

# NWIFCA Technical, Science and Byelaw Committee

1<sup>st</sup> of November 2022: 10:00 a.m.

Agenda Item  
6

## SURVEY AND INSPECTION REPORT 2<sup>ND</sup> AUGUST – 1<sup>ST</sup> NOVEMBER 2022

**Purpose:** To report on cockle and mussel surveys and inspections in the last quarter, and update members on the mussel and cockle fisheries in the district.

**Recommendation:** Approve the following:

**a) Receive the report and related survey and inspection notes**

Officers have undertaken a busy survey and inspection schedule this quarter. The corresponding inspection and survey notes are provided on our website in the Annex to TSB reports. A number of these reports have been provided to TSB via email due to the timings of meetings and surveys this year. The following sections provide a summary of our findings and details of further relevant work.

### 1. MUSSELS

#### *Survey and Inspections this quarter*

<b>Mussel</b>	
Heysham	12-08-2022 and 12-09-2022
Fleetwood	17-08-2022
South America	13-08-2022 and 12-09-2022
Falklands	14-08-2022
Seafiled - Lytham	16-08-2022
Thurstaston and West Kirby	31-08-2022

Inspection and survey notes are provided in the Annex to this report. The following sections provide a summary of our findings and details of further relevant work.

**a) Morecambe Bay mussel beds:**

**1) Heysham:**

**12-09-2022 inspection:**

The area on the higher shore to conger rock consisted of mussel 20-25mm with some up to 40mm mixed in ~ 50-70% coverage, some areas 80-90% coverage. The mussel was predominantly loose with some hard in and scoured areas were present with minor evidence of roping up. An area of Sabellaria alveolata has now begun encroaching into the seed fishery permitted area.

The area from conger rock to Dallam dyke has a mix of size classes, 25-30 mm mixed with larger mussel of 40-45mm ~ 40-60% coverage. Visible presence of Sabellaria alveolata was

found, with a band present across much of the skear to the West of conger rock. Sabellaria was also still present on the North and South of the skear away from the main mussel bed. On the edge of Dallam Dyke were patches of larger mussel >45mm but very loose from the Dyke down the South edge of the skear. Both sides of Dallam Dyke were scoured in large areas.

This year, conditions were deemed suitable for a hand gathered seed fishery on Heysham in a specified area of the higher shore. The fishery was deemed HRA compliant and opened on the 9<sup>th</sup> of September until 31<sup>st</sup> of December. A size fishery has been proposed for the lower part of beyond Conger Rock. This area is currently in the process of being classified.

## **2) Fleetwood**

### **17-08-2022 inspection:**

An inspection of Perch and Black Scar was completed to assess the condition of the mussel previously inspected in August, and prior to any seed mussel fishery opening. The inspection concentrated on the main beds of Black Scar and Perch Scar as from the previous inspection these showed the larger areas of settlement and potential for a fishery.

#### Black Scar

Very little mussel persists on Black Scar, most of the area is bare stony substrate. There has been a reduction in algae when compared to the July inspection. There is an area of mussel mud, approximately 50m x 50m in the centre of the hard ground which is likely to have had mussel which has scoured out. A small amount of seed mussel remains which is 20-25mm in length. The band of larger mussel along the channel edge remains.

#### Perch Scar

The area of seed mussel previously report in July has put down a layer of mussel mud. The mussel is 20-25mm in length. The area of seed does not cover the full extent of the hard substrate with little to no seed present near the channel and on the Northern end of the bed. The seed is not as dense as it has been in the previous years with 40-60% coverage. There are no obvious signs of scouring. The band of larger mussel along the channel edge remains.

This year, spat settlement on these beds was lower than in previous years and both coverage and density were lower. The areas proposed for opening were therefore considerably smaller than in previous fisheries, however, still considered viable for the fishery.

Perch Scar was open to dredge fishing from the 15<sup>th</sup> of September to 15<sup>th</sup> of November, after a HRA was approved. The fishery was complete in one tide.

## **3) South America**

### **12-09-22 inspection**

An inspection of South America was completed to assess the condition of the mussel previously inspected in August, and prior to any seed mussel fishery opening. Although tide and conditions were good, access remains limited to a short period over low water due to the depth and size of the channel needing to be crossed.

The mussel had changed considerably since the last inspection in August. The mussel to the North, East and South of the bed had reduced in coverage to less than 30% with only a thin layer of sediment or mussel being on hard substrate. Where mussel was on a layer of

substrate the areas in between where there wasn't any mussel consisted of exposed hard substrate. The mussel was 30-35mm with the occasional size mussel present.

The mussel in the centre of the bed appears to have spread to the East. The mussel had approximately 30% coverage on a muddy substrate, the areas where mussel wasn't present still had a layer of muddy substrate, suggesting the mussel had recently scoured. The mussel is 30-35mm with the occasional size mussel present.

The Sabellaria alveolata has grown in size and area covered to the majority of the exposed hard substrate on the North East side of the channel.

This year, spat settlement on these beds was lower than in previous years and both coverage and density were lower. The areas proposed for opening were therefore considerably smaller than in previous fisheries, however, still considered viable for the fishery.

As the conditions had changed slightly since the previous inspection, the area for the permitted dredge fishery was altered to ensure HRA compliance, and the fishery was opened on the 15<sup>th</sup> of September to 7<sup>th</sup> of October. The fishery was complete in 3 tides.

#### **4) Falklands**

Data provided by industry reported an area of mussel on the Falklands. The positional data provided was used to target an inspection by drying out a RHIB.

The estimated area of seed mussel from the 2021 heliflight and our track data were compared. The mussel on Falklands are likely to be the mussel which has survived from the 2021 settlement.

Access was limited to the areas which could be accessed by foot after the RHIB had dried out. The area of mussel was split by a channel which could not be crossed and therefore approximately half of the bed was inspected. Mussel could be seen to the South of the NWIFCA track but could not be accessed.

The mussel was patchy with large areas of sand between two areas of dense mussel to the North and South of the GPS track data. Both areas continued into the water. The mussel was size (45-55mm) with the occasional undersize, and on a layer of sand.

The area to the North had a greater density of mussel and continued into the water. Nearly all of the mussel was 45-55mm in size. The mussel was on a layer of sand with area of exposed hard substrate. The fishery was not opened as a seed dredge fishery as it would not have been HRA compliant.

### **b) District mussel beds**

#### **1) Seafield slip**

##### ***16-08-2022 Inspection:***

Information was provided by industry that Seafield slip had a mussel settlement.

Seafield Slip was last inspected in 2018 when there was a seed settlement that washed away and has previously been a seed and size mussel fishery but not since 2015/16.

The mussel was in a thin strip approximately 20m wide along the channel edge of the River Ribble, consisting of two areas totalling 750m long. The mussel consisted mainly of two size classes, newly settled seed, 5-8mm in length and larger seed, 30-40mm in length. The small seed was higher up the shore line, with a mix of 5-8mm and 30-40mm in near the channel edge. At low tide there were a number of small islands (10m<sup>2</sup>) that contain clean 30-40mm.

There was the occasional large barnacled size mussel mixed in with the seed. Higher up the shore the mussel was on hard substrate with a very thin layer of settlement underneath. Towards the channel edge the mussel was on mud with some signs of scour of the mussel still under the water at low tide.

The fishery was not taken to HRA as it did not pass the test of likely significance (the area is less than 1.6ha), and was recommended for opening. The fishery was opened on the 9th of September.

## 2) Thurstaston and West kirby

### ***31-08-2022 inspection:***

Thurstaston:

Officers were able to walk the majority of the perimeter of the mussel beds at Thurstaston with the total of the bed areas being 15.46 ha.

In total, the bed area was estimated to be 15.46 ha, made of up one large bed area and a number of smaller areas separated by channels. The bed had areas of very patchy mussel ranging from 5 – 20% coverage. The majority of the bed had very low coverage with large amounts of barnacle and green seaweed growing on the mussel. The majority of mussel was recorded as size (45-60mm) with some patches of 25mm mussel mixed in. No other spat settlement was observed. A large amount of cockle shell was observed amongst the mussel.

West Kirby:

The majority of the mussel was between 45-60mm meaning it has remained and grown on since the previous winter. Only very occasional undersize mussel was present on the bed. No spat settlement was observed. The substrate was thick mud with a large amount of cockle shell amongst the mussel and in the channels. Little evidence of scouring, the mussel present was partly buried in the mud and presence of barnacles. Mussel coverage was fairly uniform across the bed. A small flock of oyster catchers were seen feeding just off the edge of the mussel bed, and Dunlins were seen feeding on the foreshore

## 2. COCKLES

### ***Survey and Inspections this quarter***

<b><i>Cockles</i></b>	
<i>Southport</i>	01-09-2022
<i>Leasowe</i>	03-08-2022

Cockle beds in the Ribble Estuary including Lytham and Foulness were not of significant quantities to warrant summer surveys

### **a) Ribble cockle beds:**



## **1) Southport**

### **01-09-2022 inspection:**

On the most recent inspection there was a band of size and undersize cockle present on the bed running from NE to SW. Since the last survey a spat fall has occurred, with patches of 0-5mm cockle also present towards the North of the surveyed area. The cockle has grown since the last inspection with the majority of the cockle between 20-28mm in length. An area to the North of the survey grid which previously had high densities of cockle was not surveyed due to the ground being too soft to safely access. The survey estimated the volume of size cockle to be 1100 – 1200 tonnes, and undersize to be 1200 to 1300 tonnes.

The fishery underwent a HRA in September and was approved by NE on the 6th of October. TSB agreed via email on the last week of September for the fishery to open subject to HRA approval.

Preparations for the opening of the fishery are underway. In addition, the site is awaiting classification which is predicted to come through 24<sup>th</sup> of October.

## **2) Leasowe**

### **03-08-2022 inspection:**

Size cockle numbers are relatively low compared to previous year with the average size of the cockle being smaller. There is evidence of a 2022 settlement which has grown to 5-10mm in size. 100-120 tonne of size cockle and 100 tonne of undersize was present. This was not deemed sufficient to propose opening a fishery.

**NWIFCA, 19<sup>th</sup> of October 2022**

# Annex 1

## ***Mussel Inspections and surveys:***

### **Heysham Flat Mussel Inspection 12-08-22**

Officers present: JH, AP, MC  
Tides LW 06:44 1.0m (Liverpool tides)

The area on the higher shore to conger rock consisted of mussel 20-25mm with some up to 35mm mixed in ~ 80-90% coverage. The mussel was predominantly loose with some hard in and scoured areas were present.

The area from conger rock to Dallam dyke has a mix of two different size/year classes, 25-35 mm mixed with larger mussel of 35-55mm. Areas further down the skewer were very mixed, with size mussel making up approximately 40-50% of overall weight. The underlying substrate is a mix of sand and mud and is firm unlike the usual mussel mud present on Heysham. Visible presence of *Sabellaria alveolata* was found, with a band present across much of the skewer to the West of conger rock (Figure 1). *Sabellaria* was also still present on the North and South of the skewer away from the main mussel bed. Both sides of Dallam Dyke were scoured in large areas.

Access to the outer skewers was not possible across Dallam dyke although anglers had accessed the outer skewer using a sandbank to the North of Heysham Flat.

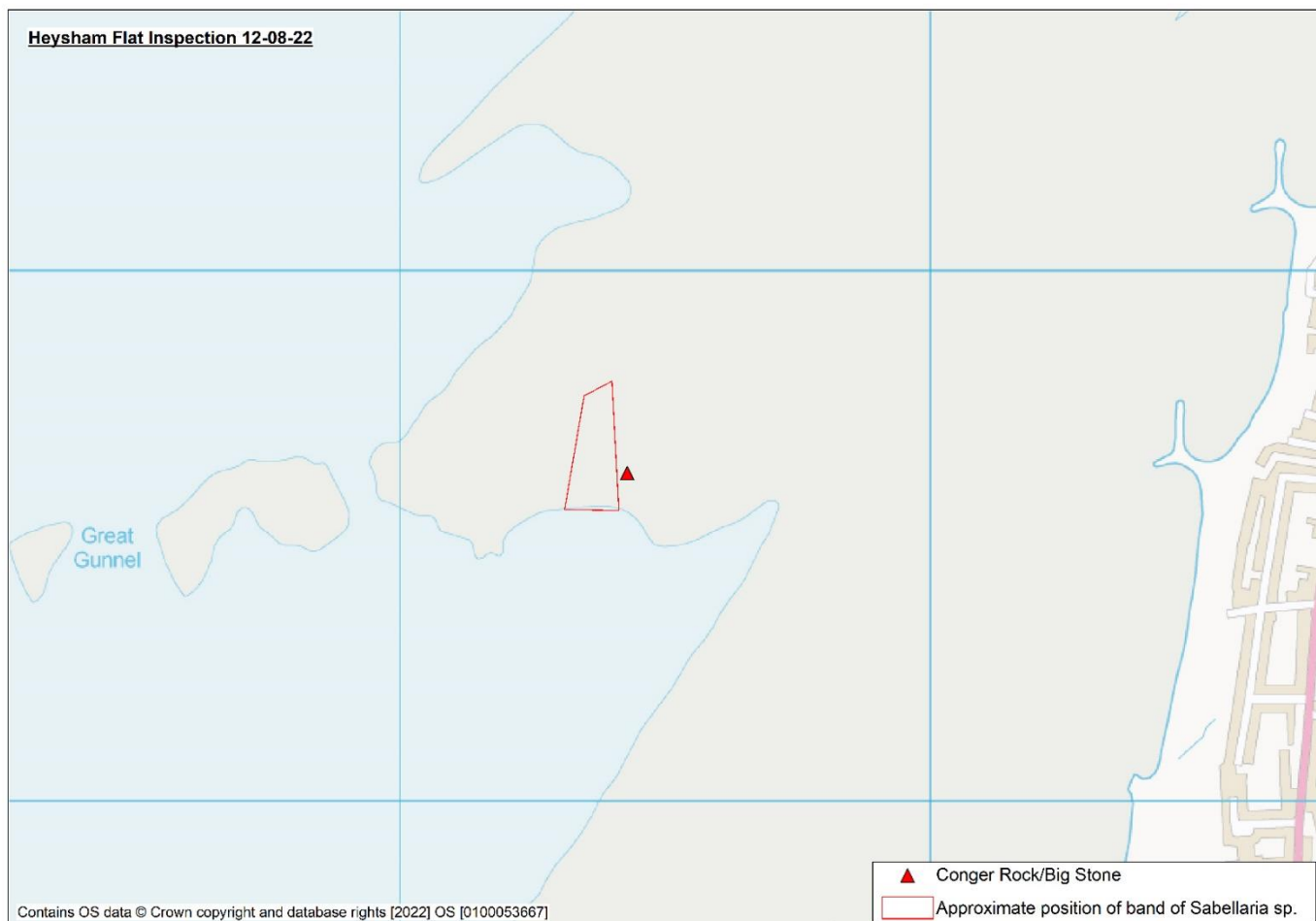


Figure 1. Map to show the approximate extent of the band of *Sabellaria* sp. present on Heysham Flat 12-08-22.



Fig 2. Area of seed before Conger Rock 12-08-2022



Fig 3. Dense seed mussel present on Heysham Flat before Conger Rock



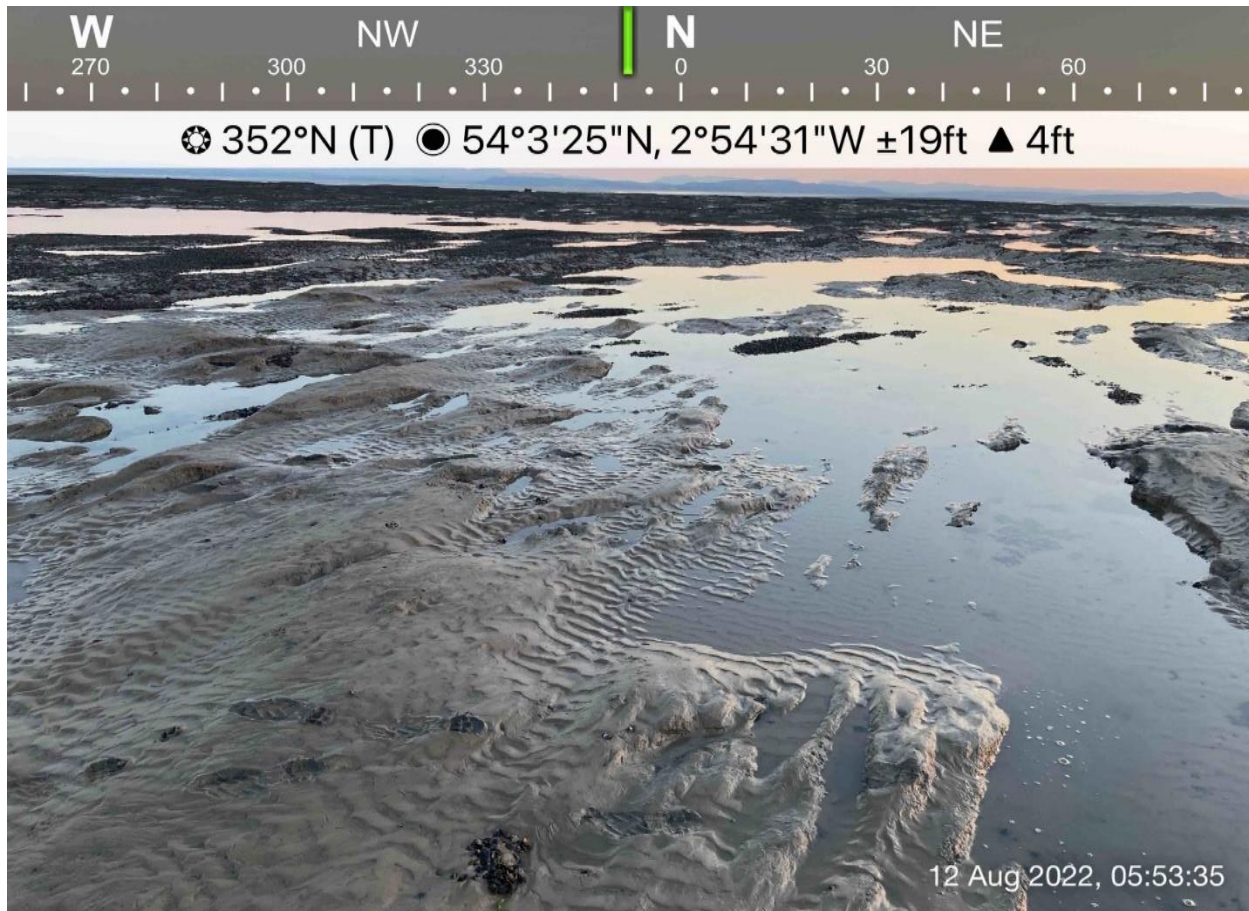


Fig 4. Evidence of early scouring in the foreshore part of the bed.



Fig 5. Evidence of scouring over the seaward side of Dallam Dyke.

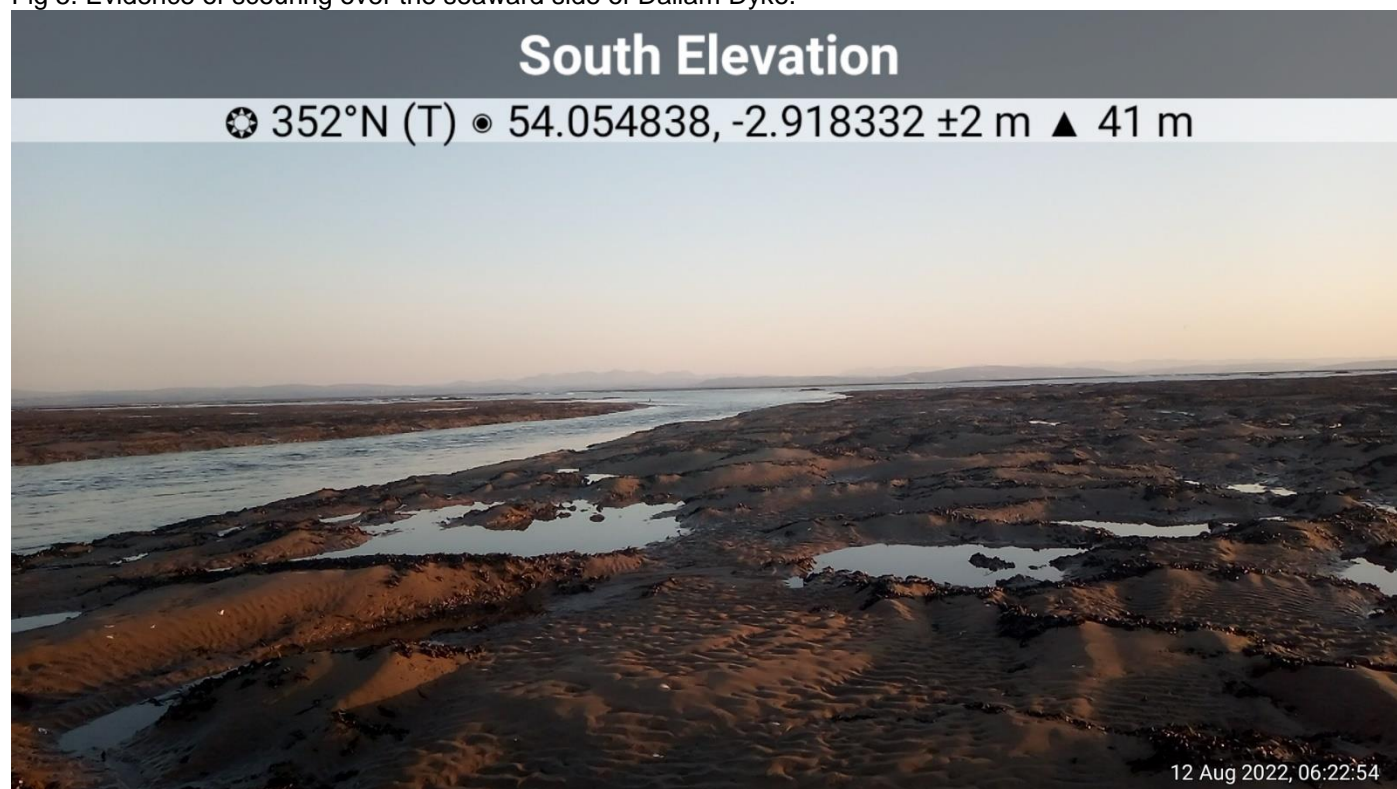


Fig 6. Patchy, scoured mussel on the shoreward side of Dallam Dyke.





Fig 7. Size mussel present between Conger Rock and Dallam Dyke

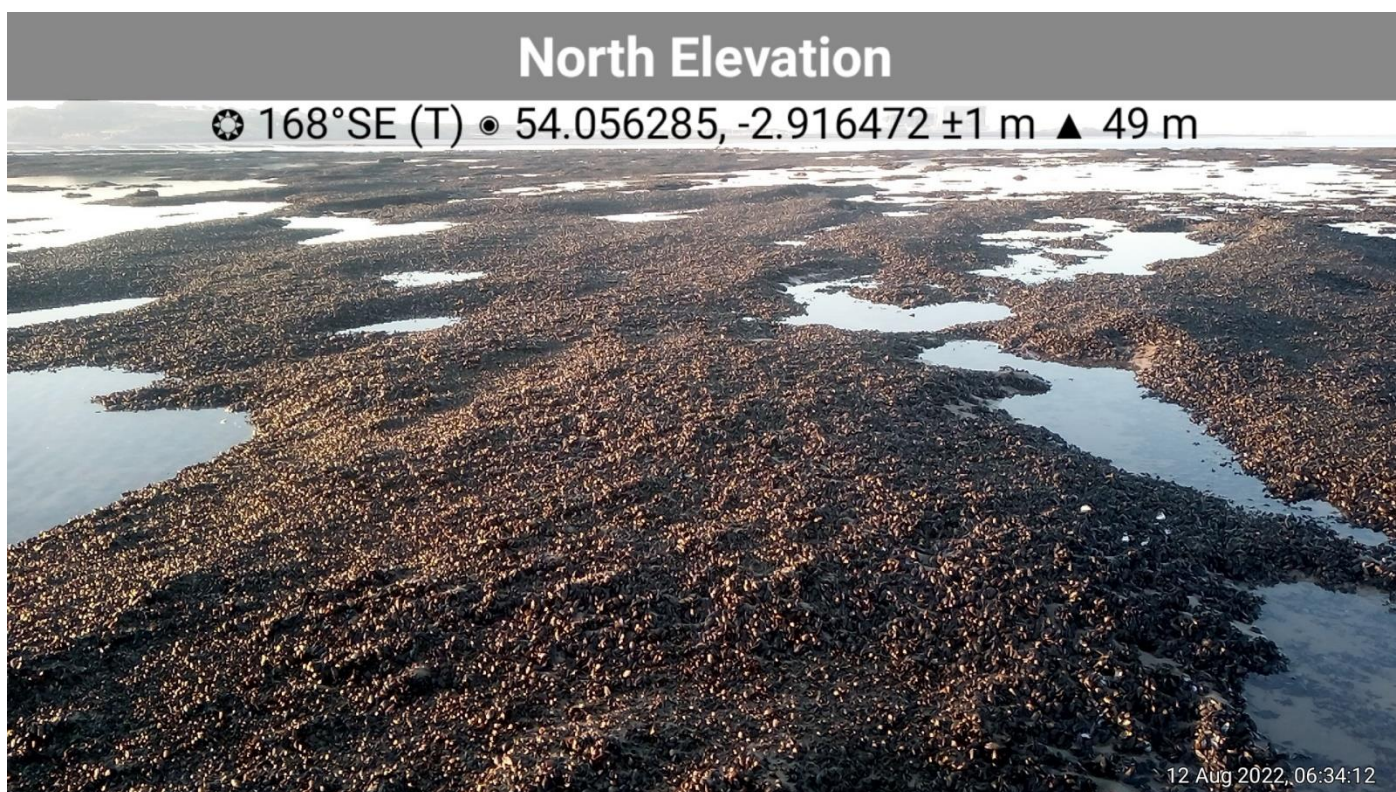


Fig 8. Mix of size mussel on Heysham between Dallam and Conger Rock.





Fig 9. Size mussel

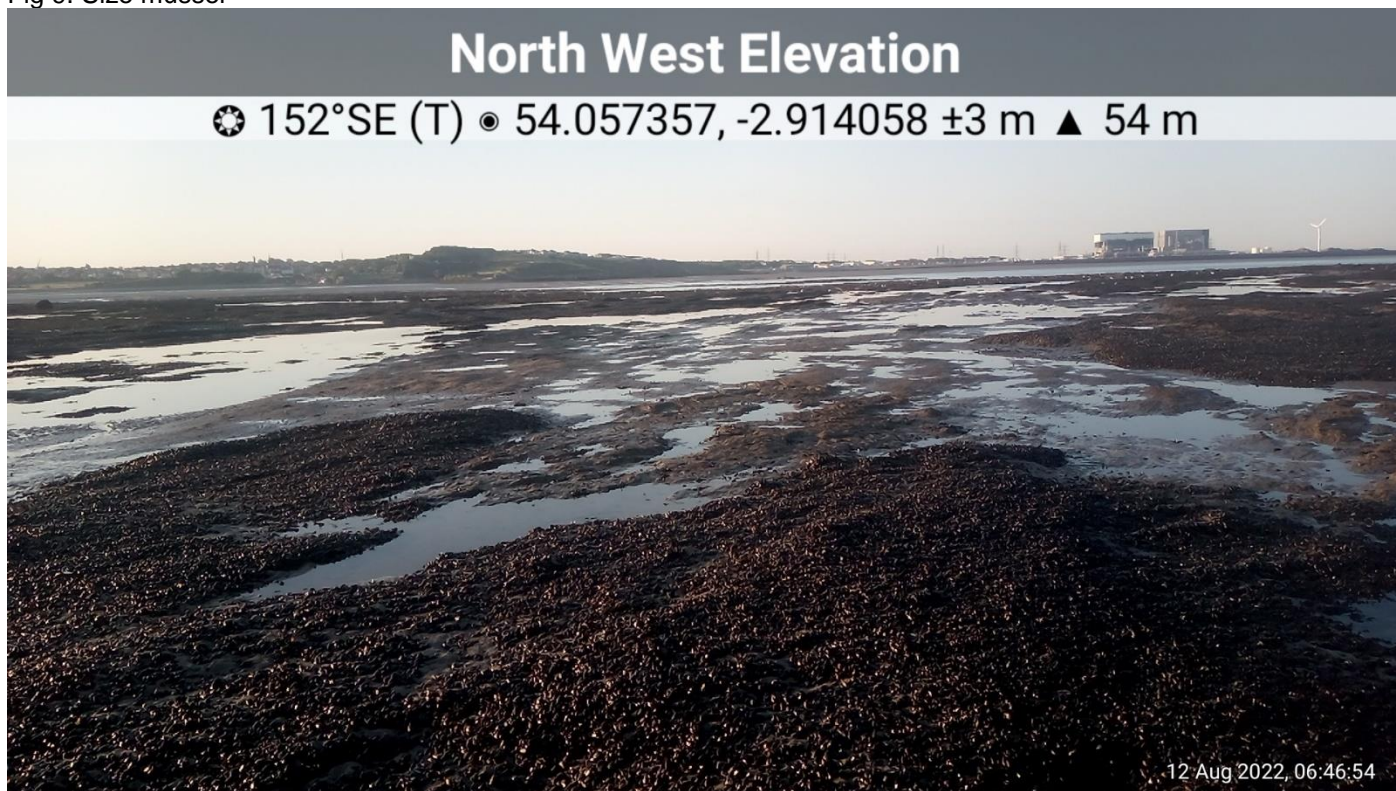


Fig 10. Scouring on the seaward side of Conger Rock.

## Heysham Flat Mussel Inspection 12-09-22

Officers present: MC, GG  
Tides LW 07:57 0.6m (Liverpool tides)

The area on the higher shore to conger rock consisted of mussel 20-25mm with some up to 40mm mixed in ~ 50-70% coverage, some areas 80-90% coverage. The mussel was predominantly loose with some hard in and scoured areas were present with minor evidence of roping up. An area of *Sabellaria alveolata* has now begun encroaching into the seed fishery permitted area as shown on the map in figure 1.

The area from conger rock to Dallam dyke has a mix of size classes, 25-30 mm mixed with larger mussel of 40-45mm ~ 40-60% coverage. Visible presence of *Sabellaria alveolata* was found, with a band present across much of the skewer to the West of conger rock. *Sabellaria* was also still present on the North and South of the skewer away from the main mussel bed. On the edge of Dallam Dyke were patches of larger mussel >45mm but very loose from the Dyke down the South edge of the skewer. Both sides of Dallam Dyke were scoured in large areas.

Access to the outer skears was not possible across Dallam dyke due to depth of water and timings.

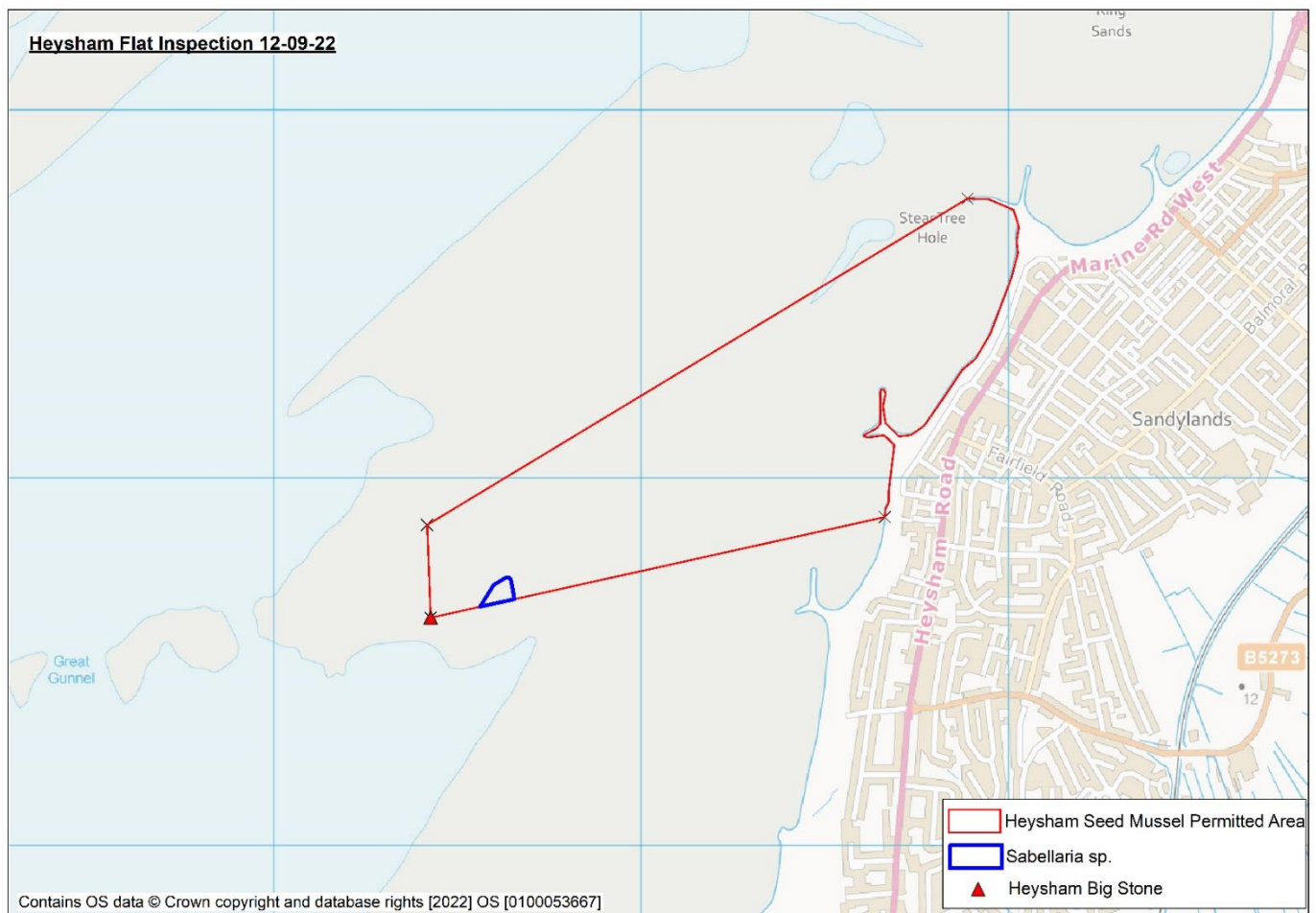


Figure 1. Map of the extent of *Sabellaria sp.* encroaching on the seed mussel fishery area on Heysham Flat 12-09-22.





Figure 2: 20-25mm mussel hard in before conger rock/big stone.





Figure 3: Size mussel patch between conger rock/big stone and Dallam Dyke.



Figure 4: Patch of new growth *Sabellaria* before conger rock/big stone.



Figure 5: Patchy, loose and scoured mussel close to Dallam Dyke.





Figure 6: Scoured areas at Dallam Dyke.

## **Perch and Black Scar Mussel Inspection 17-08-22**

Officers: AP, JH

LW: 10:17 1.5m (Liverpool Tides)

### **Black Scar**

Very little mussel persists on Black Scar, most of the area is bare stony substrate. There has been a reduction in algal when compared to the July inspection (Figure 2). There is an area of mussel mud, approximately 50m x 50m (Figure 3) in the centre of the hard ground which is likely to have had mussel which has scoured out. A small amount of seed mussel remains which is 20-25mm in length. The band of larger mussel along the channel edge remains.

### **Perch Scar**

The area of seed mussel previously report in July has put down a layer of mussel mud (Figure 4 and 5). The mussel is 20-25mm in length (Figure 6). The area of seed does not cover the full extent of the hard substrate with little to no seed present near the channel and on the Northern end of the bed (Figure 7). The seed is not as dense as it has been in the previous years with 40-60% coverage. There are no obvious signs of scouring. The band of larger mussel along the channel edge remains.

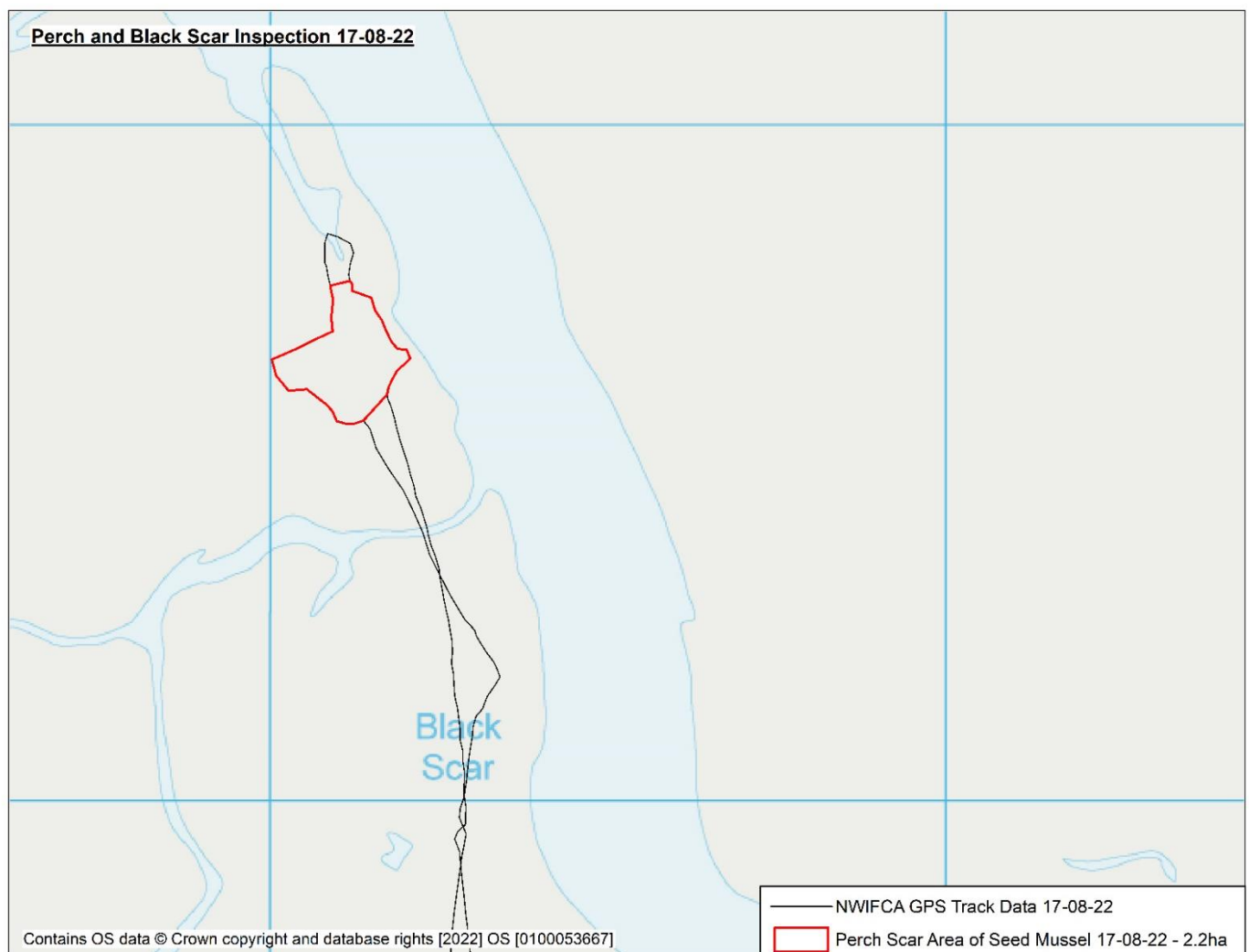


Fig. 1 – NWIFCA GPS Track Data and Area of 2022 Seed Mussel on Perch Scar 17-08-22.





Fig 2 – Overview of Black Scar 17-08-22

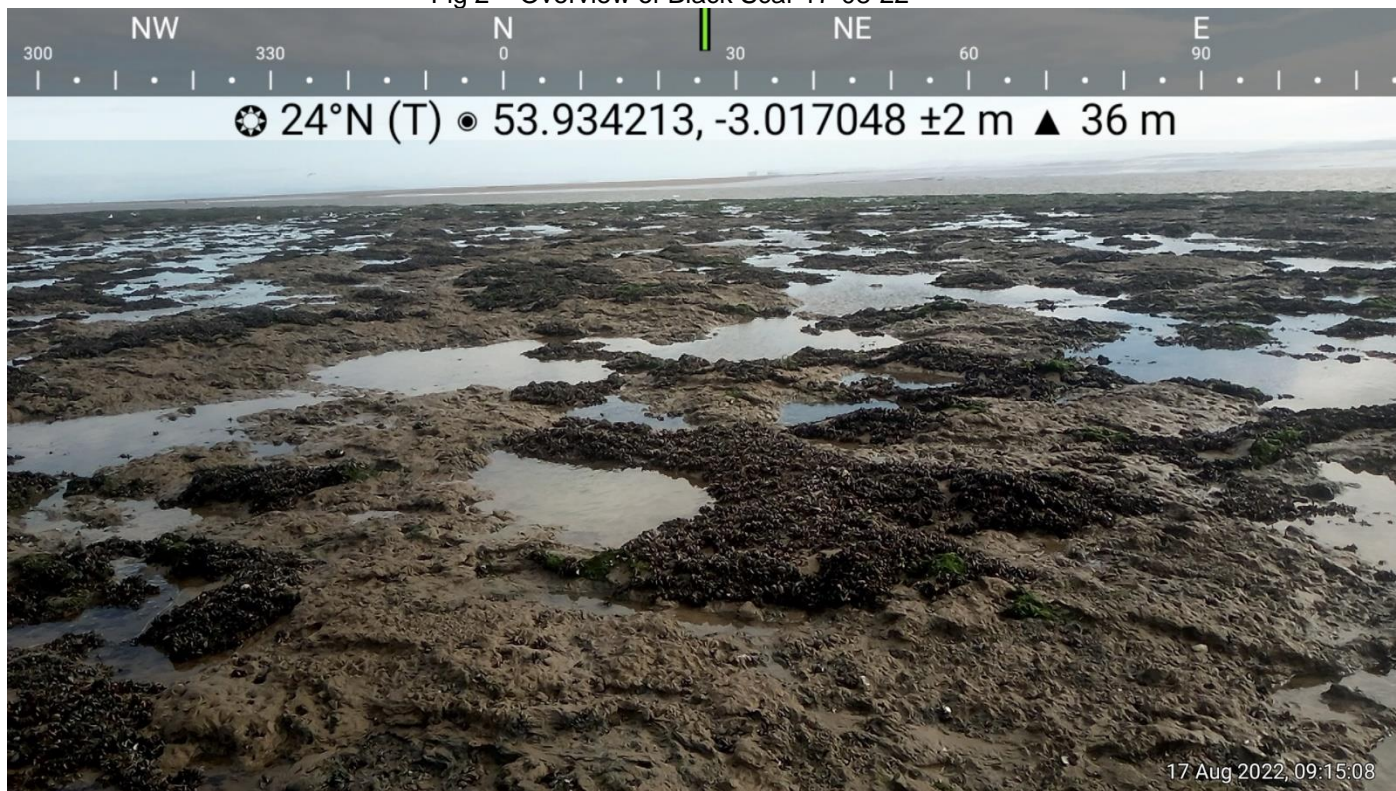


Fig. 3 – Remains of scoured mussel and mussel mud on Black Scar 17-08-22





Fig. 4 – Perch Scar overview of 2022 seed mussel 17-08-22



Fig. 5 - Perch Scar overview of 2022 seed mussel 17-08-22





Fig. 6 – Perch Scar 20-25mm seed mussel 17-08-22



Fig 7 – Perch Scar,



## **South America Mussel Inspection (Quad) 13-08-22**

LW: 07:35 0.6m (Liverpool tides)

An inspection of South America was completed to assess the condition of the mussel previously inspected in July. Although tide and conditions were good, access remains limited to a short period over low water due to the depth and size of the channel needing to be crossed.

The area consisted of a mix of mussel on different substrates. Figure 1 highlights the different areas and includes NWIFCA track data. To the North of the mussel bed the mussel is patchy and on a thin layer of sediment, where there are bare areas the stony substrate is present. The mussel is a mix of 30-35mm mussel with size mixed in. The most size mussel is present in this area. The map indicates area in red which would be suitable as a seed mussel fishery as the mussel is loose and on a soft sediment, there is already evidence of scouring (Figures 2 to 9). The mussel is 30-35mm with the occasional size mussel present. The further South the less size mussel is present. Beyond the South extent of the area suitable for fishing the mussel become less dense, with little to no settlement present between the mussel and the stony substrate until no mussel is present (Figures 10 and 11).

To the North East of mussel there is a large area of newly settled *Sabellaria alveolata* (Figures 12 and 13) which has inhabited the stony substrate exposed early this year.

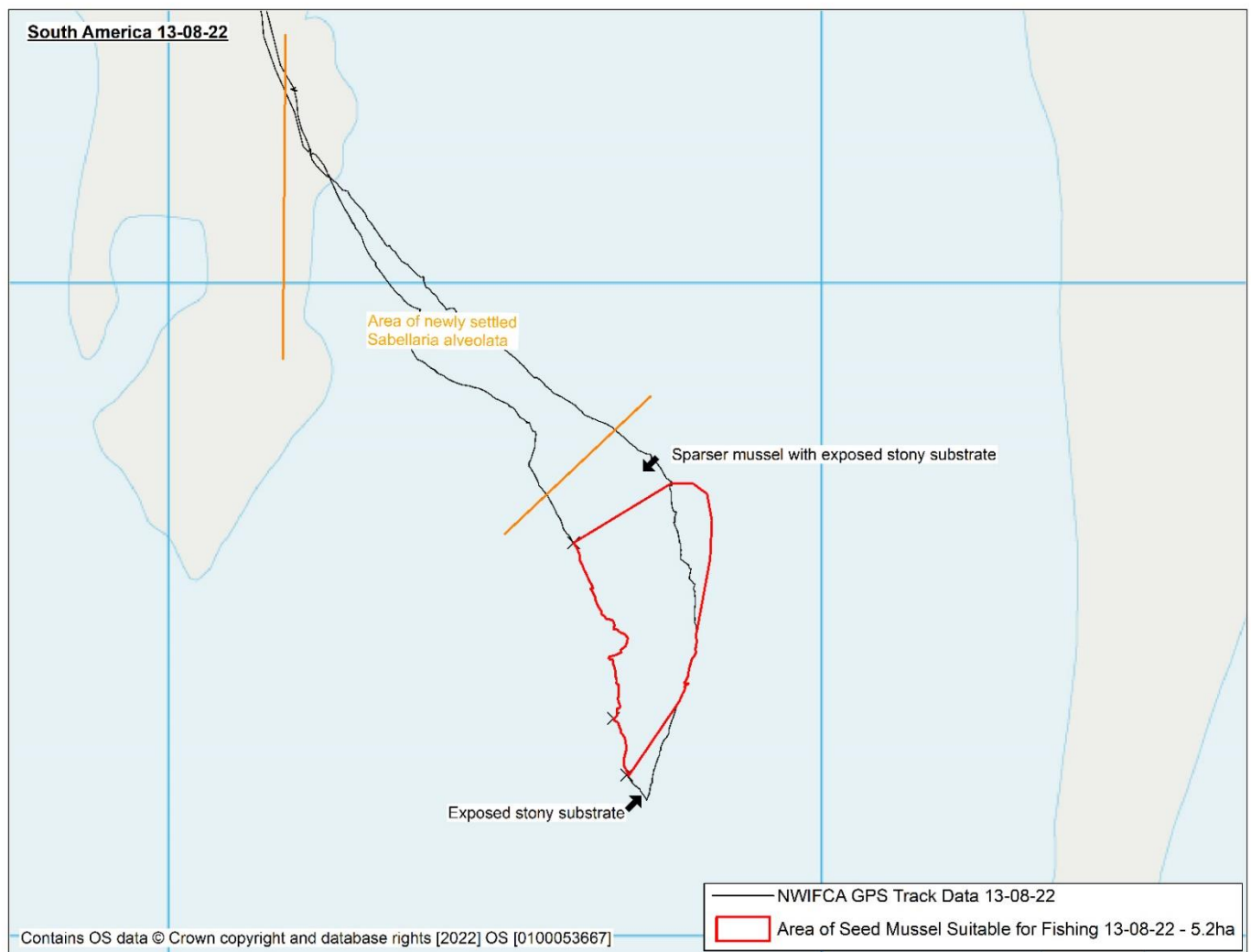


Fig 1. Map of South America including Area of Mussel Suitable for Fishing



Fig 2. North East of the mussel area, seed mussel with occasional size, with evidence of scouring 13-08-22



Fig 3. North East of the mussel bed, remaining mussel mud after scouring 13-08-22





Fig 4. North East of the mussel area, dense, loose seed mussel with occasional size mussel 13-08-22

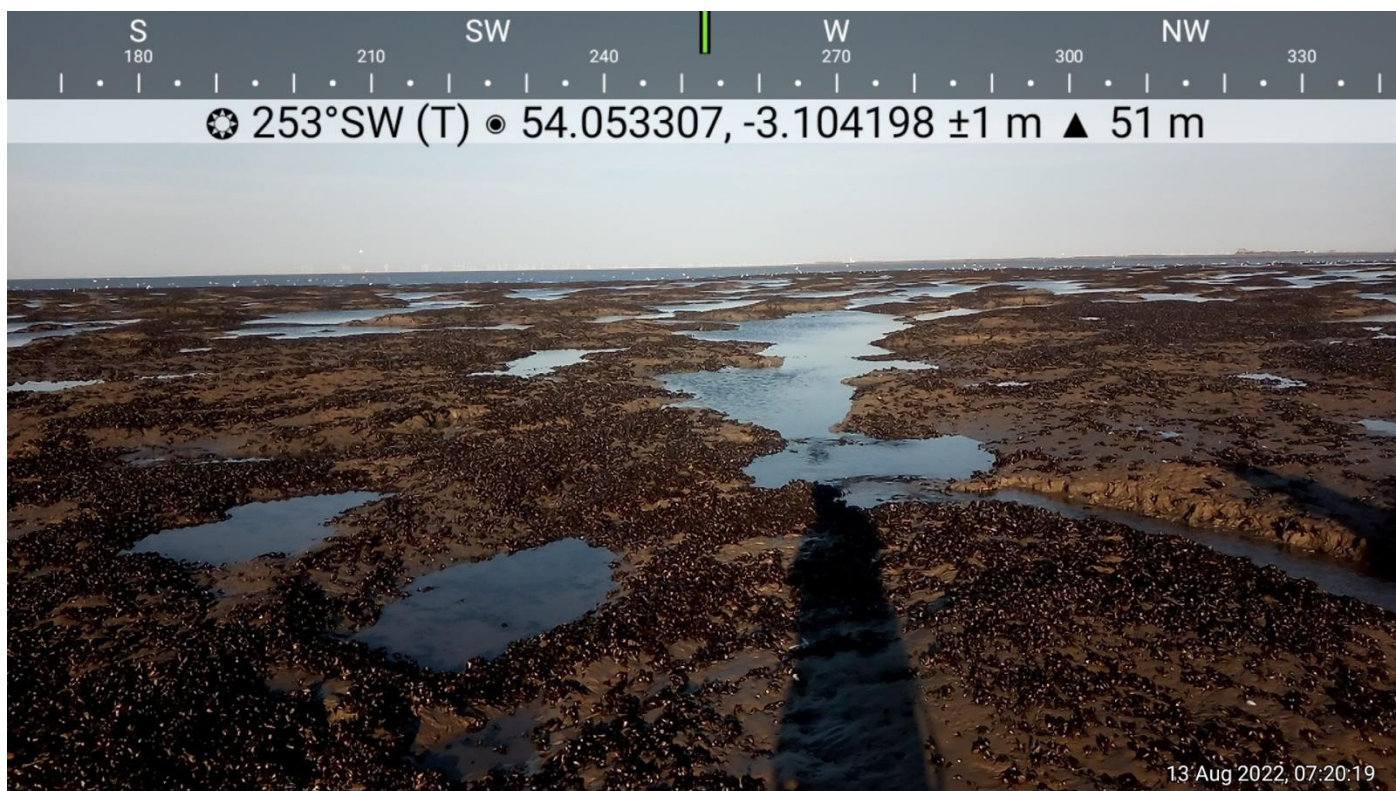


Fig 5. Overview of the Eastern side of the skear looking west 13-08-22





Fig 6. Overview of the seed mussel from the West of the bed look East. Seed mussel with very little size present on layer of mussel mud 13-08-22

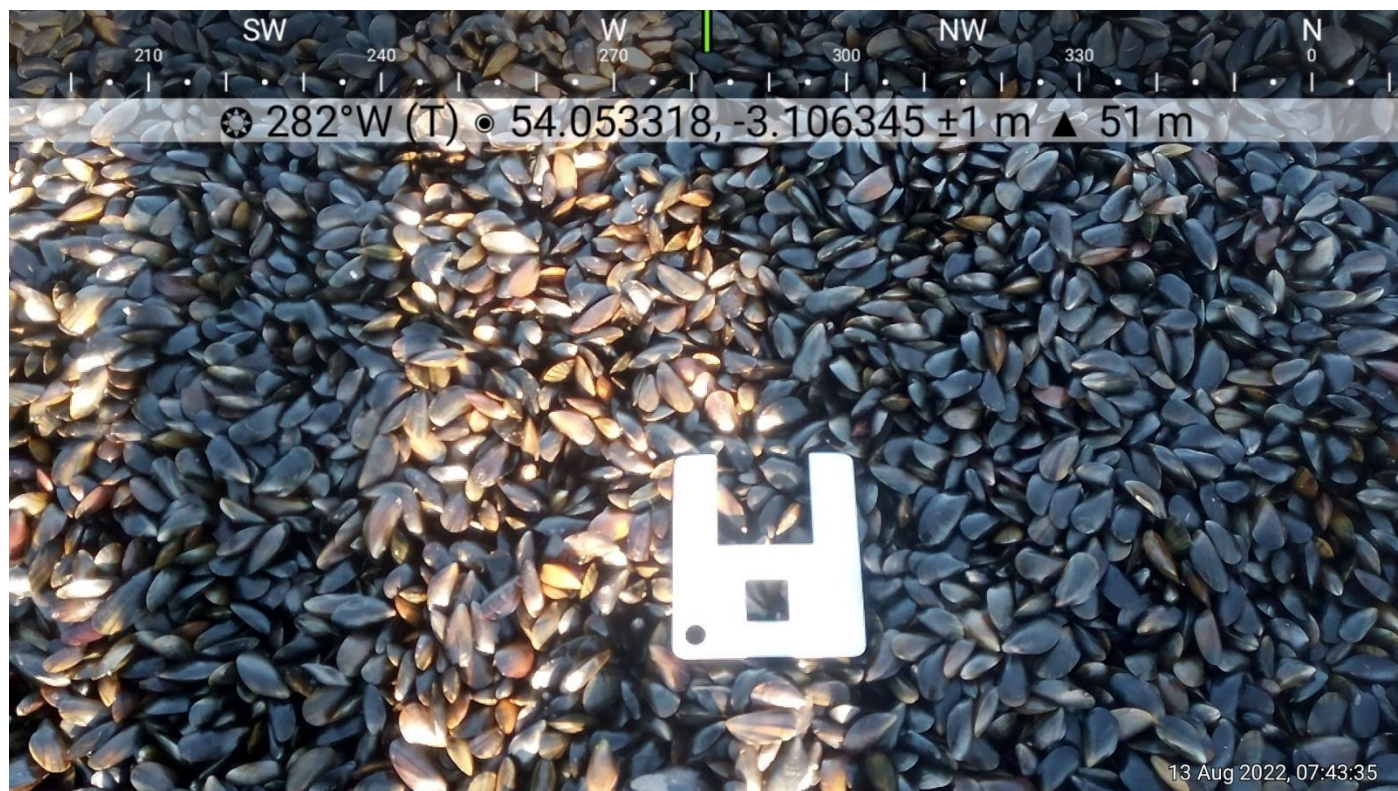


Fig 7. Seed mussel on the West of the bed 13-08-22





Fig 8. Area of scoured mussel on the West of the bed looking North 13-08-22

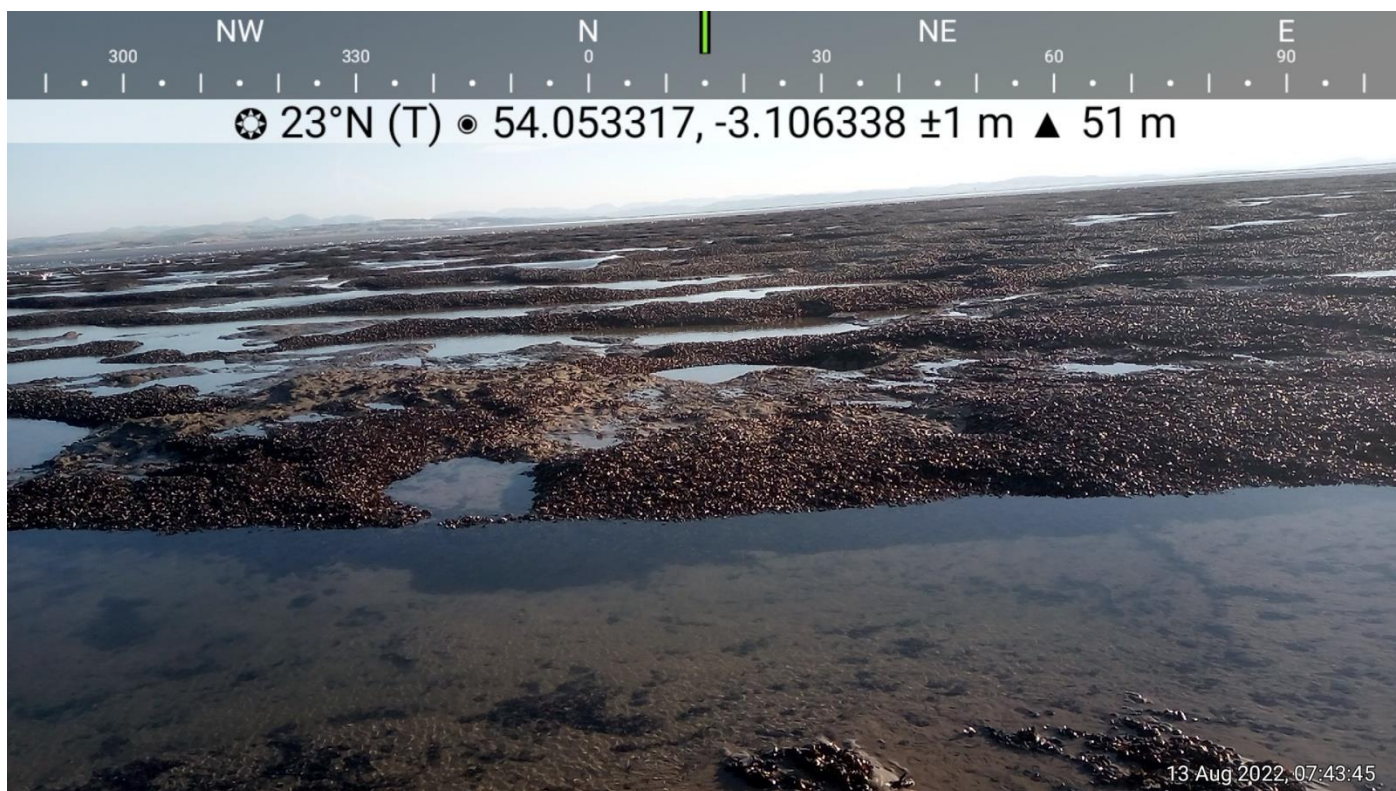


Fig 9. Area of denser seed mussel on the West of the bed looking North 13-08-22





Fig 10. Mussel reducing in density with less sediment between the mussel and stony substrate to the South East of the mussel bed 13-08-22



Fig 11. Sparse mussel with on stony substrate to the South of the mussel bed 13-08-22





Fig 12. Newly settled *Sabellaria alveolata* on the stony substrate to the North West of the mussel bed 13-08-22

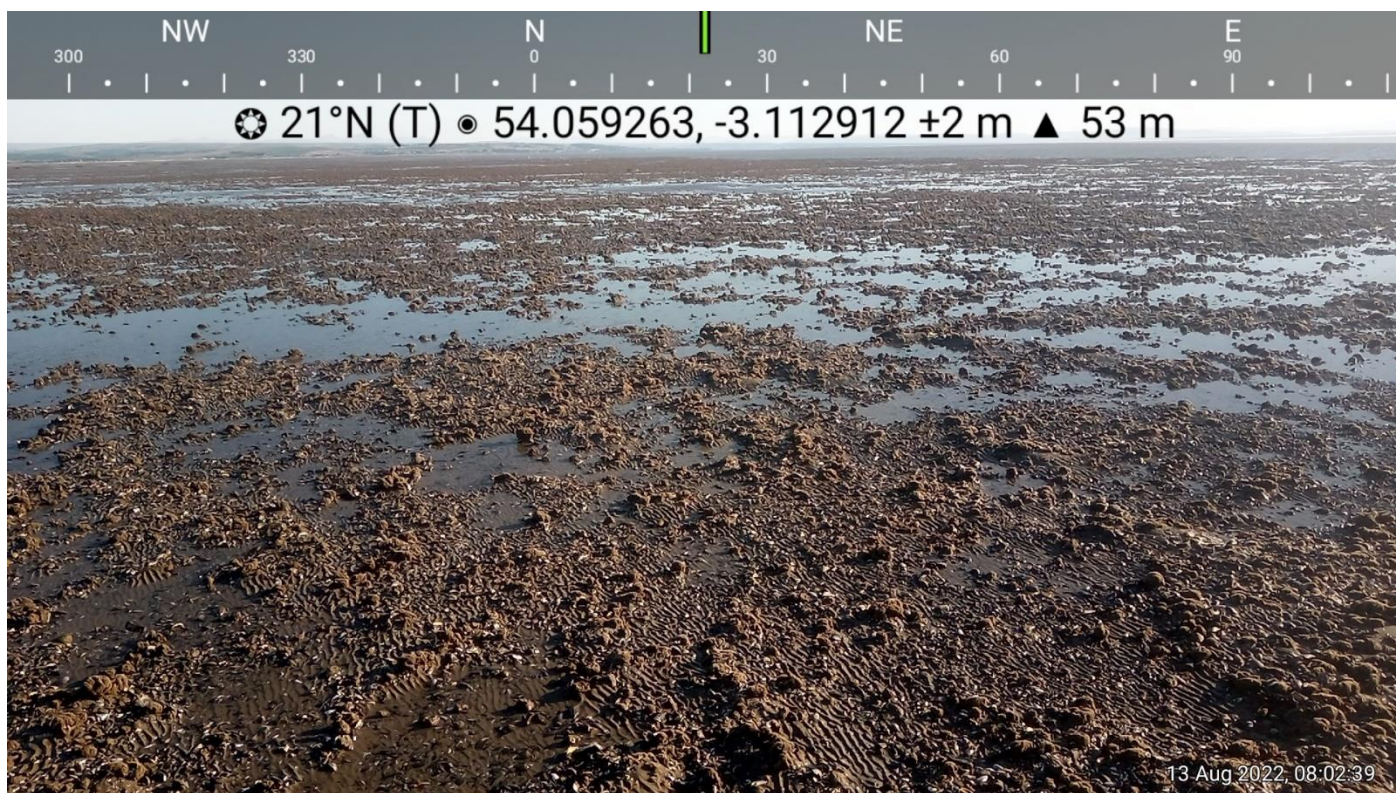


Fig 13. Newly settled *Sabellaria alveolata* on the stony substrate to the North West of the mussel bed 13-08-22

## **South America Mussel Inspection (Quad) 12-09-22**

LW: 07:57 0.6m (Liverpool tides)

An inspection of South America was completed to assess the condition of the mussel previously inspected in August, and prior to any seed mussel fishery opening. Although tide and conditions were good, access remains limited to a short period over low water due to the depth and size of the channel needing to be crossed.

The mussel had changed considerably since the last inspection in August. The mussel to the North, East and South of the bed had reduced in coverage to less than 30% with only a thin layer of sediment or mussel being on hard substrate (Figure 2). Where mussel was on a layer of substrate the areas in between where there wasn't any mussel consisted of exposed hard substrate (Figure 3 and 4). The mussel was 30-35mm with the occasional size mussel present.

The mussel in the centre of the bed appears to have spread to the East. The mussel had approximately 30% coverage on a muddy substrate, the areas where mussel wasn't present still had a layer of muddy substrate, suggesting the mussel had recent scoured (Figure 5). The mussel is 30-35mm with the occasional size mussel present (Figure 6).

The *Sabellaria alveolata* has grown in size and area covered to the majority of the exposed hard substrate on the North East side of the channel.



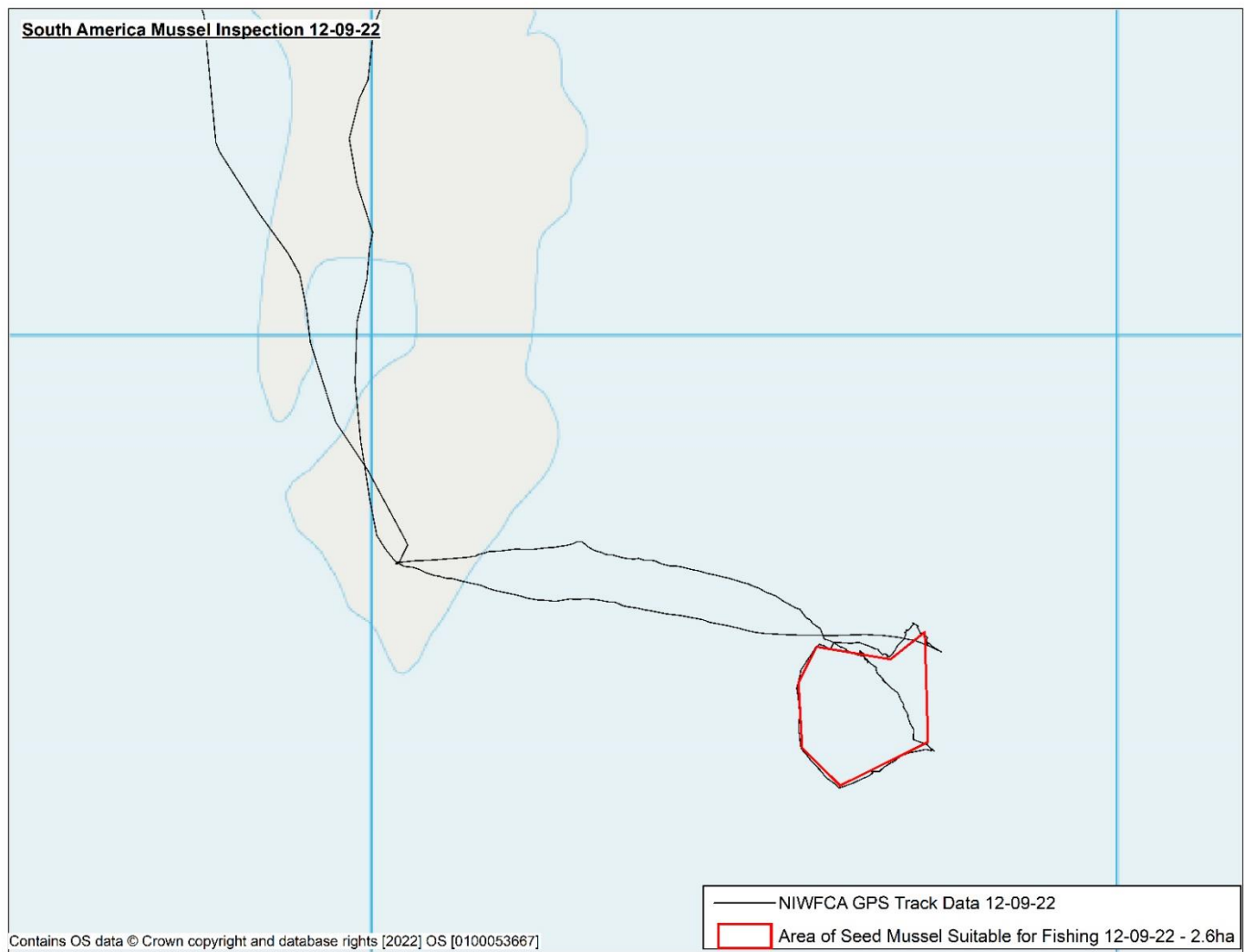


Fig 1. Map of South America including Area of Mussel Suitable for Fishing



Fig 2. South West of the mussel bed, mussel on thin layer of sediment / hard substrate 12-09-22



Fig 3. South West of the mussel bed, exposed hard substrate 12-09-22





Fig 4. North of the mussel bed, mussel on thin layer of sediment / hard substrate 12-09-22



Fig 5. Area of mussel which has likely scoured leave small mounds of mussel on a muddy substrate 12-09-22





Fig 6. Loose 30-35mm mussel with occasional size mussel

## **Falklands Mussel Inspection 14-08-22**

Low water: 08:21 0.5m (Liverpool Tides)

Survey method: Drying out NWIFCA RHIB

Data provided by industry reported an area of mussel on the Falklands. The positional data provided was used to target an inspection by drying out a RHIB.

Figure 1 shows NWIFCA track data once the boat had dried out, the estimated area of seed mussel from a 2021 heliflight and the location of the figures used in this report. The mussel on Falklands are likely to be the mussel which has survived from the 2021 settlement.

Access was limited to the areas which could be accessed by foot after the RHIB had dried out. The area of mussel was split by a channel which could not be crossed and therefore approximately half of the bed was inspected. Mussel could be seen to the South of the NWIFCA track but could not be accessed.

The mussel is patchy with large areas of sand between two areas of dense mussel to the North and South of the GPS track data. Both areas continued into the water. The area to the South was patchy (Figure 2), there were starfish present which concentrated at the water's edge (Figure 3). The mussel was size (45-55mm) with the occasional undersize, and on a layer of sand (Figure 4).

The area to the North had a greater density of mussel (Figure 5) and continued into the water. Nearly all of the mussel was 45-55mm in size (Figure 6). The mussel was on a layer of sand with area of exposed hard substrate (Figure 7).

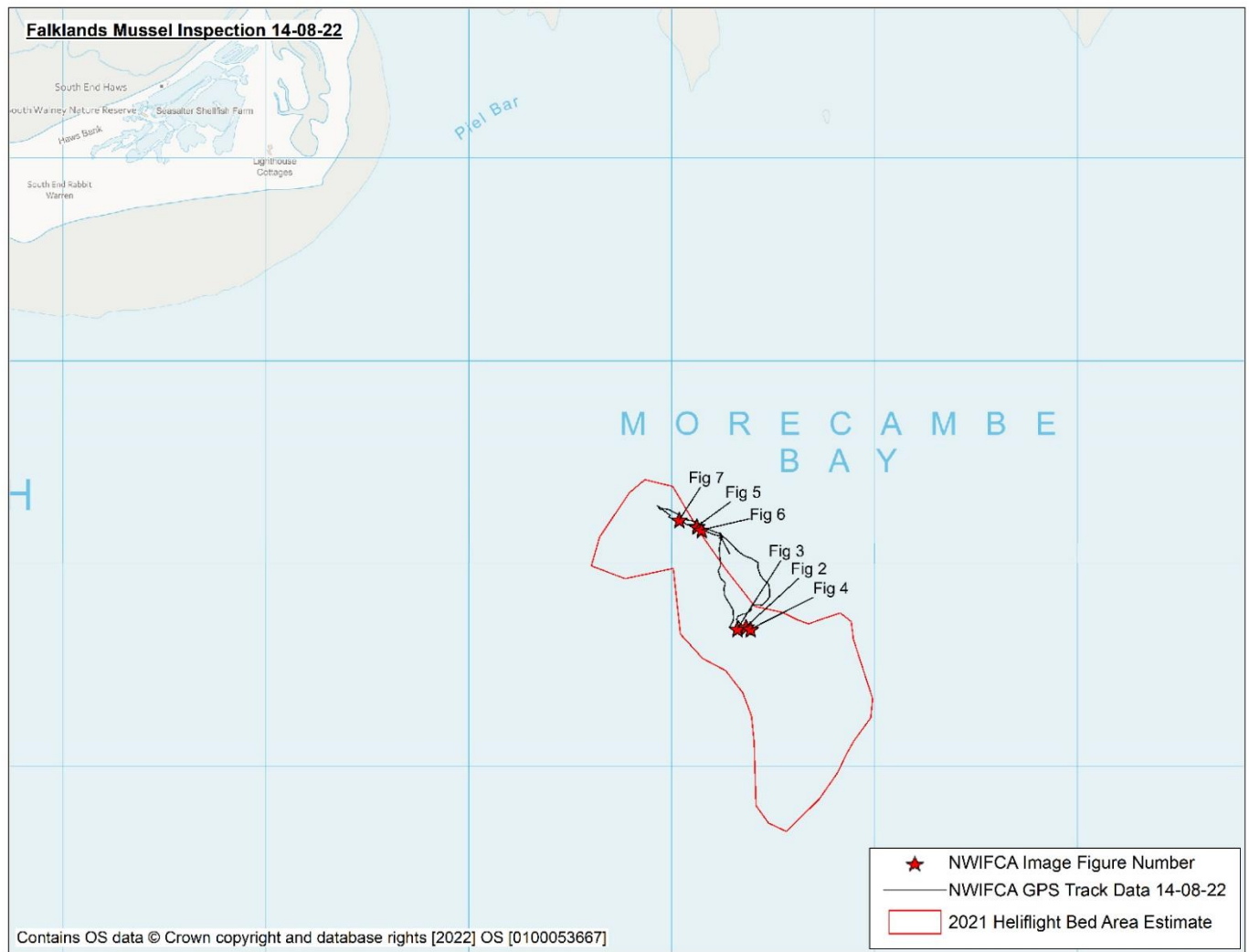


Fig 1 – Overview of NWIFCA inspection of Falklands 14-08-22



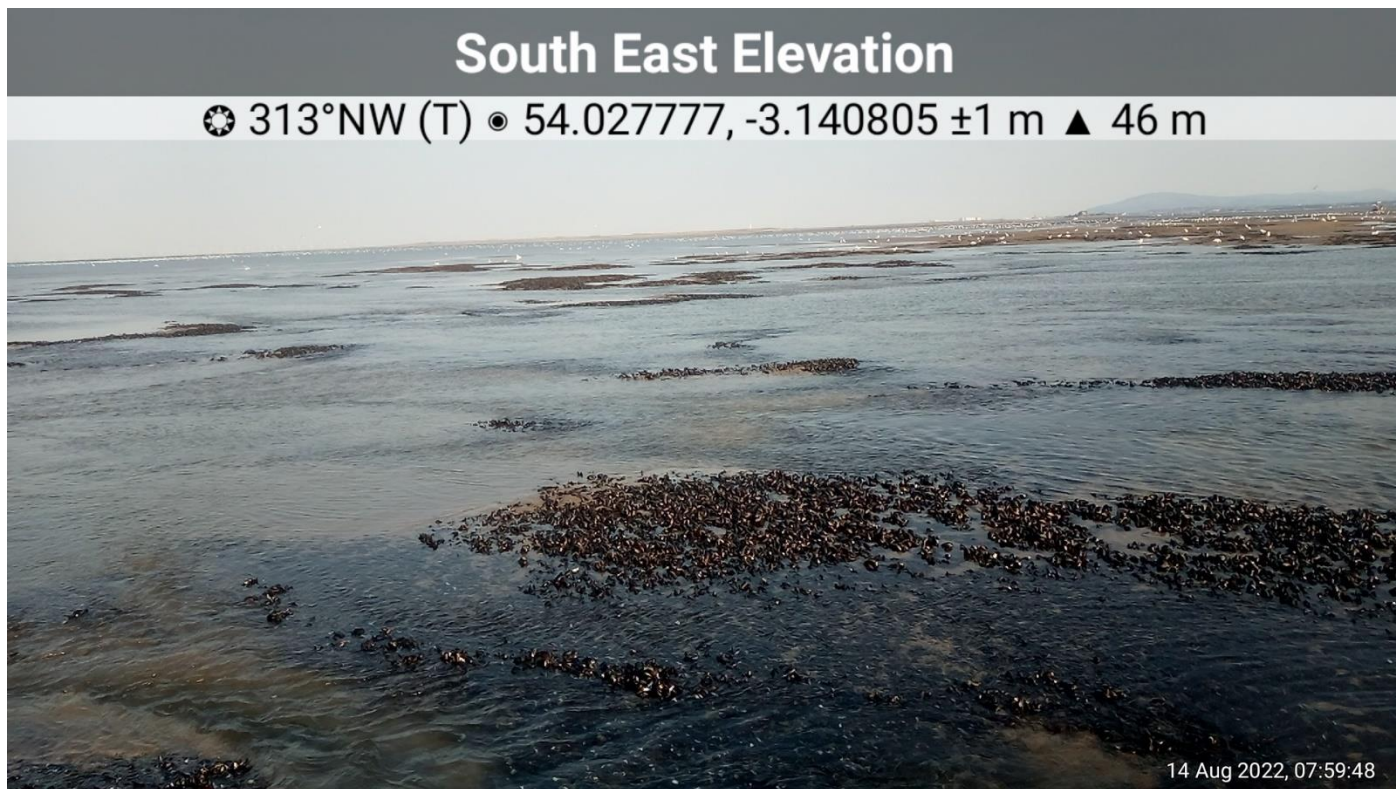


Fig 2 – Patchy mussel extending into the water 14-08-22

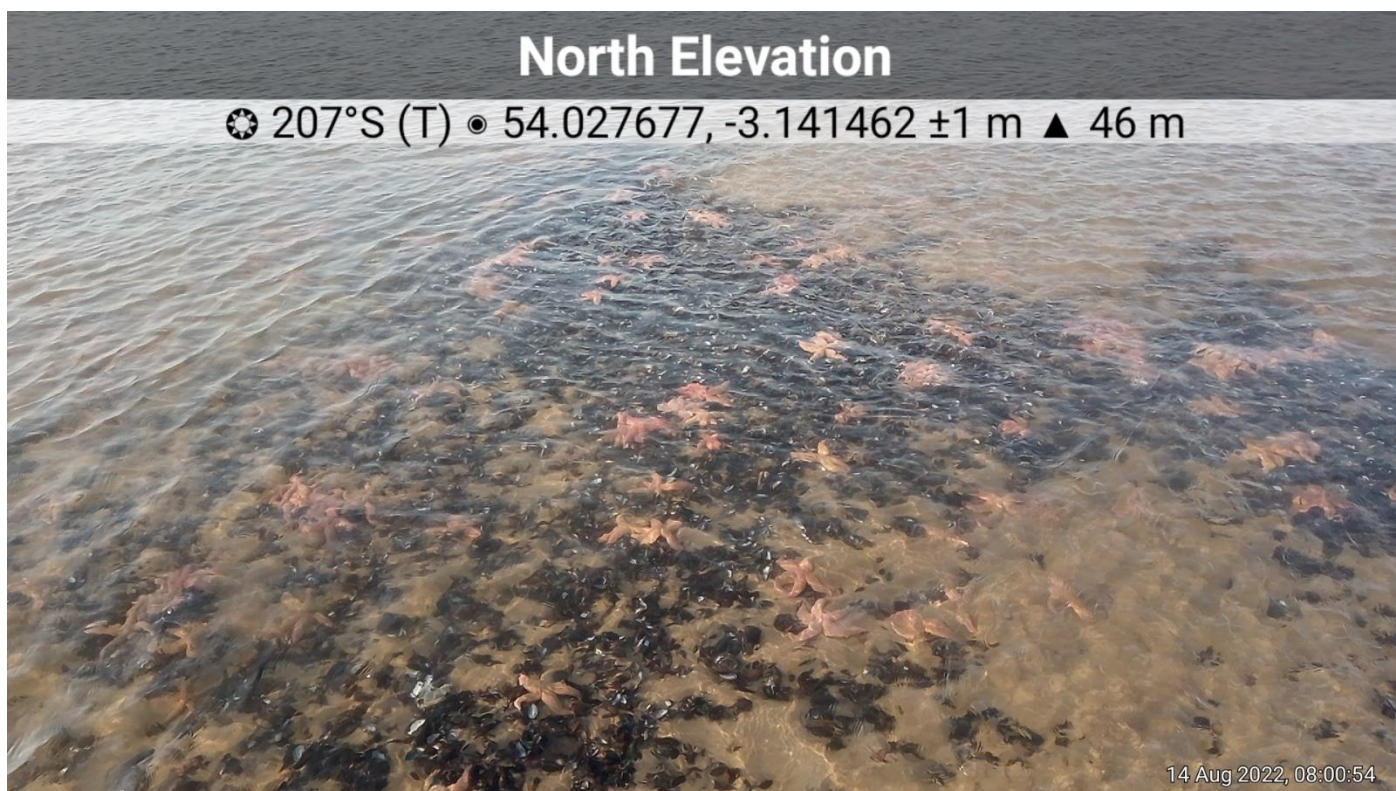


Fig 3 – Starfish along one edge of the mussel extending into the water 14-08-22



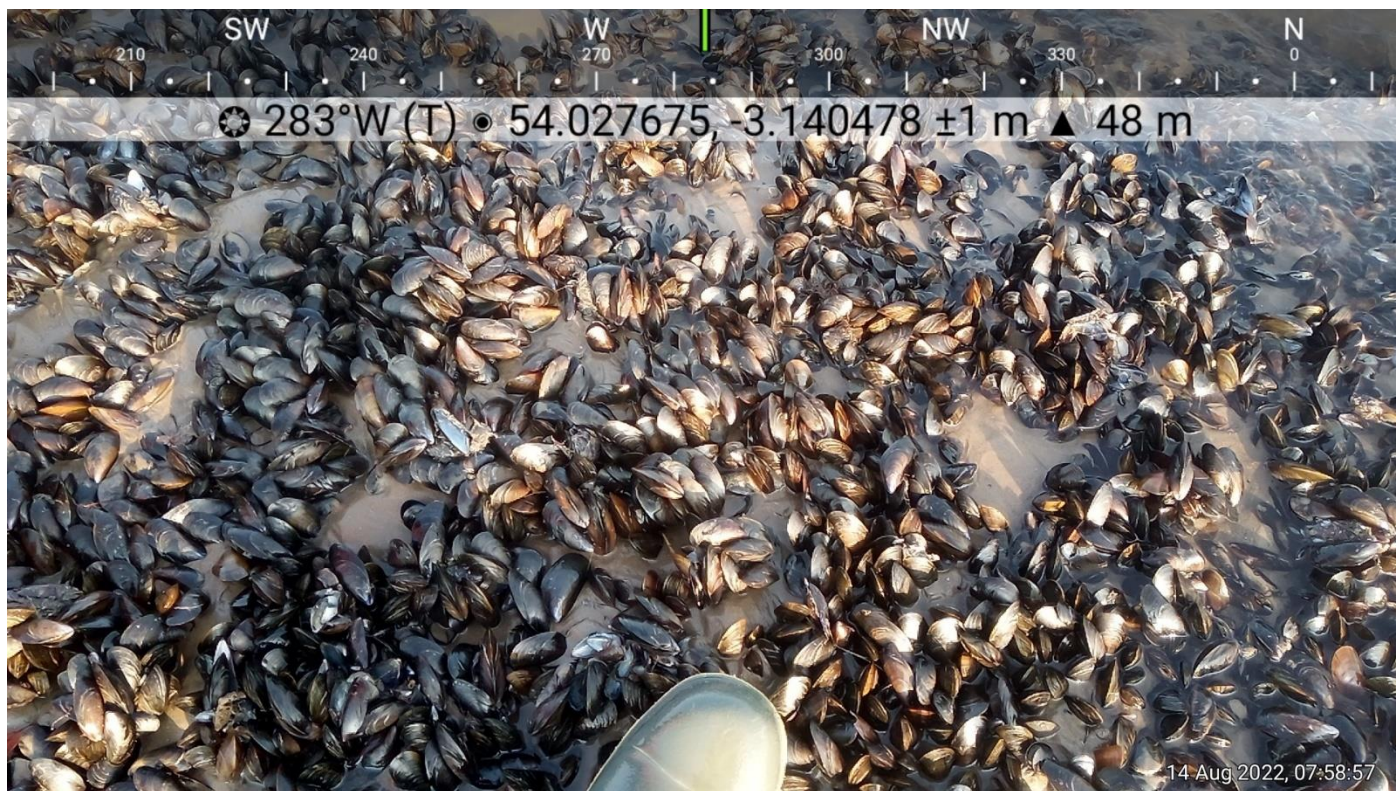


Fig 4 – Greater than 45mm mussel on sandy substrate 14-08-22

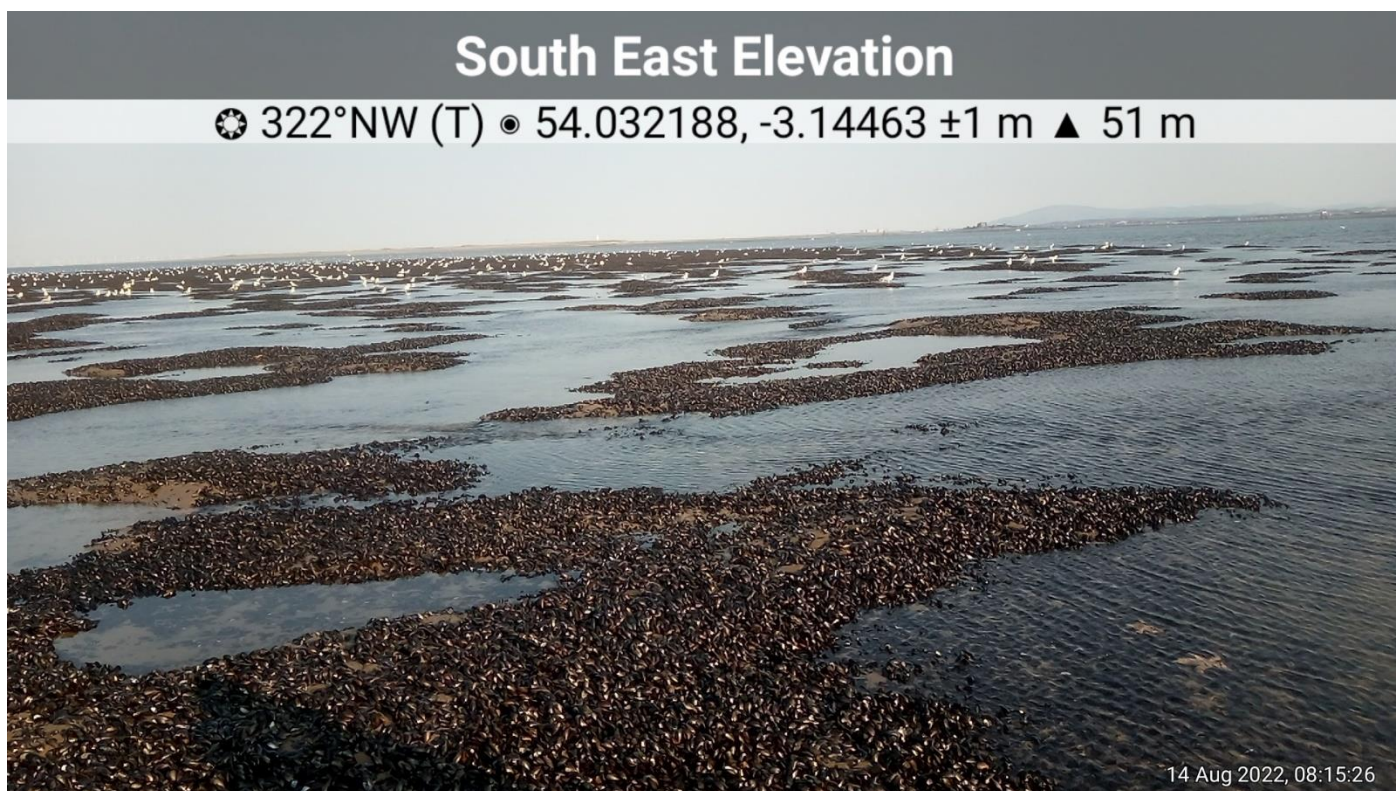


Fig 5 – Denser area of mussel extending into the water 14-08-22





Fig 6 – Greater than 45mm mussel 14-08-22



Fig 7 – Exposed hard substrate between the areas of mussel 14-08-22



## **Seafield Slip (Lytham) Mussel Inspection 16-08-22**

LW: 09:41 1.0m (Liverpool tides)

Information was provided by industry that Seafield slip has had a mussel settlement. Seafield Slip was last inspected in 2018 when there was a seed settlement that washed away and has previously been a seed and size mussel fishery but not since 2015/16.

The mussel is in a thin strip approximately 20m wide along the channel edge of the River Ribble, consisting of two areas totalling 750m long (Figures 1 and 2). The mussel consisted mainly of two size classes, newly settled seed, 5-8mm in length and larger seed, 30-40mm in length (Figure 3). The small seed was higher up the shore line, with a mix of 5-8mm and 30-40mm in near the channel edge. At low tide there are a number of small islands (10m<sup>2</sup>) that contain clean 30-40mm (Figures 4 and 5). There was the occasional large barnacled size mussel mixed in with the seed (Figure 6). Higher up the shore the mussel was on hard substrate with a very thin layer of settlement underneath. Towards the channel edge the mussel was on mud with some signs of scour of the mussel still under the water at low tide.



Fig 1. Map of Seafield Slip Mussel 16-08-22





Fig 2. Strip of mussel along the channel edge of the River Ribble 16-08-22



Fig 3. Mix of two different size classes of mussel, 5-8mm and 30-40mm 16-08-22





Fig 4. Area of 30-40mm mussel with very little 5-8mm seed mixed in 16-08-22



Fig 5. Clean 30-40mm mussel on small island on the channel edge 16-08-22





Fig 9. Area with occasional larger old mussel mixed in 16-08-22

## **Thurstaston Mussel Inspection 31-08-22**

Officers present: MC, JH

Low Water: 09:01 1.4m (Liverpool Tides)

Officers were able to walk the majority of the perimeter of the mussel beds at Thurstaston with the total of the bed areas being 15.46 ha. The bed area has been mapped in figure 1.

On previous inspections, Thurstaston has been split into separate beds, however on this inspection one bed was visible and for this report they will be referred to as one bed area.

In total, the bed area was estimated to be 15.46 ha, made of up one large bed area and a number of smaller areas separated by channels. The bed had areas of very patchy mussel ranging from 5 – 20% coverage (Figure 2). The majority of the bed had very low coverage with large amounts of barnacle and green seaweed growing on the mussel (Figure 3). The majority of mussel was recorded as size (45-60mm) with some patches of 25mm mussel mixed in. No other spat settlement was observed. A large amount of cockle shell was observed amongst the mussel.

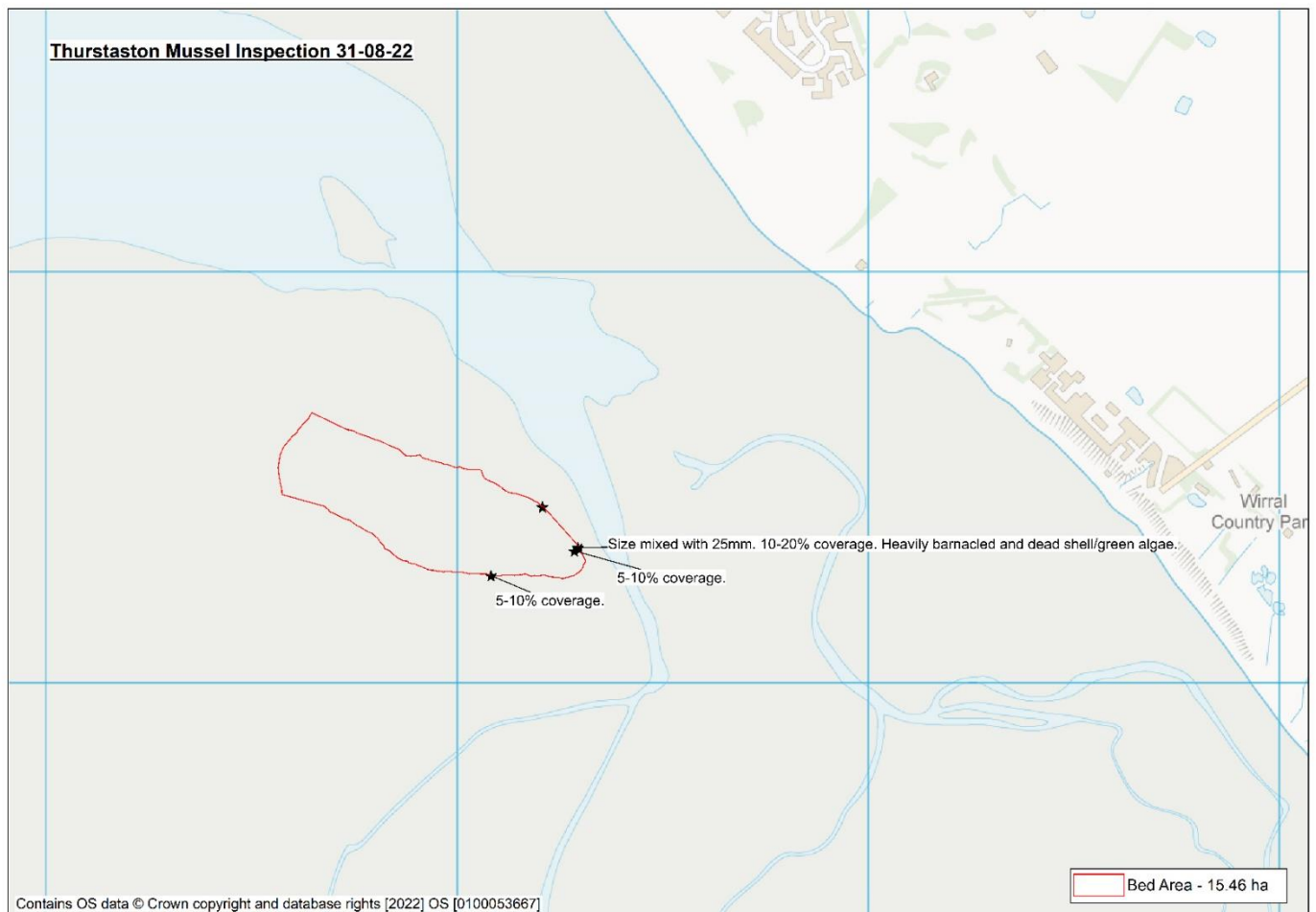


Figure 1. Map showing the area of Thurstaston mussel beds and observations of officers on 31-08-22.



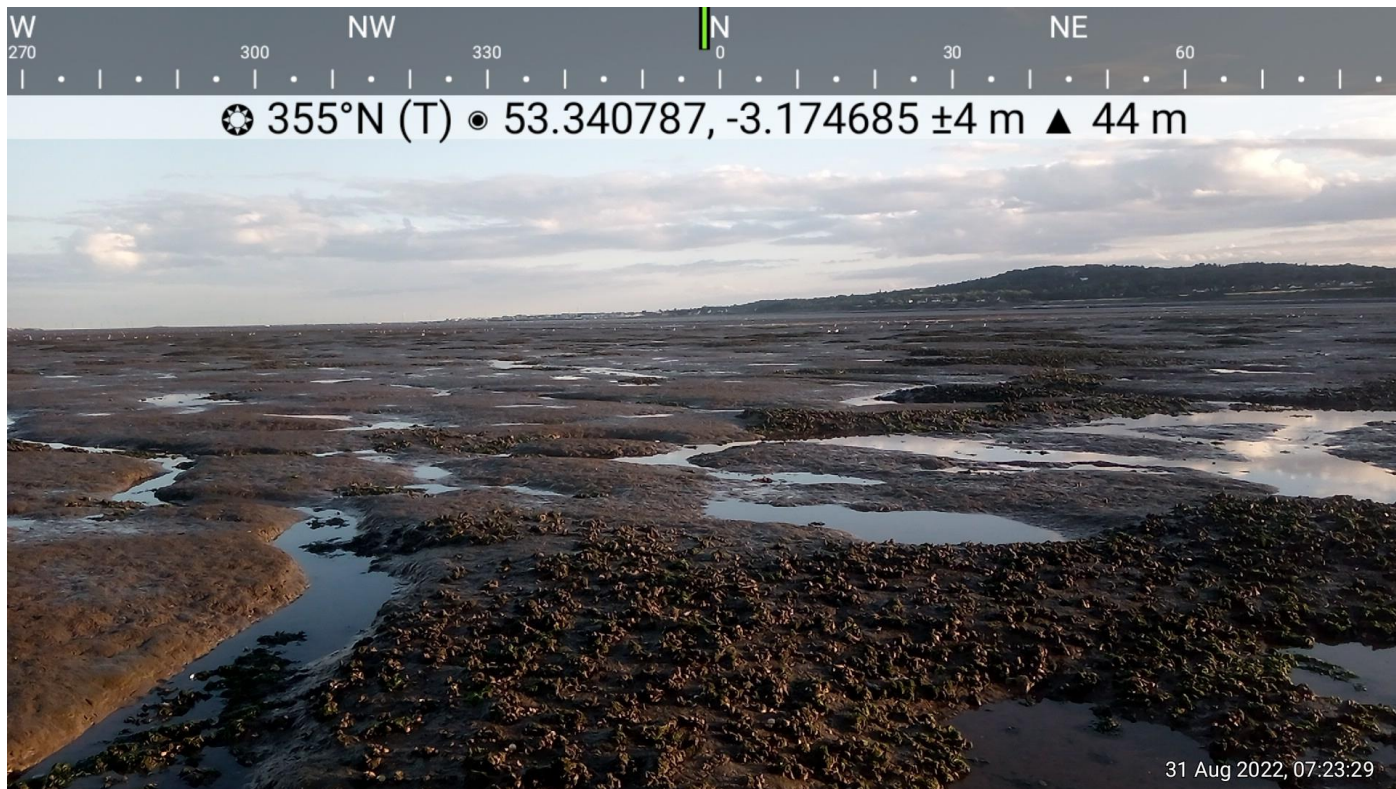


Figure 2. Thurstaston Mussel Bed 31-08-22.



Figure 3. Heavily barnacled mussel bed with green algae and cockle shell 31-08-22.



## **West Kirby 31-08-2022**

Officers present: AP, GG

LW: 09:01 1.4 m (Liverpool Tides)

Officers were unable to walk the full perimeter of the mussel bed which in 2021 covered 7.5 hectares. The bed appeared similar in size. Figure 1 shows the map of the bed in 2021 and the officer track from this survey.

The majority of the mussel was between 45-60mm meaning it has remained and grown on since the previous winter (Figure 2). Only very occasional undersize mussel was present on the bed. No spat settlement was observed. The substrate was thick mud with a large amount of cockle shell amongst the mussel and in the channels (Figure 3). Little evidence of scouring, the mussel present was partly buried in the mud and presence of barnacles (Figure 4). Mussel coverage was fairly uniform across the bed (Figure 5). A small flock of oyster catchers were seen feeding just off the edge of the mussel bed, and Dunlins were seen feeding on the foreshore.

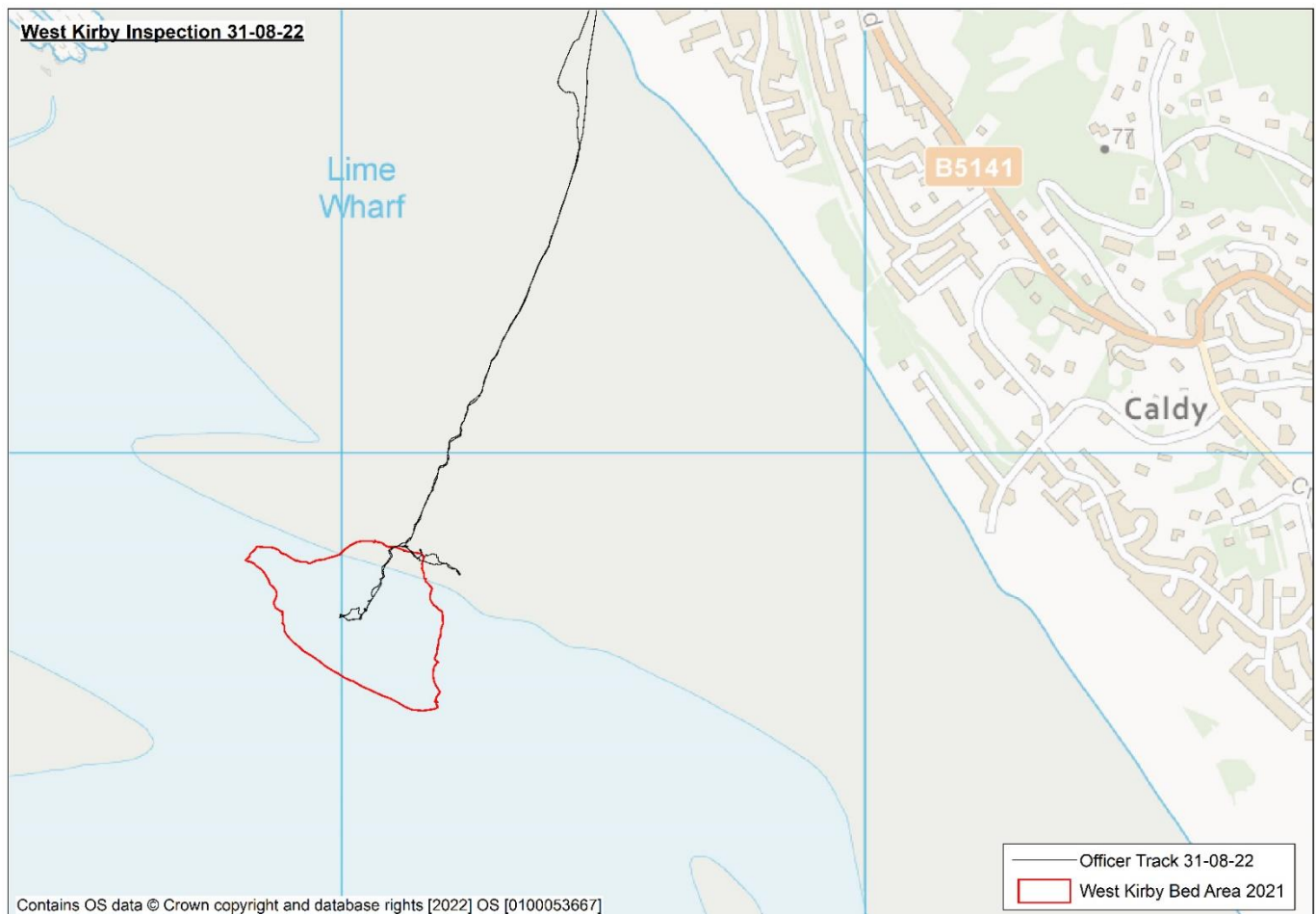


Figure 1. Map showing the area of West Kirby mussel bed 31-08-22.





Figure 2. Size Mussels 31-08-22.



Figure 3. West Kirby Mussel Bed 31-08-22.



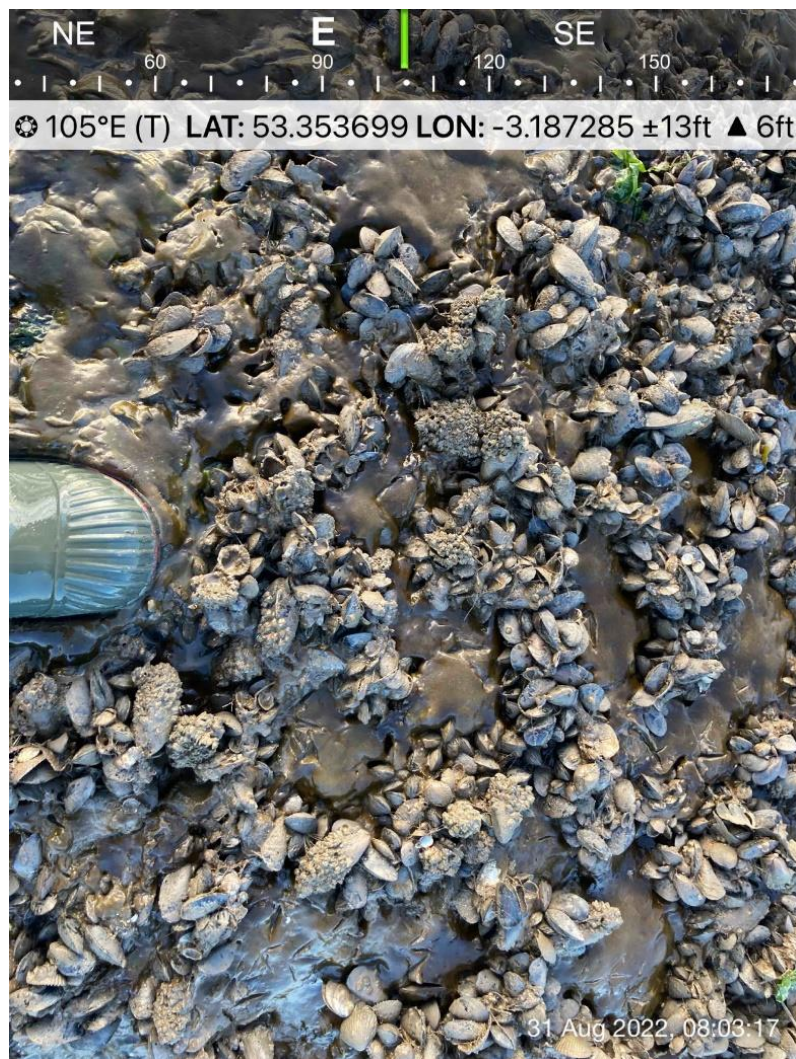
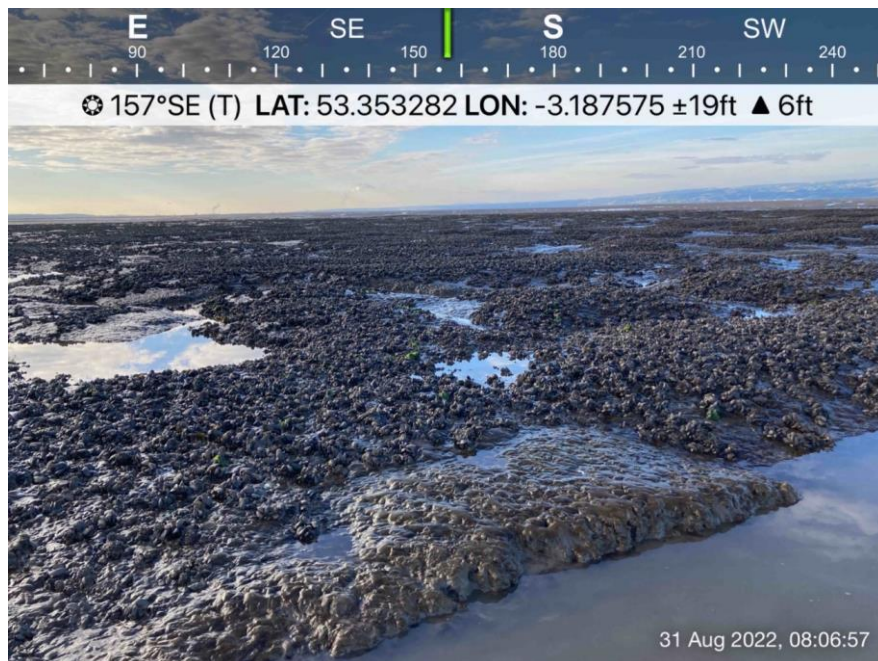


Figure 4. Barnacled mussel bed partially buried in mud 31-08-22.

Figure 5. Uniform mussel coverage 31-08-22.





## **Southport Cockle 01-09-22**

Officers present: AB, MT, JH, MC, AP, AG  
Tides: LW 09:33 1.7m (Liverpool tides)

Survey method - Jumbo and 0.5m<sup>2</sup> quadrat

84 stations were sampled from a 350m grid. The survey grid location was based on the inspection carried out by NWIFCA in April 2022 and a previous survey in May 2022. There was a band of size and undersize cockle present on the bed running from NE to SW. Since the last survey a spat fall has occurred, with patches of 0-5mm cockle also present towards the North of the surveyed area as shown in figure 3. The cockle has grown since the last inspection with the majority of the cockle between 20-28mm in length. An area to the North of the survey grid which previously had high densities of cockle was not surveyed due to the ground being too soft to safely access.

### **Means**

Means were calculated from all stations with zero counts on the edge of the bed removed. Less than 5mm cockle was not used in the undersize figures due to the high variable survivability of cockle at this small size but has been included as a separate figure.

Mean number of size cockle	17 per m <sup>2</sup>	(min 0, max 340)
Mean number of undersize cockle	50 per m <sup>2</sup>	(min 0, max 508)
Mean number of 0-5mm cockle	24 per m <sup>2</sup>	(min 0, max 400)

### **Maps**

Maps were created showing the overall survey area, density of size cockle, density of undersize cockle, 0-5mm size range cockle, and the frequency of size classes (pie charts show the frequency of different size classes, the size of the pie chart indicates the total density of cockles present).

### **Biomass**

	<b>Area (ha)</b>	<b>Size Cockle (tonnes)<sup>1</sup></b>	<b>Undersize Cockle (tonnes)<sup>2</sup></b>
<b>Southport</b>	<b>877</b>	<b>1100-1200</b>	<b>1200-1300</b>

<sup>1</sup>In regards to biomass size cockle defined as cockle which will not pass through a square gauge 20 x 20mm in size.

<sup>2</sup>The biomass of undersize cockle does not include any estimates of cockle less than 5mm due to the high variability of survival of this size class.

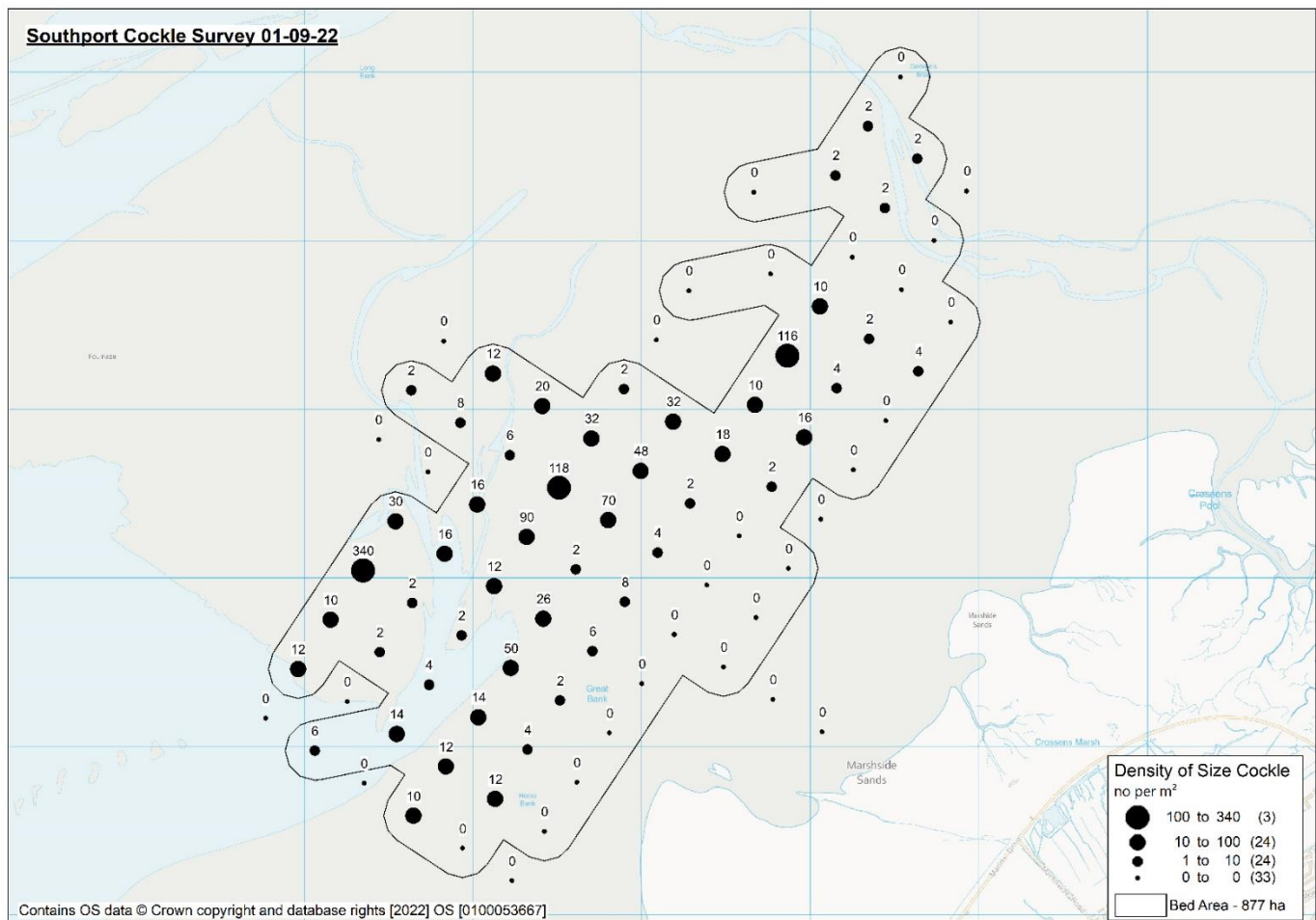


Figure 1. Density of size cockle per m<sup>2</sup> at Southport September 2022.



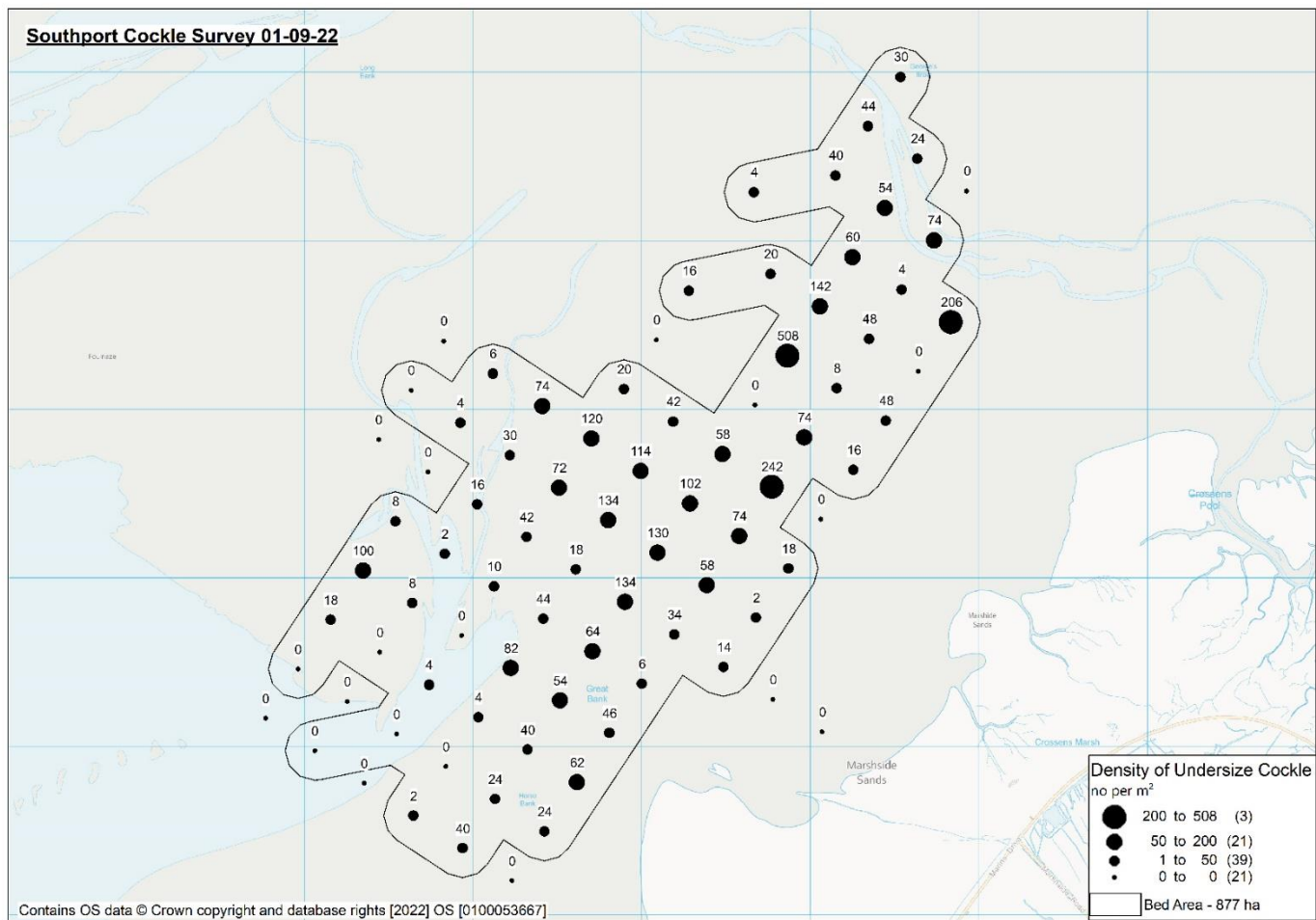


Figure 2. Density of undersize cockle per m<sup>2</sup> at Southport September 2022.

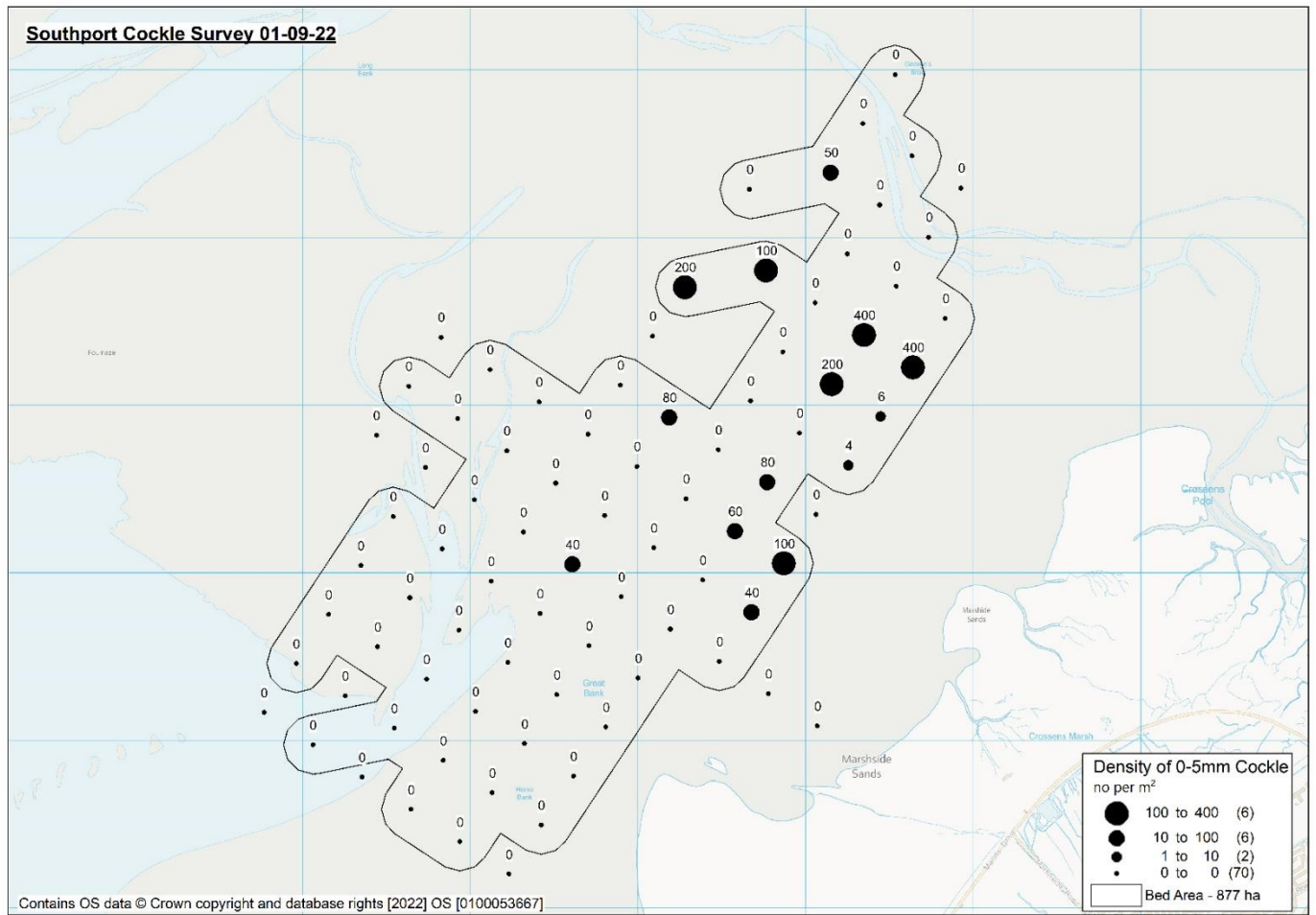


Figure 3. Density of 0-5mm per m<sup>2</sup> at Southport September 2022.



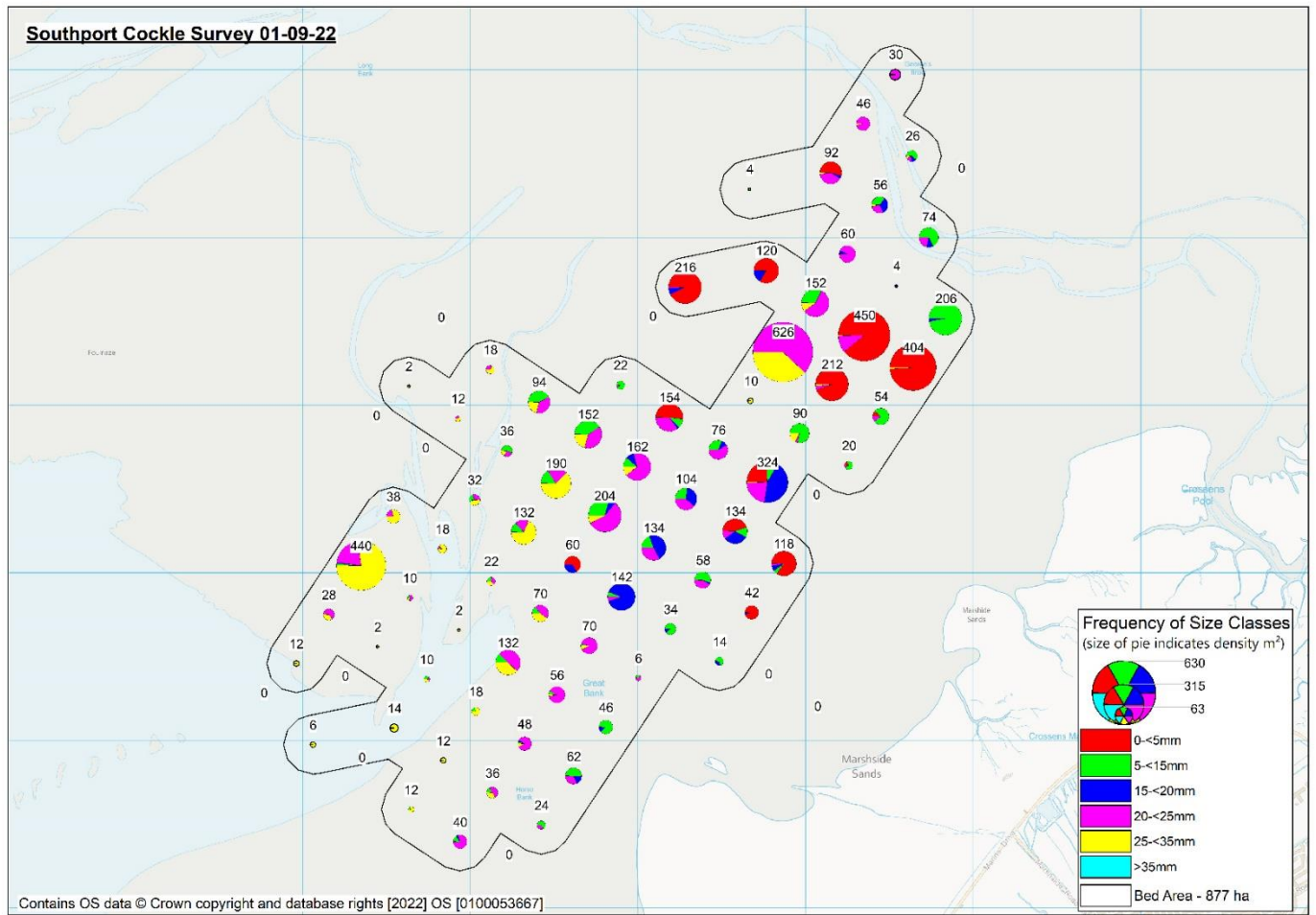


Figure 4. Frequency of size classes of cockle per  $m^2$  at Southport September 2022.

## **Leasowe Cockle Survey 03-08-22**

Officers present: AP, JH, AB, MB

Tides: LW 10:00 1.9m (Liverpool tides)

Survey method - Jumbo and 0.5m<sup>2</sup>

74 survey stations were sampled from a 250m grid. Due to the location of the tide at low water several of the survey stations from the grid could not be sampled, but they were unlikely to hold stock as the main bed is located higher up the shore. Size cockle numbers are relatively low compared to previous year with the average size of the cockle being smaller. There is evidence of a 2022 settlement which has grown to 5-10mm in size.

### **Means**

Means were calculated from all stations with zero counts on the edge of the bed removed. Less than 5mm cockle was not used in the undersize figures due to the high variable survivability of cockle at this small size but has been included as a separate figure. Due to the distance from the main bed, the area by the lighthouse is presented separately.

#### **Main bed area**

Mean number of size cockle	7 per m <sup>2</sup>	(min 0, max 40)
Mean number of undersize cockle	62 per m <sup>2</sup>	(min 0, max 520)
Mean number of 0-5mm cockle	6 per m <sup>2</sup>	(min 0, max 100)

### **Maps**

Maps were created showing the overall survey area, density of size cockle, density of undersize cockle (excluding cockles in the 0-5mm size range), and the frequency of size classes (pie charts show the frequency of different size classes, the size of the pie chart indicates the total density of cockles present). No map was created for density of 0-5mm size class as none were found on this survey.

### **Biomass**

Biomass was calculated for each of the areas as identified by the means calculations.

	<b>Area (ha)</b>	<b>Size Cockle (tonnes)<sup>1</sup></b>	<b>Undersize Cockle (tonnes)<sup>2</sup></b>
<b>Leasowe</b>	<b>225</b>	<b>100-120</b>	<b>100</b>

<sup>1</sup>In regards to biomass size cockle defined as cockle which will not pass through a square gauge 20 x 20mm in size.



<sup>2</sup>The biomass of undersize cockle does not include any estimates of cockle less than 5mm due to the high variability of survival of this size class.

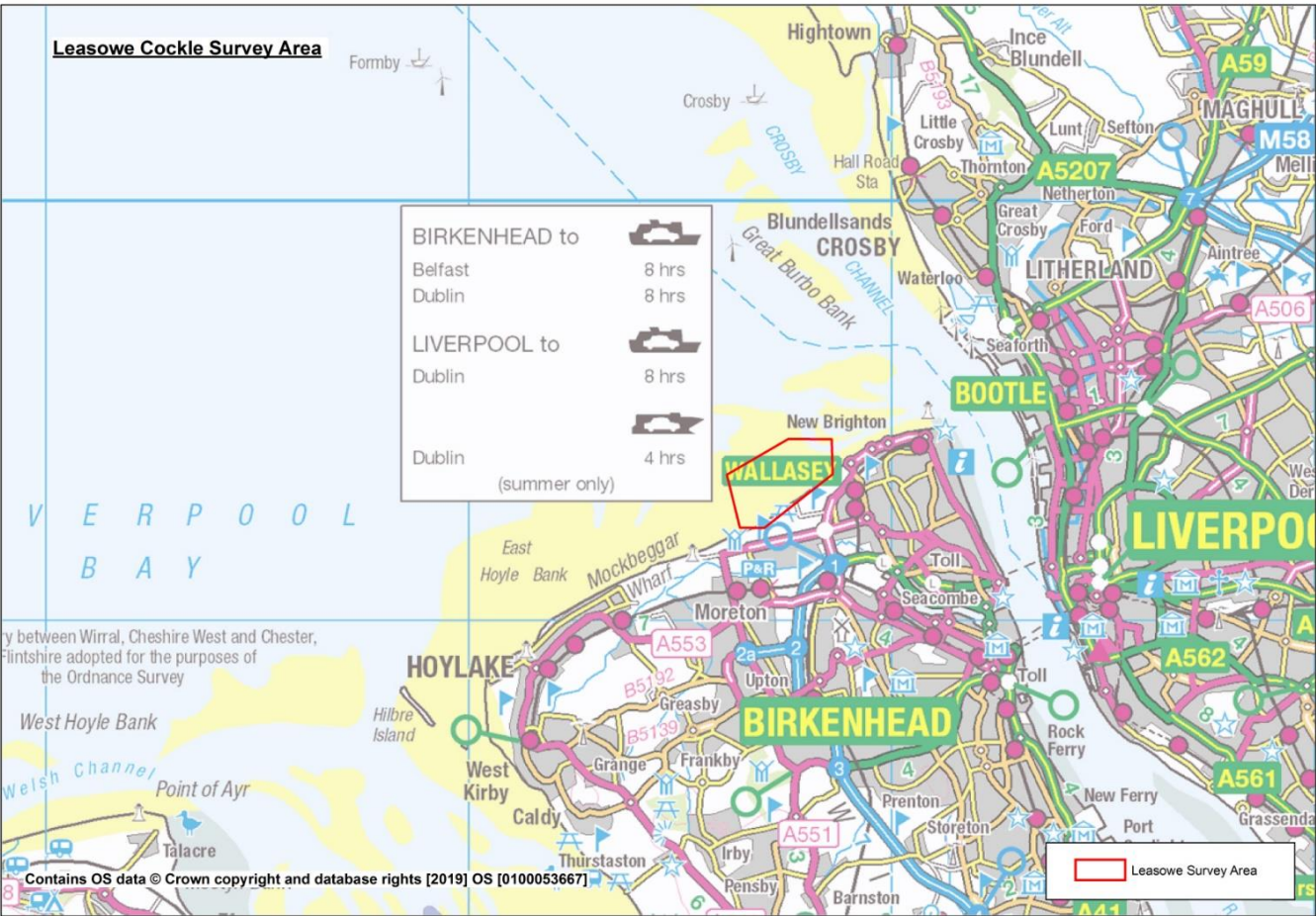
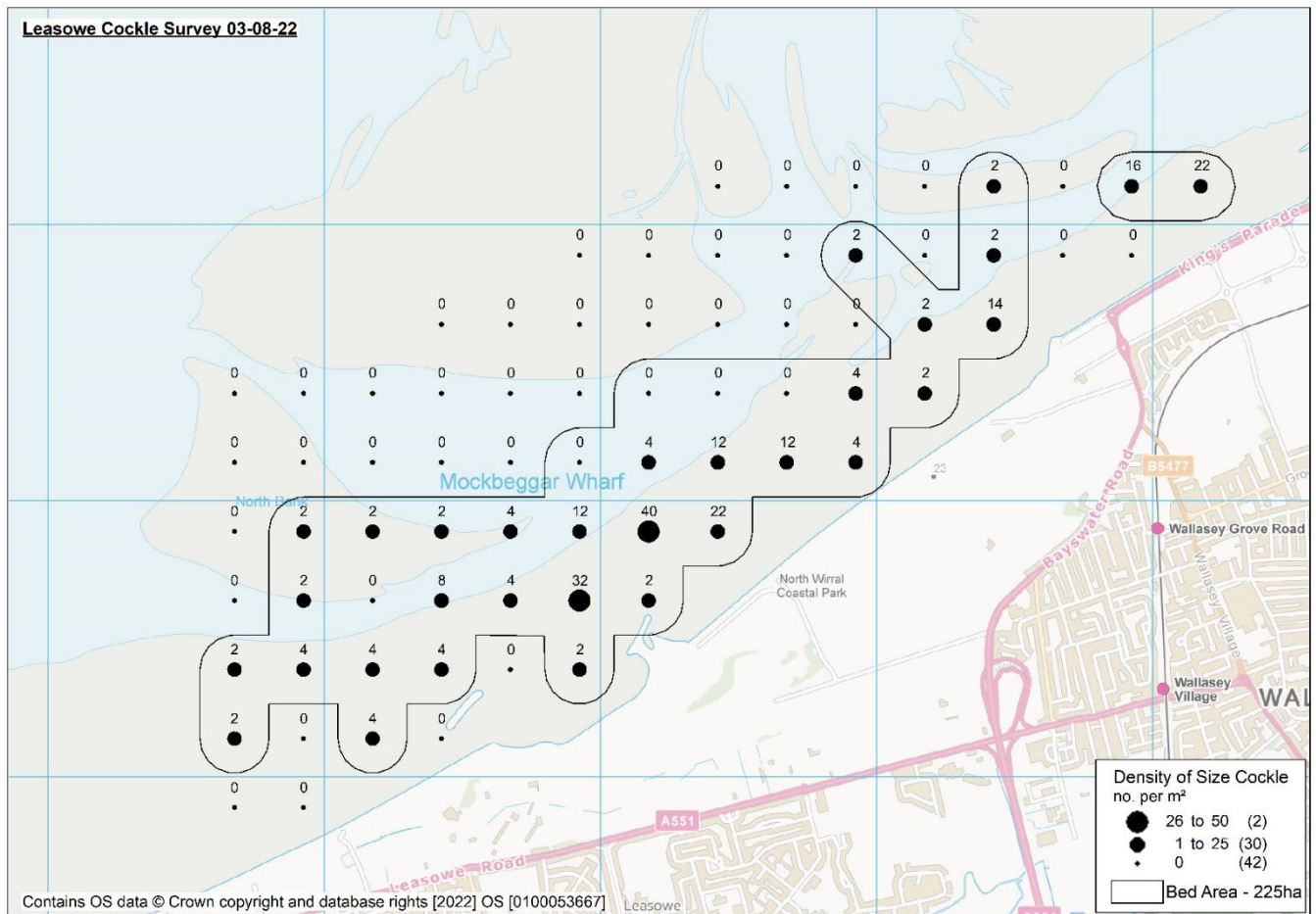
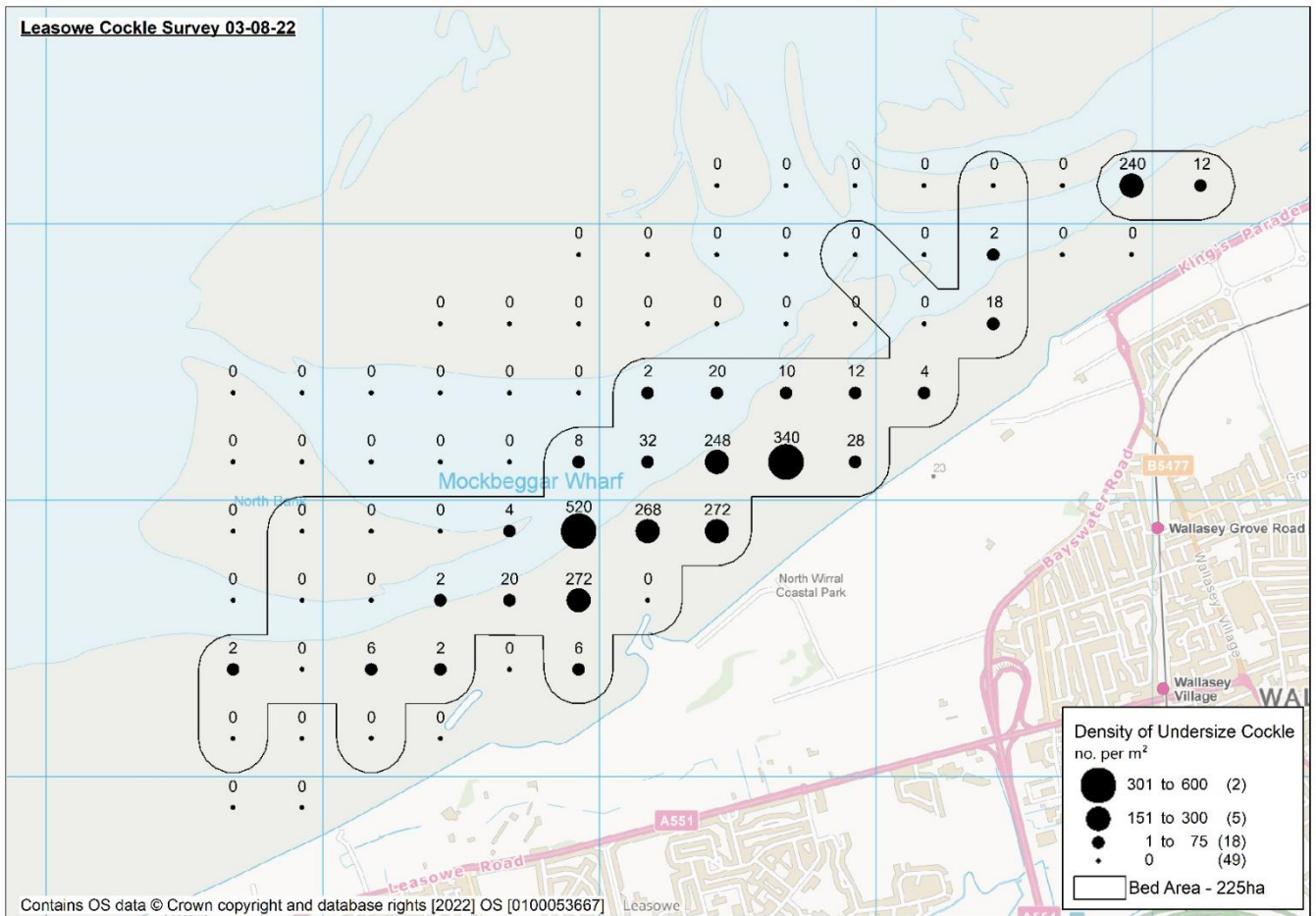


Illustration of position of Leasowe cockle bed.

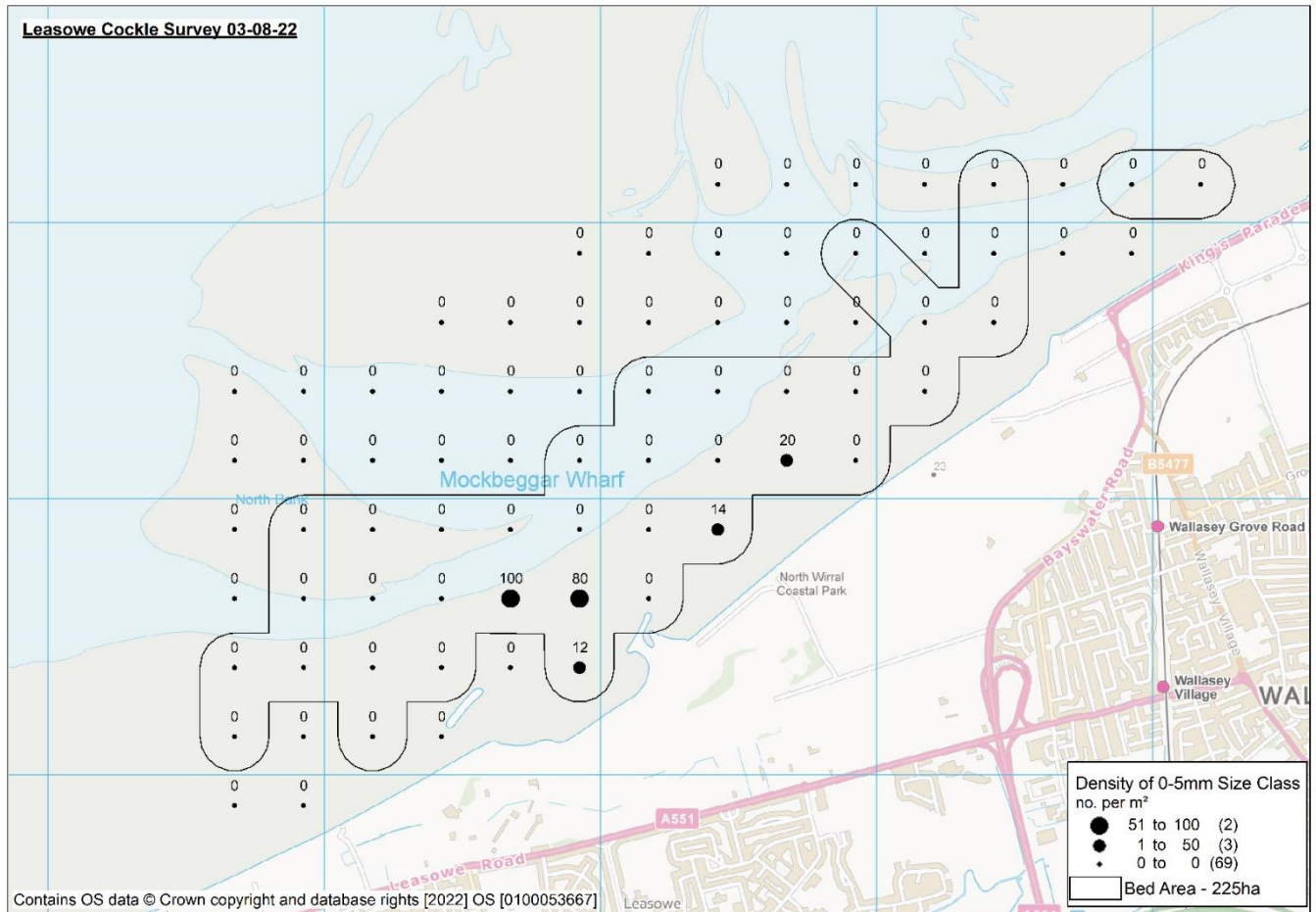


Density of size cockle per m<sup>2</sup> Leasowe August 2022.



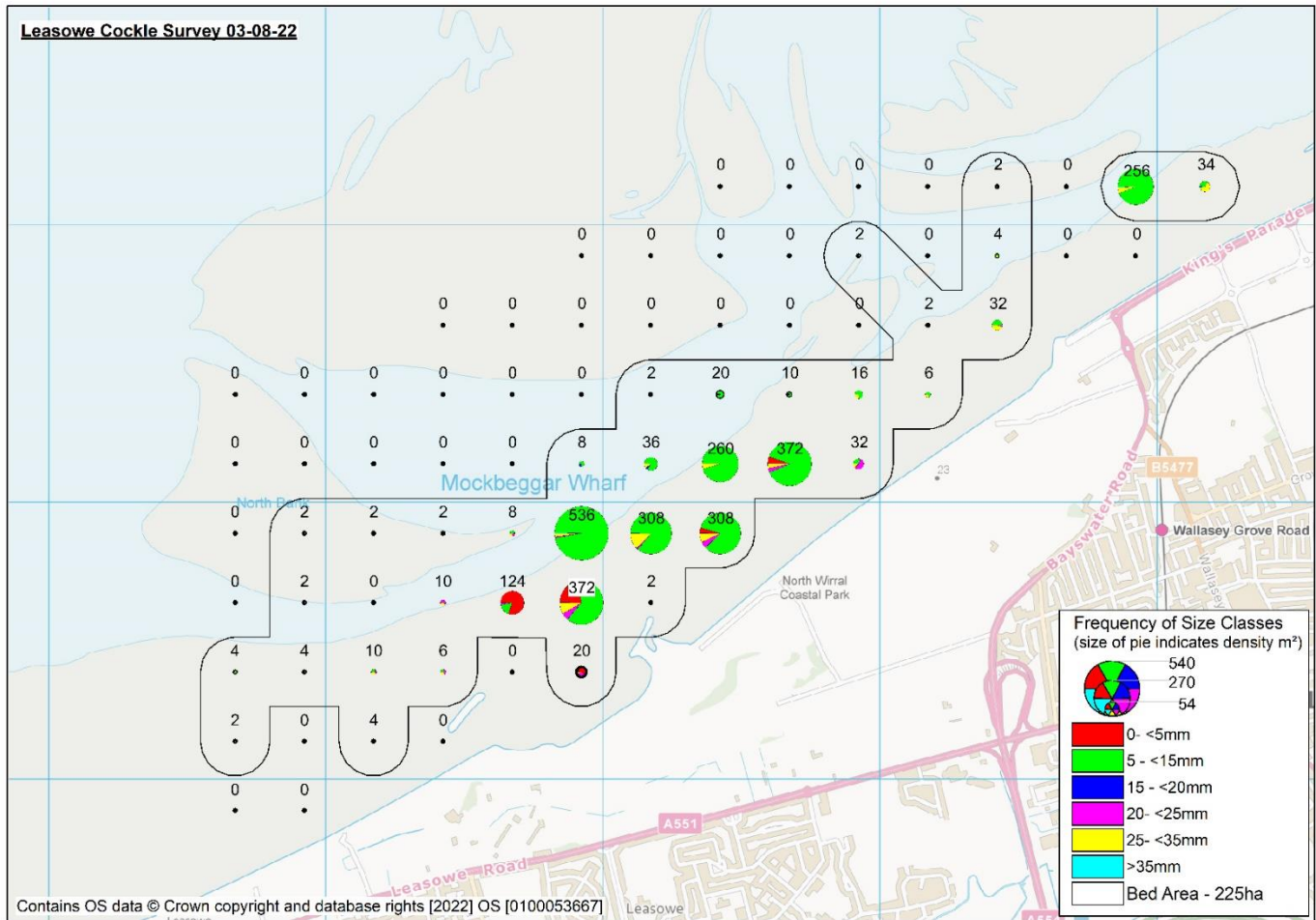


# Density of undersize cockle per m<sup>2</sup> Leasowe August 2022.



Density of 0-5mm cockle per m<sup>2</sup> Leasowe August 2022





Frequency of size classes of cockle per m<sup>2</sup> Leasowe August 2022.

