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# Deciphering the trophic plasticity of a critically endangered fish species (*Zingel asper* L.) by combining metabarcoding, prey availability and microhabitat data

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## Abstract

In rivers, variation in prey resources is influenced by the habitat quality. Concomitantly, prey resources influences the diet and behavior of predators. When predators are habitat limited, as in human fragmented and compartmentalized rivers, predators have to adjust to existing local resources, otherwise the population risks extinction. This may be especially critical for the survival of endangered species. Studying the diet plasticity and behavior therefore appears essential for conservation and management of endangered species. Here, we combined diet metabarcoding, prey (invertebrates) availability and microhabitat data in order to decipher the habitat use of a critically endangered fish species (*Zingel asper* L.). Four *Z. asper* populations that are representative of the species distribution range were sampled. We collected about 250 feces in order to identify prey DNA. In parallel, we quantified prey resource and riverine habitats by sampling macro-invertebrates and by characterizing physical habitats (90 sample points per location per campaign). Our results illustrate how the combined analysis of metabarcoding data, prey resources and habitat data helps in an integrated delineation of the trophic plasticity and habitat use of *Z. asper* and can guide conservation and management actions.

**Keywords:** Trophic ecology, Metabarcoding, Habitat use, Conservation

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