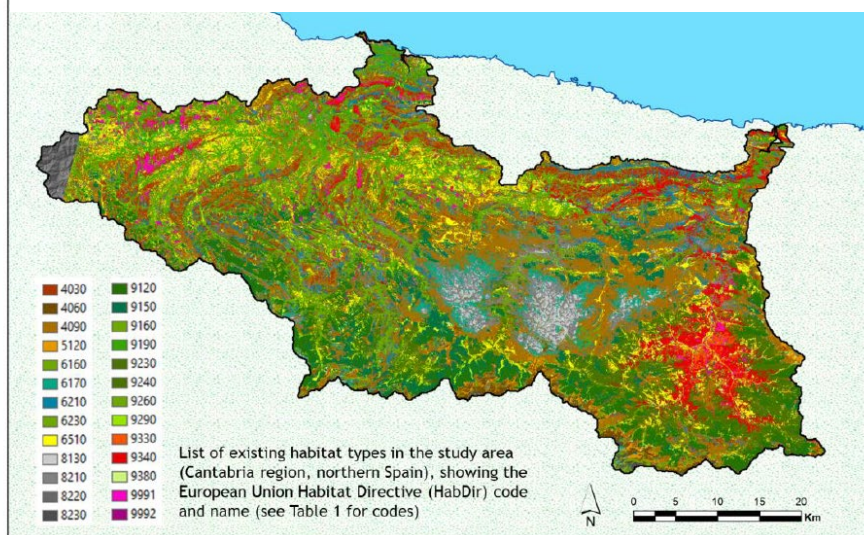
Inventory of spills, pollution sources



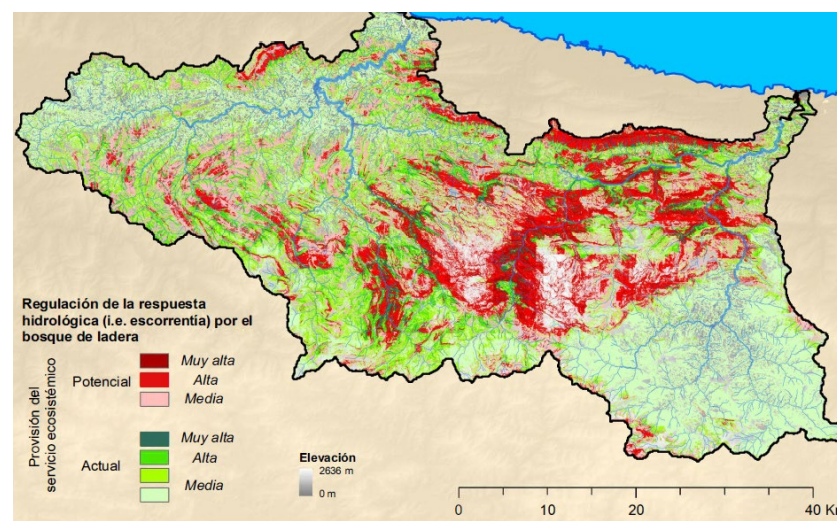
Inventory of hydraulic infrastructures



Cartography of vegetation and habitats



Cartography of ecosystem services



Developing new tools and approaches

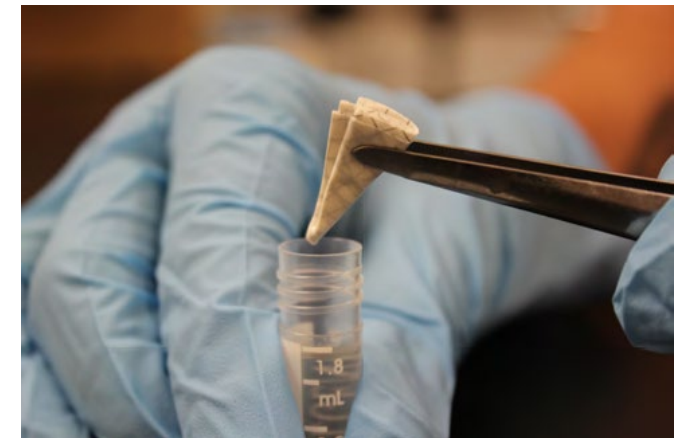
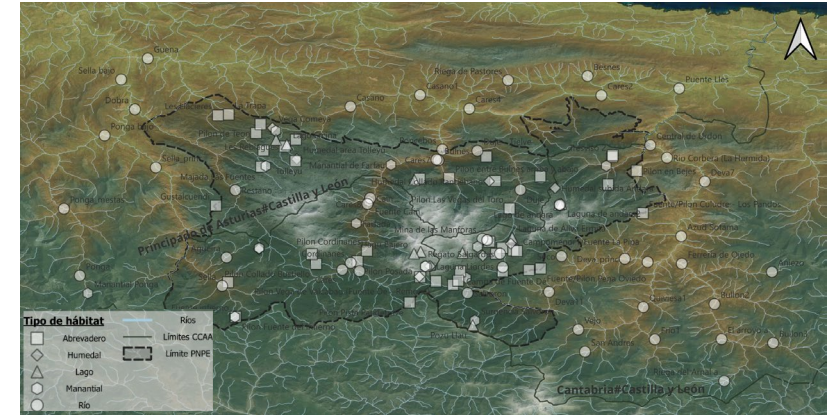
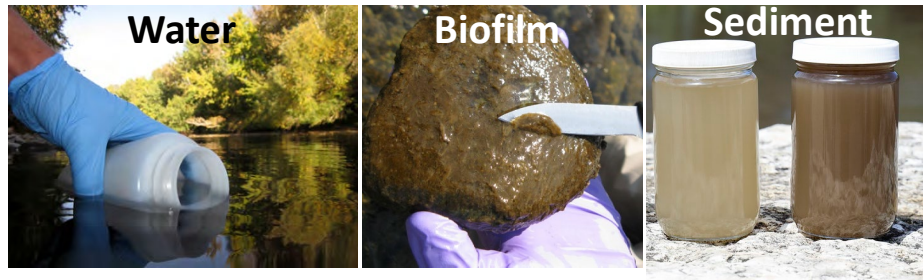


Species monitoring with eDNA



What and where?

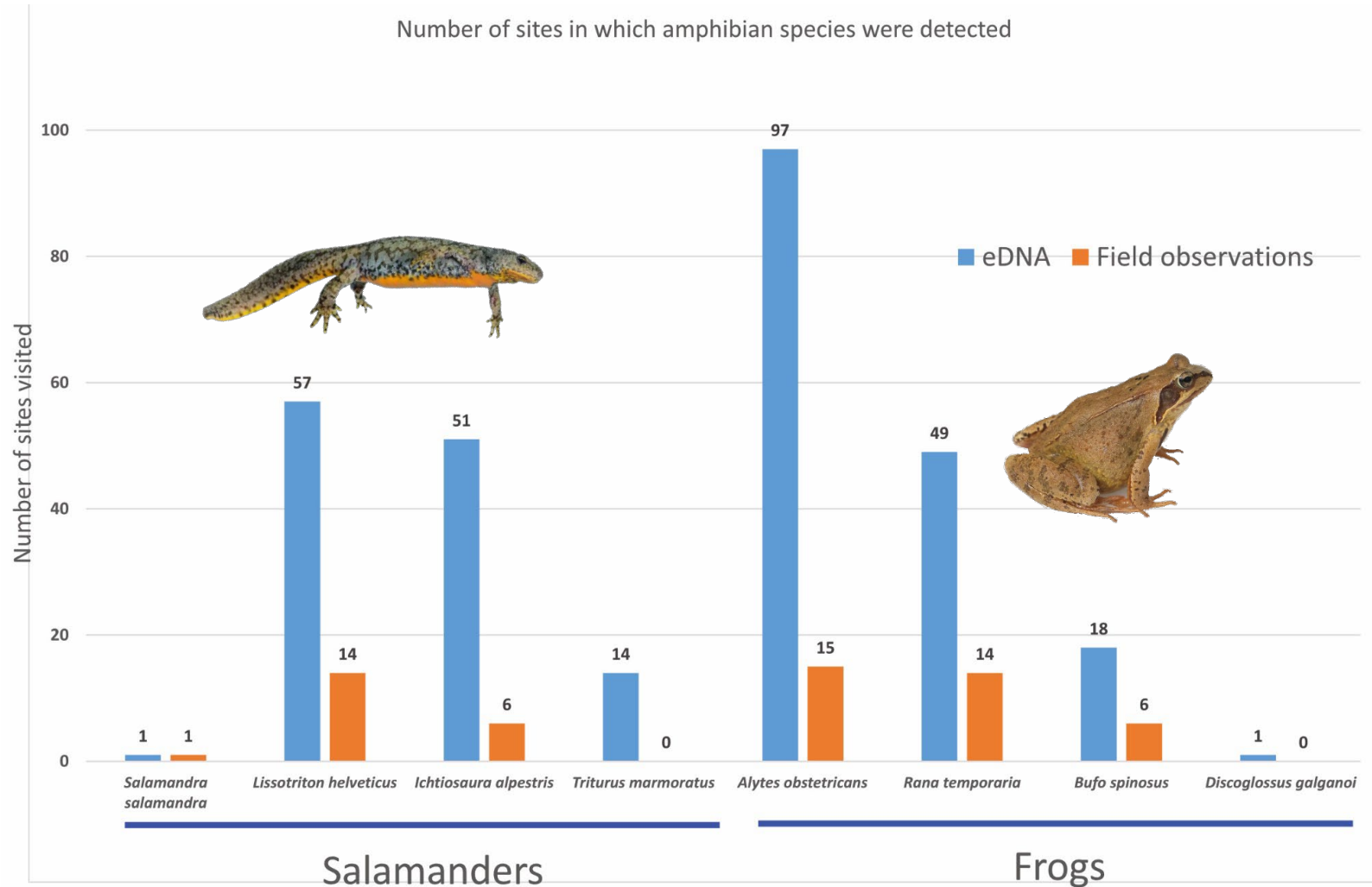
- 107 locations sampled in 3 campaigns
- 16s marker for vertebrates



Developing new tools and approaches



The detectability with eDNA surpasses field observations

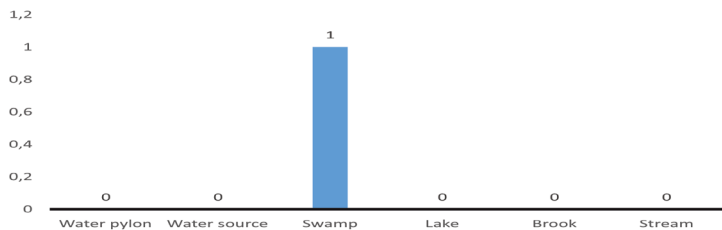
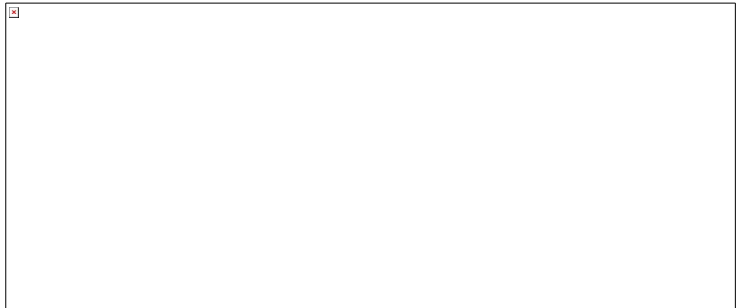
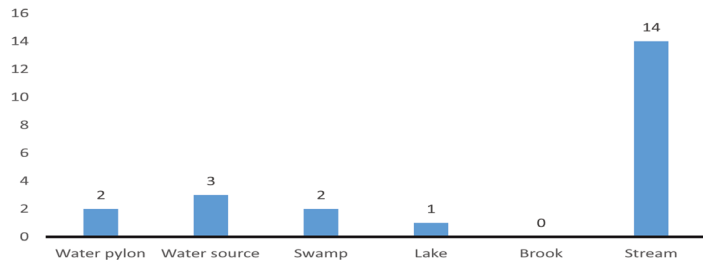
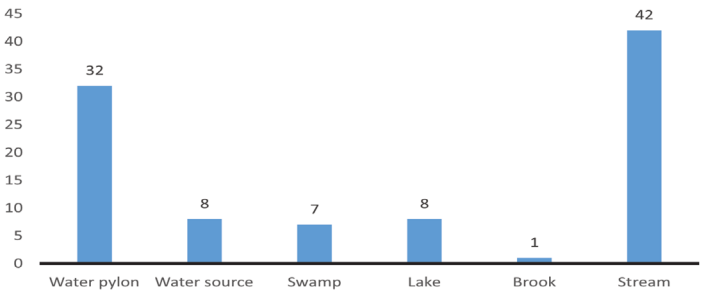


Developing new tools and approaches



Presence and habitat use by frogs

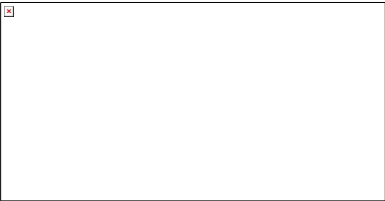
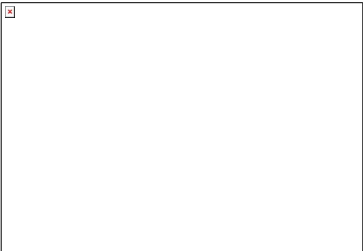
<i>A. obstetricans</i>	% sites present 91.6%	Key life history trait Tadpoles can stay several years in water.
<i>B. spinosus</i>	20.6%	Larvae several months in water.
<i>R. temporaria</i>	49.5%	Larvae several months in water. Pond breeder.
<i>D. galganoi</i>	0.9%	Explosive breeder, fast development. Breeds in temporary ponds.



Developing new tools and approaches



Presence and habitat use by salamanders

	% sites present	Key life history trait	
<i>L. helveticus</i> 	56.1%	Adults and larvae permanently in water.	
<i>I. alpestris</i> 	48.6%	Adults and larvae permanently in water.	
<i>T. marmoratus</i> 	13.1%	Explosive breeder. Mostly terrestrial. Rare.	
<i>S. salamandra</i> 	1.9%	Viviparous. Not linked to water bodies.	1 site in water pylon

Developing new tools and approaches



Updated cartography of amphibian distribution

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Alytes obstetricans

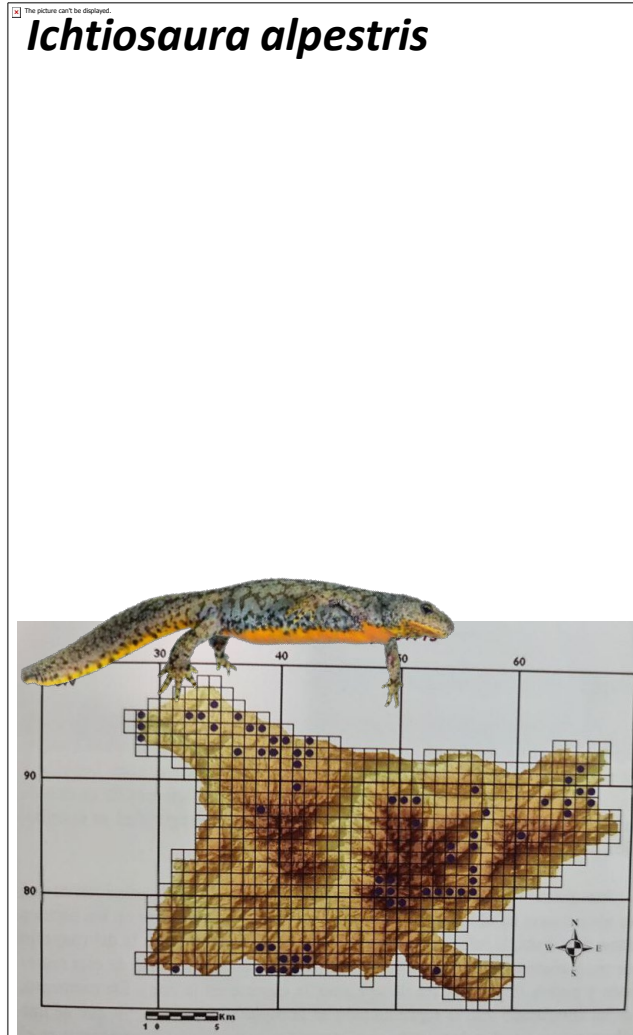
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Developing new tools and approaches



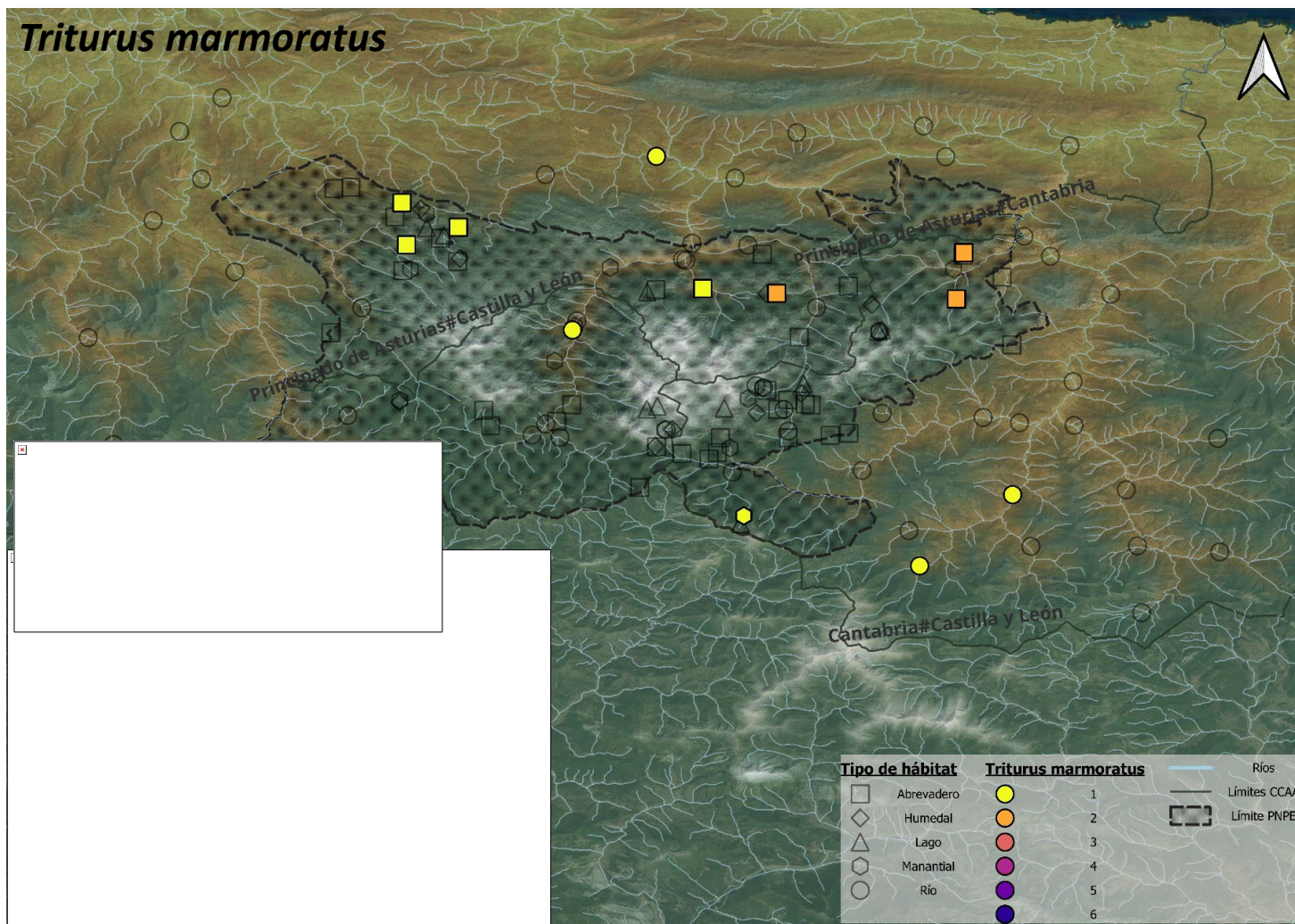
Updated cartography of amphibian distribution



Developing new tools and approaches



Updated cartography of amphibian distribution



Reducing pressure on biological diversity - amphibians

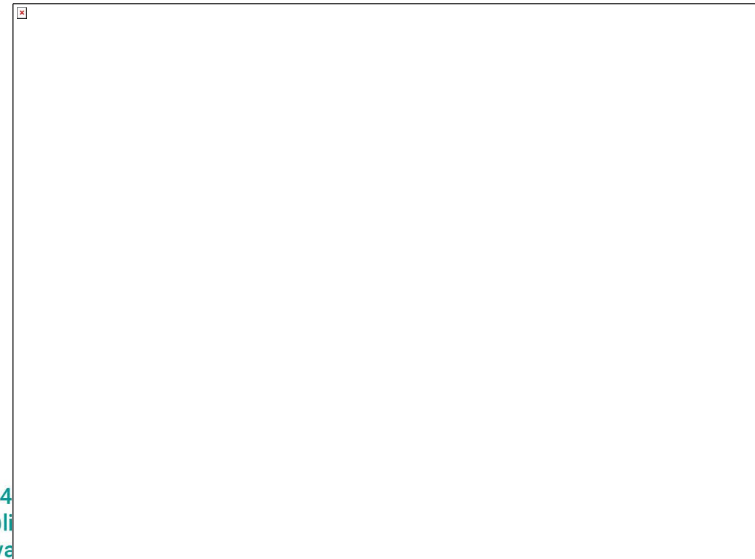
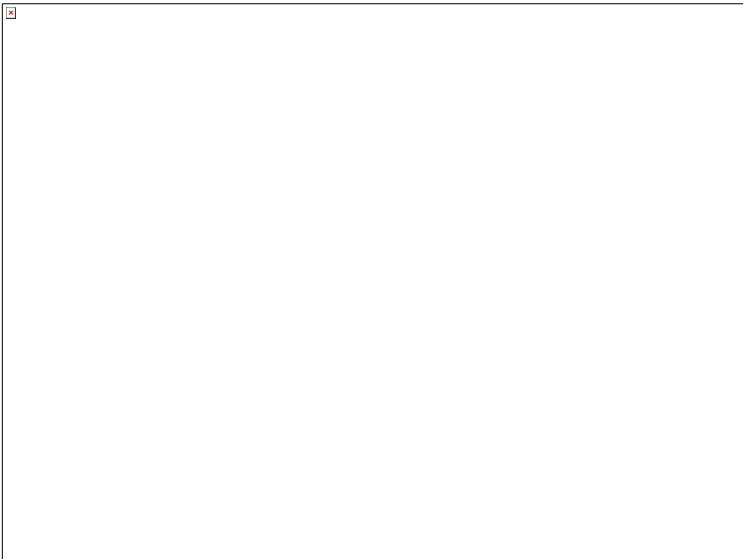
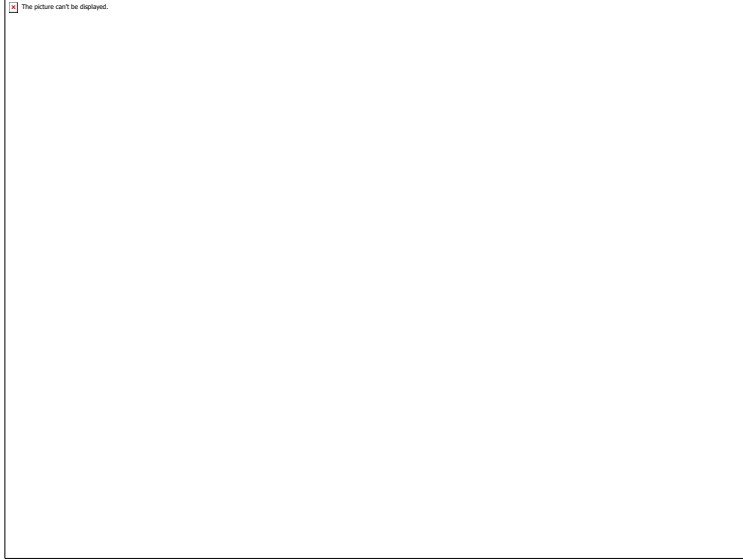
Restoration of cattle drinking troughs



- **18** cattle drinking troughs restored or created
- Adaptation of **11** water tanks with ramps

Reducing pressure on biological diversity - amphibians

Restoration of cattle drinking troughs and water tanks



Reducing pressure on biological diversity - amphibians

Restoration of wetlands (Transition mires and quacking bogs **Cod. 7140**)

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Reducing pressure on biological diversity

River connectivity – Weir removal

P. marinus

Puentellés- Río Deva

Ojedo-Río Bullón

Potes-Río Deva

Lama-Río Deva

Reducing pressure on biological diversity

River connectivity – Fish passages

P. marinus

Mejora escala de Poncebos



Canal de Camarmeña

Mejora paso central Urdón



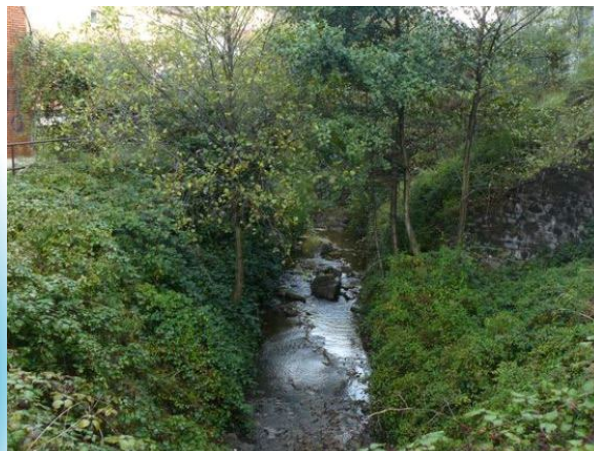
Escala en Restañ. Río Cares



Reducing pressure on biological diversity

Restoration of riparian vegetation

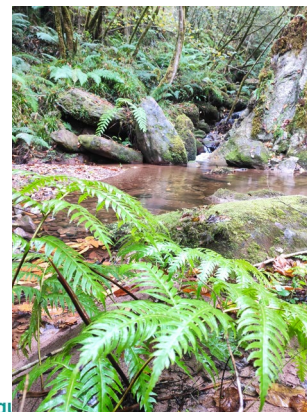
Alluvial forests with *Alnus glutinosa* y *Fraxinus excelsior* Cod. 91E0*.



<https://www.mieres.es/turismo>

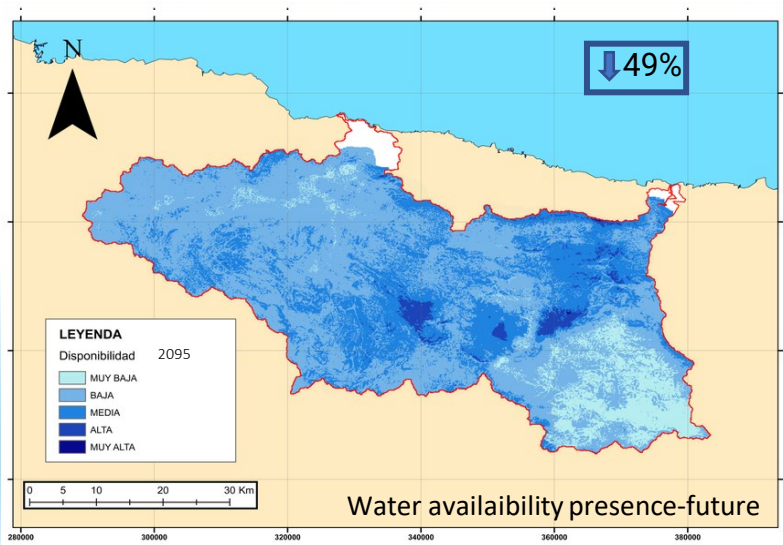


Increasing number of colonies of *W. radicans*



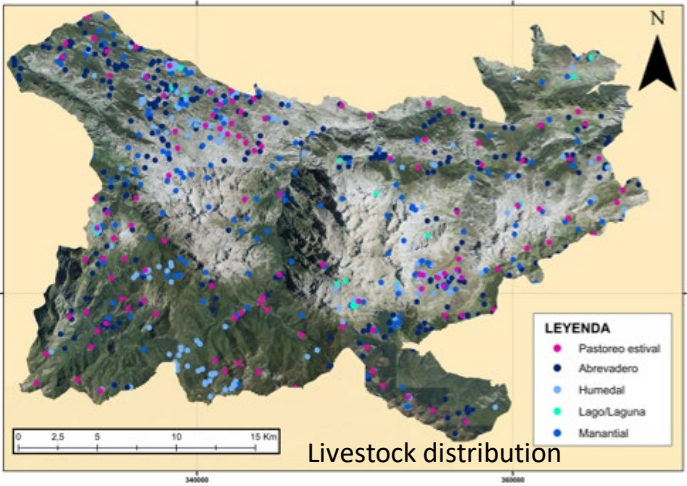
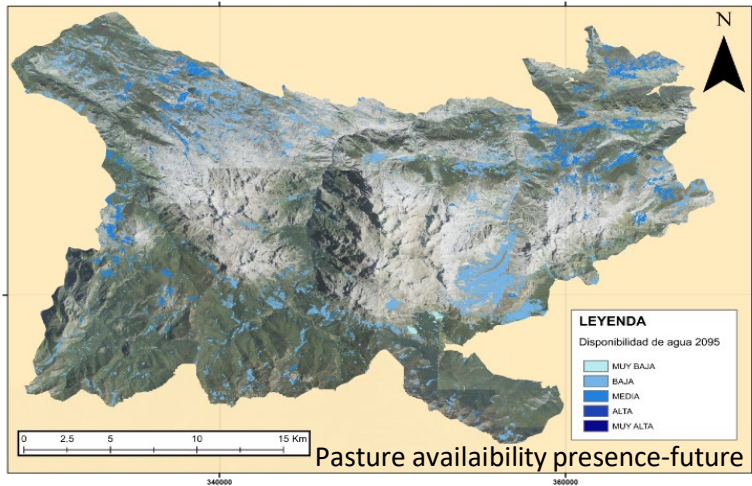
Promoting sustainability

Getting insight on future water scarcity and livestock management



Type of livestock	Daily water intake	Head of livestock (2017)	Annual water intake (L)
Sheep	9 l/day	6134	10 mill
Goat	9 l/day	6213	10 mill
Cow	30 l/day	16859	15 mill
Horse	25 l/day	1216	5 mill

- Head of livestock PNPC: 30.492
- Total water intake: **40 mill (l/año)**

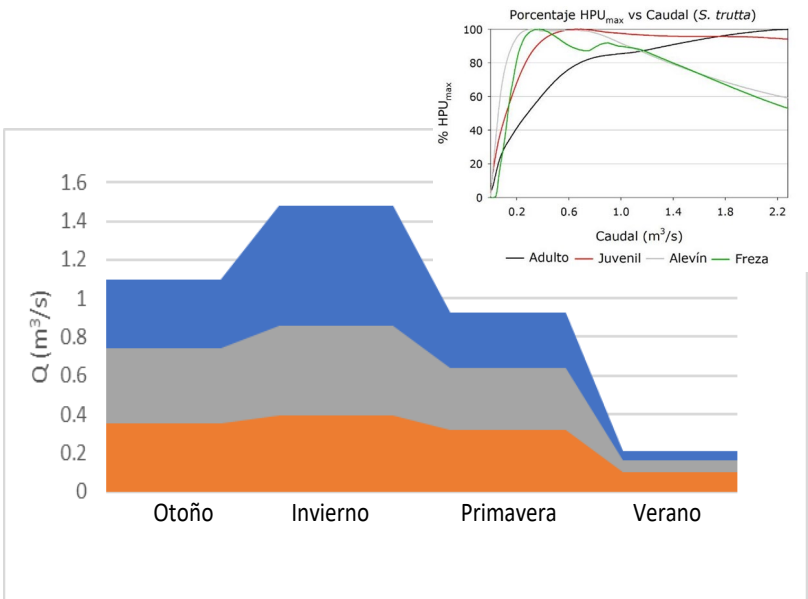
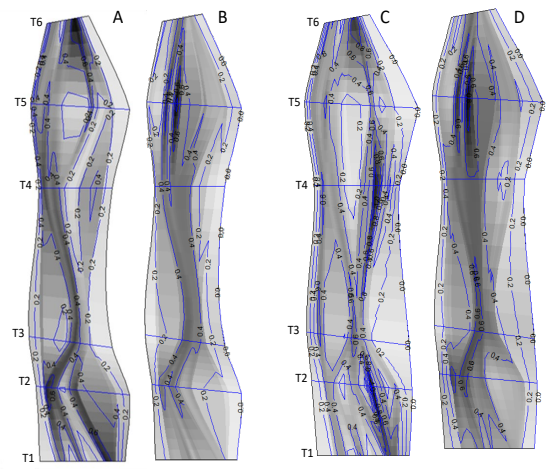
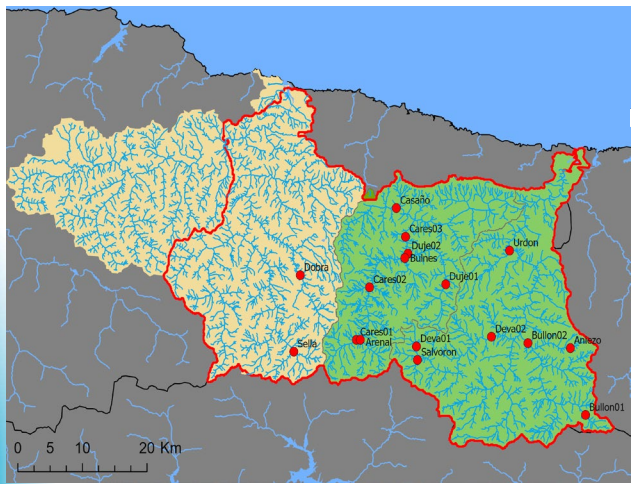


Sustainable management

- **Optimal distribution of livestock** according to water and pasture availability
- Assure **water availability** for **amphibians** enhancing population **conectivity**

Promoting sustainability

New data generated of environmental flows



Promoting a strong network for long term conservation- LTER



Conservation guide for aquatic mountain ecosystems – Plan PostLIFE



GUÍA METODOLÓGICA PARA LA
CONSERVACIÓN DE LA DIVERSIDAD
ACUÁTICA EN EL PARQUE NACIONAL DE
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Promoting sustainability

Extensive dissemination and communication program – workshops and volunteers





Key Messages

- We got **new insights** regarding the distribution of species and habitats in the DIVAQUA area
- **We reduced risks and threats** by restoring drinking troughs, improving connectivity and protecting wetlands between other actions
- We provided **scientific insights** about the effect of **climate change on water availability** – crucial for sustainable management of the territory and ES
- **We promote sustainability :**
by engaging the local population and socio-economical parties
by generating a long term node LTER
by generating a conservation guide and a PostLIFE plan



Key Messages

*Increasing our **knowledge** to **manage** and **protect** mountain aquatic **ecosystems***