MONITORING A FISH PASS DESIGNED FOR ALLIS AND TWAITE SHAD: A TOOL FOR MANAGEMENT AND CONSERVATION

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River impoundment has had severe impact in riverine ecosystems worldwide as it causes the reduction of available habitat, flow regulation and the interruption of river longitudinal connectivity. Diadromous fish are specially affected by such alterations, which can avert these species from accessing reproductive or feeding grounds and thus preventing them from completing their life cycle. Fish passes enable fish upstream and downstream migration, representing the most effective solution when obstacle removal is not possible. Monitoring these devices is essential to ensure its adequacy for the target species, since different fish have distinct flow and design requirements.

At the Coimbra dam vertical slot fish pass, in River Mondego, central Portugal, the reproductive migration of allis (*Alosa alosa* L.) and twaite shad (*Alosa fallax* Lacépède, 1803) has been monitored since 2013 through visual counts. These data allowed to identify the main environmental variables influencing shads' fish pass use, using Boosted Regression Trees (BRTs) statistical models.

Between 2013 and 2017, 26562 *Alosa* sp. were recorded using this device, mainly between April and June (on average 96%). The weakest run observed amid this period was registered in 2015, with only 966 visual counts for these species.

River flow and water temperature were identified as the most influential factors for shad migration, whereas lunar cycle, day period, water turbidity and specific conductivity explained only a small part of the variation observed. Diel cycles were also studied, with no significant patterns detected in-between migration seasons. Overall, the model's performance was high (average R^2=0.80).

Relevant information regarding shads migration patterns was gathered with this study. These results definitely contributed to a better understanding of how these species use this fish pass device which can be used to enhance fish pass attractiveness and refine management measures towards the promotion of a sustainable exploitation of the species.