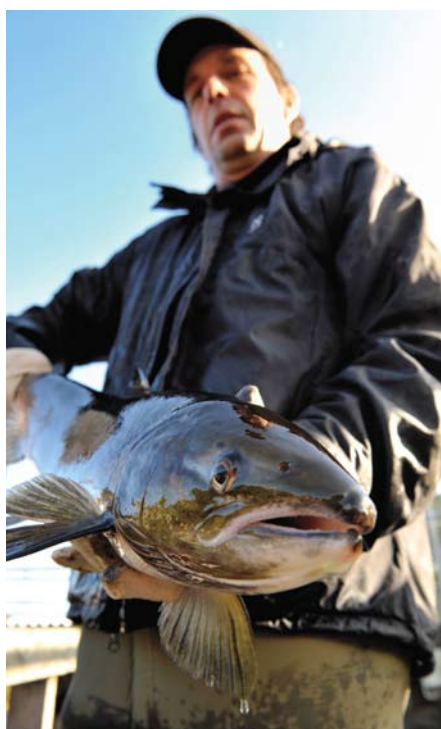


## Living North Sea

*Fish migration... from sea to source*

# Newsletter

**Working together for healthy fish stocks in the North Sea region**



Fish need to migrate both to breed and feed, in order to fulfill their life cycle. Species like sea trout and river lamprey migrate between the North Sea and freshwater rivers and lakes, possibly in more than one country. Some species like eel and salmon even cross whole oceans. These migrating fish are threatened by human activity in the North Sea region countries. Marine and freshwater ecosystems are threatened by pollution and habitat loss, and we have built thousands of barriers across rivers and estuaries for flood management, renewable energy generation, and land reclamation. Climate change and human development makes this an increasing and critical threat for migratory fish in the North Sea region. Measures and cooperation between stakeholders in multiple countries are needed to change the tide and to restore migratory fish stocks in the North Sea region.

### **The Living North Sea project**

Countries in the North Sea region not only share fish stocks, but also the problems these fish face. Problems that are often dealt with on a local level but could be better tackled at a North Sea scale. Thus

fifteen organisations from the seven North Sea countries started the Living North Sea project. The project includes government agencies, universities and non-government organisations working at all levels of society. Participants of this partnership will work together until the end of 2012 to map populations, map migratory routes, identify and find solutions for critical problems. Information will be documented and recorded in a web based Geographic Information System (GIS); a digital map and library, which will be accessible to all who are interested via [www.livingnorthsea.eu](http://www.livingnorthsea.eu), so that knowledge and solutions are shared between countries and sectors outside of fisheries and nature management. Throughout the project, a number of innovative solutions to key migratory fish problems will be identified and demonstrated. This may include new types of fish passage or building fish friendly pumping stations. New techniques will be used and international experiences shared within and outside of the partnership. Project partners will prioritise important geographic areas for key species, and identify the scale of different problems across the North Sea region to inform future policy on barriers to migratory fish.

**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

## Integrated Coastal Zone Management

The activities initiated within the project will contribute to sustainable management of the coastal zone of the North Sea region. The project will result in a series of attuned measures within the partner countries and better co-operation between management authorities in neighbouring countries in the future.

The aim of the project is the realisation of long-term changes in management and policy so that we can preserve an abundance of migrating fish species that are so important to our environment, culture and economy, on a local, regional and international level.



# INTERREG North Sea Programme

The Living North Sea project is an INTERREG IVB project in the North Sea Region Programme. The seven North Sea Region Programme countries are Sweden, Denmark, Germany, the Netherlands, the Flemish Region of Belgium, the UK and Norway. The Programme is financed through the European Regional Development Fund (ERDF), a Norwegian equivalent and contributions from all of the countries involved. The areas in the region share many of the same problems and challenges. By working together and sharing knowledge and experiences it is hoped that a sustainable and balanced future will be secured for the whole region.

Source: [www.northsearegion.eu](http://www.northsearegion.eu)

## Project launch

The INTERREG project Living North Sea was officially launched on the 26th March 2010. Hosting partner INBO, the Institute for Nature and Forest Research in Belgium, welcomed some hundred guests at a pumping station in Ertvelde, Belgium. As they watched the representative of the Flemish minister of Environment, Nature and Culture, Mrs. Lauwaart, symbolically set free three hundred glass eels, the attendees were witnessing a serious and shocking problem migratory fish face swimming along the canal between Gent and Terneuzen, passing Ertvelde. Only a mere 5% of fish survive when passing this propeller pumping station. That day a promise was made that the released glass eel, when all grown up, would be able to pass the pumping station without risk. The persons present all realised that it will take a lot of work and effort to realise that fish species, such as the eel, can migrate safely up and down



Attendees of the project launch in Belgium

stream. During the following boat trip down the canal 'Gent-Terneuzen' various speakers, including Mrs. Schemdtje of DG Environment, Mr. Theophilou of DG Mare and Mrs. Lauwaart of the Flemish department of Environment, Nature and Culture, underlined the importance of free fish migration and objectives of the Living North Sea project.





Where does it come from, where does it go?

# Pan, Zoom and Querying LNS data and information: the Web-GIS

## Mr. David R. Green of the University of Aberdeen, United Kingdom

One of the key objectives of the Living North Sea project is to share knowledge between countries and sectors, on populations and migratory fish routes. Internet technology has provided rapid and easy access to multiple and disparate sources of information in many different formats including, texts, images, video, sound and maps. Google Maps and Google Earth are two well-known examples. Much of the data and information associated with the Living North Sea project also has a spatial dimension. That is why David R. Green and his colleagues Shirisha Karnam and Guillaume De La Fons at the Center for Marine and Coastal Zone Management of the University of Aberdeen are working on a web-GIS for the Living North Sea project.

### Interactive map

David R. Green explains: "A web-based Geographical Information System (GIS) provides the opportunity to make spatial information widely available to the public, government, education and commercial organizations. It also provides a powerful means to access spatial information with the added functionality to pan, zoom and

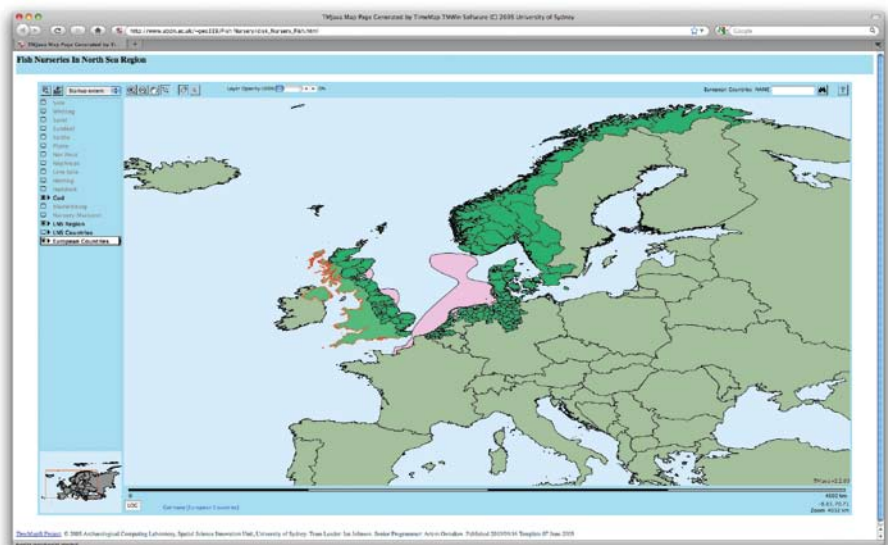
query the information. An interactive map so to speak. Using the GIS portal people can easily access maps related to fish species distribution, migration, river barriers and migratory patterns in the North Sea region.

Access to this information is important for a number of reasons. We want to provide scientists and researchers with a data and information 'store' and resources and also to facilitate educators in schools, colleges and universities with a source of data and

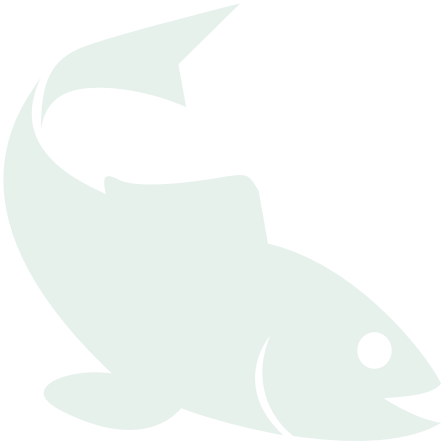
information for teaching and research. Last but not least, to provide the public with access to map-based information for planning and decision-making".

### Ongoing development

The Web-GIS is an ongoing element of the Living North Sea project. Datasets provided by the partners of the project are being prepared to input to the Web-GIS. The portal is publicly accessible through the website [www.livingnorthsea.eu](http://www.livingnorthsea.eu).



An example of spatial represented fish distribution



An eel in its transparent, postlarval stage, called glass eel.

# Simple solution, high results



## Mr. Ans Mouton of INBO, Belgium

On August 4th 1914 German troops invaded Belgium. Being no match for the mighty German military force the small and badly equipped Belgium army was forced to take a vigorous measure. In a last desperate attempt to stop the German's march, the Belgium army command flooded the Iron flat, an empoldered area lying behind the nation's only estuary belonging to the River IJzer (iron). This action led to the German retreat.

## Historical monument

Playing an important part of Belgium's history, the sluice complex of the Iron flat is now an historical monument. Ans Mouton, project leader of Aquatic Management at the Belgian Research Institute for Nature and Forest INBO explains why this is a problem for migratory fish: "The Iron flat mainly exists of polders. At low tide the sluices are opened to discharge water from the polder canals to sea. At high tide they are closed in order to prevent salt water invading the inward agricultural land. When the doors are closed fish cannot pass. The sluices however are of high historical value. No adjustments are allowed, so building a fish passage for example is not an option".

## Goose foot

To the question why a fish passage would be desirable, Mouton answers: "Eel is considered to be one of the most threatened European fish species. The limitation of migration upstream is considered to be a critical factor. One of

the most important inlets in Flanders is the six forked estuary of river IJzer, also called 'Goose foot'".

## 125 x more eel

Mouton continues: "We had a simple and cost effective solution in mind. But first we needed to research what exactly the impact of these artificial barriers were on glass eel. We wanted to find out what were the real number of migratory glass eels, if the eel had a preference for one of the six forks of the estuary and what the effect was if we continuously opened the sluice doors during the migrating season by ten centimeters".

The results were astonishing. "Per tide cycle on average 500 glass eel pass. When the sluice doors are closed only three or four glass eels swim through the cracks. In the past we thought those cracks offered enough space to pass. Now it turns out they're not". INBO also investigated whether or not opening a second sluice would mean a doubling of passing glass eels. "It was not a given fact. It could also be that most eel were attracted to that opened sluice and that the effect of opening a second was insignificant. But that was not the case. The numbers doubled!"

The solution might work for other migratory fish and shrimp as well. INBO is currently researching whether this is the case and what that means for the period in which the sluice doors are opened.



Lift net sampling near a sluice in 'Goose foot' during upcoming tide.



Pumping station Noordpolderzijl (the Netherlands), one of the three fish pass projects.



# Improving fish migration asks for creativity

## Mr. Jeroen Huisman of Regional Water Authority Noorderzijlvest, the Netherlands

For the past forty years we have 'perfected' water management. But perfection has a downside. Our 'water measures', such as dikes, dams, sluices and pumping stations, have a negative effect on the ecology. These manmade obstacles are a threat for migratory fish. Populations of eel, three-spined stickleback and smelt for instance have dropped dramatically. Jeroen Huisman of the Regional Water Authority Noorderzijlvest and his team are currently working on three projects to install fish passes at important sluices. "No fish pass is alike because each location is unique", Jeroen Huisman says. "The sluices themselves differ, but also

elements such as water level and location can make a difference. And even the perceived public value. A fish pass at a sluice located in a city for instance, could very well have an educational function. In designing fish passes we have to be creative and carefully weigh all possible options".

### Free outlet and pumping protocols

"Leaving sluice doors ajar can have large effects on migratory fish populations. It is a simple measure that we will be applying at all three sluices. We are also reviewing our pumping protocols. Pumping on half capacity for instance increases the chance of survival for many fishes. At one of the pumping stations, 'Drie Delfzijlen', these measures will not be sufficient. This location is ecological very important

because of the high number of migratory fish passing. Therefore we are working on a plan to implement a siphon fish pass. The basic principle is simple. Fresh water flows in to a container, luring fish. After a while the container is closed and a 'vacuum' transfers them inwards".

### After implementation

Huisman explains that after carrying through the different measures the projects are not finished. "We have to carefully monitor the effects. Not only the results in total, but also on the different measures taken such as free outlet. This measure is one that we can implement fairly easily and quickly at many sluices and pumping stations. And of course we will share the results within Living North Sea. After all, sharing knowledge is one of our goals".

## Contact

For more information about the Living North Sea project visit [www.livingnorthsea.eu](http://www.livingnorthsea.eu) or get in contact with:

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## Colophon

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