“Restoration of freshwater pearl mussel populations with new methods”
– an EU Interreg project in northern Fennoscandia

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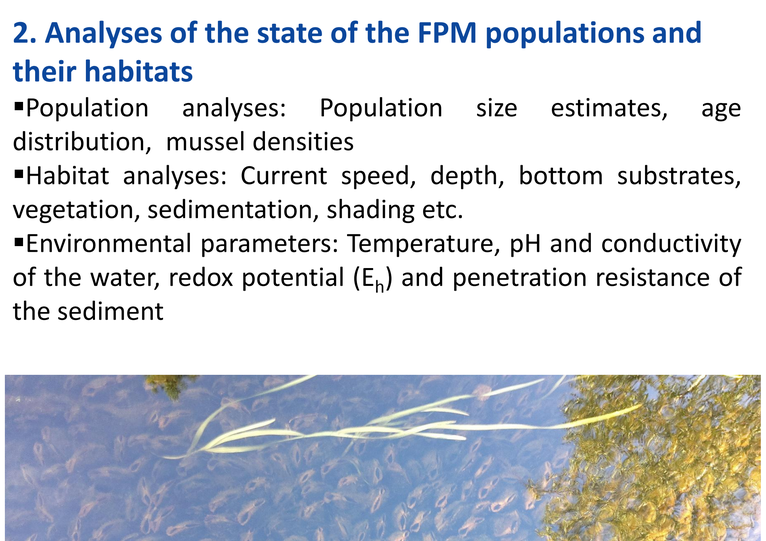
Project area



Measuring redox potential from river sediment

Background

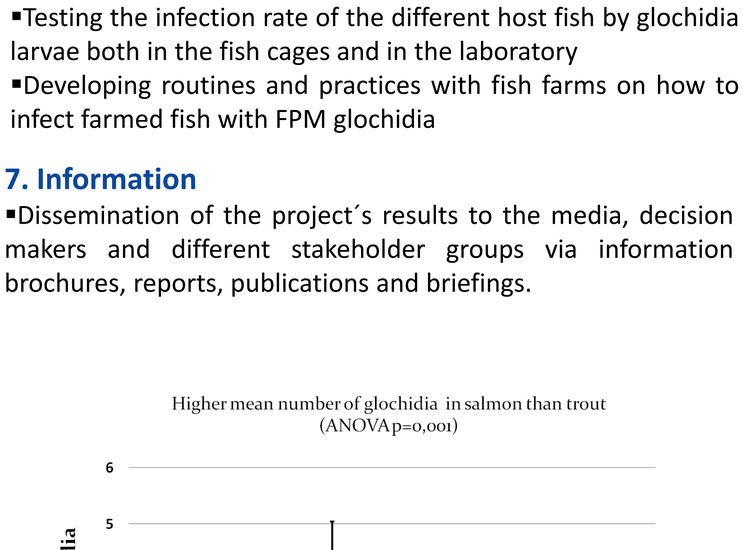
In 2003-2008, the distribution and state of the freshwater pearl mussel (*Margaritifera margaritifera*, later FPM) populations was studied in two Interreg projects in the North-Calotte region. In 2003-2006, the presence of FPM populations was studied in old pearl-fishing areas in northern Finland, Norway and Russia (Oulasvirta et al. 2006, Oulasvirta 2010) In 2007-2008, the inventories were carried out in the Tornionjoki river basin in Finland and Sweden (Oulasvirta et al. 2008). The results of these studies revealed big differences in the state of the populations both between the catchment areas and between the different rivers inside a catchment area. Although FPM was found from many historical pearl fishing sites, the recruitment was often low or totally lacking even in remote wilderness areas. In our present project we aim to find out the reasons for the poor state of the FPM populations in different water courses as well as to find methods to restore the declined populations in northern Finland, Sweden and Norway. The project started in June 2011 and will last until the end of May 2014.

Detecting glochidias from electro fished fish

Objectives

The main objectives of the project are to:

- Find out the reasons why FPM populations are declining in many northern water courses
- Develop and test methods how to restore the declining and non-breeding populations
- Provide updated information on the conservation and management of FPM populations for those target groups who are involved with the management of river environment or whose decisions or activities may influence on the state of the rivers
- Widen and deepen the Nordic cross-border co-operation between the authorities and research institutes and to develop this co-operation towards concrete measures to restore the declining populations



In situ caging experiments with different host fish species

Project activities

The project activities are divided into seven different work packages :

1. Network

- Widening and deepening of the Nordic co-operation between experts and institutes involved with the FPM management and conservation work
- Promoting the exchange of information and experiences across the nation borders

2. Analyses of the state of the FPM populations and their habitats

- Population analyses: Population size estimates, age distribution, mussel densities
- Habitat analyses: Current speed, depth, bottom substrates, vegetation, sedimentation, shading etc.
- Environmental parameters: Temperature, pH and conductivity of the water, redox potential (E_h) and penetration resistance of the sediment

More than 1000 mussels m^{-2} in a northern Finland river

3. Toxicological studies

- Analyses of heavy metals and toxic substancies from the water, sediment and mussel shells

4. Genetic analyses

- Assessment of the genetic structure and diversity of the populations
- Comparison of the genetic diversity between populations which in their breeding are depending on salmon or brown trout and to study the potential genetic host fish dependence.
- Comparison of the genetic diversity of populations with recruitment vs. no recruitment

5. Searching for new populations

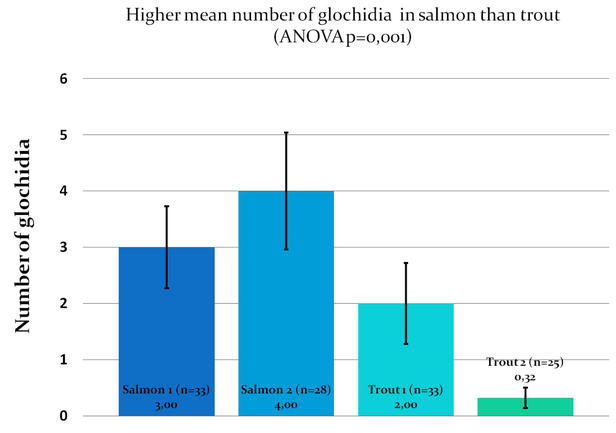
- Development of the method to detect FPM populations based on the inspection of glochidia infection from the host fish gills
- Searching of new populations by electro fishing of FPM host fish

6. Experiments with host fish and juvenile mussel cultivation

- Developing methods to artificially infect host fish both *in situ* in fish cages and in the laboratory
- Developing methods to cultivate juvenile mussels in the laboratory and thereafter plant them into the river
- Testing the infection rate of the different host fish by glochidia larvae both in the fish cages and in the laboratory
- Developing routines and practices with fish farms on how to infect farmed fish with FPM glochidia

7. Information

- Dissemination of the project´s results to the media, decision makers and different stakeholder groups via information brochures, reports, publications and briefings.



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Partners and financing

Co-operating partners in the project are Metsähallitus, Natural Heritage Services of Lapland (lead partner), Natural Heritage Services of Ostrabothnia, Lapland Centre for Economic Development, Transport and the Environment, University of Jyväskylä, Bioforsk Svanhovd, Bioforsk Holt, Norwegian Institute for Nature Research NINA, Akvaplan-niva and County Administrative Board of Norrbotten. The project is partly financed by the European Union Interreg IV A North program. The other financers are the project partners. In Norway the project is also funded by NVE Norwegian Water Resources and Energy Directorate, County Governor of Northern Trondelag and Norwegian Directorate for Nature Management.

County Administrative Board of Norrbotten