# Heysham Flat Mussel Inspection 05-03-2025

Officers present: JH, LL, RL

Tides: LW 09:06 1.6m (Liverpool tides)

Officers inspected the mussel on Heysham Flat to assess if any mussel had persisted over the winter. Access to the outer skears was not possible across Dallam Dyke due to the height of the tide. Officer tracks and notes are mapped in figure 1.

Live *Sabellaria avleolata* reef was present along the North and South of the skear (Figure 2). The edge of the South reef was mapped by officers. Smaller patches of live and dead *Sabellaria alveolata* were found throughout the area, some of which was covered by mussel (Figure 3).

There was very little mussel persisting from last year as most of the mussel had been washed away leaving areas of bare cobble and dead shell present on the skear (Figure 4). Live mussel was patchy and sparse with most mussel between 25-35mm, occasional size mussel was present (Figure 5). A denser area of mussel was present along the North of the Skear adjacent to the *Sabellaria alveolata* reef, this was a mix of size and undersize mussel (Figure 6).



Oystercatchers, gulls, knots and eiders were all present in the area.

Figure 1: Map showing officer tracks and notes on Heysham Flat mussel insepection 05-03-2025



Figure 2: Live Sabellaria alveolata reef to the North of the skear 03-05-25

Figure 3: Mussel on dead Sabellaria alveolata 03-05-25



Figure 4: Dead shell and exposed cobble 03-05-25





Figure 6: Patch of mixed size and undersize mussel near the North of the skear 03-05-25

# Bare Ayre Mussel Inspection 27-03-2025

Officers present: GG, LL, AG, GE

Tides: LW 16:25 1.4m (Liverpool tides)

Officers inspected the mussel on Bare Ayre in Morecambe Bay to get an understanding of the state and extent of the mussel bed. The mussel runs along the edge of the channel; the main strip was approximately 200m by 50m. At low water an outer skear was visible however, access to the outer skears was not possible due to the depth of the channel. Officers tracks and notes are mapped in figure 1.

Live mussel was patchy with approximately 20-30% coverage across the area (figure 2); the mussel was loose on newly forming mussel mud or around cobble (figure 3). There were dense patches of 45-55mm size mussel (figure 4) and dense patches of 25-35mm undersize mussel (figure 5). Throughout the areas there were patches of cobble and dead shell mixed in with live mussel (figure 6). Some larger mussel close to the groyne at the west of the area inspected were heavily barnacled (figure 7). There was mussel visible on the outer skear although closer inspection was not possible (figure 8).

*Sabellaria alveolata* was present in small patches along the north edge of the bed. The largest patch was at the west end of the area (figure 9). The part of the reef that was accessible was mapped by officers and is shown in red in figure 1. The *Sabellaria* was interspersed by size and undersize mussel.



Oystercatchers and Herring gulls were present in the area



Figure 2: Overview of the mussel at Bare Ayre 27-03-2025.



Figure 3: Exposed cobble around live mussel, Bare Ayre 27-03-2025.



Figure 4: Dense patch of size mussel Bare Ayre 27-03-2025.



Figure 5: Dense patch of 25-35mm undersize mussel Bare Ayre 27-03-2025.



Figure 6: Dead shell and live mussel Bare Ayre 27-03-2025



Figure 8: Outer skears visible at low tide Bare Ayre 27-03-2025.



Figure 9: Sabellaria alveolata interspersed with live mussel Bare Ayre 27-03-2025.

# South America Mussel Inspection (Quad) 29-04-25

#### LW: 07:29 0.7m (Liverpool tides)

An inspection of South America was completed to assess if the mussel inspected in July 2024 was still present, if there were signs of a 2025 settlement, and if access was possible by quad bike. Access was possible by crossing the channel closer to Newbiggin than in previous years. Officers got approximately 45 minutes to inspect all the areas. Officers returned the following day (30<sup>th</sup> April 2025) to trial more automated flights using the multispectral camera that had to be cancelled due to bird activity, due to Oystercatchers taking a disliking to the drone. As such only a couple of aerial photos could be taken which have been included in the report.

Figure 1 shows officer tracks (grey), the estimated area of mussel (blue), the previous mussel area from 2024 (green) and the geolocations of the photographic evidence provided below.

The mussel can be split into three main areas. Area one, which has been present for several years (Figures 2 to 4, 10, and 11), area two, which appeared in on some newly exposed stony substrate in 2023 (Figures 5 to 7, 12, and 13), and area three which would have likely been present last year but not inspected (Figures 8, 9, and 14).

Bed area one has reduced in size considerably from the last time it was inspected, from 15.8 hectares to 5.4 hectares, with much of the area sanding over, leaving two strips of mussel. There has been a significant change in the channel that used to run along the Northern and Eastern edge of the mussel, with no channel being present. The mussel was patchy and ranged from 50-60mm in size, likely from the 2024 and 2023 mussel settlements, on a thin layer of sand over a hard substrate. There was a small patch of 2025 settlement.

Bed area 2 has increased slightly in size from 8.5 hectares to 9.5 hectares and has moved southwest from when it was previously inspected. Most of the area consists of size mussel ranging from 50-60mm in size, likely from the 2024 and 2023 mussel settlement. The mussel is on a mixture of sand in the middle of the bed and stony substrate around the edges. The area to the South consists of a band of 2025 settlement on stony substrate and patchy *Sabellaria alveolate*.

Bed area 3 is 2.6 hectares in size. The mussel was patchy and ranged from 50-60mm in size, on a thin layer of sand over a hard substrate. There was no 2025 settlement recorded.



Figure 2. Area 1 - patchy size mussel 29-04-25



Figure 4. Area 1 - size mussel 29-04-25

# South

# © 190°S (T) ● 54.055805, -3.116407 ±3m ▲ 48m



#### Figure 5. Area 2 - patchy size mussel 29-04-25



Figure 6. Area 2 - size mussel 29-04-25



Figure 8. Area 3 - patchy size mussel with exposed hard substrate 29-04-25



Figure 9. Area 3 – size mussel 29-04-25



Figure 10. Drone image Southern extent of Area 1 29-04-25



Figure 11. Drone image Northern extent of Area 1 29-04-25



Figure 12. Drone image Southern extent of Area 2 29-04-25



Figure 13. Drone image North Western extent of Area 2 29-04-25



Figure 14. Drone image Area 3 29-04-25

#### Foulney Dutch Wand Mussel Survey 01-05-2025

Officers present: AP, LL, JH, ID, RL, CT

Low water: 08:57 1.1m (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 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 and tide restraints.

A mussel sample was taken every 25 hits using a 10 cm diameter corer. 12 transects were completed and 36 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample.

Note, not all size mussel is fishable due to the presence of fouling species on slower growing individuals or the mixing of undersize and size in close proximity that prevents the removal of sizeable mussel without removing undersize. Algae growth with present across a portion of the mussel bed.

From the transect and sample data the total mussel bed surveyed was **39 hectares**. A separation was made between the main Foulney bed and Foulney Island. Transect ten was ommitted because no mussel was present.

#### Biomass

# 1961 tonnes size mussel and 924 tonnes undersize mussel.

# **Length Frequencies**

The total length frequency for the surveyed bed is provided in Figure 3. From the length frequency data the majority of mussel present on Foulney Skear is currently a mix of size and undersize with a wide spread of mussel from 5mm to 73mm but mainly between 19mm and 27mm.

#### 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<sup>2</sup>. The weight of the size and undersize mussel has been mapped and represented in Figure 5.

It can be seen in Figures 4 and 5 that the size mussel >45 mm is predominantly on the lower half of the main skear and on the island. Undersize mussels were mainly congregated higher up the main skear with some mixed in with size mussel in the middle of the skear.



Figure 1: Location of Foulney mussel bed 01-05-2025



Figure 2: Foulney Dutch Wand survey transects and estimated bed area



Figure 3: Histogram showing size frequency of mussels from all samples on Foulney



Figure 4: Frequency of mussel by size class



Figure 5: Proportion of size and undersize mussel by weight represented as kg/m<sup>2</sup>

# Low Bottom Dutch Wand Mussel Survey 02-04-25

Officers present: GG, LL, CT

Low water: 09:09 1m (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 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 and tide restraints. A mussel sample was taken every 25 hits using a 10 cm diameter corer. 6 transects were completed and 42 samples collected. The total weight of live undersize and size mussel was recorded as well as the weight for each size category of each sample. Note, not all size mussel is fishable due to the presence of fouling species on slower growing individuals or the mixing of undersize and size in close proximity that prevents the removal of sizeable mussel without removing undersize. Some size mussel on this bed were fouled with barnacle.

From the transect and sample data the total mussel bed surveyed was **35 hectares**.

#### Biomass

1657 tonnes size mussel and 397 tonnes undersize mussel.

#### **Length Frequencies**

The total length frequency for the surveyed bed is provided in Figure 3. From the length frequency data the majority of mussel present on the Low Bottom bed is currently a mix of size and undersize mussel ranging from 13mm to 68mm with the majority size between 45mm and 54mm.

#### Maps

The proportion by weight of each size class of mussels per sample has been mapped in Figure 4 with the size of pie representing mussel weight standardised to kg/m<sup>2</sup>. The weight of the size and undersize mussel has been mapped and represented in Figure 5.

It can be seen in Figure 4 and Figure 5 that 35 to >45mm mussel is found across the entire survey area with size mussel >45mm predominantly located on the southern area of the bed. A small amount of 10-25mm mussel is located in small areas across the bed.



Figure 1 – Location of Low Bottom Mussel Bed surveyed 02-04-25.



Figure 2 – Low Bottom Dutch Wand survey transects and estimated bed area 02-04-25.



Figure 3 – Histogram showing size frequency of mussels from all samples on Low Bottom mussel Bed.



Figure 4 – Proportion by weight of size classes of mussel.

# Walney Channel Dutch Wand Survey 01-05-2025

Officers present: JH, ID

Low water: 08:57 1.1m (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 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 and tide restraints. A mussel sample was taken every 25 hits using a 10 cm diameter corer. 6 transects were completed and 14 samples collected. The total weight of live undersize and size mussel was recorded as well as the weight for each size category of each sample. Note, not all size mussel is fishable due to the presence of fouling species on slower growing individuals or the mixing of undersize and size in close proximity that prevents the removal of sizeable mussel without removing undersize. Most size mussel on this bed were fouled with barnacle. A large area at the top of the bed has flattened off with mainly dead shell remaining, some live mussel was present at the edge of the bed. Officers walked to the edge of Walney Channel where there was previously a fishery but no mussel was present. This area was not included in the bed area.

From the transect and sample data the total mussel bed surveyed was 9.25 hectares.

#### Biomass

#### 445 tonnes size mussel and 2 tonnes undersize mussel.

# **Length Frequencies**

The total length frequency for the surveyed bed is provided in Figure 3. From the length frequency data the majority of mussel present on the Walney Channel bed is currently size mussel ranging from 46mm to 75mm with the majority size between 53mm and 62mm. The smallest mussels sampled were 32mm.

#### Maps

The proportion by weight of each size class of mussels per sample has been mapped in Figure 4 with the size of pie representing mussel weight standardised to kg/m<sup>2</sup>. The weight of the size and undersize mussel has been mapped and represented in Figure 5.

It can be seen in Figure 4 and Figure 5 that >45mm mussel is found across the entire survey area.



Figure 1: Location of Walney Channel mussel bed 01-05-2025.



Figure 2: Walney Channel Dutch wand transects and estimated bed area 01-05-2025.



Figure 3: Histogram showing size frequency of mussel from all samples on Walney Channel mussel bed.



Figure 4: Proportion by weight of size classes of mussel represented as kg/m<sup>2</sup>.



Figure 5: Proportion by weight of size and undersize mussel represented as kg/m<sup>2</sup>.