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Functional ecology of the European pond turtle *(Emys orbicularis)*

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Since the 18th century, wetlands have declined by 90% due to land mismanagement, leading to significant biodiversity loss, including the European pond turtle (*Emys orbicularis,* "*Emys*"). *Emys* play a major role in wetland ecosystems, as it operates at all trophic levels from herbivore to predator and scavenger. Beyond, understanding the functional ecology of this threatened species is crucial for effective conservation efforts. In our study site between Neuburg am Rhein and Lauterbourg (Upper Rhine Valley, FR/DE), we investigated the food web dynamics involving *Emys* to determine: 1) *Emys* diet composition throughout seasons, 2) if *Emys* are opportunistic feeders or exhibit prey selection, and 3) the actual trophic levels of *Emys* within our study system. We hypothesised that according to optimal foraging theory, *Emys'* diet varies in respect to seasonal prey availability while selecting prey size relative to its own body size. We collected faecal samples from turtles (N=243) and potential predators (N=71) during the *Emys'* active season (April to September, 2022 and 2023). Using faecal eDNA and a multiplex metabarcoding approach, we performed exhaustive diet analyses, which surpass traditional methods reliant on identifying hard faecal items. To assess if *Emys* exhibit seasonal diet and prey selection, we compared the identified food items with the list of species identified during eDNA surveys in water samples analysed with the same multiplex metabarcoding approach. In addition, we analysed faeces of potential competitors, namely the invasive exotic turtle *Trachemys scripta* (as above), and of potential predators using an *Emys*-specific qPCR approach, followed by predator identification via metabarcoding in scats collected in the area. All analyses are currently in progress. Our study will reveal whether *Emys* are truly opportunistic feeders as described in literature. We identify species that act as potential competitors or predators of *Emys* to draw an exhaustive food web centered on *Emys*. As part of the Emys-R project (www.emysr.cnrs.fr), our study enhances the understanding of *Emys'* trophic ecology, revealing the *Emys´* ecological function in wetland ecosystems. This knowledge may contribute to conservation initiatives and aligning management measures to halt biodiversity loss in wetlands.

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