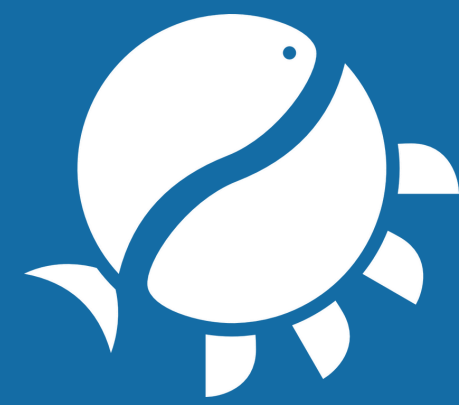# Seasonal and Size-Related Fish Microhabitat Use

#5 infosheet

Understanding Fish Habitat Selection

Small hydropower plants (SHPPs) play a growing role in **renewable energy production**, but their operation can significantly alter river ecosystems. **Hydropeaking** - rapid and short-term fluctuations in water flow - can disrupt fish behaviour, leading to **habitat displacement** and increased **energy expenditure**. Understanding how fish respond to these changes is crucial for developing effective conservation and mitigation strategies.

Methodological Approach & Results

This study assessed the **seasonal and size-related microhabitat use** of native fish species upstream (reference sites) and downstream (disturbed sites) from SHPPs in northeast Portugal.

The study focused on **native leuciscids**, including the Northern straight-mouth nase (*Pseudochondrostoma duriense*) and Northern Iberian chub (*Squalius carolitertii*), as well as brown trout (*Salmo trutta*) and calandino (*Squalius alburnoides*), assessing their microhabitat use in response to seasonal and hydropeaking variations.

Key-findings

Habitat Preferences: Depth and cover were the primary drivers of fish microhabitat selection, particularly during hydropeaking.

Seasonal Shifts: Fish used deeper and more covered areas in late summer compared to early summer.

Size-Related Differences: Larger fish preferred deeper and more sheltered habitats, whereas smaller fish were more flexible in habitat use.

Upstream vs. Downstream: No major differences were found in microhabitat use between reference and disturbed sites, suggesting that habitat features like cover may mitigate hydropeaking impacts.

Conclusions

Maintaining **riparian vegetation** and **aquatic macrophytes** is crucial for providing natural refuges that buffer fish against hydropower-induced flow variations. Future research should explore long-term impacts on fish communities and refine habitat management strategies.

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