



**EFFECTS OF CLIMATE CHANGE ON THE METACOMMUNITY
STRUCTURE OF A MEDITERRANEAN BASIN**

Eurofins Cavendish

GUADIANA BASIN



Centre and southwest of the Iberian Peninsula



Mediterranean river basin with numerous temporary rivers



Highly vulnerability to climate change due to its geographic location and its marked seasonality



GUADIANA BASIN

- Spatially and temporally heterogeneous



Marked seasonality



Long periods of drought



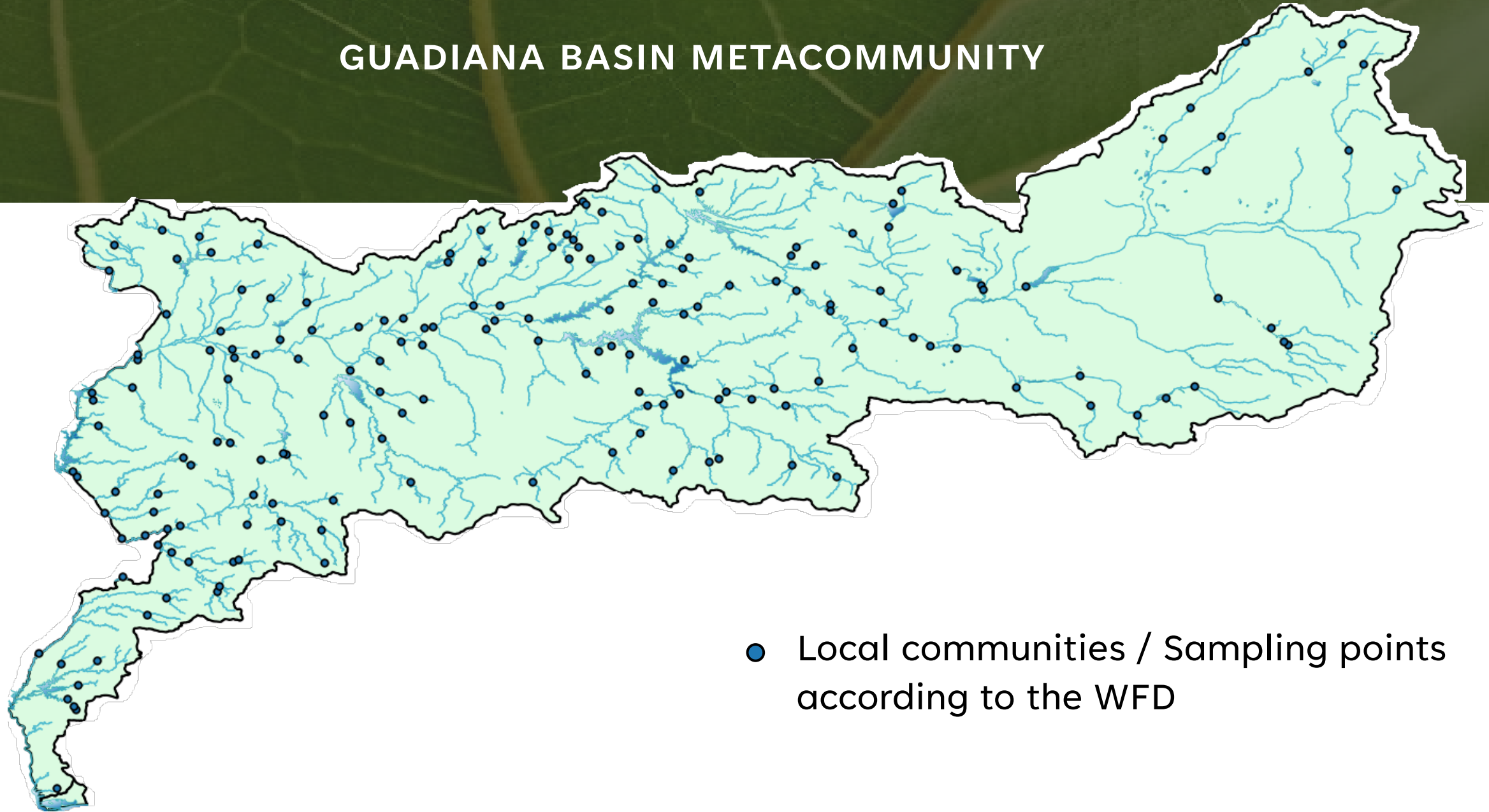
- High presence of transversal barriers



Isolation between communities

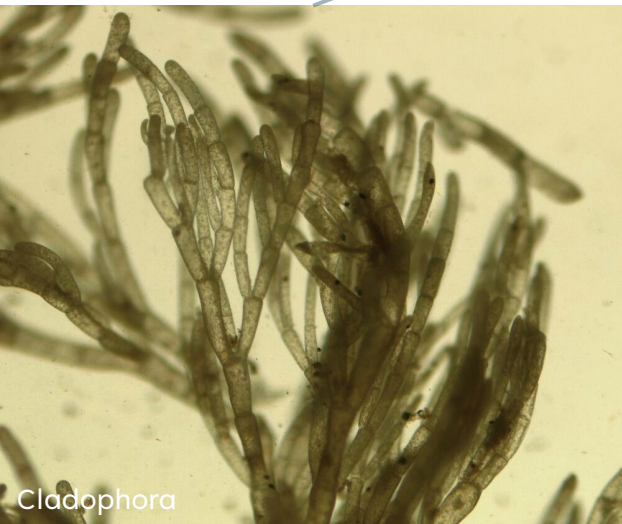
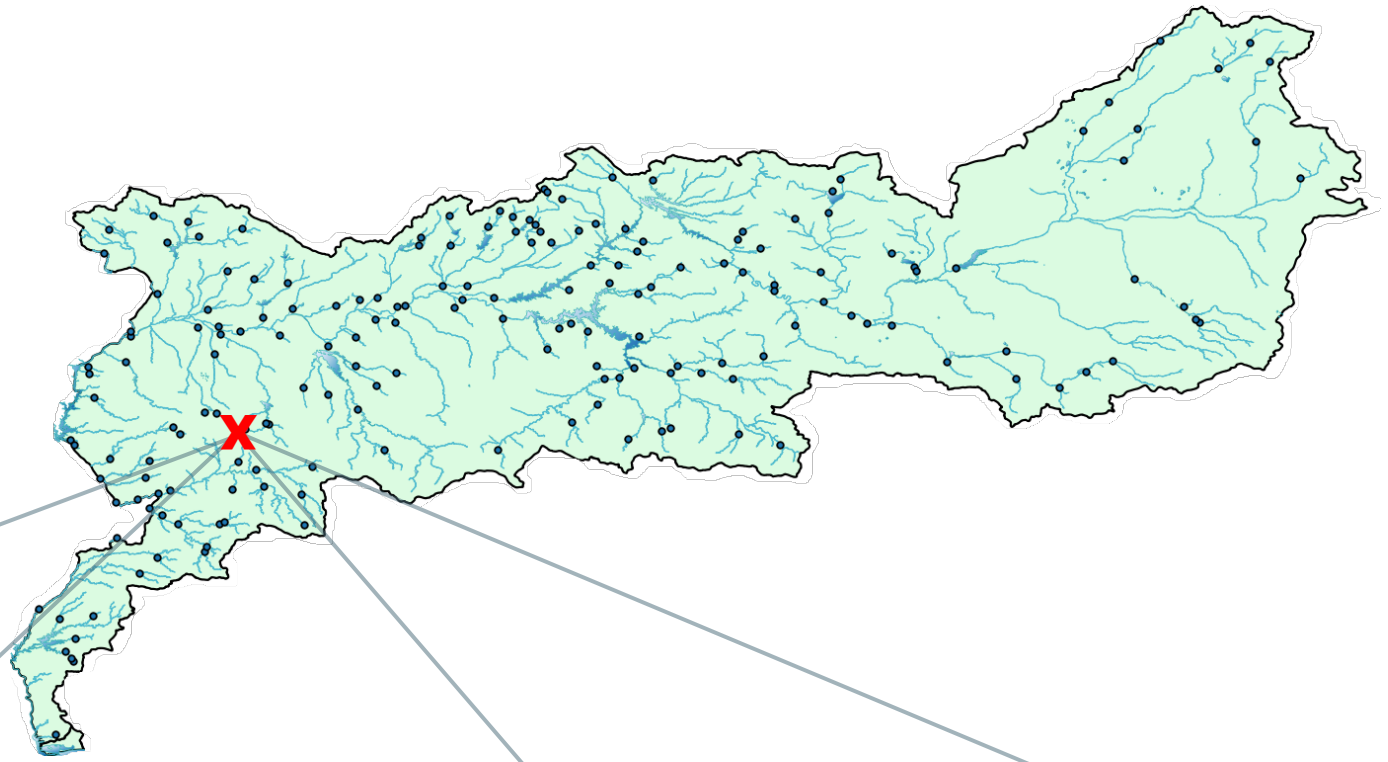


GUADIANA BASIN METACOMMUNITY

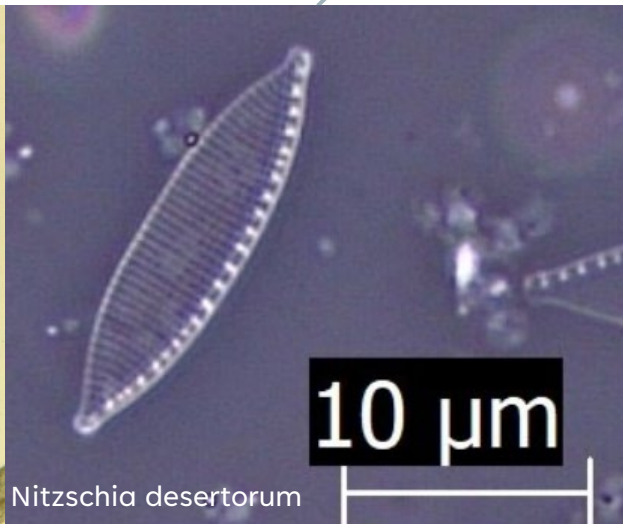


- Local communities / Sampling points according to the WFD

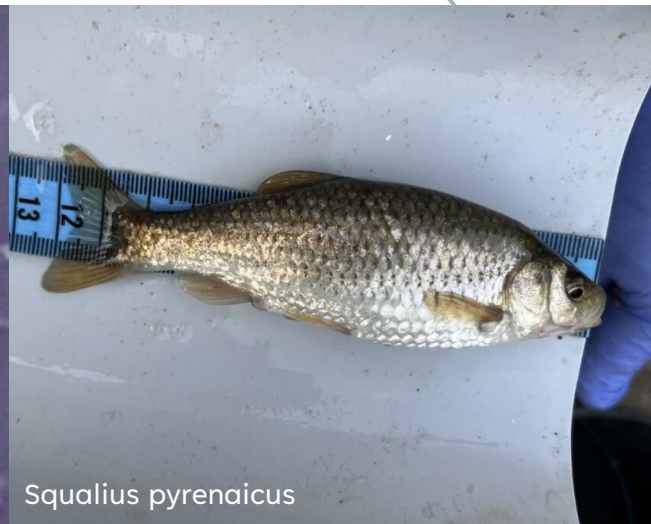
STUDIED METACOMMUNITY



Cladophora



Nitzschia desertorum



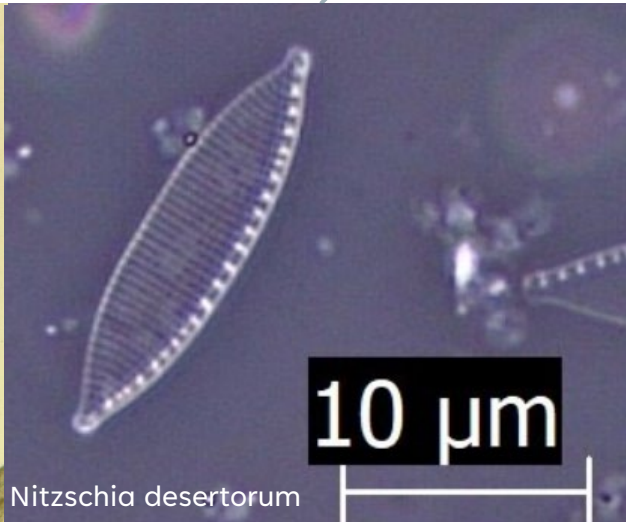
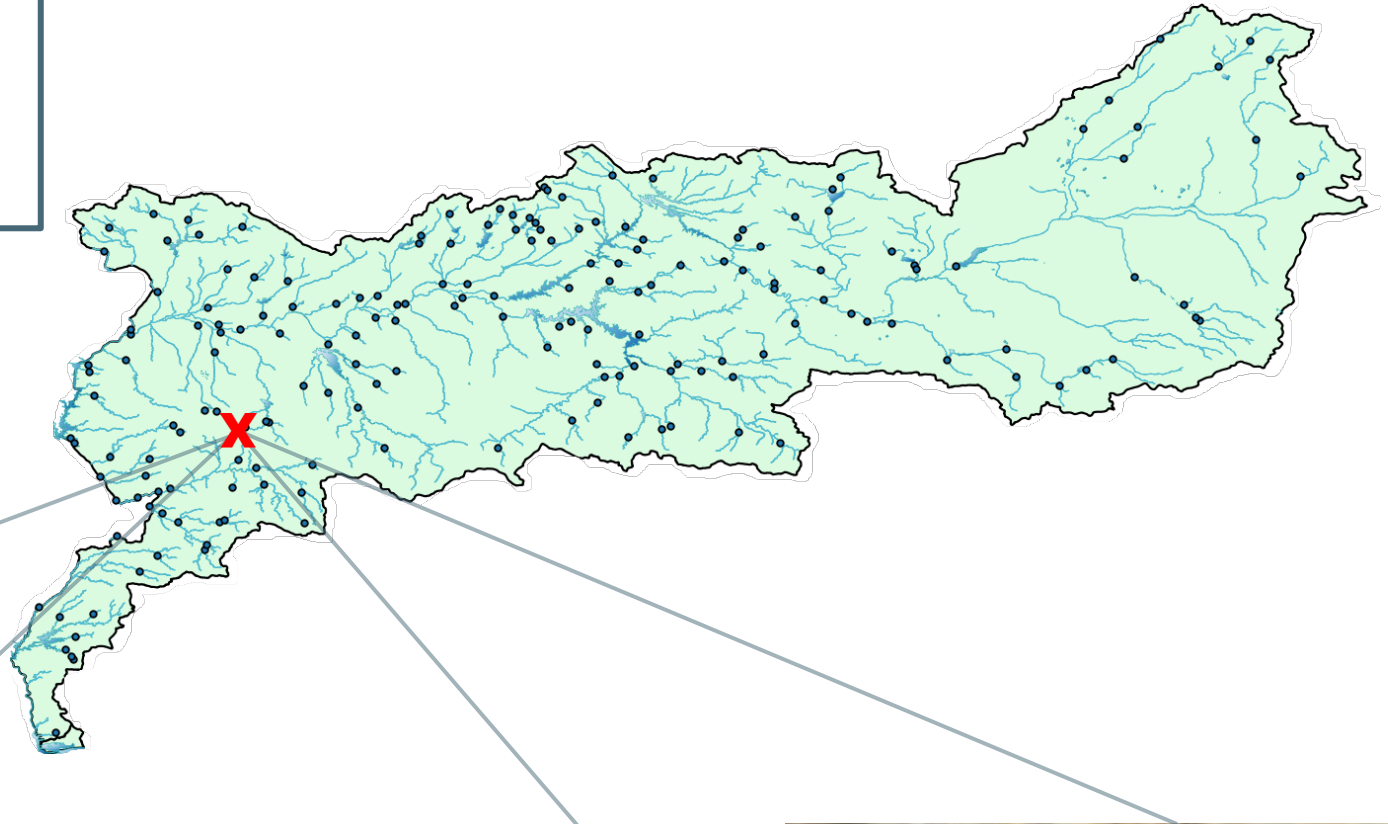
Squalius pyrenaicus



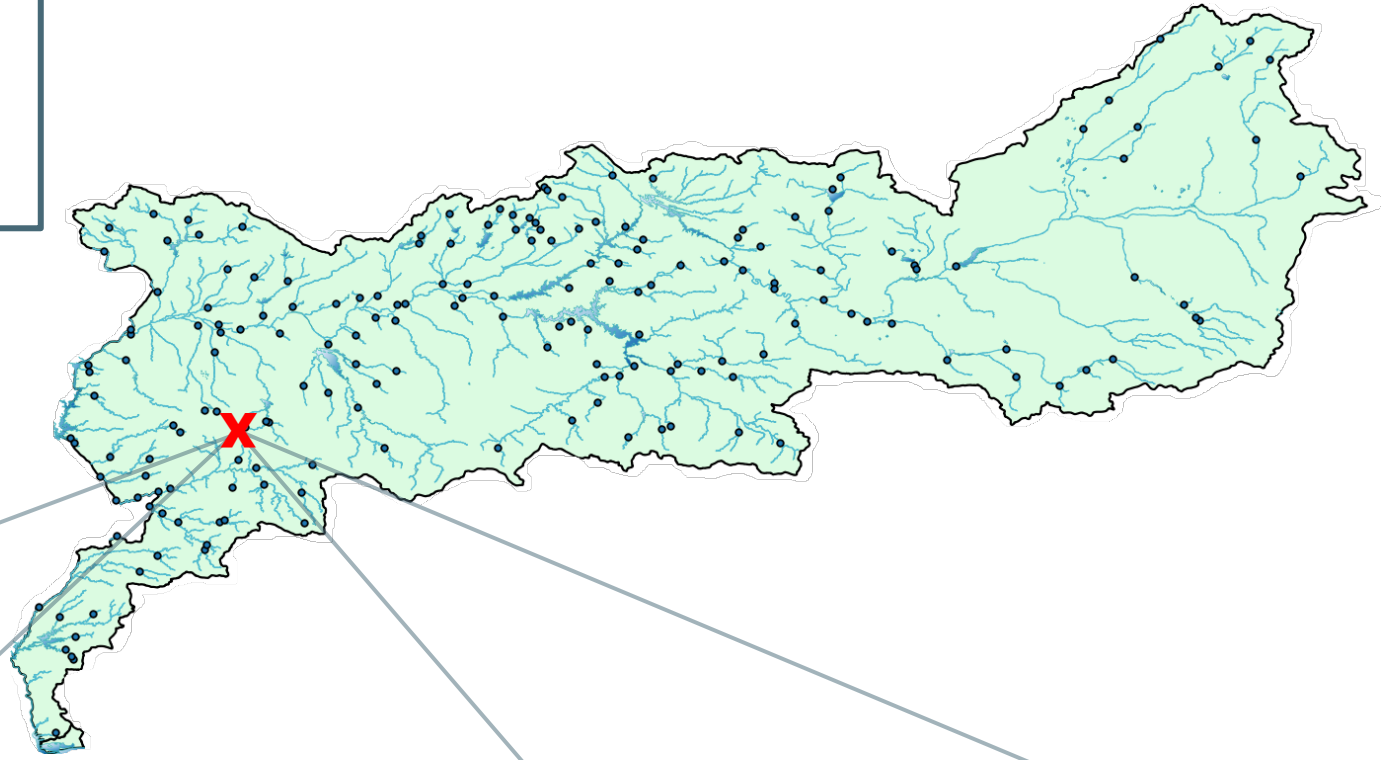
Ephemerellidae

METACOMMUNITY STRUCTURE

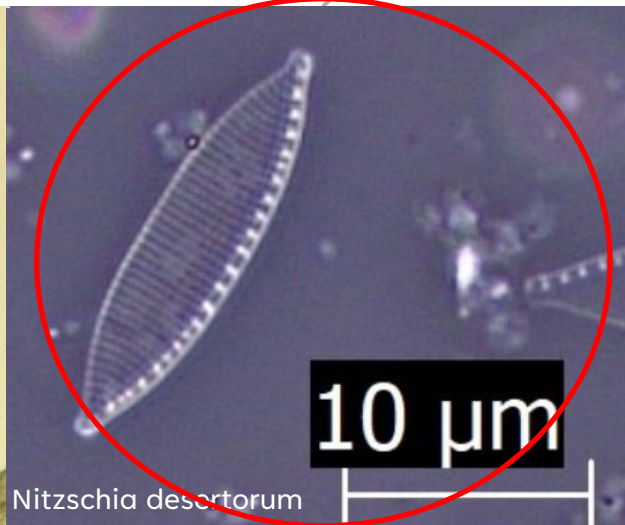
- Analysis of the elements of metacommunity structure



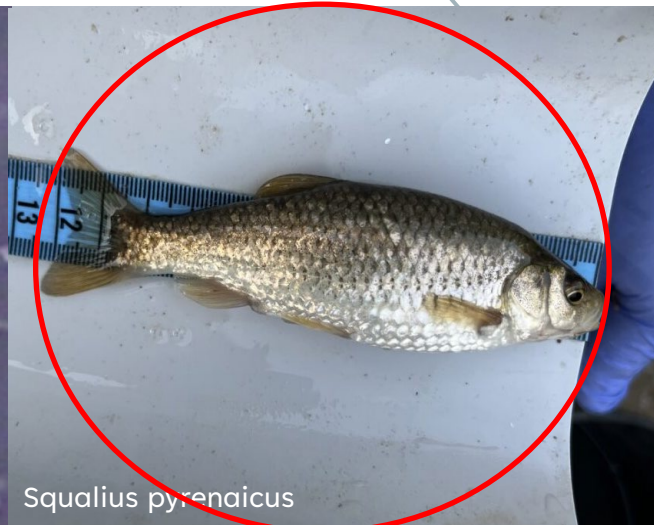
METACOMMUNITY STRUCTURE



Cladophora



Nitzschia desertorum

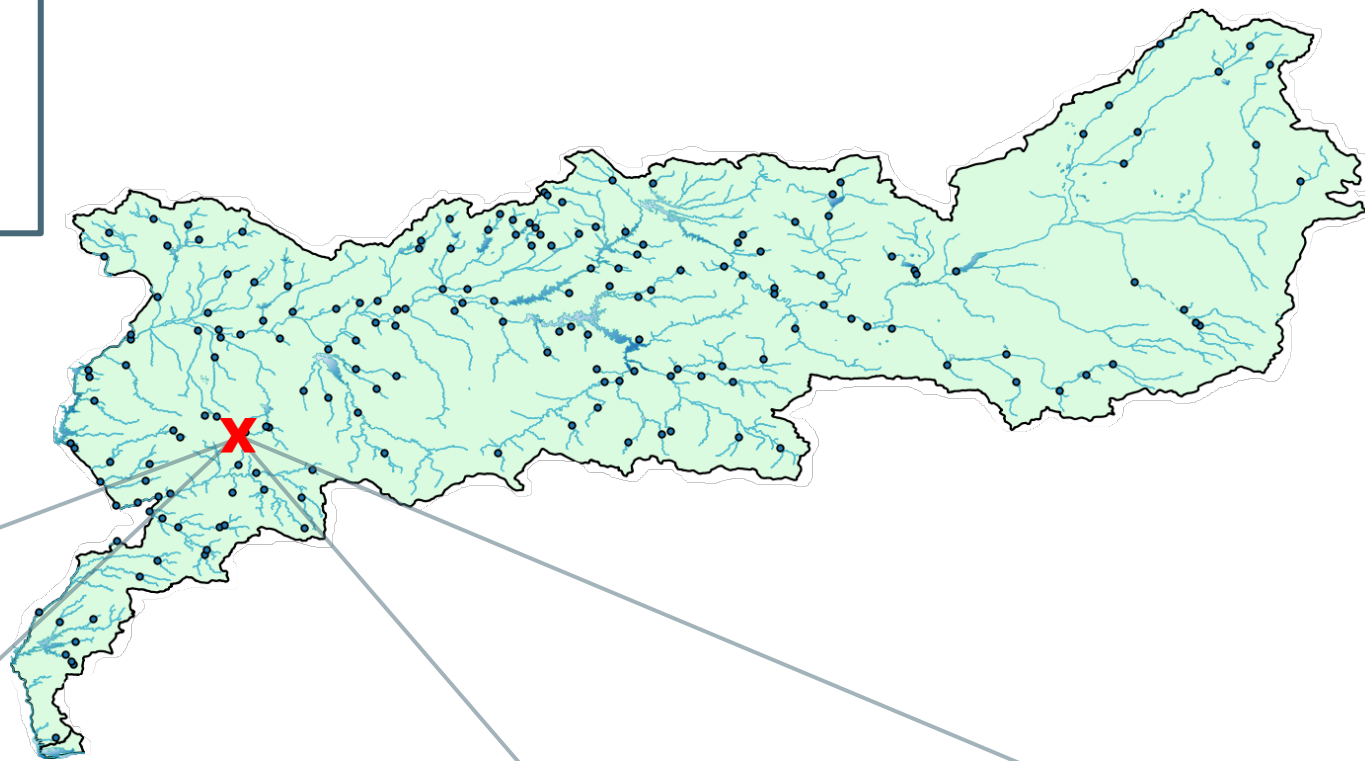


Squalius pyrenaicus

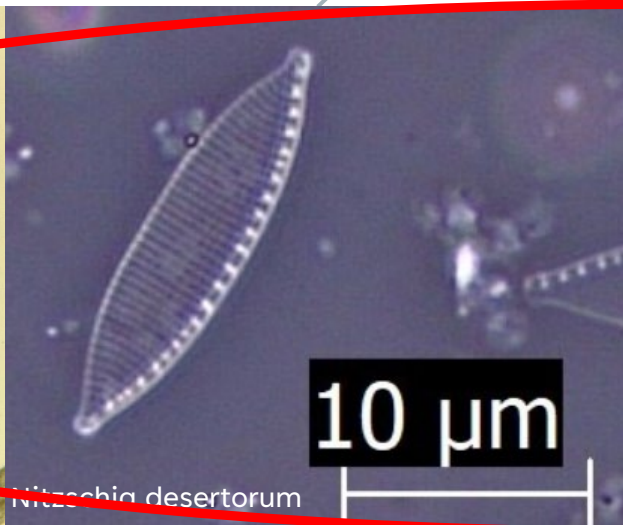


Ephemerellidae

METACOMMUNITY STRUCTURE



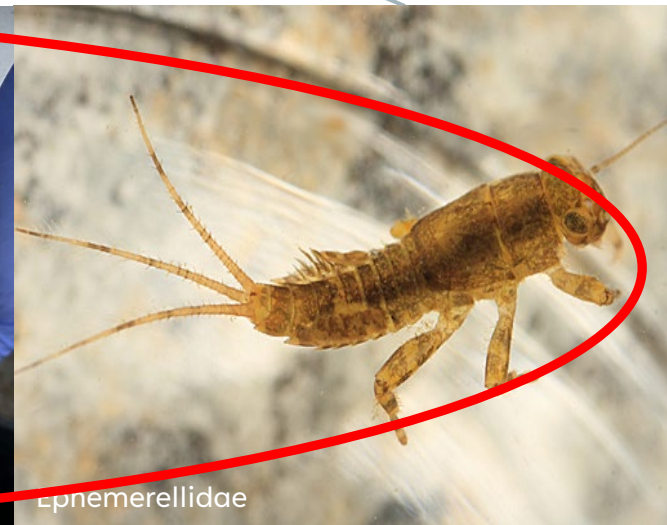
Cladophora



Nitzschia desertorum



Squalius pyrenaicus



Epnemerellidae

RESULTS

MACROINVERTEBRATES

DIATOMS

MACROPHYTES

FISH

THE WHOLE METACOMMUNITY



CLEMENSIAN

- Independent local communities
- Functionally similar species that cannot coexist with each other

WHAT DOES THIS MEAN?

Physical-chemical heterogeneity acts as an environmental filter but it is competition that structures the different communities

WHAT INFORMATION DOES THIS GIVE US IN THE FACE OF CLIMATE CHANGE?



PRECIPITATION

Reduced precipitation and increased temperatures are resulting in an increase in the frequency, intensity and severity of droughts



FRAGMENTATION

Increased isolation between communities due to the increase in distance between communities




MIGRATION

Gene flow between populations will be reduced making them increasingly vulnerable to extinction



SURVIVABILITY

worsening in the factors that determine the composition of the metacommunity, a reduction in resources and greater competition is expected



**THE FUTURE
FOR THE
GUADIANA
BASIN**

PRONOUNCED CLEMENTSIAN STRUCTURE

Greater isolation between communities

**SHRINKING HABITATS, FEWER RESOURCES AND GREATER
COMPETITION, VULNERABILITY TO EXTINCTION**

Changes in the diversity, composition and stability of the metacommunity are expected

POTENTIAL EXTINCTION OF ENDEMIC SPECIES

Global biodiversity loss

Conclusion

how can we improve
the situation?

- Ecological restoration of degraded rivers
- Cessation of the construction of barriers in water bodies
- Control of water abstraction and outflow of livestock and urban effluents

This will reduce the modification of the hydroperiod and, with it, the impacts on water bodies and the organisms that inhabit them

