



## April 2014

Huge thanks to all the fishers who have helped us so far. Your contributions are really important to us and enable vital data to be gathered for the future of Welsh fisheries.



## Scallops

### The fishing intensity trial

The experiment aimed at assessing the impact of scallop dredging in the Cardigan Bay SAC is still underway. We have completed a successful pre-impact survey with the RV Prince Madog in March, after which the 5 vessels participating in the experiment have been fishing under restrictions for almost a month now. They are finishing on the 30<sup>th</sup> of April and we are going back out on the research vessel for 2 weeks to survey the impacted areas. Looking forward to some exciting results!



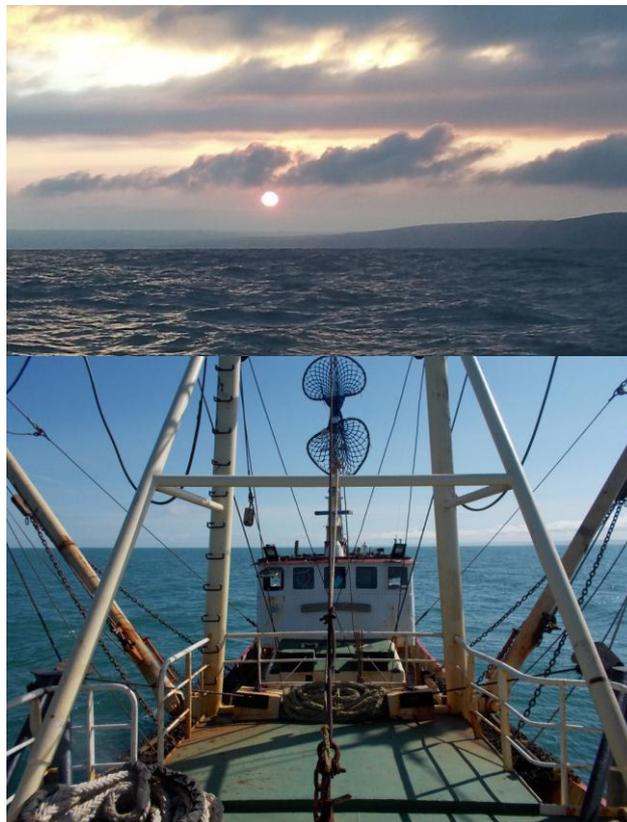
On-board the RV Prince Madog – sorting the beam trawl catch

A big thank you to our experimental fishermen who have been amazing at doing some very unusual and particularly hard work! Thanks also for having taken good care of our onboard observers and of course thank you to the volunteers and observers for the fantastic work they have done which required days and nights of data collection onboard the RV Prince Madog and the fishing vessels.



**Example of catches on fishing vessels – here mostly scallops, some spider crabs and clean boulders (NB: this is just an example and does not necessarily reflect how the catch looked in each tow – pictures have been taken of most tows on each vessel and will have to be analysed before making any conclusion)**

We will report back as soon as we have some results. Although, be warned, this will take a few months seeing the amount of data collected which needs careful entry, processing and analysing. We have carried out biological sampling using beam trawls, grab sampling, and videos (although the water was very murky probably due to the winter storms so we could see very little). We have also conducted seabed mapping and oceanographic surveys using multi-beam, side scan sonar, CTD (Conductivity Temperature Depth), and ADCP (acoustic Doppler current profiler) from the RV Prince Madog. In addition to these large data sets we have information from onboard observations of measurements of scallops and by catch. That will keep us busy for quite a while!



**Top: One of the numerous sunrises we got the privilege of witnessing during the last few weeks.  
Bottom: As seen on this fishing vessel that was out fishing for the experiment, we got very lucky with the weather. Let's hope that it holds up in May!**

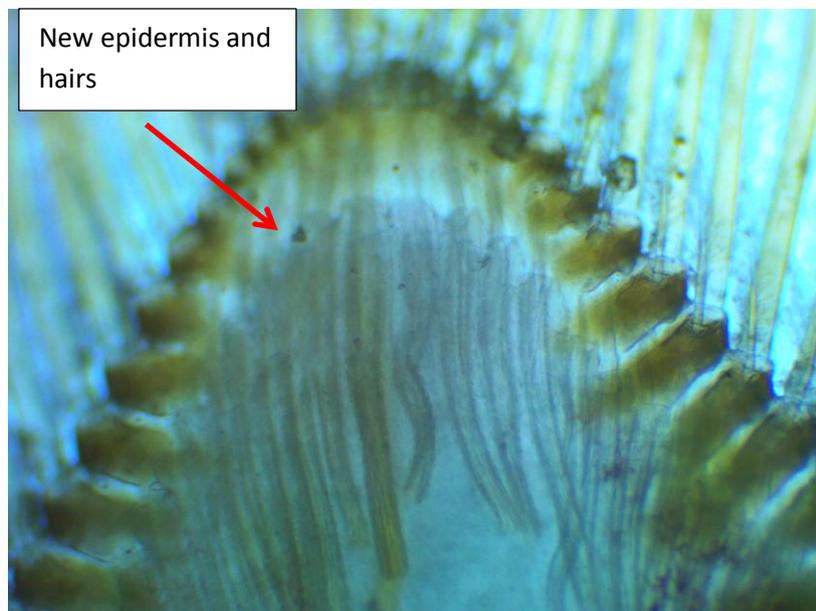


## Crustacea

### Lobster

Due to the warm waters this spring we have been monitoring good numbers of lobster since the end of March. The purpose of the at-sea and port sampling has been to monitor moult stage, reproductive timing, presence of berried females, egg development stage and tagged lobster recaptures. This is in addition to the usual size frequency, length-weight, sex ratio and catch per unit effort data.

### **Moult stage**



**A lobster pleopod (swimmer leg) under the microscope showing the new tissue and hairs forming ready for moult**

Information on the timing of moulting is useful for growth models, which are used frequently in stock assessment models by CEFAS, Marine Scotland and in the future Welsh Government. This data will be combined with growth data from re-captured tagged lobsters to ensure any assessments on Welsh lobster stocks in the future use growth data that is specific to our local stocks. Without this data we would be reliant on published data from areas such as Norway, Scotland and Ireland which may not be appropriate for Welsh stocks.

So far it appears that many lobsters have moulted earlier than they were appearing in the pots. This is evident by the presence of very clean shells, some slightly soft shelled individuals and, when looking under the microscope at swimmer leg samples, most lobsters seem to be in “inter-moult” i.e. there isn’t evidence that they are preparing to moult. However, we have had samples from a few individuals that were preparing to moult (as shown in the photograph above), where you can see the

new tissue and hairs forming under the shell. We will continue to monitor moult stage every two weeks until the autumn.

### **Reproductive timing, egg development stage and fecundity**



**Lobster eggs under the microscope – you can see the eyes and begin to see the shape of the lobster larvae**

Traditionally, size at maturity has been estimated for other marine animals by looking at the proportion of females at each size that are mature. This can be a simple process in some animals whereby all that is needed is to record the presence or absence of eggs. In others, they need to be sacrificed and dissected to look at the ovaries. In some species of crustaceans that reproduce every year, simply noting the presence of eggs is enough. However, in the European lobster there is some evidence to suggest that many lobsters, especially the larger ones, reproduce every two years. Therefore it may be possible to have a mature lobster which is in its non-reproducing year and not carrying eggs and therefore marked incorrectly as immature. It is unclear from work carried out so far on this species whether there is a single method that will provide accurate size at maturity estimates, therefore we are using several methods.

We have been monitoring the presence of berried females and the development stage of their eggs. The presence of eggs is the best indicator of maturity for females. In addition we have been taking swimmer leg samples from non-berried females to look for “cement glands” under the microscope. The presence of developed cement glands indicates reproductive maturity. Finally we are taking morphometric measurements such as carapace length, abdomen width, and claw dimensions, all of which change with maturity.

The eggs are analysed to find their development stage. This gives us an idea of when the lobsters are likely to shed their larvae. So far this year (up to late April) it appears that the majority of berried lobsters are still carrying early stage eggs (black with little larvae development). Some are starting to change colour slightly (green-black) with evidence of early larvae development. Only very few have developed as far as red eggs. This suggests that the larvae will not be shed for a few weeks yet. This is important for us to know for several reasons. Firstly, if we are to model lobster larval dispersion then we need to know what month to simulate the release of eggs. This work will continue over several years so that we can see how variable this is from year to year and if it is linked to

environmental factors such as weather/temperature. Secondly, in order to estimate fecundity (number of eggs carried by different size females) we would prefer to collect the data at a late stage of development. This way any variability in the loss of eggs with lobster size will be taken into account. Finally, we will be looking at egg quality. We have already collected early stage eggs and we also want samples of late stage eggs for comparison. For all these pieces of work, sampling at the correct stage of reproduction and egg development is really important so continued monitoring of the reproductive and egg stage every two weeks will continue throughout the spring and summer.

### **Tagged lobsters**

We have received our first tagged lobster re-capture of the season. During last summer we tagged over 700 lobsters across Wales and had excellent re-capture rates. However none of these re-captures had shown any growth. So we are very happy to have found that this tagged lobster has shown growth of 10mm since last September.

We will be continuing with our growth and tagging program this spring and summer.



**Recaptured lobster showing its yellow tag (in the circle) and a growth of 10mm over winter**

For any more information on any of this work please contact Natalie Hold

[n.hold@bangor.ac.uk](mailto:n.hold@bangor.ac.uk)

01248 382850

## **Brown crab**



Juvenile brown crab, *Cancer pagurus*

### **Moult increment**

Another Bangor University group is looking at the stress responses in Brown crab, *Cancer pagurus*, under different climate change scenarios. Whilst they are holding the crabs in the aquaria we are taking advantage of the opportunity to measure the crabs before and after they moult to look at how much they grow between each moult. This project will be complete by late June!

### **Masters project**

We have one new MSc student this year that will begin working on the recruitment of Brown crabs. He will start in late May.

### **Processor sampling**



We are sampling from processors in the north and south of Wales to gather time series data on weight, moult stage, length frequency and sex ratio of crabs and lobsters. As monthly landings data is only recorded as weight per month this will provide some insight into how landings change from month to month.

## Whelks



## **Masters projects**

We have two MSc students starting in late May this year. They will be tagging whelks in the north and south of Wales using thick elastic bands (a method found to be most reliable over short term studies). We will be estimating local abundances and the short term movement of whelks. The two students currently have a second tag retention study underway assessing the bands we will use and another experiment looking at post-tagging behaviour.



## Finfish

### **Sea bass**

Data collection of bass gonads during this spawning season (November 2013-April 2014) is continuing with a total of 185 gonads collected so far. This data will allow the size at maturity to be determined and to gain insight into the presence of possible local spawning grounds.



**Shown here female bass gonads ready to spawn, in the ripe/running stage**

The first stable isotopes analyses have been completed on bass scales sampled from 8 key areas around Wales. This has shown really interesting preliminary results with a general gradient in the nitrogen and carbon signal by latitude.

We have also started to collect undersized bass to better estimate the growth curve and other biological parameters.

Many thanks to all those who have collaborated with us so far **please get in contact with Giulia Cambiè** ([g.cambie@bangor.ac.uk](mailto:g.cambie@bangor.ac.uk)) if you can provide bass samples (scales and gonads).

### **Fisher questionnaire**

The fishers' knowledge questionnaire is currently being conducted with fishers across Wales and will continue into the spring and summer. So far 60 questionnaires have been completed; 29 in North Wales, 10 in Mid Wales, and 21 in South Wales. We hope to have the majority of the questionnaires completed by the end of summer 2014 and can move onto the analysis stage. We are looking to schedule interviews with fishers, so if you are interested please contact Julia ([j.pantin@bangor.ac.uk](mailto: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.***



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



Llywodraeth Cymru  
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