NWIFCA Technical, Science and Byelaw Committee

18th May 2021: 10:00 a.m.

Agenda Item 7

SURVEY AND INSPECTION REPORT

Purpose: **To report survey and inspections in the last quarter.**

To report on Heysham Flat mussel bed and damage to *Sabellaria alveolata* with consideration of requirement for management.

To report results of the byelaw 3 consultation and preparation for possible change to the 2021 cockle close season.

Recommendation: **Approve the following:**

a) Further work with Natural England to highlight the importance of *Sabellaria* alveolata (a protected feature), that damage to the feature could lead to prosecution by Natural England and that currently there is no size stock on Heysham Flat and access to Knott End skear is not possible from Heysham Flat without damaging the *Sabellaria alveolata.* That officer continue to monitor the mussel stock on Heysham Flat and should a size fishery look likely consider closing part of the mussel bed for management of the fishery under NWSFC Byelaw 13a.

b) The procedure be followed as set out in paragraph 2a to collect data to allow an assessment to be made for a change to the 2021 cockle close season if appropriate.

1. MUSSELS

a) Solway Subtidal Mussel Survey 20/04/21

A subtidal survey of the Solway subtidal mussel bed located near Silloth was carried out on 20th April 2021 using the Authority's Tritech Seaking Towfish Side Scan Sonar (SSS). The SSS data was ground-truthed using a Hamon Grab. Survey data is still being processes but indications are that although some mussel has persisted, the coverage has reduced from the survey done in March 2020. There are signs of a new settlement, but from the grab samples it does not seem to be extensive. A full report should be available for the August TSB.

b) Duddon Estuary Mussel Inspection 27/04/21

LW: 19:06 0.4m (Liverpool tides)

The Duddon channel was inspected to assess an area where there was a fishery in 2014-2015. The area is in a main channel and even on a low water spring tide much of the area

remains under water. Annual inspections since 2015 by quad bike and on foot have shown very little mussel present.

There was an area of mussel and bare cobble present in the channel estimated at 13.5ha shown in Figure 1. Due to the majority of the area remaining under water and the limited amount of time on the bed, the exact perimeter could not be mapped but instead waypoints were taken at the edges of the bed and the area estimated.

There was a mix of mussel size classes with some 20-30mm mussel present, (likely to have persisted from 2020), and a 2021 mussel settlement. The 20-30mm was on a mixture of cobble and sand, and was patchy across the area (Figure 2 and 3). Where the mussel was on sand it was mixed in with Sand Mason worm tubes (Figure 4). Some areas of mussel were buried under a thin layer of sand. The 2021 mussel settlement was 5-8mm in size and patchy across the bed (Figure 5). Where the mussel remained underwater regular sample were taken to observe the mussel (Figure 6). Officers will continue to monitor the bed.

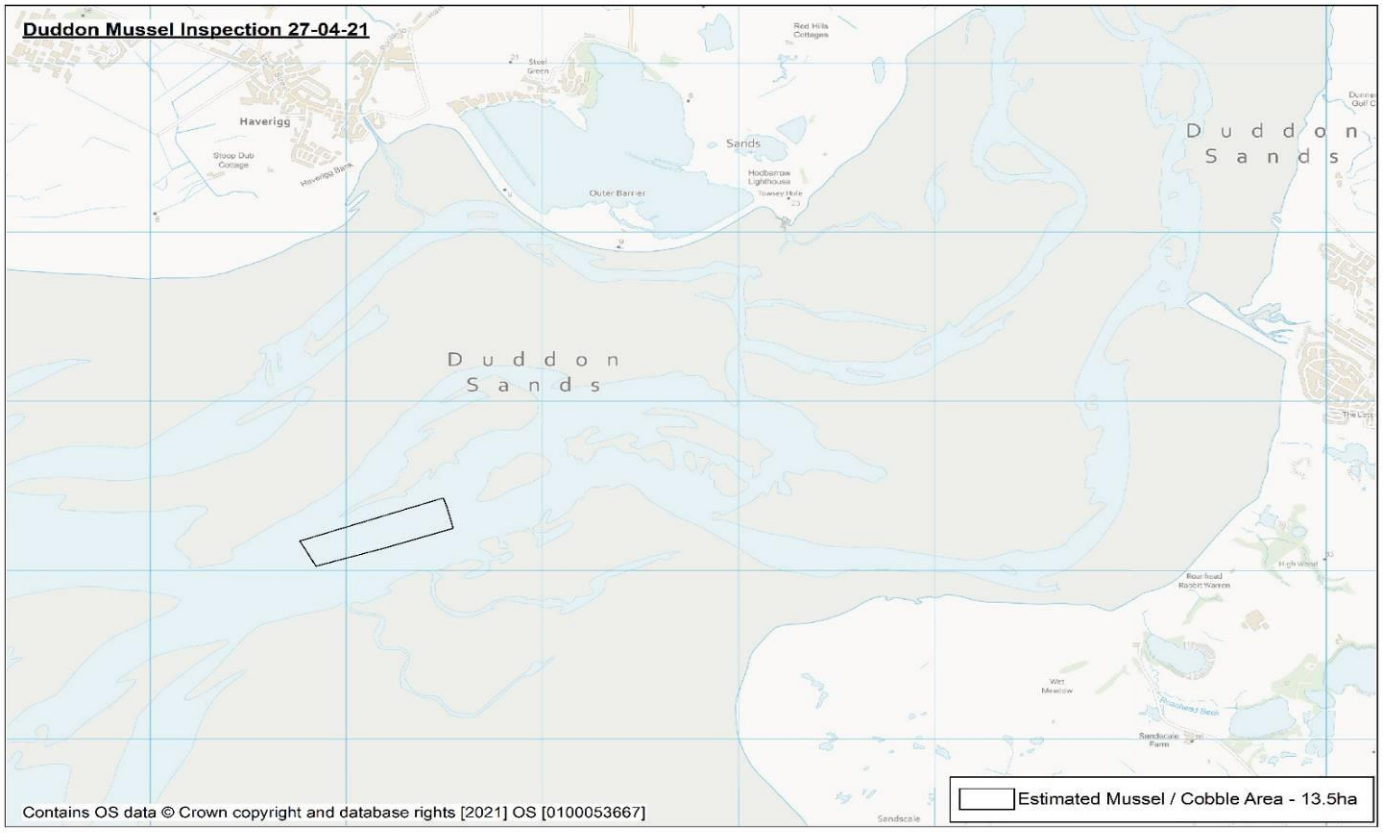

Fig 1 – Estimated extent of mussel in the Duddon Channel 27-04-21

Fig 2 – Area of 20-30mm mussel 27-04-21

Fig 3 – Area of patchy 20-30mm mussel 27-04-21

Fig 4 – Area of 20-30mm mussel mixed in with Sand Mason 27-04-21

Fig 5 – Area of patchy 2021 mussel settlement 27-04-21

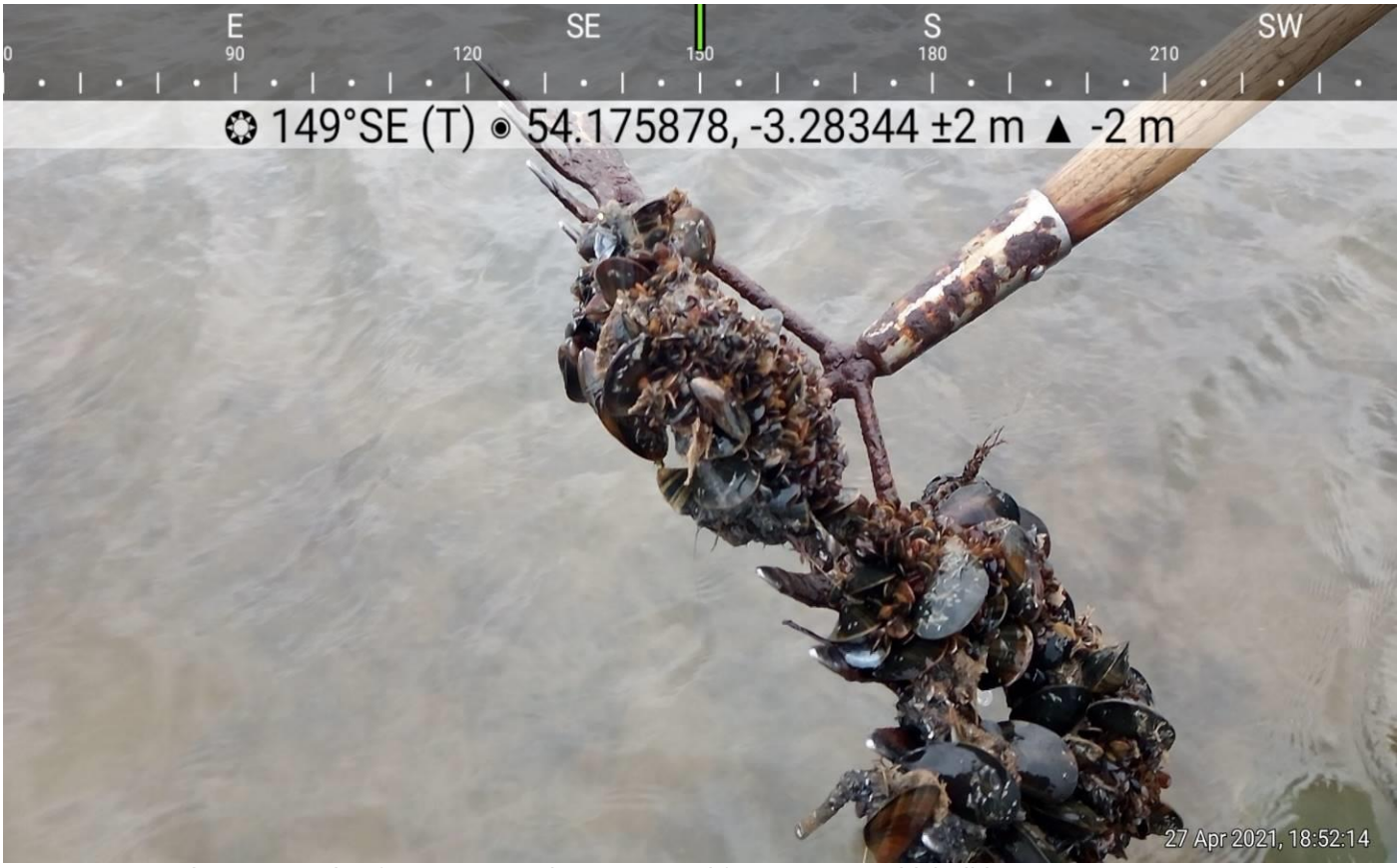

Fig 6 – Sample of 20-30mm and 2021 mussel from an area which did not uncover 27-04-21

c) Morecambe Bay Mussels

I. Heysham Flat Damage to *Sabellaria alveolata (Honeycomb worm)*

An inspection of Heysham Flat on 30th March 2021 (paragraph 1c VII) showed a small amount of mussel which had persisted through the winter. Most was undersize with only the occasional size mussel. There was also extensive growth of *Sabellaria alveolata* across the majority of the skear but unfortunately there was evidence of vehicle damage (Annex A), most likely caused by a quad bike. The damage to the *Sabellaria alveolata*, a listed designated feature of Morecambe Bay has been reported to Natural England. The reason for the use of the quadbike in the area is unknown and may be unrelated to fishing activity. Work with Natural England will continue to highlight the importance of *Sabellaria alveolata. As* a protected feature, damage could lead to prosecution by Natural England.

Currently there is no size mussel stock on Heysham Flat and access to Knott End skear is not possible from Heysham Flat without damaging *Sabellaria alveolata*. Monitoring the mussel stock on Heysham Flat will continue and should a size fishery (commercial or recreational) look likely consideration should be given to closing part of the mussel bed for management of the fishery under NWSFC Byelaw 13a.

II. Industry Heli-flight 26/04/21

Low water: 18:21 0.7m (Liverpool Tides)

Survey method: Heliflight Visual Inspection

On 26th April 2021, a helicopter survey was undertaken to assess the mussel stocks in Morecambe Bay, figure 1. This report outlines the observations of mussel stock on mussel beds: Falklands, Small Island and Trailer Bank.

Falklands

The area of exposed ground witnessed in 2019-2020 was covered in a large area of *Sabellaria alveolata,* waypoints 18 and 19*.* The *Sabellaria alveolata* is covered in a significant 2021 mussel settlement. As shown below in Figures 2 and 3.

Small Island

There was an area of exposed hard ground, waypoint 17, in the location of small islands (2020). There was no observed mussel on the hard ground.

Trailer Bank

Trailer bank consisted of mussel which has persisted through the winter, the mussel appeared to be consistent across the area, waypoint 15 and 16. There was no observed mussel settlement from the heliflight. There was also a significant number of starfish covering large areas of this mussel as shown in Figure 4.

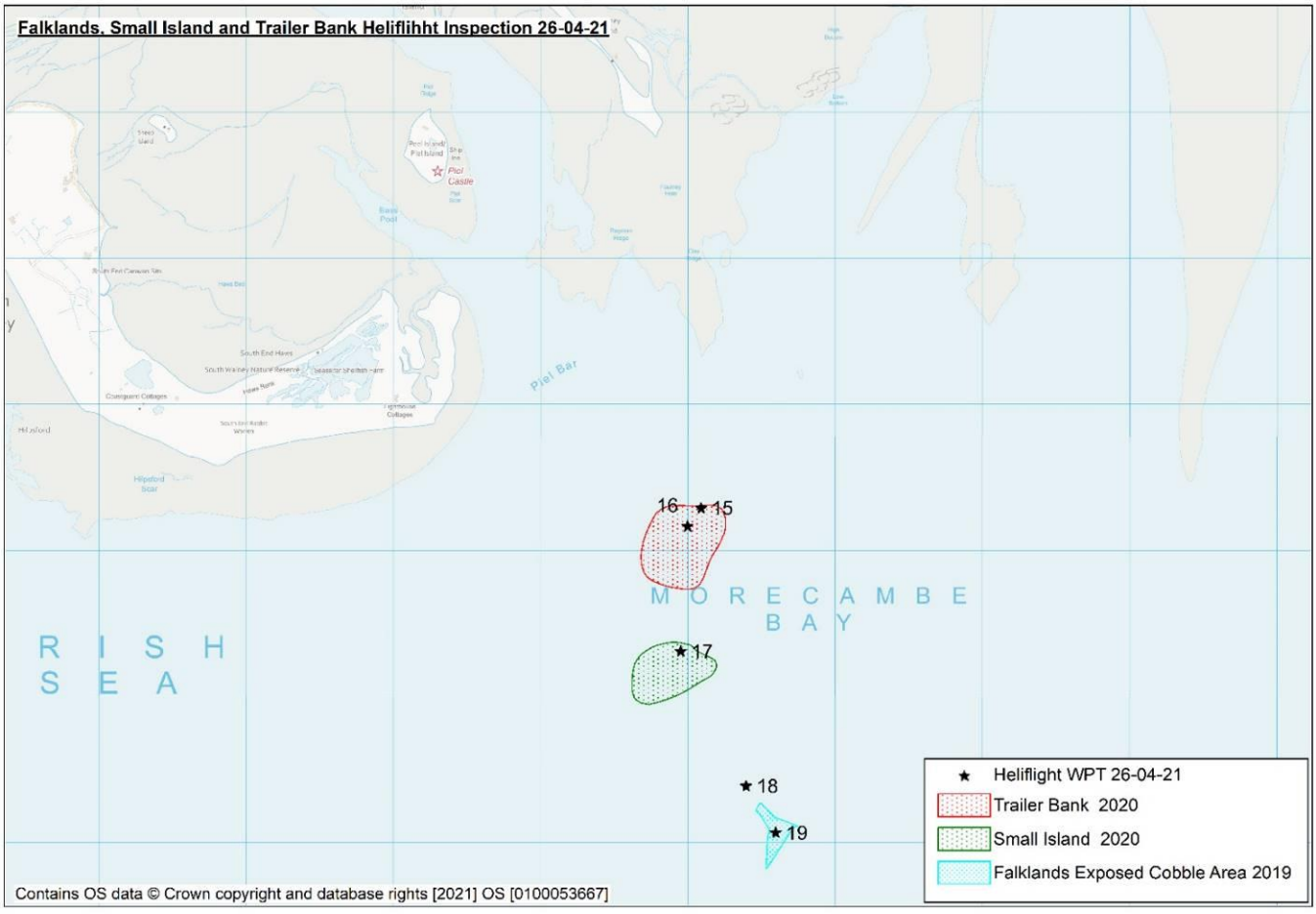

Fig 1 – Map of previously mapped areas and waypoints taken by NWIFCA on Industry Heliflight 26-04-21

Fig 2 – Falklands *Sabellaria alveolata* and 2021 mussel settlement 26-04-21

Fig 3 - Falklands *Sabellaria alveolata* and 2021 mussel settlement 26-04-21

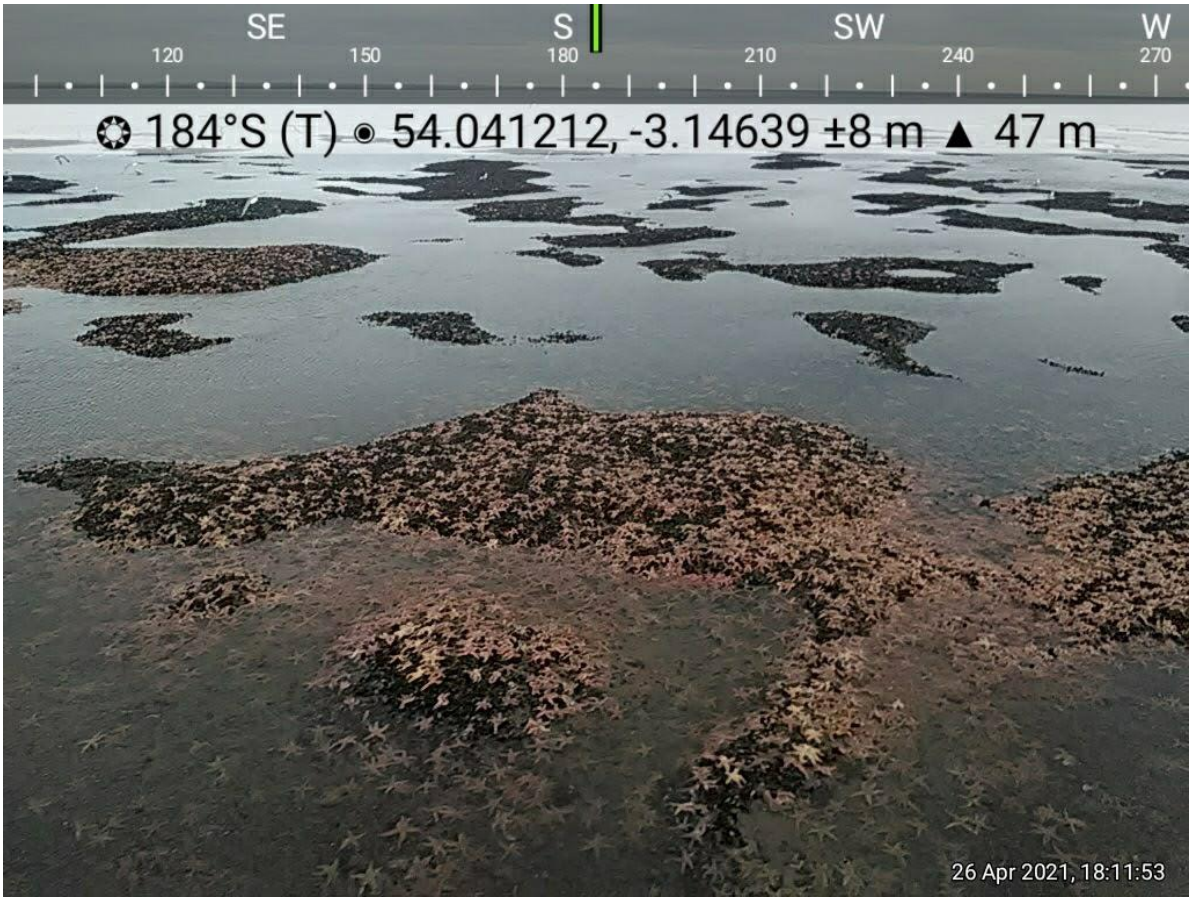

Fig 4 – Trailer Bank mussel bed with starfish present 26-04-21

III. Falklands Quad Access Inspection 31/03/21

Quad bike access to the Falklands, Small Island and Trailer Bank was not possible due to the channels, in particular a deep channel between the end of the sand bank and the areas of mussel.

IV. Walney Channel / Green Buoy (Foulney) Dutch Wand Survey 30/04/21

Low water: 08:45 0.8m (Liverpool Tides)

Survey method: Dutch Wand

Line transects were completed across the mussel bed using a Dutch Wand; transects start and finish at the edge of the bed. Due to the GPS data being lost, the transect lines and sample points have been estimated and mapped as shown in Figure 2. The number of hits and misses of live mussel were recorded to give percentage cover. The transect data and bed area were estimated from coordinates taken at the end of the survey after the initial data had been lost. It was not possible to walk the perimeter of the bed due to time restraints. A mussel sample was taken every 50 hits using a 10 cm diameter corer. Five transects were completed and 11 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample.

The cobble bank that had developed along the channel edge, and noted in previous surveys, is still prominent and it is hypothesized that this could offer some protection against scour. Similar to the previous year's survey, the mussel along the channel edge was noted as present in banks of mussel with bare cobble in between.

Due to the amount of time required to sort the relatively mixed samples, mussel under 10mm was excluded from calculations and maps except the seed map (Fig. 6). Rather than count the seed individually amounts in each sample were assessed as high, medium, low or none.

From the estimated transect and sample data, the total mussel bed surveyed was **18.67 hectares**.

Biomass estimates:
2671 tonnes of size mussel and **410 tonnes of undersize mussel**

Length Frequencies for the surveyed bed are shown in Figure 3 below. From the length frequency data the mussel present on the Walney Channel bed ranged from 18 – 71mm with the highest frequency of mussel being equal at 24, 26 and 62mm.

Maps

The mussel frequency of each size class of mussels per sample has been mapped as shown in Figure 4. The size of the pies are adjusted for sample weight standardised to kg/m². The weight of the size and undersize mussel has been mapped and represented in Figure 5. (NB neither of these maps include spat)

It can be seen from the map that the most abundant size class towards the channel edge is greater than 45 mm. Across a large proportion of the bed, there is a mix of three size classes 10-<25mm, 25-<45, and 45<mm.

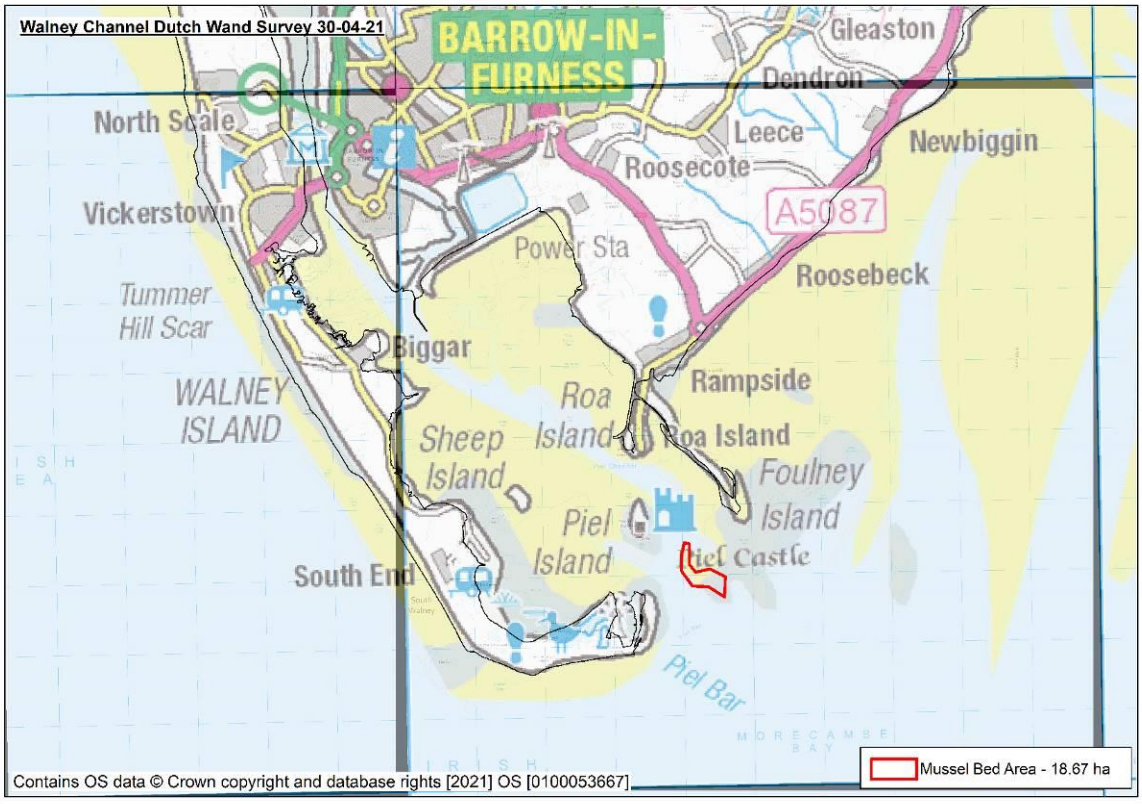

Fig 1 – Location of Walney Channel Mussel Bed 30-04-21

Fig 2 – Walney Channel Dutch Wand survey transects and estimated bed area

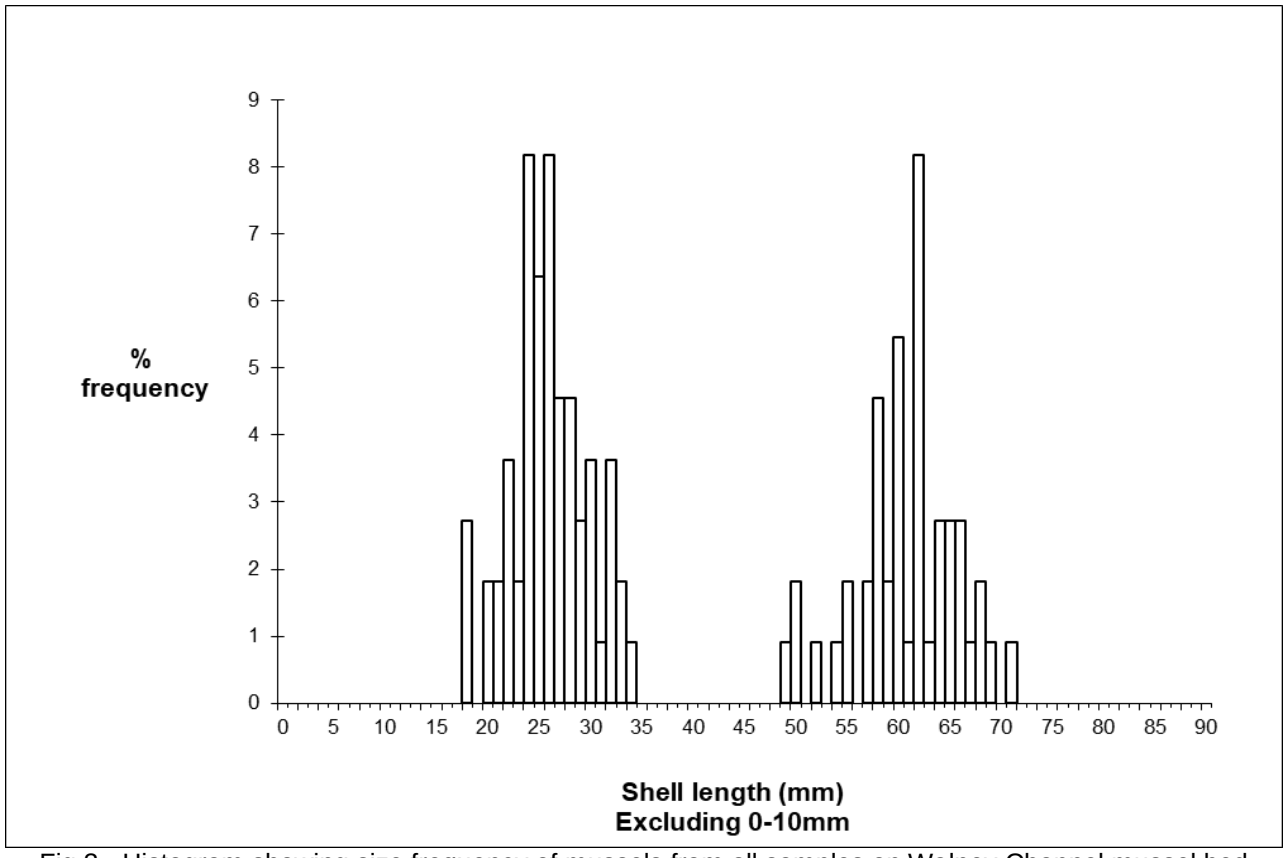

Fig 3 - Histogram showing size frequency of mussels from all samples on Walney Channel mussel bed

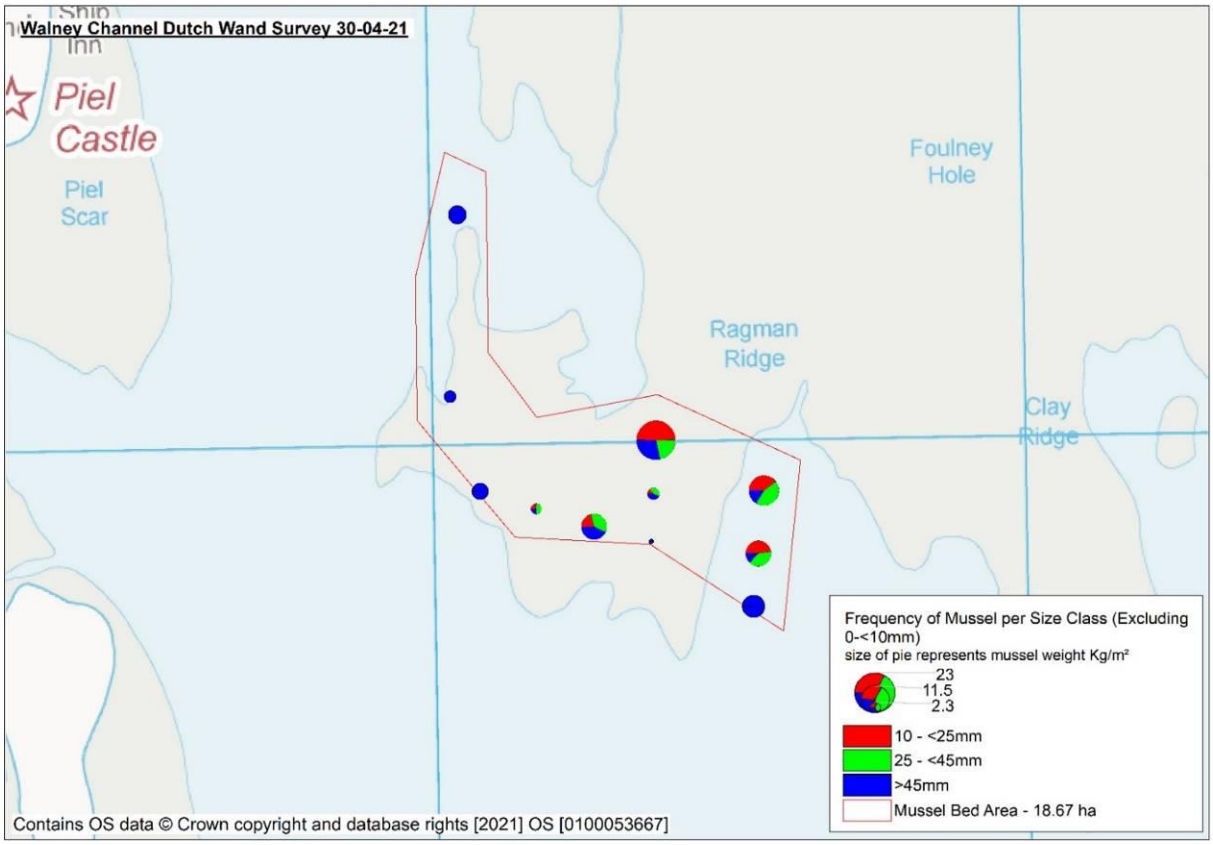

Fig 4 - Frequency of mussel by size class

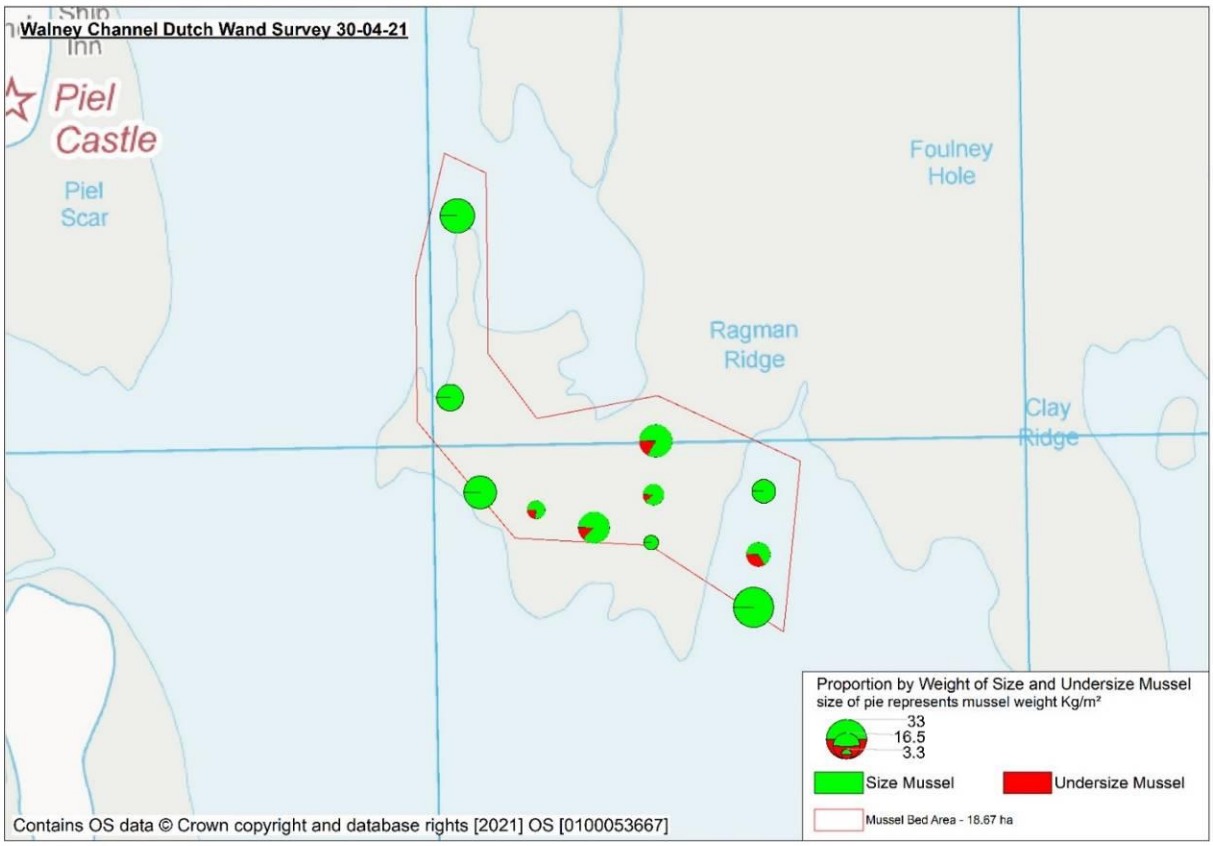

Figure 5 - Proportion of size and undersize mussel by weight represented as kg/m^2

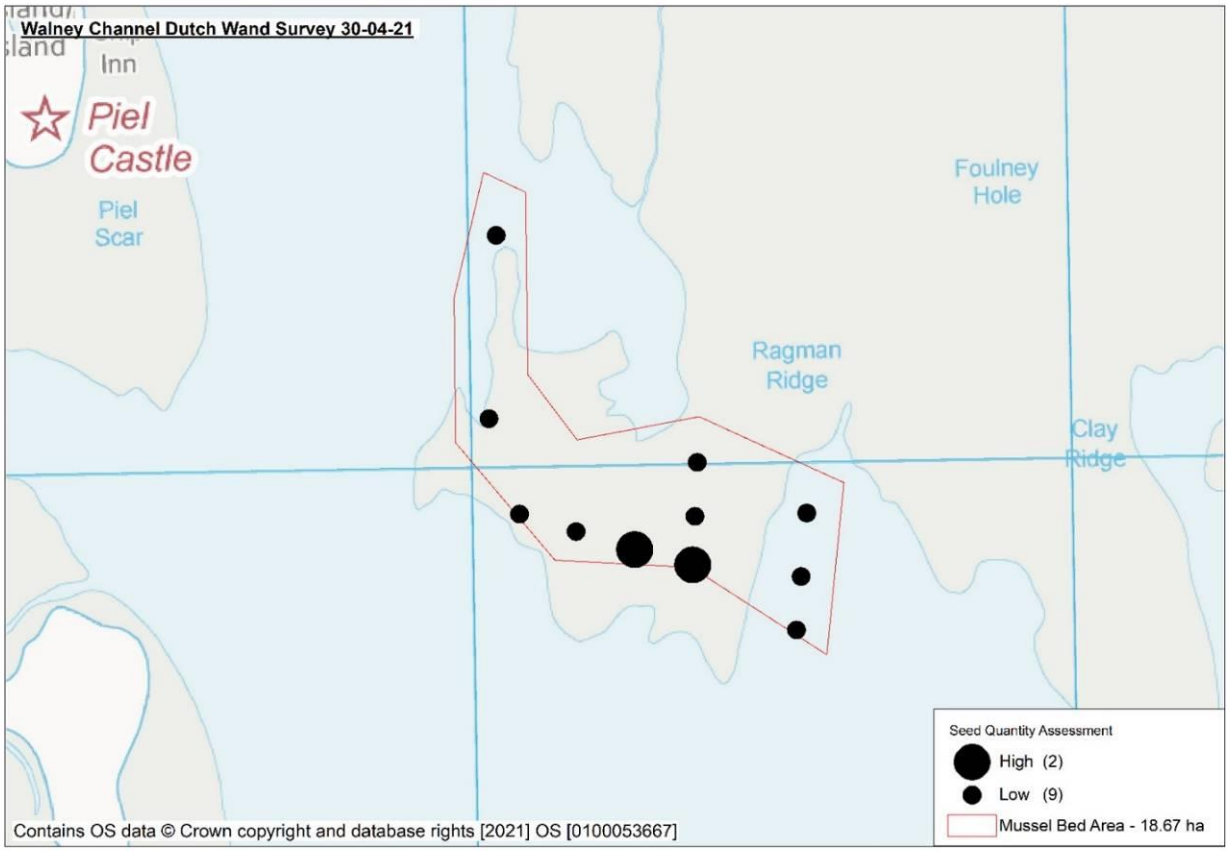

Fig. 6 - Estimated assessment of seed quantity categorised as high, medium, low and none

Fig. 7 - illustration of the banks of mussel near to the channel edge – 30-04-21

V. Foulney Skear Dutch Wand Survey 29/04/21

Low water: 08:02 0.6m (Liverpool Tides)

Survey method: Dutch Wand

Line transects were completed across the mussel bed using a Dutch Wand, with transects starting and finishing at the edge of the bed as shown in Figure 2. The number of hits and misses of live mussel were recorded to give percentage cover. The bed area was calculated from the start and end of transects and from observations of officers whilst surveying. It was not possible to walk the perimeter of the bed due to time constraints. A mussel sample was taken every 50 hits using a 10 cm diameter corer. 18 transects were completed and 47 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample. Due to the amount of time required to sort the relatively mixed samples, the mussel under 10mm was excluded from all calculations and maps except the seed map (Fig. 6). Rather than count the seed individually amounts in each sample were assessed as very high, high, medium or low.

From the transect and sample data the total mussel bed surveyed was **56.8 hectares**. There was no separation made between the main Foulney bed and Foulney Island as the mussel had spread between the two and the channel had filled in (Fig. 1). There were large starfish observed at the far low water line of the South-Eastern area of the main skear (Fig. 9).

Biomass estimates: **6332 tonnes size mussel** and **1919 tonnes undersize mussel**

Length Frequencies

The length frequency of mussels on the surveyed bed is shown in Figure 3. From the length frequency data the mussel present on Foulney Skear is varied with a wide spread of mussel from 11mm to 71mm.

Maps

The frequency of each size class of mussels per sample has been mapped in Figure 4 with the size of the pie adjusted for sample weight standardised to kg/m^2. The weight of the size and undersize mussel has been mapped and represented in Figure 5. (NB neither of these maps include spat).

It can be seen in Figure 4 that the size class is varied across the bed, with the size mussel >45 mm predominantly on Foulney Island and an area of 25-45mm mussels in the middle section of the main skear.

Figure 6 illustrates the settlement of 2021 mussel spat which extends across the majority of the skear and is heavily mixed in with the size mussel. Photographs are provided for further evidence of this in Figures 7 and 8. The size mussel bed on Foulney Island can be seen in Figure 10.

Industry report there have been a number of settlements this year some of which have stuck but others that haven't. This is evident in areas where there are two size classes of 2021 mussel.

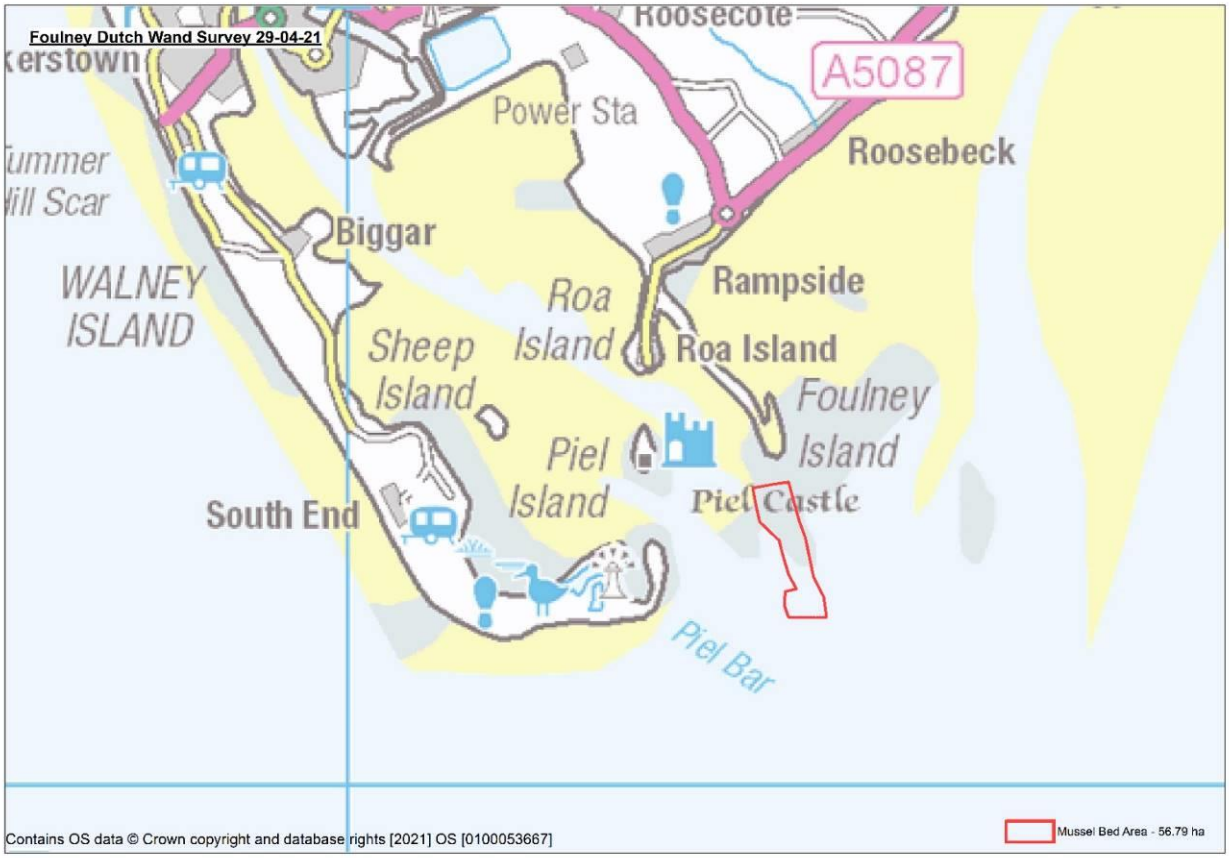

Fig 1 - Location of Foulney Mussel Bed surveyed 29-04-21.

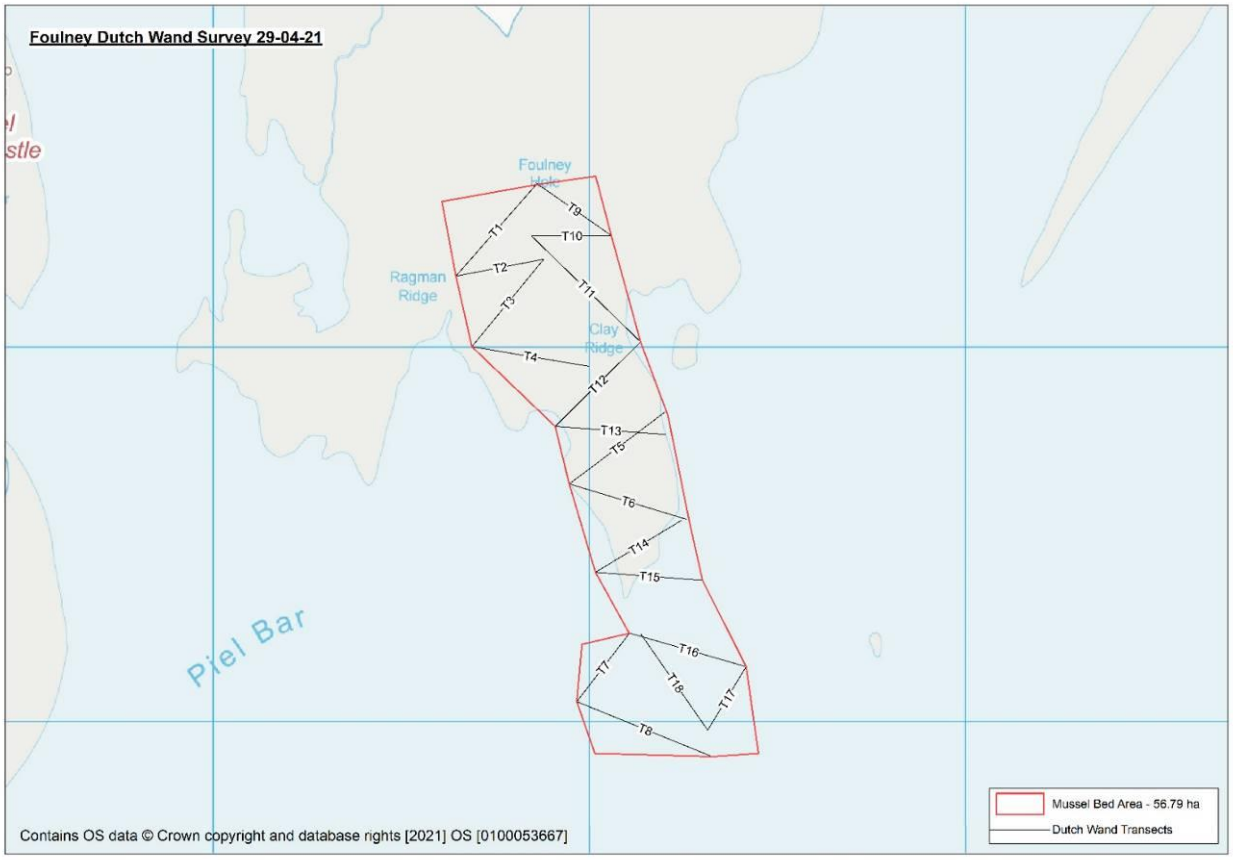

Fig 2 - Foulney Dutch Wand survey transects and estimated bed area.

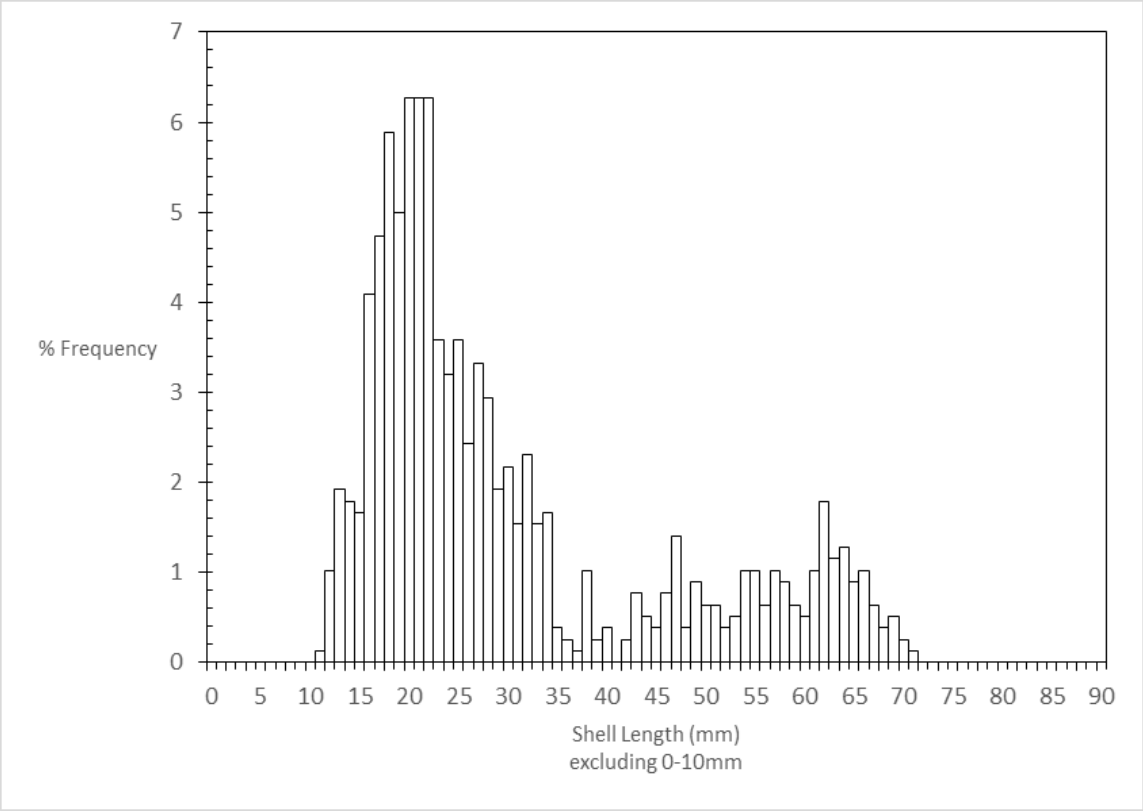

Fig 3 - Histogram showing size frequency of mussels from all samples on Foulney.

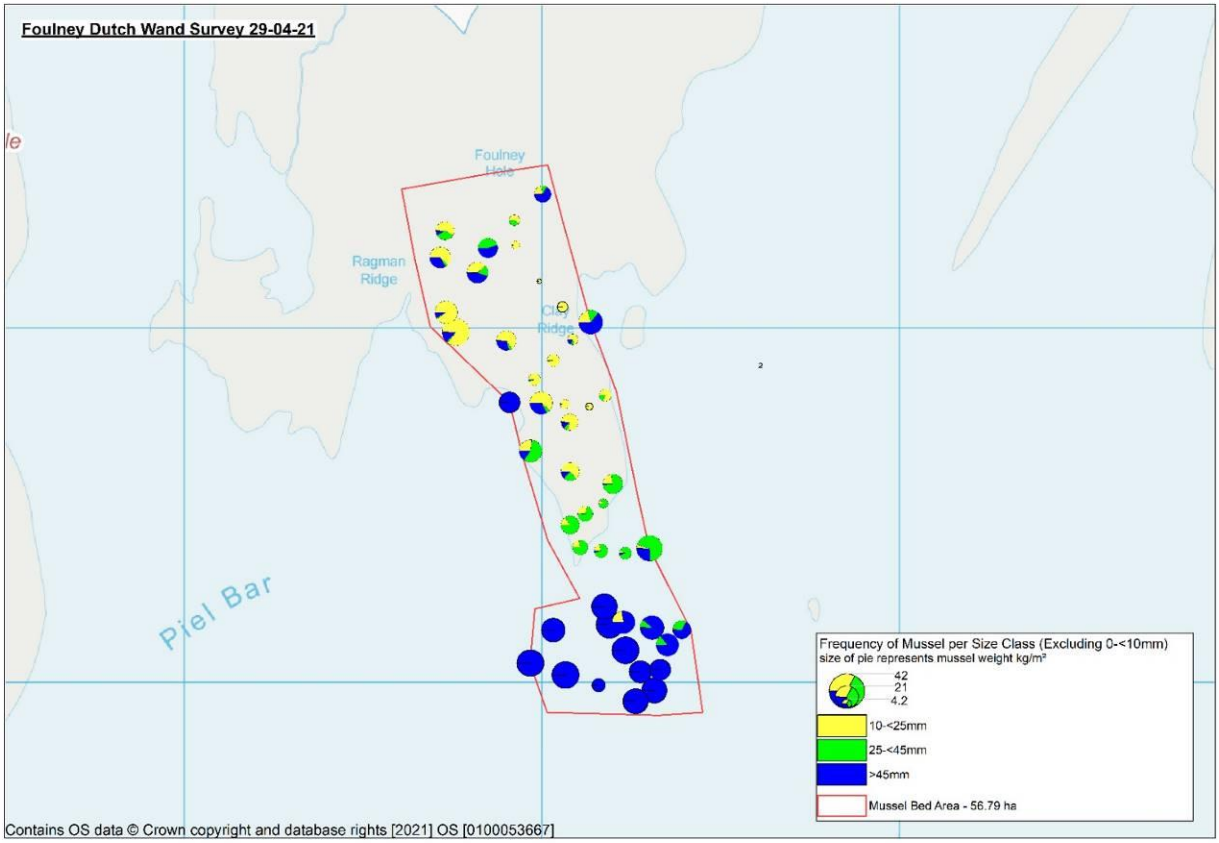

Fig 4 - Frequency of mussel by size class.

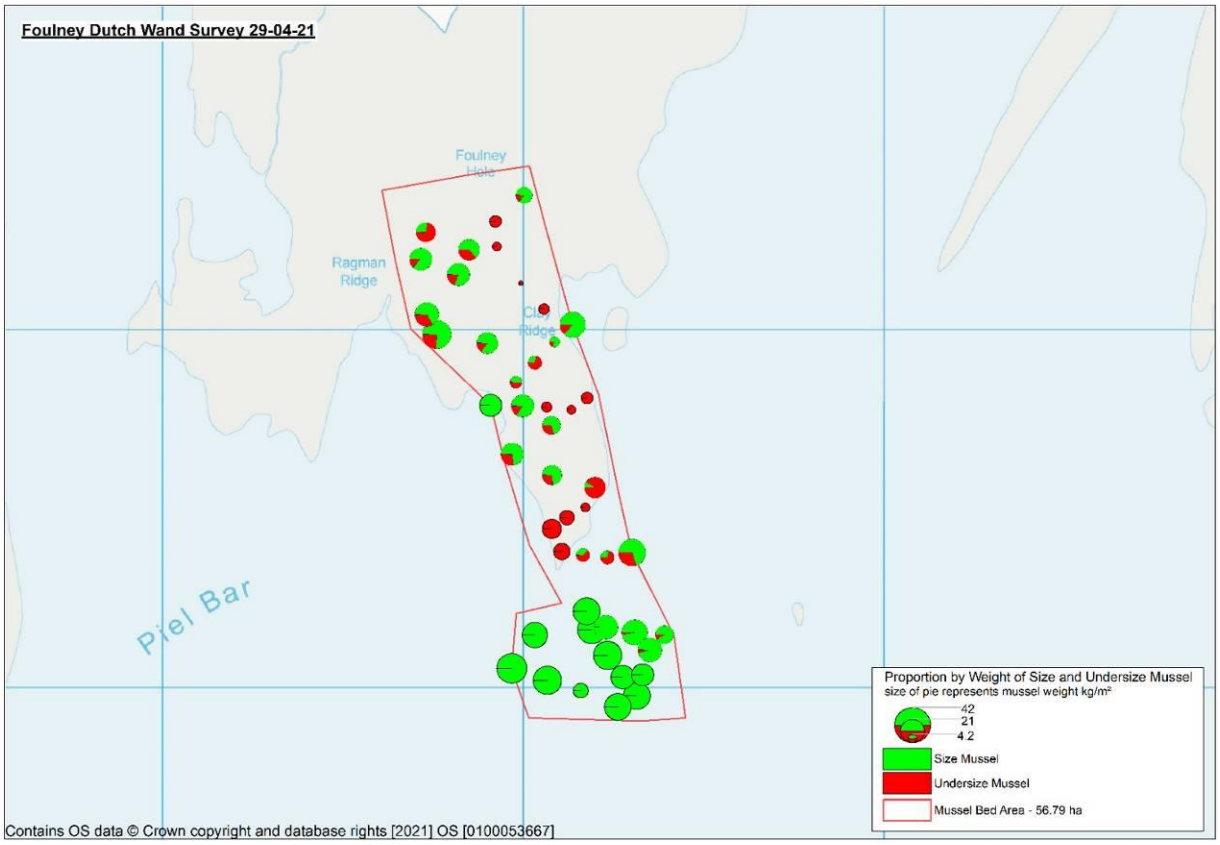

Fig 5 - Proportion of size and undersize mussel by weight represented as kg/m^2.

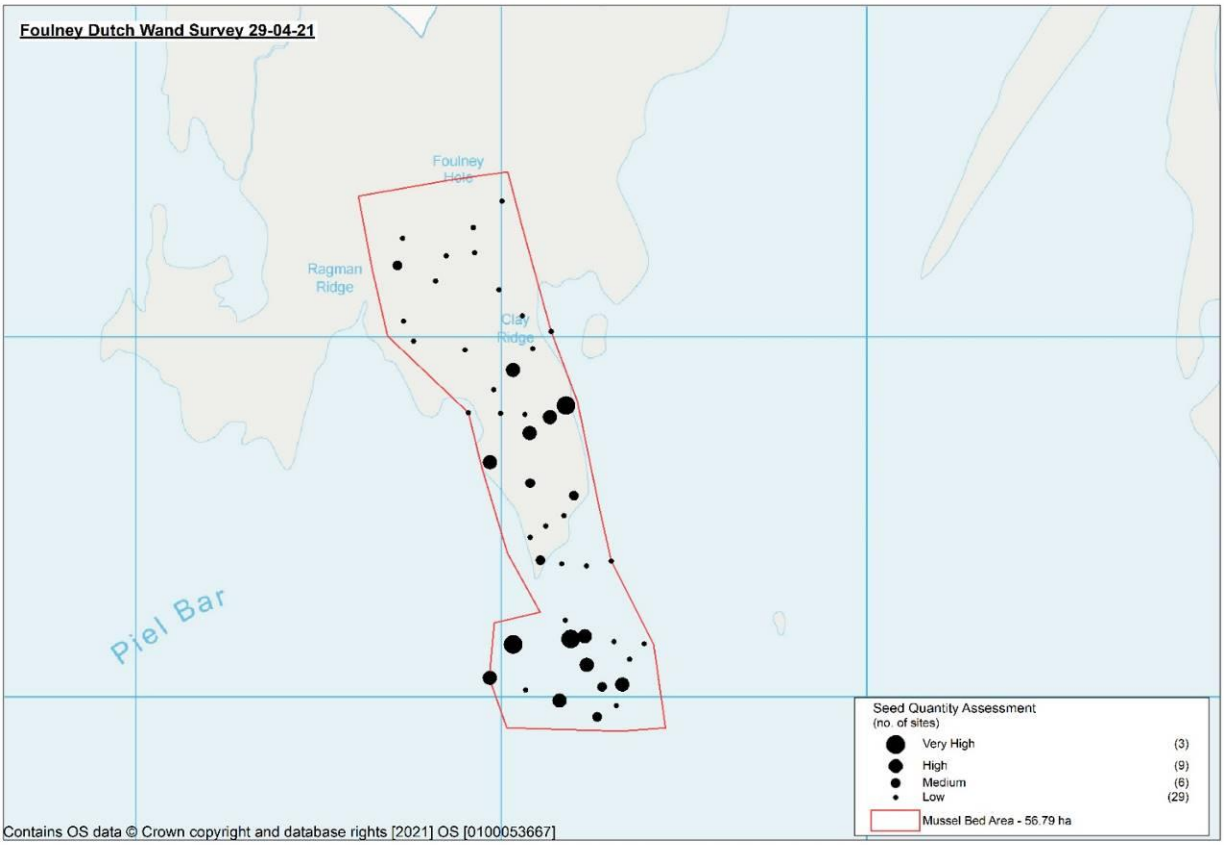

Fig 6 - Estimated assessment of seed quantity categorised as very high, high, medium or low.

Fig. 7 Illustration of the density of 2021 mussel settlement across Foulney skear 29-04-21.

Fig. 8 Illustration of the density of 2021 mussel settlement across Foulney skear 29-04-21.

Fig. 9 Large starfish feeding on mussel along the South-East edge of Foulney main skear

Fig. 10 Mussel Bed on Foulney Island 29-04-21.

VI. South America Quad Mussel Inspection 02/03/21

LW: 08:41 0.8m (Liverpool tides)

South America

The area of South America which had mussel present in October 2020 was inspected by quad buke and on foot to assess if any of the mussel had persisted through the winter.

The area was still visible but dominated by stony/sand substrate, shell debris, occasional live mussel and a 2021 mussel settlement (Figure 2). Officers mapped the perimeter but were limited by tidal height with the stony exposed ground continuing into the water on the Southern extremity as shown in Figure 3. The occasional live mussel was 35-45mm in length (Figure 4) and likely to have been from the 2020 settlement. There were some areas of dead historic *Sabellaria alveolata* patches which were covered in 2021 mussel settlement (Figure 7) and were present in 2020 and previously reported on, there were no signs of new *Sabellaria alveolata*. The area had received a dense 2021 mussel settlement which was present on stoney substrate, shell debris, dead *Sabellaria alveolata* and live 2020 mussel, the new settlement was approximately 2-3mm in size (figures 5 and 6). The settlement is earlier than what has been witnessed in recent years.

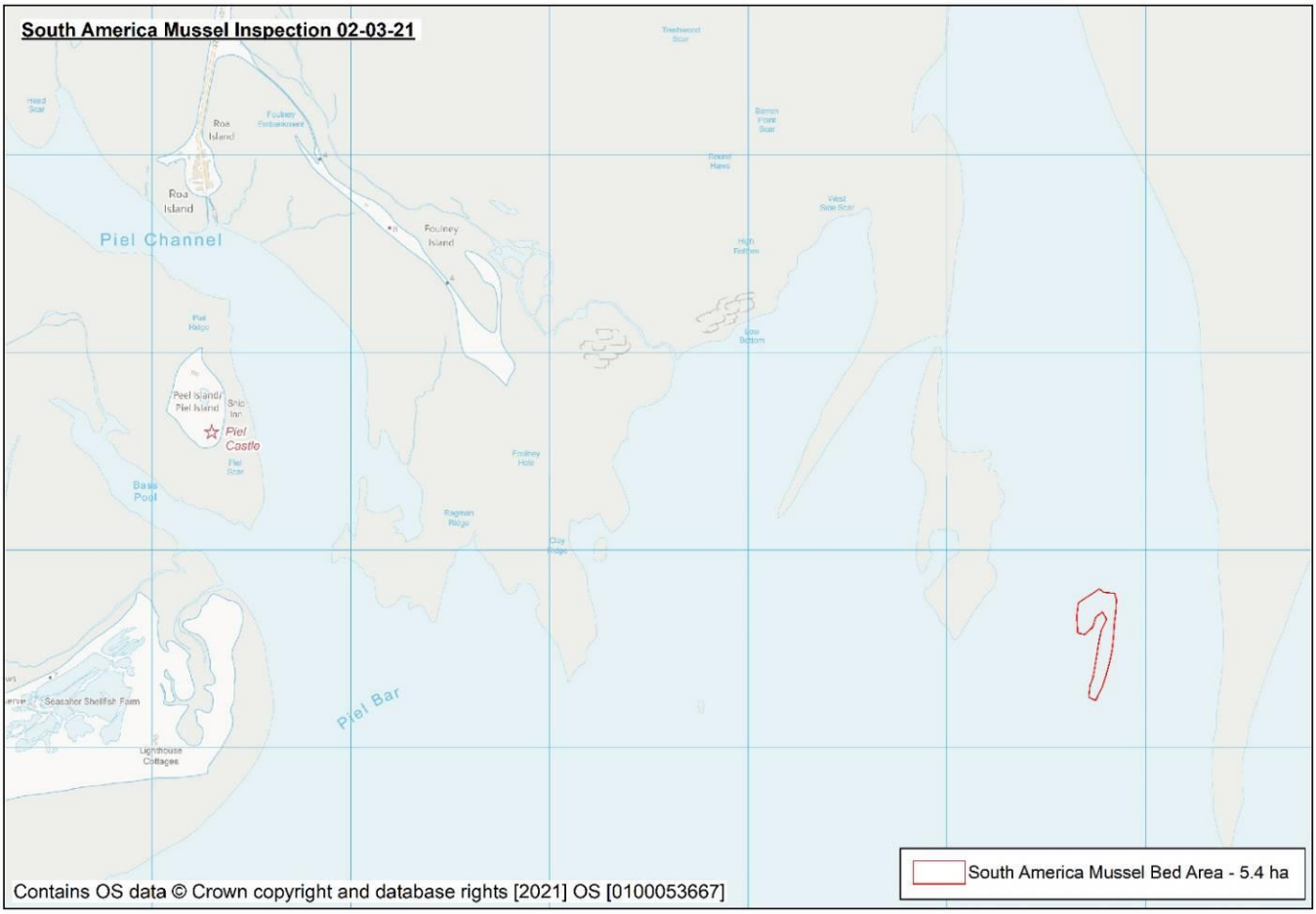

Fig 1 – Estimated extent of the exposed stony substrate of South America 02-03-21

Fig 2 – Mix of stony / sand substrate, shell debris, 2020 mussel and newly settled mussel 02-03-21

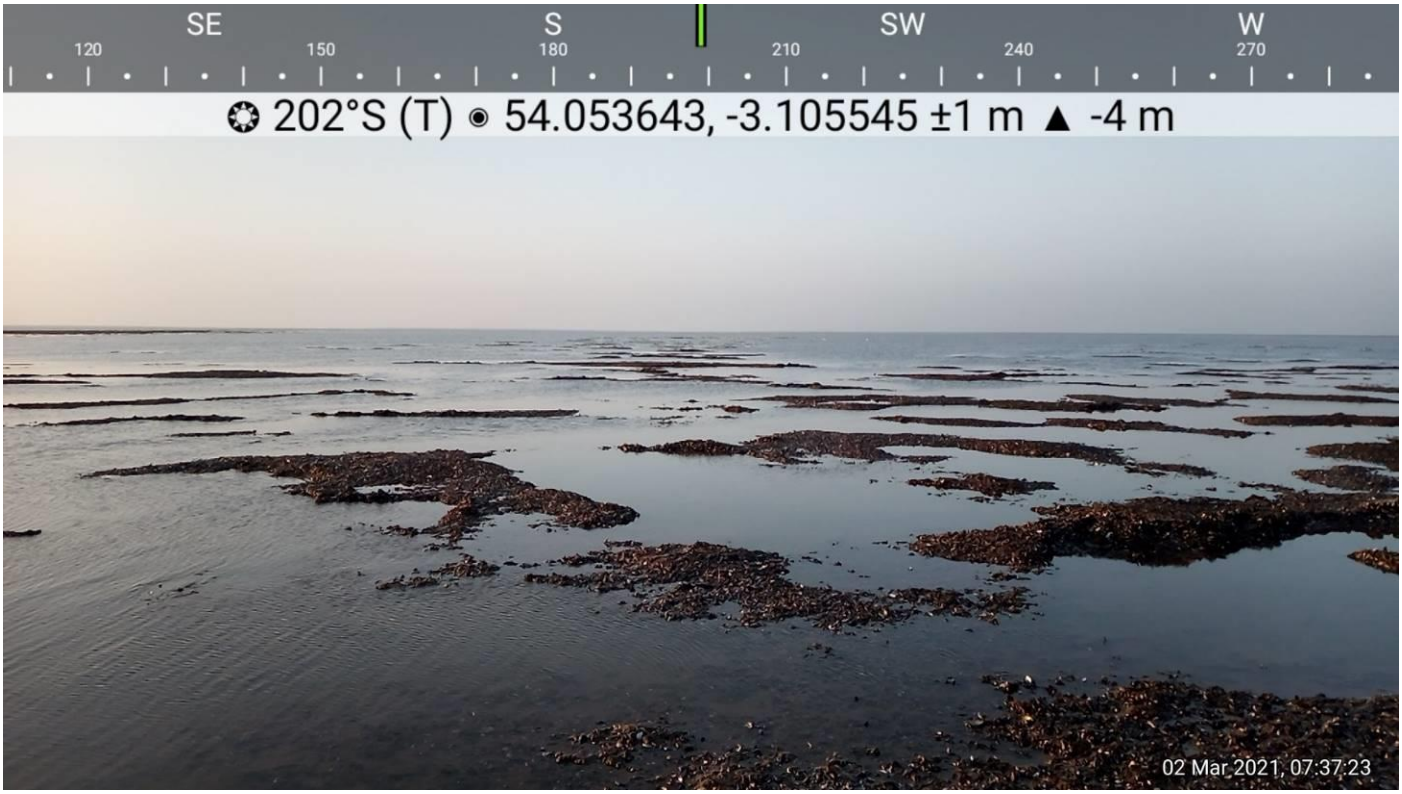

Fig 3 – Area extended in the water on the Southern Extremity 02-03-21

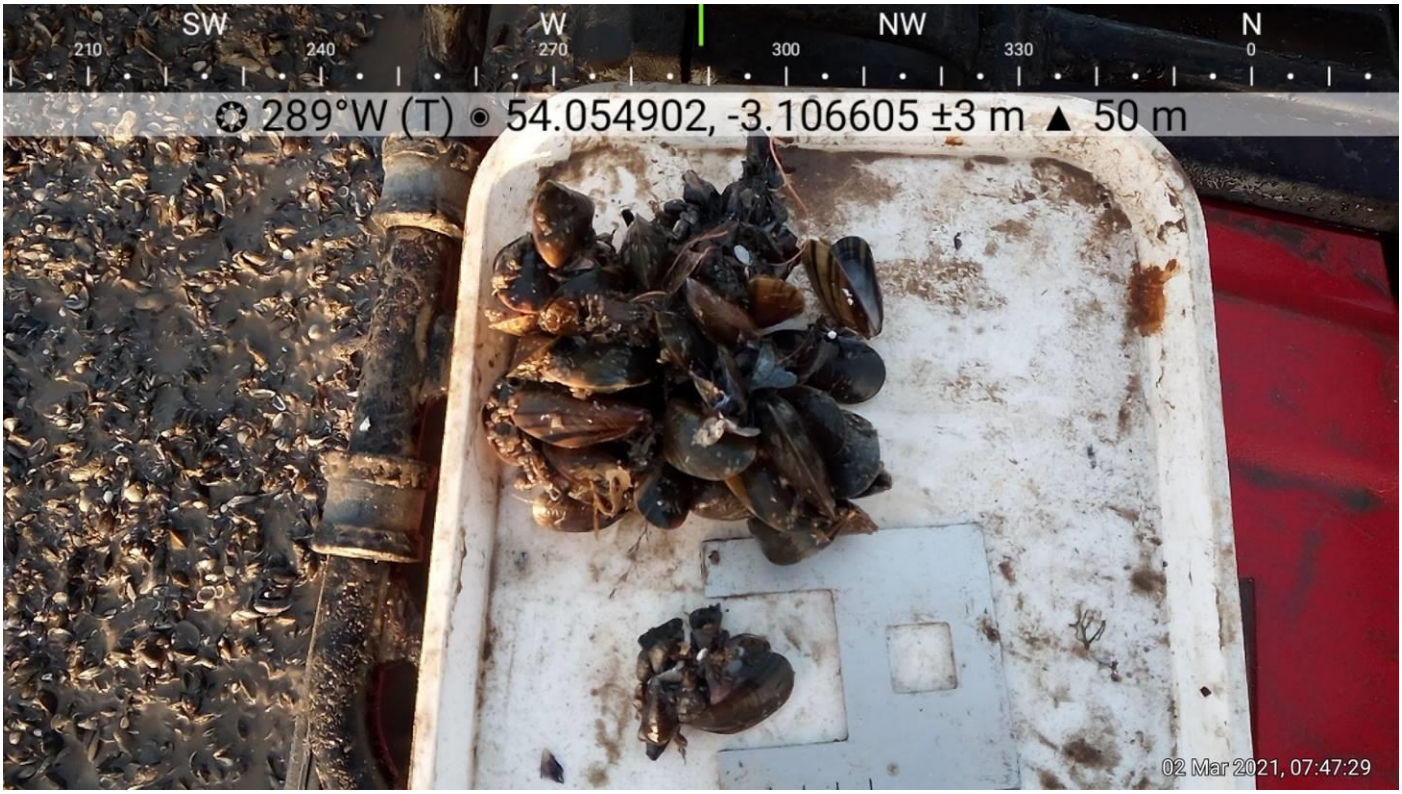

Fig 4 – Size of 2020 mussel 02-03-21

Fig 5 – 2021 mussel settlement 02-03-21

Fig 6 - Area matted with 2021 mussel settlement 02-03-21

Fig 7 – 2021 mussel settlement on historic dead patches of *Sabellaria alveolata*

VII. Heysham Flat Mussel skear and *Sabellaria alveolata* Inspection 30-03-21

Tides LW 06:42 0.6m (Liverpool tides)

The skear was accessed on foot. As other areas of Morecambe Bay have a 2021 mussel settlement, the aim was to find out if the settlement had also occurred on Heysham. Efforts were made to cross Dallam Dyke but due to water depth and tide this was not possible.

There has been a significant increase in the *Sabellaria alveolata* distribution with much of the skear containing large areas covered by reef (Figure 1). This made accessing many of the areas difficult. The extensive area of reef was present on the North and South of the Skear as seen in previous years but now extends across the skear from Conger Rock to Dallam Dyke (Figures 2 – 5). The extent is similar to that observed pre 2016 where much of the end of the skear was covered by *Sabellaria alveolata*.

Some mussel had persisted over the winter, with small patches of 30-45mm mussel, particularly along Dallam Dyke. Much of the live mussel was mixed in with the *Sabellaria alveloata*. There was the occasional size mussel present across the bed. There were some signs of a 2021 mussel settlement (Figure 6) but it did not seem to be constant across the bed and not in any significant amounts.

Knott End Skear appeared black in colour and had Oystercatchers in numbers present so it is presumed that there is mussel present but this cannot be confirmed as access was not possible by foot. There are a number of skears present beyond Knott End skear.

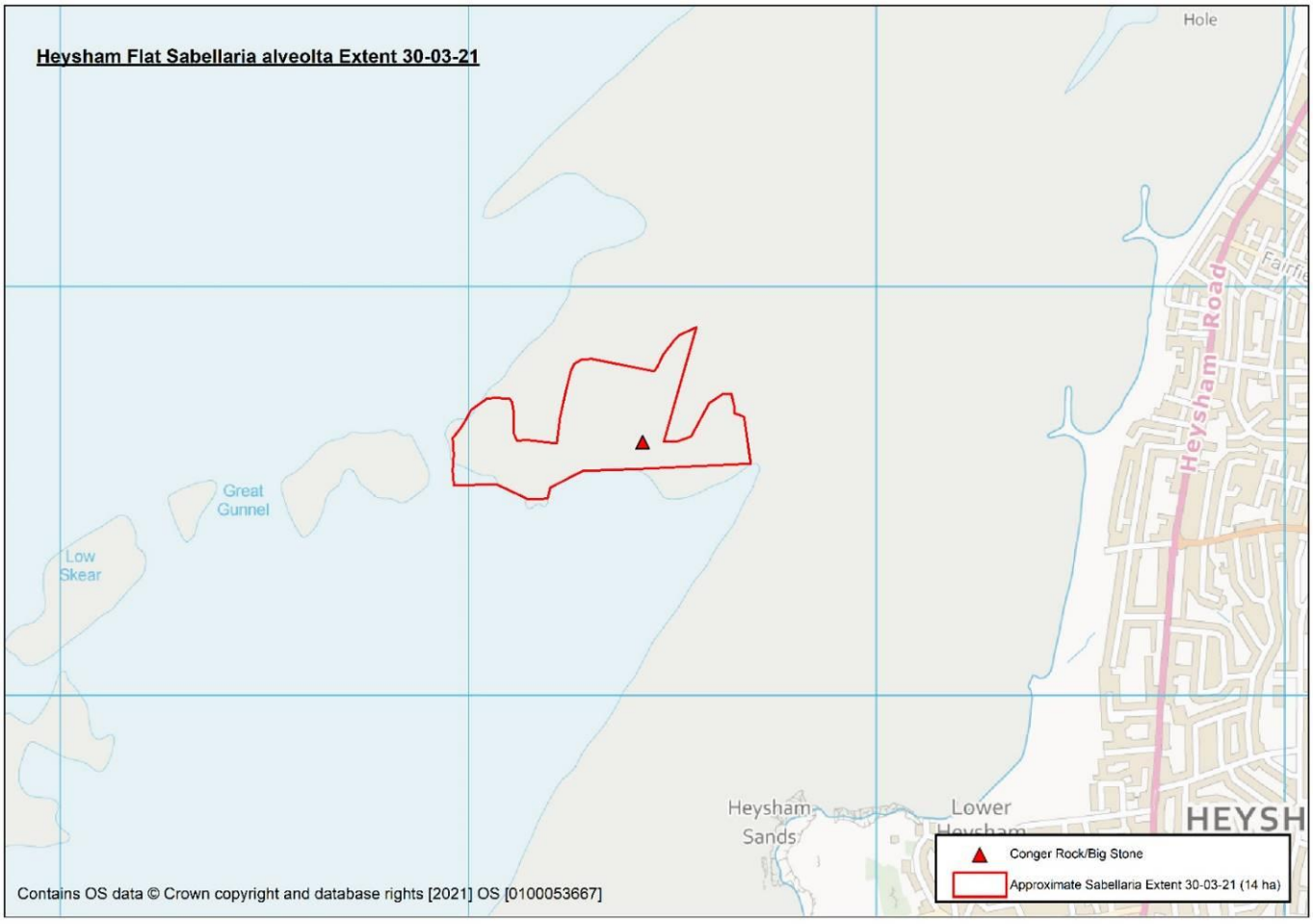

Fig.1 *Sabellaria alveolata* approximate extent 30-03-21.

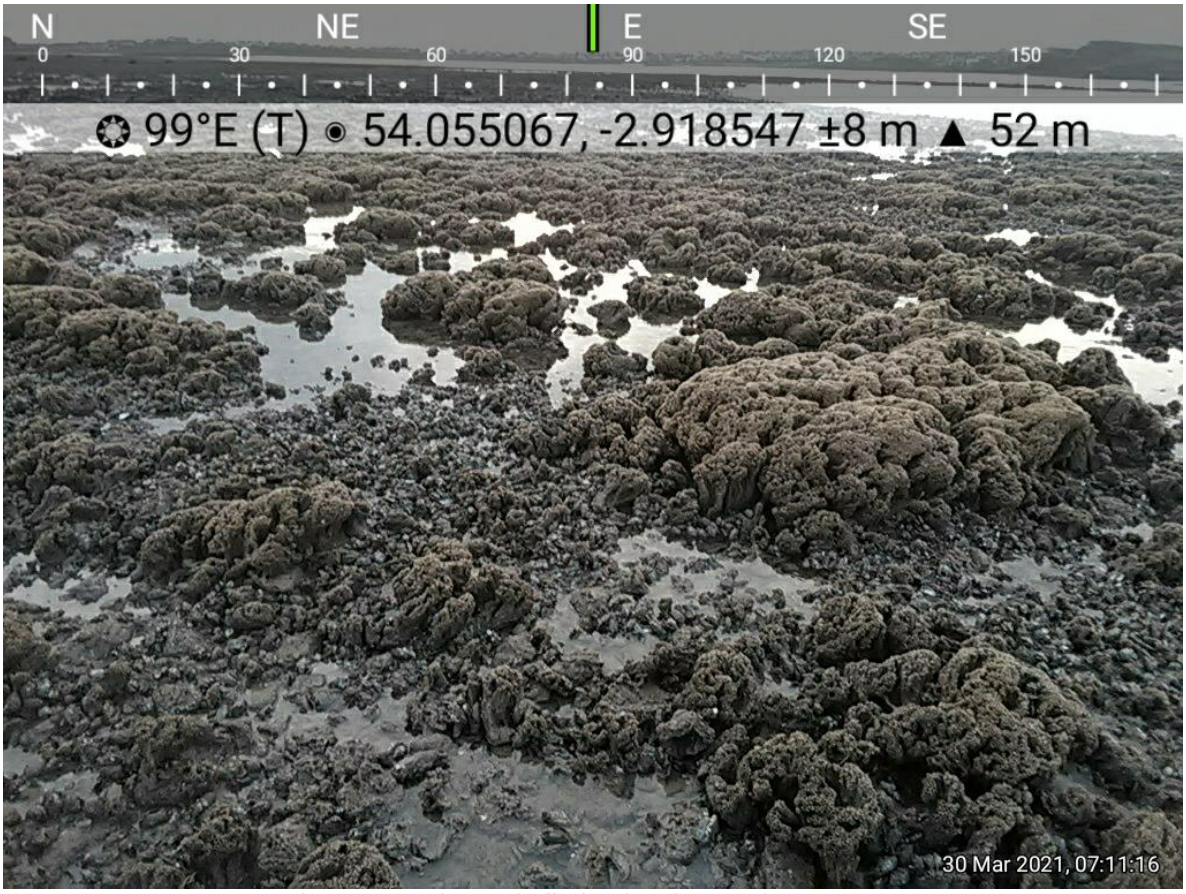

Fig. 2 Extensive *Sabellaria alveolata* reefs 30-03-21.

Fig. 3 Extensive *Sabellaria alveolata* reefs 30-03-21.

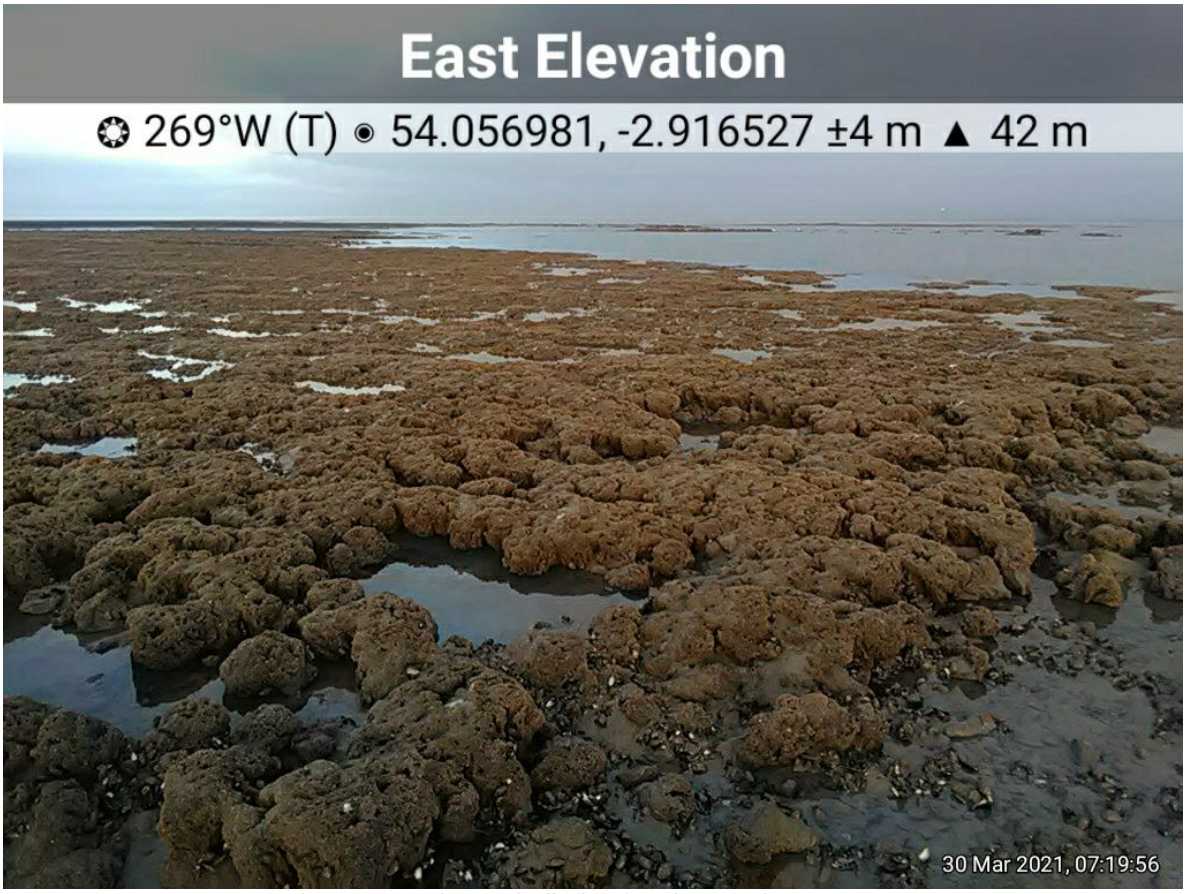

Fig. 4 Extensive *Sabellaria alveolata* reefs 30-03-21.

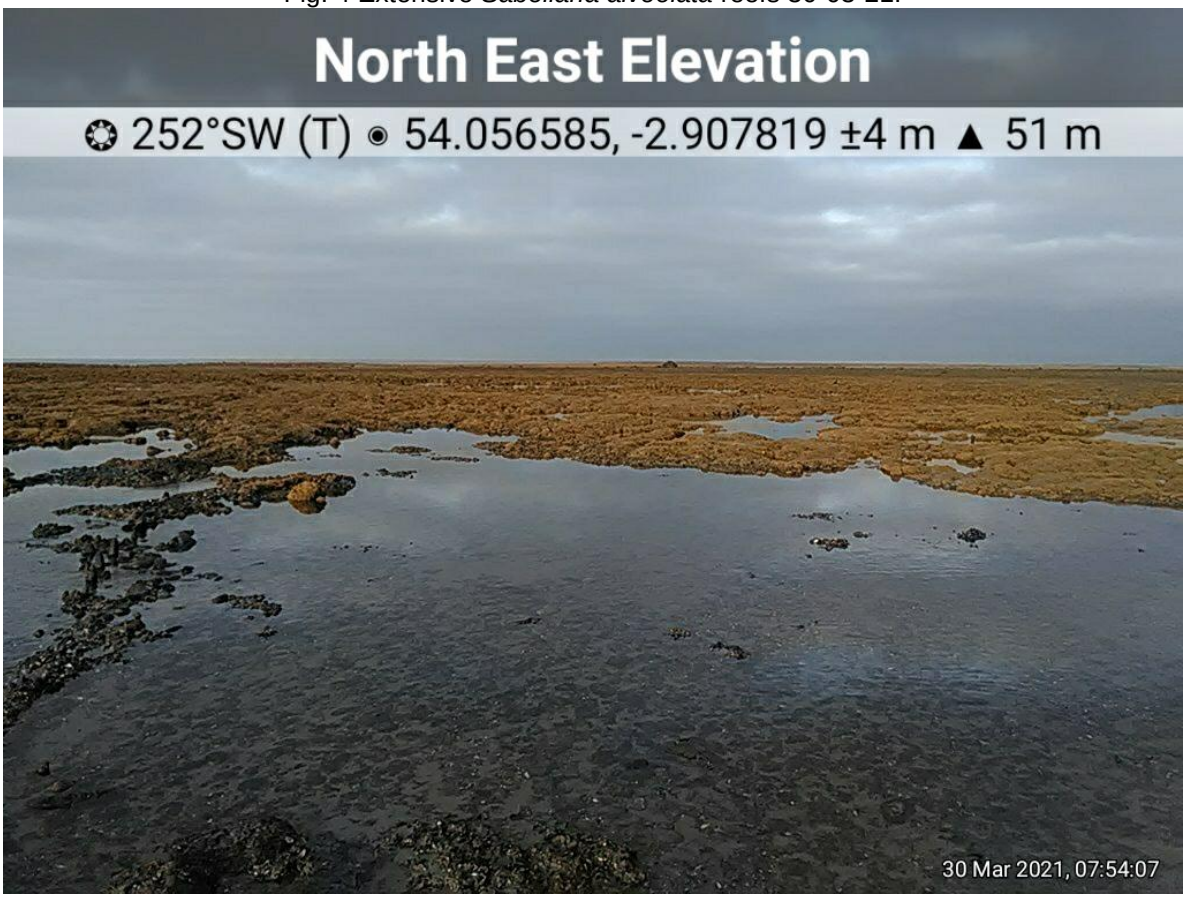

Fig. 5 Extensive *Sabellaria alveolata* reefs looking West towards Conger rock 30-03-21.

Fig. 6 – Seed settlement in cobble area 30-03-21.

2. COCKLES

a) 2021 Cockle Close Season and Consultation with Byelaw 3 Permit Holders

At the NWIFCA March Authority meeting members discussed the 2021 close season in the context of the EU post Brexit ban on undepurated live bivalve exports from class B shellfish beds to EU countries. As agreed by the Authority a consultation with Byelaw 3 permit holders. A survey was carried out asking opinions on a delay to the start of the cockle close season until the end of May.

The consultation from 1st to 9th April 2021 was advertised via the byelaw 3 permit holder's text message service and posted on the website. 13 responses were received with 12 stating the beds should close on 1st May as usual. 1 stating it could be of benefit for the beds to remain open but they would rather see an early opening to the 2021-2 season. After reviewing the responses, the beds closed on 1st May 2021 through the Byelaw 3 close season as usual.

Responses also included mixed opinions on opening cockle beds early after the close season. And no decision on this has been taken.

Any further decisions on the opening of cockle beds in 2021 is dependent on stock surveys of both mussel and cockle, HRA considerations, changes in allowing live bivalve exports to EU countries and changes to bivalve hygiene classifications. The following approach is proposed:

- All Morecambe Bay cockle beds are surveyed in May / early June. Although this is earlier than most years, it will give an indication of adequate stock present to consider an early opening and the potential for fisheries on 1st September should there be insufficient stock to open early.
- All other cockle beds within the district are surveyed in July as normal as there has been no indication of significant cockle stock on these beds to date.
- Any mussel bed data required for the HRA is collected for Morecambe Bay prior to any decision on management.
- Further consultation with byelaw 3 permit holders on any potential changes in management should stocks allow.
- Information on cockle and mussel stocks be provided to TSB with management options, HRA consideration and the current situation with live bivalve exports.

b) Morecambe Bay - Warton Sands Inspection 17/03/21

Tides: LW 07:49 1.6m (Liverpool Tides)

An inspection of the cockle bed at Warton Sands was undertaken to monitor presence, density and growth of cockle surveyed in June 2020. The bed was walked and areas where cockle were previously dense were inspected. The dense area on the South of the bed has further reduced in size to an area 30-40m wide and 100-150m long. The majority of stock present is 20-30mm in size. Cockles were estimated to have been approximately 80% size at a density of approximately 300 per m^2 as shown in Figure 2.

Moving away from the dense area the surrounding area consists of cockle in lower densities, estimated to be approximately 60 per m^2 with the majority being size (Figure 3). Bird activity was present, with high numbers of Oystercatcher feeding along the tide line and evidence of feeding on cockle further up the bed. The Northern region of the bed was inspected with only very low densities of cockles observed.

Fig. 1 Southern area of Warton Sands Cockle Bed 17-03-21.

Fig.2 High density of 20-30mm size class cockle approximately 300 per m^2 - Warton Sands 17-03-21.

Fig.3 Lower density of approximately 60 per m^2 - Warton Sands 17-03-21.

3. Leasowe Large Bivalve Survey 25/02/21

Tides: LW 16:44, 1.9m (Liverpool Tides)

Background

In 2020 methods were investigated to survey populations of large bivalve species *Lutraria lutraria* (Common Otter Shell) and *Mya arenaria* (Sand gaper). The aim was to monitor the impact of management measures implemented in 2020 and to inform future management. The measures were the North Wirral Foreshore Bivalve Mollusc Emergency Byelaw 2020 and NWIFCA Byelaw 2 – North Wirral Foreshore Bivalve Molluscs 2021 currently in development.

From the work carried out in 2020 a rapid assessment protocol for large bivalves was established so that shows of large bivalves can be differentiated from other organisms on the beach. Also the majority of small bivalves present on the beach at the time of survey have been documented.

Unfortunately the lack of large bivalves present in the 2020 survey left questions around the resolution of a systematic survey grid, and the reasons why clearly defined shows of large bivalves did not yield any individuals are now unclear.

In 2021 officers plan to address outstanding question from the 2020 surveys and refine the methodology. The aim is to collect data on the stock levels of large bivalve on Leasowe beach using quarterly sampling.

Methods

The survey was conducted on 25th February (LW 16:44, 1.9m Liverpool tides). 38 survey stations were sampled from a 250m grid.

At each station, a 10m by 10m area was marked out using a pre-measured rope and pegs. A methodical search of the plot was undertaken and organism shows that were believed to contain large bivalves were marked with a flag. An example of the variety of shows found can be seen in Figure 1. Inserting a finger into the show and examining the behaviour of the hole as it got deeper enabled differentiation between clams and other organisms with relative certainty. If the hole became larger as it got deeper, then it was very likely to contain a large bivalve. If the hole remained narrow and it took force to continue further, it was not likely to be a clam. Officers validated this by digging by hand around the show to reveal the organism present. Smaller shows which did not fit these criteria were not investigated further due to it being found unnecessary from the work carried out in 2020 to develop the survey methodology. For this survey, only large bivalve shows were recorded and plotted.

Results

Table 1 shows the summary for each station where large bivalve shows were found. Each show was dug out by hand and the species present was recorded. In total, 6 large bivalve shows were identified from the 38 100m^2 plots as shown in Figure 2. For station 47L, only one hole was found to contain a Sand Gaper. The second hole showed the characteristic shape and suction, however, digging was abandoned as the hole filled with sediment faster than it could be dug.

Due to the low numbers of large bivalves found during the survey, none were taken for biometrics in the laboratory but were placed back in the burrow and reburied. The two species that had previously been identified as present at Leasowe were the Common Otter Shell (*L. lutraria*) and Sand Gaper (*M. arenaria*) but no Common Otter Shell clams were found

All the shows from this survey were found in areas of muddy sand/ sandy mud substrate. These results support previous observations that the substrate preference for the large bivalves appears to be muddy sand on Leasowe beach. However, there is insufficient evidence for this to be conclusive. Additional observations were that stations with sand substrate either had no shows or were dominated by worm casts.

Table 1. Summary of stations where large bivalve shows were found on Leasowe beach 25-02-21.

Station number	Number of large bivalve shows	Number of holes dug	Species in hole	Estimated size of clam (mm)	Substrate
47L	2	2	1 x Sand Gaper	80	Muddy sand
54L	2	2	Sand Gaper	60-80	Sandy mud
61L	2	2	Sand Gaper	50-60	Sandy mud

Discussion

Only six shows of large bivalves were found during this survey. The low number of shows may have been because there were fewer large bivalves present on the beach, or the systematic grid overlaid on the beach was not of a high enough resolution to detect the patchy distribution of these organisms.

When comparing fishing (pre-regulation) and survey data from 2020 and 2021 large areas of Leasowe beach have not had fishing activity or large bivalve species present and therefore the survey grid should be refined further to concentrate on the central part of the beach with a higher resolution of sampling. This should limit the possibility of missing the large bivalves which may have a patchy distributions.

For conservation of stock and due to the low densities and potential damage to individuals, it is recommended the officers no longer dig the shows. Officers are confident that they can identify large bivalves by the shows and that there is little to be gained from digging the large bivalves, especially when densities are low and potential damage to remaining stock could be have an impact on recovery. This will unfortunately mean that species composition information on the two species of large bivalve found at Leasowe will not be gathered as the shows for otter clams and sand gaper are not distinctive for each species.

Fig 1. Examples of the variety of shows present on Leasowe beach

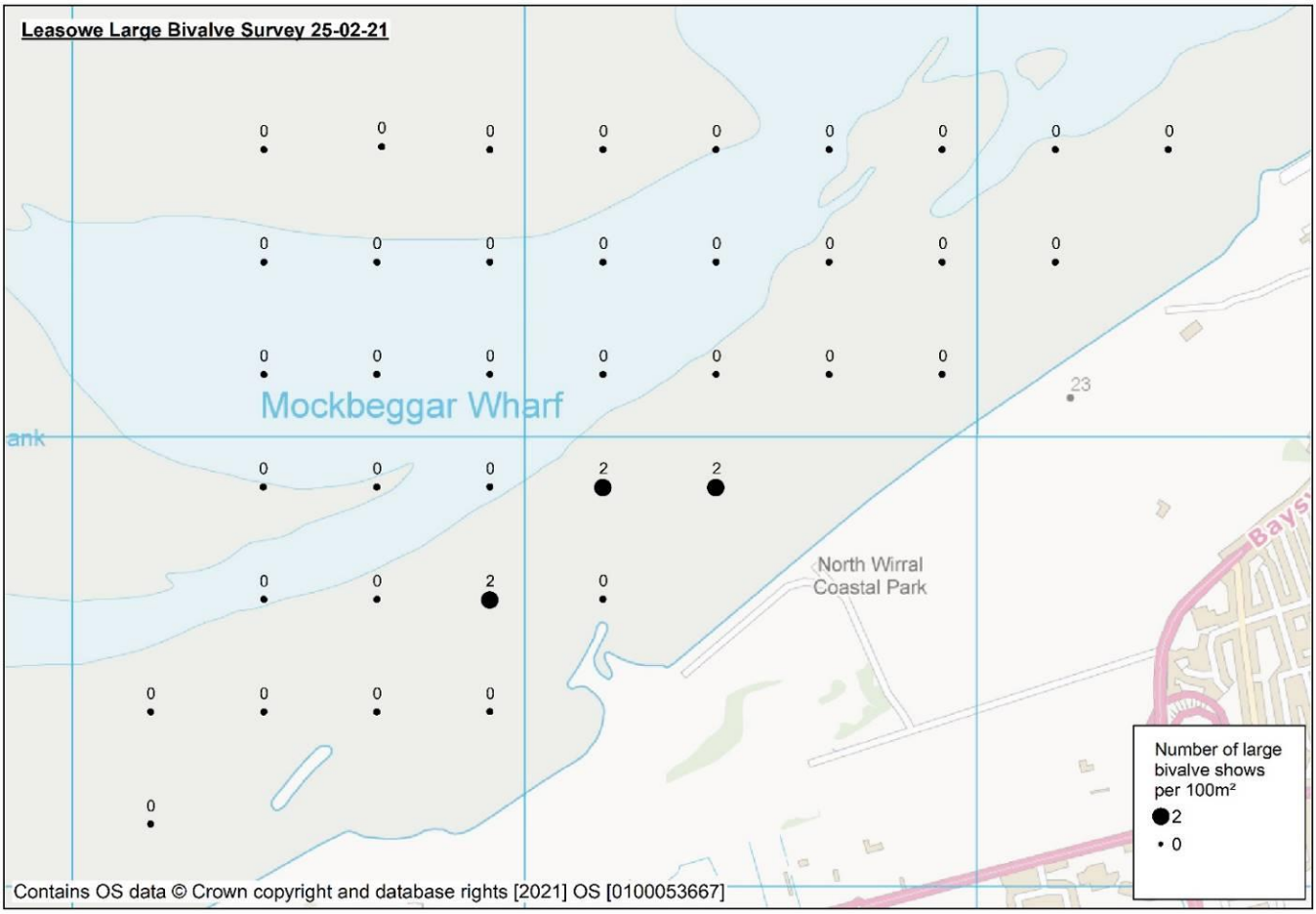

Fig 2. Number of large bivalve shows per 100m² on Leasowe beach 25-02-21

Science Officers
5th May 2021

Annex A – Evidence of Vehicle Damage to the Sabellaria alveolata at Heysham Flat 30-03-21