

## **Testing the efficiency of different typologies of fishways. Lessons from 20 years of field-research in Southern Belgian Rivers.**

Michaël Ovidio<sup>1</sup>, Gilles Rimbaud<sup>1</sup>, Alain Gillet<sup>2</sup>, Patrice Orban<sup>3</sup>, Yvan Neus<sup>1</sup>, Arnaud Diercks<sup>1</sup>, Marc Gilliquet<sup>4</sup>, Francis Lambot<sup>3</sup> & Jean-Claude Philippart<sup>1</sup>

<sup>1</sup>University of Liège, Biology of Behaviour Unit. Laboratory of Fish Demography and Hydroecology, 10 Chemin de la Justice, B-4500 Tihange, Belgium. E-mail: M.Ovidio@ulg.ac.be

<sup>2</sup>Ministry of Walloon Region DGO1, Department of infrastructure subsidized, 8 Boulevard du Nord B-5000 NAMUR, Belgium.

<sup>3</sup>Ministry of Walloon Region. DGO4, Water Division. Unnavigable watercourses, 15 Avenue Prince de Liège, B-5100 Jambes, Belgium.

<sup>4</sup>Ministry of Walloon Region. DGO3, Department of Policy and Control, Montagne Sainte-Walburge 2, B-4000 Liège, Belgium.

Fragmentation of rivers by physical obstacles has resulted in the drastic range reduction or extinction of numerous species of fish worldwide. The reconnection of river habitats and river sections is one of the most important measures in river restoration projects and management plans for the future. Fishways have been widely used with increasing success to re-establish migration routes of anadromous migratory fish species. However, the ability of holobiotic species such as cyprinids, esocids and thymallids to use different model of fish-pass is much less known. In Southern Belgium, recent river restoration project insists on the necessity to restore the longitudinal connectivity for most fish species in a large part of the drainage area. Multi-species fishways that were recently constructed in many types of river (Width : 1m to 150m) have been equipped with a fish-trap to test their efficiencies and to allow scientific controls during at least one entire year and complementary studies were conducted using radio-telemetry and RFID technology. Thousands of fish were captured, and the large amount of information's collected largely increases our knowledge's on the relation between the type of the fishways (e.g. basin fishpass, natural fishway, Denil fish pass), their morphological and hydraulic characteristics (e.g. basins dimensions, type of orifice, flow) and the biology and the ecology of the fish using them for their migration. During our talk we will synthesize the results of 20-years of field research.