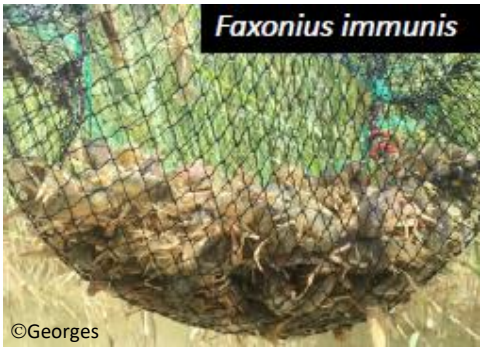
WORLD BIODIVERSITY FORUM
FROM SCIENCE TO ACTION

16-21 JUNE 2024, DAVOS, SWITZERLAND
Session HWBSDG_6.5 Biological invasions:
from impacts to solutions lessons from the IPBES-IAS assessment

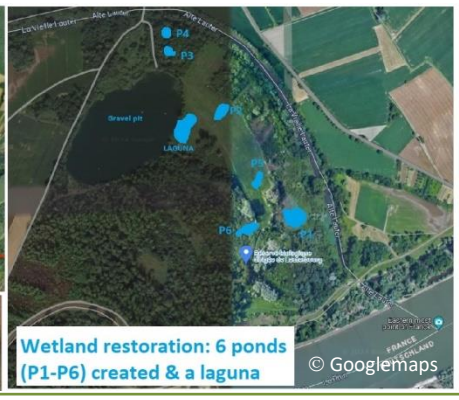
Adaptive ponds for mitigating effects of invasive crayfish in Western Europe



Calico crayfish, *Faxonius immunis,* originates from North America. It was first observed in the Upper Rhine Valley in 1993 (DEHUS et al., 1999) and disperses along the river catchment. Thanks to a rapid life cycle, high fecundity, omnivore feeding, high terrestrial dispersion, this species has a high invasive potential (CHUCHOLL, 2012). It carries crayfish plague. In small standing waters, its prefential habitat, population can attain very high densities. Its burrowing behavior tips ponds into turbid water alternative states, causes the disappearance of macrophytes, and poses a threat to amphibians and macroinvertebrates (HERRMANN et al., 2022).

Wetland restoration

In the Neuburg-Woerr area, between France & Germany, a pond network was created between 2011 and 2015. The goal of the project was to restore wetlands habitats, in particular, for herpetofauna and in general for aquatic biodiversity. From 2012 aquatic fauna and flora were surveyed regularly.

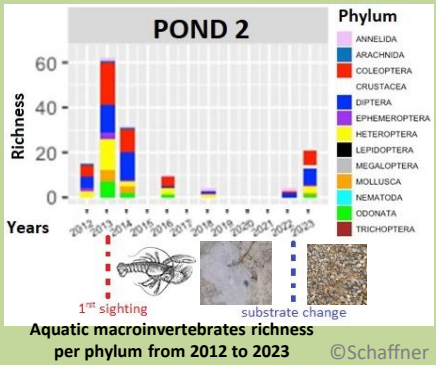


Adaptative management

Oct. 2022 : New digging in Pond 2. Fine substrate removed and replaced by a substrate of gravel (4/8)and pebbles (16/32).

1rst results

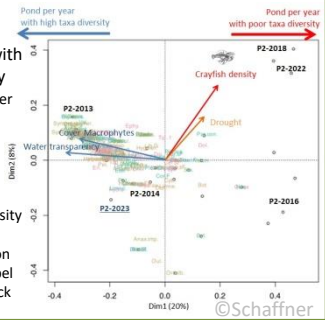
In 2023, in this first pond gravelled, one year ago, Calico crayfish cannot dig burrows and have not established a stable population yet. Nevertheless, macrophyte and macroinvertebrate communities are slightly recovering.



Aquatic macroinvertebrates richness per phylum from 2012 to 2023 ©Schaffner

Macroinvertebrate population

After pond creation in 2012 macroinvertebrate taxa richness increased steadily before shrinking due to calico invasion, as well as dry conditions in the recent years. After the new digging and substrate changing in pond 2 in 2022, the taxa richness increased in 2023.



Principal coordinate analysis (PCoA) plot with Bray-Curtis dissimilarity matrix (Objects: ponds per year; variables : relative abundances of macroinvertebrate taxa; added variables: cover macrophytes, water transparency, crayfish density & drought)
Labels in color: abbreviation of taxa; for object, only label for Pond 2 per year (in black or in blue for P2-2023)

Conclusion: Limiting the spread of invasive crayfish is a current issue but quite impossible. This collaborative and adaptive management between site managers and scientists could be a part of the solution to reduce their installation.

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