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Evolutionary-driven management of brown trout (*Salmo trutta*. L) intraspecific diversity

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Abstract: Human interventions have often led to the admixture of previously allopatric lineages, notably for salmonid species. In France, intensive stocking of Atlantic brown trout has led to a mosaic of outcomes regarding hybridization and introgression of Mediterranean alleles by Atlantic ones. To understand and predict this diversity dynamic, we developed an individual-based demo-genetic model, which implements identified reproductive isolation mechanisms – female preference and gene-by-environment embryonic survival – between both lineages. The model aims at representing the evolution of intraspecific diversity dynamics in various environmental contexts and under different management practices, by including eco-evolutionary mechanisms as well as their genetic basis. Simulations, considering pre- and post-zygotic isolation, indicate that evolutionary mechanisms help at predicting introgression dynamics, depending on the environmental context. Managers interested in native or intraspecific diversity conservation should therefore consider the role of both, reproductive isolation mechanisms and environmental factors in their decision-making regarding conservation action.