Kolarctic ENPI CBC Project

Trilateral cooperation on our common resource; the Atlantic salmon in the Barents region (KO197)

"Kolarctic salmon 2011-2013"

Kick-off seminar 15th March 2011

Vadsø Norway

Program and Abstracts

MARCH 15TH 2011 – KICK-OFF SCIENTIFIC SEMINAR DAY

Kolarctic ENPI CBC Project – *"Trilateral cooperation on our common recourse; the Atlantic salmon in the Barents region (KO197)"*

Place: Office of the Finnmark County Governor, Vadsø – Meeting room Varangerfjord

Time: 9-17:30 **Seminar language:** English

Session 1 (time: 9-12) – The Atlantic salmon resource in the Barents region

Chair: Ms Bente Christiansen, Office of the Finnmark County Governor (FMFi) and co-chair Mr Pentti Pasanen, Centre for Economic development, Traffic and the Environment (ELY- centre)

- Welcome and opening of the seminar – County Governor Mr Gunnar Kjønnøy
- Presentation of the project – Ms Bente Christiansen, FMFi
- The Atlantic salmon resource in Norway, Russia and Finland
    - Russia – Mr Sergey Prusov, Polar Research Institute of Marine Fisheries and Oceanography (PINRO)
    - Finland – Mr Panu Orell, Finnish Game and Fisheries Research Institute (FGFRI)
    - Norway – Mr Morten Johansen, Norwegian Institute for Nature Research (NINA)

Questions and discussion (coffee break at approx. 10:30-10:45)

- Coastal fishing and traditions in Norway and Russia
    - Coastal fishing in Norway , the Salmon Fishers organisations view – Ms Astrid Daniloff, Sør-Varanger Sea Salmon Fishers Association
    - Traditional knowledge – Ms Gro Ween, University of Oslo (UiO)
    - Coastal fishing in Russia, an overview – Mr Sergey Prusov, PINRO
    - Coastal fishing in Norway, the landowners view – Mr Steinar Christensen, Finnmark Property (FeFo)

Questions and discussion

Lunch 12:15-13:15 Lunch buffet at Rica hotel Vadsø

Session 2 (time: 13:15-17:30) – The Atlantic salmon research and management

Chair: Mr Pentti Pasanen, ELY-centre and co-chair Ms Bente Christiansen, FMFi

- The salmon management in Norway, Russia and Finland
    - Norway – Mr Sturla Brørs, Norwegian Directorate of Nature Management (DN)
    - Russia – Mr Sergey Prusov, PINRO
    - Finland (Tana and Neiden rivers) – Mr Pentti Pasanen, ELY-centre

Questions and discussion

- Genetic research on Atlantic salmon
    - General views on the salmon genetics – Mr Mikhail Ozerov, University of Turku (UTU)
    - Baseline for salmon stocks in the Barents region – Mr Vidar Wennevik, Institute of Marine Research (IMR)
    - Adult salmon genetics and genetic stock assignment – Mr Juha-Pekka Vähä, UTU

Questions and discussion (Coffee Break at approx. 15-15:15)

- Salmon ecology and research
    - Norway – Mr Martin Svenning, NINA
    - Russia – Mr Sergey Prusov, PINRO
    - Finland (Tana river) – Mr Eero Niemelä, FGFRI
    - Long term changes in sea temperatures – Mr Sergey Prusov, PINRO and Mr Vidar Wennevik, IMR
    - Salmon adaptation and global climate change – Mr Eero Niemelä, FGFRI

Questions and discussion

Miscellaneous and seminar conclusions

18:00 Transport I from Hotel Rica to Pikku Skitsi sauna and dinner in the village of Vestre Jakobselv

19:00 Transport II from Hotel Rica to dinner in Vestre Jakobselv

19:30 Dinner at Pikku Skitsi in the village of Vestre Jakobselv

22:30 Transport back to Vadsø

DN: Norwegian Directorate for Nature Management
FMFi: Office of the Finnmark County Governor/ The County Governor of Finnmark
NINA: Norwegian Insitute for Nature Research
IMR: Institute of Marine Research
UiO: University of Oslo
PINRO: Knipovich Polar Research Institute of Marine Fisheries and Oceanography
FGFRI: Finnish Game and Fisheries Research Institute
UTU: University of Turku
ELY-centre: Centre for Economic Development, Transport and the Environment
FeFo: Finnmarkseiendommen/ Finnmark Property

The Atlantic salmon resources in Russia

Elena Samoylova, Sergey Prusov

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Atlantic salmon is an important resource for the Russian Federation, valued highly by anglers, generating income and providing employment to local communities, particularly, through the development of recreational fisheries in the last two decades. In Russia recreational fishery with widely used catch-and-release is prioritized as an exploitation method promoting the sustainable use of resource.

Many rivers in Russia today remain in pristine condition and have healthy salmon stocks. In today's challenging environment we achieved this, in the first place, by optimizing the use of resource and taking precaution as advised by approaches and principles developed and promoted by NASCO.

Given the continuing poor survival of salmon in the ocean Russia is taking further actions to protect the Atlantic salmon. We are aiming at reducing the pressures, we can control, through reduction of the exploitation rate in commercial fisheries and phasing out the fishery in coastal waters, we educate users of the resource and disseminate information on the international best practice among relevant authorities in the five regions in the northwest Russia with salmon rivers. We now put much emphasis on the recreational use of fish resources in freshwater, Atlantic salmon too. We continue to improve our legislation. But we are also aware of problems facing us such as illegal fishing and misreporting of catches, misuse of fishing rights by certain user groups and difficulties with implementing management measures unpopular with local communities, but protecting salmon.

Though the Russian salmon aquaculture industry does not have the scale of production we see in other countries of the North Atlantic, and therefore its impacts are not that evident, we are very concerned about the threats these activities pose to wild salmon, among them transmission of diseases and parasites, impacts of farm escapees. Reinforced legislation, stronger standards and enforcement are needed. Continued dialogue with the salmon farming industry is essential.

It is clear that further and appropriate measures for the home waters need to be taken by all the relevant Parties to make the future of the wild salmon safeguarded. Measures for the mixed-stock fisheries at sea are among them. In managing these fisheries, before they are brought to an end, the real challenge for us is to have enough political will to strike an appropriate and equitable balance between salmon conservation and socio-economics.

The Atlantic salmon (*Salmo salar*) resource in Finland: rivers Teno and Näätämö

Panu Orell

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The rivers Teno (drainage area 16386 km^2, c. 30 % on Finnish side) and Näätämö (drainage area 2962 km^2, c. 80 % on Finnish side) maintain the only Finnish Atlantic salmon, *Salmo salar,* populations that migrate to Barents Sea for feeding migration. Both river systems are border rivers with Norway, and their lower reaches are running entirely on Norwegian side.

The salmon resource of the River Teno is extremely diverse with multiple genetically differentiated populations inhabiting the main stem and the tributaries. The salmon stock complex is one the largest in the world with up to 120 000 individuals estimated to ascend in the peak years. The inter-annual variation of the salmon run size is, however, very large with up to 6 fold difference between bad and good salmon years. During the “low” run years, the spawning population sizes in the small tributaries of the River Teno can be only some tens of individuals.

The River Teno is a very popular salmon fishing area for Finnish tourist anglers and annually up to 10 000 anglers visit the river on Finnish side. Additionally c. 800 local Finnish fisherman are exploiting the River Teno salmon stocks by using drift nets, gillnets, weirs and rod. The Finnish salmon catch varies between 25 and 120 tons.

The River Näätämö is a mediun sized river that supports an important salmon stock. The salmon distribution area includes c. 80 km of the mainstem up to the Lake Iijärvi and two tributaries, the rivers Kallojoki and Silisjoki.

Annually 600-700 tourist anglers are fishing on the Finnish side of the River Näätämö. In addition, local inhabitants are using gillnets and rod. The Finnish salmon catch varies between 500 and 4500 kg, constituting on average 22% of the total catch (Finnish+Norwegian catch).

Uses of local knowledge in interdisciplinary research and in co-management

Gro Birgit Ween

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Although it did not appear out of nowhere, local knowledge was first coined in *Our Common Future*, or the Brundtland report, as we Norwegians prefer to call it, presented by the World Commission of Environment and Development (WCED) in 1987. The WCED asserted: '... *larger society... could learn a great deal from ...tradition skills in sustainably managing very complex ecological systems'* (WCED 1987, 114-115).

This paper will outline the nature of local knowledge. It will moreover relate the significance of local knowledge for scientific knowledge, for the particular challenges involved in the species management and for the development and implementation of local management structures. From an anthropological perspective, the paper will reflect upon what local knowledge is, and how it has been employed in other comparable situations when local people have been made party to natural resource management situations. It will moreover, describe the methodological issues involved in collecting local knowledge, particularly in circumstances where local knowledge is intended to be placed in dialogue with scientific knowledge. This dialogue must be undertaken in the knowledge of that to the parties involved, other knowledges are perceived as culturally and historically situated.

Abstrakt:
Det har lenge vært interesse for lokalkunnskap både i og utenfor antropologiske kretser. Viktigheten av lokalkunnskap ble først bekreftet i Vår felles framtid, eller Brundtlandkommisjonens rapport, som vi nordmenn liker å kalle den. Brundtlandrapporten ble lagt fram av Verdenskommisjonen for Miljø og Utvikling i 1987. I rapporten ble det understreket: '… storsamfunn …. kan lære en hel del av … tradisjonelle ferdigheter i forvaltning av komplekse økologiske systemer (WCED 1987, 114-115).

Mitt innlegg tar for seg hva lokalkunnskap eller tradisjonskunnskap er. Det legger vekt på signifikansen av lokalkunnskap for vitenskapelig kunnskap, i forhold til de spesifikke utfordringene som vi står overfor i forvaltningen av konkrete arter, og og i utviklingen av lokalforvaltningsstrukturer. Fra et antropologisk perspektiv reflekterer jeg i dette foredraget på hva lokalkunnskap er og hvordan lokalkunnskap har blitt brukt i andre sammenlignbare naturforvaltningssituasjoner. Foredraget beskriver også de metodologiske utfordringene som det å samle inn lokalkunnskap medfører, spesielt når formålet med informasjonsinnhentingen er at kunnskapen skal settes i dialog med vitenskap. Dialogen mellom lokalkunnskap og vitenskap må inngås med forståelse av at for de involverte partene er de andres kunnskap kulturelt og historisk situert.

Review of Atlantic salmon fisheries and management measures in the Russian Federation

Sergey Prusov, Gennadiy Ustyuzhinsky

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The Atlantic salmon (*Salmo salar* L.) occurs in the rivers of five regions of the North-western part of the Russian Federation. The amount of rivers in the area indicates a large genetic biodiversity within Atlantic salmon in Russia, resulting in a huge production potential. These salmon unlike the European river systems are genetically entirely unpolluted by escapees from salmon farms for which the waters surrounding the North-west of Russia are largely unsuitable. The status of individual river salmon stocks varies considerably and in overall they have not shown the same negative trend in salmon abundance as observed in all other parts of the distribution area on the both sides of Atlantic. However a number of salmon stocks are suffering reduced numbers of spawning salmon due to various anthropogenic factors such as over-fishing in coastal areas, poaching, etc.

In Russian Federation quotas for fisheries are allocated to the First nations, to fisheries for enhancement purposes, scientific fishery, recreational fishery and commercial in-river and coastal fisheries. In 2009 Atlantic salmon was removed from the list of species subject to regulation by a total allowable catch. This amendment made it possible for the recently established Anadromous Fish Commissions to work in a more flexible and effective way and make in-season adjustments to catch limits and other measures based on scientific advice.

The biggest commercial Atlantic salmon catch in Russia was recorded in 1960 and was over 1,100 tonnes. Subsequently, despite further improvement in fishing gear the total catch began to decline. The average catch declined from 625 tonnes in 1960s to 486 tonnes in 1980s. Over the last two decades the effort in commercial fisheries has been further reduced which aimed at conserving Atlantic salmon stocks and enhancing recreational fisheries. In recent years the total declared catch was around 100 tonnes.

Commercial fisheries in 2009 were conducted both in the rivers and in the coastal areas of the White Sea. In 2009 the commercial catch was 37% and 58% bellow the means for previous 5 and 10 years, respectively. Mixed-stock coastal fisheries were operated only in Murmansk and Archangelsk regions in the White Sea primarily with trap nets and intercepted salmon migrating to the White Sea rivers. The total commercial catch taken in the coastal fisheries in the White Sea in 2009 was 22.4 t.

In Russia recreational fishery is highly developed in the region of Murmansk where most of salmon are being released. Catch and release catches have typically been high (average of 36,500 salmon in the 5 years 2004 to 2008) and are believed to have remained at this level in 2009.

Nowadays commercial salmon fishery in Russia is viewed more as a social measure – a traditional way of fishing by indigenous people from Pomor villages along the White Sea cost whereas the recreational salmon fishery, developed on the catch-and-release principle, today is seen as one of the highest quality and most prestigious in the North Atlantic.

”The Finnmark Estate”- Managing salmon fisheries in the sea

Steinar N. Christensen

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Salmon fishing in the sea according to the Finnmark Act (FA), is a right which belongs to all inhabitants of the municipality, but the Board of FeFo have limited this right. The Finnmark Estate (FeFo) established rules for the assignment of licenses in autumn 2006. The old rules for assignment of license was largely maintained, ie those who will be fishing for salmon in the sea must be associated with primary industries. Most operate as a fisherman, farmer or reindeer herder, or a combination. (ie that they have a good deal of income from fishing, herding or agriculture). You may also be assigned a license if you're about to discontinue primary industry or retire from primary industry. The board have decided that FeFo could be more liberal in interpreting these rules to ensure recruitment to the fishing. FeFo do not want to increase the number of fishermen significant as this could result in the change towards stricter regulations (eg, shorter and stricter fishing gear restrictions).

Number of nets in use is reduced signifcantly in the last 15 years. There is many reasons for this, public regulations is more strict, the prices is lower and fewer wants to participate.

The last 9 years there has been a decline in number of fishermen from 488 persons in 2001 to 276 in 2010. that is a reduction of 209 persons in 9 years, or 43 %.

In 2007 the average age was 58. Two years later it was 60.

Finnmark is responsible for an increasing proportion of the salmon caught in the sea in Norway. This is because the industry is not regulated as hard as the rest of the country.

The salmon management in Norway

Sturla Brørs

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Norway has about 400 rivers that sustain self-reproducing salmon stocks. Anadromous salmonids are protected unless otherwise determined in provisions set out in or issued pursuant to the Act Relating to Anadromous Salmonids and Freshwater Fish.

The Ministry of Environment has the overall responsibility for the salmon management, where as The Directorate for Nature Management (DN) in most cases stands for the executive management. At the regional level The County Governors have a key role for the salmon management. Fisheries in border rivers are based on bilateral agreements with Russia, Finland and Sweden.

Other state authorities than The Ministry of Environment has the main responsibility for activities affecting wild salmon stocks significantly; management and licenses for hydropower purposes are dealt with by The Ministry of Petroleum and Energy/ Norwegian Water Resources and Energy Directorate (NVE), whereas fish farming is managed by The Ministry of Fisheries and Coastal Affairs/ The Fisheries Directorate. The Food Safety Authority, which is an agency under the Ministry of Fisheries and Coastal Affairs and Ministry of Food and Agriculture, has the responsibility for health control, monitoring and prevention of diseases.

No matter of which activities affect wild Atlantic salmon, the environmental authorities have to assess the total situation of the stocks. The management should be stock specific and knowledge based, so even if stocks are weak because of river encroachments or increased numbers of escapees or salmon lice, strong regulative measures must be put into actions to preserve salmon stocks.

One measure to protect salmon stocks was the establishment of national salmon rivers and salmon fjords. The 52 most important salmon stocks were given protection from encroachments and activities in the watercoarses and in the nearby fjords and coastal areas. In these rivers no permission will be given to new enterprises or activities that might harm the wild salmon. Concerning the fjords, no additional aquaculture plants will be established while existing installations are subjected to more stringent standards for preventing escapees, controlling salmon lice and other diseases.

Until recently public fisheries regulations have primarily been based on regulations on fishing gears and length of fishing season. After 2008, based on the recommendations of The North Atlantic Salmon Conservation Organization (NASCO), spawning targets (Norw. *gytebestandsmål*), expressed as egg density needed to fulfil the production capacity, have been calculated for the 180 most important salmon rivers. The main management principle is that measures should be brought into action if numbers of spawners are too low. Sea salmon fisheries are also regulated based on how the spawning targets are met in the rivers in concern.

A Scientific Advisory Committee for Atlantic Salmon was appointed in 2008. Main objectives for the committee are to evaluate the status of salmon related to spawning targets and threats, and to give advice on harvesting rates. The implementation of the Waterframe Directive (WFD), as well as a new Act relating to the Nature Diversity (2010), should also serve as supplementary tools for a good management on wild Atlantic salmon in future.

The salmon management in Finland, Tana and Neiden Rivers

Pentti Pasanen

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Important bodies of salmon management of the Tana and Neiden rivers in Finland

The association of waterowners administer the common waterareas owned by several properties

- in Tana and Neiden rivers fishing right of salmon belongs to the private water owners (There are restrictions of the rights of nonresident water owners)
- The revenues collected from the licenses are distributed to the water owners

ELY Centre of Lapland is a provincial fisheries authority operating under the Ministry of Agriculture and Forestry

- it handles tasks related to the administartion of fishing and management of the Tana and Neiden rivers
- It negotiates every year with Fylkesmannen i Finnmark about fishing regulation for non-resident persons of the Tana river
- It takes care of selling fishing licences, supervision of fishing, preventing Gyrodactylus salaris -parasite, etc.

Ministry of Agriculture and Forestry is resposible for the agreement made by Finland and Norway on common fishing regulations for the Tana and Neiden rivers

Important agreements and legislation in Finland

The Tana River fishing district is subject to the agreement made in 1989 by Finland and Norway on common fishing regulations for the Teno River fishing district and related fishing regulations. Some of its provisions have been confirmed by law.

- The regulations apply to the Finnish sections of the Teno River, Inari River and Skietsham River where they form part of the national border

In the tributaries there is applied the finnish fishing law and decree of fishing in the Teno River tributaries

- According to the Tana river fishing agreement the national regulations in tributaries can´t be less strickt than in the border river

Guidelines of Atlantic Salmon Conservation Organization (NASCO) for the management of salmon are observed

Challenges of salmon management in the Tana-river

The picture of fishing and stock status is incomplete

- There is need of knowledge of exploitation of stocks during the hole life cycle of salmon including sea and river fishery
- The impackt of exploitation on mixed stocks in the coastal fisheries and in the river is deficient

The practical problems in regulating fishing in the border river:

- The current Nor-Fin Tana-agreement is inflexible, it allows only regulate fishing of the non-permanent fishermen annualy, fishing of locals is out of measures
- There is lacking knowledge of effectiveness of regulatory measures

Goal

- Regulation should be effectively targeted including the hole life cycle of salmon in the same minimizing damage to local livelihood

General views on the Atlantic salmon (*Salmo salar* L.) population genetics

Mikhail Yu. Ozerov, Juha-Pekka Vähä

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DNA contains the genetic information to construct an individual and no two individuals apart from identical twins have the same DNA. Diversity at the genetic level underlies the more visible diversity of life that we see expressed in individuals, populations, and species. Some variation is always neutral and does not affect the ability of an individual to survive or of population to adapt. However, the neutral variation may become important for a population when the environment changes. Therefore, a population with high level of genetic variation has better chances e.g. to adapt warmer climate or to tolerate new parasites.

Atlantic salmon is a species with very accurate natal homing behavior. The consequence of this is that populations exchange genes at a very low level and thus evolve independently from each other. This allows each population to accumulate the right mutations – genetic variation – which makes them adapted to the local environment: temperature, water level, parasites etc. In other words, natural selection has shaped the genetic composition of the populations. For example, Baltic lineages of Atlantic salmon have the right genetic variation to make them tolerant to the parasite *G. salaris*, whereas Atlantic lineages are highly susceptible.

Comparisons of the genetic variation also allow us to deduce the relationships of populations and estimate the level of gene flow among them. For example, comparison of variation has revealed a clear, sub-species level, boundary between North-American and European lineages. Further, at the smaller geographical scale studies have revealed three postglacial lineages of the Baltic salmon and genetic differences among populations even within a single river system. Such information is invaluable for conservation and management planning.

Furthermore, comparisons of the genetic variation also allow us to make inferences about the historical or contemporary events the populations have experienced and making inferences of the population size and status. While large populations usually have more genetic variation than smaller ones, the loss of genetic variation may indicate a dramatic reduction of the population size, which in the long term perspective reduces population fitness. The use of temporally replicated samples allows revealing changes of population genetic structure and diversity over time, evaluate genetic consequences of physical and biological environment changes, such as dam building or stocking and hatchery supplementations. For example, more stable genetic composition of freshwater salmon (Lakes Ladoga and Onega) was observed for populations spawning in the rivers with more stable hydrological conditions.

Taken together, revealing of underlying population genetic structure, detection of bottlenecks or instability of genetic composition over time are important for conservation and management planning of Atlantic salmon populations.

Baseline for Atlantic salmon stocks in the Barents region

Vidar Wennevik

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Several projects over the last years have contributed towards building a genetic baseline of northern populations of Atlantic salmon. Such a genetic baseline, consisting of genetic profiles of river populations in a region is useful for several reasons. Firstly, it provides a better understanding of how salmon populations in the region are structured into different genetic units with limited exchange of individuals between rivers. This reproductive isolation that is reflected in genetic differences provides the basis for salmon to develop local adaptations to the river environment it lives in. The existence of such local adaptations signifies that salmon should be managed on a population-basis. Also, the existence of a genetic baseline with river profiles provides the opportunity for studying the composition of catches in coastal fisheries, as the origin of each individual salmon may be inferred, as well as providing information on migration routes of different river populations. This presentation gives an overview of the spatial coverage of existing genetic baselines for northern populations of salmon, the genetic structures that appear from the data and outlines the methodologies that will be employed to expand the baseline geographically and genetically to provide a valuable tool for management of this resource.

Genetic Stock Identification

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Genetic assignment tests are a way of using an individual's DNA fingerprint or multi-locus genotype to find out what is the most likely source population of an individual. In fisheries research, this information can then be used e.g. to infer the origin of each individual in the mixed stock fisheries catch sample.

Major benefits of using the genetic stock identification methods over the more conventional tagging methods include cost-effectiveness and the possibility to use archived scale samples. The power of genetic stock identification methods in elucidating e.g. the patterns of migration in Atlantic salmon comes from the fact that each individual is already tagged, in its DNA, at the site it was born. Thus, the number of samples available for analyses is not dependent on recapture rates of externally tagged fish. However, a fundamental requirement, in linking an unknown individual with its source population i.e. finding a positive match is that the multilocus genetic profile of potential source population is known. In addition, depending on the genetic differentiation among the baseline populations, the number of marker genes varies and reliable genetic stock identification may require up to tens of markers.

Basically the method proceeds by calculating the observed frequencies for each allele in a baseline population. When calculations have been made for all populations, the individual is assigned to the population in which it has the highest likelihood of belonging. Due to the method assigning a mixture individual to a source stock which has the highest likelihood, it is a prerequisite for reliable identification to have sufficiently comprehensive set of source stock genetic profiles (=baseline population data).

Genetic stock identification methods have been successfully used for example in the river Teno to study the return migration behaviour of 1SW Atlantic salmon. The studies have revealed that there are clear and significant differences among the populations in the timing of return to fresh water which is valuable information for the fisheries management planning.

Salmon ecology and research in Norway

Martin A. Svenning

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Tanasmolten vandrer ut fra Tanaelva gjennom hele døgnet og de fleste smoltene vandrer langs elvebunnen. Dette er i motstrid til undersøkelser i Midt- og Sør-Norge, der det har vært hevdet at smolten vandrer i overflata og kun om natta. Dette kan skyldes at smolt i nordlige bestander viser en annen vandringsadferd, og/eller at valg av observasjonsmetodikk i mer sørlige studier har påvirket fangbarheten til smolten.

Smolten vandrer raskt ut estuariet og forlater Tanafjorden i løpet av et par uker. De mange tusen laksendene og torskene i Tanaestuariet spiser nesten utelukkende sil og påfører smolten minimal dødelighet.

Under sjøfasen bruker Tanalaksen trolig både nordlige deler av Norskehavet og Barentshavet, og innsiget av gytelaks på våren/sommeren kommer fra sørvest og går nordøstover langs kysten av Nord-Norge. Innsiget langs kysten av Finnmark består i hovedsak av laks fra nord-norske elver, samt fra elver på Kolahalvøya. Andelen russisk laks øker mot øst.

Varierende mengder med voksen laks beiter også i kystnære fjorder i Øst-Finnmark om vinteren. Vinterbestandene består både av russisk og norsk laks.

Ved bruk av satellittmerker (”pop-up” merker) har vi vist at vinterstøingene i Tana (utgytt laks) bruker Barentshavet under sjøoppholdet. Én laks ble fanget vest for Bjørnøya bare to uker etter at den var sluppet i Tanaelva. Dette er aller første gang satellittmerker er benyttet på Atlantisk laks.

Sjøoverlevelsen i de nordlige bestandene er vesentlig høyere enn hva som er rapportert fra bestander i Midt- og Sør-Norge de siste 10 årene. Dette er trolig en av årsakene til at de nordlige bestandene har vært såpass tallrike sammenlignet med bestander ellers i Europa.

Ved hjelp av genetisk merking kan vi nå også beregne fangstdødeligheten for delbestander (sideelvbestander) i Tana både langs kysten og i hovedelva, dvs. før de når hjemelva/gyteelva.

Gjennom ”Kolarctic Salmon” vil vi videreføre de genetiske analysene og bygger opp en genbase for laks fra nordre Nordland til Pechora, for å stadfeste hjemområde og hjemelv til laks som fanges langs kysten av Nord-Norge.

A life history of Atlantic salmon (*Salmo salar* L.) from the White Sea rivers

Sergey Prusov

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All Atlantic salmon rivers of the Russian Federation have two distinct runs of salmon. The summer run salmon ascend the rivers in June-July and spawn in the autumn of the same year. Autumn run fish behave differently. They start their migration in early August and continue entering the rivers until they freeze. They do not spawn in the year they arrive. Autumn run salmon overwinter in the river or estuary, oversummer in the main stem or tributaries and spawn in the autumn of the following year. Salmon do not eat during their time in the river, which imposes a fast of 18 - 22 months upon them. In the rivers which are draining in the White Sea a group of summer runners is less numerous than autumn runners. Atlantic salmon can spawn and survive the ordeal, creating an occurrence of repeat spawners, but only five percent of salmon come back as repeat spawners and less than 0.1% as second repeat spawners. Most of White Sea repeat spawners come back to a native river just in three – four months after they left it as kelts in May-June.

Upriver migration of Atlantic salmon starts in early spring, right after the ice drift, when salmon from the previous year's autumn run, which overwintered in the river estuary, recommence upriver passage to spawning areas. These are mainly small 1SW (one-sea-winter) females of silver colour with undeveloped gonads. The migration of these fish into the freshwater is most notable during the first 10-15 days after the ice drift. A run of summer salmon begins with the migration of MSW (multi-sea-winter) salmon in mid-June. From early July and until the first days of August upriver migration of a group up to 90% composed of 1SW males takes place. In early August salmon from the autumn run arrive into the river. Large MSW fish migrate first. The next group usually arrives into the river in early September and is composed of 1SW salmon. The run of autumn fish continues in October-November, and some of them overwinter in the estuary and resume their upriver passage in spring of the following year.

The Atlantic salmon of the White Sea rivers spawn in freshwater in late August – late October. The eggs hatch the following April, and the newly hatched fish (alevins) stay in the nests till June when they start their first feeding as fry. After one winter in the river fry becomes parr. In the White Sea rivers salmon parr stay for up to 6 years (generally 3-4) gaining the size that allows them migrate in the ocean. Once they hit a size of 15-25 grams (12-18 cm in length) they become smolts and start descending the river in June-July to enter the sea and proceed to their marine life cycle.

After entering the sea, smolts are called post-smolts till the end of first winter when they become 1SW salmon. Just in one year they increase their size up to 1-3 kg (45-65 cm in length). Some fish then come back to the native river to spawn as a grilse (matured one-sea-winter fish) whereas others spend more years at sea before they return home as really "trophy" MSW salmon. Spawning migration back to the home rivers occurs along coastal areas where salmon are being intercepted by mixed-stock fisheries.

Salmon ecology and research; Finland (Tana River)

Eero Niemelä

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Salmon during its life phases as a freshwater and saltwater species is adapted into different types of running water environments in river systems as well as into large oceans. Adaptation includes physiological and morphological changes when migrating from freshwater into saltwater and vice versa. Salmon has ability to come back to the river of their origin after maturing at sea 1-5 years. This behavior is the challenge for salmon to survive from generation to generation. The strong homing behavior has helped salmon to develop genetically different stocks within its distribution area. The life of salmon is full of migrations starting from the juvenile phase to the return for spawning as a mature fish, migration back to the sea as kelt after spawning, reconditioning and migrations once again back to the original home river. These periods which salmon has spent in rivers and at sea can later be found from the scales. The salmon scale information, interpretation of its life, helps us to understand the whole ecology and changes in life history of that fish. In the River Tana the life of salmon is as follows: Spawning takes place from the second half of September to c. 10. October. Females are selecting the spawning sites and in August females are moving to the spawning areas. Females are digging the nests and after spawning they are covering them. Juvenile male salmon are also fertilizing eggs. Eggs will be hatched until late next spring and fry will be seen in the middle of July close to spawning sites. During the first summer the mortality of fry is high. Those that survive the first summer and first winter stay in the river 2-8 years before migrating to sea as smolts. In the river juveniles stay most of their time below and between bottom stones to increase their survival. Juveniles are migrating between habitats actively when growing. Smolts are migrating to the sea in shoals. The mean smolt age is 4 years and the mean lengths of smolts is 14-18 cm. At sea salmon is growing 1-5 years. Salmon stocks from smaller tributaries are staying one year at sea before entering the river and stocks from the larger streams, especially female salmon, are entering the river after 2-3 years at sea. In the River Tana annually it is collected together with Norway information on salmon catches by fishing methods, their sea-age distributions and timing of the catch. Juvenile salmon abundance has been studied since 1979, the numbers of salmon ascending into tributaries has been studied with underwater video cameras and sonar. Tana River research programme is based on data collection providing understanding of the dynamics of the spawning stock and recruitment as well as the critical population levels. Monitoring programmes in the River Tana are used to assess spatial and temporal biological trends with emphasis usually on evaluating the efficiency of management policies. Monitoring in the River Tana has been long-term to identify trends in measured variables because salmon stocks in the northern part of its distribution area like in the River Tana system are renewed slowly. Since 2010 there has been official Norwegian-Finnish research group to make annual evaluations on the status of the River Tana salmon stocks and the group has made list for recommended research. GenMix research is analyzing the origin of salmon caught in the River Tana mainstem.

Salmon adaptation and global climate change

Eero Niemelä

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Atlantic salmon is known to be a salmon species that can adapt to temperature changes in the rivers and at sea within certain limits. Example from that adaptation is the reasonable large distribution area of salmon from warm and temperate areas in Spain and France to cold rivers in Norway and in Canada and to extremely cold rivers in North East Canada in Ungawa Bay. The large distribution area and adaptation to various temperature circumstances is a result of long-term development process that has taken place since the smelting period of the last ice age, during the last 8000-10 000 thousand years. Over the thousands of years atmospheric temperatures have changed affecting to the temperatures at sea as well as to the temperatures in the rivers. Temperature changes, getting colder and getting warmer, have taken place along long periods when salmon has had time to adapt to these warm or cold periods. These periods, however, have been occurring and are still today occurring more or less regularly. Many prognosis and measurements from the climate change have been indicating that the changes have taken place nowadays faster than they normally should happen. There is clear indication of the human impacts to the global climate change. Ocean climate impacts on survivorships and growth of Atlantic salmon are very complex. The eastern and western North Atlantic are influenced differently by the subpolar and subtropical gyres, and consequently show differing patterns of decadal variability, but since the early 1970s sea surface temperatures on both sides of the North Atlantic have generally increased. Since the early 1990s, sea surface temperatures throughout most of the North Atlantic has risen markedly. Growth and survivorship of Atlantic salmon clearly are linked to ocean climate variation although the responses are still poorly understood and may differ fundamentally for salmon from the Barents Sea area and salmon from the more southern distribution areas. It is likely, however, that the general patterns of stock decline throughout the North Atlantic region over the past three decades has been a response, at least in part, to global climate change. Atlantic salmon populations are known to have plasticity in their life-history strategies and the temperatures in their environments are controlling their migrations in fresh water and at sea. Changes in the temperatures are controlling the time needed to develop the eggs in their spawning nests, growth of juvenile salmon, smolt ages of salmon, smolt migration period, growth of salmon at sea, timing of the migrations back to home rives for spawning, overall survival in fresh water and at sea. Increased temperatures can affect negatively to the populations of salmon if the competition between other species from food is increasing at the same time in rivers and at sea.

Annex 1. Participants

Name	Organisation
Astrid Daniloff	Sør-Varanger Sea Salmon Fishing Association
Bente Christiansen	County Governor of Finnmark
Bjarne Johansen	Tana and vicinity Sea Salmon Fishing Association
Eero Niemelä	Finnish Game and Fisheries Research Institute - Teno
Gennadiy Ustyuzhinsky	PINRO - Archangelsk
Gro Ween	University of Oslo
Hanne Henriksen	County Governor of Finnmark (translator)
Helge Samuelsen	Tanavassdragets fiskeforvaltning
Håkon Andersen	Finnmark Sea Salmon Fishing Association
Jostein Fløgstad	County Governor of Finnmark
Juha-Pekka Vähä	University of Turku
Karl-Magne Arvola	Neidenelven fiskefelleskap
Kjell Magne Johnsen	Laksebreveierne i Tanavassdraget A/L (LBT) og Tana fiskeforvaltning
Laila Unneland	Institute of Marine Research
Lena Kristiansen	Finnmark Property (FeFo)
Martin Svenning	Norwegian Institute for Nature Research
Mikhail Ozerov	University of Turku - Kevo research station
Morten Johansen	Norwegian Institute for Nature Research
Panu Orell	Finnish Game and Fisheries Research Institute
Paul A. Lutnæs	County Governor of Finnmark
Pentti Pasanen	Centre for Economic Development, Traffic and the Environment
Rogelio Diaz Fernandez	University of Turku
Roy Isaksen	Troms Grunneierlag og sjølakselag (TGS)
Sergey Prusov	PINRO- Murmansk
Steinar Christensen	Finnmark Property (FeFo)
Sturla Brørs	Norwegian Directorate for Nature Management
Tiia Kalske	County Governor of Finnmark
Ulf Ballo	Laksebreveierne i Tanavassdraget A/L (LBT)
Veikko Guttorm	Utsjoki Municipality
Vidar Wennevik	Institute of Marine Research
Viktor Koretsky	The Norther Rivers Company

Annex 2.

Project facts

Programme:

EU Kolarctic ENPI CBC programme – cross-border cooperation

Project title:

Trilateral cooperation on our common resource; the Atlantic salmon in the Barents region (KO197)

Project schedule:

1.1.2011-31.12.2013

Main objectives:

Develop and enhance the management of the shared Atlantic salmon resource in the Barents region; enabling a future adaptive sustainable and knowledge-based harvesting regime. Enable the conservation of the rich fishing traditions and coastal culture of the area and preserves the highly important regional and local socio-economy of the coastal fisheries, and minimizes the mixed stock fishery in areas when needed to preserve declining and vulnerable stocks. The project will merge traditional, local knowledge with new ecological, and genetic salmon research in Norway, Russia and Finland.

Funding:

Total	€ 3 092 729
Norway	€ 1 349 350
Finland	€ 1 349 015
Russia	€ 394 365

The project funding consists of both EU-funding (Kolarctic ENPI CBC) and national funding.

Target groups and beneficiaries:

Ministries, management authorities, national, regional and local authorities (Counties and Municipalities), research institutions, fishers organizations, fishermen (recreational/ professional), International governmental organization (like NASCO, ICES), Indigenous peoples, tourism operators, tourists, local people, NGOs, politicians

Steering group member organizations:

Saami Council	-
Office of the Finnmark County Governor (Chair)	NOR
Norwegian Directorate for Nature Management	NOR
Sea Salmon Fishing Association, Finnmark	NOR
Centre for Economic Development, Traffic and the Environment	FIN
The Sámi Parliament in Finland/ Utsjoki Municipality	FIN
The Northern Rivers Company	RUS
Murmansk Regional Administration, Fisheries Committee	RUS

Project partners and Associates:

Norway: The County Governor of Finnmark (Lead Partner), Institute of Marine Research – Tromsø (IMR) and Norwegian Institute of Nature Research – Tromsø (NINA)
Russia: Knipovich Polar Research Institute of Marine Fisheries and Oceanography – Murmansk and Archangelsk (PINRO). Associates: Karelrybvod - Karelia, Sevrybvod-Archangelsk and Komirybvod - Komi
Finland: University of Turku – The Kevo research station (UTU-Kevo) and Finnish Game and Fisheries Research Institute (FGFRI)

Project staff:

Tiia Kalske	Project coordinator	NOR
Eero Niemelä	Project coordinator	FIN
Sergey Prusov	Project coordinator	RUS

Person in charge:

Bente Christiansen, Office of the Finnmark County Governor NOR

Annex 3. Project fact sheet in four languages

Tre-lands samarbeid om vår felles ressurs; den atlantiske laksen i Barentsregionen 2011-2013 (*"Kolarctic salmon"*)

Norge:
Fylkesmannen i Finnmark
Havforskningsinstituttet
Norsk institutt for naturforskning

Russland:
Institutt for polarforskning, marine fiskerier og oseanografi - Murmansk (PINRO)

Finland:
Finsk vilt- og fiskeriforskning
Universitetet i Turku

Felles natur og naturressurser

Grenseområdene mellom Norge, Russland og Finland har unike naturkvaliteter og naturressurser. Den atlantiske laksen er et symbol på vitale økosystemer og er av merkbar økonomisk og kulturell betydning både gjennom kommersielt fiske og i rekreasjonssammenheng. Fisket etter laks har lange tradisjoner i området, og det knytter seg et rikt samisk språk og et stort antall fiskemetoder og teknikker til disse tradisjonene.

Prosjektet er et samarbeid mellom forvaltning, forskning, laksefiskere og fiskerorganisasjoner i de tre land. Vi vil ta i bruk ny teknologi og utveksle personell, samt arrangere befaringer for å få felles forståelse om fangst, fangstmetoder og fangsttradisjoner i de tre landene.

Mål for prosjektsamarbeidet

- Å utvikle en mer langsiktig forvaltning av atlantisk laks både i sjøen og i elvene.
- Å fremskaffe data til å iverksette et bedre tilpasset, bærekraftig og kunnskapsbasert høstingsregime, samt å ta vare på de rike fisketradisjonene og kystkulturen.
- Å forene erfaringsbasert kunnskap (lokal og tradisjonell) med vitenskapelig kunnskap.
- Prosjektet vil også gi kunnskap om laksens tilpasning til klimaendringer og dens vandringsmønster langs kysten.

Aktiviteter

Vi vil samle inn skjellprøver fra laks langs Norges og Russlands kyster. Innsamlingen skal dekke hele laksens vandringsperiode (slutten av april- til slutten av august). Vi ønsker også å samle inn prøver i perioden september til desember for å finne ut hvor laksen overvintrer i havet, og for å kunne vurdere mengden av rømt oppdrettslaks. Samtidig vil vi også samle inn prøver fra lakseyngel i de mange lakseførende vassdragene i prosjektområdet. De innsamlede prøvene fra fisket langs kysten og fra elvene skal analyseres for arvemateriale (DNA).

Prosjektområdet

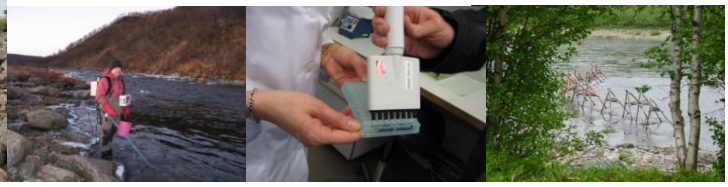
Prosjektområdet strekker seg fra sørvest gjennom Nordland, Troms, Finnmark, Kola, Kvitsjøområdet og til Petchora i nordøst. Dette området har i dag verdens mest vitale laksebestander.

Forventede resultater

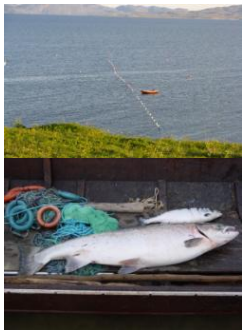
- Resultatene fra prosjektet vil munne ut i anbefalinger om hvordan man kan få en bedre tilpasset og kunnskapsbasert forvaltning av laksen i Barentsregionen.
- Gjennom data om arvematerialet vil vi få kunnskap om hvor hver laks som fanges langs kysten hører hjemme.
- Vandringsmønsteret til de forskjellige laksebestandene blir kartlagt. Mengden av rømt oppdrettslaks blir bestemt og vi vil gi anbefalinger om beskatning av disse. Klimaendringenes innvirkning på laksens vandring blir undersøkt.
- Vi forventer også aktivt samarbeid og dialog mellom forvaltning, ulike forskningsgrener, lokale fiskere og fiskeorganisasjoner. Vi ønsker å føre sammen tradisjonell og lokal kunnskap med vitenskap og forskning.

Finansieringskilde: EUs ENPI CBC program + nasjonale midler

Foto: Eero Nimelä og Eevaliisa Kivilahti



Трехстороннее сотрудничество по нашему общему ресурсу - атлантическому лососю в Баренцевом регионе 2011-2013 («Коларктический лосось»)



Норвегия:
• Офис губернатора провинции Финнмарк
• Институт морских исследований
• Норвежский институт природных исследований
Россия:
• Полярный научно - исследовательский институт рыбного хозяйства и океанографии им. Н.М.Книповича (ПИНРО)
Финляндия:
• Финский исследовательский институт дикой природы и рыбного хозяйства
• Университет г. Турку

Общая природа и природные ресурсы

Пограничные районы между Норвегией, Россией и Финляндией обладают уникальными природными качествами и ресурсами. Атлантический лосось является символом жизненно- важных экосистем и представляет значительное экономическое и культурное значение, как в целях промыслового рыболовства, так и в рекреационных целях. Промысел лосося имеет давние традиции в регионе, эти традиции нашли отражение в богатстве саамского языка и большом количестве рыболовных методов и приемов.

Проект предусматривает взаимодействие между органами власти, научно-исследовательскими организациями, рыбаками и рыболовными организациями трех стран. Мы планируем внедрять новые технологии и обмениваться персоналом, а также проводить инспекции для того, чтобы обеспечить понимание принципов и методов лова, а также традиций семужьего лова в этих трех странах.

Цели проектного сотрудничества

- Разработка более долгосрочного управления ресурсами атлантического лосося в море и в реках.
- Сбор данных для реализации наиболее оптимального, устойчивого и научнообоосновванного лова, а также сохранение богатых традиций рыболовства и прибрежной культуры.
- Сведение эмпирических знаний (местных и традиционных) с научными знаниями.
- Проект также предоставит данные об адаптации лосося к климатическим изменениям и маршрутах миграции лосося вдоль берега.

Мероприятия

Мы намерены собирать пробы чешуи лосося вдоль побережья Норвегии и России. Коллекция будет охватывать весь период миграции лосося (с конца апреля по конец августа). Мы хотим также делать пробы в период с сентября по декабрь для того, чтобы выяснить, где проходят зимовки лосося в океане, чтобы оценить объём беглого выращиваемого лосося. Одновременно с этим мы мы планируем собирать образцы мальков лосося в семужьих реках в регионе, где будет осуществляться проект. Собранные образцы прибрежной и речной рыбы будут проанализированы на предмет генетического материала (ДНК).

Масштаб проекта

Проект охватывает регион, простирающийся с юго-запада через провинции Нурланд, Тромс, Финнмарк, Кольский полуостров, Белое море к Печоре на северо-востоке. В этом регионе на сегодняшний день находятся наиболее важные лососьи стаи в мире.

Ожидаемые результаты

- Результаты проекта будут отражены в рекомендациях о том, каким образом создать наиболее оптимальное и научнообоснованное управление ресурсами лосося в Баренцевом регионе.
- Посредством данных о генетическом материале мы узнаем, откуда родом лосось, вылавливаемый вдоль побережья.
- Планируется обозначить миграционные маршруты различных лососьих стай. Объем беглого искуственного лосося будет также обозначен, и мы составим рекомендации по его вылову. Будет также исследовано влияние климатических изменений на миграцию лосося.
- Мы также рассчитываем на активное сотрудничество и диалог между органами власти, научно-исследовательскими организациями, рыбаками и рыболовными организациями. Мы хотим объединить традиционные и местные знания с наукой и исследованиями.

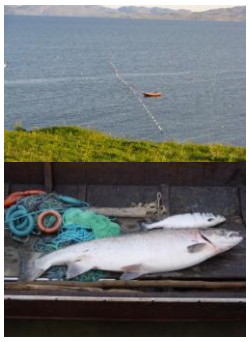
Источник финансирования: Программа ЕС Европейский инструмент соседства и партнерства (ENPI CBC) + национальное финансирование

Фото: Еерo Ниемеля и Еевалииса Кивилахти

Kolarctic ENPI CBC | CROSS-BORDER COOPERATION

Kolmen maan hanke yhteisestä luonnonvarastamme; Atlantin lohi Barentsin alueella

(”*Kolarctic salmon 2011-2013*”)



Norja:
Finnmarkin lääninhallitus
Merentutkimuslaitos - Tromsø
Norjan luonnontutkimuslaitos - Tromsø

Venäjä:
Napa-alueiden, merikalastuksen ja merentutkimuksen tutkimuslaitos - Murmansk (PINRO)

Suomi:
Riista- ja kalatalouden tutkimuslaitos – Tenojoen tutkimusasema
Turun yliopisto – Kevon tutkimusasema

Yhteinen luonto ja luonnonvarat

Norjan, Venäjän ja Suomen väliset raja-alueet ovat ainutlaatuisia luontoarvoiltaan ja -varoiltaan. Atlantin lohi on turmeltumattoman vesiluonnon vertauskuva ja sillä on merkittävää taloudellista ja kulttureIlista merkitystä ammattimaiselle kalastukselle sekä vapaa-ajan kalastukselle. Lohenkalastuksella tällä alueella on pitkät perinteet ja siihen liittyy rikas saamenkielinen sanasto ja näihin perinteisiin kuuluu suuri lukumäärä erilaisia pyyntimenetelmiä.

Hanke on hallinnon, tutkimuksen, lohenkalastajien ja kalastusjärjestöjen välistä yhteistyötä kolmessa maassa. Hyödynnämme uutta teknologiaa, mahdollistamme työskentelyn toistemme laitoksissa sekä järjestämme tutustumismatkoja kolmessa maassa saavuttaaksemme yhteisymmärryksen lohen näytteenottopyynnin järjestelyistä, pyyntimenetelmistä ja pyyntiperinteistä.

Hankeyhteistyön tavoitteet

• Yhtenäistää ja kehittää pitkäaikaisempi lohikantojen hoito-ohjelma mereen ja jokiin.

• Hankkia tietoa kestävän ja tietoon perustuvan hyödyntämisohjeen aikaansaamiseksi ottamalla huomioon rikkaat kalastusperinteet ja rannikon kulttuuri.

• Yhdistää kalastajien kokemusperäiset tiedot (paikallinen ja perinteinen) tutkimuksen tietoon.

• Hanke lisää tietoa lohen sopeutumisesta ilmastonmuutokseen sekä sen vaikutuksesta lohen vaelluskäyttäytymiseen rannikolla.

Toiminnot

Lohen suomunäytteitä hankitaan Norjan ja Venäjän rannikon pyynnistä. Näytteitä hankitaan lohen koko vaellusajalta (huhtikuun lopulta elokuun lopulle). Pyrimme hankkimaan näytteitä rannikolta myös syyskuun-joulukuun ajalta löytääksemme alueet, missä osa lohista talvehtii, ja voidaksemme arvioida kassikasvatuksesta karanneiden lohien määriä. Keräämme myös lohenpoikasista näytteitä projektialueen lukuisista joista. Rannikon kalastuksessa saaduista suomunäytteistä sekä jokipoikasista saaduista näytteistä tutkitaan niiden perinnölliset piirteet (DNA).

Hankealue

Hankkeen alue ulottuu lounaassa olevasta Nordlandin läänistä, Tromssan, Finnmarkin, Kuolan ja Vienanmeren alueiden kautta Petchoran alueelle koilliseen. Tällä alueella elää osa maailman elinvoimaisimmista lohikannoista.

Odotetut tulokset

• Hankkeen tuloksilla voidaan aikaansaada paremmin nykyoloihin sopeutuva ja moneen eri tietolähteeseen perustuva lohenpyynnin säätely Barentsin alueella.

• Geneettiset analyysit kertovat, minkä alueen tai minkä joen kantoihin pyynti rannikolla kohdistuu. Tiedolla myös laaditaan yksityiskohtainen geenikartta alueen lohikannoista.

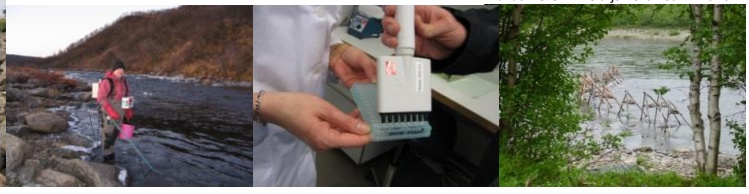
• Eri lohikantojen vaellusmallit kartoitetaan. Kassikasvatuksesta karanneiden lohien määrät arvioidaan ja niiden pyyntiin annetaan suositukset.

• Ilmaston muutoksen vaikutukset lohien vaellusajankohtiin tutkitaan.

• Odotamme aktiivista yhteistyötä ja vuoropuhelua hallinnon, eri tutkimusryhmien ja -alojen, paikallisten kalastajien ja kalastusjärjestöjen välille. Haluamme liittää yhteen perinteisen ja paikallisen tiedon sekä tutkimuksellisen tiedon ja nykyaikaisen tieteen.

Rahoituslähteet: EU:n ENPI CBC ohjelma + kansalliset rahoitukset

Kuvat: Eero Nimelä ja Eevaliisa Kivilahti



Kolarctic
ENPI CBC | CROSS-BORDER COOPERATION

Trilateral cooperation on our common resource; the Atlantic salmon in the Barents region ("*Kolarctic salmon 2011-2013*")

Norway:
The County Governor of Finnmark
Institute of Marine Research
Norwegian Institute for Nature Research

Russia:
Polar Research Institute of Marine Fisheries and Oceanography - Murmansk (PINRO)

Finland:
Finnish Game and Fisheries Research Institute
University of Turku – Kevo Research Station

A common heritage and natural resource

Border areas between Norway, Russia and Finland have unique natural qualities and natural resources. The Atlantic salmon is a symbol of healthy and vital ecosystems and is of significant economic and cultural importance, both through commercial and recreational fishing. Fishing for Atlantic salmon has a long tradition in the area, as evidenced by a unique vocabulary about the species in the Sami language, and the existence of a large number of traditional fishing methods and techniques.

The project is a joint venture between management, research, salmon fishing organizations and salmon fishermen in the participating countries. We will merge modern research technologies and traditional knowledge.

Aims of the project

• To develop an integrated, long-term management of Atlantic salmon in the sea and in the rivers.
• To provide data to implement customized, sustainable, knowledge-based harvesting regimes, and to preserve the rich traditions of fishing and coastal culture.
• To unite empirical knowledge (local and traditional) with scientific knowledge.
• To provide synthesized and new knowledge about Atlantic salmon, its adaptation to climate change and its migration along the coast.

Activities

We will collect adult salmon scale samples from salmon fisheries along the Norwegian and Russian coasts. The collection will cover most of the salmon migration period (late April to late August). We also intend to collect samples during the period September to December to ascertain where the salmon spend their winters in the ocean, and to assess the incidence of escaped famed salmon. Samples of juvenile salmon will also be collected from the many salmon rivers in the project area, to construct a so called genetic baseline map of salmon populations in the study area. The collected salmon samples will be analyzed using molecular genetics techniques (DNA) to establish the origin river of the captured salmon as well as the evolutionary history and relatedness of the salmon populations in the region.

The project area

The project area encompasses areas from the southwest county of Nordland through Troms, Finnmark, the Kola Peninsula, the White Sea to the Petchora area in the northeast. This region is home to some of the world's pristine and important Atlantic salmon stocks.

Expected results

• Results from the project will generate recommendations on how to provide a more sustainable, knowledge-based management of salmon stocks in the Barents region.
• Results from the DNA analysis, will provide genetic tags for individual stocks and assist in tracing the river of origin of individual salmon caught along the coast. It will also facilitate the creation of a unique gene map of the northern salmon stocks.
• Migratory patterns in time and space of the various salmon stocks will be mapped.
• The numbers of escaped farmed salmon will be systematically identified, and the information used to make recommendations on dealing with these.
• We will provide indications of the impacts of climate change on Atlantic salmon of this region.
• We will also leave a legacy of active cooperation and dialogue among management, various research disciplines, local fishermen and fishing organizations. We want to bring together traditional and local knowledge with modern science and research.

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Photos: Eero Nimelä and Eevaliisa Kivilahti

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