

## Update on fishing history project

A three-year project on the post-war development of Shetland's pelagic fishing industry is well underway at the Centre. PhD student Bobby Gear has been busy in the field conducting interviews with ex-fishermen, as well as doing background research.

"There's not much written about the history of the industry, which is why this study is so important. I've been looking at back issues of the Scottish Sea Fisheries Statistics and extracting the figures relevant to Shetland, such as the number of fishermen employed on local vessels and the number of active fishing vessels. This is a very useful exercise as you can start building your account around these general trends.

"I've also begun interviewing ex-fishermen, which is really bringing my story to life, as well as reviewing extracts from old newspapers.

"Looking forward, I'll be aiming to interview as many people as I can – including ex-curers, gutting lasses and anyone involved in any way in the industry.

"I'll also be carrying out a review of all information documented, including the Shetland Times, statistics and a variety of other reports – to build up a comprehensive record of changes in the pelagic fishing industry over the past 60 years."

If you were (or are) involved in Shetland's pelagic fishing industry and have a story to tell, please contact Bobby Gear on tel 01595 772207.

This project is being carried out in collaboration with Shetland Amenity Trust and is funded by Lerwick Port Authority and Shetland Catch Ltd.



View of Norwegian purse seiners in Lerwick Harbour (30th July 1965). This was the first year the Norwegian pursers fished Shetland waters, introducing the new net technology to Shetland. It is said there were over 200 pursers in Shetland that summer.

Photo courtesy of Shetland Museum and Archives

## New look for Scottish Progression Award in Aquaculture

A joint project between NAFC Marine Centre and Barony College in Dumfries is currently underway to rewrite the current Scottish Progression Award in Aquaculture units designed for Secondary school classes 3 and 4.

Kenny Gifford and his team are rewriting and extending the modules to cover:

### Intermediate 1:

- An introduction to Scottish sea fisheries
- Basic seamanship
- The aquatic environment: local investigation
- Northern European aquaculture
- Shellfish
- An introduction to fin fish production

### Intermediate 2:

- Aquatic environments for aquaculture
- Global aquaculture
- Ova production
- Floating cage fish farm operations

Kenny said: "If successfully validated in the next few months, these will be delivered under the banner of the National Progression Award in Aquaculture and will be set at Intermediate levels 1 and 2.

"We'll also be working on a joint project with Barony College and Inverness College to develop online learning materials for the aquaculture industry. It will be funded by Scottish Funding Council and will take two years to complete."

## Velvet crab survey

In Shetland, the velvet crab fishery has an alternate closed period of two months between the east and west coasts from July through to October to coincide with the moulting of crabs.

The aim of this study by shellfish biologist, Dr Beth Leslie, and shellfish scientist, Dr Richard Shelmerdine, was to gather together data to determine the practicality of implementing real time closures for this fishery in order to better protect recently moulted, soft crabs.

The data collected during 2007 and 2008 showed that the closed season did not match the periods of moulting within the velvet crab population. During 2007 this resulted in displacement of fishing effort to areas with a relatively high proportion of soft crabs. However, the data from 2008 indicated that the soft crabs were present in all areas simultaneously which, with a real time closure system, would have resulted in the complete closure of the fishery, with associated supply problems.

Market forces have a strong influence on the velvet crab fishery in Shetland and therefore this process was approached with caution by fisheries managers. It was proposed that fishermen report soft crabs in their catch to help determine the start of the closed season and that the first closure be alternated between east and west coasts in order to alleviate the pressure from displacement of fishing effort.

ANSWER:

The photographs show specimens that were brought to the NAFC Marine Centre by local fisherman Andrew White for identification.

They were caught in a trawl in the St Magnus Bay area on the west side of Shetland by the Copious LK985 last December.

We concluded that the specimens were most likely part of a basking shark vertebra, although their condition had deteriorated too much to be certain. Food-falls such as large sharks can be a locally-important source of food for scavenging fish and invertebrates.



# Newsletter

June 09

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Welcome to the third edition of our newsletter and my first. I've recently joined the team at the NAFC Marine Centre in what I class as my dream job. Arriving for my interview, I was blown away by the resource Shetland has in the Centre - the quality, commitment and dedication of the staff and the first class equipment are real hidden gems.

Shetland is a leader in marine science and technology, and in marine spatial planning, and we want to communicate this message far and wide.

Read on to find out more about major projects recently completed or currently being progressed. These projects are designed to help and support Shetland's maritime industries, after all - first and foremost - that is what we are here to do.

Please look out for our next issue where we'll focus on our training activities.

*David Gray* Professor David Gray, Director

## New information on Scotland's fifth most important demersal species

Following requests from industry, the NAFC Marine Centre secured funding through the Scottish Industry Science Partnership (SISP) to undertake a six-month pilot study during 2008 to collect fisheries and biological data on megrim.

Megrim (*Lepidorhombus whiffiagonis*) are a species of flatfish that, in economic terms, have become increasingly important to the local whitefish fleet. In Scotland, they are now the fifth most important demersal species after monkfish, haddock, cod and whiting.

However, very little is known about their biology and they are not currently an assessed species. As such they are managed under the precautionary principle. Recently, fishermen have argued that the current quota limits are low compared to the abundance of megrim, resulting in widespread discarding of these highly valuable fish.

The project consisted of both observed fishing trips and a tally book scheme, where participating vessels provided details on megrim catches and discards from individual hauls. The data collected has provided a great deal of valuable new information on the species and has served to independently verify the severe mismatch between the available quota and the abundance of megrim in the waters around Shetland.

Following on from this pilot study, funding has been secured to enable Paul Macdonald, a fisheries scientist at the Centre, to undertake a three-year research project on megrim. In addition to providing a wealth of new information on the species, this will also be the subject of his PhD study. The PhD is registered through the University of Newcastle, further strengthening the two establishments' research and teaching links.



A copy of the SISP megrim report is available on request from the NAFC Marine Centre.

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## Centre finishes FAST

An 18-month Feed And Sustainability Trial (FAST) comparing the performance of different salmon feed formulations has been completed and the results indicate that there is potential to successfully replace some fish oil with vegetable oil in salmon diets without affecting growth.

Interest in replacing some of the fish oil in salmon feed with vegetable oil has grown, due to concerns over the sustainability and cost of fish oils.

**Two salmon feeds – one high in vegetable oil and the other with a higher fishmeal and lower fibre content – were compared with a standard salmon feed during the trials at a commercial salmon farm site in Shetland.**

The main findings were:

- Compared to the standard diet, growth performance and feed efficiency were neither reduced by the diet containing vegetable oil nor increased by the diet containing higher fishmeal/lower fibre.
- Flesh quality and taste were not adversely affected in either of the diets
- As expected, the fatty acid profiles of the salmon flesh varied by feed type
- Fish fed on the feed containing vegetable oil had significantly lower levels of PCBs and dioxins

Project partners included the NAFC Marine Centre, Grieg Seafood Hjaltnland UK Ltd and Biomar with additional funding being received from both The Crown Estate and Knowledge Transfer Partnerships (KTP). KTP is a government scheme to encourage the business and academic sector to work together to achieve business growth through research and knowledge transfer.

The final report is available from Dr Chevonne Laurenson at the NAFC Marine Centre.

## Can harmful algal blooms be predicted?



The Centre has received funding for a three-year research project which will investigate whether the onset of harmful algal blooms (HABs) can be predicted in the waters around Shetland.

Algal blooms can occur when the numbers of some naturally occurring microscopic algae species in the plankton rapidly increase. Some algae species can become toxic when a bloom occurs and it is these instances that are of interest.

Toxin levels in farmed mussels are monitored rigorously through weekly sample collection and end-product testing. However, test results may take up to several days. The project will compare the results of newly developed rapid test kits with official test results and also investigate whether any relationships between environmental conditions and the onset of HAB events exist. From this, the possibility of being able to predict future HAB events can be assessed and, if models can be developed, it would be of great advantage to the local industry.

The project is funded through the Northern Periphery Programme and has partners in Shetland, Galway, Oban, Aberdeen, Faroe and Norway. Project work at the NAFC Marine Centre will be undertaken by Daniel Stone.

## Discovering brown crab movements from tag returns



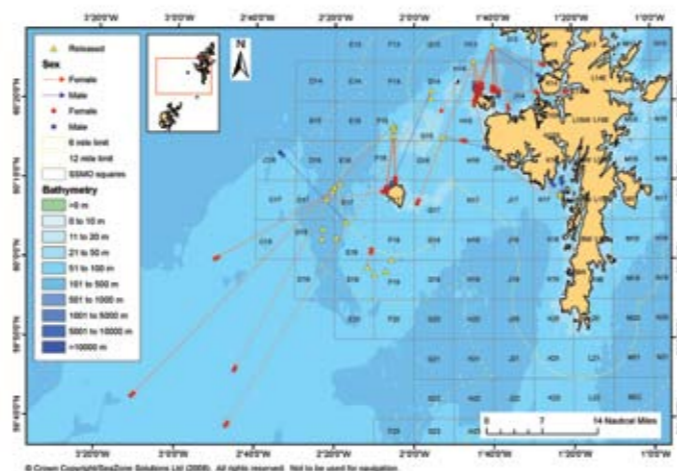
**This study has clearly shown that brown crabs move between inshore and offshore areas, probably as part of their reproductive cycle, with some being caught outside the six mile limit, which is not covered by the Shetland Regulating Order and where they could be targeted by larger vivier crabbers.**

In total 2,000 crabs were tagged during the study. The majority, 1,600 crabs, were tagged from February through to April 2008. Each crab was measured and sexed before attaching a tag round one of the claws (see above). Since the project began, 58 recaptured crabs have been reported back to us from eight different boats (see below). The last return was caught on 27 November 2008.

Dr Richard Shelmerdine, the Centre's shellfish scientist, explained the findings. "All crabs caught before July 2008 had moved towards land and mostly in a southerly direction. The five latest crab captures had all moved offshore and mostly in a south-westerly direction. The furthest travelled crab was released west of Papa Stour and captured 14 nautical miles north of Orkney. This was a straight line distance of nearly 50 nautical miles which took 225 days. On average, crabs travelled 0.12 nautical miles per day, with the fastest crab travelling 0.25 nautical miles per day.

"We are still very interested to hear from anyone who does catch one of the tagged crabs."

If you catch a tagged crab, please contact **Dr Richard Shelmerdine** on **01595 772303**



A current map of where the crabs were released after tagging (yellow triangles) and the locations where they were caught (blue and red circles)

## Findings reported on North Sea stock survey

The annual Fishers' North Sea stock survey was again undertaken in the summer of 2008 and collates up-to-date information on fishermen's perceptions of the abundances of the main demersal fish stocks in the North Sea.

Main findings include: perceptions of continued increases in cod abundances throughout most of the North Sea; a varied pattern in haddock abundances with increases in some regions and decreases in others; increases or no change in the abundance of whiting, saithe, monkfish, sole and plaice in most regions; and for Nephrops a mixture of either no change or decreases in abundances across the North Sea.

The survey canvases the views of fishermen from Scotland, England, Denmark, Belgium and the Netherlands on their perceptions of the status of the eight most important fish stocks over ten regions within the North Sea. Their views are included in the evidence considered by the scientists who assess the status of fish stocks, which itself is part of the process leading up to the annual end of year fisheries negotiations. Completed on behalf of the North Sea Regional Advisory Council (NSRAC), the survey is submitted to the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK).

Copies of the survey report are available from Dr Chevonne Laurenson at the NAFC Marine Centre.

## Can you identify these specimens?

Look on the back of the newsletter for the answer.



## Fifth annual shellfish stock assessment completed

The fifth annual shellfish stock assessment has just been completed at the Centre.

The work is undertaken on behalf of the Shetland Shellfish Management Organisation (SSMO). It involves analysing data recorded by fishermen on their log sheets, as well as data collected by the Centre's Marine Science and Technology team, to provide information on the status of local shellfish stocks. This report is then used by the SSMO in their management of Shetland's inshore fisheries.

## Centre seeks out suitable habitats for future oyster restocking

The European oyster fishery in Shetland was a thriving industry during the 19th century but, by the start of the 20th century, the fishery had collapsed. The collapse was attributed to a combination of overfishing and severe frosts. Oysters are still found in Shetland waters but not at the quantities seen in the past.

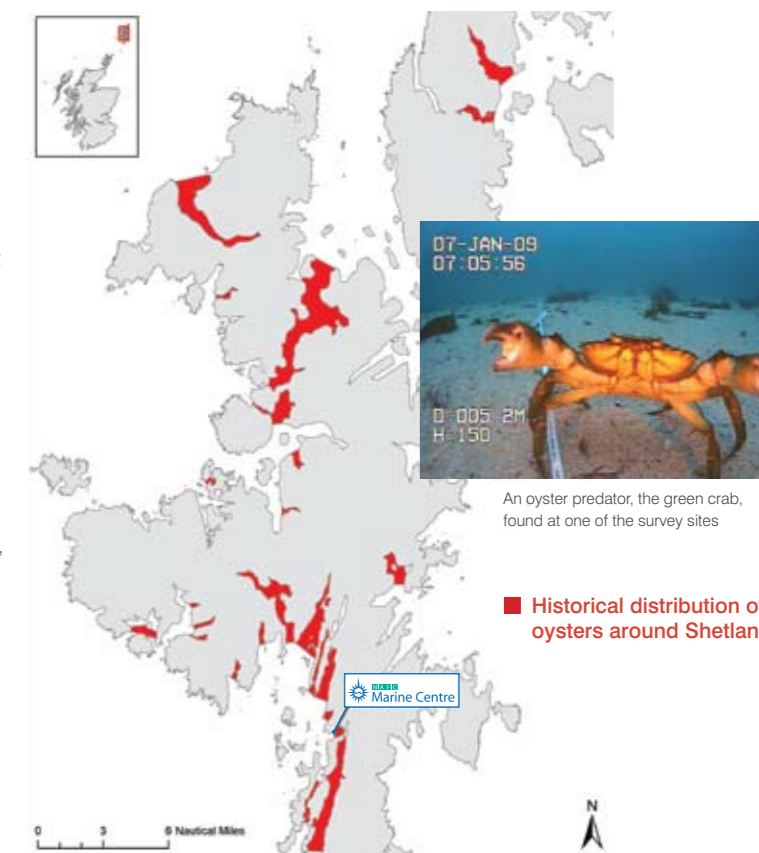
The Centre's shellfish scientist, Dr Richard Shelmerdine, has been involved in a study looking to identify suitable habitats which could be used for future oyster restocking. His work included combining the historic distribution of oysters (see map) around Shetland with habitat maps, constructed using data from the SSMEI project and bathymetry, to identify areas for sampling.

Burra (consisting of Lang Sound and South Voe), Roe Sound, The Firth, Tresta Voe and Whiteness Voe were selected. Dr Shelmerdine explained: "We sampled at the low intertidal and in the sublittoral. A remotely operated vehicle (ROV) was used in the sublittoral and, although no oysters were found, we were able to gather valuable information on their habitat, including predators.

"Oysters need a firm, stable substrate for settling which was only found, in the sublittoral, at Roe Sound and Tresta Voe.

"In the 1880s Burra was regarded as the most important oyster fishery in Shetland, however our results show that this area consists of very soft, unstable sediments with very few plants and animals. Previous work has shown that oyster beds form a complex habitat supporting many other species and helps to stabilize the sediment. The depletion of the stocks may have led to a change in the habitat, and associated species, of the area, also known as a regime shift.

"Our study has demonstrated that reliable reports of recent oyster sightings are far more important than historical information, especially when combined with accurate habitat maps, in determining potential oyster restocking sites."



An oyster predator, the green crab, found at one of the survey sites

■ Historical distribution of oysters around Shetland