



January 2014

We would like to say a huge thank you to all the fishers that have helped us with the project so far. Your help is invaluable in collecting this scientific data.

Please keep checking our website for our latest reports and all the publications and presentations we have completed to date.

The most recent report available on the website is:

- Welsh waters scallop survey – Cardigan Bay to Liverpool Bay July-August 2013

Visit: <http://fisheries-conservation.bangor.ac.uk> and choose 'Welsh Fisheries' – 'Reports'. Or link to the latest reports via our homepage (top right). The website contains photos and videos of our work. Join our Facebook page for more: <https://www.facebook.com/fisheriesconservation>. You can also follow us on twitter: @Fisheriesbangor.



The fishing intensity trial

The Fisheries and Conservation Science Group of Bangor University needs to engage approximately six fishing vessels to assist in an experimental investigation to determine the effects of different levels of scallop fishing intensity on seabed organisms and habitat in the Cardigan Bay Special Area of Conservation (SAC). Ultimately we seek to be able to advise the Welsh Government and the fishing industry on potential sustainable levels of scallop fishing activity that might be permitted in this area.

The experiment will be undertaken in pre-defined areas of Cardigan Bay and the amount of fishing undertaken by each vessel will be directed by the Fisheries and Conservation Group. The experimental fishing is planned to take place between the 1st of April and the 30th of April 2014. The proposed location of the experiment is a scallop ground that has been closed to fishing activities for almost 5 years.

Tenders must be submitted by noon Tuesday 25th February 2014. The tender specification and instructions regarding how to submit tenders can be found on the website homepage:

<http://fisheries-conservation.bangor.ac.uk/>

OR by emailing

anwen.williams@bangor.ac.uk with the '**Scallop fishing tender**' in the subject text.

Fisher questionnaire

The fishers' knowledge questionnaire is currently being conducted with fishers in Wales and will continue into the spring. We hope to have the majority of the questionnaires completed by the end of spring 2014 and can move into the analysis stage. We are looking to schedule interviews with fishers, so if you are interested please contact Julia (j.pantin@bangor.ac.uk).

You can also register on our website (just click on the 'Get Involved' link at <http://fisheries-conservation.bangor.ac.uk>)

This questionnaire is vitally important as it will identify those areas of the coast that are most important to fishers, provide a portfolio of independent evidence for the fishing industry to use going forward, and inform our understanding of the biology of the commercially important species in Wales.

Economic interviews

A total of 50 economic interviews have been completed and the economic indicators for the studied fleet will be presented by April 2014. Thanks to all fishers who have given up their time to be involved in this survey.

These interviews are essential to assess the economic performance of the inshore fisheries around Wales and they will be related to the current fishing grounds (obtained from the fisher questionnaire) to estimate the possible economic consequences of different management measures. g.cambie@bangor.ac.uk.



Scallops



Picture of an adult king scallop (over 130mm) in the hotspot of high density, inshore of the open area of the SAC, within 3nm

Fishing intensity trial

The appropriate assessment for the Cardigan Bay scallop fishing intensity study is under way with NRW and the Welsh Government.

We have now gone to tender to select the vessels which will take part in the experiment.

Scallop stock status

The data from the Welsh waters scallop survey conducted in Cardigan Bay to Liverpool Bay July-August 2013 has been analysed and the report is now available on our website:

http://fisheries-conservation.bangor.ac.uk/wales/documents/30v2_002.pdf

There were significant differences in the abundance of scallops within the three areas sampled: Liverpool Bay, North Western Llyn Peninsula and Cardigan Bay. King scallop abundance was considerably higher in Cardigan Bay compared to the other two areas surveyed. From 2 to 4 times higher densities were caught in the king dredges in the open area of Cardigan Bay compared to the other 2 grounds. Queen scallops only occurred at a high density in Liverpool Bay.

Size and age structure within the three areas sampled using scallop dredges showed that king scallops sampled from the Llyn Peninsula and Liverpool Bay were dominated mainly by old individuals with very few undersize scallops in 2012 but, in 2013, more small and young scallops were caught in Liverpool Bay. This may indicate stronger recruitment in recent years than expected from the June 2012 survey.

There was a greater difference between the closed and open areas of the Cardigan Bay SAC in 2013 compared to 2012. In 2013, the size of scallops peaked at 100mm, 3 year old, in the open area, and at 120mm, 5 year old, in the closed area. In 2012, in both the open and closed areas the scallops were between 4 and 5 years old and peaked around 120mm. There seemed to have been a shift towards smaller and younger scallops in the open area and towards older and larger scallops in the closed area, with a fairly constant number of undersize scallops in the closed area. Current evidence suggests that there may have been a poor recruitment to the fishery in 2013 in Cardigan Bay SAC.

The red bag scheme

This scheme was established by Cefas to assess scallop stocks. It is a simple method that we are using to collect information on the status of scallop stocks in Welsh waters. Red bags are given to fishers who then keep a sample of at least 120 scallops above Minimum Landing Size (MLS). A sample sheet needs filling in with details of the number of undersized scallops that are discarded. The bag is then landed as usual to the processor. The processed flat shells are returned to the bag and collected by Bangor University for age determination.

The first red bags have been returned to us. Thanks to the fisher involved and the processor AM Seafoods. **Please get in touch to participate in the scheme. Contact: g.lambert@bangor.ac.uk**



Crustacea

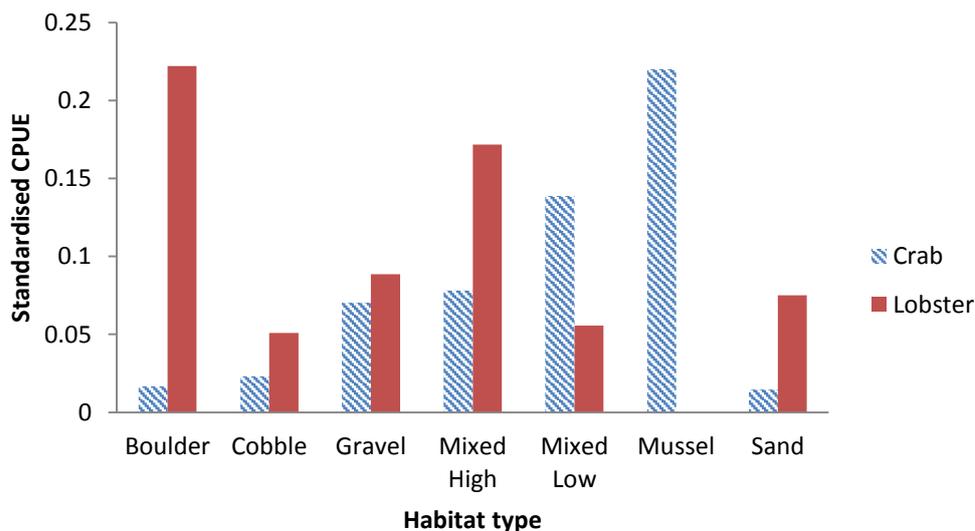
Lobster Escape Hatch Study

Data collection will continue on the Lobster Escape Hatch Study until enough samples have been collected. In addition to the abundance, size and by catch information that is being collected from the data collection with fishers, we are designing a camera system that will film what is happening inside pots. We hope this video will help answer the following questions:

1. Are undersized target species using the escape gaps?
2. What percentages of individuals entering a pot are actually caught?
3. Is cannibalism occurring on undersized target species in pots without escape gaps?

This camera system is currently being designed and should be ready for trials in spring.

Juvenile crustacean survey



CPUE (Catch per unit effort) standardised to pot days for juvenile crabs and lobsters on different habitat types. Mixed high = mixed ground with high habitat complexity, mixed low = mixed ground with low habitat complexity.

This preliminary survey is completed with the results now available on the website:

<http://fisheries-conservation.bangor.ac.uk/wales/documents/Juvenilecrustaceansurvey.pdf>

Follow the above link, or navigate from the home page choosing 'Welsh fisheries' – 'Science updates' in the main menu.

The size of lobsters caught ranged from 40-75 mm carapace length and crab 32-114 mm carapace length. There was a significant difference found in the catch per unit effort (CPUE) on different habitat types with crabs preferring mussel beds and lobsters preferring boulder grounds.

We aim to continue this study further this summer (2014) to increase the data set and improve our confidence in the findings. We will also look at some other habitats and exposures at sites to gather enough data to characterise the sites where we would expect to find the greatest numbers of juvenile crab and lobster, with the hope of starting a recruitment index.

Lobster genetics



Well-developed lobster eggs showing the eyes of the larvae

After several months of trials we have now identified a protocol that can extract high quality DNA from batches of lobster eggs. Lobster eggs contain high quantities of lipids which can interfere with DNA extraction. In addition they are quite big and the cost of extracting DNA egg by egg would have been prohibitively high, but routine methods could not cope with the large amount of tissue associated with batches of eggs. However, a method designed for extracting DNA from large volumes of dirty sediment can extract DNA from 200 eggs at a time and efficiently cleans lipids from the extraction. We have already collected samples for genetic analysis from some sites and we will now analyse these using the new protocol. We will continue with sample collection this spring/summer when the eggs are red and well developed.

Lobster Reproduction

The work undertaken last summer on lobster size at maturity has provided some baseline data and a protocol for data collection. However the sample sizes are currently too small for accurate analyses and therefore we will be adding to the data this spring/summer. We are looking for fishers from the whole of Wales to participate in this study. You will be required to take a researcher to sea on approximately four occasions to measure the size of the lobsters, the number which are berried and, for any females that are not berried, a pleopod (small swimming leg) will be sampled to allow for cement gland staging in the laboratory. Cement glands are found in the pleopods and swell up when a female is due to extrude eggs. The cement is used to fix the eggs to her abdomen.

In addition we will be sampling whole egg masses from approximately 50 lobsters from four sites around Wales (200 lobsters in total). The carapace length of the lobster will be measured, the number of eggs will be counted, the average size of eggs measured and the egg quality investigated. Anyone interested in this study should contact Natalie: n.hold@bangor.ac.uk; 07903762466

Brown crab



Juvenile brown crab, *Cancer pagurus*

The size at maturity and fecundity has not been assessed for Welsh brown crab stocks. So far a few hundred adult crabs have been measured for morphology during on-board observing activities (during the winter breeding season). We aim to determine if there are regional differences in size at maturity by assessing the reproductive state of both males and females from north, mid and south Wales. Permit applications are in place and we are waiting to hear back.

Prawns

Prawn sampling is ongoing and we aim to complete our collections in May this year. A full report will be available after this.

We are continually engaging with prawn fishermen around Wales. If you would like to be involved in the project **please contact Dr Jodie Haig** j.haig@bangor.ac.uk. For very little involvement you can contribute some vital scientific samples to the Welsh study of prawns.

Whelks

We have some preliminary results from the 2000+ whelks that have been processed so far. We have size at maturity and other catch statistics. We are also assessing the structure of catches from different regions. These will be publicly available after extensive consultation with the fishers involved in this whelk project.

There may be some cases for regional variation in whelk maturity; we are currently investigating this possibility. We are revisiting all of the whelk shells we have in storage and measuring the thickness as there is some suspicion that two morphological varieties exist: a thick-shelled and a thin-shelled morph. The hypothesis is that the thick shelled morph may remain smaller and mature at a smaller size than the larger thin shelled morph. We will soon begin measuring shells and a full report on the data to date will be available early next year after consultation with industry members. Whelk sampling will conclude in July 2014 and a final write up and report on the fisheries samples will be available after this.

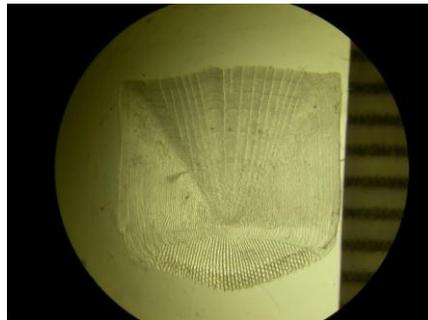


Finfish

Sea bass

More than 1300 fish have been sampled so far. We have started the analysis of the scales to age the fish and for the stable isotope analysis. A total of 200 fish have been aged. Sections of each scale, from fish caught in 8 specific areas around Wales have also been prepared for stable isotope analysis. This analysis will give us an insight into the site fidelity of bass on feeding grounds and possible migration patterns.

We are constantly collecting samples of bass from fishers and processing industries; many thanks to all those who have collaborated with us so far. The reproductive season is starting and we need to increase the number of fish collected with gonads. **Please get in contact with Giulia Cambiè** (g.cambie@bangor.ac.uk) if you can provide bass samples (scales and gonads).



Bass scale recorded by our student Tom Overy.

