Seed Mussel Survey Tonnage Estimation Report for the Rosslare Area – 10/08/2021

Equipment: 0.1 m^2 Day Grab

Area surveyed: Seed mussel settlement previously found in Rosslare (see Preliminary Seed Mussel Survey Report for Wexford/Rosslare Area – 18 and 19/05/2021 at www.bim.ie)

Survey summary:

From the possible seed mussel bed designated in the May survey (BIM n.d.), 38 random sampling station were generated so as to ensure sufficient coverage to produce a biomass estimation. Eight grabs, located on the north side of the designated area near the West Holdens navigation buoy, either did not contain mussels or returned no significant quantity. Therefore, this part of the possible bed was removed from the estimation calculation. The coordinates generated in the May report have been revised to the following:

Table 1: Area coordinates (in Degrees, decimal minutes WGS84)

Latitude	Longitude
52° 15.149' N	6° 18.041' W
52° 15.185' N	6° 18.407' W
52° 15.417' N	6° 19.010' W
52° 15.578' N	6° 19.207' W
52° 15.842' N	6° 19.228' W
52° 15.868' N	6° 19.022' W
52° 15.225' N	6° 17.913' W

NOTE: Those coordinates only indicate corners of a simplified polygon in which the seed mussel settlement is located.

The area represents approximately **59 hectares**. The remaining 30 samples were considered as relevant from the calculation of the available biomass. 5 of those samples did not show any seed mussel, which left 25 usable samples (Fig.1). Due to limited time availability as a result of tides and weather conditions, the level of sampling was slightly below the 2020 level (42 usable samples at this location), However the quantity of samples collected was deemed sufficient to carry out the biomass estimation.

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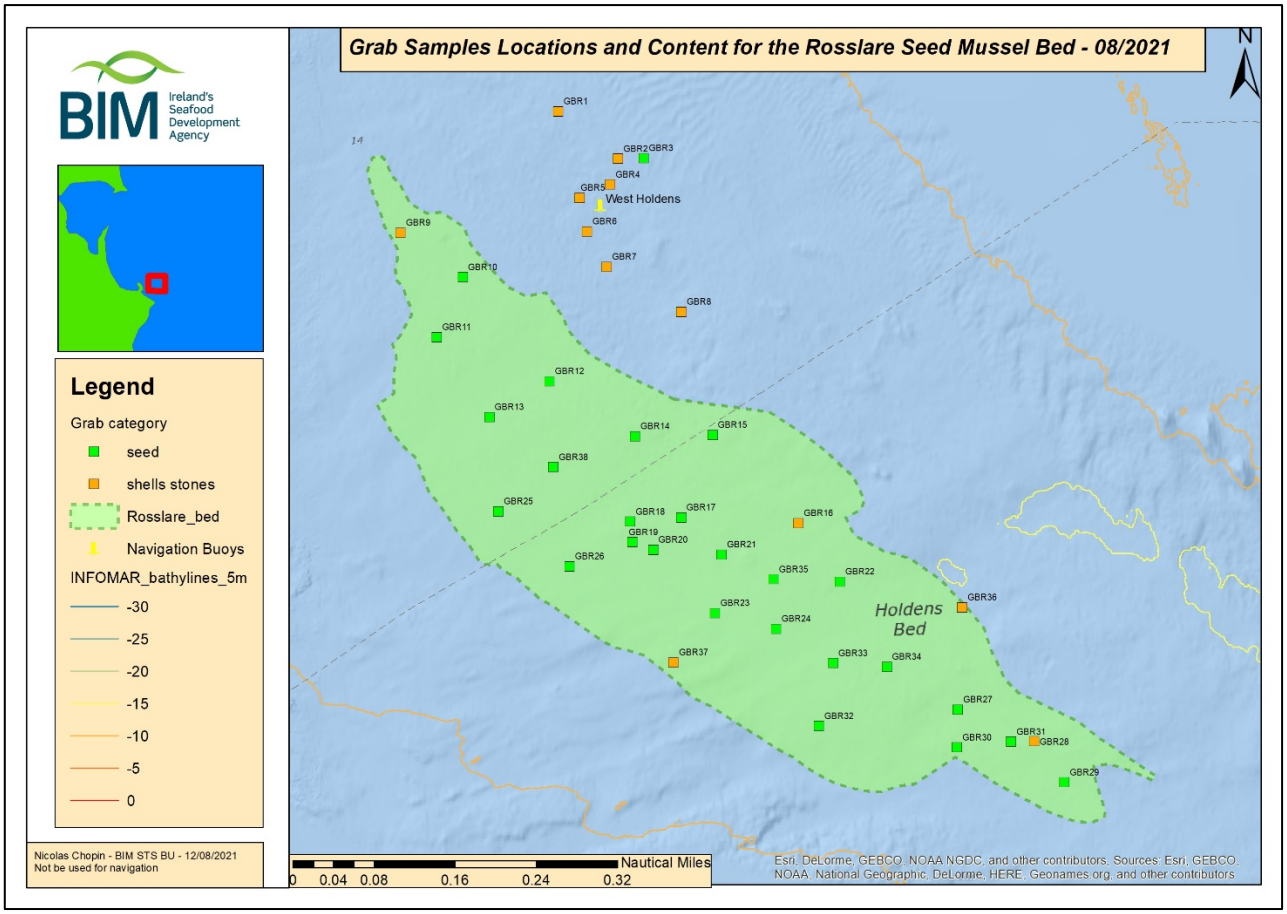

Fig.1: Grabs locations and content

The grab samples presented a wide density range from 40 g of seed to 2,720 g per 0.1 m^{-2}, averaging just above **400 g per 0.1 m^{-2}**. The higher densities were observed at the south border of the bed, while quantities similar to the average density was observed in the central part of the settlement (Fig.2).

The amount of waste per sample was averaging 63% of the weight of each grab (minimum: 14%, maximum: 94%). The waste was mainly composed of coarse shelly sand, gravel, and stones. Grab sampling also collects the substrate on which the seed has settled, explaining those high levels of waste.

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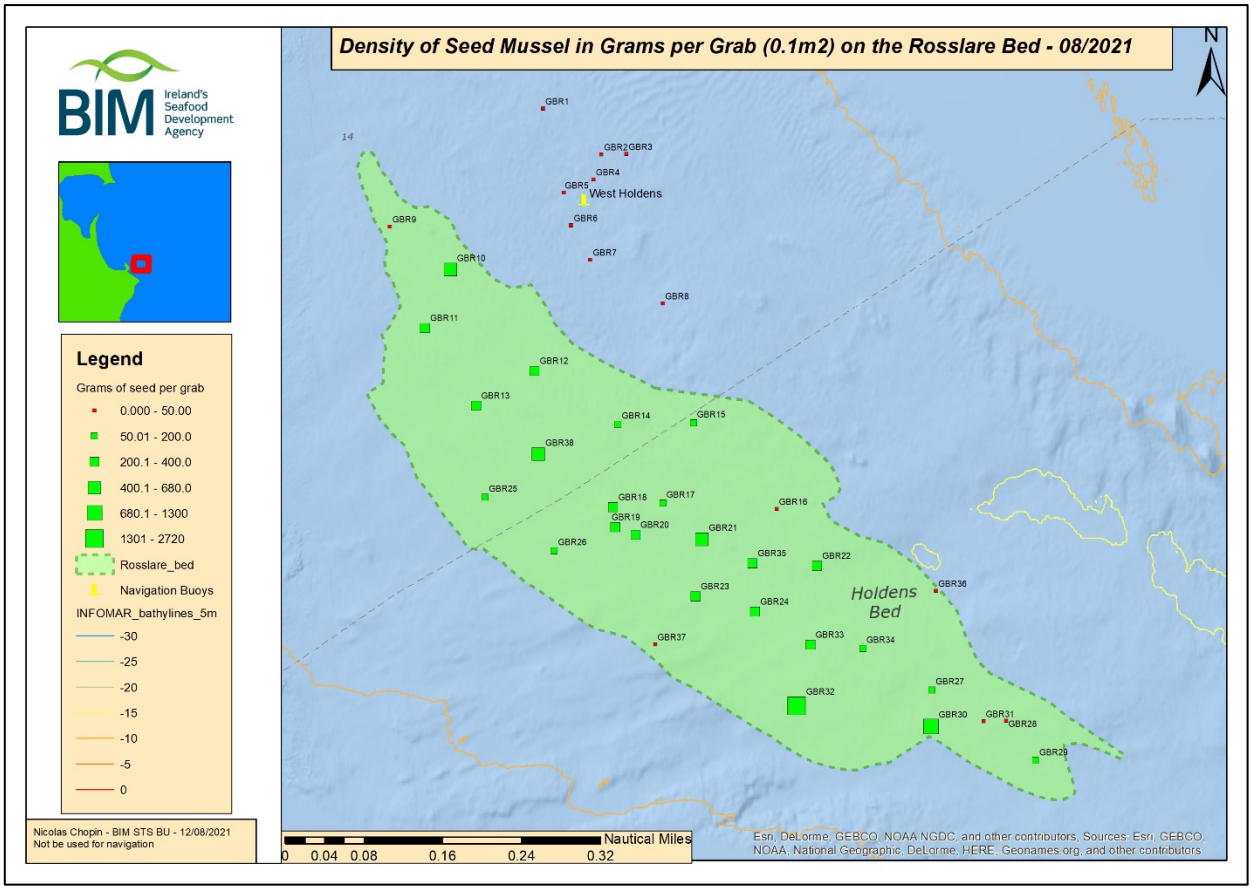

Fig.2: Seed mussel densities per grabs

Biomass estimation:

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 (BIM, Chopin, and McCoy 2020).

Based on the weight of seed collected in each grab, 8 density classes were defined and used to classify the interpolated grid within the bed boundaries. The extent of each class was then calculated in hectares and the biomass was generated by multiplying the mean weight by the area for each class (table 2). The generated map shows a possible even distribution of the seed across the bed (green variations), apart from the south corner (in red), which relates to the larger samples (Fig.3).

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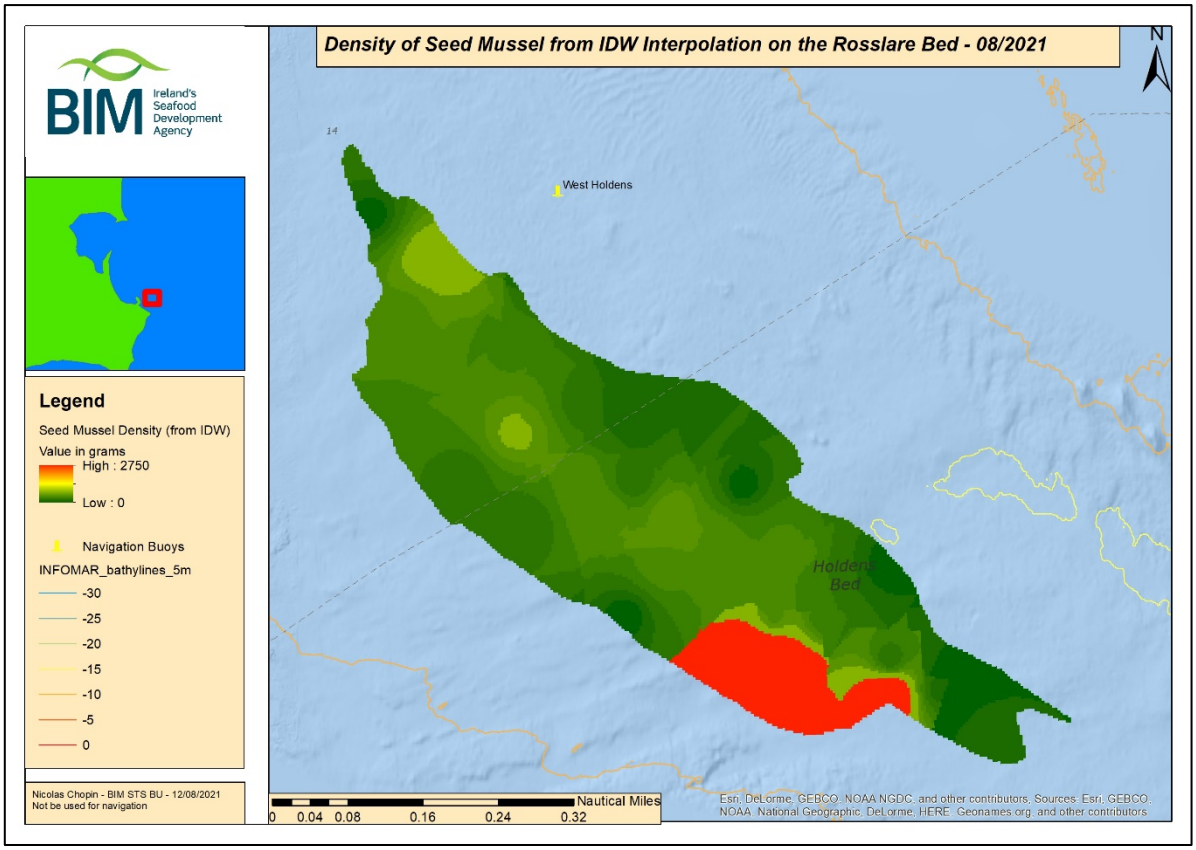

Fig.3: IDW generated density map

Density Classes	Areas in hectares	N samples	Mean Wt per 0.1 m^{-2} in Kg	Tonnes/Area
0 to 40g	3.27	5	0.00	0.00
40g to 100g	8.10	3	0.60	48.60
100g to200g	10.81	5	1.04	112.44
200g to 300g	10.86	2	2.40	260.69
300g to 400g	14.02	10	3.50	490.83
400g to 500g	4.03	1	5.00	201.50
500g to 750g	2.77	2	6.10	168.86
750g to 2750g	5.44	2	20.10	1092.93
Total area	***59.31***		***Total tonnage***	***2375.86***

Table 2: IDW biomass interpolations

At the time of this survey, the potential seed mussel biomass in Rosslare was estimated to be **2,375 metric tonnes**.

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Biometrics:

3 distinctive samples were kept for shell length measurement. For each sample, 100 individuals were measured as well as another 100 mussels taken from pooling all the other samples. **GR10** displayed very large mussels, likely to be over 1 year old with an average size of **43 mm** (range: 20 mm minimum, 53 mm maximum). **GR18** composed of what looked like younger mussel probably settled earlier in the year, giving an average size of **23 mm** (range: 9 mm minimum, 47 mm maximum). **GR32**, showing a very clean sample (2,720 grams in the grab), composed of likely overwintered seed with an average size of **39 mm** (range: 25 mm minimum, 49 mm maximum). Finally, the **sample pool** showed an average size of **33 mm** (range: 13 mm minimum, 52 mm maximum). When looking across the population size distribution, it is clear that two age classes are present in Rosslare with the majority being larger overwintered mussels (fig.4).

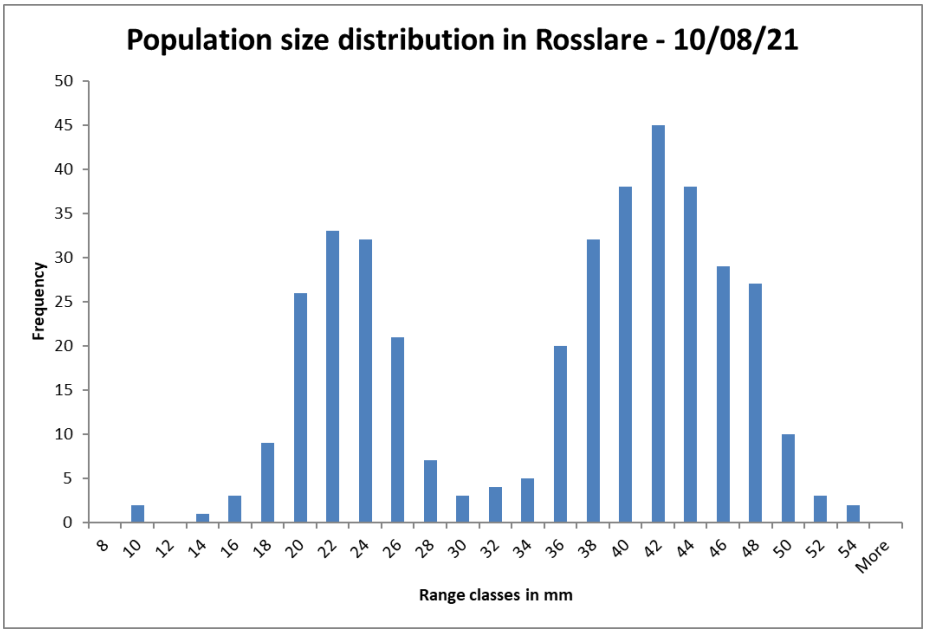

Fig.4: Population distribution histogram

The current population does not seem to be under predation pressure as only a limited amount of starfish was observed during the alien invasive species survey carried out the previous week. The main concentration appeared to be along the northern border of the bed. No significant mortalities were observed in the biomass samples.

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Summary/recommendations:

The 2021 Rosslare settlement is mainly **composed of overwintered mussel averaging 34 mm** in length. The bed is stretching over **59 hectares** and following biomass estimation calculations, could yield around **2,300 metric tonnes**. There are **two size classes**, one larger related to the overwinter mussel, one smaller related to the 2021 larvae settlement. This resulting in a wide size range (**minimum: 9 mm, maximum: 44 mm**). There is no apparent predation pressure on the settlement.

Biomass surveys need to take place on three further settlements on the southeast coast, therefore the minimum biomass threshold for the opening of the fishery should be exceeded.

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Fig.5: Processed seed sample from Rosslare

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