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Our Ref	Section 14 Alternative sources of seed mussel for bottom cultivation in Carlingford Lough
Date	16.03.22 Amended 07.04.2022
To	[REDACTED]
cc	[REDACTED]
From	[REDACTED]
Subject	Request Section 14, Alternative sources of seed mussel for bottom cultivation in Carlingford Lough

AFBI are planning to work with two of the Carlingford Lough mussel producers to trial spat collectors in Carlingford Lough. The main objective of this project is to investigate alternative sources of mussel seed for the bottom grown mussel sector within Northern Ireland. It is hoped that this project will help to address one of the main issues facing this industry, namely shortages of wild seed mussel and the importance of sustainability for the mussel industry. This work also supports the "Green Growth strategy NI" and the blue economy goals.

Pilot studies were conducted between May and October 2015 with additional work between April and August 2016. These investigations were carried out in collaboration with local producers, who provided the spat collection equipment and boat access to deploy and maintain the mussel spat collectors.

The 2015 trial provided evidence that mussel spat will settle and grow on the collector system (Figure 1 - 6), however recovery of the spat collectors was delayed and by the

time of recovery there was not adequate seed to relay on the bottom to conclude the trial for alternative sources of seed mussel.

During the 2016 trial two spat collector systems were deployed (of slightly larger scale than those deployed in 2015) within the area of licensed aquaculture site B13. The plan was collect an adequate quantity of seed mussel to relay on AFBI's leased experimental site within Belfast Lough. Adequate seed was not collected in 2016, again Eider duck predation on the seed mussels was identified as the problem.

AFBI are requesting a permit under Section 14 of the Fisheries Act for the temporary deployment of two continuous collector devices within Carlingford Lough (from April 2022 to September 2022). AFBI have permission from the producers to deploy trial set-ups on aquaculture site C6 and C5. Each trial mussel spat collector system will be approximately 200 m long and consist of a set of 28 barrels (with approximately 7 m spacing between barrels and double barrels at either end for extra buoyancy) (similar to the systems deployed in Belfast in 2016 (Figure 7) - proposed aquaculture sites C5 and C6 in Carlingford Lough are shown in Figure 7). The barrels (200 L drums) float on the surface with double head lines between the barrels, a collector rope is attached to each header line with secure ties and the collector ropes will extend to 1 m depth (Figure 8). Similar systems are currently used off Westport. Using figures produced from the Westport systems the two collectors being proposed for Carlingford Lough could potentially produce up to 100 t of seed mussel. Anchorage for these collectors is provided by Stingray high performance anchors. The ideal time for deployment is April 2022 and they will be in place until September 2022 at the latest. Deployment, maintenance and recovery of the two spat collectors will be serviced by the Ex Maria Gratia (deployment) and Conor Og (maintenance).

AFBI have requested that seed from this trial be on-grow either on the AFBI leased experimental Site A in Belfast Lough (Figure 8) or in a suitable location in Carlingford Lough. This site will be monitored, maintained and serviced by AFBI. Samples of mussels will be collected monthly (for up to a period of 18 months) and returned to the AFBI laboratory for analysis, to enable us to determine how the growth and survival of rope collected spat compares to bottom settled spat.

AFBI will carry-out a site survey (Naturalist dredge, grab samples (for particle size analysis (PSA) plus camera if available (deployment time dependant)) before and after the deployment and retrieval of the spat collector equipment.

AFBI plan to monitor the growth and survival of the seed on the ropes during the period they are deployed.

AFBI plan to monitor the growth and survival of the seed on the seabed.

Data from this monitoring program will provide evidence of the sustainability of this option as an alternative source of seed mussel for the bottom cultivated mussel industry. If the amount of seed relayed is too small there will be reduced survivorship as small quantities of seed are known to be vulnerable to predation. With a view to maintenance and on-growing of this rope grown seed we will be carrying out the same husbandry techniques (mopping for starfish) as they do on their other licensed aquaculture sites.

The benefit to the bottom grown mussel industry of the development of an alternative source of seed mussel is crucial to the sustainable development of this industry.

This pilot study in Carlingford Lough has advantages over previous trials in Belfast lough, primarily lack of Eider ducks and the aquaculture site is in an area where there is no navigation or recreational traffic due to the sand bank.

Preliminary discussions with WHA, Irish Lights seem favourable. If DAERA are minded to approve this trial in Carlingford Lough we will finalise all discussions including contact with Crown Estate Commission.

The project will meet a number of the UK Fisheries Bill objectives.

If successful meets Sustainability Objective, helping to achieve long-term sustainability that achieves economic, social (including employment) and environmental benefits and contributes to the availability of food supplies.

Precautionary Objective: the precautionary approach to fisheries management is applied - reducing impact from dredging of the seed beds.

Ecosystem Objective: using an ecosystem-based approach so as to ensure that their negative impacts on marine ecosystems are minimised and, where possible, reversed - again reduced impact of dredging for seed and the ecosystem impact can be assessed using the model as required.

Scientific Evidence Objective: scientific data relevant to the aquaculture activities are collected and that aquaculture activities are based on the best available scientific advice - pre- post site seabed monitoring and monitoring of site for the duration of the project.

Climate Change Objective: the adverse effect of aquaculture activities on climate change are minimised and aquaculture activities adapt to it - increased number of storm events with climate change may reduce the amount of seed on the seed beds, also spat collectors can ensure a sustainable seed supply to this low carbon foot print industry, supplying a high protein food source.





Fig. 1 Mussel seed on main collector rope, southern site (B24)



Fig. 2. Seed mussel from the southern sub-spat collector (B24)



Fig 3 Sub-collector, six ropes at the southern site (B24)



Fig 4 Northern spat collector (B13)



Fig 5 Mussel seed on main collector rope, northern site (B13)



Fig 6 Sub-collector, six ropes, northern site (B13)

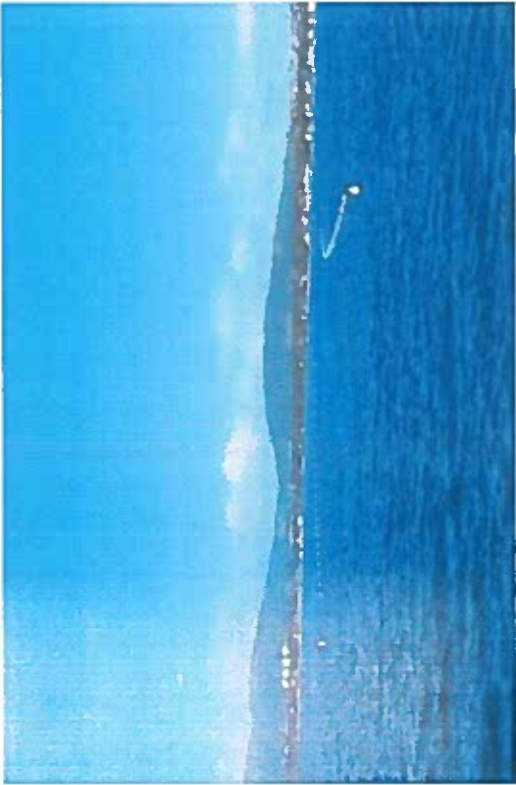


Figure 7 Spat collector systems deployed in Belfast lough 2016

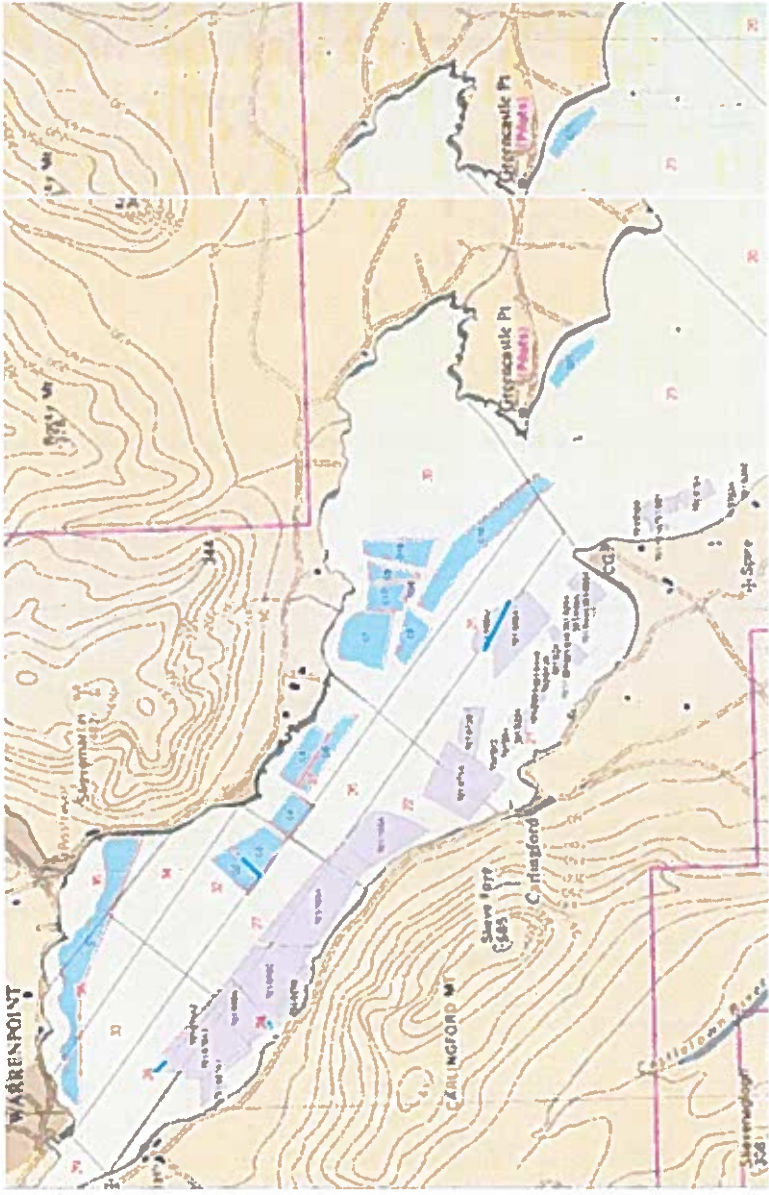


Figure 8 Showing location of aquaculture sites in Carlingford Lough.

