

Behavioural tactics and spawning activity of rheophilic cyprinids radio-tracked in the transition zone between natural flow and minimum flow conditions

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Abstract

Using water resources for hydro-electricity production influences and limits the quality and quantity of habitat available for use by resident fishes. Changes in the fish community structure after setting minimum flow conditions have been more frequently studied than the behavioural adaptations of fish living in the vicinity of the disturbed river section. In the River Amblève (River Meuse basin, Belgium), a hydraulic power plant bypasses the river over a length of 10 km. Adult nase *Chondrostoma nasus* ($n=10$) and barbel *Barbus barbus* ($n=8$) were captured in the restitution zone of the turbinated flow several weeks before their reproduction periods. They were equipped with implant radio transmitters and manually and intensively tracked over several months to more than 1 year. The environmental conditions (water temperature and flow) as well as the geomorphology of the river were compared in both natural and flow-regulated sections. Nase and barbel demonstrated the capacity to map their contrasted environment and adapted their space and habitat utilisation as well as the choice of their spawning sites in relation with their specific biological characteristics and the environmental variations. The results are discussed in the context of the management of fish movements in flow-regulated rivers.

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