Project information

Keywords
Fish migrations, aquaculture, oceanographic modelling
Project title
How to avoid conflicts between wild and farmed salmonids? -Finding good locations for aquaculture.
Year
2018
Project leader
Jenny L.A. Jensen
Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
70,122N 23,102E
Participants

Akvaplan-niva (Jenny Jensen, Guttorm Christensen)

UiT - The Arctic University (Jo Espen Tau Strand)

IMR - Havforskningsinstituttet (Rosa Maria Serra LLinares)

Flagship
MIKON
Funding Source

Main project: Kompetanseklynge Laks SA.

The main project have a yearly budget of approximately 2,3 million NOK yearly

Summary of Results

The project is suggested as a three-year project with MIKON, where 2017 and 2018 mainly included fieldwork. The project is a part of a bigger project (hereafter referred to as the main project), which combines fish migratory behavior data of Atlantic salmon with oceanographic modelling data with the aim of understanding not only where in the fjord fishes reside, but *why* they stay in different fjord areas. By understanding which underlying factors controls the migratory behavior, the knowledge can be transferred to other populations and other fjord systems. With this understanding, the ultimate goal of the project is to be able to give knowledge-based advice on best localization of new fish farms in both the study fjord (Alta) and other fjord systems in order to avoid spreading of the parasite salmon lice from farmed to wild fish. The main project deals only with Atlantic salmon, but there are two more anadromous fish species in Norway, brown trout and Arctic charr. These species gets less attention in relation to the salmon lice problem than Atlantic salmon, but may suffer more from heavy salmon lice infections as these species reside in the coastal areas where the fish farming occurs while Atlantic salmon only migrates through coastal areas on their way to their open ocean feeding grounds.

The MIKON project has mainly been executed according to the plan described in the proposal. In 2017, the plan was to tag 35 Arctic charr and 35 brown trout smolts. However, an additional 29 tags were relocated from another project, meaning that 45 Arctic charr and 54 brown trout could be tagged. In 2018, the plan was again to tag 35 brown trout and 35 Arctic charr. Despite hard efforts, only three Arctic char were

caught. We therefore used the tags on brown trout from other rivers. In total, 103 brown trout from the Hals river, the Skillefjord river and the Alta river were tagged.

Acoustic telemetry is being used to study the fish migrations. This includes tagging fish with acoustic transmitters, and detecting the tags with acoustic receivers/loggers. The main project included placement of 123 loggers on rigs in arrays across the Alta fjord system in 2017 and 178 loggers in 2018. In total, approximately 500 wild Atlantic salmon smolts and 150 adult farmed fish have been tagged in addition to the Arctic charr and brown trout.

The project suffered some loss of receivers/loggers, but not enough to be problematic. According to the plan in the project proposal, full scale data analysis is planned for 2019 when two consecutive years of field data have been collected in 2017 and 2018. The data from 2017 and 2018 have gone through a quality control, and are of good standard. Preliminary findings includes that the Arctic charr and brown trout smolts resides for long periods in river mouth areas. This is very important knowledge for managers of these species, as these habitats often do not include any form for management plans. This is good for the fishes in relation to the fish farming industry, as these areas are normally not utilized for farming purposes and the low salinity kills infectious stages of the parasites. However, many smolts of both species left the river mouths and resided in more marine areas of the fjord. Surprisingly, this type of behavior was more common towards the end of their marine residency time. Salmon lice infections in the fish farms are normally more severe during the late part of the summer, wherefore this behavior may make the Arctic charr and brown trout smolts more prone to parasite infections. Full data analysis in 2019 will reveal why the fishes behaves the way they do and include fish from more than one watercourse.

Master and PhD-students involved in the project

The MIKON project has a master student involved called Benjamin Atencio. Benjamin will finish his master thesis at UiT – The Arctic University during spring 2019. He participated in fieldwork during 2017, and is currently writing his thesis. The project partner at IMR (Rosa Maria Serra Llinares) will begin analysis and publishing of scientific papers in collaboration with Akvaplan-niva and UiT during the winter as she is pursuing a PhD related to salmon lice and anadromous fish.

For the Management

The findings from the project will be of great importance for managers, as it involves both basic biological understanding of two less researced fish species, and as it deals with one of norways largest industries aquaculture.

Published Results/Planned Publications

Only fieldwork planned for 2017 and 2018. We will start analysis and publication of the results in 2019

Communicated Results

No

Interdisciplinary Cooperation

No

Budget in accordance to results

The project was executed according to the field plan. Additional brown trout were tagged, funded by IMR and partially Akvaplan-niva

Could results from the project be subject for any commercial utilization
No
Conclusions

The project included mostly fieldwork during 2017 and 2018, and was executed mainly according to the field plan. Preliminary analysis of the results includes new basic biological understanding of the migratory behavior of Arctic charr and brown trout smolts, as well as interesting aspects of their migratory behavior which will be investigated more thouroulghly in relation to the spreading of salmon lice from fish farms during data analysis in 2019.