7th September 2023 BIM Whelk Bait Project – **IRG Update Minutes** MFRC ATU

Attendance: Dr Deirdre Brophy, Dr Colin Hannon, Liam Strachan, Janet O'Donoghue, Leslie Bates, Norah Parke, Dr Mike Fitzpatrick, Eamon Dixon, Dr Michael Gallagher, Clíodhna Griffin

Industry partnership and reporting

- Updates with Michael and Cliodhna as fishing trials conducted.
- BIM Fisheries Conservation Technologists based at Galway office helped with sea trial sampling design and gave great insight into data capture while trialling at sea.
- Fishing on Errigal Bay and SOFRIMAR boats, Barry McAuley, *Venus II*, Wicklow and Cormac Ryan, *Velvet Strand*, Howth respectively as well as Killary Fjord, Galway.
- Larry Dolan, Force10 Marine Products Ltd., provided bait containers and options on fishing gears available as accessories to pots aiming to reduce bait volume.
- Eoin Hurley, Rockabill Seafood Ltd., contacted wondering about testing razorfish offal as new waste stream not previously available however late in trialling period to integrate into plan.
- Dr Maria Hayes, Teagasc, hydrolysing and characterising brown crab, green crab and sea star samples for better understanding of odour plume.

Bait development

- Gelling of formed bait bricks failed for Wicklow fishing trial however rectified and formed bait samples ranged between 200ml and 500ml bricks. 100g of raw green crab included per portion.
- Formed bait lasts well out of freezing and/or refrigeration, greater inclusion rate of Kappa Carrageenan binder decreases degradation. Freezing softens bait but holds structure.
- Teagasc hydrolysation worked for papain however not for alcalase enzymes. Hydrolysate integrated into sample gelled with fish skin gelatine (as trialled previously) but needs specific storage (freezing/refrigeration).

Onboard trials

- Onboard commercial vessel trials conducted out of Wicklow and Howth in Irish Sea. Smaller localized fishing conducted on ground less intensively fished in Killary Fjord, County Galway.
- It must be noted that this is not a significant amount of testing and experience with different bait configurations at sea however has given good indications of formed bait performance.
- Trials included comparison between traditional bait pairing of brown crab and dogfish against contained green crab and dogfish pairing and formed bait and dogfish pairing.

Fishing Results

- Wicklow: 2 strings (x48 pots/string), shallow (South Codling Bank) and deep site (East of Codling Bank), three bait variants distributed along each string separated between by blank pots, coming off spring tides.
  Binded bait did not gel and as a result did not perform, contained green crab pairing performed best against traditional brown crab in both sites, possibly attributable to productivity over longer time period in stronger tides. Limited data captured for graded catch comparison (LPUE kg/x12 pots).
- Killary: 2 strings (x16 pots/string), shallow and deep site on opposite sides of the Fjord, three bait variants distributed along each string separated between by blank pots, coming up to neap tides.
  Deep string shot across rocky outcrop and hence catch may be down for whelk in the area (more commonly found on softer ground at depth). Shallow string over more even ground type and showed formed bait brick (500ml) to fish better than traditional and contained bait pairings. Data captured per individual pots included count, size and weight of whelk and bycatch for CPUE (kg/pot).
- Howth: 1 string (x50 pots), shallow site between Irelands Eye and Lambay Island, two bait variants distributed along string separated between by blank pots, contained green crab excluded for this trial, coming up to spring tides.
  Traditional bait pairing fished better than formed bait brick (200ml) pairing, however still fished up to 60% as much as traditional pairing.
- Venus II more recently said that 200ml formed bait portions fished similarly to fresh green crab in area, good to use user friendly bait fishing effectively.

Project Timeline Extension

- Final Project Report to be submitted in October and to include fishing effort and Teagasc work with hydrolysation and characterisation bait material.
- Industry briefing to happen before end of October.
- Project highlight video in the works with Clíodhna and BIM for industry outreach.

IRG input and AOB

- Where to pitch a follow on project? What do the industry want to see?
- Possibility of site visits to meet IRG members before end of this project timeline.

AOB

Leslie Bates: Possibility to get slides from todays presentation? Yes sent on. How much green crab used relative to whats being used currently? 100g raw green crab per formed bait brick portion for use in 1 pot, compared to 200-300g being used per pot at present. Rough cost of formed baits €75/250 portions, which includes raw green crab and binder, cost does not consider transport, storage and energy costs for production as difficult to conclusively say exact costs. Skippers opinion is that box of bait to stock a string to range between €10-€15/box of bait. If practical, economical and sustainable then industry should uptake the development. Future investment to be targeted at further production optimisation and testing at sea on industry relevant scale to increase level of technological readiness and tune formed bait.

Eamon Dixon: Was Spider Crab used in any trials? Not for lab or bait formation as seasonal available however regarded as effective pot fishing bait for whelk. Saltwater used for palatability but also may hold better than freshwater in the marine environment (ice made from marine water example given). Could there be an incentive for vessels to trial formed bait at sea? If bait performs then no incentive required as catches would stay consistent however investment to be considered for accurate data capture when trialling at sea.

Mike Fitzpatrick: Good job on fishing trials. Original tender to address reduction/dependence on brown crab volume required for baiting whelk fishery, has this been addressed? Yes as more plentiful species (green crab) can be formed, held and used to fish similarly to brown crab use for whelk as seen in lab and fishing trials. How much less can be achieved? This could be determined through further fishing effort (analogous to Horseshoe Crab bait project in Delaware, USA, where $1/16^{th}$ of female horsheshoe crab can be repurposed into a formed bait and fished successfully). Future Brown Crab FIP meeting could be opportunity to showcase positive project and pitch to industry follow on project to address present and relevant challenges.

Janet O'Donoghue: Fishing results look positive. Was dogfish paired during all trials? Yes as previously discussed. Howth presently using herring, but test string still paired with dogfish. Wider scale trials needed for industry level assessment and efficacy demonstration, need fishermen buy in.

Norah Parke: Good work, fantastic progress that has not be seen in previous projects addressing these topics. Increasing trials and usage will be a key next step for positive impression on industry.

Clíodhna Griffin: Great work, what would next steps be for industry? Looking towards IRG for input on what to include in further investigation.

Michael Gallagher: Good discussion and positive results overall, we've gotten further than initially set out for. What is next for industry? Need input for pitching to BIM. Internal resources and planning in place for following year, project plan to be drawn up and discussed soon.

Deirdre Brophy and Liam Strachan: Initial proposal for follow on project has been ongoing, looking at increasing status of technological readiness level. Testing in intended environment at expected scale would be natural trajectory to inform, adapt, tune and increase status of development. IRG Project Brief to be circulated along with minutes from today and request input on points concluding project brief to be considered by industry if possible.