

BIM EMFAF Work Programme Project Report 2022

BENEFICIARY:	Bord Iascaigh Mhara
PROJECT REFERENCE NUMBER:	22/IFCS/DIS-BG010-BR041
NAME OF PROJECT:	Developing a Formed Bait for the Commercial Whelk Fishery
IMPLEMENTATION PERIOD:	1st January to 31st December 2022

Project Scope

In 2020 Irish annual landings of crustaceans and bivalve shellfish by volume and value totalled 16,622MT and €54million, respectively. The whelk fishery, with a landed volume of 5,562MT and value of €8.67million is of significant socio-economic importance to many rural coastal communities. Export values of €34million for brown crab and €19million for whelk in 2020, further highlights their commercial importance.

Bait represents a significant cost burden, with anecdotal estimates of close to twenty percent of vessel's total running costs. It has been estimated by the fishing industry that up to 3,000MT of bait is used by Irish pot fishers annually. For whelk fisheries, undersized and poor-quality brown crab is the preferred bait. Since 2014 Ireland's Marine Institute (MI) has raised concerns regarding the poor stock abundance and reduced recruitment of Ireland's brown crab fisheries. A range of mitigation measures has been recommended including closed areas and landing of smaller volumes of higher quality crab. In addition, both the MI and industry stakeholders recommended ending the unsustainable practice of using undersized and soft crab as a bait source for the whelk fishery.

To seek a resolution BIM, industry stakeholders and third-party researcher, Nofima, commenced an eighteen-month project in 2017 to develop a formed bait primarily focusing on the whelk fishery. Despite the progress that was made within the project in terms of developing baits that attracted whelks, none of the baits matched the traditional crab, dogfish, fish offal combination. Within the final report, a series of specific recommendations were provided on the next stages required to effectively develop a bait. This project seeks to build on the knowledge base from this research to progress the development of a formed bait alternative for the whelk pot fishery.

Objectives

The aim of the project was to develop a cost effective sustainable synthetic bait solution that matches performance of existing commercial baits. Specifically, the objectives were:

- Form industry group linked to include crab FIP. Scope project and circulate to third party experts.
- Select a third-party expert resource and progress the project which will be managed by the industry group.
- Engage relevant stakeholders through regular meetings to meet project milestones to include commercial bait trials.
- Establish best-fit bait solution based on sustainability, effectiveness, and costs.
- Provide recommendations on commercial bait production.



Outcomes

During 2022, the Marine and Freshwater Research Centre at ATU Galway, BIM and Nofima (Norway) have worked closely with industry to identify a cost effective, reliable, and sustainable source of bait for the Irish whelk pot fishery. Traditional bait species such as brown crab are under significant pressure as there is increasing awareness of the negative stock sustainability impact of using under-sized poor quality brown crab as a bait. In addition, the lack of availability and increased costs of bait are impacting on the viability of many inshore fishing vessels. The project builds on previous work conducted by Nofima and BIM and aims to develop a sustainable alternative bait in order to promote the survival of the whelk fishery and to help conserve brown crab stocks, which are currently under pressure.

A literature review was conducted by ATU Galway to synthesise current knowledge of whelk foraging behaviour, potential sources of alternative bait and design considerations for whelk live-holding experiments. The effectiveness of various bait binding agents was compared, and several candidate baits were developed. Foraging responses of whelk to these baits and to the traditional brown crab bait were compared within a controlled and replicable system. Kappa Carrageenan was the best performing and most suitable binding agent although fish skin has also been proposed by Nofima as a potential alternative.

Preliminary results from these behavioural trials indicate that green crab (*Carcinus maenas*) shows promise as an alternative bait; whelk displayed similar levels of foraging activity when exposed to green crab as to brown crab. The use of this widely distributed species as an alternative bait would relieve increasing pressures on brown crab.

Industry involvement in the project is facilitated through regular consultation with the Industry Reference Group (IRG). Membership of the IRG includes representatives (processors and fishers) and scientists from Ireland (BIM and Marine Institute) and Norway (Nofima). The IRG has been instrumental in identifying and sourcing potential bait materials and experimental animals and have helped to optimise the design of the experiments and to ensure that they mimic the natural environment as closely as is feasible.

During 2023 statistical analysis of data from the behaviour trials will be carried out to provide a fully quantitative comparison of the various baits. Raw material and hydrolysed material will be worked into formulated bait samples using kappa carrageenan and fish skin binder and compared through additional behavioural trials. Additional chemical analysis will be conducted in an attempt to characterise the chemical constituents which confer attractiveness on brown crab and substitute baits. A survey design will be drawn up to support future on board commercial fishing sea trials of alternative baits.

Summary of Project Spend

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Total Approved Costs	€36,876
Total Eligible Expenditure	€36,876
EMFAF Eligible Expenditure	€18,438
Exchequer	€18,438

Report by: Michael Gallagher

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an Aontas Eorpach

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