CHANGES IN RIVER FLOW REGIMES AFFECT POPULATION VIABILITY OF BENTHIC CYPRINIDS FROM SEMI-ARID FRESHWATER SYSTEMS: THE CASE OF THE SEGURA RIVER BASIN (SE IBERIAN PENINSULA).

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INTRODUCTION & OBJECTIVES

The natural flow regimes of Mediterranean rivers have strong seasonal and inter-annual flow variations. In these environments, fish species have developed optimal life strategies for their survival over time in relation to the functional framework of the rivers.

Human-induced alterations in river flow regimes caused significant changes on aquatic ecosystems and may affect negatively fish populations through modification of stream habitat characteristics.

The catchment of the Segura River (18 870 km^2) is characterized by semi-arid climate with an annual mean rainfall of 400 mm. It is a intensively regulated basin (30 big dams) which receives external water resources by Tajo-Segura transfer (annual mean water transfer of 340 hm^3) to the Mundo river, the main tributary of the Segura river. This situation has lead to severe modification of the natural flow regimes of these rivers.

Thus, the objectives of this study were:

➢ To characterize the hydrological regimes of the study sectors.

➢ To determine how biological traits of three Iberian cyprinid fish species respond to different flow conditions.

➢ To relate hydrological changes to the variation in the biological traits of such species.
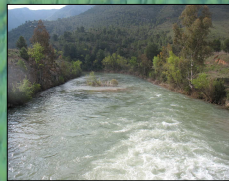
STUDY AREA
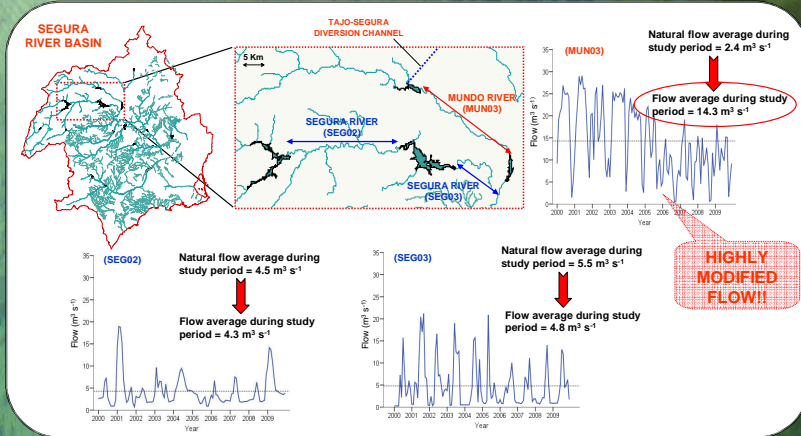
METHODOLOGY

TARGET SPECIES

Southern Iberian barbel
(*Luciobarbus sclateri*)

Iberian straight-mouth nase
(*Pseudochondrostoma polylepis*)

Pyrenean gudgeon
(*Gobio lozanoi*)

⚠ Translocated species

SAMPLING DESIGN

Fishes were identified, counted, weighed and measured for total length

• Sampling period: october-december 2008-2009
• 3 sampling sites per sector
• Electrofishing (reach of 100 m)

BIOLOGICAL TRAITS

Relative abundance ➡ CPUE (nº individuals hour^{-1}) ANOVA

Recruitment ➡ Cumulative total length frequency diagrams

Size diversity ➡ Shannon-Wiener Index

Somatic condition ➡ ANCOVAs

DATA ANALYSIS

RESULTS & DISCUSSION

Target species showed lower abundances in the sector with highly altered flow regime, but only *P. polylepis* showed significant differences

Recruitment was impaired for all species in the sector with highly altered flow regime

Size diversity was lower for *L. sclateri* and *G. lozanoi* in the sector with highly altered flow regime (*P. polylepis* only was abundant in one sampling site in the MUN03 sector).

Somatic condition was significantly higher in the sector with highly altered flow regime

Extreme water flows in the highly altered sector occur during reproductive period of the target species

REPRODUCTIVE FAILURE & REDUCED RECRUITMENT

POPULATION VIABILITY IMPERILED!!

Morphological changes? Differences in body composition?