

### October 2014

#### **Fisher questionnaire**

We're continuing to interview fishers across Wales. So far 18% of the registered Welsh fishing fleet has been interviewed and we are looking to increase this number substantially in the next three months, especially in the key area of Pembrokeshire where there are many fishers that have not yet been interviewed. If you are willing to be interviewed or know someone else that is, please contact Julia Pantin by phone (01248 382607) or email (<u>j.pantin@bangor.ac.uk</u>). All participants in the questionnaire have a chance to win Guy Cotten Bib and Brace Trousers or a subscription to <u>The Fishing News</u>.

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.

#### Whelks



#### Whelk tagging

Georgia Robson and Zara Turtle worked hard all summer tagging whelks in Swansea and off the Llŷn Peninsula to see if tagging was a viable option for estimating population parameters. Returns exceeded expectations and our methods were found to be sound. Both Georgia and Zara have completed their masters' theses and a full report of their findings will be available in early 2015. If you just can't wait that long and have any questions about the project we are more than happy to talk to you about it, please contact Jodie at <u>j.haig@bangor.ac.uk</u>.



### **Fishing intensity experiment**

In September we conducted the 3<sup>rd</sup> recovery survey for the fishing experiment. The objective was to assess the state of the seabed 4 months after we had impacted it with scallop dredges at various fishing intensities. Again, we sampled with beam trawls, videos, grabs, multi-beam and side scan sonar.

The preliminary observations are that the epifauna may have recovered in terms of biomass (weight in kgs). We have not yet defined whether the type of species found were the same between the different treatments. We observed that some marks of dredges still remained in places on the seabed. Again this will have to be scrutinized to see in which areas (i.e. what type of seabed) and after what level of effort these scars remain.

There was evidence that the sediment was modified from March to May (before to after fishing). Fine particles may have been re-suspended. This could have affected the in-faunal communities as worms, bivalves and other animals living in the sediment tend to associate with specific sediment composition types. We don't yet know if the re-suspension of fine sediments, resulting in a coarser composition of the seabed, has affected the in-fauna and whether the communities have recovered, but the analyses are in progress.



On the vertical axis (B) is biomass (wet weight of animals per unit area). On the horizontal axis is fishing intensity going from 1 to 6 times fished. There was a decline in biomass from low to high fishing in May, straight after the experiment, but in September the gradient is the same as in March, i.e. the biomass seems to have recovered. Note that scallops and brittle stars are excluded from this analysis.



#### **Crustacea**

Prawns



A literature review on the *Palaemon serratus* fishery is available on our website and a full report from the seasonal fisheries-dependant data will be available online soon. From May 2014 till May 2015 fishers from around Wales were asked to provide scientific pot samples. Winter brought with it terrible weather conditions and so not many prawn boats were out fishing. Samples have undergone full biological and morphological analysis and some interesting patterns are emerging. Due to few samples being collected last year, this winter will be vital to consolidate those findings and we look forward to working with fishers through the coming prawn season.



Thanks to Bangor students Gemma Rayner and Matthew Kings, here sorting out seine contents on an Anglesey beach (left). Alessandra Targino joined us for three months on a university placement from Brazil to net through the summer and was a great help in the lab as well (right).

Summer sampling is complete and we are processing the samples in the laboratory. Our Anglesey team and Cardigan Bay teams netted inshore all through summer to determine recruitment patterns and habitat use by juvenile *Palaemon serratus*. This project is the first in what will hopefully be a long term time series of juvenile abundance data. We hope to use this recruit data to inform future management of the *Palaemon* fishery. For more information please contact Jodie on j.haig@bangor.ac.uk.

### Brown crab



Juvenile brown crab, Cancer pagurus

Masters student Marc Uya has described the interaction between *Cancer pagurus* (brown crab) and *Carcinus maenas* (shore crab) on the shore and developed a model of juvenile crab abundance for habitats along the Welsh coastline. He has submitted his thesis and is currently working on a publication.

Babette Bookelar is a placement student from the Netherlands looking at habitat use by juvenile crabs and lobsters in sub-tidal habitats. Babette has been working out of Hells Mouth on the Llŷn Peninsula all summer and is collecting some interesting data (see next section below).

Gemma Rayner has completed the crab fecundity and morphometric study and a full report on *Cancer pagurus* is in the preparatory stages.



## Juvenile crustacean survey

Last summer (2013) we started a survey investigating the habitat preference of juvenile brown crab (*Cancer pagurus*) and European lobster (*Homarus gammarus*) off the Llŷn Peninsula. Three study sites were used and repeated this year with pots placed on different habitats to try and detect and eliminate habitat preferences. In total the pots were hauled and inspected 22 times in 2013 and 2014. The habitats were recorded using a drop down camera each time the pots were hauled.

The first results indicate that over 60% of the crabs caught were males, while female lobsters were dominant at 60%. No significant differences in carapace length between males and females were found for crabs or lobsters. The catch per unit effort (CPUE) for crabs was highest on the mussel beds. The smallest carapace length was also found at this site. The highest CPUE for lobsters and smallest carapace length measured was on boulder reefs and no lobsters were caught on mussel beds. There was no significant difference in carapace length between habitats though. In September a survey to detect the habitat preferences was carried out by using a flying array. This indicated that habitats were very patchy, particularly in Hells Mouth. This could be the result of the strong storms in autumn 2013 and spring 2014. In addition in this area fewer individuals were caught in 2014.

Freshness and type of baits seemed to have a big effect on the CPUE of juvenile crabs and lobsters. Overall baits composed of different fish species of approximately 3 weeks old were used. When one day old baits were used the catch numbers were higher. More results are coming up.



The graphs show the catch per unit effort (CPUE) of brown crab and lobster on different habitats. You can see the brown crabs' preference for mussel beds and the lobsters for boulder reefs.

Overall this study has given an indication about habitat preference of juvenile crabs and lobsters. In the next phase the flying array could be used to find new stations with the preferred habitat structures present but with different environmental conditions (exposure levels, algal coverage, and habitat patchiness). In the future it would be interesting to collect more data so that we can perform a correlation study to detect the effects of habitat structures, environmental variables and temporal scales and their interactions.



#### This winter 2014/15

We have an exciting collaborative study investigating the size at maturity for brown crab. Collaborators from Ireland, Scotland, Wales, Northeast England, Southwest England, and the Isle of Man will provide samples to enable better stock assessments and determine if regional variation exists for the size at maturity for this species. We will be collaborating with fishers from around Wales to collect samples and if you are interested in participating in this study we look forward to hearing from you. Please contact Jodie on <u>j.haig@bangor.ac.uk</u>.



# <u>Finfish</u>

### **Bass recruitment**

We are finishing our "bass recruitment" project for this year and we are starting the related analysis. We have netted all around Wales and the abundance of juvenile bass (recruits) has been much higher than last year. We are also analysing the catch species composition in the nets for the past two consecutive years (2013 and 2014) and the results will be available soon. Thanks go to our summer intern Charlie William Key for his enthusiastic support and help!



A small bass (0 group) caught with our net in South Wales.

### Bass stable isotope analysis

With the new stable isotope samples run we are building up a good picture of the isotopic signatures of bass found between North, Mid and South Wales. This is for the adult bass during the pre-spawning season. The classification model used for the analysis correctly identifies 76% of the fish to their respective areas (north, mid and south Wales) (see first graph below). In south Wales there is even less error in the classification as they have a more distinctive isotopic signature (see second graph below). These results suggest that fish in the south do not move as much during feeding, staying in a similar area. Next we will compare these results to those of mature bass caught during the spawning season to find differences and similarities in the possible movement patterns.



Representation of the separation level between different regions based on the isotopic signal detected in adult bass scales during the pre-spawning season (August-November).



Error rate over trees

Representation of the classification error between different regions based on the classification model developed from the isotopic signal detected in adult bass scales during the pre-spawning season (August-November).



Y Gronfa Pysgodfeydd Ewropeaidd: Buddsoddi mewn Pysgodfeydd Cynaliadwy European Fisheries Fund: Investing in Sustainable Fisheries



Llywodraeth Cymru Welsh Government