

Behaviour and passage of European silver eels (

Between 2004 and 2007, 116 downstream migrant silver eels (*Anguilla anguilla*) were monitored at a hydropower plant on the Gave de Pau river in South-West France using radio and PIT telemetry. The objectives of the study were: (i) to determine the environmental conditions when eels arrived and passed the facility; (ii) to determine the rate of eel escapement (passage other than via the turbines); (iii) to describe the behaviour of eels faced with the intake structure and the permeability of the intake trashracks for the different sizes of eel; and (iv) to determine whether surface bypasses originally designed for salmon could be effective for eels. Five types of behaviour of silver eels in the forebay and at the plant intakes were identified. The study showed the key factor influencing both eel behaviour and the route taken through the plant was variation in river discharge. Escapement rate was related to eel length and the spill flow to river flow ratio, which could be described by a logistic regression model. The surface bypasses originally designed for salmon were found to aid downstream eel migration significantly. At velocities $< 0.40 \text{ m}\cdot\text{s}^{-1}$, no eels, even the largest, for which the racks are a physical barrier, were found impinged on the trashracks.

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