# Pots, Traps & Creels Interactions with Seagrass

## 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.

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| **Assessment Summary:**<br>**Pots, Traps & Creels Interactions with Seagrass (SACs)** | **Assessment of impact pathway 1: Physical damage to a designated habitat feature:**<br><br>As potting is a subtidal activity it is unlikely to interact with intertidal parts of this habitat. Direct evidence, expert judgement and indicative MarLIN sensitivity assessments suggest that the physical impacts from pots, weights or anchors making contact with subtidal parts of the Seagrass habitat could cause damage to the biogenic feature e.g. smothering of fronds, movement of sediment.<br><br>**Assessment of impact pathway 2: Damage to a designated habitat feature via removal of, or other detrimental impact to, associated biological communities:**<br><br>As potting is a subtidal activity it is unlikely to interact with intertidal parts of this habitat. Direct evidence, expert judgement and indicative MarLIN sensitivity assessments suggest the impacts from pots weights or anchors making contact with the subtidal parts of the Seagrass habitat could cause damage to the subtidal biological communities.<br><br>Confidence in this assessment is **medium** (please see section 8). |

## 3. Feature description

| **Feature Description:**<br><br>**Seagrass (SACs)** | Seagrass beds are comprised of several relevant biotopes (see Annex 1 for full list of biotopes and definition).<br><br>Intertidal seagrass beds biotope LS.LMp.LSgr (and its sub-biotope LS.LMp.LSgr.Znol) are typically dominated by *Zostera noltei*.<br><br>Subtidal seagrass beds biotope SS.SMp.SSgr has sub-biotopes SS.SMp.SSgr.Zmar (dominated by *Zostera marina/angustifolia* (Note: the taxonomic status of *Z. angustifolia* is currently under consideration, currently *Z. angustifolia* is considered a synonym of *Z. marina*) and SS.SMp.SSgr.Rup (featuring *Ruppia maritima*).<br><br>Seagrass beds develop in intertidal and shallow subtidal areas on sands and muds. They may be found in marine inlets and bays but also in other areas, such as lagoons and channels, which are sheltered from significant wave action (BRIG, 2008).<br><br>The *Zostera* species that occur in the UK all are considered to be scarce. Dwarf eelgrass *Zostera noltei* is found highest on the shore, often adjacent to lower saltmarsh communities. Narrow-leaved eelgrass *Zostera marina* is found on the mid to lower shore and in the sublittoral. The plants stabilise the substratum, are an important source of organic matter and provide shelter and a surface for attachment by other species.<br><br>Eelgrass is an important source of food for wildfowl which feed on intertidal beds. Where this habitat is well developed the leaves of eelgrass plants may be colonised by diatoms and algae such as *Ulva* spp., *Cladophora ssp,*, Red Seagrass Crust *Rhodophysema georgii*, *Ceramium virgatum*, stalked jellyfish and anemones. The soft sediment infauna may include amphipods, polychaete worms, bivalves and echinoderms.<br><br>The shelter provided by seagrass beds makes them important nursery areas for flatfish and, in some areas, for cephalopods. Adult fish frequently seen in *Zostera* beds include pollack *Pollachius pollachius*, two-spotted goby *Gobiusculus flavescens* and various wrasse species (BRIG, 2008; Bertelli & Unsworth, 2014). Two species of pipefish, *Entelurus aequoraeus* and *Syngnathus typhie* are almost totally restricted to seagrass beds while the red algae *Polysiphonia harveyi* which has only recently been recorded from the British Isles is often associated with eelgrass beds (BRIG, 2008).<br><br>The diversity of species associated with the seagrass bed will depend on environmental factors such as salinity and tidal exposure and the density of microhabitats, but it is potentially highest in the perennial fully marine subtidal communities and may be lowest in intertidal, estuarine, annual beds (BRIG, 2008). |
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| | Although a wide range of species are associated with seagrass beds which provide habitat and food resources, these species occur in a range of other biotopes and were therefore not considered to characterize the sensitivity of this biotope (D'Avack *et al*., 2014).<br><br>Seagrass species are fast-growing and relatively short-lived, they can take a considerable time to recover from damaging events, if recovery does occur at all (D'Avack *et al*. 2014).<br><br>Boese *et al* (2009) found that natural seedling production was not of significance in the recovery of seagrass beds but that recovery was due exclusively to rhizome growth from adjacent perennial beds. All *Zostera* plants have a similar type of structure and they are restricted to horizontal growth of roots and, hence, unable to grow rhizomes vertically. |

## 4. Gear description

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| **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).<br><br>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).<br><br>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 |

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| | preference, vessel size and the available deck space to store the pots once they have been hauled (Seafish, 2020b).<br><br>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).<br><br>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).<br><br>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

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| **Assessment of impact pathway 1** | **1. Physical damage to a designated habitat feature (Physical Impacts)**<br><br>As potting is a subtidal activity it is unlikely to interact with intertidal parts of this habitat.<br><br>Direct studies on the impacts of lobster pots on subtidal Seagrass habitats indicate damage such as leaf shearing, damaging stems, uprooting of plants, smothering and light attenuation may occur (Roberts *et al*., 2010; Walmsley *et al*., 2015, Stevens, 2020). The length of time a pot is submerged for will likely impact the shoot densities of seagrasses too, with longer soak times leading to a reduction in seagrass shoot density (Uhrin *et al*., 2005). It has also been observed that a barren area slightly larger than the pot itself may develop in areas where pots are found, but may be dependent on the timeframe (June & Antonelis, 2009; Stevens, 2020).<br><br>Assessments based on expert knowledge suggests that the severity of the impact on Seagrass habitats will depend on a number of factors including; the number of pots set, the soak time and the frequency of hauling (JNCC and NE, 2011; Walmsley *et al*., 2015; NOAA, 1996; ASMFC, 2000). Seagrass has been assessed as |

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| | having high sensitivity to heavy levels of potting activity, medium sensitivity to moderate and low levels of potting, and low sensitivity to single potting events (Hall *et al.,* 2008; Walmsley *et al*., 2015).<br><br>If potting were to occur across subtidal Seagrass habitats, 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 (Milazzo *et al*., 2004; 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 seabed structures, potentially causing physical damage or abrasion to the seabed (MacDonald *et al*., 1996; Roberts *et al*., 2010; JNCC & 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).<br><br>In addition to the abiotic physical substrate, the Seagrass habitat is comprised of the plants that create the structure. Seagrass biotopes have been assessed to a range of pressures by MarLIN (D'Avack *et al*., 2019 ). Relevant pressures for the assessment of potting impacts are primarily abrasion and penetration of the sediment. MarLIN abrasion and penetration sensitivity assessments for Seagrass biotopes shown in Annex 1 conclude: that 2 biotopes have high sensitivity to penetration and medium sensitivity to abrasion, whilst one biotope has low sensitivity to penetration and abrasion.<br><br>Please refer to the MarLIN website which provides further information about the assessment methodology and the supporting evidence (www.marlin.ac.uk/).<br><br>Depending on the footprint and the intensity of potting it is possible that the physical impacts from pots, weights or anchors making contact with Seagrass habitats could cause damage to the biogenic feature. |
| **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)**<br><br>As potting is a subtidal activity it is unlikely to interact with intertidal parts of this habitat.<br><br>General damage to the seagrass feature is likely to be detrimental to a range of supported species, from microbes living on the leaves to commercially important fish species sheltering between the swathes (Duarte, 2002). Direct Studies on the impacts of lobster pots on Seagrass habitats indicate damage such as leaf shearing, damaging stems, uprooting of plants, smothering and light attenuation may occur (Roberts *et al*., 2010; Walmsley *et al*., 2015, Stevens, 2020) with the length of time an area is covered by a pot potentially causing a reduction in seagrass shoot density (Uhrin *et al*., 2005). It has also been observed that a barren area |

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| | slightly larger than the pot itself may develop in areas where pots are found, but may be dependent on the timeframe (June & Antonelis, 2009; Stevens, 2020).<br><br>Assessments based on expert knowledge suggests that the severity of the impact on Seagrass habitats will depend on a number of factors including; the number of pots set, the soak time and the frequency of hauling (JNCC and NE, 2011; Walmsley *et al*., 2015; NOAA, 1996; ASMFC, 2000). Seagrass has been assessed as having high sensitivity to heavy levels of potting activity, medium sensitivity to moderate and low levels of potting, and low sensitivity to single potting events (Hall *et al*., 2008; Walmsley *et al.,* 2015).<br><br>Mobile species are less vulnerable to physical damage from potting compared to sessile epifauna (Gall *et al*., 2020). Echinoderms (such as *Asterias rubens*) rolled or were gently moved away from the pot impact zone by the pressure wave preceding the moving pot (Gall *et al*., 2020).<br><br>If potting were to occur across Seagrass habitats, 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 (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 seabed 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).<br><br>Seagrass biotopes have been assessed to a range of pressures by MarLIN ( D'Avack *et al*., 2019 ). Relevant pressures for the assessment of potting impacts are primarily abrasion and penetration of the sediment. MarLIN abrasion and penetration sensitivity assessments for Seagrass biotopes shown in Annex 1 conclude: that 2 biotopes have high sensitivity to penetration and medium sensitivity to abrasion, whilst one biotope has low sensitivity to penetration and abrasion.<br><br>Please refer to the MarLIN website which provides further information about the assessment methodology and the supporting evidence (www.marlin.ac.uk/).<br><br>Depending on the footprint and the intensity of potting it is possible that the impacts from pots, weights or anchors making contact with Seagrass habitats could cause damage to the subtidal biological communities. |

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

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| **Menai Strait and Conwy Bay SAC** | The Menai Strait and Conwy Bay SAC contains examples of the seagrass 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.<br><br>The following features contain seagrass habitat within the Menai Strait and Conwy Bay SAC:<br>1. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge)<br>2. Large shallow inlets and bays |
| **Carmarthen Bay and Estuaries SAC** | The Carmarthen Bay and Estuaries SAC contains examples of the seagrass 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.<br><br>The following features contain seagrass habitat within the Carmarthen Bay and Estuaries SAC:<br>1. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge)<br>2. Large Shallow Inlets and Bays<br>3. Estuaries |
| **Pembrokeshire Marine SAC** | The Pembrokeshire Marine SAC contains examples of the seagrass 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.<br><br>The following features contain seagrass habitat within the Pembrokeshire Marine SAC:<br>1. Large shallow inlets and bays<br>2. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge)<br>3. Estuaries |
| **Lleyn Peninsula and the Sarnau SAC** | The Lleyn Peninsula and the Sarnau SAC contains examples of the seagrass 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.<br><br>The following features contain seagrass habitat within the Lleyn Peninsula and the Sarnau SAC:<br>1. Large shallow inlets and bays<br>2. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge) |

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| **Severn Estuary SAC** | The Severn Estuary SAC contains examples of the seagrass 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.<br><br>The following features contain seagrass habitat within the Severn Estuary SAC:<br>1. Mudflats and sandflats not covered by seawater at low tide (at the lower (seaward) edge)<br>2. Estuary |

## 7. Evidence Gaps

- Direct studies to measure the impacts from potting on Seagrass 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 6, representing medium confidence in the evidence.**

| Confidence | Evidence quality | Evidence applicability | Evidence agreement |
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| **High** | **Based on more than 3 recent and relevant peer reviewed papers or grey literature from established agencies. Score 3.** | 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. | **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 Seagrass 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 |
|---|---|---|
| LS.LMp.LSgr.Znol | Medium | High |
| SS.SMp.SSgr.Zmar | Medium | High |
| SS.SMp.SSgr.Rup | Low | Low |