



Abstract

# Fishway Attraction Efficiency during Upstream and Down-Stream Migration: Field Tests in a Small Hydropower Plant with Run-of-the-River Configuration <sup>†</sup>

Francisco Javier Bravo-Córdoba <sup>1,\*</sup>, Julen Torrens <sup>1,‡</sup>, Juan Francisco Fuentes-Pérez <sup>2</sup>, Ana García-Vega <sup>1</sup>  
and Francisco Javier Sanz-Ronda <sup>2</sup>

<sup>1</sup> Centro Tecnológico Agrario y Agroalimentario—ITAGRA.CT, 34004 Palencia, Spain; julentorrens@gmail.com (J.T.); agvega@itagra.com (A.G.-V.)

<sup>2</sup> Area of Hydraulics and Hydrology, Department of Agroforestry Engineering, University of Valladolid, 34004 Palencia, Spain; juanfrancisco.fuentes@uva.es (J.F.F.-P.); jsanz@uva.es (F.J.S.-R.)

\* Correspondence: fjbravo@itagra.com; Tel.: +34 979108358

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‡ Presenting author (Poster presentation).

**Abstract:** Understanding fishway attraction is one of the main open challenges in fishways research, and unraveling the mechanisms and relationships that trigger it is crucial to improve the performance of fishways. Furthermore, attraction is usually understood in terms of upstream migration; however, taking into account the possible bidirectional use of fishways, it is equally important to study this phenomenon during downstream migration, although this is usually considered negligible. Therefore, this study aims to advance our understanding of fishway attraction efficiency by considering both upstream and downstream movements in a key small hydropower plant scheme in the Iberian Peninsula. To achieve this, one of the most common Iberian fish species, the Iberian barbel (*Luciobarbus bocagei*, Steindachner), was monitored via telemetry in a stepped fishway. The studied fishway, considering the specialized literature, would be classified as poor in attraction, i.e., difficult to find due to its low competing discharge and the long distance between the main river flow and both fishway entrances. Fish were PIT tagged and released in different upstream and downstream locations and on different dates. The results showed that a significant proportion of the tagged barbels was able to successfully locate the fishway from both sides, in spite of the mentioned localization drawbacks, with inter-annual variability and with repeated events throughout the years. This suggests that even a fishway with a theoretical poor attraction can still be localized by fish, allowing their use as a two-way migration route, at least with species and HPP schemes such as those already studied.



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