

BIRTLES, C., BARAS, E., OVIDIO, M., RIMBAUD, G., PHILIPPART, J.C. (1997). Behaviour and mobility of radio-tagged *Barbus barbus* below an hydroelectric dam on the River Ourthe (Belgium). p. 53 In *Abstract book of the Second conference on fish telemetry in Europe*. La Rochelle (France), 5-9 April 1997.

Abstract

In industrialised regions of Western Europe, the construction of high river dams since the beginning of the century has greatly influenced the becoming of rheophilous species as they constitute obstacles to the free circulation of fish, modify the structure of river habitat and affect the auto-epuration process of the water. This concerns anadromous salmonids but also cyprinids, like the barbel *Barbus barbus* which show upstream spawning migrations during May and June. Telemetry techniques can provide unique sets of information to improve our knowledge on fish behaviour in such a modified environment and to analyse the actual impact of these obstacles on their mobility patterns.

In May 1996, five barbel (2128-2502g, 51.0-56.2 cm FL) were captured by electric fishing just below the Grosses Battes dam, which is the first obstacle to the migration of fish from the River Meuse into its main spawning tributary, the River Ourthe. Fish were tagged with surgically implanted transmitters (activity circuits, 40 MHz, ATS Inc.) and released on the same day, 100 m below the dam. Fish were located at least daily from mid-May to early December with a mobile receiver and tracked continuously during a 24-hour cycle which took place on the first spawning day, when the motivation of fish to clear the obstacle and to reach upstream spawning grounds normally reaches its climax.

No barbel cleared the obstacle during the study. During the pre-spawning and spawning periods, the fish were consistently located down of the existing Denil fish pass or of the spillway, with several apparent attempts to clear the obstacles by day or night. During summer and early autumn, some fish remained in close vicinity of the dam whilst others moved to more natural environments a few hundreds metres downstream of the dam. High floods in November caused the fish to move further downstream, to calmer and deeper habitats. Some fish could not be detected temporarily during this period, presumably because they had migrated more than 2.0 km downstream, into the River Meuse, where deep water (ca. 5 m) and high conductivity (500-700 $\mu\text{S cm}^{-1}$) considerably restricted the reception range. It is thus obvious that the Grosses Battes dam represents a major obstacle to barbel spawners, despite the presence of two fishways. Perspectives of improvement of the circulation of spawners at this dam are discussed, relying on the variability of fish behaviour depending on environmental conditions (flow, turbidity, temperature,...).