Invasive Fish and Flow Refuge Use

#6 infosheet

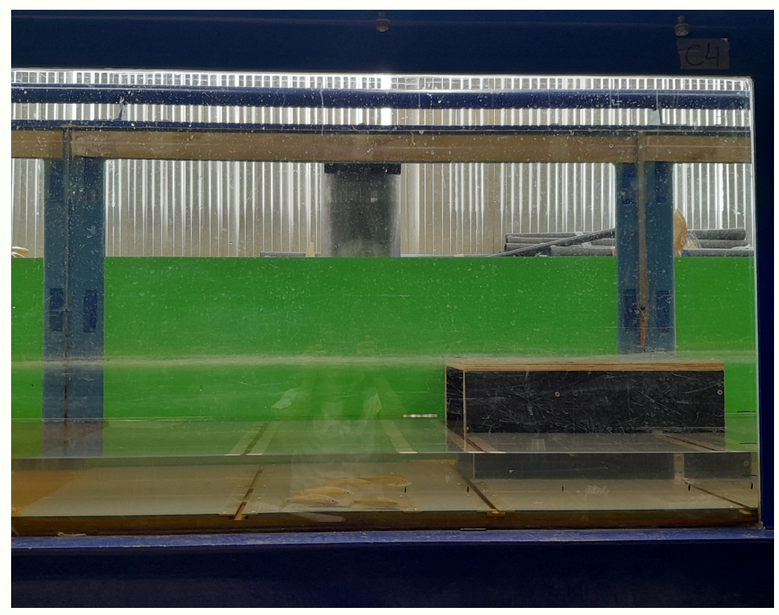
Understanding the Threats to Native Fish

Freshwater ecosystems are under increasing pressure from **flow regulation** and **biological invasions**, both of which significantly impact native fish communities. Hydropower operations often cause pulsed flows (hydropeaking), where rapid and frequent fluctuations in discharge alter habitat conditions. At the same time, **invasive fish species compete with native species** for space and resources, further stressing fragile aquatic communities.

Methodological Approach & Results

This study explored how pulsed flows and the presence of the **bleak** (*Alburnus alburnus*), invasive in the Iberian Peninsula, affected flow refuge use by the native species Iberian barbel (*Luciobarbus bocagei*). Specifically, this research aimed to:

- Assess how barbels use artificial flow refuges under different flow conditions (pulsed flow vs. base flow).
- Examine the impact of invasive fish presence on the effective use of the flow refuge by barbels.
- Quantify and assess stress responses (glucose and lactate levels) in barbels according to pulsed flows and invasive fish presence.



Key-findings

Invasive fish reduce refuge use: The presence of bleak significantly decreased the effectiveness of artificial flow refuges for barbels, particularly during high-flow pulses (60 L/s).

Increased stress in native fish: Barbels exposed to both pulsed flows and invasive bleaks showed higher levels of physiological stress indicators (glucose and lactate).

Flow refuge selection altered: While barbels actively sought low-velocity areas when bleaks were absent, they were displaced by bleaks when both species coexisted, limiting their ability to find shelter during rapid flow changes.

Implications for river management

This study highlights the **synergistic impact of hydropeaking and invasive fish presence** emphasizing the urgent need to manage invasive species and **improve habitat restoration strategies** to protect native fish populations.

Funding

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