

**Angling-induced selection mediated by fish behaviour – implications for reproductive potential in Eurasian perch (*Perca fluviatilis*)**

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**Abstract**

Fish behaviour is an important mechanism for fishing selectivity. The integrated nature of consistent individual differences in behaviour and life history implies that any selection mediated by behaviour affects evolution of co-varying traits, particularly those related to growth and reproduction. The mechanisms behind the evolutionary consequences of size-selective fishing are relatively well established, whilst the consequences of behaviourally-mediated selection are more difficult to predict. We found that in Eurasian perch – with known differences in behaviour and growth – an individual's vulnerability to angling is mediated by behaviour expressed in a novel environment. The probability to become captured increased with higher rate of exploration, independently of fish size. Contrary to the high-vulnerable fish that were highly explorative during daytime, the low-vulnerable fish showed the highest exploration during the night. The relationship between low-vulnerability and exploration was also strongly dependent on an individual's size, so that fast-grown individuals that exhibited high nocturnal exploration were least likely captured. Bold behaviour and fast growth are assumed to be directly, or through their associations, linked to high reproductive effort. Here, we also will test the hypothesis that fishing in general selects against individuals with high reproductive potential. We will particularly evaluate the consequences of behaviourally-mediated selection on reproductive potential by comparing the fecundity and reproductive success of high- and low-vulnerable perch. This study increases our understanding of how diversity in behaviour, life history and their associations are shaped by selective fishing, and how fishing-induced truncation in that diversity alters the reproductive capacity of intensively harvested populations.

**Keywords:** Fisheries-induced evolution, Fishing selectivity, Behaviour, Life history, Reproduction

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