

**MUSSELS**

For all Dutch Wand mussels surveys this quarter: 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 each sections 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 restraints. A mussel sample was taken every 50 hits using a 10cm diameter corer.

The mussel frequency of each size class of mussels per sample has been mapped and represented, 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 also been mapped and represented.

**Foulney Dutch Wand Mussel Survey 19-03-19**

Low water: 16:44 0.1m (Liverpool Tides)

Twenty transects were completed and 32 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample. From the transect and sample data the total mussel bed surveyed was **35.6 hectares**, of which **30.6 hectares** was on the main skear and **5.2 hectares** on Foulney Island. There were a few large starfish observed at the low water line.

**Biomass**

Main skear 2374 tonnes undersize mussel and 1278 tonnes size mussel

Foulney Island 880 tonnes undersize mussel of a single year class.

**Length Frequencies**

The total length frequency for the surveyed beds are provided in Figures 3 and 4 below. From the length frequency data the mussel present on Foulney skear is varied with a wide spread of mussel from 10mm to 66mm. The mussel which is present on Foulney Island is between 17 and 43mm size range with a peak at 32mm. It is likely that this mussel is all one year's settlement.

**Maps**

It can be seen on the map that the most abundant size class is the 25-45 mm which is present across most of the bed with areas of 10-25mm and greater than 45mm mussels mixed in. There was no 2019 spat observed.

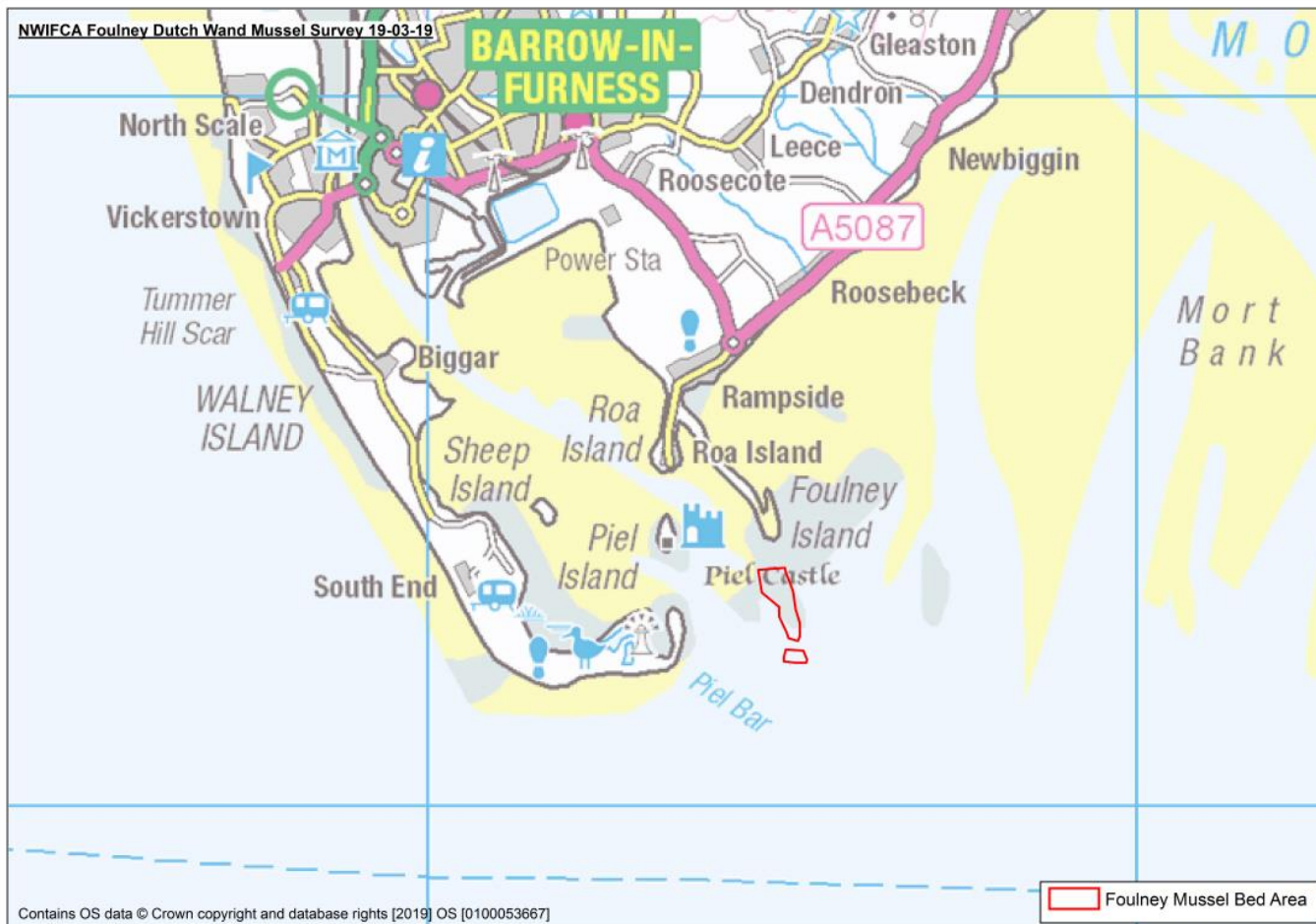


Figure 1 - Location of Foulney Mussel Bed

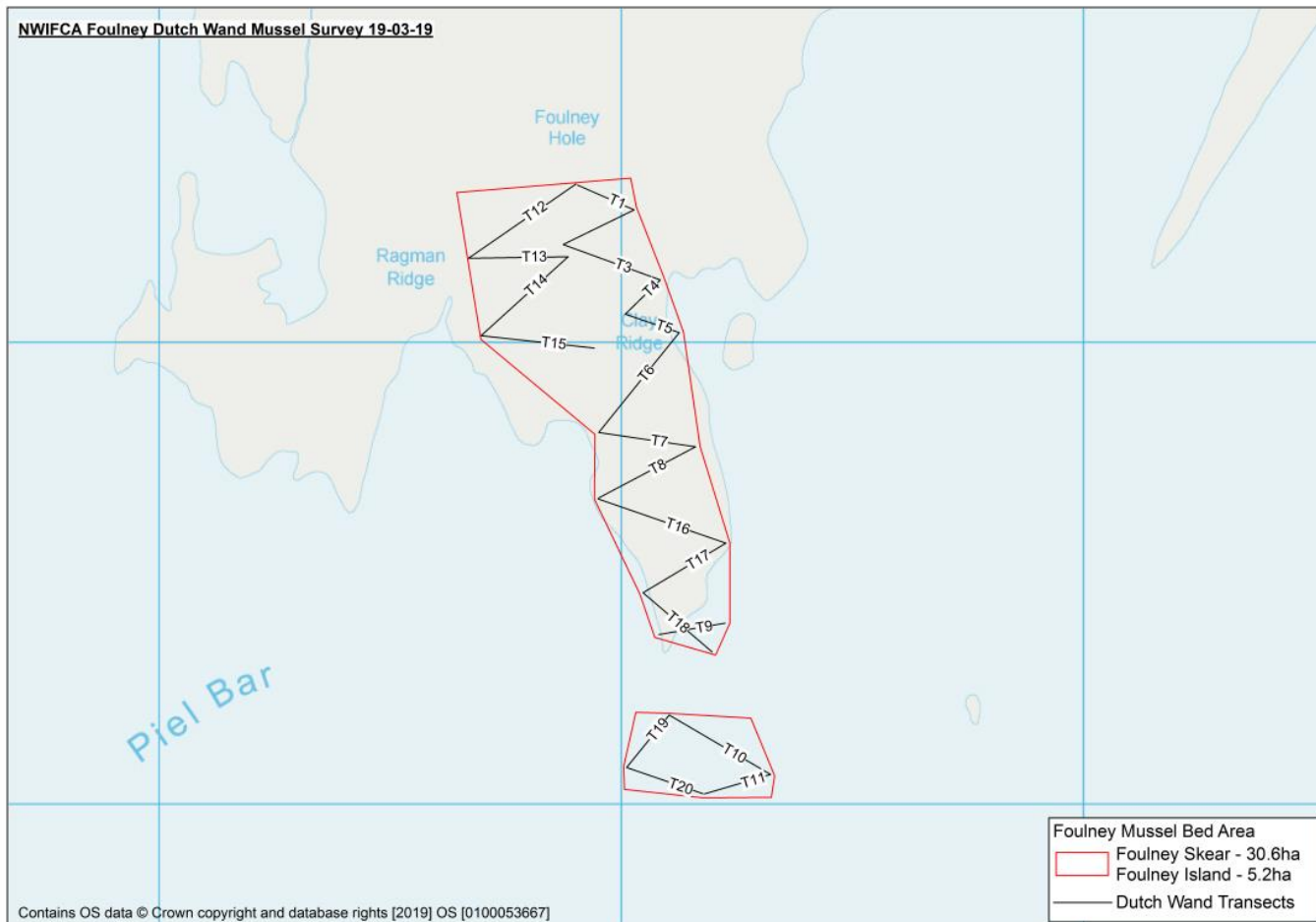


Figure 2 - Foulney Dutch Wand survey transects and estimated bed area

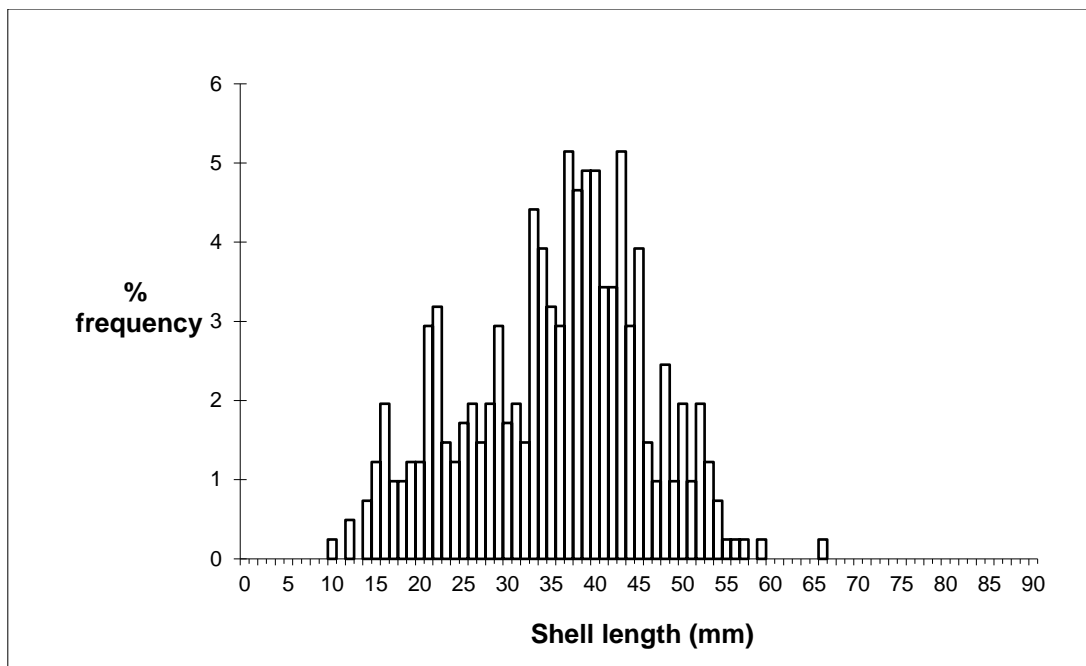


Figure 3 - Histogram showing size frequency of mussels from all samples on Foulney main skear

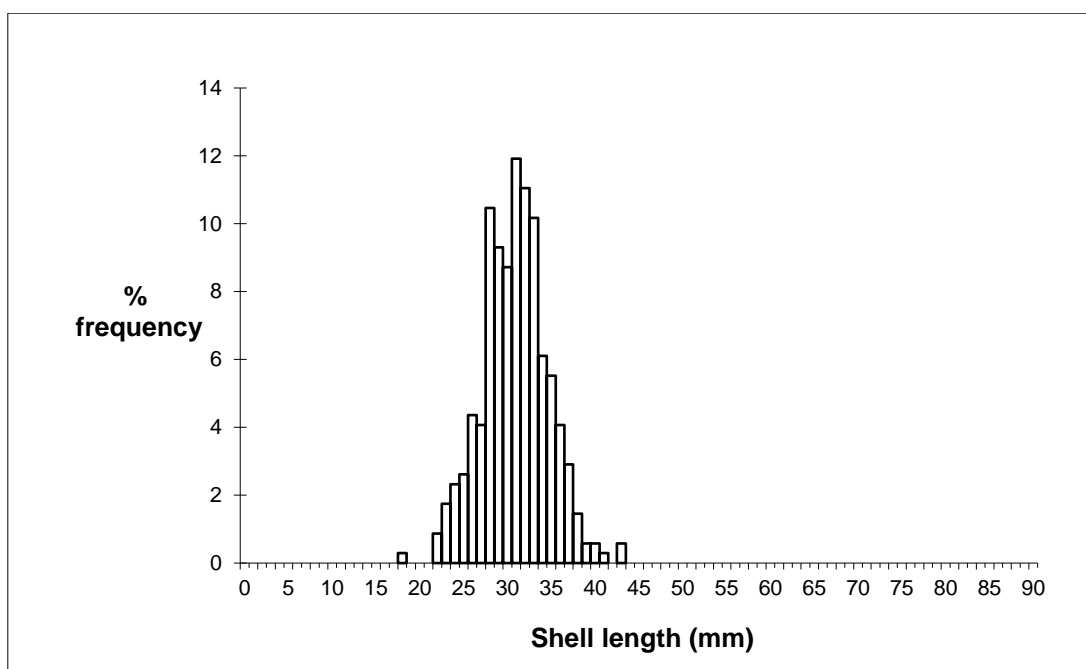


Figure 4 - Histogram showing size frequency of mussels from all samples on Foulney Island

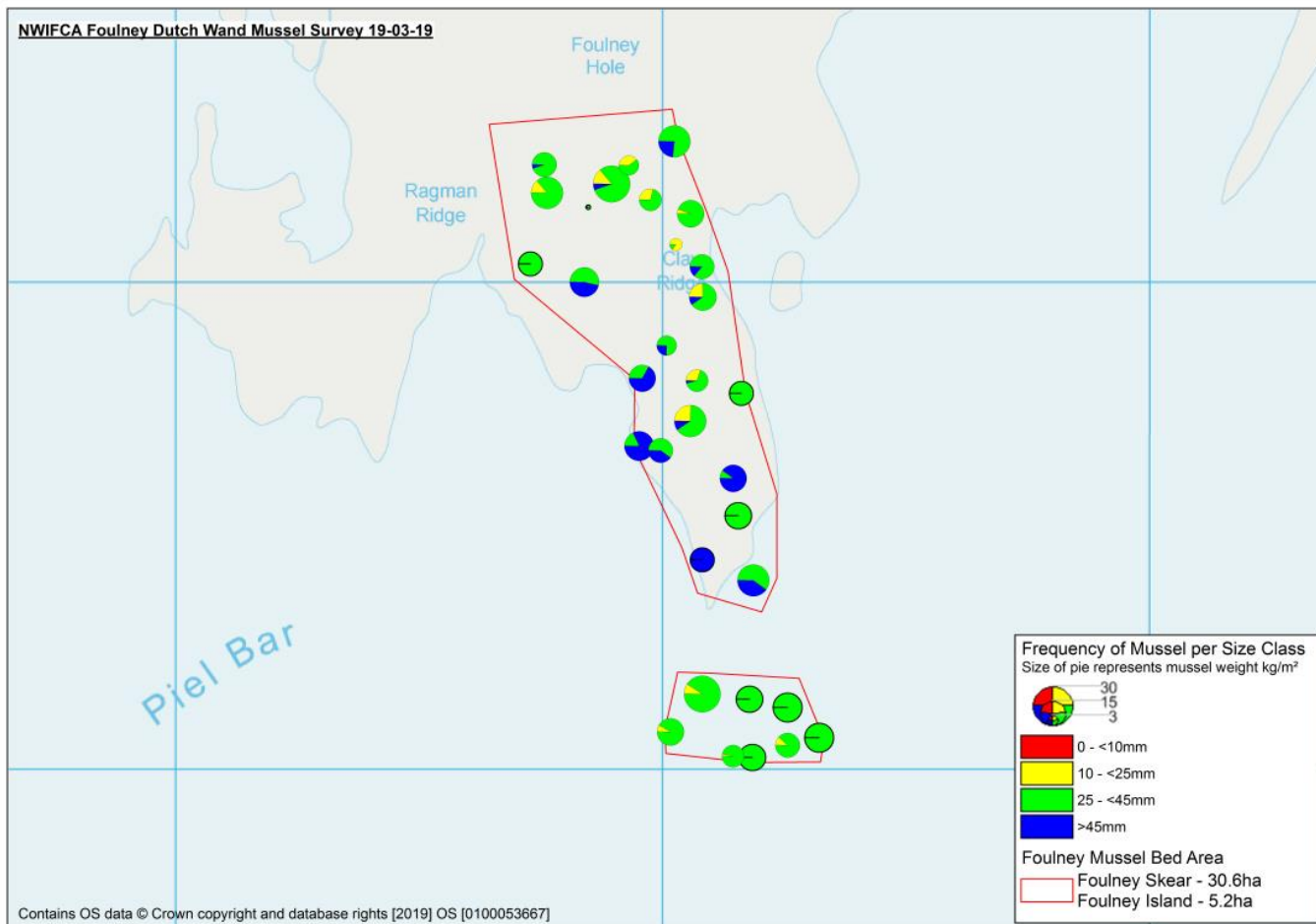


Figure 5 - Frequency of mussel by size class

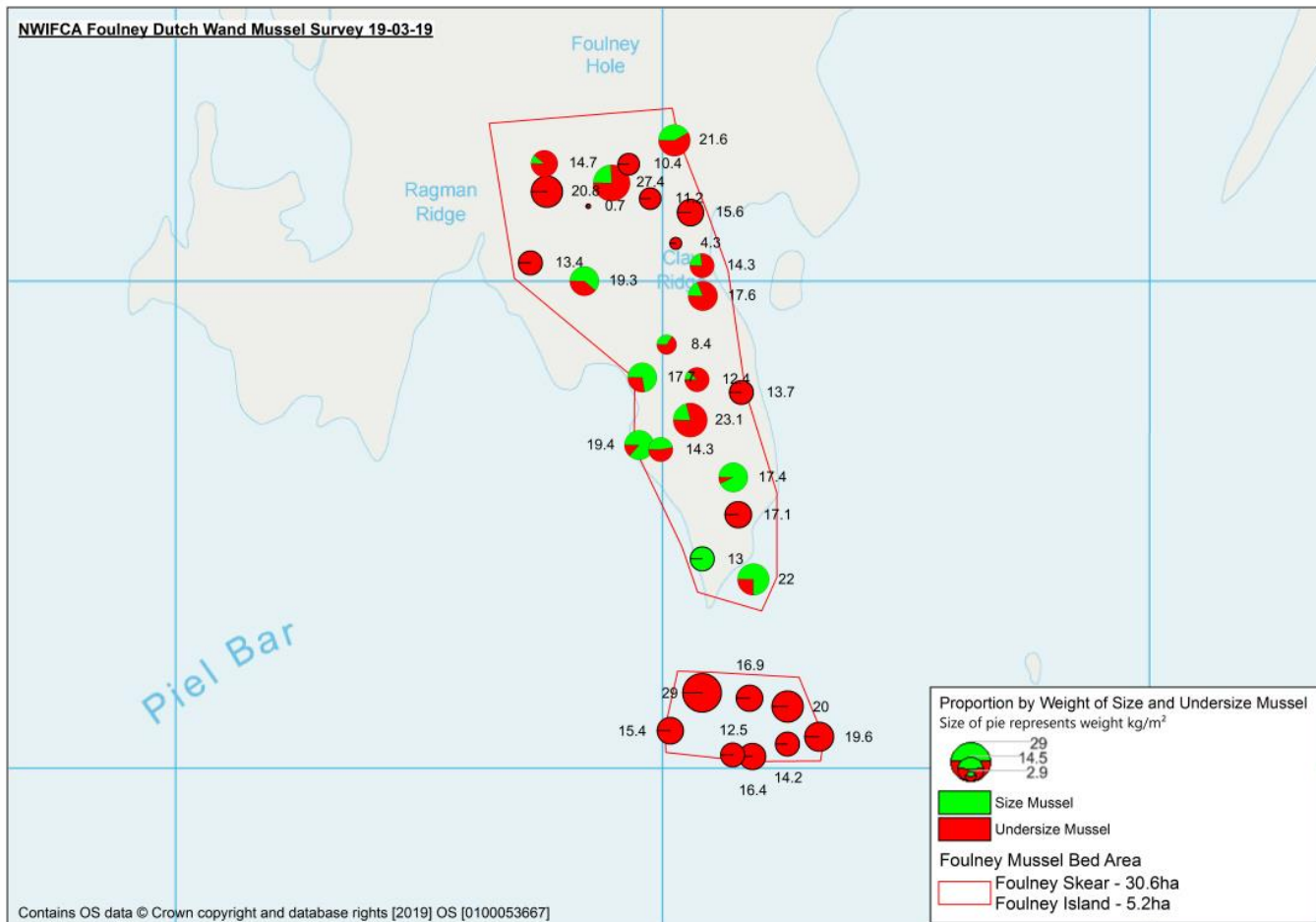


Figure 6 - Proportion of size and undersize mussel by weight represented as kg/m<sup>2</sup>

## Walney Channel Dutch Wand Mussel Survey 24-03-19

Low water: 07:55 0.6m (Liverpool Tides)

Seventeen transects were completed and 30 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample. From transect and sample data the total mussel bed surveyed was **35.4 hectares**. There were large numbers of large starfish observed along the low water line of the channel side of the skear.

### **Biomass**

3091 tonnes of size mussel and 1100 tonnes of undersize mussel.

### **Length Frequencies**

The total length frequency for the surveyed bed is provided in figure 3 below. From the length frequency data the mussel present on the Walney Channel bed range from 24 – 61mm with the highest frequency of mussel at 46mm.

### **Maps**

It can be seen from the map that the most abundant size class is greater than 45 mm which is present across most of the bed with areas of 25-45mm mixed in. There was no 2019 spat observed.

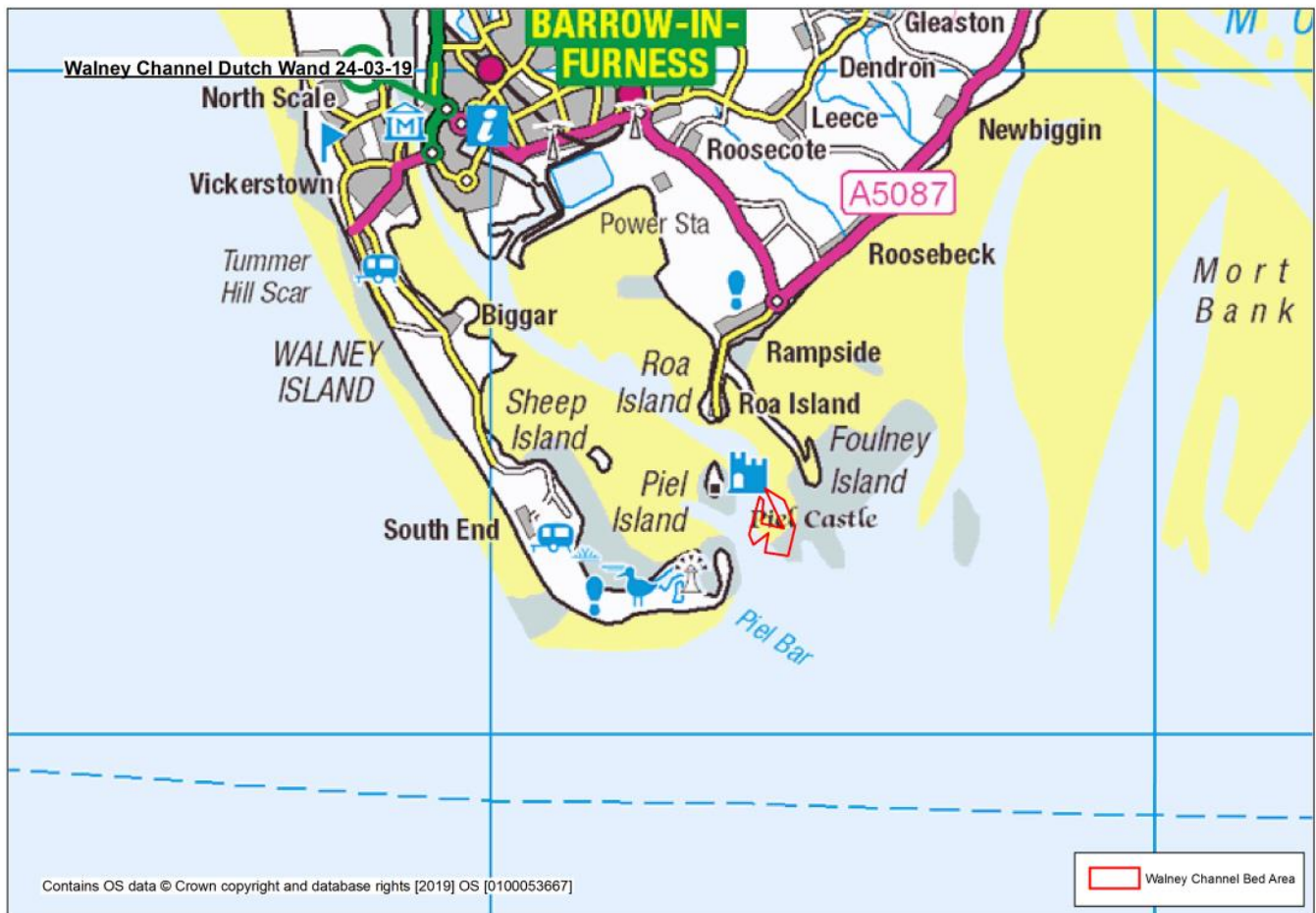


Figure 1 – Location of Walney Channel Mussel Bed

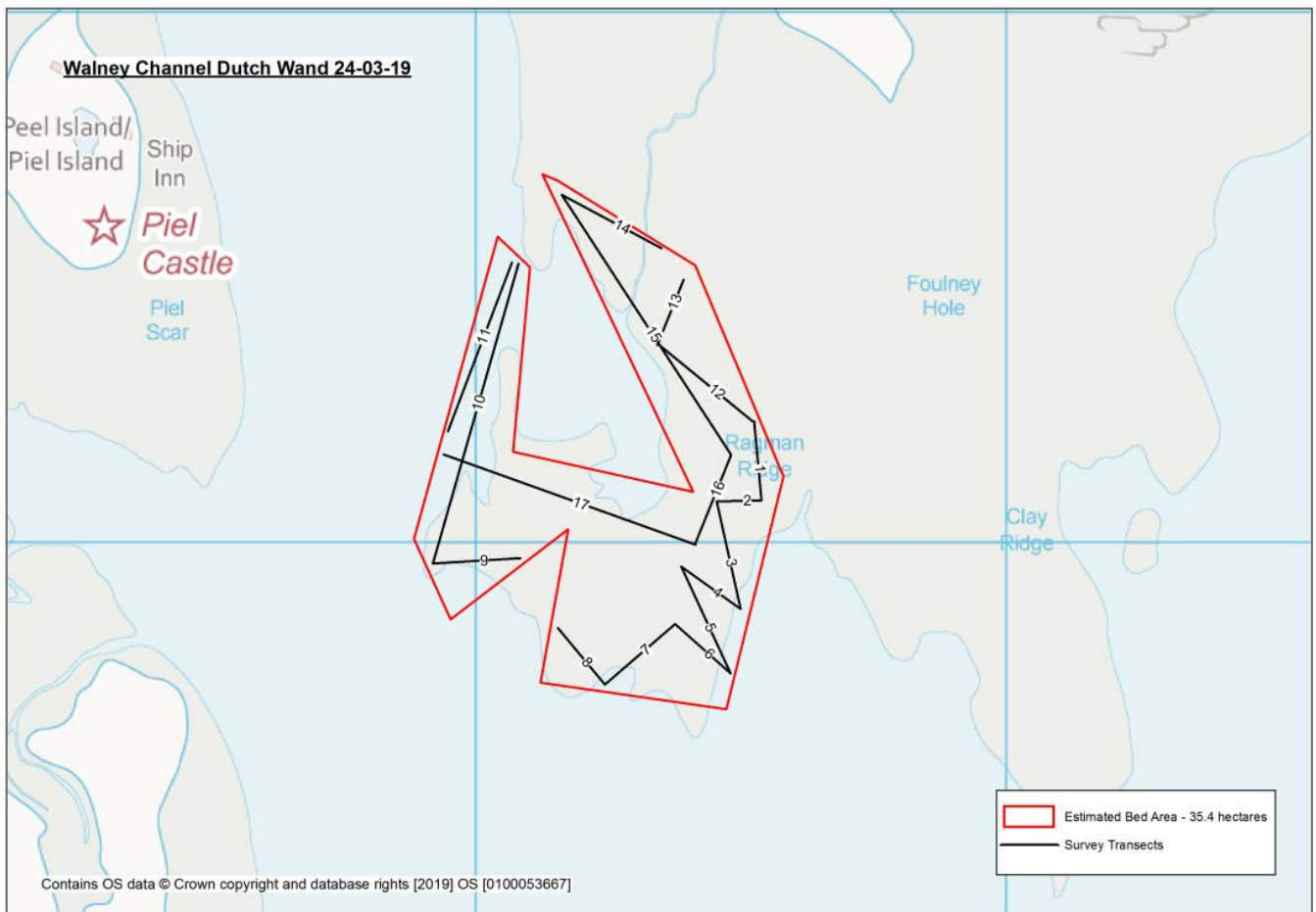


Figure 2 – Walney Channel Dutch Wand survey transects and estimated bed area

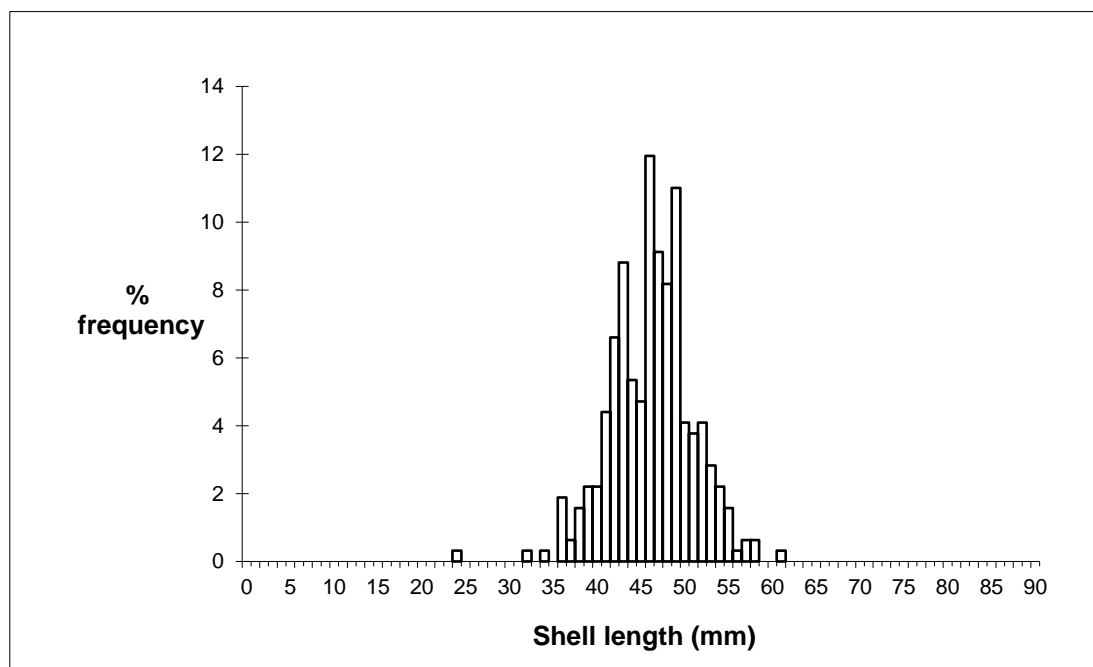


Figure 3 - Histogram showing size frequency of mussels from all samples on Walney Channel mussel bed



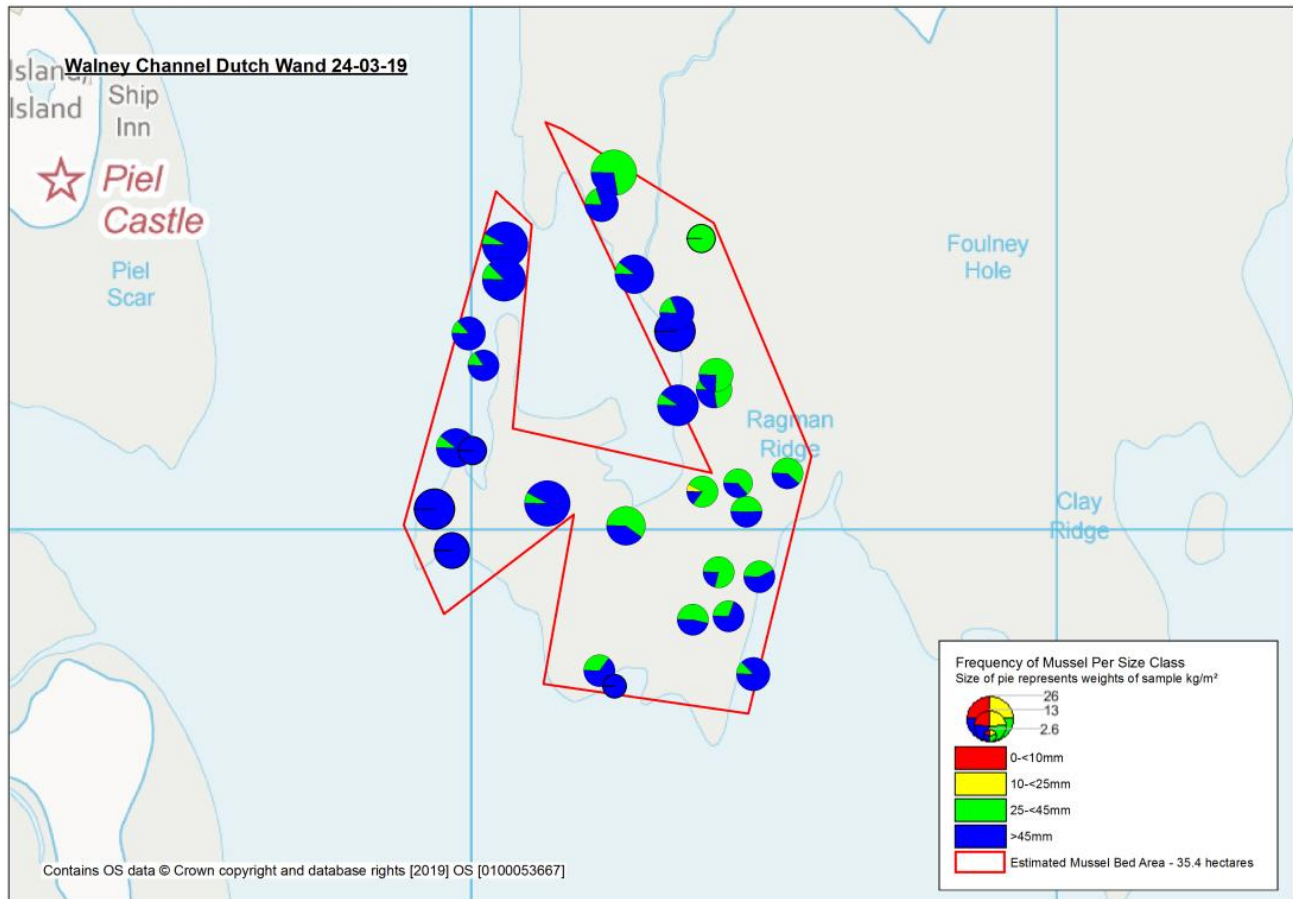


Figure 4 - Frequency of mussel by size class

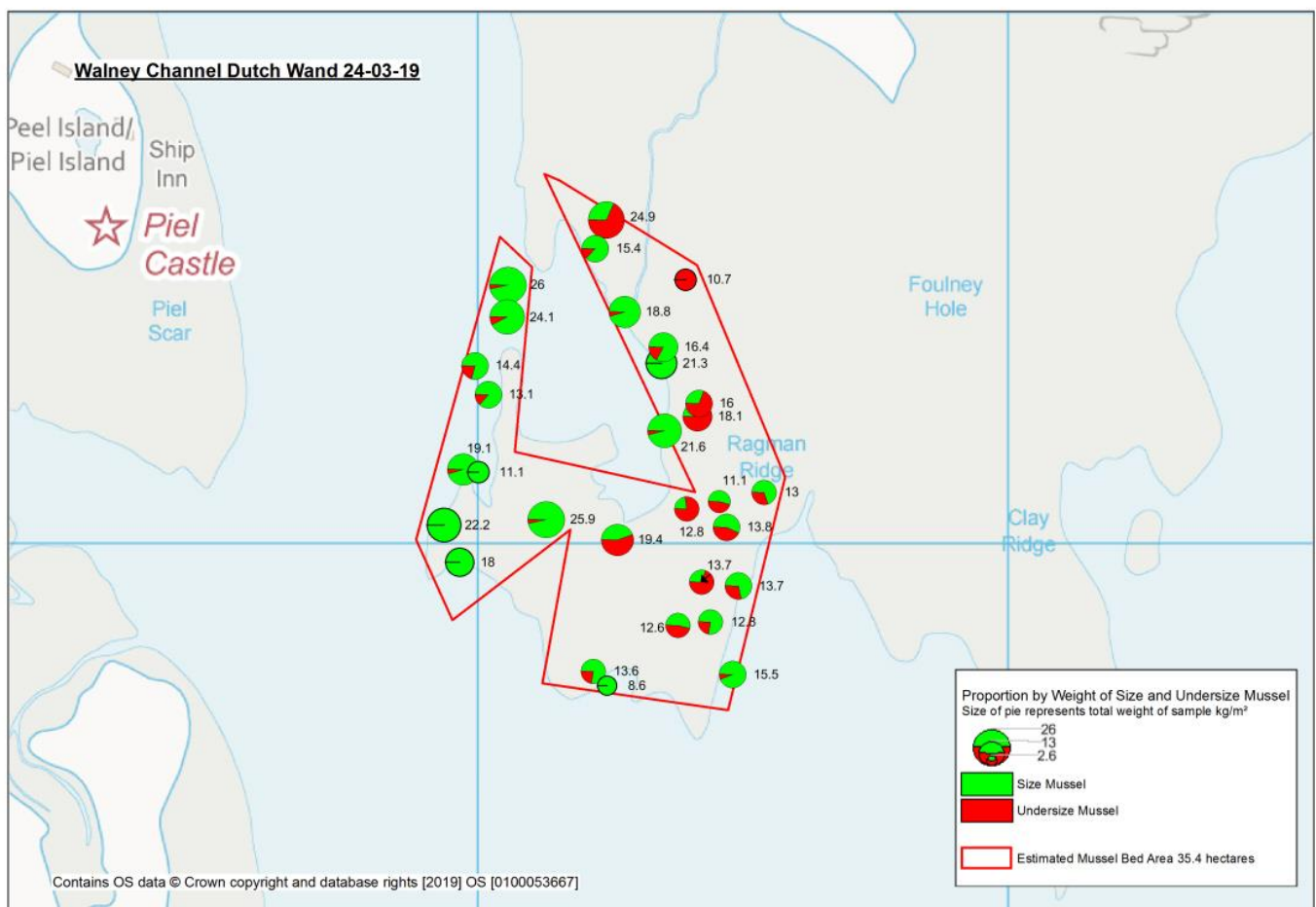


Figure 5 - Proportion of size and undersize mussel by weight represented as kg/m<sup>2</sup>

## Low Bottom Dutch Wand Mussel Survey 25-03-19

Low water: 08:33 1.09m (Liverpool Tides)

Nine transects were completed and 24 samples collected. The total weight of live undersize and size mussel was recorded as well as the size frequency of each sample. From transect and sample data the total mussel bed surveyed was **47.2 hectares**. No starfish were present on this bed.

### **Biomass**

2175 tonnes of size mussel and 2922 tonnes of undersize mussel.

### **Length Frequencies**

The total length frequency for the surveyed bed is provided in Figure 3. From the length frequency data of the mussel present on Low Bottom is varied with a wide spread of mussel from 16mm to 64mm.

### **Maps**

It can be seen on the map that the most abundant size class is the 25-45 mm which is present across most of the bed with areas of 10-25mm and greater than 45mm mussels mixed in. There was no 2019 spat observed.

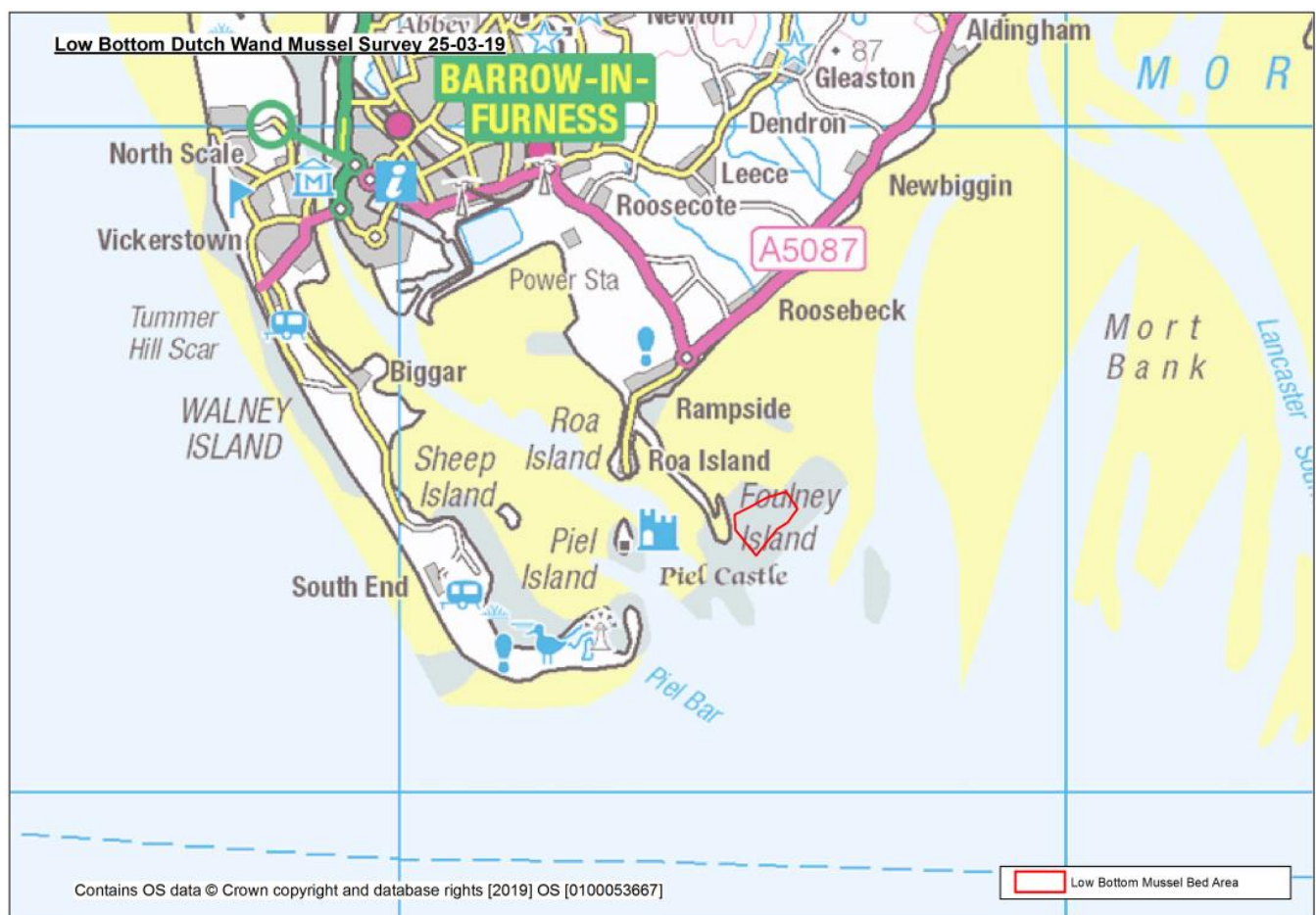


Figure 1 – Location of Low Bottom Mussel Bed



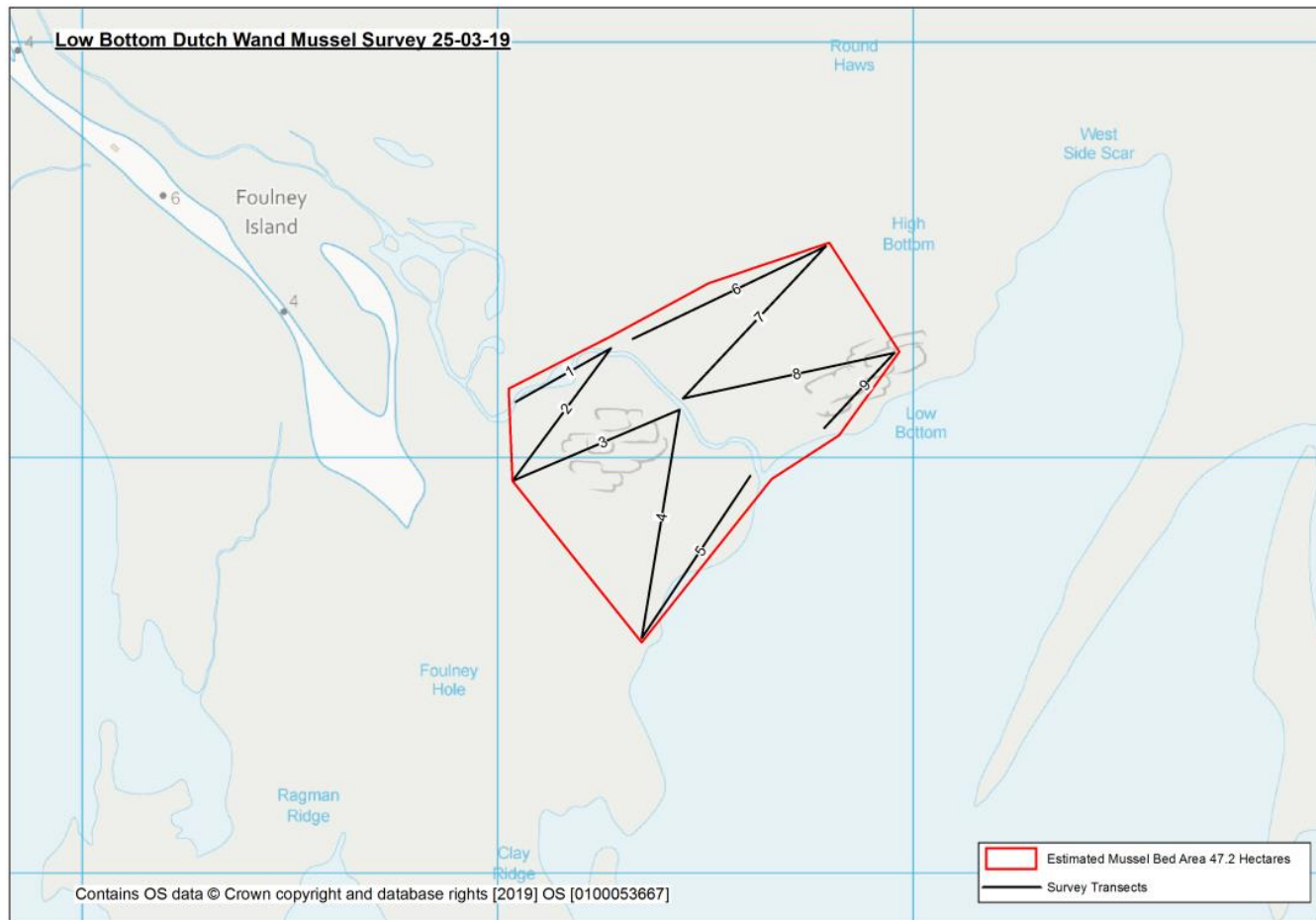


Figure 2 – Low Bottom Dutch Wand survey transects and estimated bed area

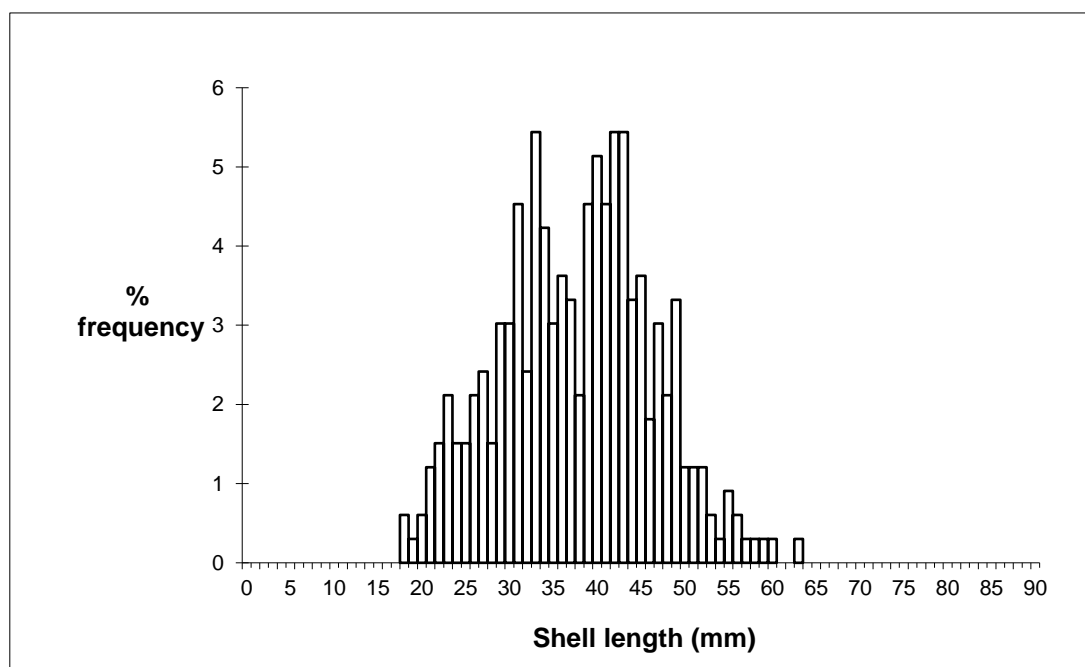


Figure 3 – Histogram showing size frequency of mussels from all samples from Low Bottom

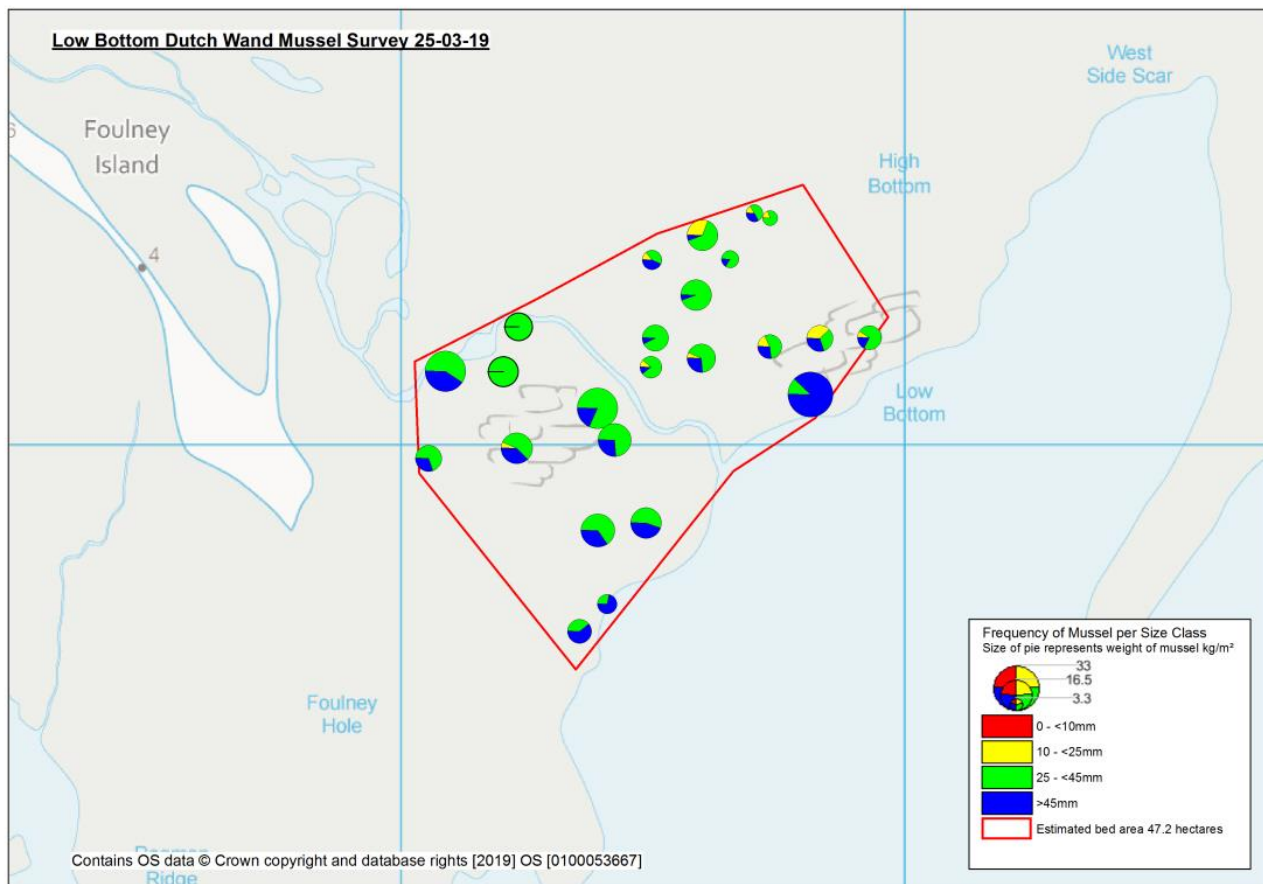


Figure 4 – Frequency of mussel by size class

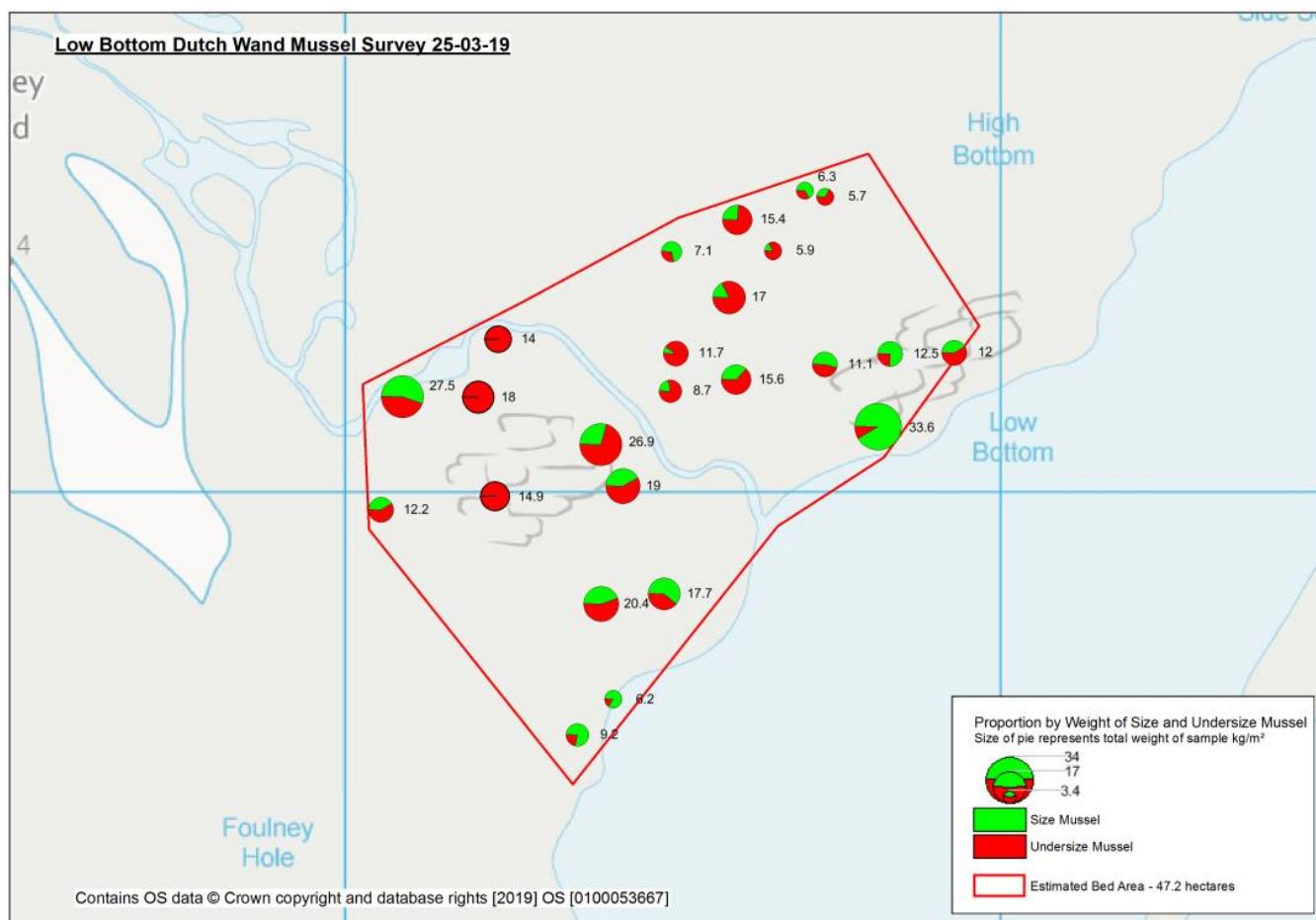


Figure 5 – Proportion of size and undersize mussel by weight represented as kg/m<sup>2</sup>

## **Heysham Flat Inspection**

Observations were made of the mussel stock and *Sabellaria alveolata* on the skear during the Chinese Mitten Crab survey in February. Some areas of the skear were devoid of mussel which has scoured out. A large proportion still held mussel of varying sizes which was very hard in to the ground. It is expected that this would become smothered with the 2019 recruitment when it occurs and starts to grow. There was very little live *Sabellaria* left on the main skear. It looked healthy around the northern edge, and from a distance appeared to still be flourishing off of the main skear and to the north of it, where it has been colonising over the past few years. This will be further inspected as the season progresses to inform management of the seed mussel fishery should settlement be dense.

## **South America and Falklands Mussel Inspection (Quad) 20/03/19**

LW: 17:35 0.4m (Liverpool tides)

### **South America**

The area of mussel fished in 2018 has gone and the hard substrate that was present is no longer exposed and has sanded over.

### **Falklands**

Access to the mussel bed was relatively easy and was accessed 50 minutes before low water. The area of mussel has decreased since last inspected in July 2018. The area of mussel, the area of exposed skear and the area of mussel in July 2018 has been mapped below. The area of mussel is 3 hectares and the area of exposed skear is 4.2 hectares although the full extent of the exposed skear was not mapped as it extended into the water in a south-westerly direction. The area to the north of the mussel and exposed skear has sanded over. On the east side of the mussel bed the mussel is being heavily predated on by starfish with a thick band of starfish and empty mussel shell present. There was an abundance of gulls present on the mussel bed which were predominately herring gulls.

The mussels vary in size from 25mm to 50mm with the majority of mussel being between 35mm and 40mm. The area of mussel is made up of areas of mussel on sand and areas of exposed skear. The mussel was hard in at the time of inspection which could be due to the recent strong winds. There was very little mussel mud across the bed. Below are images of the mussel, the starfish and the exposed skear.

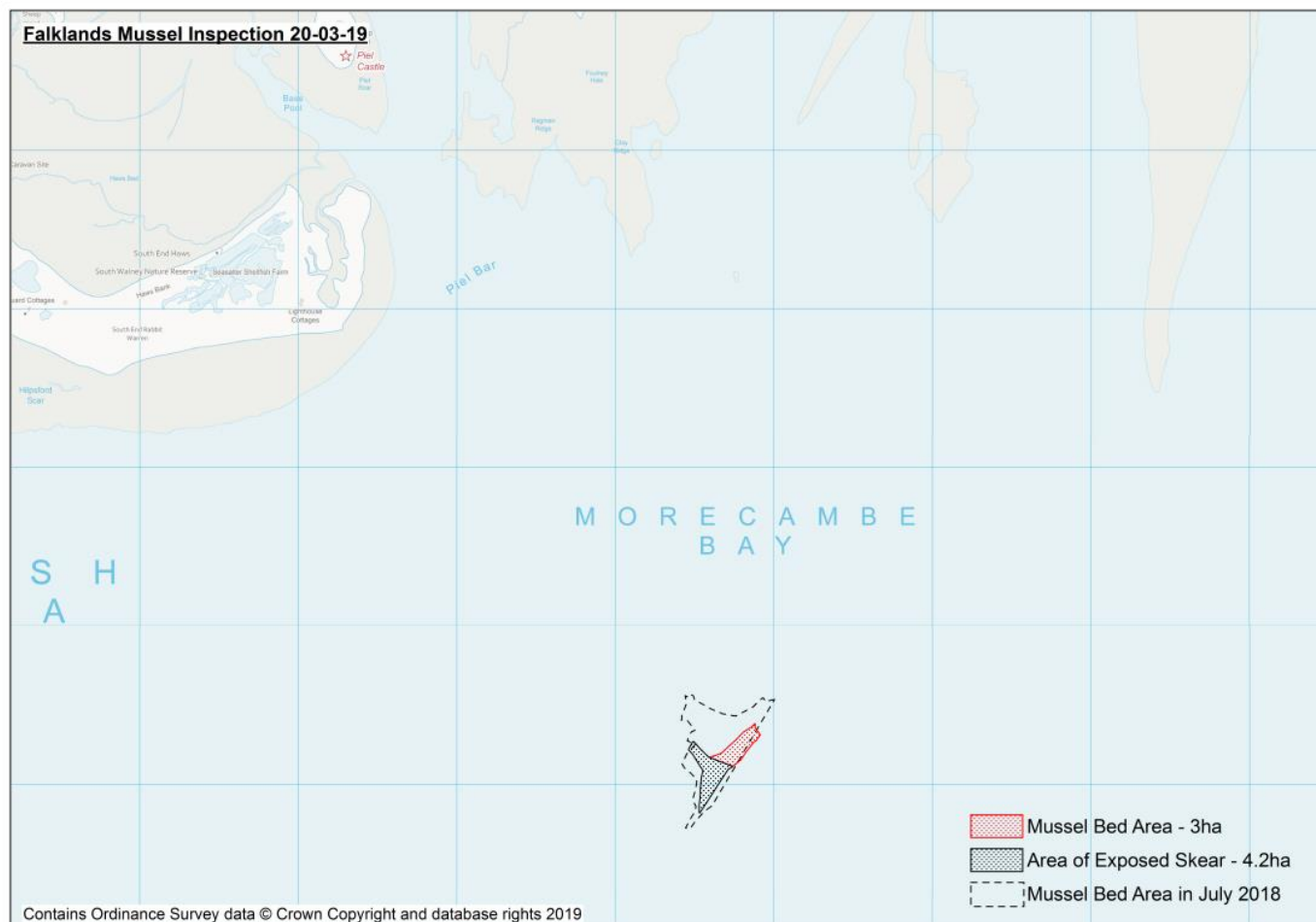


Fig. 1 Map show the area of mussel and exposed skear compared with the area of mussel inspected in July 2018



Fig 2 – Overview of the area of mussel on Falklands 20/03/19





Fig 3 – Falklands mussel on layer of sandy substrate and hard in 20/03/19



Fig. 4 – Empty mussel shell and starfish on the eastern edge of the mussel bed 20/03/19





Fig. 5 – Starfish on live mussel on the eastern edge of the mussel bed 20/03/19



Fig. 6 – Exposed skear on the south west side of the area 20/03/19



Fig. 7 – Exposed skear on the south west side of the area 20/03/19

## **COCKLES**

### **North Penfold and South Gut cockle inspection 04.04.19**

LW 18:34 1.4m (Liverpool tides)

Officers conducted an inspection of the Southport Cockle Beds, North Penfold and the surrounding areas and South Gut. The area South to Southport has recently been inspected by IFCO officers who reported very low cockle density.

At South Gut there was a very low density of cockle. At the hygiene sample point there was 2-4 per m<sup>2</sup> and the area to the north and south of the sample point had no cockle present.

The soft muddy area at North Penfold is still present but the area and density of cockle has decreased significantly with the majority of the bed containing the occasional size cockle <1 per m<sup>2</sup>. There is a small area of cockle to the southern end of the bed approximately 100m by 100m that contains a mixture of 20mm to just over size cockle at 50-100 per m<sup>2</sup>.