DRAFT Minutes

Joint NWWAC/NSAC/MAC Focus Group Brown Crab

30 November 2022

13:30 – 15:30 IE | 14:30 – 16:30 CET

Participants

Enda Conneely	IIMRO	NWWAC
Ciara Dower	Verifact	
Mike Fitzpatrick	Verifact	
Sarah Horsfall	EMPA	MAC
Salomé Khatib	CNPMEM	NWWAC/NSAC
John Lynch	IS&EFPO	NWWAC
Mo Mathies	NWWAC Secretariat	
Geert Meun	VisNed	NWWAC/NSAC
Patrick Murphy	IS&WFPO	NWWAC/MAC
Aodh O'Donnell	IFPO	NWWAC
Norah Parke	KFO	NWWAC/MAC
Tamara Talevska	NSAC Secretariat	
Oliver Tully	Marine Institute	
Jarek Zielinsky	Polish Fish Producers Organisation	MAC

1. Welcome and introductions

The Chair welcomed all participants to the meeting. Apologies were received in advance of the meeting from Pedro Reis Santos, MAC Secretariat. The agenda was approved.

Action points from the last meeting:

1	Secretariat to follow up with Peter Breckling who had been a member of the previous joint FG.
	NWWAC Secretariat contacted Peter. NSAC Secretariat explained that he is currently unable to attend due to personal circumstances.
2	Mathies to contact BIM regarding this project and circulate any official documents available.
	Report circulated on 28/10/2022
3	Members to contact the relevant research institutes for an update on the stock status.
	Norah Parke – Marine Institute, on agenda today Geert Meun – Marshall Rosemeyer contacted Salomé Khatib – Ifremer contacted, invite to next meeting
4	Secretariat to add the issue of inorganic arsenic to the ToR.
	Added and circulated on 28/10/2022
5	Secretariat to amend the ToR to reflect the later workshop date.
	Amended and circulated 28/10/2022

6	Secretariat to invite national experts on stock status to the next FG meeting.
	In progress
7	Horsfall will inform the group once the documentation on the guidelines in the UK is finalised.
	No update available yet

2. Status of the Brown Crab stock in Ireland – Oliver Tully, Marine Institute

The Chair thanked Oliver Tully for accepting the invitation to present to the members and gave him the floor.

Oliver Tully stated that the ICES Working Group met in November. Across various countries and stocks, different approaches to assessments are being undertaken, but there is no single overall approach to assessment for example on a regional Northern European level. However, he commented that the overall status is negative not only in the Irish stocks but also in the in the UK and Scotland, as well as in the North Sea. He added that the consistent downward trend is remarkable even though the data sets are coming from different fleets in different areas. His data covers Irish offshore vivier fleets up to 2006 and includes sentinel fleets which report daily catch and effort. Last year the Marine Institute started its new "skipper sampling" programme while port sampling is also carried out. Overall, there remains a high dependence on the industry for provision of data other than legally required log sheet data..

.Dr Tully described the separate and distinct brown crab fisheries in Ireland. The Malin shelf stock extends probably from West Galway to the edge of the shelf and into West Scotland with the northern limit likely unknown.
Another stock is defined in the Southwest, which is effectively an inshore stock out to 12 nautical miles with no significant offshore stocks. Pot surveys were carried out here over 15 years ago without showing any significant crab populations in that area. There is a southeast stock in the Celtic Sea or NE Celtic Sea, which is also distributed out to about 30-40 miles, which may have some connection to the UK Channel stock. Finally, there is a smaller fishery in the north Irish Sea.

In the Malin shelf area, there is activity by Irish and Northern Irish vessels as well as vessels from Scotland. There has been a shift north and east in the areas fished in recent years compared to 2006 where there was a lot of activity off the northwest coast of Ireland, including offshore, the concentration seems to have shifted to the east and concentrated along the Scottish coast. This could indicate that there may be some changes in the distribution of the stock in recent years for reasons we do not understand. Irish landings peaked in the Northwest at about 7000 tonnes in 2004, declined in following years and hovered around 2000 - 3000 tonnes in the period up to 2014/15 and has been declining since though this is not necessarily a sign of the stock status.

Landings by Scottish registered vessels are much more stable over time with no significant peaks suggesting that the participation in the fisheries is relatively constant compared to the Irish fleet. The Northern Irish landings are smaller than the Irish and Scottish landings.

There is a significant reduction in the number of vessels in the northwest fishery compared to the 1990s, but nevertheless a dramatic increase in the effort potential in terms of the number of pots in the fleet, which currently stands at about 95,000 pots. Older vessels leave the fishery or are not competitive in the fishery anymore reflecting the increasing need to go offshore to get significant quantities of crab. Therefore, there is a need to renew vessels and scale up the vessel size and power in order to maintain participation in the fishery.

The assessment method that is being used by the Marine Institute is the surplus production model called SPiCT. This is a common approach used in stock assessments measuring how the productivity of the stock changes over time in response to whatever impact is on it in terms of fishing mortality. It identifies reference points as to the biomass at which the stock has the best productivity in the long term as well as the fishing mortality that would allow that productivity to be maintained.
The model does not rely on length data or on biological data, it simply relies on having the overall outtake(landings) and then having a metric of stock status over time. This stock status is given by the landings per unit effort indicator, provided that there is certainty that the landings per unit effort (LPUE) reflect through changes in the underlying stock and are not due to something else. That is always something to be concerned about in using catch per unit effort indicators.

The Marine Institute has been collecting size data from Malin shelf fisheries for 20 years. No change in the shape of the size distribution can be observed, so this is not a sensitive indicator, or not reflecting fishing mortality given that fishing effort has really escalated, and fishing mortality has increased throughout the time series, it is not reflected in the size data. Therefore, care has to be taken in the application of the size-based methods These methods are also really sensitive to available growth rate estimates which are generally poor.

The LPUE index from the offshore Irish fleet is available between 1990 to 2006. LPUE indicators may be sometimes confounded by other issues, for example changes in gears, changes in some other fishing practice, changes in environment or changes in something else. One of the characteristics of this offshore index is that the data volume is high. High data volume tends to even out any bias that might be within it but the nominal index has also been standardised for potential confounding effects of gear prior to using the index in the assessment. Nominal and standardized index in this case is not dramatically different providing confidence that the data is robust.

Up to 2013/14 the fishery hovered around a sustainable level of fishing mortality and productivity of stocks was high. In the past six years, it has evolved into being overfished as F is now above Fmsy (sustainable fishing levels). B is below B_{MSY} indicating a reduction in the productivity of the stock. Stock productivity has declined, and fishing mortality is now too high with respect to the stock biomass according to the model. This enables the production of a management forecast which gives a number of different management response points or choices Very significant reductions in fishing mortality are needed to restore biomass. The most direct way of limiting the fishing mortality and recovering stock is to control landings. Indirectly landings could be controlled by controlling effort or having a closed season or by implementing any other measure and hoping that that would have an effect on the landings.

The model does not take into account all the dynamics of the life history of the species and does not identify other factors that may be involved in decline of the stock. High landings in previous years

around 2004 did not lead to very significant drops in LPUE. but these indicators have declined more steeply in recent years. The question is "why was this not seen before, for example in the period 2006 – 10 following that period of high landings?"

Additional potential mortality, not always taken into account but which may contribute to a drop in LPUE, due to crab being used as whelk bait could skew estimates.
However, the majority of crab used as bait does appear in the landings.

These findings correspond with industry perception. With respect to the sustainability of fishing from 2014 – 20, changes in the distribution of fishing can be observed from the inshore fleet in 1997 with some offshore activity to a much more expanded offshore regime in the following years. The escalation of fishing effort is not just in terms of number of vessels but also where the fishing is happening, meaning the entire stock is being exploited where previously in the early 90s to mid-90s, probably not all the distribution was being fished at that time. A survey carried out in 2020 identified several issues, that fishermen were concerned about; These include landings of poor-quality crab, use of crab as whelk bait, large-scale clawing of carbs at sea etc. A range of solutions were proposed by fishermen, including seasonal closures, pot limits, improving landing quality through strategic high grading to optimize the market price.

On the Irish whelk bait issue, the Marine Institute recently estimated the amount of crab being used in this fishery. Steady whelk landings of approx. 5,500 tonnes can be seen since 2015, mainly from the South Irish Sea and also some in north Donegal. Parallel data for crab landings nationally show that these are hovering around 6000 - 7000 tonnes in recent years which raises the question what proportion of this crab is being used to catch whelk.

Firstly, we need to estimate the number of whelk pots being hauled per annum. Using that combined with the amount of crab being used per pot we can estimate the crab weight in tonnes in each year which amounts to 20 - 30% of the volume of total crab being landed. Data is also available from whelk processors, and the amount of bait being used by vessels landing into these can be estimated. In summary, taking 2019 as the reference year with landings of approx. 5000 tonnes, it seems that the volume of crab being used as bait could be between 1400 and 2200 tonnes or 20 to 30% of crab landings. These estimates do not account for crab exported to the UK for bait in their whelk fishery as these are not known at the moment. In addition, with crab catches in decline, fishermen have started using spider crab as bait with an estimated 30% of the whelk bait now being used from spider crab. Increasing attention is being paid to processing of spider crab and therefore the by-products of that processing are available for whelk bait.

The question about the impact on crab stocks of using brown crab as whelk bait is still open as it is unclear at this point if stopping this practice would lead to significant reductions in landings of crab. Would the crab be landed in any case. The provenance of the crab used for bait needs to be identified in more detail.

3. Discussion & next steps

The Chair thanked Tully for this comprehensive presentation. She felt that the findings were serious for the industry though not unexpected. She added that the information regarding the volume of crab

being used as whelk bait added impetus to the various projects that have been looking into developing an alternative synthetic whelk bait.

Mike Fitzpatrick commented that a project on this topic is currently ongoing in ATU (with BIM funding) and it seem good progress is being made. He mentioned a project carried out by Nofima in Norway a few years ago though this did not result in any positive outcome. He suggested that a presentation could be made to this group on the BIM project.

The Chair agreed and referred to the joint AC workshop that is planned for 2023 where such a presentation would be very useful as well.

Khatib added that the use of crab as bait is also of concern in France which is experiencing very low discards and also low landings. Many fishermen are obliged to change their fishing techniques or strategy, some even had to ask for a refund of their boats which is sad for this traditional fishery. She was wondering if there are any regulations regarding the bait market. She added that there is an overabundance of spider crab in French waters, and that there seems to be a solution to this. She felt that shifting the bait market to spider crab could possibly solve this issue.

The Chair commented that this Focus Group to investigate the use of spider crab as bait as opposed to brown crab.

ACTION: Investigate data on use of species other than brown crab as whelk bait and what would happen if it was not used.

Mike Fitzpatrick referred to the Nofima project and his work in the Irish Brown Crab FIP. He stated that some processors involved in the FIP have identified the use of brown crab as whelk bait as an issue. There seems to be some concern that a certain amount of landings are happening because of the use of bait in the whelk fishery.

The Chair stated that she is also aware of at least one processor who participated in the Nofima project. She felt that the reason this project did not bring real results for Ireland may have been due to the Norwegian crab population used in this project may have been different from that around the Irish coast.

John Lynch added that the use of crab is seen as a necessary part in the whelk fishery but he believes that mostly by-product from the crab fishery is being used. The price for a box of bait is low so more of a side line for fishers and not driving the crab fishery. He added that as the claws are the most valuable part of the crab, the bodies are used for bait after being clawed on the pier. No crab with claws intact are being used as bait.

The Chair felt that from her own perspective crab might be returned to sea and landed several weeks later as higher quality crab if it was not landed for whelk bait. She supposed that even a low return for a box of bait is possibly better than none for some fishers.

Lynch added that he felt it would be more useful to manage the crab fishery than trying to manage the whelk fishery and that a vision was needed to improve this fishery.

Patrick Murphy agreed that sacrificing one fishery for another is not the way forward. He added that in his own experience mainly by-product from processing is being used for bait and that his main concern was for the protection of berried individuals.

Tully added that no fisher is going out to fish crab for bait only, some are bringing in mixed grades and some are bringing in high grades only. The economics depend on the price structure per grade, as the vessel's discarding strategy at sea depends on the return received for each grade when returning to port. "It is easy to see that it is still more profitable to have a low discarding rate than a high discarding rate."

Sarah Horsfall commented that crab are also being use for whelk bait in the UK though mainly by-product is being used. A ban is in place in the UK on berried hen fishing, and there is a minimum landing size for crab. The one thing not in place is effort control though it seems that despite a large increase in effort, stocks had not collapsed in the past years "which is quite an anomaly really." Unfortunately, crab stocks are now collapsing in the northeast and along the South Coast. Investigation are ongoing as very high mortality events have been observed. Initially the government indicated that this was due to algal blooms, which poisoned the crab. However, that has been disproved. Now there are investigations going on into whether it is being caused by pyridine, and it looks likely that water temperature is a contributing factor, in that the waters are getting warmer, and the crab are suffering from temperature shock. This is not very well understood, but it is thought that if the temperature is above a certain level for five consecutive months, then it causes high mortality in the crab. What is known is that fishing was not causing massive amount of stock problems before the last 18 months. But since then, large crab mortalities have been experienced for other reasons that are not fully understand yet.

Enda Conneely was wondering if the Marine Institute had managed to correlate the catch of the whelk with that of crab to see if the whelk fishery had increased when the crab fishery decreased. He added that using by-product for bait makes more sense rather than targeting crab for bait.

Tully explained that the Marine Institute accounted for whelk and crab landings in the assessment of the volume of crab used for. The total amount to crab going to whelk is related to the total amount of whelk fishing activity and whelk landings. The more pots that are hauled, the more bait is used.

Aodh O'Donnell felt that it is important to note that people have been diversifying into green crab as a source of bait as well. Based on available estimates 500 - 700 tonnes of this are being used per year as a brown crab bait substitute and this is being developed further. He added that it is not economic for fishermen to produce crab for bait and companies are diversifying into using green crab and spider crab as less brown crab is available. In terms of European whelk production, the Irish volume is less than 1/5 of the total production. If there is demand for bait in whelk fishing, there must be a big demand in other countries. In his opinion there is very little product being exported from Ireland to France or to the UK as a bait product as the economics do not work.

Fitzpatrick clarified that the aim of the alternative bait development projects was not attributing blame to any fishery but that this work is being carried out to potentially alleviate some of the pressure on the brown crab stock. Other positive results could be that a product is developed which is easier to store.

The Chair agreed but was unsure about the uptake of any new products by fishers.

Lynch commented that he fully supported the development of alternative bait particularly if it was cheaper and easier to store.

Murphy cautioned that fishing for green crab in the past resulted in the stock markedly declining, so changing from brown crab to green crab as a bait may at best be a temporary solution.

The Chair concluded that it would be useful to have similar data as from the Marine Institute presented by other countries on brown crab stocks to arrive at a more complete picture regarding stocks in the North Western Waters. She asked participants if there was anything that needed addressed regarding the health of crab and if there were any studies available, for example in the Baltic or North Sea, which this Focus Group may not be aware of. She asked if members could highlight these to the group if they are aware of any. She pointed out that ultimately the fishing effort is what needs to be looked at and developing sensible suggestion regarding management going forward especially in the North Sea.

4. AOB

Tamara Talevska mentioned that Peter Breckling informed her that the German fisheries are still interested in this work. He was wondering if members were aware of any climate related data regarding brown crab fisheries, for example CO2 footprint.

Tully mentioned that members of the ICES WG have looked at the relationship between the crab fishery and the North Atlantic Oscillation which drives climate. He was not aware of any results on this yet though it should be published soon as part of the annual report of the WG.

Talevska informed members of the NSAC webinar on climate change impacts in the North Sea scheduled for 07 December.

The Chair added that Breckling had previously mentioned the coexistence of pot fishery with offshore renewable energy in the North Sea and asked if Horsfall had any additional information on this.

Horsfall stated that while developers include the possibility of fishing in their sites to strengthen their licence applications, in reality once the wind farms are established fishing within them is deemed too dangerous. Additionally, insurance cannot be obtained to fish effectively in these areas. Industry is asking the government regularly to include as a licence condition before a licence is granted that fishing and aquaculture co-location is allowed. This has so far not produced any results.

Tully commented that the policy aspiration in Ireland is for coexistence which has been clearly stated by DECC. This also raises question of the design of wind farms and how they could be designed to enable coexistence. The insurance issue must also be addressed.

Fitzpatrick stated that in the UK the level of pot fishing that is occurring in wind farms can depend on how they are designed, and, for example, the tides in that area. He referred to the experience of the Holderness Fishing Group off the Yorkshire coast.

Khatib asked if any members attended the UK Crab Symposium and if any reports were available.

Horsfall stated that proceedings would be published and made available.

Tully queried if there were any developments in the EU-UK discussions on the development of multi-year strategies for non-quota species.

Mo Mathies informed the group of the work carried out on various non-quota species in the NWWAC including participation in the STECF EWG for which the report is sill outstanding. The latest information presented on this to the Inter-AC Brexit Forum is that a pilot project will be carried out on scallop in the English Channel which will act as a template for multi-year strategies for other species. She added that the Commission is always interested in hearing any additional information on any of the non-quota stocks. Anything that this Focus Group can provide to the Commission to support them in the negotiations is very welcome and highly appreciated.

5. Summary of actions agreed and decisions adopted by the Chair

1	Investigate data on use of crab as whelk bait and what would happen if it was not used.
2	Members to highlight studies on mortalities from other regions if available
3	Secretariat to invite other national research institutes to present at the next meeting

The Chair thanked all participants and closed the meeting.

Date of next meeting: 24 January 10:00 – 12:00 CET