Seed Mussel Beds Survey and Biomass Estimation Report for the East Long Bank Area – July 2022

Methodology:

A 400kHz side scan sonar was used to assess the presence/absence of seed mussel feature on the seabed as well as delineate the extent of the possible settlement (van Overmeeren et al., 2009). Georeferenced recorded side scan sonar targets were investigated using a 1 metre dredge deployed for a short tow (usually < 100 m long). The data (dredge and grabs) was recorded using ESRI Field Maps with the Arrow 100 GNSS receiver provide submeter accuracy.

The biomass estimation ha**s** been calculated using 0.1m-2 Day grab samples collected randomly within each 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 & McCoy, 2020).

Survey summary:

Following reports from the local industry in Wexford Harbour, a large area was surveyed using the side scan sonar. A number of relevant feature were recorded and investigated while also carrying the alien invasive species survey. A total of 51 tows were done within the surveyed area, 38 of those showed various quantities of seed mussel. Using this data and the side scan sonar imagery, a large area was delineated. At the time of the survey, the bed represents approximately **230 hectares**, situated between the Long Bank and the Lucifer Bank at an average depth of 24 m.

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

Latitude	Longitude
52° 22.061' N	6° 15.117' W
52° 21.586' N	6° 14.765' W
52° 19.367' N	6° 15.261' W
52° 19.060' N	6° 15.951' W
52° 21.787' N	6° 15.369' 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 (green boxes around the beds on the map).

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Biomass estimation:

Random sampling points were generated within the previously established borders of the settlement (see map). A total of 41 grabs were collected including 7 that returned negative with seed. The average weight per grab 259 g (minimum: 20g, maximum 920g). 10 weight classes were used for the IDW interpolation, as shown in the table below.

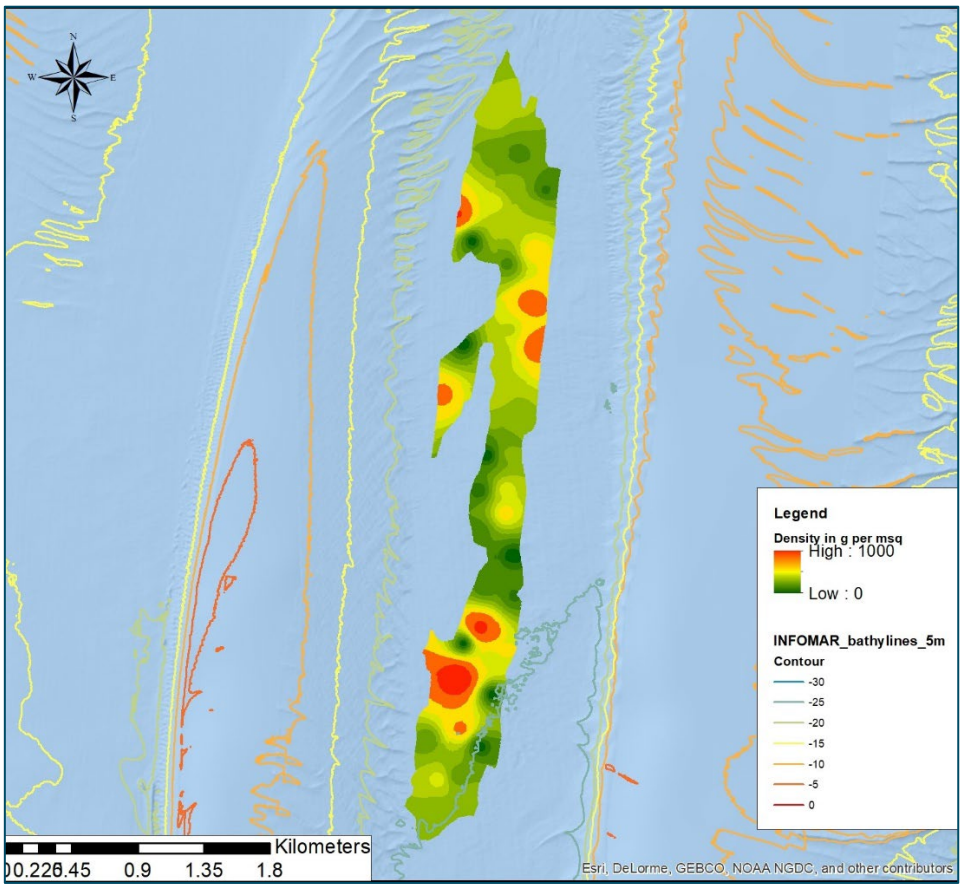
Table 2: Biomass estimation details

Density Classes	Areas in hectares	N samples	Mean Wt per 0.1 m^{-2} in Kg	Tonnes/Area
0 to 20g	2.65	7	0.00	0.00
20g to 50g	6.12	3	0.03	20.41
50g to 100g	24.42	4	0.07	170.97
100g to 150g	32.65	3	0.11	348.23
150g to 200g	49.28	5	0.18	887.05
200g to 250g	45.56	6	0.23	1032.72
250g to 300g	24.51	4	0.28	673.98
300g to 400g	29.06	2	0.35	1017.24
400g to 600g	17.89	4	0.46	823.04
600g to 1000g	4.55	3	0.74	337.04
Total area	***236.70***		***Total tonnage***	***5310.66***

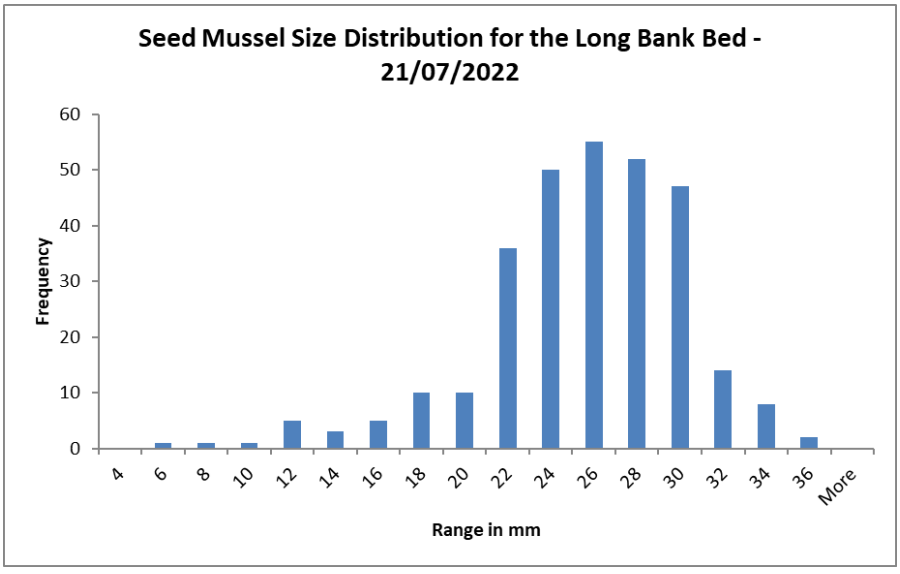
The estimate tonnage at the time of the survey for the main patch was **5,310.66 tonnes**. The seed mussel from this bed appear to be newly settled mussels, and they are expected to gain at least 14 mm in the next two months (Pérez-Camacho et al., 1995; Rodhouse et al., 1984). The average size is **24.5 mm** (minimum: 5.3 mm, maximum: 35.1 mm), the 22 to 30 mm size range represented nearly 70% of the measured individuals (300 units).

From the data gathered with the grab and the side scan sonar, it appears that these mussels are scattered over the area forming dense patches in some places (in red on the distribution map). However, due to the size of the settlement, more data would refine these areas but due to time constraints this was not possible at the time of the survey.

There was no sign of predation on this bed. The seed appears to be of good condition with stronger than usual shell for this location when compared to previous years (2011 and 2013).



Map2: Density distribution from IDW interpolation for the Long Bank Bed



Graph2: Mussel size distribution for the Rusk Channel

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Summary:

Even though, this survey took place at an early stage in the season, it already shows a large accumulation of seed mussel between the banks. In mid-July, the seed mussel biomass for this area has been estimated to be **5,310 tonnes** stretched over **230 hectares**. At the time of the survey, the average weight of 100 seed mussels was 120 grams or 1 mussel = 12 grams for an average size of **24.5 mm**.

As mentioned further above, it is expected that the settlement between the banks will significantly increase before the possible opening of the fishery.

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Seed Mussel Survey Map for East Long Bank - July 2022