Department
for Environment
Food & Rural Affairs

# Proposed Fisheries Management Plan for Whelk in English Waters

## Annexes

Date: July 2023

Version: public consultation

# List of Annexes

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## Annex 1: Evidence Statement

Date: July 2023

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# Contents

# Introduction

This Evidence Statement presents the current state of understanding around whelk (Buccinum undatum) fisheries in English waters.

In line with the policy objectives of the Fisheries Act 2020, the evidence presented here will cover:

- Stock sustainability (in relation to Maximum Sustainable Yield [MSY] or a suitable proxy)
- Fishery management approaches
- Ecosystem interactions
- Economic significance
- Social significance
- Climate change (mitigation and adaptation)

Defra would like to acknowledge the advice, evidence and support that has been provided by the Association of Inshore Fisheries Conservation Authorities (AIFCAs), Centre for Environment, Fisheries and Aquaculture Science (Cefas), Environment Agency, Joint Nature Conservation Committee (JNCC), Marine Management Organisation (MMO), Natural England, Seafish, and our stakeholders, throughout the development of this Fisheries Management Plan (FMP) and the evidence that underpins it.

All of the data included within this FMP are considered to be accurate at the time of compilation and represents the best available data at the time of drafting. Fisheries data inherently is variable due to retrospective amendments and corrections to reported data meaning revisions of a dataset may differ from another. Issues can sometimes be identified via ongoing data quality and assurance checks and retrospectively amended. Moreover, the methods used to produce estimates are constantly being assessed, iterated, and improved meaning those figures requiring additional processing may vary slightly compared to other similar datasets depending on the methods in use.

Assumptions have been made (for example, even distribution of landings across ICES rectangles) in order to apportion the data to the FMP area resulting in uncertainty in the absolute landings figures. In addition, fluctuations between years may need to be interpreted with caution due to the uncertainties described above in the data sets.

# Scope and Methodologies

## MMO Data Extracts

The scope defined for the MMO data extracts presented in this FMP are described in **Error! Reference source not found.** and sets out the ICES divisions within English w aters that are covered by this FMP. This is visually represented in Figure 1. All landings' data used within this evidence statement is publicly available through the MMO Sea fisheries annual statistics report (2021)[1] and the Data Collection Framework (DCF) Fisheries Dependent Information (FDI) data call.[2]

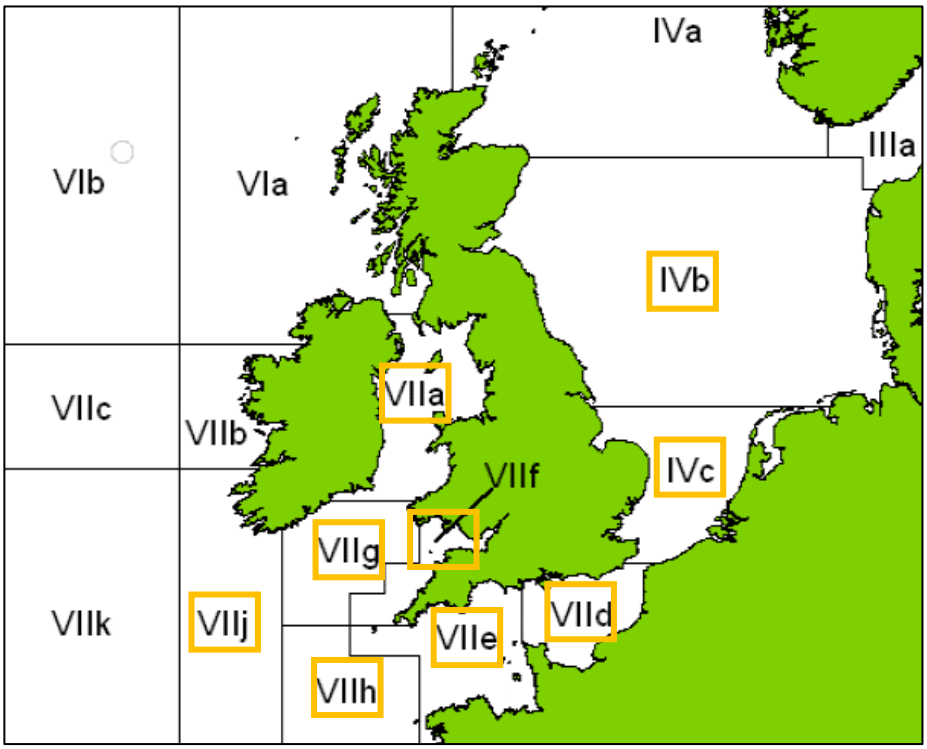
**Table 1:** Scope of MMO data extracts included in the whelk FMP for English waters in terms of ICES division and species code.

| Plan | Whelks in English waters |
|---|---|
| **Fishery** | English waters |
| **ICES division** | 4b, 4c, 7a, 7d, 7e, 7f, 7g, 7h, 7j |
| **Species (code)** | Whelks (WHE) |

1 UK sea fisheries annual statistics report 2021 - GOV.UK (www.gov.uk)

2 Fisheries Dependent Information - European Commission (europa.eu)

**Figure 1. ICES Divisions 4b, 4c, 7a, 7d, 7e, 7f, 7g, 7h, and 7j within scope of the**




## Seafish Economics Data Extracts

This report includes data collected by Seafish during the Fleet Economic Surveys and is estimated based on the methodology described in the UK Economic Fleet Estimates and Fleet Enquiry Tool[3] as well as information shared with Seafish as part of Data Collection Framework by MMO.

All economic data was collected and estimated by Seafish fleet segments, which group all vessels catching different species using different gears to 33 homogeneous groups. To separate economic values by FMP area and species, individual vessel level economic performance and employment indicators were partitioned following these steps:

- Individual vessels landings by rectangle were partitioned to FMP area based on MMO methodology published as part of the UK commercial sea fisheries landings by Exclusive Economic Zone of capture report
- The FMP stock/species economic dependency for each vessel in the fleet in relevant years was calculated. The calculations are based on associated species and FMP area definition calculated as part of step 1

3 UK Economic Fleet Estimates and Fleet Enquiry Tool - Methodology Report — Seafish

- FMP economic dependency at vessel level is multiplied by each economic variable to obtain GVA, operating profit, net profit, and FTE (full time equivalent jobs) by FMP stock/species (assumption: all stocks/species landed by vessel are contributing to the total economic results by the same share as value landed)
- All results calculated at vessel level are summarised to FMP level

Visualisations produced in Figures 6,8,11,14, and 17 based on MMO data provided and partitioning of landings information produced as part of step 1 of the methodology. Spatial analysis includes 2016 to 2021 period aggregated.

# Biology of the target species

## Life history

Whelks are common off all British coasts and distributed throughout the continental shelf waters of the North Atlantic. Whelk can grow up to 10 centimetres (cm) total shell length and 6cm wide, and typically inhabit sand, sandy mud or stony substrates from below the tide line to depths of 100 meters (m). This species is widely distributed throughout the FMP area, as shown in Figure 2.

Whelks have low reproductive rates and slow recruitment rates which vary significantly around the UK and may be influenced by environmental parameters including water temperature and depth. Maturation occurs from spring to summer months, with spawning following from October to May. Peak spawning periods vary between stocks but are generally between October and February. Eggs are fertilised internally and contained within hard capsules[4]. Females deposit the capsules in piles on hard substrates (such as rocks, stones or shells) during winter or early spring when water temperature falls below 10 degrees Celsius (°C). Egg capsules can contain up to 1000 eggs with around 2000 capsules deposited per female, however rates of egg development and survival are considered low. Juveniles emerge fully formed after 3 to 8 months. Juveniles are sedentary, and whelks have no planktonic larval dispersal phase.

The lack of a planktonic larval phase limits the whelk's dispersal potential. This, alongside their sedentary nature, leads to localised populations and reduced gene flow, and encourages adaptations to local environmental conditions. These appear

4 A.E Kideys, R.D.M Nash, R.G Hartnoll. 1993. Reproductive cycle and energy cost of reproduction of the neogastropod Buccinum undatum in the Irish Sea. J. mar. biol. Ass. UK, 73, pp. 391-403

as spatial variations in both shell morphology[5,6,7] and life-history traits (such as size of maturity [SOM], age, and size distribution[8]) across the distributional range.

Whelks are carnivorous predators and active scavengers, their diet consists of a mix of polychaetes, molluscs, echinoderms, and various small crustaceans.[9] The exact composition of the diet is dependent upon habitat type and size of the whelk. Whelks are prey to several species, including cod, dogfish, rays, flatfish, and starfish. Some fishing activities, specifically the return of undersize or unwanted whelks to the sea after handling or riddling, may increase the whelk's vulnerability to post-release predation.

## Distribution within FMP area

The common whelk is distributed around the UK. In English waters, they inhabit ICES divisions 7.a (Irish Sea), 7.d-h (English Channel and Celtic Sea), 4.b (Central North Sea), and 4.c (Southern North Sea). This FMP only applies to fishing activity within English waters, which can be seen in Figure 2.

5 Ten Hallers-Tjabbes CC. 1979. The shell of the whelk Buccinum undatum: shape analysis and sex discrimination. PhD thesis, University of Groeningen.

6 Thomas MLH, Himmelman JH. 1988. Influence of predation on shell morphology of Buccinum undatum L. on Atlantic coast of Canada. Journal of Experimental Marine Biology and Ecology 115: 221–236.

7 Kenchington E, Glass A. 1998. Local adaptation and sexual dimorphism in the waved whelk (Buccinum undatum) in Atlantic Nova Scotia with applications to fisheries management. Canadian Technical Report of Fisheries and Aquatic Sciences.

8 Haig J, Pantin J, Salomonsen H, Murray L, Kaiser M. 2015. Temporal and spatial variation in size at maturity of the common whelk (Buccinum undatum). ICES Journal of Marine Science 69: 1205–1217.

9 Himmelman, J.H., Hamel, J.R. 1993. Diet, behaviour and reproduction of the whelk Buccinum undatum in the northern Gulf of St. Lawrence, eastern Canada. Marine Biology 116, 423–430.

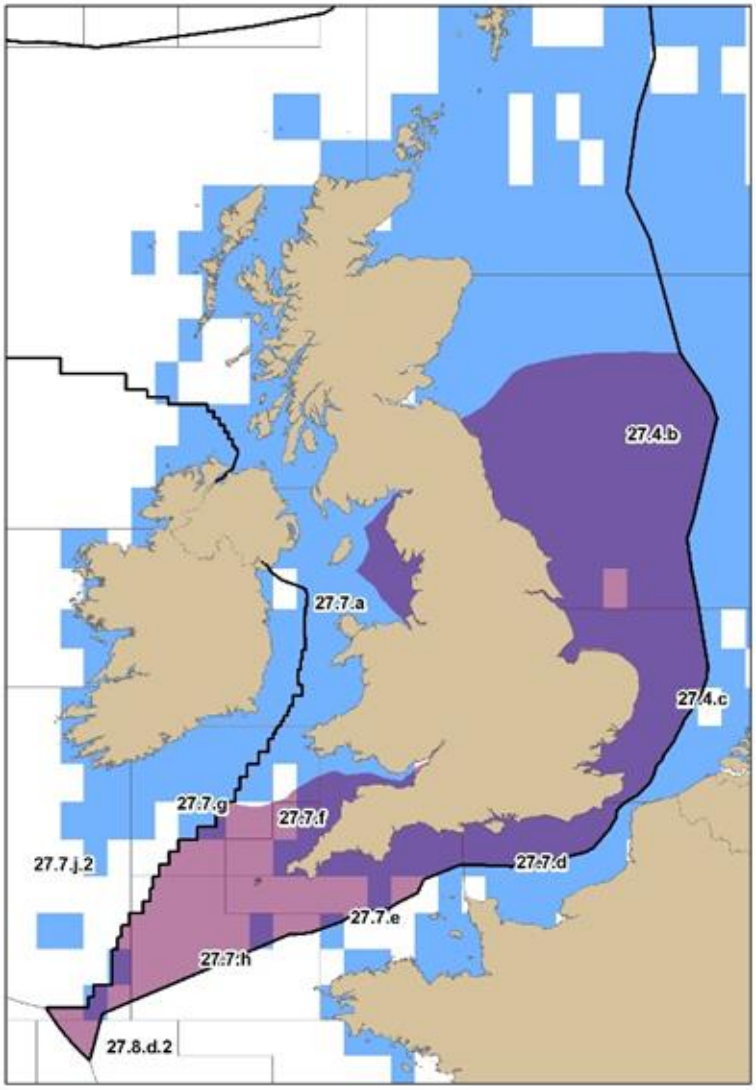



**Figure 2:** UK map representing the recorded distribution of whelk populations around the British Isles (blue) and the geographical area covered by this whelk FMP (purple). Informed by data from Ocean Biodiversity Information System (OBIS) and accessed from the Marine Life Information Network (MarLIN)

# Fleet characteristics

The scope and methodologies applied to MMO and Seafish data extraction is set out in the Landings section of this document.

## Total number of vessels (UK and Crown Dependencies vessels)

Table 2 shows the total number of UK and Crown Dependencies (CD) vessels that caught any whelks in English waters between 2016 and 2021, split by the vessels'

reported home nation. Vessels are allocated to nations based on their ports of administration. “Others” refers to the small number of vessels registered in Northern Ireland or The Islands (Isle of Man and Channel Islands).

The vast majority (88%) of vessels landing whelks from English waters are registered in England.

**Table 2: Number of UK and CD vessels involved in the whelk fishery by home nation of registry between 2016 to 21.**

| Home Nation | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| England | 292 | 286 | 291 | 277 | 262 | 254 |
| Wales | 14 | 14 | 15 | 20 | 11 | 7 |
| Scotland | 12 | 16 | 17 | 12 | 10 | 6 |
| Others | 15 | 11 | 14 | 15 | 15 | 12 |
| Total | **333** | **327** | **337** | **324** | **298** | **279** |

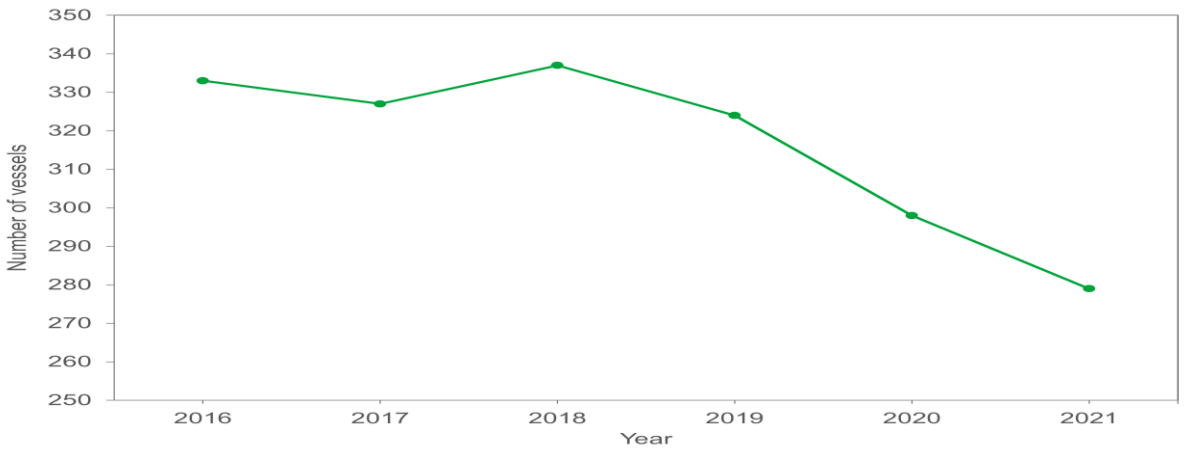



**Figure 3: Total number of UK and CD vessels from all home nations (assigned by port of registry) involved in the whelk fishery between 2016 to 2021. Note: Y-axis does not start at zero.**

As concerns have been raised around recent increases in the number of vessels exploiting the English whelk fishery, a subsequent analysis was performed on a longer timeseries of data from 2008 to 2021. It should be noted that the scope of the data extract used in these analyses differs slightly to that of

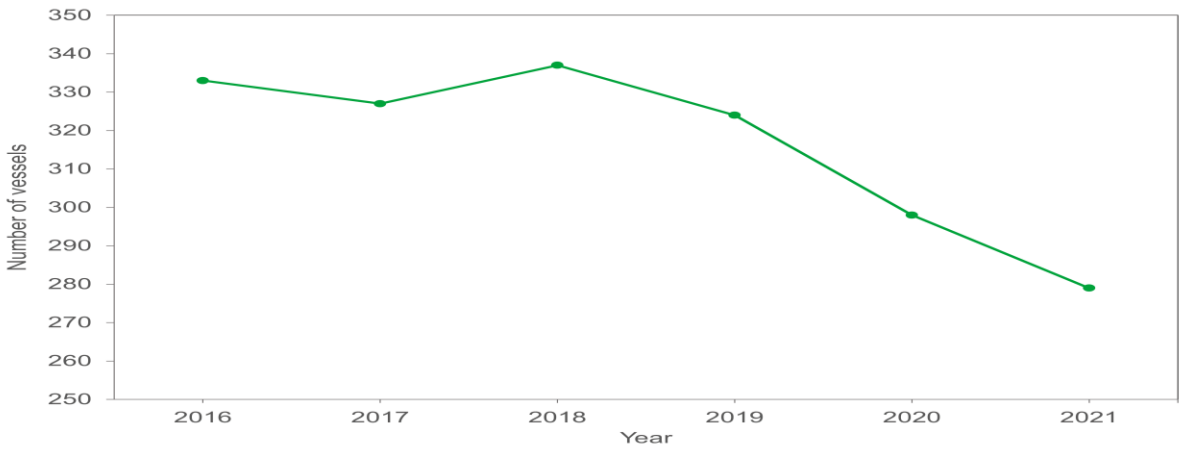



Figure 3, in that English registered vessels landing to English ports have been selected as a proxy to represent vessels active in the English whelk fishery. It is likely that this will be broadly accurate given the predominantly inshore nature of this fishery, and the fact that vessels rarely fish too far from their home port. This data also excludes low activity vessels, defined as landing less than £10,000 worth of whelks per year.

It can be seen from Figure 4 that the number of vessels active in the English whelk fishery fluctuates across the 2008 to 2021 timeframe. Despite some variability and higher numbers of vessels recorded in 2011 (294 vessels), an overarching 22% increase is observed between 2008 and 2016 from 240 to 293 vessels. There is then some fluctuation between 2016 and 2018 (286 vessels), before a slight decline (11%) between 2018 and 2021 (254 vessels).

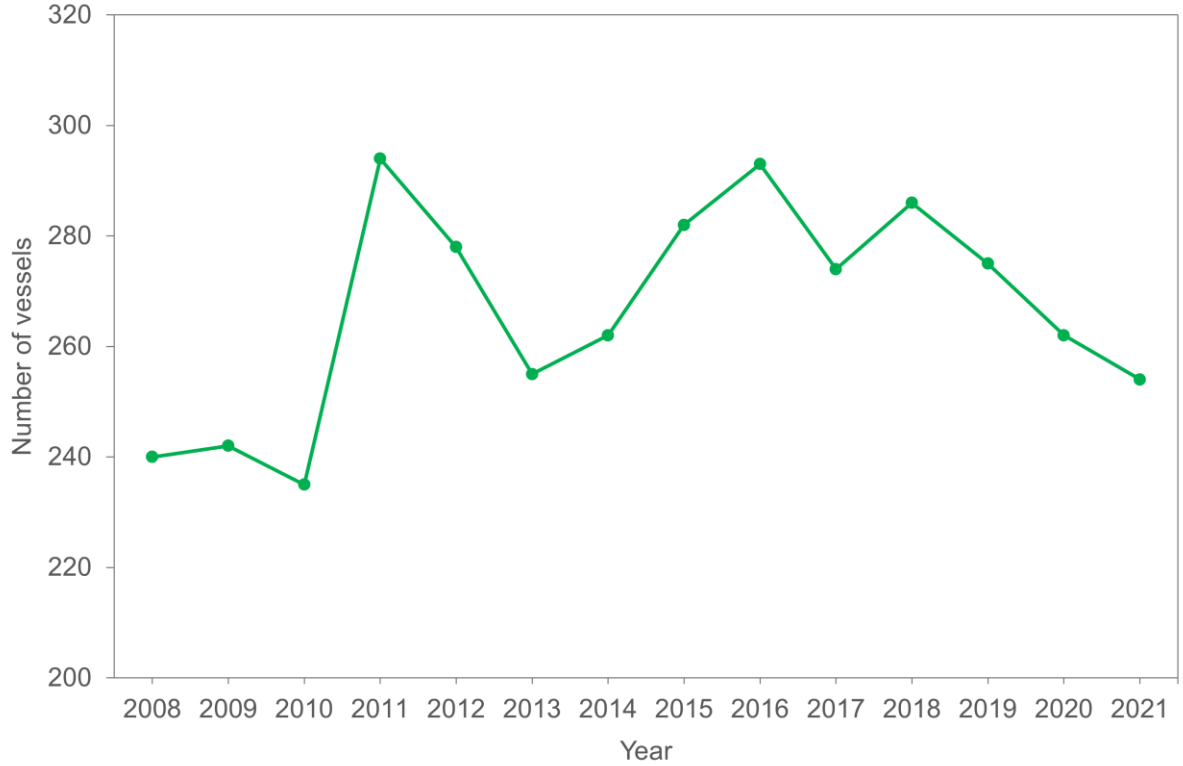


**Figure 4**: Total number of English registered vessels, landing any amount of whelk into English ports – as a proxy for the English whelk fishery. Low activity vessels landing less than £10,000 worth of whelks per year (based on MMO estimated landings) have been excluded.

## Number of vessels by length (UK vessels)

Figure 5 shows that most whelks landed from English waters are caught by vessels in the 8 to 10m category. In 2021, 87% of vessels landing whelks from English waters were 12m or under.

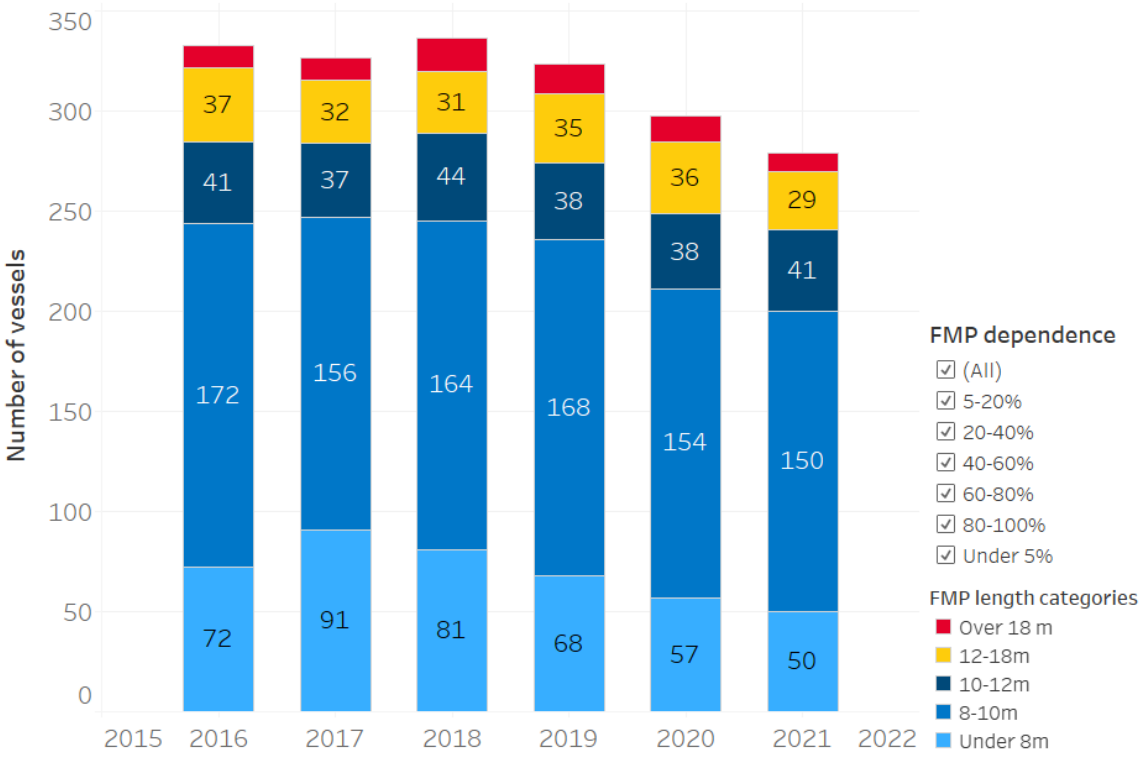



**Figure 5: Number of UK and CD vessels that landed any weight of whelks in 2016 to21 by vessel length group in English waters.**

Figure 6 shows landings of whelks by UK and CD vessels to ports in England, Wales, and southern Scotland by vessel length. Landings in the northwest and east of England (Fleetwood, Bridlington, Whitby and Scarborough) were predominantly made by larger vessels whereas landings in the south coast (Shoreham, Eastbourne, Weymouth) were predominantly made by smaller vessels 12m and under.

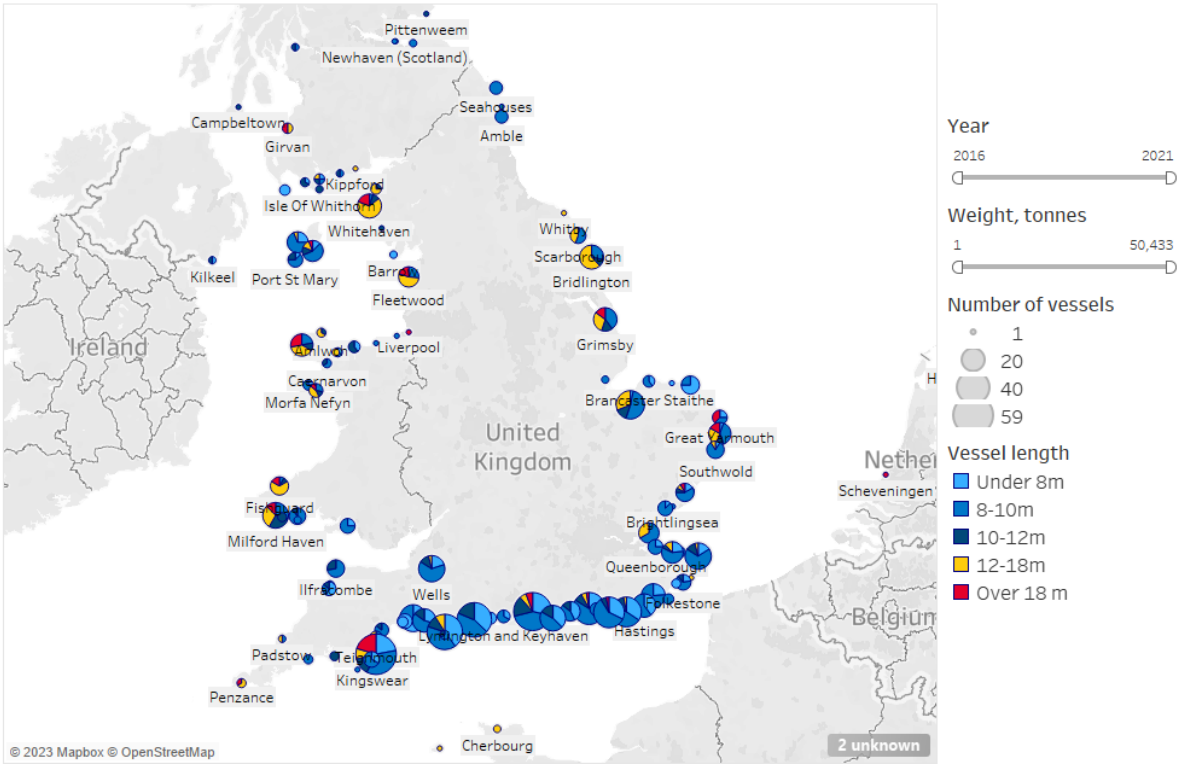



**Figure 6: Number of UK and CD vessels that landed any weight of whelks in English waters in 2016 to2021 by ports of landings, with vessels divided by vessel length. Note: figure above shows cumulative number of unique vessels that used relevant ports to land whelks in 2016 to 2021. Individual vessels might be double counted in cases when the same vessels were landing whelks in different ports during the analysed period.**

# Landings

## Total landings (tonnage and value) (UK and EU vessels)

Figure 7 shows that total landings of whelks by UK and CD vessels in England have fluctuated between around 10,000 to 13,000 tonnes between 2016 and 2021.

The lowest landings in this period were observed in 2018 at 10,239 tonnes; landings peaked in 2020 at 13,716 tonnes before decreasing to 12,070 tonnes in 2021. Volume of landings in 2020 and 2021 are likely to have been impacted by both the Covid-19 pandemic and subsequent changes in market demand. Value of landings broadly tracks trends in tonnage, peaking in 2020 at £17.42 million (Table 3).

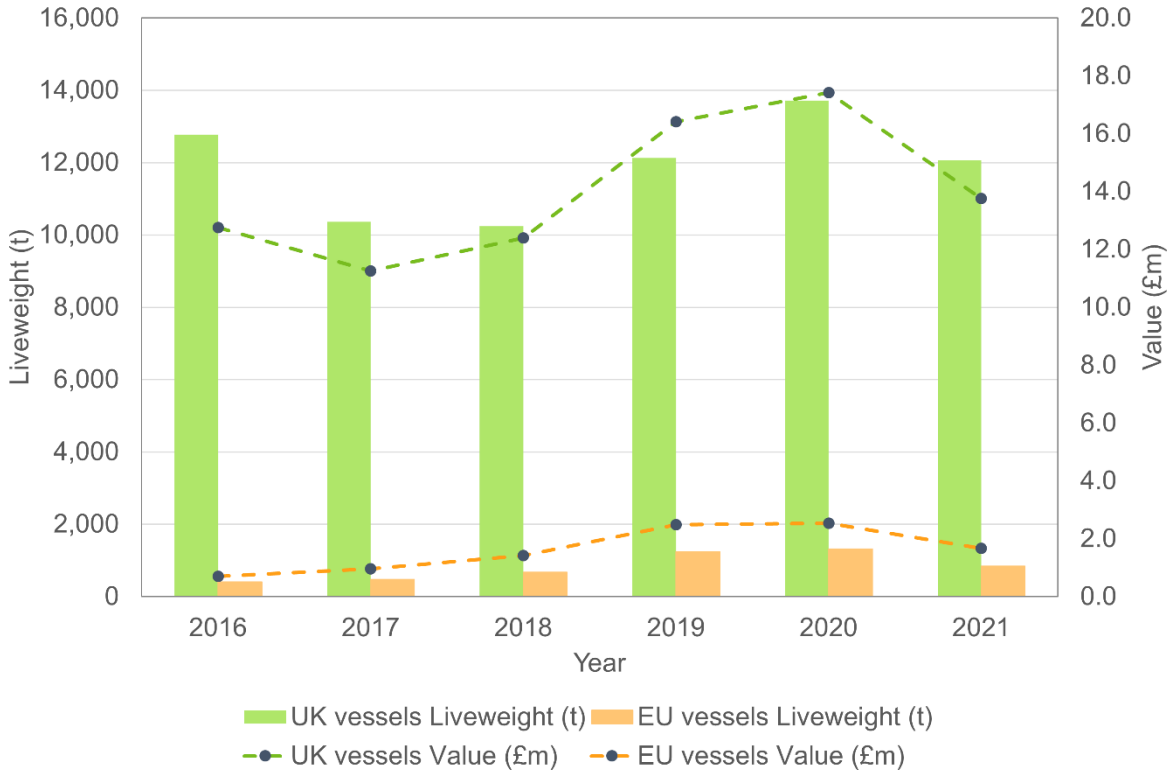



**Figure 7: Volume (tonnes) and value (£) of whelk landings by UK and EU vessels fishing in English waters between 2016 to 2021**

**Table 3: Weight (tonnes) and value (£m) of whelks landed in the FMP waters by the UK and Crown Dependencies (CD) vessels and EU vessels between 2016 and 2021.**

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| Liveweight (t) (UK and CD vessels) | 12,773 | 10,359 | 10,239 | 12,130 | 13,716 | 12,070 |
| Value (£m) (UK and CD vessels) | 12.76 | 11.26 | 12.39 | 16.42 | 17.42 | 13.76 |
| Liveweight (t) (EU vessels) | 404 | 474 | 670 | 1,238 | 1,319 | 845 |
| Value (£m) (EU vessels) | 0.71 | 0.96 | 1.42 | 2.49 | 2.54 | 1.67 |

## Landings by vessel nationality (UK and CD vessels)

Table 4 shows that English vessels are responsible for most whelk landings from English waters. In 2021, 96% of whelk landings from English waters within the FMP were made by English vessels.

**Table 4: Volume of whelk landings (tonnes) by vessel nationality, between 2016 to2021**

| Vessel Nationality | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| England | 11,122 | 9,007 | 9,007 | 11,049 | 12,613 | 11,613 |
| Wales | 904 | 836 | 785 | 435 | 369 | 166 |
| Scotland | 265 | 311 | 348 | 279 | 394 | 256 |
| Northern Ireland | - | - | 0 | 1 | 2 | 34 |
| Jersey | 429 | 158 | - | - | - | - |
| Guernsey | 1 | - | 42 | 311 | 299 | - |
| Isle of Man | 53 | 47 | 57 | 54 | 39 | 0 |

## Landings by port (UK vessels)

Table 5 shows that in 2021, four of the top five ports in terms of value of whelk landings were located along the south coast of England.

Shoreham-by-Sea was the top landing port for whelks in 2021, receiving 1,7381 tonnes with a value of £2 million. Eastbourne was the only other port to receive over 1,000 tonnes of whelks with 1,271 tonnes for a total value of £1.65 million. Table 5 provides a summary of the top ten English ports based on value of whelk landings.

**Table 5:** Top 10 English ports by value and volume of whelk landings within the FMP waters by UK and Crown Dependencies vessels in 2021

| Rank | Port of Landing | Port Nationality | Liveweight (t) | Value (£ million) |
|---|---|---|---|---|
| **1** | Shoreham-by-Sea | England | 1,738 | 2.03 |
| **2** | Eastbourne | England | 1,271 | 1.61 |
| **3** | Portsmouth | England | 955 | 1.07 |
| **4** | Grimsby | England | 801 | 0.96 |
| **5** | Weymouth | England | 723 | 0.87 |
| **6** | Lowestoft | England | 678 | 0.79 |
| **7** | Wells | England | 672 | 0.72 |
| **8** | Lyme Regis | England | 570 | 0.52 |
| **9** | Whitstable | England | 486 | 0.52 |
| **10** | Ramsgate | England | 401 | 0.45 |
| | | Total | 8,297 | 9.54 |

## Landings by ICES rectangle (UK and CD vessels)

Historical records of whelk catches are widely distributed through English waters as shown in Figure 8, with hotspots in the English Channel, off the north Norfolk coast, and the northern Irish Sea. The most whelks landed between 2016 and 2021 by UK and CD vessels were caught in ICES rectangle 30F0 (1,721 tonnes in 2021 and a high of 2,835 tonnes in 2020).

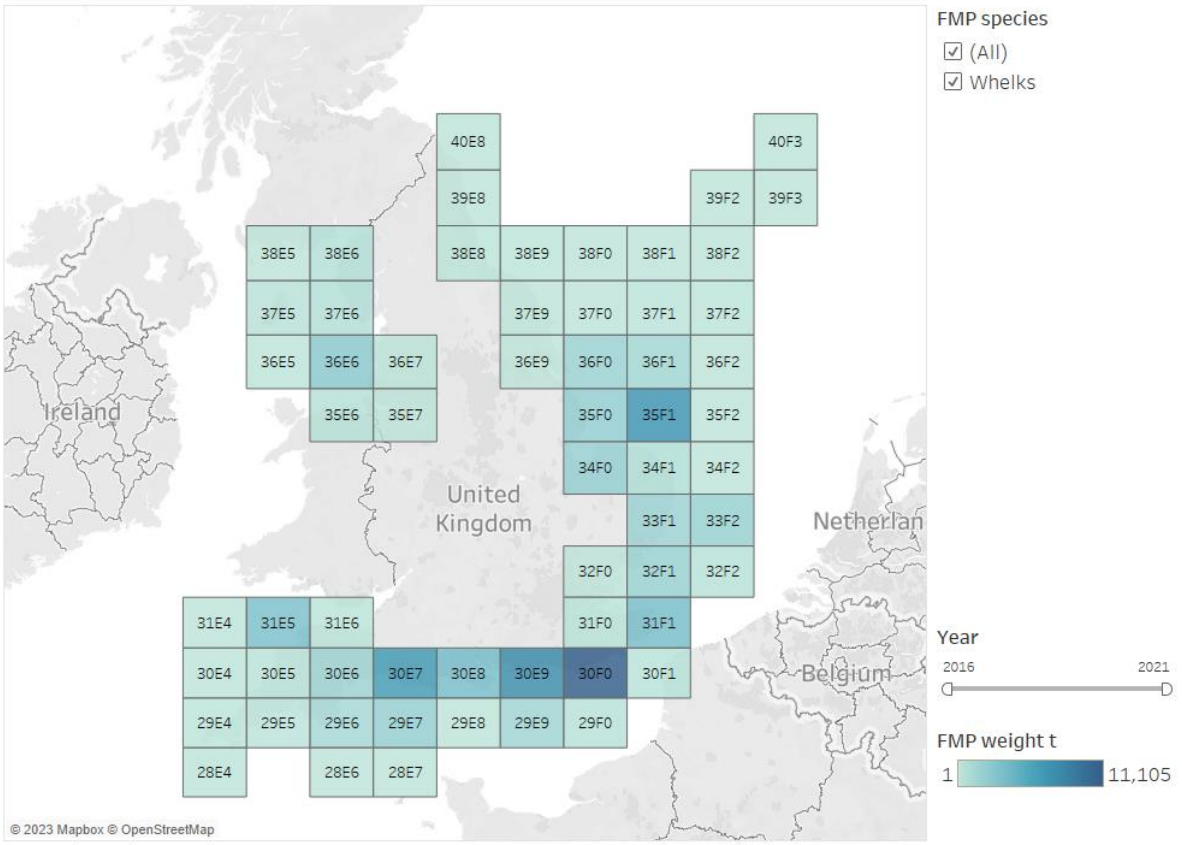



**Figure 8: Distribution of whelk catches from UK and CD vessels in English waters, by ICES rectangle between 2016 to2021. Note: only ICES rectangles with whelk landings totalling more than 1 tonne between 2016 to2021 are shown**

## Landings by vessel length (UK and CD vessels)

In all years except 2018 and 2020, vessels 10m and under in length landed more whelks by both volume and value than over 10m vessels. In 2020, landings of vessels 10m and under in length were most similar to landings of over 10m vessels compared to the previous 4 years (6,848 and 6,869 tonnes, respectively) (Table 6, Figure 99).

Whelk landings by smaller vessels (10m and under) decreased slightly between 2016 (6,871 tonnes) and 2018 (4,718 tonnes), before increasing back to near 2016 tonnages over 2019 and 2020 (to greater than 6,000 tonnes (Table 6, Figure 9). Whelk landings by larger vessels (over 10m) followed a similar trend, decreasing between 2016 (5,903 tonnes) and 2017 (4,372 tonnes), before beginning to increase slightly earlier over 2018 to 2020 (to greater than 6,000 tonnes reaching 6,869 in 2020) (Table 6, Figure 9).

In general, the difference in value of whelk landings between smaller (10m and under) and larger (over 10m) vessels tracked the differences in landed tonnages, with those smaller vessels exhibiting larger values of landings in all years except 2018 (Table 67, Figure 99). In 2018 when landed tonnages from over 10m vessels exceeded those of under 10m vessels (5,522 compared to 4,718 tonnes, respectively), the landed value was the same (£6m), suggesting a higher price per kilogram for whelks landed by smaller vessels (Table 7, Figure 99).

**Table 6: Liveweight (tonnes) of whelk landed by smaller (10m and under) and larger (over 10m) UK and CD vessels from English waters between 2016 and 2020.**

| Length Group | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| **10m and Under** | 6,871 | 5,987 | 4,718 | 6,494 | 6,848 | 6,622 |
| **Over 10m** | 5,903 | 4,372 | 5,522 | 5,636 | 6,869 | 5,448 |
| **TOTAL** | 12,773 | 10,359 | 10,239 | 12,130 | 13,716 | 12,070 |

**Table 7: Value (£) of whelk landed by smaller (10m and under) and larger (over 10m) UK and CD vessels between 2016 and 2021**

| Length Group | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| **10m and Under** | 6.89 | 6.52 | 6.15 | 9.13 | 8.88 | 7.41 |
| **Over 10m** | 5.86 | 4.74 | 6.24 | 7.29 | 8.54 | 6.40 |
| **TOTAL** | 12.76 | 11.26 | 12.39 | 16.42 | 17.42 | 13.82 |

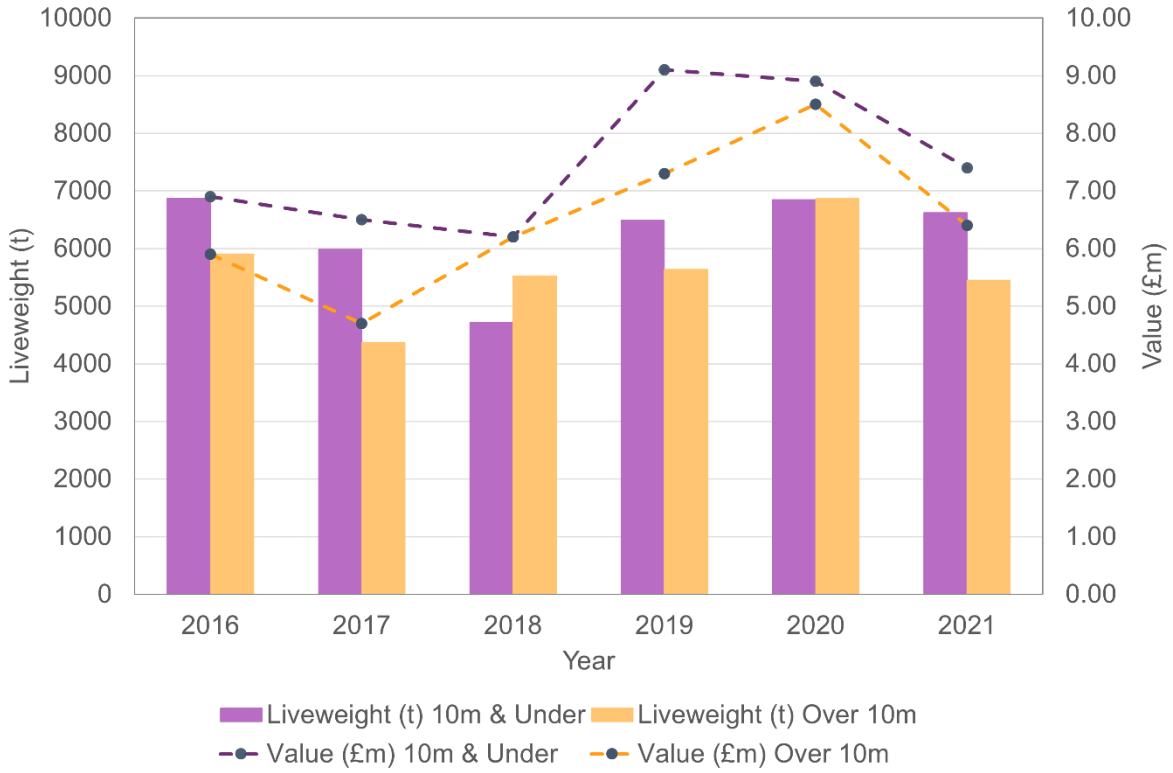



**Figure 9: Tonnages and value (£) of whelks landed between 2016 and 2021 by smaller (10m and under, purple) and larger (over 10m, orange) UK and CD vessels from English waters**

The two vessel size categories included in Figure 9 may each contain a spectrum of vessel lengths, ranging from the smallest under 8m vessels to the largest over 24m vessels. Vessel size categories can therefore be broken down further to investigate the nuanced characteristics of the English whelk fleet (Table 8).

This analysis reveals that the majority of whelk are landed by small 8.01 to 10.00m vessels (50.0%), followed by mid-sized 12.01-15.00m vessels (22%), and 10.01-12.00m vessels (15%).

The larger vessels (24.01m to 40m and over 40m) make up a smaller proportion of the total whelk landings (0.14% and 0.02%, respectively) (Figure 10).

**Table 8: Percentage (%) of landings from UK and CD vessels by liveweight in English waters from each vessel length category in 2021**

| Vessel length | Liveweight (tonnes) | Percentage of total landings (%) |
|---|---|---|
| **8.00m and under** | 644 | 5.34% |

| Vessel length | Liveweight (tonnes) | Percentage of total landings (%) |
|---|---|---|
| **8.01 - 10.00m** | 5,978 | 49.52% |
| **10.01 - 12.00m** | 1,811 | 15.00% |
| **12.01 - 15.00m** | 2,700 | 22.37% |
| **15.01 - 18.00m** | 402 | 3.33% |
| **18.01 - 24.00m** | 51 | 4.26% |
| **24.01 - 40.00m** | 17 | 0.14% |
| **Over 40.00m** | 3 | 0.02% |

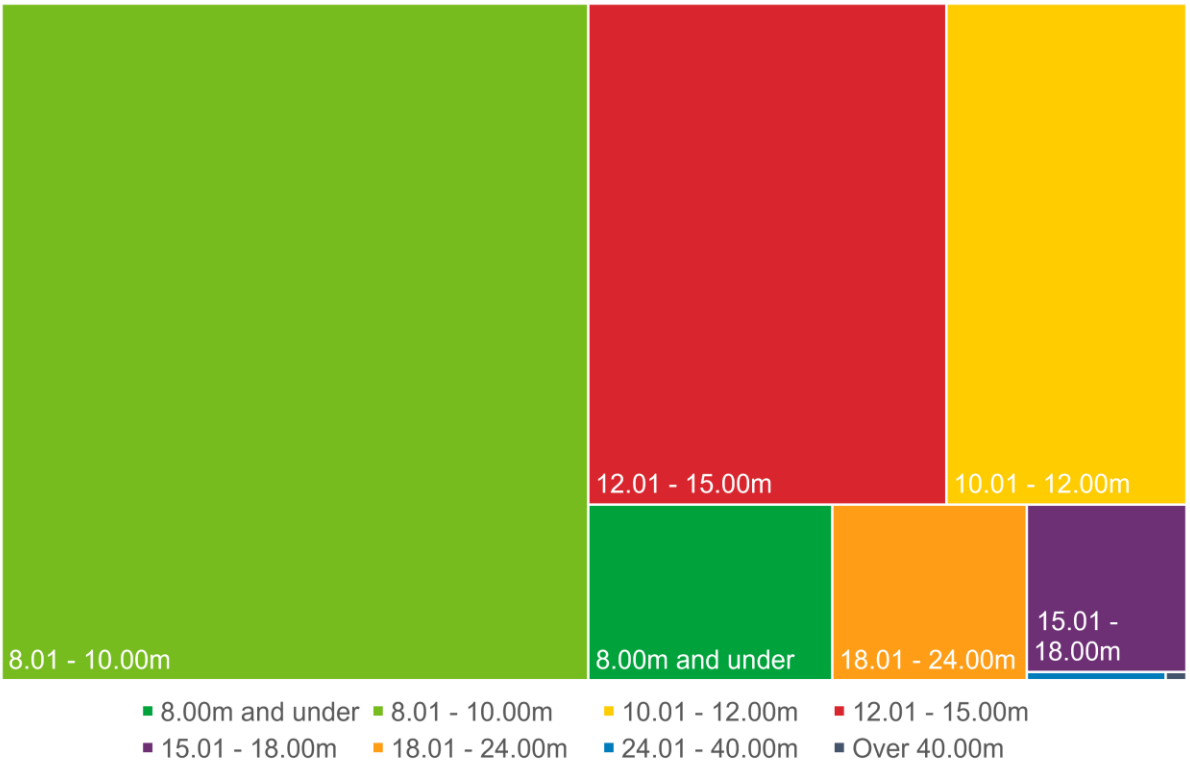



**Figure 10: Tonnages of whelk landed in 2021 by UK and CD vessels in English waters categorised into vessel length.**

At different ports around England, whelk landings are dominated by different vessel size categories. Between 2016 and 2021, there were typically more ports where whelk landings were dominated by smaller (under 10m) vessels, however there were

some instances where larger (over 12m) vessels were responsible for the majority share – with a relatively distinct geographic pattern.

Landings in the northeast and northwest of England were predominantly made by larger vessels over 12m in length. Whilst, with a couple of exceptions, whelk landings to ports in southern England and Wales were predominantly by smaller vessels under 10m in length (Figure 1111). There are some ports along the south coast have relatively small proportions of over 12m vessels, however larger vessels are responsible for a significant share of whelk landings there (Figure 1111).

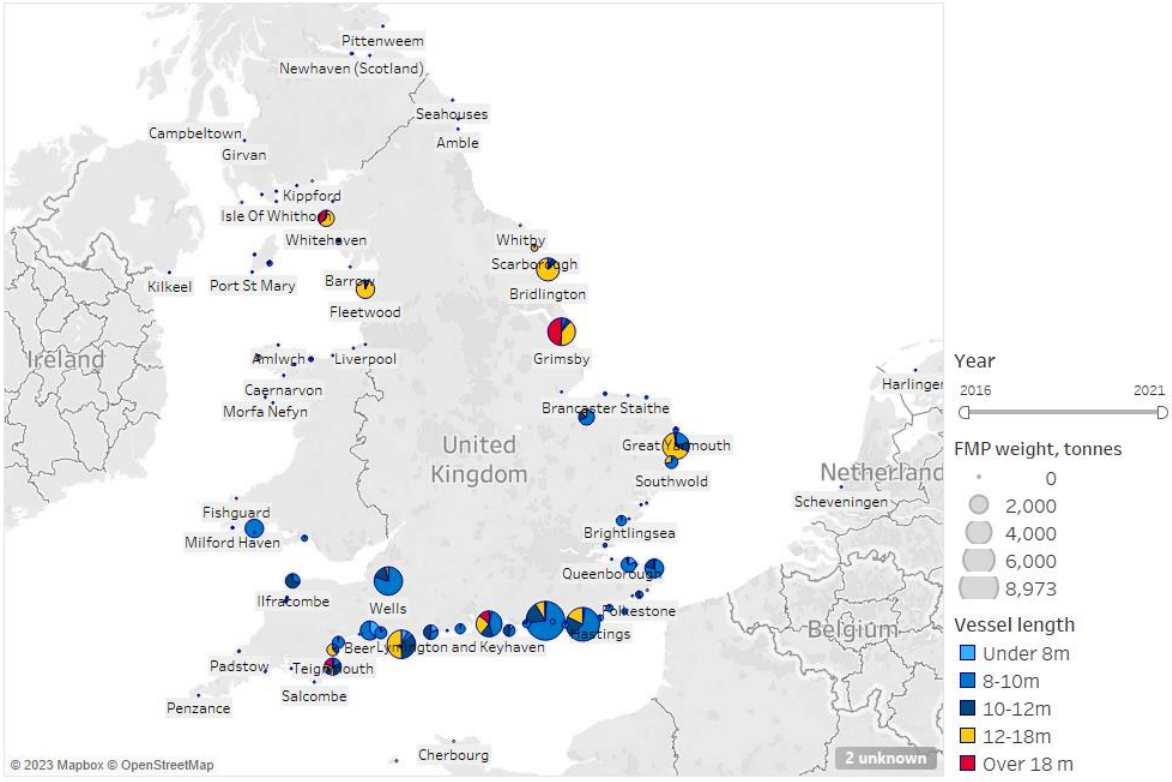



**Figure 11: Spatial distribution of UK fishing fleet's whelk landings from English waters by port of landings from 2016 to2021, with UK and CD vessels divided by length category. Larger (over 10m) vessels primarily landed to ports in the northeast and northwest of England, with smaller (under 10m) vessels primarily landing to southern England and Wales. All ports with cumulative FMP related weight of landings in 2016 to 2021 above 1 tonne were selected from the data**

## Seasonality of landings (UK vessels)

Whelk fisheries are highly seasonal, although year-round landings data show a notable peak between March and June. Landings decrease gradually from June reaching their lowest point in December. This period of lower catches during winter months coincides with both the peak spawning season for whelks – during which

whelks display reduced foraging behaviour and so are less susceptible to capture in baited pots – and the increase in other fisheries, such as the English Channel hen brown crab fishery.

Given the similar capture methods and ease of moving between fisheries, some fishers will focus on other fisheries such as crab, until sea temperatures increase in spring and whelks can be targeted more effectively.


| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Liveweight (t)** | 1,164 | 913 | 1,723 | 1,679 | 1,441 | 1,632 | 1,042 | 730 | 494 | 394 | 550 | 309 |
| **Value (£m)** | 1.41 | 1.08 | 2.03 | 1.88 | 1.79 | 1.76 | 1.13 | 0.80 | 0.54 | 0.43 | 0.58 | 0.33 |

Figure 12 shows variation in whelk catches, in terms of both volume and value, in England in 2021. Monthly landings peaked in March of 2021 at 1,723 tonnes for a total value of £2.03 million and hit a low of 326 tonnes in December.


| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Liveweight (t)** | 1,164 | 913 | 1,723 | 1,679 | 1,441 | 1,632 | 1,042 | 730 | 494 | 394 | 550 | 309 |
| **Value (£m)** | 1.41 | 1.08 | 2.03 | 1.88 | 1.79 | 1.76 | 1.13 | 0.80 | 0.54 | 0.43 | 0.58 | 0.33 |

**Figure 12: Volume (tonnes) and value (£ million) of whelk landings by UK and CD vessels in the FMP waters by month in 2021. Table included at the bottom of the figure provides volume (tonnes) and value (£ million) of whelk landings in England by month for 2021.**

# Gear types used to catch whelks (UK vessels)

Targeted whelk fisheries primarily use baited pots and traps.[10]

[10] See 'Pots and traps – whelks' on the Seafish gear database

Whelk pots may be purpose-built pots or made from repurposed plastic containers (see Figure 13). Pots are weighted and fished on the seabed in strings or ‘shanks’, marked at each end with a marker buoy. Pots are baited with mixtures of natural baits including crab, dogfish, or forage fish.

In the period of 2016 to 2021 over 98% of all whelk landings in England were from vessels using pots and traps, as shown in Table 9. MMO datasets also show a small volume of whelk bycatch in drift or fixed nets, longlines, dredges, beam trawl, other mobile gears, and demersal trawls – the majority of which is recorded off the southwest coast of England (Figure 144).

**Figure 13: Image of a 'stand up' style whelk pot. Pots feature a net entrance and are baited.**

**Table 9: Whelk landings by UK and CD vessels in England waters between 2016 to 2021, categorised by the different fishing gear used.**

| Gear Category | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| Beam trawl | 10 | 7 | 39 | 70 | 29 | 18 |

| Gear Category | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| Demersal seine | 0 | 0 | - | - | - | - |
| Demersal trawls | 9 | 16 | 6 | 6 | 18 | 17 |
| Dredge | 10 | 15 | 64 | 74 | 99 | 3 |
| Drift and fixed nets | 45 | 63 | 160 | 284 | 297 | 175 |
| Handlines | 0 | 5 | 19 | 0 | 3 | 10 |
| Other mobile gears | | | 1 | 7 | 4 | 44 |
| Other passive gears | 0 | 0 | - | - | - | - |
| Longlines | 2 | - | - | - | - | - |
| Pots and traps | 12,697 | 10,254 | 9,950 | 11,689 | 13,266 | 11,803 |
| **TOTAL** | 12,773 | 10,359 | 10,239 | 12,130 | 13,716 | 12,070 |

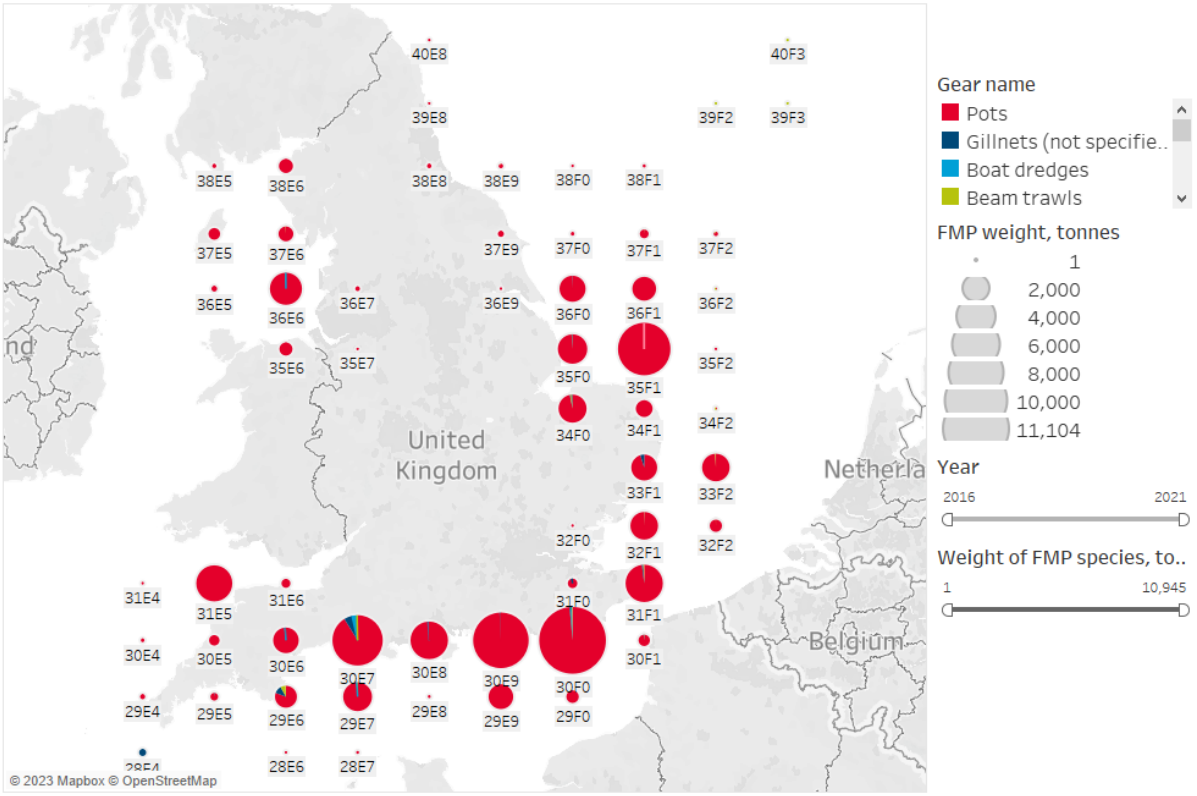



**Figure 14: Spatial distribution of the UK and CD fishing fleet's whelk landings by ICES rectangle and gears used in English waters in 2016 to2021.**

# Key recreational fisheries

Recreational fishing catch of whelks is considered to be negligeable. No whelk catches have been reported in the Sea Angling Diary Project.

The number of recreational fishers taking whelk for domestic consumption is not known. However, IFCAs have provided information on the number of recreational permits they issue for whelks and in some cases other shellfish species:

### Eastern IFCA

Eastern IFCA have issued 2 recreational permits and 70 commercial permits since the permit byelaw came into effect in 2016. In 2022, there has been 1 recreational fisher and 17 commercial vessels fishing in the district. Recreational fishing takes place within 3 nm along the Suffolk coast.

### Devon and Severn IFCA

There are limited catches of whelk by recreational fishers within the D&S IFCA district. In 2022, of the 509 recreational Potting permit holders only 8 indicated that they might target whelk.

**North Eastern IFCA**

There is a significant recreational shellfish fishery with around 2,500 permits issued. Permit allows recreational capture of lobster, edible crab, velvet crab and whelk. The permit limits recreational fishers to 10 pots or 100 metres of nets to fish for daily catch limits. Daily catch limits are restricted to 2 lobsters, 10 crab (total for both crab species), and 30 whelks. Additional technical measures applicable to recreational fishing are in place. The actual volume of whelk being caught by recreational fishers is not known.

# Stock assessment

There are currently no stock assessments for whelks in English waters. Cefas have trialled Surplus Production Modelling in Continuous Time (SPiCT), which is the recommended ICES tool to assess data-limited stocks such as common whelk. These models make use of several time series of catch and effort data to estimate changes in species populations and fishery dynamics over time.

SPiCT is considered a promising candidate for whelk stock assessments but requires improved data availability to become viable – in particular more fine-scaled data and a more accurate measure of fishing effort. Cefas trials identified issues associated with regional variability in both whelk population dynamics and data availability, as well as the use of abundance indices based on kW days at sea. With current limited data available, SPiCT modelling may not be appropriate for detecting overexploitation of whelk at the small spatial scales in which they exist[11].

Cefas (in collaboration with Kent and Eastern IFCA) are currently undertaking a Defra funded stock monitoring pilot programme in Norfolk and Lincolnshire. This sampling aims to investigate the size and age structure of catches over a suitable spatial scale to inform likely stock boundaries. Stock boundaries will be inferred using differences in morphology and growth rates between sites (potentially using mark recapture methods to determine growth rate). This work will determine what potential monitoring programme should look like. It is hope that this will eventually provide data for a stock assessment.

In Wales, fishery-independent whelk surveys combined with monthly catch returns have been used to calculate four reference points ($L_{max5\%}$, $P_{mega}$, $L_{25\%}$, and $L_C$)[12] to inform new management approaches, namely the introduction of an annual catch limit and flexible monthly catch limits allocated to individual vessels. As part of an

[11] Cefas – pers. comms.

[12] $L_{max5\%}$: average size of largest 5% of landings compared to $L_{inf}$ (theoretical maximum length); $P_{mega}$: catch proportion of older 'mega' spawners; $L_{25\%:}$ comparison of the length of the 25$^{th}$ percentile to length of maturity; $L_C$: length of first capture

improved science programme Bangor University will undertake annual whelk stock surveys to further improve the Welsh whelk evidence base. This emerging science, and in particular the application of the four identified reference points, could provide suitable proxies for whelks in English waters and an approach that could be adopted. More information on whelk fishery management and science in Wales can be found here: Guidance on the Welsh whelk fishery.

## Stock boundaries

Stock units (or small scale 'stocklets') have not been defined, primarily due to the poor understanding of stock boundaries and the lack of indices of abundance.

There are, however, a number of ongoing research projects and previous studies which may contribute towards the delineation of whelk stock boundaries in the future (see description of Cefas stock monitoring pilot study above in the Stock Assessment section of this document).

An ongoing Fishing Industry Science Partnership (FISP) project led by the Whelk Management Group and Heriot-Watt University is improving understanding of the variation in whelk stocks across the UK by gathering, analysing, and mapping anecdotal information from fishers on the morphological and biological characteristics of UK whelk populations to identify possible stock units.

Other previous studies have looked into the effects of environmental parameters on UK whelk population characteristics, which may assist with delineating stock boundaries. For example, the effect of temperature on whelk growth has been investigated in an Irish Sea case study[13], and the effect of environmental factors on whelk shell growth and repair has also been documented[14]. Genetic techniques have also revealed a single semi-continuous whelk population in English waters[15].

13 Emmerson, J.A., Hollyman, P.R., Bloor, I.S.M. and Jenkins, S.R., 2020. Effect of temperature on the growth of the commercially fished common whelk (Buccinum undatum, L.): a regional analysis within the Irish Sea. Fisheries Research, 223, p.105437.

14 Colvin, C.N., Hollyman, P.R., Richardson, C.A., Chenery, S.R.N., Waggitt, J.J. and McCarthy, I.D., 2022. The effect of environmental factors on shell growth and repair in Buccinum undatum. Journal of Experimental Marine Biology and Ecology, 551, p.151720.

15 Morrissey, D., Goodall, J., Castilho, R., Cameron, T.C. and Taylor, M.L., 2022. Population genomics reveals a single semi-continuous population of a commercially exploited marine gastropod. Fisheries Research, 254, p.106418.

# Ecological Impacts

## Crab bait

Whelk fisheries use natural baits to attract and retain whelks in pots. Baits used vary but anecdotal information from fishers suggests that a mix of brown crab and finfish (for example lesser spotted dogfish) is the preferred bait option. Other crab species (for example, spider crabs) have been trialled as bait but fishers report that they are more difficult to handle and are less effective at attracting whelks, this means that brown crab is still the preferred option for most fishers. Crab for bait may be sourced from processing waste, from dead or poor-quality crab that cannot be processed, or directly from wild capture fisheries.

Anecdotal reports suggest that recently moulted, soft brown crabs are used as bait in some fisheries; although the Sea Fisheries (Shellfish) Act 1967 prohibits the landing of soft crab, the act includes an exemption for crabs to be used as bait and offers no definition of a soft crab There are concerns that the market for whelk bait could incentivise the landing of poor-quality crab, putting additional pressure on crab stocks. Byelaws prohibit the use of soft crab as bait in some IFCA jurisdictions, and Northern Ireland introduced a ban on the landing of soft crab in 2022.

Two FISP research projects are current underway to explore this topic:

- Combined whelk data improvement project, led by the Whelk Management Group and Heriot-Watt University, is researching the use of chemical attractants as an alternative to natural baits in whelk fisheries.
- Filling the gaps in crustacean evidence project, led by the Crab & Lobster Management Group and Bangor University, is researching durometer-based methodologies for defining soft shelled brown crabs. The project will analyse the effect of shell hardness on meat yield and economic value and make the best use of fisher and processor knowledge to test whether visual determination of a soft crab is reliable for enforcing regulations.

# Environmental impacts

## Climate change

Whelks in the North Atlantic cover a broad thermal range of sea temperatures ranging from below 0$^{o}$C to above 22$^{o}$C. However, over this range whelk biology does vary in response to changing temperatures meaning that the impacts of climate change and increase sea temperature is likely to have an effect on stocks.

Whelks display distinct breeding periods which are driven by sea temperature, and the optimum thermal boundary for egg laying and development in the UK is between 6 to 10$^{o}$C. Outside of this temperature range, egg development and offspring survival reduce. This means that changes to sea temperature could impact whelk spawning seasons and viability.

A recent study in the Irish Sea found a significant negative linear relationship between sea temperature and the maximum size reached by whelk populations, this means that whelks grew to a larger maximum size in cooler waters.[16] These findings have potential implications for the population size and structure of the whelk as sea temperatures increase with climate change.

A FISP project is underway by Bangor University, the British Geological Society, Orkney Fishermen's Association, and Welsh Fishermen's Association to improve understanding of the impacts of climate change on whelks. The project will use shell isotope analysis to re-construct past temperature and growth, along with tank-based experiments on growth and survivability in whelk. Researchers aim to predict how growth rates differ by location and understand the impact of climate change on potential shifts in the growth, distribution, and natural mortality of the species. The project will generate temperature risk maps for whelks under climate change scenarios[17].

# Economic importance

Domestic fishing effort for whelk has seen dramatic rises in the last two decades, with the expansion of global markets[18]. In 2021, UK and CD vessels landed 12,070 tonnes of whelk from English waters at a value of £13.7m (please see Table 3).

The total of number of UK vessels landing whelk caught in English waters declined slightly between 2018 and 2021 (from 337 to 279 vessels). In 2021, 91% of UK vessels catching whelks in English waters were English registered.

Vessels fishing primarily for whelks in 2020 made up nearly 7% of active vessels in England, more than double their percentage share of the English fleet in 2009[19].

16 Emmerson, J.A., Hollyman, P.R., Bloor, I.S.M. and Jenkins, S.R., 2020. Effect of temperature on the growth of the commercially fished common whelk (Buccinum undatum, L.): a regional analysis within the Irish Sea. Fisheries Research, 223, p.105437.

17 Impacts of Climate Change on the common Whelk, Round 1 FISP (Fisheries Industry Science Partnership) funded project led by researchers at Bangor University (Principle contact: C. Colvin).

18 Defra NQS Evidence Strategy, 2022.

19 Seafish fleet enquiry tool (accessed January 2022).

Nearly 8% of all fishing income in England was contributed by vessels targeting whelks in 2020, more than triple the contribution of whelk vessels in 2009[19].

## Economic dependence by fleet segment

Figure 15a shows total number of UK and CD vessels that caught any amount of whelks in English waters between 2016 and 2021 categorised by their economic dependence on the value of whelk landings in English waters. The total number of vessels declined slightly across this period however the proportions of different dependency groupings remained relatively consistent.

In 2021, 49% of vessels landing whelks from English waters were less than 20% dependent on the fishery. The majority of these vessels (37% of all vessels) were less than 5% dependent on the whelk fishery. This is consistent with the notion that whelk is an important fishery for supporting diversification (a common fishing practice to reduce economic reliance and fishing pressure on single species), which in itself signifies the economic importance of whelk fisheries for supporting business continuity.

Relatively few vessels showed very high levels of dependency on whelk fishing: 15% were 20 to 40% dependent, 10% were 40 to 60% dependent, 11% were 60 to 80% dependent, and 14% were 80 to 100% dependent. This reflects the polyvalent nature of many small scale, often inshore fisheries, in which fishers will prosecute different fisheries based on availability of opportunities, seasonal variations in target species, and the influence of market demand.

Figure 5b shows the proportion of landings each dependency group was responsible for between 2016 and 2021. At least 58% of landings in any year 2018 to 2021 were made by vessels with at least a 60% dependence on the whelk fishery in English waters.

Whilst the 80 to100% dependency group typically constitutes a smaller proportion of the total number of vessels involved in the whelk fishery (Figure 155a), this group is responsible for a large share of whelk landings – ranging between 30% and 55% from 2016 to 2021.

In contrast, whilst vessels less than 20% dependent on whelk constituted the majority of vessels involved in the fishery between 2016 and 2021 (consistently around 50%), this grouping was responsible for a relatively small volume of landings during these years (consistently below 15%) as shown in Figure 155a.

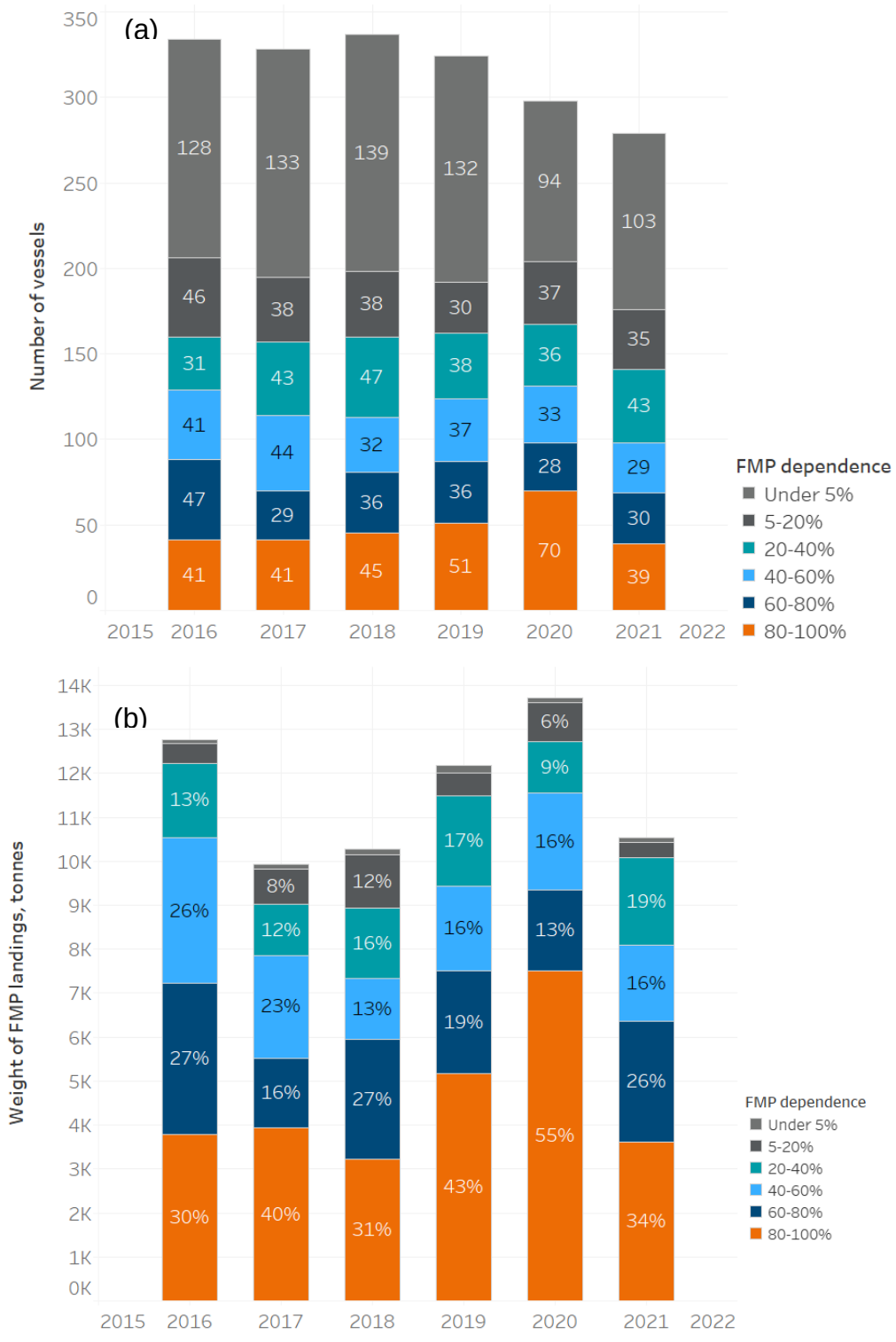



**Figure 15: (a) The total number of UK and CD vessels which caught any whelks in English waters from 2018 to 2021, based on their economic dependence on the value of whelks. (b) The total weight of whelk landings from UK and CD vessels in English waters by vessels belonging to different economic dependence groups. The bars show each group's landings as a percentage (%) of the total whelk landings from the FMP in that year.**

Figure 16 shows the number of vessels within each size category that were at least

20% economically dependent on fishing for whelk (from here on referred to as “whelk dependent”) in English waters between 2016 and 2021.

The total number of whelk dependent vessels varied slightly across this period, however the proportion of vessels of different lengths remained relatively consistent.

Small vessels in the 8 to 10m category consistently made up the majority of whelk dependent vessels between 2016 and 2021, ranging from 80 to 96 vessels within this timeframe. The smallest under 8m vessels made up a smaller but still significant proportion of whelk dependent vessels between 2016 and 2021, ranging from 20 to 34 vessels within this timeframe.

A similar number of mid-sized whelk dependent vessels were also active within this timeframe, with 17 to 29 vessels in the 10 to 12m category, and 12 to 23 vessels in the 12 to18m category recorded as being at least 20% dependent on whelk fishing in English waters between 2016 and 2021.

The largest vessels in the over 18m category consistently made up the smallest proportion of whelk dependent vessels (consistently less than 5 vessels) between 2016 and 2021.

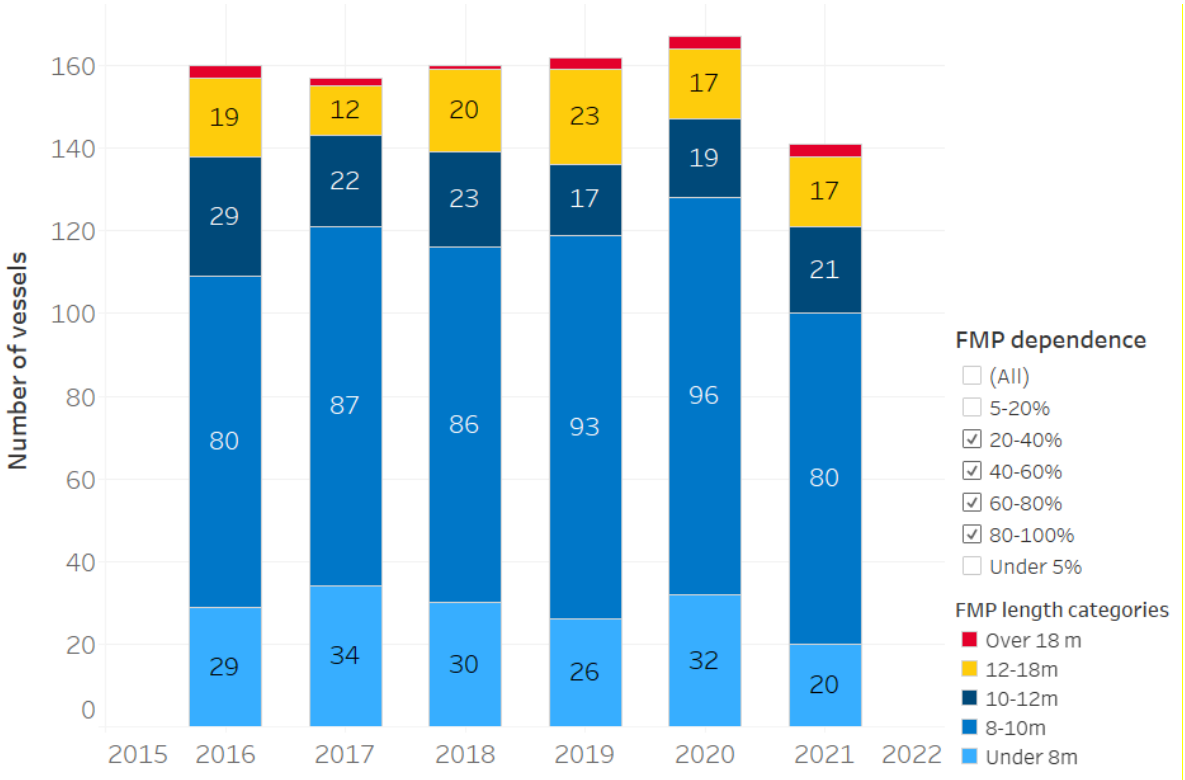



**Figure 16: Total number of UK and CD whelk dependent vessels (whelk constituted more than 20% of landings value each year) by vessel size categories.**

# Ports reliance on the whelk fishery

Figure 17 shows the value of whelk landings from English waters by port, as a proportion of the total value of landings in the relevant ports by all UK and CD fishing vessels in 2016 to 2021. Within this timeframe, whelks typically constituted a relatively small proportion of the total value of landings at most English ports.

Ports along the Southeast, East, and East Midland coasts England tend to be more reliant on the value of whelk landings, with some ports on the Northeast and Northwest coasts also reporting a significant contribution of whelks to total landings value.

There are only a small number of English ports where whelks make up over 50% of the total value of landings between 2016 and 2021. These ports typically had lower overall landings values (less than £50m) and are located along the East Anglian coastline.

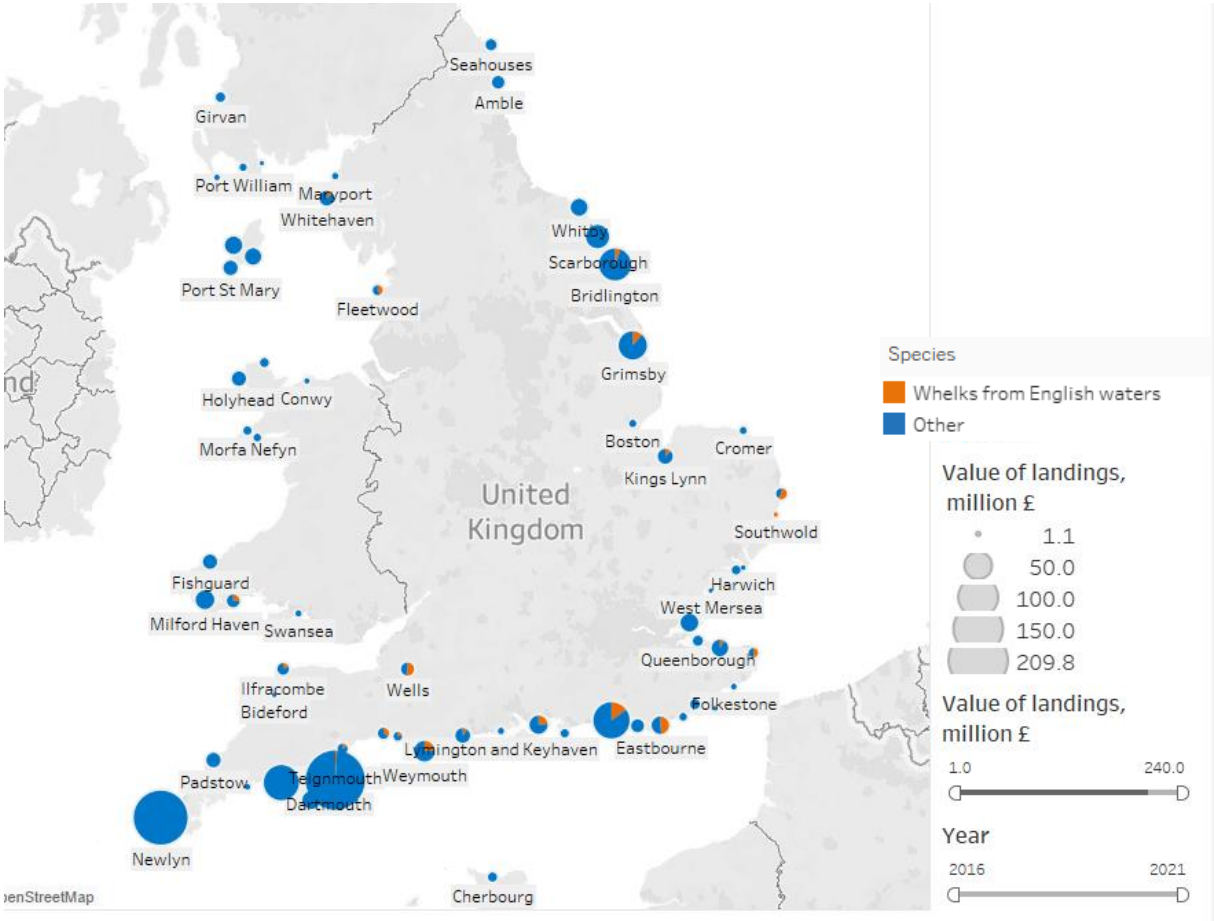



**Figure 17: Total landings from UK and CD vessels by value (£ million) at major ports in England showing the proportion of whelk landings from English waters. Only ports with total landings of more than 1 tonne are shown.**

# Economic data

In this section, economic indicators have been defined as follows[20]:

- Economic dependence percentage of revenue associated with value of landings of stocks/species in FMP managed area compared to total fishing income.
- Fishing income value of fish landed associated with FMP.
- GVA (Gross Value Added) a measure of the value of goods and services produced by an industry. GVA is calculated as the sum of operating profit and crew share.
- Operating profit the difference between total income and operating costs.
- Net profit the result of subtracting finance costs, depreciation and interest costs from operating profit.
- GVA to fishing income margin shows the economic efficiency and profitability of operations, and evolution over time.

Factors impacting economic performance are analysed in more detail as part of Economics of the UK Fishing Fleet annual reports.

Table 10 shows the main economic performance indicators used to analyse fishing fleets. Figure 188 shows that operating profit, fishing income, GVA, and GVA to fishing income margin all increased between 2018 and 2020, before falling sharply in 2021 to lower levels than 2018. Net profit also increased from 2018 to 2019 but declined slightly in 2020 (data was not available for 2021). It is worth noting that, in general, fishermen targeting whelks were acutely impacted by Covid-19 lockdowns due to their reliance on international export markets and restaurant trade. Shellfish value, weight, and average price indicators were all below 2019 levels from January to September of 2020.

**Table 10: Economic performance indicators associated with the FMP in 2016 to 2021.**

| Home Nation | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 (note) |
|---|---|---|---|---|---|---|
| Fishing income (£000) | 12,658 | 11,110 | 12,428 | 16,225 | 17,002 | 12,062 |
| GVA (£000) | 7,646 | 6,559 | 7,307 | 9,871 | 10,691 | 6,524 |
| Operating profit (£000) | 3,946 | 3,294 | 3,536 | 4,569 | 4,844 | 2,399 |

[20] Seafish FMP economic evidence (2022).

| Home Nation | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 (note) |
|---|---|---|---|---|---|---|
| Net profit (£000) | 2,983 | 2,425 | 2,638 | 3,319 | 2,335 | |
| GVA to fishing income margin | *60%* | *59%* | *59%* | *61%* | *63%* | *54%* |

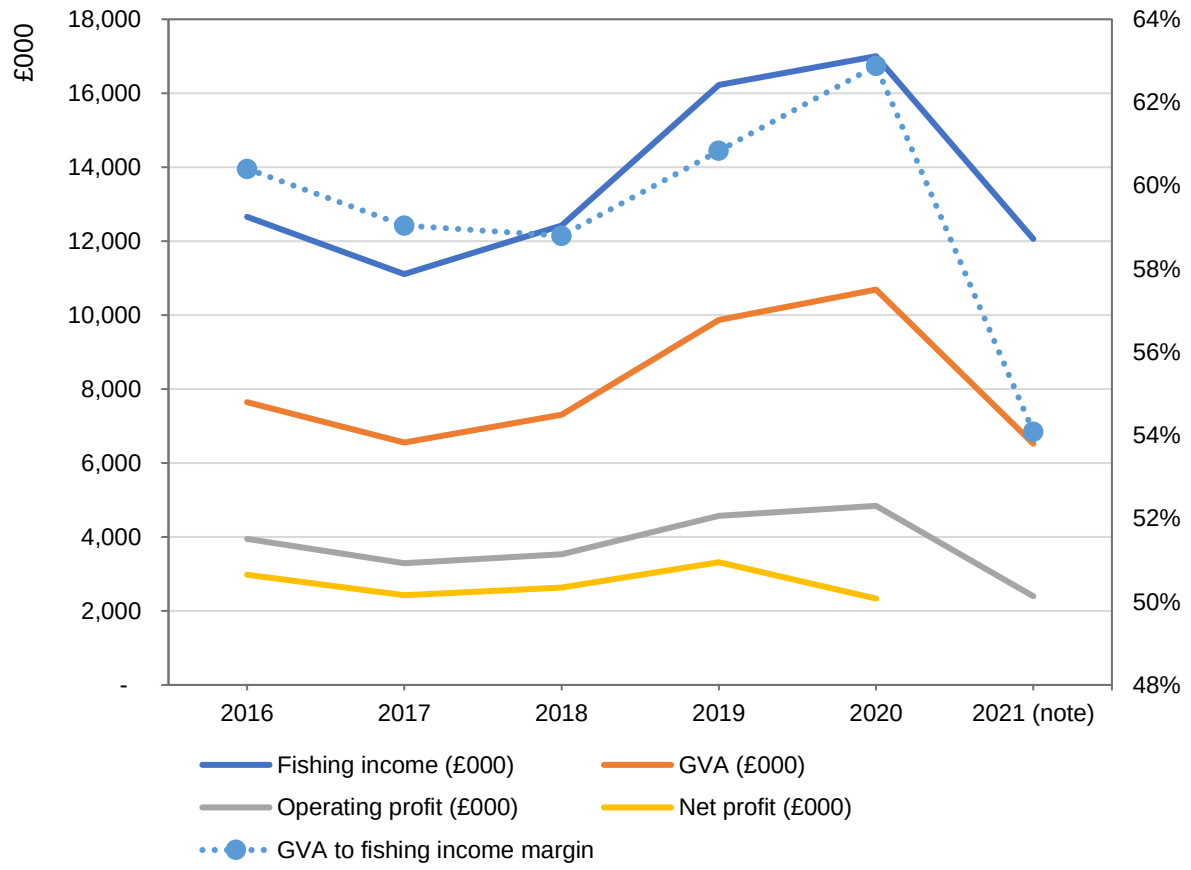



**Figure 18: Economic performance indicators associated with whelk landings from English waters, 2018 to 2021. Note: 2021 data is a forecast based on 2021 preliminary activity data provided by MMO and 2020 costs structure.**

**Figure 19:** shows the weight of whelks landed from UK and CD vessels in the FMP regulated area each month from January 2016 to December 2022 (blue bars). The evolution of the average price/tonne of whelks is shown by the orange line for the same period.

Significant fluctuations in tonnages landed are observed throughout the year, with a differential of approximately 1400 tonnes between peak fishing months (March to June) and off-peak months (September to February).

The average price (£) per kilogram does not fluctuate to the same degree, however in 2018, 2019, and 2020 price per kilogram can be seen to increase slightly during the autumn and winter months when landings are lower.

Despite such fluctuations, there is a general increase in price per kilogram between 2016 (approximately £950/kg) and mid-2018 (approximately £1400/kg), when it levelled off before declining from early 2020 to 2022 (to approximately £1000/kg).

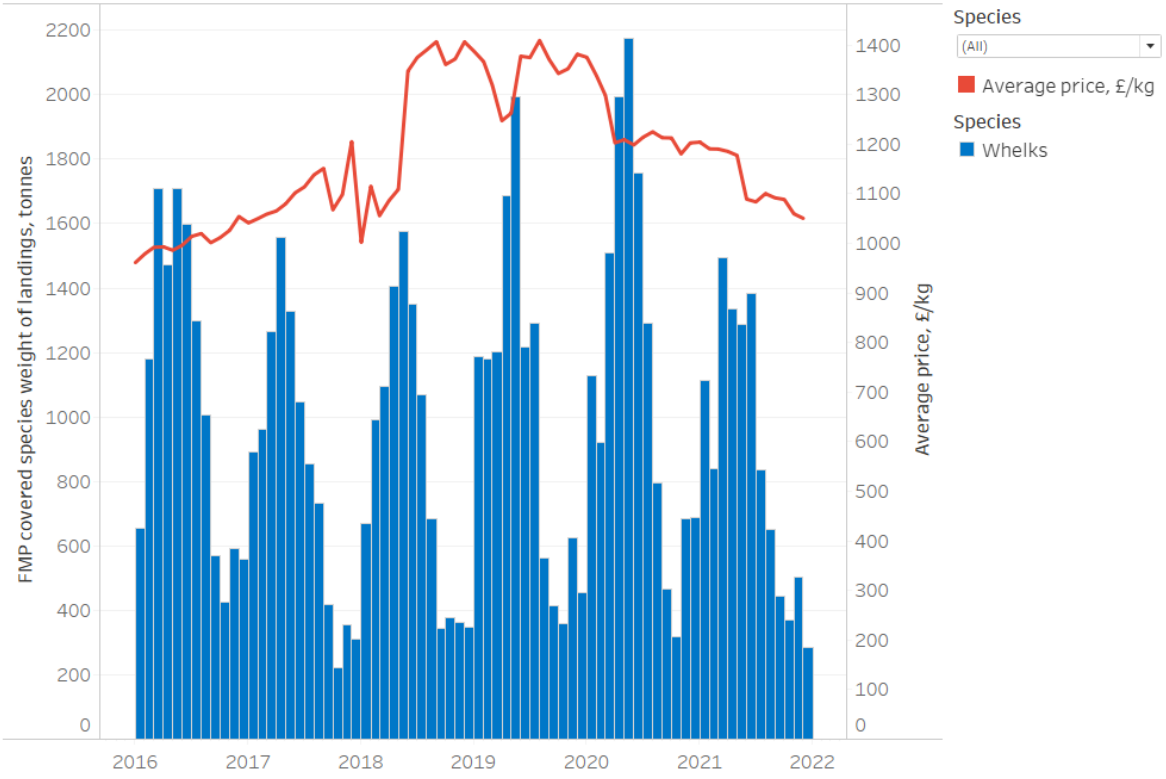



**Figure 19: Weight of whelks landed from UK and CD vessels in the FMP regulated area per month (blue bars) in 2016 to2021 and average price (orange line) evolution during the same period.**

## International sales and exports

Non-quota shellfish are economically valuable for UK trade, accounting for 11.2% of all fish exports (including exports of fish products) in 2021. The 44,900 tonnes of non-quota shellfish species exported in 2021 was valued at £331.5 million, equating to around one fifth of the money generated from total fish exports.

Domestic fishing effort for whelk has seen dramatic rises in the last two decades due to the expansion of global markets. The increasing number of whelks being landed is largely driven by rising demand from overseas markets such as Korea, Taiwan and Singapore which has pushed up the value. UK whelk landings (UK vessels catching

whelks in UK waters) increased from 8,400 tonnes in 2003 to 22,700 tonnes in 2016, when they were worth £22.9 million[21].

Data showing the import and export of whelks from the UK is available, with the caveat that this data also includes other aquatic vertebrates not listed elsewhere in trade data (primarily sea urchins and sea cucumbers). Whilst export quantities of these species are incredibly small, whelk export figures will nonetheless not be entirely accurate. Import figures may be less reliable, as the import of sea urchins, while still small, is likely greater than export.

**Export value (total):** With the above caveat noted, exports of whelks were relatively stable between 2017 and 2020, with total exports worth between £18.1 million and £19.3 million in each of these years. Exports dropped to £15.7 million in 2021 but preliminary data for 2022 suggests a full recovery of the market, with a higher weight of exports than any year since pre-2017. Despite the increase in weight of exports, data for January-October 2022 shows the lowest export price since pre-2017, more than £1.40/kg down on 2017 levels and £2.80 down on 2020, at £3.41/kg.

**Export value (live whelks):** As expected with the above in mind, when considering only live whelks (urchins and cucumbers etc.) exports were relatively stable between 2017 and 2019, with the export market worth between £1 million and £1.3 million in each of these years. In 2020 the market began to grow and this growth accelerated in 2021, with exports worth over £4.5 million. The total value of exports further increased in 2022. In keeping with the overall trend, the export price of live whelks (per kilo), while always significantly lower than frozen whelks, has fallen significantly from its peak in 2020.

**Export value (frozen, smoked, dried, salted or brined):** The export market for frozen whelks has declined over the past 2 years, having been worth at least £16 million every year from 2017to 2020. The quantity of frozen whelk exports has also declined slightly in 2021 to 22, although overall exports have increased as a result of the increase in the live export market. The price/kg of frozen exports has also decreased from a high in 2020. Exports of whelks that were smoked, dried, salted, or in brine between 2017 and 2022 never constituted more than 2% of total exports.

**Export locations:** Between 2017 and 2020, at least 70% of UK whelk exports were to South Korea, however this quantity has fallen (49% of exports in 2021 were to Korea). In parallel, exports to France have risen from 2% in 2020 to 26% in 2021. January to October data for 2022 shows Korea's share of the UK whelk export market decreasing further, while France's market share increases. Exports to Asia

21 Skerritt, D., Durrance, S. (2018). Management recommendations for English non-quota fisheries: Common whelk. Blue Marine Foundation.

tend to be of frozen products, while more than two thirds of exports to France have been of live animals over the past 2 years.

**Import value:** Imports of whelks were higher in 2021 and 2022 than in any year between 2017 and 2020, although numbers were not significant compared to exports (generally between £2 million and £3 million). At least 70% of imports since 2019 were frozen, with smoked, dried, salted or in brine products decreasing almost annually from 2017 onwards. Less than 20% of imports between 2017 to 2022 were of live animals.

## Economic impacts of Covid-19

Covid-19 had a significant economic impact on shellfish landings, with lockdowns and associated restrictions causing considerable changes across the catching sector in 2020. The initial lockdown had significant operational impacts on the UK catching sector. Fishers targeting shellfish (compared to pelagic or demersal species) were the most acutely affected by the Covid-19 lockdown due to their reliance on domestic food service, as well as the international export market. Comparing January to September 2019 with January to September 2020, total shellfish (both quota and non-quota) landings values fell 36%, landings weight fell 19%, and average price fell 21%. At its worst, shellfish values fell by 56% in April 2020 compared to April 2019 following the first government-imposed lockdown.

# Social importance

## Employment (FTE) by fleet segment

Figure 20 shows employment calculated in full time job equivalent (FTE), based on data obtained from Seafish's 2021 Employment in the UK Fishing Fleet report[22]. FTEs are a standardised measure of employment, calculated based on the average vessel crew and effort and assuming that one FTE represents 2,000 hours of work per year.

Socio-demographic characteristics cannot be partitioned down to individual FMP level, however the use of fleet segments associated with the FMP can help to understand the potential demographic profile of employees.

[22] 2021 Employment in the UK Fishing Fleet — Seafish

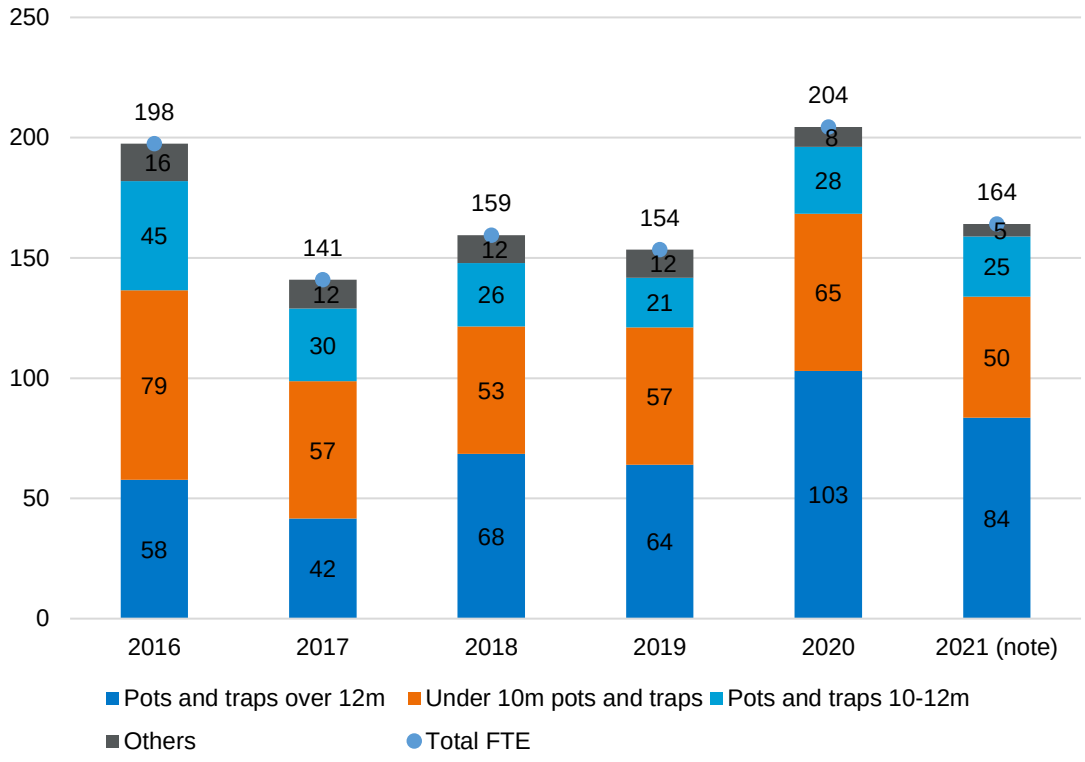



**Figure 20: Employment (FTE) of Seafish fleet segments associated with FMP from 2016 to2021. Note: 2021 data is a forecasted based on 2021 preliminary activity data provided by MMO**

## Employment (FTE) by target species (English vessels)

The Seafish Fleet Enquiry Tool[23] shows that for the last 12 years, English vessels that primarily target whelks have supported at least 1.5 FTE jobs. Since 2016, they have supported more FTE positions than the average for the UK whelk fleet.

The number of FTE jobs supported by vessels in England targeting primarily whelks rose steadily and almost annually between 2009 and 2020. By 2020, vessels fishing primarily for whelks in England supported 212 FTE positions, up from 124 in 2009. In this time, operating profit per FTE more than doubled.

In 2020, nearly one in ten FTE positions in the English fishing fleet was on a vessel targeting whelks, with the sector's share of FTEs in the fleet having more than doubled since 2009.

English vessels targeting whelks made up 63% of all UK vessels targeting the species in 2020, yet 70% of FTE jobs in the sector were in the English fleet. Every

[23] https://www.seafish.org/insight-and-research/fishing-data-and-insight/

year from 2016 to 2020, English vessels targeting whelks supported more FTEs per vessel than the UK fleet as a whole.

## Onshore employment

In 2021 the UK seafood processing industry supported 18,021 full time equivalent (FTE) jobs across 344 majority seafood processing sites (some of which belong to multi-site companies).

FTE figures from other regions (combining both shellfish only and mixed processors) in England for 2021 are as follows:

- Midlands (East and West): 510
- East of England: 267
- Northeast (England): 185
- Northwest (England): 208
- Southeast (England) and London: 200
- Southwest (England): 1,326

In total, the English shellfish processing sector supported 7,101 jobs in 2021. Employment data does not differentiate down to species level (for example, whelk only processors).

The latest financial data calculated the total income from the seafood processing sector to be £4.1 billion in 2018. These figures will be updated in 2023 following the results of the 2022 industry census conducted by Seafish.

# Fishery management

## Current management approaches

Management of whelks in English waters is delivered at two scales: inside of 6nm fisheries are managed by IFCAs and outside of 6nm Defra and the MMO are responsible for managing fisheries. Table 11 provides an overview of the range of management measures currently in place for English whelk fisheries. The only nationally applied management measure for whelk fisheries is a 45mm MCRS which was adopted into UK legislation from EU regulations.

Inside various IFCA jurisdictions, whelk fisheries are managed through a mixture of input controls, minimum conservation reference sizes (MCRS), and technical conservation measures such as mandatory escape gaps on pots.

Some IFCAs, mainly where key fishing grounds occur, operate whelk or shellfish permit schemes which typically limit pot numbers and carry reporting requirements for the submission of data including fishing effort and landings. MCRS are often regionally specific and informed by local studies on size of maturity where available. In England the whelk MCRS ranges from the national limit of 45mm outside of 6nm to 65mm in the Devon & Severn IFCA district.

Most IFCAs also enforce byelaws which are not necessarily whelk fishery specific but could limit whelk exploitation within their area of authority, for example, vessel size limits or recreational shellfish permits and pot limits.

## Marine Plans

There are 11 marine plans in place around England, the purpose of marine plans is to guide those who use and regulate the marine area to encourage sustainable development while considering the environment, economy and society. Marine plans set out priorities and direction for future development, inform sustainable use of resources, and help marine resource users understand where new developments may be appropriate. The MMO is responsible for preparing marine plans in England, plans are based on the policy framework of the UK Marine Policy Statement (under the Marine and Coastal Access Act 2009) and serve as a link between national and local policy application.24

Marine plans are particularly relevant to fisheries in the context of minimising spatial conflict and spatial squeeze. Prospective users applying for licences to develop activities in the marine space are required to show how they have considered local marine plans and to the Marine Policy Statement and evidence how their proposal aligns with the objectives laid out in local plans, this includes collecting and mapping information about fishing activities in the proposed development area in order to mitigate environmental, social, and economic impacts.

24 Marine planning in England, gov.uk

**Table 11: Byelaws for regional management of English whelk fisheries, established by IFCAs**

| | IFCA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Byelaw** | **National (England)** | **North Western** | **North Eastern** | **Eastern** | **Kent & Essex** | **Southern** | **Sussex** | **Devon & Severn** | **Cornwall** | **Isles of Scilly** | **Northumberland** |
| Whelk or Shellfish permits | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes |
| Minimum Landing Size/ MCRS (mm) | 45 | 45 | 45 | 55 | 53 | 45 | 45 | 65 | 45 | 45 | 45 |
| Pot Limit | No | 800 | No | 500 | 300 | No | 600 | No | No | No | 800 |
| Max pot size or Escape Gaps | No | No | No | Yes | Yes | No | Yes | No | No | No | No |

Annex 1 Evidence Statement for Whelk FMP

| | IFCA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Byelaw** | **National (England)** | **North Western** | **North Eastern** | **Eastern** | **Kent & Essex** | **Southern** | **Sussex** | **Devon & Severn** | **Cornwall** | **Isles of Scilly** | **Northum berland** |
| Maximum Vessel Length (m) | No | 12 | 10/16m (some areas) | No | 14 | 12 | 14 | 15.24 | 16.46 | No | 12 |
| Riddle maximum spacing (mm) | No | No | No | 24 | 25 | No | 25 | No | No | Yes | No |

Department
for Environment
Food & Rural Affairs

# Proposed Fisheries Management Plan for Whelk in English Waters

## Annex 2: Evidence and Research Plan

Date: July 2023

Version: public consultation

# Context

The FMP has identified evidence gaps which may need to be filled to achieve the stated FMP goals. In the short term, Defra will collate and prioritise these evidence gaps across the entire FMP programme, to look to deliver evidence to support in addressing some of the most pressing and key questions identified within the FMPs. However, all evidence gaps identified across the FMP programme will not be able to be funded by Defra alone. In the longer term, to support the phased approach of FMPs and progress towards meeting the Fisheries Act Objectives, Defra are developing an evidence pathway that promotes collaboration between industry, academia, and fisheries managers to address these identified evidence gaps for FMPs.

For the following table, **Reference number** relates to FMP objective e.g. research need 1.1 relates to FMP objective 1, research need 2.1 relates to FMP objective 2 etc.

# Evidence and Research Plan: Whelks

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **FMP objective 1. Develop and pilot a comprehensive data collection programme for whelk fisheries, which supports a data rich future and results in the establishment of a reliable time series that facilitates robust, sustainable management.** | | | |
| **1.1** | Develop and implement an efficient **fishery-dependent**[1] data collection programme capable of establishing a long-term time series of data suitable for evidence-based | (a) Define fishery-dependent data requirements to support assessment/ monitoring of stock status, development/ monitoring/ evaluation of harvest strategies, and MCS[2]. For example: | • Strategic approach to evidence provisioning for UK fisheries under development[4].<br>• WMG SSG[5] have met quarterly since spring 2021 to discuss data |

1 Fishery-dependent data is collected from the fishery itself, using both commercial and recreational sources. There are a variety of methods for obtaining fishery-dependent data. The most common approach is to use recorded landings.

2 MCS = Monitoring, Compliance, and Surveillance.

4 Strategic Evidence Framework for Fisheries (SEFF). This brings together key stakeholders, including Defra, Marine Management Organisation (MMO), Centre for Environment, Fisheries, and Aquaculture Science (Cefas), Association of Inshore Fisheries and Conservation Authorities (AIFCA), Fisheries Administrations, and Seafish.

5 WMG SSG = Whelk Management Group Science Sub-Group, which consists of Cefas scientists, independent scientists, and a subset of scientifically minded regulators and industry representatives who meet on a quarterly basis to discuss current best available evidence on whelk fisheries in support of the FMP.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | management (improving on existing mechanisms). | i. **Spatial distribution of fishing activity** (for example per ICES (sub)rectangle; VMS; iVMS)<br>ii. **Amount of fishing effort** (for example pot numbers at sea; pot numbers hauled per trip)<br>iii. **Landings** (tonnages; value)<br>iv. **Fleet characteristics** (for example vessel length; nationality)<br>v. **Fishing method(s)** (for example gear type(s); bait used; soak time)<br>vi. **Bycatch** (for example species; frequency of capture)<br>(b) Review what fishery-dependent data[1] is currently collected from whelk fisheries (how, when, and by whom) to identify where data gaps exist.<br>(c) Evaluate efficiency and appropriateness of current data gathering protocols, considering:<br>i. Whether data collected is fit for purpose[3] | requirements for whelk fishery management.<br>• SIAG data inventory (2021) contains a collation of all fishery dependent data collected from UK shellfish fisheries.<br>• General consensus that improved **effort data** will be critical for evidence-based management. Mandatory data collection mechanisms must therefore collect data on:<br>○ Pot numbers at sea<br>○ Pot numbers hauled<br>○ Soak time<br>○ Bait type |

3 With respect to supporting responsive, evidence-based fishery management decisions – in line with Fisheries Act 2020 objectives.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | ii. Whether data is collected at the appropriate resolution (for example ICES rectangle/ sub-rectangle) (link to objectives 2 to 7)<br>iii. Where there is duplication of effort<br>iv. Agility to address emerging evidence gaps<br>v. Opportunities for improvement<br>(d) Develop and implement an improved national whelk fishery-dependent data collection strategy (building on existing mechanisms where appropriate), which delivers evidence which is fit for purpose[3]. | |
| **1.2** | Develop and implement an efficient **fishery-independent[6]** data collection programme capable of establishing a long-term time series of data suitable | (a) Define fishery-independent data[6] requirements to support assessment/ monitoring of stock status, and development/ monitoring/ evaluation of harvest strategies. Consider data | • Strategic approach to evidence provisioning for UK fisheries under development[10]. |

6 Fishery-independent data is typically collected through scientific surveys at sea, and often forms the cornerstones of stock assessments.

10 Strategic Evidence Framework for Fisheries (SEFF).

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | for evidence-based management. | requirements of appropriate assessment method(s) (as determined under objectives 3 and 4), for example<br>i. Size-based indicators[7] (for example SOM[8])<br>ii. Abundance indicators (for example CPUE-based indices; survey-based population estimate)<br>iii. Stock assessments (for example SPiCT; age/ size structured models)<br>(b) Review what fishery-independent data[6] is currently collected from whelk fisheries (how, when, where, and by whom) to identify where data gaps exist. | • WMG SSG[11] have met quarterly since spring 2021 to discuss data requirements for whelk fishery management.<br>• IFCA-led WWG have met quarterly since February 2019 to promote the sharing of relevant literature, research, and management methods (summarised in annual reports).<br>• Southern IFCA investigating local SOM |

7 For more details on size-based indicators, see discussion of UK Harvest Standard Specification recommendations under FMP objective 4.

8 SOM = Size of maturity (the size at which 50% of the population is mature, or the probability of a whelk being mature is 0.5).

11 WMG SSG = Whelk Management Group Science Sub-Group, which consists of Cefas scientists, independent scientists, and a subset of scientifically minded regulators and industry representatives who meet on a quarterly basis to discuss current best available evidence on whelk fisheries in support of the FMP.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (c) Determine what length of timeseries is required to support whelk fishery management decisions[9].<br>(d) Review options around the gathering of catch composition data, for example:<br>i. New technologies (REM; AI)<br>ii. Opportunities for data collection at multiple stages of the supply chain (for example processors)<br>(e) Develop and implement an improved national whelk fishery-independent data collection strategy (building on existing mechanisms where appropriate), which delivers evidence which is fit for purpose[3], and available at the appropriate spatial and temporal resolution (link to objectives 2, 3, 4, and 7). | to inform a review of MCRS[12].<br>• Eastern IFCA (+Cefas and local fishermen) investigating SOM in areas of the district not previously assessed. |

9 Time series of data required is typically at least as long as the number of ages of the population. This may be around 5 to 7 years, however, may vary in populations with different growth rates (e.g. older, larger, slower growing populations further north).

12 MCRS = Minimum Conservation Reference Size.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **1.3** | Develop and implement an efficient **social and economic** data collection programme capable of establishing a long-term time series of data suitable for evidence-based management. | (a) Define social and economic data requirements to support development/ monitoring/ evaluation of harvest strategies.<br>(b) Review what social and economic data is currently collected from whelk fisheries (how, when, where, and by whom) to identify where/ whether data gaps exist.<br>(c) (If required) Improve upon the existing national social and economic data collection strategy, to ensure evidence is fit for purpose[3]. | • An ongoing data collection programme covering social and economic data across the UK fishing fleet is coordinated by Seafish. |
| **1.4** | Improve availability of data required to assess **wider environmental interactions** of whelk fisheries. | (a) Define wider environmental data requirements to support development/ monitoring/ evaluation of management measures addressing the "ecosystem objective"[13]. | • Some evidence exists (and is currently being collected through a 2022-24 FISP project led by Bangor University) on the wider environmental interactions of |

13 Fisheries Act 2020 "ecosystem objective" is that— (a) fish and aquaculture activities are managed using an ecosystem-based approach so as to ensure that their negative impacts on marine ecosystems are minimised and, where possible, reversed, and (b) incidental catches of sensitive species are minimised and, where possible, eliminated.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (b) Review what data on wider environmental interactions is currently collected from whelk fisheries (how, when, where, and by whom) to identify where data gaps exist.<br>(c) Design and deliver research addressing key data gaps around the wider environmental impacts of whelk fisheries, delivering evidence which is fit for purpose[3]. | crustacean pot fisheries, however limited whelk fishery-specific information available. |
| **FMP objective 2. Define key whelk stock boundaries at a suitable scale for management.** | | | |
| **2.1** | Review current state of understanding on whelk stock structure, identifying and addressing key evidence gaps (as appropriate). | (a) Collate relevant information on:<br>i. Whelk biology (for example SoM)<br>ii. Whelk morphology<br>iii. Spatial catch distribution<br>(b) Identify key evidence gaps inhibiting establishment of whelk stock boundaries.<br>(c) Create a resource to direct future biological sampling effort when gathering data for whelk stock delineation.<br>(d) Design and deliver research addressing key evidence gaps. | • FISP project led by Heriot-Watt University will utilise fisher knowledge to improve understanding of the variation in whelk stocks across the UK by gathering, analysing, and mapping anecdotal information on whelk populations.<br>• MMO are investigating the location of whelk |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | | fishing activity using VMS data. |
| **2.2** | Undertake research to understand the role environmental parameters play in determining stock boundaries. | (a) Increase understanding of the effect that local environmental parameters (for example temperature, food availability) have on growth and maximum size.<br>(b) Increase understanding of the role that local hydrographic conditions play in determining whelk stock boundaries. | • Emmerson et al (2020) study on the effect of temperature on whelk growth in the Irish Sea.<br>• Colvin et al (2022) study on the effect of environmental factors on whelk shell growth/ repair.<br>• Morrissey et al (2022) used population genomics to show a single semi-continuous whelk population. |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **2.3** | Define key whelk stock boundaries at a suitable scale for management. | (a) Define suitable whelk stock boundaries based on best available evidence on:<br>i. Whelk biology and morphology (and influence of local environmental conditions)<br>ii. Patterns of exploitation<br>iii. Management and enforcement landscape<br>(b) With respect to stock boundaries (or lack thereof), define an appropriate granularity of:<br>i. Data collection (link to objective 1 and 4)<br>ii. Stock assessment/ monitoring (link to objective 1 and 4)<br>iii. Management options (link to objective 7) | • Cefas testing spatial resolution of sampling required for stock assessments – pilot study in Norfolk (Lawler, 2022). |
| **FMP objective 3. Assess Catch Per Unit Effort (CPUE) in the whelk fishery.** | | | |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **3.1** | Assess CPUE in the UK whelk fishery[14]. | (a) Explore options for assessing whelk CPUE through whole catch sampling, for example using standardised, scientific whelk pots[15].<br>(b) Explore options for assessing whelk CPUE through collaborative data gathering efforts involving different stages in the supply chain, for example analogous to the scallop 'red bag scheme'. This could build on bar-coding technology commonly used to link catches with vessel of origin.<br>(c) Define appropriate spatial and temporal resolution for data gathering efforts, for example:<br>i. LPUE[16] could be assessed as an ongoing data gathering exercise | • A reliable time-series of pot-haul effort data is not yet available. |

14 Population abundance indices are a key component in most stock assessments. The use of CPUE (or LPUE) often use days fished as the effort metric, which is not a very accurate representation for whelk pots. Instead, the number of pot hauls per day is considered to be more representative of true fishing power.

15 May require a dispensation for fishers to land the entire catch.

16 LPUE = Landings Per Unit Effort.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | ii. CPUE sampling could be carried out less frequently | |
| **3.2** | Explore methods of linking commercial catches (CPUE) with survey-based whelk abundance estimates. | (a) Explore survey methods for assessing whelk abundance, for example standardised baited trap surveys[17].<br>(b) Explore methods for comparing whelk abundance across different geographic locations, accounting for factors such as:<br>i. Tidal ellipse<br>ii. Bait used<br>iii. Gear type<br>(c) Explore methods of linking commercial catches (for example CPUE) to fishery-independent survey data as a means of developing abundance indices and indirectly assessing/ estimating stock. | • Lawler and Stott (2021) investigated alternative population abundance indices, using different effort metrics.<br>• Surveys/ sampling programmes recommended to support abundance index development (Hold et al., 2020).<br>• Promising results[18] from trials of sampling gears for whelk stock assessment surveys in the Isle of Man (M. |

17 Uncontrollable variables (e.g. animal behaviour) mean that fishery independent baited trap surveys are not the most appropriate means of calculating stock density, however such work can be used to build a useful time series of relative abundance.

18 Trialed commercial whelk pots, BRUVs (Baited Remote Underwater Video), and beam trawls. Abundance observed in BRUV surveys found to correlate with trawl surveys, therefore BRUVs may be a potential non-invasive method of assessing whelk abundance.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | | Garrett, PhD Bangor University). |
| **FMP objective 4. Explore options for assessing stock(s) or exploitation status.** | | | |
| **4.1** | Explore potential size-based and/or abundance-based metrics for assessing whelk stock status. | (a) Define appropriate whelk assessment unit(s) in English waters based on outputs of objective 2.<br>(b) Determine appropriate size-based indicators and how they could be applied/ monitored in relation to reference points to increase understanding of whelk stock status.<br>(c) Explore how fishers' knowledge can be used to improve understanding of whelk stock health.<br>(d) Align assessment methods with management tools and end goals. | • Eastern IFCA stock assessment uses LPUE as a proxy for stock health in areas across the district.<br><br>Progress in the assessment of Welsh whelk fisheries[19]:<br>• Reference points calculated using maturity and growth data from 2021 surveys[20].<br>• Monthly landings and effort (number of pots fished) data from catch |

19 Further details in the Harvest Standard Specification (HSS) to guide future fisheries management in the UK.

20 Conducted by Bangor University.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | | returns will inform an LPUE timeseries.<br>• Length measurements from commercial landings will inform size-based indicators:<br>○ $L_{inf}$[21] and $L_{MAT}$[22] from annual surveys used to calculate reference points.<br>• Size at age/ maturity estimates from survey data used to calculate reference points for four |

21 $L_{inf}$ is length infinity (the theoretical maximum length beyond which a fish does not grow).

22 $L_{MAT}$ is length at maturity (the length at which 50% of individuals are mature; also referred to as L50).

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | | indicators ($L_{max5\%}$[23], $P_{mega}$[24], $L_{25\%}$[25], $L_c$[26]). |
| **4.2** | Explore options for developing stock assessments for whelk stock(s). | (a) Define appropriate whelk assessment unit(s) in English waters based on outputs of objective 2.<br>(b) Review strengths and limitations of potential stock assessment models (for example SPiCT[27] and age/ size structured models[28]).<br>(c) Define indicators and reference points. | • Cefas has investigated SPiCT model for assessing regional whelk stocks. There was large uncertainty with the results.<br>• Cefas now working to collect spatial |

23 $L_{max5\%}$ is the average size of the largest 5% of landings, which is compared against Linf. A ratio (Lmax5%/Linf) of 0.8 is considered a healthy stock.

24 $P_{mega}$, is assessed for catch proportions which could be considered 'mega' spawners, where the proportion of the catch are above optimum length ($L_{opt}$) + 10%. $L_{opt}$ is ~2/3Linf and a $P_{mega}$ of >0.3 is a healthy stock indicator.

25 $L_{25\%}$ is calculated to compare the length of the 25th percentile of landings to the LMAT. This reference point uses a $L_{25\%}/L_{MAT}$ ratio where a healthy stock gives a ratio of >1.

26 $L_c$ gives the length at first capture as an indicator and for whelks, this can be assumed to be the minimum landing size (MLS; 65mm shell length as of 2021; Hold et al., 2021) as the fishery is associated with high discard survival. The $L_c/L_{MAT}$ ratio should be >1 for a healthy stock.

27 SPiCT (Surplus Production in Continuous Time) modelling could be facilitated by representative/ higher quality effort data (e.g. recording pot hauls/ soak times rather than estimating fishing activity based on records of vessel engine power/ days at sea); determination of whelk stock boundaries; and determination of the scale at which stock assessments should be carried out at to deliver outputs suitable for management.

28 Age/ size-structured methodologies could be facilitated by exploring ways to build up a suitable time-series of age/ size-structure.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (d) Develop assessment methods as time series of data builds.<br>(e) Align assessment methods with management tools and end goals. | distribution data to run a finer scale model.<br>• Scoping study in the EIFCA district to assess whelk stocks and population variation. |
| **FMP objective 5. Assess the impact of whelk fishing activity on the wider marine environment.** | | | |
| **5.1** | Evaluate direct negative impacts of whelk fisheries on the wider marine environment (in terms of benthic impacts and interactions with ETP species). | (a) Review of current literature on the direct negative environmental impacts of whelk pot fisheries, for example:<br>i. Nature of the risk posed to benthic habitats (seafloor interactions)<br>ii. Nature of the risk posed to ETP[29] species<br>iii. Hotspots where risk is highest<br>iv. Evidence gaps<br>(b) Design and deliver research to fill key evidence gaps. | • JNCC and NE advice to Defra received December 2022. |

29 ETP = Endangered, Threatened, and Protected.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (c) Assess the anticipated need for management. | |
| **5.2** | Review existing mitigation/ avoidance measures used in shellfish pot fisheries to minimise negative **benthic impact**, and the need for additional measures. | (a) Map the prevalence and efficacy of avoidance/ mitigation measures applied in English whelk fisheries to minimise negative impacts on **benthic habitats**, accounting for regional variation in:<br>i. Fishing methods/ activity<br>ii. Gear types/ design<br>iii. Species/ habitats present<br>iv. Legislative context, for example MPA designations.<br>(b) Review measures employed in other jurisdictions/ fisheries to reduce negative interactions between static gear fisheries and benthic habitats. | • JNCC and NE advice to Defra received December 2022.<br>• IFCA led research (to be collated). |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **5.3** | Review existing mitigation/avoidance measures used in shellfish pot fisheries to minimise negative **impacts on ETP species**, and the need for additional measures. | (a) Map the prevalence and efficacy of avoidance/ mitigation measures applied in English whelk fisheries to minimise negative impacts on **ETP species**, accounting for regional variation in:<br>i. Fishing methods/ activity<br>ii. Gear types/ design<br>iii. Species/ habitats present<br>iv. Legislative context, e.g. MPA designations.<br>(b) Review measures employed in other jurisdictions/ fisheries to reduce negative interactions between static gear fisheries and ETP species. | • JNCC and NE advice to Defra received December 2022.<br>• IFCA led research (to be collated). |
| **FMP objective 6. Explore the need for management around interactions between the UK English whelk fishery and other fisheries.** | | | |
| **6.1** | Evaluate the sustainability of current bait provisioning mechanisms. | (a) Review of available information on current bait provisioning mechanisms to understand: | • SIAG, WMG, and CMG meetings may be used as a forum to invite discussions on this topic. |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | i. Ecological impact(s) of using brown crab[30] as bait (and implications for long-term sustainability in both whelk and bait source fisheries)<br>ii. Economic impact(s) of using brown crab[30] as bait (on both the whelk fishery and bait source fisheries)<br>iii. Regional differences, and localisation of issues<br>iv. Key evidence gaps<br>(b) Assess the anticipated need for additional management. | |
| **6.2** | Explore options around potential alternative sources of whelk bait. | (a) Design and deliver research to assess potential alternative sources of whelk bait, in terms of:<br>i. Efficacy<br>ii. Practicality<br>iii. Economic viability | • FISP project led by Heriot-Watt University will evaluate bait alternatives.<br>• SIAG, WMG, and CMG meetings may be used as a forum to invite |

30 Excluding processing waste or by-products.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | | discussions on this topic. |
| **6.3** | Review interactions between whelk fisheries and other fisheries (not as a result of bait provisioning). | (a) Review of available information on interactions between whelk fisheries and other fisheries, for example:<br>i. Ecological impact(s) – the likely impact of other fishing activities as a source of whelk mortality (and implications for long-term sustainability)<br>ii. Economic impact(s) (on both the whelk fishery and other fisheries)<br>iii. Regional differences, and localisation of issues<br>iv. Key evidence gaps<br>(b) Assess the anticipated need for additional management. | • SIAG and WMG meetings may be used as a forum to invite discussions on this topic. |
| **FMP objective 7. Create a proposed programme of management to align fishing effort with actual / likely stock status.** | | | |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **7.1** | Determine appropriate management units for English whelk fisheries. | (a) Using outputs from objective 2, determine appropriate management units for English whelk fisheries.<br>(b) Explore alternatives for defining management units (for example applying a dispersal dynamics approach) as required.<br>(c) Understand options around managing whelk fishing activity without clearly defined stock boundaries (for example by reviewing analogous fisheries worldwide that lack clearly defined stock boundaries). | To be commenced. |
| **7.2** | Evaluate the appropriateness of existing technical measures (for example MLS). | (a) Review existing technical conservation measures by mapping their:<br>i. Application and enforcement<br>ii. Effectiveness (if possible)<br>iii. Unintended consequences (if relevant)<br>(b) Produce guidelines for optimising the effectiveness of technical conservation measures. | • SIAG and WMG meetings may be used as a forum to invite discussions on this topic. |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **7.3** | Evaluate options for managing whelk fishing effort by improved **technical measures**. | (a) Evaluate options around improving technical measures (for example gear handling and use, gear design, and catch composition/ MLS), considering:<br>i. Appropriate design of management measure (for example MLS, gear design)<br>ii. Anticipated effectiveness (and whether supporting measures would be required)<br>iii. Practicalities of implementation and enforcement<br>iv. Appropriate scale for implementation given local variations in biological and fishery characteristics<br>v. Impact and likelihood of unintended consequences, for example displacement to other NQS fisheries<br>vi. Likely economic and social impacts | • Cefas Western Waters Effort Regime alternatives report details management options for (crustacean) pot fisheries (Reeves 2020).<br>• Project UK southwest crab and lobster FIP[31] Harvest Control Rules workshop report details industry views on management options for (crustacean) pot fisheries.<br>• Discussions held in WMG meetings.<br>• 2020 WMG Whelk Effort Management Workshop report. |

31 FIP = Fisheries Improvement Project.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (b) Identify data requirements and evidence gaps inhibiting optimisation of technical measures.<br>(c) Design and deliver research to fill key evidence gaps (as required).<br>(d) Estimate a timeframe for implementation, accounting for time to deliver on key data requirements/ evidence gaps. | • Discussions invited on this topic during early stakeholder engagement events for the whelk FMP (Oct-Dec 2022). |
| **7.4** | Evaluate options for managing whelk fishing effort by controlling **fleet capacity**. | (a) Evaluate options around controlling fleet capacity (for example whelk specific entitlement/ permits), considering:<br>i. Appropriate design of management measure (for example details of the entitlement/ permit)<br>ii. Anticipated effectiveness (and whether supporting measures would be required)<br>iii. Practicalities of implementation and enforcement<br>iv. Impact and likelihood of unintended consequences, for | • Cefas WWER alternatives report details management options for (crustacean) pot fisheries (Reeves 2020).<br>• Project UK southwest crab and lobster FIP[31] HCR workshop report details industry views on management options for (crustacean) pot fisheries.<br>• Discussions held in WMG meetings. |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | example displacement to other NQS fisheries<br>v. Likely economic and social impacts<br>(b) Identify and address data requirements/ evidence gaps for controlling fleet capacity through an entitlement/ permit.<br>(c) Estimate a timeframe for implementation, accounting for time to deliver on key data requirements/ evidence gaps. | • 2020 WMG Whelk Effort Management Workshop report.<br>• Discussions invited on this topic during early stakeholder engagement events for the whelk FMP (Oct-Dec 2022). |
| **7.5** | Evaluate options for managing whelk fishing effort by **input controls**. | (a) Evaluate options around input controls (for example spatial or seasonal closures), considering:<br>i. Appropriate design of management measure (for example details of closed areas/ timings)<br>ii. Anticipated effectiveness (and whether supporting measures would be required)<br>iii. Practicalities of implementation and enforcement | • Cefas WWER alternatives report details management options for (crustacean) pot fisheries (Reeves 2020).<br>• Project UK southwest crab and lobster FIP[31] HCR workshop report details industry views on management options for |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | iv. Appropriate spatial and temporal scale given local variations in biological and fishery characteristics<br>v. Impact and likelihood of unintended consequences, e.g. displacement to other NQS fisheries<br>vi. Likely economic and social impacts<br>(b) Identify data requirements and evidence gaps for determination of appropriate spatial and/or seasonal closures (for example spawning period).<br>(c) Design and deliver research to fill key evidence gaps.<br>(d) Estimate a timeframe for implementation, accounting for time to deliver on key data requirements/ evidence gaps. | (crustacean) pot fisheries.<br>• IFCA research available on the timings of the whelk spawning season.<br>• Discussions held in WMG meetings.<br>• 2020 WMG Whelk Effort Management Workshop report.<br>• Discussions invited on this topic during early stakeholder engagement events for the whelk FMP (Oct-Dec 2022). |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **7.6** | Evaluate options for managing whelk fishing effort by **output controls**. | (a) Evaluate options around output controls (for example TACs[32]), considering:<br>i. Appropriate design of management measure (for example details setting catch limits)<br>ii. Anticipated effectiveness (and whether supporting measures would be required)<br>iii. Practicalities of implementation and enforcement<br>iv. Appropriate scale given local variations in biological and fishery characteristics<br>v. Impact and likelihood of unintended consequences, for example displacement to other NQS fisheries<br>vi. Likely economic and social impacts | • Cefas WWER alternatives report details management options for (crustacean) pot fisheries (Reeves 2020).<br>• Project UK southwest crab and lobster FIP[31] HCR workshop report details industry views on management options for (crustacean) pot fisheries.<br>• Discussions held in WMG meetings.<br>• 2020 WMG Whelk Effort Management Workshop report.<br>• Discussions invited on this topic during early stakeholder engagement events for |

[32] TAC = Total Allowable Catch.

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | (b) Identify data requirements and evidence gaps for setting of TACs (for example analytical basis for catch forecasts to provide annual TAC advice).<br><br>(c) Design and deliver research to fill key evidence gaps (as required).<br>(d) Estimate a timeframe for implementation, accounting for time to deliver on key data requirements/ evidence gaps. | the whelk FMP (Oct-Dec 2022). |

| Reference | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **7.7** | Explore alternate management regimes. | (a) Determine appropriate management scenarios (as per outputs of activities 7.1 to 7.6), considering:<br>i. Appropriate management in the short-term? (under current data availability)<br>ii. Appropriate management in the long-term? (under future data availability)<br>(b) Undertake scenario modelling to explore alternate management regimes (different combinations of management measures and/or scales of implementation et cetera), considering costs and benefits in terms of:<br>i. Long-term stock sustainability<br>ii. Long-term economic sustainability<br>iii. Long-term social sustainability<br>iv. Wider environmental impacts<br>v. Climate change mitigation and adaptation<br>(c) Collaboratively determine most appropriate (short- and long-term) management scenario(s). | To be commenced. |

## **EVIDENCE AND RESEARCH PLAN:** SHARED SHELLFISH PRINCIPLES[33]

| **Reference**Error! Bookmark not defined. | **Research need** | **Description of activities and overall aim(s)** | **Progress** |
|---|---|---|---|
| **4.1** | Develop and pilot an approach for identifying important fishing areas. | (a) Evaluate potential methodologies and data requirements for identifying important shellfish fishing areas, for example by considering:<br>i. Hotspots where high densities of individuals above MCRS[34] are consistently recorded<br>ii. Spatial patterns of fishing activity and catches across different seasons (present/ historic)<br>iii. Spatial distribution of areas where fishing is possible (for example substrate suitability, absence of other marine activities/ environmental | To be progressed. |

33 Shared shellfish principles developed alongside frontrunner FMPs for whelk (English waters only), crab and lobster (English waters only), and king scallop fisheries (English and Welsh waters).

34 MCRS = Minimum Conservation Reference Size.

| Reference Error! Bookmark not defined. | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| | | protection which would inhibit fishing).<br>(b) Ensure data is available to support the shellfish sector in marine spatial planning issues.<br>(c) Agree on an appropriate methodology and trial under a pilot scheme. | |
| **10.1** | Assess the carbon footprint of English shellfish supply chain using a robust metric. | (a) Develop a robust metric for assessing the carbon footprint (for example emissions per kg of catch) of the shellfish catching sector, which takes into account:<br>i. Blue carbon<br>ii. Emission generations of fishing activity<br>iii. Different fleet metiers<br>iv. Carbon sequestration in shell material<br>(b) Develop a robust metric for assessing the carbon footprint of the shellfish supply chain, for example:<br>i. Processing | To be progressed. |

| **Reference**Error! Bookmark not defined. | **Research need** | **Description of activities and overall aim(s)** | **Progress** |
|---|---|---|---|
| | | ii. Refrigeration<br>iii. Transport<br>(c) Identify carbon 'hotspots' across the supply chain where efforts to reduce carbon emissions should be focused.<br>(d) Evaluate impacts of seasonal closures in terms of carbon footprint (rotational closures to fish only during the most productive season(s) may improve catch efficiency and reduce carbon footprint). | |
| **10.2** | Identify opportunities for reducing carbon emissions in the shellfish sector. | (a) Review strategies (operational changes and/or new technologies) employed in other comparable fisheries/ jurisdictions/ supply chains for reducing carbon emissions.<br>(b) Review potential strategies (operational changes and/or new technologies) for reducing carbon emissions across the English | To be progressed. |

| **Reference**Error! Bookmark not defined. | **Research need** | **Description of activities and overall aim(s)** | **Progress** |
|---|---|---|---|
| | | shellfish supply chain (catching, processing, transport), in terms of:<br>i. Targeting carbon hotspots in the supply chain<br>ii. Quantifying potential reductions in overall carbon footprint<br>iii. Economic viability (and whether additional funding streams would be required)<br>iv. Practicalities of implementation (for example whether additional infrastructure is required at ports)<br>v. Time frames for implementation/ observed reductions in carbon emissions<br>vi. Unintended consequences | |
| **10.3** | Explore innovative uses for shellfish co-/by-products, for example shell waste, to minimise scope 3 emissions in the supply chain. | (a) Facilitate collaboration between the shellfish sector, researchers, and other industries to identify viable uses for shellfish co-/by-products (for example shell waste). | To be progressed. |

| Reference Error! Bookmark not defined. | Research need | Description of activities and overall aim(s) | Progress |
|---|---|---|---|
| **10.4** | Evaluate likely impacts of changing climatic conditions on English shellfish fisheries. | (a) Review current literature on direct climate change impacts (including ocean acidification) on shellfish fisheries, for example:<br>i. Population dynamics of target species<br>ii. Fishing opportunity<br>(b) Review current literature on indirect climate change impacts on shellfish fisheries, for example:<br>i. Toxic algal blooms<br>ii. Incidence of disease<br>(c) Assess likely impacts of climate change on economic viability of commercial fisheries, with reference to knock-on societal impacts (for example loss of employment in coastal communities). | To be progressed. |
| **10.5** | Assess options for English shellfish fisheries to adapt to operate under changing climatic conditions, with the | (a) Facilitate collaboration between the shellfish sector and researchers (and other relevant industries) to identify opportunities for the shellfish | To be progressed. |

| **Reference**Error! Bookmark not defined. | **Research need** | **Description of activities and overall aim(s)** | **Progress** |
|---|---|---|---|
| | aim of safeguarding long-term environmental and socio-economic sustainability. | sector adapt to operate under changing climatic conditions. | |

Department
for Environment
Food & Rural Affairs

# Proposed Fisheries Management Plan for Whelk in English Waters

## Annex 3: Stakeholder Engagement Report by Seafish

Date: July 2023

Version: public consultation

# Contents

## 1. Summary

This report presents a summary of stakeholder feedback gathered by Seafish from informal stakeholder engagement activities delivered to develop the Whelk FMP for England. The report summarises feedback gathered from stakeholders at in-person events in England; from online events targeted around the UK; and from emails and letters sent directly to the dedicated Seafish FMP inbox. The purpose of the report is to provide a summary of feedback which Seafish can use to refine FMP content.

The Whelk FMP has been prioritised for delivery in 2023 on the basis of economic value of the fishery and perceived need for improved management.

Between November and December 2022 inclusive, Seafish hosted a series of in-person and online events as part of informal engagement to:

- Raise awareness about development of the Whelk FMP for English waters amongst stakeholders
- Present draft FMP objectives to stakeholders in order to gather feedback to determine whether they are fit for purpose and set the right direction of travel for English whelk fisheries

This report was compiled by Seafish based on information gathered through the stakeholder engagement events and was used to refine draft FMP content, including fisher management aims and objectives. Amendments to draft FMP content were presented to the Whelk Management Group's FMP Working Group to review and action as appropriate.

## 2. Overview

### 2.1 Historical engagement via the Whelk Management Group

The Whelk Management Group (WMG) was formed in early 2020 to focus on the management of the UK whelk fishery. The WMG is an industry-led group which brings together industry stakeholders from across the whelk supply chain, including scientific researchers, and fishery regulators to focus on the sustainable management of UK whelk fisheries.

A key driver to form the WMG was discussions at the Future of Our Inshore Fisheries conference in October 2019. Following the event there was an increased interest in considering how best to co-manage inshore fisheries. This initiative led to the formation of the Shellfish Industry Advisory Group (SIAG) and shellfish species-specific groups including the WMG. The WMG first met in February 2020 and meets quarterly to discuss issues facing whelk fisheries, share knowledge and scientific research, and raise awareness about fisheries management developments.

Membership of the WMG is open to all industry stakeholders with an interest in UK whelk fisheries, the group has members from across the UK and membership has grown organically through word-of-mouth communication between peers, publications in trade media, and awareness raising efforts publicised through social

media. At the time of writing the WMG has 78 members, 44% of whom are industry representatives from the catching, processing, and export / wholesale sectors.

The goal of the WMG is to facilitate collaborative working between members to help inform management and regulation of whelk fisheries at a national level.

In mid-2020 Seafish canvassed WMG members to better understand stakeholder priorities regarding management of whelk fisheries to help steer the focus of the group. Feedback from members was collated and grouped into three key priorities as follows:

1. **Establishing a baseline** - improving understanding of whelk fisheries as they currently are, including:
    - Current patterns of fleet activity and performance
    - Available biological information on stock status, life history, and stock boundaries
    - Appropriateness and effectiveness of management tools currently used in UK whelk fisheries, including unintended consequences
2. **Data and research** - reviewing existing science to identify knowledge gaps to inform the development of a fit-for-purpose collaborative data collection and research plan
3. **Managing fishing effort** - working collectively to reliably assess trends in catch per unit effort (CPUE) in the whelk fishery, developing a programme of effort management aligned with likely / actual stock status, and improving understanding of interactions between whelk fisheries and other fisheries

In early 2022 the WMG formed an FMP working group to bring together industry stakeholders and regulators to develop draft FMP objectives. The WMG's efforts to identify key priorities for the UK whelk fisheries helped inform early discussions on potential FMP objectives by aligning stakeholder priorities with the objectives of the Fisheries Act 2020.

Through the WMG and associated sub-groups industry stakeholders have played an integral role in developing draft content which was presented at FMP engagement events in 2022.

### 2.2 Attendance and representation

In total 73 stakeholders attended the events hosted by Seafish as summarised in Table 1. This included representation from the catching sector (individual fishers, producer organisations, and associations), processors, Inshore Fisheries and Conservation Authorities (IFCAs), non-governmental organisations (NGOs), and scientific researchers. The 'other' column in Table 1 includes private individuals. Some stakeholders opted to attend more than one meeting meaning there is some duplication in total numbers of individual attendees presented in Table 1.

Table 1 below lists an anonymised outline of attendance from each engagement event. This includes attendees from Seafish, industry, government bodies, NGOs and/or public bodies.

The number of attendees at each meeting was recorded using either a sign-in sheet (in-person meetings) or by recording names of attendees in Microsoft Teams. It should also be noted that some attendees did not sign the attendance register or fill in all requested information (such as their business sector). Therefore, the figures in Table 1 may be a slightly lower than actual attendance at individual meetings.

**Table 1**: Summary of attendance, by sector, at Whelk FMP engagement events, November - December 2022

| Event location and date | Format | Seafish | Industry | Government / public | NGO | Other* | Total |
|---|---|---|---|---|---|---|---|
| Weymouth (8 November) | In-person | 2 | 5 | 1 | 2 | 1 | 11 |
| Ilfracombe (9 November) | In-person | 3 | 5 | 1 | 2 | 1 | 12 |
| Wider stakeholders' event (22 November) | Online | 2 | 0 | 0 | 0 | 1 | 3 |
| Shoreham-by-sea/ Eastbourne (22 November) | In-person | 2 | 2 | 6 | 1 | 1 | 12 |
| Drop-in session (23 November) | Online | 2 | 2 | 4 | 0 | 0 | 8 |
| Fleetwood (29 November) | In-person | 2 | 0 | 2 | 0 | 1 | 5 |
| Drop-in session (7th December) | Online | 3 | 1 | 6 | 0 | 0 | 10 |
| Wells-next-the-Sea (13 December) | In-person | 2 | 4 | 6 | 0 | 0 | 12 |
| | **Total** | 18 | 19 | 26 | 5 | 5 | 73 |

### 2.3 Event format

Seafish delivered a mix of in-person and online stakeholder engagement events to ensure as many stakeholders as possible had the opportunity to discuss and provide feedback on the draft FMP vision and objectives.

Locations of in-person events were initially proposed based on MMO landings figures for whelk as an indication of fleet activity and local importance. Industry insight and advice was provided by WMG members to finalise the list of venues so that events were held in areas where industry attendance and interest in the FMP was likely to be highest. Venues were selected at central locations to ensure that stakeholders were able to travel from neighbouring ports to attend in-person events.

Two online events were held using Microsoft Teams to broaden the reach of engagement activities beyond the ports selected for in-person events. Online events

were not based on targeting specific areas and were open to all stakeholders with an interest in the FMP, regardless of their location or sector. On 22 November a dedicated online meeting was held for representatives of environmental NGOs; however, attendance was low, with some NGO representatives stating that whelk fisheries were not considered a priority in terms of environmental concerns or that they did not have sufficient expertise on the topic of whelk fisheries to warrant engaging in the FMP development process. In addition to dedicated online sessions, a Seafish representative attended a quarterly meeting of Defra's NGO group to discuss the whelk FMP, draft objectives, and proposed initial management interventions.

The engagement events were attended by a broad range of stakeholders including representatives of the catching sector (large and small inshore and offshore) vessels, processors / wholesalers, regulators, scientific researchers, and some NGOs.

In-person and online events comprised of:

- An overview of the legislation background to the FMP project and development process
- An overview of the whelk FMP development time and milestones, and
- An overview of the draft vison and objectives of the FMP as agreed by the WMG FMP Working Group and actions that need to be taken to achieve the objectives of the FMP

After presentation of both the shared shellfish principles and whelk specific objectives open discussion and feedback from attendees focused on the following questions:

Where should we focus first?

1. We will need to consult on the Whelk FMP
2. We also want to consult on the first suite of measures to help improve the state of our whelk fisheries
3. We think we need to reduce fishing effort or at least put in place better measures to control it
4. What do you think?
5. What changes would you like to see happen first?

A dedicated FMP email inbox, hosted by Seafish, was made available for attendees to share further thoughts and feedback on the FMP. This report summarises information gathered via email between the Weymouth event on Tuesday 8 November and the completion of the draft report on 27 January.

Information was received from individual businesses / vessel owners, industry associations, and consortia of seafood businesses and producer organisations. The email inbox will remain live and further feedback received through this channel will be reviewed by Seafish.

### 2.4 Promotion of events

Promotion of stakeholder engagement events was achieved through:

- Direct communication with stakeholders, including:
    - Email correspondence via the WMG and SIAG, with members asked to help pass on information to colleagues, peers, association / organisation members
    - Social media content shared through Seafish channels
    - Email correspondence via the Defra FMP Comms & Engagement Group
    - Email correspondence via IFCAs, Regional Fisheries Groups, and the Future of Inshore Fisheries (FOIF) mailing list
    - Circulation through Seafish alerts and newsletters
    - Email correspondence to all stakeholders who registered an interest in the Whelk FMP via a dedicated email address which was included in all promotional materials
    - Circulation of online event joining details to individuals who had attended in-person events and provided contact details
    - Direct communication with the eNGO community via Defra's eNGO group and through targeted email invitations sent directly to individuals engaged in other forums
    - Posters produced for each event using a template created by Mindfully Wired Communications of which was adapted for each individual event and shared widely via the means mentioned above
- Requested regular agenda segments to promote WMG FMP engagement events at Whelk Working Group (WWG) meetings, Regional Fisheries Group (RFG) meetings, and IFCA Technical Advisory Group (TAG) meetings.
- Publication of articles in the trade newspaper Fishing News by Seafish, Defra comms and Mindfully Wired Communications which including background information to the FMP process and dates for all engagement FMP engagement events

## 3. Summary of notes from Whelk FMP engagement events

Seafish presented an overview of the FMP development process, what an FMP is, how the Whelk FMP has been developed, issues facing the whelk fishery and an overview of the timeline to get the FMP finalised.

### 3.1 Feedback on the FMP development process

General feedback on the development process for the Whelk FMP is presented below:

- General support for all objectives but having a joined-up approach across the industry will be crucial to its delivery
- Consideration needs to be given as to how weather and sea conditions already restrict access for much of the year to the smaller inshore fleet and how these already are the de facto management mechanism. The FMP needs

to ensure that management can be implemented at a local level, with appropriate flexibility
- Concerns arose around how there are numerous different enforcement bodies involved in whelk management, which creates issues regarding the management of a common resource
- The Inshore Fisheries and Conservation Authorities (IFCAs) are coming to a conclusive decision on different whelk management and hopefully this will help in developing a national level plan
    - there is no stock assessment and that hinders progress with whelks
    - there cannot be management intervention before a stock assessment is developed
    - IFCAs can present anecdotal evidence to Seafish regarding the draft whelk FMP

### 3.2 Overview of shared shellfish principles and FMP aims objectives

Seafish presented the first draft of proposed aims and objectives for the overarching shared shellfish principles. The proposal sets out an overarching vision ('Contribute to the long-term sustainability and economic viability of the UKs shellfish fisheries') and objectives as follows:

1. Formalise the structure of the SIAG and associated sub-groups and ensure effective representation so that it becomes a focal point of engagement on shellfish fisheries management in England
2. Assess fishing effort (including latent capacity) and, if necessary, recommend appropriate measures to manage effort
3. Establish a mechanism that enables regulators to effectively engage with and draw on shellfish industry knowledge in relation to discussions relating to NQS management through the Trade and Cooperation Agreement
4. Enable better involvement of the shellfish industry in matters regarding marine spatial planning and spatial squeeze by facilitating better collaboration between regulators, planners, and industry stakeholders
5. Improve understanding of the impacts of non-fishing marine activities (for example capital dredging, undersea cables) on English shellfish stocks.
6. Progress initiatives to increase and promote consumption of sustainable UK shellfish
7. Facilitate and promote trade opportunities for shellfish in overseas markets (EU and non-EU)
8. Develop advice and guidance on shellfish welfare issues to help the industry to further develop and implement best practice handling measures
9. Industry to take collective responsibility to comply with welfare and good working conditions legislation and guidance to ensure the highest possible levels of standards across the shellfish sector supply chain

The purpose of this presentation was to show the proposed direction of travel for shellfish fisheries in England and show how the SIAG had developed the work to date. Open discussion was invited on the draft content with a focus on determining the appropriateness of the objectives and management options.

### 3.3 Feedback on draft shared shellfish principles and FMP objectives

Draft FMP aims and shared shellfish principles were widely agreed to be sensible and appropriate in the English whelk fishery context. Feedback from attendees at events was largely positive, with minor points of clarification or amendment sought on the more detailed sub-objectives.

Some of the detailed feedback received included below.

- There was general support for the vison of contributing to the long-term sustainability and economic viability of shellfish fisheries throughout the engagement process. There were questions raised around whether 'sustainability' is defined here in terms of the three pillars of sustainability (social, economic, and environmental) and if not, it was suggested that there should be specific mention of environmental sustainability or the ecosystem approach alongside 'economic profitability'
- Regarding the formalisation of the structure of the Shellfish Industry Advisory Group (SIAG), there were concerns from IFCAs on their level of involvement in the process. Attendees discussed representation and the need to ensure that industry, across different parts of the seafood supply chain and from different fleet metiers were well represented, particularly those who are not represented by an association or producers' organisation. A key focus of the SIAG and associated management groups should be ensuring balanced representation of different interests
- Attendees stressed the importance of formalising industry involvement in fisheries management and a move to a more collaborative management approach for English shellfish fisheries. There were concerns that aspects of co-management could be overlooked by regulators and a desire that principles of co-management are incorporated into relevant legislation
- Mixed views were gathered on the perceived importance of the objective to assess and address latent capacity in the shellfish fleet. This ranged from attendees' perception that latent capacity was a major issue facing the fleet, to others stating that latent fishing effort has no (current) impact on stocks so other aspects of fisheries' management should take precedence. The common suggestions drawn from engagement events were to:
    - Explore opportunities to upgrade aging parts of the fleet to improve efficiency and remove inefficient vessels
    - Consider how licensing could be more flexible to minimize the risk of effort displacement between fisheries
- Attendees discussed the importance of acknowledging the diversity in the shellfish fleet, noting the distinction between inshore / offshore and day / trip boats. In some areas fishers felt that the prevalence of more powerful under-10m boats had changed perceptions of 'inshore fishing' and that out to 12nm should be considered inshore
- There was concern about how non-UK vessels will interact with, and abide by, management measures brought in through FMPs. Defra colleagues noted that the Trade & Cooperation stipulates non-discriminatory fisheries management, and that FMPs will apply to anyone fishing in the English zone

- The importance of addressing spatial conflict was recurring theme, both between different fishing sectors as a result of competition for fishing space (e.g. mobile / static and static / static) and between the fishing sector and other users of marine space, such as offshore wind development. Attendees noted a need for clear economic and social analysis to evidence the impact that such conflicts can have. Improved understanding of spatial management processes and how best to deliver trade-offs between sectors was identified as a priority for the fishing sector to inform involvement in future marine spatial planning discussions
- There was general support for the objectives relating to the progression of initiatives to increase and promote and consumption of shellfish, but attendees largely agreed that promoting consumption is not the highest priority for delivery of an FMP and that focus should be on improving evidence bases and implementing better management
- Attendees at two meetings raised the need for awareness around how ever-increasing and ever-changing regulation and management landscape can have a detrimental effect on fisher mental health and wellbeing. Many changes have an associated cost and / or administrative burden (paperwork and reporting requirements) and that these are often overlooked as a cause of stress. It was acknowledged that the FMP could not necessarily address these issues but that overarching themes around data gathering, reporting, and management should give consideration to the social impact of changes
- Perceptions of the relative importance of climate change objectives were variable and could be broadly categorised as:
    - Positive: Climate change adaptation and mitigation is important, particularly as these objectives should focus on improving efficiency which can deliver economic benefits. Understanding the carbon footprint of the shellfish sector is important to show the positive environmental credentials of low impact fisheries
    - Neutral: Climate change adaptation and mitigation is important, but the shellfish sector is such a small contributor to the UK's emissions profile that efforts to improve fisheries should focus elsewhere (e.g., sustainable management) first
- Attendees at several meetings (for both the Whelk FMP and Crab & Lobster FMP) requested the addition of a new shared shellfish principle on the impacts of non-fishing, commercial marine activities on shellfish fisheries. Attendees cited influences beyond the control of fisheries managers, such as pollution incidents or maintenance dredging, as a source of shellfish mortality and expressed a desire to improve understanding of these impacts.

### 3.4 Overview of key points raised on whelk species specific objectives

**Objective 1:** Develop and pilot a comprehensive data collection programme for whelk fisheries, which supports a data rich future and results in the establishment of a reliable time series that facilitates robust, sustainable management.

- There was unanimous support for developing a more comprehensive data collection programme for English whelk fisheries and acknowledgement that

the paucity of data on whelk fisheries made management more difficult. The following key themes were recorded:
    - Willingness of fishers to collect the appropriate fishery-dependent data to inform better management but concerns about potential duplication of effort as most fishers already have to submit data in different ways to different authorities
    - There is a lack of harmonisation between current data collection methods which makes reporting more complex and leads to errors. There was a strong desire from fishers that data be submitted once, in one place, if possible
    - Minor changes to existing data collection methods would be preferable to completely new systems, for example subtle changes to the MMO Catch App and e-Logbooks would allow collection of important whelk fishery data such as gear type, soak times, and bait used
- Proposed change to the objective to ensure that researchers and regulators make the most of industry-derived data and fisher knowledge
- Proposed change to the objective to encourage building relationships between industry and research institutes

**Objective 2:** Define key whelk stock boundaries at a suitable scale for management.
- There was general support for defining key whelk stock boundaries to facilitate accurate assessments of stock status
    - Attendees described how different whelk morphological and biological characteristics can be found around the country. It was noted that the Whelk Management Group and Heriot-Watt University are working together on a Fishing Industry Science Partnership research project to gather and analyse fisher anecdotal information on whelk populations

**Objective 3:** Assess CPUE in the whelk fishery.
- Attendees discussed willingness to contribute to a whelk catch data collection scheme, similar to the scallop ‘red bag scheme’, whereby fishers could be provided with scientific whelk pots to gather more information on the size and age structure of whelk populations. This data would be beneficial in:
    - supporting assessment of trends in whelk catches, and
    - supporting the development of size and age structured stock assessments
- Fishers suggested that data should also be gathered on tide sizes and wind direction as spring tides impact fishing and catchability of whelks, this could skew data on catches.
- Industry also raised that whelk fishing is cyclical and has good years and bad years, there were concerns that reactive management decisions could be detrimental to the fishery if stocks were going through natural fluctuations. As a result attendees stressed that scientists and regulators need to base decisions on longer time series of data before implementing management measures
- Proposed change to the objective to include consideration of whelk pot design as different pot configurations change fishing efficiency, and to improve understanding of the effectiveness of technical conservation measures such as escape gaps

**Objective 4:** Explore options for assessing stock(s) or exploitation status.

- Attendees commented that accurate stock assessment based on fishery-dependent data might be problematic due to natural variability in whelk foraging behaviour and catchability. This could make it difficult to link catches to actual abundance of stocks. Fishers stated that whelks will lay dormant and then may 'switch on' suddenly, leading to periods of high catches which are not necessarily consistent or representative of the stock
- Opportunities to gather data at processers (as a natural bottleneck in the supply chain) should be explored. Many processors already gather data on the whelks they receive, such as size and meat yield, and there is a willingness to expand data collection as required
- Attendees discussed usefulness of tag and recapture schemes, as carried out in Wales, as a means of estimating stock abundance. It was suggested that financial incentives for fishers to participate in such schemes would help build industry buy-in to scientific research

**Objective 5:** Assess the impact of whelk fishing activity on the wider marine environment

- Whelk fisheries were widely considered to have a low environmental impact. Attendees discussed the validity of some scientific studies and noted examples (such as Eastern IFCA) where work has been carried out to assess potting impacts on reefs and the opportunities for transferring knowledge for best practice in undertaking research
- Attendees noted that Natural England's advice to IFCAs on the environmental impacts of whelk potting is largely positive, as there are no additional requirements to mitigate impacts of potting impacts within Marine Conservation Zones (MCZs)

**Objective 6:** Explore the need for management around interactions between the English whelk fishery and other fisheries.

- This objective posed lots of conversations at all engagement events and some of the key points are summarised below:
    - Concerns from industry seeing berried crabs landed for bait
    - Spider crabs are being used for bait as there is now no export market for them due to Brexit laws
    - Crab as whelk bait provides an additional income stream for processors as it comes as a by-product and if not utilised, ends up in landfill
    - Some IFCAs have Byelaws preventing the use of brown crab as bait
- Proposed change to the objective to ensure that action is taken 'when necessary'

**Objective 7:** Create a proposed programme of management to align fishing effort with actual / likely stock status

- Proposed change to the objective that measures to constrain effort should be 'equitable' rather than 'equal', in consideration of the need to control increasing effort within different sectors of the fleet but also to ensure fishers remain economically viable

### 3.5 Management options and discussion

Across all events there was agreement that a one-size-fits-all approach will not work for whelk fisheries in England, local variation both in stocks and in fleets prosecuting the fishery means that regional / local based management is needed. Attendees cited examples of attempts to introduce 'broad brush' management measures and pointed out weaknesses in such approaches; not least the national 45mm Minimum Conservation Reference Sizes (MCRS) which fishers felt either failed to protect some stocks sufficiently or disproportionately impacted other fisheries because the whelks were naturally smaller in size.

The significant challenge of managing whelk fisheries – being a sedentary species with no larval dispersal phase, and the lack of available data on both the species and the fishery – was acknowledged but most stakeholders felt there was a need for better management to ensure long-term sustainability of these important fisheries.

Open discussion was facilitated on future management approaches for English whelk fisheries. The aim of this session was to identify:

- What management changes stakeholders would like to see in the short, medium and long term
- What management tools were appropriate for the whelk fishery and what were considered inappropriate (for example, what management tools were most likely to deliver sustainable whelk fisheries)
- What strengths or weaknesses different management approaches may have in the whelk fishery context

Key themes emerging from these discussions are summarised below, comments are presented in the report by the range of management tools that received significant discussion at stakeholder engagement events. The order of management measures is not indicative of support or favourability amongst attendees.

**Minimum Landing Size (MLS):**

- Needs to be regionally appropriate to the local whelk stock and size of maturity to be effective. Many fishers shared anecdotes about fishing grounds that are unviable as 'whelks in some areas would not grow large enough to support fishing with a 45mm MLS
- Size of whelks is influenced by different environmental factors, including seabed type and tidal strength, this means the scale over which whelk stocks differ can be small so MLS will always be a compromise
- MLS is an important 'safety net': markets do exist for small, undersize whelks, so having an MLS is important to prevent growth overfishing
- A more fragmented and complex MLS landscape would a) be more difficult for fishers to abide by, b) would be more difficult to enforce, and c) would require consideration of carriage orders. Attendees were concerned that having more appropriate MLS would confuse management

- In some areas there was support for harmonisation of offshore (outside 6nm) and IFCA jurisdiction MLS, where there was clear evidence to support having a higher MLS than 45mm (based on a good understanding of local whelk Size of Maturity (SoM)

**Riddling:**

- Attendees were broadly supportive of a continuation of mandatory riddling across offshore Channel fisheries (currently only mandatory for inshore areas), as it is perceived that mandatory riddling has improved management and enforcement of the inshore eastern Channel whelk fishery
- The FMP could specify a riddle width, e.g., 25mm, however this would likely vary around country according to variation in SoM and as such would encounter many of the same challenges as changing MLS

**Pot limitation:**

- Perceptions of pot limits were mixed, both in terms of current ability to set sensible pot limits (in light of a lack of effort data) and regarding effective enforcement.
- Attendees in favour of pot limits felt that limits:
    - Are easily enforced if combined with a mandatory gear marking scheme;
    - Can be appropriate and equitable to vessels of different sizes, and may not impact the smallest vessels at all
    - Would help reduce gear conflict and spatial squeeze by preventing effort creep
- Attendees against pot limits felt that pot limits:
    - Are too easily circumvented, making enforcement impossible.
    - Removes a fisher's ability to temporarily increase the number of pots they are fishing to combat issues like lost days at sea due to bad weather
    - Become a target and incentivise fishers to buy more pots to reach the limit, thus increasing overall effort

**Permits and/or entitlements:**

- Seen as a favourable option to limit access to the fishery and as a means of implementing better management in the future by 'hanging' conditions upon a permit / entitlement
- Consideration should be given to how new entrants are able to enter the fishery
- Permits should not be able to be sold / should not have a monetary value to prevent consolidation of fishing opportunities in the future if further management measures were to be introduced

**Seasonal closures:**

- Closed seasons should follow a pot limitation and then shutting the grounds at certain times would really help the fishery

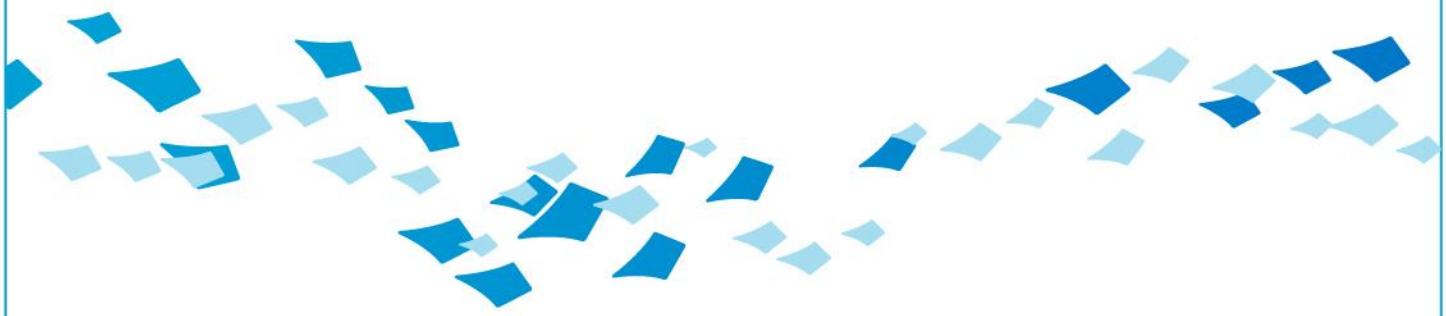
- If brought in, there will be a need to get processors to agree to not buy whelk until an agreed date
- In certain areas of the coast, there was support for a harmonised closure for both inshore and offshore whelk fisheries to give the fishery a rest whilst whelks are spawning (meat yield to shell ratio declines during reproduction) meaning whelks are less active and not feeding
- Recognition that whilst this seasonality could be effective for one area of the fishery, timings of closures would likely need to vary around the country

**Gear selectivity:**

- Escape gaps are easy to fit to pots and seem to be effective (though attendees felt that gear selectivity trials should be carried out to optimise pot design and the effectiveness of escape gaps)
- Pot design should be standardised for whelks to ensure effort data gathered from fishers is comparable
- Gear design and marking should align with industry standards being developed by the Maritime and Coastguard Agency (MCA) working group on gear marking and safety so that all fishers are operating to the same standards

**Quotas:**

- Not seen as a favourable option in any meetings due to lack of data, inflexibility of quotas, and risks of consolidation.



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# Proposed Fisheries Management Plan for Whelk in English Waters

## Annex 4: Shellfish Shared Principles

Date: July 2023

Version: public consultation

# Shared Shellfish Principles

Set out below are nine overarching shared shellfish principles designed to address key management, social, and economic issues that face all shellfish fisheries in English waters.

These principles have been developed by the Shellfish Industry Advisory Group (SIAG). This group brings together regulators, researchers, and industry stakeholders to discuss national-level strategic management of shellfish fisheries. Many issues facing the sector are not specific to individual shellfish species. These principles recognise common challenges and issues and have been reflected in each of the shellfish FMPs.

While these principles, and the associated actions, go beyond the legal obligations for FMPs in section 6 of the Fisheries Act 2020, Defra welcomes these industry commitments to complement and support the delivery of the FMPs and objectives in the Act.

The SIAG will maintain responsibility for the principles and the actions set out to deliver them.

Annex 4 Shellfish Shared Principles for Whelk FMP

| # | Principle | Rationale | Activities |
|---|---|---|---|
| **1** | Formalise the structure and operation of the SIAG, and associated sub-groups and ensure effective representation, so that it becomes a focal point of engagement on shellfish fisheries management in England. | The SIAG will act as a forum through which industry, regulators, and the research community can engage and work collaboratively on shellfish fisheries management.<br><br>The SIAG will collaborate with Defra and other partners on setting annual work plans and monitoring the delivery of overarching strategic objectives included in all shellfish FMPs. | Establish the SIAG (and species sub-groups) as a key point of engagement on shellfish matters in England. The SIAG to consider options to formalise this arrangement.<br><br>Undertake regular reviews of group membership structures and take a targeted approach to ensure adequate and effective representation from all areas of the seafood supply chain; all business sizes; and relevant researchers and regulators.<br><br>Develop and implement a comprehensive communication plan to raise awareness of the SIAG amongst shellfish fishermen and encourage engagement. |
| **2** | Assess fishing effort (including latent capacity) and, if necessary, recommend appropriate measures to manage effort. | Improve understanding of the scale and likelihood of impacts on fishing effort. Whether or not action is needed to remove or manage effort (including latent capacity) from different shellfish fleets will depend on management measures introduced. | Work collectively to:<br><br>Undertake a desk-based review of:<br><br>• The scale of the effort issue in different sectors of the shellfish fleet<br>• The extent of the risk increased effort (including latent capacity) poses to long-term sustainable management of English shellfish fisheries<br>• The potential impact of changes on individual shellfish businesses, considering business needs for flexibility and the availability of alternative fisheries on a regional basis |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| | | | • Species-specific considerations on the topic of effort (including latent capacity) that will require input from specific sub-groups (Crab and Lobster Management Group / Scallop Industry Consultation Group / Whelk Management Group) and the wider shellfish industry<br>• The likelihood of effort being displaced into other fisheries if action is taken to remove effort (including latent capacity) from the fleet<br>• Case study examples from other fisheries around the world where efforts have been made to address effort (including latent capacity)<br>• Conclusions drawn from Defra's 2021 calls for evidence on latent capacity in shellfish fleets<br><br>Identify opportunities to monitor latent capacity as part of the wider assessment of fishing effort, and outline options. |
| **3** | Establish a mechanism that enables regulators to effectively engage with and draw on shellfish industry knowledge in relation to discussions relating to NQS management through the Trade | The TCA sets tonnage limits on access for UK vessels to fish NQS in EU waters and vice versa as well as allowing for multi-year strategies for the management of NQS. Discussions and negotiations between the UK and the EU are conducted via annual consultations and the Specialised Committee | Work collectively to facilitate engagement with industry stakeholders on matters relating to management of shared NQS as required, including the assessment of the likely implications of the management measures implemented through the TCA on NQS over the short-, medium- and long-term. |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| | and Cooperation Agreement. | for Fisheries (made up of the Parties to the TCA).<br><br>A mechanism will help enable meaningful communication, information sharing, and engagement between government, regulators, and industry to ensure transparency and collaborative working. | |
| **4** | Enable better involvement of the shellfish industry in matters regarding marine spatial planning and spatial squeeze by facilitating better collaboration between regulators, planners, and industry stakeholders. | Competition for marine space means there is a need to ensure the shellfish sector has the appropriate data, evidence, and means of engaging with regulators on marine spatial planning and access issues.<br><br>This will help avoid the assumption that fishing is an infinitely relocatable activity and articulate the needs of the shellfish sector. | Work collectively to:<br><br>Continue to explore the relationship and interaction between FMPs and MSP, by progressing actions such as:<br><br>• marine spatial planning processes and opportunities for better engagement between planners and the shellfish sector<br>• available information on current patterns of fishing activity; means of identifying important fishing areas or ‘food production areas’; and social and economic importance of key fishing areas<br>• current marine space use and competing interests including the needs of the shellfish fishing industry, and how this may change in the future<br>• legislative drivers of competition for marine space<br>• what evidence is required to influence marine spatial planning decisions |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| | Develop and pilot an approach for identifying important fishing areas to better address issues of marine spatial conflict aligned with the requirement for increased marine protection. | | • opportunities for minimising spatial conflict<br><br>Ensure data, analyses, and narrative on shellfish sector is available to support marine spatial planning issues<br><br>Ensure the shellfish sector are engaged in marine spatial planning discussions alongside other marine users. |
| **5** | Improve understanding of the impacts of non-fishing marine activities (for example capital dredging, undersea cables) on English shellfish stocks. | Identification of non-fishing marine issues impacting shellfish will help drive changes to potentially damaging practices to minimise the impact non-fishing marine activities have on shellfish stocks. | SIAG to:<br><br>• Act as a central forum for fishing stakeholders to raise issues relating to non-fishing marine matters<br>• Engage with non-fishing marine sectors on activities identified by the fishing industry as possibly impacting shellfish grounds and stocks |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| **6** | Progress initiatives to increase and promote consumption of sustainable UK shellfish. | Increased consumption of sustainable shellfish (overseas and domestic markets) would build business resilience, create opportunities for cost reduction, build industry reputation and provide economic and employment benefits to coastal communities. | Work collectively to:<br>• Maintain a watching brief on trade issues and legislation that could impact shellfish consumption in domestic and overseas markets<br>• Consider ways to improve the economic benefit brought to the UK by shellfish production and consumption<br>• Build industry reputation, aligned with the implementation of credible fisheries management measures, and provide businesses with information to promote shellfish consumption<br>• Use the SIAG as a forum to horizon scan, identify and discuss issues relating to shellfish consumption, and engage with stakeholders more widely on means of promoting consumption of shellfish |
| **7** | Facilitate and promote trade opportunities for shellfish in overseas markets (EU and non-EU). | Strengthening markets for shellfish provides greater business resilience and improved ability to adapt to social, economic, or environmental influences on trade. | Publish straightforward technical guidance for shellfish exporters to enable businesses to navigate export requirements<br><br>Promote and facilitate shellfish suppliers' presence at international trade shows to promote shellfish and expand markets |
| **8** | Develop advice and guidance on shellfish welfare issues to help the | Adopting best practices regarding shellfish welfare improves industry reputation | Work collectively to:<br>• Maintain a watching brief on the impact of legislative changes around animal welfare and sentience that could impact the shellfish sector |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| | industry to further develop and implement best practice handling measures. | and provides economic benefits. | • Work with government and fisheries authorities to understand and implement relevant shellfish welfare guidance and legislation. |
| **9** | Industry to take collective responsibility to comply with welfare and good working conditions legislation and guidance to ensure the highest possible levels of standards across the shellfish sector supply chain. | Furthering best practice regarding human welfare in the shellfish supply chain will:<br><br>Help stamp out poor practice<br><br>Build a positive reputation for the shellfish sector<br><br>Provide businesses with resources to support responsible sourcing credentials<br><br>Support new recruitment and employee retention in the sector<br><br>Ensure the sector is prepared to champion and | Work collectively to:<br><br>• Maintain a watching brief on legislative and non-legislative developments and work with government and fisheries authorities to ensure the UK shellfish sector can meet any social and human welfare requirements.<br>• SIAG to act as a forum to raise issues relating to human welfare in the shellfish supply chain, work collaboratively to maintain or improve good practice, and build the shellfish sector's positive reputation. |

| # | Principle | Rationale | Activities |
|---|---|---|---|
| | | transparently implement social or human welfare requirements that may be introduced. | |

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# Proposed Fisheries Management Plan for Whelk in English Waters

# Annex 5: Legislative requirements for FMPs under the Fisheries Act 2020 and Governance

Date: July 2023

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# Contents

# Legislative requirements for FMPs under the Fisheries Act 2020 and Governance

The legislative context that applies to the development and implementation of the Whelk FMP is set out below:

| Requirement of the Fisheries Act 2020 | Approach in Whelk FMP |
|---|---|
| **Section 1 of the Act details the eight overarching Fisheries Objectives that guide its application and subsequent decisions made under that Act.** | The Whelk FMP establishes how the management of whelk fisheries in English waters will contribute to the delivery of these legislative objectives. Where relevant, the Species-Specific Objectives are also mapped to the relevant Fisheries Act objective. |
| **Section 1(3) & (10) of the Act sets out how the precautionary approach must apply, defining it as 'an approach in which the absence of sufficient scientific information is not used to justify postponing or failing to take management measures to conserve target species, associated or dependent species, non-target species or their environment'.** | The current management of whelk fisheries is characterised by scarcity of information which makes it challenging to manage their effective and long-term sustainable harvesting. Recognising the requirements of the precautionary objective, the Whelk FMP proposes an adaptive and agile management approach, also focused on improved data collection, where emerging evidence will highlight if sustainable harvesting is being compromised. The implementation of the Whelk FMP will be guided by the best available information. Even where information is uncertain or inadequate, it will still be necessary to act to deliver on management outcomes. The FMP will also allow the effectiveness of any management intervention to be monitored and reviewed, so that it can be refined if needed. |

Annex 5 Legislative requirements for Whelk FMP

| Requirement of the Fisheries Act 2020 | Approach in Whelk FMP |
|---|---|
| **Section 2(3) of the Act states that the JFS should detail the plans that are either in force or will be prepared, the scope of each plan, the responsible body for delivering the plan and the timeframes for preparation and publication.** | The JFS published in November 2022 details these requirements for the Whelk FMP. |
| **Section 2(6) of the Act explains that a 'fisheries management plan" means a document, prepared and published under this Act, that sets out policies designed to restore one or more stocks of sea fish to, or maintain them at, sustainable levels.'** | This Whelk FMP establishes the roadmap to ensure whelk stocks in English waters can be harvested at sustainable levels. |
| **Section 6(2) references that the plan should detail the indicator or indicators that will be used to monitor its effectiveness.** | The section on 'Monitoring Performance' details the performance indicators that will be used to monitor and assess the performance on this plan against the desired outcomes for these fisheries. In addition, the proposed implementation approach will enable effective monitoring of the delivery of the FMP's priorities. |
| **Section 6(3) of the Act sets out that FMPs 'must specify whether the available scientific evidence is sufficient to enable the relevant authority or authorities to make an assessment of the stock's maximum sustainable yield and if it is not, (I) must specify policies of the relevant authority or authorities for maintaining or increasing levels of the stock, (ii) specify the steps (if any) that the relevant authority or authorities propose to take to obtain** | The Whelk FMP presents the evidence that clarifies the current data / information status of whelk fisheries in English waters.<br><br>Whelk is clearly a data-limited species and, except for some IFCAs, there is currently no consistent programme in place to collect fishery and effort information to support collective stock management. The Whelk FMP establishes the roadmap to collect the necessary scientific evidence so that, in |

| Requirement of the Fisheries Act 2020 | Approach in Whelk FMP |
|---|---|
| **the scientific evidence necessary to enable an assessment of the stock's maximum sustainable yield to be made, and (iii) where no such steps are proposed, state the reasons for that.'** | time, Maximum Sustainable Yield (MSY) or an equivalent proxy can be assessed, and action taken to keep harvest rates at or below the level needed to maintain stock status at or above MSY (or equivalent). Given the current data-limited status of whelk fisheries in English waters, it will take time to establish MSY or proxy. In the meantime, the Whelk FMP sets out a precautionary approach to managing the fishery. Section 6 of this FMP details the future fishery management strategy and Annex 2 details the Evidence and Research Plan which collectively detail how the obligations under s6(3) of the Act will be met. |
| **Section 6(5) of the Fisheries Act requires that the plan must contain a statement to the effect it has been prepared and published for the purposes of the Act.** | This FMP sets out the policies and measures to manage fishing activity within the whelk fishery in English waters. The policies and measures contained within this plan have been prepared to meet the requirement of section 6(5) of the Fisheries Act 2020. |

# Roles and responsibilities in relation to the Whelk FMP

The Department for the Environment. Food and Rural Affairs (Defra) is responsible for UK fisheries policy and governance. Fisheries management is carried out by devolved fisheries administrations: Welsh Government; Scottish Government; and Department of Agriculture, Environment and Rural Affairs in Northern Ireland. Collectively, including Defra, these organisations are known as the UK Fisheries

Annex 5 Legislative requirements for Whelk FMP

Policy Authorities[1] As the Whelk FMP only applies to the management of whelk fisheries in English waters, the devolved fisheries administrations have no formal responsibility for the delivery of this plan. However, Defra will continue to engage with the devolved administrations on future whelk management measures.

The Marine Management Organisation (MMO) in England has designated authority to manage fisheries and carry out enforcement activities in English waters. The MMO has the power to make byelaws within 0–200 nautical miles (nm) and leads on management of fishing activities between 6–200nm.

Ten Inshore Fisheries and Conservation Authorities (IFCAs) have the power, in English waters, to deliver additional fisheries conservation and management within the inshore 0–6nm zone. The MMO has the power to make byelaws to manage fishing activity within an IFCA district and quality assures all IFCA byelaws prior to submission to the Secretary of State.

Seafish is the non-departmental public body that works to support the UK seafood supply chain. It is sponsored by Defra and works to all four fisheries administrations. While it holds no statutory functions relevant to fisheries management, it convenes the Shellfish Industry Advisory Group (SIAG), Crab Management Group (CMG) and Whelk Management Group (WMG), and the various sub-groups. It has also led on the development of the Whelk FMP in collaboration with the WMG.

The development of this FMP has been delivered through the shellfish groups - primarily through the WMG. These co-management groups provide a forum for industry, regulators, policy makers and researchers to come together to work collaboratively on strategic and operational issues relevant to the management of UK shellfish fisheries.

# Development of the FMP

The Whelk FMP was developed by Seafish in collaboration with the Whelk Management Group (WMG). The WMG was formed in early 2020 to bring together industry stakeholders, from across the whelk supply chain, scientific researchers, and fishery regulators to work collaboratively to address issues facing UK whelk fisheries. The WMG is facilitated by Seafish, and membership is open to all industry stakeholders with an interest in UK whelk fisheries. Further details on the membership of the WMG can be found on the Seafish website and Annex 3.

[1] [1]Fisheries Policy Authorities are defined in Section 52 Interpretation of the Fisheries Act 2020: the Secretary of State, Scottish Ministers, Welsh Ministers, and the Northern Ireland Department.

Annex 5 Legislative requirements for Whelk FMP

The WMG oversaw the development of the FMP with the support of the following stakeholder groups. A schematic diagram of the sub-group structure is shown in figure 1.

**SIAG and FMP working group**: The SIAG is focused on the strategic management of UK shellfish fisheries. It provides a forum for discussion and collaboration between members on overarching issues that are relevant to all shellfish fisheries. Membership includes representatives from across the seafood supply chain, scientific researchers, and regulators. An SIAG FMP working group was formed in 2022 and tasked with developing the shared shellfish principles in Annex 4 of this FMP. These shared principles apply to all shellfish related FMPs developed as part of the first tranche of plans (whelk, brown crab and European lobster in English waters, and King scallops in English and Welsh waters). The SIAG meets quarterly, and all meetings have a standing agenda item for updates from the respective chairs of the WMG, CMG, and Scallop Industry Consultation Group (SICG). This includes updates on progress towards developing the whelk FMP.

**WMG FMP working group:** The WMG established a ‘task-and-finish’ working group of industry stakeholders and regulators to develop draft FMP content and to focus specifically on the development of the whelk specific objectives presented in this FMP in Section 5. Members were selected from across the supply chain based on their interest in whelk fisheries in English waters and their ability to represent views indicative of the wider sector considering different patterns of activity and fleet metiers (including inshore / offshore day boat / multi-day trip boat representation). In addition to industry representatives, Defra, Cefas, MMO, and IFCAs participated in the FMP working group.

The WMG FMP working group met to discuss and refine draft objectives for the FMP, ensuring alignment with objectives of the Fisheries Act. Between meetings Seafish updated drafts and collated content for all sections of the FMP and at subsequent working group meetings members reviewed and approved the changes made. Seafish provided updates to the wider WMG on progress in drafting the FMP, and WMG members were invited to discuss details of the objectives and ask questions of Seafish and the FMP working group. The working group also advised Seafish on the delivery of stakeholder engagement events, including providing expert advice on locations of meetings, reviewing presentation materials, and reviewing stakeholder feedback on draft content as required.

Managing whelk fishing effort has been identified as a priority for the WMG since its inception in 2020. In March 2022 the WMG hosted a workshop to discuss whelk effort management with industry representatives, researchers, and regulators. A key output from this workshop was a statement of three collective aspirations for whelk fisheries:

Annex 5 Legislative requirements for Whelk FMP

- Halting expansion of whelk fishing effort in the short-term and employing a precautionary approach to fishery management
- Improving science and data availability in the medium-term to ensure that the right data (fishery dependent and independent) are gathered, and that future management decisions are underpinned by reliable scientific evidence; and
- Fostering a greater sense of industry ownership of, and responsibility for, sustainable management of the resource in the long-term

**WMG Science Sub-group:** the WMG science sub-group brings together industry stakeholders and scientific researchers from government agencies, research institutes, and academia. The group provides a forum for collaborative working (e.g., joint development of funding bids) and discussion of research needs facing whelk fisheries in the UK. The science sub-group contributed to FMP development by identifying evidence gaps and drafting the evidence and research plan presented in Annex 2. The evidence and research plan underpins the objectives of the FMP and provides additional detail on the research activities that should be undertaken to deliver on these objectives.

**Whelk Working Group:** the WWG is an IFCA-facilitated group that brings together regulators and researchers to focus on improving whelk data. Seafish is a member of the WWG and attended meetings during the FMP development phase to ensure WWG members were updated on the FMP development process.

# Future role of the WMG

The WMG, has worked collaboratively with Seafish on developing the Whelk FMP and in engaging the wider stakeholder community on this work. It is expected that the WMG will continue to work collaboratively and cooperatively to provide input as the measures are developed to help inform implementation of the FMP and to ensure the ambition for long-term sustainable and profitable whelk fisheries is realised. Further information on how this will be achieved can be found in Section 5 under ‘Management strategy.’

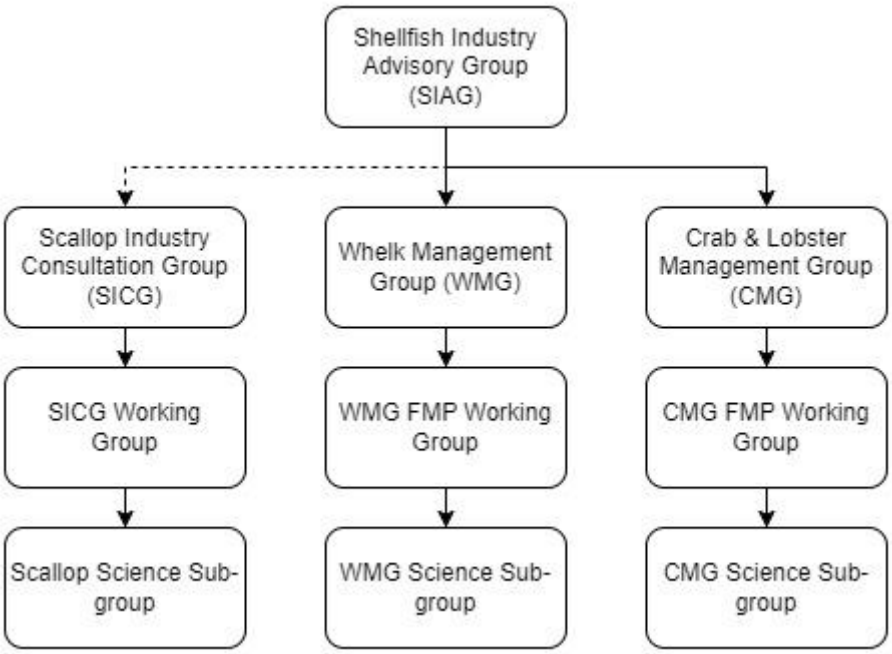


**Figure 1:** Diagram of the Shellfish Industry Advisory Group (SIAG) sub-group structure, including working groups and science.

# Processes followed to develop the FMP

In mid-2020 Seafish canvassed WMG members to better understand stakeholder priorities regarding the management of whelk fisheries. Three key priorities were identified

- Establishing a baseline - improving understanding of the current status of whelk fisheries, including:
    - Current patterns of fleet activity and performance
    - Available biological information on stock status, life history, and stock boundaries
    - Appropriateness and effectiveness of management tools currently used in UK whelk fisheries, including unintended consequences
- Data and research - reviewing existing science to identify knowledge gaps to inform the development of a fit-for-purpose collaborative data collection and research plan
- Managing fishing effort – working collectively to reliably assess trends in CPUE in the whelk fishery, developing a programme of effort management aligned with likely / actual stock status, and improving understanding of interactions between whelk fisheries and other fisheries

The WMG's efforts to identify key priorities for UK whelk fisheries helped inform early discussions on FMP objectives by aligning stakeholder priorities with the objectives

of the Fisheries Act 2020. The WMG's FMP working group used this information to develop the draft FMP objectives and actions

These were subsequently presented at stakeholder engagement events to gather feedback and stimulate discussion amongst stakeholders about prioritisation and management. Through the WMG, and associated sub-groups, industry stakeholders have played an integral role in developing the shared shellfish principles and whelk species-specific objectives which were presented at FMP engagement events in 2022.

## Informal stakeholder engagement activities

As part of the FMP development process, Seafish delivered a series of informal stakeholder engagement events during late 2022. A full summary of these events – including format of sessions and key themes emerging in stakeholder feedback – is presented in the Stakeholder Engagement Report in Annex 3. The events were promoted via social media, industry media including Fishing News, and posters in ports and harbours. Members of the WMG were encouraged to promote the events within their local communities. The purpose of these events was to:

- Raise awareness about the development of the Whelk FMP for English waters and what this means for seafood businesses
- Present draft FMP aims and objectives (as developed by the WMG FMP working group) to stakeholders and gather feedback on the proposed direction of travel for whelk fisheries
- Discuss future management of whelk fisheries in England and to help establish priority management areas

Five in-person and three online stakeholder engagement events were held to ensure that as many stakeholders as possible had the opportunity to discuss and provide feedback on the draft FMP content. In-person events were held in Weymouth, Ilfracombe, Shoreham-by-Sea, Wells, and Fleetwood; locations were selected based on the regional significance of whelk fisheries.  Events were open to all stakeholders with an interest in English whelk fisheries. Attendance included representation from the catching sector; processing and export sectors; scientists and academics; local fishery managers; and NGOs. A dedicated online meeting was held for representatives of environmental NGOs providing an opportunity for those organisations to engage with the process.

Following engagement events, Seafish collated feedback on draft FMP content, proposed initial management interventions and drafted a stakeholder engagement report (Annex 3). Feedback from the events was used by Seafish to refine draft FMP content, which was then presented to the WMG FMP working group, alongside comments on why changes had or had not been made. Key themes emerging from

stakeholder engagement events were presented to the wider WMG and SIAG in November / December 2022, affording stakeholders further opportunity to comment on priority issues or concerns about FMP content. Drafts of the FMP objectives and proposed initial management interventions were tabled at a WMG working group in January 2023 for sign off before submission to Defra.

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# Proposed Fisheries Management Plan for Whelk in English Waters

## Annex 6: Environmental considerations

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# Contents

# Background

In addition to the Ecosystem Objective and Climate Change Objective in the Fisheries Act 2020, all Fisheries Management Plans (FMPs) are subject to legal obligations for environmental protection arising from the Habitats Regulations, Marine and Coastal Access Act 2009, UK Marine Strategy Regulations 2010, and the Environmental Principles policy statement for the Environment Act 2021. These obligations are summarised in Table 1 below.

Defra commissioned advice from the Statutory Nature Conservation Bodies (SNCBs) the Joint Nature Conservation Committee (JNCC) and Natural England, on the wider environmental risks that need to be considered when implementing the Whelk FMP and developing future management interventions for these fisheries.

While the shared shellfish principles and Whelk Specific Objective #5 explicitly address environmental considerations, the delivery of all objectives detailed in the 'Description of fisheries management objectives' section will need to adhere to the legal obligations detailed below.

This section provides a more detailed overview of how known environmental risks will be assessed and managed, how climate change mitigation and adaptation will be progressed, and the impact that whelk fishing effort can have on Marine Protected Area (MPA) outcomes.

**Table1: Summary of relevant environmental legislation and FMP obligations**

| Environmental UK legislation and frameworks | FMP obligations |
|---|---|
| **The Conservation of Habitats and Species Regulation 2017**<br><br>**The Conservation of Offshore Marine Habitats and Species Regulations 2017** | FMPs and their measures must not result in adverse impacts to site integrity for European Marine Sites.<br><br>FMPs and their measures must not result in adverse impacts to site integrity for Offshore Special Areas of Conservation and Special Protection Areas.<br><br>The competent authority must undertake a Habitats Regulation Assessment (HRA) impact assessment to determine whether the FMPs (including proposed management measures) may have an impact on European Marine Site features on site integrity. |

| | |
|---|---|
| **Marine and Coastal Access Act 2009** | FMPs and their measures must not hinder the conservation objectives of Marine Conservation Zones (MCZs) including Highly Protected Marine Areas (HPMAs).<br><br>FMPs may need to undertake an MCZ impact assessment to determine whether it (including proposed management measures) may have an impact on MPA conservation objectives. |
| **UK Marine Strategy (UKMS) Regulations 2010** | The UKMS requires the UK to take the necessary measures to achieve or maintain Good Environmental Status (GES).<br><br>The UKMS identifies FMPs as a tool to support the delivery of GES. |
| **Environment Act 2021** | When developing fisheries management measures or policies, FMPs must have due regard to the Environmental Principles Policy Statement in the Environment Act 2021 |

# Part A: Risks and impacts arising from whelk fishing activity

The UK Marine Strategy Regulations (2010) place a responsibility on the UK to take the necessary measures to achieve or maintain Good Environmental Status (GES) through the development of a UK Marine Strategy (UKMS). The UKMS provides the policy framework for delivering marine policy at the UK level and sets out how the vision of clean, healthy, safe, productive, and biologically diverse oceans and seas will be achieved. The target for GES is measured through the 11 qualitative descriptors, which describe what the environment will look like once GES has been achieved.

Pot fishing for whelk potentially poses two environmental risks, acknowledging that, based on current evidence, both are considered low risk:

- Risk 1: Bycatch of Endangered, Threatened or Protected species and/or unwanted marine species
- Risk 2: Marine litter from abandoned, lost and discarded fishing gear

# Risk 1: Bycatch from potting

Bycatch is the incidental catch of unused or unmanaged species and is globally recognised as a major threat to the sustainability of marine fisheries and ecosystem functioning[1]. The bycatch rate within whelk fisheries is highly dependent on gear type, environmental factors (for example, season, fishing areas), fishery-specific factors (for example, pot design, 'soaking' time) and data collection method (for example, fishery dependent or fishery independent surveys)[2].

Potting is generally considered a low-risk fishing method, but large mobile species such as cetaceans (whales, dolphins, porpoises) can become entangled in pot ropes. While such captures are usually released alive, the degree of risk can vary geographically. Since such entanglements are unlikely to have population-level effects the risk profile is considered low. However, incidental catches of mobile sensitive species should still be minimised and, where possible, eliminated.

## Mitigation

The Bycatch Mitigation Initiative published in August 2022 sets out in more detail policy objectives and actions that should be taken to achieve the ecosystem objective in the Fisheries Act. The Bycatch Monitoring Programme is dedicated to better monitoring, reducing - and where possible - eliminating bycatch through developing and trialling technology to enhance on the ground bycatch reporting capabilities, as well as testing bycatch avoidance devices in the field.

However, reducing bycatch, even when the risk is low, is complex and requires solutions that are tailored to the different fisheries. There is limited evidence on impact of bycatch on mobile species within whelk fisheries. As such a priority focus for the delivery of whelk specific Objective #5 will be to improve reporting via a bycatch monitoring plan which will encourage fishers to report accidental bycatches along with the geographical location – noting that is already a requirement to notify any marine mammals caught in fishing gear within 48 hours of returning to Port. This information will be used to better assess risk, potential hotspot areas, and whether management measures are required.

1 Komoroske LM and Lewison RL (2015) Addressing fisheries bycatch in a changing world. Front. Mar. Sci.

2 Öndes, F., Kaiser, M. J., & Murray, L. G. (2018). Fish and invertebrate by-catch in the crab pot fishery in the isle of man, irish sea. Marine Biological Association of the United Kingdom. Journal of the Marine Biological Association of the United Kingdom, 98(8), 2099-2111.

# Risk 2: Litter from fishing gear

Marine litter is described as any persistent, manufactured or processed solid material discarded, disposed, or abandoned in the marine and coastal environment. At a global scale, it is estimated that 8.6% of all pots and traps are lost each year[3].

Whelk fisheries contribute to fishing related litter (UKMS descriptor 10) through the loss of pots, ropes, and buoys. Rates of fishing gear loss for potting is low in comparison to other fishing practices. However, the potential impact of 'ghost' fishing which refers to unintended bycatch from fishing gear that has been abandoned, lost or otherwise discarded is still largely unknown for pot fisheries. While the overall risk from potting is considered low further consideration of how best to avoid or minimise gear loss and how to achieve sustainable end of life disposal remains important. Whelk Specific Objective #5 includes gear management in its scope.

## Mitigation:

The UK is committed to protecting the marine environment from all human-induced stressors, including marine litter such as abandoned, lost, and discarded fishing gear (ALDFG). Existing monitoring programmes assess seafloor litter, surface litter and beach litter. We are also working internationally, calling for an ambitious, legally binding treaty to end plastic pollution, and pushing for action to reduce marine litter through the G7, our regional seas convention (OSPAR) and the International Maritime Organisation. The UK is a member of the Global Ghost Gear Initiative (GGGI), the first initiative dedicated to tackling this problem on a global scale. Through the UK's £500m Blue Planet Fund that was launched in 2021, we are also working in partnership with developing countries to tackle marine pollution, including ALDFG. In addition to tackling marine litter, we are exploring methods to recycle and reuse end of life gear at ports and aquaculture farms with the intention of moving the sector towards a circular economy model which will reduce the impacts generated from fishing gear waste.

The UK Gear Forum will lead on exploring these issues for all pot and trap fisheries and will work with the CMG, WMG and the SIAG to ensure alignment with relevant FMP Objectives. This will include (1) improving understanding of the scale of ecosystem impacts from abandoned lost and discarded potting gear (2) identifying opportunities to collect and reuse end of life potting gear, (3) assessing how to better record and assess the scale of abandoned and lost fishing gear, and (4) reviewing the effectiveness of existing technical measures to minimise ghost fishing from pots and rope entanglement.

3 Richardson, K., Hardesty, BD., Wilcox C. (2019). Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis. Fish and Fisheries. 20: 1218-1231.

# Part B: Climate change – adaptation and mitigation

Whelk stocks and fisheries are sensitive to the environmental changes brought about by climate change – such as ocean warming and ocean acidification which can have an impact on stock range and health. Equally, fishing activity creates a carbon footprint and contributes to our national vessels' emissions profile, as well as disruption and potential release of stored blue-carbon from the marine environment through the impact of fishing gear interacting with the seabed.

This is not a whelk specific issue therefore the challenge to mitigate impact through reducing emissions and to ensure resilience to adaptation is being addressed across all shellfish fisheries via Shared Shellfish Objective #10.

Two elements are considered in the context of climate change – supporting the seafood industry to adapt to the impacts of climate change and mitigation of emissions (reducing the direct and indirect emissions profile of the sector).

## Climate change adaptation

Climate change and warming oceans are changing the distribution of commercially important shellfish species.[4] Whelks have a large thermal range and populations can experience temperature ranges from below 0°C to above 22°C. Whelks do, however, have distinct breeding periods with optimum conditions for egg-laying and egg development found between 6-10°C.[5] Beyond this range, egg development and offspring survival reduce. Therefore, ocean warming does pose a potential risk to the distributional boundaries of this species.

Recent evidence has also shown that whelks have a negative relationship between temperature and size, with whelks in cooler waters reaching larger maximum sizes.[6] This poses the additional potential impact of climate warming altering the whelk

4 Mieszkowska, N., Burrows, M. and Sugden, H. (2020) Impacts of climate change on intertidal habitats relevant to the coastal and marine environment around the UK. MCCIP Science Review 2020, 256–271.

5 Smith, KE., Thatje, S., Hauton, C. (2013) Thermal tolerance during early ontogeny in the common whelk Buccinum undatum (Linnaeus 1785): Bioenergetics, nurse egg partitioning and developmental success. Journal of Sea Research, Volume 79, 2013, Pages 32-39. https://doi.org/10.1016/j.seares.2013.01.008.

6 Smith, KE., Thatje, S., Hauton, C. (2013) Thermal tolerance during early ontogeny in the common whelk Buccinum undatum (Linnaeus 1785): Bioenergetics, nurse egg partitioning and developmental success. Journal of Sea Research, Volume 79, 2013, Pages 32-39. https://doi.org/10.1016/j.seares.2013.01.008.

population size and structure, which would have knock on implications for size-based management measures. Ocean acidification may also lead to shell weakening could affect the quality of the catch and its transportability. [7]

Work on adaptation is occurring at a national level via the Marine Climate Change Impact Partnership (MCCIP) which provides a coordinating framework for the UK, delivering high quality evidence on the latest marine climate change impacts, and guidance on adaptation advice to policy advisors. Defra's Marine Natural Capital and Ecosystem Assessment (mNCEA) includes sampling, collation, and data analysis to baseline the location, extent and condition of marine natural capital assets in English seabed environments. Marrying this intel up with known climate change impacts to whelks can support in identifying which whelk stocks might be most vulnerable to the changes in ocean acidification and ocean warming.

Adaptation is also important for any future whelk fishery management strategy as we understand how a changing climate can influence whelk stock range and the physical and biological characteristics of whelk species.

Over the duration of this plan the focus will be on contributing to the evidence base and monitoring trends to assess likely impact to shellfish species generally and whelk specifically.

## Climate change mitigation - reaching Net Zero

The Climate Change Act 2008 (Amended in 2019) sets a legally binding target of achieving net-zero greenhouse gas (GHG) emissions by 2050 across the UK economy, with an ambition of a 78% reduction by 2035. The SIAG have committed through the high-level principles for all shellfish management to support the shellfish industry to a) mitigate emissions from the shellfish supply chain, and b) adapt to the environmental impacts of climate change.

### Emissions profile:

While specific vessel emissions for whelk fisheries are not yet well understood, and the fact that most of the effort is from vessels using static gears, the emissions are likely to be lower than fisheries using mobile gears. Recent analysis has shown that the total UK pot and trap fishing fleet segment (which comprises of 1,542 vessels)

7 Nicole Martin, Susana Clusella-Trullas, Tamara B Robinson, Predicted changes in temperature, more than acidification, affect the shell morphology and survival of the girdled dogwhelk, Trochia cingulata (Linnaeus, 1771), Journal of Molluscan Studies, Volume 88, Issue 2, June 2022, eyac011, https://doi.org/10.1093/mollus/eyac011

produced 12.5% (101kt $CO_2e$) of the total at sea carbon emissions annually across the UK's fishing fleets.[8]

Whilst passive gears are generally less emission-intensive than mobile gears, quantification of carbon emissions across the fishing fleet supply chain (for example, preharvest through to postharvest) is required to truly understand the fisheries carbon footprint. This is particularly relevant to those whelk fisheries that use bait sourced from other wild capture fisheries, which can significantly add to the carbon footprint of the fishery.[9] Before any action can be taken to reduce emissions the extent of the emissions and their origin must first be understood.

The UK shellfish sector collectively will need to consider how it will reduce emissions to contribute to meeting the Net Zero target. Mitigating actions could include technological, regulatory, managerial, and behavioural changes to increase efficiency or transition to alternative fuels and energy sources, and reducing the direct impact that fisheries' have on marine carbon stores.

Work is occurring at a national level to understand the current evidence gaps and latest innovations to support the development of pathways towards Net Zero for the UK fishing fleet. From a shellfish-specific perspective the FMP aspirations will be progressed through the Seafood Emissions Profiling Tool in the first instance, to help establish a more detailed emissions profile (and emissions' hotspots) for whelk products. This information will then help establish what mitigation actions could be taken to further reduce the emissions profile.

## Blue carbon habitats:

Healthy coastal and marine environments can provide nature-based solutions to help tackle climate change. For example, certain marine habitats (including some that are home to whelks), such as seagrass, kelp and muddy sediments, are able to capture and store carbon and therefore these are known as blue carbon habitats. If left undisturbed, these habitats can contribute to GHG emissions reductions. Habitat disturbance through fishing practices may affect seabed carbon dynamics.

The evidence around the risks and impacts of whelk potting gear on blue carbon habitats within English waters is limited but work continues to build the evidence base to understand the trade-offs and wider consequences of decisions. Given the lack of information available on whelk specific impacts the priority for this iteration of the Whelk FMP will be to collate research findings to build an improved

8 Engelhard, GH., Harrod, OL., Pinnegar, JK. (2022). Carbon emissions in UK fisheries: recent trends, current levels, and pathways to Net Zero. Defra project – in review.

9 Driscoll, J., Boyd, C., Tyedmers, P. (2015). Life cycle assessment of the Maine and southwest Nova Scotia lobster industries. Fisheries Research 172: 385-400.

understanding of the potential impacts that whelk fishing can have on blue-carbon habitats.

# MPAs and other marine spatial protection

There is a comprehensive network of MPAs and other marine spatial protection across English waters. The location of these spatial measures overlaps with known whelk fishing areas. Figure 2 shows the distribution of MPAs across England.

Whelks are primarily caught using static pots. The main environmental pressure of potting on MPA features includes the removal of target and non-target species, as well as localised abrasion and disturbance of the substrate on the surface of the seabed. At a general level there is a risk that fishing activity occurring outside of an MPA can impact on the features protected within an MPA. This can happen when either the pressure exerted by the fishery impacts protected features beyond its spatial footprint or when the feature of an MPA is mobile and travels outside the site.

Assessments of the impacts of whelk fishing activities inside MPAs are undertaken by the IFCAs within 6nm and the MMO outside 6nm. IFCAs or the MMO are responsible for implementing measures for fishing activities inside MPAs, where assessments deem it to be necessary. The Government is aiming to have all MPAs in English waters protected from damaging fishing activity by 2024.

However, the extent of any risk from whelk fishing activity on MPAs is considered low. Whelk potting is generally selective as most unwanted animals can either escape the pot or usually remain alive until the pots are hauled, and the fishers can discard them back to the sea. As highlighted previously a bycatch monitoring plan will be implemented as part of this FMP. This will gather more evidence on the nature and extent of this impact to help inform if intervention is required to reduce/avoid this impact in the future. Furthermore, this work can contribute to other national initiatives such as the Defra Bycatch Monitoring Initiative.

Whilst MPAs are designated to protect specific features and can support the recovery of the marine environment to a good, healthy state, HPMAs are being designated to protect all species and habitats within the HPMA boundary and associated processes, in order to allow protection and full of marine ecosystems. This includes spawning and nursery grounds for commercially important species within the HPMA boundary. The first three pilot HPMAs (North East of Farnes Deep, Allonby Bay, and Dolphin Head) were selected following a 12-week consultation and analysis of responses and their ecological importance. The sites will be designated before 6th July 2023, and Defra are currently exploring options for additional sites. Future options will also be subject to consultation.

Management measures within HPMAs will need to align with the conservation objective of HPMAs. Recovery to a more natural state will be achieved by prohibiting extractive, destructive and depositional activities within each site. This would include activities such as dredging and anchoring. Non-damaging levels of other activities to the extent permitted by international law will be allowed. Fisheries management measures, including MMO and IFCA byelaws will be used to prohibit or restrict fishing activities from occurring within the site.

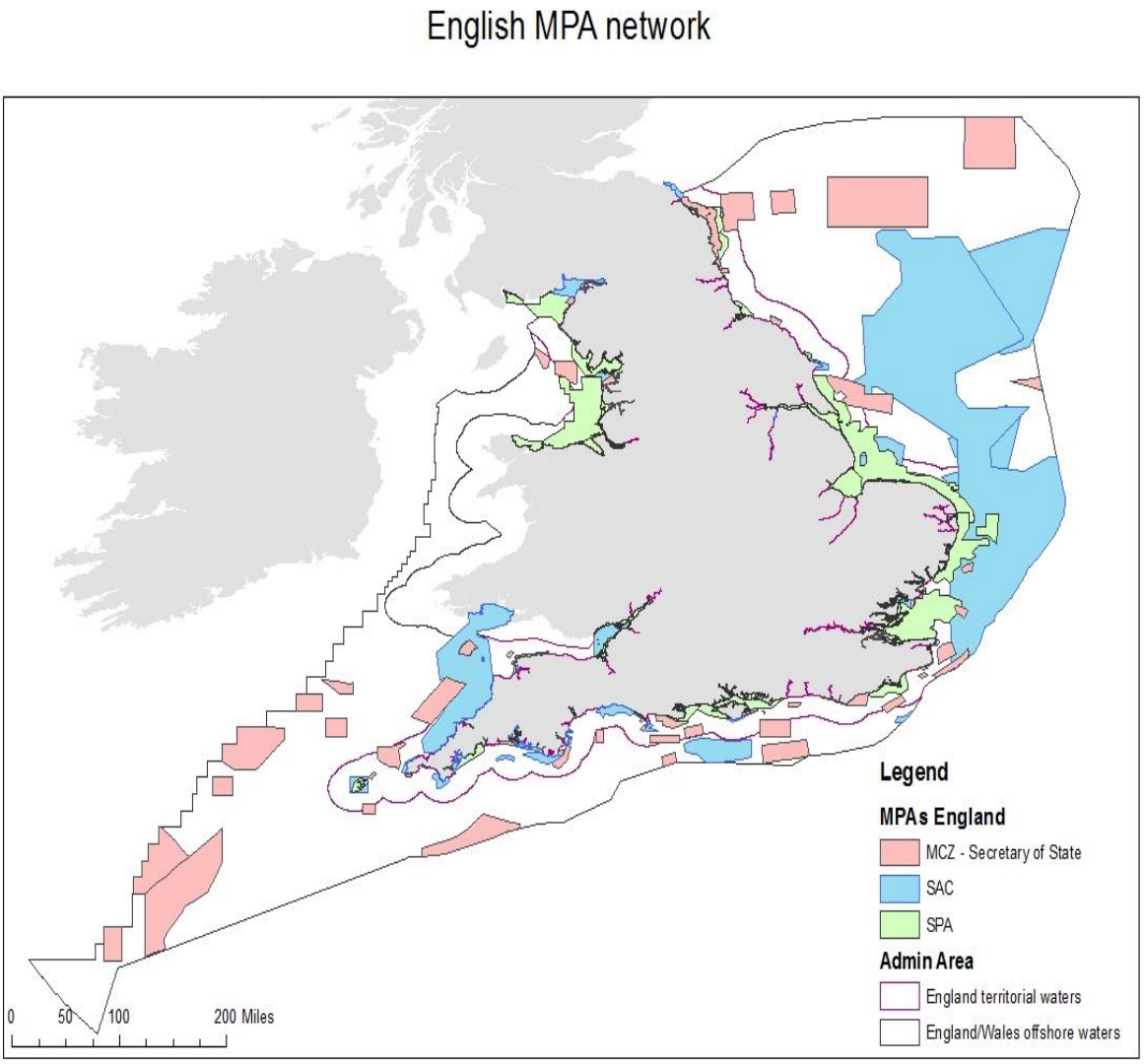


**Figure 2: Map of the Marine Protected Areas Network categorised by Marine Conservation Zones (MCZ), Special Areas Conservation (SACs), and Special Protection Areas (SPAs) in the English EEZ and territorial waters. Source: Cefas FMP evidence, 2022.**