



FRAGMENTATION OF WATER COURSES

FFH Focus 2

The longitudinal fragmentation of water courses is due to the presence of artificial and non-artificial obstacles that impede the free movement of animal and plant communities, especially migratory fish. It affects the distribution of natural habitats within the river ecosystem and associated riparian environments, altering their ecological capacity.

Three types of continuity

The hydromorphological quality¹ of a water course is notably determined by its continuity. Vertical continuity involves the durability of transfers between water courses and groundwater, transfers that can be reduced by concreting the bed, or the accumulation of organic matter and sediment deposits²; lateral continuity implies a dynamic equilibrium between the river and alluvial habitats and can be affected by the presence of longitudinal obstacles (dikes, rockfills, etc.); longitudinal continuity involves an undisturbed transfer of sediments and a free movement of animal and plant communities (upstream to downstream and vice versa) and can be disturbed by the presence of transverse obstacles (dams, underground pipelines, etc.). The frequency of these obstacles and the severity of their effects on the environment make it possible to assess the longitudinal fragmentation of water courses.

57% of obstacles are 'significant' to 'impassable'

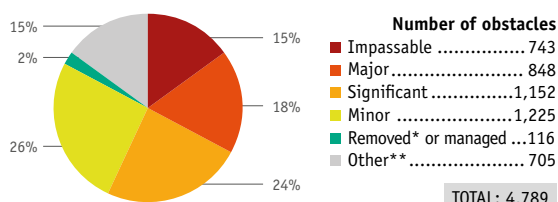
In Wallonia, an inventory of obstacles to the free movement of fish has been organised since 1997. It defines the degree to which obstacles can be crossed and establishes a priority plan for their removal or management, based on the quality of upstream fishing waters and implementation opportunities³. By November 2016, 4,789 obstacles had been inventoried. Of these, 15% were considered impassable, 18% were considered major and 24% significant, and 2% (116 obstacles) had been removed or managed. The most interventions were made in the sub-basins of the Meuse upstream, the Ourthe, the Meuse downstream and the Moselle⁴.

The reintroduction of salmon in the Meuse basin

Following the observation of sea trout in a tributary of the Meuse River, the "Saumon Meuse" (Meuse Salmon) project was launched in the late 1980s⁵ with the aim of reintroducing Atlantic salmon⁶ in the basin of the Meuse. Salmon eggs originating from the rivers of Scotland, Ireland and France were imported and farmed in two salmon farms in Wallonia. Since 1988, juvenile salmon have been released annually into various rivers and tributaries. At the same time, a series of dams were equipped with fish ladders. The first returns of adult salmon to spawning grounds were observed in early 2000. In 2015, 70 adult salmon were caught⁷. Genetic analyses showed that these salmon were almost all from the re-stocking that had taken place two or three years earlier. It should be noted that beyond the removal of physical obstacles, the return of migratory fish and, more generally, the status of the fish fauna of our rivers, also depend on water quality⁸ and the conservation status of aquatic habitats⁹.

[1] → WATER 9 | [2] → WATER 12 | [3] Ideally, the obstacles are removed from downstream to upstream, but management is also dependent on local initiatives (e.g. river contracts or LIFE projects → WATER 22 and FFH 19). | [4] → Map 44 | [5] SPW (fishing service), ULg and UNamur (<http://www.saumon-meuse.be>; Malbrouck *et al.*, 2007) | [6] Sea trout and salmon have a comparable life cycle. Initially common in the Meuse basin, salmon declined as early as 1885 due to dams and pollution, but disappeared completely around 1940. | [7] Salmon are caught in Angleur, Lixhe and Roermond (Netherlands) for fish breeding (as such, for the time being, they do not have the opportunity to migrate further upstream). | [8] → WATER 1, 3, 4, 5, 6, 7 & 8 | [9] → FFH 1

Fig. FFH Focus 2-1 Obstacles to the free movement of fish inventoried on water courses in Wallonia (November 2016)

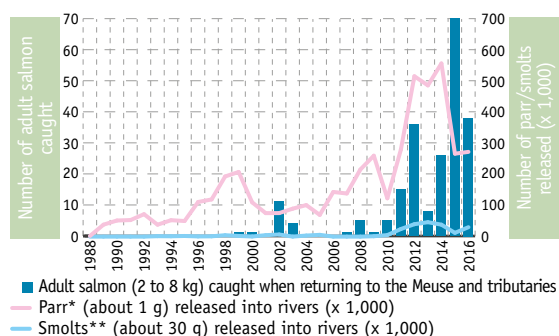


* Dam levelled, rock piles washed away by the current, etc.

** The category "Other" includes obstacles for which the level of passability could not be assessed (unquantifiable underground passage, inaccessible private land, etc.) (n = 317) and obstacles considered as "terminus" points beyond which the environment is no longer favourable to fish (temporary water courses, underground passages over a very long distance, over-polluted or artificialised water courses, etc.). (n = 388).

SOERW 2017 – Source: SPW - DG03 - DRCE

Fig. FFH Focus 2-2 Re-stocking of juvenile salmon and census of adult salmon in Wallonia



■ Adult salmon (2 to 8 kg) caught when returning to the Meuse and tributaries
 — Parr* (about 1 g) released into rivers (x 1,000)
 — Smolts** (about 30 g) released into rivers (x 1,000)

* Salmon are called "parr" during their first or second year of freshwater life.

** Salmon are called "smolts" during their morphological, physiological and behavioural adaptation to life in the marine environment (smoltification).

SOERW 2017 – Source: SPW - DG03 - DNF (fishing service)