

# Spain's natural river basins network should expand to protect biodiversity in rivers

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Image: the river Noguera Ribagorçana. The goal of protecting biodiversity is not fulfilled in the Natural River Basins network in Spain. Credit: Tony Herrera

The European eel (*Anguilla anguilla*), the freshwater blenny (*Salaria fluviatilis*), the freshwater pearl mussel (*Margaritifera auricularia*) and the pronged clubtail (*Gomphus graslini*) are some of the vulnerable species that are not sufficiently represented in the biodiversity catalog of the Natural River Basins (RNF) in Spain, according to a new article published in the journal *Aquatic Conservation: Marine and Freshwater Ecosystems*. Researchers Miguel Cañedo-Argüelles and Núria Bonada from the Research Group Freshwater Ecology, Hydrology and Management (FEHM) of the University of Barcelona participated.

The article, focused on the Ebro River basin, includes citizens and other social and institutional agents (water agencies, hydrographic confederations, scientists, non-governmental organizations, environment consultants, etc.) in the design process for the water reserves map in Spain.

The Natural River Basins (RNF) were created in Spain in 2015 to preserve the river areas with no human intervention, and which were in a perfect ecological state. The new study reveals the first conclusions of Reservial (2015-2017), a pioneering project in the European framework to assess the efficiency of the RNF in Spain with the participation of all stakeholders.

This innovative project seeks to shape a network of water basins of the rivers in Spain to guarantee the protection of river regions with the highest ecological and socioenvironmental value, as well as the preservation of water [biodiversity](#). Reservial is led by Núria Bonada, lecturer from the Department of Evolutionary Biology, Ecology and Environmental Sciences and the Biodiversity Research Institute (UB-IRBio) of the U.

With public participation in the research protocol, experts defined the conservation criteria RNF should fulfill to guarantee the protection of

biodiversity related to rivers. "About 60 percent of the species that were assessed in the project are not sufficiently represented in the RNF. Some of these species are regarded as vulnerable according to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species," says Miguel Cañedo-Argüelles, member of the FEHM-UB research group and the Water Research Institute (IdRA) of the University of Barcelona. "Therefore, social and scientific and technical requirements demand an additional effort to bring the element of biodiversity as a strategic criteria when assigning the RNF in a certain river basin."

Apart from protecting biodiversity, the sectors said RNF should be regarded as effective ecological corridors that include all water typologies of the country. Those declared RNF are almost exclusively located in mountains, and leave aside the middle and low stretches of rivers, which are usually degraded or insufficiently studied.

"As a result, current RNF are not connected to each other and do not favor the interrelation between populations of different species in the fluvial ecosystems. This disconnection is one of the main causes for the extinction of the species, according to the Platform for Biodiversity and Ecosystem Services," says lecturer Núria Bonada (UB-IRBio), who also leads the Freshwater Ecology, Hydrology and Management (FEHM) research group of the University of Barcelona.

From a methodological perspective, the research team applied a planning program for conservation known as Marxan designed by the University of Queensland, Australia, to identify the rivers stretches that should be added to fulfill the objectives stated by the involved sectors in the study. Marxan could be an efficient tool for the management and conservation of water ecosystems since it enables the creation of maps showing priority areas to be protected in order to fulfill the objectives.

"This tool could contribute to improving the current RNF network in the future, and through the corresponding processes of citizen participation, it could involve the people in the conservation of our water ecosystems," write Miguel Cañedo-Argüelles and Núria Bonada.

## **Social consensus to guarantee protection and conservation of rivers**

According to the new study, citizen participation in the systematic planning of conservation could improve the protection of freshwater ecosystems in the country to integrate a wide variety of preferences in the design of RNF.

"Having detailed and updated information on the distribution of invasive species or threatened ones, apart from conducting frequent comprehensive ecological monitoring, are essential elements to respond to the social requirements in order to improve the protection of biodiversity in [freshwater ecosystems](#) and preserve natural environments with a high ecological value," conclude the authors.

**More information:** Miguel Cañedo-Argüelles et al. Freshwater conservation planning informed and validated by public participation: The Ebro catchment, Spain, as a case study, *Aquatic Conservation: Marine and Freshwater Ecosystems* (2019). [DOI: 10.1002/aqc.3108](https://doi.org/10.1002/aqc.3108)

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