

Annex 1.2

Hard Acre Mussel Inspection 12-09-26

Officers: ID, JH, RL, LL

LW: 07:24 0.7m (Liverpool tides)

Officers inspected Hard Acre mussel bed in the Duddon Estuary. The area was accessed by quadbike, and an inspection was carried out on foot. Due to the water not ebbing off until late officers were unable to map the complete perimeter of the bed however, estimates were made from what they could access and see. The mussel bed is in the main channel and patchy throughout (Figure 1).

Mussel size across the bed was uniform and had grown on from the previous survey on 15/07/26. Majority of the stock was 40-50mm found mainly on hard sand or firm mud (Figure 2 & 3). There were large areas of scour present with the largest area towards the centre of the channel (Figure 4 & 6). Overall coverage of the bed was like the previous survey with approximately 20% with denser patches at the Northern extent of the bed (Figure 10). The smallest of the sized mussels are found at the Southern extent of the bed showing continued signs of growth from previous survey, mixed with 45mm mussel (Figures 7 and 8). Conversely the largest of the sized mussels can be found at the Northern edge of the bed (Figure 9).

There were a large number gulls, eiders and oystercatchers present on the bed.

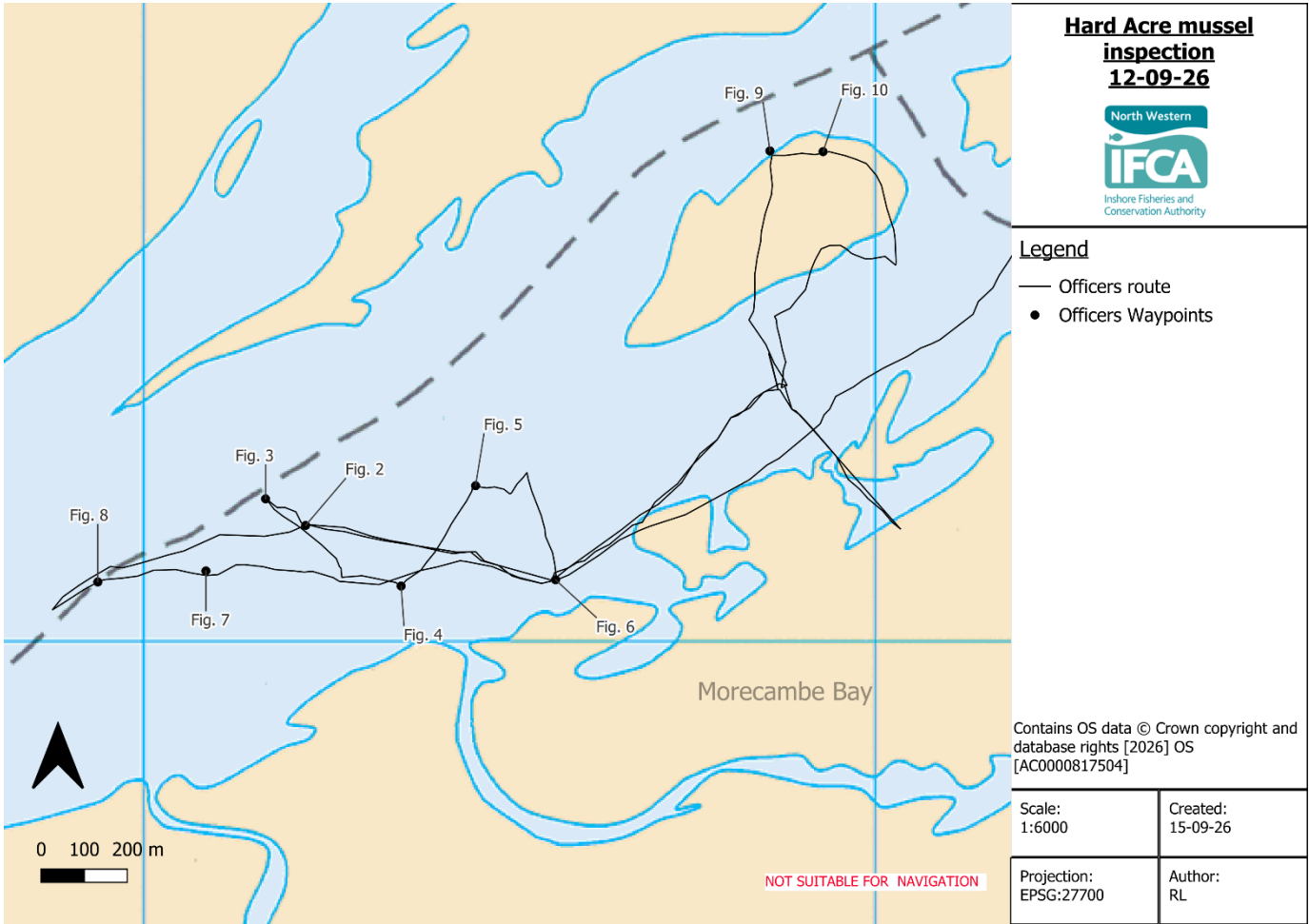


Figure 1 Overview map of the officers route and corresponding images



Figure 2 40-50mm mussel mixed with deadshell on hard sand

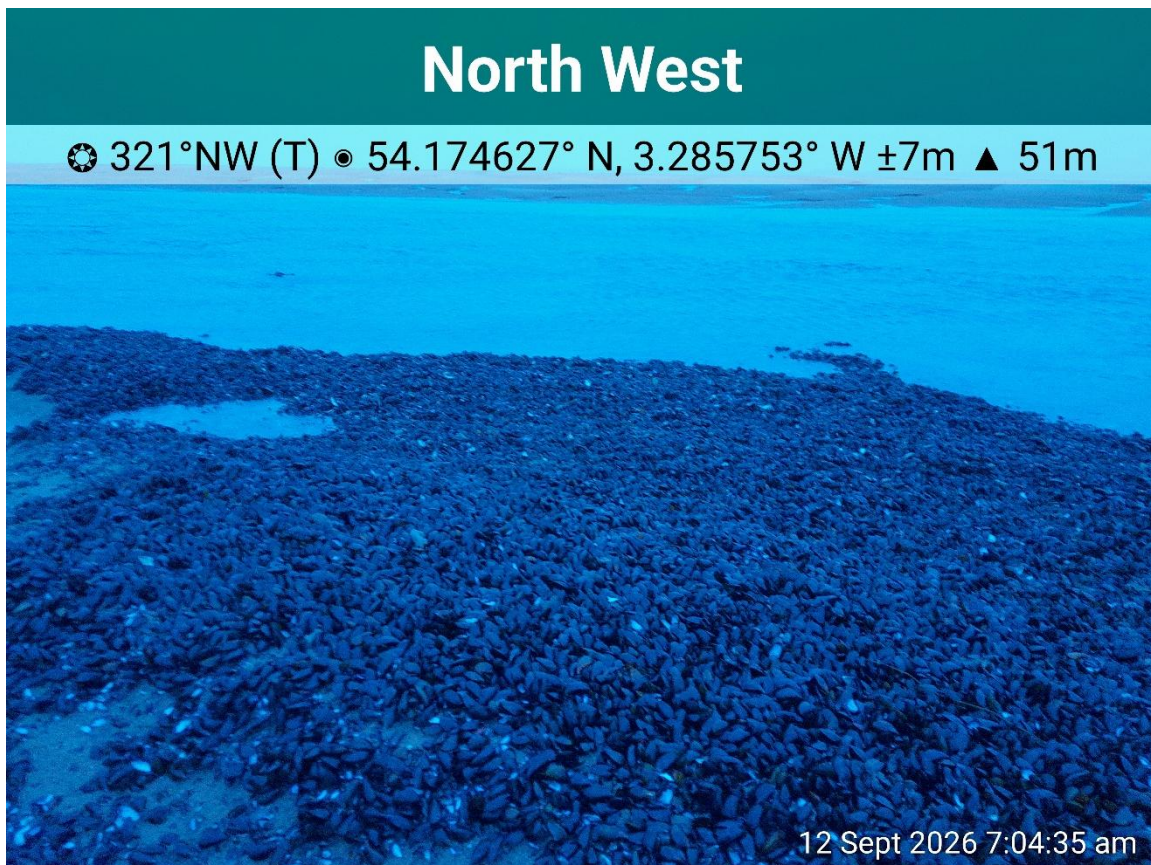


Figure 3 Dense sized mussel on firm mud

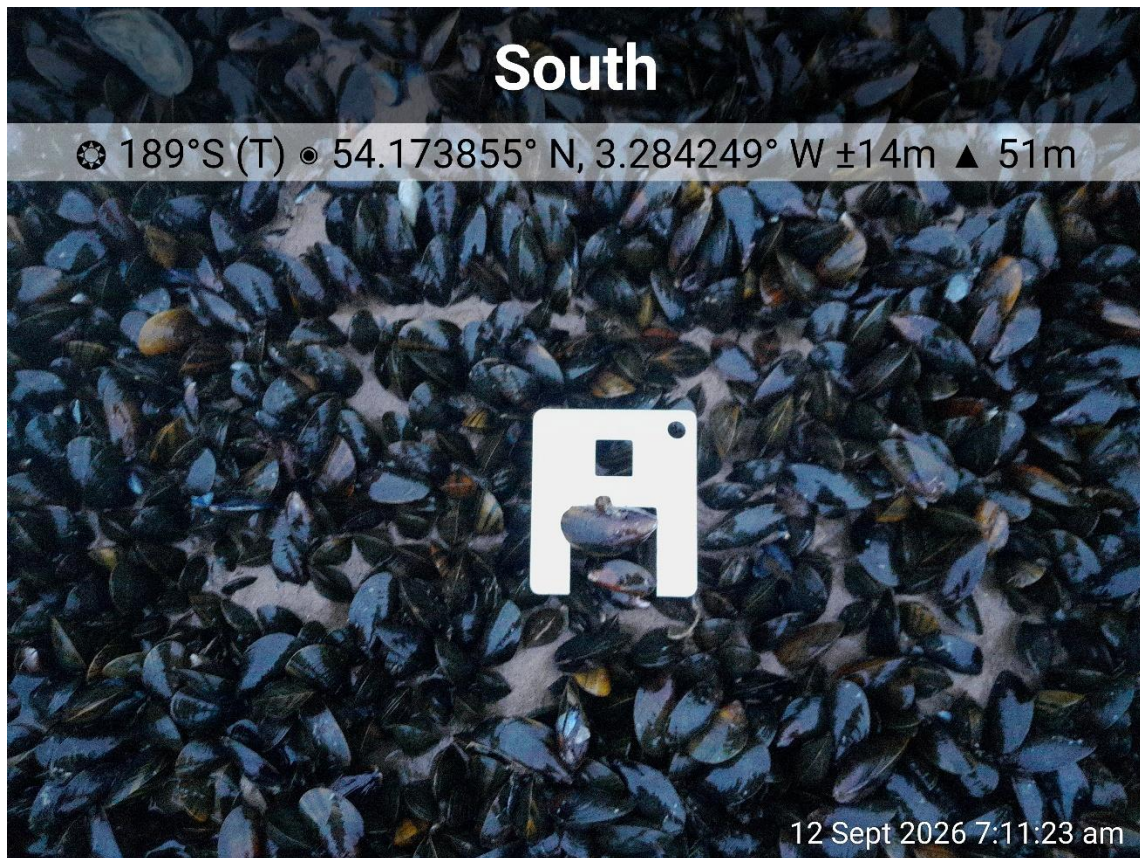


Figure 4 (a) 35-50mm mussel on hard mud



Figure 4 (b) Large patches of scour approximately 2ft deep

South

☉ 190°S (T) ● 54.173727° N, 3.284173° W ±3m ▲ 54m



12 Sept 2026 7:12:39 am

Figure 5 Small patches of mixed size and undersize mussel on hard mud

North

☉ 26°N (T) ● 54.174864° N, 3.281358° W ±3m ▲ 46m



12 Sept 2026 7:23:20 am

Figure 6 Large area of scour extending under the water line



Figure 7 Southern extent of bed, majority of mussel 45mm and above in length with some 35-40mm mussel mixed in.



Figure 8 Southern extent of bed, patchy mussel 40-50% coverage, mussel on sand.



Figure 9 Northern extent of bed, mussel 45-50mm in length.



Figure 10 Northern extent of bed, patchy 50-60% coverage, mussel on sand

Foulney Dutch Wand Mussel Survey Autumn 2026

Officers present: ID, JH, LL, GE

Low water: 13/09/26 08:00 0.9m (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 31 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 **44 hectares**, 36 hectares for the main bed and 8 hectares for the Foulney Island. There is still a bare area between the main bed and the island with no mussel present, as such one transect was omitted from the survey.

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.

Biomass

1565 tonnes size mussel (33 tonnes for the Island *) and **1421 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 9mm to 73mm.

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/m². 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. Undersize mussels were mainly congregated higher up the main skear with some mixed in with size mussel in the middle of the skear. There is a higher proportion of the larger size classes (35mm+) in the upper area of the main skear compared to the spring surveys.

* Due to very low coverage of mussel only one sample was taken from the Island. Therefore the biomass estimate may not be representative of the area. However officer observations confirmed that the biomass of the island was low.

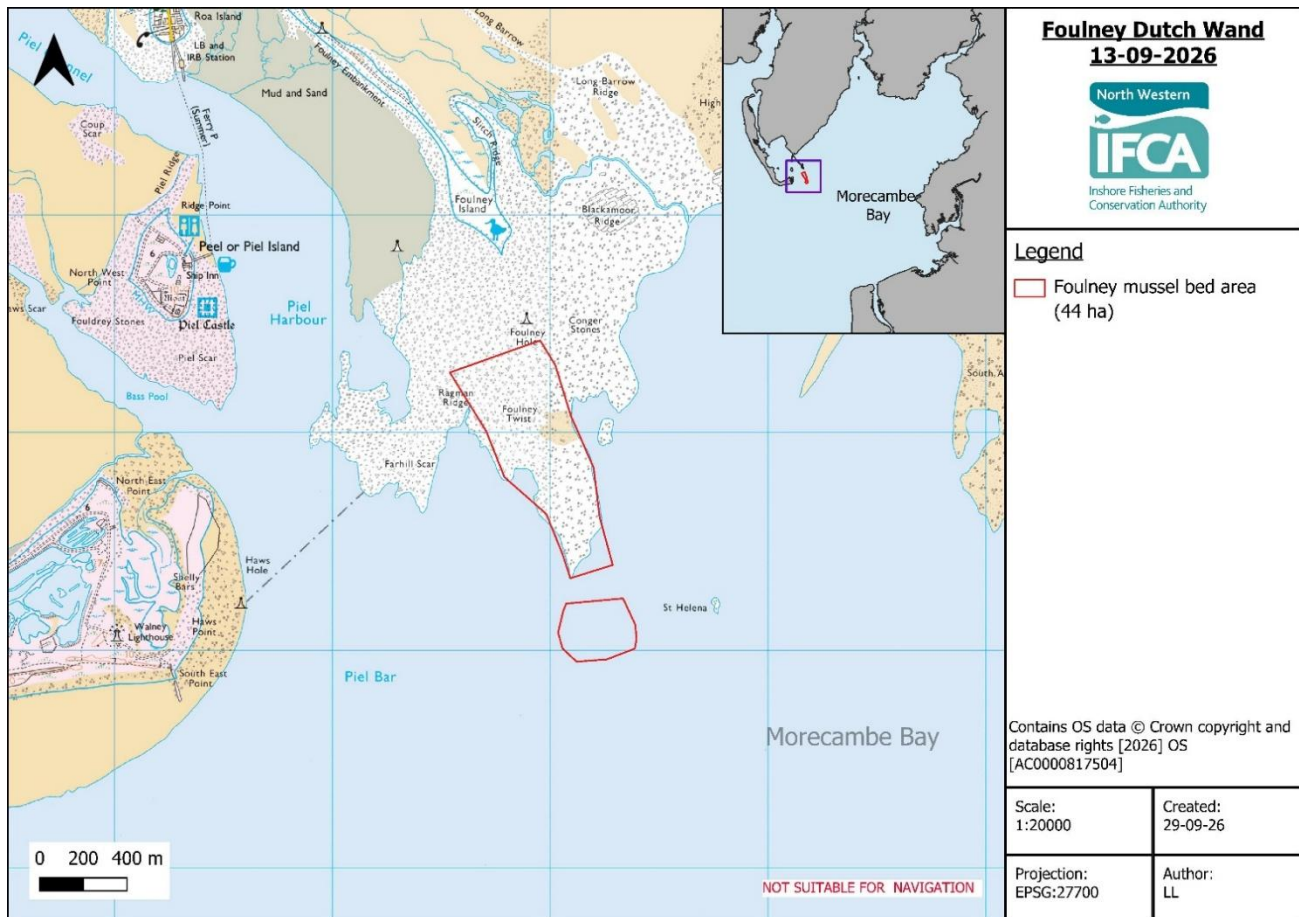


Figure 1: Location of Foulney mussel bed autumn 2026

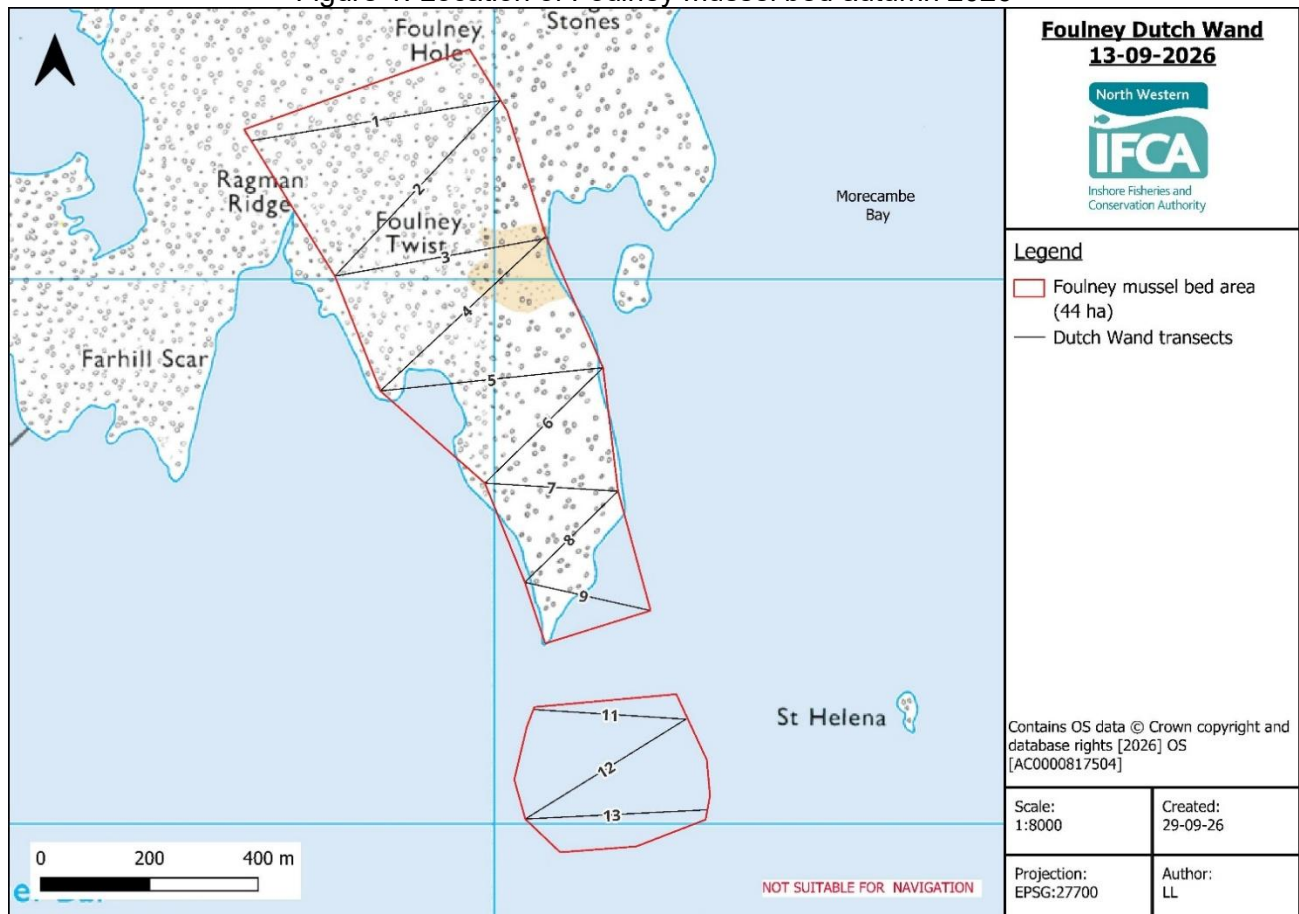


Figure 2: Foulney Dutch Wand survey transects and estimated bed area

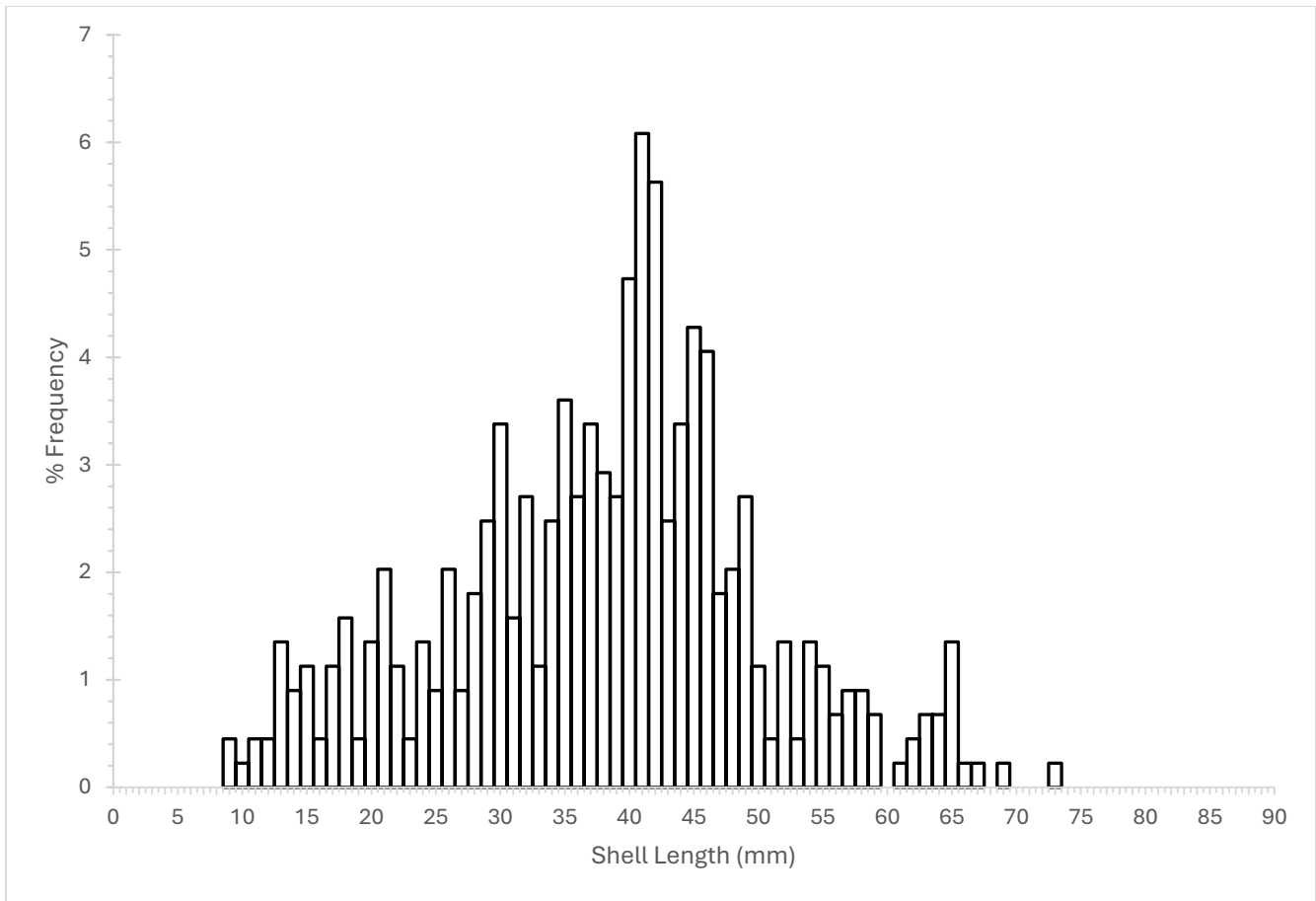


Figure 3: Histogram showing size frequency of mussels from all samples on Foulne

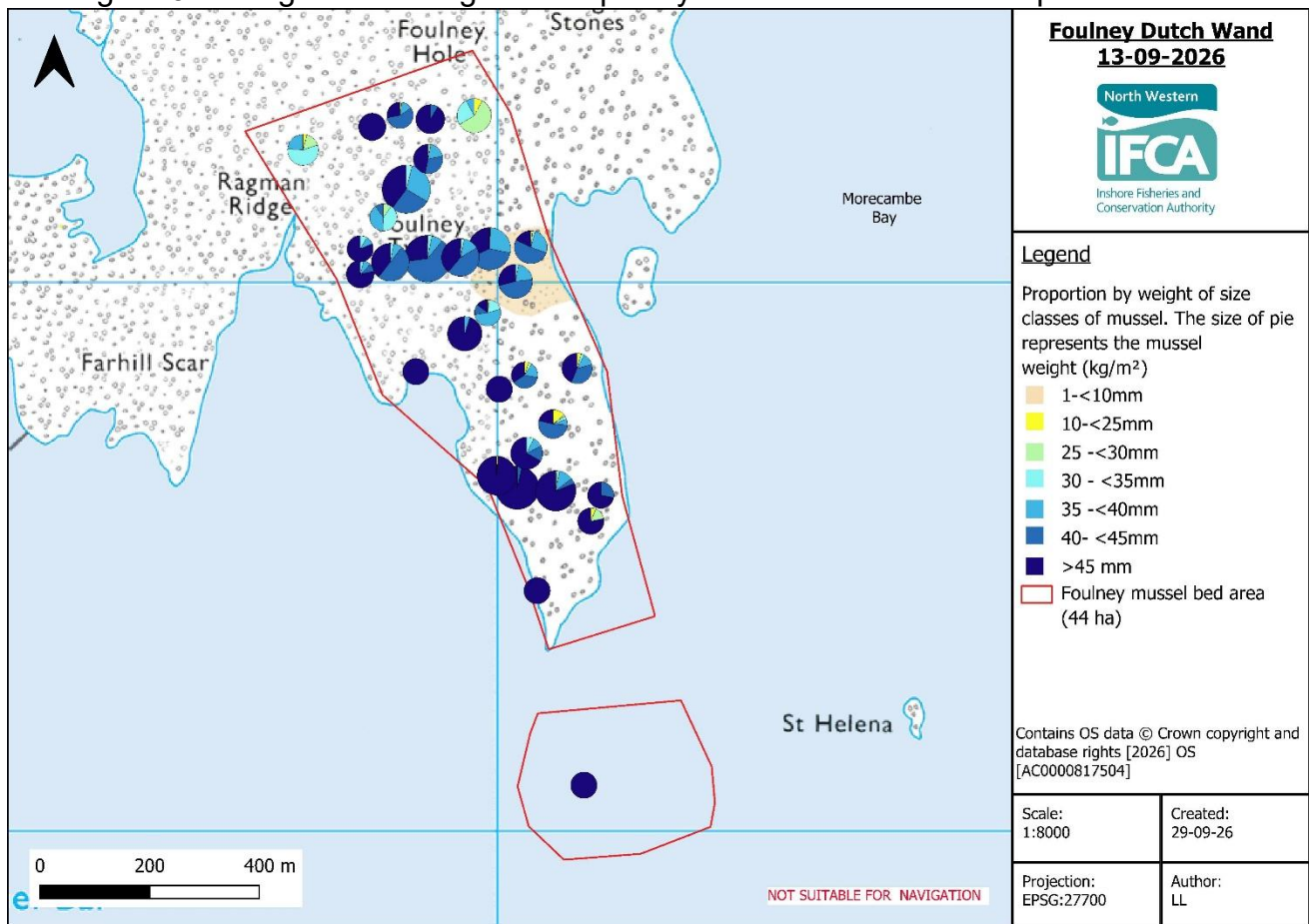


Figure 4: Proportion of size classes by weight represented as kg/m²

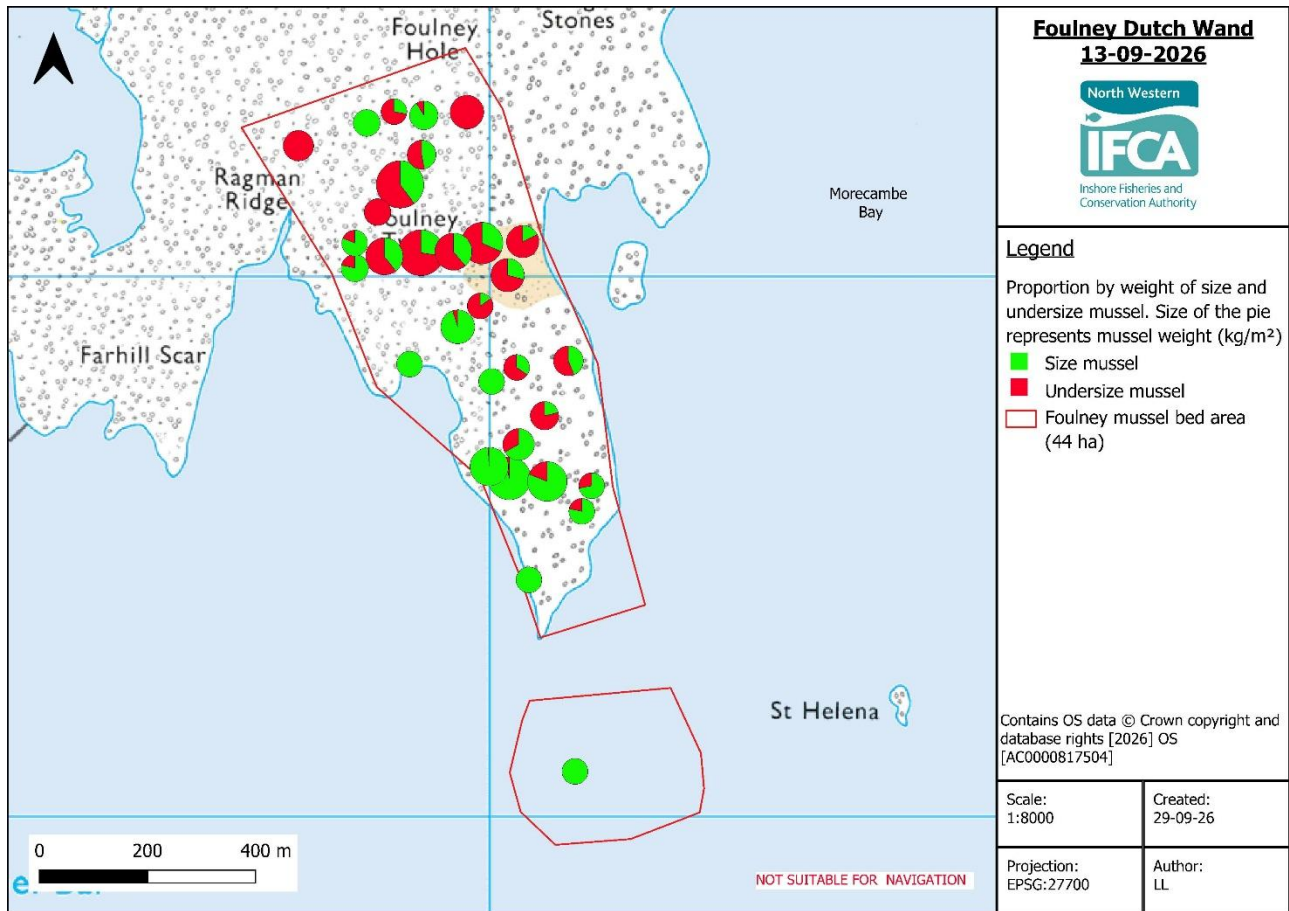


Figure 5: Proportion of size and undersize mussel by weight represented as kg/m²

Walney Channel Mussel Inspection Note 29-09-26

Officers present: ID, JH

Low water: 08:03 1.2m (Liverpool Tides)

Survey method: Inspection

Due to the continued decrease in the mussel bed in both size and density over recent years, and due to the inaccuracy of completing a Dutch Wand mussel survey over a large area with a low number of samples, and a large percentage of the transects void of mussel, officers carried out an inspection of the bed.

There has been a further decrease in mussel with most of the higher elevation areas flat and consisting of old shell with a very occasionally 60mm barnacled mussel present (Figure 1). The small strip of mussel along East side previously inspected is no longer present (Figure 2). Officers will continue to inspect the area in spring and autumn each year.

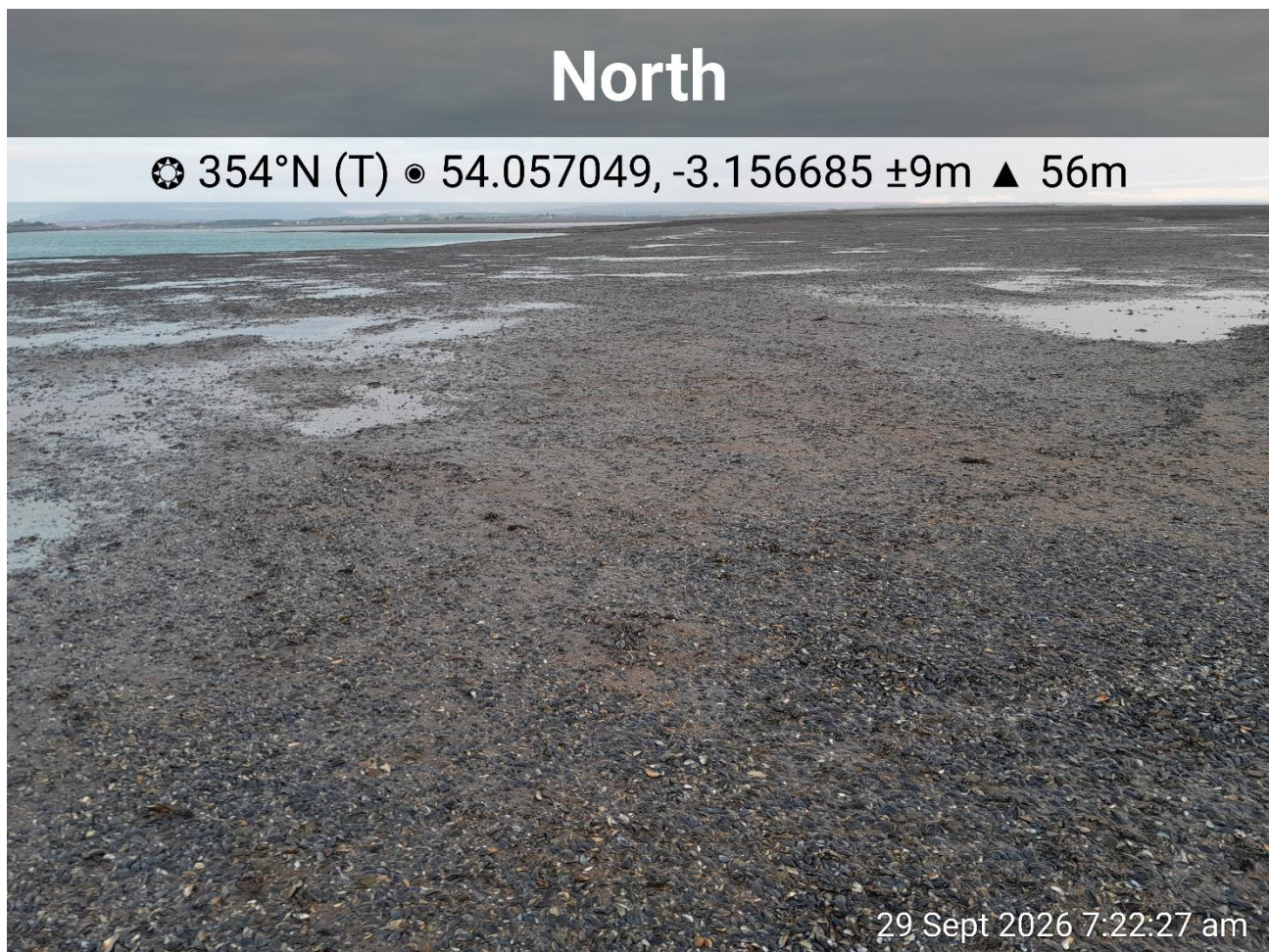


Figure 1 – Large area void of mussel 29-06-2026

North West

☉ 312°NW (T) ● 54.055493, -3.154912 ±31m ▲ 67m



Figure 2 – Area void of mussel which previously (March 26) had a strip

Thurstaston Mussel Inspection 01-10-26

Officers present: JH, MT

Low Water: 09:11 1.8m (Liverpool Tides)

Figure 1 show the estimated mussel bed areas; these are taken from observations on the day and previous years mapping. There has been a slight increase in the mussel coverage on the Eastern area of mussel due to the area receiving a settlement in 2025 which is 25-30m in size and approximately 25% coverage (Figures 2 and 3). There is a large are of sand which split the beds (Figure 4). There has been a further reduction in the density of mussel in the two eastern areas which have not received a mussel settlement in 2025, the areas consist of less than 5% coverage of older barnacled mussel, mixed in with macroalgae (Figures 5, 6, and 7).

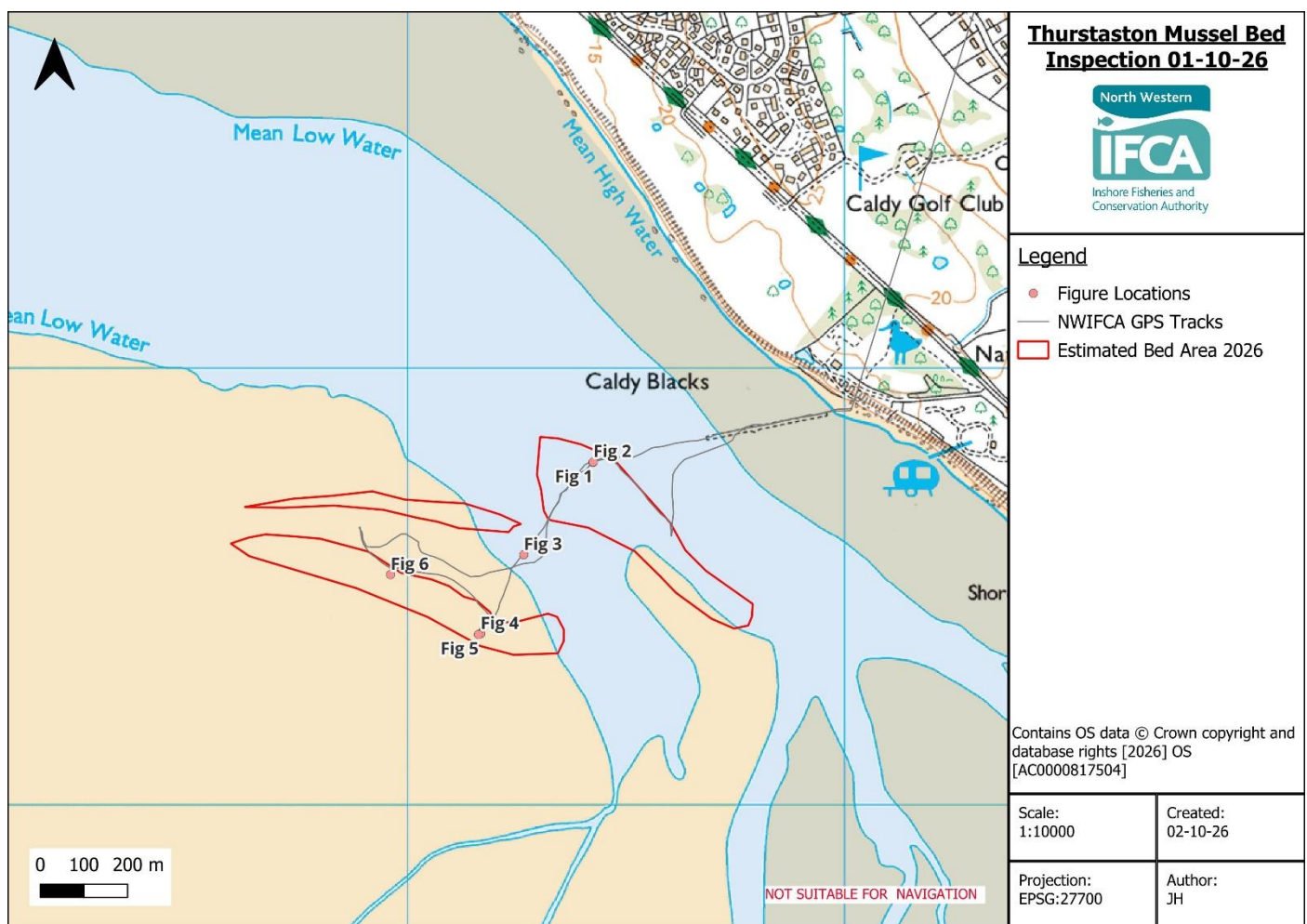


Figure 1. Map of the estimated Thurstaston mussel bed area 01-10-26.

South West

☉ 230°SW (T) ☉ 53.345252, -3.166693 ±6m ▲ 57m



01 Oct 2026 7:14:12 am

Figure 2. Thurstaston Eastern Mussel Bed 01-10-26.

West

☉ 267°W (T) ☉ 53.345263, -3.166686 ±3m ▲ 53m



01 Oct 2026 7:14:30 am

Figure 3. Mussel 25-30mm in length on the Eastern area 01-10-26

South West

☀ 227°SW (T) ● 53.343329, -3.169018 ±3m ▲ 80m



01 Oct 2026 7:20:35 am

Figure 4. Area of sand between the mussel beds 01-10-26.

South

☀ 186°S (T) ● 53.341689, -3.170456 ±4m ▲ 77m



01 Oct 2026 7:25:19 am

Figure 5. Low density older barnacled mussel mixed in with macroalgae 01-10-26.

West

☉ 279°W (T) ☉ 53.341673, -3.170532 ±3m ▲ 77m



Figure 6. Western mussel bed with low density of older mussel 01-10-26.

South

☉ 211°S (T) ☉ 53.342876, -3.173585 ±11m ▲ 77m



Figure 7. Western mussel bed with low density of older mussel 01-10-26