

Living North Sea

Fish migration... from sea to source

Newsletter



The 15 Living North Sea partners have been working together for over two years now to improve fish habitats and migration in the North Sea region. In addition to the local efforts they are making, this project allows the partners to tackle problems on a larger scale. This will always remain necessary, as fish do not observe national borders. The partners jointly survey fish populations and their migration routes, identify problem areas and implement solutions. Information is documented using a web-based Geographical Information System (GIS).

Numerous projects have been launched. This newsletter describes some of these initiatives. You can find more information at www.livingnorthsea.eu.



The Interreg IVB
North Sea Region
Programme



*Investing in the future by working together
for a sustainable and competitive region*

European Union



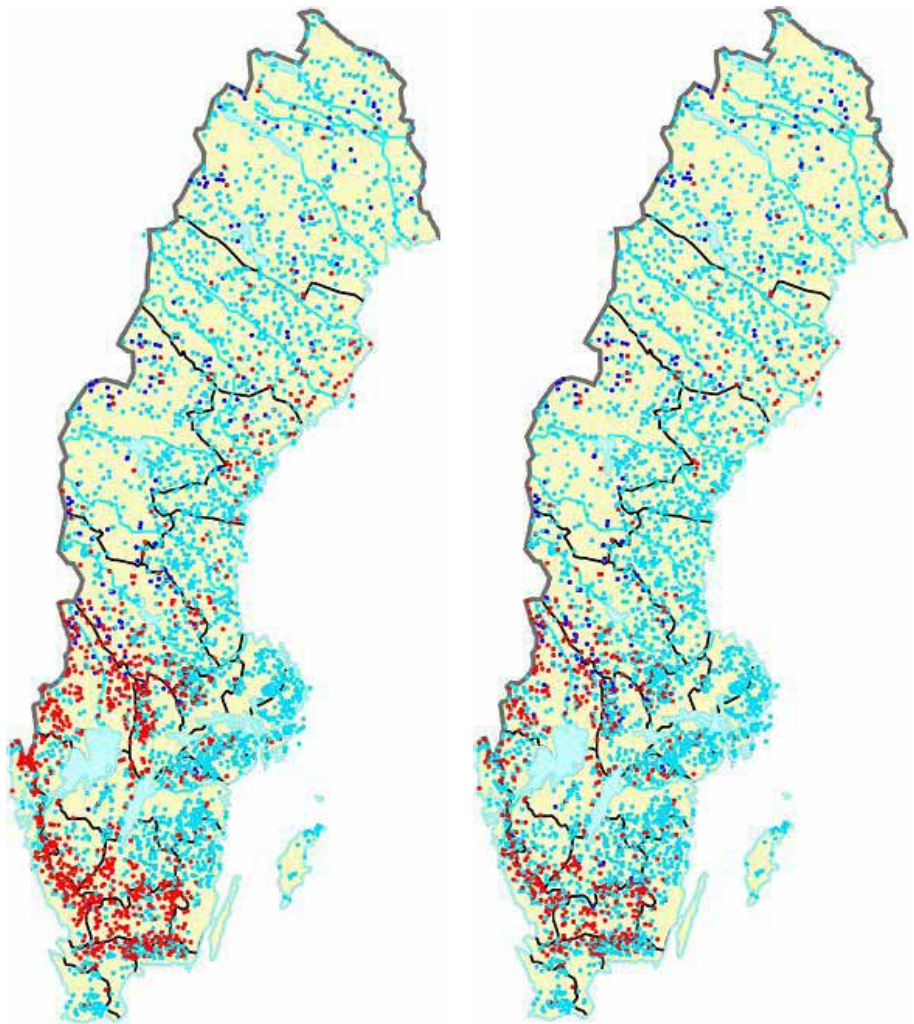
The European Regional Development Fund

Sweden's acidified lakes

The lakes of southwest Sweden are acidified to such an extent that the ecosystem has been damaged and sensitive fish species like salmon, trout and lamprey are barely able to survive in them. This upsets many Swedes, and not only conservationists. Tourists who like to fish on holidays are restricted to limed lakes in the area, so local residents are also feeling it in their pockets.

Toxic banana

Ash particles and acid rain are the villains of the piece. Humans are the root cause. Airborne soot, carbon and oil particles from all over Europe are deposited in Scandinavia. The bedrock in southwest Sweden contains little calcium and magnesium, which act as a natural buffer against acid rain. The damage in this area has been particularly bad. The Swedes call the affected area the 'toxic banana'.



Sweden before and after liming 1990
(source: Sveriges National Atlas)

Liming acidified lakes in Sweden



The 256 lakes of Falkenburg

Ingemar Alenäs has devoted his entire working life to acidified lakes. As a researcher at the Environmental Research Institute, he explored the effects of adding lime to the water. Now, as project manager at Falkenburg municipality, he actually applies the technique. 'We have 256 lakes in our district,' he says. 'Almost all of them are acidified. We've added lime to about 130. We can neutralise the acidification by adding lime with boats, helicopters and lime dosers into the lakes and running waters.'

Ingemar explains that emissions have been reduced and the effects of acid rain is no longer as bad as it used to be. 'But the damage has been done. It will take decades to fully recover. Until then we will have to continue adding lime to the water.'

Support from Living North Sea

The Swedish government has given Falkenburg funding to add lime to 130 lakes. 'Thanks to our participation in Living North Sea, we also get money from the EU, so we can tackle more lakes not dealt with in the Swedish liming programme. This autumn we will be adding lime to a further ten lakes to achieve good ecological status,' Ingemar proudly tells us.

Project Living North Sea has been helping in other ways too. 'We are now able to research the possibility of using another type of lime to make the technique more effective,' Ingemar adds. 'You'll see, our lakes will soon be full of fish again.'

European trout under the microscope



Sea trout are not all the same, as proved by a study led by Dorte Bekkevold, senior scientific researcher at the Technical University of Denmark's DTU Aqua institute. She puts trout under the metaphorical microscope. 'The genetic profile of a trout can even differ from one stream to another,' she explains. 'Trout are highly adapted to their environment.'

Best match

Earlier studies of the genetic profile of trout typically 'mapped' the fish on the basis of eight to ten genetic properties. In her research, Dorte used no fewer than 4200 properties. 'That allowed us to identify the conditions in which each trout "strain" thrives,' she explains. 'This helps us understand trout better and for

example achieve a much better match if we need to release trout to rebuild a population. If the water in the river is very cold, for example, it is important to release a strain that is adapted to cold conditions.'

'A lot of farmed strains have been released in the past. These fish were lacking certain genetic properties that they needed to survive in the wild. So what happened? They didn't make it. Or they spawned with wild trout, creating weaker offspring that makes the strain much more vulnerable.'

'Billion euro industry'

Trout play a key role in the ecosystem and in the food chain. But it is also

important for the economy that the trout population remains healthy. The tourist industry benefits if fishing is good. 'It's a billion euro industry,' says Dorte. 'The research will allow us to keep trout stocks up in a good, sustainable way. It is providing a very reliable, solid dataset that will enable us to answer complex questions about trout, like how they migrate, and what they do.'

Dorte is currently analysing the adult samples from major rivers in the North Sea region. The analysis is being funded by Living North Sea. 'But the partner network is just as important,' she says. 'We exchange knowledge, and I also get samples and important information about different populations for my statistical analyses.'

Danish hospitality at full partner meeting

All project partners meet twice a year to talk about the status of the project, exchange knowledge and visit sites where



Electric fishing demonstration during excursion full partner meeting

solutions have been put into practice. In spring 2011 the partners went to Odense in Denmark. Host Jan Hald Kjeldsen, Seatrout Fyn project manager at Odense local authority, looks back with pleasure on a successful meeting.

'It's very useful to get together now and again,' he says. 'Some things are just easier to discuss face to face than on the telephone. Plus, if you know people, it's much easier to pick up the phone and call them.' For Jan, the highlight of the meeting was the excursion. 'A lot of knowledge and experiences get shared

during an excursion. We showed our visitors a number of demo sites. Some where a solution has already been put into practice, and also one place where we are planning to remove a dam. That was an inspiring visit, judging by the partners' reactions.'

The meeting in Odense was attended by the director of the Interreg IVb programme, which includes Living North Sea. 'He seemed very pleased with our progress and was definitely interested in our activities. It was really nice to have him there,' concludes Jan.



Small change, big difference

Peter Paul Schollema, who works as an ecologist at Hunze en Aa's water board, is involved in the Living North Sea tidal barriers working group. He explains that barriers differ from one country to another. In Britain, for example, there are lots of tidal flap gates in rivers. The Netherlands mainly has locks with vertical lift gates. 'But we can still learn from each other,' he points out.

Operating locks

He adds – not without pride – that the Netherlands is a model for solutions to promote freshwater-saltwater migration in polder areas. 'A large part of our country lies below sea level, so we cannot often use gravity flow to help fish on their way to the hinterland,' he explains. 'Northern Germany, Belgium and eastern England have the same problem, and they are now looking to us to some extent. We have had good results from changing the way we operate locks. Smelt and three-spined stickleback have been spotted up to 30 km inland again!'

In the past, lock gates were fully opened when the water level in the sea was lower, to drain as much water as possible as quickly as possible. This produced very strong currents and the doors were closed when the sea level was still much lower than the freshwater level. The fish hadn't a hope of getting past the locks. 'But you can do things differently,' says Peter Paul. 'At the sluice at Nieuwe Statenzijl we only open one of the four gates. The fish collect in front of the gates and when the water level in the sea and the inland water is the same, they can continue happily on their way.'

Good balance

'When the water levels are the same the gates are only left open for 10-15 minutes,' he continues. 'Of course you don't want to let too much brackish water in. Our water quality monitoring indicates that, thanks partly to a generous line of inclination, the water mixes so well that the salt content is negligible. Things are actually no different than they were in the past, when the gates were continually

operated by lockkeepers. They also often had fishing rights and they frequently left the gates open a little longer so fish could pass through. It was all in their own interests, of course, but the fish benefited too. Locks also tended to be made of wood. Lots of young fish managed to slip through the gaps, sometimes helped by a small plank placed between the lock gates. With modern technology and materials, watercourses are hermetically sealed these days. So changing the way we operate locks is a necessity, not a luxury. That's why it's nice to see it happening in a number of places,' Peter Paul concludes.



INBO (Belgium): catching fish for public display



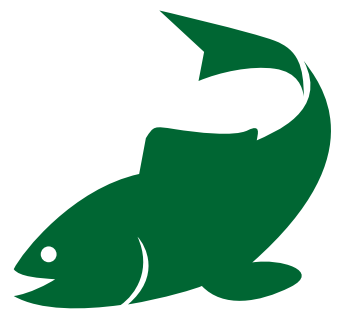
Noorderzijvest (Holland): colouring fish



Johan Heinrich von Thunen Institute (Germany): introduction of workshop about migratory fish in Northern Germany



Fish Migration Day



The first ever international Fish Migration Day – a Living North Sea initiative – took place on 14 May 2011. The day was marked with public events at 26 locations in Europe where visitors could explore the world of fish. What prompts fish to move to another area? What problems do they encounter during their journey? And, above all, how can we help them reach their spawning and nursery grounds?

Angling association 'Sportvisserij Nederland' coordinated the day and helped the partners by developing a website, as well as promotional and educational material. 'I think we can really say it was a success,' says Niels Brevé, project manager at Sportvisserij Nederland. 'Some 5000 people visited an event, though numbers varied widely between locations. But it's not only the number of visitors that determines the success of an event. In Britain the BBC broadcast an item about the day. Millions of British viewers – that really is a lot of publicity!'

Details left to participants

The details of the day were left to the participants. 'We spread our fyke nets behind the IJzerspuien in Nieuwpoort and put the fish we caught on display in aquariums so that we could tell the public about them,' says Ans Mouton of the Research Institute for Nature and Forest (INBO) in Belgium. 'The 150 participants were all positive, as were the national newspaper and national radio.'

'We got together with Hunze en Aas regional water authority and the regional angling association and organised an open day at fish ladders in two locations,' says Silvia Mosterd of Noorderzijvest regional water authority in the Netherlands. 'We had activities for both young and old. Thanks to the enthusiasm of my colleagues and over 600 visitors, we had a fun, relaxed and educational day.'

'We organised a workshop: 'Migratory Fish in Northern Germany – Status, Problems, Projects', says Klaus Wysujack of the Institute for Fisheries Ecology (Johann Heinrich von Thünen-Institute) in Germany. 'The participants listened to 7 interesting presentations about different aspects of six migratory fish species in northern Germany. There were fruitful discussions and a very positive feedback. It is intended to publish a special issue of the journal 'Informationen aus der Fischereiforschung' with articles from the presentations.'



Exchanging knowledge ‘on the spot’

In March this year ecologists, water managers and pumping station designers spent three days visiting some 16 pumping stations and locks in the Netherlands and Belgium. Together, they inspected fish ladders and discussed problem cases: engineering works where there is no fish-friendly solution as yet, or where what has been put in place has failed to help. Experts from various disciplines had interesting and useful discussions.

Waternet was one of the hosts. ‘It was simply inspiring,’ ecologist Jacques

van Alphen tells us. ‘And much more educational than a book. It also led to some tangible results. We visited a number of engineering works in our district where specific ideas were put forward on location for ways of improving the situation for fish. The pros and cons were discussed, everyone contributed, and we have now adapted the eel ladder, which did not work before. We will shortly be testing a bypass at one of our pumping stations, too. That was another solution the experts came up with during the excursion.’



Ely the Eel

Hunze en Aas water board has developed Ali.P, a computer game in which a courageous eel travels from the Sargasso Sea to the Netherlands and back. It’s a tense, difficult journey full of danger and obstacles. An English-language version of the game was launched to mark Fish Migration Day on 14 May.

The game teaches players about the dangers Ely faces, the pumps and locks which she and her fellow eels have to pass, water pollution, silver eel fishing, their search for food. At the same time she has to ensure that she does not get eaten. Click on the link below, play the game and discover how we can make life a little easier for eels.

www.elyeel.eu

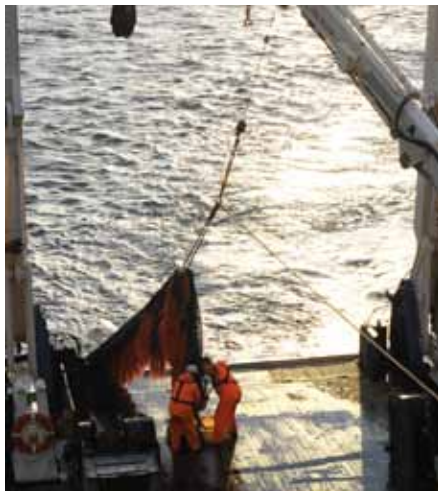


Scallops reveal trout migration route

How does a study of scallop tissue tie in with a project about fish migration? Barry Bendall, a scientist at the Centre for Environment, Fisheries & Aquaculture Science (Cefas) in the UK explains: 'Carbon (^{13}C) and nitrogen (^{15}N) are abundant in plant and animal tissue. The same is true of scallops. Perhaps nothing too exciting about that, but the quantity of these substances they absorb differs from one habitat to another. The isotopic composition of these shellfish tells us about the isotopic 'landscape' of the North Sea. And that can help reveal where trout migrate to once they leave our inland waters and enter the sea.'

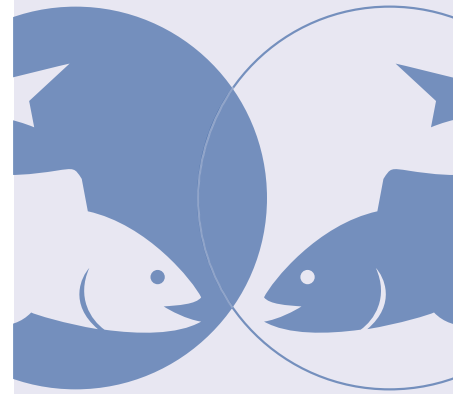
Analysis

Cefas and colleagues at the Institute for Marine Resources and Ecosystems Studies (IMARES) in the Netherlands, have been collecting scallop samples and analysis is underway. The next step will be to study scale tissue from the trout themselves. 'That will allow us to identify where they have been feeding,' Barry explains. 'And that may well produce some surprising results. We know very little about the behaviour of trout at sea, so we also know very little about how best to manage the populations. Once we have a better idea of their migratory routes and marine feeding grounds we can for instance incorporate this into decisions relating to maritime and coastal planning.'



Several studies produce one picture. 'Results from various LNS projects can be compared,' says Barry. In addition to the isotope analysis we are also collecting and analysing data from historical and current mark/recapture studies in the North Sea region, but we can also compare our results with those obtained from the genetic analysis being done by DTU Aqua in Denmark.'

What makes this project unique is that the researchers have deliberately sought close collaboration at various levels. 'We are working with LNS partners, the Celtic Sea Trout project and the AARC project,' says Barry. 'And that's precisely the strong point of transnational projects: pooling knowledge, resources and experience, that's what really gets results.'



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