Cromer Shoal Chalk Beds MCZ
Project Board
Meeting 24

Date: 26 March 2025

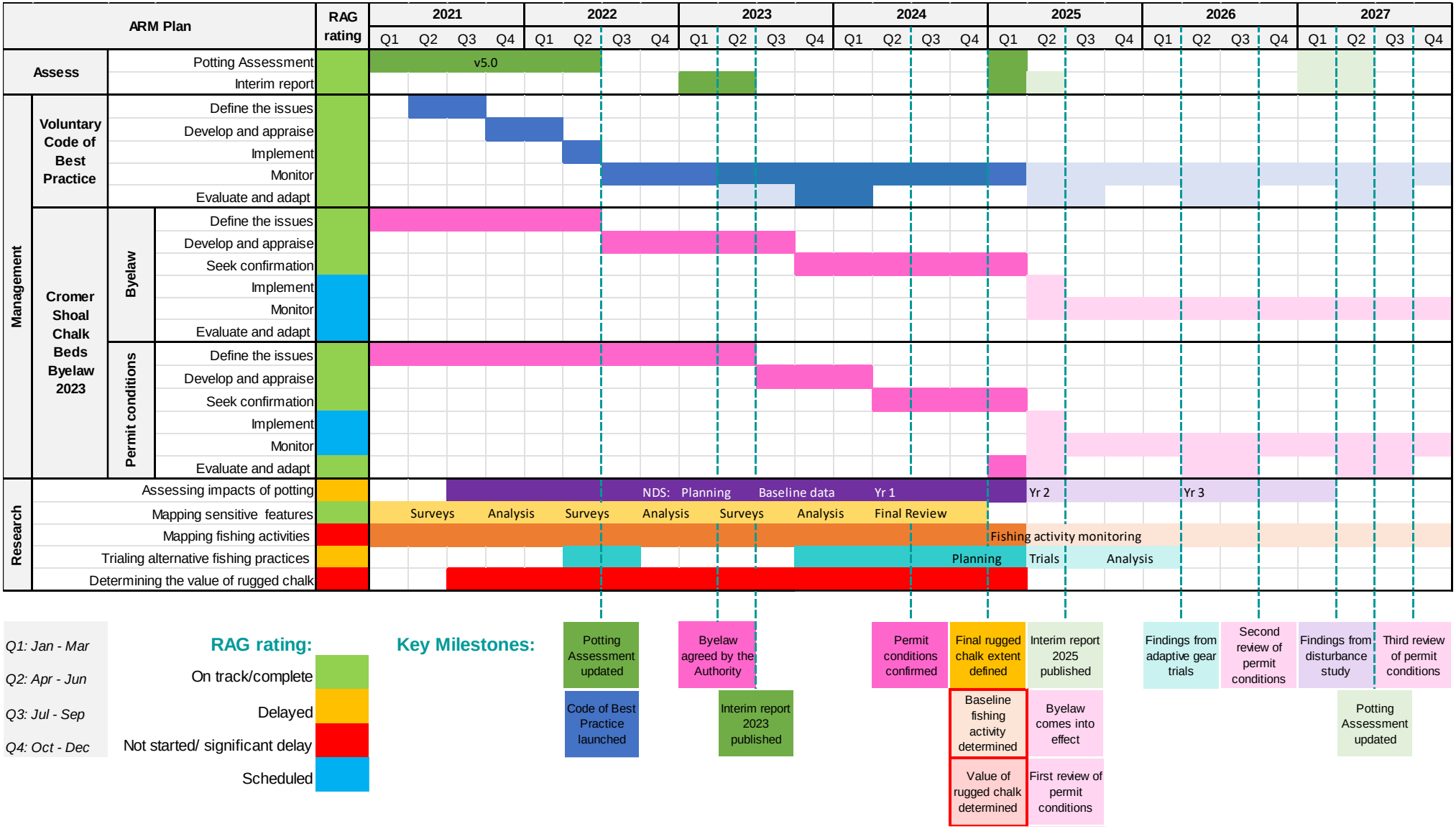
Time: 1530hrs

Venue: Online via Teams video conferencing

Agenda:

1. Apologies
2. Notes of last meeting
3. Actions and Decisions
4. Progress against ARM plan (SH)
5. Risk review
    a. Project Risks (SH)
    b. MCZ Risks (SH)
6. ARM budgets and Funding (SH)
7. Adaptive Gear Trials (WW)
8. Research Task & Finish Group update (RWJ)
9. Management Task & Finish Group update (LG)
10. Stakeholder Group update (EC)
11. Evidence subgroup (LG)
12. Communications update (EC)
13. Date of next meeting (SH)
14. AOB

Item 4: Progress against ARM plan



Item 5a: Project Risk Assessment Review (March 2025)

Identified Risk	Risk Score (last review)	Action taken	Current risk		Further action required to mitigate risk
Non-compliance with voluntary management measures	**12**	The have Authority agreed to implement voluntary closed areas for NDS as mandatory closures using Byelaw 8.	**6**	Severity: high (3) - no change Likelihood: possible (2) - mandatory restrictions reduce the chance of non-compliance so likelihood is reduced	No further action required.
The Cromer Shoal Chalk Beds Byelaw 2023 is not confirmed or is significantly delayed	**4**	No action required.	**4**	Severity: very high (4) – no change Likelihood: unlikely (1) – no change	No further action required
Failure to implement management measures which are proportionate to the risk posed and adequately precautionary	**8**	No action required.	**8**	Severity: very high (4) – no change Likelihood: possible (2) – no change	No further action required
Failure to evidence effectiveness of management measures	**4**	No action required.	**4**	Severity: very high (4) – no change Likelihood: unlikely (1) – no change	No further action required
Lack of stakeholder buy-in for management measures	**9**[1]	Recent identification of a number of fishery stakeholders who were not consulted on during the development of Phase 1 permit conditions have resulted in an additional engagement exercise to ensure their views have been considered. This has led to some amendments to agreed permit conditions.	**6**	Severity: high (3) - no change Likelihood: possible (2) – decreased as recent management proposals have generally been supported by industry and any newly identified concerns addressed.	No further action required

[1] Note that in the previous risk assessment this risk was scored as 9 but incorrectly reported as a medium risk (amber). The previous risk score has been updated in this table to reflect the high level of risk associated which requires treatment.

Change in Natural England advice (i.e. that a precautionary approach is required)	**3**	No action required.	**4**	Severity: high (3) - no change Likelihood: unlikely (1) – no change	No further action required
Inability to secure funding for the project	**6**	No action required.	**16**	Severity: very high (4) - no change Likelihood: very likely (4) - no funding has been secured for the current financial year for the Natural Disturbance Study and data analysis components of the Adaptive Gear Trials so likelihood has increased. Whilst funding applications were submitted for both of these projects, none were successful.	Consider agreement from the Authority to utilise reserves to fund project critical gaps and identify other funding sources to apply for.
Unable to deliver research projects (particularly practical components including vessel breakdown, research equipment / contractors unavailable, poor weather, lack of internal resources)	**9**	Alternative means of obtaining research equipment has been sought but none identified. Significant flexibility and contingency has been built into planning and alternative contractors to conduct data analysis components identified.	**6**	Severity: high (3) - no change Likelihood: possible (2) – building flexibility and significant contingency into planning e.g. via hiring multibeam kit for an extended period of time to give maximum flexibility has reduced the likelihood of multibeam surveys not being completed. In addition, alternative contractors have been identified who can complete the data analysis components of the work reducing the likelihood of this component of the work from not being delivered. As a consequence, overall likelihood has reduced.	Continued careful planning and project management.
National I-VMS requirement does not come into effect in a timely manner	**6**	No action required.	**6**	Severity: high (3) - no change Likelihood: possible (2) – no change	No further action required

Item 5b: MCZ Risk Review

Report by: Samantha Hormbrey, SMSO

Purpose:
To provide an update on the latest MCZ risk review.

Recommendations:
It is recommended that members:

- **Note** the contents of the report

Report

An update on the MCZ risk review is summarised below:

- Since the MCZ potting assessment was updated by Eastern IFCA and shared with Natural England (28 April 2022) several new evidence sources have become available.
- In addition to this, officers have received formal advice letters from Natural England on 29 November 2024 and 7 January 2025. These letters provided clarification of Natural England's previous formal advice, raised concerns of delays in ARM progress and formally shared their disagreement with the decision to exclude Type 2 rugged chalk from the winter closure permit condition.
- Phase 1 permit conditions were agreed at the 58th Eastern IFCA meeting (11 December 2024), developed from suggestions from fishery stakeholders to reduce risk to the site. However, whilst these measures reduce risk to some extent, it was acknowledged that risk would need to be further reduced through a second phase of permit condition development planned in for Q1 and Q2 of 2025.
- In light of the new data and advice and the need to further reduce risk, it was considered appropriate to review the existing MCZ risk assessment to inform the development of Phase 2 permit conditions.
- As part of this review an approach has been identified based on calculating the impact footprint of potting in the site so that long term impact projections can be made and considered against conservation objectives. Such an approach could not be achieved previously with the data available. This approach has been shared with Natural England who are yet to provide feedback.

To allow time for the MCZ risk review to be completed so that it can inform Phase 2 permit condition development, it was decided that consultation on Phase 2 conditions would be delayed until April (by a period of three months) with the intention of taking proposed conditions to the June Authority meeting. As it stands, delays in progressing the MCZ risk review means we are not currently in a position to conduct a consultation in April and, consequently, the development of Phase 2 permit conditions will likely be further delayed into Q3 of 2025

Item 6: ARM Budgets and Funding

Report by: Samantha Hormbrey, SMSO

Purpose:

To provide an update on project costs and secured funding for ARM related work to inform members of the financial restraints and requirements and to ensure transparency.

Recommendations:

It is recommended that members:

- **Note** the contents of the report

Report

This report provides an update on the financial projections for each ARM workstream:

Fishing Activity Mapping

No external funding has been identified for this project for the 2025/2026 financial year.

Interim measures were agreed at the 59th Authority Meeting (12 March 2025) to mandate the provision of vessel positional data from vessels fishing in the MCZ using Byelaw 11 (Development of Shellfish Fisheries). The Authority agreed to facilitate compliance through the provision of trackers until the national requirement for iVMS comes into effect. The estimated costs of this to the Authority equates to £1,199.76. As no external funding has been secured this will be absorbed by the Authority's annual revenue budget.

Tagging Project

The funding period for the tagging project was for the 2024 calendar year and no further funding has been secured for future years. The project has now ended, with the exception of the 'knowledge exchange events' which have been delayed until 2025. The cost associated with the events are staff costs and vessel costs and are staff and vessel costs rather than capital costs and are therefore effectively catered for within the Authority's revenue budget.

Of the £15,000 of funding received for this project for the 2024 calendar year, £7,137.67 was allocated to project costs and the remaining £7,862.33 allocated to officer time. As officer time is already covered by the Authority's budget, this funding provides £7,792.13 of surplus which has been absorbed into the Authority's budget and will effectively offset costs that occur beyond the funding period including, for example, additional pot tag applications.

Natural Disturbance Study

No external funding has been identified for this project for the 2025/2026 financial year. An application was made to the Hornsea Three Community Fund which was unsuccessful.

Estimated project costs for the 2025/2026 financial year are approximately £48,000. Without funding secured this leaves a substantial budget deficit.

However, it is important to note that a significant proportion of the FASS funding secured for the current financial year is allocated to officer time and vessel fuel costs. As most of these costs are already covered by the Authority's revenue budget, this creates what might be referred to as a surplus which could be considered in the Authority's budget management processes in order to support unfunded or future project related costs. Latest projections indicate that a 'surplus' of £22,586.80 will be generated from covering these costs.

A further 'surplus' of £33,215.19 is identified from other projects which could also be allocated to the NDS for 2025/26. A summary of funding against expenditure for this project is provided in Table 1.

Table 1: Summary of funding streams for the Natural Disturbance Study against total spent and projected 'surplus' generated by claiming for staff costs related to project delivery.

Funding Source	Period	Amount confirmed	Spent	'Surplus' generated
Natural Disturbance Study				
Blue Marine Foundation	2023/2024	£25,000.00	£17,638.07	£4,089.19
Natural England	2023/2024	£25,000.00	£9,505.81	£15,280.86
Natural England	2024/2025	£25,000.00	£11,154.86	£13,845.14
Fisheries and Seafood Scheme	2024/2025	£70,457.16	£33,464.58	£22,586.80

Adaptive Gear Trials

The Wildlife Trusts submitted an application on behalf of Eastern IFCA for this workstream to the Esmee Fairburn Foundation however this application was unsuccessful. Therefore no external funding has been identified for this project for the 2025/2026 financial year.

Estimated project costs for the 2025/2026 financial year equate to approximately £40,000 (not including vessel and staff costs), however, the final budget is dependent on agreeing a final methodology. The project will be reviewed to determine what can be achieved in lieu of funding.

Item 7: Adaptive Gear Trials

Report by: William Wade, MSO

Purpose:
To report on the outcomes of the feasibility study for the Adaptive Gear Trial and report on the funding situation for the project.

Recommendations:
It is recommended that members:

- **Note** the contents of the report and Appendix 1
- **Agree** to remove the rope modification from the trial
- **Note** the intention to review the project in the context of failing to secure funding for the 2025/26 financial year

Report

Removal of the Rope Modification

The feasibility study for the Adaptive Gear Trial (AGT) included two potential modifications: armoured pots and 'floating' ropes. The intention of the latter was to add floats to ropes such that they float above rugged chalk, reducing the likelihood of interaction with rugged chalk.

Feasibility studies undertaken in the summer of 2024 identified that adding floats to ropes was ineffective at raising the ground line when the shank was pulled taut. Moreover, the inherently buoyant polypropylene rope was sufficiently buoyant to raise the ground line irrespective of whether additional floats were attached to the pot lines, however that this was dependent on how 'taut' the gear was set.

Dialogue with stakeholders determined that potting gear is typically set taut on the North Norfolk Coast to prevent movement of pots within the strong tidal conditions of the North Norfolk Coast. This practice was considered to reduce pot movement and reduce instances of limb loss from captured crab and lobster.

The feasibility study did however confirm that the pot modification component of the project is feasible and has informed revision of the associated methodology.

Funding

The application for funding to support the project in 2025/26 made by the Wildlife Trust to the ESME Foundation Fund (EFF) on behalf of Eastern IFCA was unsuccessful.

The main costs associated with the AGT are the data analysis of accelerometer data (circa £20,000) and the accelerometer units and associated equipment (circa £7000). However, both of these costs are reduced if the rope modification component is removed (reducing the cost associated with the accelerometer by about half and potentially reducing data analysis costs by the same).

As a consequence of failing to secure funding, a number of options are being considered and will be presented to the Research Task and Finish Group in due course. These options include the following:

- Other funding sources – other funding options are being explored however it is considered unlikely that a new funding stream will be identified within a suitable timeframe to progress the project fully.
- Deferring data analysis – given that the main capital cost associated with the project relates to data analysis (rather than data collection), it may be possible to absorb costs associated with data gathering and store the data gathered until other funding opportunities present themselves.
- Partnership work with a University – the potential to provide the data obtained to a university to support a dissertation may enable data analysis without funding.
- Revised methodology – there is the potential to revise the method to gather more theoretical data using fewer accelerometers, generating less data (lowering associated costs).

Conclusions

The rope modification element of the AGT does not appear to be feasible and its removal from the project is recommended on that basis. Funding for the project has not been forthcoming which requires a review of the project, and a number of options are currently being considered. The removal of the rope modification component from the project reduces the cost associated with the project and will enable the limited resource available to be focussed on the pot modification component.

Appendices

Appendix 1- Gear modification review report-

Appendix 1: Gear modification review report.

Cromer Shoal Chalk Beds Marine Conservation Zone (MCZ): Adaptive Risk Management (ARM)

Adaptive Potting Gear Trials

Gear Modification Review (Version 1.0)

Eastern Inshore Fisheries and Conservation Authority

February 2025

1.0 Introduction

Whilst potting activities are generally considered compatible with rocky habitats, with potential impacts being limited to abrasion of attached biota, recent evidence has come to light which provides direct observations of potting gears interacting with raised chalk features and resulting in abrasion and penetration impacts to the chalk features themself (Spray, 2021; Tibbitt et al., 2020; O'Dell and Dewey 2022). Such interactions have the potential to contribute to the degradation of the rugged chalk features, however, without understanding more about the rate and scale of impact its significance against a background of natural disturbance is currently unknown.

To manage the potting fishery and ensure it does not hinder the site's Conservation Objectives Eastern IFCA are taking an Adaptive Risk Management (ARM) approach. ARM requires the development of management proportionate to the risk to the site and is informed by ongoing monitoring. To ensure management is proportionate, it is vital that uncertainties are addressed so that appropriate mitigation can be developed based on evidence. In parallel with addressing the current uncertainties, a Research and Development Task and Finish Group (R&D TFG) has developed a workstream with the aim of identifying and testing viable gear adaptations which will reduce the frequency and severity of rugged chalk interactions.

Two gear modifications for lobster and crab parlour pots have been initially proposed to test whether interactions between gear and rugged chalk features can be reduced when compared to the types of gear traditionally used within the Cromer Shoals Chalk Beds MCZ. These modifications consist of soft armoured pots and floats attached to the pot line, Table 1.

Table 1: Description of the different gear adaptations proposed for initial trials

Gear adaptation	Description	Image
Soft armoured pot	Pots which have been modified using rubber and plastic to soften the metal frame and edges of the parlour pot.	
Floats attached to the pot line	Small floats attached to the line between the pot and the ground rope to increase its buoyancy.	

Over the course of developing this project, newer evidence (including our own trials) have highlighted that the rope adaptations will be ineffective leading us to reconsider the validity of testing them as a feasible adaptation.

The following sections provide justification and discusses the following in more detail:

- A Risk Assessment that identifies the key types of impacts: level shear and grating.
- Evidence that floats are ineffective at raising the ropes when the main line is taut.
- Evidence that pot lines are buoyant irrespective of floats.
- A review of industry practices highlighting the requirement of having a taut main line for effective fishing.

2.0 Gear/Chalk Interaction Risk Assessment

To identify the level of risk associated to the different categories of impacts (Table 1) that can be attributed to potting gear, analysis was undertaken of the data in Tibbet *et al.* (2020) and O'Dell and Dewey (2022). The frequency and the severity of the interactions were analysed to determine the level of risk that particular impacts had upon chalk features in the MCZ. Severity of interactions have been attributed values of low, medium and high (Table 2). These interactions are such, that continued pressure that results in a low impact, can over time develop further into medium

severity impacts and potentially high severity impacts. So a low-severity ‘abrasion’ impact can develop into a high severity ‘grating’ impact if the pressure continues.

The three most frequently occurring impacts that are attributed to human activity as is reported in Tibbet *et al.,* (2020) were “strike” with 17 observed impacts out of 65 (26.56%), “abrasion” with 26 incidences observed (40.63%) and “level shear” with 9 observed impacts (14.06%). As “abrasion” is considered a low severity activity, the level of risk it poses is not substantial. The severity level and frequency of “strike” and “level shear” impacts had highlighted these as the two highest risk impacts (Appendix 1). However, only “level shear” impacts are considered to be high severity and are attributed solely to rope interactions whereas “strike” impacts are assessed as low severity and are attributable to pot and anchor interactions.

Of the 76 impacts observed, 45 of these could be provided an impact as defined within the Tibbet *et al.,* (2020) report whereas the remaining 31 impacts were placed in broader categories that encapsulated multiple types of similar impacts (Table 3). Addressing the 45 incidences first, 66.67% of these were attributable to ‘grating’ (30 observed impacts) with ‘cuts’ being the second most frequently observed with 15.56% (7 observed impacts). As opposed to findings in Tibbet *et al*., (2020), only a singular ‘level shear’ impact was observed out of the 76 impacts that were discovered. In regard to the broader impact categories, 61.29% (19 observed impacts) of the 31 impacts were attributed to ‘grates’ whereas both ‘cuts’ and strikes’ were recorded with 16.13% (5 observed impacts) each. However, the O’Dell and Dewey (2022) report also took into account the presence or the absence of gear where an impact was observed. For this analysis, only the impacts that were observed with gear that was in-situ or within the vicinity (within frame but not directly causing damage) are considered. In this analysis, 25 out of the total 76 impacts observed met the aforementioned specifications. Of these, 16 impacts could be provided an impact category as referred to in Table 2 whereas the remaining 9 impacts were placed into the broader categories detailed in Table 3. ‘Cut’ impacts were most frequently observed with 43.75% (7 observed impacts) of the 16 impacts being recorded whereas ‘abrasion’ and ‘grating’ were joint second most frequently observed incidences with 18.75% (3 observed impacts) each. This trend continued with the broader categories which found 55.56% (5 observed impacts) of the 9 impacts attributable to ‘cuts’ and 33.33% (3 observed impacts) of impact attributable to ‘grates’. Although more ‘cuts’ were observed with gear nearby, ‘grating’ (high severity) and ‘grates’ are likely to be the most prevalent impacts present within the MCZ with 64.47% of the total impacts whereas ‘cuts’ (medium severity) represented 15.79% (Appendix 2).

Medium severity impacts include ‘strike’ damage caused by pots or anchors falling onto chalk structures and ‘cut’ damage where ropes cut into an outcropping piece of chalk. Whilst both of these damage types are likely to increase the rate at which structural complexity of the chalk reduces (by weakening chalk structures making them more vulnerable to natural processes or future interactions with fishing gears), neither represent a loss of structural diversity (and in the case of ‘cut’ damage, it could be argued that structural diversity increases in a manner not dissimilar to the effect of

boring mussels and other ecosystem engineering bioeroders which are in part responsible for the site's structural diversity). Further, where medium severity impacts do lead to a reduction in structural diversity, it can be assumed that there will be an associated 'high severity' impact counted as a consequence and therefore, inclusion of medium severity damage would effectively be double counting. For the purpose of calculating damage rates to the rugged chalk, medium severity impacts are also discarded on this basis.

To summarise, Tibbet *et al.,* (2020) had identified 'level shear' impacts attributed to rope interactions with rugged chalk to be the most frequent high severity impact. In comparison, O'Dell and Dewey found that high severity 'grating' impacts were more frequent than other types of impacts, with 'level shear' only being identified on a single occurrence. It could be assumed that only high severity damage caused by potting gear leads to a reduction in the structural diversity of rugged chalk features, as outlined above. Therefore, adaptations to potting gear should focus on minimising the impacts that pose the highest risk to chalk structures: grating and level shear.

Table 2: Categorisation of the types of impact that could be observed on the chalk bed, including the most likely cause and severity (Tibbet *et al.,* 2020).

Type	Abbreviation	Description	Most likely human cause	Severity
Strike	STR	Top down vertical strike with a visible impact site and shattered chalk in edged pieces	Pot, anchor	Medium
Drag	DRA	Single lines of chalk indentations of unequal width	Pot, anchor	Low
Lift	LIF	Shattered chalk in edged pieces with one edge lifted out	Pot, anchor	High
Abrasion	ABR	Rubbing of epifauna and chalk creating a flattened horizontal plane	Pot, anchor, rope	Low
Grating	GRA	Rubbing of epifauna and chalk on non-horizontal areas creating uneven grooves and chalk debris below the impact site	Pot, anchor	High
Angular rubble	RUB	Clean angular chalk cobbles that indicate disturbance but with no clear cause (see above)	Pot, anchor	High
Burn	BUR	Single line of vertical indentation of approximate equal width	Rope	Low

Saw	SAW	Broken angular rubble in a line as a result of continued vertical burns	Rope	High
Cut	CUT	Single line of horizontal indentation of approximate equal width	Rope	Medium
Level shear	LSH	Horizontal and flat area of exposed chalk as a result of a complete cut	Rope	High
Unlevel shear	USH	Flat (but not necessarily horizontal or level) area of exposed chalk as a result of an incomplete cut or large amount of chalk disturbance in one impact	Pot, anchor, rope	High

Table 3: Impact category as defined in Tibbet *et al.,* (2020) and their corresponding severity and broad impact category.

Impact category (Tibbitt *et al.,* 2020) (Appendix 1)	**Associated severity (Tibbitt *et al.,* 2020)**	**Corresponding broad impact category**
Abrasion	Low	Grates
Drag	Low	Grates
Burn	Low	Cuts
Strike	Medium	Strikes
Cut	Medium	Cuts
Lift	High	Strikes
Grating	High	Grates
Angular rubble	High	Rubble
Saw	High	Cuts
Level shear	High	Cuts
Unlevel shear	High	Cuts

3.0 Sea Trials

A second trial took place on the 14th August 2024 off Wells-next-the-sea. A depiction of the experimental shank of potting gear can be seen in Figure 1, but note that the positions and the number of equipment used on the day varied. Observations gathered from this feasibility study are detailed below.

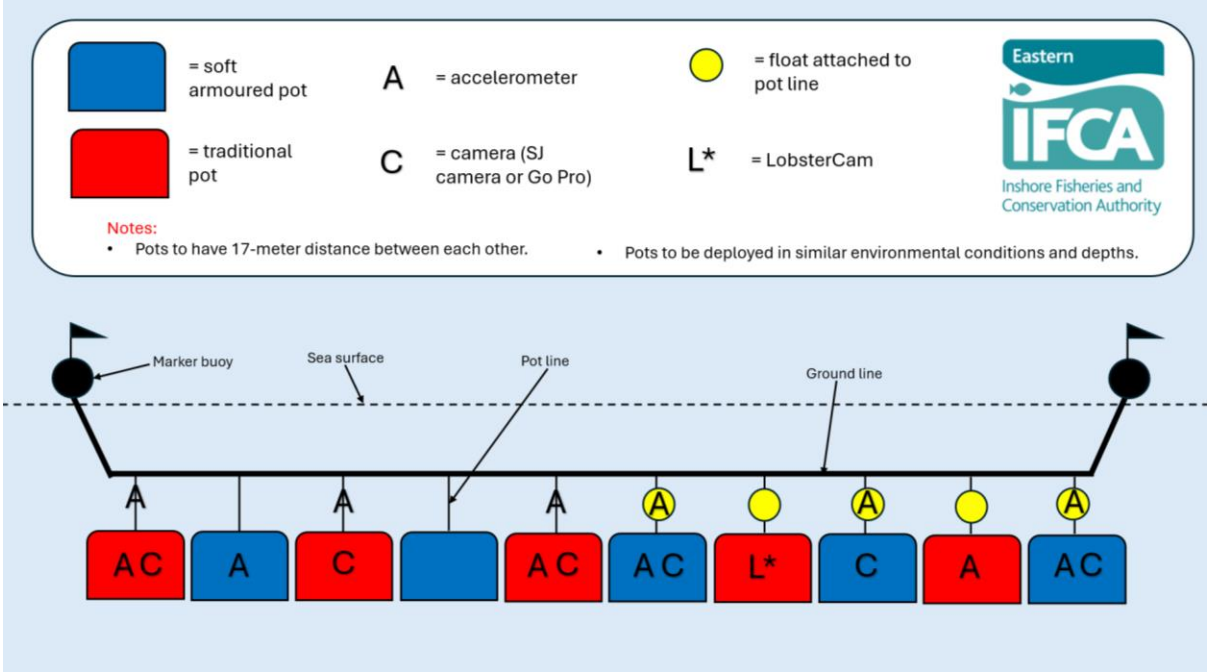


Figure 1: Experimental potting gear shank set-up.

1. One of the plastic floats on the pot lines was found to have flooded during the trial. Whether the float was damaged before or during the sea trial is unclear, but its effectiveness appears compromised. Alternative types of floats were investigated and discussed with IFCOs and fishermen whom agreed that foam floats were the preferred alternative by industry because they are more resilient to becoming damaged during fishing operations. Moreover, even if they do become damaged, they will continue to be positively buoyant, thus increasing their lifespan, and reducing the ongoing financial cost to industry of replacing damaged floats. However, these benefits need to be balanced with their potential to increase marine litter as they degrade. Due to the concerns about increasing marine litter, the foam float alternative was ruled out.

2. The type of rope that is used in the experimental shank of gear and by industry is polypropylene rope, which is inherently buoyant, so irrespective of whether floats are attached to the pot lines these will float when there is sufficient slack in the mainline (Figure 2C, 2G, 2H and 2I). However, when the lines are taut either because of the tide or because of the method that the gear has been deployed, the floats were ineffective at raising the pot lines (Figure 2A and 2B). This trial has highlighted that the addition of floats to the pot lines is not likely to result in a beneficial reduction of damage to chalk features. Removing this modification could alleviate the potential financial burden on fishers if this gear adaptation were approved as a statutory management measure.

3. A challenge that was highlighted through the trial studies showed that attempts to monitor pot line movement behaviour led to issues in data validity. Accelerometers must be orientated in a specific arrangement in order to accurately record data which is representative of the movement behaviour exhibited. Accelerometers that are not oriented correctly, i.e. slanted, will result in readings caused by gravitation pull on all three axis. However, pot lines tend to twist around which can lead to data being inaccurate and difficulties can arise when attempting to interpret the recordings at a later date.

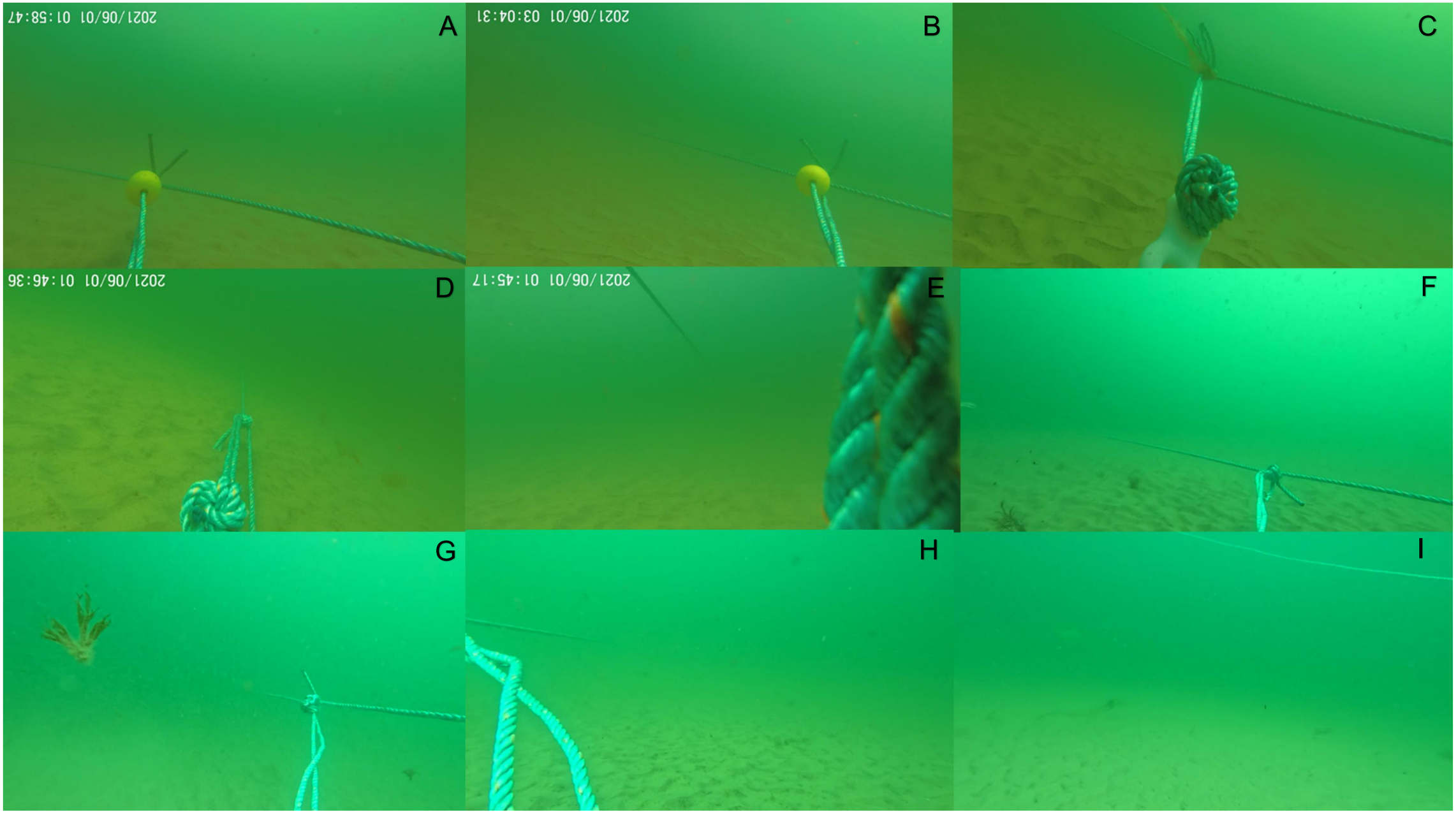


Figure 2: Images taken through pot line facing cameras during the Wells sea trial. Image A = taut floated pot line. Image B = taut floated pot line. Image C = slack non-floated pot line. Image D = taut non-floated pot line. Image E = slack floated pot line. Image F = taut non-floated pot line. Image G = semi-slack non-floated pot line. Image H = slack non-floated pot line. Image I = slack non-floated pot line.

4.0 Fishing Practices

The second sea trial identified that floats were an ineffective measure for raising the ground line. In order to explore possible alternative adaptations, structured dialogue was held with stakeholders to inform a further experimental design phase of the project. Within the R&D TFG meeting (dated 10/10/2024), discussions were held to gather information from scuba divers and industry representatives to better understand how gear is set/observed on dives when in-situ. In addition, discussions around the feasibility of setting gear with slack in the mainline were held to identify whether the effectiveness of the floats could be improved via changes to gear deployment methods. However, the general consensus from this meeting was that the majority of fishers will set their gear taut so as to minimise the pots movement whilst the gear is soaking.

To provide further confidence in this consensus, two fishermen with an understanding of the wider fleets fishing practices provided detailed information. It was outlined that fishing gear is traditionally set taut within the MCZ (Figure 3) and is the method that has been passed down from generation to generation. This is primarily to minimise pots from moving during tidal cycles and severe weather conditions as moving pots are less effective at fishing and more likely to cause damage to chalk features. Moreover, pots that have been unintentionally set with slack in mainline can lead to higher incidences of limb loss in crabs and lobster, thereby reducing the value of the catch.

Figure 3: Commercial fishing gear in-situ.

Another aspect that must be considered is the feasibility of enforcing any potential statutory management measures that are introduced. Monitoring and enforcement of fishing gear to determine whether it had been set taut or with slack would be difficult and likely to prove ineffective. However, as detailed above, setting the groundline slack

could increase the damage caused by the pots if they moved more, Moreover, intentionally setting gear slack has the potential to increase the risk of cetacean entanglements, as has been found in some Scottish fisheries (Calderan et al., 2024). While this risk isn't as significant as in other creel fisheries across the UK, adding this pressure should be avoided. Especially considering ongoing research in Scotland aims to mitigate cetacean entanglements by lowering ropes (Calderan et al., 2024).

In summary, it was determined that floats on the pot lines are not a feasible adaptation because they require slack to effectively raise the mainline. However, gear set with slack would result in a reduced catch and could potentially cause more damage to the rugged chalk as pots are more likely to move around during severe weather and tidal cycles.

5.0 Next Steps

Evidence presented in this report has shown floats on the pot lines would be an ineffective adaptation for reducing the impacts caused by ropes on the chalk features.. Rather than pursue this further as a potential adaptation, it would be more beneficial to focus the available resources to thoroughly test the effectiveness of soft-armoured pots‘

Removing pot line floats from this research opens up more capacity to study the interactions that pots have on the rugged chalk features. This can be achieved by using the cameras and accelerometers that would have been required to study the floats to improve the information captured when studying the adaptations to the pots. For instance, the additional cameras will provide coverage of all four corners of the pot during deployment, the soak period and recovery of the pot, Figure 4. As the corners of the pots are potentially responsible for causing a high proportion of the damage that pots cause, focusing more cameras on them is desirable. Moreover, these extra camera angles can capture interactions that happen when a pot moves over chalk features.

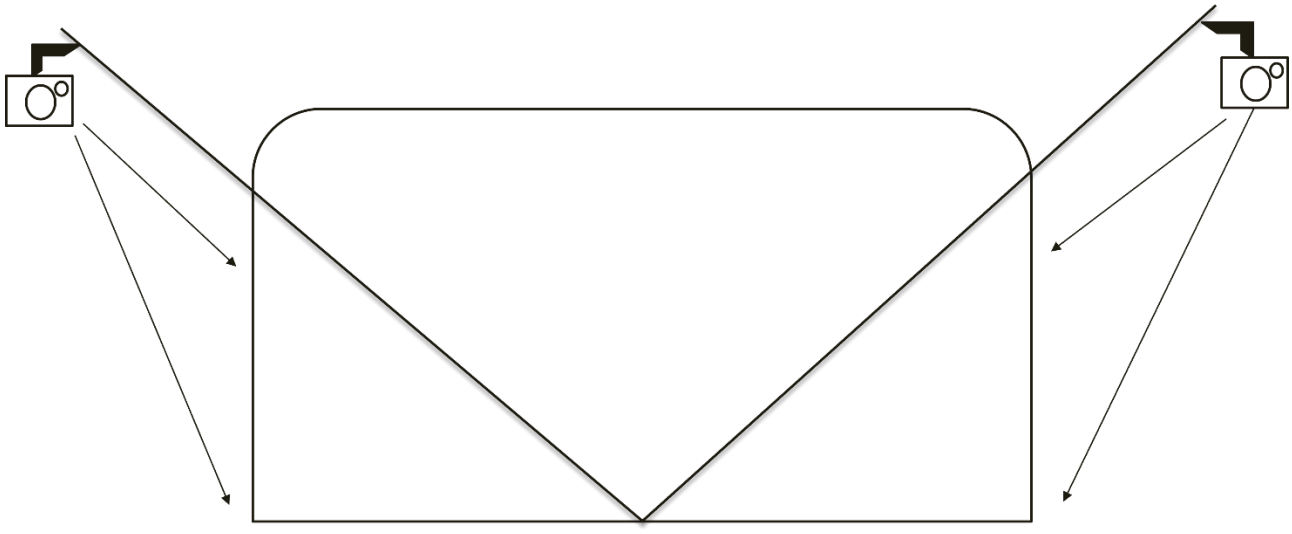


Figure 4: Camera positioning option that prioritises capturing the four corners of the pot. Aluminium tubes will be fixed with jubilee clips to secure the tubes to the pole and cameras will be tethered to the pot as well as the tube to prevent the loss of equipment.

Recent information had highlighted that the control pots in this study (totally unarmoured) are rarely deployed within the MCZ as the majority of the fishing fleet use smaller single parlour pots and use some form of armouring to protect them against weathering. To better reflect the gear used within the site, a third type of pot could be introduced into the study that falls between the two extremes: double parlour pot with no armouring, single parlour pot with some armouring and double parlour pot with full armouring. However, as there is no standardised pot design used by the industry, there are too many variations to test each. The current experimental design is intended to test the effect that armouring a pot has. The current unarmoured control pots represent one extreme of an unarmoured to fully armoured scale, while the adapted pots represent the other extreme of that scale. Semi-armoured pots currently used by the industry will fit somewhere along that continuum. While it would be desirable to include different sizes of pots used by the fishery in the experiment, there is not a standard size used by the industry, so doing so would not effectively test all current designs. As the inclusion of further gear variations would detract from the current study, it is suggested that the size of pot is something that could be tested in future studies.

6.0 Summary

To summarise, two high severity impacts were initially identified as being the highest risk, these being: grating and level shear (by Tibbet et al). This informed the initial plans of which gear modifications should be prioritised. Feasibility studies conducted in the summer of 2024 provided evidence that floats were ineffective at raising the ropes when the shank of gear was pulled taut and that buoyant non-floated rope could achieve similar buoyancy when the gear was slack. Moreover, it had identified challenges with the validity of the data being recorded due to the nature of the ropes which had the accelerometers attached. Discussions with the R&D TFG and fishermen had highlighted that setting potting gear slack is not a feasible option due to a decline fishing effectiveness, potential increase of damage due to more movement of the pots, difficulties of enforcing potential management measures and the risk of increasing cetacean entanglements. Due to the above reasons, it is proposed that the ‘floats on the pot line’ modification is not continued further and that a singular adaption is made the primary focus of the adaptive gear trials study.

References

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Appendices

Appendix 1: Table (A) displays the frequency of damage that occurred at each site surveyed that can be attributed to human activity, the severity of impacts (top row) are coloured as follows; green = low, medium = orange and high = red. Table (B) displays the risk matrix which has been formulated using the likelihood and severity scores from Tables (C) and (D). Table (E) displays the risk score associated with each of the impacts, highlighted in orange are the highest risk impacts.

A

	STR	DRA	LIF	ABR	GRA	RUB	SAW	BUR	CUT	LSH	USH	TOTAL
W. Sheringham	2	1	0	14	1	1	1	2	1	7	0	30
W. Runton	3	0	0	7	0	0	0	1	0	1	0	12
E. Runton	12	0	2	6	0	0	1	0	1	1	0	23
TOTAL	**17**	**1**	**2**	**26**	**1**	**1**	**2**	**3**	**2**	**9**	**0**	**65**
PERCENTAGE	26.56%	1.56%	3.13%	40.63%	1.56%	1.56%	3.13%	4.69%	3.13%	14.06%	0.00%	100.00%

B

Severity/Likelihood	Rare	Unlikely	Possible	Likely	Almost certain
Low	1	2	3	4	5
Medium	2	4	6	8	10
High	3	6	9	12	15

C

Likelihood		
1	<5%	Rare
2	5%-20%	Unlikely
3	20%-50%	Possible
4	50%-80%	Likely
5	>80%	Almost certain

D

Severity	
1	Low
2	Medium
3	High

E

Type of Impact	Risk Score
STR	**6**
DRA	**1**
LIF	**3**
ABR	**3**
GRA	**3**
RUB	**3**
SAW	**3**
BUR	**1**
CUT	**2**
LSH	**6**
USH	**3**

Appendix 2: Table (A) displays the total impacts observed within the O'Dell and Dewey (2022) report, the severity of these impacts (top row) are coloured as follows; green = low, medium = orange and high = red. Table (B) displays the total impacts for the broader categories, whereby individual types of impacts could not be classified. Table (C) displays the impacts that's were observed with potting gear within the vicinity or in-situ, with the severity of these impacts (top row) coloured as follows; green = low, medium = orange and high = red. Table (D) displays the broader category impacts that were observed with potting gear in the vicinity or in-situ.

A

	STR	DRA	LIF	ABR	GRA	RUB	SAW	BUR	CUT	LSH	USH	TOTAL
Impacts observed	1	0	0	4	30	1	0	1	7	1	0	45
Percentage	2.22%	0%	0%	8.89%	66.67%	2.22%	0%	2.22%	15.56%	2.22%	0%	100%

B

	Grates	Cuts	Strikes	Rubble	**TOTAL**
Impacts observed	19	5	5	2	31
Percentage	61.29%	16.13%	16.13%	6.45%	100%

C

	STR	DRA	LIF	ABR	GRA	RUB	SAW	BUR	CUT	LSH	USH	TOTAL
Impacts observed	1	0	0	3	3	0	0	1	7	1	0	16
Percentage	6.25%	0%	0%	18.75%	18.75%	0%	0%	6.25%	43.75%	6.25%	0%	100%

D

	Grates	Cuts	Strikes	Rubble	**TOTAL**
Impacts observed	3	5	1	0	9
Percentage	33.33	55.56	11.11	0.00	1.00