

Update Report on the Seed Mussel Survey around Wicklow Head – 23 to 26/08/2023 and 5 to 7/09/2023

Methodology: Acoustic data collection using 400 kHz side scan sonar, data processing on SonarWiz 7 and ground truthing of acoustic targets with an industry standard seed mussel fishing dredge (Van Lancker *et al.*, 2007; van Overmeeren *et al.*, 2009). The biomass estimation survey was carried out using 0.1-0.2 Day grab to collect samples randomly within the predefined boundaries of beds. The data collected was interpolated using the IDW (Inverse Distance Weighting) tool in ArcGIS, which was previously used to assess biomass on cockle beds (Hervas *et al.*, 2008) as well as seed mussel beds in 2020 and 2021 (Chopin and McCoy, 2020). The data (dredge and grabs) was recorded using ESRI Field Maps with the Arrow 100 GNSS receiver for submeter accuracy

Area surveyed: south of the India Bank along the trench (map 1), and north of Wicklow head on historical beds location (map 2) South of Wicklow Head just south of the Horseshoe navigational buoy (map 3) . An overall survey map is also provided.

Survey details

- India Bank (map 1): the side scan sonar was deployed in an area east of the India South cardinal buoy. Possible mussel features were observed at 5 locations. The ground truthing of those five locations did not indicate any presence of seed mussel or large mussels.
- North Wicklow (map 2): the side scan sonar was deployed north of Wicklow head in an area corresponding to historical seed mussel bed locations. 7 acoustic targets were recorded and were investigated by dredging. No seed mussels or large mussels were found in any of the tows.
- South Wicklow (map 3): Following extra tows showing low quantities of overwintered mussels south of Wicklow head, acoustic data was collected in an area just south of the Horseshoe buoy. Multiple features resembling mussel bed structures were observed in the area. Industry members carried out



a number of tows in this area, confirming the presence of overwintered mussels. An area representing 29 hectares was defined using the side scan sonar data.

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

latitude	longitude
52° 55.367' N	5° 58.499' W
52° 55.977' N	5° 58.124' W
52° 56.129' N	5° 57.818' W
52° 56.089' N	5° 57.643' W
52° 55.325' N	5° 58.337' W

NOTE: The seed bed 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).

Biomass survey

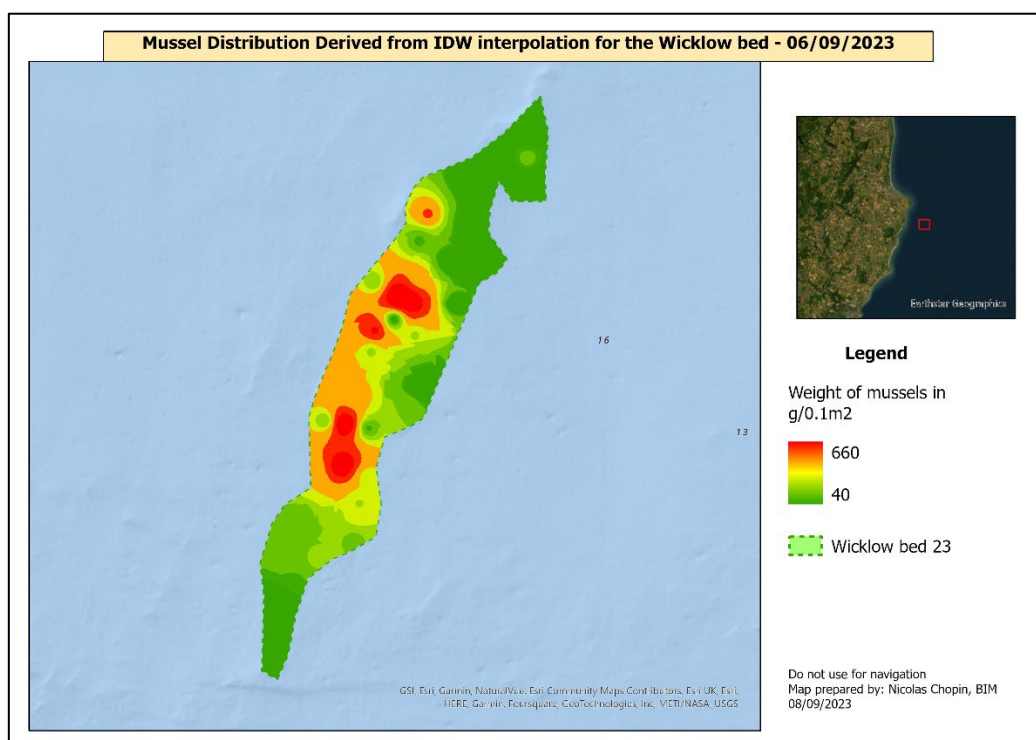
39 points were randomly generated in the mussel bed possible footprint. During survey 40 grabs were collected. No mussel was found in 14 grabs. The average weight of mussel through the remaining 26 grabs was 203.84 grams (minimum: 40 g, maximum 660 g). 9 weight classes were used to run the IDW interpolation for the calculation of the estimated biomass.

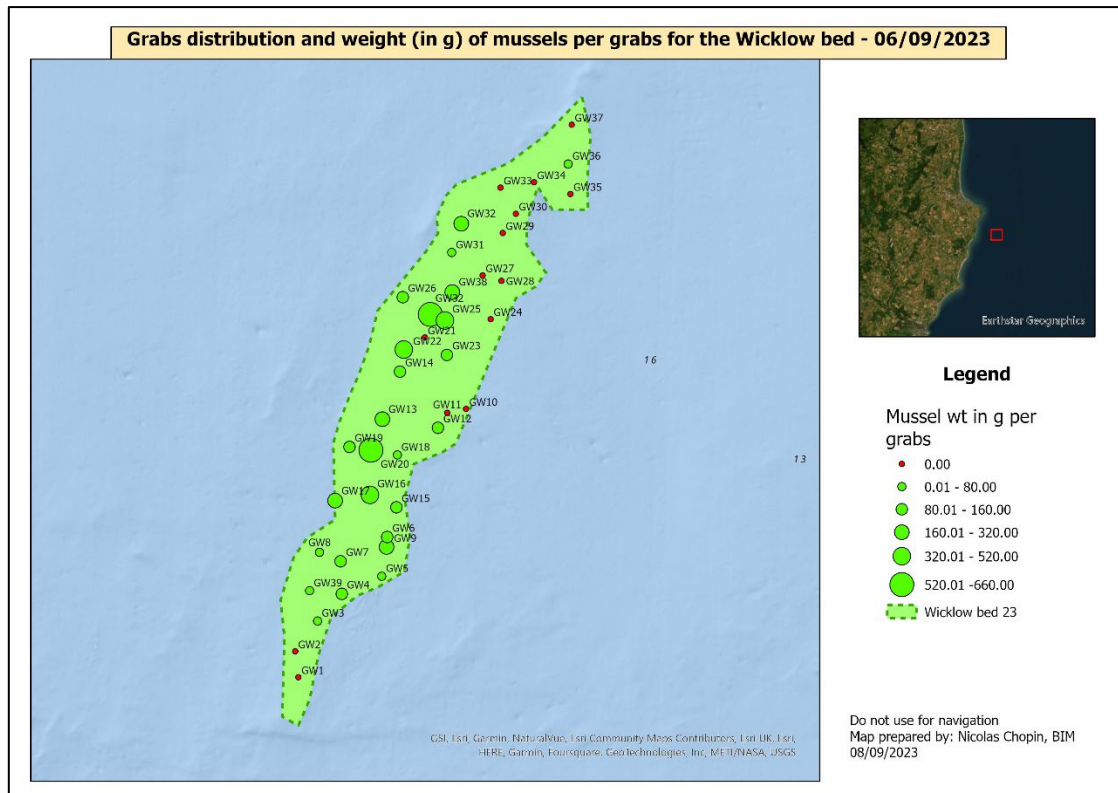


Table 2: Biomass estimation details

Density Classes	Areas in hectares	N samples	Mean Wt per 0.1 m ⁻² in Kg	Tonnes/Area
0 to 40g	8.08	14	0.00	0.00
40 to 50g	1.06	3	0.04	4.24
50 to 100g	4.50	6	0.08	34.48
100 to 150g	3.51	6	0.12	43.27
150 to 200g	3.63	2	0.18	65.42
200 to 300g	5.56	3	0.22	122.32
300 to 400g	1.61	1	0.32	51.59
400 to 500g	0.71	2	0.45	31.82
500 to 660g	0.22	3	0.58	13.03
Total area	28.89		Total tonnage	366.17

The available tonnage at the time of the survey was estimated to be **366.17 tonnes**. The highest concentration appears to be in the centre of the designated bed as shown in the map below. Both, north and south extremities present low volume of mussels.





Biometrics

The mussels observed on the bed are mainly overwintered and are fouled with epifauna (mainly barnacles and bryozoans). Small quantities of seed mussel were also observed through the samples, including one grab (GW12) presenting only new seed. Overall, the average size of the mussels (including seed) is 36.62 mm (minimum: 9.88 mm, maximum: 57.96 mm) and 34% of the mussel sampled (N= 388) were comprised between 44 and 50 mm. For the seed mussel only, the average size was 18.36 mm (minimum: 10.14 mm, maximum: 25.21 mm). Both overwintered and new seed population are clearly defined on the size distribution graph. Some level of mortality was also observed through the samples, mainly due to predation from common starfish.

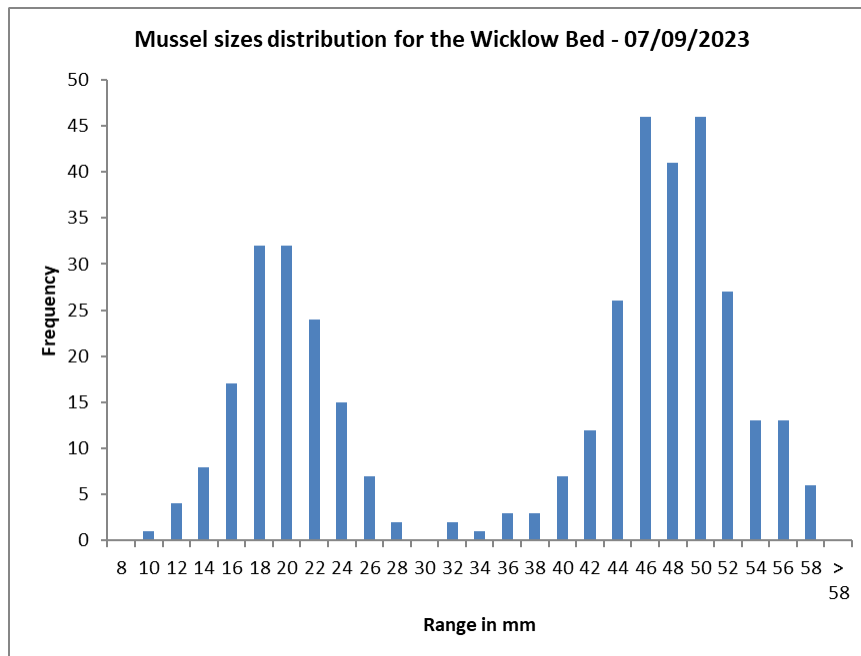


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Summary

The extended survey of North Wicklow and the India Bank did not show any amount of either seed mussel or adult stock. Mussels were, however, found on the south side of Wicklow Head. In contrast from the mussels found in 2022 in this general area, the extent of a bed could be defined following characteristic acoustic features. The bed extends to **29 hectares** with a biomass of **366 metric tonnes**, mainly composed of one year old mussels. Seed mussel was also found in small quantities throughout the settlement. The average size of the mussels **36.62 mm (including seed mussel measurements)**. The average size of seed mussel found (**18.36 mm**) likely indicate a late Spring settlement (mid- June) if we consider the average growth of 7 mm per month (Pérez-Camacho *et al.*, 1995).

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Seed Mussel Survey Map for Wicklow - August and September 2023



Legend

Tows

- seed
- other species
- shells stones
- signs of seed
- side scan sonar track

INFOMAR Bathymetry

- 0 to -10 m
- 10 to -20m
- 20 to -30m
- 30 to -40m
- 40 to -50m
- below -50m

Do not use for navigation
Map prepared by: Nicolas Chopin, BIM
28/08/2023
Credit bathymetry: INFOMAR 2022

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Do not use for navigation
Map prepared by: Nicolas Chopin, BIM
28/08/2023
Credit bathymetry: INFOMAR 2022

Seed Mussel Survey Map for North Wicklow - August 2023



Legend

Tows

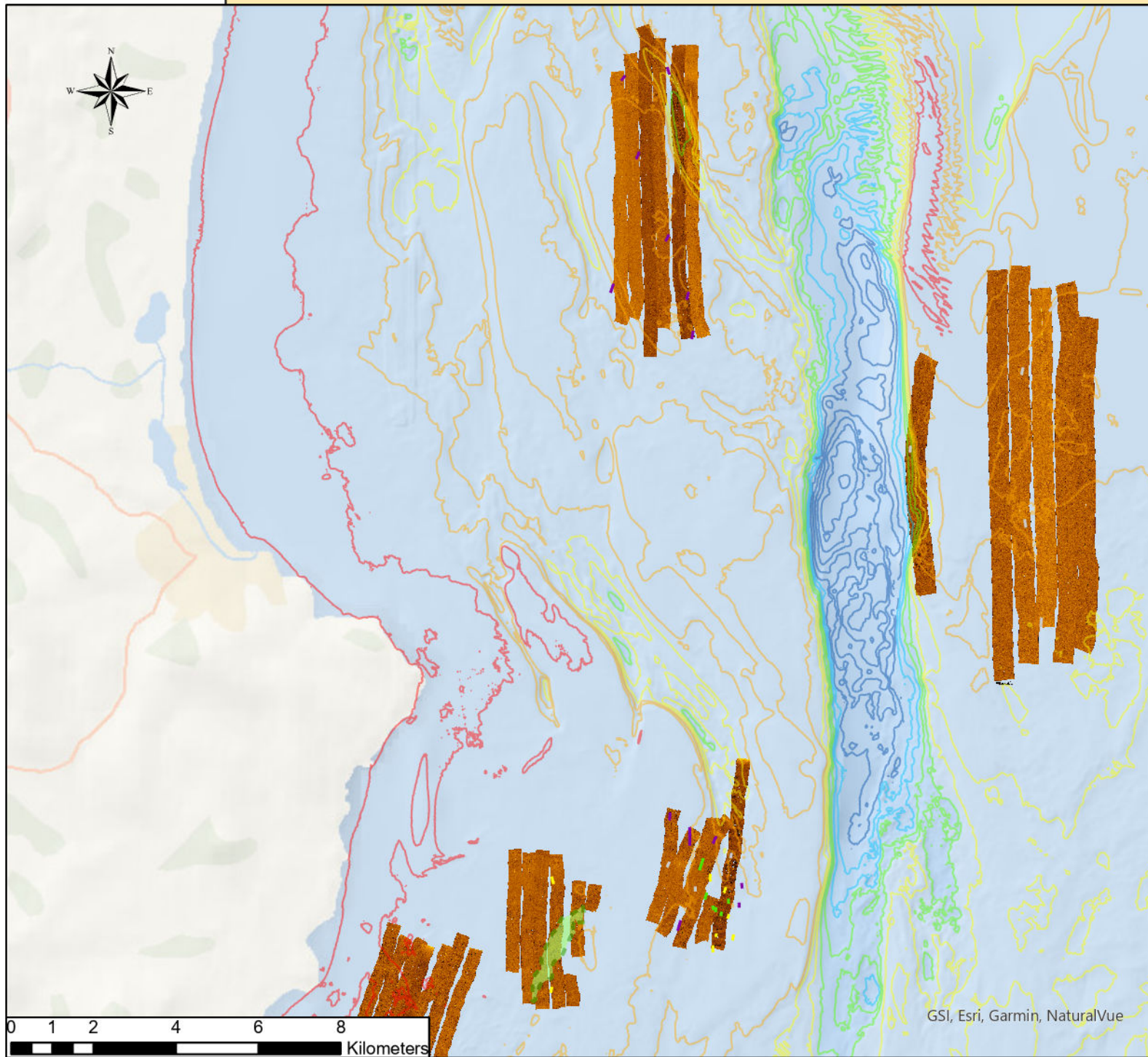
- seed
- other species
- shells stones
- signs of seed
- bed extent 23
- side scan sonar track

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