

# Fisheries Impacts Evidence Database Project Methodology Report

An in-depth review of fishing impacts on protected habitats and accompanying evidence spreadsheet

October 2023

Natural England Evidence Review NEER029

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# Report details

## Author

Ruth Cantrell and Joshua Day

## Project Manager

Ruth Cantrell

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# Executive summary

*The Fisheries Impacts Evidence Database Spreadsheet (FIED)* and *Fisheries Impacts on Marine Protected Habitats – A Review of the Evidence* are two evidence products produced by Natural England as part of a project commissioned by Defra's Marine Biodiversity Impacts Evidence Group. The purpose of each product is to support the assessment and management of commercial fishing in Marine Protected Areas (MPAs), providing a collation of impacts evidence is to inform Habitat Regulations and Marine Conservation Zone Assessments. These products will therefore be primarily of use to fisheries regulators but will be publicly available.

The FIED was initially created and developed by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) to signpost key evidence sources to support the assessment of the potential fishing impacts in European Marine Sites. As part of this evidence project the spreadsheet has been updated and increased in scope to include evidence related to Marine Conservation Zone feature. The updated spreadsheet is searchable using specific terms for features, sub-features, and fishing gear types. Natural England will periodically update it.

*The Fisheries Impacts on Marine Protected Habitats – A Review of the Evidence* is a written document that provides summaries of evidence concerning the impacts of different fishing gears on MPA features. These summaries reflect our best available evidence on impacts at the time of writing, as well as highlight key evidence gaps and limitations. It should be noted that whilst these syntheses will support regulators in their MPA assessments, site specific assessments would need to also consider any further new or site-specific evidence.

This report details how evidence sources were collated, and prioritised, how, and why the evidence found were brigaded to be consistent with Natural England's MPA conservation advice packages, limitations of the project and quality assurance processes.

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# 1. Overview and background

## 1.1. The Revised Approach to Fisheries Management

In 2013, a policy decision, made by the Department for Environment, Food and Rural Affairs (Defra), meant all existing and potential commercial fishing operations should be managed in accordance with Article 6 of the Habitats Directive. This [Revised Approach](#) applies to all European Marine Sites<sup>1</sup> (EMS), requiring fisheries to be assessed, and management measures identified and put in place to protected designated habitats and species (Defra, 2013).

Management of fisheries is required to protected designated features of Marine Conservation Zones (MCZs). Section 125 of the [Marine and Coastal Access Act 2009](#) (UK Government, 2009) confers a duty upon public authorities to exercise their functions to best further the conservation objectives of UK MCZs. To support fisheries assessments, Natural England (Marine Management Organisation (MMO) developed a matrix of gear-feature interactions, 2014a). This was based upon features and sub-features as noted in Conservation Advice packages at the time, and a set of agreed gear types. This matrix provides a risk rating of the potential for different fishing gears to adversely impact designated marine habitats and species.

## 1.2. The Fisheries Impacts Evidence Database Spreadsheet

The Fisheries Impacts Evidence Database spreadsheet (FIED), a record of literature held within a spreadsheet, was developed by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) between 2012 and 2014 to signpost key evidence resources which could be used to support the assessment of the potential fishing impacts in EMS. The spreadsheet was based upon the gears and features defined in the Fisheries Matrix (Section 1.1.). The FIED is a library of papers, journals, books, reports, theses, and web-based tools which provide evidence regarding fisheries impacts on habitats and species. The FIED will be shared with relevant organisation upon request. Since 2014, Natural England has made occasional minor updates to the FIED including consideration of MCZ features.

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<sup>1</sup> European Marine Sites are Special Areas of Conservation and Special Protection Areas, consisting of marine areas (The Conservation of Habitats and Species Regulation, 2017, section 8)

## 1.3. Enhancing the FIED

The MMO and Natural England developed a project to enhance the FIED. The aims of the project were four-fold:

- a) To collate new up-to-date literature on gear-feature interactions
- b) To provide a spreadsheet to hold the data enabling searching and updating by users with standard software.
- c) To provide a desk note on appropriate spreadsheet use and caveats.
- d) To synthesise literature into summaries for gear-feature interactions.

Since Natural England are involved with Cefas and the original FIED and had identified a platform in which to host an enhanced spreadsheet, Natural England led on this project. Defra's Marine Biodiversity Impacts Evidence Group (MBIEG) awarded funding for this project.

The project steering group comprises Natural England, the MMO, the Joint Nature Conservation Committee (JNCC), Natural Resources Wales (NRW), the representatives of the Inshore Fisheries and Conservation Authorities (IFCAs) of Cornwall and Eastern IFCAs, Cefas and Defra. The group met by phone throughout the project to discuss and agree direction, progress, and content of the work.

## 1.4. The FIED

### 1.4.1. Purpose

The updated FIED, a record of literature held within a spreadsheet, retains its original purpose of sign-posting evidence resources for the assessment of fishing activities in marine protected areas. Further, it is a library of reference sources for publications regarding fisheries impacts. It can be searched using specific terms for features, sub-features, and fishing gear types.

### 1.4.2. Availability of the FIED

The FIED spreadsheet is currently shared with regulators and is available upon request. It will eventually be formally published together with this draft project report. The FIED spreadsheet will be made available via an external SharePoint where it will also contain metadata on Natural England's Conservation Advice references, and Condition Assessment References.

### **1.4.3. Updating the original Conservation Advice terminology**

The objective of making the spreadsheet more user-friendly involved a standardisation of “generic *features*” from the original FIED, with designated features and sub-features as described in Statutory Nature Conservation Body (SNCB) Conservation Advice.

Features of Special Areas of Conservation (SACs) are named in Conservation Advice following Annex 1 and 2 of the Habitats Directive (The Council of the European Communities, 1992); features of Special Protected Areas (SPAs) are named following Annex 1 of the Birds Directive (The Council of the European Communities, 2009); features of MCZs are named following the MCZ Ecological Network Guidance (ENG) (Natural England and the JNCC, 2010). Conservation Advice for English Marine Protected Areas (MPAs) include sub-features of designated habitat features and supporting habitats for species. These sub-features and supporting habitats are identified as European Nature Information System (EUNIS) biotopes and are named as such.

It was determined the FIED and accompanying literature synthesis would focus on MCZ features and EMS sub-features and supporting habitats as the appropriate level at which to conduct the literature reviews and search for evidence. This is the most common level of habitat mapping, and the most detailed level at which Conservation Advice is provided in England. Conservation Advice includes Conservation Objectives and Advice on Operations.

A translation from generic features named in the original FIED, to standardised features and sub-features was conducted in 2015. This translation was applied along with expert judgement within this current project to re-tag each reference. There was not always a one-to-one relationship between old and new terminology, but an approach was taken to ensure, in cases of doubt, references would be returned by appropriate search terms to enable users to access suitability for their specific purposes. The translations used can be found in Annex 1. Feature descriptions are linked from Annex 2.

Gear types used in the original FIED were retained as these are more specific than the coarser categorisation of fishing activity types used in Conservation Advice. Each gear type in the spreadsheet relates to one activity in the Advice on Operations within Conservation Advice packages, this translation can be found in Annex 3.

Whilst project staff were developing the Fisheries Impacts Evidence synthesis (Section 2), they searched for, found and recorded metadata for appropriate references which were not already in the FIED. Further additions were made to the FIED from metadata supplied by Devon and Severn IFCA, NRW, and the MMO.

## **1.5. Limitations**

The FIED holds bibliographic metadata concerning journals, reports, book, theses, and web resources. Links to websites are provided where possible. Users made need to



subscribe to journals or pay for access to individual papers. Further, this report will be formally published when the FIED spreadsheet is made available via Defra's Digital Data Services Platform.

Research is constantly being conducted and much research is conducted and published in the English language and other languages too. The FIED will evolve and be updated on an approximately twice-yearly basis. It does not hold information on all fisheries impacts research. If further information is required, various journal search engines are available online. During this project (2020-2021), literature searches were conducted for demersal towed gear on sediment, and for static gear on rock, maerl, and biogenic reef.

## **1.6. User guidance**

The FIED will eventually be hosted on Natural England's Access to Evidence Catalogue. Full user guidance is available on the opening page of the FIED which is available upon request. In summary, the spreadsheet will provide a list of references which can be downloaded as a Comma Separated Values (CSV) file. Then it can be opened in a spreadsheet programme such as Microsoft Excel.

## **1.7. Process for updating the FIED**

Natural England will maintain and update the spreadsheet on an opportunistic and periodic basis. It is expected that periodic updates will occur in line with the six-monthly Conservation Advice updates. Periodically, Natural England will update the references contained in the spreadsheet. Stakeholders must include a list of standardised gears and features relevant to each new reference. It will be possible to identify new records based on the date entered to the spreadsheet.

# **2. Fisheries Impacts Evidence Synthesis report: Fishing Impacts on Marine Protected Habitats – A Review of the Evidence**

## **2.1. Purpose and use of the syntheses**

The [syntheses](#) have been developed to support the drafting of fisheries assessments by regulators (e.g., Habitat Regulations Assessments (HRAs), MCZ assessments etc) and to support the provision of advice by statutory advisors. They may also to signpost organisations to evidence regarding fishing in wider seas and for considering Good

Environmental Status. They provide summaries of evidence concerning impacts on gear-types on features and sub-features. In some cases, the evidence sources do not agree on the impacts, and this reflected in the synthesis. Evidence sources used in the syntheses are referenced in the syntheses and should be read, and considered, alongside other site-specific and more recent evidence to provide full assessment at a local level of fishing practices.

These syntheses are not Natural England's advice on HRAs or MCZ assessments. Our high-level advice on sensitivity of features to fishing and the attainment of MPA Conservation Objectives in English MPAs can be found in the Conservation Advice packages (see [Designated Sites View](#)). Similarly, Conservation for offshore MPAs for which JNCC is the lead SNCB can be found in the Site Information Centres see [Offshore Marine Protected Areas](#) and for Welsh Conservation Advice see [Conservation Advice for European Marine Sites](#). Natural England and JNCC will continue to provide bespoke advice for individual fisheries assessments in MPAs and in wider seas through standard consultation processes.

## 2.2. Literature searches

It was accepted at the start of the project that an exhaustive search of all papers, reports, books etc (hereafter referred to as evidence) would not be possible and a strategic cascading approach would be needed. Evidence already within the FIED was used as indicated by its tagging. Specific and generic search terms were entered into Open Athens (the journal search engine used by Natural England) and into Google and Google Scholar to seek more recent evidence. The searches were conducted for papers published since 2014 to eliminate results already in the FIED. Evidence was chosen for inclusion in the updated FIED and review for the syntheses based on the relevance of the title. Citations within papers were read where deemed pertinent. Thus, a cascade of identifying relevant literature was followed. Due to the variation in terminology used in scientific literature, the search terms used in the literature searches were not prescribed prior to searching. The authors of the literature syntheses conducted literature searches using specific standardised habitat and gear names as well as generic terminology e.g., bottom towed gear and demersal towed gear; seagrass and eel grass and *Zostera*.

## 2.3. Terminology used in syntheses

As mentioned in section 2.2., the terminology used to define features and sub-features has been standardised to match that used in Conservation Advice. Further, the syntheses use the Conservation Advice terminology of pressures where possible. It should be noted whilst standardised terminology is used in the syntheses and the FIED to facilitate accurate searching and linking between different products, individual sources and wider science may use different terminology.

Gear types, features and sub-features which are the focus of each synthesis are based upon the following:

1. Gear types and descriptions developed at the time of the Revised Approach and used in the original FIED – [Definitions of different fishing gears](#) (MMO 2014 b). Names of some gears have been changed slightly to enable easier searching (See Annex 2).
2. Feature and sub-features as described in Conservation Advice, based upon EUNIS categorisation and the MCZ Ecological Network Guidance (See Annex 1)

Caution should be used when referring to evidence that discusses bycatch and discards. This terminology is used in the literature but does not necessarily along with any legislative definition(s) or those used by SNCBs. There is also a section in each synthesis on “*Removal of species.*” It is important to note for MPA pressures, removal of any species (whether targeted by a fishery or caught as bycatch) is only a pressure if those species can be directly linked back to the designated features on an MPA and the Conservation Objectives. Sites specific advice is likely to be needed from SNCBs regarding relevance of that pressure of species removal and how it could impact the Conservation Objectives of a site. Removal of species may have food web effects as well as altering biotopes.

## 2.4. Limitations

Some gears have been thoroughly researched and linked to impacts on habitats and species. However, there are several gear-feature interactions where there is a lack of targeted research and therefore gaps in the literature. Each synthesis is presented with a statement about the evidence reviewed at the start and where evidence is lacking, this is stated. Similarly, where there is little evidence in the synthesis about a particular pressure, this is because little evidence was found during extensive literature searches. In general, fishing intensity and thresholds are not set out. There are a few exceptions where the evidence itself discusses these. Impacts will be relative to intensity of fishing but the relationship between intensity and impact may not be linear. The syntheses do not set out to provide thresholds below which fishing could occur without significant adverse impact as this will vary between different geographical areas and on distinctive features.

Confidence levels have not been assigned to each piece of evidence or to each impact synthesis. However, the “*evidence*” section at the start of each synthesis sets out the provenance of evidence reviewed including the media types and geographic locations. This information could be used to assess the relevance of the evidence to a given fisheries assessment. Ghost fishing or the continued fishing by abandoned, lost, or discarded gear is a ubiquitous issue and may result from any gear type. Several papers regarding potting and static netting discuss ghost fishing and this is reflected in the syntheses. No references to ghost fishing from bottom towed gear were found although this was not a specific search criterion. There is no distinction drawn in the syntheses between commercial and recreational fishing.

## 2.5. Prioritisation

The project steering group recognised the resource available required prioritisation of gear-feature interactions for sourcing new data and providing syntheses. Steering group members put forward their priority interactions based upon their plans for upcoming fisheries assessments and their experience of data gaps and requirements for summarised information. Priorities were determined as bottom-towed gear on sediment and static gear on rock, *Sabellaria*, seagrass and maerl. Any remaining gear-feature syntheses will be completed when funding and resource become available.

## 2.6. Brigading of gears and features

In most cases, papers did not differentiate between habitat or gear types. For example, many papers discuss “*sediment habitats*” rather than breaking this down to sand or mud. Similarly, it was found there was little differentiation between different types of static nets – gill, entangling, and trammel nets. Due to this non-differentiation, syntheses may cover more than one gear or feature type.

# 3. Quality Assurance

The syntheses, FIED and this report have been through a Quality Assurance process following Natural England’s Quality Management standard (Natural England, 2014). The gear-feature literature syntheses have undergone a period of internal and external quality assurance. Towards the beginning of the project, a small number of syntheses of differing formats and content were presenting to the steering group for comment. Those comments were assessed and used to refine the final format, content, and language of the syntheses. First drafts of the syntheses were shared within the Fisheries team of Natural England and with the steering group. Each synthesis, in turn, was reviewed by at least one internal staff member and the vast majority were reviewed by one or more members of the steering group. This Quality Assurance sought comment on the content, language, and usability of the documents. Final drafts of the syntheses and this report were Quality Assured by internal fisheries staff, the steering group, and members of Impacts Evidence Group.

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# Glossary

Cefas - Centre for Environment, Fisheries and Aquaculture Science

CSV - Comma Separated Value (file type which can be opened in a spreadsheet programme)

Defra - Department for Environment, Food and Rural Affairs

EMS - European Marine Site

ENG - Ecological Network Guidance

EUNIS - European Nature Information System

FIED - Fisheries Impacts Evidence Spreadsheet

GES - Good Environmental Status

GI – Geographical Information

HRA - Habitats Regulations Assessment

IFCA - Inshore Fisheries and Conservation Authority

JNCC - Joint Nature Conservation Committee

MBIEG - Marine Biodiversity Impacts Evidence Group

MCZ - Marine Conservation Zone

MEP - Marine Evidence Portal

MMO - Marine Management Organisation

MPA - Marine Protected Area

NRW - Natural Resources Wales

OLIB - Online Library (Defra's internal online library)

QA - Quality Assurance

SAC - Special Area of Conservation

SNCB - Statutory Nature Conservation Body

SPA - Special Protection Area

UK - United Kingdom



# Annexes

## Annex 1 – Standardising components of the FIED

Existing identification of features discussed in references were based on the “generic features” in the original FIED. These generic features have been translated to the standardised features and sub-features for which Conservation Advice has been written as follows. Where there is no translation possible, the original generic feature is included in the FIED as “Other Habitat or species”. Note: some cells have been left deliberately blank.

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
Benthic feeding seabirds										Benthic feeding seabirds
Estuarine Birds										Estuarine Birds
Pursuit and plunge diving birds										Pursuit and plunge diving birds
Surface feeding birds										Surface feeding birds

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Grey and Common Seal</b>	Grey seal	Harbour (common) seal								
<b>Salmon</b>	Atlantic salmon (Salmo salar)									
<b>River and sea lamprey</b>	River lamprey	Sea lamprey								
<b>Twaite and Allis shad</b>	Twaite shad	Allis shad								
<b>Estuarine fish community</b>	Water column									Estuarine fish community
<b>Seagrass (SACs)</b>	Intertidal seagrass beds	Subtidal seagrass beds								

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Original FIED Generic feature</b>	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Seagrass (SPAs)</b>	Intertidal seagrass beds	Subtidal seagrass beds								
<b>Maerl</b>	Maerl beds	Subtidal macrophyte-dominated sediment								
<b>Saltmarsh spp, Salicornia and Seablite</b>	Atlantic salt meadows (Glaucopuccinellia maritima)	Coastal saltmarshes and saline reedbeds	Freshwater and brackish wetlands including reedbeds, marshes and wet grasslands, fen meadows, ditches, calcareous fens with	Marshland coastal habitats	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornea fruticosi)	Salicornia and other annuals colonising mud and sand	Saltmarsh (including transitions to peatland mires)	Spartina swards (Spartinion maritimae)	Freshwater and coastal grazing marsh	

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
			Cladium mariscus)							
<b>Annual vegetation of driftlines</b>	Annual vegetation of driftlines									
<b>Reedbeds</b>	Coastal reedbeds									
<b>Coastal lagoons</b>	Coastal lagoons									
<b>Brittlestar beds</b>										Brittlestar beds
<b>Kelp forest communities</b>										Kelp forest communities
<b>Original FIED Generic feature</b>	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Intertidal sea caves</b>	Submerged or partially submerged sea caves									
<b>Subtidal sea caves</b>	Submerged or partially submerged sea caves									
<b>Tideswept communities</b>	Tide-swept channels									
<b>Submarine structures made by leaking gases</b>	Submarine structures made by leaking gases									
<b>Mussel bed on boulder and cobble skears</b>	Intertidal biogenic reefs	Subtidal biogenic reefs	Blue mussel ( <i>Mytilus edulis</i> ) beds	Intertidal biogenic reef: mussel beds	Subtidal biogenic reefs: mussel beds					

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Mussel beds on mixed and sandy sediments</b>	Intertidal biogenic reefs	Subtidal biogenic reefs	Blue mussel ( <i>Mytilus edulis</i> ) beds	Intertidal biogenic reef: mussel beds	Subtidal biogenic reefs: mussel beds					
<b>Subtidal mussel bed on rock</b>	Subtidal biogenic reefs	Blue mussel ( <i>Mytilus edulis</i> ) beds	Subtidal biogenic reefs: mussel beds							
<b>Sabellaria spp reef</b>	Intertidal biogenic reefs	Subtidal biogenic reefs	Honeycomb worm ( <i>Sabellaria alveolata</i> ) reefs	Ross worm ( <i>Sabellaria spinulosa</i> ) reefs	Intertidal biogenic reef: Sabellaria spp.	Subtidal biogenic reefs: Sabellaria spp.				
<b>Original FIED Generic feature</b>	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Intertidal and subtidal chalk reef</b>	Subtidal chalk	Littoral chalk communities								

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Estuarine rock (boulder, cobble, and bedrock)</b>	Estuarine rocky habitats	Intertidal under boulder communities	Infralittoral rock	Circalittoral rock	Intertidal rock					
<b>Intertidal bedrock reef</b>	Intertidal stony reef	High energy intertidal rock	Moderate energy intertidal rock	Low energy intertidal rock	Estuarine rocky habitats					
<b>Intertidal boulder and cobble reef</b>	Intertidal stony reef	High energy intertidal rock	Moderate energy intertidal rock	Low energy intertidal rock	Estuarine rocky habitats					
<b>Subtidal bedrock reef</b>	Infralittoral rock	Circalittoral rock	High energy infralittoral rock	Moderate energy infralittoral rock	Low energy infralittoral rock	High energy circalittoral rock	Moderate energy circalittoral rock	Estuarine rocky habitats		
<b>Subtidal boulder and cobble reef</b>	Infralittoral rock	Circalittoral rock	Subtidal stony reef	High energy infralittoral rock	Moderate energy infralittoral rock	Low energy infralittoral rock	High energy circalittoral rock	Moderate energy circalittoral rock	Estuarine rocky habitats	

Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Intertidal mud</b>	Intertidal mud	Intertidal sand and muddy sand	Intertidal mixed sediments							
<b>Intertidal mud and sand</b>	Intertidal mud	Intertidal sand and muddy sand	Intertidal mixed sediments							
<b>Intertidal sand (high energy)</b>	Intertidal sand and muddy sand									
<b>Original FIED Generic feature</b>	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Intertidal gravel and sand</b>	Intertidal coarse sediment	Intertidal sand and muddy sand	Intertidal mixed sediments							
<b>Intertidal mixed sediments</b>	Intertidal mixed sediments	Intertidal coarse sediment								



Original FIED Generic feature	Standardised feature or sub-feature 1	Standardised feature or sub-feature 2	Standardised feature or sub-feature 3	Standardised feature or sub-feature 4	Standardised feature or sub-feature 5	Standardised feature or sub-feature 6	Standardised feature or sub-feature 7	Standardised feature or sub-feature 8	Standardised feature or sub-feature 9	Other habitat or species
<b>Subtidal mud</b>	Subtidal mud	Subtidal mixed sediment								
<b>Subtidal muddy sand</b>	Subtidal mud	Subtidal sand	Subtidal mixed sediment							
<b>Subtidal sand (high energy)</b>	Subtidal sand									
<b>Subtidal gravel and sand</b>	Subtidal coarse sediment	Subtidal sand	Subtidal mixed sediment							
<b>Subtidal mixed sediments</b>	Subtidal mixed sediment	Subtidal coarse sediment	Subtidal sand							
<b>Coarse sediment (high energy)</b>	Intertidal coarse sediment	Subtidal coarse sediment								

## Annex 2 – Feature Descriptions

SAC features and sub-features:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/520290/SAC-feature-descriptions.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/520290/SAC-feature-descriptions.pdf)

MCZ Broad Scale Habitats and Features of Conservation Importance:

<https://webarchive.nationalarchives.gov.uk/20140605104959/http://www.naturalengland.org.uk/ourwork/marine/mpa/mcz/features/default.aspx>

## Annex 3 – Gear descriptions and translations

Different gear types have been described in documents accompanying information on the revised approach to fisheries management. The descriptions were used to develop the original FIED see [gear glossary](#).

The gear names and descriptions used in the updated FIED, and literature syntheses are shown in the first two columns of the following table. The equivalent gear names used in the Revised Approach and translations to Natural England Advice on Operations activities are also included.

FIED Gear Name	Gear Definition	Revised approach gear name	Advice on Operations Activity Name
<b>Beam trawl (whitefish)</b>	Trawl towed on the seabed in which the net is held open by a wood or steel beam.	Towed (demersal): Beam trawl (whitefish)	Demersal trawl
<b>Beam trawl (shrimp)</b>	Trawl towed on the seabed in which the net is held open by a wood or steel beam.	Towed (demersal): Beam trawl (shrimp)	Demersal trawl
<b>Beam trawl (pulse/wing)</b>	Innovative new whitefish beam trawl method using electric current.	Towed (demersal): Beam trawl (pulse/wing)	Electrofishing
<b>Heavy otter trawl</b>	Any otter trawl that uses any of the following: sheet netting of greater than 4mm twine thickness; rockhoppers or discs of 200mm or above diameter; a chain for the foot/ground line (instead of wire); multiple tickler chains	Towed (demersal): Heavy otter trawl	Demersal trawl
<b>Multi-rig otter trawls</b>	Method of towing two or more otter trawls side by side.	Towed (demersal): Multi-rig trawls	Demersal trawl
<b>Light otter trawl</b>	Any otter trawl that uses anything less than the definition of a heavy otter trawl.	Towed (demersal): Light otter trawl	Demersal trawl
<b>Pair trawl</b>	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	Towed (demersal): Pair trawl	Demersal trawl
<b>Anchor seine</b>	An encircling net shot in the open sea using very long ropes to lay out the net and ropes	Towed (demersal): Anchor seine	Demersal seines

<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
	on the seabed prior to hauling from a boat at anchor.		
<b>Scottish/fly seine</b>	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.	Towed (demersal): Scottish/fly seine	Demersal seines
<b>Mid-water trawl (single)</b>	Trawl towed by one vessel using a set of otter boards (trawl doors) designed for the midwater 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.	Towed (pelagic): Mid-water trawl (single)	Pelagic fishing
<b>Mid-water trawl (pair)</b>	Trawl towed by two vessels using a set of otter boards (trawl doors) designed for the midwater 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.	Towed (pelagic): Mid-water trawl (pair)	Pelagic fishing
<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
<b>Industrial trawls</b>	Small mesh towed net used to catch fish (such as sandeels, blue whiting or horse mackerel) for purposes other than human consumption.	Towed (pelagic): Industrial trawls	Pelagic fishing
<b>Scallop dredge</b>	Rigid structure towed on the seabed usually for shellfish.	Dredges (towed): Scallops	Dredges
<b>Mussel, clam, oyster dredge</b>	Rigid structure towed on the seabed usually for shellfish.	Dredges (towed): Mussels, clams, oysters	Dredges
<b>Pump scoop dredge (cockles, clams)</b>	Small shallow drafted boats tow or drag metal baskets along the seabed to collect cockles and clams.	Dredges (towed): Pump scoop (cockles, clams)	Hydraulic dredges

<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
<b>Suction dredge (cockles)</b>	Use of hydraulic dredger to collect cockles.	Dredges (other): Suction (cockles)	Hydraulic dredges
<b>Tractor dredge</b>	Rigid structure towed on the seabed usually for shellfish.	Dredges (other): Tractor	Dredges
<b>Hand work (access from vessel)</b>	Use of hand, rakes, and buckets to collect shellfish usually at low tide accessed by boat.	Intertidal handwork: Hand working (access from vessel)	Shore-based activities
<b>Hand work (access from land)</b>	Use of hand, rakes, and buckets to collect shellfish usually at low tide accessed from the shore.	Intertidal handwork: Hand work (access from land)	Shore-based activities
<b>Pots/creels (crustacea/gastropods)</b>	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, fish traps.	Static – pots/traps: Pots/creels (crustacea/gastropods)	Traps
<b>Cuttle pots</b>	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, fish traps.	Static – pots/traps: Cuttle pots	Traps
<b>Fish traps</b>	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, fish traps.	Static – pots/traps: Fish traps	Traps
<b>Gill nets</b>	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.	Static – fixed nets: Gill nets	Anchored nets/lines
<b>Trammel nets</b>	Consists of three parallel panels of nets with different mesh sizes which can be used to catch a much wider variety of species.	Static – fixed nets: Trammels	Anchored nets/lines
<b>Entangling nets</b>	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).	Static – fixed nets: Entangling	Anchored nets/lines

<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
<b>Drift nets (pelagic)</b>	Panel of gill nets set perpendicular to the surface, allowed to drift with the tide or current to catch fish.	Passive – nets: Drift nets (pelagic)	Pelagic fishing
<b>Drift nets (demersal)</b>	Panel of gill nets set perpendicular to the surface, allowed to drift with the tide or current to catch fish.	Passive – nets: Drift nets (demersal)	Anchored nets/lines
<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
<b>Longlines (demersal)</b>	Longlines that can be anchored or drifting, comprising backing lines, of variable lengths, to which are attached a series of baited hooks on snoods.	Lines: Longlines (demersal)	Anchored nets/lines
<b>Longlines (pelagic)</b>	Longlines that can be anchored or drifting, comprising backing lines, of variable lengths, to which are attached a series of baited hooks on snoods.	Lines: Longlines (pelagic)	Pelagic fishing
<b>Handlines (rod/gurdy)</b>	Fishing with a single fishing line by hand. Handlines is also a term used for 'gurdy' fishing for mackerel (a large hand operated reel).	Lines: Handlines (rod/gurdy)	Pelagic fishing
<b>Jigging/trolling</b>	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.	Lines: Jigging/trolling	Pelagic fishing
<b>Purse seine</b>	A large net used to surround a shoal of pelagic fish, the bottom of which is then drawn together to enclose them.	Seine nets and other: Purse seine	Pelagic fishing
<b>Beach seines/ring nets</b>	A beach seine is an encircling net shot from a small boat then drawn ashore by ropes. This is sometimes called a dragnet. A ring net is operated by surrounding a shoal of pelagic fish with a 'wall' of netting, often	Seine nets and other: Beach seines/ring nets	Demersal seines

<b>FIED Gear Name</b>	<b>Gear Definition</b>	<b>Revised approach gear name</b>	<b>Advice on Operations Activity Name</b>
	operated by two boats. Works in a similar manner as a purse seine.		
<b>Shrimp push-nets</b>	A triangular shape hand net with wooden or metal frame used to collect shrimp. A handle is attached to the frame and pushed along the surface of sand to collect the shrimp	Seine nets and other: Shrimp push-nets	Shore-based activities
<b>Fyke and takenets</b>	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 eel. Stake nets: Is a net fixed by stakes generally in rivers or where the sea ebbs and flows in shallow intertidal zones.	Seine nets and other: Fyke and stakenets	Traps
<b>Commercial diving</b>	Diving for commercial profit (such as rig divers or armed forces divers, scientists and those diving to fish or collect).	Miscellaneous: Commercial diving	Diving
<b>Bait dragging</b>	Rake is towed along the mudflats from a boat to gather worms.	Miscellaneous: Bait dragging	Dredges
<b>Crab tiling</b>	Use of tiles, tyres, pipes, or other objects, placed on intertidal areas, which act as shelters for crabs. Crabs are collected from underneath these objects.	Miscellaneous: Crab tiling	Shore-based activities
<b>Bait digging</b>	Bait digging: Fork, spade or bait pump are used to collect bait for fishing.	Bait collection: Bait digging	Shore-based activities

Seafish has published a [useful guide to different fishing gear types](#) and this document covers the basic concepts of each fishing method (Montgomery 2015).

[Seafish also has a searchable online gear spreadsheet.](#)

[www.gov.uk/natural-england](http://www.gov.uk/natural-england)

