Pots, Traps & Creels Interactions with Subtidal Gravel and Sand

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 Subtidal** **Gravel and Sand**	**<u>Assessment of impact pathway 1: Physical damage to a designated habitat feature:</u>** No studies were found that directly or indirectly measured or estimated impacts of potting on Subtidal Gravel and Sand or similar habitats. Expert judgement suggests the impacts from pots, weights or anchors making contact with Subtidal Gravel and Sand habitat could cause damage to the substrate. **<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 or indirectly measured or estimated impacts of potting on Subtidal Gravel and Sand or similar habitats. Expert judgement and indicative MarLIN sensitivity assessments suggest the impacts from pots, weights or anchors making contact with subtidal Subtidal Gravel and Sand habitat could cause damage to some of the biological communities. Confidence in this assessment is **low** (please see section 8).

3. Feature description

Feature Description: **Subtidal Gravel and Sand**	Subtidal Gravels and Sands are found from shallow areas, below the extreme low water mark (infralittoral), to circalittoral and offshore habitats. This habitat ranges from mainly sand of various size classes, through various combinations of sand and gravel, to mainly gravel (BRIG, 2011). While very large areas are covered by sand and gravel in various combinations, much of this area is covered by very thin deposits over bedrock, glacial drift or mud (BRIG, 2011). Muddy Sands, Subtidal Sands (High energy) and Coarse Sediment (High energy) are not included in this habitat for the purposes of the assessments as they are covered by other habitat descriptions. Subtidal Gravel and Sand habitat described here generally include the more stable components of this habitat. Areas of coarse to medium sands and gravels, often found in areas with some tidal streams and some wave action, have characteristic fauna including robust infaunal polychaetes (e.g. *Mediomastus fragilis, Lanice conchilega, Chaetozone setosa, Glycera lapidum*) and bivalves (venerid bivalves such as *Moerella spp., Dosinia lupinus and Timoclea ovata*). Also typical are cumacean crustacea (*Iphinoe trispinosa* and *Diastylis bradyi*) and mobile crustacea. Common biotopes (see Annex 1 for definition) in Wales include SS.SCS.CCS.MedLumVen (which is often variable and considered akin to a 'biotope complex' (JNCC, 2015), SS.SCS.ICS.SLan and SS.SCS.ICS.MoeVen. Sea cucumbers (e.g. *Neopentadactyla mixta)* may be prevalent in circalittoral areas associated with the biotope (SS.SCS.CCS.Nmix). Subtidal 'sands' consist of clean, medium to fine sands or non-cohesive slightly muddy sands on open coasts, offshore or in estuaries and marine inlets (JNCC, 2015). Circalittoral and offshore medium to fine sands tend to be more stable and consequently, support a more diverse community than their infralittoral counterparts. Circalittoral fine sands typically support polychaetes (*e.g. Scoloplos armiger*), amphipods (e.g. *Bathyporeia elegans*) and bivalves (e.g. *Abra prismatica)*, typically in the biotope SS.SSa.CFiSa.ApriBatPo. This biotope is found in Wales predominantly in Conwy Bay and St. Brides Bay, with other records off the south Lleyn Peninsula. The offshore, species poor coarse sand biotope SS.SCS.OCS.HeloPkef, supporting polychaetes *Hesionura elongata* and *Protodorvillea kefersteini,* was found in a number of locations including in Caernarfon Bay, Cardigan Bay and off the west coast of Anglesey (Robinson *et al,* 2009).

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 or indirectly measured or estimated impacts of potting on Subtidal Gravel and Sand or similar habitats. Assessments based on expert knowledge suggest that potting is of limited concern to Subtidal Gravel and Sand (Roberts *et al.*, 2010; Hall *et al.*, 2008; JNCC and NE, 2011). If potting were to occur across Subtidal Gravel and Sand, the general physical impacts from static gear, including pots, weights or anchors, making contact with the seabed during gear deployment could cause surface disturbance (e.g. scour marks) in the sediment (JNCC and NE, 2011; Walmsley *et al.*, 2015; Gall *et al*., 2020). However, it seems unlikely that impacts from potting would prevent feature recovery in the long term, as these habitats are subject to some sediment movement due to wave and/or tidal action (Hall *et al*., 2008; 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 seabed structures, potentially causing physical damage or abrasion to the seabed (MacDonald *et al.*, 1996; Roberts *et al.*, 2010; JNCC and NE, 2011). 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). Depending on the footprint and the intensity of potting it is possible that the impacts from pots, weights or anchors making contact with Subtidal Gravel and Sand habitat could cause damage to the substrate (Walmsley *et al*., 2015).
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 or indirectly measured impacts of potting on Subtidal Gravel and Sand or similar habitats. If potting were to occur across Subtidal Gravel and Sand, 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 to biological communities (Roberts *et al.*, 2010; JNCC and NE, 2011; Walmsley *et al.*, 2015; Gall *et al*., 2020). 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 biological communities (MacDonald *et al.*, 1996; Roberts *et al.*, 2010; JNCC and 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). If there is a sensitive species, further assessment of the intensity of potting activity is recommended (Walmsley *et al.*, 2015). Subtidal Gravel and Sand biotopes have been assessed to a range of pressures by MarLIN (Tillin and Rayment, 2016). Relevant pressures for the assessment of potting impacts are primarily abrasion and penetration of the sediment. MarLIN abrasion and penetration sensitivity assessments for Subtidal Gravel and Sand biotopes shown in Annex 1 conclude: the majority of biotopes have a low sensitivity to abrasion (7 biotopes) and penetration (6 biotopes) with 3 biotopes of medium sensitivity. Please refer to the MarLIN website which provides further information about the assessment methodology and the supporting evidence (www.marlin.ac.uk/). Depending on the footprint and the intensity of potting it is possible that the impacts from pots, weights or anchors making contact with subtidal Subtidal Gravel and Sand habitat could cause damage to some of the biological communities.

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

Menai Strait and Conwy Bay SAC	The Menai Strait and Conwy Bay SAC contains examples of the Subtidal Gravel and Sand habitat, as evidenced by data and relevant literature (NRW, 2018a). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Subtidal Gravel and Sand habitat within the Menai Strait and Conwy Bay SAC: 1. Large Shallow Inlets and Bays 2. Sandbanks which are slightly covered by seawater at low tide
Carmarthen Bay and Estuaries SAC	The Carmarthen Bay and Estuaries SAC contains examples of the Subtidal Gravel and Sand habitat, as evidenced by data and relevant literature (NRW, 2018b). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Subtidal Gravel and Sand habitat within the Carmarthen Bay and Estuaries SAC: 1. Large shallow inlets and bays 2. Sandbanks which are slightly covered by sea water all the time

Pembrokeshire Marine SAC	The Pembrokeshire Marine SAC contains examples of the Subtidal Gravel and Sand habitat, as evidenced by data and relevant literature (NRW, 2018c). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Subtidal Gravel and Sand habitat within the Pembrokeshire Marine SAC: 1. Estuaries 2. Large shallow inlets and bays 3. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge) 4. Sandbanks which are slightly covered by seawater at low tide
Lleyn Peninsula and the Sarnau SAC	The Lleyn Peninsula and the Sarnau SAC contains examples of the Subtidal Gravel and Sand habitat, as evidenced by data and relevant literature (NRW, 2018d). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Subtidal Gravel and Sand habitat within the Lleyn Peninsula and the Sarnau SAC: 1. Large shallow inlets and bays 2. Sandbanks which are slightly covered by seawater all the time
Cardigan Bay SAC	The Cardigan Bay SAC contains examples of the Subtidal Gravel and Sand habitat, as evidenced by data and relevant literature (NRW, 2018e). Please see the latest SAC feature condition assessment for information on the location and condition of features. The following features contain Subtidal Gravel and Sand habitat within the Cardigan Bay SAC: 1. Sandbanks

7. Evidence Gaps

- Direct studies to measure the impacts from potting on Subtidal Gravel and Sand 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 5, 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.** **Score 2.**	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.	**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.

N.B. When evidence is indirect the evidence quality and applicability will be capped to medium, to ensure that direct evidence gaps are captured in this approach.

9. References

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Annex 1: Welsh biotopes included in the AWFA potting and Subtidal Gravel and Sand 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.

Sublittoral sediments	MarESA sensitivity to abrasion	MarESA sensitivity to penetration
SS.SCS.CCS.MedLumVen	Low	Low
SS.SCS.CCS.Nmix	Not sensitive	Medium
SS.SCS.ICS.CumCset	Low	Low
SS.SCS.ICS.HchrEdw	Not sensitive	Medium
SS.SCS.ICS.MoeVen	Low	Low
SS.SCS.ICS.SLan	Not sensitive	Not sensitive
SS.SSa.CFiSa.ApriBatPo	Low	Low
SS.SSa.CFiSa.EpusOborApri	Low	Low
SS.SSa.IFiSa.TbAmPo	Low	Medium
SS.SCS.OCS	Not assessed	Not assessed
SS.SCS.OCS.HeloPkef	Low	Low