

Predation Risk as an Opportunity for Compensatory Growth in Juvenile Coho Salmon?

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It is a common occurrence in the freshwater stages of anadromous salmonids that growth rates of large individuals within a cohort surpass those of smaller fish. Small size classes of fish are lost from the population due to emigration or mortality from predators. The present study explores the reasons for the apparent higher susceptibility of small individuals to predation. We used field and laboratory observations of size-dependent foraging strategies in age-0 coho salmon (*Oncorhynchus kisutch*) under predation risk. In laboratory stream tanks groups of juvenile coho salmon were given a choice of a safe habitat and a habitat offering the same amount of food but associated with simulated predation risk from a model predator. Fish were individually marked, their position and behaviour recorded over one week and their change in size assessed. Fish that made use of the risky pool were smaller and fewer in numbers than their counterparts in the safe pool. Fish distribution pattern

was remarkably stable over a 2-day period after predation simulation had been discontinued. Overall growth rates were depressed and the difference in growth rates between small and large individuals was reduced when compared with control experiments without simulated predation. We argue that large fish behaved in a risk-averse manner compared to small individuals, the latter making use of enhanced feeding opportunities indirectly provided by the presence of the predation threat. We speculate that in a natural environment, the presence of predators may serve to depress growth rates in a population through risk-avoidance behaviour, but may allow for growth compensation among size classes within a cohort. Before removal of predators as part of an enhancement scheme for salmonids, managers may consider the potential effect not only on mortality rates but also on growth patterns in a population of fish.