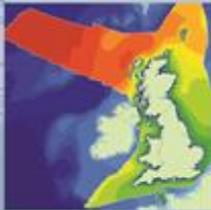


Assessing Welsh Fishing Activities - Phase 1

Principles and prioritisation report

Welsh Government
October 2016

Creating sustainable solutions for the marine environment



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Executive Summary

The Welsh Government commissioned ABPmer to build upon the work carried out by other administrations on fishing gear–feature interactions, tailoring the information to the Welsh context and incorporating new evidence sources. This is Phase 1 of the Assessing Welsh Fishing Activities Project and the outputs of this work are:

- A generic ‘Welsh Matrix’ which identifies the risk of each gear–feature interaction, and prioritises the interactions for further assessment, whilst maintaining a clear audit trail;
- An Evidence Database that compiles relevant evidence on the impacts of each gear–feature interaction; and
- This Principles and Priorities document.

This report provides the principles under which the assessment process of fisheries impacts should be considered, and details the methodology used to arrive at the prioritisation of interactions for assessment.

It is accompanied by an Excel Matrix file showing the step-wise prioritisation process, and an Excel Evidence Database providing summaries of key sources of evidence relating to specific gear–feature interactions.

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1 Introduction

In 2012, the Department for Environment, Food and Rural Affairs (Defra) announced a revised approach to the management of commercial fisheries in European Marine Sites (EMS). The objective of this revised approach is to ensure that all existing and potential commercial fishing activities are managed in accordance with Article 6 of the Habitats and Birds Directives.

The Welsh Government has been assessing new fisheries legislation and permitted activities under Article 6 of the Habitats and Birds Directives for a number of years. Following careful consideration of obligations and resources, Welsh Government has decided, in partnership with its statutory nature conservation advisors Natural Resources Wales (NRW), to undertake a structured evaluation of fishing activity interactions with features of Welsh Marine Protected Areas (MPAs). This is referred to as the Assessing Welsh Fishing Activities (AWFA) Project.

Welsh Government is currently in the process of reviewing all fisheries legislation in Wales. Whilst this is a large task and will take some time to complete this new structured evaluation of the interactions between fishing activities and MPA features/sub-features will contribute towards this review process.

The outputs of AWFA Project will also assist in the delivery of a number of actions from the LIFE Natura 2000 (N2K) Programme for Wales¹, enabling Wales to make significant progress toward bringing EMS habitats and species into favourable condition and helping meet commitments under the Habitats and Birds Directives.

The Welsh Government commissioned ABPmer to build upon the work carried out by other administrations on fishing gear–feature interactions, tailoring the information to the Welsh context and incorporating new evidence sources. This is Phase 1 of the AWFA Project and the outputs of this work are:

- A generic 'Welsh Matrix' which identifies the risk of each gear/feature interaction, and prioritises the interactions for further assessment, whilst maintaining a clear audit trail;
- An Evidence Database that compiles relevant evidence on the impacts of each gear–feature interaction; and
- This Principles and Priorities document.

The scope of the work focuses on Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites within 12 nm of the Welsh coast and considers impacts on habitats as well as mobile species features (e.g. fish, birds and marine mammals). The scope covers existing and potential commercial marine fishing activities from a licensed and registered fishing vessel (hereafter referred to as 'commercial fishing').

The fishing gear classification for the Matrix is based on an existing English Matrix (MMO, 2014), which has been reviewed to ensure that all relevant Welsh fishing activities are reflected and are included within the Matrix. The Matrix is generic, providing a high-level consideration of the risk of impact from fishing gear types against protected habitats and species.

¹ <https://naturalresources.wales/about-us/our-projects/life-n2k-wales/life-n2k-wales/?lang=en>

Sequential versions of the Matrix apply a series of transparent steps to guide Welsh Government in prioritising interactions for further assessment. This provides a risk-based approach to prioritisation and will allow for a phased approach to delivery of assessments. The assessments will be implemented through Phase 2 of the AWFA Project.

This report provides the principles under which the assessment process of fisheries impacts should be considered, and details the methodology used to arrive at the prioritisation of interactions for assessment.

2 Principles

Assessments of the impact of commercial fishing activities on Welsh designated features will be conducted under the following principles.

2.1 Scope

2.1.1 Legislative drivers

Two key Acts have recently been passed in Wales which provide an over-arching context for the AWFA Project. The Well-being of Future Generations (Wales) Act 2015 requires public bodies to pursue the economic, social, environmental and cultural well-being of Wales in a way that accords with the sustainable development principle. The Environment (Wales) Act 2016 aims to promote sustainable management of natural resources in Wales. The outputs of this Project will support the aims of these pieces of legislation by contributing to the sustainable management of the marine environment which is fundamental to the well-being of future generations. The outputs will safeguard Wales' network of MPAs, strengthen the resilience of the marine environment so that it continues to provide employment, food and tourism, and contribute to a sustainable exploitation of marine fisheries resources as defined under the Environment Act.

The impacts of fishing activities in EMS will be considered under Article 6(2) of the Habitats Directive (92/43/EEC), where 'Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbances of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive'.

Article 6(2) of the Habitats Directive (92/43/EEC), requires Welsh Government to avoid the deterioration of natural habitats and the habitats of species, as well as disturbances of the species for which the areas have been designated, in so far as such disturbance by fishing activities could be significant in relation to the objectives of the Habitats and Birds Directives. Article 6(2) of the Habitats Directive has an emphasis on preventative measures, it is broad in scope and it is applicable to the all activities within a SAC.

2.1.2 Geographic

The scope of the current work covers Welsh waters out to 12 nm.

2.1.3 MPA sites and features

The project will utilise the features contained within the Habitats and Birds Directives including EUNIS level 3 habitats and habitats of conservation interest listed in OSPAR and the Environment Act section 7.

The features/sub-features are considered from the following types of site:

- Special Areas of Conservation (SACs);
- Possible Special Areas of Conservation (pSACs);
- Special Protection Areas (SPAs);
- Potential Special Protection Areas (pSPAs);
- Ramsar sites.

Habitats Directive Annex IV species are not included in the scope, unless they are also listed in Annex II.

Designated habitat features are only considered within the sites in which they are designated. Designated mobile species for specific sites are considered wherever they occur in Welsh waters to 12 nm if they are known to utilise those areas.

The prioritisation of interactions in the Matrix considers direct impacts on habitats and species only (e.g. impact of a fishing gear on a benthic habitat, entanglement of a mobile species in a fishing gear). It does not consider indirect impacts (e.g. sedimentation on adjacent habitats as a result of the action of the gear, effects of removal of prey for mobile species) or ancillary activities (e.g. impacts as a result of gaining access or bait collecting).

When further detailed assessments are undertaken in Phase 2 of the AWFA Project, both direct and indirect impacts of the activity and ancillary activities will be considered, as appropriate.

2.1.4 Activity type

The activity type includes existing and potential fishing activities taking place from licensed and registered commercial fishing vessels only.

2.2 Assessments

Assessments of the impacts of fishing activities in European Marine Sites will be implemented under Article 6(2) of the Habitats Directive (92/43/EEC), where *'Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbances of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive'*.

The objectives of the Directives in this context relate to the favourable conservation status of a site's features. The conservation objectives of a site prescribe the conditions required to enable the site to make its appropriate contribution to favourable conservation status for the site's features.

2.3 Roles and responsibilities

Welsh Government is responsible for the management of fishing activities from licensed and registered commercial fishing vessels.

Natural Resources Wales is the statutory nature conservation advisor to Welsh Government, advising on the environmental sustainability of management measures on MPA features.

The AWFA Project, led by Welsh Government but in partnership with NRW, will deliver evidence-based assessments to inform Welsh Government on the interactions between fishing activities from licensed and registered commercial fishing vessels with protected features. The assessments will be undertaken in a fully auditable and transparent manner.

Informed by the assessments but outside the scope of this project, the Welsh Government, as fishery manager, will decide whether additional management measures should be implemented to avoid impacts on protected habitats or mobile species.

2.4 Generic risk prioritisation followed by assessments of specific interactions

The Matrix provides the generic risk-rating of gear–feature interactions, in line with the approach adopted by the English administration. These generic ratings will be considered in detail in subsequent assessments of each interaction under Phase 2 of the AWFA Project. These further assessments will consider the specific detail of the gear types used in Welsh waters, and the specific biotopes or characteristics of features in Welsh waters. The assessments will need to identify the presence or absence of features and the associated confidence level.

2.5 Evidence-led approach

Assessments of gear–feature interactions are based on best-available current evidence. This has been compiled into an Evidence Database, using the English Matrix and Fisheries Impacts Evidence Database (FIED) as a starting point, supplemented by other relevant evidence sources.

2.6 Risk prioritisation

Assessments will be implemented in phases, prioritised according to the risk associated with gear–feature interactions. These gear–feature combinations are initially categorised as:

- **Purple (high risk)** - these have the highest priority for further assessment due to the high risk of the gear damaging the feature, should fishing occur on it, and the confidence in the underpinning evidence. Irrespective of feature condition, level of pressure, or background environmental conditions in all MPAs where that feature occurs, these interactions are a priority for further assessment.
- **Orange (medium risk)** - feature may be impacted by the gear type. In all MPAs where that feature occurs, the effect of that activity or activities on such features will need to be assessed in detail, taking into account the characteristics of the gears used in Wales, and the characteristics of the feature present. The orange risk interactions reflect a range of situations, such as:
 - Lack of confidence in the impacts of the gear on the feature, which may reflect either conflicting conclusions of different studies, or a range of sensitivities of the feature according to the specific biotopes considered;
 - Lack of evidence on the impacts from the gear on the feature;
 - Available evidence indicates the impact is low but unsure about level of fishing effort.
- **Green (low risk)** - feature is highly unlikely to be affected by a type of fishing activity in all MPAs where that feature occurs. Further action is not likely to be required, unless there is the potential for in-combination effects or fishing occurs at very high levels of intensity.
- **Blue (no risk)** - no feasible interaction between the gear and the feature.

The various steps of the prioritisation process (see Section 3.2) results in interactions being either greyed out or changed to a lighter shade of the original risk rating, as follows:

- **Grey** - interaction cannot feasibly or legally occur in Welsh waters or the activity is assessed in a Habitat Regulation Assessment under Article 6(3) of the Habitats Directive, it is therefore not considered further in the current round of assessments (but may be in future assessments - see Section 2.8);
- Lighter shade of risk rating - interaction de-prioritised; the interaction is afforded less importance in terms of the order in which assessments will be implemented for all relevant Welsh gear–feature interactions. A de-prioritised interaction will be assessed, but the assessment will be carried out in a later phase, after the priority interactions have first been assessed. De-prioritisation reflects a range of situations, depending on the step in the prioritisation process in which it occurs:
 - Interaction does not currently occur as the gear type is not currently used in Wales (can be applied to purple-risk interactions);
 - Interaction has already been assessed and addressed through legislation (can be applied to purple-risk interactions);
 - Interaction that previous evidence reviews have concluded are lower risk (not applied to purple-risk interactions);
 - The gear is used in Wales, but the interaction is unlikely to occur, based on where and how fishing gears are deployed in Wales (not applied to purple-risk interactions, due to the risk to the feature should the interaction take place).

The de-prioritised interactions are reflected in the Matrix as:

- **Pale purple**: a purple-risk interaction that has been de-prioritised in one of the steps in the Matrix;
- **Pale orange** : an orange-risk interaction that has been de-prioritised in one of the steps in the Matrix;
- **Pale green**: a green-risk interaction that has been de-prioritised in one of the steps in the Matrix;
- **Pale blue**: a blue-risk interaction that has been de-prioritised in one of the steps in the Matrix.

The risk prioritisation process allows the identification of which assessments should be carried out first, in a transparent and auditable manner. The prioritisation is adaptive and may be revised should there be a need to increase or decrease the priority of some interactions over others, for example to address issues of concern or if evidence indicates that an interaction is of higher or lower risk than previously indicated.

Each gear–feature interaction encompasses a range of potential sensitivities according to the details of the gear type and its operation, and the specific biotopes present or characteristics of the feature. The specific sensitivity of each relevant interaction will be considered through a further detailed assessment (see Section 2.4). These assessments may conclude that the actual risk is either higher or lower than indicated in the generic Matrix.

FishMap Môn (FMM) sensitivity assessments are not incorporated in the phase 1 prioritisation process. The FMM tool may be used to indicatively inform further individual phase 2 assessments, which will consider sensitivity of features and intensity of fishing activity.

Further details on the prioritisation process and its outcome are provided in Section 3.

2.7 Management of risk

The Welsh Government will seek to prevent those fisheries with the potential to cause a significant negative impact on designated features and species, based on the outcome of the specific assessments, through a range of measures. Such measures include:

- Voluntary measures;
- Adaptive management measures;
- Remove/restrict measures delivered through statutory instruments.

Remove/restrict measures may include the implementation of spatial, temporal and effort restrictions, and mitigation measures to reduce the risk of a negative impact, such as technical gear measures or effort limitations to ensure fishing intensity is kept within thresholds.

Where there is a risk of a negative impact, but there is uncertainty in the assessment, further evidence gathering may be undertaken to increase the understanding of the risk. This may include clarification of the presence and extent of the designated feature, the distribution and intensity of fishing activity, and the impacts of fishing activity on the feature.

2.8 Periodic review

The risk rating of the Welsh Matrix, and the prioritisation of interactions for detailed assessment, can be periodically reviewed and updated. This will allow the incorporation of new evidence on the risk of impacts to features from fishing gears, as well as ensuring that any new or emerging fishing activities are taken account of and assessments are conducted as appropriate.

While the Matrix provides an indicative approach to prioritising the assessments in relation to the order in which they will be carried out, the Welsh Government may also direct Phase 2 of the AWFA Project to specific assessments if there is a need to do so.

3 Matrix Structure and Prioritisation

3.1 Matrix structure and risk rating

The Welsh Matrix builds upon the work already carried out by the English administration, adapted for the Welsh marine environment. This enables the assessment of Welsh fisheries to be comparable with the assessments carried out by other administrations, following a similar process. The presence of cross-border sites with England also drives the need for the process underlying the implementation of assessments to be comparable and compatible with other administrations.

The Welsh Matrix lists features that correspond to all Habitats Directive Annex I, Annex II and component features (see below) associated with Welsh SACs and SPAs against all fishing and gear types. These are referred to as 'Matrix Features'.

For habitats, the Matrix Features are based on EUNIS Level 3 categories, as in the English Matrix which termed them 'generic sub-features'. Mobile species are considered in groups that relate to behaviour and potential for interaction with fishing gears, such as benthic-feeding seabirds, and pursuit and plunge-diving seabirds.

The Welsh implementation of the MPA Stocktake process considered the 'component features' that are afforded protection in each MPA. This included EUNIS Level 3 habitats and habitats and species of conservation interest listed by OSPAR and NERC (formerly BAP), that are present within each Annex I feature for each MPA. Component features were matched against the Matrix Features to ensure that all component features were reflected in the Matrix, and any additional component features required were added to the matrix (see Section 3.2, step 1). The component features that relate to each Matrix Feature, and the Matrix Features that each component feature could be considered under, are provided in Appendix B.

The aim of the Welsh Matrix is to show, at a high generic level, gear types and their effect on relevant features, by identifying the risk of each interaction (see Section 2.4). The original risk rating from the English Matrix was used. Only direct impacts are considered in the Welsh Matrix (Section 2.1.3). Therefore, the feature 'Seagrass (SPAs)' from the English Matrix was removed, because the interaction related to indirect impacts on the designated (bird) feature of an SPA; and intertidal handwork (access from land) was removed, because a category for intertidal handwork (access from vessel) was also included and the only difference related to indirect impacts from access. The need for any additional Welsh features was considered in Step 1 of the prioritisation process (Section 3.2).

The original English Matrix included both habitat and mobile species features in a single matrix. For the Welsh Matrix, habitats and mobile species were split out into separate matrices.

The Matrix Features were ordered alphabetically, to make it easier for users to locate a particular feature. The associated Evidence Database uses pivot tables to identify relevant evidence sources, in which the Matrix Features are also displayed alphabetically.

3.2 Process for prioritisation of gear–feature interactions

The gear–feature interactions were prioritised to determine the order in which assessments should be carried out. This followed a structured, evidence-based and auditable process, described below.

Specifically, it involved the following steps to deprioritise interactions:

1. Matrix Features present in Welsh waters (Excel tabs 'Hab1' and 'Spp1');
2. Fishing activities that are relevant to the Welsh context (Excel tabs 'Hab2' and 'Spp2');
3. Interactions that are already addressed through fishery management measures, implemented for conservation purposes (Excel tabs 'Hab3' and 'Spp3');
4. Interactions that evidence reviews have concluded are lower risk (Excel tabs 'Hab4' and 'Spp4'); and
5. Interactions that are unlikely to occur (not carried out for purple risk) (Excel tabs 'Hab5' and 'Spp5').

Each step is described in detail below and shown in the accompanying Excel Matrix file.

On each successive tab of the Excel file, where a risk rating has been adjusted in that step, text is entered into the relevant cell(s). This text is removed in the subsequent step, so each step highlights (by the addition of text) the interactions that have been de-prioritised in that step.

The Excel tabs 'HabFinal' and 'SppFinal' provide the final risk rating prioritisation, and summary text of the reason each interaction was greyed out, deprioritised or adjusted (combined from all previous steps), as appropriate.

3.2.1 Step 1: Features present in Welsh waters

The first step to create the Welsh Matrix involved comparing all component features as provided by Natural Resources Wales against the generic sub-features included within the existing English Matrix. This enabled the Matrix to be tailored the Welsh context. The results for habitat Matrix Features are provided in the Excel tab 'Hab1', and for mobile species in 'Spp1'. Specifically:

- Intertidal and subtidal chalk reefs do not occur in Wales.
- Peat and clay exposures (a Welsh component feature) were not included in the English Matrix generic sub-features, but a relevant proxy habitat would be 'intertidal and subtidal chalk reefs', due to the softness of the substrate. Furthermore, the Marine Life Information Network (MarLIN) groups 'subtidal chalk / peat and clay exposures' together in the Habitats of Principle Importance. Intertidal and subtidal chalk reefs were therefore renamed to 'peat and clay exposures'.
- Harbour porpoise and bottlenose dolphin were added to the Matrix. SACs currently exist for bottlenose dolphin (Cardigan Bay and Pen Llyn ar Sarnau), and possible SACs for harbour porpoise are currently being consulted on.
- Otter (*Lutra lutra*) was added to the matrix as a Matrix Feature.
- The Welsh component feature *Ostrea edulis* beds is not present in Matrix Features, but would be considered either within 'subtidal mixed sediments' as the parent habitat, or 'mussel beds on mixed and sandy sediments' as an appropriate proxy.
- The Welsh component feature 'intertidal underboulder communities' is not present in the Matrix Features, but would be considered within 'intertidal boulder and cobble reef'.

The Welsh component features that correspond to each Matrix Feature, and the Matrix Features that may correspond to each Welsh component feature (according to the specific characteristics of individual component features), are provided in Appendix B.

3.2.2 Step 2: Fishing gears currently used in Welsh waters

A review of fishing activities in Wales was undertaken, based on existing evidence sources and confirmed with Welsh Government fishery officers and the Welsh Fishermen's Association (see Appendix C). Fishing gears that are present in the Matrix but which do not currently take place within Welsh waters were therefore de-prioritised. This is indicated in the Matrix by a lighter shade of the original risk rating. Gears that are not operated from a licensed and registered commercial fishing vessel were removed from the Matrix. Scallop dredging was split into dredging for King scallop, and dredging for Queen scallop.

The results for habitat Matrix Features are provided in the Excel tab 'Hab2', and for mobile species Matrix Features in 'Spp2'.

This list should be reviewed periodically to ensure that any new or emerging fishing gears taking place in Welsh waters are taken into account, and can be re-incorporated into the Welsh Matrix if necessary.

3.2.3 Step 3: Fisheries management measures

Existing fishery management measures have been used to prioritise interactions for further assessment where they have not already been addressed through management. The Welsh Government is currently undertaking a marine fisheries legislative review process which the AWFA Project will complement in terms of environmental assessment under Article 6 of the Habitats Directive.

The prioritisation of interactions based on fisheries management measures had two parts:

- Interactions are greyed out where activities are addressed by legislation throughout all Welsh waters and cannot legally occur.
- Interactions are de-prioritised (risk rating shaded lighter) where they are currently addressed through localised legislation but there may still remain the potential to occur in other areas.

The Welsh legislative review process seeks to harmonise and modernise a large number of existing fishery management regimes applicable to Welsh waters (0–12 nm) including EU Regulations, UK legislation and the saved Byelaws from the former Sea Fisheries Committees. These various regimes apply to various geographic limits and for the purpose of this project these are differentiated into inshore (0–6 nm) and offshore (6–12 nm), and those applicable in the north and south. It is likely that some of these areas will have local legislation that is specific to those areas.

A list of relevant fisheries legislation was compiled including Statutory Instruments and Bye-laws. The full list is provided in Appendix D.

The results of this prioritisation step for habitat features are provided in the Excel tab 'Hab3', and for mobile species in 'Spp3'.

3.2.4 Step 4: Additional evidence on risk of impacts

Interactions that evidence reviews have shown to be low risk were de-prioritised. This covered:

- Defra (2015) recommended scoping out assessments of potting on a number of Matrix Features, or scoping out unless there were site-specific concerns.
- Evidence on impact of mobile towed gears on mobile sand (high energy) habitats.

No purple-risk interactions were de-prioritised in this step. The results for habitat Matrix Features are provided in the Excel tab 'Hab4', and for mobile species in 'Spp4'.

3.2.5 Step 5: Likelihood of interactions

Interactions that are unlikely to occur e.g. potting on intertidal habitats, mobile demersal gear on saltmarsh and reedbeds, were de-prioritised based on expert knowledge including input from the Welsh Fishermen's Association and Welsh Government fishery officers. No purple-risk interactions were de-prioritised in this step, due to the risk to the feature should the interaction take place. The results for habitat Matrix Features are provided in the Excel tab 'Hab5', and for mobile species Matrix Features in 'Spp5'.

3.3 Outcome of prioritisation

The outcome of the prioritisation process is shown in Table 1.

Further prioritisation within each category can take place. For example, vessel or gear size and fishing intensity, where known, can provide additional prioritisation.

Table 1. Outcome of prioritisation process

Priority	Interactions
1	<p>Purple-risk interactions remaining in the Matrix:</p> <p><i>Habitats</i></p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls and light otter trawl gears on: <ul style="list-style-type: none"> - Maerl - Peat and clay exposures (except shrimp trawl and light otter trawl) - <i>Sabellaria</i> spp reef - Seagrass (SACs) - Submarine structures made by leaking gases - Subtidal reefs (bedrock, boulder and cobble) - Subtidal mussel bed on rock <p><i>Mobile Species</i></p> <ul style="list-style-type: none"> ▪ None
2	<p>Purple-risk interactions which were de-prioritised because legislation addresses the interaction in part of Welsh waters</p> <p><i>Habitats</i></p> <ul style="list-style-type: none"> ▪ Queen scallop dredging on: <ul style="list-style-type: none"> - Maerl - <i>Sabellaria</i> reef - Seagrass (SACs) - Submarine structures made by leaking gases - Subtidal reefs (bedrock, boulder and cobble) <p><i>Mobile Species</i></p> <ul style="list-style-type: none"> ▪ None
3	<p>Orange-risk interactions remaining in the Matrix:</p> <p><i>Habitats</i></p> <ul style="list-style-type: none"> ▪ Beam trawl (shrimp) and light otter trawl gears on: <ul style="list-style-type: none"> - Peat and clay exposures ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls and light otter trawl gears on: <ul style="list-style-type: none"> - Brittlestar beds

Priority	Interactions
	<ul style="list-style-type: none"> - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand) - Tideswept communities ▪ Fixed nets (gill nets, trammel nets, entangling nets) and drift nets (demersal) on remaining orange interactions: <ul style="list-style-type: none"> - Brittlestar beds - Estuarine rock - Intertidal bedrock reef, intertidal boulder and cobble reef - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Kelp forest communities - Maerl - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Peat and clay exposures - <i>Sabellaria</i> spp reef - Seagrass - Submarine structures made by leading gases - Subtidal reefs (bedrock, boulder and cobble) - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Subtidal mussel bed on rock - Tideswept communities. ▪ Longlines (demersal) on remaining orange interactions: <ul style="list-style-type: none"> - Brittlestar beds - Estuarine rock - Intertidal reefs (bedrock, boulder and cobble) - Kelp forest communities - Maerl - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Peat and clay exposures - <i>Sabellaria</i> spp reef - Seagrass - Submarine structures made by leading gases - Subtidal reefs (bedrock, boulder and cobble) - Subtidal mussel bed on rock - Tideswept communities. ▪ Seine nets (beach seines/ring nets) on remaining orange interactions: <ul style="list-style-type: none"> - Brittlestar beds - intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Kelp forest communities - Maerl - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Peat and clay exposures - <i>Sabellaria</i> spp reef - Seagrass - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand)

Priority	Interactions
	<ul style="list-style-type: none"> ▪ Commercial diving on remaining orange interactions: <ul style="list-style-type: none"> - Intertidal sea caves - Kelp forest communities - Maerl - Peat and clay exposures - <i>Sabellaria</i> spp reef - Seagrass - Submarine structures made by leaking gases - Subtidal reefs (bedrock, boulder and cobble) - Subtidal sea caves ▪ Pots/creels (crustacea/ gastropods) on: <ul style="list-style-type: none"> - Intertidal bedrock reef (where there are site-specific concerns) - Maerl (dependent on level of potting intensity) - Mussel beds (on mixed and sandy sediment, on boulder and cobble skears) (where there are site-specific concerns) - Peat and clay exposures (where there are site-specific concerns) - <i>Sabellaria</i> reef (dependent on level of potting intensity) - Seagrass (SACs) (dependent on level of potting intensity) - Submarine structures made by leaking gases (where there are site-specific concerns) - Subtidal bedrock reef (where there are site-specific concerns) - Subtidal mussel bed on rock (where there are site-specific concerns) <p>Mobile Species</p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls and light otter trawl gears on: <ul style="list-style-type: none"> - Estuarine fish community - River and sea lamprey - Twaite and Allis shad ▪ Scallop dredge (King and Queen) on: <ul style="list-style-type: none"> - Estuarine fish community ▪ Pots/creels on: <ul style="list-style-type: none"> - Estuarine fish community ▪ Fixed nets (gill nets, trammel nets, entangling nets) on: <ul style="list-style-type: none"> - Benthic feeding seabirds - Estuarine birds - Pursuit and plunge-diving birds - Estuarine fish community - River and sea lamprey - Twaite and Allis shad - Bottlenose dolphin - Harbour porpoise ▪ Drift nets (demersal) on: <ul style="list-style-type: none"> - Benthic feeding seabirds - Pursuit and plunge-diving birds - Estuarine fish community - River and sea lamprey - Twaite and Allis shad ▪ Longlines (demersal) on: <ul style="list-style-type: none"> - Surface feeding birds - Estuarine fish community

Priority	Interactions
	<ul style="list-style-type: none"> - River and sea lamprey - Twaite and Allis shad ▪ Handlines (rod/gurdy) on: <ul style="list-style-type: none"> - Estuarine fish community - River and sea lamprey - Twaite and Allis shad ▪ Jigging/trolling on: <ul style="list-style-type: none"> - Estuarine fish community - Twaite and Allis shad ▪ Beach seines/ring nets on: <ul style="list-style-type: none"> - Estuarine fish community - River and sea lamprey - Twaite and Allis shad
4	<p>Orange-risk interactions that were de-prioritised because legislation addresses the interaction in part of Welsh waters</p> <p><i>Habitats</i></p> <ul style="list-style-type: none"> ▪ Queen scallop dredging on: <ul style="list-style-type: none"> - Brittlestar beds - Coarse sediment (high energy) - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand, sand (high energy)) - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand, sand (high energy)) - Subtidal mussel bed on rock - Tideswept communities <p><i>Mobile Species</i></p> <ul style="list-style-type: none"> ▪ None
5	<p>Orange-risk interactions that are unlikely to occur (confirm whether the interaction occurs):</p> <p><i>Habitats</i></p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls, light otter trawls and Queen scallop dredging on: <ul style="list-style-type: none"> - Estuarine rock - Intertidal reefs (bedrock, boulder and cobble) - Kelp forest communities - Reedbeds - Saltmarsh spp., <i>Salicornia</i> and seablite ▪ Queen scallop dredging also on: <ul style="list-style-type: none"> - Peat and clay exposures ▪ Coastal lagoons for the following gears: <ul style="list-style-type: none"> - Pots/creels - Fixed nets (gill nets, trammel nets, entangling nets) - Drift nets (demersal) - Longlines (demersal) - Beach seines/ring nets ▪ Beach seines/ring nets on: <ul style="list-style-type: none"> - Estuarine rock - Intertidal reefs (bedrock, boulder and cobble)

Priority	Interactions
	<ul style="list-style-type: none"> - Submarine structures made by leaking gases - Subtidal reefs (bedrock, boulder and cobble) - Subtidal mussel bed on rock - Tideswept communities <p>Mobile Species</p> <ul style="list-style-type: none"> ▪ None
6	<p>Orange-risk interactions that were de-prioritised because evidence indicates low risk or legislation partially addresses the risk</p> <p>Habitats</p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls and light otter trawl on: <ul style="list-style-type: none"> - Coarse sediment (high energy) - Intertidal sand (high energy) - Subtidal sand (high energy) ▪ Pots/creels on: <ul style="list-style-type: none"> - Habitats indicated in priority 3 for this gear type, where there are not any site-specific concerns due to the feature or level of fishing intensity - Brittlestar beds - Estuarine rock - Intertidal boulder and cobble reef - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Kelp forest communities - Subtidal boulder and cobble reef - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand) - Tideswept communities <p>Mobile Species</p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls, light otter trawls on: <ul style="list-style-type: none"> - Salmon ▪ Fixed nets (gill nets, trammel nets, entangling nets), drift nets (demersal), longlines (demersal), handlines (rod/gurdy), jigging/trolling, and beach seines/ring nets on: <ul style="list-style-type: none"> - Salmon
7	<p>Green-risk interactions</p> <p>Habitats</p> <ul style="list-style-type: none"> ▪ Coarse sediment (high energy), intertidal sand (high energy) and subtidal sand (high energy) for the following gears: <ul style="list-style-type: none"> - Pots/creels - Fixed nets (gill nets, trammel nets, entangling nets) - Drift nets (demersal) - Longlines (demersal) - Beach seines/ring nets - Commercial diving ▪ Longlines (demersal) for the following additional habitats: <ul style="list-style-type: none"> - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand) ▪ Commercial diving for the following additional habitats: <ul style="list-style-type: none"> - Brittlestar beds - Coastal lagoons

Priority	Interactions
	<ul style="list-style-type: none"> - Estuarine rock - Intertidal reefs (bedrock, boulder and cobble) - Intertidal sediment habitats (gravel and sand, mixed sediments, mud, mud and sand) - Mussel beds (on mixed and sandy sediments, on boulder and cobble skears) - Subtidal sediment habitats (gravel and sand, mixed sediments, mud, muddy sand) - Subtidal mussel bed on rock - Tideswept communities <p>Mobile Species</p> <ul style="list-style-type: none"> ▪ Beam trawl (whitefish), beam trawl (shrimp), multi-rig trawls, light otter trawls on: <ul style="list-style-type: none"> - Benthic feeding seabirds - Estuarine birds - Pursuit and plunge diving birds - Grey seal - Bottlenose dolphin - Harbour porpoise - Otter ▪ Scallop dredging (King/Queen), and dredging for mussels, clams, oysters on: <ul style="list-style-type: none"> - As above, excluding pursuit and plunge diving birds ▪ Pots/creels on: <ul style="list-style-type: none"> - Bottlenose dolphin - Harbour porpoise - Otter ▪ Fixed nets (gill nets, trammel nets, entangling nets) on: <ul style="list-style-type: none"> - Surface feeding birds - Grey seal - Otter ▪ Drift nets (demersal) and longlines (demersal) on: <ul style="list-style-type: none"> - Benthic feeding seabirds (except drift nets) - Estuarine birds - Pursuit and plunge diving birds (except drift nets) - Grey seal - Bottlenose dolphin - Harbour porpoise - Otter ▪ Handlines (rod/gurdy), jigging/trolling and beach seines/ring nets on: <ul style="list-style-type: none"> - Grey seal - Bottlenose dolphin - Harbour porpoise - Otter (except jigging/trolling) ▪ Commercial diving on: <ul style="list-style-type: none"> - Estuarine fish community

4 Evidence Database

An Evidence Database was compiled, to assist with the identification of relevant references for each interaction in the Matrix. This was based on existing evidence compilations, and additional evidence sources were added. The starting point was Natural England's Fisheries Impacts Evidence Database (FIED), which contained references relating to 5,416 gear–feature interactions.

Additional evidence sources were identified from:

- ABPmer (2013) Tools for Appropriate Assessment of Fishing and Aquaculture Activities in Marine and Coastal Natura 2000 Sites. R. 2070. Report for the Marine Institute, Ireland;
- Seafish's Risk Assessment for Sourcing Seafood (RASS)²;
- Defra (2015) Evidence for Management of Potting Impacts on Designated Features. Report prepared by ABPmer, Eno Consulting and Centre for Environment, Fisheries and Aquaculture Science for the Marine Biodiversity Impact Evidence Group. Contract reference MMO1086;
- Natural England SPA Toolkit;
- ABPmer & Ichthys Marine (2015). Supporting Risk-Based Assessments of Fisheries in MPAs, Final Report. ABPmer Report No. R.2551. A report produced by ABPmer for National Federation of Fishermen's Organisations, December 2015;
- References provided by NRW;
- Further literature and web searches.

A total of 357 additional potentially-relevant references were identified. These were prioritised for inclusion in the Evidence Database according to the following criteria:

- Not already reviewed and rejected from inclusion in FIED;
- Relates to direct impacts from fishing;
- Possible to clearly identify relevant gear types and assign to Matrix Features (i.e. paper provides sufficient description);
- Relates to gears that are currently active in Wales;
- Relates to an interaction that is purple or orange;
- Primary data or evidence rather than review papers;
- UK or EU-based studies (i.e. relevant to habitats/species in Wales);
- Studies beyond EU, if other criteria are fulfilled.

An additional 72 references were added to the Evidence Database and attributed to 538 relevant gear–feature interactions.

References relating to 'Intertidal and subtidal chalk reef' were reclassified as relating to 'Peat and clay exposures' due to the change in the name of this component feature for the purposes of the Welsh Matrix. When assessing any gear interactions with this habitat, the references should therefore be checked for their validity to peat and clay exposures.

The full list of references included in the Evidence Database, highlighting the additional references that were added through this project is provided in Appendix E.

² Seafish - Risk Assessment for Sourcing Seafood: www.seafish.org/rass/.

The Evidence Database is structured as follows:

- Notes: Cover page including date, version and description of the file;
- Instructions: Summary of each tab and explanation of fields in the Evidence Database;
- PIVOT-HABITATS: Pivot tables of fishing gears against habitat features;
- PIVOT-SPECIES: Pivot tables of fishing gears against mobile species features;
- Evidence Database: Data on which the pivot tables draw (see below), to identify relevant references for each gear-feature interaction;
- References within EvidDb: List of references included in the Evidence Database.
- All References sourced: List of all the references considered for the Evidence Database, and an indication of whether each is included or not.

Pivot tables are shown for:

- Prioritised Matrix Features and fishing gears;
- All Matrix Features and fishing gears.

The former is to enable quick and easy access to references for relevant interactions for the prioritised assessments. The latter is to enable access to references for any of the gear-feature interactions included in the habitats and species matrices.

The values in each cell of the pivot tables indicate the number of references that have been identified as relevant to that gear-feature interaction. Double-clicking on the number opens a new tab that displays the references for that interaction. When assessments are carried out, these references will be reviewed for their relevance to the specific component features and the characteristics of Welsh fisheries under consideration (e.g. vessel size, gear size, configuration and deployment) in each case, which will influence the conclusions on sensitivity of the feature. Intensity of fishing activity will then be considered in forming the final judgement on potential vulnerability to deterioration or significant disturbance.

Clicking on the 'Tidy up!' button deletes all the additional sheets³ that have been generated by double-clicking on the pivot tables, returning the Excel workbook to its initial configuration. For the 'Tidy up!' button to work, macros must be enabled.

³ It will delete tabs with a name starting 'Sheet'. If a tab is renamed, it will not be deleted, unless its name still begins with 'Sheet'.

5 References

ABPmer (2013). Tools for Appropriate Assessment of Fishing and Aquaculture Activities in Marine and Coastal Natura 2000 Sites. ABP Marine Environmental Research Ltd, Report No. R. 2070. Report for the Marine Institute, Ireland.

ABPmer & Ichthys Marine (2015). Supporting Risk-Based Assessments of Fisheries in MPAs, Final Report. ABP Marine Environmental Research Ltd, Report No. R.2551. A report for National Federation of Fishermen's Organisations, December 2015.

Defra (2015). Evidence for Management of Potting Impacts on Designated Features. Report prepared by ABP Marine Environmental Research, Eno Consulting and Centre for Environment, Fisheries and Aquaculture Science for the Marine Biodiversity Impact Evidence Group. Contract reference MMO1086.

MMO (2014). Matrix of fisheries gear types and European marine site protected features. Fisheries in EMS Matrix – Generic fisheries template. Available online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310811/matrix.xls. Accessed 28.01.2016.

Natural England (2015) SPA Toolkit. Dated 08.12.2015. Natural England.

Seafish (no date). Risk Assessment for Sourcing Seafood website: www.seafish.org/rass/.

6 Abbreviations/Acronyms

ABPmer	ABP Marine Environmental Research Ltd
AFBI	Agri-Food and Biosciences Institute
AWFA	Assessing Welsh Fishing Activities
BAP	Biodiversity Action Plan
CCW	Countryside Council for Wales
CJEU	The Court of Justice of the European Union
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
EMS	European Marine Site
EUNIS	European Nature Information System
FIED	Fisheries Impacts Evidence Database
FMM	FishMap Môn
HRA	Habitats Regulation Assessment
mSAC	Marine Special Area of Conservation
MarLIN	Marine Life Information Network
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
NERC	Natural Environment Research Council
N2K	Natura 2000
nm	Nautical Mile
NERC	Natural Environment Research Council
NRW	Natural Resources Wales
NWNW SFC	North Western & North Wales Sea Fisheries Committee
OSPAR	Oslo-Paris Convention
pSAC	possible Special Area of Conservation
pSPA	potential Special Protection Area
Ramsar	Wetlands of international importance, designated under The Convention on Wetlands (Ramsar, Iran, 1971)
RASS	Risk Assessment for Sourcing Seafood
SAC	Special Area of Conservation
SEPA	Scottish Environmental Protection Agency
SFC	Sea Fisheries Committee
SPA	Special Protection Area
spp	Species
UK	United Kingdom
WG	Welsh Government

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Appendices



A Final Prioritisation Matrix

A.1 Habitats

Fishing Gear Group	Matrix Features	Gear Type	Annual vegetation of driftlines	Brittlestar beds	Coarse sediment (high energy)	Coastal lagoons	Estuarine rock (boulder, cobble and pebbles)	Intertidal bedrock reef	Intertidal boulder and cobble reef	Intertidal gravel and sand	Intertidal mixed sediments	Intertidal mud	Intertidal mud and sand	Intertidal sand (high energy)	Intertidal sea caves	Kelp forest communities	Maerl	Mussel beds on mixed and sandy sediments	Mussel bed on boulder and cobble skears	Peat and clay exposures	Reedbeds	Sabellaria spp reef	Saltmarsh spp, Salicornia and Seablite	Seagrass (SACs)	Submarine structures made by leaking gases	Subtidal bedrock reef	Subtidal boulder and cobble reef	Subtidal gravel and sand	Subtidal mixed sediments	Subtidal mud	Subtidal muddy sand	Subtidal mussel bed on rock	Subtidal sand (high energy)	Subtidal sea caves	Tideswept communities	
			Towed (demersal)	Beam trawl (whitefish)		3	6		5	5	5	3	3	3	3	6		5	1	3	3	1	5	1	5	1	1	1	1	3	3	3	3	1	6	
Beam trawl (shrimp)		3		6		5	5	5	3	3	3	3	6		5	1	3	3	3	5	1	5	1	1	1	1	3	3	3	3	1	6		3		
Multi-rig trawls		3		6		5	5	5	3	3	3	3	6		5	1	3	3	1	5	1	5	1	1	1	1	3	3	3	3	1	6		3		
Light otter trawl		3		6		5	5	5	3	3	3	3	6		5	1	3	3	3	5	1	5	1	1	1	1	3	3	3	3	1	6		3		
Dredges (towed)	Scallops (King)																																			
	Scallops (Queen)		4	4		5	5	5	4	4	4	4	4		5	2	4	4	5	5	2	5	2	2	2	2	2	4	4	4	4	4	4		4	
	Mussels, clams, oysters																																			
Static - pots/traps	Pots/creels (crustacea/gastropods)		6	7	5	6	3	6	6	6	6	6	7		6	3	3	3	3		3			3	3	3	6	6	6	6	6	3	7		6	
4Static - fixed nets	Gill nets		3	7	5	3	3	3	3	3	3	3	7		3	3	3	3	3	3		3		3	3	3	3	3	3	3	3	3	3	7		3
	Trammels		3	7	5	3	3	3	3	3	3	3	7		3	3	3	3	3	3		3		3	3	3	3	3	3	3	3	3	3	7		3
	Entangling		3	7	5	3	3	3	3	3	3	3	7		3	3	3	3	3	3		3		3	3	3	3	3	3	3	3	3	3	7		3
Passive - nets	Drift nets (demersal)		3	7	5	3	3	3	3	3	3	7		3	3	3	3	3	3		3		3	3	3	3	3	3	3	3	3	3	7		3	
Lines	Longlines (demersal)		3	7	5	3	3	3	7	7	7	7	7		3	3	3	3	3		3		3	3	3	3	7	7	7	7	7	3	7		3	
Seine nets and other	Beach seines/ ring nets		3	7	5	5	5	5	3	3	3	3	7		3	3	3	3	3		3		3	5	5	5	3	3	3	3	3	5	7		5	
Miscellaneous	Commercial diving		7	7	7	7	7	7	7	7	7	7	7		3	3	3	7	7	3		3		3	3	3	3	7	7	7	7	7	7	3	7	

4 Colours and Numbers in cells are fully explained in risk prioritisation (section 2.6) and outcome of prioritisation (section 3.3) and are summarised as follows: 1 (Purple) - High risk interactions remaining in the Matrix; 2 (Pale Purple) - High risk interactions which were de-prioritised because legislation addresses the interaction in part of Welsh waters; 3 (Orange) - medium risk interactions remaining in the Matrix; 4 (Pale Orange) - medium risk interactions that were de-prioritised because legislation addresses the interaction in part of Welsh waters; 5 (Pale Orange) - Medium-risk interactions that are unlikely to occur; 6 (Pale Orange) - Medium risk interactions that were de-prioritised because evidence indicates low risk or legislation partially addresses the risk; 7 (Green) - Low risk interactions; Blue - No risk of interaction.

A.2 Mobile Species

Fishing Gear Group	Matrix Features	B_Benthic feeding seabirds	B_Estuarine Birds	B_Pursuit and plunge diving birds	B_Surface feeding birds	F_Estuarine fish community	F_River and sea lamprey	F_Salmon	F_Twaite and Allis shad	M_Grey seal	M_Bottlenose dolphin	M_Harbour porpoise	M_Otter <i>Lutra lutra</i>
	Gear Type												
Towed (demersal)	Beam trawl (whitefish)	7	7	7		3	3	6	3	7	7	7	7
	Beam trawl (shrimp)	7	7	7		3	3	6	3	7	7	7	7
	Multi-rig trawls	7	7	7		3	3	6	3	7	7	7	7
	Light otter trawl	7	7	7		3	3	6	3	7	7	7	7
Dredges (towed)	Scallops (King)	7	7			3				7	7	7	7
	Scallops (Queen)	7	7			3				7	7	7	7
	Mussels, clams, oysters	7	7							7	7	7	7
Static - pots/traps	Pots/creels (crustacea/gastropods)					3					7	7	7
Static - fixed nets	Gill nets	3	3	3	7	3	3	6	3	7	3	3	7
	Trammels	3	3	3	7	3	3	6	3	7	3	3	7
	Entangling	3	3	3	7	3	3	6	3	7	3	3	7
Passive - nets	Drift nets (demersal)	3	7	3		3	3	6	3	7	7	7	7
Lines	Longlines (demersal)	7	7	7	3	3	3	6	3	7	7	7	7
	Handlines (rod/gurdy)					3	3	6	3	7	7	7	7
	Jigging/trolling					3		6	3	7	7	7	
Seine nets and other	Beach seines/ring nets					3	3	6	3	7	7	7	7
Miscellaneous	Commercial diving					7							

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⁵ Colours and Numbers in cells are fully explained in risk prioritisation (section 2.6) and outcome of prioritisation (section 3.3) and are summarised as follows: 1 (Purple) - High risk interactions remaining in the Matrix; 2 (Pale Purple) - High risk interactions which were de-prioritised because legislation addresses the interaction in part of Welsh waters; 3 (Orange) - medium risk interactions remaining in the Matrix; 4 (Pale Orange) - medium risk interactions that were de-prioritised because legislation addresses the interaction in part of Welsh waters; 5 (Pale Orange) - Medium-risk interactions that are unlikely to occur; 6 (Pale Orange) - Medium risk interactions that were de-prioritised because evidence indicates low risk or legislation partially addresses the risk; 7 (Green) - Low risk interactions; Blue - No risk of interaction.

B Features Present in Welsh Sites

The following tables show the correspondence between the Matrix Features and Welsh component features:

- List of Matrix Features and relevant Welsh component features (Table B.1).
- List of Welsh component features and relevant Matrix Features (Table B.2).

There may be additional Matrix Features and component features that relate to each, depending on the specific characteristics of the feature or component feature.

Table B.3 shows the correspondence between Matrix Features and FishMap Mon habitats.

Table B.1 Matrix features and corresponding Welsh component features

Matrix Feature	Corresponding Welsh Component Features
Habitats	
Annual vegetation of driftlines	
Brittlestar beds	
Coarse sediment (high energy)	Littoral coarse sediment (A2.1) Sublittoral coarse sediment (A5.1)
Coastal lagoons	
Estuarine rock (boulder, cobble and bedrock)	Estuarine rocky habitats
Intertidal bedrock reef	High energy littoral rock (A1.1) Intertidal Underboulder Communities Low energy littoral rock (A1.3) Moderate energy littoral rock (A1.2)
Intertidal boulder and cobble reef	High energy littoral rock (A1.1) Intertidal Underboulder Communities Low energy littoral rock (A1.3) Moderate energy littoral rock (A1.2)
Intertidal gravel and sand	Littoral coarse sediment (A2.1)
Intertidal mixed sediments	Littoral mixed sediments (A2.4) Sheltered muddy gravels
Intertidal mud	Intertidal mudflats Littoral mud (A2.3)
Intertidal mud and sand	Littoral sand and muddy sand (A2.2)
Intertidal sand (high energy)	Littoral sand and muddy sand (A2.2)
Intertidal sea caves	
Kelp forest communities	Sublittoral macrophyte-dominated sediment (A5.5)
Maerl	Maerl Sublittoral macrophyte-dominated sediment (A5.5)
Mussel beds on mixed and sandy sediments	Blue mussel beds Horse mussel (<i>Modiolus modiolus</i>) beds Mussel beds Littoral biogenic reefs (A2.7) Sublittoral biogenic reefs (A5.6) <i>Ostrea edulis</i> beds
Mussel bed on boulder and cobble skears	<i>Musculus discors</i> beds Sublittoral biogenic reefs (A5.6) Blue mussel beds Horse mussel (<i>Modiolus modiolus</i>) beds Mussel beds
Peat and clay exposures	Peat and clay exposures
Reedbeds	Coastal saltmarshes and saline reedbeds (A2.5)
Sabellaria spp reef	Littoral biogenic reefs (A2.7) <i>Sabellaria alveolata</i> reef <i>Sabellaria spinulosa</i> reefs Sublittoral biogenic reefs (A5.6)

Matrix Feature	Corresponding Welsh Component Features
Saltmarsh spp, Salicornia and Seablite	Coastal saltmarshes and saline reedbeds (A2.5)
Seagrass (SACs)	Littoral sediments dominated by aquatic angiosperms (A2.6) Seagrass beds Sublittoral macrophyte-dominated sediment (A5.5)
Submarine structures made by leaking gases	Carbonate reef
Subtidal bedrock reef	Atlantic and Mediterranean high energy circalittoral rock (A4.1) Atlantic and Mediterranean high energy infralittoral rock (A3.1) Atlantic and Mediterranean low energy circalittoral rock (A4.3) Atlantic and Mediterranean low energy infralittoral rock (A3.3) Atlantic and Mediterranean moderate energy circalittoral rock (A4.2) Atlantic and Mediterranean moderate energy infralittoral rock (A3.2) Fragile sponge & anthozoan communities on subtidal rocky habitats <i>Musculus discors</i> beds
Subtidal boulder and cobble reef	Sublittoral macrophyte-dominated sediment (A5.5) <i>Musculus discors</i> beds Atlantic and Mediterranean high energy circalittoral rock (A4.1) Atlantic and Mediterranean high energy infralittoral rock (A3.1) Atlantic and Mediterranean low energy circalittoral rock (A4.3) Atlantic and Mediterranean low energy infralittoral rock (A3.3) Atlantic and Mediterranean moderate energy circalittoral rock (A4.2) Atlantic and Mediterranean moderate energy infralittoral rock (A3.2) Fragile sponge & anthozoan communities on subtidal rocky habitats Sublittoral mixed sediments (A5.4)
Subtidal gravel and sand	Sublittoral coarse sediment (A5.1) Sublittoral sand (A5.2)
Subtidal mixed sediments	<i>Ostrea edulis</i> beds Sublittoral mixed sediments (A5.4) Subtidal mixed muddy sediments
Subtidal mud	Mud habitats in deep water Seapens and burrowing megafauna Sublittoral mud (A5.3)
Subtidal muddy sand	Sublittoral sand (A5.2)
Subtidal mussel bed on rock	<i>Musculus discors</i> beds Mussel beds
Subtidal sand (high energy)	Sublittoral sand (A5.2)
Subtidal sea caves	
Tideswept communities	Tide swept channels
Mobile species	
Estuarine fish community	Migratory fish species
River and sea lamprey	River lamprey (<i>Lampreta fluviatilis</i>) Sea lamprey (<i>Petromyzon marinus</i>)
Salmon	Atlantic salmon <i>Salmo salar</i>
Twaite and Allis shad	Allis shad (<i>Alosa alosa</i>) Twaite shad (<i>Alosa fallax</i>)
Estuarine Birds	Bar-tailed godwit <i>Limosa lapponica</i> Black-tailed godwit <i>Limosa limosa islandica</i> Chough <i>Pyrrhocorax pyrrhocorax</i> Common greenshank <i>Tringa nebularia</i> Common redshank <i>Tringa totanus totanus</i> Curlew <i>Numenius arquata</i> Dunlin <i>Calidris alpina alpina</i> Eurasian oystercatcher <i>Haematopus ostralegus</i> Grey plover <i>Pluvialis squatarola</i> Knot <i>Calidris canutus</i> Eurasian wigeon Shelduck <i>Tadorna tadorna</i> Teal <i>Anas crecca</i> Gadwall <i>Anas strepera</i> Pintail <i>Anas acuta</i> European white-fronted goose <i>Anser albifrons albifrons</i> Greater white fronted goose Bewick's Swan <i>Cygnus bewickii</i>

Matrix Feature	Corresponding Welsh Component Features
Benthic feeding seabirds	Common scoter <i>Melanitta nigra</i> Red breasted merganser Northern shoveler <i>Anas clypeata</i> Great crested grebe
Pursuit and plunge diving birds	Atlantic Puffin Cormorant Manx Shearwater (<i>Puffinus puffinus</i>) Northern gannet Red-throated diver <i>Gavia stellata</i>
Surface feeding birds	Arctic tern Common tern <i>Sterna hirundo</i> European storm-petrel Lesser black-backed gull Little Gull Little tern <i>Sterna albifrons</i> Roseate tern Sandwich tern <i>Sterna sandvicensis</i>
Grey Seal	Grey seal <i>Halichoerus grypus</i>
Bottlenose dolphin	Bottlenose dolphin <i>Tursiops truncatus</i>
Harbour porpoise	Harbour porpoise
Otter <i>Lutra lutra</i>	Otter <i>Lutra lutra</i>

Table B.2 Welsh component features and corresponding Matrix Features

Welsh Component Features	Corresponding Matrix Features
Habitats	
Atlantic and Mediterranean high energy circalittoral rock (A4.1)	Subtidal bedrock reef Subtidal boulder and cobble reef
Atlantic and Mediterranean high energy infralittoral rock (A3.1)	Subtidal bedrock reef Subtidal boulder and cobble reef
Atlantic and Mediterranean low energy circalittoral rock (A4.3)	Subtidal bedrock reef Subtidal boulder and cobble reef
Atlantic and Mediterranean low energy infralittoral rock (A3.3)	Subtidal bedrock reef Subtidal boulder and cobble reef
Atlantic and Mediterranean moderate energy circalittoral rock (A4.2)	Subtidal bedrock reef Subtidal boulder and cobble reef
Atlantic and Mediterranean moderate energy infralittoral rock (A3.2)	Subtidal bedrock reef Subtidal boulder and cobble reef
Blue mussel beds	Mussel beds on mixed and sandy sediments Mussel bed on boulder and cobble skears
Carbonate reef	Submarine structures made by leaking gases
Coastal saltmarshes and saline reedbeds (A2.5)	Saltmarsh spp, <i>Salicornia</i> and Seablite Reedbeds
Estuarine rocky habitats	Estuarine rock (boulder, cobble and bedrock)
Fragile sponge & anthozoan communities on subtidal rocky habitats	Subtidal bedrock reef Subtidal boulder and cobble reef
High energy littoral rock (A1.1)	Intertidal bedrock reef Intertidal boulder and cobble reef
Horse mussel (<i>Modiolus modiolus</i>) beds	Mussel beds on mixed and sandy sediments Mussel bed on boulder and cobble skears
Intertidal mudflats	Intertidal mud
Intertidal Underboulder Communities	Intertidal bedrock reef Intertidal boulder and cobble reef
Littoral biogenic reefs (A2.7)	Sabellaria spp reef Mussel beds on mixed and sandy sediments
Littoral coarse sediment (A2.1)	Coarse sediment (high energy) Intertidal gravel and sand
Littoral mixed sediments (A2.4)	Intertidal mixed sediments
Littoral mud (A2.3)	Intertidal mud
Littoral sand and muddy sand (A2.2)	Intertidal mud and sand
Littoral sediments dominated by aquatic angiosperms (A2.6)	Seagrass (SACs)
Low energy littoral rock (A1.3)	Intertidal bedrock reef Intertidal boulder and cobble reef
Maerl	Maerl
Moderate energy littoral rock (A1.2)	Intertidal bedrock reef Intertidal boulder and cobble reef
Mud habitats in deep water	Subtidal mud
<i>Musculus discors</i> beds	Mussel bed on boulder and cobble skears Subtidal bedrock reef Subtidal boulder and cobble reef
Mussel beds	Mussel beds on mixed and sandy sediments Mussel bed on boulder and cobble skears
<i>Ostrea edulis</i> beds	Subtidal mixed sediments Mussel beds on mixed and sandy sediments (proxy)
Peat and clay exposures	Intertidal and subtidal chalk reefs (proxy)
<i>Sabellaria alveolata</i> reef	<i>Sabellaria</i> spp reef
<i>Sabellaria spinulosa</i> reefs	<i>Sabellaria</i> spp reef
Seagrass beds	Seagrass (SACs)
Seapens and burrowing megafauna	Subtidal mud
Sheltered muddy gravels	Intertidal mixed sediments
Sublittoral biogenic reefs (A5.6)	<i>Sabellaria</i> spp reef Mussel beds on mixed and sandy sediments Mussel bed on boulder and cobble skears
Sublittoral coarse sediment (A5.1)	Subtidal gravel and sand Coarse sediment (high energy)

Welsh Component Features	Corresponding Matrix Features
Sublittoral macrophyte-dominated sediment (A5.5)	Seagrass (SACs) Kelp forest communities Maerl Subtidal boulder and cobble reef
Sublittoral mixed sediments (A5.4)	Subtidal mixed sediments Subtidal boulder and cobble reef
Sublittoral mud (A5.3)	Subtidal mud
Sublittoral sand (A5.2)	Subtidal gravel and sand Subtidal sand (high energy)
Subtidal mixed muddy sediments	Subtidal mixed sediments
Tide swept channels	Tideswept communities
Mobile species	
Allis shad (<i>Alosa alosa</i>)	Twaite and Allis shad
Twaite shad (<i>Alosa fallax</i>)	Twaite and Allis shad
Atlantic salmon <i>Salmo salar</i>	Salmon
Migratory fish species	Estuarine fish community
River lamprey (<i>Lampreta fluviatilis</i>)	River and sea lamprey
Sea lamprey (<i>Petromyzon marinus</i>)	River and sea lamprey
Bottlenose dolphin <i>Tursiops truncatus</i>	Bottlenose dolphin
Grey seal <i>Halichoerus grypus</i>	Grey seal
Otter <i>Lutra lutra</i>	Otter <i>Lutra lutra</i>
Harbour porpoise	Harbour porpoise
Arctic tern	Surface feeding birds
Common tern <i>Sterna hirundo</i>	Surface feeding birds
European storm-petrel	Surface feeding birds
Lesser black-backed gull	Surface feeding birds
Little Gull	Surface feeding birds
Little tern <i>Sterna albifrons</i>	Surface feeding birds
Roseate tern	Surface feeding birds
Sandwich tern <i>Sterna sandvicensis</i>	Surface feeding birds
Bar-tailed godwit <i>Limosa lapponica</i>	Estuarine birds
Black-tailed godwit <i>Limosa limosa islandica</i>	Estuarine birds
Chough <i>Pyrrhocorax pyrrhocorax</i>	Estuarine birds
Common greenshank <i>Tringa nebularia</i>	Estuarine birds
Common redshank <i>Tringa totanus totanus</i>	Estuarine birds
Curlew <i>Numenius arquata</i>	Estuarine birds
Dunlin <i>Calidris alpina alpina</i>	Estuarine birds
Eurasian oystercatcher <i>Haematopus ostralegus</i>	Estuarine birds
Grey plover <i>Pluvialis squatarola</i>	Estuarine birds
Knot <i>Calidris canutus</i>	Estuarine birds
Eurasian wigeon	Estuarine birds
Shelduck <i>Tadorna tadorna</i>	Estuarine birds
Teal <i>Anas crecca</i>	Estuarine birds
Gadwall <i>Anas strepera</i>	Estuarine birds
Pintail <i>Anas acuta</i>	Estuarine birds
European white-fronted goose <i>Anser albifrons albifrons</i>	Estuarine birds
Greater white fronted goose	Estuarine birds
Bewick's Swan <i>Cygnus bewickii</i>	Estuarine birds
Atlantic Puffin	Pursuit and plunge diving birds
Cormorant	Pursuit and plunge diving birds
Manx Shearwater (<i>Puffinus puffinus</i>)	Pursuit and plunge diving birds
Northern gannet	Pursuit and plunge diving birds
Red-throated diver <i>Gavia stellata</i>	Pursuit and plunge diving birds
Common scoter <i>Melanitta nigra</i>	Benthic feeding seabirds
Red breasted merganser	Benthic feeding seabirds
Northern shoveler <i>Anas clypeata</i>	Benthic feeding seabirds
Great crested grebe	Benthic feeding seabirds

Table B.3 Matrix Features and corresponding FishMap Môn Habitats

Matrix Feature	Corresponding FMM Habitats
Annual vegetation of driftlines	
Brittlestar beds	
Coarse sediment (high energy)	29 Unstable coarse sediments, robust fauna
Coastal lagoons	
Estuarine rock (boulder, cobble and bedrock)	7 Sheltered bedrock, boulders & cobbles
Intertidal bedrock reef	2 Wave exposed intertidal stable rock. 3 Moderately wave exposed intertidal rock. 1 Upper shore stable, rock, lichens and algal crusts
Intertidal boulder and cobble reef	7 Sheltered bedrock, boulders and cobbles 26 Low shore and shallow subtidal under boulder and cobbles (intertidal underboulder communities)
Intertidal gravel and sand	
Intertidal mixed sediments	28 Stable species; rich, mixed sediments
Intertidal mud	12 Intertidal muds
Intertidal mud and sand	10 Muddy sands excluding gaper clams 11 Muddy sands including gaper clams
Intertidal sand (high energy)	
Intertidal sea caves	8 Rockpools and overhangs
Kelp forest communities	22 Shallow subtidal rock with kelp 23 Kelp and seaweeds on sand scoured rock
Maerl	17 Maerl beds
Mussel beds on mixed and sandy sediments	27 Biogenic reef on sediment
Mussel bed on boulder and cobble skears	4 Seaweeds and mussels on moderately exposed rock
Peat and clay exposures	5 Mussels and piddocks on intertidal clay & peat
Reedbeds	
Sabellaria spp reef	6 Honeycomb worm reefs
Saltmarsh spp, Salicornia and Seablite	13 Salt marshes
Seagrass (SACs)	30 Seagrass beds
Submarine structures made by leaking gases	
Subtidal bedrock reef	14 Vertical rock with associated species 15 Erect & branching species, very slow growing 20 Rock with low-lying, fast-growing faunal turf 21 Rock with erect and branching species
Subtidal boulder and cobble reef	15 Erect & branching species, very slow growing 20 Rock with low-lying, fast-growing faunal turf 21 Rock with erect and branching species 22 Shallow subtidal rock with kelp
Subtidal gravel and sand	16 Sand and gravel (incl with long lived bivalves) 18 Stable subtidal fine sands
Subtidal mixed sediments	28 Stable species rich, mixed sediments 25 Oyster beds
Subtidal mud	19 Stable muddy sands, sandy muds and muds
Subtidal muddy sand	19 Stable muddy sands, sandy muds and muds
Subtidal mussel bed on rock	4 Seaweeds and mussels on moderately exposed rock
Subtidal sand (high energy)	24 Dynamic, shallow water fine sands
Subtidal sea caves	
Tideswept communities	31 Stable but tideswept cobbles, pebbles and gravel

C Fishing Gears Currently Used in Welsh Waters

Fishing Gear Group	Fishing Gear Type	Definition of Gear Type	Equivalent Welsh Activity Identified in Literature	Source (Specific Gear Type*) (See Reference List Below)	Currently undertaken Commercially in Welsh Waters? (Y/N)	Gear Operated From Licensed and Registered Commercial Fishing Vessel?	Notes - Information on Whether Occurring or not, Additional Clarifications etc
Towed (demersal)	Beam trawl (whitefish)	Trawl towed on the seabed in which the net is held open by a wood or steel beam	Beam trawl	1, 3, 4, 5, 8, 10, 12	Y	Y	
	Beam trawl (shrimp)		Shrimp trawl	1, 10	Y	Y	
	Beam trawl (pulse/wing)	Innovative new whitefish beam trawl method using electric current. Wing: uses sumwing and tickler chains to fish for whitefish			N	Y	WG pers. comm.
	Heavy otter trawl	Trawl towed on the seabed, held open by a pair of otter boards (trawl doors). Typically allows greater ground cover than a beam trawl. There are a wide variety of otter trawl varieties depending upon the nature of the ground to be fished and the target species. This includes light and heavy otter trawl designs. Heavy otter trawls include rock-hopper ground rope designs.	Otter trawl (not specified as heavy)	1, 10, 12	N (heavy otter trawl)	Y	WG pers. comm. (heavy otter trawl / no rockhopper trawls)
	Multi-rig trawls	Method of towing two or more otter trawls side by side	Twin rig trawl	1	Y	Y	
	Light otter trawl	See above	Light otter trawl	1, 2, 10	Y	Y	
	Pair trawl	Trawl towed between two boats, either on the seabed or in mid-water, held open by the distance apart of the two vessels. Covers small areas of hard seabed and can cover a swept area of 250 to 450 metres between boats with/without otter boards (trawl doors)	Demersal pair trawl	1	N	Y	WG pers. comm.
	Anchor seine	An encircling net shot in the open sea using very long ropes to lay out the net and ropes on the seabed prior to hauling from a boat at anchor	Danish seine netting	1	N	Y	WG pers. comm. Prohibited in [former] North Wales SFC area
Scottish/fly seine	An encircling net shot in the open sea using very long ropes to lay out the net and ropes on the seabed prior to towing the net closed and hauling from a boat under its own power. Sometimes called fly dragging, fly shooting or Danish seine	Scottish fly seine netting	1	N	Y	WG pers. comm. Prohibited in [former] North Wales SFC area	

Fishing Gear Group	Fishing Gear Type	Definition of Gear Type	Equivalent Welsh Activity Identified in Literature	Source (Specific Gear Type*) (See Reference List Below)	Currently undertaken Commercially in Welsh Waters? (Y/N)	Gear Operated From Licensed and Registered Commercial Fishing Vessel?	Notes - Information on Whether Occurring or not, Additional Clarifications etc
Towed (pelagic)	Mid-water trawl (single)	Trawl towed by one vessel using a set of midwater doors to open the net horizontally. The position within the water column is controlled by the speed of the vessel and the amount of weight on the wing ends.	Pelagic trawling	1, 12	N	Y	WG pers. comm.
	Mid-water trawl (pair)	As above but towed by two vessels	Pelagic pair trawling	1	N	Y	WG/NRW pers. comm.
	Industrial trawls	Small mesh towed net used to catch fish (such as sandeels, blue whiting or horse mackerel) for purposes other than human consumption	Industrial trawls?		N	Y	WG pers. comm.
Dredges (towed)	Scallops (King)	[Definition for 'Dredge:'] Rigid structure towed on the seabed usually for shellfish	Scallop dredge (teeth)	1, 2, 6, 7, 9, 10, 12	Y	Y	
	Scallops (Queen)	[Definition for 'Dredge:'] Rigid structure towed on the seabed usually for shellfish	Scallop dredge (blade)		Y	Y	
	Mussels, clams, oysters	[Definition for 'Dredge:'] Rigid structure towed on the seabed usually for shellfish	Mussel dredging (wild fishery) Oyster dredging (wild fishery)	1, 8	Y	Y	
	Pump scoop (cockles, clams)	Small shallow drafted boats tow or drag metal baskets along the seabed to collect cockles and clams			N	Y	WG pers. comm.
Dredges (other)	Suction (cockles)	Use of hydraulic dredger to collect cockles	Hydraulic suction dredging	1, 10	N	Y	WG/NRW pers. comm.
	Tractor		Tractor dredging	7	N	N	WG pers. comm.
Intertidal handwork	Hand working	Use of hand, rakes and buckets to collect shellfish usually at low tide, accessed from shore or by boat	Professional hand gathering	1, 2, 10, 12	Y	N	
Static - pots/traps	Pots/creels (crustacea/gastropods)	[Definition for 'Traps:'] A collective term for structures into which fish or shellfish are guided or enticed through funnels that encourage entry but limit escape. Pots, creels, cuttle pots, fish trap, and so on.	Potting (inkwellpots, parlour pots, prawn pots, whelk pots)	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12	Y	Y	
	Cuttle pots	See above	Cuttle pots	11, 12	N	Y	WG pers. comm.
	Fish traps	See above			N	Y	WG pers. comm.
Static - fixed nets	Gill nets	Single wall of netting which can either be fixed or allowed to drift. They catch fish by enmeshing or entangling them usually around their gill covers	Gill nets (surface set, bottom set, beach set)	1, 6, 7, 12	Y	Y	
	Trammels	Consists of three parallel panels of nets with different mesh sizes which can be used to catch a much wider variety of species	Trammel nets	1, 7	Y	Y	

Fishing Gear Group	Fishing Gear Type	Definition of Gear Type	Equivalent Welsh Activity Identified in Literature	Source (Specific Gear Type*) (See Reference List Below)	Currently undertaken Commercially in Welsh Waters? (Y/N)	Gear Operated From Licensed and Registered Commercial Fishing Vessel?	Notes - Information on Whether Occurring or not, Additional Clarifications etc
	Entangling	Nets with large meshes set on the seabed to capture shellfish and large whitefish such as monk, ray and turbot (also known as ray nets)	Tangle nets	1, 6, 7, 12	Y	Y	
Passive - nets	Drift nets (pelagic)	Panel of gill nets set perpendicular to the surface, allowed to drift with the tide or current to catch fish [targeting fish in the water column rather than on the seafloor]	Drift nets (pelagic)	1, 6, 7, 12	N	Y	WG pers. comm.
	Drift nets (demersal)	Panel of gill nets set perpendicular to the surface, allowed to drift with the tide or current to catch fish [targeting fish on the seafloor]			Y	Y	
Lines	Longlines (demersal)	Longlines that can be anchored or drifting, comprising backing lines, of variable lengths, to which are attached a series of baited hooks on snoods	Longlines	1, 6, 7, 10, 11, 12	Y	Y	Long lining limited to a few areas. Trot lines (beach set long lines). WG/NRW pers. comm.
	Longlines (pelagic)	Longlines that can be anchored or drifting, comprising backing lines, of variable lengths, to which are attached a series of baited hooks on snoods			N	Y	WG pers. comm.
	Handlines (rod/gurdy)	Fishing with a single fishing line by hand. Handlines is also a term used for 'gurdy' fishing for mackerel (a large hand operated reel)	Handlining / Commercial rod and line	1, 7, 8, 10, 11, 12	Y	Y	
	Jigging/trolling	Jigging is a type of fishing with a rod or machine and is a type of fishing lure. A sinker with hooks on a single or multiple lines is jerked to attract many species of fish in both fresh and saltwater. Trolling is a method of towing artificial lures to attract fish	Jigging	1, 10, 12	Y	Y	
Seine nets and other	Purse seine	A large net used to surround a shoal of pelagic fish, the bottom of which is then drawn together to enclose them	Purse Seine	12	N	Y	WG/NRW pers. comm.
	Beach seines/ring nets	An encircling net shot from a small boat then drawn ashore by ropes. This is sometimes called a dragnet. Ring net is a net operated by surrounding a shoal of pelagic fish with a 'wall' of netting, often operated by two boats. Works in a similar manner to a purse seine.	Beach seine	1, 10	Y	Y	

Fishing Gear Group	Fishing Gear Type	Definition of Gear Type	Equivalent Welsh Activity Identified in Literature	Source (Specific Gear Type*) (See Reference List Below)	Currently undertaken Commercially in Welsh Waters? (Y/N)	Gear Operated From Licensed and Registered Commercial Fishing Vessel?	Notes - Information on Whether Occurring or not, Additional Clarifications etc
	Shrimp push-nets	A triangular shape net with a wooden or metal frame used to collect shrimp. A handle is attached to the frame and pushed along the surface of sand in order to collect the shrimp.	Shrimp push net	1	Y	N	
	Fyke and stakenets	Fyke net is a conical shaped trap net with a circular or D-shaped opening often with a guide panel/s of netting often used to catch eels. Stake net is a net fixed by stakes generally in rivers or where the sea ebbs and flows in shallow intertidal zones	Fyke and stake nets	12	Y	N	
Miscellaneous	Commercial diving	Diving for commercial profit (such a rig divers or armed forces divers, scientists and those diving to fish/collect)			Y	Y	NRW pers. comm. (RS)
	Bait dragging	Rake is towed along the mudflats from a boat to gather worms			N	Y	WG pers. comm.
	Crab tiling		Peeler crab traps?	1	Y	N	
Bait collection	Digging with forks	Fork, spade or bait pump are used to collect bait for fishing	Soft substrate (digging)	1	Y	N	WG pers. comm. Does not occur commercially.

* Sources in which the specific gear type was referred to (e.g. trammel nets, tangle nets) as opposed to generic gear types (e.g. static nets).

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D Fisheries Management Measures

Ref no	Legislation	Description	Relevant Influence on Gear/Feature Interactions	Additional Note(s)
L1	The Scallop Fishing (Wales) (No. 2) Order 2010	The Scallop Fishing (Wales) (No. 2) Order 2010 manages the scallop fishery throughout Wales and includes technical (i.e. type and quantity of gear etc), temporal (i.e. season or length of time etc) and spatial (i.e. area) restrictions. The 2010 Order prohibits scallop dredge fishing in areas which have been identified as important to vulnerable marine species and habitats and allows a specific area within the Cardigan Bay SAC (known as the Kaiser Box) to open on 01 November and close on 30 April annually.	Spatial restrictions. Prohibits (king) scallop dredging within 1 nm, i.e. for all intertidal habitats. HRA carried out. All relevant sensitive features addressed.	<p>Revoked Prohibition of Fishing for Scallops (Wales) Order 2009 and the Scallop Fishing (Wales) Order 2010. Note , there is an ongoing consultation on new management measures for scallop fishing in Cardigan Bay , which closes on 17.02.16.</p> <p>N Wales Byelaws 12, 20 of the former NWNW SFC are relevant to the regulation of Scallop fishing in Wales (stated in Welsh Government, 2015 - Cardigan Bay scallop dredging consultation document)</p> <p>S Wales Byelaws 14 (MLS), 40 (restriction method of harvesting - written authorisation and 45 (temporal restriction) of former South Wales SFC are relevant to the regulation of Scallop fishing in Wales (stated in Welsh Government, 2015 - Cardigan Bay scallop dredging consultation document)</p>
L2	Scallop Dredging Operations (Tracking Devices) (Wales) Order 2012	Requires scallop vessels to use tracking devices		The explanatory note states that the order regulates scallop dredging operations (in Wales) by placing a requirements on certain British fishing boats with scallop dredges onboard to transmit certain information.
L3	Sea Fish (Specified Sea Areas) (Prohibition of Fishing Method) (Wales) Order 2012	Prohibits use of bottom towed gear from any fishing boat in two specified sea areas in North Wales to protect horse mussel reefs	Spatial restrictions (see Column I) - mobile gears and horse mussel reefs	Revokes and replaces Byelaw 21 of the former NWNW SFC. Specific sea areas provided as co-ordinates in Order.
L4-3	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments. BYL3 - prohibition of anchor seining and Scottish seining	BYL3 - prohibition of anchor seining and Scottish seining in SFC district <6 nm)	
L4-6	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL6 - size limit on shrimp trawl beam length	BYL6 - prohibition of mobile trawls for shrimp (beam and otter) where length of beam (or otter trawl headline) or multiple beams/headlines > 10 m in length; also min mesh size 20 mm, use of riddle	Applicable to Beam trawl (shrimp) and shrimp push nets in 0-6 nm.
L4-12	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL12 – bivalve molluscan shellfish	BYL12 - any dredge for molluscan shellfish must have written authorisation from SFC which may have conditions (temporal and/or spatial restrictions) attached (0-6 nm)	BYL 12 relevant to scallop/mussel/clam/oyster dredging 0-6 nm
L4-20	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL20 - scallop dredging in Cardigan Bay	BYL20 - temporal restrictions on scallop fishing in Cardigan Bay	

Ref no	Legislation	Description	Relevant Influence on Gear/Feature Interactions	Additional Note(s)
L4-21	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL21 - bottom towed gear	BYL21 - prohibition of bottom trawled gear in specific areas (co-ords given)	BYL 21 relevant to tractor dredging 0-6 nm. REVOKED BY Sea Fish (Specified Sea Areas) (Prohibition of Fishing Method) (Wales) order 2012
L4-24	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL214- fixed engines	BYL24 - temporal restrictions and technical specifications on fixed engines to avoid taking salmonids	
L4-25	Inshore Fishery Legislation (North Wales, 0-6 nm)	Bye-laws of the former North Western and North Wales SFC, implemented via statutory instruments BYL25 - drift nets	BYL25 - prohibition of drift nets in specific areas at specific times (2 areas all the time) to protect migrating salmonids (rel. to mobile features)	
L5-13	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL13 - Shellfish minimum sizes	BYL13 - Shellfish minimum sizes. Min sizes for oyster, mussels and cockles. Undersized mussels and cockles (for seed) may be taken with a permit - undergoes assessment	
L5-17	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL17 - Burry Inlet cockle fishery	BYL17 - The licensing of cockle gathering in the Burry Inlet. Must have a permit to gather cockles	
L5-20	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL20 - Protection of shellfish beds - Burry Inlet	BYL 20 - no activity permitted which disturbs or damages the surface of the seabed within specific areas in Burry Inlet (without written authority)	
L5-25	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL25 - Milford Haven prohibited area	BYL25 - prohibition of towed fishing gear for sea fish within a specified area (river) in Milford Haven	
L5-26	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL26 - Milford Haven prohibited area	BYL26 - prohibition of any trawl, anchor seine or fly dragging seine for sea fish in a specific area in Milford Haven	
L5-27	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL27 - Prohibition of dredge and beam trawls, Skomer	BYL27 - prohibition of any dredge or beam trawl in specific area (Skomer)	
L5-28	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL28 - Prohibition scallop fishing Skomer	BYL28 - prohibition of scallop fishing in specific area (Skomer)	
L5-29	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL29 - Bass nursery areas	BYL29 - restriction on fishing by boat in bass nursery areas - dredging for molluscs and potting for crustaceans exempt	
L5-30	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL30 - Fixed nets	BYL30 - Fixed nets to be cleared of fish regularly, salmon/sea trout returned to sea, specification of areas where nets cannot be set (reason for restrictions not specified)	
L5-31	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL31 - prohibition of drift nets	BYL31 - prohibition of drift nets in specific areas at specific times (some areas all times) - mainly rivers	

Ref no	Legislation	Description	Relevant Influence on Gear/Feature Interactions	Additional Note(s)
L5-39	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL39 - beam trawl max length	BYL39 - restriction on beam trawls >4 m length without written authority, within 3 nm.	
L5-40	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL40 - shellfish harvesting	BYL40 - restriction of methods of bivalve molluscan shellfish harvesting to hand/hand held instrument (other methods to be approved dependent on its use not causing unacceptable damage to any molluscan fishery and/or other biota (marine or otherwise) and/or more than 10% by weight of target species damaged)	BYL 40 relevant to scallop, mussel, clam, oyster and tractor dredging 0-6 nm.
L5-47	Inshore Fishery Legislation (South Wales, 0-6 nm)	Bye-laws of the former South Wales SFC, implemented via statutory instruments BYL47 - Three Rivers cockle fishery	BYL47 - Permit to take Cockles in the Three Rivers Estuary.	
L6	The Cockles and Mussels (Specified Area) (Wales) Order 2011	Prohibits commercial hand gathering of cockles and mussels in north Wales without a permit granted by the Welsh Ministers. A permit is required to take cockles and mussels within a specified area, unless <5 kg per day for personal consumption, or from a British fishing boat.	All intertidal shellfisheries require permit and potential interactions are assessed.	Revokes BYL5N.
L7	Common Fisheries Policy	Retaining salmon and sea trout is prohibited anywhere in UK waters by UK boats as a condition to fishing licences and also under Art 26 of the Tech Con. Reg 850/98 for non UK boats.	Prohibited to catch or retain salmon and sea trout without a licence.	
Consultation	Welsh Government Consultation - Scallop fishing in Cardigan Bay: New Management Measures	WG consultation on proposed adaptive management measures for scallop fisheries within Cardigan bay within 3-12 nm		Consultation end 17.02.16.

E List of Evidence Sources

E.1 List of evidence sources from FIED

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