

NWIFCA Technical, Science and Byelaw Committee

13th of August 2024: 10:00 a.m.

Agenda Item

6

SURVEY AND INSPECTION REPORT 24TH OF MAY – 13TH OF AUGUST 2024

Purpose:

- a) To report on the results of the mussel surveys and inspections in the last quarter.
- b) To report on the results of the July 2024 District cockle surveys and inspections

Recommendation: Approve the following:

- a) Receive the report and related survey and inspection notes
- b) Approve that the Flookburgh and Leven cockle beds are opened as of September 1st 2024 under Byelaw 3.
- c) Approve that the Flookburgh and Leven cockle fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.
- d) Approve that the Pilling cockle bed is opened as of 1st of October 2024 under paragraph 15 of Byelaw 3, subject to additional inspection.
- e) Approve that the Pilling fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.
- f) Approve that the Leasowe cockle bed is opened as 1st of October 2024 under paragraph 15 of Byelaw 3, subject to additional survey.
- g) Approve that the Leasowe fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.
- h) Approve that all other District cockle beds, including Aldingham and Newbiggin, Middleton and Southport remain closed for the rest of the closed season, and from September 1st 2024 under paragraph 15 of Byelaw 3.

BACKGROUND

Every year NWIFCA officers undertake extensive surveys and inspections of the cockle and mussel beds across the NWIFCA District. The aim of the surveys is to conduct stock assessments on each bed. The aim of inspections is to gather information in areas that either; a) do not have enough stock to warrant a survey, and/or b) conditions of the bed preclude surveying – for example, large channels or short exposure times which limit the time officers can safely access. Inspections may also take place to see if a full stock assessment is needed.

Mussel bed surveys and inspections

Large, accessible mussel beds that are stable (large areas are not frequently washed away) are typically surveyed by the Dutch Wand method. This method allows officers to calculate an overall biomass of stock on the bed, identify the proportion of the population that is size, and map a perimeter. Beds that are typically surveyed by Dutch Wand include: Foulney mussel bed, Low Bottom, and Walney Channel. Mussel beds which are exposed for short amounts of time or are typically fished

for seed mussel and are therefore liable to large changes over short periods are inspected visually, with reports presenting pictures and a description of the stock. Beds that are typically inspected using this approach include: Fleetwood, South America, Falklands, and Heysham.

Mussel inspection methodology overview

Inspections of mussel beds are undertaken by officers who will walk the perimeter of the mussel bed with GPS to map the location and extent. Officers will then access the middle of the bed and as much as can reasonably be accessed, taking notes on this size, coverage, presence of any important features (presence of sabellaria, exposed cobble and boulder substrate, depth of mud, indications of scour, looseness of mussel), and mussel size composition. Full inspection criteria is detailed in the agreed in Agenda Item 10 at the February 6th 2024 TSB meeting (<https://www.nw-ifca.gov.uk/app/uploads/Agenda-Item-10-Seed-mussel-definition-of-ephemerality-TSB-February-2024.pdf>). Typically these surveys are limited by tides and can only be conducted on spring tides. Inspections are undertaken to assess the suitability of a bed for either a seed or size fishery.

Cockle bed surveys

The purpose of cockle surveying is to establish data regarding the abundance, density and location of cockle stocks to inform fisheries management. Most cockle beds in the district are surveyed using the methodology outlined below.

Cockle survey methodology overview

Cockle surveys are undertaken by splitting each bed extent into a grid of sample points spaced between 250 to 500 m apart. Typically, each bed has between 40 and 150 sample points depending on its size. Each year, officers survey a minimum of approximately 750 sample points across the main beds from Morecambe Bay, the Ribble Estuary and Leasowe.

Sample locations are mapped on a GPS to ensure each year the same locations are surveyed. Officers access each sample location by quad, jumbo the sand to fluidise the sediment to cause cockles to rise to the surface and lay down a 0.5 m2 quadrat. Officers pick and rake the cockles within the quadrat and collect them for analysis in the lab. In the lab, cockles are separated into size cohorts (0.1-<5mm, 5-<15mm, 15-<20mm, 20-<25mm, 25-<35mm, +35mm) and record the number in each. A total of 200 cockles (100 undersize, 100 size) are taken from the bed as a whole, for analysis of weight and length. From this data, the overall proportion of size and undersize and total stock biomass is estimated.

1. MUSSELS

Between May 24th and August 13th, NWIFCA science officers carried out seven mussel inspections across NWIFCA District. Full inspection reports are provided in Annex 1 of this report. The location and extent of the beds inspected are provided in Figures below.

Table 1. Mussel survey and inspections this quarter.

Surveys and inspections this quarter	Date
Mussels	
Morecambe Bay (Figure 1.1):	
Heysham inspection x 2	04-06-24 & 23-07-24
Wyre End	07-07-24
Fleetwood	26-06-24

South America	24-07-24
Dee (Figure 1.6):	
West Kirby	11-06-24
Thurstaston	11-06-24
Solway	
Solway subtidal beds (sidescan from boat)* analysis in draft	19-06-24

a) Morecambe Bay Seed mussel fishery

Mussel beds are assessed each year to see if they can be opened as hand gathered or seed dredge fisheries. Typically these beds are located within Morecambe Bay. The conditions which we look for to allow a seed fishery to take place are:

- loose mussel,
- a single size class of seed (<1yr old) of dense settlement, (not mixed)
- a large amount of mussel mud underneath with little exposed cobble/boulder substrate, and
- a high probability of washing away (evidence of scour or loose mussel and historical trends).

The criteria that should be met in order for a fishery to be considered for opening is detailed in the definition of 'ephemerality' and the 'process for determining ephemerality' agreed at the February 6th 2024 TSB meeting (<https://www.nw-ifca.gov.uk/app/uploads/Agenda-Item-10-Seed-mussel-definition-of-ephemerality-TSB-February-2024.pdf>). This information is gathered through inspections and presented to the Authority.

This year, there has been very little seed mussel seed during inspections. Access to South America mussel bed has been difficult due to a change in the Leven channel and limited spring tides.

1.1 Morecambe Bay mussel beds overview

The location and extent of mussel beds surveyed in Morecambe Bay from May 24th to August 13th 2024 is provided in Figure 1.1. An overview of the status of the bed is provided in the following section. Full inspection reports with images are provided in Annex 1.

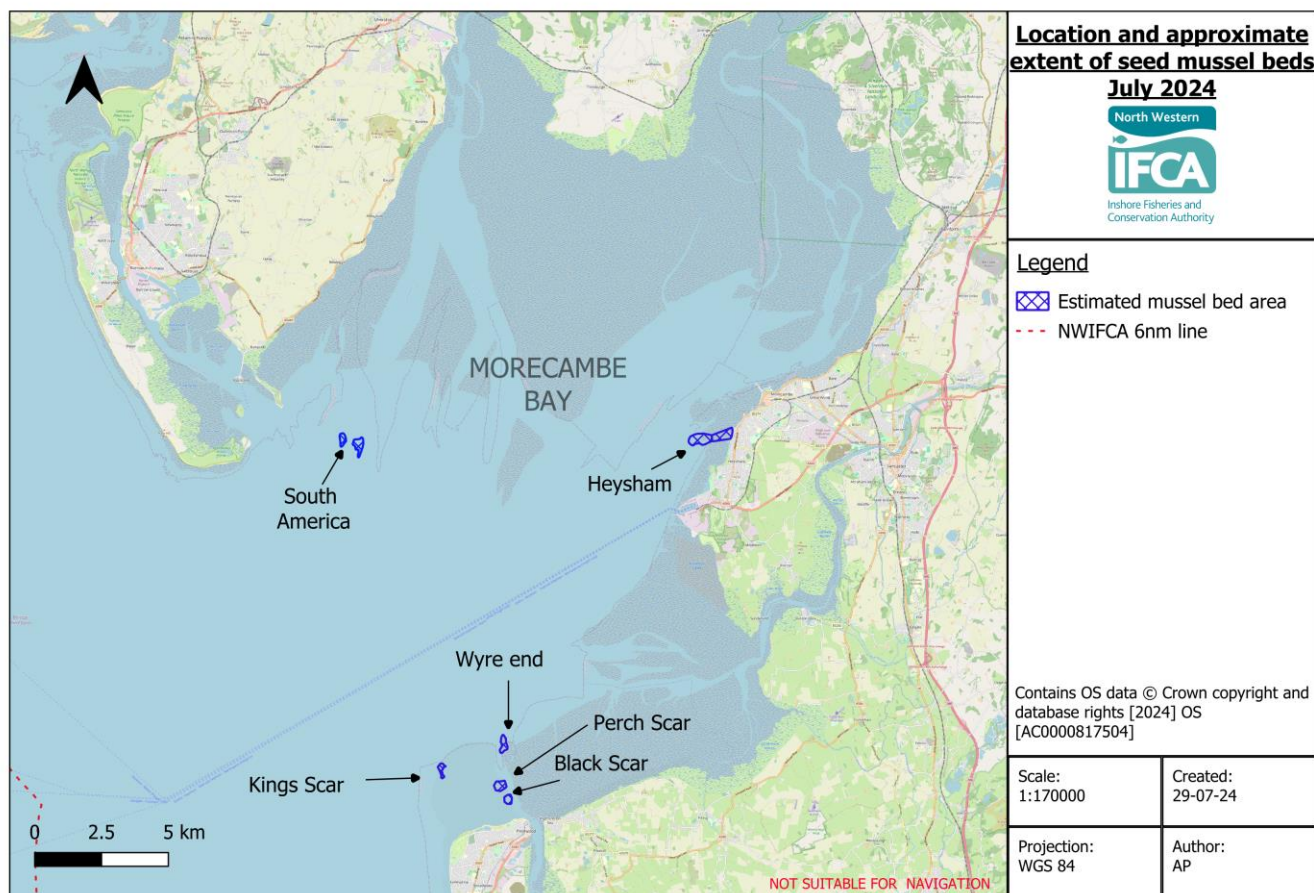


Figure 1.1 Surveyed and inspected mussel beds in Morecambe Bay from June to July 2024.
1) Heysham:

Heysham mussel bed was inspected on the June 4th and the July 23rd.

The outer skears appeared dark in colouration suggesting mussel is present but access to the outer skears was not possible across Dallam Dyke due to depth of water and timings.

On the main skear, there is a *Sabellaria alveolata* reef consisting of a mixture of remnant reef, dead reef and new live reef structures. There are areas of large reef on the mussel bed and areas where coverage is patchy. To the north and south of the skear is the main extent of the live *Sabellaria*. New patches of live *Sabellaria* were found near the channel edge. The majority of the *Sabellaria* was covered by mussel, with only a few sections now visible on the main skear.

Mussel coverage varied over the entire skear. There were areas of dense mussel with over 70% coverage and areas of patchy mussel with less than 30% coverage. The 2024 settlement was mixed in with the 2023 settlement. The mussel ranged in size across the bed from 10mm to 45mm and covered all substrates including cobble, dead shell, dead and live *Sabellaria alveolata*. There were also areas of bare cobble. Green algae was present on the skear amongst these substrates. Bird species were present in the area including oystercatchers and gulls.

This year, Heysham Flat will not be recommended for opening for hand gathered seed, this is based on the following factors:

1. Seed mussel density is low across the extent of the bed suitable to fish
2. Dense areas of seed are located over *Sabellaria*

2) Wyre end

Wyre end mussel bed was inspected on the 7th of July. Wyre end has at times been fished by hand gatherers for size mussel.

Officers surveyed the main skear and edges of the historical bed area (Figure 1.3). There has been a 2024 settlement of seed mussel, varying in density across the main skear. An area of raised pebble was observed along the eastern edge with none or very low density of seed. At the northern end of the bed some 25-30mm mussel was observed, this area also had algae present. Small patches of size mussel were observed along the western edge of the bed.

The patches of mussel on the channel edge present in the previous years survey had been scoured away leaving patches of mussel mud and very low seed coverage. The area of these patches were not mapped as there was no significant mussel present.

Eiders and gulls were present on the bed.

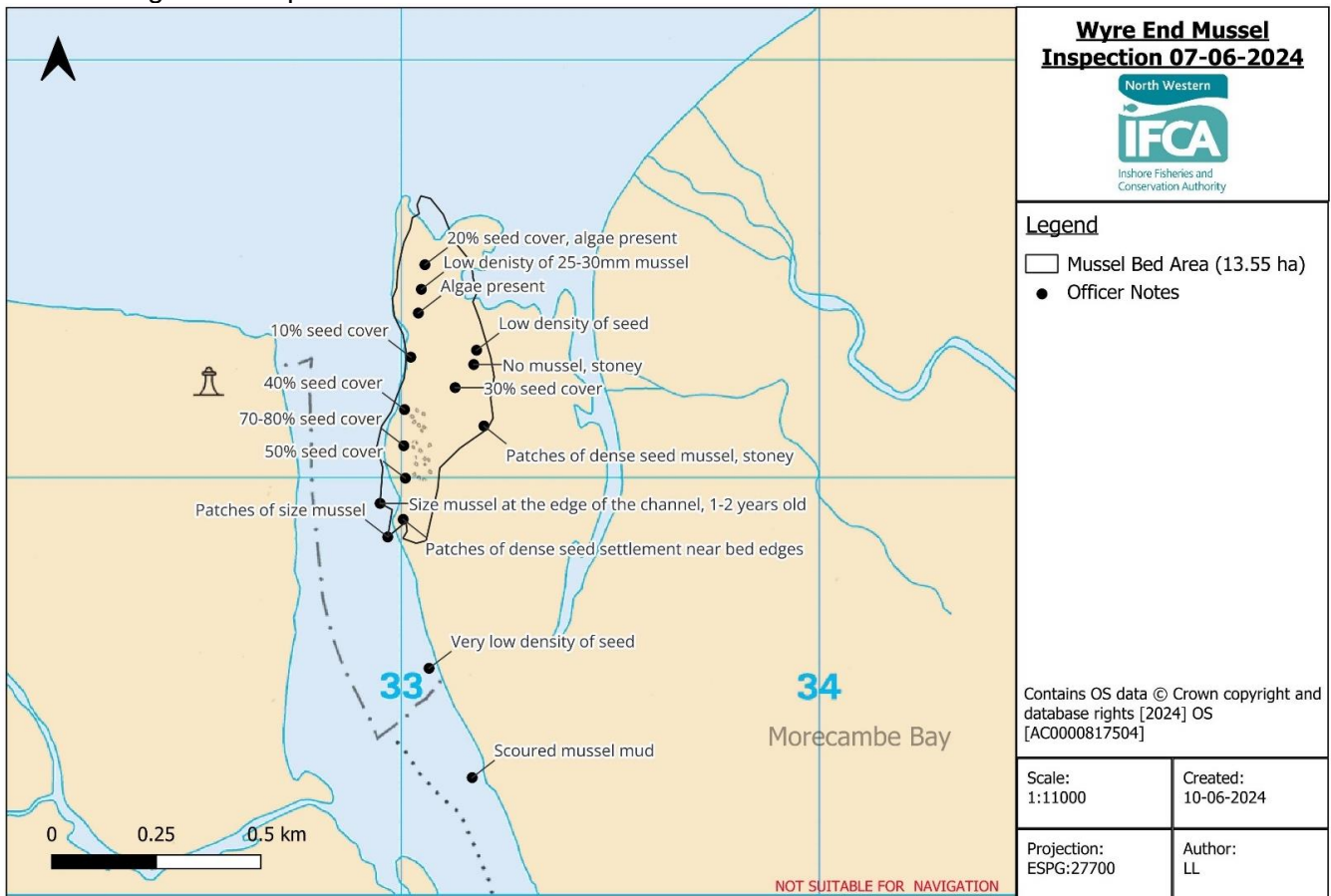


Figure 1.3 Approximate Wyre End bed area boundary and officer notes 07-06-2024

3) Fleetwood

Officers inspected Fleetwood mussel beds on June 26th. Black and Perch Scar beds are typically considered for commercial mussel (either hand or dredge fishing). Rossal, Neckings and Kings are not typically commercial beds and are surveyed to monitor additional food availability for birds.

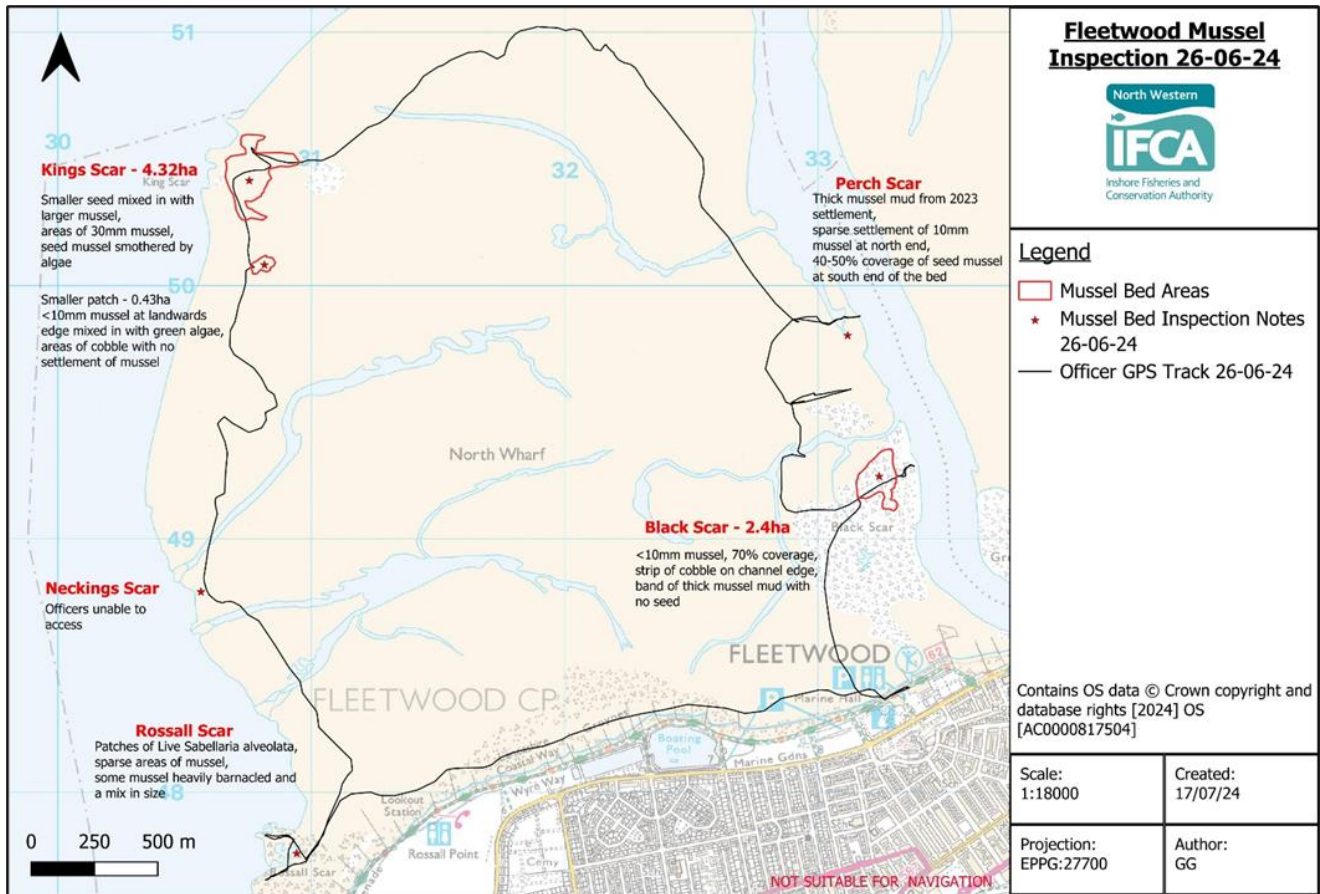


Figure 1.4. Approximate Fleetwood beds area boundary and officer notes 26-06-2024

Rossall Scar

The mussel on Rossall Scar is patchy and interspersed with cobble and small patches of live *Sabellaria alveolata*. There was a mix in size, and some mussels were heavily barnacled.

Neckings Scar

It was not possible to inspect Necking scar due to tide times this year

Kings Scar

The mussel on Kings Scar was patchy and varied across the bed in density, with some dense areas, and evidence of a 2024 settlement. There were patches of larger mussel measuring 30mm mixed in with smaller seed. Seed mussel was smothered by green algae and there were areas of bare cobble with no mussel settlement. The approximate area of the mussel bed was 4.32ha.

Perch Scar

Mussel mud covered the main extent of the Northern area with very sparse settlement. The mussel mud was thick and had remained from the 2023 settlement. There was no exposed cobble or bare substrate. The Southern area had a small 2024 mussel settlement covering approximately 40-50%. The mussel was approximately 8-10mm in size.

Black Scar

Black Scar has a 2024 settlement of approximately 70% coverage in a very small area. The mussel was 6-8mm. There was a band of thick mussel mud which had not received a settlement and a strip of bare cobble on the channel edge. The approximate area of the mussel was 2.4ha.

This year, Fleetwood mussel beds (inclusive of Perch and Black Scar) will not be recommended for opening, this is based on the following factors:

1. Low seed mussel settlement and coverage

4) South America

Due to changes in the Leven channel and difficulties with tides this year, South America has only been accessed once on July 24th. Officers walked the perimeter of the historical bed, and a new area on the landward side (Figure 1.5).

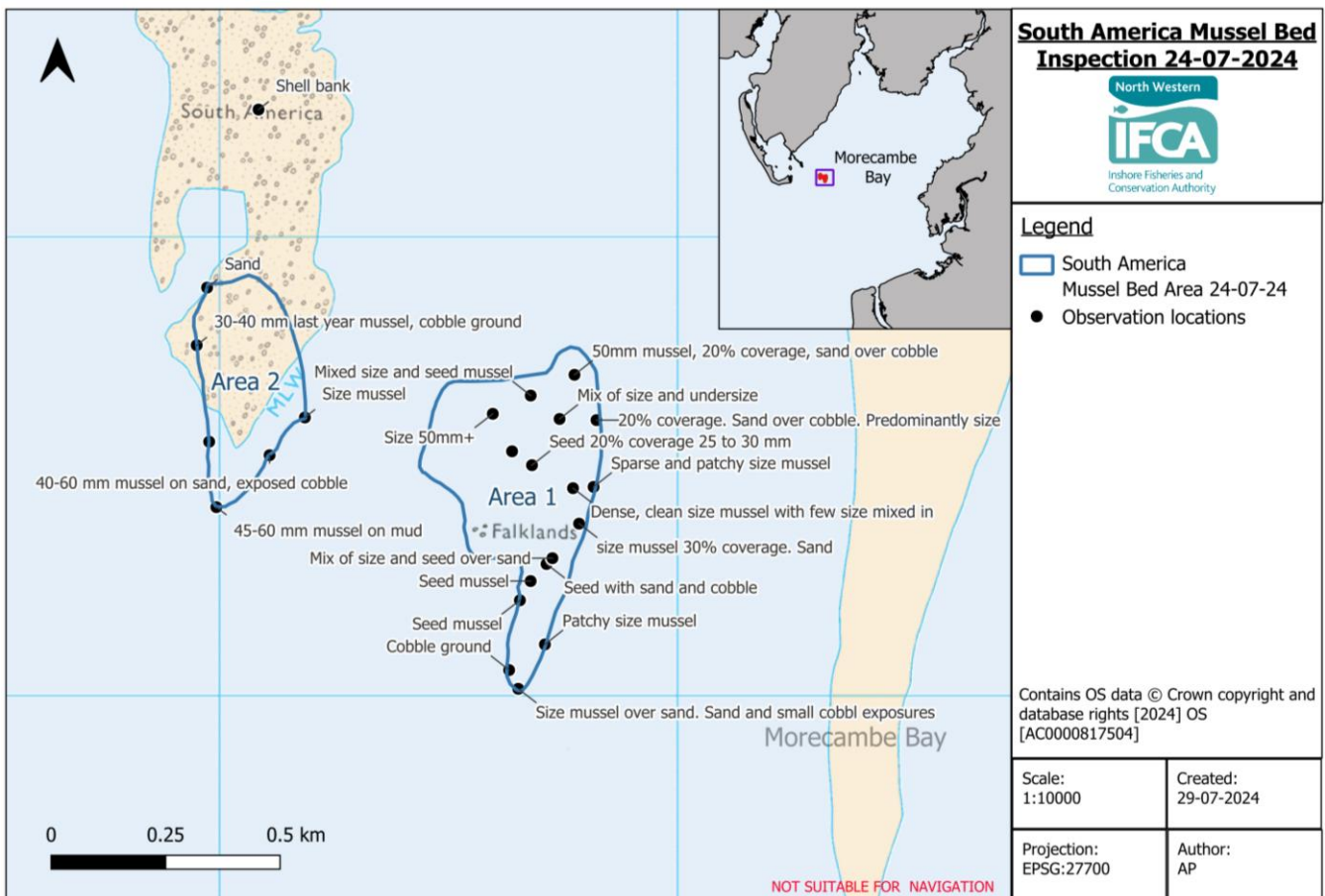


Figure 1.5 Approximate area of South America mussel bed (officer notes) as of 24-06-2024

Mussel on the historical bed area 1 was predominantly size mussel, with small areas of undersized mixed in. much of the mussel was on sand over cobble, with little cobble exposure. The area is not suitable for seed dredging.

The southern extent of bed area 2, consisted predominantly of size mussel 45-60mm on a sandy substrate at a density of 40-50%, with the area of highest density (60-70%) mussel on the southern tip of the bed. From the centre of the bed moving North the mussel is smaller, 30-40mm, reduces in density (20-40%) with more exposed cobble and a thinner layer of sand.

This year, South America will not be recommended for opening, this is based on the following factors:

1. This year the mussel bed does not meet the agreed criteria laid out in the definition of ephemerality
2. This year mussel is predominantly size, having survived the previous winter
3. This year mussel coverage is patchy and not showing signs of possible scouring or imminent loss

5) Falklands

The Falklands was not surveyed this year due to tide and access restraints

b) Dee mussel beds

The Dee mussel beds have typically not been suitable for seed dredging, but has been fished at low levels for size mussel. Stock is large and typically dominated by older mussel. The beds remain relatively stable with little observable change over the past few years. The stock is inspected as its presence contributes to bird food availability to protected species in the District. Further information is available in the full inspection report, with images, in Annex 1.

The location and extent of mussel beds surveyed in the Dee in June 2024 is provided in Figure 1.6.

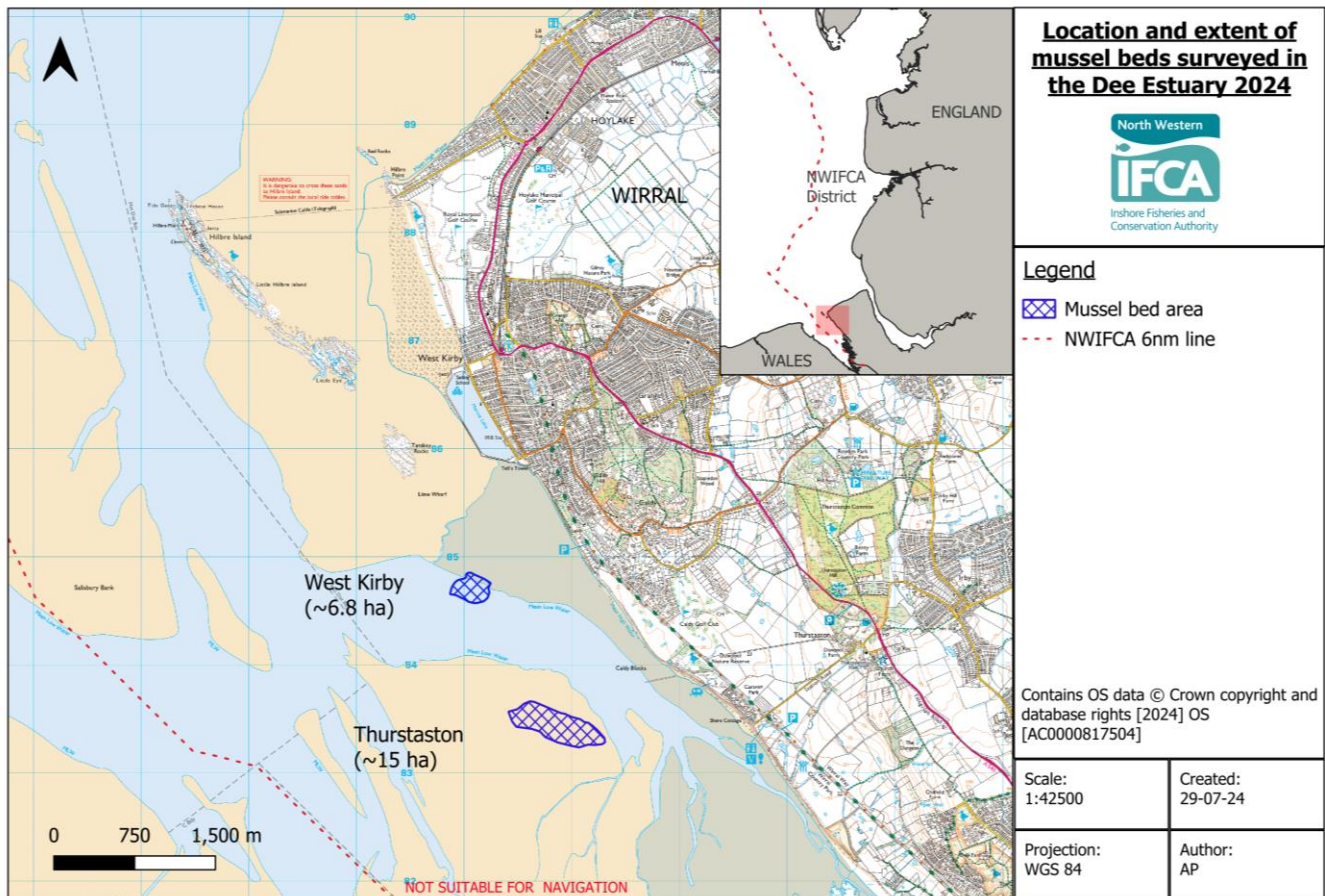


Figure 1.6. The location and extent of Dee mussel beds Thurstaston and West Kirby in June 2024

2. COCKLES

Between June 27th and July 26th, NWIFCA science officers carried out seven cockle surveys across NWIFCA District. Full survey reports are provided in Annex 2 of this report. The location and extent of the beds inspected are provided in Figures in the relevant section.

Table 2.1 Cockle survey and inspections this quarter.

Surveys and inspections this quarter	Date
Cockles	
<p>Morecambe Bay (Figure 1): Flookburgh Pilling Newbiggin and Aldingham Leven Middleton</p> <p>Ribble (Figure 2): Southport</p> <p>Wirral Coast (Figure 3): Leasowe</p>	<p>09-07-24 & 10-07-24 03-07-24 11-07-24 10-07-24 02-07-24</p> <p>27-06-24</p> <p>25-07-24</p>

When analysing results, NWIFCA look to answer the following questions which may assist in determining the stock levels, stock trends and HRA requirements.

- 1) What is the **biomass of size and undersize cockle** on individual beds and across the Bay as a whole,
- 2) What is the **density of size and undersize cockle** on individual beds and across the Bay, and
- 3) What is the **composition of size classes** on individual beds and across the Bay as a whole,

Additional considerations:

As has been previously discussed, there are several additional considerations when proposing the opening or closing of a fishery, which as yet do not have established parameters:

- 1) Bird food requirements for SPA designated species
- 2) Minimum cockle density spawning requirements
- 3) Location of cockle brood stock for re-seeding
- 4) An agreed threshold limit beyond which the fishery will remain closed
- 5) Criteria for selecting which beds should open in the event of low stock numbers.

Undersize cockle is typically important for; contributing to the following years fisheries, and as a food source for knot. Size cockle is important for oyster catcher, potentially contributing to spawning stock, and for the main fishery.

NWIFCA does not have an agreed minimum total cockle biomass for Morecambe Bay from which to recommend the opening or closing of a fishery. There are outstanding questions on the requirements of birds for food, location of potential sources of cockle brood stock for Morecambe Bay and cockle survivability of juvenile cockle is highly reliant on environmental factors.

2.1 Morecambe Bay July 2024 Cockle Results

Morecambe Bay cockle surveys were conducted for the second time this year, between July 2nd and July 11th.

Survey reports for all Morecambe Bay cockle beds were finalised on July 26th and are provided in Annex 2 of this report. Please note, as of April 2024, officers have standardised the survey note figures. The size of the pie charts corresponds to set values, making them comparable between beds and future surveys.

Officers collected and analysed 11,862 cockles from 500 sample points across 7,700 ha of Morecambe Bay. Figure 2.1.1 shows the location and extent of sample points for the respective beds.

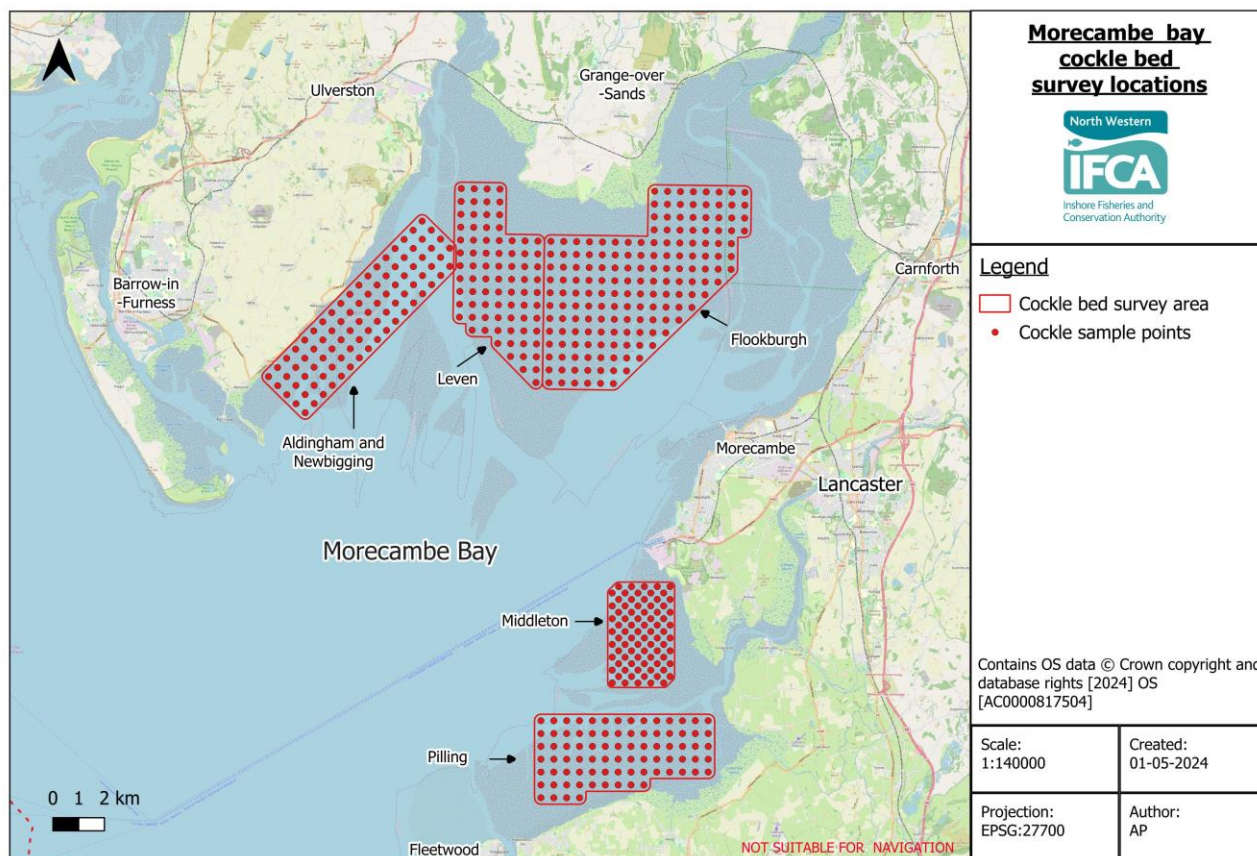


Figure 2.1.1 The location of sample points across Morecambe Bay cockle beds

A summary of the July survey results is provided in table 2.1.1.

Table 2.1.1. Biomass calculations of size, undersize and combined biomass of cockles on Morecambe Bay cockle beds July 2024. *figures represent the max cockle biomass

Cockle bed	Date surveyed	Area of cockle present (ha)	Size cockle (tonnes)	Undersize cockle (tonnes)	Total cockle biomass (tonnes)
Aldingham and Newbiggin	July 11 th 2024	1050	846	874	1720
Leven	July 10 th 2024	1250	573	305	878
Flookburgh	July 9 th & 10 th 2024	2675	3629	2551	6180
Warton Sands	na	na	na	na	Na
Middleton	July 2 nd 2024	747	518	216	734
Pilling	July 3 rd 2024	1500	1742	1640	3382

a. Biomass of size and undersize cockle across Morecambe Bay

Table 2.1.2 provides yearly maximum cockle biomass figures from 2017 to 2024. All surveys presented here were undertaken between June/July each year and are therefore comparable.

In July this year, there is an estimated and 7308 tonnes of size cockle and 5586 tonnes of undersize over 7247 hectares surveyed across Morecambe Bay.

Table 2.1.2. The yearly biomass of figures for size, undersize and total biomass of cockles on Morecambe Bay cockle beds from 2017 to 2024. *figures represent the max cockle biomass

Year	All surveyed Morecambe Bay cockle beds				Beds opened
	Area (ha)	Size cockle (tonne)	Undersize cockle (tonne)	Total cockle (tonne)	
2017	5177	6980	4230	11210	Flookburgh Leven Pilling
2018	6088	7000	12140	19140	Flookburgh Leven Pilling Newbiggin
2019	6705	4635	12900	17535	Flookburgh Leven Pilling Newbiggin
2020	8085	12580	3975	16555	Flookburgh Leven Pilling Newbiggin
2021	7089	6450	955	7415	Pilling
2022	6582	3950	1990	5940	None
2023	7730	3035	12975	16010	None
2024	7247	7308	5586	12894	TBC

Figure 2.1.2 shows the data from table 2.1.2 in graphical form to demonstrate the trends in cockle biomass across Morecambe Bay since 2017 (a and b), and the composition of this year's size and undersize cockle (c).

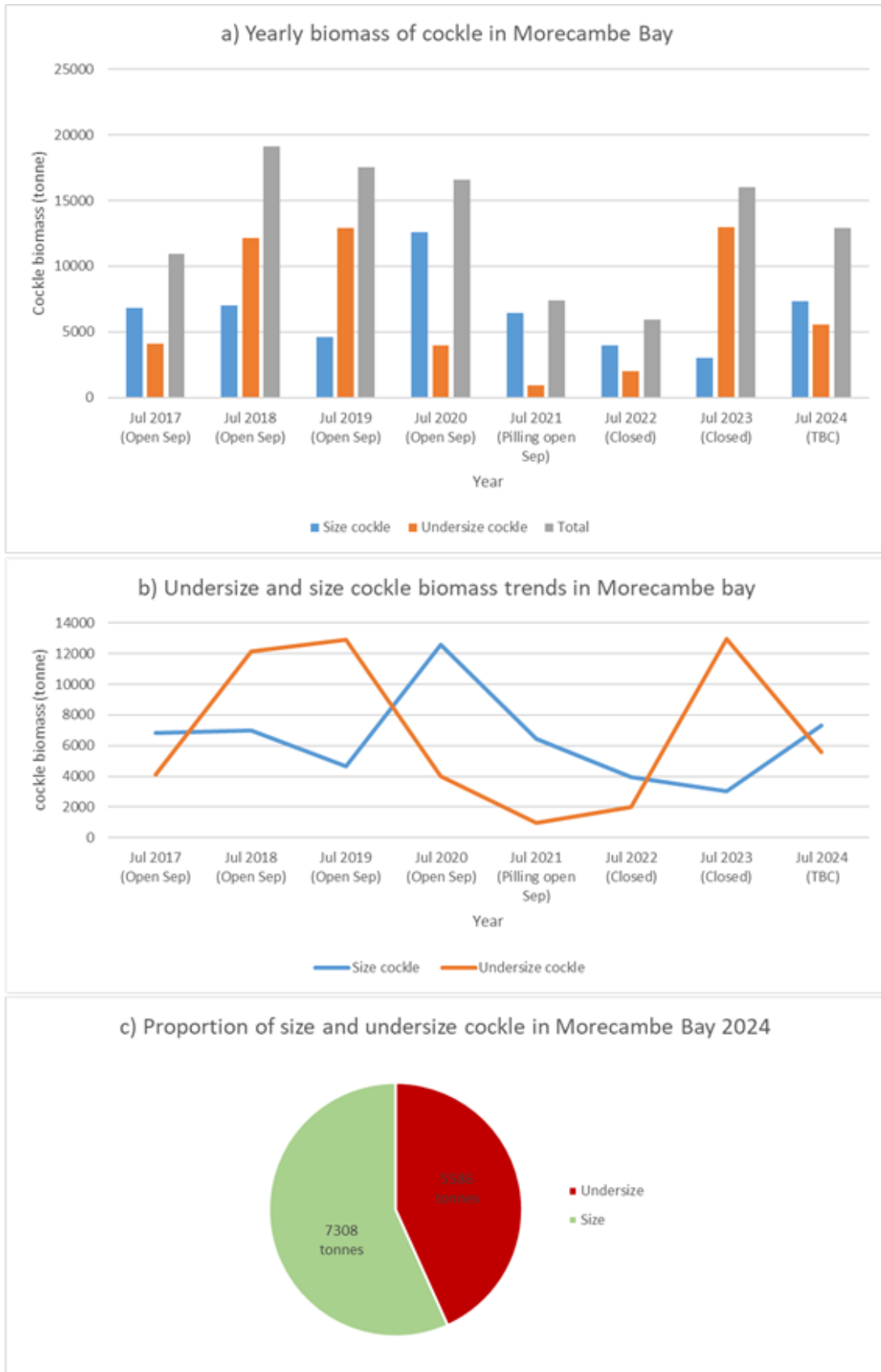


Figure 2.1.2. Summary of Morecambe Bay cockle survey results from July 2024. a) shows the yearly biomass of size, undersize and total cockle in Morecambe Bay from 2017 to 2024, b) the relational trend in size and undersize cockle from 2017 to 2024, and c) the composition of size and undersize cockle across Morecambe Bay in 2024

As of July 2024, the total biomass of cockle has decreased across Morecambe Bay from approximately 16,010 tonnes in July 2023, to 12894 tonnes (Figure 2.1.2 a). This decrease is likely due to the loss of some of the 2023 undersize cockle.

The total biomass of size cockle has increased from 3035 tonnes in July 2023, to 7308 tonnes in July 2024 (Figure 2.1.2.a). This is above the minimum threshold a fishery in Morecambe Bay has previously been recommended open.

Figure 2.1.2.b indicates the trend in the biomass of size (blue) and undersize (orange) cockle for Morecambe Bay as a whole since 2017. High levels of undersize cockle in 2018 and 2019 preceded an increase in the biomass of size cockle, one to two years later. In 2023, there was a significant increase in the biomass of undersize cockle, which would be expected to grow on in 2024 to support an increased biomass of size cockle. An increase in size biomass has occurred this year, likely the result of the previous year's undersize growing to size over the summer months.

There has also been a significant decrease in the proportion of undersize cockle across the Bay, possibly due to the 2023 size cohort growing on to size this summer, and also natural mortality. There has been very little spat settlements seen during surveys this season.

The proportion of size to undersize is greater this July (Figure 2.1.2 c) than in results presented at the May TSB meeting from April 2024 surveys. Considering this alongside the overall increase in size biomass demonstrates the growing on of undersize through to size during the summer months.

The density of size and undersize cockle across Morecambe Bay

Average density of size cockle across Morecambe Bay is 12 cockle per m². This is an increase from 5 per m² in July 2023.

Average density of undersize cockle across the Bay is 19 cockle per m². This is a decrease from 89 per m² in July 2023.

Less than 5mm cockle are not used in the undersize density or biomass figures due to the highly variable nature of survivability.

b. Individual beds

An analysis of survey data for each of the main cockle beds in Morecambe Bay is presented below.

Morecambe Bay is considered in its entirety due to the overarching SPA and SAC designation of the site, however, individual beds may be **opened if they meet the HRA requirements for the site as a whole**. Survey results for each cockle bed are provided in Annex 2. It is also important to consider all information provided when building a recommendation for a fishery, and not any one piece in isolation. For example, understanding the composition of size and undersize on a bed, distribution of cockle, and total overall biomass can help with determining an appropriate recommendation.

c. Biomass of size and undersize cockle for individual beds

Figure 2.1.3a shows the biomass of size cockle for each surveyed Morecambe Bay cockle bed from 2017 to July 2024, and which beds were opened for fishing that same year.

All beds have seen an increase in size cockle biomass since 2023. Flookburgh is highest at approximately 3629 tonnes of size. This is the second highest biomass of size cockle on Flookburgh since 2017.

The bed with the second highest biomass of size cockle is Pilling cockle bed at approximately 1742 tonnes.

All other beds have increased in size biomass but remain relatively low in comparison to previous years. All beds have decreased in undersize biomass. Therefore, Pilling and Flookburgh will be considered for opening this year.

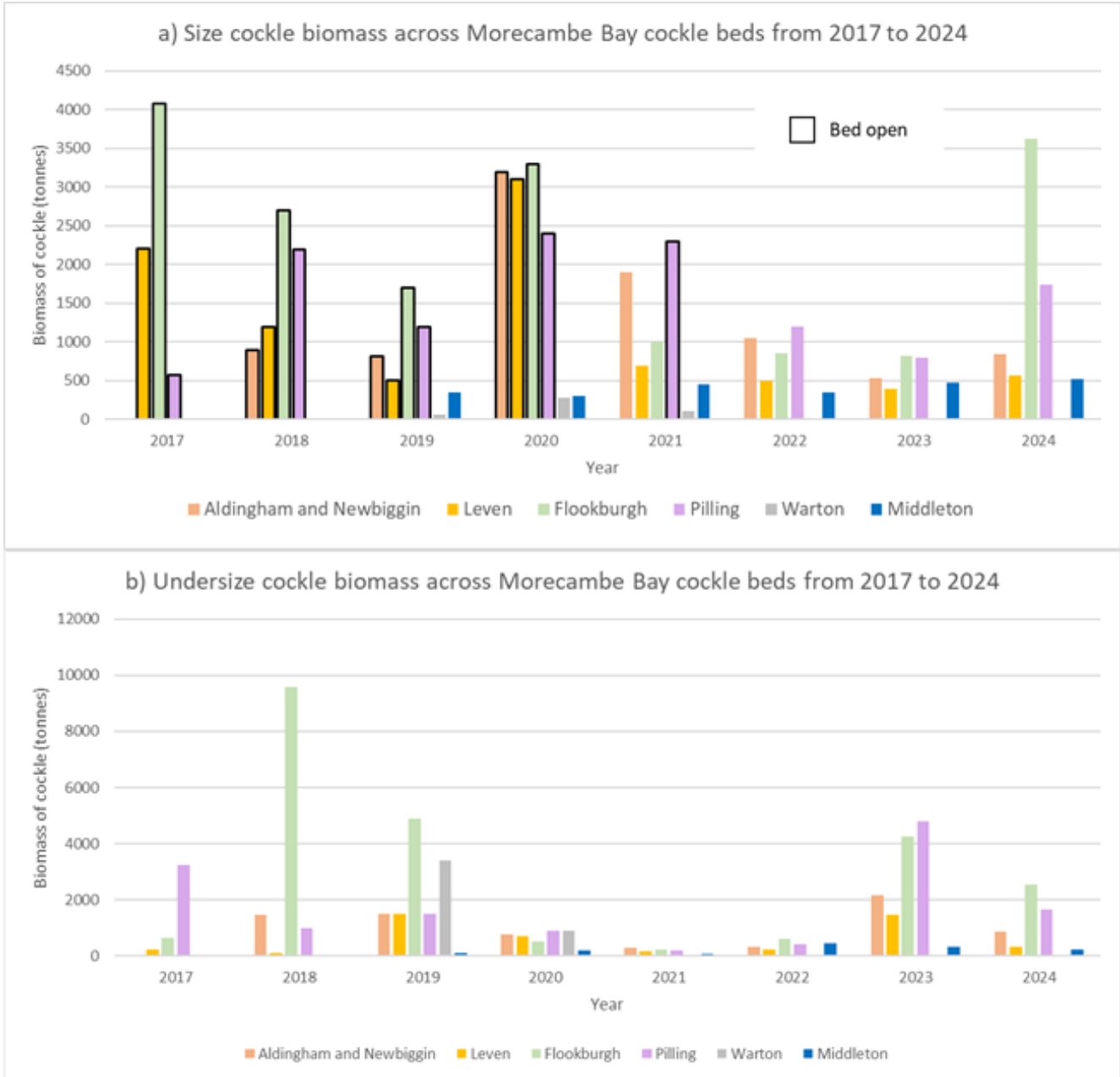


Figure 2.1.3 Biomass of size cockles on the individual Morecambe Bay cockle beds from 2017 to 2024, 2.a) the biomass of size cockle from 2017 to 2024 for all surveyed beds with the corresponding open beds, and 2.b) the biomass of undersize cockle on all surveyed beds from 2017 to 2024.

d. Biomass of cockle size classes on each bed

Figure 2.1.4 shows the biomass of cockles in each size class (0-5 mm, 15-20mm, 20-25mm 25-35mm and 35+mm) for the main Morecambe Bay cockle beds in July 2023, and July 2024 respectively. The two years have been provided for comparative purposes.

For Pilling, and Flookburgh beds, cockles in the 15-20mm size classes made up a large proportion of their total biomass in July 2023 (Figure 2.1.4 a). These cockles have subsequently survived the winter and grown on to contribute to the increase in the 25+mm category seen in 2024 (Figure 2.1.4.b). Typically, size cockle falls within the 24 mm+ category, (though there is variability among beds), therefore this increase in the 25-35mm category correlates with the increase in size biomass seen across the Bay.

The biomass of all size categories remains low across Aldingham & Newbiggin, Leven and Middleton.

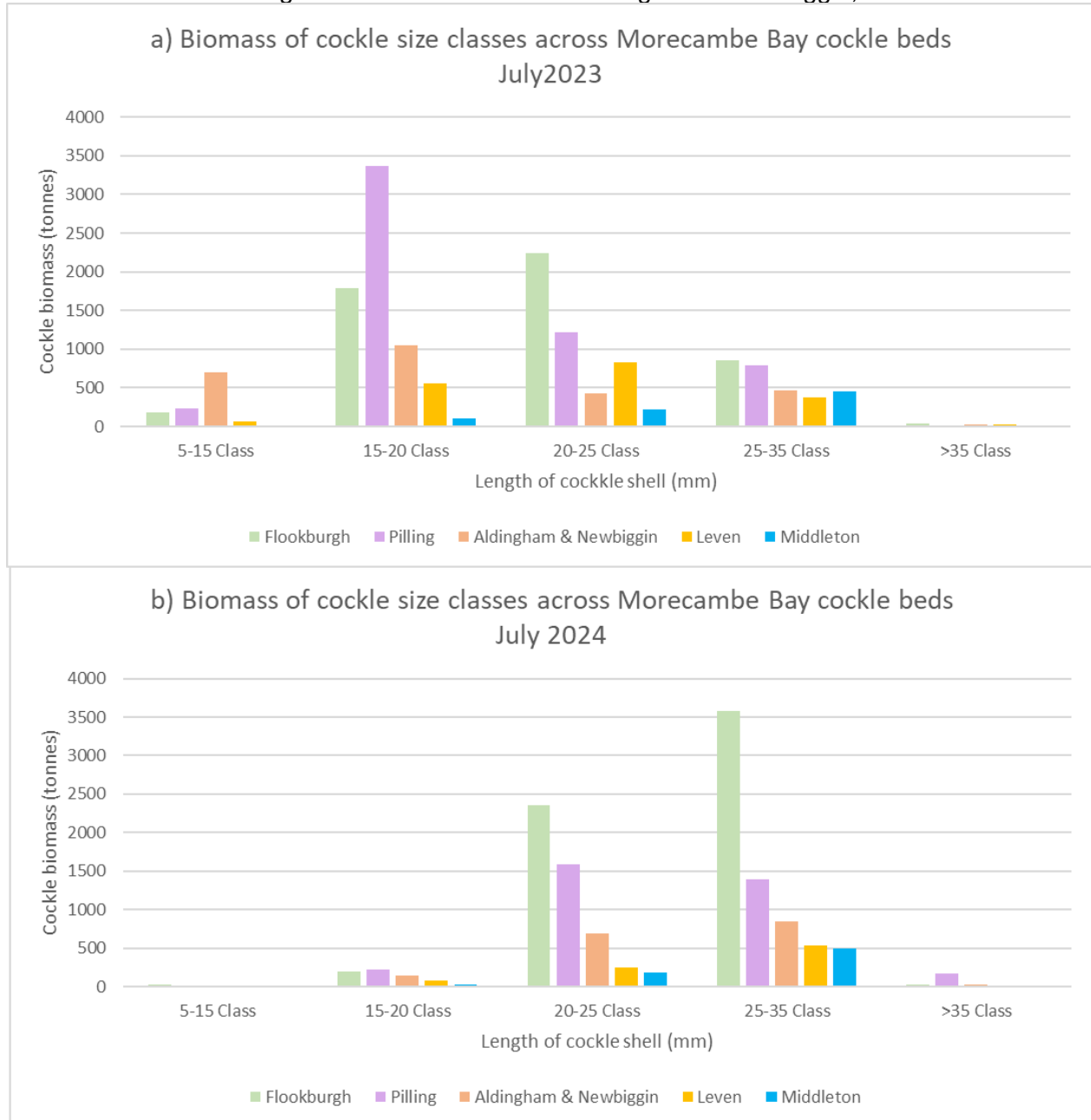


Figure 2.1.4. The biomass of different size classes of cockle for each of the Morecambe Bay cockle beds. 3.a demonstrates this for 2023, and figure 3.b for 2024 for comparison.

e. Composition of size classes on individual beds

The composition of size classes across a bed is important to consider as it has implications for fisheries management, and fishing highly mixed stock may have an impact on juvenile cockles survivability.

Figures provided in Annex 1– show a highly mixed composition of cockles across the beds, with size and undersize spread throughout..

3.4 Density of size and undersize cockle per m²

The average density of size cockle across all the beds has increased this year, though is still comparatively low on Leven, and Middleton. Flookburgh and Pilling have increased considerably in the density of size cockle (see Table 2.1.3). The density of cockle on Aldingham and Newbiggin has increased, however, the size of the bed has reduced considerably due to the movement of the Leven channel, which may have influenced this result.

Table 2.1.3. The mean number of size cockle per m² for each bed from 2018 to 2024. The cells highlighted green indicate years the beds were recommended open, and red cells indicate those recommended closed.

	2018	2019	2020	2021	2022	2023	2024
Aldingham and Newbiggin	7	7	12	4	4	4	9
Flookburgh	10	7	19	10	8	4	16
Leven	11	4	18	5	5	3	5
Pilling	21	8	17	17	7	6	14
Middleton	473	7	5	7	5	8	8

Summary:

The results of the 2024 Morecambe Bay cockle survey show:

1. Flookburgh and Pilling cockle beds have increased in size biomass since July 2023 and their numbers are comparatively high in comparison to previous years. All other beds have increased in size biomass but still remain low. (see figure 2.1.3).
2. The total biomass of cockle across the Bay has decreased since 2023, but size cockle biomass has increased.
3. The 15-20mm cockle size class identified in 2023 has grown on during May to July to contribute to a more significant size cockle class (see figure 2.1.4).
4. There is still a highly mixed composition of size and undersize cockle across all beds with few discrete patches of predominantly size cockle (see size frequency graphs in Annex 2).
5. The average density of size cockle has increased across the Bay and for the majority of beds (see table 2.13), but particularly for Flookburgh and Pilling.

Morecambe Bay cockle fishery recommendations:

Recommendation 1: Officers recommend that the Flookburgh and Leven cockle beds are opened as of September 1st 2024 under Byelaw 3.

This recommendation is based on the following factors:

1. **The biomass of size cockle is high** compared with previous years when the fishery has been opened at 3629 tonnes (see figure 2.3a)
2. The **cockle biomass across Morecambe Bay as a whole is high** compared with previous years (see figure 2.1.2) therefore there will be resource availability to birds across other areas of the Bay.
3. **Potential for further growth** - Though there is a mix of size and undersize across much of the bed (see figure 2.1.5 below), the undersize is predominantly in the 20-25mm category which will likely grow on during the late summer
4. **Assist stakeholder compliance** – Leven cockle bed boundary adjoins the Flookburgh cockle bed. The beds used to be separate but have become joined in recent years. Though the cockle biomass for this Leven is low, there is a small area of size (see figure 2.1.6) in the lower right corner, which may be fished. Given the rest of the bed is of low density and undersize, there is minimal risk of fishers targeting these areas, and allowing fishers to access the small area of size reduces their risk of non-compliance.

Recommendation 2: The fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.

This recommendation is based on the following factors:

1. Effort limitation
2. Additional feedback from responses to the consultation on early opening

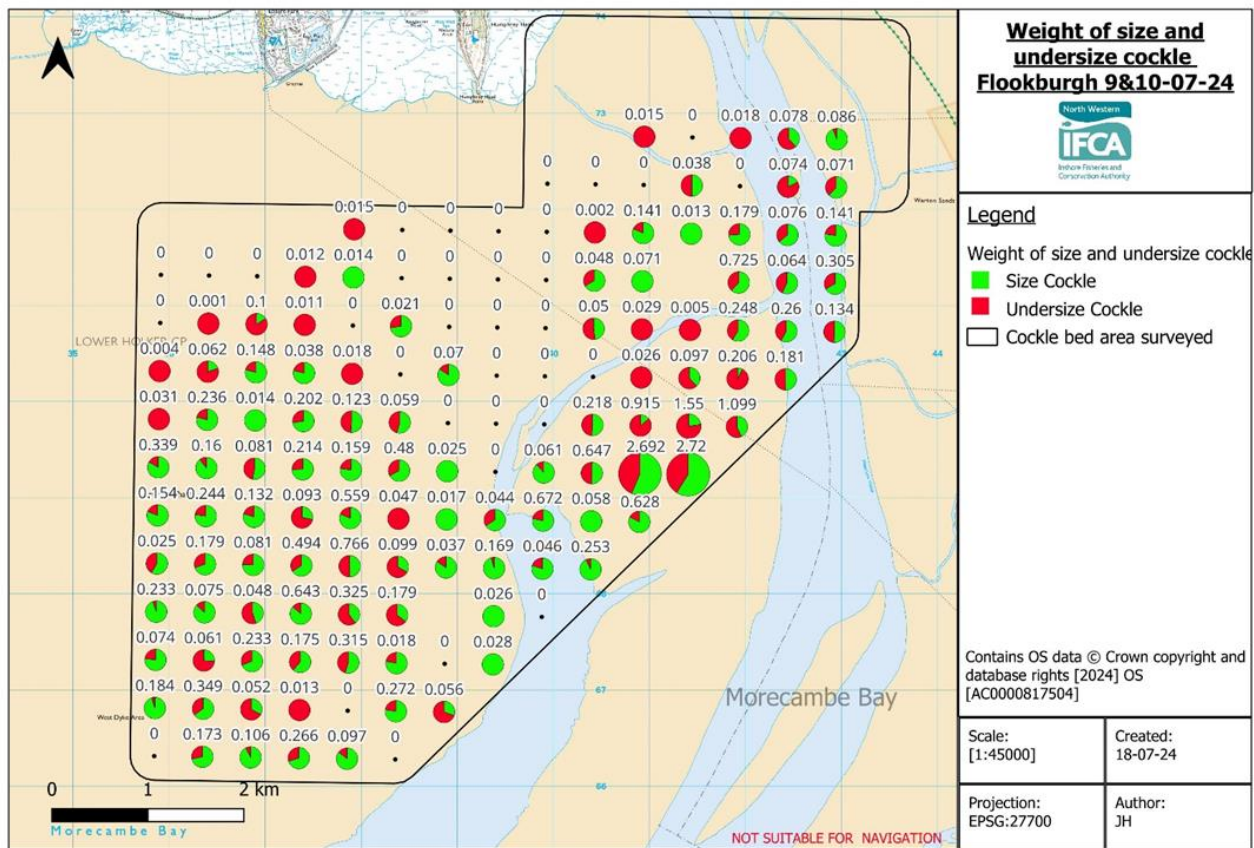


Figure 2.1.5. Proportion of size to undersize cockle on Flookburgh July 2024

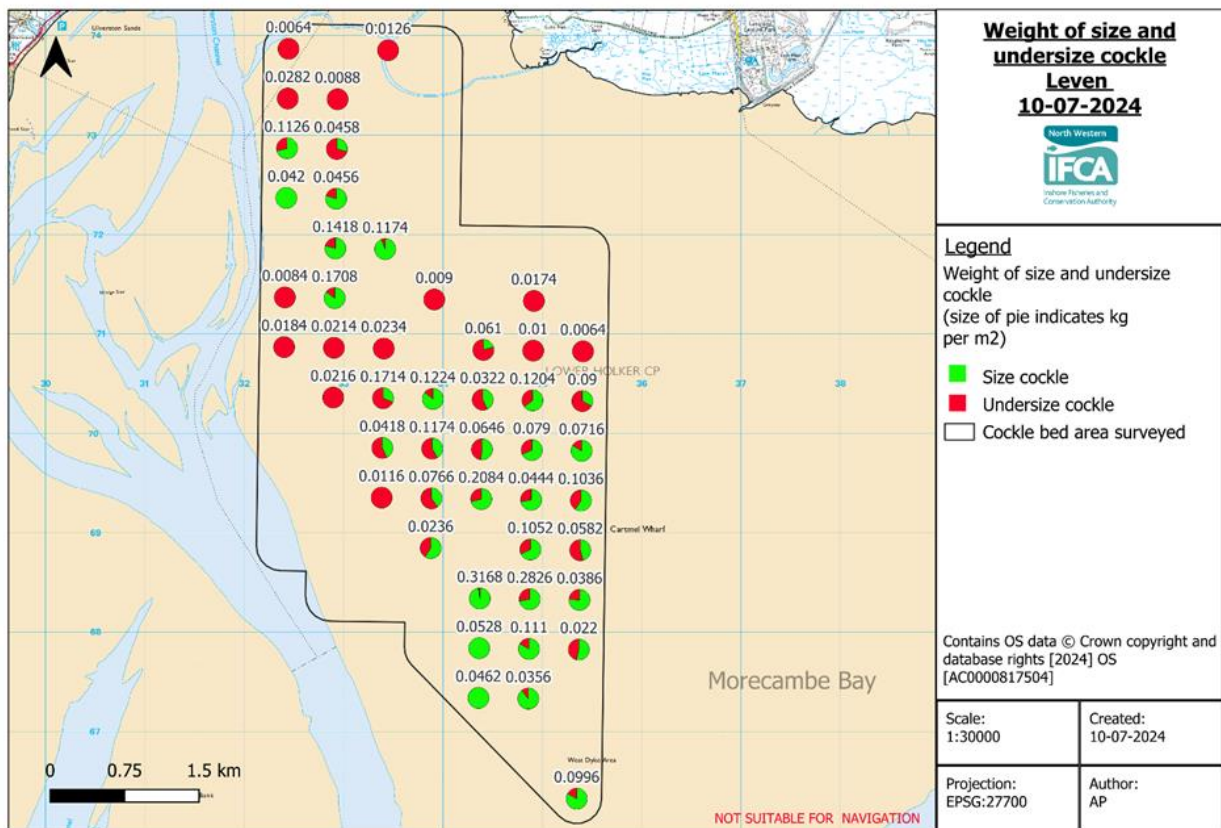


Figure 2.1.6. Proportion of size to undersize cockle on Leven July 2024

Recommendation 3: Officers recommend that the Pilling cockle bed is opened as of 1st of October 2024 under paragraph 15 of Byelaw 3, subject to additional inspection.

This recommendation is based on the following factors:

1. **Biomass of size cockle is** greater than the minimum biomass of size cockle the fishery has previously been recommended open, and the total cockle biomass of Morecambe Bay is comparatively high (see figure 2.1.3).
2. **The composition of the stock is highly mixed**, which increases the likelihood of undersize cockle being removed and disturbed. The densest areas of cockle are located in the west of the bed, and is highly mixed with the majority undersize – undersize cockle making up the majority of the biomass (see figure 2.1.7) .This has enforcement and riddling implications. Mixed cockle requires thorough riddling, and also has the potential to disturb stock on the ground should it struggle to re-settle. In previous years (2017 and 2019), though the biomass of size cockle was low, and the biomass of undersize large, there were discrete patches of size on the beds which allowed fishers to concentrate on areas where effort return was greatest, minimise riddling and disturbance to undersize stock. The Authority closed a portion of the Pilling cockle bed to facilitate this (see table for HRA justifications for previous years).
3. **Potential for further growth** - Though there is a mix of size and undersize across much of the bed, the undersize is predominantly in the 20-25mm category (see figure 2.1.4) which will likely grow on during the late summer – leaving the cockle bed for an additional month will allow the stock to grow on in the summer months will allow the undersize to grow on and reduce the highly mixed stock composition.

Table 2.1.4. Rationale for opening of Pilling cockle bed on lower stock volumes than 2024.

Year	Biomass of size	Biomass of undersize	HRA justification for opening
2017	571	3250	<ul style="list-style-type: none"> - Predicted low activity of 10 permit holders due to very high numbers on other beds that were open - Though there was a high biomass of undersize, size cockle was located in a discrete area, meaning fishing would not disturb undersize cockle. This would also limit disturbance of knot
2019	1200	1500	<ul style="list-style-type: none"> - Only east side proposed opened, as the west side had a highly mixed stock – areas of mixed stock were closed. - Discrete area of size cockle so only East portion of the bed was opened.
Comparison with 2024 concerns			
2024	1742	1640	<ul style="list-style-type: none"> - Highly mixed stock with limited discrete patches of size - Likely a greater number of permit holders targeting the stock as only Flookburgh cockle bed may be opened

Recommendation 4: The fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.

1. Effort limitation
2. Additional feedback from responses to the consultation on early opening

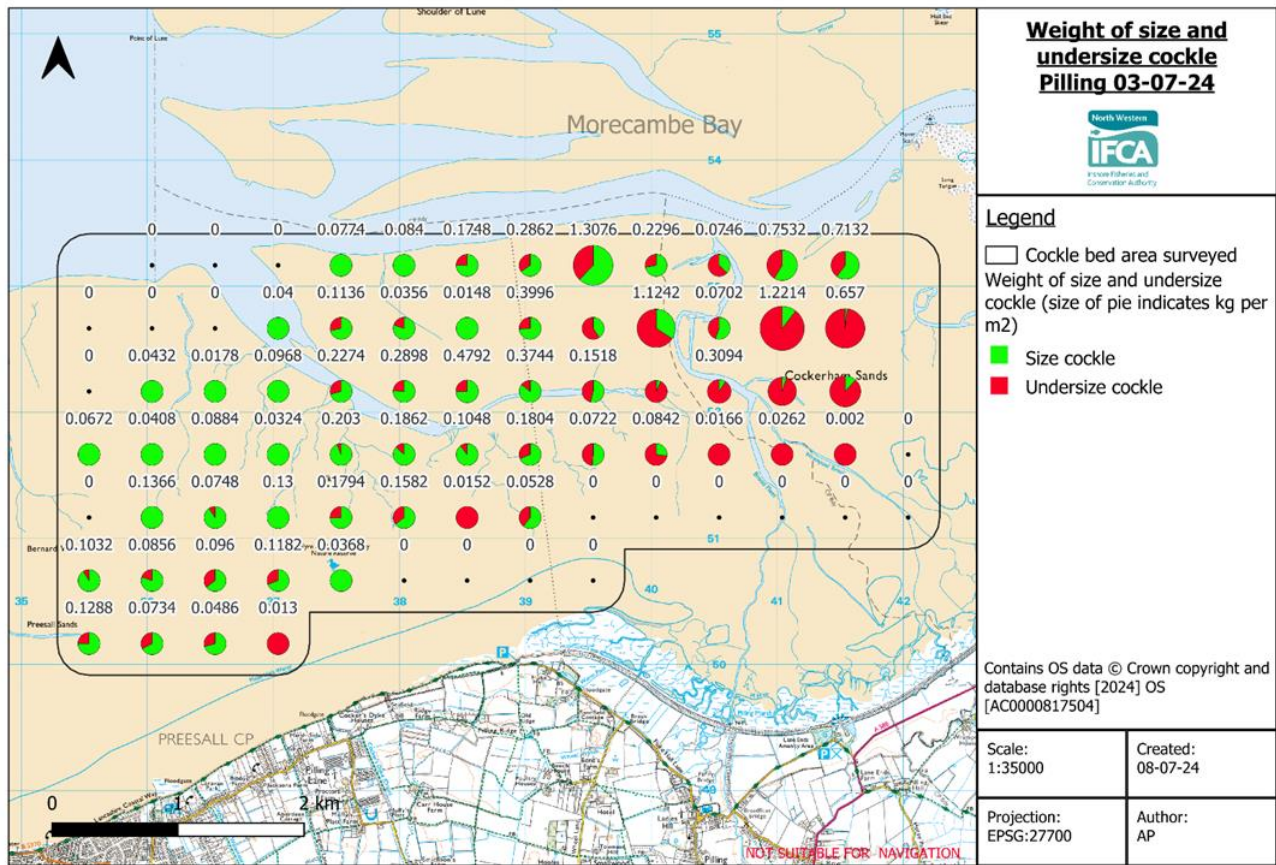


Figure 2.1.7. Proportion of size to undersize cockle on Pilling July 2024

2.2 Ribble cockle beds July 2024 results

Southport (Penfold)

The full survey reports for the Southport cockle bed was finalised on July 8th and is provided in Annex 2 of this report. The location and extent of the Penfold cockle bed in the Ribble Estuary is provided in Figure 3.1 below.

This year officers inspected the bed on June 27th. Officers collected and analysed 542 cockles from 68 sample points across 800 ha of Penfold. Figure 2.2.1 shows the location and extent of sample points for Southport.

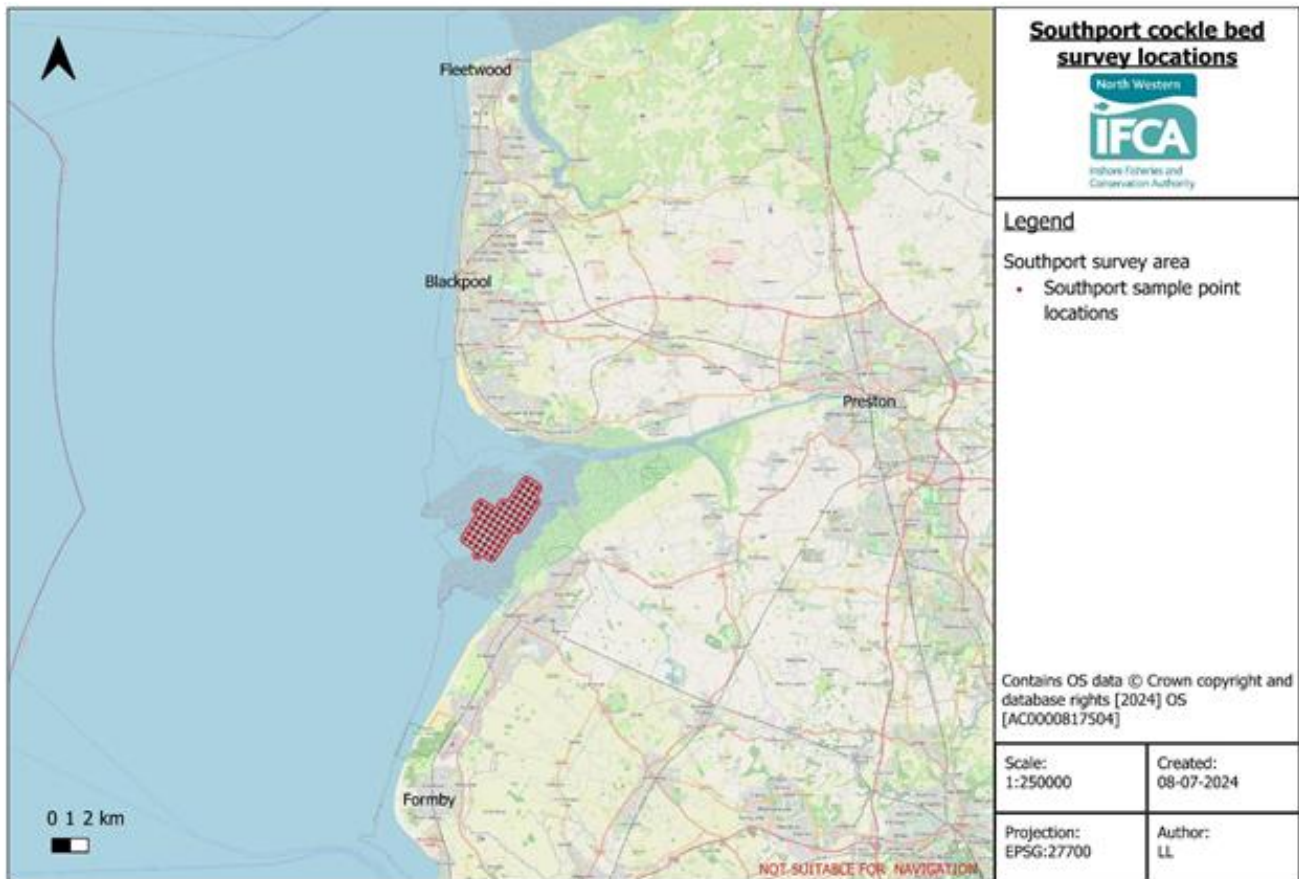


Figure 2.2.1. Surveyed and inspected cockle beds in the Ribble, June 2024.

a. Biomass of size and undersize cockle across Penfold

Table 2.2.1 provides yearly maximum cockle biomass figures from 2022 (date of earliest survey) to 2024. All surveys presented here were undertaken between June/July each year and are therefore comparable.

In June this year, there is an estimated and 380 tonnes of size cockle and 87 tonnes of undersize over 600 hectares of Southport cockle bed.

Table 2.2.1. The biomass of size, undersize and total biomass of cockles on Penfold cockle bed from 2022 to 2024. *figures represent the max cockle biomass

Year	Southport cockle bed				Bed recommended opened
	Area (ha)	Size cockle (tonne)	Undersize cockle (tonne)	Total cockle (tonne)	
2022	877	1200	1300	2500	Yes
2023	637	800	120	920	No
2024	600	380	87	467	TBC

Figure 2.2.2 shows the data from table 2.2.1 in graphical form to demonstrate the trends in cockle biomass across Penfold since 2022.

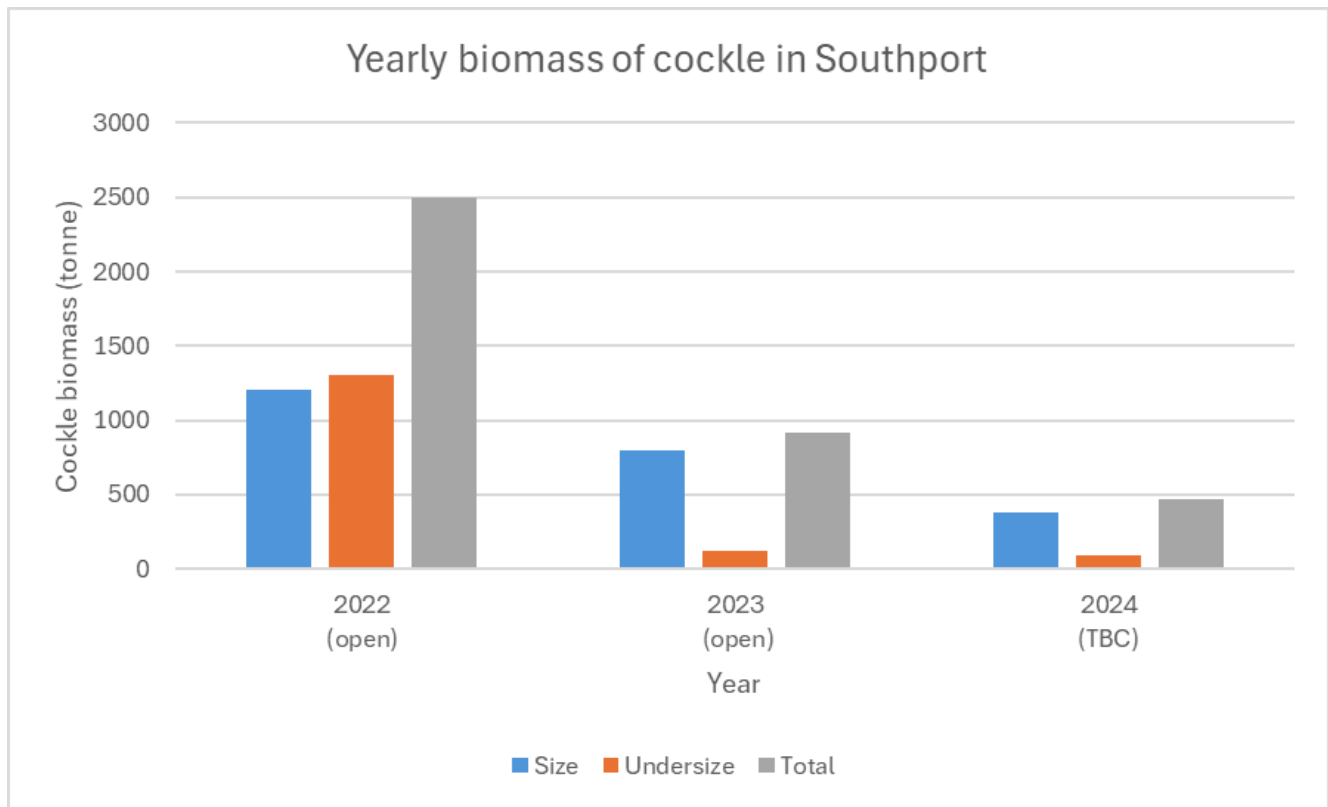


Figure 2.2.1. The yearly biomass of size, undersize and total cockle on Penfold cockle bed from 2022 to 2024

This year there has been a further a significant decrease in the biomass of both size and undersize cockle across the bed for a second year.

A 2024 spat settlement has not been seen this year, though this is not considered in biomass calculations due to its high variability, and survivability through the winter. Little spat settlement and few juvenile cockles left on the ground means there is not the younger cohort of cockles available to grow on to size in the coming years and sustain its population on the bed.

b. The density of size and undersize cockle on Southport

There has been a decrease in the density of cockle across the bed. Average density of size cockle on Southport is 5 cockle per m². This is an decrease from 14 per m² in July 2023.

Average density of undersize cockle is 6 cockle per m². This is an increase from 3 per m² in July 2023, however, the area over which the cockle is present has also reduced, and might be the cause of this perceived increase.

Maximum densities have also reduced from 2023, indicating that there are few dense areas on the bed. See Annex 2 of this report for full survey details of biomass and density distributions.

Less than 5mm cockle are not used in the undersize density or biomass figures due to the highly variable nature of survivability.

Summary

The results of the 2024 Ribble cockle survey show:

1. The biomass of size cockle has decreased by approximately 50% each year since 2022
2. The biomass of undersize cockle has decreased approximately 15 fold since 2022
3. There is little to know undersize stock or spat settlement present to grow through next year and contribute to a following year's fishery
4. The average density, and maximum density of size cockle has decreased.

Ribble cockle fishery recommendation:

Recommendation provided with all other fisheries on page 31.

2.3 Wirral coast cockle beds:

Leasowe

The location and extent of the Leasowe cockle bed on the Wirral Coast is provided in Figure 2.3.1. This year officers inspected the bed on the 24th of July. The full survey report is detailed in Annex 2.

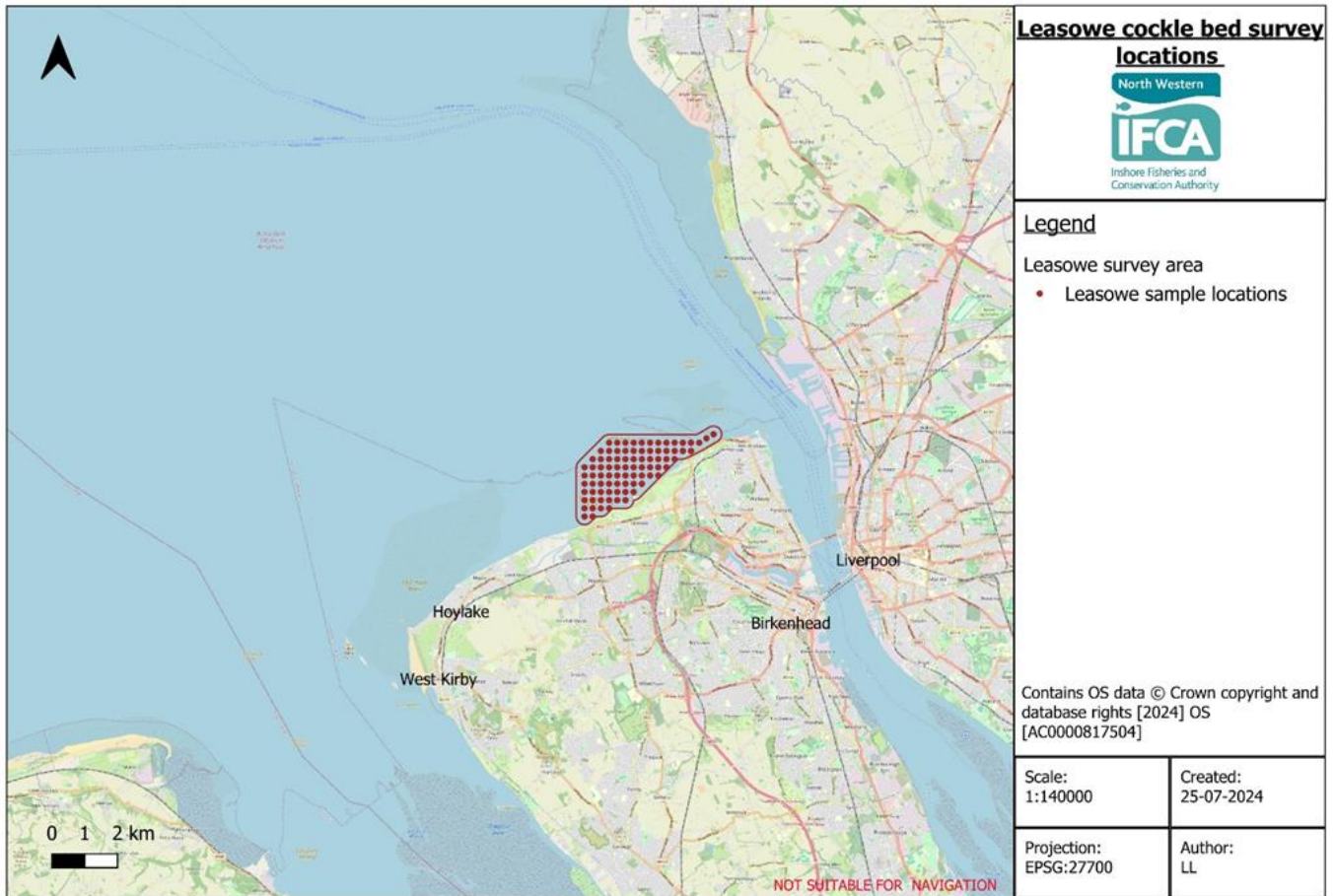


Figure 2.3.1. The location of surveyed points on the Leasowe cockle bed July 2024

a. Total biomass estimates

Estimates of undersize, size and total cockle biomass are provided in table 2.3.1 from 2017 to July 2024 for comparative purposes.

Table 2.3.1. The biomass of size, undersize and total biomass of cockles on Leasowe cockle bed from 2017 to 2024. *figures represent the max cockle biomass

Year	Leasowe cockle bed				Bed opened
	Area (ha)	Size cockle (tonne)	Undersize cockle (tonne)	Total cockle (tonne)	
2017	212.4	3523.5	292.8	3815.8	Open
2018	238	700	10	710	Closed
2019	220	1200	500	1700	Open
2020	199.5	607	20	627	Closed
2021	206	367	16.5	383.5	Closed
2022	225	120	100	220	Closed
2023	235	171	604	775	Closed
2024	213	799	751	1550	TBC

Figure 2.3.2 shows the data from table 2.3.1 in graphical form to demonstrate the trends in cockle biomass on Leasowe since 2017 (a and b), and the composition of this year's size and undersize cockle (c).

The total biomass of cockle has increased from approximately 775 tonnes in July 2023, to 1550. The total biomass of size cockle has increased from 171 tonnes in July 2023, to 799 tonnes in July 2024 (Table 2.3.1). Though this is still below the minimum threshold a fishery has previously been opened on Leasowe.

Figure 2.3.2.b indicates the trend in the biomass of size (blue) and undersize (orange) cockle for Leasowe since 2017. This year, both size and undersize cockle biomass have been seen to increase.

The proportion of size to undersize is almost 50:50 (Figure 2.3.2 c), which is also seen in the composition of size and undersize stock on the bed.

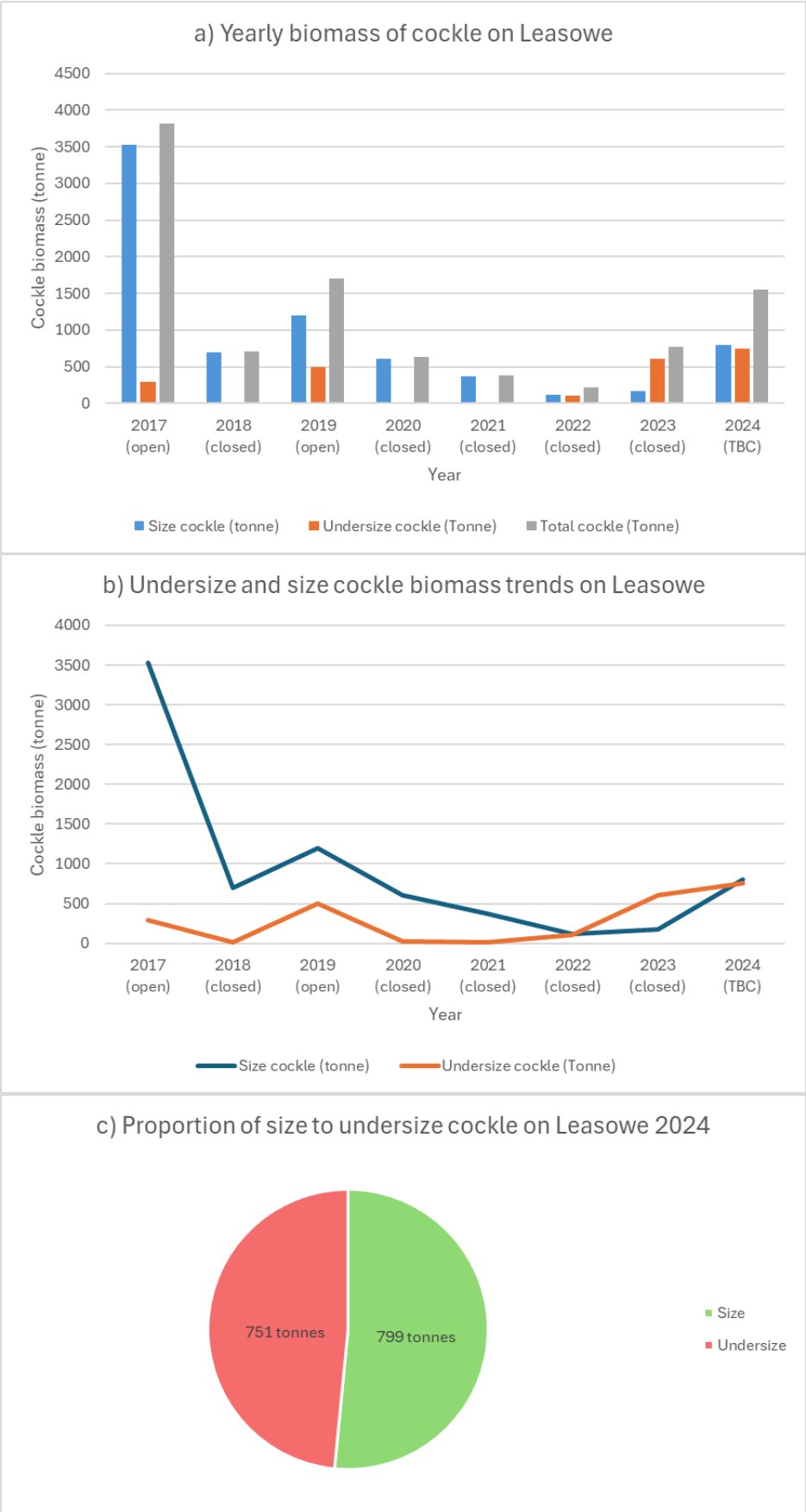


Figure 2.3.2. Summary of Leasowe cockle survey results from July 2024. a) shows the yearly biomass of size, undersize and total on Leasowe from 2017 to 2024, b) the relational trend in size and undersize cockle from 2017 to 2024, and c) the composition of size and undersize cockle on Leasowe in 2024

b. The density of size and undersize cockle on Leasowe July 2024

Average density of size cockle across Leasowe is 45 cockle per m². This is an increase from 6 per m² in July 2023.

Average density of undersize cockle on Leasowe is 66 cockle per m². This is a decrease from 863 per m² in July 2023. Likely the result of undersize growing on, and natural mortality.

c. Biomass and composition of cockle size classes

Figure 2.3.3 shows the biomass of cockles in each size class (0-5 mm, 15-20mm, 20-25mm 25-35mm and 35+mm) Leasowe in July 2024. It demonstrates the predominant biomass is held within the 20-35 size class range. When comparing this to the size frequency diagrams in Figure 2.3.4, we can see that they are predominantly located together. Officer observations detail that the 20-25mm size class is borderline with size. Size and undersize cockle were highly mixed because of this (Figure 2.3.5).

The composition of size classes across a bed is important to consider as it has implications for fisheries management, and fishing highly mixed stock may have an impact on juvenile cockles survivability.

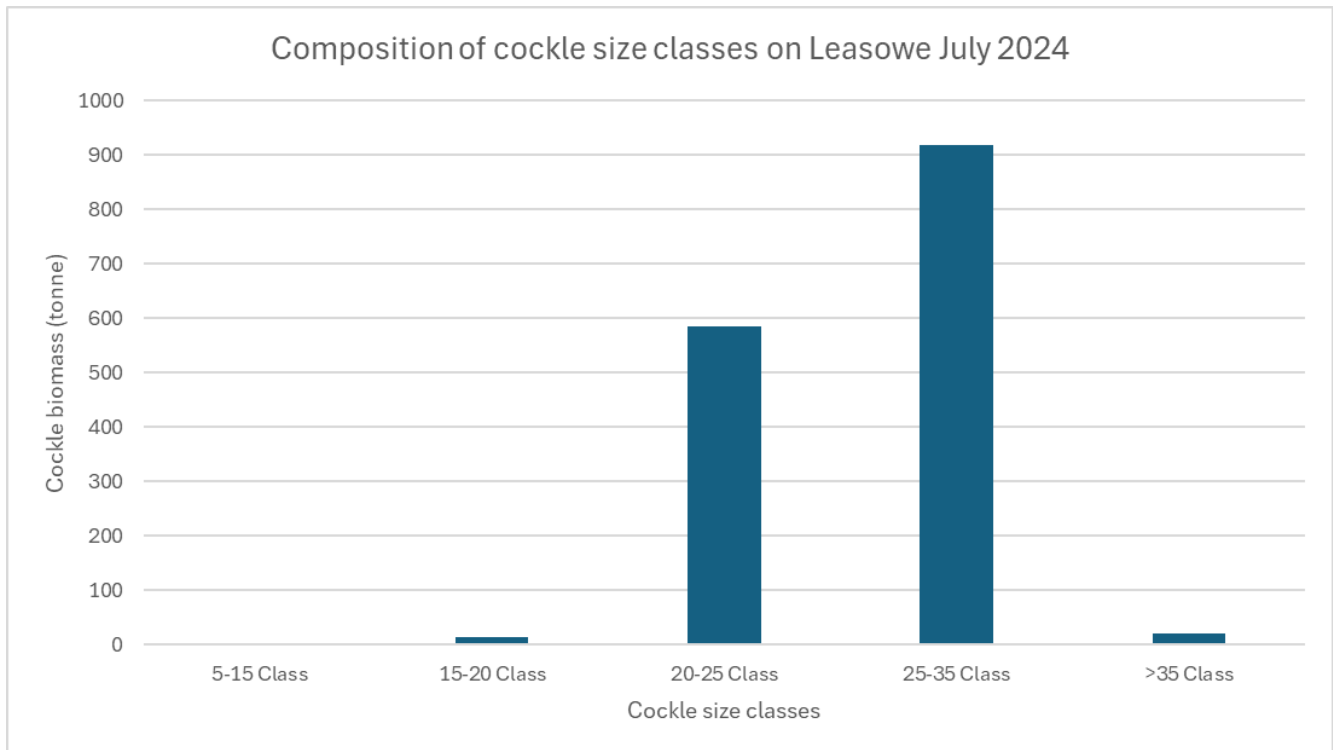


Figure 2.3.3 The biomass of different size classes of cockle on Leasow July 2024

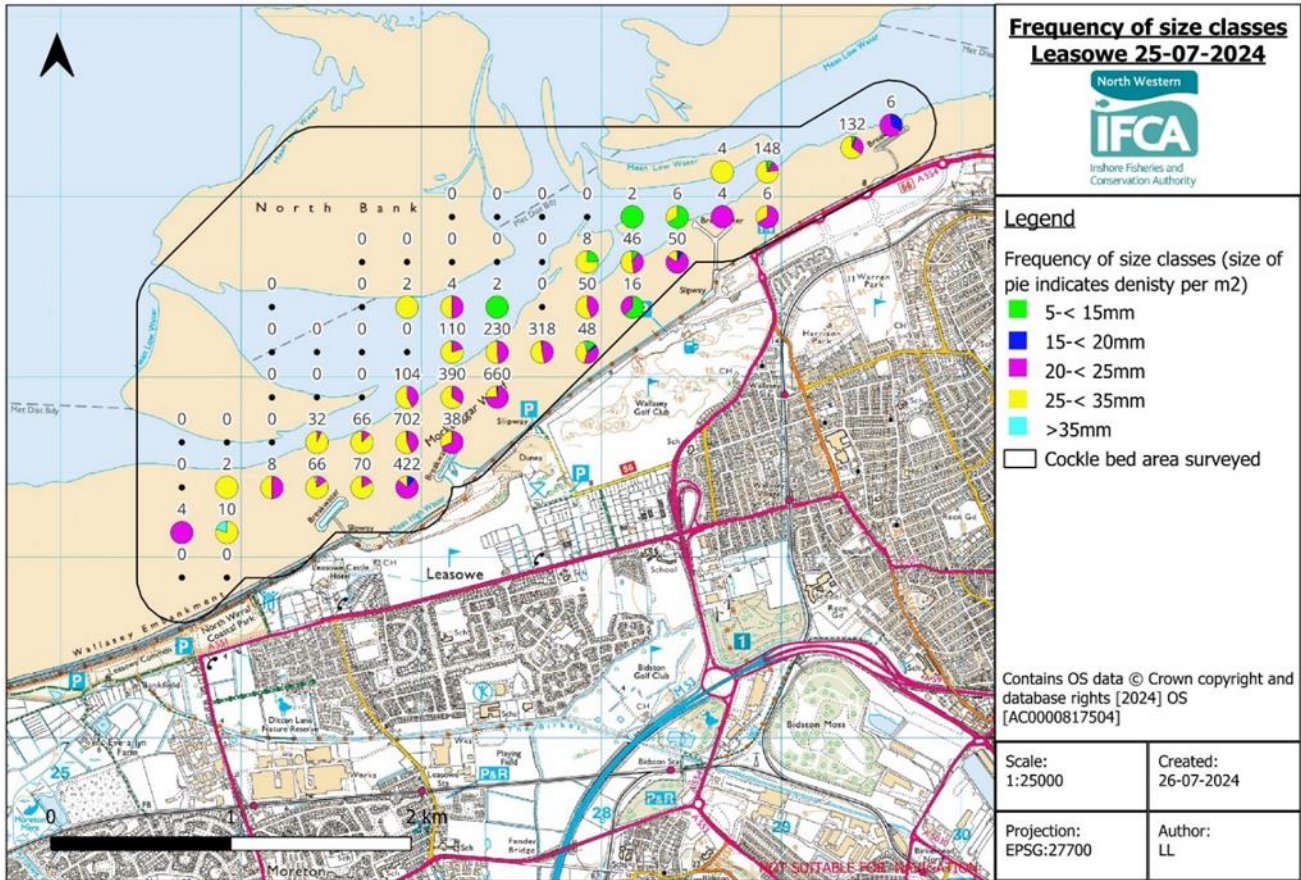


Figure 2.3.4 Size frequency distribution of cockle on Leasowe July 2024

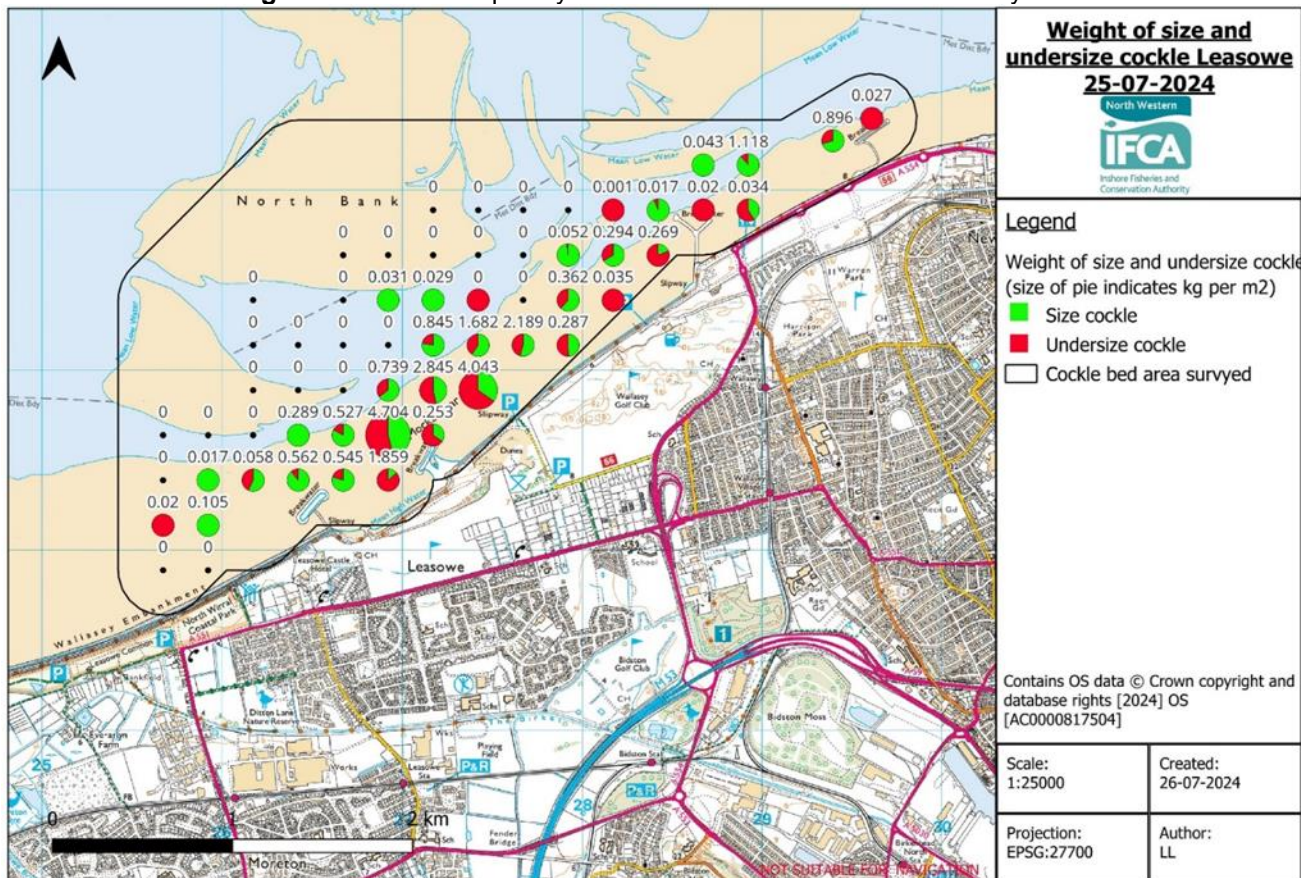


Figure 2.3.5. Composition of size and undersize cockle on Leasowe July 2024

d. Historical TAC requirements on Leasowe

Previous HRA agreements (2017 and 2019) for the total size biomass available for birds (dependent on bird numbers) is between 700 and 900 tonnes. This is based on food requirements for oyster catcher that target size cockle. This year the approximate size biomass on Leasowe is 799 tonnes – below the required amount.

However, Leasowe cockle is known to grow quickly in the summer months, and it is likely the biomass of size cockle will increase to exceed the 800 tonne limit.

Leasowe cockle fishery recommendation:

Recommendation 1: Officers recommend that the Leasowe cockle bed is opened as 1st of October 2024 under paragraph 15 of Byelaw 3, subject to additional survey.

This recommendation is based on the following reasons:

- 1. Minimum biomass of size cockle for bird food requirements is not met** – Historically, 800 tonnes of size cockle has been required under HRA conditions to support oyster catcher on the Leasowe cockle bed (see 2017 <https://www.nw-ifca.gov.uk/app/uploads/NWIFCA-MNNWF-DE-LB-COCKLE-Leasowe-FINAL-small.pdf> and 2019 HRA's <https://www.nw-ifca.gov.uk/app/uploads/NWIFCA-EMS-North-Wirral-Leasowe-Cockle-Fishery-HRA-Sept-2019.pdf>). Size biomass of cockle on Leasowe is currently 799 tonnes.
- 2. There is a highly mixed composition of size and undersize** – distribution of size and undersize is highly mixed. This has enforcement and riddling implications. Mixed cockle requires thorough riddling, and also has the potential to disturb stock on the ground should it struggle to re-settle. On Leasowe there is a limited ability to split the stock by area.
- 3. Undersize cockle could grow on over the summer months** – the composition of undersize cockle is close to size and has the potential to grow on by the autumn. Leasowe is historically known to grow quickly.

Recommendation 2: The fishery will be opened weekdays (Mon-Fri) one tide a day under Byelaw 3 flexible permit conditions.

1. Effort limitation
2. Additional feedback from responses to the consultation on early opening

Other cockle bed recommendation:

Recommendation 1: Officers recommend that all other District cockle beds, including Aldingham and Newbiggin, Middleton and Southport remain closed for the rest of the closed season, and from September 1st 2024 under paragraph 15 of Byelaw 3.

This recommendation is based on the following factors:

1. Biomass of size cockle is very low
2. Biomass of undersize cockle is very low

NWIFCA, 30th of July 2024