



**September 2014**

## **Seafood Festivals**

This summer we presented displays at four seafood festivals around Wales (Aberdaron, Aberystwyth, Menai Bridge and Milford Haven) telling people about our project and Welsh fisheries. We had a great time at all four festivals and talked to a lot of interested people. Thanks to everyone that stopped by our displays and you can check out more pictures from the festivals on our Facebook page (<https://www.facebook.com/fisheriesconservation>).



## **Fisher questionnaire**

After a summer hiatus for field work, we are looking to schedule questionnaires with fishers across Wales again. So far 14% 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 areas of Milford Haven, Swansea, Saundersfoot, Cardigan and Holyhead where there are many fishers that have not been interviewed yet. If you are willing to be interviewed or know someone else that is, please contact Julia Pantin by phone (01248 382607) or email ([j.pantin@bangor.ac.uk](mailto:j.pantin@bangor.ac.uk)). All participants in the questionnaire have a chance to win a subscription to The Fishing News or Guy Cotten Bib and Brace Trousers.

***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.***



## **Finfish**

### **Sea bass**

Since July we have been carrying out our bass recruitment project.

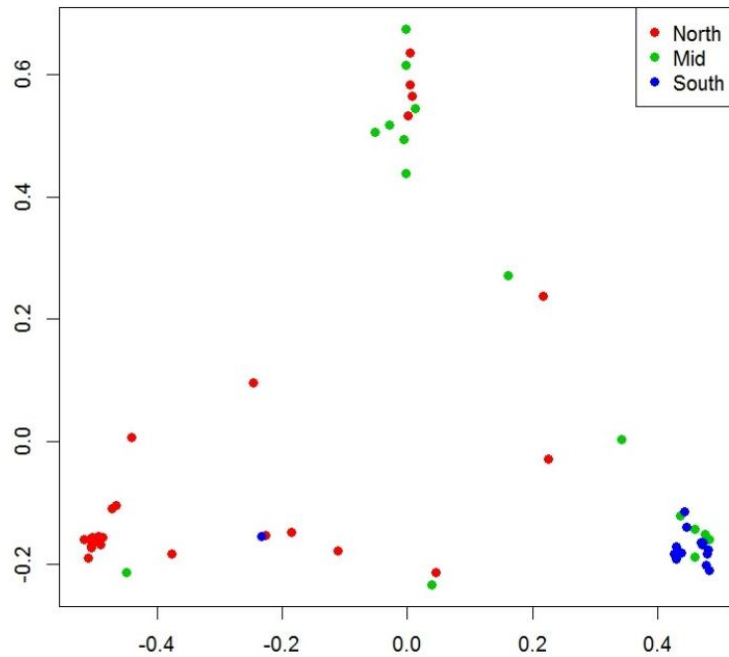
We have netted all around Wales and the abundance of recruits has been much higher than last year! In most of the areas 0 group (post larvae <1 year old) bass have been found in sheltered river creeks with a muddy bottom and high food availability (e.g. Mysid shrimp – see image below). Thanks go to our summer intern Charlie William Key for his enthusiastic support and help!



**A small bass (0 group) caught with our net in Mid Wales. Right: Charlie recording all the data on the bass caught and catch species composition.**

### **Bass stable isotope analysis**

Another 117 samples of bass scales have been run this summer. With the previous 56 samples run in March, isotopic information on a total of 173 adult bass will be analysed to detect differences in the isotopic signal between North, Mid and South Wales. Preliminary results, obtained with the first 56 samples, show a good separation between areas (see image below), indicating the presence of regional chemical tags in the scales of sea bass. These tags can be used to understand connectivity and movement patterns.



Representation of the separation level between different regions based on the isotopic signal detected in adult bass scales.



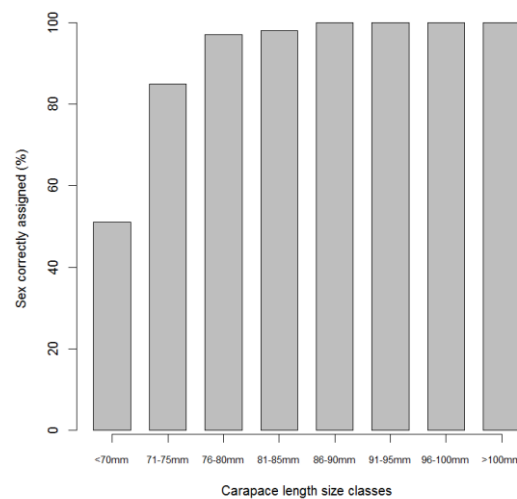
## Crustacea

### **On-board camera results**

The introduction of the Marine Strategy Framework Directive (MSFD) and the reform of the Common Fisheries Policy (CFP) will require EU member states to commence collection or improve collection of data for species which previously needed little reporting. The CFP is linked via descriptor three of Good Environmental Status (GES) in the MSFD: *“Populations of commercially exploited fish and shellfish are within safe biological limits and exhibiting an age structure and size distribution indicative of a healthy stock”*. This descriptor will apply not only to the traditional quota species which are already reported upon by member states, but also to other locally important species. Under descriptor three there are three criteria for assessing GES. For criterion one it is expected that member states will provide an estimate of fishing mortality as a primary indicator. If this isn’t possible then a ratio of catch to biomass will be permissible. The second criterion will require spawning stock biomass to be reported or if this is not possible other biomass indices. Finally under criterion three member states will need to report the proportion of fish larger than the mean size of first sexual maturation and the 95<sup>th</sup> percentile of the fish length distribution observed in research vessel surveys. For the UK (and many other EU member states) >90% of the landings or regionally economic important species will include shellfish species such as scallop, crab, lobster and whelk (Fisheries Statistics, MMO 2012) which are not currently reported on under the CFP. Therefore, the burden of data collection is set to increase dramatically.

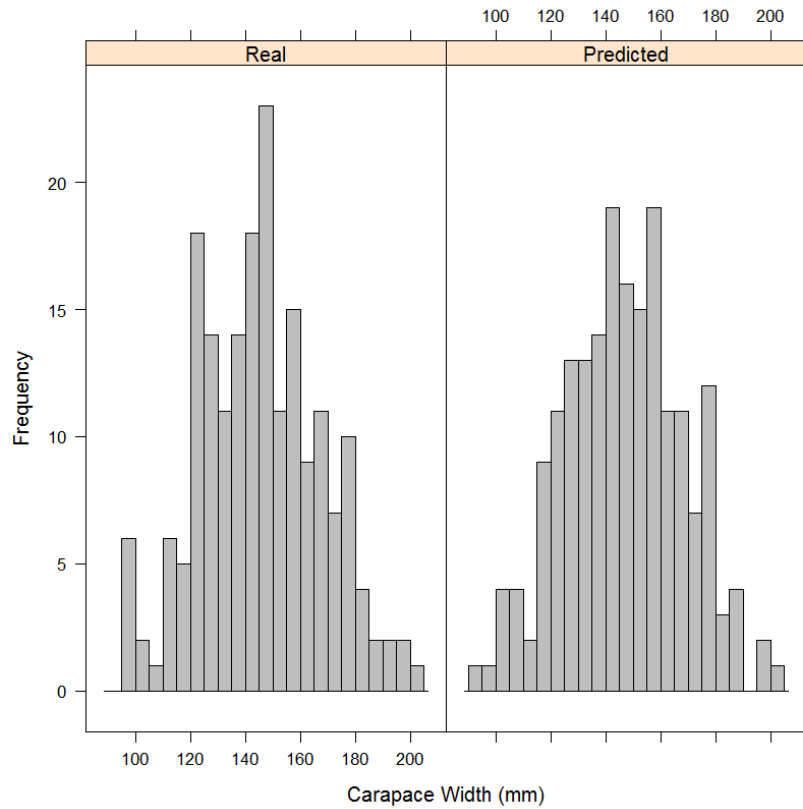
The final report on the use of video systems on potting vessels will shortly be available on our website. After measuring over 3000 crabs and lobsters on fishing vessels, passing them under the video camera and then re-measuring them back at the office from pictures extracted from the video, we are very pleased to be able to report on the accuracy and suitability of the use of this method for the collection of fisheries data.

Correct sex allocation for crabs was 100%. All male lobsters were correctly assigned. Figure 1 shows the percentage of females each size class correctly assigned as females. For lobsters over 86mm in length the correct female sex allocation was 100%, gradually decreasing with smaller size classes.



**Figure 1. Percentage of female lobsters correctly assigned as females using Abdomen width to Carapace length ratio.**

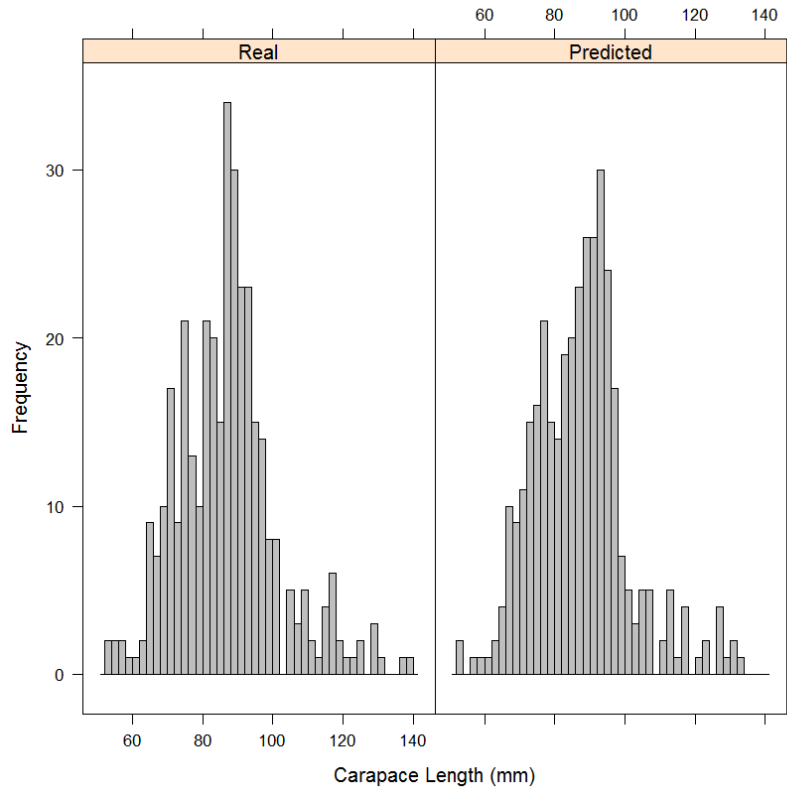
Statistical models for crabs and lobsters were developed to link the measurements taken from the video to those taken on the boat. These models were then applied to a separate test data set and checked to see how well it could predict size. For both crabs and lobsters there was no statistical difference between the size distributions measured from the video and in person at sea. The graphs and tables below show the comparison between “real” measurements and video predicted measurements.



**Figure 2. Frequency histograms (3 mm size classes) of real carapace widths of crabs and those predicted from video measurements.**

**Table 1. Differences between real measured data and data predicted from video measurements for crabs. CW – carapace width, undersized is less than 130mm CW.**

Statistic	CRABS	
	Real data	Predicted data
Mean CW(mm)	146	147
Median CW (mm)	146	146
CW range (mm)	97 – 201	95 – 202
Number of undersized	48	45



**Figure 3. Frequency histograms (2 mm size classes) of real carapace lengths of lobsters and those predicted from video measurements.**

**Table 2. Differences between real measured data and data predicted from video measurements for lobsters. CL – carapace length, undersized is less than 90mm CL.**

Statistic	LOBSTERS	
	Real data	Predicted data
Mean CL (mm)	87	87
Median CL (mm)	87	87
CL range (mm)	52 - 139	53 - 132
Number of undersized	211	210

The error associated with the size measurements was calculated and resulted in crabs being able to be put into 3mm size classes and lobsters into 2mm size classes.

This level of accuracy will enable this technology to be able to be used with confidence for the collection of fisheries data. We also believe that some of the error is associated with the type of lens used in our prototype video box. The next step will be to work with camera technology specialists to improve the video and to make the camera unit more user friendly. In addition we hope to work



with computer software experts to help automate some of the data extraction and analysis. This technology should enable the fishing industry to participate in scientific data collection and to meet the extra burden of data need associated with MSFD and CFP changes that will be implemented in the very near future. For more detailed analysis and results please see the full report on our website.

## **Lobster**

### **Lobster Escape Hatch Study in Cardigan Bay**

Data collection is in full swing in Cardigan Bay with four fishers using on-board camera systems to record their catch from three types of lobster pots (no escape hatches, small escape hatches, and large escape hatches). The videos are being analysed as soon as they come in to record lobster and crab sizes and bycatch abundance. A report on this study will be ready in early 2015.



## **Scallops**

### **Scallop stock assessment**

This summer we have conducted the third scallop stock status survey. We were lucky with the weather and just had to stop for one day because of some strong westerly winds off the Llŷn Peninsula. The visibility underwater was amazing and we got some very clear footage.



*left* - Image taken in the closed area of Cardigan Bay – live adult scallop covered in sediment; *right* - Image taken in the closed area of Cardigan Bay –open Plumose anemones (*Metridium senile*).

We mostly surveyed Cardigan Bay (25 dredge tows and 34 video tows) and spent a couple of days north of the Llŷn Peninsula and north of Anglesey. The data have not yet been analysed but a report comparing and summarising the results and findings of the last 3 years of sampling will be made available by the end of the year.



Thanks again to all the volunteer students who helped us with all the hard work during the long hours... and the fun ones!

### Experimental fishery

We have now delivered the grab samples to the company who will process them for us over the next 4 months. Once we have got those data on infauna we will have a comprehensive overview of the impact of scallop dredging on the seabed communities in Cardigan Bay, including animals living in and on top of the sediment, something we have never looked at before.

So far, the rest of the data (beam trawl, videos, side scan and multibeam – together with part of the sediment data from the grab samples) have mostly been analysed and we will report on the findings after the first recovery survey has been conducted and those latest data have been analysed.

We are going out between the 8<sup>th</sup> and the 17<sup>th</sup> of September this month for an intensive survey, working around the clock, to resample the experimental area and assess how the ecosystem has responded and recovered from the fishing disturbance we applied in April.



Some of the grab samples taken in May 2014 being sorted for delivery.



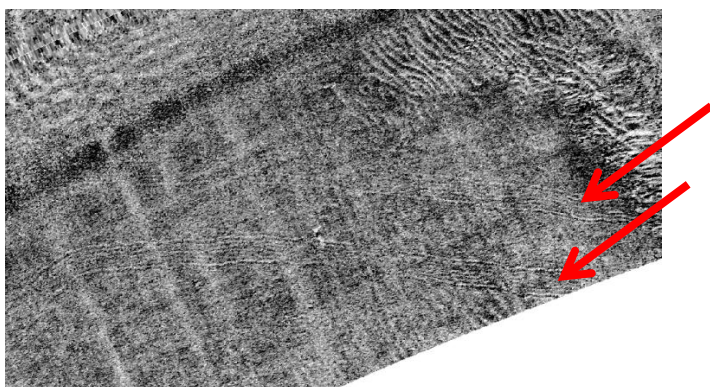
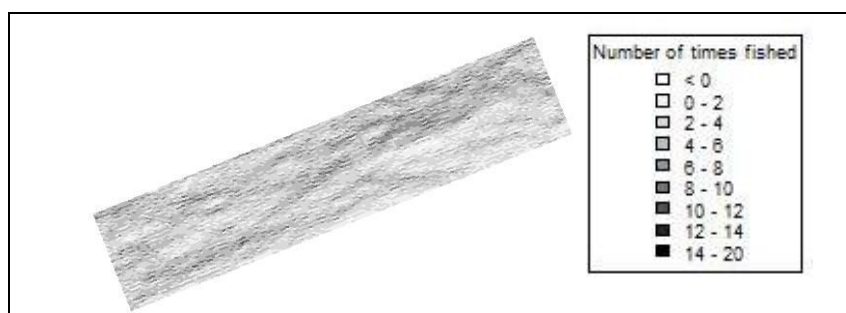


Image extracted from the side scan data analysis showing the clear marks left by two beams of 7 dredges each in the Cardigan Bay experimental area in May 2014 (straight after the fishing disturbance occurred in April 2014).



Example of the distribution of fishing effort in one of the experimental fishing boxes which has been fished on average 5 times – This figure shows how (despite the small size of the experimental boxes – 1.7km by 0.4km) fishing effort still varied over the whole area with some patches being fished over 8 times and some none.

