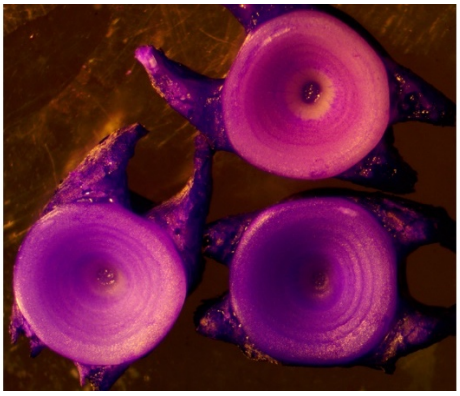
Pysgodfeydd Cynaliadwy Cymru
Sustainable Fisheries Wales

EMFF Fisher – Science Partnership for Sustainable Fisheries


Newsletter 7
December 2021

Welcome

Welcome to our seventh 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.

Lobsters – V-notching

Recently, our fisheries team was awarded funding to carry out a lobster v-notching project that was put into action in September and will last a year. In addition to conservation of the stock, v-notching can be seen as a 'tagging' method, as the notch can last through a moult and provides protection against landing. Whilst we won't be able to identify between individuals, we can then carry out what is called 'batch tagging' and we can apply variations to the notch to identify between time/location of a notching event. We hope to estimate 2 main research questions with this work:

1. Do lobsters of different sexes and sizes have the same chance of being caught in a commercial pot, and

2. What is the proportion of the populations (usually by size and sex) dies as a result of fishing in any one year. To apply as much accuracy as possible, this work comprises into 4 smaller surveys.

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We have now begun survey 1 to establish a baseline, investigating what proportion of lobsters are currently notched, and starting to notch many more on the ground. Our team has been on board some participating vessels across Wales with some good catch rates.

As winter weather is now setting in, in the Spring of 2022 we hope to re-visit some of those fishers to conduct recapture surveys, and then we will look to include any more interested fishers. Please get in touch with our team if you are interested in Spring participation.

Crabs

Size at maturity

We have now completed analysis of the data for size at maturity study, from samples collected last winter. This involved looking at two different types of maturity – in the gonads (physiological maturity), and changes to secondary sexual characters (claws in males, abdomen width in females)(Morphological maturity).

After examining the gonads of over 600 crabs of all sizes we found that the gonads of 50% of crabs are mature by the size they are 88 mm carapace width (CW) (males) and 107 mm (females). This is similar to sizes found in other regional studies. We also found that there was a significant difference between north and south Wales, with crabs from north Wales attaining gonad maturity at a smaller size (for both males and females). Although these sizes are well under the MLS of 140mm, it is important to note that crabs with mature gonads may not necessarily mate and/or spawn. Males are thought to only be able to successfully compete for mates, and mate, once their claws undergo distinctive change to size and shape.

To address this we also measured the claws of males, and the abdomen of females, for a further 1,100 crabs from when we were onboard vessels during 2019 and 2021. We found that the claws of male crabs change to being

disproportionately larger at around 115 mm CW (i.e. attain morphological maturity). When combined with the results from the gonad maturity, this means that nearly all males greater than 115 mm will have both mature gonads, and have claws that allow them to compete for mates (and therefore be more likely to be 'functionally mature'). This is size is well below the MLS of 140mm, meaning that very few immature males will be landed. Results for female abdomen width were less certain, and highlighted possible concerns about using this body part to accurately measure maturity. Overall, the results suggest that the existing MLS is adequate.

We compared our results to the previous crab size at maturity study done by Bangor about 6 years ago, as we would expect to see a decline in size at maturity if intensive overexploitation was occurring. We found no clear evidence of a decline in size at maturity. This might mean that recruitment overfishing – where too many immature crabs are caught before they have a chance to spawn – is not a key factor in the decline in landings per unit effort that many of you have reported. Further research is needed on other factors that may be affecting all life history stages of the crab in Welsh waters.

Brood grounds

As part of trying to understand when (and where) brooding brown crab release their eggs and larvae, we have been attempting to develop microscopic and genetic methods. This will help us find out when they spawn, how variable this is from year to year, and is the first step in being able to conduct surveys to locate brood grounds. We are also mapping records of berried crab caught in trawl & dredge surveys to find out preferred sediment type and depth. In the coming winter months we hope to investigate reported brood grounds with a Remotely Operated Vehicle (ROV), so we can plan wider surveys.

Bycatch

We are still collecting data on the bycatch in crab and lobster pots – having documented evidence of this is an important requirement of eco-certification schemes. So far we have sampled from over 4,000 individual pots from around the coast of Wales, across seasons. This has given us the opportunity to get hands-on measuring everything from thrashing bullhuss and conger to delicate pipefish!

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Scallops

In April 2021 we chartered three commercial scallop vessels to fish alongside the RV Prince Madog during part of the annual Welsh scallop survey. By doing this, it was possible to directly compare the catch rates between these vessels to help understand how to compare previous survey data collected by the RV Prince Madog to any future survey data collected by commercial vessels. Conducting this fishing comparison experiment involved many members of the project, as scientists were required on each of the four vessels to record haul information and process the catches.

The provisional results showed that the commercial vessels caught significantly less king scallops than the research vessel, and this was driven by catching significantly less small scallops (individuals less than 105 mm in shell width). Limited significant differences existed between the catch rates of commercially-sized scallops (those 110 mm or greater) between vessels, however the smallest and least powerful commercial vessel caught significantly less than the other vessels at depths greater than 35 m. Very little significant differences existed between the catches of the two commercial vessels that were of similar size and engine power. These findings show that changing the survey vessel to a commercial vessel using commercial gear would result in a considerable loss of information about small scallops. In addition, although some commercial vessels may produce similar catch rates, this work has shown this is not always the case and the difference in catch rates can vary across depths. This study provides correction factors that would need to be applied to make previous survey data comparable to future survey data collected by commercial vessels. This study will be written up in the coming months and is intended for publication.

On a similar note, two members of the project recently published a peer-reviewed study that analysed differences in commercial vessel catch efficiency. Catch efficiency is the fraction of scallops caught from the amount available in the haul path. This study was based on Bangor University data collected prior to this project, but a considerable amount of data analysis and write-up time was conducted during this project. This paper demonstrates that catch efficiency can be considerably different between commercial vessels and it is likely problematic to assume that commercial vessel catch rates are equal for the purpose of stock assessment. This paper can be found online (link below) but please contact adam.delargy@bangor.ac.uk to discuss if you have trouble accessing it.

Link to paper: https://www.sciencedirect.com/science/article/pii/S0165783621002666

Two of the commercial vessels from the fishing comparison experiment following the RV Prince Madog.

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European Sea Bass

Tagging

This summer we spent 2 weeks tagging sea bass in North Wales. With help from local fishers and the Centre for Fisheries and Aquaculture Science (CEFAS) we have so far tagged 34 bass with data storage tags (DSTs). These tags collect data on depth, temperature and pressure allowing us to track where the bass have been, allowing us to understand more about their lifecycles. However, we need the tags back to collect the data stored on them. They are contained within bright orange floating jackets so keep an eye out on beaches for any that might have washed up. The bass are tagged with external markers as well so you should know if you catch one of these tagged fish. If you find a tag, call the number to send it in and claim a financial reward.

For tag returns phone: 01502 524526

For more information contact: Harriet Lincoln – h.lincoln@bangor.ac.uk

0-group seabass work – Joe Dawson

I am currently conducting work to assess 0-group seabass recruitment to local estuaries in North Wales. My work is concerned with the presence of multiple cohorts of individuals recruiting concurrently into estuaries, and what this may represent in regards to population structure of local seabass populations. The data collection has now finished for my project, and currently I am at the stage of processing individuals otoliths. This involves extracting and photographing otoliths in order to age individuals in days, and from there examining the age structure and presence/absence of multiple recruitment pulses. This study will help to assess whether there is evidence of local spawning to this area. Eventually the data will be used to model where these individuals were spawned, and drifted into estuaries from. If evidence of localized spawning is shown, this is important, as seabass have recently been found to show fidelity to winter spawning grounds, meaning it is likely they will return to spawn in these areas, and populations of seabass may begin to be established further north, possibly as a result of climate change.

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Sampling in the Dwyryd estuary

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