

Seed Mussel Survey Report for South Wicklow – 13,14 and 15/06/2023

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).

Area surveyed: South of Wicklow Head from the south tip of the Horseshoe Reef to the north end of Brittas Bay extending east to the 20 meter contour line (see map 1 attached).

Survey summary:

- Shore:

An extensive acoustic survey was carried out along the shore from the Horseshoe reef to north end of Brittas bay. No significant seed mussel acoustic patterns were observed on the side scan sonar data; therefore, no dredge data was collected.

- On the 2022 settlement:

The side scan sonar was deployed on the area of the historical settlement identified in May/June 2022. Some patterns were observed, and 9 acoustic targets were identified and investigated further. A total 21 tows were carried out in the survey area. From those tows, only 5 showed significant amount of mussels (more than a quarter of the volume of the dredge content). 6 tows (marked as signs on the map) produced small quantities of mussel and only one of those tows produced few clumps of newly settled seed.

Two samples were collected, accounting for 190 individual mussels. The mussels appear to be from last year's settlement as no individual under 22 mm in length was found. The average size found through the sample was **41.18 mm** (minimum: 23.49 mm; maximum: 57.85 mm), with over 44% of the sampled individuals comprised between 42 and 50 mm (see Fig.1).

A significant amount of empty shells (see Fig.2) were found throughout the area, indicating possible predation by starfish: clean empty shells with no signs of holes or crushed shells.



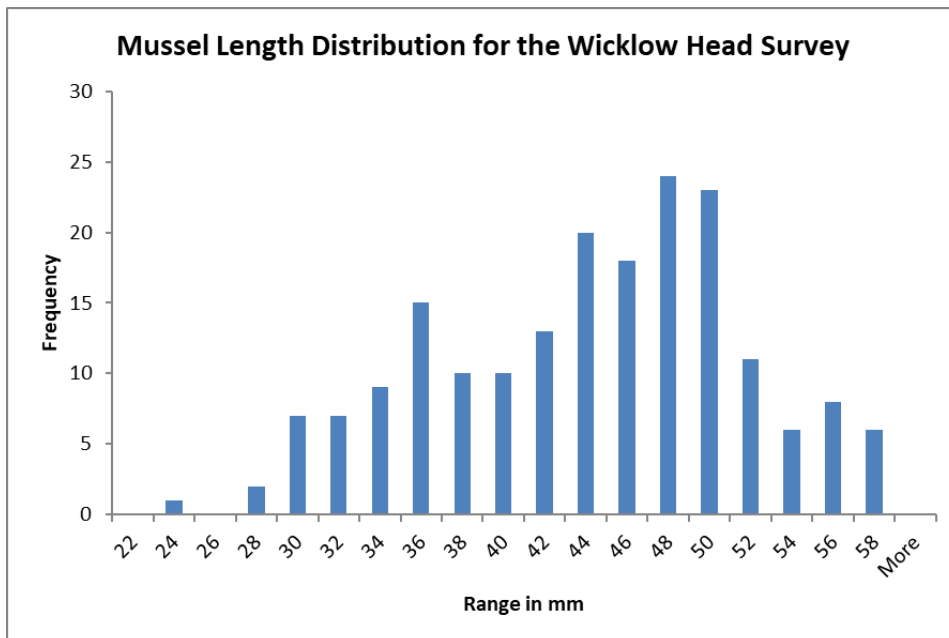


Fig.1: Mussel length distribution at Wicklow Head (14/06/2023).



Fig. 2: Content of a dredge from the Wicklow settlement

A comparison to the samples collected in 2022 and 2023 shows a 5 mm increase in average size between 2022 and 2023. However, the maximum size in 2023 was slightly below the 2022 maximum. Overall, 2023 measurements indicate a clear increase of size throughout the defined size classes (Fig.3).

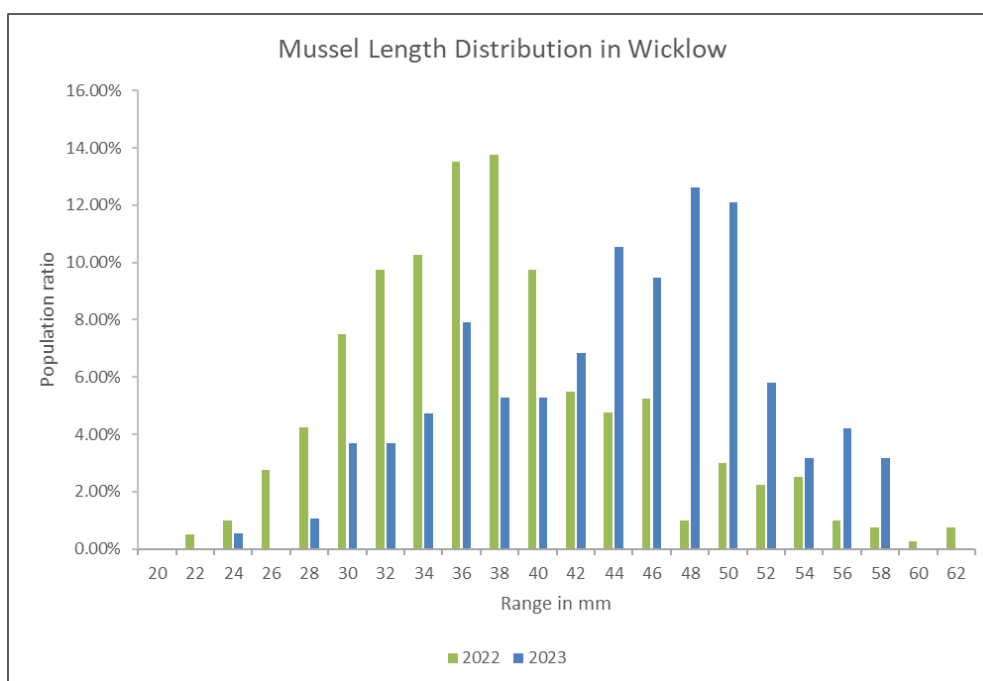


Fig.3: Wicklow mussel length classes for 2022 and 2023.

A significant amount of biomass has been lost on the settlement since May 2022. The acoustic data collected on the area showed no defined patterns on the western side of the settlement. The ground truthing of the area also showed substantial differences between the two years. The two surveys carried out last year showed consistent biomass throughout the defined bed borders. The only relevant biomass found in 2023 is located on the east side of the defined bed and sporadic quantities were found further east and south (see Map 2). Predation is the likely cause of the biomass depletion.

The bed identified in 2022 was presumed to be composed of seed mussel settled in 2021 (BIM, 2022). From a recent publication, it was estimated that wild subtidal mussel beds can have a lifespan of 2.3 years, once they pass the first winter (Troost *et al.*, 2022), which would correspond what has been observed on the Wicklow settlement.

Summary:

The survey carried out in Wicklow did not indicate significant amount of seed mussel biomass. In addition, it appears that the 2022 settlement has been substantially reduced, probably due to predation by starfish. Otherwise, the mussels observed in the area appeared in good condition with medium to low level of waste (between 18 and 31% according to the samples), mostly comprised of bryozoans (Flustra), stones, and mixed sediment. Further survey is recommended in the area later in the survey season.

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References

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Seed Mussel Survey Map of Wicklow Head - 13 and 14/06/2023

