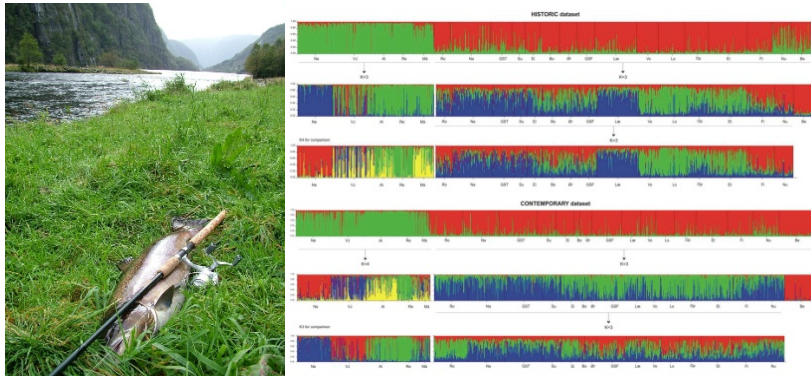


Masters project:

Modelling genetic interactions between farmed escapees and wild conspecifics

Supervisors: Professor Mikko Heino (UiB/IMR) and Professor Kevin Glover (IMR/UiB)



 PLOS ONE

RESEARCH ARTICLE

IBSEM: An Individual-Based Atlantic Salmon Population Model

Marco Castellani^{1,2*}, Mikko Heino^{1,3,4}, John Gilbey⁵, Hitoshi Araki⁶, Terje Svåsand¹, Kevin A. Glover^{1,3*}

1 Institute of Marine Research, P.O. Box 1870, Nordnes, N-5817, Bergen, Norway, **2** School of Mechanical Engineering, University of Birmingham, B15 2TT, Birmingham, United Kingdom, **3** Department of Biology, University of Bergen, Bergen, Norway, **4** International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, **5** Marine Scotland Science, Freshwater Laboratory, Faskilly, Pitlochry, PH16 5LB, Scotland, United Kingdom, **6** Research Faculty of Agriculture, Hokkaido University, Sapporo, 060-8589, Japan

* M.Castellani@bham.ac.uk (MC); kevin.glover@imr.no (KG)



Abstract

Background:

Each year, thousands of domesticated salmon escape from fish farms into the wild. Some of these migrate into rivers and interbreed with wild salmon populations. All empirical evidence suggests that introgression of domesticated escapees will lead to less productive natural populations, and changes in their phenotypic traits. However, at the present, such changes are difficult to study and detect in the wild.

Models offer the ability to “look into the crystal ball” and predict the future – of course with some uncertainty. We recently developed the model IBSEM which is an individual-based genetic model that allows us to investigate different scenarios of introgression in natural populations.

Work and overall project aims:

The project is based upon computer simulations using the model IBSEM. The program operates in **XXXX** and requires a certain level of computer skills. We will model different introgression scenarios (e.g., changing the relative fitness of escapees, more or less escapees, increasing genetic differences

between domesticated and wild salmon – etc) in order to investigate potential outcomes on natural populations. The model is up and running.

Output:

We have already published two scientific papers using the model, one in PLoS ONE and one recently accepted in Evolutionary Applications. In addition to a novel and important masters thesis, it is our primary aim to publish the results of the masters project – hopefully driven by the student themselves.