Seed Mussel Survey Report for the South Wicklow Head – 12/08/2020 to 10/09/2020

Equipment: 400 kHz side-scan sonar (van Overmeeren et al., 2009), 1 m dredge.

Area surveyed: (see Seed Mussel Survey Extent Map) From the Horseshoe Reef to the north end of Brittas Bay extending eastward to the north tip of the Arklow Bank and the deep trench of Wicklow Head.

Survey summary:

An extensive side-scan sonar survey was carried out in the area, but no typical mussel bed patterns were observed. However, 54 investigatory tows were carried out. Forty-five of those tows were comprised of stones, shells, and coarse sediment.

Scattered overwintered seed mussels were found at three locations (see map of scattered patches of mussel). No clear borders could be established due to the low density of the mussel and the type of seabed.

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

- **Area 1**

Latitude	Longitude
52° 55.304' N	5° 58.976' W
52° 54.999' N	5° 59.063' W
52° 55.083' N	5° 59.324' W
52° 55.314' N	5° 59.272' W

- **Area 2**

Latitude	Longitude
52° 56.071' N	5° 58.268' W
52° 56.184' N	5° 57.650' W
52° 56.126' N	5° 56.974' W
52° 55.936' N	5° 57.011' W
52° 56.036' N	5° 57.797' W
52° 55.781' N	5° 58.217' W
52° 55.891' N	5° 58.469' W

- **Area 3**

Latitude	Longitude
52° 55.336' N	5° 57.979' W
52° 55.137' N	5° 58.045' W
52° 55.183' N	5° 58.254' W
52° 55.351' N	5° 58.148' W

NOTE: These areas are only possible extent of the scattered mussel at Wicklow Head and do not reflect the exact distribution.

Mainly large mussels were found at those locations with a **high proportion of mix sediment bycatch** (from 60 to 80% of each dredge content) especially around Area 1. The average size found throughout the 195 individual mussels measured was **42.27 mm** (minimum: 11.8 mm, maximum: 57.77 mm) from **TW18** and **TW28,** representing an average of **154 pieces per kg**. More than 50% of the population measured is comprised between **38 and 46 mm (see Fig 1)**.

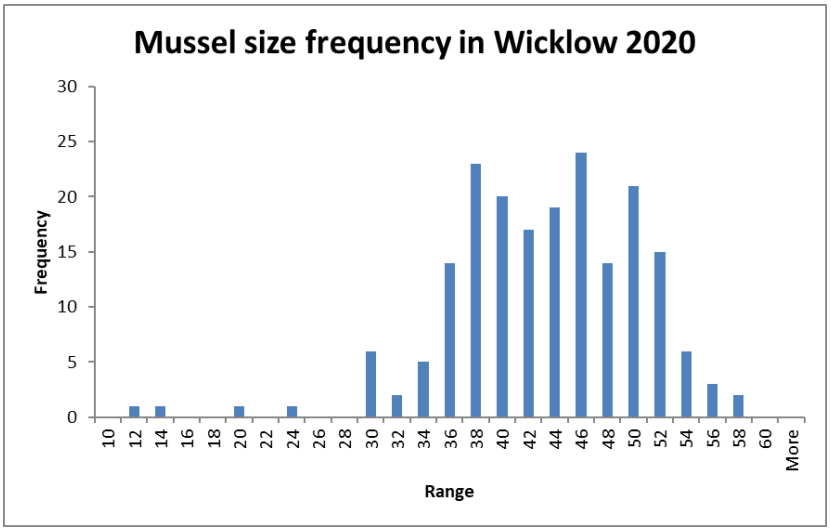

Fig. 1: Size mussel range at Wicklow Head

In addition to high sediment bycatch, a large population of starfish has been observed at the location. High level of mortality was noticed, particularly in **TW25** and **TW26.** A high number of dogwhelks (*Nucella lapillus*) have also been observed which are known to feed on mussels. Large dogwhelk spawn was found attached to some of the rocks collected in the dredges (see Fig.2).

Fig.2: Large spawn of dogwhelk on a stone

Biomass estimation:

No biomass could be estimated due to the scattered distribution of the mussel, the high level of bycatch and mortality in the tows and the impossibility to delineate the borders of the possible settlement.

At the time of the survey, and because the mussels found were relatively large, a visual inspection for maturation was carried out. Twenty mussels were opened and showed a various level of maturation according to their mantle colouration and texture (Chipperfield, 1953) as illustrated in Fig.3. However, most mussels displayed Stage II or Stage III maturation level, easily identifiable on females which display a dark orange/amber mantle colouration.

Very little new seed was observed at the location, which can indicate a low level of retention of the larvae produced from the stock.

Fig.3: Mussel maturation inspection

Recommendation:

No extensive quantity of mussel was found at Wicklow Head despite extensive survey coverage. The scattered settlement was found to compose mainly of large mussels, and each tow presented a high level of bycatch material as well as predators and observed mussel mortality. Considering that the survey took place a month ago, the status of the stock is currently unknown. Following the observations made at the time, total loss of the population could be a possibility.

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Seafood Technology Services Business Unit
BIM

References:

Chipperfield, P. N. J. (1953). Observations on the breeding and settlement of mytilus edulis (L.) in British waters. *Journal of the Marine Biological Association of the United Kingdom*, *32*(2), 449–476. https://doi.org/10.1017/S002531540001465X

van Overmeeren, R., Craeymeersch, J., van Dalfsen, J., Fey, F., van Heteren, S., & 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*(3), 437–448. https://doi.org/10.1016/j.ecss.2009.07.016

Survey Extent Map of South Wicklow Head - September 2020

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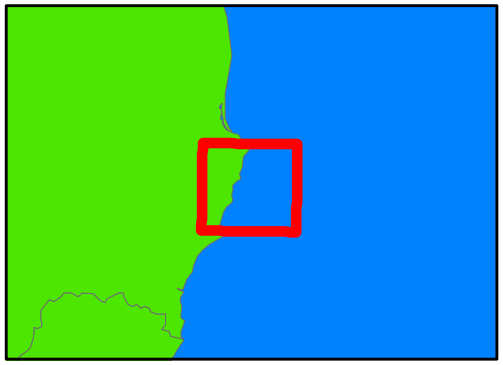

Legend

- signs_tows
- shells_stones_tows
- o_species_tows
- buoysMFAWgs
- side_scan_sonar_track

INFOMAR_bathylines_10m

CONTOUR

- -40
- -30
- -20
- -10
- 0

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Nautical Miles
0 0.25 0.5 1 1.5 2

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Map of Scattered Mussel Patches of South Wicklow Head - September 2020

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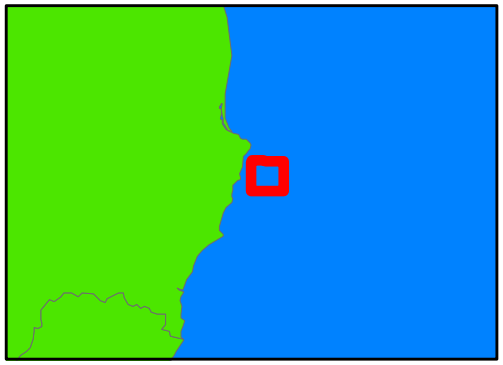

Legend

- signs_tows
- shells_stones_tows
- o_species_tows
- buoysMFAWgs
- patches_wicklow
- side_scan_sonar_track

INFOMAR_bathylines_10m

CONTOUR

- -40
- -30
- -20
- -10
- 0

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Horseshoe

Area 1

Area 2

Area 3

TW20E TW20 TW17E TW17 TW18E TW18 TW19E TW19 TW16E TW16 TW11E TW11 TW15E TW15 TW10E TW10 TW13E TW13 TW14E TW14 TW12E TW12 TW6E TW6 TW7 TW7E TW8E TW8 TW9E TW9 TW5 TW5E TW3 TW3E TW4 TW4E TW2 TW2E TW1E TW1 TW34 TW34E TW35 TW35E TW36 TW36E TW32 TW32E TW31 TW31E TW33 TW33E TW28E TW28 TW37E TW37 TW38 TW38E TW26E TW26 TW30 TW30E TW27E TW27 TW25E TW25

Nautical Miles

0 0.075 0.15 0.3 0.45 0.6

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