

Title: An Ecological-Economic Simulation Model of Genetic interaction Between Farmed and Wild Salmon

Authors: Yajie Liu, Department of Economics, Norwegian University of Science and Technology (Norway)
Ola Diserud, Norwegian Institute for Nature Research (NINA), (Norway)
Kjetil Hindar, Norwegian Institute for Nature Research (NINA) (Norway)
Anders Skonhoft, Department of Economics NTNU (Norway)

Abstract: The paper is the first attempt to explore the ecological and economic impacts of genetic interaction between farmed and wild salmon over generations. An age- and stage-structured bioeconomic model is developed. The biological part of the model includes age-specific life history traits such as survival rate, fecundity, spawning success for both wild and farmed salmon and their hybrids, while the economic part takes account of market and non-market values of fish stock. The model is constructed based on the Atlantic salmon fishery and salmon farming in Norway. The discounted profits are estimated given the current fishing practice over 50 years. The sensitivity analysis is also performed. It is expected that wild salmon stock will be gradually replaced with hybrid ones, while the total discounted profit will decline, but not significantly. The analysis will provide some new insights for designing effective management strategies to protect wild salmon stocks from genetic intrusion of farmed escapees.