

Survey Report - Cahore Point and the Rusk Channel – 20 to 22/06/2023.

Methodology: Acoustic data collection using 400 kHz side scan sonar, data processing on SonarWiz 7 and ground truthing of acoustic targets with a 1 meter dredge (Van Lancker *et al.*, 2007; van Overmeeren *et al.*, 2009; BIM, 2016).

Area surveyed: South of Cahore Point along the shore covering the 2022 beds as well as in the Rusk Channel from Buoy No. 4 to the Buoys No.1 and 2 (see map attached).

Survey summary:

- Shore:

The side scan sonar was deployed along the shore, covering the 2022 mussel beds. Some mussel features were observed on the acoustic data, however none of these were consistent throughout the data which would indicate a very patchy distribution on the seabed. 27 tows were carried out in the area, some confirming the presence of mussels. Following the survey, two areas have been designated as possible settlement. The large area along the shore correspond to the location of previous beds found in 2021 and 2022 (BIM, 2021-2023) and is composed of multiple patches of variable mussel densities (from dredge results). Those patches stretch over **65 hectares**. The second area is much smaller, could not be precisely delineated on the acoustic data and represents an area of approximately **8 hectares**.

Table 1: Areas coordinates (in Degrees, Decimal minutes and WGS84 projection)

Area 1 (old mussels): 65 hectares

latitude	longitude
52° 29.205' N	6° 15.558' W
52° 29.247' N	6° 15.046' W
52° 28.652' N	6° 15.597' W
52° 28.589' N	6° 16.092' W
52° 28.613' N	6° 16.182' W



Area 2 (new seed): 8 hectares

latitude	longitude
52° 28.766' N	6° 14.900' W
52° 28.606' N	6° 15.291' W
52° 28.634' N	6° 15.332' W
52° 28.824' N	6° 14.931' W
52° 28.987' N	6° 14.735' W
52° 28.966' N	6° 14.664' W

NOTE: The seed beds displayed on the attached map has been established following verification by ground- truthing of the side-scan sonar data. These coordinates represent the corners of a simplified polygon of the area of the possible settlement identified (yellow boxes around the beds on the map).

The mussels found in the patches along the shore appears to be **1 to 2 years old** with extensive barnacle fouling (from 100% coverage to >10%). The five tows containing mussels returned variable amounts, from few clumps to a full bag. The average size of the mussels is **59.23 mm** (min: 26.79, maxi: 71.85 mm) with 69% of the sampled mussel comprised between 58 and 66 mm (N= 82). No newly settled seed mussels were observed in any of dredge from this area. Heavy starfish predation was also observed in the area with the dredge content indicating over 90% mortality. No biomass estimation was carried out during this survey; however, volumes appear to be below what was observed in November 2022 during the post fishery survey.



Có-mhaoinithe ag an
Aontas Eorpach
Co-funded by the
European Union



Rialtas na hÉireann
Government of Ireland

Bord Iascaigh Mhara
Irish Sea Fisheries Board

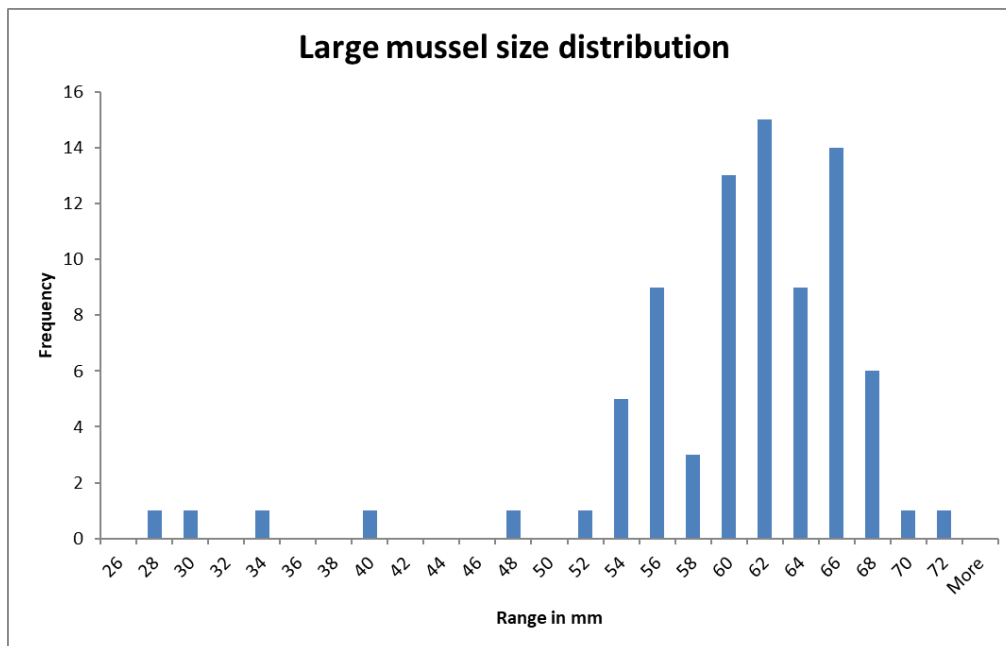


Fig.1: Mussel size distribution in the patches south of Cahore Point



Fig.2: Example of mussel found in patches along the shore

Some **newly settled seed** was observed in a small area to the south of the patches. Small amounts of seed was observed in three different tows. The average size of the seed in that area is **11.56 mm** (mini: 2.92 mm. maxi: 20.87 mm) with 46% of the sampled mussels (N= 200) comprised between 6 and 12 mm but also 23% comprised between 14 and 18 mm. This likely indicates multiple settlement periods (King *et al.*, 1989), as densities of mussels on the ground appears to be small, discarding the hypothesis of size variations due to space and food competition. At the time of the survey, it was not possible to establish the full extent of that particular settlement.

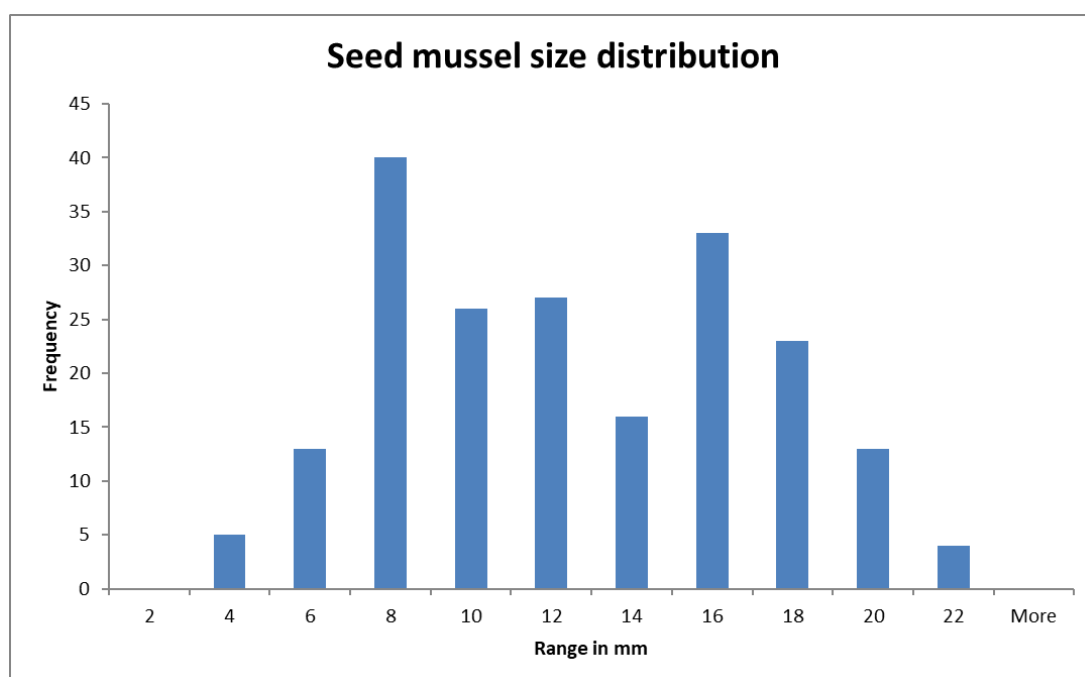


Fig.3: Seed mussel size distribution (newly settled)



Fig.4: Example of seed mussel from Cahore

- Rusk Channel:

The side scan sonar was deployed in the Rusk Channel, but no significant seed mussel acoustic features were observed. 16 tows were made with the dredge. No seed mussel or large mussel were found in any of the tows.

Summary



Có-mhaoinithe ag an
Aontas Eorpach
Co-funded by the
European Union



Rialtas na hÉireann
Government of Ireland

Bord Iascaigh Mhara
Irish Sea Fisheries Board

Mussels along the shore in Cahore are still present after two years despite significant biomass removal from the fishery. However, due their current conditions (heavy barnacle cover) and significant mortality from starfish predation, the contribution of this bed to the 2023 fishery may be limited. As mentioned above, the amount of mussel appears to be less than during the November 2022 survey. Those results seems to be in line with the experiment carried in the Netherlands, indicating that the estimated lifespan of a subtidal seed mussel bed in the Wadden Sea to be 2.3 years once passed the first winter (Troost *et al.*, 2022). From survey observation, it also appears that self-recruitment within the settlement is limited.

The small amount of newly settled seed found further south from the bed is currently too small to properly estimate the available biomass, therefore, further survey should be carried out in this location at a later stage in the season.

Aquaculture Technical Section
Seafood Technology Services Business Unit
BIM



Có-mhaoinithe ag an
Aontas Eorpach
Co-funded by the
European Union



Rialtas na hÉireann
Government of Ireland

Bord Iascaigh Mhara
Irish Sea Fisheries Board

References

- BIM. (n.d.). Seed Mussel Survey Reports. <http://www.bim.ie/our-publications/aquaculture/> (Accessed 18 December 2019).
- BIM. 2016. Side Scan Sonar Features Catalogue.
https://www.researchgate.net/publication/358640202_Side_Scan_Sonar_Features_Catalogue_related_to_Aquaculture_and_Inshore_Fishing_Activities#fullTextFileContent.
- King, P. A., McGrath, D., and Gosling, E. M. 1989. Reproduction and settlement of *mytilus edulis* on an exposed rocky shore in galway bay, west coast of ireland. *Journal of the Marine Biological Association of the United Kingdom*, 69: 355–365.
- Troost, K., van der Meer, J., and van Stralen, M. 2022. The longevity of subtidal mussel beds in the Dutch Wadden Sea. *Journal of Sea Research*, 181: 102174. Elsevier B.V. <https://doi.org/10.1016/j.seares.2022.102174>.
- Van Lancker, V., Du Four, I., Papili, S., Verfaillie, E., Schelfout, K., Rabout, M., and Degraer, S. 2007. Habitat signature catalogue, Belgian Part of the North Sea.
- van Overmeeren, R., Craeymeersch, J., van Dalfsen, J., Fey, F., van Heteren, S., and Meesters, E. 2009. Acoustic habitat and shellfish mapping and monitoring in shallow coastal water - Sidescan sonar experiences in The Netherlands. *Estuarine, Coastal and Shelf Science*, 85: 437–448. Elsevier Ltd.
<http://dx.doi.org/10.1016/j.ecss.2009.07.016>.



Seed Mussel Survey Map of Cahore Point and the Rusk Channel - June 2023

