



Growth models and estimation of migratory reaction norm for invasive brown trout (*Salmo trutta* L.) in Kerguelen Islands

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SUMMARY

In a context of global warming, generalized polar ice retreat provides new habitats where native or non-native fish species may establish. Because of its dispersal and adaptive capacities, Brown trout (*Salmo trutta* L.), a cold water facultative anadromous salmonid, is a viable candidate to colonize those kinds of ecosystem. The case of introduced brown trout to Sub Antarctic Kerguelen Islands in the 1950's provides a good opportunity to investigate local adaptation through growth patterns and evolution of age at first marine migration. Based on scales and otoliths sampled from three populations that differ in their colonization date (from 1968 to 2000) and environmental conditions, we determined age at capture and age at first marine migration of each fish. We then measured scale radius at each age and back calculate the length at all ages. To do so, we compared two approaches (GAM models versus more classical parametric models) while taking into account various sources of variance (methodological, populational ...). Based on these results, we explored probabilistic reaction norms of age and size at migration, and compare how these norms differ between our populations with respect to both colonization date and environment.

KEYWORDS

Growth, invasion, life history traits, migration, reaction norm.