Project information

Keywords
ecology, anadromous fish, telemetry

Project title
The coastal migratory behaviour of anadromous fish in relation to environmental parameters

Year
2016

Project leader
Guttorm Christensen

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
69°41'37.5"N 29°33'31.9"E

Participants

Akvaplan-niva: Guttorm Christensen and Jenny L.A. Jensen

UiT-Norges Arktiske Universitet: Prof. Audun H. Rikardsen

Norsk Institutt for Vannforskning (NIVA): M.Sc. Kate Hawley

Norges Miljø- og Biovitenskapelige Universitet (NMBU): Prof. Thrond Haugen

Flagship
Fjord and Coast

Funding Source

Norterminal, APN, UiT, FRAM Fjord&Coast

Total, ca. 2,5 million in 2016

Summary of Results

The F&C project have given valuable information on the marine whereabouts of anadromous Arctic charr and brown trout, and as the project is included in a bigger project the results can be put in a bigger context by relating them to the documented behavior of Atlantic salmon and European whitefish at the end of the project period (2017). The results from the first study year of the main and Fjord & Coast project can be found at: http://www.akvaplan.niva.no/no/resource_centre/news_detail/new_report_on_salmonid_migration

The corresponding report for 2016 will be online by 1st March 2017.

Due to extreme water levels during the time when Arctic charr left the rivers, this species could not be captured by traps in the river in 2016. Attempts to capture this species with bag nets in the outlet area were also unsuccessful, wherefore only brown trout could be tagged in 2016. There were, however, Arctic charr tagged in 2014 and 2015 that returned to the fjord system, resulting in data from 4 individuals. These individuals showed a similar migratory behavior as the previous years, i.e. they resided in the outer part of the fjord. This behavior is most likely related to Arctic charr´s low temperature preference, as the outer parts of fjord systems are normally colder than the inner parts. In total, 17 brown trout were tagged with temperature and depth recording tags in 2016 (funded by the FRAM-center). In addition, 10 trout tagged in 2014 and 15 trout tagged in 2015 returned to the fjord. The trout showed large individual variation in migratory behavior, where about half of the fish resided solely in the estuary and the other half migrated into the fjord. About half of the fjord-migrating fish resided close to the outlet (within 5 km), whereas the rest used the entire fjord system. In addition, there is still 7 of 26 whitefish tagged in 2014 alive in the system. These are of particular interest, as this is normally a freshwater resident species. The data gathered is of good quality with frequent registrations of the fishes. There are multiple individuals which have generated data over multiple years, meaning that the dataset allows interpretation of individual responses to between-year differences in environmental parameters. Hopefully the data can be thoroughly analyzed using advanced statistics in 2017.

Master and PhD-students involved in the project

The Fjord & Coast project had a master student (Odin Kirkemoen, NMBU) involved in 2015, which defended his thesis in January 2016. Msc. Kirkemoen´s thesis got graded "B", and used likelihood modelling in order to investigate the area use of Arctic charr and brown trout in relation to planned and established human coastaldevelopments. The thesis can be viewed at: https://brage.bibsys.no/xmlui/handle/11250/2383752

In addition, the main project had a master student (Pierre Fagard) working on anadromous whitefish in 2014. His thesis work can be viewed at: http://munin.uit.no/handle/10037/7961

We could not find a suited master candidate for the project in 2016.

For the Management

The findings from the study will greatly aid managers in making sound decisions regarding how to manage these species, especially at sea but also in rivers. There is currently a national debate on restricting the fishing times of these species at sea, and the findings provides new knowledge on temporal and spatial aspects of these species marine residency, as well as harvest rates.
The plan is to further analyse the findings in 2017, and investigate how these species utilize coastal areas related to different temperatures, coastal currents and salinities. An understanding of these relationships means that the knowledge can be transferred to other populations, and should provide an important management tool. Also, the findings include that both species utilize estuarine areas and areas close to the river mouths to a great extent, which is important knowledge for management institutions.

Published Results/Planned Publications

We have submitted an application to the Fjord & Coast flagship for funding to publish 3 papers from the project (the thesis work of the 1st years master student (Pierre Fagard) onanadromous whitefish, the master thesis of Odin Kirkemoen and a paper of the total findings from the Fjord & Coast project on the migratory behaviour of Arctic charr and brown trout in relation to environmental parameters).

Communicated Results

Results from the project have been communicated to hunting and fishing associations from all of Finnmark county in presentations during their annual meetings. The report from the main project has been sent to the County governor of Finnmark.

Local media have covered the main project during spring and summer. We are working on a video which summarize the entire project, which will be used in presentations and on social media.

Budget in accordance to results

The budget was 100 000 NOK lower than the sum applied for, wherefore we in 2016 focused on performing field tasks (tagging and tracking of fish). These tasks were performed in accordance with the budget. The findings will be analyzed and reported before 1. March 2017 for the topics related to the main project (migratory routes and area use).

Could results from the project be subject for any commercial utilization

No

Conclusions

With partial funding from the Fjord & Coast Flagship, the project have generated a large dataset describing in detail the migratory behavior of all naturally occuring Norwegian anadromous fish species from multiple populations. The project have produced two master students. With thorough analysis of the 3-year project after completion in 2017, a much deeper understanding of these species migratory behaviour and marien area use will be achieved.