



Abstract

Activity Patterns and Tridimensional Space Use of the European Catfish on a Reservoir in River Tagus (Portugal) †

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Abstract: The European catfish (*Silurus glanis*) is a non-native species with invasive character to Iberian freshwaters. Being the largest fish species in those invaded water bodies, with high fecundity rates, a large life expectancy and an extraordinary predatory potential, *S. glanis* has all the indicators that it could be exerting a dangerous pressure on native fish communities. Albeit there are some studies regarding the activity and depth use of this catfish, many of them are restricted to its native range and do not describe the circadian and annual behaviours in detail. Moreover, no studies have compared the differences in habitat use and movement ranges between adults and juveniles in a recently invaded territory. To fill these knowledge gaps, this study resorts to acoustic biotelemetry to track 25 fish (10 adults and 15 juveniles) in a Tagus river reservoir, the Belver dam, through an array of fixed acoustic receivers. The fish were internally tagged with acoustic transmitters, which, in the case of the adults, including a 3D-accelerometer and pressure sensors that allow obtaining information on activity and depth use for over a year. The results show that *S. glanis* is active throughout the year but with higher activity levels in summer and minimal in autumn, and with a crepuscular and nocturnal increase in activity. This species occupies shallower depths in spring/summer, while in autumn/winter roams at relatively deeper waters. Circadian vertical movement patterns were identified; however, they vary seasonally and have some individual variability. The areas used by the adults are larger than the juveniles' and increase in warmer months. Adult preferences in the use of specific areas across the year and a possible migration to a spawning site were identified. Such findings will support the development of more effective control measures, for instance, by providing information on how to allocate the fishing efforts in space and time to maximize the efficiency of mass removal actions of this invasive fish.

Keywords: *Silurus glanis*; invasive species; habitat use; movement patterns; vertical migration; acoustic biotelemetry



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