

Fisheries Natura Plan for mussel seed (*Mytilus edulis*) in the Irish Sea, 2023-2027

Prepared by the Secretariat of the Bottom Grown Mussel Consultative Forum (BGMCF) in consultation with Bord Iascaigh Mhara (BIM) and industry members of the BGMCF

1.0 Legal Basis

The Irish Sea mussel seed fishery occurs in areas designated as both Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). This Fisheries Natura Plan relates exclusively to mussel seed fishing in the area over the five-year period 2023-2027; subsequent husbandry practices are considered in bay-specific assessments.

The Minister for Agriculture, Food, and the Marine, as a public authority under Regulation 27 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011, as amended), must exercise his functions so as to ensure compliance with the requirements of the Habitats Directive, the Birds Directive and the 2011 Regulations.

The European Union (Birds and Natural Habitats) (Sea-Fisheries) Regulations 2013 (S.I. No. 290 of 2013, as amended), provide for the submission of a draft Fisheries Natura Plan and the appropriate assessment of the plan to identify where sea-fisheries may be allowed to proceed within appropriate guidelines to address risks to protected species and habitats (Regulation 5 assessment) to enable the fulfilment of the Minister's obligations.

The Minister must also exercise his functions so as to ensure compliance with the requirements of the Common Fisheries Policy (Regulation (EU) No. 1380/2013), with an emphasis on the Article 2 objectives of aiming for the environmental sustainability of fisheries in the long term and applying the precautionary approach to fisheries management.

The Plan was prepared by the Secretariat of the Bottom Grown Mussel Consultative Forum (BGMCF) in consultation with Bord Iascaigh Mhara (BIM), and industry members of the BGMCF (persons affected by the designation). It was amended and submitted to the Minister in May 2023. The Marine Institute (MI) screened the plan for appropriate assessment purposes (Regulation 4) and the Minister determined that appropriate assessment of the plan was required. The MI then reviewed the Plan as part of the appropriate assessment (Regulation 5).

The Plan was modified and adopted by the Minister in accordance with Regulation 6 of S.I. No. 290 of 2013 (as amended) and covers seed fishing in the period from 2023 to 31st December 2027.

2.0 Rationale for Mitigation

The potential generic ecological effects on the qualifying interests of the sites relate to the physical and biological effects of dredging shellfish species which overlap with invertebrate communities found in inter-tidal and sub-tidal habitats.

Bird populations may also be affected by these habitat changes and by disturbance caused by fishing vessels and by changes in the availability of prey species as a result of changes in habitat brought about by shellfish production.

Using the mussel seed sustainably, to ensure a continuing and prosperous fishery, is in line with Government and EU policy.

3.0 Seed Mussel Fisheries

3.1 Introduction

In the context of this Plan, “seed fishing” refers to the sub-tidal collection of mussels for relaying on aquaculture sites; seed mussel is not suitable for direct human consumption. The Plan covers all areas of suitable subtidal substrate for mussel seed fishing within the protected sites under consideration.

The Irish Sea blue mussel seed fishery has been exploited since the late 1960s, when the Irish Sea Fisheries Board (BIM) provided support to what was considered a sustainable opportunity for the development of bottom growing culture of seed mussel that was re-located to inshore, protected environments where yield would be improved compared to the wild fishery.

The bottom grown mussel industry relies on a consistent settlement of mussel spat to provide seed which is then relayed and on-grown on sheltered inshore and licensed beds. Settlement of mussel seed varies (volume, location and exact time of settlement) annually (Figures 1, 2 & 3). Furthermore, identifying the locations of mussel settlement in the southern Irish Sea is particularly challenging and all beds are not formally identified in advance of fishing.

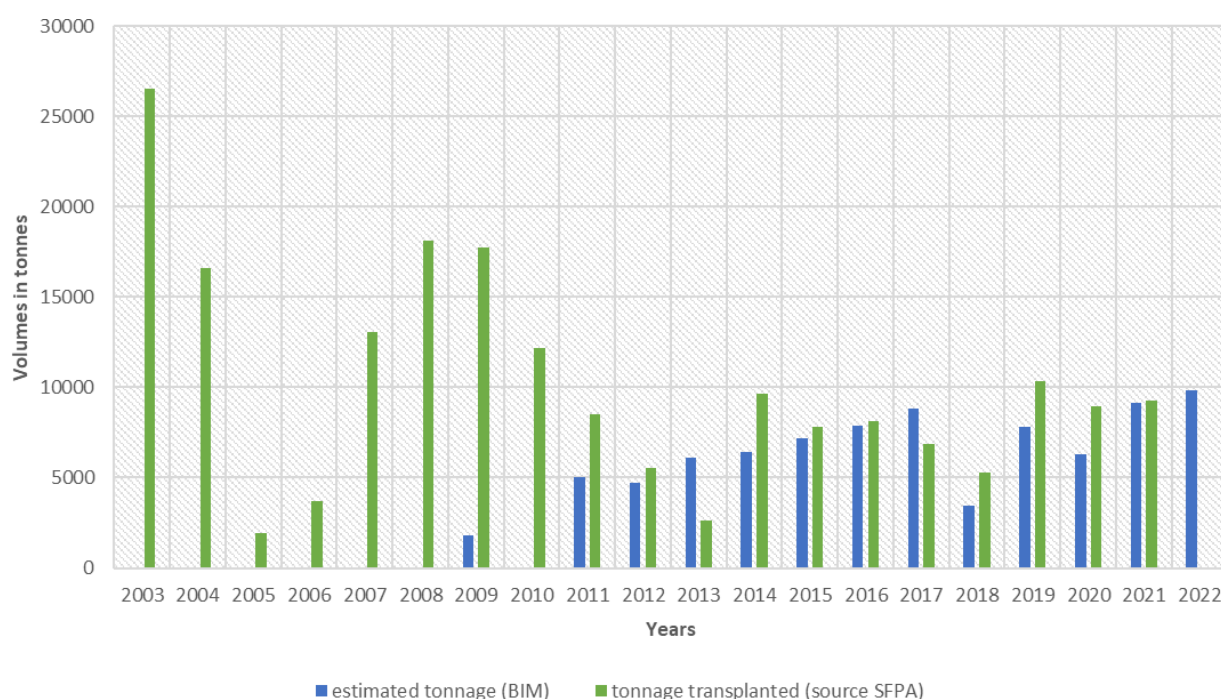


Figure 1- Estimated and Transplanted Subtidal Seed Mussel in the Irish Sea 2003 to 2021

There are two types of natural mussel beds, a ‘permanent or stable mussel bed’ which receives regular (or periodic) spat settlement, and thus contains mussels from a range of age classes; and the second is a ‘seed mussel’ bed – an area in which there is periodic settlement of spat, which may survive a few months or until the following winter, but which is then frequently lost or dispersed by winter storms (highly energetic) or predators. As the relayed stocks spawn prior to harvest, relayed mussels continue to contribute to the spawning stock within the Irish Sea post fishing.

The exploitation of these two types of seed beds will have different consequences for the overall mussel population, because while permanent beds can be expected to be a source of larvae, seed mussel beds will not produce large volumes of larvae, since mussel mortality in these beds is very high

before mussels reach reproductive maturity¹. It is thus preferable to exploit these seed beds, rather than permanent mussel beds.

BIM have been undertaking sub-tidal seed surveys in the Irish Sea since the 1970s. The historical surveys are the best source of available scientific information on the nature and extent of seed beds in the Irish Sea; these records were examined to assess the assertions that stable “overwintering” beds exist in this area. The data indicates that while seed beds do sometimes overwinter, no currently identified beds consistently overwinter in all years and therefore no currently identified beds can be described as “permanent or stable.”

The absence of “permanent” beds is thought to be due to the highly energetic nature of the Irish Sea, when compared with the location of stable beds elsewhere in Europe where they occur in much more sheltered locations, and the level of starfish predation. Also, literature indicates that the longevity of sub-tidal mussel beds in relatively sheltered water is 2.3 years².

Given the dynamic nature of the environment and the type of dredge used, repeated seed surveys of the Irish Sea have found that seed fishing leaves no permanent tracks on the areas fished. Repeated settlements on the same ground as shown in Figures 2 and 3 shows fishing activity does not prevent settlement of seed in the same area in the following years.

3.2 Spatial Extent

Mussel fishing activity occurs in or adjacent to the following SACs, but the spatial extent is severely limited by substrate type. Restrictions apply in some sites, as indicated, and fishing may not take place in intertidal areas.

- Long Bank SAC
- Blackwater Bank SAC
- Wicklow Reef SAC (outside the exclusion zone within the SAC)
- Rockabill to Dalkey Island SAC (not in the reef habitats)
- The Murrough Wetlands SAC
- Wicklow Head SPA
- Howth Head Coast SPA,
- Dundalk Bay SPA
- Skerries Islands SPA
- Ireland’s Eye SPA
- Dalkey Island SPA (not in reef habitats)
- Rockabill SPA (not in reef habitats)
- The Murroughs SPA
- Raven SPA.

Mussel seed is targeted in areas of sands, muds, coarse sands, and mixed bivalve shell. In sandbank areas dredging does not occur on the tops or slopes of the banks as seed mussel is not found in these areas and the gear is not effective on such grounds. Mobile gear cannot be deployed in rocky or reef areas therefore these areas are not targeted.

Seed may occur in other areas of suitable substrate during the five-year period covered by this Plan.

¹ Maguire, J A., Knights, T., Burnell, G., Crowe, T., O’Beirn, F., McGrath, D., Ferns, M., McDonough, N., McQuaid, N., O’Connor, B., Doyle, R., Newell, C., Seed, R., Small, A., O’Carroll, T., Watson, L., Dennis, J., and O’Cinneide, M., 2007.

'Management Recommendations for the sustainable exploitation of mussel seed in the Irish Sea.'
Marine Environment and Health Series. 3.1.

² Troost, K., van der Meer, J., & van Stralen, M. (2022). The longevity of subtidal mussel beds in the Dutch Wadden Sea. *Journal of Sea Research*, 181(May 2021), 102174. <https://doi.org/10.1016/j.seares.2022.102174>

Seed Mussel beds Location for Wicklow Coast from 1970 to 2021 - BIM



Legend

buoysMFAWgs

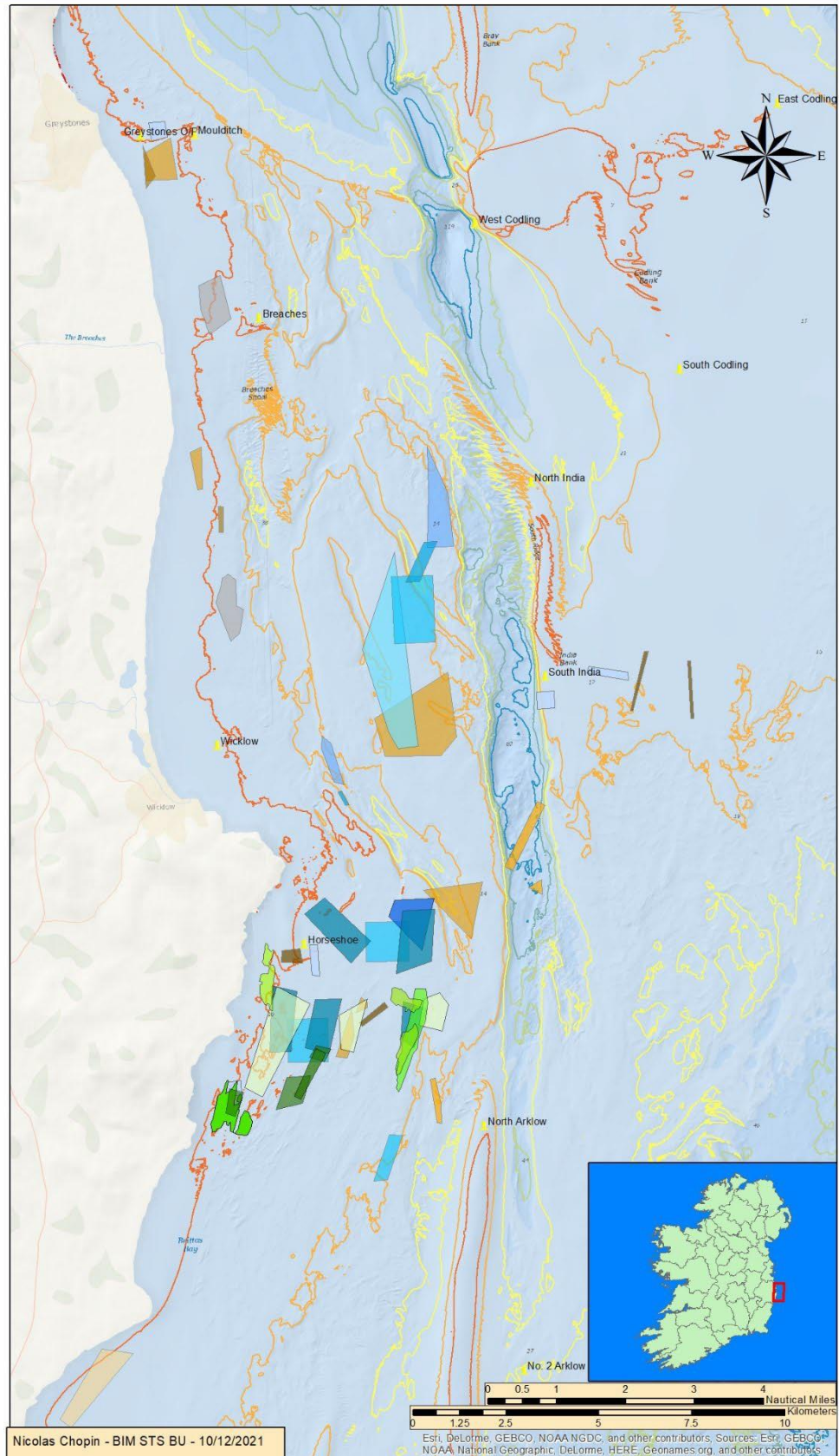


Figure 2- Historical spatial extent of seed fishing areas southern Irish Sea 1970-2021

Seed Mussel beds Location for East Wexford Coast from 1970 to 2021 - BIM



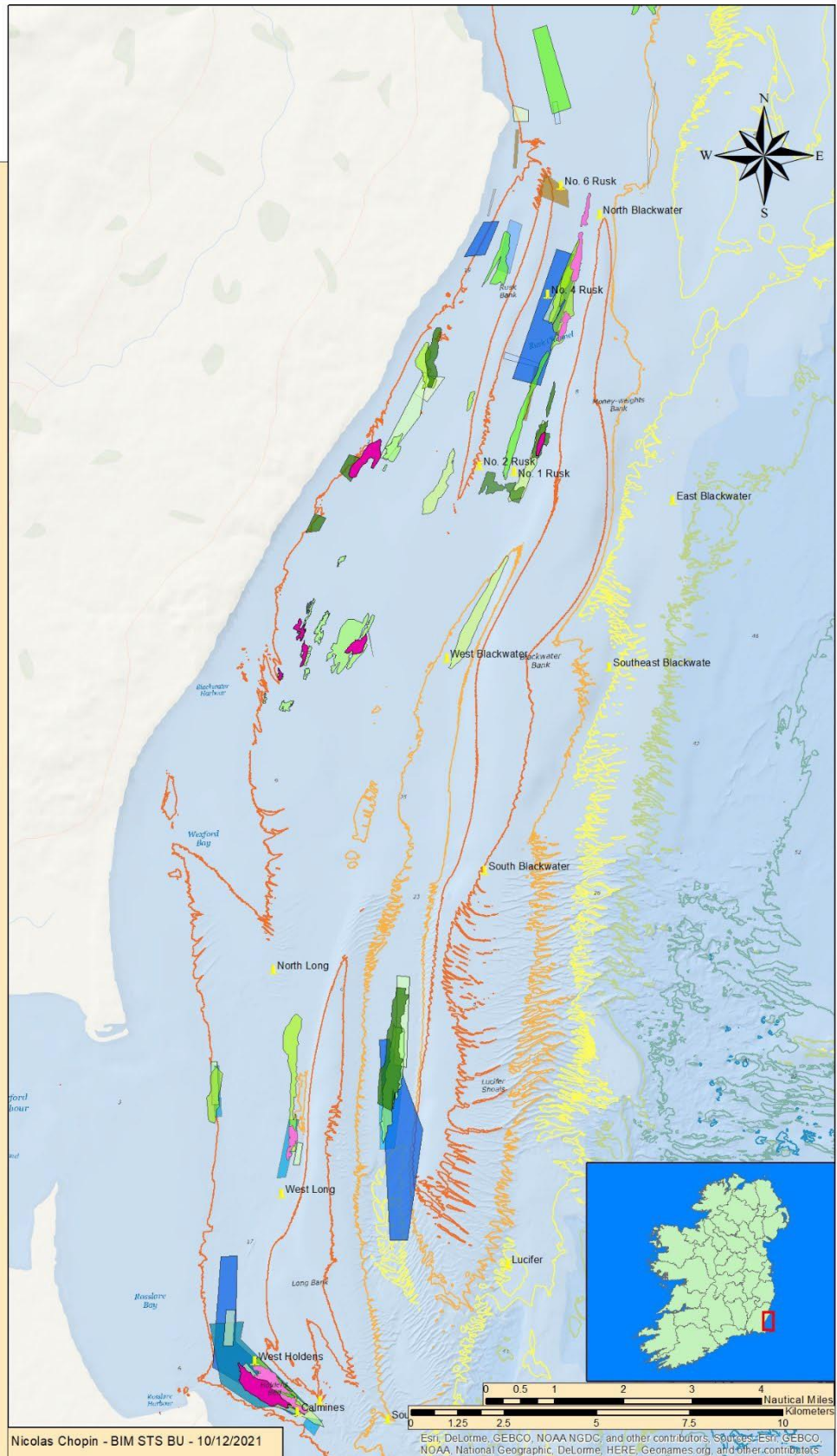
Legend

buoysMFAWgs

- 2021
- 2020
- 2019
- 2018
- 2017
- 2016
- 2015
- 2014
- 2013
- 2012
- 2011
- 2010
- 2009
- 2008
- 2007
- 2006
- 2005
- 2004
- 2003
- 2001
- 2000
- 1999
- 1998
- 1997
- 1996
- 1993
- 1992
- 1974
- 1972
- 1970

Contour (INFOMAR)

- 60
- 50
- 40
- 30
- 20
- 10
- 0



Nicolas Chopin - BIM STS BU - 10/12/2021

Est: Delorme, GEBCO, NOAA NGDC, and other contributors. Sources: Est: GEBCO, NOAA, National Geographic, Delorme, HERE, Geonames.org, and other contributors

Figure 3- Spatial extent of seed fishing areas southern Irish Sea 1970-2021

3.3 Temporal Extent

Fishing takes place on suitable neap tides (<7m as predicted in the Llanelli tide tables) subject to seed availability, allocation, and suitable weather conditions. Suitable tides will be proposed at the first meeting of the BGMCF in the calendar year. Fishing may take place in the early spring (two tides) and autumn (August to December) subject to seed availability. Also, a force majeure clause may be initiated, and a request made to the Minister through the BGMCF to have the area opened outside these periods, if the bed is subject to high predation pressure. Maximum permitted fishing days in a given year is 70 and fishing is only conducted from 06.00 to 18.00.

Fishery Profile	2017	2018	2019	2020	2021
Total Seed fished (Net)	6851	5286	10345	8921	9270
Days fished	21	15	21	20	16
Vessels	23	16	21	21	18

Table 1 – Seed fishing statistics (tonnes) ROI and NI waters 2017-2021

3.4 Vessel Numbers

The number of permitted vessels in a given year is at a maximum level of 35, however not all vessels participate every year – see Table 1 above.

Dredging of mussel seed by Irish registered vessels and reseedling of the seed for the purposes of on-growing within the exclusive fishery limits of the State may take place only on issue of a licence under the Mussel Seed (Conservation of Stocks) Order 1987 (S.I. No. 118 of 1987) as amended by the Mussel Seed (Conservation and Rational Exploitation) Order 2003 (S.I. No. 241 of 2003). Under the Sea Fisheries (Amendment) Act 2019, vessels owned and operated in Northern Ireland have access to fishing in the 0 to 6 nautical mile zone of the territorial waters of the State. Such vessels must be authorised for access by the EU Commission. They must also hold a seed fishing license issued by the Department of Agriculture, Environment and Rural Affairs (DAERA) to participate in the fishery. Northern Ireland vessels may not fish within the baseline.

3.5 Gear Type

Seed Surveys

Seed surveys seek to identify seed areas in advance of the fishing season. Seed may not be fished outside the permitted tides and all surveys conducted by industry members must be notified in advance to the Sea-Fisheries Protection Authority (SFPA). If seed is found this is also reported to the SFPA.

Surveys are conducted by industry members using ground discrimination software onboard the vessels and commercial fishing equipment to “ground truth” results. Surveys are generally conducted on one to two available tides in advance of the defined opening periods in May and August/September. Surveys will only be conducted in areas of suitable substrate.

BIM surveys are conducted from May to September (inclusive) and are divided into three steps. The first step consists of surveying previously known beds to assess potential remaining stock following the winter or recently settled spat. This survey yields acoustically generated imagery from a side scan sonar system which identifies relevant features which are then ground-truthed using a one meter dredge. The second step consists of estimating the available mussel seed biomass. The extent of the settlement is mapped using acoustic imagery analysed on GIS. Random sampling points (approximately 40 per bed) are generated within the bed and samples are collected using a Day grab with a 0.1m² footprint. The position and weight of mussel per grab is recorded and a density map is produced using IDW interpolation³. Estimated biomass is then calculated, providing the extent of the

³ Hervas, A., Tully, O., Hickey, J., Keeffe, E. O., & Kelly, E. (2008). *Assessment, Monitoring and Management of the*

bed in hectares and an estimated tonnage for the area. The final step consists of carrying out a post-fishery assessment using the methodology detailed above. Seed survey reports are published on the BIM website as they become available.

Given the large areas of the potential fishery and the ephemeral nature of the resource, not all beds are identified by a formal survey in advance of fishing. Beds may be discovered and exploited during the fishing season by industry members; however, all seed fishing locations are reported via logbook and SMS returns as per the management measures set out in section 4.0 below.

Harvesting

Mussels are harvested by industry members in compliance with the management measures presented in section 4.0 below. Mussel seed fishing is conducted using a variety of equipment types. By far the most commonly used dredge is the modified Dutch design.

Depending on size, vessels deploy four dredges at a time. The dredge is composed of a fixed bar (of between 2 and 4 meters in length, the bar is round and without teeth) and a frame with a net bag attached, which is 2-3 meters in length to retain the seed mussel catches. The dredge is designed to skim the surface of the substrate and separate mussels from the underlying sediment. This mud bar in effect 'peels' the overlying seed mussel 'mat' away from the underlying substrate and in doing so removes the mussel seed which is caught in a bag which follows the bar.

The bottom part of the bag is made up of either a chain link matrix or a nylon mesh. The upper part is made of nylon mesh. In the case where a chain link matrix is used on the lower part of the bag it is common practice for a rubber mat or rope dollies (bits of chafed ropes) to be attached to the belly of the dredge to minimize disturbance of the substrate. The dredge is towed with a steel cable. The length of this cable during fishing operations is usually three times the water column depth, although this varies according to the speed of the current and the seed mussel bed type.

4.0 Management Measures

The fishing of seed mussel and the operation of mussel dredgers is controlled primarily by the following legislation: the Sea-Fisheries and Maritime Jurisdiction Act 2006 (No. 8 of 2006); the Mussel Seed (Fishing) Regulations 2006 (S.I. No. 311 of 2006); the Molluscan Shellfish (Conservation of Stocks) Regulations 2006 (S.I. No. 345 of 2006); the European Communities (Health of Aquaculture Animals and Products) Regulations 2008 (S.I. No. 261 of 2008); the European Communities (Natural Habitats and Birds) (Sea-fisheries) Regulations 2013 (S.I. No. 290 of 2013); Fisheries Natura Declaration No. 3 of 2018 (Mussel Fishing); Fisheries Natura Declaration No. 2 of 2019 (Mussel Fishing).

Working from this legislative base and from a fishery conservation point of view, and in the interests of minimising any possible adverse environmental impact, the following are the general terms and conditions that will apply to all vessels involved in the sub-tidal fishery in the areas under assessment 2023-2027:

- Surveys will be conducted by BIM and by industry members following notification to the SFPA. In conjunction with industry members and BIM, the BGMCF advises the Department on decisions to open or close seed mussel beds on conservation grounds, i.e., if the seed is too small or fragile to transport. Mortality of seed would prevent the relayed stock contributing to the spawning stock in the Irish Sea.
- All vessels participating in the fishery will hold a mussel seed authorisation particular to that vessel. The vessel must have the correct authorisations and licences on board at all times of operation.
- Prior to the issuing of seed allocations, hull markings and tracking systems will be certified by an authorised officer. All vessels will have each side of the stowage hold marked in 0.5m segments from the bottom to the top; 0m being the bottom or floor of the hold to facilitate estimation of catches on-board.
- Operators will nominate for the Department's approval which vessels will be fishing the seed allocation on their behalf. The vessels will be registered and licensed to fish mussel seed and the authorisations to fish and move seed are linked to the aquaculture operators.
- Mussel vessels over 15m in length are required to have the EU Vessel Monitoring System ('Blue box'). This system allows the vessels to be monitored and tracked on a more continuous basis and allows detailed tracks and locations to be recorded.
- Regulation 1224/2009, article 10, requires that all vessels exceeding fifteen meters shall be fitted with and maintain in operation AIS. This is an autonomous and continuous vessel identification and monitoring system used for maritime safety and security which allows vessels to electronically exchange with other nearby ships and authorities ashore the vessel identification data, position, course, and speed.
- Member States may use AIS data for monitoring and control purposes.
- All vessels fishing seed mussels will maintain EU logbooks as required.
- The seed fishing authorisation further requires that "in addition to the requirement to keep the EU fishing logbook, the master of the authorised boat shall keep and record all catch in a mussel spat book, which shall be submitted to a Sea-Fisheries Protection Officer at the end of each tide, or on request."
- In line with S.I. No. 311 of 2006 the master of a vessel must "inform a Sea-Fisheries Protection Officer at least 4 hours in advance of his or her intention to fish for mussel seed and give the officer the name of the holder of the authorisation on whose behalf he or she intends to fish".
- The authorisation also requires that "the Master of the authorised boat or his agent shall give to the Fisheries Monitoring Centre not less than 4 hours' notice of his intention to transplant mussel

seed” and that “a Sea-Fisheries Protection Officer may direct that the authorised boat proceed to a specified port for inspection prior to mussel seed being transplanted on any licensed aquaculture site”.

- The authorisation holder shall send a record on each day of fishing via SMS to 0035387 9885116 in the format: the name of the authorised boat; the source of the seed; the destination of the seed, including aquaculture licence number and bay; gross tonnage; net tonnage; the number of the mussel seed authorisation.
- Operators recognise that under the Health of Aquaculture Animals, S.I. No. 261 of 2008 European Communities (Health of Aquaculture Animals and Products) Regulations 2008, that authorised officers have the authority to prevent the movement of animals if they feel there will be unresolved increases in mortality.
- Fishing will only take place between the hours of 06.00 and 18.00.
- Fishing will only take place on defined tides.

ENDS (modified in December 2023).