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Determinants of predator-prey interaction on

salmonid fish species and their survival rate

（サケ科魚類の捕食・被食関係と生残率決定要因の解明）

Predator-prey interaction is one of the key factors in ecology. In this study, I aimed to understand the mechanisms of predator-prey interaction on salmonids, and how they are affected by target species and physical habitat. This paper has four Chapters: (1) evaluating the size-selective predation on fish by piscivorous fish and (2) that by riparian wildlife, (3) fish trait variations on their predation risk, and (4) evaluating the effects of physical habitat on predator-prey interaction.

In Chapter-1 my results show that not only predator and prey sizes, but also the interaction between said sizes strongly affected the predation risk of stocked salmon juvenile. Specifically, the survival rates of stocked salmon were extremely low ($\leq 10\%$) when their body size was less than 30% that of predator fish. In Chapter-2 the results suggest that the primary predator in the experimental area was the grey heron, and that their predation resulted in a significantly lower survival rate of large salmon juvenile compared to the small ones. Chapter-3 elaborates on the fact that the most critical determinant for the survival of juvenile fish was their behavior under normal conditions, rather than their hiding behavior after the stimulus. One of the possible reasons for this could be the fact that the primary predator in the experimental area was an ambush predator (grey heron). In Chapter-4 my results show that declining water levels and loss of structural complexity can increase the predation risk of stocked fish by making the process of hunting easier for the grey heron. These results suggest that the predator-prey interaction in my experimental settings is mainly determined by a combination of predator and prey traits, whereas the intensity of predator-prey interaction is mainly determined by physical habitat.