Pots, Traps & Creels Interactions with Maerl

1. Introduction

The Assessing Welsh Fishing Activities (AWFA) Project is a structured risk-based approach to determining impacts from current and potential fishing activities (undertaken from licensed and registered commercial fishing vessels), upon the features of European marine sites (EMS) in Wales.

Further details of the AWFA Project, and all completed assessments to date, can be found on the AWFA website.

The methods and process used to classify the risk of interactions between fishing gears and EMS features, as either purple (high), orange (medium) or green (low) risk, can be found in the AWFA Project Phase 1 outputs: Principles and Prioritisation Report and resulting Matrix spreadsheet.

2. Assessment summary

Assessment Summary: **Pots, Traps & Creels** **Interactions with Maerl**	**<u>Assessment of impact pathway 1: Physical damage to a designated habitat feature:</u>** No studies were found that directly measured or estimated the impacts of potting on Maerl. Indirect evidence, expert judgement and indicative MarLIN sensitivity assessments suggest the impact from pots, weights or anchors making contact with Maerl would cause permanent or long-term physical damage to the biogenic structure. **<u>Assessment of impact pathway 2: Damage to a designated habitat feature via removal of, or other detrimental impact to, associated biological communities:</u>** No studies were found that directly measured or estimated the impacts of potting on Maerl. Indirect evidence, expert judgement and indicative MarLIN sensitivity assessments suggest the impact from pots, weights or anchors making contact with Maerl would cause permanent or long-term damage to the living biological structure and communities. Confidence in this assessment is **low** (please see section 8).

3. Feature description

Feature Description: **Maerl**	Maerl is a generic term for nodule forming calcareous red algae and is comprised of three species in Britain; *Phymatolithon calcareum*, *Lithothamnion coralloides* and *Lithothamnion glaciale*. The 'Maerl beds' biotope complex (SS.SMp.Mrl) encompasses a number of biotopes (see Annex 1 for full biotope description and definition). *Phymatolithon calcareum* dominates in SMp.Mrl.Pcal (and its sub-biotopes SMp.Mrl.Pcal.R, and SMp.Mrl.Pcal.Nmix), *Lithothamnion corallioides* dominates in SMp.Mrl.Lcor and *Lithothamnion glaciale* dominates in variable salinity (SMp.Mrl.Lgla). In all cases the dominant Maerl forms a unique habitat that supports a diverse assemblage of species (Perry *et al*., 2020). Both *Phymatolithon calcareum* and *Lithothamnion coralloides* are listed in the EC Habitats Directive Annex V (CD, 1992) which restricts the exploitation and taking in the wild. *Lithothamnion corallioides* is listed on Section 7 of the Environment (Wales) Act 2016 and the OSPAR list of threatened and/or declining species and habitats. *Phymatolithon calcareum* and *Lithothamnion corallioides* form the only live Maerl bed known in Wales (Bunker *et al*., 2007; Bunker, 2011; Carro *et al.*, 2014). Beds of Maerl predominantly occur in coarse clean sediments of gravels and clean sands, either on the open coast or in tide-swept channels or sheltered areas of marine inlets. In fully marine conditions the dominant Maerl is typically *Phymatolithon calcareum* (SMp.Mrl.Pcal) (Perry *et al.*, 2020). Maerl is a fragile long lived and slow growing calcified red algae which grows in unattached nodules on the seabed. It favours clear clean seawater, is intolerant of siltation (Wilson *et al*., 2004) and thrives mainly in areas of moderate tidal flow (Bunker *et al*., 2007). Maerl beds are an important habitat for a multitude of animals and plants which live attached to the branches, in the spaces between, or burrow in the coarse gravel of dead Maerl beneath (Bunker *et al*., 2007). As Maerl requires light to photosynthesize, the depth of live beds is determined by water turbidity, it can occur from the lower shore to approximately 40m (Hall-Spencer *et al*., 2010), although in Welsh waters the distribution is restricted to shallower waters. In Wales, the only known Maerl bed is found at Milford Haven Waterway within the Pembrokeshire Marine SAC.

4. Gear description

Gear Description: Pots, Traps & Creels	Pots, traps and creels (pots) are rigid cage-like structures designed to capture fish or shellfish species living on or near the seabed (FAO, 2001; Seafish, 2020a). They typically comprise one or more funnel-shaped entrances that guide fish or shellfish into one or more easily accessed and usually baited compartments (FAO, 2001; Seafish, 2020a). UK pot designs, sizes and construction materials vary geographically and according to target species, environmental conditions and fisher's preference (Seafish, 2020a). Top-entry inkwell pots (0.28-0.47 m^2 footprint) and side or top-entry parlour pots or 'D-creels' (0.24-0.55 m^2 footprint) weighing 15-20kg are used to catch crab or lobster and are made from wire, rubber, metal and netting (Gravestock, 2018; Cornwall Creels, 2020; Seafish, 2020a). Solid sided 20-30 litre rectangular containers with holes in the sides (0.09-0.14 m^2 footprint), a mesh funnel at the top, a concrete bottom and weighing 6-12kg are used to target whelks (Channel Pots, 2020; Seafish, 2020c). Lightweight plastic tubular pots with small-mesh sides and funnel entries at either end are used to target prawns (Coastal Nets, 2020; Seafish, 2020a). Pots can be fished individually or in strings (fleets), where several pots are attached to a length of rope, laid along the seabed and marked at either end with a rope to the surface and a marker buoy (Seafish, 2020a). The number of pots in a fleet will depend on factors including pot design, target species, habitat fished, fisher's preference, vessel size and the available deck space to store the pots once they have been hauled (Seafish, 2020b). Fishers can have multiple strings of pots deployed at any one time, hauled following a soak time of 24-48 hours (Seafish, 2020a). Multi-compartment 'parlour' pots generally retain catch for longer periods making them more suitable for longer soak times, whereas single-compartment 'inkwell' pots are subject to more escapees during longer soak times (Swarbrick & Arkley, 2002). Strings of lighter traps, such as prawn creels, use anchors or weights at either end to reduce movement in tides (Seafish, 2020a). Other pots are designed to be heavy or utilise concrete-weighted end-pots that replace the need for anchors or weights (Seafish, 2020b). Strings of pots are deployed (or shot) one at a time whilst the boat slowly moves over the target fishing ground (Seafish, 2020a). Single pots are generally set in rocky inshore areas and can be bounced along the seabed until they contact rock or reef (FAO, 2001). Baited pots can capture undersized target species, non-target invertebrates and occasionally fish species (Pantin *et al.*, 2015). However, the use of appropriate-sized mesh coverings, or the addition of large-mesh panels or escape-gaps, can ensure smaller individuals and non-target species are able to escape (Seafish, 2020a).

5. Assessment of impact pathways

Assessment of impact pathway 1	**1. Physical damage to a designated habitat feature (Physical Impacts)** No studies were found that directly measured or estimated the impacts of potting on Maerl. Various reports raise concerns over the potential impacts from static gear lines becoming entangled (Fossa *et al.*, 2002; Chiappone *et al.*, 2005) and from gear and anchors colliding with sensitive structures and the delicate form of the Maerl (Fossa *et al.*, 2002; Hall-Spencer *et al.*, 2002) resulting in the potential physical loss of the Maerl habitat. If potting were to occur across Maerl habitat, the general physical impacts from static gear, including pots, weights or anchors, making contact with the seabed during gear deployment could cause surface disturbance and abrasion (JNCC & NE, 2011; Walmsley *et al.*, 2015; Fossa *et al.*, 2002; Hall-Spencer *et al.*, 2002). Where pots are fixed in strings, the retrieval of pots, or incidences of rough weather, could lead to ropes, pots and anchors dragging over or entangling seabed structures, potentially causing physical damage or abrasion to the seabed (MacDonald *et al.*, 1996; Roberts *et al.*, 2010; JNCC & NE, 2011; Fossa *et al.*, 2002; Chiappone *et al.*, 2005). During spring tides, strong wind and large waves may cause unintentional movement of pots and any associated seabed abrasion could be increased (Eno *et al.*, 2001; Sørensen *et al.*, 2015; Stephenson *et al.*, 2015). Maerl is comprised of a living biogenic physical structure created by organisms. Maerl biotopes have been assessed to a range of pressures by MarLIN (Tyler-Walters *et al.*, 2018). Relevant pressures for the assessment of potting impacts are primarily abrasion and penetration of the sediment. MarLIN abrasion and penetration sensitivity assessments for Maerl biotopes shown in Annex 1 conclude: all biotopes have a high sensitivity to abrasion and penetration. Please refer to the MarLIN website which provides further information about the assessment methodology and the supporting evidence (www.marlin.ac.uk/). The impacts from pots, weights or anchors making contact with Maerl would cause permanent or long-term physical damage to the biogenic structure.
Assessment of impact pathway 2	**2. Damage to a designated habitat feature via removal of, or other detrimental impact to, associated biological communities (Impacts on Biological Communities)**

	No studies were found that directly measured or estimated impacts of potting on the biological communities of Maerl. General assessments of the impact of static gear on biogenic habitats suggest that removal or damage to the structuring biota will reduce the biological complexity of communities and decrease the ability of the community to support biodiversity (ICES, 2002, 2003, 2006; Hall *et al.*, 2008). Mobile species are less vulnerable to physical damage from potting compared to sessile epifauna (Gall, 2016; 2020). Echinoderms (*Asterias rubens* and *Echinus esculentus*) rolled or were gently moved away from the pot impact zone by the pressure wave preceding the moving pot (Gall, 2016; 2020). If potting were to occur across Maerl habitat, the general physical impacts from static gear, including pots, weights or anchors, making contact with the delicate form of the Maerl during gear deployment could cause surface disturbance and abrasion to biological communities (JNCC & NE, 2011; Walmsley *et al*., 2015). Where pots are fixed in strings, the retrieval of pots, or incidences of rough weather, could lead to ropes, pots and anchors dragging over or entangling Maerl structures, potentially causing physical damage or abrasion to the biological communities (MacDonald *et al*., 1996; Roberts *et al*., 2010; JNCC & NE, 2011, Gall *et al*., 2020). During spring tides, strong wind and large waves may cause unintentional movement of pots and any associated seabed abrasion could be increased (Eno *et al*., 2001; Sørensen *et al*., 2015; Stephenson *et al*., 2015). Maerl biotopes have been assessed to a range of pressures by MarLIN (Tyler-Walters *et al.*, 2018). Relevant pressures for the assessment of potting impacts are primarily abrasion and penetration of the sediment. MarLIN abrasion and penetration sensitivity assessments for Maerl biotopes shown in Annex 1 conclude: all biotopes have a high sensitivity to abrasion and penetration. Please refer to the MarLIN website which provides further information about the assessment methodology and the supporting evidence (www.marlin.ac.uk/). The impacts from pots, weights or anchors making contact with Maerl would cause permanent or long-term damage to the living biological structure and communities.

6. SACs where the habitat occurs as a component of a designated feature

Pembrokeshire Marine SAC	The Pembrokeshire Marine SAC contains examples of the Maerl habitat, as evidenced by data and relevant literature (NRW, 2018). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Maerl habitat within the Pembrokeshire Marine SAC: 1. Large shallow inlets and bays Since 2005 there has been a 91.7% decline in live Maerl (Bunker, 2011; NRW, 2018; NRW internal communication, 2021). It is not known what has caused the decline in Maerl, but possible causes include fisheries activities, increases in sediment, increases in chemical contaminants and invasive species (NRW internal communication, 2021).

7. Evidence Gaps

- Direct studies to measure the impacts from potting on Maerl habitat.
- A study comparing the impacts from different types of pots and methods of potting.

8. Confidence assessment

The confidence score is the sum of scores from three evidence components: quality, applicability and agreement. These are qualitatively assessed as high, medium or low using the most appropriate statements in the table below, and these are numerically represented as scores of 3, 2, or 1 respectively.

A total confidence score of 3 – 5 represents low confidence, 6 or 7 shows medium confidence and 8 or 9 demonstrates high confidence in the evidence used in the assessment.

This assessment scores 4, representing low confidence in the evidence.

Confidence	Evidence quality	Evidence applicability	Evidence agreement
High	Based on more than 3 recent and relevant peer reviewed papers or grey literature from established agencies.	Based on the fishing gear acting on the feature in the UK.	Strong agreement between multiple (>3) evidence sources.
Medium	Based on either relevant but older peer reviewed papers or grey literature from less established agencies; or based on only 2-3 recent and relevant peer reviewed evidence sources.	Based on similar fishing gears, or other activities with a similar impact, acting on the feature in the UK.	**Some disagreement but majority of evidence agrees. Or fewer than 3 evidence sources used.** **Score 2.**
Low	**Based on either less relevant or older grey literature from less established agencies; or based on only 1 recent and relevant peer reviewed evidence source.** **Score 1.**	**Based on similar fishing gears acting on the feature in other areas, or the fishing gear acting upon a similar feature in the UK.** **Score 1.**	Little agreement between evidence.

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Annex 1: Welsh biotopes included in the AWFA potting and Maerl assessment

The term ‘biotope’ refers to both the physical environment (e.g. substrate) and the unique set of species associated with that environment (Tyler-Walters and Jackson, 1999). Biotopes are defined by the JNCC Marine Habitat Classification for Britain and Ireland Version 15.03 (https://mhc.jncc.gov.uk/) and sensitivities to abrasion and penetration are from the Marine Evidence based Sensitivity Assessment (MarESA) (https://www.marlin.ac.uk/sensitivity/sensitivity_rationale). The MarESA approach considers a range of pressures and benchmarks for all biotopes using all available evidence and expertise (Tyler-Walters *et al*., 2018). The MarESA sensitivity to abrasion and penetration assessments highlighted in the table below consider any type of potential abrasion to the surface substratum and associated biology and do not specifically refer to potting activity (Tyler-Walters *et al*., 2018). High sensitivity indicates a significant loss of species combined with a recovery time of more than 10 years. Medium sensitivity indicates either significant mortality combined with medium recovery times (2-10 years) or lower mortality with recovery times varying from 2 to 25+ years. Whilst a low sensitivity indicates a full recovery within 2 years.

Component Biotopes	MarESA sensitivity to abrasion	MarESA sensitivity to penetration
SMp.Mrl.Pcal	High	High
SMp.Mrl.Pcal.R	High	High
SMp.Mrl.Lcor	High	High