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Abstract

From 1992 to 2004 upstream migrating eels were collected in a trap (0,5 cm mesh size) installed at the top of a small pool-type fish-pass at the Visé-Lixhe dam (built in 1980 for navigation purposes and hydropower generation; height : 8,2 m; not equipped with a ship-lock) on the international River Meuse near the Dutch -Belgium border (290 km from the North Sea; width: 200 m; mean annual discharge: 238 m³/s; summer water temperature 21-26°C). The trap in the fish-pass was checked continuously (three times a week) over the migration period from March to September each year, except in 1994. We caught a total number of 32157 eels (biomass 1,955 kg) with a size from 14 cm to 85 cm and a mean value of 31,6 cm corresponding to yellow eels. The study based on a constant year-to-year sampling effort revealed a regular decrease of the annual catch from a maximum of 5613 fish in 1992 to a minimum of 423 in 2004. This demographic trend is fitted by the equation: number per year = $5.614 - 299 t$, where t is time in years with 1992 as year 1. According to this model, the upstream migrating yellow eelstock in the Belgian Meuse should drop to near zero within the next ten years, as an expression of a collapsing recruitment of glass eels in the estuary in the Netherlands. In the discussion of these results, we examine the possible role of two other factors on the decrease over time of the number of yellow eels caught in the fish-pass. i) the effect of environmental variables (river discharge, water temperature and dissolved oxygen content) on the timing and intensity of upstream migration waves and ii) the existence and use of alternative migration routes.