

Vision

The Eastern Inshore Fisheries and Conservation Authority will lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry.



Summary of the 2022 Wash intertidal mussel stock assessment surveys.

Introduction

The 2022 Wash inter-tidal mussel surveys were conducted between September 12th and November 12th, during which 19 inter-tidal beds, plus the Welland Bank were surveyed. These surveys incorporated all of the known beds apart from two small beds on the Roger and Pandora sands which had previously been removed from the survey programme due to their small stock size and general deterioration. When last surveyed in 2019, the Roger bed had only supported 17 tonnes, while anecdotal evidence from local fishermen suggested the part of the sandbank where the Pandora bed was located, which had been eroding for several years, had washed totally away¹. A small bed on the East Mare Tail did not receive a bespoke survey, either. This bed is usually surveyed independently during the same trip as the nearby Shellridge bed, but this year the Shellridge survey also needed to incorporate an assessment of the cockles located in that area to help inform the management of the on-going cockle fishery. Instead of a bespoke survey, the mussels within the East Mare Tail were included within the adjacent North Mare Tail bed when it was surveyed.

One additional bed (Back of the Wall, on the east side of the Breast sand) was incorporated into the survey programme this year. This is a relatively young bed that had been identified to the Authority by local fishermen following the 2021 surveys. It had been surveyed for the first time in June 2022 but required resurveying after being opened to the 2022 relaying seed fishery. Figure 1 shows the beds surveyed in 2022.

¹ A subsequent visit to the Pandora bed in February 2023 found that while the mussel bed had not totally washed away, surviving mussel densities were too sparse to be considered a mussel bed.

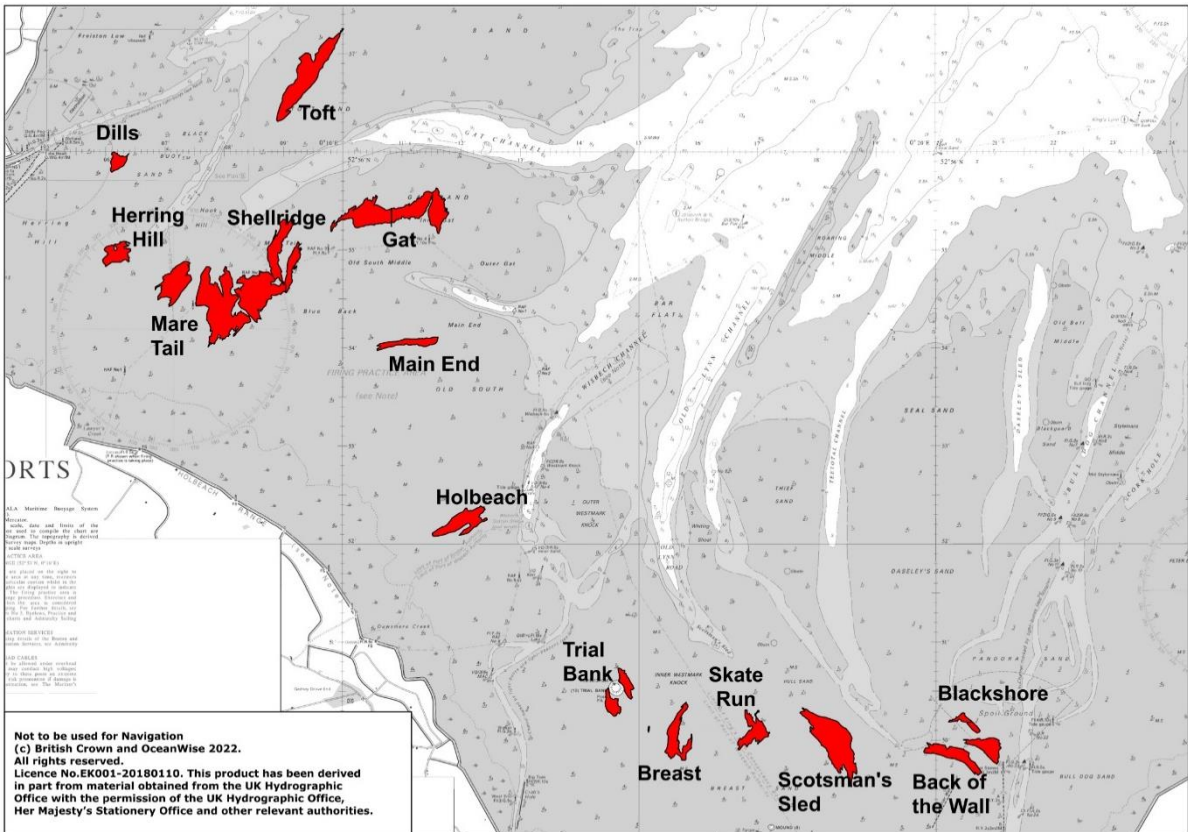


Figure 1 – Mussel beds surveyed during 2022 surveys

Survey results

Excluding the Welland Wall, which is managed separately to the inter-tidal beds, the total inter-tidal mussel stock biomass was found to be 13,147 tonnes. This is a slight decline of 210 tonnes from the 2021 figure of 13,357 tonnes but still exceeds the 12,000 tonnes SSSI Conservation Objective target for the site. The biomass of mussels that had reached 45mm Minimum Landing Size (MLS) had declined to a much greater extent, however, from 6,008 tonnes to 4,471 tonnes. The Conservation Objective target for these larger mussels is 7,000 tonnes, a target that has not been achieved since 2009 when the higher-than-average levels of mortality were first observed. Figure 2 shows how this year's stocks compare to previous years and to the Conservation Objective targets.

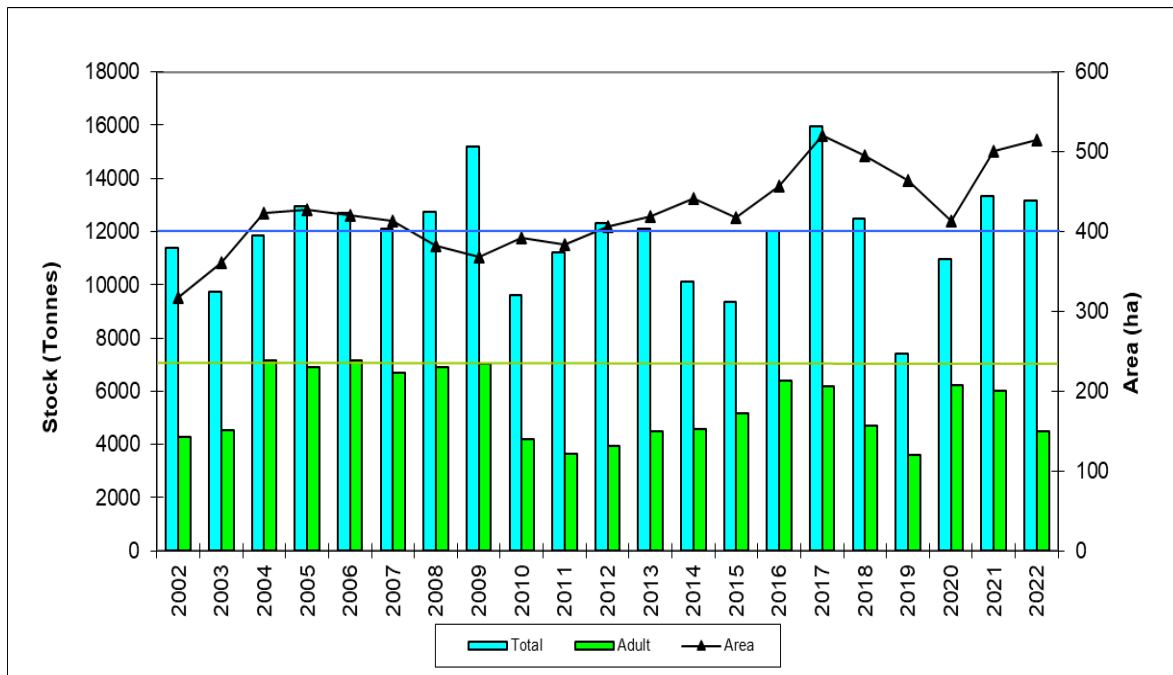


Figure 2 – Intertidal mussel stock levels in The Wash since 2002 and the Conservation Objective targets

Considering 170 tonnes were removed from the inter-tidal beds during the 2022 seed relaying fishery, the overall stock biomass figures would suggest there had been relative stability during the past year. A closer examination of the figures for individual beds, summarised in table 1, however, shows this is not the case. Even accounting for usual survey error margins, several of the beds were found to have suffered significant declines during the year, while others had shown improvements. The latest survey figures also include 1,019 tonnes of mussels on the Back of the Wall bed, which were not included in the 2021 surveys. Figure 3 highlights the beds in which biomass had declined or improved by more than 10% from 2021.

Table 1 – Summary of the stocks present on the inter-tidal mussel beds at the time of the 2022 autumn surveys

BED	AREA (ha)	COVERAGE (%)	DENSITY (t/ha)	TOTAL STOCK (tonnes)	STOCK >45MM (tonnes)
Mare Tail North	46.2	37	1.06	1812	1165
Mare Tail Relay	0.5	53	0.92	26	10
Mare Tail South	72.0	23	0.57	918	159
Mare Tail West	28.1	28	0.69	551	176
Shellridge	34.0	39	0.74	980	305
Dills	7.1	15	0.45	50	3
Toft	51.5	35	373	1315	354
Roger					
Gat, West	31.7	39	0.96	1197	482
Gat, Mid	20.4	40	0.92	751	332
Gat, East	17.4	41	0.87	625	325
Main End	12.2	17	0.5	105	28
Holbeach	24.3	23	0.6	375	36
Herring Hill	14.7	40	0.94	547	61
Trial bank	15.9	39	1.12	689	129
Breast, West	0.2	31	0.54	3	0.4
Breast, East	21.1	25	0.38	199	11
Scotsman's Sled, East	58.4	18	1.08	1140	421
Blackshore	21.3	17	0.57	213	28
Back of the Wall	20.5	41	1.21	1019	372
Skate Run	17.5	29	1.25	632	74
TOTAL	514.9			13147	4471.4
Welland Bank	2.4	63	2.99	448	335

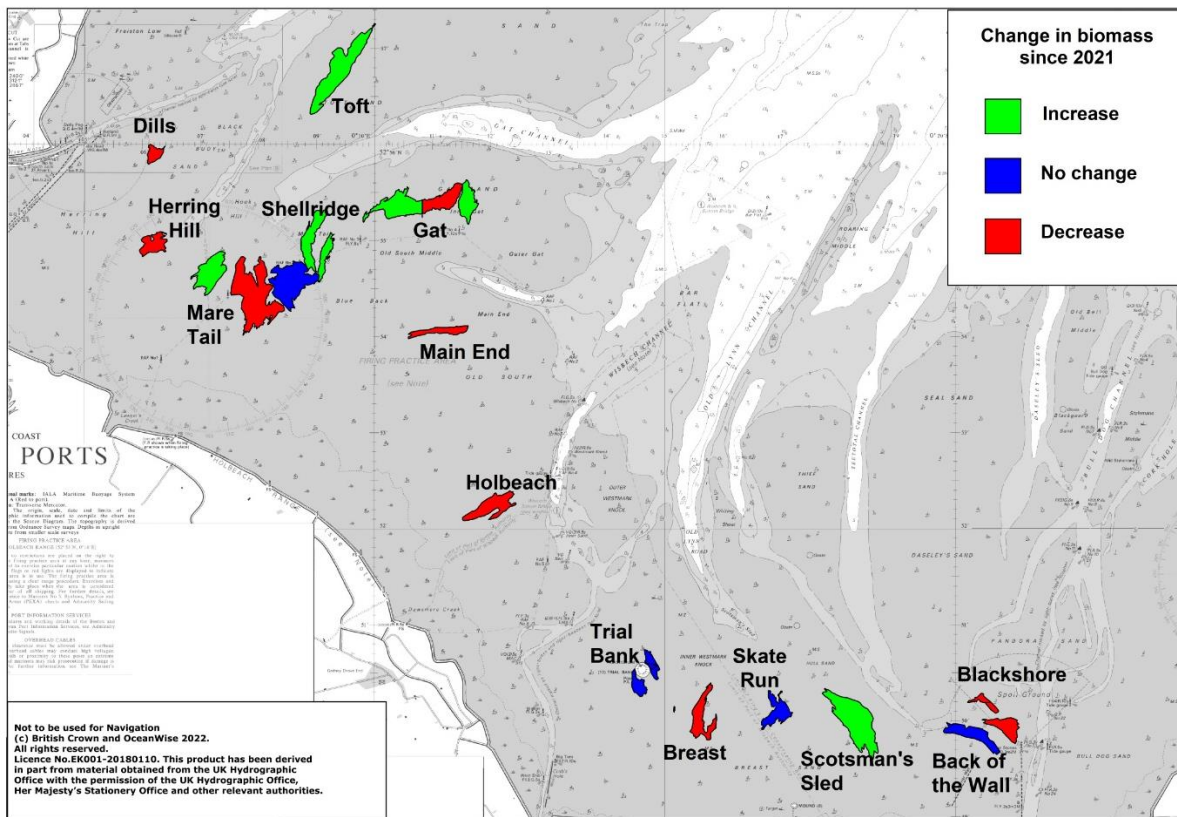


Figure 3 – Chart showing relative changes in mussel biomass from 2021

Excluding the figures for the Back of the Wall bed, which did not contribute towards the 2021 results, there has been an overall stock reduction of 9% compared to the previous year. 1.3% of the reduction can be attributed to the 2022 fishery. Whereas in recent years high mortality among 2-3 year-old mussels has been the main contributing factor in any decline, this year the greatest losses have been among the older, larger mussels. Again excluding 372 tonnes currently present on the Back of the Wall bed, the stocks of adult mussels ($\geq 45\text{mm}$ length) have declined from 6,008 tonnes to 4,099 tonnes, a reduction of 32%. The decline in biomass of larger mussels was seen on all but three of the beds, including some beds that had increased in overall biomass. Not all of the losses can be attributed to the fishery or mortality among older mussels, however. The stocks on the Blackshore bed declined by 905 tonnes, the majority of which were younger mussels. This bed has suffered similar high losses previously. On each occasion, the absence of large numbers of dead shell within the bed suggests mortalities are not occurring in situ but that the mussels are potentially being washed away. This is supported by evidence from some of the previous surveys, in which changes to the mussel distribution seen between successive surveys have indicated large areas of the bed had broken away from where they had settled and had migrated south-eastward towards the river channel. These observations strongly suggest the bed is naturally ephemeral and should be managed accordingly.

Although this is one of the few occasions in the past twenty years that the total mussel biomass has exceeded 13,000 tonnes, the majority of the older, more established beds are in poor condition, with sparse coverage, lots of dead shell and poor-quality, barnacle-encrusted mussels. Where some of these beds have benefited from fresh recruitment in recent years, the younger mussels have helped to improve mussel density and biomass, while the two new beds at Skate Run and Back of the Wall, which appear to have benefitted from large settlements in the past three years, support good densities of young, clean mussels.

Prospects for a 2023 Mussel Fishery

In order to open a mussel fishery within The Wash, The Authority must demonstrate that the proposed fishery will not impact on site integrity of the Wash's designated Marine Protected Areas. To facilitate this, the management of the mussel fishery is subject to a suite of agreed conditions contained in the 2008 Wash Shellfish Policies², which were developed to enable the site's Conservation Objective targets to be met. These include measures that aim to:

- Maintain stocks above the Conservation Objective targets of 12,000 tonnes total stock and 7,000 tonnes adult stock,
- Limit the Total Allowable Catch of the dredged harvestable fishery to 20% of the "adult" stock biomass, and the dredged relaying fishery to 20% of the juvenile stock biomass, with an additional 2% added to each for the hand-worked fisheries.
- Restrict exploitation so that fisheries do not reduce stock densities on individual beds below a minimum density of 25 tonnes/hectare (Note – this measure does not apply to vulnerable/ephemeral beds).

² https://www.eastern-ifca.gov.uk/wp-content/uploads/2022/01/2022_01_27_stock_survey_summary.pdf

- Protect adult stocks from the relaying fishery and juvenile stocks from the harvestable fishery by opening the most appropriate beds for each fishery based on their stock composition.

The stock survey is considered in the context of the management policies below.

Wash intertidal harvestable and relaying fisheries

If the stocks allow, the inter-tidal beds support two fisheries; a harvestable fishery, in which adult (≥ 45 mm length) mussels are landed directly for market, and a relaying fishery, in which seed (< 45 mm length) mussels are re-laid onto private lays for growing-on.

Because the biomass of adult mussels has failed to achieve the 7,000 tonnes Conservation Objective target, there are insufficient stocks to open a harvestable fishery this year. The harvestable fishery must, therefore, remain closed and beds supporting predominantly adult mussels must be protected from a potential relaying fishery.

Despite the general poor condition of the beds, the total stock biomass is 1,147 tonnes above the 12,000 tonnes Conservation Objective target and the juvenile stock biomass exceeds the 5,000 tonnes threshold required to open a seed fishery. A seed relaying fishery can, therefore, be opened. The following management measures would be required in accordance with the Management Policies.

Total Allowable Catch (TAC) for relaying fishery

The biomass of juvenile mussels was found to be 8,677 tonnes. A TAC based on 20% of this would be 1,735 tonnes (plus 174 tonnes for the hand-worked fishery). A fishery of this size, however, would reduce the stocks below the 12,000 tonnes Conservation Objective target. The maximum size of the relaying fishery (including the hand-worked element) should, therefore, be limited to a maximum of 1,147 tonnes.

Beds to be opened to relaying fishery

To minimise disturbance to adult stocks, the relaying fishery can only target beds that are composed predominantly of juvenile mussels. To prevent over-fishing occurring on individual beds, average mussel densities should also be maintained above 25 tonnes/hectare within each bed. Although the mean density of mussels on the Blackshore bed is currently below 25 tonnes/hectare, the bed is believed to be vulnerable/ephemeral so could also be opened under the 2008 policies.

Taking into account the above conditions, 7 beds could potentially be opened to the 2023 relaying fishery. These are listed in table 2, which also shows the maximum mussel harvest that could be taken from each before their average densities fell below the 25 tonnes/hectare threshold (or in the case of the Backshore bed, 50% of the mussel biomass was removed). A total of 1,439 tonnes could potentially be removed from these beds, sufficient to satisfy the maximum available TAC of 1,147 tonnes). Charts highlighting the areas proposed to be opened to the relaying fishery are shown in Appendix 1.

Table 2. Beds that could be opened to the 2023 relaying seed fishery and the maximum harvest rates that the policies would allow

Bed	Maximum harvest
Shellridge	130
Tofts	28
Herring Hill	180
Trial Bank	292
Back of the Wall	507
Skate Run	196
Blackshore	106
TOTAL	1,439

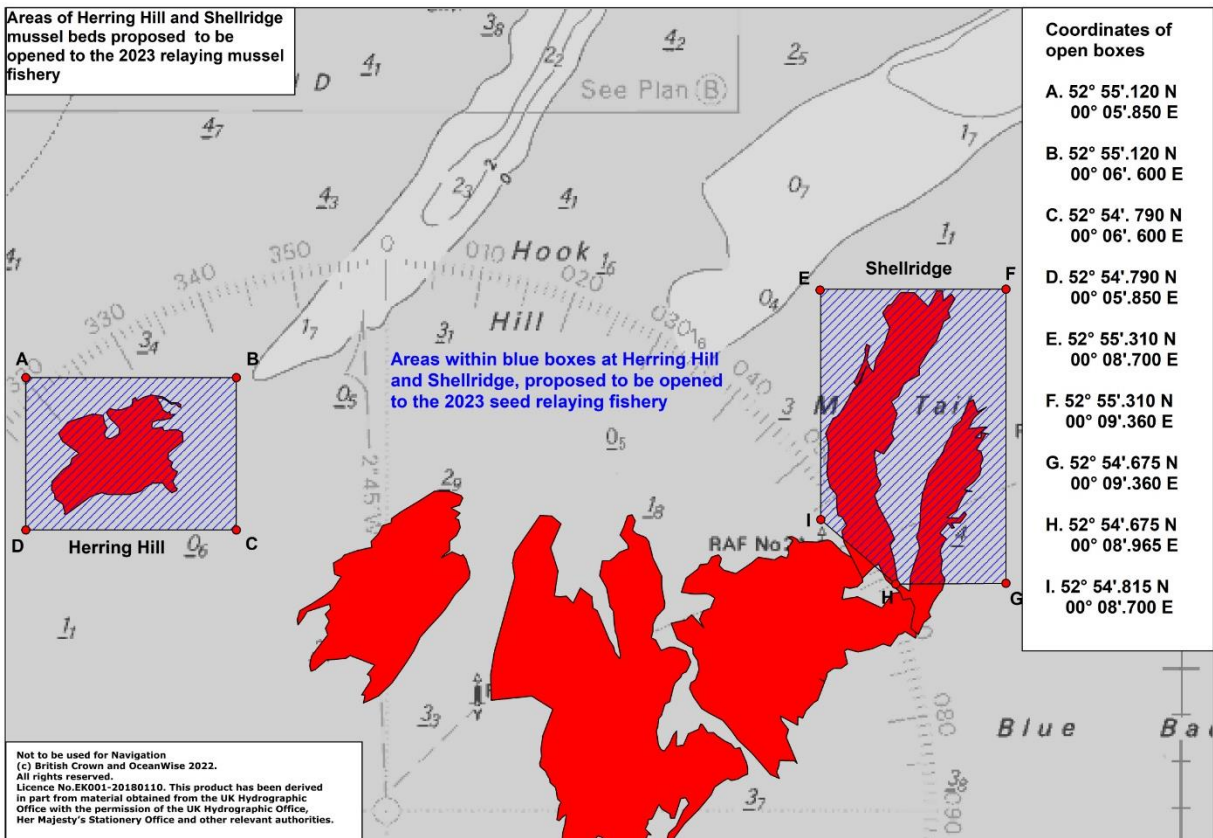
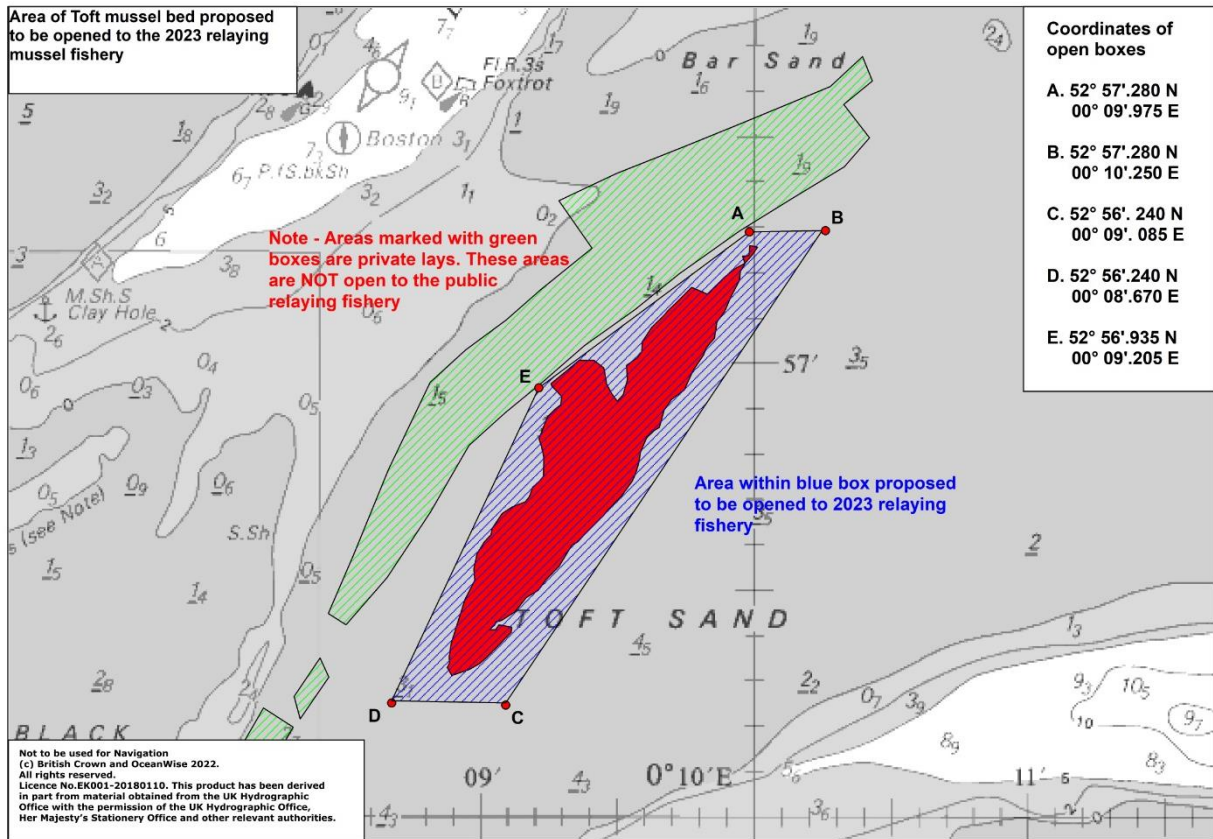
Fishing methods

While the mussel relaying fisheries are traditionally undertaken using both dredges and via hand-working, the majority of the fishery is usually targeted using dredges (the use and specification of which are governed by a combination of WFO Regulations and licence conditions). Traditionally, the TAC for the dredge fisheries has been set at 20% of the stock biomass, with an additional 2% reserved for the hand-worked fisheries. With a maximum TAC of 1,147 tonnes available, based on those proportions, the maximum TAC for the dredge fishery would be 1,043 tonnes and 104 tonnes for the hand-worked fishery.

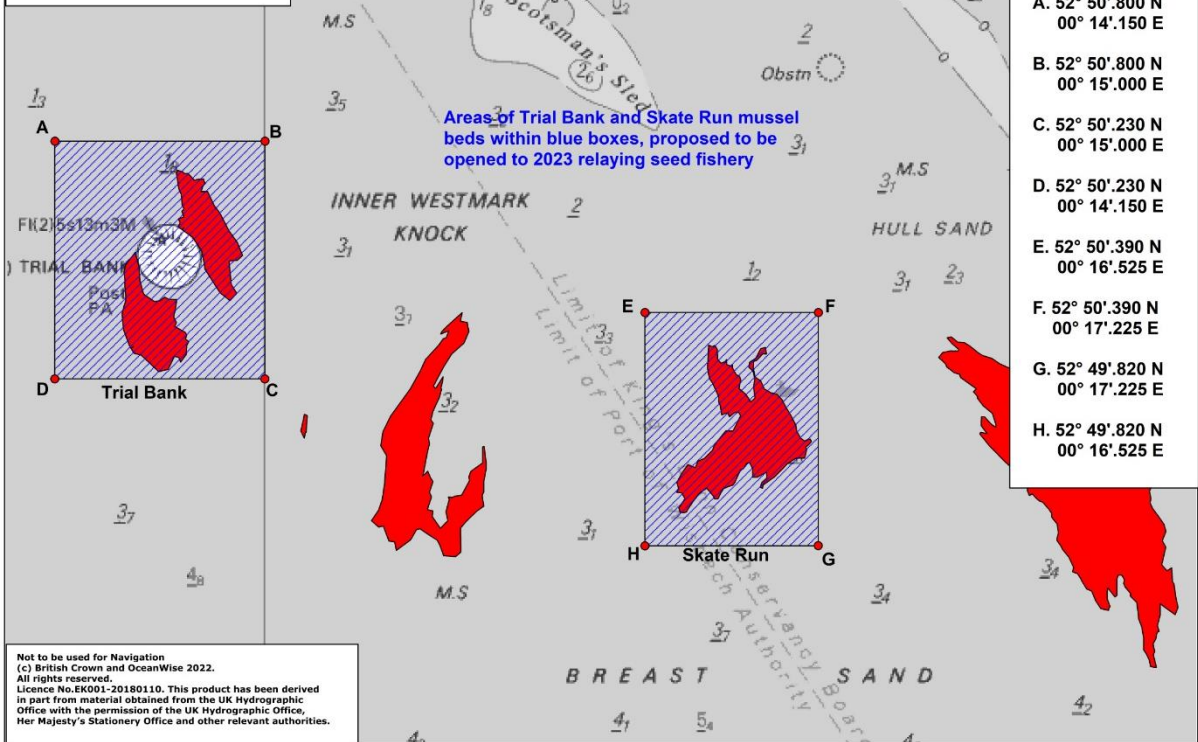
The Welland Wall Mussel Fishery

The cracks and crevices between the rocks of the man-made Welland Bank training wall provide shelter for mussel seed to settle and protection for juveniles. This protection, and the fact that the rocks cannot be dredged mean overfishing is unlikely to occur. Differences in habitat mean the mussels growing on the Welland Wall are considered to be discrete and independent to those on the inter-tidal beds and, as such, are managed separately. The mussels on the Welland Wall do not contribute towards the Conservation Objective targets so are not constrained by them. Because there is a very low risk of overfishing occurring, the Welland Wall mussel fishery is usually left open. The 2022 survey found the mussel biomass on the wall had increased from 2021, and so the Welland Wall Fishery can remain open with existing management measures maintained.

Appendix 1:- Charts showing the beds proposed to be opened to the 2023 mussel relaying fishery



Areas of Trial Bank and Skate Run mussel beds proposed to be opened to the 2023 relaying mussel fishery

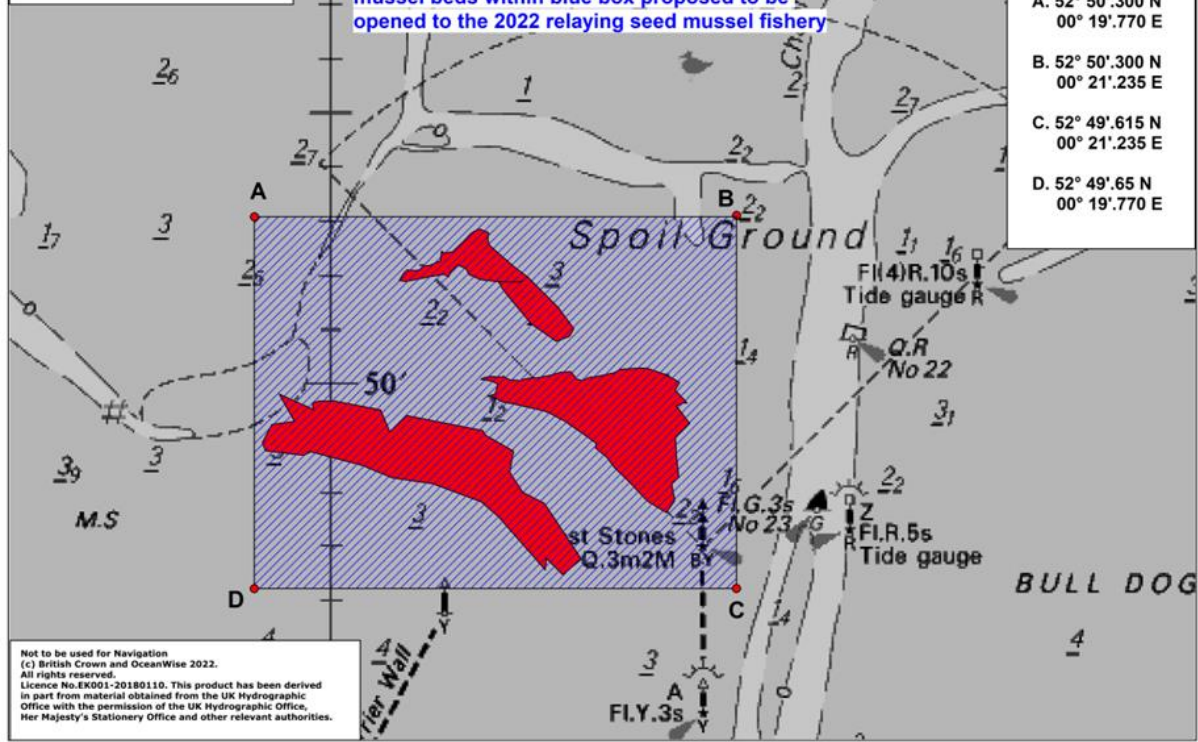


Coordinates of open box

- A. 52° 50'.800 N
00° 14'.150 E
- B. 52° 50'.800 N
00° 15'.000 E
- C. 52° 50'.230 N
00° 15'.000 E
- D. 52° 50'.230 N
00° 14'.150 E
- E. 52° 50'.390 N
00° 16'.525 E
- F. 52° 50'.390 N
00° 17'.225 E
- G. 52° 49'.820 N
00° 17'.225 E
- H. 52° 49'.820 N
00° 16'.525 E

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Area of Blackshore and Back of the Wall mussel beds proposed to be opened to the 2023 relaying mussel fishery



Coordinates of open box

- A. 52° 50'.300 N
00° 19'.770 E
- B. 52° 50'.300 N
00° 21'.235 E
- C. 52° 49'.615 N
00° 21'.235 E
- D. 52° 49'.65 N
00° 19'.770 E

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