Project information

Project title
    Atlantic salmon; biological and genetic knowledge and resource use among local people II
Year
    2012/2013
Project leader
    Martin Svenning, NINA
Participants
- Martin Svenning (NINA) project leader
- Einar Eythorsson (NIKU)
- Camilla Brattland (NIKU)
- Torstein Pedersen (UiT)
- Vidar Wennevik (HI)
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Flagship

    Fjord and coast, Theme: Physical-biological coupling - Oceanography and habitat use by predators and their prey

Funding Source
    Fram Centre
Summary of Results

Due to strongly reduced budget, the project in 2012 has focused on biological data sampling and interviews of fishermen in Porsanger and Kvalsund. Of the seven WP's put up in the application, only WP1 (River origin), WP3 (Ecopath) and WP7 (Farmed fish) has been prioritized in 2012. Some data will not be analyzed until December (scale ageing) and March 2013 (genetic origin).

Main goal: How to improve the management of salmon and salmon fisheries in the Porsanger fjord by combining natural and social science together with fishers' ecological knowledge?

WP1. River origin of salmon captured in the Porsanger fjord

Sub goal: *Define river origin of salmon captured in Porsanger fjord (time/space); 2011/2012*

During the fishing season (May-September) 2012, the five fishermen located in the Porsanger fjord, captured a total of 1 009 salmon, whereas they categorized 29 (2.9 %) as farmed fish. Fishers are generally not able to accurately identify the river origin of salmon, but hypothesize that the fish they catch in salmon nets originate in one of the rivers Lakselv, Stabburselv or Børselv based on outer characteristics. Interview data support that fishers characterize salmon as slim or fat depending on the river they are going to. For instance, salmon going to Lakselv are consistently characterized as rounder than other salmon (Børselv, Stabburselv and Repparfjord salmon), because the river is wider. Fishers in Porsanger do not believe that the salmon they catch are on their way to rivers further east. Detailed stock-specific information, i.e. genetic origin, of all salmon captured will be analyzed within the "Kolarctic salmon project" (KSP), given the prerequisite to determine the river origin of the salmon captured. These data will be available in March 2013. All fish will be aged by scale reading, to sort the fish into different sea age classes (finished December 2012). The coastal fisheries inevitably exploit a mixture of stocks from widely different areas, including fish from neighboring countries. Combining detailed knowledge from the Kolarctic and the Flagship project, together with local knowledge, we hope to enable a future adaptive, sustainable and knowledge-based harvesting regime in the Porsanger fjord area. If funded, this important part of the project will be fully analyzed and reported in 2013.

WP3. Ecopath and feeding

Sub goal: Develop model to assess how biological ecosystem conditions affect salmon

An ecosystem mass-balance model for the Porsangerfjord has been expanded to include salmon smolts and large salmon. The model has 59 ecological groups and for each group, data on biomass, predators and other mortality, consumption, diet and fishery are included. Data on diet from large salmon from Porsangerfjord show that they feed on fish in the pelagic and the four species herring, capelin, sand-eel and small haddock dominate. There are not local data on diet for small salmon, but data from other areas indicate that they feed on small juvenile herring and sand-eel and some crustaceans. Diet overlaps are considerable between small salmon and gadoid fish and between large salmon, piscivore birds, large cod and sea mammals. The model can be used to assess which ecosystem conditions that may affect small and large salmon given the uncertainty in input data.

WP7. Farmed fish

Sub goal: *Define incidence of farmed fish (time/space) in the Porsangerfjord in 2011/2012*

In 2011 the three fishermen (included in the Flagship project) caught 542 salmon, while the five fishermen in 2012 (2 new included in the

project) caught 1 009 salmon. Based on the fishermen's opinion the incidence of farmed fish were 63 (9.8 %) and 29 (2.9 %) in 2011 and 2012, respectively. Based on the scale reading from salmon captured in 2011 we found 93 farmed fish (17.3 %), i.e. the fishermen identified approximately only one half (56 %) of farmed fish in the catches. During the KSP in 2011, where more than 8 500 salmon were caught along the outer coastal areas from northern Nordland to eastern Finnmark, the incidence of farmed salmon was 27.2 % in Nordland, 15.2 % in Troms and 10.4 % in Finnmark. Thus the proportion of farmed fish seem to be higher in Porsanger (17 %) compared to the outer coast of Finnmark (10 %). The scales from the 2012 catches have not been analysed yet but based on the preliminary report from the fishermen the incidence is significantly lower in 2012, in all the three counties.

Regarding fishers' ecological knowledge, the role of learning has emerged as an important factor to research. It is reasonable to assume that fishers, at least the ones who have participated over two years, are able to identify a larger percentage of farmed fished in their catches due to learning through participation in the KSP since 2011. The interviews show that at least half of the fishers have increased the number of criteria used for identifying farmed salmon from two (only by checking fins and tails) to four (including spots and intestines). These criteria were communicated to fishers through hand-outs and interaction with salmon biologists. If learning has occurred through participating in the project, fishers will be able to contribute with more accurate information regarding the incidence of farmed salmon in sea catches in the future. When the scales from 2012 have been analysed, we will be able to check the effect of learning from participating in the research project.

Fishers in coastal areas report a higher incidence of seals (havert) and otters preying on up to half of the salmon in the nets than fishers in the inner part of the fjord (reports of just a few salmon eaten from nets).

Published Results/Planned Publications
- Schreiber, Dorothee and Camilla Brattland (eds) 2012: *Salmon Cultures; Indigenous Peoples and the Aquaculture Industry.* Rachel Carson Center Perspectives 2012/4. Munich.
- Svenning, M-A. et al. 2012. Incidence of farmed Atlantic salmon in the sea fishery along the North-Norwegian coast. Poster, ICES, Symposium, Bergen, Norway, August, 2012
- Brattland, Camilla (under utarbeidelse). Urfolk, laks og fisk på rømmen. Oppsummering av workshop om lakseoppdrett og urfolk i München, 2011 til forskning.no og Fram Forum.

Communicated Results
- Symposium, ICES, Bergen, Norway
- Steering group meeting in Kolarctic salmon, PINRO-Murmansk, Porsanger project was presented
- Presented at several local meetings in Finnmark

Interdisciplinary Cooperation

In this Flagship-project, both natural/biological and social sciences are strong integrated elements. The collaboration between NIKU and NINA included collection of local ecological knowledge (LEK) on the differences between wild and farmed salmon and different salmon stocks among participants in the Kolarctic project in the index fjord (Porsanger). The role of learning among fishers through participation in biological research is a special focus of this project because of the unique collaboration between fishers and researchers in the period 2011 – 2013. The results from this project can be used for assessing the capacity of fishers to contribute with reliable and accurate data to research and management in the future. This will strengthen the legitimacy of salmon governance among local fishers as well as contribute to a more adaptive management plan for coastal, fjord and river systems in the future. According to an agreement between the Directorate of Nature Management (DN) and the Sami Parliament in 2011, it is desirable that fisher`s knowledge, as well as biological research are important inputs to the management of salmon. This project is a pilot study on how this intention can be implemented.

Budget in accordance to results

Due to strong reduction in funding for the year 2012, we had to prioritize biological data sampling and interviews with the local sea fishermen in the Porsanger fjord area. In order to complete the project, it is highly important to have some funding in 2013 for analysis of data and to report the project.

If Yes

The results can be used to adapt salmon fisheries in the sea to the variability of salmon stocks on a regional basis.

Conclusions

a)   The present flagship study has/will provide detailed stock-specific information about exploitation within the Porsanger mixed stock fishery, enabling a future adaptive, sustainable and knowledge-based harvesting regime. This is hugely important to ensure that traditional cultural fishing methods still can be used, while at the same time minimizing the mixed-stock fishery in areas when needed to preserve declining stocks. More detailed, incident of different stocks will be estimated and compared between different fishing sites (i.e. distance from inner fjord area), during season and between fishing gear types. In the interviews, we have also asked fishers about their perception of distinction between salmon stocks of different river origin, and perceived changes over time. Thus, building on this interdisciplinary NINA-NIKU flagship project (2012-2013), the management of salmon fisheries not only in the Porsanger fjord, but also in northern coastal areas in general, would be improved.

The method used in this project includes involvement of salmon fishers as research partners; for collection of biological samples, observation of ecological changes and changes in salmon catch composition (river origin and farmed salmon), predators, and parasites. This combined method is new in salmon research in Norway.