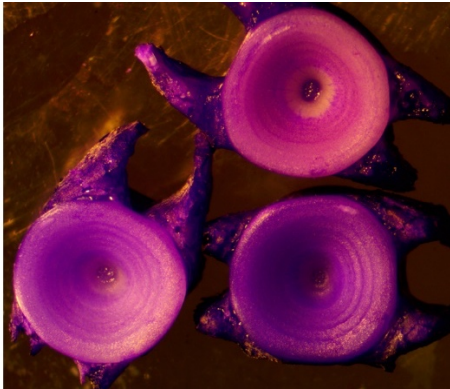


EMFF Fisher – Science Partnership for Sustainable Fisheries



Newsletter 6 April 2021

Welcome

Welcome to our sixth newsletter. Since our last update, although the way we are working is still not back to normal, we do have plenty of very robust Covid-19 protocols in place to allow us to continue with field and at sea work safely, as well as to return to the laboratory to process samples. We would like to re-emphasise the fact that we know this has been a very difficult time for the fishing industry, and thank all of you once again for continuing to help us with our science during such uncertain times. We sincerely hope that this year will run more smoothly and be easier for all of us.

Lobsters

Lobster Fecundity and egg loss:

After the pause in field work due to COVID restrictions last summer, this work was picked up again in the Autumn 2020 where we were able to collect further samples to support the validation of non-invasive methods in determining fecundity. This work will assist future assessments of fecundity where egg masses and females can be returned to sea unharmed. We are still collecting samples to analyse in the lab and collectively this work will help to decipher seasonal egg-carrying variation between different sized individuals across different years.



Lobster size at maturity

We have discussed the lobster size at maturity results with fellow scientists within the ICES crab and lobster working-group. This has been useful to discuss some methodological and analysis difficulties and to understand the results in the context of the European wide population and the regional differences we might see. Our results suggest that the 90 mm landing size does protect at least 50% of the females until they have had time reproduce at least once. We are continuing to work with colleagues within the ICES group and understanding some of the reproductive biology of the lobster that may influence the wider interpretation and use of these data. For example, how frequently do lobsters reproduce and does this get less frequent with size? We think that larger females reproduce every two or even three years, but we are unsure if this varies with environmental factors such as temperature and how variable this might be between individuals. We also don't know if smaller animals reproduce routinely on an annual basis and at what size this frequency might drop.

Video capture of Crab and lobster data

This project has progressed well, although the impact of Covid as meant that we still have some work to complete. We are now on version 3 of the video camera unit. This uses a motion sensor to start recording to avoid hours of footage when nothing is happening. The software can automatically extract an image when something is passed under the camera and it can then identify if this is a crab or lobster. It can then measure and sex each individual. All of this computer vision work can be run on the camera unit. This means that we only need to transfer a spreadsheet of data rather than large video files. We are currently working with Welsh Government and CEFAS on data security, data transfer and data storage. We will also have a web-based interface that fishers can use to view their own data. All of the computer vision has been trained on data collected by the team; however, we still need much more data to improve the accuracy and confidence. Covid has interrupted the fieldwork and to complete this and we are working on securing other funding opportunities (This section of EMFF is due to end shortly).



A batch of cameras being made up



The outer housing for the camera



Image collected through motion detection.



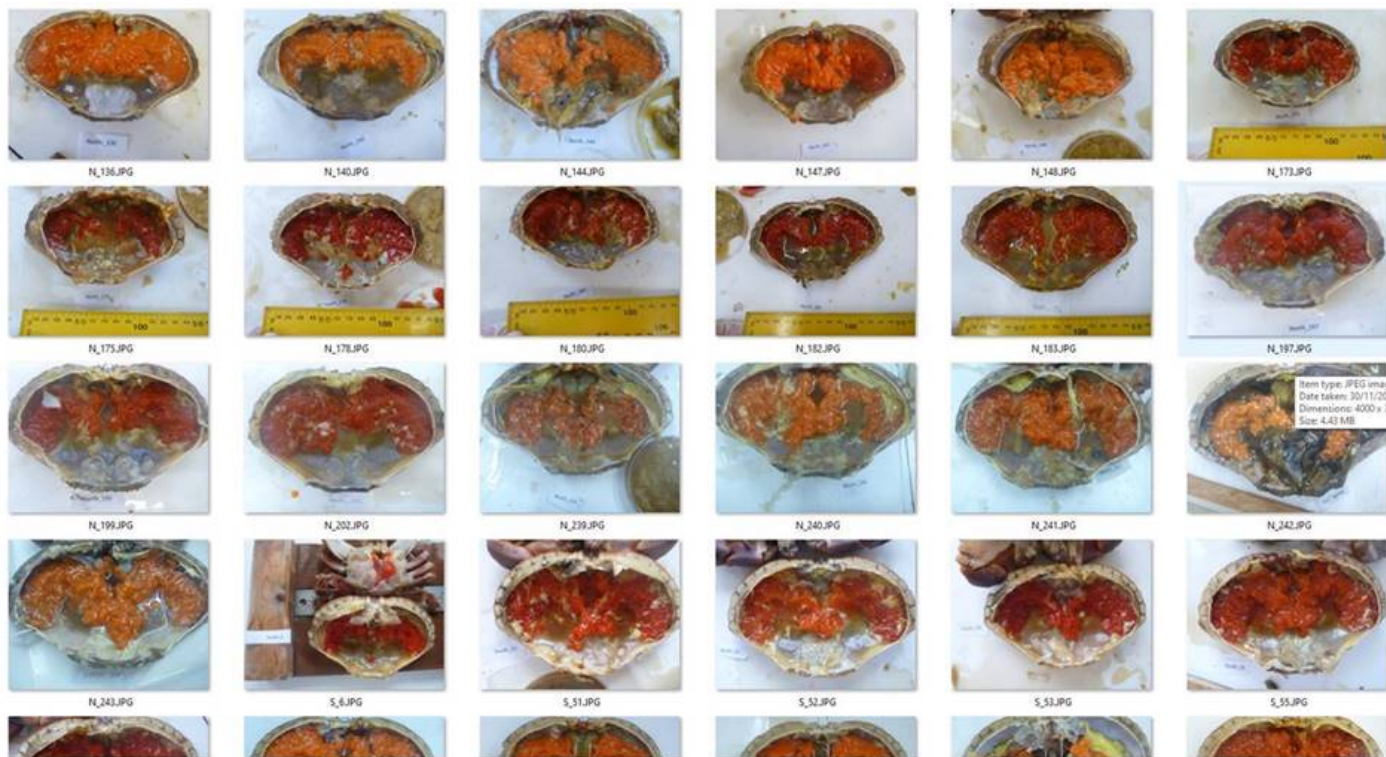
Computer vision images for estimation of size

Crabs

One of our project aims was to repeat the Bangor study done in 2015 on the size at which edible crab become mature at in Welsh waters, to see if there had been any changes over time (e.g. due to fishing pressure).

From October to December we were busy in the field and working closely with fishers to collect samples, from the same locations as the previous study, in both North and South Wales. We have been very busy in the labs, and have now completed dissections of just under 600 crabs to examine their sexual maturity status. The next part of the study will be analysing the data, and assessing whether there has been any significant change. We will keep you updated on this. Many thanks to those fishers who helped us collect samples.





Whelk in Welsh waters

In early 2020 we undertook work to assess a standardised survey methodology for the analysis and stock maintenance of whelk.

From October 2020 we started to work looking at the possible variation in size and age at maturity for whelk in Welsh waters. We are collecting whelk of all size classes, including those undersized, from a series of locations across wales to look at differences on a large spatial scale. In addition, a finer scale study is being conducted in North Wales within a single area to look at localised variation within the population. We are currently busy in the lab taking measurements of size, maturity and age of whelk collected, with more samples coming in soon.

Many thanks to all fishers who have helped us collect samples and have spent time talking to us about their fishing experiences.

Any questions please contact c.n.colvin@bangor.ac.uk



Mature gonads of female whelk



Scallops

After having to cancel the plan to have commercial vessels fish alongside the RV Prince Madog during the 2020 annual scallop survey, we hope to conduct this experiment in 2021. This comparative fishing study will allow us to quantify the differences in fishing performance between the Prince Madog and commercial vessels, which would be extremely important if commercial vessels were to be used for scallop stock surveys in the future. Currently, our annual survey is scheduled for late April although both the survey and the use of the commercial vessels are subject to Covid-19 regulations at the time of the work. Other fieldwork is also being planned for the spring and summer, including analysis of maturity and spawning in king scallops and trialling of an ROV fitted with a camera for estimating scallop abundance. In addition, we are close to completing computer-intensive studies of various stock assessment models used to estimate abundance of scallops and catch efficiency of vessels.



Bass & thornback ray

In 2019 we had undertaken work on the bass and thornback ray in neighbouring English waters of Liverpool Bay, resulting in an interim report (issued May 2020). Since then, we have analysed further samples and data, to produce a final report for the project – available on our website:

http://sustainable-fisheries-wales.bangor.ac.uk/documents/Bass-and-ray-ecology-in-Liverpool-Bay_FINAL.pdf

The most important finding of this report relates to bass spawning. We collected tiny bass fry (around 3-5cm) from the Wyre estuary, aged them using their ear-bones, and then calculated the most likely location they were spawned using oceanographic modelling, for 9 different scenarios. The outputs of the modelling all suggested relatively local spawning in inshore regions of Liverpool Bay (approximately inshore of a line between the Orme and Barrow), and some of the local estuaries. This intriguing finding adds further weight to evidence that at least some of the bass in the area are spawned locally, contrary to the broadly accepted behaviour of offshore spawning in the Southwest. Further work is currently being done by Harriet Lincoln on examining this for Welsh waters.

Historical fish

Many fishers we work with note how catches – in terms of abundance, size and the types of fish present - were better or different at the start of their fishing career, or in the generations before them. It is important to understand these longer-term changes to learn how fisheries might be improved and restored.

Alec Moore is undertaking a short project looking at how fish communities have changed around North Wales over time, using a range of historical sources like old archives, newspapers, and fishery statistics-some going back to the 1700s or further. If you, or relatives or friends who used to fish, would like to share anything – such as old photos of big fish, good catches, memories, or old logbooks – please contact Alec (a.moore@bangor.ac.uk).

Crab and lobster sustainability – Kiran Bhandari

This is my first column for the monthly newsletter so I will start with a short introduction about myself.

I am a PhD student at Bangor School of Ocean Sciences and have been at the university since April last year. Prior to starting this PhD, I worked as a Marine Enforcement Officer for the Marine Management Organisation, based in Scarborough for just over a year. East Yorkshire is home to one of the largest small fleet shellfish fisheries in the UK so naturally most of what I was enforcing and interacting with were small boat crab and lobster fishermen, and this sparked my interest in studying this fishery for my PhD. I previously completed my MSc in Marine Biology at Bangor in 2013.

At present my PhD has the working title of “The factors that influence the sustainability of the Welsh crab and lobster fishery” and I aim to collect data onboard boats and from video footage of potting effort, habitat type, size and weight of crab/lobsters, sex and whether they are berried or not. I hope to be able to obtain egg samples from both species and conduct laboratory test to measure egg quality, composition and also possibly fecundity. I aim to establish what environmental factors are driving these changes in both egg quality and adult physiology and down the line I also aim to rear crab larvae and investigate which factors most affect their survivability. I hope that this research can be used to help predict where lobster and crab are more and less likely to be caught and their survival rates with changing climate.

As part of my thesis and the background to my study, I wish to obtain the knowledge and fishing habits of the local pot fishermen. This is so I can create an overall picture of the current status of the Welsh pot fishery and also to narrow down where my sample sites are going to be. For this purpose, I will shortly be sending out an online questionnaire to pot fishermen that are known to the EMFF team and would greatly appreciate it if as many fishers could respond as possible. The questionnaire will only take around 10 mins to complete and there will be a small incentive on offer for those who do complete the questionnaire.

Happy fishing and I will keep everyone posted on future updates about my research.

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