



Tees and North Yorkshire shellfish landings report

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Executive Summary

Since the release of the first report in September 2022, NEIFCA continued with the assessment of landings data for 2022 using the MMO iFish2 data set, a collation of landings data from vessels of various lengths. Various approaches for analysing catch and effort data to better understand fishing activity and behaviour within inshore waters were explored. However, due to data deficiencies, it was not possible to use a list of sentinel vessels for each port to narrow down the vessels fishing inshore only. Instead, the approach taken used <10m vessels as a proxy for vessels fishing inshore.

The aim of this second report is to present an impartial assessment of landings data for the full year of 2022 and to describe any trends and changes in landings for each port in comparison to previous years.

Across all assessed ports (Bridlington, Scarborough, Whitby, Staithes, Redcar and Hartlepool) there have been clear reductions in landings by <10m vessels for edible crabs in 2022 with declines considerably higher for ports North of Bridlington. Lobster landings have been at their highest for 2022 in Bridlington and Whitby for <10m vessels. For Scarborough lobster landings are broadly in line with 2021 landings. However, landings for lobsters by <10m vessels into Staithes, Redcar and Hartlepool in 2022 are considerably reduced compared to previous years.

There is a low degree of confidence in the effort data provided by the MMO as verification of pots hauled is very limited with high levels of misreporting. Therefore, only number of recorded landing events and vessels actively landing for each port were used for comparison of trends in fishing activity to previous years. For Staithes, Redcar and Hartlepool recorded landing events in 2022 are down by up to 74%. The number of under 10m vessels landing shellfish in the regional ports has been reduced in 2022 compared to previous years except for Bridlington with more under 10m vessels fishing in 2022.

In June 2022 the NEIFCA has re-established their own in-house catch return system to collate landings and effort data at a higher spatial resolution and higher level of confidence. However, the uptake of the additional landings reporting within the industry has been slow and submissions of catch returns were low at the beginning.

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1. Scope and key assumption

Working on the basis that a significant mortality event involving edible crab and lobster occurred between October and December 2021, the work summarised within this report intends to review landings data for edible crab and European lobster to assess for changes in landings trends for 2022 in comparison to previous years. It is not the intention of this report to address the investigation into potential causes of the events observed or to provide explanation in any changes observed in landings.

In order to assess the state of the shellfish (edible crab and lobster) stocks in the affected areas, iFish2 landings data provided by the Marine Management Organisation were interrogated to assess deviation in annual landings compared to historic averages.

The key assumptions associated with this work were that <10m vessels provide a proxy for assessing landings data from the inshore fleet and that anecdotal reports from fishers of declining catch rates in the affected area would be mirrored in the landings data assessed.

2. Methodology

Landings data was provided by the Marine Management Organisation extending back to 2016. The iFish2 (Integrated Fisheries System Holding) data are derived from a CEFAS-hosted integrated database system for UK fisheries authorities. This database system was introduced in 2006 and contains UK vessel activity at sea, landings, and sales of fish. Data for vessels over 12m in length are derived from e-logbooks and landings declarations, data for vessels between 10-12m are derived from paper logbooks and landings declarations and for under 10m vessels from sales notes with estimated landings information attached subsequently. For this report iFish2 data were used to provide a complete timeseries of crab and lobster landings across the ports of interest from 2016-2022.

Various approaches were trialled during the production of this report to address limitations faced during the collation of the previous Stock Monitoring report where landings figures were pooled from a range of vessel sizes (i.e. < and > 10m vessels including vivier vessels) and presented for each port. Initially a vessel level approach was attempted, using Inshore Fisheries & Conservation Officers knowledge to separate vessels that currently operate out of the five ports of interest (Hartlepool; Redcar; Staithes; Whitby; Scarborough) into categories of 'inshore', 'inshore & offshore' and 'offshore' based on their fishing activity. However, this approach was rejected due to deficiencies in data across the selected timeframe. The second and accepted approach from which this report is based on, uses **<10 m vessels as a proxy for the inshore fleet** (vessels fishing out to 6nm) to assess trends in landings of crab and lobster for the five ports of interest, neighbouring IFCA districts and UK total landings. This approach is commonly used to assess fishing activity of the inshore fleet, however, it is important to acknowledge that not all vessels which fish inshore (within 6nm) are <10m in length.

Caveats attached to the iFish2 dataset are largely due to the reliance of sales notes data for under 10m vessels which is not derived directly from the fisher. These include; inaccuracies in the reporting of area fished for vessels <10m where ICES rectangles attributed to daily landings are estimated by coastal CEFAS staff using knowledge of where a vessel fishes based on historic fishing activity logs. Therefore, within the process of data extraction from iFish2 some data may have been lost if attributed to the incorrect ICES rectangle which can inflate or deflate the landings figures presented. Additionally, officers noticed many landings into the port of Scarborough were found to have aggregated weights of crab and lobster reported as the landed weight of lobster. This creates additional inaccurate and inflated landed weights of lobster into Scarborough.

For the assessment of changes in fishing behaviour and activity, iFish2 data were used to summarize the total number of recorded landings events for each year in each port. A landings event is a vessel landing shellfish with a merchant. Additionally, the number of under 10m vessels were summarized to assess any changes in size of the under 10m fishing fleet for each port.

3. Landing Trends

Edible crabs

The assessment of the landings data indicates a clear reduction in the inshore edible crab landings by under 10m vessels across all ports in the NEIFCA district (~51%) with Redcar being the most impacted port where landings in 2022 were down by around 96% compared to the 2016 - 2019 average (Table 1). Neighbouring IFCA's such as Northumberland and Eastern, have also seen reduced landings by under 10m vessels for edible crabs in 2022 and some of the IFCA's in the South of England have reported a steady decline over the past few years as well (personal communication). An overall reduction in landings of edible crabs in the UK by under 10m vessels of around 45% indicates that this trend is also of national concern. Landings for Bridlington were assessed for comparison as it is the biggest shellfish port in the NEIFCA district with many vessels fishing offshore only. For edible crabs, landings in Bridlington from vessels of all sizes (over and under 10m) were reduced in 2022 compared to previous years, suggesting that offshore catches might be impacted as well as inshore ones.

Table 1: Differences in edible crab landings for under 10m vessel in 2022 for various ports within the NEIFCA district, all ports in the NIFCA and EIFCA district and total UK landings for under 10m vessels compared to 2021 and the average landings between 2016 and 2019. Data for NEIFCA ports derived from iFish2 and includes landings from all ICES rectangles. Data for NIFCA, EIFCA and UK nationally were sourced from the MMO's UK and foreign vessels landings by UK port dataset derived from the iFish database (MMO, 2023).

Port/Region	Landings average 2016 - 2019 (tonnes)	Landings 2021 (tonnes)	Landings 2022 (tonnes)	2022 compared to average 2016 - 2019	2022 compared to 2021
Hartlepool u10	14.64	14.47	8.03	-45.11% ▼	-44.49% ▼
Redcar u10	8.74	5.01	0.30	-96.62% ▼	-94.10% ▼
Staithes u10	14.11	14.23	11.74	-16.78% ▼	-17.49% ▼
Whitby u10	197.39	169.22	104.86	-46.88% ▼	-38.03% ▼
Scarborough u10	345.90	197.13	182.70	-47.18% ▼	-7.32% ▼
Bridlington all*	2342.41	2114.27	1946.43	-16.90% ▼	-7.94% ▼
Bridlington u10	197.02	210.39	179.44	-8.92% ▼	-14.71% ▼
NEIFCA District u10	1329.82	1079.25	651.26	-51.03% ▼	-39.66% ▼
NIFCA District u10	996.38	791.47	744.75	-25.25% ▼	-5.90% ▼
EIFCA District u10	751.90	687.02	384.10	-48.92% ▼	-44.09% ▼
UK u10	9769.90	6339.28	5297.66	-45.78% ▼	-16.43% ▼

* under and over 10m vessels

Lobster

The assessment of the landings data for lobster indicates two opposite trends (Table 2). Whilst across the NEIFCA district landings are up by around 5% with record landings for Bridlington and Whitby in 2022, landings in Staithes, Redcar and Hartlepool are reduced by up to 69% compared to the 2016 – 2019 average. Anecdotal reports from fishermen and NEIFCA officers indicate that some fishermen from Hartlepool and Redcar have moved to work fishing grounds either further North or South to avoid the Teesmouth area as catches have been too low but overall landings still remain very low. Landings for lobsters in 2022 across the UK for under 10m vessels have also seen a drop by nearly 10% compared to previous years including neighbouring IFCA's such as the Eastern and Northumberland IFCA with 31% and 42% reduction respectively.

Table 2: Differences in lobster landings for under 10m vessel in 2022 for various ports within the NEIFCA district, all ports in the NIFCA and EIFCA district and total UK landings for under 10m vessels compared to 2021 and the average landings between 2016 and 2019. Data for NEIFCA ports derived from iFish2 and includes landings from all ICES rectangles. Data for NIFCA, EIFCA and UK nationally were sourced from the MMO's UK and foreign vessels landings by UK port dataset derived from the iFish database (MMO, 2023).

Port/Region	Landings average 2016 - 2019 (tonnes)	Landings 2021 (tonnes)	Landings 2022 (tonnes)	2022 compared to average 2016 - 2019	2022 compared to 2021
Hartlepool u10	17.71	16.48	12.77	-27.92% ▼	-22.55% ▼
Redcar u10	27.09	20.12	8.41	-68.95% ▼	-58.21% ▼
Staithes u10	12.79	8.57	4.65	-63.60% ▼	-45.68% ▼
Whitby u10	58.51	75.35	79.96	36.67% ▲	6.12% ▲
Scarborough u10	116.89	98.00	98.89	-15.40% ▼	0.90% ▲
Bridlington all*	368.51	441.54	479.53	44.78% ▲	3.80% ▲
Bridlington u10	94.06	131.19	136.18	30.13% ▲	8.60% ▲
NEIFCA District u10	486.37	523.73	514.66	5.82% ▲	-1.73% ▼
NIFCA District u10	362.54	298.92	304.56	-42.81% ▼	5.53% ▲
EIFCA District u10	74.98	56.39	51.72	-31.03% ▼	-8.28% ▼
UK u10	2167.94	2019.53	1966.76	-9.28% ▼	-2.61% ▼

* under and over 10m vessels

4. Fishing activity in 2022

It was not possible to assess any significant shifts in fishing behaviour by linking landings to effort (pots hauled) data due to the low confidence in effort data and the lack of sufficient spatial resolution. However, the assessment of the number of landing events recorded in each port (Table 3) still highlights a clear downward trend in fishing with reduced landing events in 2022 compared to the 2016 – 2019 average and 2021. In 2022, Hartlepool has seen a reduction in recorded landing events by 61%, Redcar by 74%, Staithes by 40%, Scarborough by 36% and Bridlington by 9% compared to the 2016 – 2019 average. The only port in the NEIFCA district with a reported increase in recorded landing events was Whitby with 2.9% compared to the 2016 – 2019 average. A reduction in reported landings for crab and lobster can also be seen across the UK for under 10m fishing vessel with a 21% decrease in 2022 compared to the average between 2016 to 2019 and 10% compared to 2021.

Table 3: Differences in recorded landing events (Crab and lobster) for under 10m vessel in 2022 for regional ports within the NEIFCA district and UK, compared to 2021 and the average between 2016 and 2019. Data derived from iFish2 and includes landings from all ICES rectangles.

Port/Region	Average recorded landing events 2016-2019	Recorded landing events 2021	Recorded landing events 2022	2022 compared to average 2016 - 2019	2022 compared to 2021
Hartlepool	509.75	435	316	-38.01% ▼	-27.36% ▼
Redcar	741	498	188	-74.63% ▼	-62.25% ▼
Staithes	470.25	432	279	-40.67% ▼	-35.42% ▼
Whitby	2534.5	2417	2608	2.90% ▲	7.90% ▲
Scarborough	5202	4071	3292	-36.72% ▼	-19.14% ▼
Bridlington	1349.75	1338	1229	-8.95% ▼	-8.15% ▼
Uk under 10m	57661	50110	45092	-21.80% ▼	-10.01% ▼

The number of registered vessels landing in 2022 for each of the ports are on a declining trend compared to previous years with the exception of Bridlington which has seen an upward trend in 2022 (Table 4). Hartlepool has seen a reduction of 31%, Redcar 17%, Staithes 20%, Whitby 3.85% and Scarborough 26% in 2022 compared to the 2016-2019 average. Staithes experienced the biggest drop in fleet size in 2022 compared to 2021 at 50%. This is a much bigger decrease in vessel numbers than compared to the under 10m vessel fishing vessels across the UK where a drop of 10% can be seen in 2022 compared to the average between 2016 to 2019 and 4.5% compared to 2021.

Table 4: Differences in number of under 10m vessels (crab and lobster) reporting landings of shellfish in 2022 to regional ports within the NEIFCA district and UK, compared to 2021 and the average between 2016 and 2019. Data derived from iFish2 and includes landings from all ICES rectangles.

Port/Region	Average number of vessels landing 2016 - 2019	Number of vessels landing in 2021	Number of vessels landing in 2022	2022 compared to average 2016 - 2019	2022 compared to 2021
Hartlepool	14.5	13	10	-31.03% ▼	-23.08% ▼
Redcar	25.5	33	21	-17.65% ▼	-36.36% ▼
Staithes	7.5	12	6	-20.00% ▼	-50.00% ▼
Whitby	26	27	25	-3.85% ▼	-7.41% ▼
Scarborough	34	27	25	-26.47% ▼	-7.41% ▼
Bridlington	24.25	24	26	7.22% ▲	8.33% ▲
UK under 10m	2007.25	1879	1795	-10.57% ▼	-4.47% ▼

5. Discussion & Conclusion

At this stage it is not possible to evaluate the state of the stock due to the lack of reliable effort data. Assessing landings does not give any reliable information about stock status, however they can be used to identify general trends. There is a wider concern regarding the status of the inshore stocks for edible crabs throughout the NEIFCA district and nationally. Within this assessment, the comparison of national and regional trends in shellfish landings highlights the localised disproportionate decline of shellfish landings in the affected area. For example, Redcar port has seen a decline of 96% in edible crab landings, as well as 69% decline in lobster landings in 2022 (compared to the 2016-2019 average), which is considerably greater than the national trend estimated at 45% and ~10% for edible crab and lobster respectively. These instances where trends by port fall outside of trends at a national level suggests that the shellfish stocks within this geographical area are subjected to additional localised impacts. NEIFCA officers are aware of the prolonged financial effects of low landings to certain industry members and businesses since the mass mortality event in 2021. It is not possible within the scope of this report to discern to what extent the mass mortality event in 2021 and the reduced fishing activity in 2022 contributed to the substantial decrease in landings for both lobster and edible crabs in the affected area (Hartlepool, Redcar & Staithes) in 2022. However, the reduction in vessel landing events and number of vessels actively landing in this area in 2022 indicates a possible reduction in catch rates as well. Many fishing vessels would reduce the number of fishing trips at times if catches were too low to cover their day to day running costs of the vessel. Further assessments would be required to determine the level of impacts on the stocks in the affected area.

The marine environment is complex, and it is possible that the reductions shown may be due to cumulation of different factors rather than a single cause. There are many other potential contributing factors which need to be considered and could have either contributed to the overall decline or weakened the crab and lobster population enough for such an event to cause a mortality at this scale. For example, seawater temperatures have hit record levels in the North Sea in 2022. Warmer seas around the UK are already having an impact on the distribution and behaviour of fish species (Rutterford *et al.*, 2005; Simpson *et al.*, 2011). An increase in warm water species and retreat in cold water species has already been observed around the UK (Perry *et al.*, 2005; Rutterford *et al.*, 2023). Climate change can potentially also impact the availability of certain nutrients in the water and sediment and therefore can cause shifts in the food web (Hoegh-Guldberg & Bruno, 2010; Capuzzo *et al.*, 2018). Changes in weather patterns can have an impact on the behaviour of fish stocks, e.g. the wind direction of winter and spring storms may affect the migratory behaviour of edible crabs between the in- and offshore grounds. Anecdotal reports from the fishing industry suggest that predominantly westerlies in springtime results in lower inshore edible crab stocks, this supports tagging studies conducted on edible crab which showed that they migrate westerly and so their efforts would be impeded by strong westerly winds (Bennett & Brown, 1983; Hunter *et al.*, 2013). Further factors that have the potential to impact or weaken crab stocks are diseases such as the Amoebic Crab Disease (ACD) recently discovered in the English Channel (Bateman *et al.*, 2023), or potentially new and undiscovered pathogens. However, to date the ACD has not been confirmed in any edible crab populations North of the English Channel or any other new pathogens (Bateman *et al.*, 2023). Finally, the decline in inshore edible crab stocks especially North of Bridlington coincides with a significant increase of vivier vessels in Hartlepool over the past 4-5 years landing catches from further offshore grounds. Edible crabs migrate between inshore and offshore grounds and therefore an increased fishing pressure on offshore stocks by these “vivier” vessels has the potential to reduce inshore stocks. Any mass mortality event such as the one in 2021 would have the potential to reduce the already affected local stocks even further.

This report has been compiled with the best available data, however it has also highlighted the current level of data deficiencies, challenges of data recording and low levels of confidence in certain data. The current catch and landings system is fragmented; under 10m vessels reporting via the u10 Catch App, 10-12m vessels use paper catch returns and over 12m vessels use eLogs. This shows that there is a need for a system providing more reliable data and recording at a higher spatial resolution for the areas fished which would allow for more meaningful assessment of inshore vs offshore fishing activity.

To address the need for better catch and effort data for inshore waters, the NEIFCA re-established their catch return system in June 2022 alongside the development of a new online system due to be introduced in the third quarter of 2023. This new system will allow for more reliable catch and effort data to be gathered which will increase the ability to assess changes in fishing activity on a finer spatial scale.

Further work is also needed to collect more reliable data on potting effort and assess the condition of the habitats in the affected areas. The mass mortality event in 2021 has also highlighted that there is a need for better monitoring of the health of our marine environment around the UK.

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